

# BIOCHEMISTRY WITH A MEDICAL PERSPECTIVE

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

## Course Schedule

Fall Semester 01 October to 23 Feb 2013

Week	Section / Online Quiz	Dates (Week Start)	Lectures	Lecturer	Clinical Insights By Dr. Murray	Text Chapter
			<b>Course Introductory Lecture (Mandatory), E - presence Controls Video</b>	Dr. Reithmeier	<b>*One clinical insight will be selected per weekly lecture series*</b>	
1	<b>Proteins and Enzymes</b>	01 Oct 2012	Lecture 1 - <b>Biochemistry and the Unity of Life</b> Lecture 2 - <b>Water, Weak bonds, pH</b> Lecture 3 - <b>Amino Acids</b>	Dr. Reithmeier Dr. Reithmeier Dr. Reithmeier	<b>Water and pH Balance</b> <b>Pathological Conditions Result if Protein Intake Is Inadequate</b>	1 2 3
2		08 Oct 2012	Lecture 4 - <b>Protein 3D Structure: Part 1</b> Lecture 5 - <b>Protein 3D Structure: Part 2</b> Lecture 6 - <b>Enzymes: Basic Concepts</b>	Dr. Reithmeier Dr. Reithmeier Dr. Baker	<b>Protein Misfolding and Aggregation Are Associated with Some Neurological Diseases</b> <b>Vitamin C Deficiency Causes Scurvy</b>	4 4 5
3		15 Oct 2012	Lecture 7 - <b>Enzyme Kinetics</b> Lecture 8 - <b>Enzyme Regulation, Allostery</b> Lecture 9 - <b>Enzyme Inhibition</b>	Dr. Baker Dr. Baker Dr. Baker	<b>Medical Uses of Enzymes: Diagnostic Enzymology</b> <b>Variations in Km Can Have Physiological Consequences</b>	6 6 7
<b>Quiz 1 22 Oct 2012</b>						
4		22 Oct 2012	Lecture 10 - <b>Enzyme Mechanisms</b> Lecture 11 - <b>Hemoglobin</b> Lecture 12 - <b>Carbohydrates One</b>	Dr. Baker Dr. Baker Dr. Baker	<b>Penicillin Irreversibly Inactivates a Key Enzyme in Bacterial Cell Wall Synthesis</b> <b>Sickle Cell Anemia</b> <b>CO- The Silent Killer</b>	7 8 9
5		29 Oct 2012	Lecture 13 - <b>Carbohydrates Two</b> Lecture 14 - <b>Lipids: Fatty Acids, Membrane Lipids</b> Lecture 15 - <b>Membrane Structure and Membrane Proteins</b>	Dr. Baker Dr. Reithmeier Dr. Reithmeier	<b>Lactose Intolerance</b> <b>Liposomes</b>	9 10 11
6	<b>Metabolism</b>	05 Nov 2012	Lecture 16 - <b>Membrane Transport Proteins</b> Lecture 17 - <b>Membrane Signaling Proteins</b> Lecture 18 - <b>Metabolism : Basic Concepts</b>	Dr. Reithmeier Dr. Reithmeier Dr. Baker	<b>Digitalis</b> <b>Cholera and Whooping Cough Are Due to Altered G-protein Activity</b>	11 11,12 14
<b>Quiz 2 12 Nov 2012</b>						

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7		12 Nov 2012	Lecture 19 - <b>Glycolysis</b> Lecture 20 – <b>Accessing Glycogen Stores</b> Lecture 21 – <b>Pyruvate Dehydrogenase Complex and the Citric Acid Cycle</b>	Dr. Baker Dr. Baker Dr. Baker	<b>Exercise Depends on Various Means of Generating ATP</b>	15 23 17,18
8		19 Nov 2012	Lecture 22 - <b>Oxidative Phosphorylation/The Electron Transport Chain</b> Lecture 23 - <b>Oxidative Phosphorylation/Proton Motive Force</b> Lecture 24 – <b>Rebuilding Glycogen</b>	Dr. Baker Dr. Baker Dr. Baker	<b>Beriberi-A Disease Due to Deficiency Of Thiamine (Vitamin B-1)</b>	19 20 24
9		26 Nov 2012	Lecture 25 - <b>Fat Mobilization</b> Lecture 26 - <b>Fatty Acid Degradation, ATP Production and Gluconeogenesis</b> Lecture 27 - <b>Diabetes and Ketone Bodies</b>	Dr. Baker Dr. Baker Dr. Baker	<b>A Biochemical Understanding Of Glycogen Storage Diseases (GSDs) Is Possible</b>	26 16,26 26
<b>Quiz 3      03 Dec 2012</b>						
10		03 Dec 2012	Lecture 28 - <b>Discovery of Insulin</b> Lecture 29 - <b>Fatty Acid and Triacylglycerol Synthesis</b> Lecture 30 - <b>Cholesterol Synthesis</b>	Dr. Baker Dr. Baker Dr. Baker	<b>Hyperglycemia</b>	12,26 27,28 28
11		10 Dec 2012	Lecture 31 - <b>Lipoproteins</b> Lecture 32 - <b>Biochemistry of Platelets and Eicosanoids</b> Lecture 33 - <b>Phospholipid Synthesis</b>	Dr. Baker Dr. Baker Dr. Baker	<b>Familial Hypercholesterolemia (FH) Tay-Sachs Disease</b>	28 27 28
12		17 Dec 2012	Lecture 34 - <b>Phosphoinositides and Signalling</b> Lecture 35 - <b>Amino Acid Synthesis</b> Lecture 36 - <b>Nucleotide Metabolism</b>	Dr. Baker Dr. Reithmeier Dr. Reithmeier	<b>Inherited Defects Of The Urea Cycle Cause Hyperammonemia</b>	12 29 30
<b>BREAK (24 Dec 2012 to 06 Jan 2013)</b>						
<b>Quiz 4      07 Jan 2013</b>						
13	<b>Nucleic Acids</b>	07 Jan 2013	Lecture 37 - <b>Amino Acid Degradation and The Urea Cycle</b> Lecture 38 - <b>Nucleic Acid Structure One</b> Lecture 39 - <b>Nucleic Acid Structure Two</b>	Dr. Reithmeier Dr. Kelley Dr. Kelley	<b>Loss of Allosteric Control Can Result in Pathological Conditions</b> <b>Cancers Are Caused by Defective Repair of DNA</b>	31 32 32

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14		14 Jan 2013	Lecture 40 - <b>DNA Replication</b> Lecture 41 - <b>DNA Repair</b> Lecture 42 – <b>Transcription I</b>	Dr. Kelley Dr. Kelley Dr. Kelley	<b>Some Genetic Diseases Are Caused by The Expansion of Repeats of Three Nucleotides</b>	33 34 35
15		21 Jan 2013	Lecture 43 – <b>Transcription II</b> Lecture 44 – <b>Prokaryotic Regulation</b> Lecture 45 – <b>Eukaryotic Regulation</b>	Dr. Kelley Dr. Kelley Dr. Kelley	<b>Mutations that Affect pre-mRNA and Alternative Splicing Cause Disease</b>	35 36 36
<b>Quiz 5      28 Jan 2013</b>						
16		28 Jan 2013	Lecture 46 - <b>RNA Processing</b> Lecture 47 - <b>Genetic Code</b> Lecture 48 – <b>tRNAs and Amino Acids</b>	Dr. Kelley Dr. Kelley Dr. Kelley	<b>Genetic Defects Causing Cystic Fibrosis</b>	37 38 38
17		04 Feb 2013	Lecture 49 – <b>Translation I</b> Lecture 50 – <b>Translation II</b> Lecture 51 - <b>Protein Secretion</b>	Dr. Kelley Dr. Kelley Dr. Kelley	<b>Some Antibiotics and Some Toxins Act by Inhibiting Protein Synthesis</b>	39 39 39
18		11 Feb 2013	Lecture 52 – <b>Translation Regulation</b> Lecture 53 - <b>Recombinant Technology I</b> Lecture 54 - <b>Recombinant Technology II</b>	Dr. Kelley Dr. Kelley Dr. Kelley	<b>Gene Therapy, Transgenic Animals</b>	41 41 41

## **Final Examination 2013**

### **Date**

23 February 2013

### **Time**

9:30am - 12:30pm

### **Material Tested**

Final exam includes all the lectures