BMS 6204 MEDICAL BIOCHEMISTRY & GENETICS
SPRING 2010

Week	Date	Cases	Topic	Subtopic/Class Activity	Readings
	Jan 4th		Course Introduction	1.1 Discussion of course organization, lecture format, quizzes, exams	
Unit I: Genetic Diseases: Structure and Function of Genetic Material					
1	Jan 5th	• Lesch-Nyhan Syndrome • Gout • Neural Tube Defects • Adenine Phosphoribosyl-transferase deficiency	Nucleic Acids	1.2 Purine & pyrimidine synthesis and metabolism Small groups: Intro to small groups. Meet in 1200	Chapter 28 (p. 511-522): The Metabolism of purines and pyrimidines Page 15: nucleic acids are formed from nucleotides
	Jan 6th	• Rett Syndrome	DNA	1.3 Structure: Genes to Chromosomes	Chapter 6 (p. 71-75): DNA Chapter 8 (p. 119-122): The Human Genome
	Jan 7th	• Werner Syndrome		1.4 DNA Replication Q & A with Levenson	Chapter 6 (p. 76-82): DNA Synthesis Chapter 8 (p. 123-130): DNA Replication
	Jan 8th	• Down Syndrome • Klinefelter Syndrome • Turner Syndrome • Edwards Syndrome • Patau Syndrome • Williams Syndrome		Quiz 1: Readings & lectures 1.2-1.4 1.5 Clinical Cytogenetics	

2	Jan 11th	• Acute promyelocytic leukemia	Transcription	1.6 Promoters, enhancers, transcription factors & nuclear receptors	Page 83-100: transcription Page 130-140: transcription
	Jan 12th	• Neurofibromatosis type I		1.7 RNA synthesis, elongation and processing Small groups (Case Studies 1.1)	
	Jan 13th	• Iron deficiency • Hemochromatosis		1.8 Regulation of mRNA stability	Chapter 6 (p. 82-86): transcription to post-transcriptional modification
	Jan 14th	• Diamond-Blackfan anemia	Translation	1.9 Translation of mRNA into protein: Initiation, Elongation, and Termination Q & A with Levenson	Page 89-93: tRNA, codons, rRNA Page 136-140: mRNA processing and translation
	Jan 15th	• Sickle cell anemia • basal/squamous cell carcinoma • muscular dystrophy • Fragile X syndrome	Mutations	Quiz 2: Readings & lectures 1.5-1.9 1.10 Causes and types of Genetic Mutations	Chapter 10 (p. 153-167): Introduction to Genetic Diseases

3	Jan 18th			MLK Day	
	Jan 19th		Informatics	1.11 Using informatics to apply biochemical and molecular knowledge in a patient care setting Small groups (1.2)	Nancy Clark, MS
	Jan 20th	• Cystic Fibrosis Thalassemia • Anti-trypsin Deficiency • Adult Polycystic Kidney Disease • Alkaptonuria • Achondroplasia • Retinoblastoma • Myotonic Dystrophy		1.12 Autosomal dominant and recessive disorders	
	Jan 21st	• folate deficiency • α-thalassemia/mental retardation aka ATR-X • DNA methylation/cancer • Myeloid/lymphoid or mixed lineage leukemia • Prader-Willi syndrome • Angelman syndrome • Beckwith-Wiedemann syndrome		1.13 Epigenetics and disorders related to Epigenetics Q & A with Levenson	
	Jan 22nd			Quiz 3	

				1.14 X-inactivation and X-linked disorders (Dr. Brian Chadwick, Dept of Biological Sciences, FSU)	
4	Jan 25th			1.15 The mitochondrial genome	
	Jan 26th	• Exercise intolerance • MELAS		1.16: Mitochondrial mutations	
				Small groups (1.3)	
	Jan 27th			Study day – no lecture	
	Jan 28th			Optional Q and A session - No lecture	
	Jan 29th	**EXAM 1**			
Unit IIA. Cancer: Molecular Mechanisms of Development and Treatment					
5	Feb 1st			2.1 Intro to cancer	
	Feb 2nd			2.2 Cell cycle	
				No small group this week	
	Feb 3rd			2.3 Apoptosis	Page 348-356: Transcription factors in cancer
	Feb 4th			2.4 Tumor suppressors	
				Q & A with Levenson	
	Feb 5th			Quiz 4	
				Dr. Nancy Baker Fort Pierce Regional Campus	
6	Feb 8th			2.5 Oncogenes	

	Feb 9th			2.6 DNA repair Small groups (2.1)	
	Feb 10th			2.7 Molecular Mechanisms of Cancer therapy Thomas Morgan, PhD Post-doctoral Research Associate, FSU COM	
	Feb 11th			2.7 Molecular Mechanisms of Cancer therapy Thomas Morgan, PhD Post-doctoral Research Associate, FSU COM Q & A with Levenson	
	Feb 12th			Quiz 5 Dr. Terrance Riesman GI Disease Associates, Tallahassee, FL	3:00 PM (we are switching with Physiology today)
Unit IIB. Disorders of Protein Structure and Function					
7	Feb 15th	• Vegetarian Diet-Essential Amino Acids • Phenylketonuria • BH2 Reductase Deficiency • Acetaminophen Overdose • Hyperhomocysteinemia • Hartnup Disease • Methylmalonic Acidemia • Glutathionuria • Maple Syrup Urine Disease	Amino Acids	2.8 Amino acid Synthesis	Chapter 26 (p. 479-501): Amino Acid Metabolism

		• Homocystinuria			
	Feb 16th	• Inborn errors of Urea Synthesis • Hereditary Hyperammonemia		2.9 Amino acid metabolism and bonding Small groups (2.2)	
	Feb 17th	• Familial Amyloid Polyneuropathy • Multiple Myeloma • Amyloid Diseases	Proteins	2.10 Protein structure and folding	Chapter 2 (p. 19-28): Introduction to Protein Structure
	Feb 18th			2.11 Post-translational modifications, targeting and translocation Q & A with Levenson	Pages 26-27, 143-145: post-translational processing Pages 145-147: post-translational modifications of glycoproteins
	Feb 19th			Quiz 6 2.12 Hemoglobin	
8	Feb 22nd			2.13 Plasma proteins	
	Feb 23rd			2.14 Collagen Proteins Small groups (2.3)	Page 233-237: post- translational modifications of collagen
	Feb 24th			Study day – no lecture	
	Feb 25th			Optional Q and A session – no lecture	
	Feb 26th	**EXAM 2**			
Unit III. Disruptions in Energy Metabolism: Biochemical Mechanisms and Clinical Outcomes					
9	March 1st	• Pellagra • Riboflavin deficiency	Enzymes	3.1 Enzyme Cofactors and Kinetics	
	March 2nd	• Starvation	Carbohydrate	3.2 Carb structure and digestion	

		• Lactose intolerance	Metabolism	No small group this week	
	March 3rd	• WK • Beri beri		3.3 Energy: glycolysis, anaerobic metabolism, BPG, Hexokinase, PFK1 Hexose, monophosphate shunt	
	March 4th	• Depression		3.4 Energy: Krebs, pyruvate dehydrogenase complex	
				Q & A with Levenson	
	March 5th			Quiz 7	
				3.5 Mitochondria/ETC and ATP	
	March 8th- 12th	**Spring Break**			
	March 15th			3.6 ATP: Do I really want that second serving of pasta? Let's do the math (anaerobic vs. aerobic)	
	March 16th			3.7 Glucose Storage: glycogenesis/glycogenolysis	
				Small groups (3.1)	
	March 17th		Amino Acid Metabolism	3.8 Gluconeogenesis: Glucogenic and ketogenic amino acids Muscle Metabolism: Cori cycle	
10	March 18th			3.9 Urea Synthesis and Metabolism	
				Q & A with Levenson	
	March 19th	• Heart disease	Lipid Metabolism	Quiz 8	
				3.10 Fatty acid structure, digestion, absorption, clinical implications of lipid structure	
	March 22nd	• Obesity		3.11 Energy: beta oxidation & Ketogenesis Why is fat so fattening? Let's do the math	
11	March 23rd			3.12 Lipid Storage: Lipogenesis, saturation, desaturation	

				Small groups (3.2)	
	March 24th	• Alcohol/drug interactions • Alcoholic liver disease • Wernike Korsakoff's syndrome	Alcohol Metabolism	3.13 Ethanol as energy, metabolism, drug interactions, clinical implications	
	March 25th		Lipoprotein Metabolism	3.14 Cholesterol, Cholesterol Esters, Bile Acids	
				Q & A with Levenson	
	March 26th			Quiz 9	
				3.15 Lipid Transport: Lipoproteins	
12	March 29th			**3.16 Lipoprotein Abnormalities:** Dyslipidemias and Atherosclerosis (VanLandingham)	
	March 30th			**3.16 Lipoprotein Abnormalities:** Dyslipidemias and Atherosclerosis (VanLandingham)	
				Small groups (3.3)	
	March 31st			Study day – no lecture	
	April 1st			Optional Q and A session at 1 PM – no lecture	
	April 2nd	**EXAM 3**			
Unit IV. Applying Biochemical & Molecular Knowledge: Clinical Problems and Current Biochemical Answers					
13	April 5th	• Type I diabetes		4.1 Diabetes – glucose	

		• Type II Diabetes • Metabolic syndrome		transporters, insulin receptors, resistance	
	April 6th			4.2 Weight Loss: Putting your patients on a weight loss diet - What's the best approach? Small groups (4.1)	
	April 7th	• Megaloblastic anemia • Microcytic anemia		4.3 Nutritional Anemias	
	April 8th	• Mental Retardation • Down's syndrome		4.4 Developmental Disorders: Using biochemistry to optimize brain function Q & A with Levenson	
	April 9th			Quiz 10 4.5 Treatment of Psychiatric disorders: Phospholipids, Cell Signaling, calcium	
14	April 12th	• Bipolar disorder		4.6 Lipid Storage Disorders: Metabolism of sphingolipids and ceramides	
	April 13th			4.7 Inflammation: causes and treatments Small groups (4.2)	
	April 14th	• Adrenogenital Syndromes • Menopause		4.8 Steroid Hormones: Function and Dysfunction	
	April 15th	• Osteoporosis • Ricketts • Osteomalacia		4.9 Bone Density Disorders: Genes x Environment Q & A with Levenson	
	April 16th	• Night blindness		Quiz 11	

				4.10 Eye: retinol and retinoic acid, rhodopsin	
15	April 19th	• Megaloblastic anemia • Microcytic Hypochromic anemia		4.11 Nutritional Anemias: Causes and Complications	
	April 20th			4.12 Autoimmune disorders	
				Small groups (4.3)	
	April 21st			Study day	
	April 22nd			Optional Q and A session at 1PM – no lecture	
	April 23rd	**EXAM 4**			
	April 29th			**NBME STEP 1 EXAM**	