

PHL 551
PHYSIOLOGICAL CHEMISTRY (3 + 0)

Course Description:

A comprehensive study of those aspects of physiological chemistry most relevant to biology and medicine. Among the topics to be covered are biomembranes, immunochemistry, biochemistry of endocrine glands, structure of the genetic material and regulation of metabolic pathways.

Course contents:

Hours

1. Biomembranes:	5
<ul style="list-style-type: none">- Functions of biomembranes.- Structure of biomembranes.- Assembly of biomembranes.- Transport through membranes.- Thermodynamics, Kinetics and Types of Transport.	
2. Immunochemistry:	10
<ul style="list-style-type: none">- Essential features of immunity.- The immune response.- The immunoglobulins - humeral - mediated system.- Cell-mediated immunity.- Phagocytosis.- The complement system.- HLA system and autoimmunity.- Immuno-deficiency diseases.- Immunology of cancer.	
3. Biochemical aspects of hormone action:	8
<ul style="list-style-type: none">- The organization of the mammalian endocrine system.- Hormone receptors and intracellular messengers.- Adenyl cyclase, protein kinase and phosphodiesterase.- Other endocrine and regulatory systems mediated by cyclic AMP.- Insulin: synthesis, storage and secretion.- The action of insulin on target tissues.- Steroid hormones.- Thyroid hormones and basal metabolic rate.- Parathyroid hormone and calcitonin.	

4. **DNA and the structure of the genetic materials: ...** 8
- Replication and transcription of DNA.
 - Translation - Biosynthesis of proteins.
 - The genetic code.
 - Regulation of gene expression.
 - Mutation as related to toxicology.
 - DNA Recombination.
 - Application of recombinant DNA technology in Pharm. Industry.
 - Current studies of some viruses e.g. AIDS.
5. **Regulation of metabolic pathways:** 8
- Control of enzyme - catalyzed reactions.
 - Allosteric enzymes.
 - Physiologic role of metabolic regulation.
 - The concept of homeostasis.
 - Scope of metabolic regulation.
 - Regulation of enzyme quantity.
 - Control of enzyme synthesis.
 - Enzyme turnover.
 - Regulation of the catalytic efficacy of enzymes.
 - Role of enzyme compartmentation.
 - Feedback inhibition.
 - Regulation of carbohydrate, fat and protein metabolism.