

**GRADUATE SCHOOL**  
**IDPT 7803: Biomedical Sciences Core Course**  
Fall Semester 2007  
Part Three – November 6 thru December 15

Time: 8:00-10:00 a.m. Monday thru Friday

Location: Fitzsimons Campus -Education Auditorium in Research Complex 1

Course Directors: Kathryn E. Howell, Cell and Developmental Biology &  
Robert Evans, Pathology

**Week 11**

11/05 Day 1 - **Exam 4 7802**

**CELL BIOLOGY METHODS AND MEMBRANE LIPIDS,  
CHANNELS AND TRANSPORTERS**

- 11/06 Day 2 - 1<sup>st</sup> Hour **K. Howell** (CDB) Introduction to Cell Biology  
2<sup>nd</sup> Hour **J. McManaman** (OB-GYN) Basics of Membrane Lipids
- 11/07 Day 3 - **Wm. Betz** (PHSL) Methods of light microscopy and live-cell imaging, FRAP, FLIP, FRET etc., Demonstrations from the literature
- 11/08 Day 4 - **J. McManaman** (OB-GYN) Cholesterol and Sphingolipids and how the cell senses and regulates cholesterol levels; Peroxisomes and lipid regulation
- 11/09 Day 5 - **J. Caldwell** (CDB) Channels and Pumps traversing the membrane bilayer

**MECHANISMS OF MEMBRANE TRAFFIC**

**Week 12**

- 11/12 Day 1 - **R. Garcea** (CDB) Import and export from the nucleus
- 11/13 Day 2 - 1<sup>st</sup> Hour **A. Sorkin** (Pharm) Sorting within membranes and vesicle formation- the Clathrin Paradigm, COPI & COPII  
2<sup>nd</sup> Hour **-R. Prekeris** (CDB) Membrane fission and fusion; viruses and vesicles
- 11/14 Day 3 - **K. Howell** (CDB) Endoplasmic Reticulum- Mechanism of translocation and retrotranslocation across the ER membrane, TAP transporters- a model of ABC transporters, ER quality control, Function of chaperones in ER lumen and cytosol, the unfolded protein response
- 11/15 Day 4 1<sup>st</sup> Hour **K. Howell** (CDB) Golgi complex; cholesterol/sphingolipid mediated sorting, exocytosis  
-2<sup>nd</sup> Hour **K. Howell** (CDB) Protein degradation by the lysosome, proteasome, and autophagy
- 11/16 Day 5 **A. Sorkin** (PHCL) Endocytic pathways, Caveolae and phagocytic pathways

### **Week 13**

11/19 Day 1 - **R. Prekeris** (CDB) Mitochondrial - import and export

11/20 Day 2 - **EXAM 5 (Covers lectures from 11/06 through 11/19)**

### **CYTOSKELETON**

11/21 Day 3 – R. Evans (Path) Introduction to the Cytoskeleton

11/22 Day 4 –**Thanksgiving Break**

11/23 Day 5 –**Thanksgiving Break**

### **Week 14**

11/26 Day 1 - **R. Evans** (PATH) Cytoskeleton I; microtubules; microtubule-associated proteins; Cytoskeleton II: intermediate filaments; IF in nuclear envelope; IF in mechanical stability of epidermis

11/27 Day 2 - **B. Doctor** (Gastroenterology) Cytoskeleton III: actin; actin-associated proteins and Actin based cell motility

11/28 Day 3 - **B. Doctor** (Gastroenterology) Actin interactions with organelles and actin-myosin interactions

### **JUNCTIONS AND EXTRACELLULAR MATRIX**

11/29 Day 4 – **P. Koch** (Dermatology) Cell-cell interactions; junctions; polarity, Cell extracellular matrix interactions

11.30 Day 5 - **P. Koch** (Dermatology) signaling from the extracellular matrix

### **Week 15**

### **DEVELOPMENTAL BIOLOGY**

12/03 Day 1 - **L. Niswander** (Peds) Introduction to Developmental Biology and Key Concepts

12/04 Day 2 - **J. Hooper** (CDB) Embryonic Polarity

12/05 Day 3 - **K. Artinger** (School of Dental Medicine) Neural Patterning

12/06 Day 4 - **L. Niswander** (Peds) Specification & Patterning in Limb Development

12/07 Day 5 - **D. Roop** (Dermatology) Stem Cells

### **Week 16 - Finals Week 12/11 to 12/15**

12/10 Day 1 - No Class

12/11 Day 2 - **Exam 6 (Covers lectures from 11/21 through 12/07)**

**End of 7803 and Term - 12/15**

**PRELIMINARY EXAM, JUNE 12 and 13, 2007**