MOLECULAR EVOLUTION

20374 - BIOL435 - A01
January 6 – April 3, 2020

COURSE OUTLINE

LECTURER: JOHN S. TAYLOR

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Lectures: Room: Cunningham 146 MR: 11:30 am - 12:50 pm

COURSE DESCRIPTION. Ten topics in Molecular Evolution. 1. Alignments and conserved elements. 2. Rapid and remarkable sequence evolution (e.g., positive selection and immunity, and fish antifreeze glycoproteins). 3. 'Normal' molecular evolution (e.g., Blossum matrices). 4. Gene duplication and divergence. 5. Gene conversion. 6. 'de novo' protein coding genes. 7. Phylogenetics (incl. two in-class 'labs'). 8. RNA coding genes and ribo-switches. 9. Repetitive sequences. 10. Mitochondrial DNA evolution.

EVALUATION

1. ASSIGNMENTS: (35 pts)
    a) Reading assignment (5)
    b) Sequence analysis assignment (10)
    c) Phylogenetics assignment (10)
    d) Paper Presentation (10)

2. MID-TERM EXAM: (30 pts)

3. FINAL EXAM: (35 pts)

Grading scheme: A+ (90%-100%), A (85-89.9%), A- (80-84.9%), B+ (77-79.9, B (73-76.9%), B- (70-72.9%), C+ (65-69.9%), C (60-64.9%), D (50-59.9%), F (<50%), N (Failure to complete one or more of the following: Presentation, mid-term exam, final exam).

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

Lecture schedule (2020)*

1	JAN. 6	Genome alignment (BLAST)	Topic 1
2	9	Genome alignment and MSCs	
3	13	Ultra-conserved elements I	
4	16	Ultra-conserved elements II	
5	20	Conserved protein-coding genes	
6	23	Rapid and remarkable sequence evolution	2
7	27	Positive selection	
8	30	Blossum matrices and Blastp	3
9	FEB. 3	Gene duplication I	4
10	6	Gene duplication II	
11	10	Gene conversion	5
	13	**Midterm**	
	17	*Reading Break*	
	20	*Reading Break*	
12	24	De-novo genes	6
13	27	Lab exercises (Alignment, Codons, Positive selection)	7
14	MAR. 2	Lab exercises (Genetics Distance, MP, Bootstrap)	
15	5	RNA-coding genes	8
16	9	Ribo-switches (Dr. Neil Clark)	
17	12	Repetitive DNA	9
	16	Mitochondrial DNA	10
	19	Group 1/Group 2	
	23	Group 3/Group 4	
	26	Group 5/Group 6	
	30	Group 7/Group 8	
	APR. 2	Group 9/Group 10	

* Revisions may be made