

Course: PBS500 (Molecular Biology Techniques), Cross-listed with HORT500

Time: MWF, 2:25PM - 3:15 pm

Location: Animal Science, room 209

Lab: Thursday 3-6 pm, Animal Science room 203

Directors: Adel M. Talaat, Avtar Roopra

Course Description.

This course is a 3 credit hours, 10-week course that is offered in the spring semester and could be useful to both graduate and under-graduate students. This course focuses on laboratory techniques needed to work on a variety of molecular biology and genomics projects. Basics of each protocol and potential variations are usually discussed in the lecture. Students will also have hands-on experience by participating in a weekly laboratory session. The laboratory sessions could be handled during the designated laboratory time for the course (attend either Tuesdays or Thursdays from 2:30-5 pm) or in any molecular biology lab chosen by the student. Topics in this course include (but not limited to) protocols such as PCR, real-time PCR, cloning, sequencing, hybridization techniques, DNA microarrays and protein-based assays.

PBS 500 Syllabus. Suggested text book: Analysis of Genes and Genomes (Richard J Reece, Publisher: Wiley, 2004)

*The order of topics may change during the semester.

	Lecture No* , Lecturer	Date	Topic
WK1	1, Adel	1/21/15	Nucleic Acid structure
	2, Adel	1/23/15	RNA structure
	3, Adel	1/26/15	Nucleic acid isolation
WK2	4, Adel	1/28/15	Gel Electrophoresis
	5, Adel	1/30/15	Applications of NA techniques
	6. Adel	2/2/15	Genomics and Molecular hybridization
WK3	7, Adel	2/4/15	Blotting Techniques
	8, Avtar	2/6/15	Enzymes in Molecular Biology
	9, Avtar	2/9/15	Restriction Enzymes
WK4	10, Avtar	2/11/15	Polymerases
	11, John	2/13/15	PCR-I
	12, John	2/16/15	PCR-II

WK5	13, John	2/18/15	Quantitative PCR-I
	15, John	2/20/15	Quantitative PCR-II
	16, Avtar	2/23/15	Sequencing
WK6	Aubrey	2/25/15	Mid-term Exam
	17, Avtar	2/27/15	High Throughput Sequencing
	18, Avtar	3/2/15	Sequence Analysis
WK7	19, Avtar	3/4/15	DNA transfer
	20, Adel	3/6/15	Cloning of nucleic acids
	21, Adel	3/9/15	Cloning: Vectors
WK8	22, Adel	3/11/15	Cloning: Inserts
	23, Adel	3/13/15	Northern/ Western blotting
	24, Adel	3/16/15	DNA microarrays
WK9	25, Adel	3/18/15	Microarrays applications
	26, Avtar	3/20/15	Proteomic analysis (2DGE, Mass spec.)
	27, Avtar	3/23/15	Proteomic screening (Y2H, Phage Display)
WK10	28, Avtar	3/25/15	Protein-based techniques (ELISA, Western Blot)
	29, Avtar	3/27/15	Protein-DNA interactions (EMSA, ChIP-Chip)
	No class	3/28-4/5	Spring Break
WK11	30, Avtar, Adel	4/6/15	Reviews and Q&A.
	31	4/10/15 (Friday)	Final Exam and term paper due

Grading:

-Mid-term exam: 35%

-Final exam: 35%

-Online discussions and surprise quiz: 15%

-Term paper: 15%