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Phytochemical Profiling, Antimicrobial and Cytotoxic Properties of Four Phlomis species

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15-18 February 2022

Poster: P1

Abstract Presenter:
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Abstract:
Chewing of the sticks has been recently recommended by World Health Organization (WHO) as effective accessories for oral health. Salvadora persica plays an important role in maintaining the integrity of the tooth structure. The purpose of the present study was to determine the effectiveness of Salvadora persica extract on saliva pH after acidic changes. Participants were asked to take part in three different days with one-week interval in our open label non-randomized clinical trial. The effects of aqueous ethanolic (80%) extract of fresh S. persica sticks, distilled water, and sucrose on pH of saliva were examined at some time points, immediately to 20 min. The obtained results showed that the pH of saliva was significantly increased following gargling the distilled water (p=0.007) and S. persica extract (p=0.000) compared to the control group. In addition, the pH of saliva in a group which applied mouthwash of S. persica was significantly increased compared to the distilled water (p=0.04). Application of S. persica extract as a mouthwash increased the pH of saliva after acidic changes. Therefore, it may be recommended as an alternative to increase pH of oral cavity for oral health improvement.

Keywords: antimicrobial, cytotoxicity, flavonoid, Phlomis, verbascoside

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Synthesis of Novel Indole Chalcones as Potential Cytotoxic Agents

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15-18 February 2022

Poster: P2

Abstract Presenter:
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Abstract:
Cancer is the second leading cause of death in the world and its incidence and mortality rates are ever-growing. Nowadays, the clinical use of conventional anticancer drugs like Taxanes and Vinca alkaloids have been limited due to their drug resistance and neurotoxic effects. Therefore, much more attention has been paid to the discovery of new antitumor agents. Indole and chalcone scaffolds are found in many naturally occurring compounds and recently their derivatives have received significant attention not only because of their simple structure and ease of production, but also their biological activities, including antioxidant, antimicrobial, anticancer and anti-inflammatory activities. In this work, we have designed and synthesized different indole chalcone derivatives as a new series of potential cytotoxic agents. Desired chalcones were synthesized via the reaction of different aromatic aldehydes, in basic condition, with chlorobenzyl-1H-indole derivative. All the synthesized compounds were characterized by 1HNMR, 13CNMR, LC-MS and IR spectral data. The target compounds were obtained by optimized condensation reaction between different aromatic aldehydes and desired ketone with good to excellent yields.

Keywords: Synthesis, Cancer, Cytotoxic Agents, Indole-chalcone

References:
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Enhanced Corneal Permeation of Pilocarpine Using Liposome Technology

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15-18 February 2022

Poster: P3

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Abstract:
A novel liposomal pilocarpine formulation as an ophthalmic drug delivery system has been designed to treat patients with glaucoma. The purpose of the present study was to formulate and evaluate liposomes loaded with pilocarpine and to evaluate permeation through rabbit cornea. Liposomes containing pilocarpine were prepared using thin film method. The quantities of soya lecithin and cholesterol were changed to enhance the encapsulation of the drug. The physicochemical properties of the prepared liposomes were evaluated according to their viscosity, pH, particle size, in vitro drug release, and transcorneal rabbit permeation. Dialysis membrane method was utilized to assess drug release profile. The results indicated that the mean particle sizes of liposomes were 120.5-212 nm and the pH and viscosity of formulations were in the range of 6.30-6.63 and 43.85-80.1 cps, respectively. According to the release study results, maximumally 60% of the drug released from liposomal formulations after 24 hours of the experiment. Also, the cumulative percentage of the drug permeated through rabbit cornea was differing from 3.86 to 14.9%. Irrespective from the composition and characteristics of the different liposomal formulations, they significantly increased the drug partitioning, permeability coefficient and flux of pilocarpine in rabbit cornea ex vivo model in comparison to control drug solution. The present study proved that any alteration in composition and nature of pilocarpine liposomal formulations may affect the drug permeability parameters through corneal membrane and also physico-chemical properties. It is probably due to the change in corneal structure in the presence of different liposomes composition.

Keywords: Corneal Permeability, Pearmeability, Liposome, Rabbit

References:
1. Tsai CH, Wang PY, Lin IC, Huang H, Liu GS, Tseng CL. Ocular drug delivery: role of degradable polymeric nanocarriers for ophthalmic application. Int J Mol Sci 2018; 19(9):2830. doi: 10.3390/ijms19092830.

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Preparation of Naringenin-Load Polyethyleneglycol(PEG)/Polycaprolactone (PCL) Electrospun Nnanofibers for Eevaluating the In-Vivo Wound Healing of Naringe

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15-18 February 2022

Poster: P4

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Abstract:
The skin is one of the most important defenses against pathogens. It can also be a penetrate way by wounds, damages and diseases. Some compounds like polycaprolactone fibers, phenolic plant compounds and naringenin are considered in wound treatment due to their stimulating collagen production, less side effects and high efficiency, respectively. Combining nanofibers and phenolic compounds is noticed to accelerating wound treatment. Materials and methods Synthesizing nanofibers of polycaprolactone and polyethylene glycol 3:1 in ratio using electrospinning and confirming by scanning electron microscope and FTIR test was done to perform this project. Then the rate of releasing of 3.125% naringenin of synthesized nanofibers were investigated by UV-visable. The animal test was done by creating wound on the Wistar breed rat and measuring the wound area during the test for 14 days and analyzing the datas use of imageJ and spss softwares. The wound tissue was removed for the tissue studies on the 15th day. Test results showed that the increase in naringenin concentration along nanofibers reduces the releasing rate. Likewise, in animal studies, outcomes showed that wound treatment in the nanofibers group on 1st, 4th, 7th days has no noticeable differences compared with the control group, on 10th and 14th days the treatment was decreased significantly and on the 1st day there was no significant differences compared with the nanofibers group containing naringenin. On the 4th , 7th , 10th , and 14th days there was no significant difference in nanofibers group containing naringenin compared with control group, but on 1st ,7th ,10th ,and 14th days a noticeable increase in healing was observed.

Keywords: Nanofiber, Polycaprolactone, Naringenin, Polyethylene Glycol, Wound

References:
1. McGrath JA, Eady RAJ PF. No TitleAnatomy and organization of human skin. In: Rook A, Burns T (eds) Rook's textbook of dermatology. In 2004.

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Molecular Binding Study of the Main Constituents of Thymus Migricus with Trimmer Spike Protein of Corona Virus by Molecular Docking

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15-18 February 202

Poster: P5

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Abstract:
Thymus, which includes around 215 species, is an important genus of the Lamiaceae family. It comprises several species that are native to Iran and can serve as valuable medicinal plants because of their biological and pharmacological properties. Indeed, it is commonly used by the local inhabitants as an expectorant, antiseptic, antispasmodic, carminative, antirheumatic, and diuretic. Furthermore, this plants antibacterial, antifungal, and antiviral characteristics have made it a global source of potential antimicrobial agents. Analysis of the compounds of this plant by gas chromatography reveals the main compounds as the following: thymol (55.6 %), γ-terpinene (16.7 %), geraniol (4.6 %), p-cymene (4.0 %), limonene (2.6 %) E-Caryophyllene (1.9 %) and α-Pinene (1.8 %). The aim of this study was to investigate the molecular binding of the main components of Thyme migricus with the trimmer of spike protein of Corona virus by the molecular docking method. According to the method, first, the PDB file of ten main constituents of Thymus migricus was extracted from the Chemspider database. Then, the PDB file of trimmer of spike protein was obtained from the rcsb site. In the next step, molecular binding analysis was performed for each compound using HDOCK online software. This study showed that although all of the analyzed compounds were able to bind to the coronavirus spike trimmer to some extent, Carvacrol exhibited the lowest docking energy and RMSD. To validate the genuine effectiveness of Thymus migricus compounds, more in vitro and in vivo researches are needed.

Keywords: Molecular Binding Study, Thymus Migricus, Trimmer, Spike Protein, Corona Virus, Molecular Docking

References:

1. Tohidi B, Rahimmalek M, Trindade H. Review on essential oil, extracts composition, molecular and phytochemical properties of Thymus species in Iran. Industrial Crops and Products. 2019; 134:89-99.

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Design and Synthesis of New Methyl 1,2-Diaryl-4-Hydroxy-5-oxo -2,5-Dihydro-1H-Pyrrole-3-Carboxylate Derivatives as Selective COX-2 Inhibitors

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15-18 February 2022

Poster: P6

Abstract Presenter:
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Abstract:
The use of non-steroidal anti-inflammatory drugs (NSAIDs) for the treatment of inflammation and pain is often accompanied by adverse gastrointestinal and renal side effects. Their anti-inflammatory activity results from inflammation of cyclooxygenase (COX), which catalyzes bioconversion of arachidonic acid to prostaglandins. Nowadays, it is well established that there are at least two COX isozymes, COX-1 and COX-2. COX-1 is responsible for the physiological production of prostaglandins while COX-2 is responsible for the elevated production of prostaglandins during inflammation. Thus, selective inhibition of COX-2 over COX-1 is useful for the treatment of inflammation and inflammation associated disorders with reduced gastrointestinal toxicities compared to NSAIDs. The withdrawal of some diaryl heterocyclic selective COX-2 inhibitors due to the adverse cardiovascular side effects delineates the need to explore and evaluate a new structural ring template possessing COX inhibitory activity. Therefore, in this study, new methyl 1,2-diaryl-4-hydroxy-5-oxo -2,5-dihydro-1H-pyrrole-3-carboxylate derivatives were designed and synthesized based on the structure-activity relationship of selective COX-2 inhibitors. Target compounds were synthesized in two steps. In the first step, 4-(methylthio)benzaldehyde, arylamine derivatives, and dimethylacetylenedicarboxylate (DMAD) in the presence of para-toluene sulfonic acid (PTSA) were stirred in ethanol for 72 hours. After the completion of the reaction, the resulting product was filtered off and recrystallized with ethanol. In the second step, a solution of Oxone and water was added to a well-stirred solution of the resulting product and diethylamine in acetonitrile. After the completion of the reaction, the resulting precipitates were filtered off and recrystallized with ethanol. In this study, new derivatives of new methyl 1,2-diaryl-4-hydroxy-5-oxo -2,5-dihydro-1H-pyrrole-3-carboxylate were designed, synthesized, and purified. The structure of the synthesized compounds was confirmed by FT- IR, 1HNMR, and MASS. We designed and synthesized some new methyl 1,2-diaryl-4-hydroxy-5-oxo -2,5-dihydro-1H-pyrrole-3-carboxylate derivatives as selective COX-2 inhibitors. The structure of synthesized compounds was confirmed by FT- IR, 1HNMR, and MASS. The COX-2 inhibitory activity of these compounds is under investigation.

Keywords: Design, Synthesis, Pyrrolidinone, Selective COX-2 Inhibitor

References:
1. Kim KJ, Choi MJ, Shin JS, Kim M, Choi HE, Kang SM, Jin JH, Lee KT, Lee JY. Synthesis, biological evaluation, and docking analysis of a novel family of 1-methyl-1H-pyrrole-2, 5-diones as highly potent and selective cyclooxygenase-2 (COX-2) inhibitors. Bioorganic & medicinal chemistry letters.

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Design and Synthesis of Novel Diaryl Oxo Pyrrole Derivative as Selective COX-2 Inhibitors

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15-18 February 2022

Poster: P7

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Abstract:
Inflammation is the initial defense response of the body cells and tissues to various stimuli such as pathogens, infections, irritation, chemicals, mechanical or thermal injuries.These symptoms are due to the release of some inflammatory mediators including prostaglandins (PGs). Non-steroidal anti-inflammatory drugs (NSAIDs), widely used for the treatment of pain, pyrexia, inflammation, rheumatoid arthritis and osteoarthritis, block biosynthesis of prostaglandins by inhibiting the different isoforms of cyclooxygenase enzyme (COX-1,2) . The range of activities of NSAIDs against COX-1 compared with COX-2 explains the variations in the side effects of NSAIDs at their anti-inflammatory doses. Drugs which have a high potency against COX-2 and a low COX-2/COX-1 activity ratio will have potent anti-inflammatory activity with few side effects on the stomach and kidney. The recent market withdrawal of some coxibs such as rofecoxib and valdecoxib due to their adverse cardiovascular side effects clearly delineates the need to develop alternative structures with COX-2 inhibitory activity. For this reason novel scaffolds with high selectivity for COX-2 inhibition need to be found and evaluated for their anti-inflammatory effects. Therefore in this study, novel diaryl oxo pyrrole derivatives were designed and synthesized based on the structure-activity relationship of selective COX-2 inhibitors. Target compounds were synthesized in two steps: In the first step, a solution of 4-(Methylthio)benzaldehyde, arylamine derivatives and dimethylacetylenedicarboxylate (DMAD) in the presence of para-toluenesulfonic acid (PTSA) as a catalyst, was stirred in ethanol for 72 hours. After the completion of the reaction, the resulting product was filtered off and recrystallized with ethanol. In the second step, the resulting precipitates and diethylamine were stirred in acetonitrile. Then a solution of Oxone and water was added to the mixture. After the completion of the reaction, the resulting precipitates were filtered off and recrystallized with ethanol. A series of novel diaryl oxo pyrrole derivatives were synthesized in good yields and the structure of the compounds was confirmed by FT- IR, 1HNMR and MASS spectroscopy. In this study new derivatives of diaryl oxo pyrrole was synthesized in two steps. Molecular structures of the synthesized compounds were confirmed by FT- IR, 1HNMR and MASS spectroscopy.

Keywords: Design, Synthesis, Pyrrole, COX-2 Selective Inhibitor

References:
1. R. M. Botting,Cyclooxygenase: past, present and future. A tribute to John R. Vane (1927–2004), J. Thermal Biology, 31(2006) 208-219

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Design and synthesis of New Methyl4-Hydroxy-1-Alkyl-2-aryl 5-Oxo 2,5-Dihydropyrrole-3-Carboxylate Derivatives as Selective COX-2 Inhibitors

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15-18 February 2022

Poster: P8

Abstract Presenter:
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Abstract:
The non-steroidal anti-inflammatory drugs (NSAIDs) are among the most commonly medications in the world. The mechanism of action of these drugs is the inhibition of cyclooxygenase (COX) enzyme, which catalyzes the first step of the biosynthesis of PGG2 from arachidonic acid. COX isozymes exist at least in two isoforms, COX-1 and COX-2.The constitutive COX-1 isozyme is found in plateletes, kidneys, and the gastrointestinal tract and is believed to be responsible for the maintenance of physiological functions such as gastro protection and vascular homeostasis. In contrast, the COX-2 enzyme is the inducible isoform that is produced by various cell types upon exposure to cytokines, mitogens, and endotoxins released during injury and therefore molecules that inhibit its enzymatic activity would be of therapeutic value. The gastrointestinal side effects associated with NSAIDs are due to the inhibition of gastroprotective PGs synthesized through the COX-1 pathway. Thus, selective inhibition of COX-2 over COX-1 is useful for the treatment of inflammation and inflammation-associated disorders with reduced gastrointestinal toxicities when compared with NSAIDs. The recent market withdrawal of some coxibs such as rofecoxib and valdecoxib due to their adverse cardiovascular side effects clearly delineates the need to develop alternative structures with COX-2 inhibitory activity. For this reason novel scaffolds with high selectivity for COX-2 inhibition need to be found and evaluated for their anti-inflammatory effects. As a result, in this study, new methyl4-hydroxy-1-alkyl-2-aryl 5-oxo 2,5-dihydropyrrole-3-carboxylate derivatives were designed and sythesized based on the structure-activity relationship of selective COX-2 inhibitors. A mixture of 4-methylthiobenzaldehyde, arylamine derivatives and para-toluene sulfonic acid (PTSA) as a catalyst in ethanol was stirred at room temperature for 1 hour until a white precipitate appeared. Then, dimethylacetylenedicarboxylate (DMAD) was added. The reaction was stirred at room temperature until a new precipitate appeared. Finally, the resulting precipitate was recrystallized with ethanol. In the next step, a solution of Oxone in water was added to a well-stirred solution of the resulting product and diethyamine as a catalyst in acetonitrile. After the completion of the reaction, the precipitates were filtered and recrystallized with ethanol. All the target compounds were synthesized in good to high yields and the chemical structures were confirmed by IR, 1HNMR and Mass spectra. A novel series of methyl4-hydroxy-1-alkyl-2-aryl 5-oxo 2,5-dihydropyrrole-3-carboxylate derivatives was designed and synthesized as selective COX-2 inhibitors in good yields. The target compounds were characterized via IR, 1HNMR and Mass spectroscopies. The COX-2 inhibitory activity of the target compouds is under investigation.

Keywords: Design , Synthesis, COX-2 Inhibtors, Dihydroprrole

References:
1. Zarghi, A., & Arfaei, S. (2011). Selective COX-2 inhibitors: a review of their structure-activity .1 relationships. Iranian journal of pharmaceutical research: IJPR, 10(4), 655

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A glance into the Pathology of Covid-19, Its Current and Possible Treatments; Interleukin Antagonists as an Effective Option; a Review

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15-18 February 2022

Poster: P9

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Abstract:
The outbreak of the novel SARS-COV-2 and its following complications has caused an almost unprecedented chaos throughout the world in recent years. Although a series of vaccines have been proposed recently in order to reduce the risk of mortality and morbidity of this disease, an ultimate and reliable cure has yet to be discovered. One of the major complications of Covid-19 is the outburst of a series of inflammatory responses in the respiratory system of the patients, which eventually causes a hypoxemic pneumonitis and accounts for most of the Covid-19 patients' mortality. It is suggested that a group of inflammatory cytokines such as different interleukins are responsible for this complication, therefore drugs which can influence this system may be useful in reducing this exaggerated inflammatory response which is dubbed the 'cytokine storm'. In this article we review potential treatment options for reducing the inflammatory response and discuss some clinical trials and case reports related to the drugs interfering with responsible interleukins in order to quench the cytokine storm.

Keywords: COVID-19, Cytokine Storm, Tocilizumab, Interleukin Antagonist, Inflammatory Response

References:

1. Organization WH.COVID-19 weekly epidemiological update, edition 45, 22 June 2021. Available. https://apps.who.int/iris/bitstream/handle/10665/342009/CoV-weeklysitrep22Jun21-eng.pdf?sequence=1accessed 30.6.2021 2021.

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Nanostructured Lipid Carriers, the Optional Carriers for Carbamazepine, the Drug of CNS Diseases.

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15-18 February 2022

Poster: P10

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Abstract:
Carbamazepine (CZB) is a drug that is used to treat seizures and some other mental diseases like depression; this drug has some drawbacks like needing high using frequency, and some side effects like its stimulating effects on patients liver; so these drawbacks and side effects should be fixed by using the different methods like the use of carriers; one of the best carriers for this drug is lipid-based carriers, for example, Nanostructured Lipid Carriers (NLCs). In this research, the Cetyl palmitate and Coconut oil were used as basic lipids of NLCs and the nanoparticles were produced at 75°C water-based environments; this environment included surfactants (Tween80 and Sodium Lauryl Sulfate (SLS)) and the NLCs were produced by adding the above lipids, which were dissolved in Dichloromethane (the drug loading to NLCs was done by dissolving the pure CZB in the same solution) in this environment. After size checking and some other tests, the in vitro drug-releasing of nano drugs was checked by using the HPLC system. The results show that the selected process caused the nanoparticles with acceptable and stable size, which causes the in vitro releasing with gradual concentration increasing and so the longer time of drug concentrations stability at wanted domain. The data of this article showed that NLCs would be a good career for CZB and they can reduce the number of times the drug is taken and especially makes it easier to use the drug and reduce its side effects.

Keywords: Carbamazepine, Drug Loading, Invitro Release, NLCs, Seizure, Side Effects

References:
1. Echeverri JD, Alhajj MJ, Montero N, Yarce CJ, Barrera-Ocampo A, Salamanca CH. Study of In Vitro and In Vivo Carbamazepine Release from Coarse and Nanometric Pharmaceutical Emulsions Obtained via Ultra-High-Pressure Homogenization. Pharmaceuticals 2020; 13: 53.

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Design and Synthesis of Pyrimidinone Derivative as an Inhibitor of Dipeptidyl Peptidase-4

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15-18 February 2022

Poster: P11

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Abstract:
Type 2 diabetes is one of the most common chronic metabolic disorders in the world. Many drugs have been developed with different mechanisms to control and treat this disease. GLP1 (Glucagon-like peptide 1) is a hormone that secreted in response to food is and plays an important role in regulating blood glucose, but it is inactivated in less than 90 seconds by the enzyme DPP4 (dipeptidyl peptidase-4). Inhibition of the enzyme DPP-4 is one of the appropriate therapeutic approaches to control type 2 diabetes.in this study, we designed a novel compound to inhibit the DPP-4 enzyme with pyrimidinone scaffold and synthesized through multi-stage reactions and structurally confirmed by C, H-NMR, IR, and mass spectra. The pyrimidine heterocycle was synthesized by treatment of 4-nitroacetophenone, urea, and benzaldehyde in the presence of zinc/ammonium chloride as a catalyst through the Biginelli reaction. The chloroacetamide intermediate was afforded by reduction of the nitro group followed by reaction with. The final product was achieved by SN2 reaction of 4-chloro benzylamine with above chloroacetamide. According to SAR of DPP-4 inhibitors, a novel compound with a pyrimidinone ring was designed. This compound showed proper affinity to the active sites of DPP-4 enzymes and was synthesized through the optimized method with acceptable yield and characterized by IR, Mass, 1HNMR, and 13CNMR spectra. This study presents a novel scaffold of DPP-4 inhibitors as potentially useful lead compounds in drug design for future studies.

Keywords: DPP-4 inhibitor, Synthesis, Pyrimidinone, Anti-diabetes Activity

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1. Dastjerdi HF, Naderi N, Nematpour M, Rezaee E, Mahboubi-Rabbani M, Ebrahimi M, Hosseinipoor S, Hosseini O, Tabatabai SA. Design, synthesis and anti-diabetic activity of novel 1, 2, 3-triazole-5-carboximidamide derivatives as dipeptidyl peptidase-4 inhibitors. Journal of Molecular Structure. 2020 Dec 5;1221:128745.
2. Diprolyl nitriles as potent dipeptidyl peptidase IV inhibitors, Bioorg. Med. Chem. Lett. 15 (2005) 3992–3995. Potent non-nitrile dipeptides dipeptidyl peptidase IV inhibitors, Bioorg. Med. Chem. Lett. 17 (2007) 6476–6480.
3. Synthesis and SAR of azolopyrimidines as potent and selective dipeptidyl peptidase-4 (DPP4) inhibitors for type 2 diabetes, Bioorg. Med. Chem. Lett. 1 (2010), 4395-8. Synthesis, SAR, and atropisomerism of imidazolopyrimidine DPP4 inhibitors, Bioorg. Med. Chem. Lett. 1 (2010), 6273-6.
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The Use of Quantitative Structure-Activity Relationship Models to Predict GABA-A Receptor Binding Affinity of Novel Heterocycle Compounds

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15-18 February 2022

Poster: P12

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Abstract:
Agonists of benzodiazepine (BZD) receptor, are extensively used in the treatment of epilepsy, anxiety, muscle cramps and sleep disorders. The pharmacological effects of BZDs result from their affinity for a specific binding site on the GABA-A receptors, known as the BZD receptor. In spite of their benefits, they have several side effects, so synthesis of new agonists of these receptors to get more specific effect and better profile of adverse drug reactions is still continued. Quantitative structure-activity relationship (QSAR) study is one of the computational methods, which has been developed as an alternative tool for predicting compound, properties such as biological activity. Two-dimensional Quantitative Structure-Activity Relationship (2D-QSAR) and three dimensional Quantitative Structure-Activity Relationship (3D-QSAR) analysis are common methods used in the computer-assisted molecular design. In this study, Stepwise (SW) method for variable selection in Multiple Linear Regressions (MLR), and CoMFA analysis was used to build an accurate and reliable quantitative relationship between the molecular structure and the affinity to GABA-A agonist of the heterocyclic derivatives. The findings can be helpful for designing new active analogs.

Keywords: 2D-QSAR, 2D-QSAR, SW-MLR, COMFA, COMSIA, Benzodiazepine

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Potentials of Microalgae in Neurological Diseases

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15-18 February 2022

Poster: P13

Abstract Presenter:
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Abstract:
The present study aimed to investigate the neuroprotective effect of microalgae metabolites on Alzheimer-disease. Microalgae are photosynthetic microorganisms that can produce different types of biomolecules and metabolites that are widely used in medicine and pharmacy. For example, metabolites produced from microalgae showed various properties such as anti-cancer, antioxidant, anti-inflammatory, anti-tumor, anti-inflammatory and, anti-allergic properties. In addition, these substances are widely used in pharmaceutical and medical biotechnology. In this study, Astaxanthin, Beta-carotene, and Kappa-carrageenan metabolites were selected as ligands and Acetylcholinesterase (AChE), N-methyl-D-aspartate (NMDA), Cannabinoid (CB1, CB2), Muscarinic (M1, M2, M4), α-amino-3-hydroxy-5-methyl-4-isoxazole propionic acid (AMPA) were selected as receptors, and the 3D structure of these receptors was obtained from the PDB, Drug Bank, and PubChem data banks. Additionally, the CASTp online server was used to determine the location of each receptor's active sites. Molecular docking was performed using Autodock Vina software for the desired cases in three locations of active sites. After docking and obtaining the results, the first five priorities with lower binding energy (bond between ligand and source were more stable) were selected for molecular dynamics simulation using Discovery Studio software. These cases include: M4/Astaxanthin (-11.3 Kcal/mol), CB2/Beta-Carotene (-10.3 Kcal/mol), AChE/Beta-Carotene (-9.4 Kcal/mol), M2/Astaxanthin (-9 Kcal/mol) and CB1/Beta-Carotene (-9 Kcal/mol). The results showed that due to the stability of the binding between the studied microalgae metabolites with the target receptors, these metabolites could be suitable candidates for neuroprotective properties in the treatment of Alzheimer-disease.

Keywords: Microalgae Metabolites, Bioinformatics, Molecular Dynamics, Molecular Docking

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Bioinformatics Evaluation of Potential Targets of miR-222-3p in Acute Lymphoblastic Leukemia in Children

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15-18 February 2022

Poster: P14

Abstract Presenter:
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Abstract:
Acute lymphocytic leukemia (ALL) is a type of cancer that affects white blood cells. The disease progresses rapidly and needs immediate treatment. ALL is the most common type of leukemia that affects children. An increase in the miR-222-3p molecule has been observed during this disease. The microarray method can be used to examine the binding of this miRNA and target genes, which has some limitations. Accordingly, in this study, computer and bioinformatics methods have been used by various and specialized software. Target genes were identified using different algorithms available in Mirbase, TargetScan, NCBI and RNA hybrid databases, and based on the scores obtained, the targets with the highest affinity were identified. The findings of this study showed that the CDH4, AJAP1, HNRNPA0, UBN1 and ZNF618 genes are potential targets with higher specificity for miR-222-3p.

Keywords: miRNA, Acute Lymphocytic Leukemia, Bioinformatics, miR-222-3p

References:

1. Ghodousi ES, Rahgozar S. MicroRNA-326 and microRNA-200c: Two novel biomarkers for diagnosis and prognosis of pediatric acute lymphoblastic leukemia. Journal of cellular biochemistry. 2018;119(7):6024-32.

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Evaluation of the Protective Effect of Prosopis Farcta Decoction in Animal Model of Ulcerative Colitis

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15-18 February 2022

Poster: P15

Abstract Presenter:
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Abstract:
Inflammatory bowel disease (IBD), which encompasses Crohns disease (CD) and ulcerative colitis, is a chronic gastrointestinal disease with an unknown cause (UC). Because no effective medication has yet been discovered, this study was conducted to see how melon root decoction affected inflammatory alterations in the colon in male rats. Twenty-five rats were separated into four groups. Mice were sedated with ketamine before being exposed to one milliliter of 4% acetic acid in the colon for ten minutes. Wistar rats were administered the obtained nanoparticles by gavage in varied doses (10, 20 and 30 mg / kg) under optimum conditions. The doses of 10, 20, and 30 mg/kg were substantially different from the negative control group (P0.05) in macroscopic investigations. At doses of 10 and 20 mg/kg, mild and moderate improvements were reported, respectively. However, a reduction in inflammation and colon lesions was noted in the group receiving the product at a dose of 30 mg/kg. As a result of the findings, the group receiving the melon root decoction at a dose of 30 mg/kg had the best benefit. The results showed that a 30 mg/kg decoction of melon root is beneficial in reducing colon inflammation and improving it

Keywords: Measles, Ulcerative Colitis, Rat

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2. Kesarwani K, Gupta R. Bioavailability enhancers of herbal origin: An overview. Asian Pac J Trop Biomed. 2013;3(4):253-66. 3. Baumgart DC, Carding SR. Inflammatory bowel disease: cause and immunobiology. The Lancet. 2007;369(9573):1627-40.

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Synthesis, Molecular Modeling of Novel Phthalimide Analog as Nonpeptide Small-Molecular Inhibitor of Dipeptidyl Peptidase 4

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15-18 February 2022

Poster: P16

Abstract Presenter:
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Abstract:
Recently, novel anti-diabetic drugs were designed by focusing on having less undesirable side effects, long half-lives, and appropriate oral bioavailability. Therefore, drugs that belong to the glucagon-like peptide-1(GLP-1) were suggested. GLP-1 is an endogenous peptide that regulates blood sugar by increasing insulin and decreasing glucagon release. Unfortunately, GLP-1 was destroyed rapidly by the dipeptidyl peptidase-4 enzyme. Cause of the short half-lives of GLP-1 in the body, DPP-4 inhibitors were considered as new drugs for treating diabetes. Here, we designed a novel phthalimide-based compound as a DPP-4 inhibitor. 2-(4-nitrobenzyl)isoindoline-1,3-dione was obtained by treatment of potassium phthalimide and 4-nitrobenzyl bromide through nucleophilic substitution reaction. 2-chloro-N-(4-((1,3-dioxoisoindolin-2-yl)methyl)phenyl)acetamide was achieved by reduction of the nitro group of intermediate using elemental iron in acetic acid followed by reaction with chloroacetylchloride. Finally, the latter intermediate was reacted with 4-methoxy benzylamine to produce the final product. According to the structure-activity relationship of DPP-4 inhibitors, a novel phthalimide derivative was designed and showed reasonable and suitable affinity to active sites of DPP-4 enzyme. Synthesis of this compound was confirmed by Mass, 1HNMR and 13CNMR spectra. This study demonstrates a novel scaffold of DPP-4 inhibitor that has the potential to be mentioned as an efficient lead compound in new drug design.

Keywords: DPP-4 inhibitor, phthalimide, synthesis, anti-diabetes activity

References:
1. Dastjerdi HF, Naderi N, Nematpour M, Rezaee E, Mahboubi-Rabbani M, Ebrahimi M, Hosseinipoor S, Hosseini O, Tabatabai SA. Design, synthesis and anti-diabetic activity of novel 1, 2, 3-triazole-5-carboximidamide derivatives as dipeptidyl peptidase-4 inhibitors. Journal of Molecular Structure. 2020 Dec 5;1221:128745.

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The Hydrogen Sulfide Promoting Effects of Treadmill Exercise Prevent Memory Deficient and Oxidative Stress Changes Following Ovariectomy in Aβ-induced

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15-18 February 2022

Poster: P17

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Abstract:
This study evaluated the effect of hydrogen sulfide on promoting effects of treadmill exercise regarding prevention of memory deficiency and oxidative stress in the Aβ-induced neurotoxicity in the old ovariectomized rats. Female Wistar rats were evaluated as the following groups: Yg= (Control Young, 3 months age), Co.Ag= (Control Aged, 24-20 months age), Sham= (old rats underwent surgery without AD induced model, ovariectomy, and treatment), OVY= (Ovariectomized, the old rats underwent bilateral ovariectomy without treatment), OVY.Al= (Ovariectomized + Alzheimer's), OV.A.Ex= (OVY.Al group with exercise treatment), OV.A.NaHS = (OVY.Al group with NaHS treatment), OV.A.N.E= (OVY.Al group with exercise and NaHS treatments). The behavioral characteristics of animals were evaluated through locomotor activity in the open field, Novel Object Recognition, Morris Water Maze, and Passive avoidance learning. The total antioxidant capacity, total oxidant status, the oxidative stress index, total thiol groups, and malondialdehyde were quantified through RT-qPCR and SIRT-1 and BNDF was evaluated through western blot.

Keywords: Hydrogen Sulfide, Treadmill Exercise, Alzheimer's Disease, Ovariectomy, Aging, BDNF

References:
Tabassum R, Jeong NY, Jung J. Therapeutic importance of hydrogen sulfide in age-associated neurodegenerative diseases. Neural Regen Res. 2020;15(4):653-62.

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Formulation and Characterization and Compare of Bisoprolol Fumarate Fast Dissolving Filmand Nanofiber

Reza Kiani, Maryam Mortazavi

15-18 February 2022

Poster: P18

Abstract Presenter:
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Abstract:
The concept of fast dissolving dosage form has become popular as new delivery system. This system will provide maximum therapeutic efficacy, increased bioavailability and maximum stability by reducing the frequency of dosage. It will also avoid first pass metabolism of the drugs. This system provides more rapid drug absorption from the pre gastric area which may provide quick onset of action. Bisoprolol Fumarate is an antihypertensive agent used in the management of hypertension and prophylaxis treatment of angina pectoris and heart failure. Present work aimed at preparing fast dissolving forms of bisoprolol fumarat which is beneficial in hypertension, aiding in the enhancement of bioavailabity and is very convenient for administration without the problem of swallowing and using water. HPMC-based hydrophilic composites (HCs) used for fast dissolution of bisoprolol fumarat were investigated. Electrospun and casting HCs were prepared from a solution containing HPMC, bisoprolol fumarat and polyethylene glycol. Nanofibers were prepared by electrospining method and films were prepared by a solvent casting method. Fifteen formulation whithout-API were prepared with different concentrations of water soluble polymer hydroxypropyl methylcellulose (HPMC E6) and polyethylene glycol (PEG) by solvent casting technique. The prepared films were subjected to characterization for folding endurance, weight variations, thickness and disintegration time.six of these formulation were chosen for drug-loaded formulations.These of six drug loaded formulations were evaluated for morphological properties, film thickness, folding Endurance, Surface pH, content uniformity, in vitro disintegration time and in vitro dissolution studies. The optimized formulation was subjected to stability study. More than fourty formulation whithout-API were prepared to find the best solvent for the polymeric solutions which supposed to form the nanofibers, and optimized the flow rate of polymeric solution, distance between syring and collector of electrospining machine and voltage and evaluated for morphological properties by optical microscope.only two of these formulations were suitable and acceptable for drug-loaded formulation.Two drug-loaded nanofibers were fabricated and evaluated for morphological characters and nanofibers diameter which were identified by scanning electron microscopy,drug content and invitro dissoloution studies. In the both methods Physical compatibility between the drug and excipients was guaranteed in the selected formulations by means of differential scanning calorimetry analysis and Fouriertransform infrared spectroscopy.

Keywords: Bisoprolol Fumarate , Nanofiber , Fast Disolving Film

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The Effect of *Cucurbita Pepo* Fruits on Blood Lipid Profile in the Rat

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15-18 February 2022

Poster: P19

Abstract Presenter:
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Abstract:
One of the usual medical procedures for preventing cardiovascular diseases is lipid-lowering agents. Since these drugs have side effects, finding the plants with the same effect will be useful. The purpose of this study was to compare the effect of hydroalcoholic extract of Cucurbita Pepo with lovastatin as a chemical and effective drug on blood lipid profile. This experimental study used 36 adult male Wistar rats (160gr). The rats were randomly divided into six groups of 6. Group one, two, three, four, five, and six were fed with a normal diet, a high-cholesterol diet (5 % cholesterol +0.5 % olive oil), a high-cholesterol diet with lovastatin(10mg/kg), a high-cholesterol diet with hydroalcoholic extract of Cucurbita Pepo(50mg/kg), a high-cholesterol diet with hydroalcoholic extract of Cucurbita Pepo (100mg/kg) and high-cholesterol diet plus hydroalcoholic extract of Cucurbita Pepo (250mg/kg) respectively for 21 days by gavage method. Cholesterol serum concentration, LDL, TG, HDL and Cho/HDL, LDL/HDL were measured and compared for each animal to determine the blood lipid profile. of this study showed that using hydroalcoholic extract of Cucurbita Pepo (100mg/kg) comparison to group two, caused a significant decrease in the serum level of cholesterol (61.67 2.79 vs. 107.8 3.54).

Keywords: Lovastatin, *Cucurbita Pepo*, Blood Lipid Profile

References:
1. Zarei MA, Eftekhary H, Aqababa H. Effect of hydroalcoholic extract of Zataria multiflora Bioss on serum lipids levels in high cholesterol diet fed Rats. Quarterly of the Horizon of Medical Sciences 2014; 19(4): 218-223

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Evaluation of Anti-Anxiety Effect of *Tanacetum Balsamita* and *Asperugo Procumbens* Using Experimental Models in Male Mice.

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15-18 February 2022

Poster: P20

Abstract Presenter:
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Abstract:
Anxiety disorders are significant psychological diseases and can cause other psychological disorders. Although there are several effective medications for treatment or control of Anxiety disorders, they have limited efficacy or may cause adverse drug reactions. Therefore, investigation for newer medications, especially natural products, could be helpful to solve the problem. This study evaluated the anti-anxiety effects of hydroalcoholic extracts of the aerial part of two plants, Tanacetum balsamita, and Asperugo procumbens. Two experimental methods, elevated plus maze (EPM) and light-dark box, were used to evaluate the anti-anxiety effects of the extracts, and the open field test was used to evaluate locomotor activity. The extract of Tanacetum balsamita showed anti-anxiety effects in doses of 2.5, 5 mg/kg i.p. in the EPM test. Flumazenil was able to inhibit the anti-anxiety effect of the extract in the EPM test. However, the extract of Asperugo procumbens did not show a statistically significant effect in the EPM test. Both extracts did not show any significant anti-anxiety effect in the light-dark box test. The extract also did not show any significant effect on locomotor activity in Open field test in a dose of 5 mg/kg i.p. . The results reveal that Tanacetum balsamita has active components with anti-anxiety properties, and at least a part of this effect is produced by the interaction of the component(s) with benzodiazepine receptors. Further studies are needed to evaluate the safety and find active components of the extract.

Keywords: anti-anxiety, *Asperugo procumbens*, *Tanacetum balsamita*, mice

References:
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Highly Sensitive Determination of Daclatasvir Using Sucrose-Capped Gold Nanoparticles in Biological Samples

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15-18 February 2022

Poster: P21

Abstract Presenter:
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Abstract:
The development of metal nanoparticle-based facile spectrophotometric assays for drugs is an emerging area of current scientific research. In this present investigation, Daclatasvir dihydrochloride (DAC) was used as one of the common oral therapies for the chronic hepatitis C virus for detecting therapeutic range. As recognizing the therapeutic range of drugs could offer a hopeful perspective, hence, the development of an eco-friendly, easy, fast sensitive, and selective approach has drawn massive attention for DAC detection in biological samples. In the present study, sucrose-capped gold nanoparticles (Suc-AuNPs) were synthesized and used as a nanoprobe for the DAC detection using its localized surface plasmon resonance (LSPR) property. The determination mechanism was experimentally shown using transmission electron microscope (TEM) measurements, dynamic light scattering and UV-Vis. The DAC detection is accompanied by the color change from pink to blue following a decrease in the LSPR band of Suc-Au NPs after adding various concentrations of DAC. Under the optimum condition, a good limit of detection with a linear concentration-response, high stability, simplicity, and repeatability were obtained which can be considered as a routine method in clinical laboratories.

Keywords: Response Surface Method, Sucrose-Gold Nanparticle, Spectrophotometry, Daclatasvir

References:
1. P.L. McCormack, Daclatasvir: A Review of Its Use in Adult Patients with Chronic Hepatitis C Virus Infection, Drugs.75 (2015) 515-524.

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Molecular Cloning and Three-Dimensional Structure Modeling of Therapeutic L-Glutaminase with High Affinity to Glutamine

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15-18 February 2022

Poster: P22

Abstract Presenter:
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Abstract:
L-glutaminase (GLS, EC 3.5.1.2) is a member of the beta-lactamase superfamily, catalyzes the hydrolysis of l-glutamine (Gln) to l-glutamic acid and ammonia, known as anticancer enzyme against acute lymphocytic leukemia. So far, several native glutaminases have been detected from different microorganisms, but there are only a few reports on recombinant engineering of this enzyme from bacterial sources. The objective of the current study is an efficient construct engineering of GLS from a recently identified new isolate of Bacillus licheniformis (Bacillus sp. SL-1) with high Gln hydrolytic activity, in order to its recombinant production in Origami expression system. Further, prediction of the quaternary structure of the enzyme was conducted to evaluate the 6×His-tag exposure in the N- and C-terminal of the engineered recombinant GLs. In the current study, primers for GLSylm-SL1 were designed according to the Bacillus licheniformis whole genome sequence available in the GenBank database. The amplified ylm gene in a polymerase chain reaction (PCR) was cloned and sub-cloned into pET28a+ and pET22b+ expression vectors using endonucleases NdeI/ XhoI and XbaI/XhoI, respectively. The cloning accuracy was confirmed using specific primers for ylm and universal primers for the pET vectors in PCR reaction. The generated constructs were sent out for sequencing by the Sanger method to further confirmation. The BLAST program has been used to find the homologous sequences from the NCBI database. Three-D (3D) structure modeling, refinement, and validation were conducted to evaluate the 6×His-tag exposure in both C- and N-terminal GLSylm-SL1 using MODELLER v9.24, Ramachandran plot statistics. The 3D modeled structure was refined using the GalaxyRefine web-server. The local and overall quality of the structurally refined model was evaluated using the verify3D and ERRAT tools. Cloning and sub-cloning procedures led to producing recombinant constructs, including the 6×His-ylm-6×His kanamycin-resistant gene and the 6×His-ylm ampicillin-resistant gene, respectively. The pairwise alignment of the ylm (SL-1) showed high identity (≥95%) to the ylm gene from B. licheniformis ATCC14580 with some nucleotides substitution, which led to residue changes in the GLSylm-SL1 protein sequence. The tertiary structure of the homology modeled GLSylm-SL1 indicated that the enzyme 3D structure has the required quality with a GA341 score near 1.0. All the residues were placed in the favored and allowed regions in the refined model. From tertiary structure, the GLSylm-SL1 was active in homotetramer form, and the C-terminal 6×His-tags are buried in the non-exposed regions of the enzyme complex. While, the N-terminal 6×His-tags revealed a surface spatial nature, valuable for recombinant enzyme purification.

Keywords: 3D Structure, Modeling, L-Glutaminase, Histidine-Tag, Cloning

References:

1. Yu, Y., Y. Jin, J. Zhou, H. Ruan, H. Zhao, S. Lu, Y. Zhang, D. Li, X. Ji, and B. H. Ruan. 2017. Ebselen: mechanisms of glutamate dehydrogenase and glutaminase enzyme inhibition. ACS chemical biology 12 (12):3003-3011.

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Design, Synthesis, and Characterization of Carnosine-Conjugated Paclitaxel with a Potential Enhancement of Paclitaxel Efficacy on Brain Tumors

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15-18 February 2022

Poster: P23

Abstract Presenter:
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Abstract:
Brain cancer involves one of the most challenging treatments cancers because of the blood-brain barrier. The blood-brain barrier is an impermeable barrier that controls drug and poisons transfer. So finding a way to help drugs pass the blood-brain barrier is an important goal. One of the delivery systems that can make drugs such as Paclitaxel more permeable through BBB is peptide conjugation. Carnosine (Beta-alanyl-L-histidine), a naturally occurring dipeptide, has been considered for its antiproliferative properties. Carnosine can also pass the blood-brain barrier by dipeptide membrane transporters called POTs (proton-coupled oligopeptide transporters). This study aims to synthesize carnosine, its derivatives and conjugate them to Paclitaxel to increase the potential of penetration of this drug to the brain. Carnosine (β-Alanine-Histidine) and reverse carnosine (Histidine-β-Alanine) were synthesized by solid-phase peptide synthesis using both wang resin and 2-Chlorotrityl resin. Trifluoroacetic acid was used to cleave the ester bond linking peptides to the resins. For coupling (esterification) reaction, each peptide and DIC (N, N′-Diisopropylcarbodiimide) was dissolved in dichloromethane containing Paclitaxel, and the reaction was stirred under an argon atmosphere for 24 to 48 hours. This reaction was also performed between the protected histidine or beta-alanine alone and Paclitaxel. Characterization and prediction of distribution within the brain are made using ADMETlab 2.0. Carnosine synthesis was confirmed by LC-mass spectrometry. According to the results of LC-mass spectrometry, the binding of carnosine and reverse carnosine (both with fmoc protecting group but without trityl group) with Paclitaxel was not successful, whereas, the binding of each of the amino acids, histidine (containing trityl and fmoc protective group) and beta-alanine (containing fmoc protecting group), as well as the reverse carnosine (containing the trityl and fmoc protecting groups) with Paclitaxel, were successful. The prediction distribution of synthesized products shows that these products could be successfully cross the blood-brain barrier. Carnosine with the trityl-protected histidine and fmoc group was conjugated to Paclitaxel, but this conjugation did not occur when the peptide carried histidine with no trityl group (fmoc presented), so it seems that the presence of unprotected imidazole ring in the histidine structure disrupts or deters the carnosine reaction with Paclitaxel and prevents the binding reaction between Paclitaxel and carnosine.

Keywords: Peptide synthesis, Peptide-drug conjugation, Blood-brain barrier, Brain tumors, Carnosine, Paclitaxel

References:

1. Tanaka M, Dohgu S, Komabayashi G, Kiyohara H, Takata F, Kataoka Y, et al. Brain-transportable dipeptides across the blood-brain barrier in mice. Sci Rep. 2019;9(1):5769.

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Development of a Measurement Tool for Risk Assessment of Health and Safety Status in Nanomaterials Factories

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15-18 February 2022

Poster: P24

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Abstract:
Today, nanomaterials unique properties and size increased the use of these materials in different fields of science and technology. On the other hand, the size of these materials increased concerns about their effects on human health and the environment. There are no systematic risk assessments and regulations for monitoring health and safety in nanomaterials producing and consuming factories. The studys purpose is to design a comprehensive health and safety risk assessment tool for nanomaterials producing and consuming factories to facilitate the monitoring of health and safety in these industries. The first bank of tool items was prepared based on literature review and interviews with stakeholders, workers, occupational safety and health engineers, employers, and other experts. In the next step, the logical validity of tool items was checked. For reliability, a checklist completed by three raters in nanomaterials producing and consuming factories and collected data were analyzed by SPSS using kappa coefficient and in-class correlation coefficient (ICC). Values above 0.8 are ideal in an agreement between raters. The tools bank consists of 50 items: 35 items in the checklist (yes or no questions) section and 15 items in a questionnaire. Twenty experts checked the logical validity of tool items in different fields. Using the kappa coefficient to evaluate the reliability by agreement between raters method, the minimum kappa coefficient in the two-to-two agreement was 0.85 and maximum was 1, which indicated excellent agreement between the raters. In order to check the agreement between raters for the whole tool, the in-class correlation coefficient (ICC) was used, which its value with three degrees of freedom is equal to 0.918 and the %95 confidence interval for it was 0.853 to 0.988 and also the probability value was equal to 0.001 which indicated good agreement between raters and excellent tool reliability. Workers, as human capital, are the central pillar of development and progress in any country, and protecting them against diseases and occupational accidents will cause a great leap forward in improving the countrys economy. Therefore, a comprehensive information tool helps us obtain information on this industrys health and safety status. To take a step towards facilitating the assessment of these industries health and safety status and maintaining and promoting workers health. The tool allows us to categorize these industries health and safety status into different categories of the weak, medium, acceptable and excellent to obtain the necessary information about nano industries health and safety status and the necessary measures to improve their situation.

Keywords: Health, Risk Assessment, Nanomaterial, Producing/Consumin Factories, Measurement Tool, Safety

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KCC-1-NH2/EEGO Nanocomposite Sorbent for Dispersive Solid-Phase Extraction, Pre-Concentration and Fluorescence Determination of Total Para-cresol Biom

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15-18 February 2022

Poster: P25

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Abstract:
p-Cresol sulfate (pCs) is a uremic toxin with many effects on the renal function and cardiovascular disease (CVD). In healthy people, all forms of pCs are competently removed from the bloodstream, however, in chronic kidney disease (CKD) patients uremic toxins accumulated in the blood and increase the level with the progression of the disease. Hence, measuring the production of pCS when evaluating kidney disease might provide a reliable monitoring indicator allowing timely interference to preserve kidney function. In this study, KCC-1-NH2/EEGO nanocomposite was synthesized and characterized and then the capability of this nanocomposite for selective extraction of pCS in plasma sample was investigated. In this study, The influence of different factors on the extraction efficiency, including the amount of sorbent, sample pH, extraction time, elution solvents and their volume, and desorption time were also investigated. Based on the above conditions, the method was validated by the FDA guideline and the efficiency of the validated method was evaluated by analyzing 5 plasma samples of kidney patients: The developed method showed a linear range from 0.02 to 6 µg/mL with an acceptable correlation (R2=0.9982). The limit of quantification (LOQ) and limit of detection (LOD) were found 0.043 and 0.013 µg/mL, respectively. The use of this method was successfully tested and confirmed for the extraction and quantification of pCS in chronic kidney disease (CKD) patients' plasma samples. In summary, the developed d-SPE based spectrofluorometric method was validated and applied for the preconcentration and determination of pC using KCC-1-NH2/EEGO nanocomposites. This method can detect trace amounts of pC in patients' plasma samples with high specificity and sensitivity.

Keywords: Dispersive Solid Phase Extraction, Silica/Graphene Oxide Nanocomposite, P-Cresyl Sulfate, Fluorescence, Patients' Plasma Samples

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Introduce New 1,3-Diarylpropane-1-ones as Selective COX-2 Inhibitors and Anti-platelet Aggregation Agents

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15-18 February 2022

Poster: P26

Abstract Presenter:
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Abstract:
Cancer is the second leading cause of death in the world after heart disease. A vast number of studies indicated that selective cyclooxygenase-2 (COX-2) inhibitors could be chemopreventive against different types of cancer because the expression of COX-2 is increased. Therefore, to develop new therapeutics for cancer, the design and synthesis of new COX-2 inhibitors with few side effects seem attractive as anti-cancer agents. Some well-known classes of COX-2 inhibitors due to their adverse cardiovascular effects such as rofecoxib and valdecoxib have been withdrawn from the market. So new COX-2 inhibitors with lower side effects as well as higher potency are needed to be designed and evaluated. Most selective COX-2 inhibitors belong to a class of diarylheterocycles that have 1,2-diarylsubstitution attached to central hetero, carbocyclic ring system, or acyclic central systems. Recent studies have shown that chalcone derivatives have different therapeutic properties such as anti-oncogenes, antitumor, anti-inflammatory, and antiulcer effects, antioxidants, and enzymes inhibitors. Thus a new series of β-aryl-β-mercapto ketones possessing a methylsulfonyl pharmacophore was synthesized and evaluated as selective COX-2 inhibitors. In vitro COX-1 and COX-2 inhibition effects of these compounds were evaluated, and molecular modeling was examined. Also, the Antiplatelet aggregation activity of the synthesized compounds was also tested. In vitro COX-1 and COX-2 inhibition assays indicated that almost all newly synthesized compounds showed selectivity for COX-2 with IC50 values in the 0.07-0.22 µM range, and COX-2 selectivity indexes in the 170 to 703.7 range. Among the tested compounds 3-(3,4-dimethoxyphenyl)-1-(4-(methylsulfonyl)phenyl)-3-(phenylthio)propan-1-one and 3-(4-fluorophenyl)-1-(4-(methyl sulfonyl)phenyl)-3-(phenylthio)propan-1-one were the most potent COX-2 inhibitors and 3-(3,4-dimethoxyphenyl)-1-(4-(methylsulfonyl)phenyl)-3-(phenylthio)propan-1-one had the highest selectivity index for COX-2 enzyme inhibitory activity. The Antiplatelet aggregation activity results indicated that the compound 1-(4-(methylsulfonyl)phenyl)-3-(phenylthio)-3-(p-tolyl)propan-1-one possesses the strong antiplatelet activity. Our molecular modeling studies also indicated that the methylsulfonyl pharmacophore group is placed into the adjunct pocket present in the COX-2 active site and forms hydrogen bond interactions with NH of Arg513 and NH of His90. In brief, all designed and synthesized compounds showed moderate to good COX-2 inhibitory effects and showed good antiplatelet activity. Therefore, these compounds have the potential for further research into the development of anti-cancer agents.

Keywords: Docking Study, Anti-Platelet aggregation, COX-2 Inhibitory, β-aryl-β-mercapto Ketones, Thio-Michael Addition, Aldol Condensation

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In Vitro Evaluation of Antibacterial Effect of *Frangula grandifolia* Methanolic Arial Parts Extract

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15-18 February 2022

Poster: P27

Abstract Presenter:
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Abstract:
Antimicrobial resistance (AMR) is a substantive menace across the board both in terms of public health and economy. The use of medicinal plants has been done since ancient times as remedies for simple infectious diseases and their therapeutic use is not only still popular today as past but also due to advancements that have been made in phytochemical and analytical methods , plants are becoming more attention grabbing in providing effective treatments for antibiotic-resistant infections. Frangula grandifolia (Rhamnaceae). F. grandifolia is one of the medicinal plants used traditionally for treatment of bacterial infections. The present study investigated the in-vitro antimicrobial activity of methanolic extract of aerial parts of F. grandifolia against methicillin-resistant Staphylococcus aureus (MRSA) and other Gram-positive and Gram-negative bacteria. Methanolic extracts of aerial parts of the F. grandifolia were prepared using Soxhelt extraction method and evaluated for their antibacterial activity against three gram positive pathogenic bacteria- Bacillus cereus, Staphylococcus aureus, MRSA and against two gram negative pathogenic bacteria- Escherichia coli and Pseudomonas aeruginosa. The antibacterial activity was performed using disc diffusion and minimal inhibitory concentration (MIC) methods. Chemical profiling of the extracts was performed using standard methods. MIC investigation showed that methanolic extract of F.grandifolia is capable of inhibiting growth of MRSA and other Gram-positive bacteria in concentrations of 3.3-6.0 mg/ml. While Gram-negative organisms were unaffected. Phytochemical studies on this extract revealed presence of alkaloids, flavonoids, tannins and saponins. Our study is the first to report the antimicrobial properties of F. grandifolia and illustrates their promising anti-MRSA potential. The observed data backed the original claim of antibacterial properties and traditional medicinal Uses of this plant by the peoples of north of Iran.

Keywords: Antimicrobial Activity, Medicinal Plants, MRSA, *Frangula grandifolia*

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Prediction of Solubility Class in Biopharmaceutics Classification System (BCS)

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15-18 February 2022

Poster: P28

Abstract Presenter:
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Abstract:
Biopharmaceutics Classification System (BCS) and Biopharmaceutics Drug Disposition Classification System (BDDCS) is a four-class system based on solubility and permeability/metabolism. Drugs are classified into high or low soluble drugs. A drug is considered highly soluble when the highest dose strength is soluble in 250 ml or less of aqueous media over the pH range of 1 to 7.5 (1-4). Therefore, ionization parameters could be a significant factor in estimating solubility class. In this study, a large data set (583 compounds) was used to predict class of solubility based on the effect of ionization on solubility of pharmaceuticals. Methodology All of the available data (583 compounds) in the literature were collected and structural parameters were calculated by ACD/LAB software. In this paper, a QSPR model was proposed based on structural parameters i.e., logP, log D1 for acidic compounds, logD7.5 for basic compounds, maximum logD in range of 1 to 7.5 for zwitterion compounds and Abraham solvation parameters, by logistic regression. Results The QSPR model based on Abraham solvation parameters and Clog P (Eq. 1) or Clog D (Eq. 2). Figures 1 and 2 illustrate the ROC curve to assess the classification ability of the developed models (Eqs. 1–2). The area under the curve of Eqs. 1 and 2 were 0.784, 0.891, respectively. P = e^((2.725-0.406A+0.498B-0.915S-0.041E-0.430ClogP))/(1+e^((2.725-0.406A+0.498B-0.915S-0.041E-0.430ClogP))) (1) P = e^((2.637-0.559A+0.481B-0.924S-0.518ClogD))/(1+e^((2.637-0.559A+0.481B-0.924S-0.518ClogD))) (2) where P is the probability of binary responses (class 0 or 1) based on the solubility. In addition, probability values (p-value) associated with each descriptor were less than 0.01. E is the excess molar refraction, S indicates dipolarity/polarizability descriptors of the solute A and B are the solute hydrogen-bond acidity and basicity. Both developed classification models could estimate solubility class with satisfactory accuracy. However the QSPR model based on Clog D instead of Clog P (the effect of ionization) could improve the prediction accuracy of the developed models.

Keywords: Solubility, Classification, Biopharmaceutics, Parameters, Prediction

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Formulation and Physicochemical Evaluation of Cream-gel Containing Salvia Hispanica Seed Extract

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15-18 February 2022

Poster: P29

Abstract Presenter:
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Abstract:
Herbal medicine always have had particular status among Persian People. In the vast medicine market which consumers demand is rising in herbal skincare products. In this project we provide a stable cream-gel formulation by using Chia seed oil. Although Chia seed oil had satisfying result in the skincare there was no similar product in the market. The oily extract obtained by soxhelt with n-hexan solvent. The cream-gel formulation was designed by using oily extract of Salvia hispanica in 16% W/W for oily phase. In Aqueous phase, we examined Carbomer 934-940, Chitosan in medium molecular weight and Cellulose derivative gelling agents. Moreover, these physicochemical parameters were studied in this process: Appearance, Spreadability, Stability (in 1,3 and month 6 in the 4,25 and 40 ℃ with 75% humidity), Rheology, Freeze-thaw cycle, Release and quantification of Linoleic acid in oil and cream-gel formulation by gas chromatography, pH and o/w or w/o emulsion type. Results: The final formulation is made from carbomer 934 with 2% W/W, distilled water 60% W/W, glycerin 7% W/W, propylene glycol 7.5% W/W, emulwax BP 2% W/W, propyl paraben 0.3% W/W, methyl paraben 0.3% W/W, sodium hydroxide 6% W/W and the oily extract of Salvia hispanica 16% W/W (pH~5.95±0.01). The formulation demonstrated plastic rheology behavior. Also, there was no release from franz diffusion cell as expectations. Stability test was satisfying. The quantity of linoleic acid in oily extract and cream-gel formulation was 20.01% W/W and approximately 2.87 % W/W respectively, which were measured by gas chromatography. Based on the results of physicochemical and stability tests, the cream-gel formulation contains Salvia hispanica seed extract has the potential to be used as a new stable herbal skin whitening product.

Keywords: Cream-Gel, Formulation, Salvia Hipanica, Hyperpigmentation, Carbomer, Linoleic Acid

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Potent Antifungal Agents and Use of Caspofungin-Coated Silver Nanoparticles against Clinically Candida Krusei

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15-18 February 2022

Poster: P30

Abstract Presenter:
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Abstract:
The growing incidence of invasive candidiasis has become one of the serious concerns, especially in immunocompromised individuals. ・This is due to the limitation of the current antifungals and emergence of resistant fungal strains to antifungal agents. Caspofungin isconsidered the first-line therapeutic strategy for patients with invasive candidiasis. Herein, we examine whether caspofungin-coated silver nanoparticles may effect on resistant isolates. A total of 10 archived ・Candida ・krusei were enrolled in this study. The conjugated CAS-AgNPs were synthesized and then characterized using TEM and Zetasizer system to determine their morphology, size, and charge. Furthermore, the efficacy was assessed based on the Clinical and Laboratory Standards Institute. According to the results, CAS-AgNPs could significantly reduce the minimum inhibitory concentration against ・C. krusei ・(P ・=0.0005). All isolates had a MIC value of ≥ 4 µg/ml for CAS. According to findings, CAS-AgNPs conjugates had significant antifungal effects against ・C. krusei. Therefore, it can be concluded that the encapsulation of antifungal drugs in combination with NPs may be enhances the effectiveness of the medications.

Keywords: Candida Krusei, Caspofungin, Silver Nanoparticles

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The Role of Silver Nanoparticles-Fluconazole Conjugates in Combating Biofilm-based Candida albicans Resistance

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15-18 February 2022

Poster: P31

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Abstract:
Onychomycosis is the most common fungal nail infection that causes discoloration and thickening of the involved nail plate. Candida species such as C. albicans, C. glabrata, C. parapsilosis, C. tropicalis and C. krusei are second cause of the infection. C. albicans is the most problematic and prevalent one. However fluconazole is used for the treatment of fungal infections but wide use leads to resistance. Combination of silver nanoparticles (AgNPs) with fluconazole is an approach to overcome drug resistance. Herein, we reported the in-vitro antifungal activity of fluconazole (FCZ)–Ag conjugates, biofilm-producing ability, and time-kill studies of five FCZ-resistant C. albicans. A colorimetry assay (MTT) quantitative results revealed that two out of five resistant isolates studied able to form biofilms in vitro. The effect of FCZ-Ag conjugates was relatively similar to the FCZ or Ag nanoparticle alone and no significant difference was observed. Also the time-kill tests pointed to the equivalent effect of FCZ-Au conjugate. Conjugating nanoparticles with antifungal drugs is not practical in all cases. Contrary to the results of most articles that indicate the antifungal effect of nanoparticles, it seems that the types of nanoparticle and the antifungal drug are important. Due to the financial cost of synthesizing drugs, initial studies should be performed and then enter the next stage.

Keywords: Onychomycosis, Candida Albicans, Biofilm, Fluconazole, Drug Resistance, Silver Nanoparticles

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Selective Antifungal Activity of Nanoparticles against Fluconazole Resistant Candidatropicalis in Clinical Isolates

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15-18 February 2022

Poster: P32

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Abstract:
Candida tropicalis is an unrecognizable species in comparison with other Candida species. C. tropicalis is expressed to be resistant to antifungal medications. Some previous studies stated that invasive candidiasis caused by C. tropicalis have higher fatal rate measured against those caused by other Candida species. Nanoparticles (NPs) have appeared as a promising tool to decrease drug side effects while protecting or improving its therapeutic efficacy. Methods: Antifungal activities of NPs (Silver, Gold and Selenium) against five strains were examined based on the Clinical and Laboratory Standards Institute (M27–A3/S4) guideline. The effect of NP on the membrane permeability of C. tropicalis and the viability of the cells was assessed using MTT assay, respectively. Minimum inhibitory concentration of NPs of five strains was in the concentration range of 0.5–4 μg/mL. Results: The antifungal activity of synthesized silver NPs against resistant Candida tropicalis was greater in comparison with the gold NPs.

Keywords: Candida Tropicalis, Drug Resistance, Nanoparticles

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An Insilico Approach to Design of Drug Cocrystals

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15-18 February 2022

Poster: P33

Abstract Presenter:
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Abstract:
Despite great advances in personal and public health care, cardiovascular diseases, prevalently myocardial infarction (MI) is one of the most common causes of human death globally. In the present study, the protective effects of hydroalcoholic extract of Lepidium draba on isoproterenol-induced myocardial infarction (MI) were evaluated. Myocardial infarction was induced by subcutaneous injection of isoproterenol (100mg/kg) for two consecutive days in rats. Lepidium draba (L. darab) hydroalcoholic extract was injected intraperitoneally at doses of 50, 250 and 500mg/kg and then at the end of experiment the electrocardiogram and hemodynamic parameters as well as histopathological samples were evaluated. The results of the current study showed an improvement in the electrocardiogram pattern in L. draba extract treated rats. Induction of MI reduced mean arterial blood pressure (MAP) and treatment with L. draba extract increased significantly MAP near to normal value. In the animals treated with ISO wide necrosis and fibrosis are seen in histopathological samples but treatment with L. draba extract reduced significantly both fibrosis and necrosis especially at the dose of 500mg/kg. The results of this study for the first time indicated potential cardioprotective effects of L. draba following MI. However, further studies are needed to recommend its use in myocardial infarction.

Keywords: Myocardial Infarction, Lepidium Draba, Hemodynamics, Electrocardiogram, Histopathology

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Separation and Purification of Active Pharmaceutical Ingredients from Degradation Products in Pharmaceutical Dosage Forms by Molecularly Imprinted Pol

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15-18 February 2022

Poster: P34

Abstract Presenter:
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Abstract:
In general, most drugs are not toxic when expired. The medication is used within its shelf life and shows maximum efficacy and safety. Over 1.3 million adults with disabilities, do not take their medications as prescribed and on the other hand many people are not able to afford medication vital to their health and wellbeing. In other cases, the drugstores have a wide range of dosage forms of drugs and some of these dosage forms will expire during their shelf life and must be disposed of in order to be replaced with new dosage forms. Although The concentration of API molecules in the expired dosage form is lower than 90% which still is recyclable. Using a proper molecularly imprinted polymer can create a selective extraction and increase the purification rate of API intact molecules from degraded products. In this project, we aimed to use Molecularly Imprinted Polymers (MIPs) to separate and purify the intact Norfloxacin and Meropenem molecule from the pharmaceutical matrix. the computational methods for polymer reaction optimization, based on data gained from Schrödinger's Maestro, we used a Portion of Monomers (MAA and 4-VP) based on their capability to make hydrophilic or hydrophobic or bonds or pi-pi interactions to the template, Norfloxacin and Meropenem as the template, EGDMA as crosslinker. For MIP synthesis, synthesis methods such as UV photopolymerization and thermal polymerization were used. In order to mimic a suitable pharmaceutical degraded matrix, the forced degradation method of the pharmaceutical was used which contained target template and by products made by force degradation, in order to make sure MIPs efficacy. After the separation, we used UV and HPLC methods based on USP for assaying the template and validation of the polymer and LC/MASS for identifying the degraded molecules other methods such as TGA and FTIR for polymer characterization were used. Unfortunately, due to rapid degradation and instability of Meropenem, synthesized MIP was unable to separate Meropenem and the by-products efficiently due to low imprinting ratio, on the other hand, MIP synthesis for Norfloxacin was successful, and after forced degradation of norfloxacin the recovery based on MAA-4VP-EGDMA MIP was 90.4% in comparison to NIP. Which showed synthesized MIP is able to separate the template from degraded molecules of norfloxacin which was proven by the HPLC method using the equation Y=8437933*X+62863 (R2=0.9980).

Keywords: MIP, Pharmaceutical Recycling, Polymer, Polymer Design

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A New UHPLC-DAD Method for Simultaneous Determination of Sofosbuvir and Ledipasvir in Serum of Healthy Volunteers and its Application to a Pharmacy

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Poster: P35

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Abstract:
Viral hepatitis is the seventh cause of death in the world. Today, Sofosbuvir (SOF) and ledipasvir (LED) are widely used to treat the hepatitis virus infection. The aim of this study was to develop a rapid, valid, and simple, ultra-high performance liquid chromatography equipped with a diode array detector (UHPLC-DAD) method for the simultaneous determination of SOF and LED in human plasma for the pharmacokinetic study. The C18 column (1.8 µm, 50 × 2 mm) using 0.1 % formic acid in water (pH 2.6) and acetonitrile (60:40; v/v) as mobile phase at a flow rate of 0.5 mL/min. The UV detector was set at 328 nm and 260 nm for analysis of SOF and LED, respectively. Clonazepam was used as the internal standard. Analytes were extracted from the serum by a liquid-liquid method using 1000 µl of diethyl ether. The calibration curves were linear over the concentration range of 20−1280 ng/mL for SOF and 5−1280 ng/mL for LED with respective regression equations of y = 0.1383x+3.8164 and y = 0.1145x+0.0074. The correlation coefficients of calibration curves for SOF and LED were obtained 0.9990. The limits of quantification (LOQ) were 20 ng/mL and 5 ng/mL for SOF and LED, respectively. Also, the Tmax were calculated 1 h and 4.3 h for SOF and LED, respectively. The Cmax was 387 ng/mL for SOF and 124 ng/mL for LED after single oral administration of 400/90 mg of SOF and LED drug. In conclusion, a rapid, simple, and sensitive method with a limit of quantifications of 20 ng/mL and 5 ng/mL for SOF and LED, respectively for 400 µl of serum has been described. This method is the first report for analysis of LED and SOF in human serum of healthy volunteers using UHPLC-DAD. Our method was simple, rapid with a total run time of 1.2 min and found to be enough sensitive for pharmacokinetic and clinical trial studies of the drugs.

Keywords: Sofosbuvir, Ledipasvir, Pharmacokinetic Study

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Prerartion and Physicochemical Evaluation of Cosmeceutical Stick Formulation Containing Salicylic Acid for Acne Treatment

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15-18 February 2022

Poster: P36

Abstract Presenter:
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Abstract:
Acne Vulgaris is a common disorder with symptoms of comedones, papules, nodules, and blemishes on the skin of the face, neck, and body. Acne affects self-esteem and mental health. 80 percents of teenagers suffer from acne. Retinoids, Antibiotics, and Keratolytics are recommended as first-line therapies for acne. Salicylic Acid is an efficient Keratolytic and peeling compound. Salicylic Acid has also comedolytic and anti-inflammatory effects on the skin. Due to all of the beneficial characteristics of this compound, it's a suitable active ingredient for cosmeceutical formulations such as anti-blemish or anti-acne sticks. Formulating a stick that can conceal the blemishes and help to cure acne simultaneously is the aim of this study. Different excipients and cosmetic colors were used to formulate various stick bases and physicochemical properties and stability of stick bases were evaluated. Salicylic acid was added to the selected formulation. An assay of salicylic acid was performed with UV/Vis spectroscopy. Antimicrobial effects of sticks containing salicylic acid and stick bases and salicylic acid solutions (1/25mg, 2/5mg, 5mg, and 10mg salicylic acid) against Staphylococcus aureus and Staphylococcus epidermidis was measured by the Agar diffusion method. Stability tests were carried out for 6 months. The ability of sticks in concealing blemishes was tested. Major compounds of the selected formulation are PEG 600, PEG 6000, and Salicylic acid. The physicochemical properties and stability of sticks were acceptable. Assay results demonstrate 20/045 mg salicylic acid in each gram of cosmeceutical stick. The mean diameter of inhibition zones for sticks containing salicylic acid, stick bases, 10mg/ml salicylic acid solution (DMSO/purified water) for Staphylococcus epidermidis was 21mm, 15mm, and 20mm and for Staphylococcus aureus was 13mm, 12mm, 12mm. The average diameters of the inhibition zone of Staphylococcus epidermidis and Staphylococcus aureus for sticks containing salicylic acid were greater than stick bases or salicylic acid solutions. Stick containing 2% salicylic acid has the potential to become helpful to both concealing blemishes and the treatment of acne.

Keywords: Salicylic Acid, Acne, Stick, Cosmecuetical, Cosmetic, Blemish

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Fabrication and Characterization of Ag nanoparticle-Containing Microneedle

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15-18 February 2022

Poster: P37

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Abstract:
Microneedle is a novel drug delivery system that circumvents the stratum corneum as the main obstacle of transdermal drug delivery and directly delivers the therapeutic agents into the skin. Long-acting microneedles would be effective in sustained release of drugs and thereby the treatment of chronic skin diseases (1, 2). In this work, the fabrication and characterization of AgNP-containing polymeric microneedles are considered. Polylactic acid (PLA) microneedles containing different amounts of Ag nanoparticles (as an antibacterial agent) were fabricated by the micro-molding/solvent casting method. The obtained microneedles were characterized in terms of crystalline state (by XRD), thermal behavior (using DSC), the interaction of nanoparticle and polymeric matrix (by FT-IR), mechanical strength (by texture analyzer), size, and microstructure of microneedles (using FE-SEM). The results of XRD showed the presence of AgNP in the polymeric matrices and the semicrystalline state of the polymer. DSC peaks indicated that the AgNP content does not have an influence on Tg and the degree of the crystallinity of the polymer. The FT-IR showed that there is no interaction between polymer and AgNP.The mechanical study revealed that the fabricated microneedles have appropriate mechanical properties. Fabricated AgNP-containing microneedles showed proper physicochemical characteristics and can be used as a suitable platform for dermal applications.

Keywords: Microneedle, Ag nanoparticle, Dermal Drug Delivery, Characterization

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Biomedical Applications of Injectable Photoactive Hemostatic Farsi Gum-Alginate Hydrogel Designed via Metal-Coordinated Crosslink

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15-18 February 2022

Poster: P38

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Abstract:
Treatment of full-thickness wounds, as a major clinical challenge, has caused a tremendous economic burden worldwide. Therefore, an efficient new strategy is a high demand for promoted wound healing. In recent decades, natural-based hydrogels exhibited interesting features in comparison to synthetic ones like biodegradability, biocompatibility, and higher water absorption capacity. Herein, we reported a photothermal therapy (PTT) assisted antibacterial system utilizing bismuth sulfide nanoparticles (BiH NPs) and allantoin (Alla) as a hydrophilic drug derived from plants, which could stimulate proliferation and cell migration for the acceleration of wound healing. BiH synthesis carried out through bismuth nitrate pentahydrate and thioacetamide reaction in an acidic environment. Gel-BiH-Alla hydrogel was prepared through abundant metal coordination among the functional groups of farsi gum and alginate via ferric ions. Physicochemical characterizations were performed to confirm the formation of the hydrogel. Furthermore, the injectability and rheology properties of hydrogels were assessed. The photothermal effect of the hydrogel was evaluated under near-infrared (NIR) light irradiation at 808 nm with a power density of 1 W/cm2 for 10 min. Moreover, antibacterial activity, blood clotting test, and in vivo toxicity of the hydrogel were evaluated. Subsequently, in vivo wound healing and cancer phototherapy evaluations were carried out. The rod-shaped NPs, with an average particle size of about 57 nm, were synthesized and successfully loaded in the hydrogel. The prepared hydrogel showed good injectability and self-healing capacity. In addition, Scanning Electron Microscopy (SEM) results confirmed the porous structure of the hydrogel. The hematoxylin and eosin (H&E) staining of the main organs of rats showed no organ abnormality, like necrosis and inflammation. Moreover, the blood clotting test showed a significant decrease in hemostatic time and blood loss in hydrogel-treated groups in comparison to the control groups. The temperature of BiH-loaded hydrogel increased after NIR irradiation, which was efficient for wound healing and reduction of relative tumor volume in the breast cancer model. In addition, the hydrogel showed a desirable antibacterial activity due to the photothermal and bacterial killing effect of BiH and Alla. This novel multifunctional hydrogel demonstrated excellent hemostatic performance, antimicrobial activity, and photothermal-induced skin regeneration, which had great application potential in wound healing and cancer therapy.

Keywords: Multifunctional Biomaterials, Photothermal Therapy, Injectable Hydrogels, Hemostatic, Cancer Thermotherapy, Wound Healing

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Solubility Study of Clotrimazole in (Propylene Glycol + Water) Binary Mixtures at Different Temperatures

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15-18 February 2022

Poster: P39

Abstract Presenter:
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Abstract:
The knowledge of solubility is important in the pharmaceutical industry, because it permits the scientist the choice of the best solvent system for a drug or combination of drugs, and helps in overcoming certain difficulties arising in the preparation of pharmaceutical solutions. The aims of this study were to investigate the solubility behavior of clotrimazole (CLO) in the binary mixed solvents of propylene glycol (PG) and water at different temperatures and correlate the experimental values by some mathematical models including the vant Hoff equation, the Jouyban-Acree and the Jouyban-Acree-vant Hoff models. Method: A shake-flask technique followed by spectrophotometry was used for the solid-liquid equilibrium and the solubility measurement of CLO in the solvent mixtures of propylene glycol(PG) + water. The excess quantity of CLO was dispersed into the glass vessel containing 10 g of solvent mixtures or neat solvent. Each measurement was carried out in triplicates. The obtained mixtures were located in an incubator at a definite temperature and allowed to equilibrate for 48 h on a shaker. At the end of the equilibration time, the saturated solutions were centrifuged, diluted with ethanol: water (30:70% v/v) and analyzed at 260 nm using a UV–Vis spectrophotometer. Additionally, the experimental values were correlated by some mathematical models including the vant Hoff equation, the Jouyban-Acree and Jouyban-Acree-vant Hoff models by SPSS software. Results: Our findings reveal the solubility of CLO increase with the increment of cosolvant mass fraction and temperature and mean relative deviation for back-calculated data with the investigated models shows that the studied model have enough reliability for solubility prediction in the binary mixtures. Conclusion: A growing of evidence shows CLO has successful results in treatment of individuals failed to cure by certain other antifungal medications. So, the optimization of formulated products to enhance drug delivery will be vital. Our study suggests the importance of cosolvancy in pharmacokinetics of CLO and necessity for developing of new approaches to the formulation of the drug with higher efficacy.

Keywords: Solubility, Clotrimazole, Shake-Flask

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Influence of lyophilization on Biological Activity of Anti-HER2 scFv

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15-18 February 2022

Poster: P40

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Abstract:
Recombinant protein production and purification are very challenging. Furthermore, the physical and chemical stability of recombinant proteins is limited. To overcome the instability barriers of proteins under liquid conditions and obtain an acceptable shelf life for protein products, they can be made into solid forms. Lyophilization, also known as freeze-drying, is commonly used for preparing solid protein pharmaceuticals. The major advantages of lyophilization are improved stability and allowing lyophilized products to be stored at room temperature. However, as the lyophilization process causes both freezing and drying stresses, this process can denaturize proteins to various degrees. Herein, we aimed to evaluate the effect of lyophilization on the biological activity of the purified single chain variable fragment (scFv) against human epidermal growth factor 2 (HER2) receptor. Correlation between breast cancer malignancy and HER2 overexpression has led to the application of monoclonal antibodies targeting HER2 receptors in the treatment and diagnosis of HER2-overexpressing breast cancer. Single chain variable fragment (scFv) contains variable regions of heavy and light chains of an antibody. The penetrability of scFvs into tumors is improved; while, their specific affinity is retained and its immunogenicity is lowered as compared to full-length antibodies. Anti-HER2 scFv can be conjugated to radioisotopes for staging and diagnosis of HER2-positive breast cancers. Furthermore, it can be fused to toxins to treat HER2-overexpressing breast cancer. Herein, anti-HER2 scFv gene was expressed in Escherichia coli BL21 (DE3) host and then purified by immobilized metal affinity chromatography (IMAC) under native condition. Next, the purified anti-HER2 scFv was freeze-dried. The biological activity of the purified anti-HER2 scFv was evaluated by HER2-based enzyme-linked immunoassay (ELISA) before and after lyophilization. In the present study, highly pure anti-HER2 scFv with approximately 28 kDa molecular weight was obtained by IMAC using Ni-NTA resin under native condition. HER2-based ELISA demonstrated no significant difference between the biological activity of anti-HER2 scFv before and after lyophilization. It can be concluded that anti-HER2 scFv can be preserved by freeze-drying with no change in its biological activity. Therefore, the lyophilized anti-HER2 scFv can be stably kept at room temperature in a dry place.

Keywords: Human Epidermal Growth Factor, Single Chain Variable Fragment, Freeze Drying (lyophilization), Stability.

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Step-By-Step Fabrication and Optimization of Electrospun Zein/Chitosan Nanofibers

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15-18 February 2022

Poster: P41

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Abstract:
Electrospinning of chitosan, a natural polymer, is reported to be difficult because of its high viscosity in low concentrations. As a result, blending chitosan with other polymers may improve chitosan nanofiber properties. Zein is a biodegradable, non-toxic plant-based protein with anti-oxidant and anti-bacterial activities, and great benefits in electrospinning. Electrospinning of this polymer in aqueous ethanol has various drawbacks such as needle clogging, ribbon-shaped morphology, and poor elasticity of the nanofibrous mats. The electrospinning parameters including voltage, feeding rate, needle-to-collector distance, and polymer viscosity can control nanofiber properties. Initially, zein (20% and 30% w/v) was electrospun in ethanolic solution. Then, a mixture of zein 30% and chitosan 3% with the mass ratio of 40:60 was electrospun. Thereafter, the solutions of 60:40 and 80:20 ratios were further electrospun. Subsequently, tween 80 was added to the formulation and the effect of sonication was also observed. Moreover, glycerin was added to the optimized solution. Finally, pure zein and optimized solution were prepared with a new solvent. Electrospinning was conducted with different feeding rates (0.4, 0.5, and 0.6 mL/h) and two needle-to-collector distances (12 and 15 cm). To obtain a suitable ethanolic zein solution for electrospinning and preventing the aging effect, the stirring time should be modified. Beaded nanofibers were observed in zein 20% but an increase in the zein concentration to 30% exhibited homogeneous and almost bead-free nanofibers. Through the fabrication of the mixture's mats, an increase in the mass ratio of zein:chitosan from 40:60 to 80:20 improved the electrospinninability. Moreover, fewer particles and beads were seen in the electrospun nanofibers of the 80:20 mixture via microscopic observation. The use of acetic acid as solvent and addition of glycerin and tween 80 to the optimized solution showed improvement in the electrospinnability of the polymeric mixture and morphology of nanofibers. Natural electrospun nanofibers of zein and chitosan can be prepared through the optimization of the fabrication method and the prepared mats may be applied in several applications due to their promising properties.

Keywords: Zein , Chitosan , Electrospinning , Nanofiber

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Preparation and Stability Assessment of Extemporaneous Rabeprazole Suspension

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15-18 February 2022

Poster: P42

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Abstract:
Stress-related mucosal disease is prevalent in critically-ill patients within 24 hours of admission. It has been shown that treatment with proton pump inhibitors is more effective than histamine-2 receptor antagonists for lowering gastric acid secretion. Proton pump inhibitor suspensions have proven to be effective in lowering gastric acid secretion and can be used in patients unable to swallow solid forms of drugs. The main goal of this study has been to prepare rabeprazole (RB) suspension for clinical use and to evaluate its stability. Suspension of 2 mg/ml RB was prepared with 8.4% sodium bicarbonate. Six containers each holding 120 ml of the formulation were stored in 5°C for 28 days. Sampling was carried out on days 0, 1, 7, 14, 21 and 28. The amount of medicine in dosage forms were measured by UV-vis spectroscopy and were expressed as percentage of remaining medicine. Also, sample color and odor was evaluated for each case. RB suspensions prepared with 4.2% and 6.2% sodium bicarbonate, were stable up to 14 days in 5°C, whereas RB suspensions prepared with 8.4% and 9.6% sodium bicarbonate were stable up to 21 days at the same temperature. Appearance characteristics of the suspension such as color and odor together with remaining RB content of at least 90% were taken as stability indicators. Results obtained in this study suggest that RB suspension prepared with 8.4% sodium bicarbonate is a proper choice for critically ill patients in ICU. This conclusion is supported by the fact that this dosage form is stable for sufficiently long consumption period. Furthermore due to lower content of sodium bicarbonate, this formulation is less costly and less prone to drug interactions.

Keywords: Rabeprazole, Suspension, Stability

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Could New Drug Delivery Systems Affect The Pharmaceutical Effect Of Calendula?

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15-18 February 2022

Poster: P43

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Abstract:
Calendula genus is a group of herbs used in the treatment of some human diseases and disorders, such as wounds, inflammations, and cancers. Calendula was used as medicine from humans earliest ages to the present days; from using the plant itself as herbal tea in renaissance to using the calendulas as tablets and other drug formations. However, these herbal treatments have some disadvantages, including unwanted side effects in some organs of the body, toxicities, and fast ending of medicinal effects. Therefore, researchers have made special attention to overcoming these disadvantages via novel drug delivery formulations and using new drug delivery systems such as nanotubes, liposomes, carrier polymers, lipid-based nano particles (like Nanostructured lipid carriers (NLCs) or Solid lipid nanoparticles (SLNs)), fullerenes and etc.,. These carriers and delivery systems could help the marigold extract and oil to perform better pharmacological effects, leading to decreased toxicity and other side effects. Carriers loaded with marigold extract can be a good (sometimes the best) formulation in the treatment of many diseases in humans (like cancer and the other which were mentioned earlier), especially if a suitable carrier is chosen.

Keywords: C.Officinalis, Lipid-Based Nanoparticles, Marigold, Metal-Based Nanoparticles, New Drug Delivery Systems, Wound Healing.

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The Effect of Mild Solubilization Process on Anti-HER2 scFv Recovery from Inclusion Body of Escherichia Coli

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15-18 February 2022

Poster: P44

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Abstract:
The high rate of protein expression in E. coli and the inadequacy of existing chaperones lead to the formation of proteins aggregates that lack biological activity called inclusion bodies. To recover biologically active proteins from inclusion bodies, they need to be denatured, dissolved and finally renaturated after separation of inclusion bodies. Due to the advantages of inclusion bodies such as the possibility of isolating the desired protein with high purity, many strategies have been reported to recover the active protein from inclusion bodies. Accordingly, it is appropriate to use mild solubilization processes, which do not completely disrupt the protein intact structure. In mild solubilization process, protein aggregation are reduced during refolding and active protein recovery from inclusion bodies is enhanced. Due to high solubility, low cost, and easy use various detergents are used to dissolve inclusion bodies. The aim of this study was to evaluate the efficiency of detergent-based mild solubilization of inclusion bodies containing anti-HER2 scFv. Anti-HER2 scFv can be used to diagnose and treat breast cancer, which is the most common cancer among women and the le ading cause of cancer death worldwide. Herein, BL21 containing pET-22 (anti-HER2 scFv) was induced under its optimal condition. To disrupt cell wall, the pellet of the induced bacteria was resuspended in lysis buffer containing lysosyme, and then sonicated. After isolation of inclusion bodies and their washing, the inclusion bodies containing anti-HER2 scFv were suspended in solubilization buffer containing different kinds of detergents such as sodium dodecyl sulfate (SDS), sodium lauryl sulfate (SLS) or deoxycholic acid sodium (DOC) and low concentration of urea at different pH (8.5 and 12). In the next step, the proteins in supernatant were precipitated using tricholoroacetic acid. To evaluate the efficacy of the applied solubilization process the absorbance at 350 and 280 nm was measured. Additionally, the proteins in supernatant were analyzed using SDS-PAGE and finally, the concentration of anti-HER2 scFv was calculated. The result of the present study demonstrated that among the evaluated detergents, SDS 1% pH (8.5 and 12) and SDS 1% + urea 0.5 M have the best efficacy to solubilize the inclusion bodies containing anti-HER2 scFv. In conclusion, the type and the percent of detergent as well as pH of solubilization buffer had influence on its efficacy.

Keywords: Breast cancer, Human Epidermal Growth Factor, Single Chain Fragment Variable, Detergent, Sodium Dodecylsulfat

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Investigation of Anti-HER2 scFv Expression in ClearColiTM BL21(DE3), an Endotoxin-Free Host

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15-18 February 2022

Poster: P45

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Abstract:
Recombinant protein expression in Escherichia coli (E. coli) is one of the breakthroughs facilitating application of numerous proteins for diagnosis and treatment of different diseases. However, removal of E. coli endotoxin is a challenging step to purify the recombinant proteins. ClearColiTM is an engineered E. coli BL21(DE3) strain with a genetically modified LPS. Since endotoxins are able to stimulate immune system and provoke septic shock and multi-organ failure, expression in endotoxin-free ClearColi™ can warrant a safer profile. Single chain variable fragment (scFv) is a common recombinant antibody in which the variable regions of the light chains and heavy chains are connected to each other with a flexible hinge. Anti-HER2 scFv can be used in diagnosis and treatment of HER2 positive breast cancer. In this study, we assessed the expression of recombinant anti-HER2 scFv in ClearColiTM BL21 (DE3). Herein, pET-22 (anti-HER2 scFv) was transformed into ClearColiTM competent cells using heat shock method. Then, ClearColiTM containing pET-22 (anti-HER2 scFv) was induced at 37 ℃by 1 mM isopropyl-β-d-thiogalactopyranoside (IPTG) when the optical density at 600 nm (OD600) of recombinant ClearColiTM was reached to 0.6-0.8. Next, 2- and 24-hour post-induction samples were analyzed using SDS-PAGE. One protein band corresponding to the expected molecular weight of anti-HER2 scFv (~28 kDa) was observed in post-induction ClearColiTM pET-22 (anti-HER2 scFv) samples in SDS-PAGE analysis. While, no band related to anti-HER2 scFv was seen in pre-induction sample. It can be concluded that recombinant anti-HER2 scFv protein with the size of 28 kDa was induced successfully in ClearColiTM. Totally, ClearColiTM is an effective system for preparing endotoxin-free anti-HER2 scFv.

Keywords: ClearColiTM BL21(DE3), Anti-HER2 scFv, Novel Expression System, Engineered E. Coli BL21

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Designing the Implementation and Evaluation of the Optimal Use of Specialized Pharmaceutical Laboratory Equipment Using SOP Adjustment and Increasing

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15-18 February 2022

Poster: P46

Abstract Presenter:
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Abstract:
With the advancement of science and discussions of analysis, the role of equipments and analytical tools have become more prominent, so the correct use and correct implementation of the instructions for working with each device is of particular importance. Proper use of any device, in addition to obtaining the desired results and reducing errors and wasted resources, due to the high cost of repair or purchase of devices, possible damage to this valuable tool is also prevented. To use each device, in addition to obtaining precise results, a standard method should be followed to prevent damage to the device and wasting resources and consumables. Considering the high cost of purchasing and repairing laboratory equipments, the importance of this issue is doubled. The traditional way of teaching how to work with devices in the form of oral explanation which is being implemented includes negative points such as making mistakes in conveying quotes, forgetting commands or the absence of the relevant expert. Preparing the SOP (Standard operating procedure) in a written form and attaching it to each device is a proper method to provide education and instructions to use each device. QR codes (Quick Response codes) are a modern form of codes which are used to guide clients and represent information in many service locations such as restaurants and hospitals today. Considering the developments made in mobile phones and their useful potential, the QR code method can be used to provide the user with SOP. The main aim of this process is reducing damage costs made by the misuse in addition to accelerating the availability of instructions to the user and consequently increasing the provision quality of services and Improving student's practical skills. In this plan, considering the importance of the application and the correct method of using each device, standard instructions were provided for each device and uploaded in the cloud space of google drive. Then, the link of instructions was attached to each device in the form of QR code and the instructions are shown to the user when that code is scanned with the mobile phone camera. For a group of students, it was piloted to measure the performance of the project and address its potential weaknesses. Students were evaluated in two stages and in two ways during this process. First, the trained experts evaluated students based on the usual method of teaching in pharmacy faculties. Then, in the second stage, the training was conducted in a new method and the students were re-evaluated. The graphs and charts based on descriptive statistics and the results of analytical statistics indicated that the level of knowledge and skills has increased and the level of knowledge of the students is not the same comparing before and after the study. Statistical analysis of the students' self-assessment and the survey done before and after the study show that students believe that their level of skill and specialized knowledge has increased.

Keywords: QR codes(Quick Response codes), SOP, Mobile Device

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Predicting the Drugs Clearance Pathway by Structural Descriptors

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15-18 February 2022

Poster: P47

Abstract Presenter:
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Abstract:
Clearance pathway of a drug, by renal elimination or hepatic metabolism, is one of the most important pharmacokinetic parameters. It allows to predict half- life, bioavailability, drug-drug interactions, and it can also affect the dose regimen of a drug. Predicting clearance pathway for new chemical candidates is vital in drug development to minimize the risk of possible side effects and drug interactions. Many in vivo methods have been established in order to predict human clearance, and these mainly rely on data from in vivo studies in preclinical species, mainly rats, dogs, and monkeys. They are time-consuming with a significant cost. The aim of this study is to find out the relationship between structural parameters of drugs and clearance pathway. Clearance pathway of drugs was obtained from literature. Various structural descriptors (Abraham solvation parameters, topological polar surface area, number of hydrogen bond donors and acceptors, number of rotatable bonds, molecular weight, logarithm of partition coefficient (logP), and logarithm of distribution coefficient at pH=7.4 (logD7.4)) were applied to develop a mechanistic model for predicting clearance pathway. The results of this study indicate the compounds having logD7.4>1 or number of hydrogen bond donors zero or one are undergoing hepatic metabolism and whenever chemicals have logD7.4

Keywords: Clearance, LogP, Prediction, Model, Renal, Metabolism

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Preparation and In Vivo Evaluation of Honey-Chitosan Gel Containing Lipid Nanoparticles for Wound Healing Application

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15-18 February 2022

Poster: P48

Abstract Presenter:
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Abstract:
Burns are a common health problem, and secondary bacterial infections is the most important issue in burns. Previous study indicated honey and chitosan gel can improve microbial infections. In this study, we prepare the chitosan-honey based gel containing nano lipid carrier (NLC) of herbal oil and butter which is suitable for burns healing. The efficacy of formulation was evaluated by in vivo test. NLCs were developed by solvent evaporation technique. The formulation was characterized for size, zeta potential and morphology using and dynamic light scattering and transmission electron microscopy, respectively. The gel was prepared by cold mechanical method and incorporated into the gel and the color, consistency, homogeneity, pH, and spread ability was evaluated. In vivo study was done in 2 groups of vistar rats and follow up the treatment process by histopathology analysis. The formulation is a homogenous and consistent gel with colloidal creamy color, with adjusted pH to apply on the skin (pH= 6.1). Gel contains 100 nm NLC with -34.5 mV zeta potential. TEM image indicated NLC structures in gel matrix. Synergism of the contents in formulation was confirmed in wound healing. The ingredients accelerated wound- healing process through bacteriostatic, antimicrobial, anti- inflammatory, and anti-oxidative activities and by promoting cell proliferation, increasing collagen synthesis, stimulating dermal reconstruction, and repairing the skins lipid barrier function and improving moist environment. Honey-chitosan gel containing NLC with specific formulation is an alternative cheap, non-toxic, natural and efficient system for wound healing.

Keywords: Chitosan, Honey, Nanolipidparticles

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Preparation and Characterization of Nanoliposomes Loaded with Lavandula Angustifolia Essential Oil Using Sonication and Filtration Methods

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15-18 February 2022

Poster: P49

Abstract Presenter:
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Abstract:
Nanoliposomes are one of the new nanocarriers for the encapsulation of bioactive compounds and are made of spherical lipid bilayer. They are used as carriers of the encapsulated molecules for the purpose of enhancing their Stability, decreasing toxicity and giving target selectivity. Lavander (Lavandula angustifolia) has antioxidant, analgesic and anti-inflamatory properties and shows significance therapeutic potential. Although essential oils contains many therapeutic agents, their use is limited due to their instability, low solubility and sensitivity to oxidation and light radiation and evaporation. The aim of this study is to improve the stability of lavander essential oil by encapsulating it within nanoliposomes and comparison of two methods of preparation. The lavander essential oil was extracted and its compounds were analyzed by using gas chromatography and mass spectroscopy methods. Thin-film hydration method was used for preparation of small liposome loaded with the essential oil. The lipid phase prepared by using L-α-Phosphatidylethanolamine, Cholesteryl hemisuccinate and the essential oil. PBS buffer solution used for hydration and liposomes were prepared using two methods of sonication and filtration. Then the characteristics of liposomes including size distribution and homogeneity of were evaluated. The size of liposomes prepared using sonication method was 241.3 nm with 100% abundance and poly dispersity index (PDI) of 0.875. The size of liposomes prepared using filtration method was 518.6 nm with 100% abundance and poly dispersity index (PDI) of 0.672. This study shows that the sonication method compared to filtration method prepares smaller size liposomes loaded with lavander essential oil.

Keywords: Nanoliposome, Encapsulation, Lavandula Angustifolia, Essential Oil

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Monitoring of Pethidine Using Voltammetric Sensor Modified with Pd/Ru Nanoparticles on Hollow Nitrogen Doped Carbon Nanoboxes in Biofluid

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15-18 February 2022

Poster: P50

Abstract Presenter:
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Abstract:
Improving a sensitive sensor for the monitoring of illicit drugs is always challenging. Owing to the matter of pethidine tracking in addiction assessment, numerous demands have recently developed for a sensitive and selective sensor. In summary, in order to discover an electrochemical sensor for the illicit drug, pethidine, we fabricated a screen-printed electrode (SPE) modified by to provide a strategy as a pethidine sensing tool. The modified SPE is shown to provide the voltammetric designation of traces of pethidine. Experimental features affecting the results such as pH value of the electrolyte, accumulation time, the scan rate were optimized. Due to peak current variations, the pethidine was showed over a broad concentration range from 25 nM up to 160 µM with a limit of detection as low as 17.8 nM compared to the other studied pethidine sensors. The structure of used nanomaterials was characterized by many physicochemical characterization methods including high-resolu1tion transmission electron microscopy (HRTEM), field emission scanning electron microscopy (FESEM), X-ray diffraction (XRD) , Brunauer–Emmett–Teller (BET) method, Fourier-transform infrared (FTIR), thermo gravimetric analysis (TGA), and Raman spectroscopies. The fabricated sensor showed the spiked pethidine concentrations in several biofluid samples, including urine, human blood and saliva. The good sensitivity of the electrochemical sensor herein, which is a bonus for the evaluation of pethidine, may open up a path for noninvasive routine strategy in target clinical samples.

Keywords: Electrochemical Sensor, Pethidine, Clinical Samples, Screen-Printed Electrode, Hollow Structures

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Dual-Emission Carbon Dots for Determination Simultaneous Carbidopa and Levodopa

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15-18 February 2022

Poster: P51

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Abstract:
Rapid, sensitive, and simultaneous detection of drugs is necessary for therapeutics, and prognostic of diseases. We have developed a facile and convenient route to the synthesis of carbon dots with dual emission peaks respectively at 445 and 530 nm. The N-doped carbon dots (NCDs) are designed by the hydrothermal method of a mixture of citric acid and Ethylene amine. The prepared dual-emission carbon dots can be used for the determination of Carbidopa in the range from 0 to 35 µmol/L with a 0.8 µmol/L detection limit based on the fluorescence quenching at 530 nm. The fluorescence was enhanced by Leodopa at 445 nm. A linear range of 2–40 µmol/L with a detection limit of 0.9 µmol/L for Levodopa. The carbon dots were successfully applied to determine Carbidopa and Levodopa in biological samples with promising results.

Keywords: Levodopa, Simulation Determine, Carbidopa

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Optimization of Radiolabeling Methods of His-Tagged Single-Chain Antibody Fragments (scFvs) with Technetium-99m Tricarbonyl as Molecular Imaging Agent

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15-18 February 2022

Poster: P52

Abstract Presenter:
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Abstract:
Single-chain antibody fragments (scFvs) are considered more valuable agents for clinical imaging compared with parent antibodies due to their rapid tumor uptake and high tumor-to-background ratios at early times. Because of the rapid blood clearance, they also are potential agents for radiolabelling with short half-life radioisotopes such as technetium-99m. A number of the studies reported that biomolecules can be radiolabeled with ^{99m}Tc in a high yield using indirect labeling techniques or non-site-specific conjugations, but these approaches can reduce their biological activities. Histidine-tags (His-tags) are incorporated into recombinant proteins such as scFvs to provide fast and better purification. His-tags are specific sites for radiolabeling of scFvs with ^{99m}Tc-tricarbonyl ($[^{99m}Tc(CO)_3]^+$). In this attractive method, technetium-99m binds conveniently and efficiently to histidine-tagged scFvs without affecting their biological activities. According to the reported studies, radiolabeling efficiency of His-tag-containing biomolecules vary unpredictably and depend on a series of various factors including the structure of the biomolecule and the conditions of radiolabeling. Therefore, in this study, we tried to radiolabel two His-tagged scFvs with precursor complex of $^{99m}Tc(CO)_3$ and evaluate their radiolabeling efficiencies in the different conditions to obtain a suitable radiolabelling efficiency (>95%) for in vivo molecular imaging. scFvs were gifted from the biotechnology group. Then, the Influence of type of buffer, volume, ionic strength, pH, the concentration of antibody, and activity, temperature, and time on their radiolabelling reaction with $^{99m}Tc(CO)_3$ was studied using Thin-layer chromatography (TLC) and gamma counter. His-tagged scFvs were radiolabeled with $[^{99m}Tc(CO)_3]^+$ in 100% radiochemical purity at a range of 480-600 µCi/µg for 2 h at 50°C. We demonstrated that the radiochemical purity of radiolabeled His-tagged scFvs increases with higher $[^{99m}Tc(CO)_3]^+$ activity, antibody concentrations in a smaller volume, increasing the temperature and pH of the reaction medium. Moreover, the radiolabeled His-tagged scFvs showed high stability for 24 h in the reaction medium. In the present study, the optimal and efficient radiolabelling of His-tagged scFvs successfully obtained that they can be used as potential agents for in vivo imaging.

Keywords: His-Tagged scFvs, ^{99m}Tc tricarbonyl, Radiolabeling, Molecular Imaging

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Efficient Expression of Extracellular Domain of MOG in Escherichia Coli

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15-18 February 2022

Poster: P53

Abstract Presenter:
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Abstract:
Myelin oligodendrocyte glycoprotein (MOG) is a surface-exposed antigen belonging to the large immunoglobulin superfamily whose function has remained relatively unknowns. The recombinant extracellular domain of MOG is known to induce experimental autoimmune encephalomyelitis (EAE) when injected into susceptible animals. EAE induced by MOG has become one of the most reliable animal models to understand the mechanism of the human disease. In the present study, extracellular domain of MOG was expressed in Escherichia coli (E. coli). Material and method A codon optimized gene expressing MOG vector was synthetically prepared and cloned in pET28a (+) expression vector under the control of an IPTG inducible T7 promoter. The MOG/pET28a (+) construct was transformed and expressed in the BL21 (DE3) E. coli strain. Transformants were grown 24hr in Ty2x medium at 37°C and when the culture OD600 reached 0/6-0/8, protein expression was induced by addition of IPTG to a final concentration of 1 mM. Result Constructed plasmid was approved by PCR and restriction enzyme analysis. Sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE) and western blot analysis using mouse anti-6XHis tag antibody showed an estimated 15 kDa-size protein band corresponding to the recombinant MOG. Conclusion These findings imply the ability of E.coli in the expression of recombinant extracellular domain of MOG which can be used for creating an EAE model.
Keywords: MOG, Expression Escherichia Coli

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Preparation and In Vitro Evaluation of PLA–PCL–PEG–PCL–PLA Based Micelles as Promising Candidates for Improving Ocular Permeability of Dexamethasone

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15-18 February 2022

Poster: P54

Abstract Presenter:
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Abstract:
Polymeric micelles as nano-scaled drug delivery vehicles have been a subject of interest for improving the ocular bioavailability of hydrophobic drugs. The purpose of this study was to explore the possibility of developing polylactide–polycaprolactone–polyethylene glycol–polycaprolactone–polylactide (PLA–PCL–PEG–PCL–PLA) based micelles to facilitate the intra-ocular penetrance of dexamethasone (DEX). The PLA–PCL–PEG–PCL–PLA copolymers were synthesized. The successfully synthesis of the copolymers was confirmed using fourier-transform infrared spectroscopy (FT-IR) and nuclear magnetic resonance (NMR). DEX was loaded into the developed copolymers using an o/w emulsion solvent evaporation method. The DEX-loaded micelles were characterized using transmission electron microscopy (TEM) and dynamic light scattering (DLS) methods. An MTT assay was used to determine the cytotoxicity of the micelles obtained on L929 cell line. The cellular internalization was evaluated by fluorescence microscopy and flow cytometry analysis. The in-vitro drug release and kinetics were evaluated. Finally, the corneal permeability was assessed using an ex vivo bovine model. The pentablock copolymers were successfully synthesized which was confirmed by FT-IR and NMR analysis. TEM measurements showed the formation of spherical micelles with a 45 nm diameter, while according to the DLS data, the mean size of the micelles was approximately 65 nm. The DEX-loaded micelles exhibited acceptable toxicity on L929 cells with a time and concentration-dependent cellular internalization. The in vitro drug release profile from the micelles showed a biphasic release pattern consisting of an initial burst release phase within a few minutes followed by a slower release phase over 24 h. Among all the models that were investigated, the Weibull distribution model, with an R^2 of 0.99, gave the best fit for the data when explaining the in vitro release profile. The prepared micellar formulations showed a significant improvement in corneal penetrance of DEX compared with that of a marketed DEX eye drop. Overall, the results of this study suggest that the PLA–PCL–PEG–PCL–PLA based micelles might be promising candidates for the ocular delivery of DEX, and possibly other hydrophobic drugs.

Keywords: Corneal Permeability, Drug Delivery Systems, Micelles, Nano-Scaled, PLA-PCL-PEG-PCL-PLA, Hydrophobic Drugs

References:
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Evaluating the Effect of Black Myrobalan on Cognitive, Positive, and Negative Symptoms in Patients with Chronic Schizophrenia: A Randomized Trial.

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15-18 February 2022

Poster: P55

Abstract Presenter:
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Abstract:
Schizophrenia, as a chronic and disabling mental disorder, causes a wide range of symptoms, including cognitive impairments, positive, negative, and mood symptoms. There are no effective treatments for cognitive symptoms. Black myrobalan (Terminalia chebula Retz.), a medicinal plant of the Combretaceae family, exerts antioxidant, antiacetylcholinesterase, and anti-inflammatory effects. These effects can lessen the symptoms of schizophrenia. So, this study was conducted to evaluate black myrobalans impact on cognitive impairments and negative/positive symptoms in patients with chronic schizophrenia. This was a randomized, double-blind, placebo-controlled clinical trial in which participants were divided into treatment and placebo groups. They received six 500 mg capsules of black myrobalan or placebo in two divided doses for 4 weeks. Patients cognitive impairments, positive, negative, depression/anxiety, and excitement/activity symptoms were assessed using the Screen for Cognitive Impairments in Psychiatry (SCIP) and the relevant subscales of the Positive and Negative Syndrome Scale (PANSS) pretreatment and 4 weeks after treatment. Cognitive impairments (SCIP) (p value .004), negative symptoms (PANSS subscale) (p value .017), and excitement/activity (PANSS subscale) (p value .003) were significantly improved in the black myrobalan group compared with the control group after 4 weeks. No serious adverse effects were reported. Black myrobalan could improve cognitive impairments, negative and excitement/activity symptoms in chronic schizophrenic patients.

Keywords: Excitement/activity Symptoms, Cognitive Impairments, Black Myrobalan, Schizophrenia, Negative Symptoms

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Effects of Angiotensin Receptor Blockers (ARBs) on Clinical Outcomes of Patients with Hypertension and COVID-19: A 7-Month Follow-Up Cohort Study

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15-18 February 2022

Poster: P56

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Abstract:
Since the coronavirus disease 2019 (COVID-19) pandemic, the use of angiotensin II receptor blockers (ARBs) in hypertensive patients with COVID-19 has been controversial. Following our previous study, after one year, we intended to extend our sample size and results to investigate the effects of ARBs with both in-hospital outcomes and 7-month follow-up results in patients with COVID-19. Patients with a diagnosis of COVID-19 who were admitted to Sina Hospital, Tehran, Iran, from February to October 2020 participated in this follow-up cohort study. The COVID-19 diagnosis was based on a positive polymerase chain reaction test or chest computed tomography scan according to guidelines. Patients were followed for disease severity, incurring in-hospital mortality, complications, and 7-month all-cause mortality. We evaluated 1413 patients with COVID-19 in this study. After excluding 124 patients, 1289 including 561(43.5%) hypertensive patients entered the analysis. During the study, 875(67.9%) severe disease, 227(17.6%) in-hospital mortality, and 307(23.8%) 7-month all-cause mortality were observed. After adjustment for possible confounders, using ARB was not associated with severity, in-hospital and 7-month all-cause mortality, and in-hospital complications except for acute kidney injury. Discontinuation of ARBs was significantly associated with higher in-hospital mortality and 7-month all-cause mortality.

Keywords: Hypertension, COVID-19, Angiotensin-converting Enzyme, SARS-CoV-2, Renin-Angiotensin System

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Ethical Considerations in Telepharmacy: Insights from a Focus Group Discussion

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15-18 February 2022

Poster: P57

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Abstract:
Telepharmacy is defined as "the provision of pharmacist care by registered pharmacists and pharmacies through the use of telecommunications to patients located at a distance". Since 2019, coronavirus has become epidemic; also, this service has got noticed. Besides, ethics is one of the main pillars of social communication, and its existence is a guarantee to provide the best services and communication; one of the severe challenges of implementing telepharmacy is the Lack of ethical rules that can be problematic in different societies. Based on our knowledge, Ethical issues have not been noticed in studies; also, There is no search result published yet. For this reason, we decided to investigate some ethical rules and regulations in telepharmacy. In this study, we used a qualitative design based on a focus group discussion. We conducted four focus group discussions with eight people. Due to the pandemic conditions, the meetings were held online. Also, The data were collected from people specializing in clinical pharmacy, pharma economy and pharma management, ethics in medicine, and jurist in several stages; finally, the ethics considerations for telepharmacy were drafted. We developed a draft of ethical considerations in telepharmacy; twenty-eight paragraphs are defined on eight axes. These eight axes include; 1. General moral principles and rules, 2. Patient awareness of the situation, 3. Pharmacist decision independence, 4. Pharmacist privacy, 5. Pharmacist responsibility, 6. Emergency services providing, 7. Quality of care, 8. Product presentation. With the development and expansion of electronic services in all aspects of human life, it can be hoped that modern technologies will be used to improve services, and ethical principles will be contemplated in telepharmacy and telemedicine. In our country, telemedicine and telepharmacy are considered new and emerging services that face many challenges; one of these aspects is ethical issues that have not been noticed in Iran so far. Ethical issues in telemedicine that we can use in telepharmacy are technology, doctor-patient relationship, data confidentiality and security, informed consent, patient and patient's relative satisfaction. Following ethical issues in telemedicine and telepharmacy is a primary aspect of high-quality services. In other statements, if pharmacists and physicians abide by ethical rules, they can provide better services for patients. Based on a focus group discussion method, according to results, we collected twenty-eight paragraphs that are composed of eight phrases. These outcomes can be used as ethical considerations in telepharmacy. The practical activities of telepharmacy in the current pandemic conditions show the importance and necessity of implementing these services on a large scale and examining ethical principles.

Keywords: Telemedicine, Ethics, Telepharmacy

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A Study of Pharmacist's Performance in Dealing with Overlapping Drug Prescriptions in Ardabil Pharmacies in 1400

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15-18 February 2022

Poster: P58

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Abstract:
Drug interactions or drugs with wrong prescription are very common, so according to the professional duty of pharmacists, community pharmacists should carefully review all prescriptions so that in case of any interaction or wrong prescription, they can talk to the relevant doctor or Guide patients to correct mistakes and protect the patient's life. The purpose of this study is to evaluate the professional performance of pharmacists in dealing with such prescriptions. Material and methods: A person trained as a hypothetical patient would go to the pharmacy with an overlapping prescription with the wrong prescription and ask the community pharmacist to evaluate the pharmacists performance in the face of such a prescription .The overlapping version was written by an oncologist for the study results: Out of 122 pharmacies surveyed, 110 (90.16%) pharmacists were present, of which 85 pharmacists (69.67%) were active in the pharmacy. Only 68 pharmacists (55.73%) were able to detect drug interactions and misdiagnosis of drugs. Of these, 15 (12.29%) were able to detect all interactions and misdiagnosis, 32 pharmacists (26.22%) were able to detect one of the major interactions, and 10 pharmacists (8.19%) were able to detect two other interactions in addition to one significant. And 11 pharmacists (9.01%) recognized only the wrong prescription and significant interference. Conclusion: Although there are strict rules for the presence of pharmacists in all pharmacies, but the active role of pharmacists is seen in a number of pharmacies and detailed prescriptions and prescription advice are not provided in all pharmacies and may be endangered. The patient's life goes up. It seems that the performance of community pharmacists should be evaluated by better methods, for example, clinical competency tests should be performed periodically. Also, retraining for this group of members of the health system should be more practical so that pharmacists with more knowledge to Provide services to patients. Also, students learn more theory during their general studies at pharmacy schools and are less likely to encounter cases and patient's .It is suggested that pharmacy students also attend morning sessions with medical students and be able to master the necessary cases to perform their duties by examining different cases.

Keywords: Community Pharmacist, Pharmacists Roles, Pharmacy, Drug Interaction, Prescription Advice, Adverse Drug Reactions

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Investigating the Effect of Familiarity of Pharmacy Technicians with Information Technology on the Speed and Accuracy of Prescription in Pharmacies

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15-18 February 2022

Poster: P59

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Abstract:
Investigating the effect of familiarity of pharmacy technicians with information technology on the speed and accuracy of prescription in pharmacies In recent years, information technology and IT has entered most professions. In medicine and pharmacy, information technology has found a colorful role. In the past, most pharmaceutical service processes in pharmacies, including accepting prescriptions, prescriptions, enforcing insurance laws, pricing, and calculating payment amounts, were done traditionally and manually without the use of information technology. But today in pharmacies, most of the processes of providing pharmaceutical services are done using information and communication technology and the use of pharmaceutical informatics. Pharmaceutical service delivery processes must be done accurately and quickly so that it is done in an acceptable time and without error. Therefore, pharmaceutical experts and technicians should be familiar with the IT tools that can be used in pharmacies. In a descriptive cross-sectional study conducted in 2021 in 10 pharmacies in Kermanshah city in Iran, through objective observation of the performance of 10 pharmaceutical technicians, a significant relationship between the amount of experience and work experience, degree, age on the speed and accuracy of use There was information technology in the scripting processes. Sample size was calculated using Morgan and Georgian tables. According to the table gin for 10 items, the sample size should be 10. Findings For pharmaceutical technicians with 2 to 12 years of experience, the speed and accuracy of using information technology in prescription processes was less than 2 years and more than 12 years. This result was also true for those with a bachelor's degree or higher. Technicians 50 years of age and older had lower speeds and accuracy than younger ages. Conclusion The results of the present study showed that the more familiar pharmaceutical technicians working in pharmacies with information technology tools, the greater the accuracy and speed of prescription processes. Therefore, employing people familiar with and fluent in information technology, as well as in-service training, can increase the efficiency of users and significantly save time and increase accuracy in performing affairs and processes of providing pharmaceutical services. Due to the short study time, not all pharmacies may have generalizability.

Keywords: Pharmacy, Pharmaceutical Informatics, Pharmaceutical Technician, Pharmaceutical Services, Information Technology

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Incidental Clinical Examination of Safety and Effectiveness of Oral Tramadol in Colonoscopy Procedure

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15-18 February 2022

Poster: P60

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Abstract:
Colonoscopy is a generally used technique to diagnose and treat colonic diseases with spreading complications for both patients and medical team. The point of this investigation is to assess the safety and effectiveness of tramadol in colonoscopy procedure. Tramadol is an atypical opioid with analgesic properties and modulatory effects on pain-signaling to overcome moderate to severe pain, it also has more activities like anti-depressant, anti-shivering and anxiolytic effects that can enhance pain management outcomes. This random controlled examination was executed in 124 successive patients undergo total colonoscopy separated into two subgroups that were given either 100 mg of oral tramadol or placebo (single dose). The strength of pain throughout the process of colonoscopy is apprised by an extent called Numerical Rating Scale (NRS) under four levels including No pain, mild pain, moderate pain and sever pain. This trial was enrolled in www.IRCT.ir, number IRCT2015010820610N1.as a result, although both groups were equal in conditions such as sex, age and the indication of colonoscopy, the intensity of pain in those patients who received tramadol was remarkably lower than placebo. There was also a huge reduction in colonoscopy complications such as nausea, palpitation, sweating and moaning during the process which provides an opportunity to do colonoscopy without sedation. Oral tramadol is a potent drug to overcome the symptoms of patients whom undergo colonoscopy procedure.

Keywords: Colonoscopy, Pain, Tramadol, Clinical

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Biological Activity of Ferula Haussknechtii Constitutes

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15-18 February 2022

Poster: P61

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Abstract:
Alzheimers is one of the most common forms of dementia in the elderly population and is mainly associated with progressive and degenerative neurological disorders. The most common signs and symptoms of Alzheimers disease include memory loss and poor learning and the main treatments for this disease are based on inhibition of acetylcholinesterase enzyme for now. Natural compounds are more prone to be effective because they are more similar to living systems and more likely to cross biological barriers. In this study, monoterpenoid compounds chimgin and chimganin were extracted and isolated from the methanolic extract of Ferula haussknechtii. The in vitro inhibitory effect of these compounds on acetylcholinesterase was measured. For this purpose, different concentrations of these two compounds were prepared and the Ellman test was performed as follows: The solution of the evaluated compounds was diluted to purpose concentrations using the buffer 0.1% KH2PO4 / K2HPO4 (Ph: 7.4). 5 different concentrations of each compound were evaluated with three replications. To measure the inhibitory potency of the compounds, 3 ml of phosphate buffer 0.1M, 100 µl of 5,5-dithio-bis-(2-nitrobenzoic acid) 0.1M, 100 µl of 2.5-unit enzyme solution, and 100 µl of the evaluated compounds were added to the well. The prepared mixture was incubated for 25 minutes at 25 ° C. Then 20 µl of the enzyme-substrate (acetyl thiocoline iodide) was added. Then, for 5 minutes, absorption changes were recorded at 412 nm at 1-minute intervals. Tacrine was used as a positive control. The percentage inhibition of enzyme activity was calculated by comparison with the negative control: Inhibition % = (A0 − A1) × 100/A0 Where A0 was the absorbance of the negative control and A1 was the absorbance of the sample. Tests were carried out in triplicate and data were analyzed using descriptive statistics. And then IC50 of them was determined, both of these compounds had significant IC50. IC50 chimgin: 12µM IC50 chimganin: 10 µM

Keywords: Alzheimer Disease, Ferula Haussknechtii, Monoterpenoids, Extract, Ellman Assay

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Formulation and Characterization of Naproxen O/W Microemulsion Systems

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15-18 February 2022

Poster: P62

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Abstract:
Naproxen is a poor water-soluble and non-steroidal anti-inflammatory drug commonly used for the reduction of a wide variety of pain, inflammation, and stiffness in joints and muscles. The risk of serious gastrointestinal adverse effects remains one of the most challenging aspects of the oral use of Naproxen, therefore its topical use is recommended. Although, enhancement of solubility and improvement of the skin permeation is an important step in drug development. Utilizing the microemulsion as a clear, stable, and isotropic mixture of oil, water, and surfactant can be used to enhance drug solubilizing capacity and bioavailability. This study aimed to prepare a new oil-in-water (O/W) microemulsion delivery system to improve solubility and reduce adverse drug reactions. The three main components including oil phase, surfactant, and water are used in producing microemulsion. In the first step for choosing the oil phase, the solubility of Naproxen was evaluated with different oils. Then the surfactants were selected based on their availability, frequency of use in recent years, suitability for topical drug delivery, having a suitable HLB for O/W microemulsion formation, and the ability to create a large microemulsion area. Pseudo-ternary phase diagrams were plotted by using the titration method at 25±2°C to obtain the appropriate components and their concentration ranges. After this step, different formulations with large microemulsion regions were selected and characterized for transparency, droplet size, polydispersity index, and rheological behavior. The results of the drug solubility study between six different oils and Pseudo-ternary phase diagrams led to the selection of Triacetin as the oil phase. The final concentration of Naproxen in the optimized formulation was 1% (w/w). Therefore, the result represents that the solubility of Naproxen was increased in the microemulsion compared to water solubility (0.016 mg/mL) at the same temperature. The average droplet size and PDI value of the optimized formulation were 83 nm and 0.3, respectively. Finally, these results demonstrated that the optimized formulation was clear, homogeneous, transparent, and stable. The viscosity of the formulation was 4.62 cps. Also, the results of the rheological assessment indicated that it showed Newtonian behavior. The results of the drug solubility study in different oils and pseudo-ternary phase diagram were used to optimize the formulations and selected formulations were evaluated. The results suggested that the system containing Triacetin, Tween 20, and Propylene Glycol as oil phase, surfactant, and cosurfactants respectively, is the most suitable system for preparing Naproxen microemulsion. Furthermore, having a large microemulsion region on the pseudo-ternary diagram, appropriate droplet size and maximum solubilizing of Naproxen in the system were among the reasons for choosing this formulation. It seems that the use of microemulsion can increase the amount of drug in the carrier base.

Keywords: Naproxen, Microemulsion, Pseudo-Ternary Phase Diagrams, Droplet Sizes

References: Moghimipour E, Salimi A, Eftekhari S. Design and characterization of microemulsion systems for naproxen. Advanced pharmaceutical bulletin. 2013;3(1):63.

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Designing an Injectable Enzyme-Responsive Chitosan/Gelatin-Based Biosystem in the Treatment of Rheumatoid Arthritis

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15-18 February 2022

Poster: P63

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Abstract:
Rheumatoid arthritis (RA) is one of the most common intricate chronic autoimmune diseases affecting diverse organs and tissues, especially synovial joints. Due to the lack of definite cures for RA by available therapeutic strategies, the goal of medication is to achieve symptomatic relief and limit the advancement of the disease. Drug administration by intra-articular (IA) injection is an emerging popular treatment for RA, which provides localized drugs accumulation and reduces undesirable side effects such as systemic toxicity and gastrointestinal problems. In this regard, biomaterials such as chitosan hydrogels have gained more attention for intra-articular injection because of their perfect biocompatibility and biodegradability, resulting in extended drug retention time and high loading capacity. Besides, cartilage degradation and RA flares are attributed to metalloproteinases (MMPs) enzymes that belong to extracellular matrix metalloproteinase produced by inflamed joint tissues. The objective of the current study was to design an enzyme-responsive drug delivery system based on natural chitosan/gelatin containing diclofenac sodium as a model drug, which could titrate drug release to match the disease activity, resulting in optimal therapeutic efficacy. Chitosan/gelatin hydrogels were prepared using gelatin and chitosan at different ratios with the addition of β-glycerophosphate as an ionic crosslinking agent. Gelation time was determined by the test tube inversion method. The synthesized hydrogels were characterized by FT-IR and scanning electron microscopy. The cytotoxicity of the synthesized hydrogels was investigated on the Huvec cell line by MTT assay. Enzyme-responsive release of diclofenac sodium from prepared hydrogels was investigated in PBS buffer (pH 7.4), with or without collagenase I with incubation at 37 °C and 150 rpm during ten consecutive days. An aliquot of sink medium was removed and replenished with the same volume of fresh PBS at specific time intervals. Drug release was determined by UV-VIS spectrophotometry at 276 nm and the drugs calibration equation. Based on the optimization procedures, the gelation time of the final drug-loaded hydrogel was adjusted to 8 minutes. The cell viability assay of the final formulation revealed that the hydrogels are cytocompatible and exert no/negligible cytotoxicity on Huvec cells. Drug release study showed that the amount of released diclofenac sodium was related to the rate of gelatin degradation, which confirmed the sustained and controlled release in the presence of different concentrations of collagenase. This study develops a novel drug-releasing hydrogel that can effectively respond to arthritis flares. Designed hydrogels can encapsulate a wide range of therapeutic agents, containing enzyme-cleavable sites to facilitate hydrogel disassembly in response to enzymes present in inflammatory environments. The designed hydrogel will be liquid below or at room temperature and indicate fast response thermo-gelling behavior at the body temperature.

Keywords: Enzyme-responsive, Hydrogel, Chitosan, Rheumatoid arthritis, Flare-responsive

References: Joshi N, Yan J, Levy S, Bhagchandani S, Slaughter KV, Sherman NE, et al. Towards an arthritis flare-responsive drug delivery system. 2018;9(1):1-11.

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Phytochemical Study and Biological Assays on Cousina harazensis and C. Calocephala

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15-18 February 2022

Poster: P64

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Abstract:
Recognition of the therapeutic benefits of plants is concomitant with the onset of the disease in humans and gradually after the beginning of orthodox medicine, scientists began to look at which compounds cause the biological effects. Nowadays, measuring biological effects such as anti-microbial effects, anti-parasitic, cytotoxicity, enzymatic studies, etc. should be in addition to phytochemical studies to open the frontiers of knowledge to find compounds with new effects. The plant genus Cousinia is considered to be one of the most diverse species of the Compositae family and many of them are considered endemic. In this study, the biological effects of methanol: water (8: 2) extract including anti-bacterial, anti-fungal, anti-malarial and cytotoxic effects of C. harazensis and C. calocephala was evaluated and then according to the results of biological effects, phytochemical study of the species with better effects was performed. In this study, anti-bacterial, anti-fungal, anti-malarial and cytotoxicity effects by CLSI methods against five gram-positive and five gram-negative strains, CLSI against one yeast strain and one string strain, Inhibition Test of Heme Detoxification and MTT cytotoxicity study is performed on four cell lines A2780, T-47D, A549 and Hep-G2 (Ovarian, Breast, Lung and Liver cancer cell lines), respectively. After completing the biological assays, the best plant was selected and phytochemical studies (chromatographic and spectroscopic techniques) were performed on it. The resulting spectra were interpreted using instrumental analysis methods and their structure was determined. C. harazensis extract had an effect on all gram-positive strains and a growth inhibition zone was recorded. The best result of a growth inhibition zone related to the effect of this plant on Streptococcus epidermidis with 31.5 ± 0.7 mm and in general the best effects of zone of inhibition for gram-negative bacteria is also related to this extract, especially against the pathogenic bacterium Pseudomonas aeruginosa. The minimum inhibitory concentration of gram-positive and gram-negative bacterial growth also confirmed this trend but the bactericidal rate of gram-positive was the same for both extracts and bactericidal effect of C. harazensis against the gram-negative was better. The results of anti-fungal assay didn't show a growth inhibition zone but in terms of growth inhibition and fungicidal effect of C. harazensis against Aspergillus fumigatus is much better than other plant species. The study of the anti-malarial effect shows that these two plants are ineffective in this way. The trend of changes in cytotoxicity indicates the presence of cytotoxicity of C. harazensis on T-47D, A549 and T-47D with IC50 of 32.21±8.58, 31.68±10.90 and 4.52±3.19 µg/mL, respectively. The effect of this plant on A2780 was transient proliferative. C. calocephala had a proliferative effect on cell line A2780 with EC50 8.03±4.49 µg/ml, a relative and transient proliferative effect on Hep-G2 and didn't show an effect on other lines. According to the better observed biological results of C. harazensis, from its ethyl-acetate fraction, a phenyl ester compound, two flavonoid, a sesquiterpene lactone and a phytosterol compound were isolated and the structure was determined by NMR and MS techniques. C. harazensis has good anti-bacterial, anti-fungal and cytotoxic effects and its phytochemical study indicates the presence of valuable plant compounds that can be candidates for further biological studies.

Keywords: Anti-Microbial Activity, Cousinia Calocephala, Cousinia Harazensis, Phytochemistry, Cytotoxicity, Anti-Malarial

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Nanoclay-Drug Complex: an Attempt to Enhance Bioavailability of Poorly Soluble Drugs

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15-18 February 2022

Poster: P65

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Abstract:
The solubility behavior of drugs is one of the most challenging aspects in formulation development. With the advantage of combinatorial chemistry and high throughput screening, the number of poorly water soluble compounds has dramatically increased. Preparation of nanoparticle drug delivery systems such as nanoclays could improve the solubility and bioavailability of poorly water soluble drugs. Clay minerals are wildly used in drug products as excipient and active agents. Drug-clay interaction have been observed as a possible method to modify the solubility of drugs. Naproxen is a low water soluble drug. The aim of this study is to increase solubility of Naproxen using nanoclays. Methods: Naproxen molecules were attached on the surface of bentonite nanoclays by nan-covalent binding. The size and zeta potential of Naproxen-nanoclay complexes were evaluation using zeta sizer. The saturation solubility of Naproxen was evaluated after surface modification on the nanoclays and release of Naproxen from surface modified nanoclays was evaluated. The size and zeta potential of finest Naproxen-nanoclay complex were 469.4±2.5 nm and -32.5±0.1 mv, respectively. The result of dissolution study showed that the solubility of Naproxen was increased more than 100 fold after placement on the surface of nanoclays. In addition, the resales of Naproxen from Naproxen-nanoclay complexes was in sustained release manner and 90% of Naproxen was released after 8 hours. This study suggests that nanoclays could be introduced as effective drug vehicles to improve the solubility of low water-soluble drugs and prolong their release profile.

Keywords: Naproxen, Nanoclays, Poorly Soluble Drug

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Exploration of the Interactions Mechanism of Sodium Propionate with Bovine Serum Albumin Using Multi-Spectroscopic Analysis

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15-18 February 2022

Poster: P66

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Abstract:
To have a deep insight into the effect of sodium propionate (SP) on functional biomacromolecules, it is imperative to study their binding mode using multi-spectroscopic and molecular modeling techniques to understand better the additive's physiological properties at the molecular level. Herein, we examined the molecular interactions between SP and BSA via in-depth steady-state fluorescence spectroscopy supported by synchronous measurement and Ultraviolet-visible (UV) combined with detailed molecular docking analysis. SternVolmer demonstrated that the SP additive could be quenched by BSA intensity using a hybrid quenching procedure, validated by UV–vis absorption results. As the temperature increased, the binding constant values decreased indicating that the SP-BSA complex's stability decreased as the temperature was raised. Besides, van der Waals forces and hydrogen bonding have a substantial role in controlling the SP-BSA complex. The results of synchronous fluorescence of BSA in the SP existence cause the greatest change nearby the microenvironment of Trp residues compared to Tyr residues. From the molecular modeling analysis, it can be deduced that SP has a suitable binding affinity to this protein.

Keywords: Molecular Docking Analysis, Multi-Spectroscopy**,** Bovine Serum Albumin, Sodium Propionate, Interaction

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Preparation of a Protectant Sunscreen against Environmental Pollution

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15-18 February 2022

Poste: P67

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Abstract:
The skin, the outermost barrier of the body, is sensitive to environmental pollutants and solar UV rays. It is frequently exposed to the environment and may be damaged aesthetically. Pollution can cause inflammation, oxidative stress and skin barrier function impairment and can make the skin dull, dry and hyperpigmented. Thus, formulating a broad-spectrum sunscreen cream with protecting features reducing these undesired effects is the aim of this paper. Zinc oxide, one of the few safe sunscreen agents recommended by FDA, was selected as sunscreen agent. Anti-inflammatory properties, antioxidant action, enhancing skin barrier function, and soothing effect are some of the other zinc oxide attributes making it rational to be considered as one of the protecting agents against environmental skin pollutants. Other protecting ingredients of antioxidating, anti-inflammatory, moisturizing and lightening properties were also incorporated. Three different methods were employed for adding zinc oxide to the cream base. The first was dispersing in oil phase while the oil is hot and other solids have melted and mixing well to wet the particles, the second was premixing with a water soluble emollient and then mixing in water phase until uniform and the third was levigating with the freshly formed cream and homogenizing until uniform and cooled to room temperature. Sun Protection Factor (SPF) of the cream containing 20% zinc oxide was evaluated by Mansur *et al.* method. The third method of dispersion was the best, in terms of powder uniform distribution, pH and whitening effect. The value of SPF by Mansur *et al.* method was found to be 23, which is lower than the value reported for zinc oxide 20% cream from *in vivo* tests in the literature which is approximately 30. This difference could be due to the light scattering of zinc oxide particles. The obtained SPF value of this method is by 31% lower than *in vivo* value. Although this method is considered unsuitable for evaluating heavy physical sunscreens, it is more accurate than ISO method in which, according to the literature, the SPF value of the sunscreens containing 20-22% zinc oxide is by 41-44% lower than *in vivo* value because ISO method has not been validated for sunscreens with high concentrations of inorganic filters in terms of application rate and substrate roughness and therefore needs adaption.

Keywords: Pollution, Sunscreen, Zinc Oxide, SPF

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Radiolabeling of Metal-Organic Frameworks (Mofs) with Technetium-99m for Diagnostic Applications

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15-18 February 2022

Poster: P68

Abstract Presenter:
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Abstract:
Among various types of nanoparticles, metal-organic frameworks (MOFs) have shown great potential to be used for biomedical applications. MOFs have exhibited such advantages as structure variety, high porosity, high surface area, ease of functionalization, biocompatibility, and biodegradability. Like other nanoparticles, MOFs can be labeled with appropriate markers. Labeled nanoparticles can be traced in the body for biodistribution and pharmacokinetic studies, and diagnostic applications. In this study, a Zn-based MOF, ZIF-8 nanoparticles (NPs), were synthesized and radiolabeled with ^{99m}Tc radioisotope using four different techniques. The difference between these methods was the reaction temperature and presence or absence of tin (II) chloride ($SnCl_2$) solution in the reaction kit as a reducing agent. After radiolabeling, radiochemical purity and radiolabeling efficiency were determined for each technique. Radiochemical purity was determined using thin-layer chromatography (TLC). Also, radiolabeling efficiency was calculated based on initial and final radioactivity. Then, a radiolabeling method with the highest labeling efficiency and radiochemical purity was selected for further studies. The best approach is radiolabeling ZIF-8 nanoparticles using $SnCl_2$ solution under 70° C for 30 minutes. Besides, the purification process was performed using an Amicon filter to separate radiolabeled ZIF-8 NPs from free and unreacted ^{99m}Tc. In the next step, the stability of the radiolabeled ZIF-8 NPs was evaluated in the buffer and human plasma at room temperature and 37° C, respectively. The results revealed that the radiolabeled ZIF-8 NPs were highly stable for up to 24 hours in buffer and human plasma. According to the capability of ZIF-8 NPs to be efficiently labeled with ^{99m}Tc, it can be concluded that these nanoparticles can be traced in the body for biodistribution and pharmacokinetic studies. Furthermore, ZIF-8 NPs can provide promising platforms for diagnostic applications. (This research was supported by National Institute for Medical Research Development Grant No.988055).

Keywords: Radiolabeling, MOFs, Technetium-99m

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Green Synthesis of Silver Nanoparticles Using Juglans Regia Extract and its Anti-Bacterial and Anti-Cancer Effect in Prostate Cancer Cell Lines

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15-18 February 2022

Poster: P69

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Abstract:
The green synthesis of silver nanoparticles has been the focus of many researchers in recent years. Silver nanoparticles are used as antimicrobial and anti-cancer agents and, in this study, we intend to evaluate the antimicrobial and anti-cancer effect of silver nanoparticles synthesized with Jaglans regia leaf extract by evaluating the expression of HSD3B1, HSD3B2 and SRD5A2 genes in PC3 and DU145 cell lines. First, the ethanolic extract of Jaglans regia was prepared and added to 2 mM silver nitrate solution. After discoloration of the extract, the physical and chemical properties of the reaction product were investigated by spectrophotometric, DLS, FTIR, SEM and TEM methods. The antimicrobial properties of the synthesized nanoparticles were evaluated using MIC and MBC tests at 20, 35, 50, 65 and 80 nM concentrations. Cytotoxicity was assessed by MTT assay on PC3 and DU145 cell lines. Apoptosis and cell cycle inhibition were assessed by flow cytometry. Gene expression was tested by Real Time PCR. The spherical morphology and size of 40±15 nm, silver nanoparticles were confirmed by TEM and SEM images. FTIR proved covalent bonds and silver nanoparticle formation. MIC and MBC experiments showed that silver nanoparticles on Pseudomonas aeruginosa (gram-negative representative) at 35 nM MIC and at 50 nM MBC and on Staphylococcus (gram-positive representative) at 65 nM MIC and at 80 nM MBC They have desirable antimicrobial properties. The anti-cancer properties of silver nanoparticles were demonstrated on cell lines using MTT assay and IC 50 was observed in PC3 class, 20 nM and in DU145 class, 10 nM. Decreased gene expression was demonstrated by Real Time PCR. In PC3 cell line, the expression of SRD5A2 genes was 2/5 times higher than control, HSD3B1 was 1/25 times higher than control group and HSD3B2 was 1/20 times higher than control. In DU145 cell line, the expression of HSD3B1 gene was 1/40 times higher than the control and HSD3B2 gene was 1/2 times higher than the control group. Jaglans regia extract is able to reduce Ag ions to silver nanoparticles. Silver nanoparticles synthesized from Jaglans regia extract have acceptable antimicrobial and anti-cancer properties.

Keywords: Prostate Cancer, Green Synthesis, Jaglans Regia, Silver Nanoparticles

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1. Khalili H, Baghbani-arani F. Green Synthesized of Silver Nanoparticles Using Artemisia tschernieviana Extract and Evaluation of Cytotoxicity Effects on Human Colon Cancer (HT29) and Normal (HEK293) Cell Lines. Journal of ilam university of medical sciences. 2017;25(2):91-100. 3.
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Green Synthesis of Silver Nanoparticles using Spinacia oleracea extract and its antibacterial and anticancer effect in breast cancer cell lines

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15-18 February 2022

Poster: P70

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Abstract:
The green synthesis of silver nanoparticles has been the focus of many researchers in recent years. Silver nanoparticles are used as antimicrobial and anti-cancer agents and, in this study, we intend to evaluate the antimicrobial and anticancer effect of silver nanoparticles synthesized with Spinacia oleracea leaf extract by evaluating the expression of BRCA1, BRCA2 and ABRAXAS genes in MCF-7 and MDA-MB-231 cell lines. First, the ethanolic extract of Spinacia oleracea was prepared and added to 2 mM silver nitrate solution. After discoloration of the extract, the physical and chemical properties of the reaction product were investigated by spectrophotometric, DLS, FTIR, SEM and TEM methods. Then, the antimicrobial properties of the synthesized nanoparticles were evaluated using MIC and MBC tests at 20, 35, 50, 65 and 80 nM concentrations. Cytotoxicity was assessed by MTT assay on MCF-7 and MDA-MB-231 cell lines. Apoptosis and cell cycle inhibition were assessed by flow cytometry. Gene expression was tested by Real Time PCR. Finally, the spherical morphology and size of 15±10 nm, silver nanoparticles were confirmed by TEM and SEM images. FTIR proved covalent bonds and silver nanoparticle formation. MIC and MBC experiments showed that silver nanoparticles on Pseudomonas aeruginosa (gram-negative representative) and Staphylococcus aureus (gram-positive representative) have MIC at a concentration of 35 nM and MBC at a concentration of 50 nM and have desirable antimicrobial properties. The anti-cancer properties of silver nanoparticles were demonstrated on cell lines using MTT assay, and in both of cell lines IC 50, 20 nM was observed. Decreased gene expression was demonstrated by Real Time PCR. In MCF-7 cell line, the expression of BRCA2 and ABRAXAS genes was 1/5 times higher than control group and the expression of BRCA1 gene was 1/3 times higher than the control. In MDA-MB231 cell line, BRCA1 gene expression was 1/7 times higher than the control and BRCA2 gene expression was 1/16 times higher than control group. Spinacia oleracea extract is able to reduce Ag ions to silver nanoparticles. Silver nanoparticles synthesized from Spinacia oleracea extract have acceptable antimicrobial and anticancer properties.

Keywords: Breast Cancer, Green Synthesis, Spinacia Oleracea, Silver Nanoparticles

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Encapsulation of Ginger Extract in Nanoemulsions: Preparation, Characterization and ex Vivo Permeability Evaluation

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15-18 February 2022

Poster: P71

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Abstract:
Objective Ginger is a potent anti-inflammatory and anti-oxidant natural substance. Hence, this study aimed to formulate and evaluate the encapsulation of ginger extract in nanoemulsion to achieve improved therapeutic benefits intended for topical inflammatory disease. The ginger extract loaded nanoemulsion was prepared using the spontaneous emulsification method and characterized with respect to the particle size, morphology, and zeta potential. Also, the stability through accelerated tests, antioxidant activities, and ex vivo skin permeability were investigated. After optimization of the nanoemulsion components including surfactant, co-surfactant, oil phase, and ginger extract, the formulation was prepared as a completely transparent medium. The particle size was found in the range of < 100 nm along with a narrow polydispersibility. The accelerated stability analyses showed that the prepared nanoemulsion had high resistance against freeze-thawing cycles and were able to preserve their characteristics. Besides, radical scavenging capacity assay indicated the high antioxidant activities of ginger extract and the loaded nanoemulsion. Moreover, the free ginger extract showed very little skin permeability, while the loaded nanoemulsions resulted in a significant increase in the permeability of the extract through the skin. The formulation of ginger nanoemulsion is an efficient topical treatment strategy for inflammatory diseases.

Keywords: Ginger, Nanoemulsion, Skin Permeability, Antioxidant, Stability, Inflammatory Diseases

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Preparation and Physicochemical Evaluation of Cream-Gel Formulation Containing Rosemary Plant Extract

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15-18 February 2022

Poster: P72

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Abstract:
Herbal products have long been important in skin care. Rosemary extract has shown anti-oxidant properties due to the presence of various compounds such as phenolic compounds. There is no product with skin repairing and anti-aging potential of this plant extract available in the Iranian markets. Hence, it seems necessary to conduct a study in cream-gel formulation and physicochemical evaluation of rosemarinus officinalis extract. Stem and leaf of Rosemarinus officinalis were collected from alborz, Iran and its hydro-alcoholic was obtained by maceration method. The amount of total phenol and rosmarinic acid in the extract was determined by Folin Siocalto and HPTLC methods respectively. The cream-gel formulation was prepareded by using carbopol 940, glyserin, water, paraffin, emulvax and preservative. Hydro-alcoholic extract of Rosemarinus officinalis in different concentrations added to formulation. The physiochemical parameters of final formulation such as pH, rheology, spreadability, appearance, total phenol; and rosemarinic acid content and release test were evaluated. Finally, stability test of total phenol content, appearance and pH was performed for 6 months. Rosemary extract was contained 0.3% rosemarinic acid and 52.554 ± 0.003 µg GAE/mg total phenol. The best results were obtained from the cream-gel prepared with 2% rosemary extract, 1.5% Carbopol 940, 10% glycerin, 6% paraffin, 2% emulvax, 5%NaOH and 0. 3% methyl and propyl paraben with pH=5.6±0.01. The final formulation showed plastic rheological behavior and the kinetics of release was higuchi. Amount of total phenolic content and rosmarinic acid were determined as 1.031± 0.002 µg GAE/mg and 0.602 mg/g respectively. The six-month stability test showed acceptable results in terms of appearance, phenolic content and formulation acidity. Tests to be considers as a suitable product. Based on the results of physicochemical and stability tests, the formulation containing Rosmarinus officinalis extract has the potential to be used as an antioxidant and anti-aging skin product and can be considered as a suitable product by performing additional studies such as microbial and antioxidant tests.

Keywords: Emul-Gel, Rosemarinic Acid, Antioxidant

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Effects of Frangula Grandifolia Extract on MCF7 Cells in Cell Culture

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15-18 February 2022

Poster: P73

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Abstract:
Breast cancer is one of the most prevalent cancers through women and has high mortality. Using of plants extracts as medicine for treatment is more recommended and preferred because of their less adverse effects. Based on previous studies extracts of some plants are useful in breast cancer treatment. The purpose of this study is determining and evaluating effects of Frangula grandifolia extract from Rhamnaceae family on MCF7 human breast cancer cell line viability in cell culture. In this experiment the viability of mentioned cells was determined by MTT assay. Process steps briefly was adding cells, incubation, removing media, getting extract and adding of MTT. Administered doses of Frangula grandifolia extract in cell culture were 0.01 mg/ml, 0.1 mg/ml, 1 mg/ml and 10 mg/ml. Obtained data statistically analyzed by ANOVA. Analysis demonstrated that administration of different doses of Frangula can decrease viability of MCF7 cells and is cytotoxic.

Keywords: Frangula Grandifolia, MCF7, Breast Cancer, Viability

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Phytochemical Screening, Antioxidant, and Antimicrobial Activities of Pentanema Kurdistanicum Volatile Oil

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15-18 February 2022

Poster: P74

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Abstract:
Pentanema genus is from the Asteraceae family and has a wide distribution throughout Central Asia, Iran, Afghanistan, Iraq, Pamir-Alai, and Tien Shan. Pharmacological activities such as antibacterial, antiviral, antifungal, antifertility, antidiabetic, anti-inflammatory, and antipyretic have been reported in Pentanema genus. Pentanema kurdistanicum Maroofi & Ghaderi is found in Kurdistan province, west of Iran. The phytochemical and biological studies of P. kurdistanicum essential oil were done for the first time in the present study. The volatile oil of air-dried samples was isolated by hydro distillation for 3 hours, using a Clevenger-type apparatus. The obtained volatile oil was put in closed dark vials at 4 ℃ until the GC/Mass and GC/FID analyses. The programmed temperature was 60 to 250℃, at the rate of 5℃/min, and finally held isothermally at 250℃ for 2 minutes. The identification of compounds was performed by calculating their retention indices (RI) relative to n-alkanes (C6-C30) and by matching their mass spectra with reference mass spectral library or with authentic compound. 39 compounds were recognized that include 97.1% of total essential oil. The essential oil of the aerial parts of P. kurdistanicum was rich in oxygenated sesquiterpenes components. Among the compounds, 14-hydroxy-(Z)-caryophyllene (49.9%), epoxide-allo-aromadendrene (9.9 %), syn-anti-anti-helifolen-12-al A (6.9%), terpinen-4-ol (5.9%), and (E)-nerolidol (4.5%) included the most percent of essential oil. The essential oil of P. kurdistanicum was tested against 9 bacteria by disk diffusion and broth microdilution assay. The results indicated that P. kurdistanicum essential oil has high activity against Bacillus subtilis, Klebsiella pneumonia, Enterococcus faecalis, and Bacillus cereus. Antioxidant activity of essential oil was evaluated with DPPH radical scavenging activity. The DPPH scavenging activity of the essential oil (IC50 value of 68 µgmL_1) was remarkable compared with BHT as control (IC50 value of 24 µgmL_1).

Keywords: Essential Oil, Antioxidant, Antimicrobial, GC-MS, Pentanema Kurdistanicum

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Effects of Hydroalcoholic Extract of Lepidium Draba on Hemodynamic Parameters, Electrocardiogram Pattern and Histopathology in Myocardial Infarction

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15-18 February 2022

Poster: P75

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Abstract:
Despite great advances in personal and public health care, cardiovascular diseases, prevalently myocardial infarction (MI) is one of the most common causes of human death globally. In the present study, the protective effects of hydroalcoholic extract of Lepidium draba on isoproterenol-induced myocardial infarction (MI) were evaluated. Myocardial infarction was induced by subcutaneous injection of isoproterenol (100mg/kg) for two consecutive days in rats. Lepidium draba (L. darab) hydroalcoholic extract was injected intraperitoneally at doses of 50, 250 and 500mg/kg and then at the end of experiment the electrocardiogram and hemodynamic parameters as well as histopathological samples were evaluated. The results of the current study showed an improvement in the electrocardiogram pattern in L. draba extract treated rats. Induction of MI reduced mean arterial blood pressure (MAP) and treatment with L. draba extract increased significantly MAP near to normal value. In the animals treated with ISO wide necrosis and fibrosis are seen in histopathological samples but treatment with L. draba extract reduced significantly both fibrosis and necrosis especially at the dose of 500mg/kg. The results of this study for the first time indicated potential cardioprotective effects of L. draba following MI. However, further studies are needed to recommend its use in myocardial infarction.

Keywords: Myocardial Infarction, Lepidium Draba, Hemodynamics, Electrocardiogram, Histopathology

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Preliminary Phytochemical Analysis and In Vitro Evaluation of Antioxidant, Antimalaria and Xanthine Oxidase Inhibitory Effects of Alcea Glabrata

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15-18 February 2022

Poster: P76

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Abstract:
Alcea glabrata (family: Malvaceae) is one of the subspecies of the genus Alcea which are a group of flowering and vascular plants. Since ancient times, various subspecies of this plant genus were used for medicinal and ritual purposes. They are also used as ornamental plants. Some species of this family have been studied for their chemical composition. Generally, members of this family contain mucilage, saponins, tannins, leucoanthocyanins, and phenolic acids. The mucilage of the plants of the Malvaceae family is a source of carbohydrates that has therapeutic uses. Some biological and pharmacological activities such as antioxidant, antimicrobial, antiviral, hepatoprotective, hypoglycemic, antitumor, diuretic, and antidiarrheal effects were reported from Alcea subspecies. This study was designed to evaluate the antioxidant, anti-malarial, and xanthine oxidase inhibitory activities of essential oil, different extracts, and the fractions of potent extracts of A. glabrata as one of the Iranian species. Additionally, a preliminary phytochemical investigation of the potent extract was performed. The plant was collected during growth season. The dried and pulverized aerial parts of A. glabrata were extracted with petroleum ether, chloroform, and methanol (MeOH) by the Soxhlet apparatus in the order of their polarity. Free radical scavenging, anti-malarial, and xanthine oxidase inhibitory activities of extracts were investigated using DPPH (2,2-diphenyl-1-picrylhydrazyl), cell-free β-hematin formation, and XO-induced superoxide formation methods, respectively. In the next step, methanol and chloroform extracts were subjected to Sep-pak and VLC fractionation as the most potent parts, respectively. Then, thin layer chromatography (TLC) and gas chromatography-mass spectrometry (GC-MS) were used for the characterization of potent fractions and essential oil. Among different extracts of A. glabrata aerial parts, methanolic extract showed the most potent antioxidant (RC50=4/842µg/ml) and xanthine oxidase inhibitory (RC50= 0.369 mg/ml) activities and chloroform extract was the stronger part in anti-malarial assay (IC50=0.8 mg/ml). Furthermore, the 100% (IC50=0.852 mg/ml) and 80% (IC50=1.213 mg/ml) VLC fraction of chloroform extracts demonstrated potent inhibitory activities on Beta-hematin formation assay. The obtained results revealed strong bioactive effects of three different extracts of Alcea glabrata and it could be used as a new herbal medicine in the treatment and relief of relevant diseases. It seems that more studies on A. glabrata are necessary to focus on its pure compounds and their biological activities.

Keywords: Alcea Glabrata, Anti-Malaria, Antioxidant, Xanthine Oxidase, VLC, GC-MS

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The Antinociceptive Effects of Anise, Asafoetida, Bay Leaf, Black Cumin, Clove, Fennel, Sage, Tarragon, Thyme and Turmeric in Rats

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15-18 February 2022

Poster: P77

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Abstract:
Background and aims Anise, asafoetida, bay leaf, black cumin, clove, fennel, sage, tarragon, thyme and turmeric are commonly used in traditional medicine, and modern phytotherapy worldwide. Many studies have examined the potential analgesic effects of these herbs. Here, we investigated their effects on formalin-induced pain in rats. The samples were prepared by maceration and extraction in a mixture of ethanol and water (1:1). The effects of intraperitoneal administration of hydro-alcoholic extracts of anise, asafoetida, bay leaf, black cumin, clove, fennel, sage, tarragon, thyme, turmeric (200 mg/kg), subcutaneous morphine (10 mg/kg), intraperitoneal indomethacin (10 mg/kg), and normal saline on formalin-induced pain were studied in 13 groups of 5 male Wistar rats each. All the evaluated extracts alleviated the animal pain. The analgesic effects of all the herbal samples were comparable to those of indomethacin and morphine. Clove, turmeric, tarragon and fennel were the most and asafoetida, bay leaf, lack cumin, sage, thyme and anise were the least effective herbs, respectively. The results showed that the extracts of anise, asafoetida, bay leaf, black cumin, clove, fennel, sage, tarragon, thyme and turmeric could significantly reduce formalin-induced pain in Wistar rats. Further studies are recommended to confirm our findings and to investigate the underlying mechanisms.

Keywords: Analgesic, Medicinal Herb, Traditional Medicine

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Woundhealing Potential of *Cucurbita Moschata* Duchense Fruit Peel Extract in a Rat Model of Excision Wound Repair

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15-18 February 2022

Poster: P78

Abstract Presenter:
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Abstract:
Pumpkin (*Cucurbita moschata* Duchesne) is a medicinal plant with different pharmacological effects such as antioxidant, anti-diabetic, hepatoprotective and anti-cancer effects. In the present study, we aimed to investigate wound-healing activity of pumpkin fruit peel in a rat model of excision wound repair. Hydroalcoholic extractions of pumpkin fruit peel were obtained and used to prepare two different cold cream-based formulations, namely 10% and 20% pumpkin peel extracts (PPE). These formulations, phenytoin cream, and cold cream were topically used once daily for 14 days to compare their wound healing effects in a rat model of excision wound repair. Wound sizes were monitored at different intervals. Skin tissue samples were subject to H&E staining for histopathological analysis. Blood samples also were taken on day 14 to measure serum levels of nitrite. Both 10% and 20% PPE formulations resulted in a significant reduction of wound sizes compared to positive and negative controls. The wound contraction rate was estimated to be higher in 20% PPE-treated rats. According to histopathological analysis, treatment with 20% PPE improved parameters associated with efficient wound repair, including better regeneration of epidemic layer, higher density of dermis collagen fibers and lower presence of inflammatory cells. Also, both formulations lowered serum concentrations of nitrite. Given the obtained data from our study, hydroalcoholic extract of *Cucurbita moschata* Duchesne fruit peel is proposed to be effective in accelerating the process of excision wound repair partly due to its antioxidant effect in terms of decreasing nitrite concentration.

Keywords: Cucurbita Moschata, Pumpkin, Formulation, Nitrite, Wound

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Evaluation the Efficacy and Pharmacological Mechanisms of Medicinal Plants for Anxiety Disorders Based on Modern Medicine Resources

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15-18 February 2022

Poster: P79

Abstract Presenter:
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Abstract:
Anxiety is a definition for a set of disorders including separation anxiety disorder, adjustment disorders, post-traumatic stress disorder, anxiety caused by an object, selective mutation, specific fears, social phobia, panic disorder and also disorder. Anxiety becomes general. Studies have shown that cognitive-behavioral and pharmacological therapies such as buspirone, trazodone, imipramine, and retansrin greatly alleviate anxiety, but long-term use has many side effects, so today the use of herbal remedies with fewer side effects is much It is noticable. Valuable written and oral experiences in traditional and complementary medicine can increase the chances of getting new drugs. Methods: In this study, effective plants in the treatment of anxiety disorders are extracted based on the texts of traditional Iranian medicine, their nature and scientific name are determined, and their effectiveness is evaluated based on modern medical sources today. Sources of traditional medicine included Ibn Sinas law, the repository of medicines, the great elixir, the data of reputable scientific databases such as Pubmed with the keywords anxiety and traditional medicine. The scientific name and mechanism of action of each of these components have been studied by adapting to modern scientific sources and evidence of the effectiveness of plants used in traditional medicine to improve the treatment of anxiety disorders, based on authoritative scientific articles including causes and mechanisms, will be analyzed. Results and Discussion: In this study, some traditional medicinal plants with protective or therapeutic effect on anxiety disorders such as barberry, coriander, cinnamon, borage, cloves, lavender, lemon balm, etc. have been mentioned. Numerous biochemical compounds can reduce and improve anxiety by acting on the GABA system or by inducing ion channel transfer by blocking voltage gates or inhibiting norepinephrine expression. According to the results of several studies, these herbal compounds can be used as alternative drugs or complementary drugs in the treatment of cancer.

Keywords: Anxiety, Traditional Medicine, Herbs, Modern Medical Resources

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The Effect of High and Low Temperatures on the Stability of Anthocyanins in Raw Materials

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15-18 February 2022

Poster: P80

Abstract Presenter:
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Abstract:
It is known that the content of biologically active substances (BAS) in medicinal plant raw materials decreases over time. Special studies are conducted to substantiate the shelf life of medicinal plant raw materials; the content of BAS in the raw materials is determined after a certain amount of time. In our work, the stability of anthocyanins was determined; this BAS group is one of the most promising and possesses a lot of pharmacological actions. The objects of the study were the fruits of cherry and lingonberry, frozen and dried. The quantitative determination of anthocyanins was carried out according to the methods set out in the monographs of the State Pharmacopoeia of the Russian Federation XIV edition. When studying the stability of anthocyanins in cherry fruits for 4 months, there is a decrease in the content of anthocyanins by 33% if the raw materials are frozen, and only by 11% if the raw materials are dried. When storing frozen lingonberry fruits for 6 months, anthocyanins decline without stabilization, whereas in dried fruits their content ceases to decrease after 3 months of storage.

Keywords: Anthocyanins, Stability, Conservation Methods, Raw Materials

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Development of the Composition and Technology of Eye Drops Based on Safflower Extract (Carthamus Tinctorius L.)

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15-18 February 2022

Poster: P81

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Abstract:
To develop the composition and technology of eye drops based on safflower extract (Carthamus tinctorius L.). Ten models of emulsion-type eye drop based on oil extract of safflower (Carthamus tinctorius L.) with vasodilator effect with various excipients were developed: as a conservant- citric acid, as a prolongator- methylcellulose and sodium carboxymethyl cellulose, as an emulsifier- Tween 80 and gelatose, and water for injection as a solvent. Parameters of the eye drops were examined by organoleptic and microscopic methods. According to the research data, the optimal model was selected with the most appropriate parameters: liquid; white; quickly absorbed; homogeneous; does not spread when applied to glass (shows the presence of oil extract); it splits, but when shaken, it recovers easily. The composition of the model is as follows: Active substance: CO2 extract - 0.85 ml Excipients: Citric acid-0.04 g Methylcellulose- 0.04 g TWEEN 80- 0.15 g Water for injection up to 10 ml Manufacturing technology: 1. Safflower extract and TWEEN-80 were intensively mixed (condition: temperature has to be 60-70°C); 2. Methylcellulose and water for injection were slowly mixed (condition: temperature has to be 50° C; requirement: no bubbles); 3. Mixtures from the 1. and 2. were homogenized (condition: temperature has to be 50° C). Ten models using different bases were developed, and the optimal model №10 was selected. The full composition is outlined in the results of the study. Research in the development of the composition and technology of eye drops based on safflower extract is planned to continue in the future.

Keywords: Emulsion-Type Eye Drops, Safflower, Composition And Technology, Carthamus Tinctorius L.

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The Method of Solid Dispersions Is a Promising Way to Increase the Solubility of Drugs that a Low-Soluble in Water by the Example of Metronidazole

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15-18 February 2022

Poster: P82

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Abstract:
The work was carried out at Sechenov University and continues the direction "solid dispersions (SD) in medicine". Metronidazole is a poorly soluble antimicrobial agent. An increase in its dissolution from SD with PEG-1500 obtained by "solvent removal" by 20% has been proven. The reasons are a decrease in crystallinity; solubilization, obtaining colloidal solutions when solid dispersion is dissolved. The results were used in the development of "effervescent" tablets with TD metronidazole.

Keywords: Solubility, Solid Dispersions, Metronidazole

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HPTLC as a Method of Identification of Biologically Active Substances in Medicinal Plant Raw Materials

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15-18 February 2022

Poster: P83

Abstract Presenter:
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Abstract:
A simple, sensitive, selective, precise, and robust high-performance TLC (HPTLC) method was developed and validated for determination of flavonoids in herbal extracts Ginkgo biloba folia, Sambuci nigrae flores. Crataegi flores. The HPTLC of flavonoids was performed on RP-18 F254 HPTLC plates. The solvents used as mobile phases were: water (acidified with 5% formic acid): methanol (70:30) and water (acidified with 5% formic acid): methanol (50:50). Densitometric determination of flavonoids was performed at λ = 280 nm in reflectance/ absorbance mode. The linear regression analysis data for the calibration plots showed a good linear relationship in the concentration range of 150 – 800 ng/spot for rutin and 200 – 1000 ng/spot for quercetin with respect to peak area. The average recovery for quercetin and rutin was 97 – 99.8% indicating the excellent reproducibility. Statistical analysis of the data showed that the method is reproducible and selective for determination of flavonoids.

Keywords: HPTLC, Quality Control, Medicinal Plant Raw Materials

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Marketing Analysis of Personal Protective Equipment during a Viral Pandemic

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15-18 February 2022

Poster: P84

Abstract Presenter:
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Abstract:
In the Republic of Bashkortostan, measures for individual protection against coronavirus remain in place, as elsewhere in the Russian Federation. It is recommended to use personal protective equipment - medical masks, gloves and sanitizers. The relevance of the study is due to the need for high-quality provision of the population with personal protective equipment and increasing the level of information about the need for their use in a viral pandemic. The materials and methods of the study were content analysis of regulatory documents, publications on Internet resources, as well as information provided on the websites of pharmacy organizations; questionnaire survey of the population of the Republic of Bashkortostan; marketing analysis of the assortment of medical masks and gloves in pharmacy organizations of the Republic of Bashkortostan. A pilot study (64 respondents) of the opinion of the population regarding personal protective equipment was conducted, it was found that the population does not have enough information about the effectiveness of personal protective equipment, they believe that there is not enough information, they are looking for information on their own, they do not fully trust the media, the Internet, doctors and pharmacists. It was revealed that at the moment the fear of the virus has gone away, but psychological fatigue from the current situation has appeared. 54.7% of the respondents had a coronavirus infection, which influenced their decision to use personal protective equipment. 81.3% of respondents prefer disposable masks, changing them daily or more often, 2% do not wear masks, and only 28.1% use gloves. If the indicator for wearing masks in crowded places has not changed over the course of the pandemic, then it has decreased for gloves. Another tool necessary to protect against a viral pandemic is a sanitizer. Only 20% of respondents do not use it at all. 51.6% of respondents started using sanitizer more often than at the beginning of the pandemic and plan to keep this habit after the pandemic. The study showed the need to carry out explanatory work among the population, to increase the level of trust in official sources of information. To evaluate the choice of masks and respirators by consumers, based on the content analysis of Internet sites, we show the main characteristics of some types of masks and respirators. The conducted research has revealed the availability and accessibility of medical masks in the Republic of Bashkortostan by the main manufacturers: Russia and China. We have analyzed the assortment of 4 large pharmacy chain organizations that sell their products both through pharmacies and on the Internet. The study showed that at the moment a large selection of gloves is available to the buyer, you can choose by quality and at an affordable price, the manufacturer, as well as the right size and a pleasant color scheme for him. These funds during the COVID19 epidemic are becoming increasingly important for pharmacy organizations, being a social commodity, and therefore, there is an increase in the volume of their sale.

Keywords: Personal Protective Equipment, Medical Gloves, Medical Masks, Pharmacy Organizations, Marketing Research

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Lignans and Flavonoids of Larch Knotwood

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15-18 February 2022

Poster: P85

Abstract Presenter:
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Abstract:
Polyphenolic composition of knotwood from larch Larix dahurica Turcz. was studied by HPLC-DAD/ESI-MS/MS. Flavonoid and lignan fractions were found. The major constituents of the polyphenol extract of larch knotwood were the flavonoids dihydroquercetin and quercetin and the lignan secoisolariciresinol; minor constituents, the flavonoids aromadendrene, dihydroisorhamnetin, and eriodictyol and the lignans isolariciresinol and nortrachelogenin.

Keywords: Larix Dahurica Turcz, HPLC-DAD/ESI-MS/MS, Polyphenols

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Vasopressin and Diabetic Kidney Disease

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15-18 February 2022

Poster: P86

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Abstract:
Diabetic kidney disease (DKD) is a major complication of diabetes mellitus (DM) and is also the most common cause of chronic kidney disease (CKD). Therapeutic approaches to prevent the progression of diabetic nephropathy are still insufficiently efficient. Excessive VP signaling significantly contributes to the progression of diabetic nephropathy to end-stage kidney disease requiring dialysis or kidney transplantation. The vasopressin V1a receptor (V1aR) is of great interest as a new therapeutic target for slowing the progression of DN and CKD. To address this hypothesis we studied the effects of selective V1a receptors antagonists and agonists in a rodent model of DM. The V1a R antagonist, in comparison with the positive control, reduces urine output by 64%, reduces natriuresis by 17%, and produced a hypoglycemic effect (reduces glucose concentration by 58%). In contrast, the V1aR agonist aggravated the course of diabetic nephropathy. Ongoing morphological and biochemical, as well as proteomics approaches are aimed at detailed characterization of the therapeutic potential of V1aR antagonisms for retardation of diabetic kidney disease. Antagonism of V1aR bears therapeutic potential for prevention or retardation of the DKD course thus reducing the risk of ensuing CKD.

Keywords: Diabetic Kidney Disease, Vasopressin Receptors, Experimental Diabetes

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Monoclonal Antibodies: Current State and Approaches to Pharmacokinetics and Immunogenicity Assessment in Russian Practice

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15-18 February 2022

Poster: P87

Abstract Presenter:
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Abstract:
The first drug based on monoclonal antibody technology was approved in 1986. Today many pharmaceutical companies develop monoclonal antibody drugs (mAbs). The main advantage of mAbs is high selectivity and specificity to the biological targets, but they can also be associated with such concerns as potential immunogenicity. Drugs applied for registration should undergo many tests (preclinical and clinical trials). Thus, the development and validation of simple, sensitive analytical methods for mAb pharmacokinetics and immunogenicity assessment contribute to drug development.

Keywords: Immunogenicity, Pharmacokinetics, Monoclonal Antibodies, Anti-Drug Antibodies

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Genistein and Exercise Improve the Effects of Inflammation and Oxidative Stress on Retina of Ovariectomized Rats

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15-18 February 2022

Poster P88

Abstract Presenter:
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Abstract:
This study investigated the effects of genistein, swimming exercise, and their co-treatment on retina angiogenesis, oxidative stress, and inflammation in ovariectomized rats. Main methods: Wistar rats were randomly divided into five groups (n=8 per group): sham, ovariectomized group (OVX), OVX+genistein (1 mg/kg, eight weeks; daily SC), OVX+exercise (eight weeks), and OVX+ genistein+exercise (eight weeks). At the end of 8 weeks, the retina was removed under anesthesia. The assessed effects of treatment were by measuring MiR-146a and miR-132 expression via RT-PCR, the protein levels of ERK, MMP-2, VEGF, and NF-κB via western blotting, inflammation, and oxidative stress markers levels via the Eliza. Key findings: The results showed miR-132, miR-146b, and MMP-2, NF-κB, ERK, VEGF, TNF-α, IL-1β proteins, and MDA factor in the OVX group were increased, but glutathione (GSH) was decreased in comparison with the sham group. Both exercise and genistein treatment has reversed the disorder caused by ovariectomy. However, the combination of exercise and genistein was more effective than each treatment alone. Significance: It can be concluded that the interaction of exercise and genistein on microRNAs and their target protein was affected in the inflammation, stress oxidative, and extracellular matrix metalloproteinase pathways, can leading to a decrease in impairment of retinal neovascularization of the ovariectomized rats.

Keywords: Retinal Neovascularization, Genistei, Exercise, MiR-132, MiR-146b, Angiogenesis

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Anti-inflammatory and Anti-oxidant Properties of L.avicennia

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15-18 February 2022

Poster: P89

Abstract Presenter:
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Abstract:
Living cells, including those of man, animals, and plants, are continuously exposed to a variety of challenges that exert oxidative stress. Oxidative stress arises in a biological system after an increased exposure to oxidants, a decrease in the antioxidant capacity of the system, or both. It is often associated with or leads to the generation of reactive oxygen species (ROS), including free radicals, which are strongly implicated in the pathophysiology of diseases, such as cancer, rheumatoid arthritis, cirrhosis and arteriosclerosis. Reactive free radicals may come from both endogenous as well as exogenous sources. The present study was designed to evaluate the antioxidant and anti-inflammatory activity of orally administered methanolic leaf extract of Leutea avicennia in Carrageenan induced inflammation in rats. Aerial parts of L.avicennia were collected from mountains in Hamadan province. The dried aerial parts of plant were macerated with 70% methanol to extract the active ingredient of plant. For In-vivo study, both sex of Albino wistar rats(150-200g) were housed in standard environment conditions (12/12light/dark cycle and 25 ± 2 °C temperature). Carrageenan induced rat paw edema method is used in this study and 0.1 ml of 1% v/v carrageenan was injected to the rats and maximum edema reached at 3-5 hours after injection. Three Different doses of methanolic leaf extract of L.avicennia (200mg/Kg, 400mg/kg and 800mg/kg) were injected to rats. Paw edema and paw thickness were measured every hour up to 6 h. Antioxidant effect of L.avicennia was evaluated by DPPH free radical scavenging method. The antioxidant activity of plant was measured by Shimadzu; UV/VIS. The IC50 value was calculated as means±SD and butylated hydroxytoluene (BHT) was used as positive control. Carrageenan induced rat paw edema model is the most commonly used screening model for testing the anti-inflammatory activity of the plant extracts. The methanolic leaf extract of L. avicennia was given in three doses of 200 mg/kg, 400 mg/kg and 800 mg/kg. The dose 800 mg/kg showed maximum percentage inhibition (47.83%) of paw edema at 3 h after carrageenan injection. We found that methanolic leaf extract of L.avicennia (IC50 = 49.8 ± 7.0 µg/mL) showed appropriate free radical scavenging activity and this antioxidant nature might be responsible for its in vivo anti-inflammatory activity. In the present study we found that methanolic leaf extract of L.avicennia showed good in vitro antioxidant activity and in vivo anti-inflammatory activity in rats.

Keywords: L.Avicennia, Carrageenan, Butylated Hydroxytoluene

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Scaffold Hopping of DHPMs Design New Anticancer Agents

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15-18 February 2022

Poster: P90

Abstract Presenter:
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Abstract:
Cancer continues to be the second leading cause of death worldwide. Dysregulation of the Eg5 receptor pathway plays an important role in cancer progression and makes this receptor an attractive molecular target for anticancer drug discovery. Several studies have unraveled the potential of dihydropyrimidinone (DHPM) scaffold toward generating cancer agents. Experimental approach: In the present contribution, aseries of of DHPM derivatives were synthesized by utilizing Biginelli reaction and evaluated for their in vitro anticancer activity against MCF-7 human breast cancer. Molecular modeling studies were carried out to further investigate the interactions of the most promising compounds with the active site Eg5 kinesin. Finding/Result: DHPM derivatives bearing (3-indole) ethylcarbamoyl substitution at C5 in general exhibited higher antiproliferative effects. Molecular docking and dynamics simulation studies confirmed the interaction of N-(2-(1H-indol-3-yl)ethyl)-6-methyl-4-(4-nitrophenyl)-2-oxo-1,2,3,4-tetrahydropyrimidine-5-carboxamide) with the key residues in the active site of the kinesin Eg5 receptor. DHPM derivative with 4-(4-nitrobenzaldehyde) substituent showed the greatest inhibitory effect of Eg5 receptor. By applying scaffold hopping approach, 3-indolecarboxamide substitution at C5 of DHPM ring showed privileged priority. Interestingly, the cytotoxicity of compounds that bears an electron withdrawing group (-NO2) was, in general, around 10-fold higher than compound which displays an electron donating group (-CH3).

Keywords: Scoffold Hopping, DHPM, Eg5

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Human Monoamine Oxidase Inhibitory Activity of Indolyl Chalcone Derivatives and Studies of Docking and Molecular Dynamic Simulation

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15-18 February 2022

Poster: P91

Abstract Presenter:
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Abstract:
Monoamine oxidases (MAOs) are flavin-dependent enzymes that play vital roles in the metabolism of monoamine neurotransmitters, such as dopamine, noradrenaline and serotonin. There are two isoforms of Monoamine oxidase, MAO-A and MAO-B, which share approximately 70% sequence identity. In the human body, MAO-A prevails in sympathetic nerve terminals and intestinal mucosa, whereas MAO-B is the principal isoform expressed in the brain. Conversely, the activity of MAO-B meaningfully increases in the brain of Parkinson's disease patients. Thus, the inhibition of MAO-B can enhance the level of dopamine in the brain following that MAO-B inhibitors are considered promising therapeutic agents for Parkinson disease. In this study, a series of chalcone derivatives were designed, synthesized and evaluated for their inhibitory activity against human MAO-B (hMAO-B) and studied the molecular docking and dynamic simulation of these compounds in enzyme active site. To consider the selective inhibitory activity of compounds, the evaluation against human MAO-A (hMAO-A) was completed as well. The most potent compounds, C9 and 4a, revealed an IC50 of 0.012 and 0.010 mM with a selectivity indices greater than 13 and 15, respectively. Kinetics and reversibility studies confirmed that the mentioned active compounds represented as competitive and reversible inhibitors of hMAO-B. Besides, the molecular docking and dynamic simulation studies of representative compounds displayed a rational enzyme-ligand interaction.

Keywords: Indolyl Chalcone, Monoamine Oxidase, Synthesis, Molecular Docking, Molecular Dynamic

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1. Fernandez HH, Chen JJ. Monoamine Oxidase-B Inhibition in the Treatment of Parkinsons Disease. Pharmacotherapy: The Journal of Human Pharmacology and Drug Therapy. 2007;27(12P2):174S-85S.

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Comparison of the Effect of Hydroalcoholic Extract of *Allium Sativum* and Hydroalcoholic Extract of *Ocimum Basilicumon* on the Serum Lipoproteins of the Diabetic Rat

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15-18 February 2022

Poster: P92

Abstract Presenter:
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Abstract:
Diabetes is ametabolic disorder. Improving lipid and glucose is important in the prevention of diabetic complications. Considering people's tendency to use herbal medicines, in this study effect of hydroalcoholic extract of Allium sativum and Ocimum basilicumon on blood and lipid patterns were determined. In this experiment, 40 male rats in the range of 200-250 g were divided into five groups of eight , including non-diabetic control, diabetic control the received 120 mg/kg alloxan monohydrate (IP injection), for six days. Group III and IV rats were treated with extracts of Cress leaves and *Urtica dioica* (ip injection) at dose of 300 mg/kg body, groups V received equally from 150 mg/kg to 300 mg/kg total amount of the two extracts, every other day, for ten days Total cholesterol (TC), triglyceride (TG), high-density lipoprotein (HDL), low-density lipoprotein (LDL), and glucose levels were evaluated. After ten days of treatment, data indicated significant reductions in blood glucose, TG, TC and LDL levels of diabetic rats treated with hydroalcoholic extract of *Urtica dioica* and Cress leaves compared to the non-treated group ($p< 0.05$).

Keywords: Alloxan-Monohydrate, *Ocimum basilicumon* , Diabetes Dyslipidemia, *Allium sativum*, Cress Leaves

References:
1. Mikail, HG. Phytochemical screening, elemental analysis and acute toxicity of aqueous extract of Allium sativum L. bulbs in experimental rabbits. J Med Plant Res 2010, 4 (4): 322-326

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Novel Effect of Arthrocen (avocado/soy unsaponifiables) on Pentylenetetrazole-Induced Seizure Threshold in Mice: Role of GABAergic Pathway

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15-18 February 2022

Poster: P93

Abstract Presenter:
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Abstract:
Arthrocen, an avocado/soy unsaponifiable (ASU)-containing agent, is now used in the clinic and has potentially to decrease joint inflammation and pain associated with mild to severe osteoarthritis. Phytosterols are the major component of Arthrocen with documented anti-inflammatory properties, antioxidant, and analgesic effects. Here, we evaluated ASU anticonvulsant effect by its oral administration in pentylenetetrazole (PTZ)-induced seizure threshold and Maximal Electroshock Seizure (MES) Models. Also, the involvement of N-methyl-D-aspartate (NMDA) receptor, benzodiazepine receptor, and nitric oxide (NO) pathway were studied in anticonvulsant effect of ASU in male NMRI mice. Acute administration of Arthrocen (150, 75, 30, 10 mg/kg) by oral gavage significantly (p b 0.001) increased the clonic seizure threshold induced by intravenous administration of PTZ. Nonspecific inducible NO synthase (NOS) inhibitor L-NAME (10 mg/kg) and a specific NMDA receptor antagonist MK-801 (0.05 mg/kg) did not affect the anticonvulsant effect of Arthrocen, while pretreatment with flumazenil (0.25 mg/kg), a selective benzodiazepine receptor antagonist, reversed this effect (p b 0.01). Also, Arthrocen treated mice did not affect tonic hindlimb extension in the MES model. The data showed that Arthrocen might produce its anticonvulsant effect by enhancing GABAergic neurotransmission and/or action in the brain.

Keywords: Nitric Oxide Synthase, (NMDA) Receptor, Arthrocen, Seizure Threshold, Pentylenetetrazole, GABA-A Receptor

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Maternal Exposure to Silicon Dioxide Nanoparticles Reduces Hippocampal Neurogenesis and Induces Neurodegeneration in Rat Offspring Hippocampus

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15-18 February 2022

Poster: P94

Abstract Presenter:
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Abstract:
Silicon dioxide nanoparticles (SiO2-NPs) are among the most widely used nanoparticles. Brain maturation occurs in neonatal period. It is important to understand how NPs may affect this process. Accordingly, pregnant rats, after delivery, were divided into control and SiO2-NPs groups. Rats were treated from 2nd to 21st days post-delivery and the effects of NPs were evaluated in offspring's hippocampi. Offspring in SiO2-NPs group had lower antioxidant activity. Number of doublecortin positive cells in hippocampi of SiO2-NPs group were significantly lower than control, number of dark neurons was significantly higher, and animals in the SiO2-NPs group had a weak cognitive performance. So, maternal exposure to SiO2-NPs could affect offspring's neurogenesis, leading to impaired cognitive performance.

Keywords: Neurotoxins, Nanoparticle, Toxicology

References:

1. Ebrahimzadeh Bideskan A, Mohammadipour A, Fazel A, et al. (2017) Maternal exposure to titanium dioxide nanoparticles during pregnancy and lactation alters offspring hippocampal mRNA BAX and Bcl-2 levels, induces apoptosis and decreases neurogenesis. Experimental and Toxicologic Pathology 69(6): 329–337.

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Selective Antifungal Activity of Nanoparticles against Fluconazole Resistant Candida Tropicalis in Clinical Isolates

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15-18 February 2022

Poster: P95

Abstract Presenter:
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Abstract:
Candida tropicalis is an unrecognizable species in comparison with other Candida species. C. tropicalis is expressed to be resistant to antifungal medications. Some previous studies stated that invasive candidiasis caused by C. tropicalis have higher fatal rate measured against those caused by other Candida species. Nanoparticles (NPs) have appeared as a promising tool to decrease drug side effects while protecting or improving its therapeutic efficacy. Methods: Antifungal activities of NPs (Silver, Gold and Selenium) against five strains were examined based on the Clinical and Laboratory Standards Institute (M27–A3/S4) guideline. The effect of NP on the membrane permeability of C. tropicalis and the viability of the cells was assessed using MTT assay, respectively. Minimum inhibitory concentration of NPs of five strains was in the concentration range of 0.5–4 μg/mL. Results: The antifungal activity of synthesized silver NPs against resistant Candida tropicalis was greater in comparison with the gold NPs.

Keywords: Candida Tropicalis, Drug Resistance, Nanoparticles

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Anti EGFR monoclonal antibody -conjugated gold nanoparticles for combined antibody and photothermal therapy of cancer

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15-18 February 2022

Poster: P96

Abstract Presenter:
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Abstract:
The current investigation developed effective tumor therapeutic nanomedicine composed of PEGylated gold nanoparticles (GNPs) conjugated with cetuximab (Anti-EGFR monoclonal antibody). GNP-PEG-Cet nanomedicine was characterized and evaluated its combinational therapy on SW-480 colorectal cancer cells apoptosis. To determine the efficacy of GNP-PEG-Cet combined with photothermal therapy (PTT) was utilized. The GNP-PEG-Cet led to nuclear fragmentation and induced apoptosis in the SW480 cell line. In our study, once combined GNP-PEG-Cet with PTT induced an augmented impact on apoptosis of cancer cells. After two h exposure to 4 and 16 J/ (s.m2) light doses of NIR irradiation, the IC50 value of GNP-PEG-Cet was significantly decreased compared to the cells treated with GNP-PEG-Cet without NIR laser irradiation or NIR laser irradiation alone.

Keywords: Cetuximab, Colorectal Cancer, Gold Nanoparticles, Pegylation, Photothermal Therapy

References:
1. Khiavi MA, Safary A, Aghanejad A, Barar J, Rasta SH, Golchin A. et al. Enzyme conjugated gold nanoparticles for combined enzyme and photothermal therapy of colon cancer cells. Colloids Surf A Physicochem Eng Asp. 2019;572:333–44. doi: 10.1016/j.colsurfa.2019.04.019.

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Combined Effects of NaHS and Exercise Reduced Developed Anxiety Disorders through the Decrease of miR134 and miR124 Expression in Ovariectomized Aged

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15-18 February 2022

Poster: P97

Abstract Presenter:
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Abstract:
The purpose of this study was to evaluate the effect of hydrogen sulfide on promoting effects of treadmill exercise regarding prevention of memory deficient, oxidative stress following ovariectomized aged rats. Female Wistar rats were evaluated as the following groups: Cont.Yg = (Control Young, 3 months age, without surgery and treatment), Cont.Ag= (Control Aged, 24-20 months age, without surgery and treatment), Cont.Sh= (Sham, the old rats underwent surgery without AD induced model, ovariectomy, and treatment), Cont.Ovx= (Ovariectomized, the old rats underwent bilateral ovariectomy without treatment), Ovx.Ex= (Cont.Ovx group+exercise treatment), Ovx.Na= (Cont.Ovx group+NaHS treatment), Ovx.Ex.Na= (Cont.Ovx group+exercise and NaHS treatments). The behavioral characteristics of animals were evaluated through Novel Object Recognition, Elevated plus-maze. The total antioxidant capacity (TAC), total oxidant status (TOS), total thiol groups (TTG) were assessed. Additionally, miR134 and miR124 were quantified through RT-qPCR and proteins were evaluated western blot. The exercise and NaHS treatment lead to significantly reduced TAC and TTG compared to Cont.

Keywords: NaHS, Exercise, Anxiety Disorders, Ovariectomy, Aging, miR124

References: Mohammadi M, Zare ZJP, Behavior. Effects of treadmill exercise on cognitive functions and anxiety-related behaviors in ovariectomized diabetic rats. 2020;224:113021.

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In Vivo Study of *Curcuma Longa* and *Allium Sativum* Aqueous Extract on Non-Alcoholic Fatty Liver Disease (NAFLD)

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15-18 February 2022

Poster: P98

Abstract Presenter:
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Abstract:
The fat in the liver is normal, but if it is more than 5 to 10 percent of the total weight of the liver, the person has a fatty liver disease. This disease does not have a specific symptom, but, after not observing and progressing, the disease in the liver causes indigestion. Fat deposits in the liver are called fatty liver.. Of course, non-alcoholic people may also suffer from this illness for various reasons, including obesity, consuming ready-made foods and greasy foods, physical inactivity, and inappropriate nutrition. Therefore, due to the above, the disease is increasing. This complication is sometimes due to the use of some medications that cause fat deposits in the liver. Due to the lack of proper treatment, researchers have found a suitable treatment option, among the proposed drugs available to medicinal herbs have a special place. This study aimed to investigate *in vivo* protective effects of aqueous extract from *Curcuma longa* and *Allium sativum* on non-alcoholic fatty liver. In this study, extraction was done by massaging method. The phenolic content of aqueous extract of dandelion and clove plants was determined by HPLC. Adult male Wistar rats were fed either normal rat diet or high-fat diet described by Zou and co-workers. Rats in groups 1, 2 and 3 were treated with 250, 500, 1000 mL/kg of aqueous dandelion extract, aqueous clove extract and 1:1 of dandelion and clove aqueous extracts, respectively... After 30 days, After 30 days, blood and liver tissue samples were compared with the control groups. The results showed that the mixture of aqueous extracts of cloves and dandelions can restore and restore damaged tissues and liver factors to Normal**.**

Keywords: *Curcuma Longa*, *Allium Sativumon*, Medicinal Plants, Non-Alcoholic Fatty Liver, Rat, Liver Toxicity

References:
1. Thomson M, Al-Amin ZM et al. Anti-diabetic and hyperlipidemic properties of garlic (Allium sativum) in streptozotocin-induced diabetic rats. Int. J Diabetes & Metabolism. 2007; 15:108-11

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Cytotoxic Activities of Gypsophila Ruscifolia, a Native Species of West North of Iran

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15-18 February 2022

Poster: P99

Abstract Presenter:
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Abstract:
Considering the mortality rate of cancer and the importance of medicinal plants in treating various diseases, the present study was carried out to evaluate the cytotoxic effects of Gypsophila ruscifolia on cancerous cell lines to perform phytochemical investigation of the effective fractions. n-Hexane, chloroform, and methanol 80% extracts were prepared, and cytotoxic activities were determined by MTT assay on MCF-7, A-549, HT-29 cancerous and AGO-1522 normal cell lines. The most effective extract was then fractionated, and the fractions with the most cell growth inhibition were selected to isolate natural compounds. Then isolated compounds were also tested on two cancerous cell lines (MCF-7, A-549) and a normal breast cell line (MCF-10A). To understand the cytotoxic effects, apoptosis induction was studied by annexin V/PI assay in the MCF-7 cell line. Fractions 3 and 4 of the root chloroform extract with IC50 values of 71.07 and 60.6 µg/mL showed inhibition of cell growth in MCF-7; fraction 5 with IC50 value of 104.6 µg/mL showed a toxic effect in the A-549 cell line. The treatment of MCF-7 cells with 100 µg/mL of fraction 4 resulted in 52% apoptosis induction. Oleic acid and the mixture of β-sitosterol and stigmasterol were obtained from phytochemical studies of fractions 4 and 5. Stigmasterol with IC50 value of 84.90 µM on MCF-7 cell line and β-sitosterol with IC50 value of 93.84 µM on MCF-7 and 115.98 µM on A-549 cell line exhibited cytotoxic effects. Bioassay-guided fractionation of G.ruscifolia isolated and identified three known compounds with moderate cytotoxic effects.

Keywords: Apoptosis, Cell Survival, Cell Line, Gypsophila Ruscifolia, Medicine Plant

References:
1. Mohamadian M, Salehiniya H, Mohammadian Hafshejani A. Some facts on incidence and mortality of cancer in Iran. Iran J Public Health. 2017; 46(10): 1446-1447. 2. Chandra S, Rawat DS. Medicinal plants of the family Caryophyllaceae: a review of ethno-medicinal uses and pharmacological properties. Integr Med Res. 2015; 4(3): 123-131.

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Influence of Fruits and Shoots of Riverine Hawthorn on the Hemostasis System in Vitro

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15-18 February 2022

Poster: P100

Abstract Presenter:
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Abstract:
Diseases of the circulatory system today are one of the most global problems of mankind. One of the central links in the development of cardiovascular diseases is hemostatic activation with a violation of the rheological properties of blood and endothelial dysfunction that occur before the development of thrombosis. The use of antithrombic, hemangiocorrective agents is considered as the most optimal method for restoring vascular patency, but they have a number of side effects, so the search for new, safer drugs is an urgent problem in pharmacology. So, for example, plant substances act most gently and rarely cause side effects. At the same time, antiplatelet, angioprotective, hypocholesterolemic properties of various plant flavonoids (dihydroquercetin, anthocyanidinene, rutin, hyperoside, etc.), identified, which are also accumulated by the riverine hawthorn species studied by us. The objects of study are dried shoots and fruits of riverine hawthorn, harvested during flowering and fruiting in 2021 in the South Ural Botanical Garden-Institute. A decoction was prepared from the fruits, and an infusion from the shoots in accordance with the methods of the State Pharmacopoeia of the XIV edition. Experiments to determine anticoagulant and antiaggregatory activity were performed in vitro on human donor blood. Determination of anticoagulant activities were carried out by generally recognized clotting tests. Activated-partial thromboplastin time (APTT), prothrombin time (PT) and fibrinogen concentration were studied according to A. Clauss. Study of the effect on platelet aggregation carried out according to the Born method. According to the data obtained, the fruits and shoots of the riverine hawthorn did not show anticoagulant activity, comparable in effect with drugs comparison (acetylsalicylic acid and sodium heparin). However, analyzing the parameters of APTT, we can note a trend towards the manifestation of anticoagulant activity in the fruits of riverine hawthorn (+7.1% compared to the control). The antiaggregating activity of the shoots of Crataegus rivularis was 16% higher than the reference drug, and extracts from the fruits showed results identical to those of acetylsalicylic acid. It has been established that the fruits and shoots of riverine hawthorn in the studied concentration, they have only a tendency to manifest anticoagulant activity. At the same time, water extracts from shoots have pronounced antiaggregating properties. Thus, riverine hawthorn can be considered a promising species for further research.

Keywords: Corneal Permeability, Hawthorn, Flavonoids, Anticoagulant Activity

References:
Peculiarities of P-selectin expression and platelet aggregation under the influence of drugs. paratov / A.L. Urakov, A.V. Samorodov, F.Kh. Kamilov [and others] // Pharmacy.

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Selection of Solvent to Study the Impact of Water-Insoluble Substances on the Coagulatory Component of Hemostasis

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15-18 February 2022

Poster: P101

Abstract Presenter:
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Abstract:
The interest of specialists in the use of natural biopolymers of chitin, chitosan and other derivatives in various fields of medicine remains an urgent task at the present time. The physicochemical and pharmacological properties of deacetylated chitin derivatives, which include chitosan and its oligomers, open up new possibilities for using these substances in the development of drugs, innovative dosage forms. The purpose of this study was to conduct a theoretical and experimental substantiation of an integrated approach to the pharmaceutical standardization of chitosan. According to the requirements of regulatory documentation, when checking the quality of chitosan products, its main physical and chemical quality indicators are determined: appearance and solubility in water, authenticity, viscosity, impurity content of proteins in the pH solution, the degree of deacetylation (method for determining the quantitative content). The control methods used for standardization and quality control of chitosan products include the following: viscometric method, titration method and spectrophotometric determination of the degree of deacetylation, size exclusion high performance liquid chromatography. In this work, various specifications of chitosan were used, differing in various structural characteristics, degree of deacetylation, viscosity, molecular weight, degree of purification, etc. The methods of capillary and rotational viscometry made it possible to determine one of the important parameters - the viscosity and molecular weight of chitosan samples. The method for determining the degree of deacetylation made it possible to quantitatively determine the percentage of D-glucosamine in the chitosan molecule. A method was also carried out for determining the degree of deacetylation for water-soluble chitosan (the method of the first derivative). The UV spectroscopic method of the 1st derivative has sufficient accuracy in modern experimental conditions, and also corresponds to the data given in 1H NMR spectroscopy, which is one of the most accurate analytical methods for determining the degree of deacetylation. Conclusions obtained in this work correspond to the tasks set for analyzing samples of chitosan substances: determining the degree of deacetylation, viscosity, swelling and dissolution in order to develop a unified express method for identifying and checking the quality of the presented raw materials.

Keywords: Hemostasis System, Lipid Emulsion, Nonclinical and Clinical Study, Off−Label Use, Slightly Soluble in Water

References:
https://www.elibrary.ru/item.asp?id=37457318&;
https://www.elibrary.ru/item.asp?id=32828474;
http://radiotec.ru/ru/journal/19/number/2014-6/article/14843

Synthesis and Molecular Docking of Xanthine Derivatives

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15-18 February 2022

Poster: P102

Abstract Presenter:
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Abstract:
The synthesis of 13 compounds containing and not containing the thietane ring was carried out. The physical and spectral characteristics of the obtained substances are studied. Inhibition of inegrin alfa2b beta3 was studied by molecular modeling. The results were compared with RUC-1(specific antagonist).

Keywords: Aggregation, Xanthines, Docking

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New Parameters for Studying Thermoreversible Complexes of Poloxamers as Promising Bases for In Situ Systems.

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b. I.M. Sechenov First Moscow State Medical University (Sechenov University)

15-18 February 2022

Poster: P103

Abstract Presenter:
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Abstract:
One of the most promising polymers in modern pharmaceutical development are poloxamers used for thermoreversible in situ systems, due to solution viscosity depending on temperature, rheological properties and mucoadhesion. Complexes of poloxamers and other excipients are used to achieve optimal formulation characteristics, but not all of excipients affect the same way. We have proposed new methods for determining quality indicators to provide effective screening and gain the best compositions.

Keywords: Poloxamers, In Situ, Thermoreversible

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Generic and Disease-Specific Quality of Life Instruments in Therapy of Rheumatic Arthritis with Biological Disease Modifying Antirheumatic Drug

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15-18 February 2022

Poster: P104

bstract Presenter:
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Abstract:
Rheumatoid arthritis (RA) is a long-term autoimmune disease that leads to reduced quality of life and further disability of patients. The use of biological disease-modifying antirheumatic drugs significantly improved the results of treatment of patients with RA. The main goal of antirheumatic therapy should be improvement of health-related quality of life. To evaluate the potential use of general and disease-specific quality of life questionnaires in patients treated with biological disease-modifying antirheumatic drugs (by the example of tocilizumab). Screening methods (questionnaires, scales, and techniques) are used to assess quality of life in RA patients, among them: The Short Form-36, The European Quality of Life Questionnaire, The Health Assessment Questionnaire, The Visual Analogue Scale, The Rheumatology Assessment Patient Index Data, and The Functional Assessment of Chronic Illness Therapy. Our study included 35 patents aged 24 to 75 diagnosed with RA. They were all treated with tocilizumab for 12 months. Patients were measured for quality of life and physical function using general and disease-specific questionnaires at the beginning of the study and after 12 months of therapy. The therapy with tocilizumab reduced the activity of the disease, which was reflected in the improvement of patients quality of life according to general questionnaires (The Short Form-36, The European Quality of Life Questionnaire, The Visual Analogue Scale, and The Functional Assessment of Chronic Illness Therapy) and disease-specific quality of life questionnaires (The Health Assessment Questionnaire, The Rheumatology Assessment Patient Index Data).

Keywords: Quality Of Life, Rheumatoid Arthritis, Tocilizumab, Physical Function

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Determinations of Porphyrins in Biological Fluids of Patients by HPLC for Diagnostic Purposes

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b. Dmitry Rogachev National Medical Research Center of Pediatric Hematology, Oncology and Immunology of Ministry of Healthcare of the Russian Federation, Moscow

15-18 February 2022

Poster: P105

Abstract Presenter:
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Abstract:
Porphyrias are a group of pathologies caused by hereditary or acquired disorders in the heme biosynthesis pathway. The use of reverse-phase high performance liquid chromatography with UV detection in the determination of porphyrins is substantiated. This method can be proposed for use in diagnosing various porphyrins in body fluids (urine and blood) of patients.

Keywords: Porphyrias, HPLC, Diagnosis, Porphyrins

References: Kildyushkin D.A., et al. (2022)

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The Pharmacoeconomical Cost Estimation of the Treating Patients with Recurrent Depressive Disorder

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15-18 February 2022

Poster: P106

Abstract Presenter:
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Abstract:
To conduct a cost assessment on pharmacotherapy of patients with recurrent depressive disorder in hospital.Materials.Results in a solid copy of 107medical histories.Results. As a research tool methodology was developed consisting of 7 stages.The analysis of socio-demographic indicators was performed, the assortment of medicines was studied retrospectively based on frequency of prescription. Pharmacoeconomical cost analysis revealed the most resource-intensive group of patients.

Keywords: Depression, Costs, Neuroleptics, Pharmacoeconomics, Antidepressants, Hospital

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Pharmacognostical and Phytochemical Studies of Japanese Knotweed Leaves Growing on the Territory of Russian Federation

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15-18 February 2022

Poster: P107

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Abstract:
Morphological, anatomical and phytochemical study of the leaves of Japanese Knotweed growing on the territory of the Botanical Garden of the Sechenov University, for the development of a regulatory document characterizing their quality, since this type of raw material is promising for medical use. Japanese Knotweed – highly invasive species, listed in the "Black Book of Flora of Middle Russia", with a large raw material base. According to the literature, the leaves of Japanese Knotweed are promising for the production of pharmaceuticals and pharmacognostic study of this type of raw materials is relevant.: The objects of the study are the leaves of Japanese Knotweed, harvested in the Botanical Garden of the I. M. Sechenov First Moscow State Medicine University (Sechenov University) in 2019 (in June, before flowering) and in 2020 (in September, during flowering) and dried by the air-shadow method. The raw materials were stored in paper bags in a dry, dark place at room temperature. The study were carried out according to the methods of pharmacognostic analysis of the State Pharmacopoeia XIV edition. The study of morphological and anatomico-diagnostic signs were carried out. The qualitative composition of biologically active substances was studied. By thin-layer chromatography (in the water-formic acid-ethyl acetate system (5:5:40), detection with 3% solution iron (III) chloride with heating at 100-110°C and chloroform-ethyl acetate-formic acid (25:10:1) - UV detection) confirmed the presence of rutin and tannin, and resveratrol, respectively. For the studied samples of raw materials, the moisture content, the content of extractives extracted by water, total tannins in terms of tannin, total flavonoids in terms of rutin were determined. Preliminary studies of leaves of Japanese knotweed show the perspective of the use of this type of medicinal plant raw materials. The data obtained can be used to develop a draft regulatory documentation for a new type of raw material «Japanese knotweed leaves»

Keywords: Japanese Knotweed, Reynoutria Japonica (Houtt.), Resveratrol, Flavonoids, Tannins

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Standardization Methods and Quality Problems of Natural Chitosan Biopolymer

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15-18 February 2022

Poster: P108

Abstract Presenter:
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Abstract:
The interest of specialists in the use of natural biopolymers of chitin, chitosan and other derivatives in various fields of medicine remains an urgent task at the present time. The physicochemical and pharmacological properties of deacetylated chitin derivatives, which include chitosan and its oligomers, open up new possibilities for using these substances in the development of drugs and innovative dosage forms. The purpose of this study was to conduct a theoretical and experimental substantiation of an integrated approach to the pharmaceutical standardization of chitosan. According to the requirements of regulatory documentation, when checking the quality of chitosan products, its main physical and chemical quality indicators are determined: appearance and solubility in water, authenticity, viscosity, impurity content of proteins in the pH solution, and the degree of deacetylation.

Keywords: Standardization Methods, Chitosan, Biopolymers

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Assessment and Development of the Drug Portfolio Plan in Pharmacy Company

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15-18 February 2022

Poster: P109

Abstract Presenter:
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Abstract:
Strategic marketing analysis of a group antianginal drugs with systematic study of the assortment portfolio in a pharmaceutical company. For the analysis, we used indicators of sales volume, prices, data on the registration of medicines, the composition of manufacturers in the studied market segment; pharmacotherapeutic and pharmaco-economic characteristics of the drugs included in the analyzed group. The methods of economic and statistical analysis in our study allow us to determine the current trends in the market segment of antianginal drugs. The use of a marketing positioning tool and SWOT analysis reveals perspectives for expanding the assortment portfolio of a pharmaceutical company in the group of cardiological drugs. An analysis of sales volume indicators in the studied market segment, as well as the results of the positioning, showed that the most promising drug to be included in the company's product portfolio is Ivabradine, which is characterized by positive sales dynamics, the main share of which is distributed between the two strongest players in the segment of cardiac drugs: Servier and Krka (83% in value terms and 78% in kind). The results of the SWOT analysis indicate significant advantages of Ivabradine, including the fact that, being the only IF-channel inhibitor, it is included in the list of essential drugs and in national and international clinical guidelines for the treatment of myocardial infarction and chronic heart failure. The formation and development of the assortment portfolio of a pharmaceutical company is a complex systemic process, which consists with different stages of strategic marketing analysis in various segments plays a significant role, the results which provide justification for the company's management to include a new drug in the portfolio.

Keywords: Assessment, Development, Portfolio Plan, Pharmacy Company

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The Effect of a New 3-Substituted Theitane-1,1-Dioxide Derivative on the Central Neurotransmission

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15-18 February 2022

Poster: P110

Abstract Presenter:
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Abstract:
Our previous studies in vivo revealed a new promising molecule (N-199/1), exhibiting significant antidepressant properties in a wide range of doses. We studied the mechanism of action of N-199/1, using tests of neuropharmacological interaction. N-199/1 (2 mg/kg) was administered once intraperitoneally to white outbred male mice and its effect on 5-HTP-induced head-twitch response (50 and 300 mg/kg), haloperidol-induced catalepsy (1 mg/kg) and hypothermia, induced by apomorphine (10 mg/kg), levodopa (140 mg/kg) and clonidine (0.3 mg/kg) was assessed. Amitriptyline (10 mg/kg), imipramine (10 mg/kg) and moclobemide (40 mg/kg) were used as reference drugs. N-199/1 decreased the number of 5-HTP (300 mg/kg) induced head twitches (by 83%), the duration of haloperidol-induced catalepsy (by 1-32 s) and reduced hypothermia, caused by apomorphine (by 0.6°C), levodopa (by 0.7°C) and clonidine (by 0.7˚C). The effect of N-199/1 was less pronounced, than the effects of the reference drugs ($p<0.05$). N-199/1 increase serotonergic, noradrenergic and dopaminergic neurotransmission due to the stimulation of 5HT1A-receptors and blockade of 5HT2A/2C-receptors and α2-adrenoreceptors similarly to atypical antidepressants and does not affect neuronal reuptake of monoamines or monoamine oxidase.

Keywords: Thietane, Antidepressant, Outbred Mice

References:
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2. Gaisina GG, Nikitina IL. Study of the range of effective doses of a new 3-substituted thietane-1,1-dioxide derivative. Bashkortostan Medical Journal [Internet]. 2020 [cited 2021 Dec 14];15(6 (90)). Available from: https://www.elibrary.ru/item.asp?id=45723682

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Development of a Method for Isolation and Identification of Propafenone Isolated from Biological Material

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15-18 February 2022

Poster: P111

Abstract Presenter:
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Abstract:
Modified methods for isolating propafenone from putrefactive material according to Stas-Otto and from fresh cadaveric material according to Vasilyeva have been developed. The extraction conditions that affect the yield of the target analyte are optimized. To obtain a highly purified extract, additional centrifugation at a speed of 3000 rpm and the use of an ultrasonic water bath are proposed. The analyte was identified by preliminary and confirmatory methods. For these purposes, a thin-layer chromatography technique has been developed in a solvent system consisting of diethyl ether-n-hexane-butanol (10:5:5) with Rf=0.55±0.03. UV light (254, 365 nm) was used as a detector. For confirmatory analysis, a method for detecting propafenone isolated from biological material using chromogenic and microcrystalloscopic reactions has been developed. The detection limit for propafenone for chromogenic reactions is 5 µg/ml, for microcrystalloscopic reactions it is 3 µg/ml. In the detection technique using IR spectroscopy, the analyte was preliminarily purified by thin layer chromatography, then the adsorption zone was extracted three times with acetone. The bending and stretching vibrations in the structure of the propafenone molecule (C=O, C-H, C-H2, C-H3, NH, OH, C6H5) correspond to the standard sample of the analyte witness substance. When identifying the test substance by high performance liquid chromatography, sample preparation is optimized by precipitation of protein substances with acetonitrile. In the course of the studies, the optimal mobile phase for propafenone was chosen, consisting of acetonitrile and water (70:30), while the retention time of propafenone is 3.01 ± 0.03 min. The developed methods can be used for the purpose of chemical-toxicological, forensic analysis and in the laboratories of toxicological centers in the diagnosis of acute poisoning.

Keywords: Propafenone, Isolation, Biological Material, IR Spectroscopy, HPLC, TLC

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Study of the Numerical Indicators of the Oil Extract of Liqorice

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15-18 February 2022

Poster: P112

Abstract Presenter:
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Abstract:
The study of numerical indicators was carried out on laboratory samples of an oil extract obtained from the root of licorice growing in the territory of South Kazakhstan. Samples of the oil extract were obtained in the educational and scientific laboratory of the Department of Pharmaceutical and Toxicological Chemistry of the South Kazakhstan Medical Academy in accordance with the requirements for oil extracts of the State Pharmacopoeia of the Republic of Kazakhstan (SP RK). According to 5 series of laboratory samples, the oil extract is a transparent oily liquid of light yellow color with a specific odor characteristic of the raw material used. The relative density of the oil extract is determined by the hydrometric method, is in the range of 0.925-0.926, the relative deviation of the average result is ±0.056%. The refractive index of the oil extract was determined by the refractometric method, with a spread for five laboratory samples is 1.472-1.473, the relative deviation of the average result is ±0.41%. To control the oxidation processes of the oil extract, the SP RK regulates the determination of such numerical indicators as acid number, saponification number, ester number, peroxide number. According to the results of studies of laboratory samples, the acid number is in the range of 0.609-0.671, the average result of the indicator is 0.633 with a relative error of ±2.45. The limits of the saponification number are 148-154, with an average of 150.5±1.44%. The peroxide number is in the range of 0.195-0.203, the average result of the indicator is 0.199±1.73%. The ethereal number is within 149.87. Thus, the study of numerical indicators proves the compliance of the obtained oil extract with the requirements of the SP RK.

Keywords: Oil Extract, Liqorice, Numerical Indicators

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Comparative Phytochemical Study of Thyme Species from the Flora of Bashkortostan

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b. Alexandrovna, Ufa, Russian
c. Vasilevna, Ufa, Russian

15-18 February 2022

Poster: P113

Abstract Presenter:
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Abstract:
Today, phytotherapy plays an important role in the treatment and prevention of many diseases. The use of medicinal preparations, which include components of plant origin, especially in the complex treatment of chronic diseases, has a number of advantages, which include: a milder, physiological therapeutic effect, a complex effect on the body, the possibility of long-term use, the practical absence of side effects. In scientific medicine, creeping thyme herb is used, the chemical composition of which has been studied in sufficient detail and is represented by various groups of biologically active substances. It has an expectorant, antimicrobial, analgesic effect. However, studies on the study of new types of thyme are of interest and are relevant, as they allow expanding the range and scope of creeping thyme in medicine. In this regard, promising objects of study are the grass of some types of thyme growing on the territory of the Republic of Bashkortostan**.**

Keywords: Essential Oils, Thyme, Flavonoids, Biologically Active Substances

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Quantification of Essential Oils in Antimicrobial Collection

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15-18 February 2022

Poster: P114

Abstract Presenter:
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Abstract:
The problem of finding new highly effective, harmless and easy-to-use medicines based on plant materials remains relevant. The raw materials of the Republic of Bashkortostan allow organizing the production of herbal preparations and preparations based on them for the treatment of various diseases, including SARS. To justify the possibility of using which, it is necessary to have complete information on the quantitative content of essential oils in the collection.

Keywords: Drug Collection, Essential Oil, Antimicrobial Collection

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Qualitative Analysis of the Herb of Galium Spurium

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15-18 February 2022

Poster: P115

Abstract Presenter:
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Abstract:
The biological active substance was determined in the composition of the herb Galium spurium. Based on the results of the research, the following biologically active substances were found: iridoids and polysaccharides. Iridoids were detected using the Trim-Hill reagent, polysaccharides, using 95% ethanol and concentrated sulfuric acid**.**

Keywords: Galium spurium, Biological Active Substance, Iridoids

References:

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Development of Technology for Processing and Storage of Medicinal Plant Artemisia Serotina Bunge Raw Materials

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15-18 February 2022

Poster: P116

Abstract Presenter:
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Abstract:
The paper presents the results on the development of technology for the preparation and storage of medicinal plant Artemisia Serotina Bunge raw materials. The harvesting period for potentially medicinal herbal raw materials was determined as a period from mid-August to mid-September. The technology involves the drying stage in the open air in the shade of the hangar on special frames at an ambient temperature of 20-35 ºC. The primary packaging for dried raw materials is kraft paper bags. The storage of the product is carried out within the framework of national requirements. In accordance with the developed pilot-industrial regulations, three pilot-industrial batches of the finished product were produced; their samples were laid down for long-term stability studies

Keywords: Artemisia Serotina Bunge, Harvesting, Storage, Medicinal Herbal, Raw Materials, Technological Parameters

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TlC Screening of Neonicotinoids Isolated from Biological Fluid

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15-18 February 2022

Poster: P117

Abstract Presenter:
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Abstract:
Pesticides are used worldwide to protect crops from insects, rodents, fungi and weeds. According to the United Nations Committee on Food and Agriculture, more than 650,000 tons of active pesticide compounds are used worldwide. Self-poisoning with pesticides is the leading cause of global suicide. Pesticide poisoning is estimated to account for one third of all suicides worldwide, resulting in approximately 260,000 deaths per year. In this regard, the detection of pesticides in biological objects is an urgent problem of analytical toxicology. To date, there are no possible routine analytical methods for the detection of neonicotinoid pesticides acetamiprid, imidocloprid, thiocloprid, thiometaxam in human biological fluids. To solve this problem, the possibility of detecting neonicotinoids in general and individual solvent systems, which are often used in screening studies, was studied. For pesticides from the group of neonicotinoids in biological fluids, a detection technique has been developed using the TLC screening method. The choice of the composition of the mobile phase for TLC screening was made in accordance with the recommendations of the Association of International Toxicologists (TIAFT) and taking into account the elution strength, selectivity and chemical stability of the solvents that make up the mobile phase. According to the results of the experiment, the mobile phase of the composition hexane:acetone:chloroform in the ratio (20:20:10) shows the selective separation of neonicotinoid pesticides acetamiprid, imidocloprid, thiocloprid, thiometaxam with RF values of 0.45±0.03, 0.55±0.03 , 0.63±0.03, 0.32±0.03, respectively. UV light has been proposed for detection.

Keywords: Neonicotinoids, Acetamiprid, Imidacloprid, Thiacloprid, Thiamethoxam, TLC

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Pharmacognostic study of herba Thlaspi arvense L

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15-18 February 2022

Poster: P118

Abstract Presenter:
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Abstract:
Studies have been conducted to study the quality indicators of field yarutka grass: humidity - 5.53 ± 0.25%, total ash - 6.17 ± 0.31%. A microscopic analysis of the grass of the field yarutka was carried out and diagnostically significant signs were established that allow identifying raw materials. The chemical composition of some groups of biologically active substances was studied: the quantitative content of ascorbic acid (0.57 ± 0.03%), organic acids (2.25 ± 0.18%), tannins (4.07 ± 0.16%), flavonoids in terms of luteolin-7-glucoside (1,120 ± 0.024%) was determined.

Keywords: Thlaspi Arvense L, Herba, Microscopy, Chemical Composition

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Study of the Content of Lipophilic Substances and Carotenoids in Fenugreek Seeds

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15-18 February 2022

Poster: P119

Abstract Presenter:
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Abstract:
Recently, you can find a huge amount of literature that reflects the effect of chronic mechanical trauma on periodontal tissue and oral mucosa, which is expressed by chronic inflammation. There are also proven facts of the positive dynamics of the removal of the inflammation process with herbal-based drugs. We examined patients with various malocclusion pathologies who were treated by an orthodontist using braces and had pronounced changes in the periodontium and on the mucous membrane due to the chronic traumatic factor from braces. We have established successful results of treatment and prevention of inflammation due to mechanical injury, which helps us to reduce the risk of complications after the removal of braces**.**

Keywords: Oral Mucosa, Trauma, Braces**,** Hyperkeratosis, Leukoplakia

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Pharmacognostic Study of the Scutellaria Subcaespitosa

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15-18 February 2022

Poster: P120

Abstract Presenter:
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Abstract:
Scutellaria subcaespitosa – is a perennial herbaceous plant of the Lamiaceae family, widely used in folk medicine and not known in official medicine. Pharmacognostic and phytochemical analysis of the aerial part of the plant was carried out during the study. As a new type of medicinal raw material, we offer the grass of the Scutellaria subcaespitosa, harvested during the flowering phase - the beginning of fruiting. For the proposed type of medicinal plant raw materials, the main quality indicators were determined (morphological and anatomical features of raw materials, qualitative reactions to the main groups of biologically active compounds, the content of the sum of flavonoids, total ash and insoluble ash in 10% hydrochloric acid, the content of crushed parts of raw materials, as well as mineral and organic impurities). The proposed plant can become a promising source of biologically active substances with a wide spectrum of pharmacological action.

Keywords: Medicinal Plant Raw Materials, Scutellaria Subcaespitosa, Pharmacognosy

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Study of Antioxidant Properties of Suppositories with Nicotinic Acid in Toxic Liver Damage

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15-18 February 2022

Poster: P121

Abstract Presenter:
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Abstract:
New medicinal forms of acid are proposed nicotine original composition: suppositories with nicotine acid and propolis extract and suppositories with nicotine acid and pyridoxine hydrochloride. In conditions of toxic liver lesions are shown to activate free – radical processes oxidation. Against the background of medicinal forms application with acid nicotine observed expressed antioxidant effect.

Keywords: Antioxidant Properties, Suppositories, Pharmaceutical Technology

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Comparative Study of the Antioxidant Activity of Some Representatives of the Family Lamiaceae

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b. Alexandrovna, Ufa, Russia
c. Vasilevna, Ufa, Russia

15-18 February 2022

Poster: P122

Abstract Presenter:
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Abstract:
Comparative studies have been carried out to assess the antioxidant activity of medicinal plants of the Lamiaceae family containing essential oils of the aromatic group, in which thymol, carvacrol and other derivatives are the predominant components. Four species of plants of the genus Thymus growing in the flora of Bashkortostan: Thymus serpillum, Thymus bashkiriensis, Thymus Marshallianus, Thymus Taliyeva and five species of plants of the genus Monarda introduced in the conditions of the Republic of Bashkortostan: Monarda fistuosa, Monarda didyma, Monarda hybrida, Monarda citriodora and Monarda Rassela. The results of the study indicate a significant inhibitory effect of the studied samples on the kinetics of free radical oxidation in model systems of reactive oxygen species and lipid peroxidation. The greatest antioxidant effect in the two systems among the studied thyme species was shown by the infusion of the herb Thymi Marshalliani, among the species of monarda - the infusion of the herb Monardae fistuosae, and the smallest - the infusion of the herb Thymi bashkiriensis and the infusion of the herb Monardae citriodorae.

Keywords: Antioxidant Activity, Types of Thymi, Types of Monardae

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Macroscopic Analysis of Tanacetum Santolina

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15-18 February 2022

Poster: P123

Abstract Presenter:
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Abstract:
A macroscopic analysis of Tanacetum Santolina flowers was carried out according to the pharmacopoeia of the Republic of Kazakhstan. The sample included 25 middle-aged generative plants with the same standard of living. In each sample, the height of the plant, the length and width of the inflorescence, flower baskets, and leaf blade were measured. According to the results of the analysis, external signs: plant height 20-30 cm; leaves are gray-green, slightly pubescent, 5-7 cm long, 2-3 cm wide; yellow inflorescences, flower baskets 0.5 mm long, 0.56 mm wide; has a peculiar smell

Keywords: Tansy Santolina, Macroscopic Analysis, Genus Tanacetum

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Chemical-Toxicological Study of Meloxicam by Liquid Chromatography

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15-18 February 2022

Poster: P124

Abstract Presenter:
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Abstract:
A technique for the identification and quantitative determination of the non-steroidal anti-inflammatory drug meloxicam isolated from blood plasma by HPLC has been developed. Chromatography was carried out in isocratic mode on a ProStar Varian liquid chromatograph (Australia) with a Reprospher C8 150x4.6, 5µ chromatographic column with UV detection (366 nm). The column temperature was 25°C, the eluent flow rate was 1 mL/min, and the injected sample volume was 20 µL. Sample preparation was carried out by precipitation of proteins with a solution of trifluoroacetic acid. The retention time (rt) of meloxicam was 5.11 ± 0.03 min with the selected optimal mobile phase consisting of acetonitrile and phosphoric acid (80:20) with a pH of 3.55. The quantitative determination of the toxicant was carried out by the method of absolute calibration and validated for the following parameters: selectivity, linearity, correctness, precision, limit of quantitation and stability. The analytical concentration range was 10-120 µg/ml. At the same time, the correlation coefficient of the linear dependence of the developed method was 0.9996. As a result of experiments, 99.24±1.62% of meloxicam was extracted from blood plasma. The average relative error of the method was 1.63%. The developed technique can be used in the chemical-toxicological departments of the Center for Forensic Examination and clinical and toxicological laboratories of toxicological centers.

Keywords: Meloxicam, HPLC, Validation, Identification, Assay

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The In Vitro Antioxidant and Acetylcholinesterase Inhibition Activities of Ficus Deltoidea Var. Trengganuensis, Var. Kunstleri and Var. Deltoidea

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15-18 February 2022

Poster: P125

Abstract Presenter:
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Abstract:
icus deltoidea (Mas Cotek) has long been used as traditional medicine in Malaysia. The common varieties include trengganuensis, kunstleri and deltoidea. This study aims to determine the in vitro antioxidant and acetylcholinesterase inhibition capabilities of the ethanolic extract of the plants. Among the three varieties, the significantly highest extraction yield was obtained from var. trengganuensis ($p<0.05$). In addition, the significantly highest total phenolic content (TPC), total flavonoid content (TFC) and DPPH free radical scavenging capacities were also shown by the var. trengganuensis ($p<0.05$). On the other hand, var. deltoidea revealed the spectacular performance in the inhibition of acetylcholinesterase activity shown by the significantly lowest IC50 value ($p<0.05$). Hence, it can be concluded that both var. trengganuensis and var. deltoidea are suitable to be developed further for medicinal purpose

Keywords: Ficus Deltoidea, Var. Trengganuensis, Var. Kunstleri, Var. Deltoidea, Antioxidant, Acethylcholinesterase

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Development of Functional Beverages from Blends of Ficus Deltoidea Leaves and Brown Rice Powders

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15-18 February 2022

Poster: P126

Abstract Presenter:
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Abstract:
Functional foods and beverages offer a promising opportunity to improve public health. Ficus deltoidea (Ficus: Moraceae) has great potential as a functional food. Administration of F. deltoidea has been reported to reduce hyperglycemia, oxidative stress and increase insulin secretion in diabetic rats. However, the potential benefits of adding F. deltoidea to food or beverage products remain to be investigated. The study is aimed to investigate the phyto-physicochemical profile, antioxidant properties, consumer acceptance, and safety of new functional beverages formulated from fine powder mixtures of F. deltoidea leaves and brown rice. The new beverage formulations were prepared by mixing the F. deltoidea leaves powder with a commercial brown rice beverage product in two different ratios (2.5:32.5 and 5.0:30 g). The formulated beverages were subjected to physicochemical and phytochemical analyses. The antioxidant properties of the formulated beverage were measured using FRAP and DPPH assays. Consumer acceptance on the appearance, color, aroma, taste, aftertaste and overall acceptability was assessed utilizing a 9-point hedonic scale. The acute toxicity study was conducted for 14 days to determine the safety of F. deltoidea-added formulations. The results showed, for the first time, that adding F. deltoidea to a brown rice beverage decreased the pH and increased the moisture content, ash, and viscosity. The formulation with higher F. deltoidea was associated with lighter, greener and yellower in color. The total phenolics, flavonoids, and tannins content have also significantly increased in F. deltoidea-added formulations. Adding F. deltoidea to a brown rice beverage caused a significant increase in antioxidant activity. The sensory evaluations showed that the new formulation beverages were accepted by the consumer with the value of mean scores range for each parameter were higher than 5.0. The oral LD50 of F. deltoidea-added formulation was higher than 2000 mg/kg body weight. In conclusion, these results suggest that adding F. deltoidea leaves to brown rice is safe to consume and improved the phyto-physicochemical profile, antioxidant activities, and consumers' acceptance of the products.

Keywords: Physicochemical, Phytochemical, Sensory, Antioxidant, Acute Toxicity Testing, 9-Points Hedonic Scale

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Phytochemical Study of Pomegranate Leaves Punica Granatum L

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15-18 February 2022

Poster: P127

Abstract Presenter:
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Abstract:
Pomegranate is a delicious exotic fruit. Since ancient times, pomegranate has been considered the king of all fruits and vegetables. Its fruits are tasty and have useful properties: analgesic, anti-inflammatory, hemostatic, astringent, anthelmintic action, moreover, fresh pomegranate fruits are effective for coughs and colds, they are prescribed as a tonic for exhaustion of the body. However, as it turned out, not only the juicy pulp, but also the leaves of this fruit have a large number of medicinal properties. In addition to traditional vitamins and minerals, it contains tannins, polyphenols, essential oils, pectins. Due to the diverse biological composition, pomegranate leaves are a good antihelminthic. To date, only pomegranate fruits are used, and the leaves are thrown away. It is for this reason that we decided to study pomegranate leaves for their medicinal use. The purpose of this work was to study the leaves of common pomegranate grown in Azerbaijan. To achieve the goal, it is necessary to solve the following tasks: 1) Carry out the harvesting of common pomegranate leaves. 2) Carry out commodity analysis: determine the moisture content of raw materials. 3) Conduct a microscopic examination of the leaves of the common pomegranate. 4) Conduct a study of certain groups of biologically active substances: tannins, procyanides, ascorbic acid. 5) Carry out statistical processing of the obtained results. Persia (modern Iran) is considered the birthplace of the pomegranate plant. One of the two existing species is the common pomegranate (Punica granatum L.). These are tall five-meter trees. The natural range of the pomegranate covers Azerbaijan, Iran, Abkhazia and Georgia.

Keywords: Pomegranate Leaves, Use in Medicine, Learning Objectives

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Pharmacognostic Study of Herba Pulmonaria Obscura Dum

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15-18 February 2022

Poster: P128

Abstract Presenter:
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Abstract:
Studies have been conducted on the pharmacognostic study of the herb lungwort obscure. Quality indicators were established: humidity - 9.52 ± 0.43%, total ash - 9.8 ± 0.46%. Microscopic analysis of the herb lungwort obscure revealed diagnostically significant signs that allow the identification of raw materials. The qualitative and quantitative composition of some groups of biologically active substances was studied: the quantitative content of ascorbic acid (1.63 ± 0.07%), carotenoids (5.43 ± 0.26 mg%), organic acids (9.64 ± 0.45%), tannins (4.12 ± 0.18%), flavonoids in terms of rutin (0.75 ± 0.03%) was determined.

Keywords: Pulmonaria Obscura Dum, Herba, Microscopy, Chemical Composition

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Mathematics and Implementations of Physiologically Based Pharmacokinetic Modeling

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15-18 February 2022

Poster: P129

Abstract Presenter:
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Abstract:
The thesis addresses some basic aspects of pharmacokinetic modeling, which is used to describe pharmacokinetic processes. Understanding these processes is important for example to determine optimal concentrations of drugs dosing. The thesis focuses on mathematical proofs of a number of pharmacokinetic equations, which are often not given in standard books. The derived equations are illustrated with numerical experiments for a particular drug in the software PharmCalcCl and MATLAB. In this thesis, we focus on most-frequently-used one-compartmental and two-compartmental models. We give detailed mathematical proofs of pharmacokinetic equations, which are often not in the standard books. In the first chapter, basics of pharmacokinetics, we describe important pharmacokinetic processes, the main reaction types and we end the chapter with a brief introduction to compartmental theory. In our second chapter, we will consider one-compartmental intravenous injection in single and multiple doses, intravenous infusion, and discuss extravascular drug application. We perform numerical experiments in the software PharmCalcCl for the drug gentamicin. In the next third chapter, we discuss two-compartmental models and describe their typical parameters. We end our thesis with the chapter, approximation of the AUC, describing some popularly used numerical methods, Trapezoidal and Simpsons rule, and also perform numerical experiments in the MATLAB software.

Keywords: Pharmacokinetics, Compartmental Models, AUC, Trapezoidal Rule, Simpsons Rule, MATLAB

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Study of Antioxidant Properties of Suppositories with Nicotinic Acid in Toxic Liver Damage

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15-18 February 2022

Poster: P130

Abstract Presenter:
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Abstract:
The article presents the results of an analysis of the problems that arise during pharmaceutical counseling of patients with malignant neoplasms of the prostate. 92% of the surveyed pharmaceutical workers experience emotional stress and lack of knowledge about oncopathology prevention measures during pharmaceutical counseling of oncological patients. There is a need for training in pharmaceutical counseling for cancer patients.

Keywords: Pharmaceutical Consulting, Oncology, Prostate Cancer

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Optimization of the Conditions of Dispersive Liquid-Liquid Microextraction in the Chemical-Toxicological Analysis of Amlodipine

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15-18 February 2022

Poster: P131

Abstract Presenter:
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Abstract:
An effective method for isolating amlodipine from a bioliquid by dispersive liquid-liquid microextraction has been developed. In the course of the work carried out, the factors affecting the extractability of the analyte were studied: the nature and volume of the extractant and dispersant, centrifugation time and pH of the medium. Quantitative determination of amlodipine in the resulting extract was carried out by UV spectrophotometry at λ=240±2 nm. The results of the studies showed that when using 300 µl of chloroform and 3 ml of acetonitrile, the optimal yield of the analyte can be achieved. It was also found that at pH 11-12 and centrifugation for 20 minutes at 3000 rpm, the analyte was recovered with a yield of 73-80% with an average method error of ±3.73%. The developed technique can be used in the chemical and toxicological departments of the Center for Forensic Examination and clinical and toxicological laboratories of toxicological centers

Keywords: Amlodipine, Dispersive Microextraction, Extragent, Dispergator, Biologic Materia

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Essential Oil Composition of two *Calendula Species* from Iran

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15-18 February 2022

Poster: 132

Abstract Presenter:
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Abstract:
Herbal medicines are valuable sources to treat illnesses. Essential oils have been used for centuries to improve health. This study was performed to identify the essential oil compositions of *Calendula alata* Rech.fil. and *C. palaestina* Boiss. The essential oils were extracted by hydro-distillation from aerial parts of these species, and then the composition was determined by GC/MS. Finally, Compounds were identified with the comparison of their mass spectra with standards. Overall, 13 and 14 compounds (%99.1 and %95.8) of essential oils of *C. alata* and *C. palaestina* were identified, respectively. *C. alata* essential oil mainly included camphor (%29.3), E-*α*-bisabolene (%24.2), and chrysanthenyl acetate (%15.7). Heptacosane (%20.7), *δ*-cadinol (%13.8), and *δ*-cadinene (%10.9) are the main components of *C. palaestina* essential oil.

Keywords: Essential Oil Composition, *Calendula Alata*, *Calendula Palaestina*, GC/MS, Δ-Cadinol, Camphor

References:

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Reduction of Coprizone-Induced Demyelination with Trifluoperazine by Targeting Nrf2 and IKB in Mice

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15-18 February 2022

Oral: O1

Abstract Presenter:
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Abstract:
Multiple sclerosis (MS) is a neurological illness that affects a large number of people. The immune system assaults oligodendrocyte cells and the myelin coating of myelinated neurons in the central nervous system in this condition, causing them to die. These disorders cause poor nerve impulse conduction and are characterized by symptoms such as weakness, exhaustion, and visual and movement disturbances. The goal of this study was to see if trifluoperazine (TF) could help C57BL/6 male mice with cuprizone-induced behavioral and histological alterations in the prefrontal cortex. For 6 weeks, cuprizone (CPZ) was added to the usual animal food to induce demyelination. For the final two weeks of treatment, three TF dosages (0.5, 1, and 2 mg/kg/day; i.p.) were administered once daily. In comparison to the control group, CPZ treatment resulted in weight loss over 6 weeks, which was reversed by the administration of TF. In behavioral tests (pole test and rotarod performance test), the group given CPZ demonstrated a deterioration in motor coordination and balance (P 0.01). These motor deficits were improved after two weeks of treatment with TF. In the CPZ group, the histopathological investigation revealed an increase in demyelination, which was alleviated by the use of TF. Furthermore, CPZ intake lowered p-Nrf2 levels in the cerebral cortex (P 0.001) while increasing p-IKB levels (P 0.001), and these alterations were normalized in the TF groups. Increased nitrate levels and decreased activity of the antioxidant enzyme superoxide dismutase associated with CPZ exposure were likewise reversed by TF treatment. By lowering demyelination and regulating the Nrf2 and NF-kB signaling pathways, TF can help to mitigate the negative effects of CPZ.

Keywords: Multiple Sclerosis, Trifluoperazine, NF-kB, Nrf2, Cuprizone

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Preparation and Evaluation of Physicochemical Properties of Core-Shell Nanofibers Containing Platelet-Derived Growth Factor (PDGF)

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15-18 February 2022

Oral: O2

Abstract Presenter:
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Abstract:
Guided Bone Regeneration (GBR) and Guided Tissue Regeneration (GTR) are dental surgical procedures that use barrier membranes to guide the growth of bone, tissue or gingiva in small places. These methods are used for proper function, beauty or restoration of the prosthesis. GBR is similar to the GTR, but it focuses on the development of periodontal soft tissues in addition to hard tissues. Recently, efforts have been made to accelerate tissue repairing by adding factors such as growth factors to the GBR or GTR structure, accelerating tissue repair Commented. Drug delivery systems, cause more treatment efficacy and less drug adverse reactions, by targeted and controlled drug release manner. The aim of this study was preparation and evaluation of growth factor loaded, biodegradable nanofibers, as a GTR membrane in oral cavity disease. In this study, two electrostatic systems were constructed in a coaxial or core-shell manner. The shell consists of a biodegradable polymer and a Polycaprolacton (PCL) solution in a mixture of dichloromethane and ethanol at a volume ratio of 40:60. To form the core, a hydrophilic solution of polyvinyl alcohol with a concentration of 7% by weight, in distilled water, and Collagen with a concentration of 70% by weight-weight in distilled water was used. Platelet derived growth factor (PDGF) was added at three concentrations to the core polymer solution. The electrical process was optimized by changing the voltage, the nozzle – collector distance, and the change in the flow rate. For characterization of fibers, FTIR, SEM, and TEM techniques were used. An ELISA technique was used to determine the rate of release of the growth factor. Also, proliferation method was used to determine the efficacy of the cell Cytotoxicity was evaluated using MTT method. FTIR shows that the fibers constituents do not interfere with each other. The 12 kV voltages and the flow rate of 1: 3 are electrically the best condition for fiber preparation. The diameter of the fibers is in the range of 400 nm. The growth factor released from fibers in 38 days. Collagen polymer has more suitable physicochemical properties than PVA. TEM images show that the core- shell structure is formed. Fibers containing collagen have good mechanical strength. The growth factor releases from fibers in a controlled manner. The fibers do not show any cellular toxicity, have a positive effect on cell proliferation and increase the number of cells. In general, it can be concluded that nanofiber PCL/Col contains growth factor PDGF both in terms of physicochemical properties and in terms of PDGF release and cell proliferation profile were suitable. The nanofibers have no toxic effects on human cells and if Completion of clinical findings can be used as a type of GTR.

Keywords: Electrospinning, Core-Shell, Poly-Caprolactone, Platelet-Derived Growth Factor

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Investigation of Biological Activities of two Cultivars of Cicer Arietinum Proteins Mass Associated with Alzheimer's disease

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b. Thalassemia and Hemoglobinopathy Research Center, Health Research Institute, Ahvaz Jundishapur University of Medical Science, Ahvaz, Iran
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15-18 February 2022

Oral: O3

Abstract Presenter:
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Abstract:
Alzheimer's disease (AD) is the most common reason of dementia in the elderly with some classical known causes. Cicer arietinum (Leguminosae) is a source of protein for humans and contains albumin, globulin, glutelin, and prolamin. Protein mass of two cultivars of C. arietinum, Hashem and Mansour, isolated to evaluate their inhibition activity against acetylcholinesterase (AChE), butyrylcholine esterase (BChE) and β-amyloid peptide (βA) aggregation. Sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE) and molecular docking were also applied to evaluate the content of the isolated mass and figured out the potential of each chickpea protein to interact with AChE, respectively. Obtained data showed that proteins of both cultivars inhibited AChE by IC50 of 17.73 (0.03) and 22.20 (0.06) µg/mL, respectively, with no activity on BChE. With concentration of 50 µg/mL, they suppressed βA accumulation (Mansour 25.66 and Hashem 21.69 %) and showed bio-metal chelating activity. SDS-PAGE analysis revealed relatively different patterns, though Mansour cultivar contained some protein bands with molecular weights of 18, 24, 70 KDa that estimated belongs to vicilin and legumin, they were absent in Hashem protein mass. Molecular docking showed that legumin and especially vicilin have good potential to interact with AChE. The chickpea proteins showed inhibitory activity against AChE that might be due to the vicilin and legumin fractions. Chararcterization of the inhibitory effect of each protein band could be promissing in finding new therapeutic peptide candidates to treat Alzheimers in the future, although more experimental works are needed in this issue.

Keywords: Acetylcholinesterase, β-Amyloid Peptide, Butyrylcholine Esterase, Chickpea, Molecular Docking, SDS-PAGE

References:

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Selective Extraction and Isolation of Phenolic Compounds from the Medicinal Plant

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15-18 February 2022

Poster: O4

Abstract Presenter:
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Abstract:
Flavonoids are known as valuable molecules in the world. The widespread use of these compounds is increasing day by day. Chamomile is a rich source of flavonoids as an ancient plant with a historical application in traditional medicine. To that end, this plant has been able to occupy an important place in the pharmacopeia of most countries. One of the most important of these compounds is apigenin, which is known as responsible for the main effects of the plant. Considering all these cases, it seems necessary to find an effective and practical method for the optimal separation of these compounds. In this study, we tried to use the surface capacity of titanium oxide nanoparticles as a separating agent to extract the phenolic compound from Chamomile ethanolic extract. The accuracy of the extraction process using nanoparticles was measured by HPLC-PAD, UV Spectroscopy, and FT-IR techniques. By changing the Influential parameters in the extraction process, we were able to obtain optimal conditions. Isolation parameters include pH of the extraction medium, concentration of nanoparticles, extraction temperature, and time. Optimal results include: pH=5, temperature =65°C, time=30min, and concentration of Tio2 Nano particle= 24Mm.

Keywords: Flavonoids, Titanium Oxide Nanoparticle, Chamomile, Phenolic Compounds, Extraction, Apigenin.

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Design and Optimization of Pegylation Methods for Lysozyme as a Model to Improve Long-Term Stability and Bioactivity of Enzyme

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b. Department of Pharmaceutics, Faculty of Pharmacy, Tabriz University of Medical Sciences, Tabriz, Iran
c. Liver and Gastrointestinal Diseases Research Center, Tabriz University of Medical Sciences, Tabriz, Iran
d. Connective Tissue Diseases Research Center, Tabriz University of Medical Sciences, Tabriz, Iran

15-18 February 2022

Poster: O5

Abstract Presenter:
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Abstract:
PEGylation is a process in which polyethylene glycol (PEG) molecules are attached to macromolecules by covalent bonds. This modification is often used to improve the characteristics of biopharmaceuticals such as proteins and especially enzymes. PEGylation can significantly increase the blood-circulation half-life, bioavailability, potency, and therapeutic effects of the biopharmaceutical. Besides, this modification can remarkably minimize immunological responses induced by foreign biological agents. The objective of the current study was to design and optimize the PEGylation methods of the lysozyme as a model enzyme to evaluate the method's efficacy and feasibility on the therapeutical scale. PEGylation processes were conducted using two different methods. At first, 30 mg of carboxylate-functionalized PEG was diluted in 2.66 ml of phosphate buffer (pH=6-6.5), then 200µl of EDC-NHS (0.25%) was added to the solution and incubated at room temperature for one hour. Then 10 mg of lysozyme was added to the mixture and incubated for 24 hours at room temperature. At the second method, 5 mg of lysozyme was added in 3 mL of sodium carbonate buffer (pH=8) containing different concentrations of synthesized epoxy-PEG (5, 10, 15, and 25 mg). All the samples were stirred for 24 hours at room temperature. In both methods level of PEGylation is assessed by SDS-PAGE electrophoresis. The gel is dyed using iodide-barium staining in both methods. From the SDS-PAGE analysis, carboxylate-functionalized PEG showed a significant PEGylation rate on the lysozyme surface. Compared with the bare lysozyme, the PEGylated lysozyme bond was visible approximately four protein markers higher, indicating a ~20 kD difference in molecular weights between bare and the PEGylated enzyme. In contrast, the results from the SDS-PAGE related to epoxy-PEG did not show any significant rise in molecular weights. The bond for the PEGylated enzyme was only slightly higher than the bond for the bare enzyme, and the difference between the bonds was less than one protein marker. The UV-vis spectra of bare and PEGylated enzymes confirmed the results obtained from SDS-PAGE analysis. Lysozyme is a standard model protein used in PEGylation studies due to the wide varieties of PEGylation chemistries that can be applied, the well-characterized secondary structure of lysozyme, and the ability to quantify enzymatic activity via simple assays. PEGylation using carboxylate-functionalized PEG with chemical linkers EDC-NHS was more efficient than the direct attachment of epoxy-PEG to lysozyme as a model enzyme.

Keywords: PEGylation, Lysozyme, Chemical Linker, Polyethylene Glycol

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Enhancement of In Vitro Antitumour Activity of Epirubicin in HER2+ Breast Cancer Cells Using Immunoliposome Formulation

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15-18 February 2022

Oral: O6

Abstract Presenter:
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Abstract:
Epirubicin (EPI) is one of the potent breast cancer (BC) chemotherapeutic agents, but its adverse effects limit its efficacy. Herein, EPI was selected to be loaded in liposomal carrier, which has been targeted by a monoclonal antibody, Herceptin. The preparation process of liposomes was a modified ethanol injection method followed by Herceptin conjugation. The in vitro cell toxicity and cellular uptake of optimum formulation against HER2þ and HER2 cancer cell lines were evaluated. The results showed that the drug loading (DL%) and encapsulation efficiency (EE%) of liposome preparation method yielded 30.62% ± 0.49% and 62.39% ± 8.75%, respectively. The average size of naked liposomes (EPI-Lipo) and immunoliposomes (EPI-Lipo-mAb) was 234 ± 9.86 and 257.26 ± 6.25 nm, with a relatively monodisperse distribution, which was confirmed by SEM micrographs. The release kinetic followed Higuchi model for both naked and immunoliposomes. In vitro cytotoxicity study on three different BC cell lines including BT-20, MDA-MB-453 and MCF-7 demonstrated higher toxicity of EPI in the Herceptin conjugated form (EPI-Lipo-mAb) in comparison with the free EPI and EPI-Lipo in HER2 overexpressing cell line. In addition, the cellular uptake study showed a higher uptake of immunoliposomes by MCF-7 cells in comparison with naked liposomes. In conclusion, these data show that the targeted delivery of EPI to breast cancer cells can be achieved by EPI-Lipo-mAb in vitro, and this strategy could be used for breast cancer therapy with further studies.

Keywords: Epirubicin, Lipodome, Breast Cancer Cells

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Preparation of Dexamethasone-Loaded PCL-PEG-PCL Micelles and Evaluation of Their Anti-Inflammatory Effects in Rabbits

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15-18 February 2022

Oral: O7

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Abstract:
The ocular bioavailability of most topically administered drugs is less than 5%. Micelles have been studied as tools for improving topical delivery of hydrophobic drugs to the eye. The aim of this study was to investigate the capability of polycaprolactone-polyethylene glycol-polycaprolactone (PCL-PEG-PCL) micelles in improving the anti-inflammatory effects of dexamethasone (DEX). PCL-PEG-PCL copolymers were synthesized by ring opening polymerization of ε- caprolactone. DEX was loaded as a model hydrophobic drug into the obtained copolymers. The DEX-loaded micelles were characterized by transmission electron microscopy (TEM) and dynamic light scattering (DLS). The release behavior of DEX from the micelles was studied. The corneal permeability was assessed using an ex vivo bovine model. In vitro cytotoxicity of the micelles obtained was investigated on L929 cells. Cellular uptake was followed by using of fluorescence microscopy and flow cytometry analyses. Finally, the anti-inflammatory impact of the prepared micelles was investigated on endotoxin-induced uveitis (EIU) in rabbits. The PCL-PEG-PCL copolymers were synthesized. TEM and DLS results verified the successful formation of spherical micelles, the sizes of which were approximately 37 nm. The release profile showed an initial burst release within the first 2 hours, followed by a sustained release phase which lasted for 5 days. The micellar formulation showed two times higher penetration across the excised bovine cornea compared to a marketed DEX eye drop. The micelles exhibited acceptable compatibility with L929 cells and were internalized into the cells in a concentration- and time-dependent manner. The results of animal studies demonstrated a better, but not statistically significant, impact of the DEX-loaded micelles on EIU than the marketed DEX eye drop. The results showed that PCL-PEG-PCL based copolymers can be used as a platform for the treatment of anterior eye disease.

Keywords: Dexamethasone, Endotoxin Induced Uveitis, Micelles, Ocular Drug Delivery, PCL-PEG-PCL, Nanoparticulate

References:
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Design, Synthesis and Biological Evaluation of Amino-1,3,4-Oxadiazole Derivative as a Novel Inhibitor of Dipeptidyl Peptidase-4 (DPP-4) Enzyme

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15-18 February 2022

Oral: O8

Abstract Presenter:
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Abstract:
Type 2 diabetes is a chronic metabolic disease with an increasing number of patients worldwide. Therefore, many drugs have been developed to control the disease, which have side effects such as hypoglycemia, beta-cell apoptosis, and other complications. As a result, these days, researchers are working on compounds with higher specificity and potency along with fewer side effects. One promising approach for diabetes treatment is increasing the plasma half-life of the incretin hormone glucagon-like peptide-1 (GLP-1) by inhibition of Dipeptidyl peptidase-4 (DPP4) enzyme. Glp1 hormone is secreted in response to food from the intestine cells and has an important role in the regulation of plasma glucose. This hormone stimulates the production and secretion of glucose-dependent insulin, postpones the absorption of glucose, prevents the production of hepatic glucose, increases the growth and differentiation of beta cells, and suppresses the appetite by deferral of stomach discharge, but it is deactivated by DPP-4 enzyme in less than 90 seconds. In this study, by regarding the structure-activity relationship of DPP-4 inhibitors, the compound with amino-1,3,4-oxadiazole ring was designed and synthesized. 1,3,4-oxadiazole ring, with its unique structure, represents broad spectra biological activities including antitumor, antimicrobial, antiviral, anti-tuberculosis, anticonvulsant, anti-inflammatory, analgesic, anti-allergic, anti-diabetic. Docking studies demonstrated that the designed compound has a satisfactory affinity to enzyme active site in comparison with standard Sitagliptin. This compound can be ionizable in the body and properly binds to amino acids of Glutamate 205 and 206. This derivative was synthesized in 4 steps with acceptable yield and structurally was approved by FTIR, LC-Mass, 1HNMR, and 13CNMR analysis methods. In biological evaluation, the synthesized compound showed acceptable inhibitory effects on DPP-4 enzyme with IC50 = 1.23 µM.

Keywords: Diabetes, Amino-1,3,4-Oxadiazole, DPP-4 Inhibitor

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The Impact of Dapsone on Polycystic Ovarian Syndrome in Rats Caused by Testosterone Enanthate

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15-18 February 2022

Oral: O9

Abstract Presenter:
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Abstract:
Polycystic ovary syndrome (PCOS) is one of the most common causes of infertility. PCOS has been linked to metabolic syndrome, weight gain, type 2 diabetes, and heart disease. PCOS is caused by disturbance of the hypothalamus-pituitary-ovary axis, insulin activity, sympathetic nervous hyperactivity, and increased pro-inflammatory cytokine levels in the blood. Dapsone, an antibacterial sulfonamide drug, has anti-inflammatory properties, including reducing levels of inflammatory cytokines such as TNF-α and IL-1β. Methods: PCOS was developed in 21-day-old female rats for 35 days with subcutaneous injection of testosterone enanthate (1 mg/100 g). The MET control got metformin (300 mg/kg/day, orally) for 28 days, while the DAP group received 12.5 mg/kg, orally for 28 days to assess the effectiveness of dapsone (DAP). The rats were then euthanized on the final day of the study, and blood was collected to determine serum levels of hormones, glucose, LDL, and LDL/HDL, as well as dissecting the left ovaries for histological analysis. Serum glucose, LDL, and LDL/HDL values were significantly higher in the PCOS group compared to the control group ($P < 0.001$). In addition, the PCOS groups LH, FSH, and testosterone levels differed from the control group ($P < 0.001$). The ovary of the SOP group had severe histological morphological abnormalities. The effects of testosterone were reversed in the DAP and MET groups after treatment with dapsone and metformin. According to the findings, dapsone has an antiandrogenic effect by lowering testosterone levels in PCOS-induced rats.

Keywords: Dapsone, Testosterone, Polycystic, Progesterone, Rat

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Preparation and Evaluation of Extended-Release Nanofibers Loaded With Pramipexole as a Novel Oral Drug Delivery System: Hybridization of Hydrophilic

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15-18 February 2022

Oral: O10

Abstract Presenter:
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Abstract:
Parkinson's disease (PD) is one of the most common neurodegenerative motor diseases due to the loss of dopaminergic neurons in the substantia nigra pars compacta (SNpc). Pramipexole is one of the most-used medications to treat Parkinson's disease. This study purposed to prepare and evaluate extended-release nanofibers of Pramipexole to use as an oral dosage form. For this aim, polyvinyl alcohol (PVA)/carboxymethylcellulose (CMC) nanofibers loaded with Pramipexole were prepared by using the electrospinning method. Pramipexole-loaded nanofibers were investigated by scanning electron microscopy (SEM)and infrared spectroscopy (FTIR). The release profile of both polycaprolactone (PCL) and cross-linked nanofibers was assessed with HPLC method. The results present that the co-electrospun nanofibers crosslinked by 12-h exposure to glutaraldehyde vapor have a slow-release profile in comparison to non-hybrid and non-crosslinked fibers. The release kinetic fitted with the Higuchi model. The results indicated that slow-release nanofibers can be considered as a novel carrier in encapsulation dosage forms with reduced used excipients and ease of production advantages.

Keywords: Pramipexole, Nanofiber, Controlled-Release, Drug Deliver

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Evaluation the Efficacy of "Equmelis" Syrup in Patients with Depression

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15-18 February 2022

Oral: O11

Abstract Presenter:
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Abstract:

According to the World Health Organization, depression is one of the leading causes of disability worldwide and plays a major role in the global burden of disease. Numerous pharmacological and non-pharmacological treatments are used to treat this mental disorder. Plant extracts are one of the most attractive sources of new drugs and have promising results in treating depression. The aim of this study was to determine the clinical effects of Lemongrass and Bovine Syrup in the treatment of depression. In this randomized, double-blind, placebo-controlled clinical trial, which was performed with the participation of patients with mild to moderate depression. In this study, the herbal treatment group received borage extract for one month and the other group received a placebo. The severity of depression in all patients was determined through the Hamilton questionnaire at the beginning and end of the study and the information obtained from the clinical trial was statistically analyzed. According to the results of this study, the Hamilton index in the intervention group before the drug intervention is higher than after the intervention and this difference is significant. Therefore, it indicates that Equmelis syrup in patients with depression improves the Hamilton depression standard and has significant therapeutic effects in these patients. Due to the lack of side effects due to treatment with bovine and lemongrass, the active ingredient of these plants can be a good candidate for the development and production of effective and efficient medicinal formulations and at the same time with minimal side effects in Treatment of depression and even other mood disorders should be considered and used.

Keywords: Plant Extracts, Lamongrass, Deppression, Bovine, Oculis

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Chitosan/Gelatin Nanofibers Containing *Zataria Multiflora* Extract: Preparation, Characterization and Antibacterial Activity

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15-18 February 2022

Oral: O12

Abstract Presenter:
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Abstract:
Many bacteria have become progressively more resistant to antibiotics, resulting in a challenging task to control their overall levels and treatment of bacterial diseases. Therefore, in recent years, discovery and development of natural and biocompatible antibacterial agents has been a main aim for many investigations. Polymeric nanofibers incorporated with antibacterial agents are considered to have great potential for various biomedical applications, as they exhibit several unique properties such as large specific surface area and high porosity. Zataria multiflora plant, as a member of Labiatae, has shown great antibacterial activity against different bacterial strains. The aim of this study was to fabricate chitosan/gelatin nanofibers containing Zataria multiflora extract (ZME) and investigate their antibacterial activity. In present study, nanofibers loaded with ZME were electrospun from gelatin and chitosan solutions at different weight ratios (chitosan:gelatin: 0:100, 20:80, 30:70, 40:60). The surface morphology of the prepared nanofibers was studied using scanning electron microscopy (SEM). The optimum chitosan/gelatin weight ratio was selected based on SEM results. Further characterization studies were done on the optimized nanofibers. Fourier transform infrared spectroscopy (FTIR) was performed to reveal the chemical compositions and molecular interactions between the components of the nanofibers. Eventually, the antibacterial activity of electrospun nanofibers was evaluated using bacterial colony counting method against Staphylococcus aureus and Escherichia coli. SEM images showed that the gradual increase of chitosan content from 0% to 40% decreased the average fiber diameter from 770 nm to 170 nm. Chitosan:gelatin 30:70 (% w/w) was chosen as an optimum nanofiber composition due to having the highest amount of chitosan and at the same time uniform and defect-free morphology. The presence of chitosan, gelatin and ZME in the nanofibrous mat was confirmed by FTIR. ZME loaded nanofibers exhibited favorable antibacterial effect on both bacterial strains. S. aureus and E. coli treated with nanofibers achieved about 4 and 2 log CFU/mL reduction in population, respectively. In conclusion, the chitosan/gelatin nanofibers loaded with ZME were successfully fabricated through the electrospinning method and can be used for controlling bacterial infections.

Keywords: Antibacterial, Nanofibers, *Zataria multiflora*, Gelatin, Chitosan

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Protective Effects of Astazanthin Solid Lipid Nanoparticles Formulation Following Renal Ischemia-Reperfusion in Rats

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15-18 February 2022

Oral: O13

Abstract Presenter:
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Abstract:
Ischemia is one of the common causes of acute renal failure which results from severe reduction or cessation of blood supply to the kidneys. Astaxantine (AST) is a compound derived from green algae with anti-oxidative, anti-inflammatory and anti-apoptotic effects. The use of nano-formulations of this compound in order to slow the release of the drug and increase its bioavailability can play an important role in its protective effects. Solid lipid nanoparticles (SLNs; lipids that are solid at room and body temperature) Colloidal carriers smaller than microns (1000-50 nm) dispersed in water or an aqueous surfactant solution. The aim of this study was to evaluate the therapeutic effects of astaxantine on ischemia-induced renal reperfusion cell damage in rats. In the present study, 28 male Wistar rats with a weight range of 250-300 g were used. In order to perform the tests, the studied animals are randomly divided into 4 groups: 1) control group (Sham) 2) ischemia-reperfusion group 3 and 4) ischemia-reperfusion groups receiving solid lipid nanoparticles containing astaxantine in two different doses intraperitoneally (each group of 7 male rats). At the end of the reperfusion period, an abdominal blood sample was taken to evaluate the functional status of the kidney. After preparation of SLNs, astaxantine is loaded into solid lipid nanoparticles and the physicochemical properties of nanocarrier nanoparticles are evaluated by zeta potential zeta, TEM and DLS tests. The groups underwent intraperitoneal injection of drug solvent for 5 days, then underwent surgery and renal ischemia for 30 minutes. After 24 hours of ischemia, rat kidneys are isolated for histological studies and animal serum is used to measure BUN, Cr, GSH and CAT levels. Blank Ast-SINs were 394 and 420 nm in size with negative zeta potential, respectively. The loading efficiencies and drug content of Ast in SLNs were 89.06% and 20.55%, respectively. The nanoformulation showed initial rapid release and then continuous release for up to 72 hours. The results of this study showed that the solid nanoparticle form of astazanthin has protective effects against functional tissue damage, oxidative stress and inflammation caused by ischemia-reperfusion in rats.

Keywords: Ischemic Reperfusion, Astaxantine, Solid Lipid Nanoparticles

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Exploring the Role of Silver and Gold Nanoperticles, Zinc and Gallium on the Pathophysiology of COVID−19

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15-18 February 2022

Oral: O14

Abstract Presenter:
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Abstract:
COVID-19 pandemic caused by SARS-CoV-2 has influenced on all the world and has impaired the public communication, education, economy and many aspect of social life. Treatments for reducing symptoms and preventing the spread of disease are needed but there is no actual drug for this disease. Vaccination has reduced the rate of infection and mortality. Many chemical compounds can affect the SARS-CoV-2 and its disease COVID-19. Heavy metals and their derivatives like nanoparticles and salts have effects on COVID-19. Entry and DNA transcription of virus can inhibit by Ag nanoparticles. Au nanoparticles can reduce the cytokine storm by inhibiting the expression of cytokines. Zinc oxide interferes with SARS-CoV-2 RNA replication by inhibiting the RNA-dependent RNA polymerase (RdRP) activity and also preventing entry of virus to the cells. There are three suppositions for the effect of gallium on SARS-CoV-2 in the way of entry, replication and immune response of the body.

Keywords: Gallium, Nanoparticles, COVID-19, Zinc

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A Photoactive Cellulosic Scaffold Loaded with Gelatin-Hyaluronic Acid Hydrogel for Bone Regeneration

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15-18 February 2022

Oral: O15

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Abstract:
Bone-related diseases such as cancers, infection, and trauma, are common clinical problems that result in irrecoverable bone defects, which cause a burden to healthcare systems due to the prolonged hospitalization and long recovery process. NIR-responsive scaffolds coated with photothermal agents can absorb near-infrared (NIR) light and convert it to thermal energy. The generated heat can be controlled to maintain the temperature of the defect site to 39-40 °C as it is approved to assist in enhancing the proliferation of human mesenchymal stem cells and promoting osteogenesis. In this study, mild heat-induced osteogenesis is studied by a biodegradable cellulose-based scaffold coated with Bi2S3 nanoparticles (NPs) while its pores are filled with gelatin-hyaluronic acid thermo-responsive hydrogel. Bi2S3 NPs were prepared using a simple chemical reaction and plant-derived cellulose scaffolds were coated with Bi2S3 NPs. Then the scaffolds were immersed in gelatin-HA hydrogel for 4 hours. Following that, the scaffolds were transferred to the freeze drier. Scanning electron microscope (SEM) was used to characterize the morphology and structure of the scaffolds. Elemental analysis, porosity, surface area, and thermo-gravimetric analysis (TGA) of the NPs and scaffolds were evaluated. In addition, in vitro photothermal activity and in vivo toxicity of Bi2S3 NPs and scaffolds were assessed. Transmission electron microscope (TEM) image shows that Bi2S3 NPs have a uniform spherical shape with an average diameter of about 5 nm, which is mostly composed of Bi and S. The SEM images and BET analysis of scaffolds demonstrated the sufficient porosity of suitable size, which is ideal for bone tissue engineering. In addition, the elemental analysis of the scaffolds confirms the hydrogel was loaded in the Bi2S3 coated scaffold. The photothermal performance of the Bi2S3 coated scaffold showed that the temperature increased rapidly to ≈ 44, 55, and 58 °C after NIR laser irradiation at 0.5, 1, and 1.5 W/cm2, respectively within 5 min, which confirm the high photothermal conversion efficiency of the scaffold. Moreover, the hematoxylin and eosin staining of the main organs of treated rats showed no significant histopathological changes in the main organs after subcutaneous implantation of scaffolds in the rat model. The Bi2S3 coated cellulosic scaffold has great potential in orthopedic applications due to good NIR-mediated and hydrogel-assisted osteogenic performances and this study provides new insights into the design and fabrication of new-style osteoimplants for bone regeneration.

Keywords: Cellulose Scaffold, Hydrogel, Photothermal Therapy, Bone Regeneration

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The Effect of Target Therapy in Colorectal Cancer Cell Line Based Drug Nano-Carrier Modified and Folic Acid

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15-18 February 2022

Oral: O16

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Abstract:
Cancer is one of most significant health concerns with high mortality, and numerous attempts are being undertaken to treat it. One of the most common treatments for cancer is chemotherapy but the problem with this method developing resistance to chemotherapy. Colorectal cancer is one of the most common cancers. The aim of this study was to use compound a novel drug-polymer combination based on poly (styrene-alt-maleic anhydride) copolymer (PAM) was created for targeted to delivery medication and improve colorectal cancer treatment. This study was performed on HT-29 colorectal cell line. First of all PAM was synthesized using a traditional radical polymerization technique and then linked with thiourea. Following that to generate the targeted drug-polymer complex, the altered PAM was coupled with carboxymethyl-beta-cyclodextrin (CM-β-CD), and folic acid (FA) was implanted into the CD cavity as a targeting agent via host-guest interactions and then injections of doxorubicin were made into copolymer spheres. On the colorectal cancer cell line, the proposed polymer-drug complex was assessed, and changes in nucleus shape and biocompatibility of the produced complex was evaluated. FTIR, EDX, and UV-Vis studies were used to identify the samples. According to the results of the drug-polymer complex, the prepared effects have better effects than doxorubicin only on HT29 cell line, indicating a decrease in cell growth by MTT assay test and changes in the morphology of the nucleus and increase apoptosis in cancer cell by DAPI and flow cytometry analysis. Due to the prevalence of colorectal cancer in the world and the importance of its treatment, the use of drugs with new technology has reduced the side effects of chemotherapy drugs. In this project, in order to increase the effectiveness of the anti-cancer drug doxorubicin, we load the drug on the surface of the nano-carrier. Carboxymethyl-beta-cyclodextrin modified polyester (styrene-maleic anhydride) showed that the results Increase the effectiveness of the drug. Conclusion: This supports the idea that directing doxorubicin to a certain cell type may increase drug penetration and, as a result, toxicity. A customized polymer complex containing doxorubicin that is targeted by folic acid receptors was shown to improve the drug's effects on HT-29 colorectal cancer cells. These drug-carrying devices may be beneficial in lowering doxorubicin dosages while reducing systemic side effects, based on these findings. Doxorubicin doses while simultaneously decreasing adverse effects.

Keywords: Folic Acid, Colorectal Cancer, Target Therapy

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Evaluation of the Effects of Different Polymers on Improving the Properties of Gelatin-Based Pastilles

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15-18 February 2022

Oral: O17

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Abstract:
Pastilles are one of the chewable oral dosage forms. The gelatin polymer is the most used gelling agent to prepare pastilles. Pastilles prepared by gelatin have suitable texture and transition temperature. In addition, the resulting gel has an acceptable dissolution profile. Despite these advantages, gelatin-based pastilles also have some drawbacks. For example, in the environmental high temperature, the pastille dosage units may stick together. The ease of mastication, thermal, and sensory properties can also be improved. The purpose of this study was to evaluate the effects of different polymers on improving the properties of gelatin-based pastilles. In this study, forty formulations were prepared. The formulations containing different concentrations of gelatin powder (7-17%) and 14% of glycerin (as humectant) were initially prepared. Then, acacia, pectin, carbomer 940, and starch in different concentrations were individually used with gelatin and glycerin to prepare combination formulations. The preparation methods were different depending on the type of polymer. The effects of different concentrations of polymers on the elasticity (using an in-house apparatus), appearance, pH, thermal properties (using TGA and DSC), sensory properties and ease of mastication (scored from 1 to 5 by 30 volunteers) of combination pastilles were studied then compared with gelatin-based pastilles. The results revealed that the best concentration of gelatin powder to prepare gelatin-based pastilles was 14% w/v. The appropriate concentrations of gelatin in the combination pastilles prepared from acacia, carbomer 940, and starch were 13% w/v. This concentration was 11% w/v for pastilles prepared with the combination of gelatin and pectin. In terms of elasticity, the highest (198 ± 8 g) and the lowest (146 ± 16 g) elasticity belonged to the combination formulation of starch and gelatin and formulation of gelatin, respectively. The results of the scoring of ease of mastication showed that the best formulations were those prepared with 2% of starch and 13% of gelatin (score: 4.6 ± 0.49). The score of pastilles prepared with gelatin was 2.96 ± 0.76. In the case of taste, pectin caused an unpleasant sour taste which was not acceptable to the volunteers. The most transparent pastilles were those prepared with gelatin alone. Adding polymers to the gelatin-based pastilles decreased the transparency, especially carbomer 940. The thermograms of combination pastilles had different peaks in comparison with gelatin-based pastilles, indicating the effect of polymers on the thermal properties of gelatin-based pastilles. This study showed that although the gelatin base had a more transparent appearance, the ease of mastication, elasticity and thermal properties can be improved with other polymers.

Keywords: Pastille, Gelatin, Combination Pastilles, Ease of Mastication, Thermal Properties, Pastille Polymer

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In-Situ Forming Poloxamer-Based Hydrogel Containing Thiolated Chitosan Nanoparticles as Intranasal Galantamine Delivery System

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15-18 February 2022

Oral: O18

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Abstract:
Alzheimers disease (AD) is a progressive and irreversible neurodegenerative disease. Many neurodegenerative diseases require the efficient delivery of drugs to the brain. Considering the blood-brain barrier, drug delivery approaches for AD is limited. To overcome this problem, delivering the drug via the nasal route seems to be an appropriate approach as an alternative way to the systemic administration due to direct targeting of the brain. In this study, in order to optimize the drug delivery of AD, a new drug delivery system as a mucoadhesive in-situ forming hydrogel for Galantamine was prepared To this end, Mucoadhesive nanoparticles (NPs) were prepared by thiolation of chitosan (TCS) with mercaptopropionic acid. The number of thiol groups was measured using Ellmans reagent (DTNB dye). The Galantamine-loaded TCS NPs were synthesized by the two ionic gelation methods (via sodium tripolyphosphate) and desolvation technique (via Glutaraldehyde). After ultracentrifugation, the entrapment efficiency of Galantamine was estimated by a UV spectrophotometer at λmax of 289 nm. Three different concentrations of Poloxamer solution were prepared by the cold method. The concentration with the suitable gelation time and gelation temperature was then attained. The amount of the Galantamine-loaded NPs required as the therapeutic dose was calculated based on the entrapment efficiency. Two different amounts of NPs containing the drug were dispersed in 4 mL of poloxamer 18% gel and the achieved hydrogel at 37 ℃ was then sonicated. In-vitro release studies were carried out in pH 6.4 phosphate-buffered saline media using the dialysis bag. Fourier transform infrared (FT-IR) spectroscopy was used to analyze the structure of prepared formulations. In-vitro cell cytotoxicity of prepared hydrogel on CaCO2 cells (nasal mucosal cell model) was evaluated using the MTT method. The cell viability of hydrogels was determined by DAPI-staining and live/dead kit, too. The obtained results demonstrated that the thiolation value of CS was 198.6 ± 18.7 µmol S. g-1 CS, which is a convenient result based on reported works. In the preparation of TCS NPs via the ionic gelation method, by increasing the amount of TPP, the particle size increased and the zeta potential decreased. The mean size and zeta potential of NPs prepared by the desolvation method were 238.7 nm and 22.9 mV, respectively. The drug entrapment efficiency of Galantamine in the prepared NPs by ionic gelation method was zero, while the prepared NPs by desolvation method indicated encapsulation efficiency equal to 30%. As the concentration of Poloxamer 407 solution increased, gelling temperature and the time required for gelling decreased. Thus, according to the temperature of the intranasal environment (32-35 °C), Poloxamer 18% has the best concentration to prepare in-situ forming hydrogel for drug delivery via the intranasal route. Drug release from the hydrogel containing drug loaded-TCS NPs was slower and more controlled compared to the hydrogel containing the drug without NPs, which will lead to more effective drug delivery. Our results confirmed that Poloxamer hydrogels containing drug-loaded-TCS NPs are non-toxic for encapsulation of Galantamine and indicated high cell viability.

Keywords: Nasal drug delivery, Alzheimers disease, Poloxamer, Nanoparticles, Galantamine, Thiolated chitosan

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Paclitaxel Loaded Chitosan/Copper Sulfide Nanoparticles for Combinational Chemo/Photothermal Therapy of Breast Cancer

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15-18 February 2022

Oral: O19

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Abstract:
Photothermal therapy (PTT) is a laser-based, targeted technique for destroying tumor cells that is induced by light-heat conversion in cancer cells until the cells die. PTT has received a lot of attention because of its exceptional specificity, limited invasiveness, and low toxicity to normal tissues, and potent anti-tumor performance. For these reasons, it may be an effective technique for treating kinds of breast cancer that are resistant to conventional therapies. The combination of photothermal therapy and chemotherapy in cancer therapy can lead to the increased therapeutic success of both strategies with lower side effects. For this aim, chitosan-coated copper sulfide nanoparticles (CuS@CS-NPs) were designed and synthesized as a photothermal agent, using copper sulfate as the copper source and sodium sulfide as a sulfide source. Later, nanogels form of nanoparticles (CuS@CS-NGs) were obtained after adding tripolyphosphate pentabasic (TPP). Structural characterization of the prepared nanogels was done by different methods such as FT-IR and XRD analysis. Particle size distribution and zeta potential of the prepared nanogels were determined by DLS. TEM was conducted for morphological analysis. Under the irradiation of 808 nm laser at a power density of 1 W/cm2 the photothermal effects of various concentrations of CuS@CS-NGs solutions were measured. After encapsulation of paclitaxel to CuS@CS-NGs, the amount of loaded drug from nanogels was analyzed using UV absorbance. Release of paclitaxel from nanogels was performed at 37 °C with a shaking speed of 150 rpm under various pH values of 5.8 and 7.4. The cytotoxicity of the nanogels alone and paclitaxel-loaded nanogels against the MCF7 cell line was investigated via MTT assay in presence and absence of NIR irradiation. The apoptotic effect of the nanogels alone and paclitaxel-loaded nanogels on cancer cells was determined after 72 hours of treatment using flow cytometry. After labeling the nanogels alone and paclitaxel-loaded nanogels with FITC, the cellular uptake of nanogels in cancer cells was determined via flow cytometry. TEM images indicated that CuS@CS-NPs and CuS@CS-NGs had average size of 10 nm and 30 nm, respectively, while their average hydrodynamic size in aqueous dispersion was 153.7 and 200.9 in the same order which was measured by DLS. Under NIR irradiation, the temperature of an aqueous dispersion containing 5 mg/mL nanogels was dramatically increased from 27 to 55 °C in 360 seconds of exposure, while the temperature elevation of 2 mg/ml nanogel solution was from 27 to 44 °C, which proved that photothermal efficacy could increase with a higher concentration of the photothermal agent. Based on the drug release profile, the cumulative drug release at the pH of 7.4 is 38.99% after 168 h. With lowering the pH of the release medium to 5.8, the drug release reached 35.19%. After introducing paclitaxel to nanogels, the cellular uptake by the cancer cells was increased from 23.05 to 43.02. Based on Flow cytometry-based apoptosis/necrosis assay of MCF-7 cells, we could confirm that a combination of photothermal and chemotherapy has a better cytotoxic effect than each one alone.

Keywords: Photothermal Therapy, Combination Therapy, Chitosan Coated Copper Sulfide, Nanoparticles, Paclitaxel, Breast Cancer

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Localized Delivery of Micelle/ Hydrogel Hybrid Formulation Containing 5-FU and Dexamethasone for Effective Suppress Skin Melanoma

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15-18 February 2022

Oral: O20

Abstract Presenter:
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Abstract:
Skin cancer has become the most common type of cancer worldwide as a result of ultraviolet irradiation, exposure to certain chemicals, trauma, etc. Despite many therapeutic options, therapeutic efficacy is not satisfied in all patients with advanced skin cancers, especially in melanoma. Fluorouracil (5-FU) is an anti metabolite drug used in the treatment of various malignancies, such as colon and skin cancers. However, its systemic administration results in severe side effects like inflammation reactions. To enhance 5-FU efficacy against skin cancer and reduce its systemic side effects, it is loaded into a micelle-hydrogel structure and co-delivered with a corticosteroid (e.g., dexamethasone) as a controlled drug delivery system. In this study we present a dual-drug delivery system of hydrogel/micelle, in which independent release behaviors of two drugs (5-FU and Dexamethasone) are observed. 5-FU was incorporated into deoxycholic acid (DCA) as a self-assembled micelle. 5-FU incorporated DCA micelle was then combined with carboxymethyl chitosan hydrogel (CMC Hyd) containing DEX, to develop a pH-responsive micellar hydrogel system. The properties of the micellar hydrogel system were determined by Fourier-transform infrared spectroscopy (FT-IR), Dynamic light scattering (DLS), zeta potential, and atomic force microscopy (AFM). The amount of drugs in the aqueous medium was measured by HPLC. Finally, the in vitro anticancer effect was carried out on A375, and MCF7 cancer cell lines. Results: The DCA micelle had an ellipsoidal shape and their size were around 164±46 nm. Maximum 5-FU entrapment was achieved in micelle at molar ratio of 1:50. Drug release from micelle was sustained and pH dependent. The simultaneous delivery of 5-FU and Dexamethasone (DEX) via Nano micelle could maintain the synergistic drug level for 12 h in vitro. 5-FU/DEX formulation had around 2-fold higher cytotoxicity on cancer cell line compared with normal fibroblast. Discussion: 5-FU incorporated to micellar hydrogel system was successfully prepared by the self-assembling the micelle and mixed it with DEX@CMC Hydrogel. These systems respond to pH and show controlled drug-release properties that can be controlled by hydrogel. The 5-FU@Mic-Hyd exhibited rapid drug-release manner at physiological pH, meanwhile, its properties was reversed at pH 5 which not only does it reduce drug degradation, but also by control the release behavior of 5-Fu to cancer cells lead to improves the effectiveness of the formulation. The formulation attained a high entrapment efficiency of 5-FU, and release was sustained over 24 h, potentially making it useful as a controlled drug release system. Conclusions: The results show the desirable chemotherapeutic properties of formulations as a promising strategy for treating melanoma cancer with high efficiency.

Keywords: 5-FU, Dexamethasone, Hydrogel, Micelle, Drug Delivery System, Skin Cancer

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Investigating the Potential of an Anti-aging Peptide, Pal-KT, to Form Lyotropic Liquid Crystals

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15-18 February 2022

Oral: O21

Abstract Presenter:
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Abstract:
Lyotropic liquid crystals are an intermediate state of matter composed of amphiphilic molecules and solvents. These self-assembled structures are advantageous as drug delivery carriers, particularly to improve permeation through the skin. Regarding the amphiphilic nature of Pal-KT, as an anti-aging peptide with some undesired physicochemical properties to cross the skin barrier, it may be able to reap the benefits of being formulated as liquid crystals upon addition of water. Crystallinity, texture, isotropism, and thermal behavior of Pal-KT were investigated in its solid-state using X-ray diffraction (XRD), polarized light microscopy (PLM), and differential scanning calorimetry (DSC). Then, different amounts of water were added to the dry powder of Pal-KT and thoroughly mixed to form homogenous mixtures. The intended properties of the obtained structures were evaluated by the aforementioned techniques. The results were compared to determine how the system changed upon the addition of water. According to XRD spectra, the solid-state and liquid crystalline samples of Pal-KT exhibited index Bragg's reflection ratio of lamellar structures. Also, PLM results showed similar oily streaks textures (one of the indexed textures of lamellar phase) for different concentrations of Pal-KT. DSC thermograms indicated the disappearance of the index melting point of the compound; which means the involvement of the whole mass in the formation of liquid crystalline structure. The capability of Pal-KT to form liquid crystals upon the addition of water as the solvent of choice in drug delivery systems, can make it a good candidate for the preparation of drug-based formulations and increase its skin absorption.

Keywords: Lyotropic Liquid Crystal, Pal-KT, Anti-Aging Peptide, Amphiphilic Conjugate, Dermal Drug Delivery

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L-DOPA-PEI Conjugates as Targeted Delivery System for Plasmid Encoding IL-12 gene

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15-18 February 2022

Oral: O22

Abstract Presenter:
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Abstract:
L-Type Amino Acid Transporter 1 (LAT 1) is responsible for carrying large, neutral L-amino acids to the cells. Polyethylenimine (PEI) is used as the golden standard for transferring genes to various tissues of the body. Despite its high transfection efficiency, PEI may enter normal tissues and cells due to the lack of specificity. Therefore, various targeting strategies have been developed to increase the targetability of this polymer. In this study, we aimed to target polyethylenimine to cells or tissues that have overexpression of LAT 1 using L-DOPA, which can mediate cell entry via LAT 1 transporter. Methods: L-DOPA (3,4-Dihydroxy-L-phenylalanine) was conjugated on 25 kDa PEI at various conjugation degrees. Then, plasmid/polymer DNA complex was prepared and particle size, zeta potential, DNA condensation and nuclease protection assay were evaluated. Cytotoxicity and transfection study were performed on HepG2 and 4T1 cell lines with IL-12 encoding plasmid. Three conjugates with different conjugation degrees (1%, 2%, and 4%) were synthesized. 1H-NMR, FT-IR and buffering capacity test showed that the conjugates have been prepared properly. DNA condensation assay and nuclease protection assay indicated that conjugates could protect the plasmid effectively. Results of zeta potential and particle size measurement demonstrated that the polyplexes were in the optimal size and zeta range. Transfection test was performed on 4T1 cells overexpressing the transporter and HepG2 cells lacking this transporter. The results revealed that the PEI conjugation with L-DOPA can increase the targeted delivery of plasmid into the cells overexpressing LAT-1 while no increase was observed in HepG2 cells. In addition, this conjugation led to the induction of lower toxic effects on 4T1 cells compared with HepG2 cell line. Totally, we expect that our designed conjugate can carry plasmid DNA to the cells through LAT 1 transporter with high efficiency.

Keywords: Targeted Gene Delivery, LAT 1, IL-12, L-DOPA, PEI

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Knowledge and Attitude of Parents towards Using Herbal Medicine for Treatment of Common Illnesses in Children Up to 6 Years Old

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15-18 February 2022

Oral: O23

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Abstract:
Herbal medicines have been popular during Iranian history and have been used for curing illnesses both in adults and children. Based on this historical popularity Iranians still believe in them and use them even for treatment of their children. The problem is that children are more prone to be sensitive to adverse effects of herbal medicines because of their drug metabolism which is different from adults in some ways. This popular belief that herbal medicines are safe because of being natural can put children in the risk of herbal medicines adverse effects. The aim of this research was to evaluate knowledge and attitude of parents of children up to 6 years toward herbal medicine use and also its prevalence and the reasons for using them. The data were with a self-administered questionnaire based on previous researches and were analyzed by SPSS v.26 software, chi-square test applied for the finding relationships of qualitative variables, Mann-Whitney, Kruskal-Wallis and Spearman tests were also used to explore differences and correlations respectively. Out of 126 parents who took part in this research most of them (79.4%) had used herbal medicine for treatment of their children. Gastrointestinal problems (35.8%) and neonate jaundice (11.5%) were top rated illnesses treated with herbal medicines followed by respiratory problems. The most important reason to use herbal medicine was that it is was considered less dangerous and safer than chemical medicines (44%). The most important motivating factor for the use of herbal medicine was previous experience of its effectiveness in treating the child (38%). Although there was a positive attitude towards disclosure of using herbal medicine to physicians or pharmacist (11.72±2.31 out of 15), about half of the parents (48%) had not talked about it to them. In terms of knowledge the main source of information for parents was older relatives (20.5%) and then searching on the Internet (20.2%), while physicians and pharmacist were amongst the lowest rated sources. Mint was the best known (84.1%) plant in between others for its medicinal effects. On the whole parents had good knowledge about herbal medicines (3.012±1.24 out of 4). In terms of attitude, there was a positive attitude towards herbal medicine effectiveness (14.99±2.67 out of 20) and its use as a complementary treatment (11.031±2.26 out of 15) and neutral to negative attitudes towards their adverse effects (4.627±1.66 out of 10). Based on the results it seems necessary to educate parents more about herbal medicine adverse effects and provide them with trustable information sources. Physicians and pharmacists should take a more active role in giving advice about herbal medicine use to parents. Also the communication barriers between parent and physicians or pharmacist should be investigated and resolved so that parents would use herbal medicine more wisely and children would be at lower risk of the adverse effects.

Keywords: Herbal Medicines, Medicinal Herbs, Knowledge, Attitude

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The Effect of Simultaneous Encapsulation of Paclitaxel and Sodium Oxamate in Niosome for the Efficient Treatment of Breast Cancer Cells

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15-18 February 2022

Oral: O24

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Abstract:
Breast cancer is a malignant disease that begins in the breast cells. Paclitaxel disrupts the dynamic balance in microtubules and blocks cells at the end of G2 and M phase of the cell cycle, thus resulting in blocking cell replication. Sodium oxamate is an inhibitor of lactate dehydrogenase (LDH). Because of the low solubility of paclitaxel, nanoparticles (NPs) have been used to overcome this problem. Niosomes are layered vesicles composed of nonionic surfactants that improve therapeutic effects. Different proportions of surfactant 60 and tween 80, PEG 2000 with cholesterol and paclitaxel were added in chloroform and methanol solvents in a round bottom flask and put in a rotary solvent evaporated at approximately 60 ° C and 120 rpm to form a thin layer of surfactant in the flask wall. After 1h, phosphate buffer containing sodium oxamate, hyaluronic acid, and quantum dot was added to the thin layer to prepare the niosomes using the thin film hydration (TFH) method. Nanocarriers size distribution and zeta potential of the prepared niosome were determined by DLS. The amount of loaded drug was measured with a UV spectrophotometer at 230 nm. Release of paclitaxel from niosome was performed at 37 °C with a shaking speed of 150 rpm under various pH values of 5.8 and 7.4. The cytotoxicity of the blank noisome, noisome modified by hyaluronic acid, paclitaxel alone, paclitaxel loaded niosome, and paclitaxel sodium oxamate entrapped in noisome against MCF-7 cell line was investigated via MTT assay in 24, 48, and 72 hours. Abcam mitochondrial staining kit was used in the treated and untreated MCF-7 cells to evaluate the mitochondrial targeting potential of the niosome NPs. The apoptotic effect of the noisome blank, noisome modified by hyaluronic acid, paclitaxel alone, and paclitaxel sodium oxamate loaded in noisome, paclitaxel sodium oxamate-loaded noisome modified by hyaluronic on MCF-7 cell line was evaluated after 72 hours of treatment using flow cytometry to determine the apoptotic effect. The DLS indicated that niosome size was 241 nm with a zeta potential of - 21 mv. The entrapment efficiency of the drug was equal to 80%. Based on the drug release profile, the cumulative drug release was 20% and 80%, respectively at the pH of 7.4 and pH 5.8 after 72 h. Our results have shown that blank niosme and noisome modified by hyaluronic acid did not have toxicity on the breast cancer cells, while paclitaxel-loaded niosome had more fatality than paclitaxel alone. Additionally, sodium oxamate and paclitaxel-loaded niosome increased the mortality of MCF-7 cells compared to paclitaxel-loaded noisome. Moreover, paclitaxel/sodium oxamate-loaded noisome modified by hyaluronic acid had more effects on cancer cells than niosome entrapped paclitaxel/sodium oxamate. These findings were confirmed by results of MTT assay, flow cytometry, and mitochondrial staining kit.

Keywords: Breast Cancer, Niosome, Paclitaxel, Nanoparticles, Drug delivery, Cytotoxicity

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Investigation of the Production, Purification And Binding Ability of Anti- FGF7 Sdab D53 Antibody Identified by Phage Display Technique

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15-18 February 2022

Oral: O25

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Abstract:
Fibroblast growth factor 7 (FGF7) is a member of the fibroblast growth factor (FGF) family. FGFs are involved in a variety of biological processes, including embryonic development, cell growth, morphogenesis, tissue repair, and tumor growth. Therefore, inhibition of FGF7 can be an effective treatment for such pathological diseases. Aims: In this study, we aimed to investigate the production, purification and binding ability of single domain anti-FGF7 antibody (i.e., D53) identified by phage display technique against FGF7. The DNA sequence of D53 antibody was modified to change stop codon present in CDR2 region of heavy variable chain to glutamine codon with site directed mutagenesis and then the corrected sequence was cloned into pGEX-6p-1 expression vector. The constructed vector was transformed into *E. coli* origami and the protein of interest was expressed and subsequently purified using Glutathione-Sepharose affinity column. The produced domain antibody was analyzed by SDS-PAGE and western blotting techniques. To assess the binding ability of the produced antibody toFGF7, ELISA experiment was performed. Molecular docking of D53 into FGF7 was conducted using Z-dock program. The D53 domain antibody was produced in bacterial expression system. The protein band at about 13 kDa on SDS-PAGE was attributed to sdAb of interest. The production of D53 domain antibody was confirmed by using western blotting technique. In ELISA experiment, the produced sdAb showed appropriate affinity towards FGF7. Docking data was analyzed in protein interaction calculator (PIC) web site and various interactions of FGF7 and D53 were investigated. In the current work, anti-FGF7 sdAb D53 antibody was expressed in a prokaryotic system and the affinity of the purified protein was elucidated. The findings in the current study can be valuable in designing and developing new FGF7 inhibitors.

Keywords: CAF, FGF7, sdAb, Affinity Chromatography, Westorn blot, ELISA

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Evaluation Apoptotic Effects of Nanoformulation Anti-EGFR Monoclonal Antibody via Mediating ROS Generation

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15-18 February 2022

Oral: O26

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Abstract:
The current investigation introduces an advanced and effective active targeted tumor therapeutic nanomedicine composed of pegylated gold nanoparticles (PEG-GNPs) conjugated with Cetuximab that induced reactive oxygen species (ROSs) mediating apoptosis pathway as effective strategies for colorectal cancer treatment. The GNPs was synthesized, stabilized by polyethylene glycol (PEG), functionalized, and covalently conjugated with Cetuximab. The physicochemical properties of engineered nanomedicine (GNPs-PEG-Cet) were characterized by UV-vis spectrum. Then, its biological impacts, including cell viability, apoptosis, and ROS production, were evaluated in the colorectal cancer cell line. The engineered nanomedicine was found to effectively induce apoptosis in SW-480 cells and resulted in a significant reduction in cancer cells viability. From the flow cytometry results, this nanoscale showed a significant apoptotic effect on cells. In addition, the maximum production of ROS was obtained after the treatment of cells with an IC50 dose of GNPs-PEG-Cet. We introduced a nanoformulation of Cetuximab with a high apoptosis effect on colorectal cancer cells compared to the free Cetuximab.

Keywords: Cetuximab, Colorectal Cancer, Gold Nanoparticles, Nanomedicine , Pegylation, Reactive Oxygen Species

References: El Hallal R, Lyu N, Wang Y. Effect of Cetuximab-Conjugated Gold Nanoparticles on the Cytotoxicity and Phenotypic Evolution of Colorectal Cancer Cells. Molecules 2021; 26. doi:10.3390/molecules26030567

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Preparation and In-Vitro Characterization of Naltrexone Hydrochloride Multivesicular Liposomes Employing Experimental Design

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15-18 February 2022

Oral: O27

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Abstract:

Naltrexone hydrochloride is an opiate receptor antagonist that reduces alcohol craving and blocks the reinforcing effects of opioids. Multivesicular liposomes (MVLs) as depot formulations can slow the drug release and overcome the therapeutic limitations of conventional drug delivery systems. The aim of this study is preparation of naltrexone hydrochloride multivesicular liposomes (NTX-MVLs), evaluating the factors affecting encapsulation efficiency and in vitro characterization of the optimized formulation. Methods: NTX-MVLs were prepared using double emulsification process. An aqueous solution of naltrexone hydrochloride containing varying amounts of sucrose was emulsified with an equal volume of lipids solution (primary emulsion). Then primary emulsion was emulsified with a second aqueous solution. Preliminary studies investigated the effect of solvent removal type, solvent removal temperature, speed of the rotatory evaporator, first vortex speed and osmolarity of the second aqueous solution on encapsulation efficiency of the drug. Based on the data, 2-level full factorial design was used to assess the influence of other factors (as independent variables) including lipid: drug ratio, soy phosphatidylcholine: cholesterol (SPC: CHOL) ratio, triolein percent, sucrose percent in first aqueous solution and second-vortex time on encapsulation efficiency. The amount of encapsulated drug was measured with a validated HPLC method by using a reversed phase C18 (4.6 mm ×150 mm, 10 µm) with UV detection. The detection wavelength was set at 233 nm. The morphology and structure of optimized formulation was studied by optical microscopy. In-vitro release study was performed at 37 ◦C using dialysis membrane (MW cut off 12 kDa) and phosphate buffer solution (144 mM, pH 7.4), as a release medium for 72 h. Preliminary studies showed that the appropriate condition for preparation of NTX-MVLs was incomplete vacuum system at 25 ℃ for solvent removal, 30 rpm for the speed of rotary evaporator, 2500 rpm for the speed of first vortex and 80 mOSM for osmolarity of the second aqueous solution. 2-Level full factorial design suggested 20 runs to evaluate the effects of different factors on encapsulation efficiency. The results of experimental design indicated that lipid: drug and SPC: CHOL ratio had significant effects (P-value ≤ 0.05) on entrapment efficiency. Based on data, lipid: drug and SPC: CHOL ratio had positive and negative influence, respectively. Optical microscopy exhibited that NTX-MVLs were smooth and spherical in shape. According to the data of release study, there was an initial burst release at 1 hr followed by a modified release. More than 80% of drug was released after 24 h. The effects of five parameters was studied on the drug encapsulation, however there was no data on their effects on drug release. Thus, the preparation of the optimum NTX-MVLs with high encapsulation efficiency and sustained release profile requires more complex set-ups.

Keywords: Multivesicular Liposomes, Naltrexone Hcl, Encapsulation Efficiency, Depot Formulations, Novel Drug Delivery Systems

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Evaluating the Effect of Culture Media on the Expression and Solubility of Scfv against HER2 Protein in Escherichia Coli

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15-18 February 2022

Oral: O28

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Abstract:

Breast cancer is the most common cancer worldwide and in Iran among women. Considering the overexpression of human epidermal growth factor receptor 2 (HER2) in about 30% of breast cancers, using anti-HER2 monoclonal antibodies against HER2 extracellular domains would be a good approach against HER2+ malignancies. Single-chain variable domain (Fv) fragments (scFv) monoclonal antibodies show lower stability in non-target tissues, rapid blood clearance, and better tumor penetration in comparison with complete antibodies as a result of their smaller size. Conjugated molecules containing anti-HER2 scFvs and toxins, chemical drugs, or radio-isotopes can be used in the diagnosis and treatment of HER2+ cancers. As post-translational modifications such as glycosylation are not required for scFvs activity, E. coli is a suitable host for their expression. Various culture media with different nutrients and energy sources can change protein expression and solubility by altering bacterial metabolism. Therefore, it is highly required to optimize the culture medium. In this study, the effect of culture media on the expression and solubility of the anti-HER2 scFv in E. coli BL21 was examined. In this study, E. coli host BL21 containing pET-22 (anti-HER2 scFv) was cultured in Luria Broth (LB), Terrific Broth (TB), and Super Broth (SB) in the incubator with a shaking rate of 250 rpm, and induced by IPTG 0.25 mM at OD600=0.6-0.8. Following the separation of soluble and insoluble protein fractions by lysis procedure, total protein concentration was quantified using BCA assay and the purity of the anti-HER2 scFv band was determined using SDS-PAGE gel densitometry. Then, anti-HER2 scFv concentration in the soluble, and insoluble fraction was calculated. TB media showed the highest protein expression level among the examined media. The average yield of anti-HER2 scFv expression in TB media was increased approximately 47% compared to the LB media. Furthermore, the solubility of anti-HER2 scFv was significantly increased in TB and SB media as compared to the LB medium. The average concentration of soluble protein in TB media and SB media was 11.5 and 7.1 times higher than in LB media, respectively. Totally, the highest level of expression and solubility of anti-HER2 scFv protein in E. coli BL21 was observed when BL21 containing pET-22 (anti-HER2 scFv) was cultured in TB media in incubator shaking at 250 rpm and induced at OD600~0.6-0.8. The higher expression level in TB media can be related to its higher nutrients and energy source.

Keywords: Culture Media, Expression,Solubility, HER2, scFv, Escherichia Coli

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Overview of Translational Animal Models In Neurological and Neuropsychiatric Disorders: Current Challenges and Ethical Perspectives

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15-18 February 2022

Oral: O29

Abstract Presenter:
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Abstract:

Animal models used in scientific research should accurately simulate the genetic or induced disease or injury following human conditions to assist researchers in understanding the disease pathophysiology, providing new therapeutic strategies, and drug development. Because it is immoral to inflict a level of harm on a human patient, animal models allow researchers to investigate the disease states. Although biological activity in animal models does not guarantee its proper effect on humans, it has almost helped researchers in drug development and finding new approaches for human diseases. Neurological and neuropsychiatric disorders are emerging as the leading causes of morbidity and mortality with high prevalence and have had significant public health costs. Because of the unclear and complex molecular mechanisms of disease progression and testing potential therapeutics, using a human-like model is essential. Efficient models should be assessed and recapitulate all aspects of the disease spectrum. Animal models are limited in satisfying all the dimensions of investigation validity. Perspectives such as etiology, pathophysiology, and weak response to the treatment have not been well examined based on the accepted criteria. Due to the chronic nature of neurological or neuropsychiatric disorders and the weak response to treatments, crucial questions have been raised regarding the effectiveness, reliability, and ethics of current investigations of animal modeling. Data of widely-used animal models and lab studies from PubMed, Web of Science, Scopus, Google Scholar, Embase, and PsycINFO were systematically reviewed for eligible literature. Articles that elucidate the benefits and defects of existing experimental modeling on prevalent neurological and neuropsychiatric disorders were included. Screening for eligibility, validity, and reliability of the models to fully replicate human conditions were evaluated. The presented article has listed all in-vitro assays and in-vivo models of neurological and neuropsychiatric disorders and demonstrated their advantages and disadvantages. Animal welfare is the essential factor to be considered in research. Procedures performed on animals should fulfill ethical, legal, and economic concepts and ensure that minimum numbers of animals have participated. The major obstacle in utilizing animal models is the lack of meaningful advances in attributing the biological activity of animals to human responses. A set of principles contributing to the welfare of animals in scientific research are called the three Rs (3Rs), and it is the leading basis of the humane use of animals. Any research on animals must first show why there is no alternative and what can minimize the number and suffering: Replace the animal experiment with alternative techniques. Reduce the number of required animals or experiments to obtain a statistically significant outcome. Refine the methods of experiments to ensure minimum animal suffering and improve animal welfare to the greatest possible extent. Despite advances in animal modeling, there is still no significant progress in research on new therapeutics. Therefore, creating an efficient model that mimics human disorders while complying with the 3Rs guiding principles is a challenge, and developing new models for more accurate results.

Keywords: Animal Model, Three Rs, Neurological Disorders, Neuropsychiatric

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Phytochemical and Antioxidant Analysis of Loranthus Europaeus Fruits

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15-18 February 2022

Oral: O30

Abstract Presenter:
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Abstract:
Loranthus, a plant genus belonging to the family Loranthaceae, is used as a medicinal plant with various therapeutic applications in different nations. In this study Loranthus europaeus was selected for further phytochemical analysis. The air-dried grounded L. europaeus fruits were solvent extracted with petroleum ether, chloroform and methanol, resepectively, via Soxhlet apparatus and dried at 40°c using a rotary vacuum evaporator. Further evaluation of methanol extract was accomplished by fractionation via different methods of chromatography (SPE, VLC and HPLC) using various solvents. Structure elucidation for the isolated purified compounds were achieved with 1HNMR and 13CNMR spectra. Qualitative and quantitative tests were performed to evaluate the phytochemical properties of L. europaeus extracts. The antioxidant property of L. europaeus methanol extract together with its phenolic and flavonoids content were evaluated. Moreover, the essential oil from the L. europaeus fruits was achieved through hydrodistillation and analyzed via Gas Chromatography-Mass Spectrometry. Retention indices for all compounds were determined according to the kovats retention indices using n-alkanes series as standards. Structure elucidation of the purified compounds from methanol extract based on the 1D NMR revealed presence of a flavonoid in the extract. Moreover, the RC50 value for DPPH antioxidant activity of the methanol extract was determined as 3.78 mg/mL and values for the total phenolic and flavonoids content was calculated as 12.78 g gallic acid equivalent and 3.61 g quercetin equivalent per 100g of dry plant material. Analysis of the L. europaeus fruits essential oil resulted in the identification of 18 components, representing 93.6% of the total essential oil that principally contained germacrene D (32.8%), beta-caryophyllene (19.2%), bicyclogermacrene (7.7%), spathulenol (5.1%), copaene (3.6%). According to the results of this study, the essential oil of L. europaeus was poor in terms of diterpenoids compared with other species of Loranthus, but relatively high amounts of sesquiterpenes were reported in this analysis. Overall, the present study is the first report on the phytochemical analysis of L. europaeus which revealed presence of 7-O-methylkaempferol-3-O-β-rhamnoside alongside high superior of sesquiterpenoids in its fruits essential oil.

Keywords: Loranthus, Flavonoid, Beta Caryophyllene, Germacrene

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Anti-Nociceptive Effect of a Novel Fluorophenyl-Triazole Derivative of Morphine in Mice

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15-18 February 2022

Oral: O31

Abstract Presenter:
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Abstract:
Pain occurs when tissue damage appears and triggers a reaction to remove the pain stimulus. Morphine is one of the most famous analgesic opioids that have a high affinity to mu opiate receptors and is used to control pain. Opioids differ in their duration, potency and show various affinities toward opioid receptors. Heterocyclic rings are very considerable in medicinal chemistry. Triazole is a pentagonal ring with $C_2 H_3 N_3$ molecular formula. Adding triazole to various compounds have pharmacological effects such as analgesic, anti-inflammatory, etc. To achieve opioid agonists with more selective activity on opioid receptors, novel triazole morphine derivatives were synthesized. In the present study, the analgesic effects of one of these compounds were investigated. A novel compound with $C_{26} H_{25} FN_4 O_3$ molecular formula was assessed for anti-nociceptive potential by behavioral responses of mice in the tail-flick test. In this study, male NMRI mice were used and anti-nociceptive activities of the compound was evaluated. The Animals were housed in groups of 8 mice. The novel compound was dissolved in DMSO and was injected at a volume of 5 mL/kg body weight of mice subcutaneously. The treated groups of eight mice received the compound at doses of 0.5, 1, 2, and 4 mg/kg. Tail-flick latency was measured at 30-min intervals after the injection of the compound. The mean latency time recorded three times before injecting the compound is considered as baseline latency. Analgesic activity was quantified as either tail-flick latency time or percentage of maximal possible effect (%MPE). The pharmacological effect of the compound was antagonized by naloxone, an opioid antagonist. The results of this study indicated that compound (4R,4aR,7S,7aR,12bS)-9-((1-(4-fluorophenyl)-1H-1,2,3-triazol-4-yl)methoxy)-3-methyl-2,3,4,4a,7,7a-hexahydro-1H 4,12-methanobenzofuro[3,2-e]isoquinolin-7-ol has significant anti-nociceptive effect with ED50=0.67 (0.48 to 0.92) mg/kg in tail-flick test. This study demonstrated that the novel compound has analgesic effect, which is comparable to morphine. Further studies are needed to evaluate the toxicity of the compound.

Keywords: Morphine, Triazol, Anti-Nociceptive, Tail-Flick

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Thromboelastography as a Method of Preclinical Studies of Potential Drug Products

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15-18 February 2022

Oral: O32

Abstract Presenter:
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Abstract:
Preclinical study of drugs affecting the hemostasis system is an urgent task. It has been established that one of the complications of coronavirus infection is a high risk of developing deep vein thrombosis and pulmonary embolism. Studies demonstrate the potential of thromboelastography as a method for screening of products affecting haemostatic system. Thromboelastography revealed the pharmacological effects of drugs that were not planned to be used as anti-aggregants.

Keywords: Thromboelastography, Hemostasis, Thrombosis, Polyethylene Glycol

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Langendorf Method of Perfusion of Isolated Heart as an Instrument of Studies of the Substances with Potential Antiischemic Activity

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15-18 February 2022

Oral: O33

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Abstract:
CHD is the most common type of heart disease. That's the reason we study drugs with anti-ischemic activity. We use Langendorf model of isolated heart for model total myocardial infarction and investigate drugs with anti-ischemic abilities. That model include heart perfusion through aortal cannula with oxygenated Krebs–Henseleit solution. In our opinion it's accurate method of examining of myocardial infarction on rats. We study anti-ischemic activity of substances that has antioxidant activity.

Keywords: Ardioprotection, Miocardial Infarction, Antioxydant

References:

Ye L, Chen X, Wang M, Jin L, Zhuang Z, Yang D, Guan X, Samorodov AV, Pavlov VN, Chattipakorn N, Feng J, Wang Y, Luo W, Liang G. Curcumin analogue C66 attenuates obesity-induced myocardial injury by inhibiting JNK-mediated inflammation. Biomed Pharmacother. 2021 Nov;143:112121. doi: 10.1016/j.biopha.2021.112121. Epub 2021 Aug 30. PMID: 34474346.

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Heavy metals in Raw Materials of Turmeric

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15-18 February 2022

Oral: O34

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Abstract:
Medicinal plant raw materials from different countries enter the international market, so it is important to study safety indicators and unify quality requirements. The deterioration of ecological conditions in the world necessitates to control heavy metals in medicinal plant raw materials and drugs based on it. Curcuma longa is widely used as a medicinal and food raw material, which has anti-inflammatory and antioxidant activities, rises appetite up, improves digestion and has many other effects. Rhizomes are part of such complex preparations as Dr. Mom syrup, oral solution, syrup and tablets for resorption of Travisil. Curcumin is a part of many dietary supplements. Previously, it was established that there is the possibility to reduce the intake of some heavy metals in turmeric raw materials by soil alkalinization with 1% calcium hydroxide solution. In addition, it was determined that rhizomes accumulated more heavy metals than leaves. Therefore, the safety assessment of turmeric raw materials harvested in different regions is relevant. Method and Results: The object of the study was turmeric rhizome powder (Hassan, India). The content of heavy metals in it was determined by atomic emission spectrometry after sample preparation by mineralization. For this, concentrated nitric acid and hydrogen peroxide were added to the accurate weighted portion of the pulverised raw materials, after that the mixture was placed into the microwave decomposition system, then the solution cooled to room temperature was transferred to an atomic emission spectrometer. Calculations were carried out by the method of relative calibration with standard samples of known concentration. The results of the study showed that the content of heavy metals in turmeric raw materials varied in the range of 2.17-15580 mg/l. The concentration of essential metals (Cu, Zn, Mn, Fe) was 2.17-233.30 mg/l; potentially toxic (Rb, Sr) – 8.01-13.30 mg/l and toxic (Ba, Al) - 8.92-229.40 mg/l. The content of Pb, Cd and As was below the detection limit of the method. Conclusions: At comparison the received information with the literature, it was found that Cu, Zn, Fe, Al were at the average content level in the underground organs of plants. However, Sr accumulated in smaller quantities in turmeric rhizomes, and Mn - in large ones.

Keywords: Rhizomes, Turmeric, Curcuma Longa, Heavy Metals, Atomic Emission Spectrometry, Raw Materials

References:
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Generic and Disease-Specific Quality of Life Instruments in Therapy of Rheumatic Arthritis with Biological Disease Modifying Antirheumatic Drug

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15-18 February 2022

Oral: O35

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Abstract:
Background. Rheumatoid arthritis (RA) is a long-term autoimmune disease that leads to reduced quality of life and further disability of patients. The use of biological disease-modifying antirheumatic drugs significantly improved the results of treatment of patients with RA. The main goal of antirheumatic therapy should be improvement of health-related quality of life. Objective. To evaluate the potential use of general and disease-specific quality of life questionnaires in patients treated with biological disease-modifying antirheumatic drugs (by the example of tocilizumab). Methods. Screening methods (questionnaires, scales, and techniques) are used to assess quality of life in RA patients, among them: The Short Form-36, The European Quality of Life Questionnaire, The Health Assessment Questionnaire, The Visual Analogue Scale, The Rheumatology Assessment Patient Index Data, and The Functional Assessment of Chronic Illness Therapy. Our study included 35 patents aged 24 to 75 diagnosed with RA. They were all treated with tocilizumab for 12 months. Patients were measured for quality of life and physical function using general and disease-specific questionnaires at the beginning of the study and after 12 months of therapy. Results. The therapy with tocilizumab reduced the activity of the disease, which was reflected in the improvement of patients quality of life according to general questionnaires (The Short Form-36, The European Quality of Life Questionnaire, The Visual Analogue Scale, and The Functional Assessment of Chronic Illness Therapy) and disease-specific quality of life questionnaires (The Health Assessment Questionnaire, The Rheumatology Assessment Patient Index Data).

Keywords: Quality Of Life, Rheumatic Arthritis, Disease Modifying Drug, Interleukin-6 Inhibitor

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BDNF and Potential Analgesic Effect

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15-18 February 2022

Oral: O36

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Abstract:
Pain can be an important signal of the existence of pathological processes. Brain-Derived Neurotrophic Factor can amplify and attenuate these signals. Every patient would like to reduce the symptoms of pain in order to improve the quality of life. Therefore, at all times, painkillers have played a very important role in the pharmaceutical market. In this review, we tried to find the possibilities of using BDNF mimetics to obtain an analgesic effect.

Keywords: Analgesia , BDNF , Somatic Pain , Peptide Mimetics , Painkillers , Preclinical Studies

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Research of the Gel Form of a Biopreparation with Wound-Healing Activity

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15-18 February 2022

Oral: O37

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Abstract:
The active ingredient is Bactisporin. It is a biomass of an antagonistically active strain of bacteria Bacillus subtilis 3H that has antimicotic activity against dermatophyte fungi, or Bacillus subtilis 11B isolated from natural material that suppresses a wide range of conditionally pathogenic, pathogenic bacteria and fungi. Collagen solutions with high thickening and swelling capacity in combination with acetic acid maintain normal pH at the site of inflammation, restore metabolic processes, slow down the activity of microorganisms and create favorable conditions for wound healing. For technological research, well-known gelators (CEKOL, CARBOPOL, styrene copolymer with maleic anhydride and acetic-acid collagen solution) were used. Experimentally based formulations with bactisporin were combined with auxiliary substances (dimethylsulfoxide, glycerine, and preservatives) to ensure physical, technological, and microbiological stability, also to improve visco-plastic and adhesive properties of gels. Stable compositions were selected during storage. The antimicrobial effect of experimental compositions on pathogenic and conditionally pathogenic bacteria is determined in accordance with the State Pharmacopoeia. Moreover, the activity of the gel with bactisporin against St. aureus, Proteus, Candida albicans test strains was revealed. Experimental burn wounds in white rats were used to study the wound-healing activity of gel in comparison with Laevomecolum (Russia). Wound healing time in rats when using a wound-healing biopreparation is significantly shorter than in the comparison group and in the control group. The compositions of gels with bactisporin are stable physically, technologically and microbiologically. This gel is stable during storage, easy to apply, does not violate the gas exchange, easily releases the active principle. Thus, the composition and technology of a wound healing biopreparation in the form of a gel were developed.

Keywords: His-Tagged scFvs, 99mTc Tricarbonyl, Radiolabeling, Molecular Imaging

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Building a Logical-Semantic Model of the Choice of Fixed Combinations of Drugs for Treatment of Hypertension

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15-18 February 2022

Oral: O38

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Abstract:
Development of logical-semantic model of choice of fixed combinations of antihypertensive drugs (FCAHD) to optimize the algorithm of choice of drugs for the treatment of hypertension and the time of medical admission. Determination of factors affecting the screening selection of drugs, identification of the place and role of the doctor and pharmacist in the effective pharmacotherapy of arterial hypertension (AH). The development of logical-semantic model of choice of FC AHD was carried out on the basis of a systematic approach, content analysis, using analytical, logical, semantic and modeling methods of significant criteria for the selection of drugs, which are systematized in the framework of the proposed model as the determining factors were considered. A logical-semantic model of the choice of fixed combinations of drugs for the treatment of arterial hypertension (hereinafter the model) was proposed, taking into account significant factors in the choice of drugs. The model will optimize the algorithm for prescribing fixed combinations of antihypertensive drugs by doctors of different specialties. To improve the quality of medical and pharmaceutical care for patients with hypertension, further improvement of antihypertensive treatment from the point of view of evidence-based medicine is necessary, the conduct of pharmacoeconomic studies of FC AHD, increase of professional level of doctors and pharmaceutical professionals on issues of pharmaceutical care to patients with hypertension, the improvement of interaction in the system "patient – doctor – pharmacist".

Keywords: Arterial Hypertension, Fixed Combinations, Comorbidity, Logical-Semantic Model , Medication Adherence

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Study of the Biological Activity of Hepatoprotective Collection

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15-18 February 2022

Poster: O39

Abstract Presenter:
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Abstract:
The postoperative period is the time from the end of the operation to recovery or complete stabilization of the patient's condition. This period depends on the complex of therapeutic and protective measures in the hospital - the fight against the disorders caused by the operation, the prevention of possible complications. All this is achieved by careful observation, care of the sick and the implementation of therapeutic measures as prescribed by the doctor. In this paper, it is considered how the hepatoprotective collection has a positive therapeutic effect both on the condition of the patient - a volunteer, and on his laboratory tests. Purpose of the study: to study the effect of hepatoprotective collection on the condition of patients with diffuse liver lesions. Materials and methods: the work studied the effect of a hepatoprotective collection developed from medicinal plants of the flora of Bashkortostan by employees of the Department of Pharmacognosy with a course of botany and the basics of herbal medicine at Bashkir State Medical University. The collection was prescribed in the form of a decoction for 7 days. The study involved (with informed consent) 15 volunteers (7 men, 8 women) with diffuse liver diseases treated at the Republican Center for Surgical Hepatology on the basis of the Republican Clinical Hospital named after GG Kuvatov. The patients were treated for obstructive jaundice of various origins (n=11), or secondary toxic hepatitis (n=4). Patients received an infusion from the collection 2-3 days after the surgical removal of the cause, which led to secondary diffuse liver damage. In the control group (also 15 patients) in the postoperative period, patients received traditional treatment. Results and discussion. Clinically patients, when taking the hepatoprotective collection, noted a mild laxative, diuretic effect, as well as a sedative effect. In addition, patients noted the analgesic effect of the collection, which was expressed in the abolition of narcotic analgesics 2.8 ± 0.4 days after the operation (in the control group - the abolition of analgesics after 3.7 ± 0.5 days). According to the results of biochemical liver tests in patients, the following results were obtained: in terms of total bilirubin (μmol/l) in the main group after surgery, the results were 48.8±2.3, at the end of the course of taking the hepatoprotective collection 18.5±1.7;in the control group, the total bilirubin after surgery was 47.9±3.4, at the end of the course of traditional therapy 19.9±1.4. In terms of bound bilirubin (μmol/l) in the main group after surgery, the results were 27.5±1.1, at the end of the course of taking the hepatoprotective collection 8.8±0.5; in the control group, the total bilirubin after surgery was 28.2±1.4, at the end of the course of traditional therapy 9.7±0.4. In terms of indirect bilirubin (μmol/l) in the main group after surgery, the results were 19.7±1.4, at the end of the course of taking the hepatoprotective collection 9.7±0.4; in the control group, the total bilirubin after surgery was 19.2±1.3, at the end of the course of traditional therapy 10.3±0.4.In terms of ALT (U/l) in the main group after surgery, the results were 77.8±2.9, at the end of the course of taking the hepatoprotective collection 45.7±1.9; in the control group, the total bilirubin after surgery was 76.7±3.1, at the end of the course of traditional therapy 47.8±2.1. In terms of AST (U/l) in the main group after surgery, the results were 52.9±1.9, at the end of the course of taking the hepatoprotective collection 27.9±1.1; in the control group, the total bilirubin after surgery was 53.2±2.4, at the end of the course of traditional therapy 30.3±1.4. Conclusion and conclusions: The use of hepatoprotective collection can improve the condition of patients with diffuse liver damage. The effect on the biochemical parameters of the liver (total bilirubin, conjugated bilirubin, unbound bilirubin, AST and ALT) of the hepatoprotective collection is comparable to the effectiveness of traditional liver tablet thera.

Keywords: Hepatoprotective Collection, Phytotherapy, Liver Diseases, Liver, Biological Activity, Flavonoids

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Study of Spectral Characteristics of 8-Brom-3-Metylxantine

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15-18 February 2022

Poster: O40

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Abstract:
An important aspect is the study of their spectral characteristics for the introduction of new biologically active compounds in medical practice. The IR spectra of the compound were recorded on an INFRALUM FT-08 spectrometer by disking with potassium bromide in the range of 4000-400 cm-1. The spectrum of 8-Bromo-3-methylxanthine has the following specific absorption bands: secondary amine group (NH) in the region 3435 cm-1, carbonyl group (C = O) in the region 1651, 1677 cm-1, carbon-hydrogen in the region 2969 cm-1 The valence oscillations of the (C-H) bond are observed, and the absorption bands in the region of 604 cm-1 correspond to the valence oscillations of the halogen derivative of the organic compound (C-Br). The range of the spectrum from 1300 to 625 cm-1 is known as the "fingerprint" zone of the molecule. Valence oscillations of carbon-carbon (C-C = C) and carbon-nitrogen (C = N) bonds, as well as deformation oscillations are observed in the zone 956, 974 cm-1 and in the zone 1548 cm-1, which is characteristic of this purine ring. The IR spectrum of the studied substance was compared with the spectrum of 3-methylxanthine, which is its source. The spectrum of 3-methylxanthine has the following absorption bands: in the zone 3430 cm-1 of the secondary amine group (NH), in the zone of 1681 cm-1 of the carbonyl group (C = O), in the zone of 2988 cm-1 of the carbon-hydrogen (C-H) bond. Valence oscillations are observed. Valence oscillations of carbon-carbon (C-C = C) and carbon-nitrogen (C = N) bonds, as well as deformation oscillations in the zone 934, 975 cm-1 and in the zone 1564 cm-1, characteristic of the purine ring from 1400 to 900 cm-1 are observed. . The IR spectrum of 8-bromo-3-methylxanthine differs from that of 3-methylxanthine by the presence of covalently bound bromine (C-Br) in the region of 604 cm-1. It turned out to be a new biologically active purine derivative. It was observed that the maxima of the spectra of functional groups in the substance correspond to the data given in the literature.

Keywords: Purine, Xanthine, 8-Bromo-3-Methylxanthine, IR Spectroscopy, Methylxanthine-3

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