The Human Body: Molecules to Cells

Course Description

Medical diagnosis and treatment relies largely on synthesis of knowledge from diverse scientific fields. Despite this, medical science has traditionally been taught as discrete disciplines such as biochemistry, genetics, and cell and molecular biology. The objective of this course is to integrate these fields into a cohesive approach to learning the cellular and sub-cellular structures and processes which impact health and disease.

The goal of the course is to teach students facts and concepts of medicine that will form a basis for continuing professional life, with an emphasis on the use of electronic resources to access and interpret the latest scientific advances impacting medical practice.

The course will include lectures which address major concepts. The small group active learning sessions will often focus directly on the application of scientific concepts to clinical scenarios. Knowledge and skills taught in this course are selected to provide a foundation and will be revisited during subsequent blocks of the first year and beyond. Each block will build on the previous just as medical knowledge builds on itself over a lifetime of practice and learning.

Course Objectives

Upon completion of this course medical students should be able to:

1. Understand the clinical impact of the basic sciences and their importance to your development as a physician
2. Gain an appreciation of the integrated aspects of medicine that span molecules to society
3. Understand the role of gene replication, repair, and expression in health and disease
4. Appreciate the use of molecular biology techniques in clinical diagnostics and in clinical research
5. Know the value of protein structural and functional information for understanding protein folding diseases, how many mutations lead to disease and for drug development
6. Understand the structure and function of cell organelles and how these can relate to human disease.
7. Understand the role of metabolism in normal physiological responses and the metabolic changes associated with disease processes
8. Understand the role of hormones and cellular signaling processes in health and diseaseAppreciate how fundamental cellular processes, such as vesicle trafficking, endocytosis, secretion, cell migration and adhesion, function in health and disease.
9. Recognize patterns of human inheritance in health and disease and understand the utility of such recognition for clinical medicine

10. Demonstrate the ability to analyze search questions, select relevant resources, build concise search strategies using clinical information resources such as PubMed, drug databases, and Up-to-Date.
11. Demonstrate the ability to use a standard bibliographic management application to download and organize citations from a PubMed search.
12. Understand the basic principles of Evidence Based Medicine and how to search the literature to support its practice.