Rajiv Dahiya, Nat Prod Chem Res 2015, 3:6
http://dx.doi.org/10.4172/2329-6836.C1.007

OMICS International
conferenceseries.com
3rd International Conference and Exhibition on
Pharmacognosy, Phytochemistry & Natural Products
October 26-28, 2015 Hyderabad, India

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Complex cyclic oligopeptides: Synthesis and biological properties

Natural products are the active components not only of most traditional medicines but also many modern medicines. They have pharmacological or biological activity that can be of therapeutic benefit in treating disorders. Some current medicines are obtained directly from natural sources but other medicines are developed from the natural product lead originally obtained from the natural source. Among wide range of natural products, complex cyclic oligopeptides peptides are of special interest for their enhanced stability and pharmacologic properties. Due to their limited conformational flexibility, cyclic peptides with C-to-N-terminal peptide bond and a disulfide bridge can confer high target binding affinity and resistance to proteolytic enzymes. Peptides and proteins are attractive initial leads for the rational design of bioactive molecules. Several natural cyclic peptides have recently emerged as templates for drug design due to their resistance to chemical or enzymatic hydrolysis and high selectivity to receptors. Further, bicyclic peptides can bind with high affinity and selectivity to protein targets, making this format attractive for biotechnological and medicinal applications. The good binding properties are based to a large extent on the limited conformational flexibility of the two connected peptide rings. On the other hand, Host Defense Peptides (HDPs), small cationic peptides, play a vital role in innate immunity response and immuno-modulatory stimulation. Antimicrobial Peptides (AMPs) like β-defensins and cathelicidin are involved in the defense against pathogenic organisms, e.g., the antimicrobial activity of saliva largely depends on histidine-rich AMPs (histatins). These complex cyclic congeners being isolated from higher plants and marine resources possess modified amino acid residues like DHHA, ADHA, AHOA and AHMP and exhibit their pharmacological properties through binding to corresponding enzymes which allow cyclic oligopeptides to act as therapeutic agents in resistant world.

Biography

Rajiv Dahiya is Doctor of Science in Clinical Pharmacology from International University for Complementary Medicine, Colombo, Sri Lanka and also holds PhD in Pharmacy from Uttar Pradesh Technical University, India. He is presently President of Association of Pharmacy Professionals (APP), Editor-in-Chief of International level journal *Bulletin of Pharmaceutical Research* (BPR) and Principal at Globus College of Pharmacy, Bhopal, India. He has 13 years of teaching and 10 years of research experience. His research area is synthetic peptide chemistry and he has published 51 research papers and 9 review articles in various international and national journals covering a total impact factor of 36.6. He is the recipient of 'Innovative Researcher Award' in Jun 2012; 'Excellence Award' in Pharmacy in Feb 2014; 'Young Pharmacist Award' & 'Young Scientist Award' in Mar 2014; 'Distinguished Pharmacy Professional Award' in Oct 2014 and 'Young Investigator Award' in Mar 2015.

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