Archives of Advances in Biosciences

Review Article

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Abstract

Contex: Optical biopsy, an innovative and interdisciplinary approach leveraging light-tissue interaction, holds significant potential to revolutionize medical diagnostics. This review article explores the fundamental physical and biological principles underlying this approach, including light absorption, scattering, reflection, and fluorescence by endogenous and exogenous chromophores and fluorophores

Evidence Acquisition: We detail key optical biopsy techniques such as fluorescence, Raman, and reflectance/absorbance spectroscopies, as well as advanced optical imaging methods like confocal microscopy, optical coherence tomography (OCT), multi/hyperspectral imaging, and advanced optical endoscopy

Results: The broad clinical applications of these methods in early cancer detection (skin, gastrointestinal, respiratory, cervical, and other organs), non-cancerous diseases (inflammation, infection, wound monitoring), and intraoperative guidance are highlighted. Despite advantages like non-invasiveness, real-time diagnosis, and reduced side effects, optical biopsy faces limitations such as limited light penetration depth, complexity of data interpretation, and its inability to fully replace histopathology.

Conclusion: Nevertheless, the future outlook is highly promising, driven by development of more portable instruments, advancements in artificial intelligence (AI) algorithms, multimodal approaches, and extensive clinical studies. This article concludes that optical biopsy will play a pivotal role as a powerful complementary tool in enhancing disease diagnosis and management in the future.

Keywords: Fluorescence Spectroscopy, Optical Coherence Tomography, Confocal Microscopy, Raman Spectroscopy. **The Keywords should be Mesh**

1. Contex

Includes 1 or 2 sentences describing the clinical question or issue and its importance in clinical practice or public health.
insert reference format using Endnote based on **Vancouver** style. References should be numeric and in parenthesis (1).

2. Evidence Acquisition

Describes the data sources, including the research strategies, time of the study, and other sources of the materials used such as subsequent reference searches of retrieved articles. It explains the methods used for quality assessment and inclusion of the identified articles.

3. Results

Addresses the major findings of the review in an evidence-based, objective, and balanced style, emphasizing the available highest-quality evidence.

Figures: Figures should be kept to a necessary minimum and their information should not be duplicated in the text. Figures must be supplied either as JPEG or TIFF. Photographs and radiological imaging must be high resolution (at least 300 dpi, or higher) and at least 10 x 10 cm large. All figures

should be cited in the paper in a consecutive order as: **Figure 2.**

4. Conclusion

Clearly states the conclusions in order to answer the questions raised, if applicable, based on the conclusions of the available evidence, and it emphasizes how clinicians should apply the current knowledge.

Acknowledgments

All logistic, financial, and technical assistance along with the nature of the support should be noted. You can thank the institution, laboratory, clinic, organizational affiliation, and/or those who contributed to the research. You may thank assistance with the patients, cells, supplies, animals, processes, data provision, referrals, and/or samples.
Financial resources should also be included in Acknowledgments. Full or partial investment and the information associated with the grant received, if applicable, need to be specified.

Here are three sample acknowledgments:

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Sample II: We would like to extend our appreciation and thanks to all participants, staff, and managers who made this study possible.

Sample III: We are extremely grateful to Dr. Sarah Kahani for her comments and feedback during the study.

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b.This study was approved by the Ethics Committee of the University of (...) (Code: ...).

c.This article is a meta-analysis with no human or animal sample.

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Author's contributions

Please mention the contributor role of each author on this parts: Conceptualization, Methodology, Software, Validation, Formal Analysis, Investigation, Resources, Data Curation, Writing – Original Draft Preparation, Writing – Review & Editing, Visualization, Supervision, Project Administration, and Funding Acquisition.

The example below shows the Author Contributions:

Conceptualization and Supervision: Asghar Farhadi and Ibrahim Hassanpour; Methodology: Elahe Mahdavi; Investigation, Writing – original draft, and Writing – review & editing: All authors; Data collection: ???, ???, and ???; Data analysis: ??? and ???; Funding acquisition and Resources: Ibrahim Hassanpour, Elahe Mahdavi, Sima Kiani, and Reza Noori.

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Sample : The authors equally contributed to preparing this article.

5. References

The DOI code and its link should be inserted separately at the end of each reference.If the reference does not have Doi code, insert the URL link.

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3. Wang J, Xu Y, Boppart SA. Review of optical coherence tomography in oncology. Journal of biomedical optics. 2017 Dec 1;22(12):121711.(PMID)

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