

JM 205 (Aug) 3:0

Course title: Cellular and Molecular Biology

Instructor: Dr. Kaustuv Sanyal

MBGU, JNCASR, JAKKUR, BANGALORE-64.

Outline of the course:

Intra-cellular protein trafficking and sorting:

The compartmentalization of higher cells, the transport of molecules into and out of the nucleus, transport of proteins into mitochondria and chloroplasts, peroxisomes, the endoplasmic reticulum, transport from ER to the Golgi apparatus

Nucleic acids and chromosomes:

DNA: Structure & function of DNA, chromosomal DNA & its packaging in chromatin fibre

RNA: RNA and the origin of life, RNA as an enzyme, RNA as a regulator of gene expression, RNA interference

Chromosomes: Global structure of chromosomes

Genetic analysis:

Physical structure of the gene, analysis of gene sequence, the genetic code, study of promoter analysis, study of domains of a protein, monitor expression of a gene

Basic principals behind molecular biology techniques: DNA sequencing, PCR analysis, Southern, northern and western blot analysis, DNA microarray, Chromatin immunoprecipitation (ChIP)

Genetic analysis approaches in pre-genome sequencing and post-genome sequencing era

Yeast as a model system to study gene function

Cell division and Cell cycle:

Major phases in cell cycle, cell cycle controls, mechanism of cell division, replication origins, centromeres and telomeres