MB210 Jan 2:0

Peptides and Drug-Design

Instructor

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Department: Molecular Biophysics Unit

Course Time: Tue., Thu. 10:00-11:15 AM

Lecture venue: MBU Annex seminar room

Detailed Course Page:

Announcements

Brief description of the course

The course can be taken by undergraduate and postgraduate students who have taken basic courses in organic and physical chemistry and basic biology.

Prerequisites

None

Syllabus

Organic reaction mechanisms pertaining to peptide chemistry; synthesis and properties of alpha, beta and gamma amino acids; conventional and contemporary ways of peptide and protein synthesis conformational features of small-peptides; synthesis and properties of cell-penetrating peptides; design of peptide mimics for drug-discovery.

Course outcomes

The students would learn the structure and conformation of natural and unnatural amino acid containing peptides, the methods for their combinatorial and parallel synthesis, the reagents for efficient amide bond coupling. They learn how to design a bioactive sequence from a given protein or hormonal peptide sequence,

they learn about strategies for macrocyclization and conformational restriction that are important for the lead development in drug discovery. They learn about strategies to enhance the cellular permeability of peptides, along with the strategies to enhance their metabolic stability. Finally they learn about the various peptide bond isosteres that are used in drug discovery, which have forwarded peptide leads into clinic.

Grading policy

50 % mid term

50 % end term

Assignments

Resources

a. Norbert Sewald and Hans-Dieter Jakubke, Peptides: Chemistry and Biology, Second Edition, Wiley-VCH Verlag GmbH & Co. KGaA, 2009.

b. Miguel Castanho and Nuno C. Santos (Eds), Peptide Drug Discovery and Development: Translational Research in Academia and Industry, Wiley-VCH Verlag GmbH & Co. KGaA, 2011.

c. Selected review articles.