

MEDI 590 (3 units) Tele. Reg. #28363

MOLECULAR REGULATION OF CELL GROWTH AND DIFFERENTIATION 2017

It has been estimated that over 40% of biomedical research today involves the study of cell signalling systems, and this knowledge is critical for the advancement of improved diagnostics and therapeutics for health care delivery. This advanced lecture series provides graduate level students with a strong introduction to the protein signalling systems by which cellular functions, reproduction and death are controlled. Different classes of signal transduction and metabolic proteins are profiled for their integration into regulatory systems to provide fundamental insights into their operations under normal and pathological conditions. Bioinformatics approaches and the applications of “omics” technologies to the study of cell signalling are also introduced. All lectures are held in **Room 10206** – 10th floor - Gordon and Leslie Diamond Health Care Centre (DHCC), (2775 Laurel Street, VGH) on Mondays and Wednesdays from 10:00 am-12:00 noon except as noted below. Forty % of the final mark will be based upon the results of a midterm examination, and 60% on a detailed literature review prepared in MS-Excel format based upon Internet analyses. The final literature review topic is selected by the class.

Day	Date	Session Topics
Wednesday	Sept. 6	Hierarchical Intelligence – Molecular, Cellular and Social Intelligence Systems.
Monday	Sept. 11	Cells and Genomes.
Wednesday	Sept. 13	Proteins and Proteomes.
Monday	Sept. 18	Techniques for Proteomics-based Analyses.
Wednesday	Sept. 20	The Phosphoproteome, Kineome and Phosphatome.
Monday	Sept. 25	Signalling Through Cyclic Nucleotides – cAMP and cGMP.
Wednesday	Sept. 27	Signalling Through Ion channels and G protein-coupled Cell Surface Receptors.
Monday	Oct. 2	Trimeric G proteins.
Wednesday	Oct. 4	cAMP-dependent Protein Kinase - Structure and Function.
Monday	Oct. 9	NO LECTURE – Thanksgiving Day
Wednesday	Oct. 11	Mitogenic Signalling Through Growth Factors and Receptor-tyrosine Kinases.
Monday	Oct. 16	Adapter Proteins and Their Interaction Domains.
Wednesday	Oct. 18	Signalling Through Non-receptor Protein-tyrosine Kinases.
Monday	Oct. 23	MID-TERM EXAM
Wednesday	Oct. 25	Signalling Through Calcium via Calmodulin and Protein Kinase C.
Monday	Oct. 30	Biosynthesis and Regulation of Phospholipids.
Wednesday	Nov. 1	Signalling Through Phosphoinositides – PI Kinases and S6 Kinases.
Monday	Nov. 6	Regulation of Glycogen Metabolism, Protein Synthesis and Degradation.
Wednesday	Nov. 8	Signalling Through Ras and Other Monomeric G proteins.
Monday	Nov. 13	Signalling Through MAP kinases.
Wednesday	Nov. 15	Protein Phosphatases.
Monday	Nov. 20	Transcriptional Regulation.
Wednesday	Nov. 21	Mitotic Cell Cycle Regulation.
Monday	Nov. 27	Meiotic Cell Cycle Regulation.
Wednesday	Nov. 29	Oncoproteins and Cancer.
Monday	Dec. 4	Tumour Suppressor Proteins and Cancer.
Wednesday	Dec. 6	Apoptosis and Cell Death Control.

Friday, December 15th at 5:00 pm:

Deadline for receipt of literature review to be delivered electronically to spelech@kinexus.ca

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2017**

Instructor: Dr. Steven Pelech

Dr. Pelech has been the principal lecturer for the MEDI590 course for 25 years. He is a full professor in the Department of Medicine, and the president and chief scientific officer of Kinexus Bioinformatics Corporation. He was previously the principal founder, president and chief executive officer of Kinetek Pharmaceuticals, Inc. Prior to his academic and industrial experience, he spent five years in post-doctoral training with Sir Philip Cohen at the University of Dundee in Scotland and Nobel laureate Dr. Edwin Krebs at the University of Washington in Seattle. He received his B.Sc. (1979; Honours) and Ph.D. (1982) degrees in Biochemistry from the University of British Columbia. He has authored over 230 scientific publications and is one of the discoverers of the MAP kinase family of cell signalling proteins. Dr. Pelech is the principal architect of the SigNET KnowledgeBank family of open-access websites, and has contributed over 220 commentaries to the GenomeWeb Daily Scan website. He has served on review panels or served as an external reviewer for over 30 granting agencies and as an external reviewer for over 30 scientific journals.

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