UB208 Jan. 2:0

Basic Molecular Biology

Instructor

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Department: Molecular Reproduction, Development and Genetics

Course Time: Tuesdays and Thursdays 11 am - 12 noon

Lecture venue: Old Physics Building G-21

Detailed Course Page:

Announcements

Brief description of the course

The course is designed for the 4th semester undergraduate students in the Institute and hopes to cover the fundamental principles that govern the processing of genetic information by living organisms. The emphasis is more on concepts and the evolution of new ideas is explored via classic experiments starting with the discovery of nucleic acids, the role of DNA as the carrier of genetic information and how the information is processed and transmitted.

Prerequisites

A knowledge of basic biology covered during the first semester is assumed.

Syllabus

Genes as carriers of hereditary information, the Transforming Principle - chemical identity of the gene, early models of DNA structure, Chargaffâ€™s rule, the Double Helix and the origins of molecular biology, the coding problem, elucidation of the genetic code, confirmation of DNA as the genetic material, gene organization in bacteria - operons and regulons, structure of bacterial promoters, initiation of transcription, multiple mechanisms of gene regulation in bacteria, chromosome organization in eukaryotes, histones and

nucleosomes, gene regulation in eukaryotes, transcription factors and enhancers, multiple mechanisms of regulation in eukaryotes, DNA modification and epigenetics, gene expression during development, regulation mediated by RNA, molecular evolution, genomics.

Course outcomes

The course is expected to present a broader picture of living systems by integrating the reductionistic concepts of molecular biology with holistic concepts such as evolution. As the discussions are interactive, students are encouraged to develop a critical approach and enhance their analytical abilities.

Grading policy

Based on a Mid-term and Final Examination with equal weightage.

Assignments

Given as at appropriate intervals.

Resources

Molecular Biology of the Gene by Watson et al is recommended general text. Additional references including original papers will be provided during all discussions