

Macrocycles: Recent Advances in Synthesis, Reactivity, and Medicinal Chemistry

Maryam Barancheshme^a, Mozhan kakouei^a, Samad Khaksar^{b*},

Authors' Affiliations:

^a Department of Pharmacy, Ayatollah Amoli Branch, Islamic Azad University, Amol, Iran;

^b Department of Chemistry, Ayatollah Amoli Branch, Islamic Azad University, Amol, Iran;

Abstract Presenter:

Maryam Barancheshme; Department of Pharmacy, Ayatollah Amoli Branch, Islamic Azad University, Amol, Iran; Email: barancheshme.maryam@gmail.com

*Correspondence:

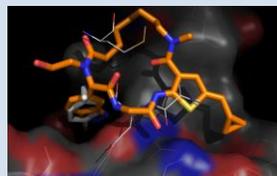
Samad Khaksar; Ph.D.; Department of Chemistry, Ayatollah Amoli Branch, Islamic Azad University, Amol, Iran E-mail: samadkhaksar@yahoo.com

Abstract

Introduction: A cyclic compound is common motif in natural product structures. Cyclic peptides, a vast subset of natural products, display a wide variety of biological activities. Owing to their size, cyclic peptides are particularly attractive scaffolds for interrogating challenging biomolecular interactions, such as those at protein-protein interfaces.

Methods and Results:

This review takes an overview of the literature for the synthesis of peptide and non-peptide macrocycles, concentrating on advances in the last five years up to the end of 2017. These methods are clustered by strategies for preparation and further derivatization of preformed macrocycle-containing building blocks. Examples of the use of macrocycles in medicinal chemistry are reported, including a collation of macrocycle derivatives appearing in recent patents for medicinal chemistry applications.



Scheme 1: Structure of the Complex of Human Programmed Death 1, PD-1, and Its Ligand PD-L1

Conclusions:

This review aims to provide an overview of the extensive recent studies involving macrocycles in synthesis and medicinal chemistry and to highlight the continuing challenges.

Key words: Macrocyclic; Peptide; Human Programmed Death 1; biomolecular

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