

BIO-634 Molecular Medicine

Content : A graduate level course that aims at analyzing molecular mechanisms of disease. Mechanisms leading to disease and observed molecular changes will be dissected in diseases such as cancer, Alzheimer's, Parkinson's and Huntington's disease, infectious diseases and some inherited diseases. The lectures will involve discussion of recent advances in the light of current literature. Genetic and environmental causes of cancer, cancer types, molecular changes causing cancer, metastasis, treatment of cancer, genetics and molecular mechanisms leading of Alzheimer's, Parkinson's and Huntington's disease, major causes of infectious diseases, viruses, bacteria and parasites, molecular mechanisms of AIDS, hepatitis and common bacterial infections, genetic basis of inherited disease, common genetic diseases and molecular mechanisms will be covered during the course.

Syllabus:

| Week | Subject |
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| 1-2 | Genetic Disorders |
| | Single-Gene Disorders |
| | Autosomal Dominant Disorders (Polycystic Kidney Disease, Marfan's Syndrome, Huntington's Disease etc.) |
| | Autosomal Recessive Disorders (Cystic Fibrosis, Phenylketonuria, Gaucher Disease, Ichthyosis, Tay-Sachs Disease etc.) |
| | Polygenic Disorders (Asthma, Diabetes Mellitus) |
| 3-4 | Molecular Biology of The Most Common Cancer and Its Clinical Implications |
| | Breast, Lung, Hepatocellular Carcinoma, Colorectal Cancer, Prostate Cancer etc. |
| 5 | Molecular Biology of Cardiovascular Diseases |
| 6 | Molecular Virology |
| | HIV, Hepatitis Virus, Influenza Virus, Prions, |
| | Antiviral Therapy |
| 7 | Bacteria and Eukaryotic Pathogens |
| | Pathogenic Bacteria, Eukaryotic Pathogens |
| | Bacterial Vaccines, Diagnostic, and Antibiotics |
| 8-9 | Pharmacogenetics/Pharmacogenomics |
| | Uptake and Transport of Drugs, Drug Metabolism, Drug Toxicity and Hypersensitivity, Drug Development |
| 10-11 | Recombinant Protein Drugs |
| | Production of Recombinant Proteins, Classes of Recombinant Drugs, |
| 12-13 | Gene Therapy |
| | Types of Gene Therapy, Methods of Gene Transfer, Applications of Gene Therapy |
| 14 | Antisense, Ribozyme, RNA Interference, microRNA Strategies and Clinical Applications |
| 14 | Ethics in Molecular Medicine |

Course materials

Suggested textbooks:

An Introduction to Molecular Medicine and Gene Therapy, Thomas F. Kresina, Wiley, ISBN 0-471-22387-5