

GRADUATE SCHOOL
IDPT 7802: Biomedical Sciences Core Course
Fall Semester 2007
Part 2

Time: 8a.m. - 10a.m. Mon to Fri

Location: Education Auditorium in Research Complex 1 North at the Anschutz Medical Campus

Course Director:
James Hagman

GENOMICS, GENE EXPRESSION, RECOMBINATION

Week 6

10/2 Day 1 - **Sandy Martin** (CDBI) Biological homology: definition, background, and exploitation.

10/3 Day 2 - **Larry Wysocki** (IMMU) Antibodies and their uses in research.

10/4 Day 3 - **Larry Wysocki** (IMMU) Non-homologous recombination I: VDJ recombination.

10/5 Day 4 - **James Hagman** (IMMU) Eukaryotic transcriptional regulation, control modules, families of transcriptional repressors/activators, combinatorial regulation, methods for studying transcriptional regulation.

Week 7

10/8 Day 5 - **David Bentley** (BMG) Prokaryotic genetics.

10/9 Day 6 - **David Bentley** (BMG) Prokaryotic RNA polymerase, initiation and regulation of transcription.

10/10 Day 7 - **David Bentley** (BMG) Eukaryotic RNA polymerases and general transcription factors: RNA polymerases I, II and III; TAFs; holoenzyme; transcriptional elongation and termination.

10/11 Day 8 - **James Hagman** (IMMU) Epigenetic control of transcription.

10/12 Day 9 - **James Hagman** (IMMU) DNA methylation, genomic imprinting, epigenetic variation and disease.

Week 8

10/15 Day 10 - **Tom Evans** (CDBI) Translation and cytoplasmic control of mRNAs

10/16 Day 11 - **Richard Davis** (BMG) mRNA life cycle and pre-mRNA processing: 5' capping, 3' end formation, splicing mechanisms, and alternative splicing.

10/17 Day 12 - **Tom Evans** (CDBI) Cytoplasmic control of mRNAs.

Last lecture for first exam.

10/18 Day 13 - **Richard Davis** (BMG) Small RNAs and gene regulation.
10/19 Day 14 - **Sandy Martin** (CDBI) Non-homologous recombination II: Site-specific recombination and transposons, retrotransposons, and retroviruses.

Week 9

10/22 Day 15 - **Exam 3 (covers 10/2-10/17)**
10/23 Day 16 - **Mingxia Huang** (BMG) DNA Recombination and Double Strand Break Repair-Homologous recombination; general models of recombination in prokaryotes and eukaryotes.

CELL CYCLE REGULATION AND CELL SIGNALING

10/24 Day 17 - **Jim Maller** (PHARM) Introduction to the cell cycle: CDKs, cyclins, and inhibitors. Definition of MPF; Cell cycle control in developmental biology – CDK regulation during development.
10/25 Day 18 – **Jim Maller** (PHARM) Yeast and human cell cycle regulation: the concept of ‘START’ and cell size control.
10/26 Day 19 – **Linda van Dyk** (MICRO) Oncogenes and tumor suppressor genes.

Week 10

10/29 Day 20 – **Linda van Dyk** (MICRO) Virus-host interaction-subversion of cellular functions including host translation, transcription, cell cycle and cancer/apoptosis.
10/30 Day 21- **Andy Bradford** (OB/Gyn) Overview of cell signaling pathways, methods used to study signaling.
10/31 Day 22- **Andy Bradford** (OB/Gyn) Overview of cell surface receptors, signal cascades, control of protein phosphorylation.
11/1 Day 23 - **Haihua Gu** (PATH)- Receptor tyrosine kinases; protein-protein interaction motifs (SH2 and SH3 domains) in signal transduction.
11/2 Day 24 - **Lynn Heasley** (CRAN) Second messengers, lipid regulated kinases and lipid kinases.

Week 11

11/5 Day 25 - Exam 4 (covers 10/18-11/2)
11/6 7803 continues