MOLECULAR EPIDEMIOLOGY

BIOL 439 - A01 (10430)
September 8 – December 3, 2021

COURSE OUTLINE

LECTURER: JOHN S. TAYLOR

Office: Petch 012   Tel: 250-472-5206   email: taylorjs@uvic.ca

Lectures: TWF 11:30 AM – 12:20 PM - Rm. Cornett B143

COURSE DESCRIPTION. This course provides an introduction to the basic principles and applications of molecular epidemiology. We focus on the identification of genes that play a role in disease in humans (e.g., using linkage and association studies, exome and genome sequencing) and the implications of such discoveries for diagnosis, screening, and treatment. Cystic fibrosis, cancer, HIV progression, and the human HapMap are among the subjects covered. A key component of the course is the completion and presentation of semester-long group projects.

EVALUATION

1. ASSIGNMENTS: (60 pts)
   a) OR assignment (5)
   b) Reading assignment: Pre-implantation genetic diagnosis (5)
   d) Boadicea breast cancer risk assignment (5)
   e) HapMap assignment: Selecting tagging SNPs (5)
   f) Group presentation (20)
   g) Research report (20)

2. MID-TERM EXAM: (20 pts)

3. FINAL EXAM: (20 pts)

Grading scheme: A+ (90%-100%), A (85-89%), A- (80-84%), B+ (77-79), B (73-76%), B- (70-72%), C+ (65-69%), C (60-64%), D (50-59%), F (<50%), N (max. 49%) = Failure to complete one or more of the following: Mid-term exam, Final exam, Research Report.

UVic is committed to promoting, providing and protecting a supportive and safe learning and working environment for all its members.

Lecture schedule

1	**SEPT. 8**	Exposure, Spot Maps and Odds Ratio	Start Assignment 1
2	**10**	Cystic Fibrosis (CF), Kissing Cousins, LOD Score	
3	**14**	CF, RFLPs	Assignment 1 due
4	**15**	F508del	Start Assignment 2
5	**17**	Pre-implantation Genetics Diagnosis	
6	**21**	Gene Therapy	
7	**22**	Personalized Medicine and CF	Assignment 2 due
	24	Groups meet in class	
8	**28**	Cancer Linkage Studies	
9	**29**	Odds Ratio, Relative Risk, and *BRCA1* & *BRCA2*	Start Assignment 3
10	**OCT. 1**	Interactions among loci	
11	**5**	SNPs and the Hazard Ratio	
12	**6**	Tumor Transcription, Over-diagnosis,	Assignment 3 due
13	**8**	*HER2*. Cancer Evolution.	
	12	**Midterm**	
14	**13**	HIV-AIDS	
15	**15**	The Hap Map	
16	**19**	Groups meet in class	Start Assignment 4
	20	Macular Degeneration and GWAS	
17	**22**	Exome sequencing	
18	**26**	Whole Genomes: Specific Mutations	Assignment 4 due
19	**27**	Genetic Resilience	
20	**29**	Genome Prediction.	
21	**NOV. 2**	CRISPR Cas-9/Genome editing/CCR5	
22	**3**	Group Presentations begin	