

Chem 697

Cellular Signaling

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

	<i>f</i> Innate immunity <i>f</i> Inflammation <i>f</i> Adaptive immunity <i>f</i> Nuclear Receptors	(Chpt 15) (Chpt 16) (Chpt 17) (Chpt 10)
15	<i>Final Exams</i>	

[Schedule based on a 15 week semester]