Chem 697

Cellular Signaling

Week	Topic	Reading
1-2	I) Introduction to Signaling ƒ Parameters inherent to any signaling network (type of signal carrier, agonist/antagonist, information flow) ƒ Protein Switches as nanoprocessors (structure/function, coupling types, allostery) ƒ Energetics (information, order, energy extraction, non covalent interactions) ƒ Kinetics (Michaelis-Menton, Scatchard, Hill)	Chpts 1-3
3-5	II) GTP-dependent Nanoprocessing ƒ Structure function consequences of GTP hydrolysis (G proteins, Ras) ƒ Kinetics of GTP hydrolysis and allostery ƒ Upstream interactions (Gprotein coupled receptors) ƒ Downstream interactions ƒ Vision and sensory processing ¾ Pharmacology, experimental approaches, pathways, interaction domains	Chpts 4-6 Chpts 23, 24
6	III) Second Messengers ƒ cAMP and adenylate cyclases ƒ Ca2+ and Calcium channels	Chpts 7, 8
7-8	IV) Serine/Threonine-phosphorylation-dependent Nanoprocessing ƒ Tyr kinases (receptor and cytoplasmic types) ƒ Growth factor Receptors and Adhesion Molecules ¾ Pharmacology, experimental approaches, pathways, interaction domains	Chpts 11-13 Chpts 23, 24
11-12	VI) Lipid-dependent Nanoprocessing ƒ Inositol phosphates and respective lipases and kinases ƒ Lipid messengers (arachidonic acid, ceramide, DAG) ƒ Insulin signaling and glucose/glycogen metabolism ¾ Pharmacology, experimental approaches, pathways, interaction domains	

	ƒ Innate immunity ƒ Inflammation ƒ Adaptive immunity ƒ Nuclear Receptors	(Chpt 15) (Chpt 16) (Chpt 17) (Chpt 10)
15	***Final Exams***	

[Schedule based on a 15 week semester]