

BIOCHEMISTRY WITH A MEDICAL PERSPECTIVE

Online Biochemistry Course, Faculty of Medicine, University of Toronto, Canada

Course Schedule

Summer Semester 11 April to 23 July 2016

Week	Section / Online Quiz	Dates (Week Start)	Lectures	Lecturer	Medical Vignettes By Dr. Murray	Text Chapter
			Course Introductory Lecture (Mandatory), E - presence Controls Video	Dr. Reithmeier	*One medical vignette will be selected per weekly lecture series*	
1	Proteins and Enzymes	11 Apr 2016	Lecture 1 - Biochemistry and the Unity of Life Lecture 2 - Water, Weak bonds, pH Lecture 3 - Amino Acids Lecture 4 - Protein 3D Structure: Part 1	Dr. Reithmeier Dr. Reithmeier Dr. Reithmeier Dr. Reithmeier	Water and pH Balance Pathological Conditions Result if Protein Intake Is Inadequate Protein Misfolding and Aggregation Are Associated with Some Neurological Diseases	1 2 3 4
2		18 Apr 2016	Lecture 5 - Protein 3D Structure: Part 2 Lecture 6 - Enzymes: Basic Concepts Lecture 7 - Enzyme Kinetics Lecture 8 - Enzyme Regulation, Allostery	Dr. Reithmeier Dr. Baker Dr. Baker Dr. Baker	Vitamin C Deficiency Causes Scurvy Medical Uses of Enzymes: Diagnostic Enzymology Variations in Km Can Have Physiological Consequences	4 6 7 7
Quiz 1		25 Apr 2016				
3		25 Apr 2016	Lecture 9 - Enzyme Inhibition Lecture 10 - Enzyme Mechanisms Lecture 11 - Hemoglobin Lecture 12 - Carbohydrates One	Dr. Baker Dr. Baker Dr. Baker Dr. Baker	Penicillin Irreversibly Inactivates a Key Enzyme in Bacterial Cell Wall Synthesis Sickle Cell Anemia CO- The Silent Killer	8 8 9 10
4		02 May 2016	Lecture 13 - Carbohydrates Two Lecture 14 - Lipids: Fatty Acids, Membrane Lipids Lecture 15 - Membrane Structure and Membrane Proteins Lecture 16 - Membrane Transport Proteins	Dr. Baker Dr. Reithmeier Dr. Reithmeier Dr. Reithmeier	Lactose Intolerance Liposomes	10 11 12 12
Quiz 2		09 May 2016				
5	Metabolism	09 May 2016	Lecture 17 - Membrane Signaling Proteins Lecture 18 - Metabolism : Basic Concepts Lecture 19 - Glycolysis	Dr. Reithmeier Dr. Baker Dr. Baker	Digitalis Cholera and Whooping Cough Are Due to Altered G-protein Activity	13 15 16

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			Lecture 20 – Accessing Glycogen Stores	Dr. Baker		24
6		16 May 2016	Lecture 21 – Pyruvate Dehydrogenase Complex and the Citric Acid Cycle	Dr. Baker	Exercise Depends on Various Means of Generating ATP Beriberi-A Disease Due to Deficiency Of Thiamine (Vitamin B-1)	18,19
			Lecture 22 - Oxidative Phosphorylation/The Electron Transport Chain	Dr. Baker		20
			Lecture 23 - Oxidative Phosphorylation/Proton Motive Force	Dr. Baker		21
			Lecture 24 – Rebuilding Glycogen	Dr. Baker		25
Quiz 3 24 May 2016 **QUIZ MOVED TO TUESDAY MAY 24th						
7		23 May 2016	Lecture 25 - Fat Mobilization	Dr. Baker	A Biochemical Understanding Of Glycogen Storage Diseases (GSDs) Is Possible	27
			Lecture 26 - Fatty Acid Degradation, ATP Production and Gluconeogenesis	Dr. Baker		17,27
			Lecture 27 - Diabetes and Ketone Bodies	Dr. Baker		27
			Lecture 28 - Discovery of Insulin	Dr. Baker		13,27
8		30 May 2016	Lecture 29 - Fatty Acid and Triacylglycerol Synthesis	Dr. Baker	Hyperglycemia Familial Hypercholesterolemia (FH)	28,29
			Lecture 30 - Cholesterol Synthesis	Dr. Baker		29
			Lecture 31 - Lipoproteins	Dr. Baker		29
			Lecture 32 - Biochemistry of Platelets and Eicosanoids	Dr. Baker		28
Quiz 4 06 Jun 2016						
9		06 Jun 2016	Lecture 33 - Phospholipid Synthesis	Dr. Baker	Tay-Sachs Disease Inherited Defects Of The Urea Cycle Cause Hyperammonemia	29
			Lecture 34 - Phosphoinositides and Signaling	Dr. Baker		13
			Lecture 35 - Amino Acid Synthesis	Dr. Reithmeier		31
			Lecture 36 - Nucleotide Metabolism	Dr. Reithmeier		32
10	Nucleic Acids	13 Jun 2016	Lecture 37 - Amino Acid Degradation and The Urea Cycle	Dr. Reithmeier	Loss of Allosteric Control Can Result in Pathological Conditions	30
			Lecture 38 - Nucleic Acid Structure One	Dr. Kelley		33
			Lecture 39 - Nucleic Acid Structure Two	Dr. Kelley		33
			Lecture 40 - DNA Replication	Dr. Kelley		34
Quiz 5 20 Jun 2016						

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11		20 Jun 2016	Lecture 41 - DNA Repair Lecture 42 - Transcription I Lecture 43 - Transcription II Lecture 44 - Prokaryotic Regulation	Dr. Kelley Dr. Kelley Dr. Kelley Dr. Kelley	Some Genetic Diseases Are Caused by The Expansion of Repeats of Three Nucleotides Cancers Are Caused by Defective Repair of DNA	35 36 36 37
12		27 Jun 2016	Lecture 45 - Eukaryotic Regulation Lecture 46 - RNA Processing Lecture 47 - Genetic Code Lecture 48 - tRNAs and Amino Acids	Dr. Kelley Dr. Kelley Dr. Kelley Dr. Kelley	Mutations that Affect pre-mRNA and Alternative Splicing Cause Disease Genetic Defects Causing Cystic Fibrosis	37 38 39 39
Quiz 6 05 Jul 2016 **QUIZ MOVED TO TUESDAY JULY 5th						
13		04 Jul 2016	Lecture 49 - Translation I Lecture 50 - Translation II Lecture 51 - Protein Secretion Lecture 52 - Translation Regulation	Dr. Kelley Dr. Kelley Dr. Kelley Dr. Kelley	Some Antibiotics and Some Toxins Act by Inhibiting Protein Synthesis	40 40 40 40
14		11 Jul 2016	Lecture 53 - Recombinant Technology I Lecture 54 - Recombinant Technology II	Dr. Kelley Dr. Kelley	Gene Therapy, Transgenic Animals	5, 41 5, 41
MOCK QUIZ Available 18 Jul 2016						

Final Examination 2016

Date

23 July 2016

Duration of Exam

3 hours

Material Tested

Final exam includes all topics covered throughout the course