JCL 304 (Aug) (3-1-0)
Bioorganic & Medicinal Chemistry
Instructor: Jayanta Haldar

Fatty acid, Essential Fatty Acids, Lipids classification, Energy-storage lipids (triacylglycerols), Chemical Reactions of Triacylglycerols, Triacylglycerols and diseases, Lipid absorption, Membrane lipids (phospholipids, sphingoglycolipids, and cholesterol), Cell Membrane, Apolipoproteins & Lipoproteins, transport of lipoproteins and diseases, Lipid-lowering drugs, Lipid aggregates (Liposome, Vesicle, micelle), Membrane dynamics, Prokaryotic cell membrane and envelope, Antimicrobial peptide targeting bacterial cell membrane, Transport Across Cell Membranes, drugs targeting transport mechanism and diseases, Emulsification lipids (bile acids) and diseases, Protective-coating lipids (biological waxes), Messenger lipids (steroid hormones and eicosanoids) and diseases-related drugs, Cationic synthetic lipids and use in gene delivery, membrane (lipids) as drug target (Antifungal drug, Antimicrobial peptides), lipids (liposome) use as drug delivery system; Carbohydrates, Classification of Carbohydrates, nomenclature of Carbohydrates, Reaction of Monosaccharide, Glucose testing and diabetes and drugs, Disaccharide (Maltose, Cellobiose, Lactose, and Sucrose), Lactose Intolerance, Galactosemia, Artificial Sweeteners, oligosaccharide, polysaccharide (Starch, glycogen, cellulose, chitin, hyaluronic acid and heparin), Glycogen, Glycogenesis, Glycogenolysis, Carbohydrate Digestion, Carbohydrate metabolism, Warburg effect, Targeting Glucose metabolism for Cancer therapy, Glycolipids and Glycoprotein, Cell Recognition, viral entry into host cells (Influenza virus, Herpes Simplex Virus), Bacterial Cell wall, Sugar based drugs and their mechanism (anti-flu, glycopeptides antibiotics, aminoglycosides, anti-cancer drugs like doxorubicin). Nucleic Acids, Primary and Secondary Structure of DNA, Replication of DNA, Transcription: RNA Synthesis, Genetic Code, Translation: Protein Synthesis, Recombinant DNA and Genetic Engineering, Polymerase Chain Reaction (PCR), Nucleic Acids as drug targets specially for cancer and infectious diseases, DNA-DNA crosslinker, Alkylating agents, DNA intercalator, Topoisomerase inhibitors, Chain cutters, Chain terminators (Acyclovir), Telomere and Telomerase inhibitors, Antisense Therapy, RNA Interference (micro-RNA or Si-RNA therapy)

Reference Books:

1. Biochemistry by D. Voet and J. G. Voet
2. Biochemistry by A. L. Lehninger
3. Medicinal Chemistry T. L. Lemke, D. A. Williams, V. F. Roche and S. W. Zito
4. An Introduction to Medicinal Chemistry by G. L. Patrick