

EEBL 607 Evolutionary Genomics

Day: MW (Feb 28– April 1)
Time: 2:00-3:15

Location: ILSB 3145
Number of Credits: 1

Instructors:

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E-mail will be the primary means of communication for the course. Check your email often and keep your mailbox below quota!

Course prerequisites: Graduate classification.

Course description: This seventh component of the Core Sequence in Ecology & Evolutionary Biology examines evolutionary genomics. It is a basic overview of this field; fundamental concepts and their applications in research.

Course requirements:

- Attend all lectures. Absences for previously scheduled activities will only be excused if they are communicated well in advance. If you have not discussed an absence with the instructor ahead of time, it will be considered unexcused unless proper documentation is provided. See <http://student-rules.tamu.edu/rule07>.
- Read all required material, and complete assigned homework.
- Participate actively in discussions.

Course goals: The goal of this course is to provide an introduction to a few key issues central to the field of evolutionary genomics. Examples will be drawn from studies involving plants and animals, as well as the interactions between these organisms.

Grading: Letter grades will be assigned based as follows: participation related to in-class discussion: 25%; homework assignment: 50%; online quiz: 25%.

Grade scale: 90-100 A; 80-89 B; 70-79 C; 60-69 D; < 60 F

Americans with Disabilities Act (ADA): The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the

Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit <http://disability.tamu.edu>.

Academic Integrity: For additional information please visit: <http://aggiehonor.tamu.edu>. Please pay close attention to guidelines on avoiding plagiarism: <http://aggiehonor.tamu.edu/Descriptions/Plagiarism.aspx>.

“An Aggie does not lie, cheat, or steal, or tolerate those who do.”

SUGGESTED ADDITIONAL READINGS

Divergence with Genetic Exchange, Michael Arnold, Oxford University Press (2016)
Ohno S. 1970 *Evolution by Gene Duplication*. Springer-Verlag.

Hughes AL. 1994. The evolution of functionally novel proteins after gene duplication. *Proceedings of the Royal Society London Series B* **256**:119-124.

Lynch M, Conery JS. 2000. The evolutionary fate and consequences of duplicate genes. *Science* **290**: 1151-1154.

Lynch M, Katju V. 2004. The altered evolutionary trajectories of gene duplicates. *Trends in Genetics* **20**(11): 544-549.

Crow KD, Wagner GP. 2006. What is the role of genome duplication in the evolution of complexity and diversity? *Molecular Biology and Evolution* **23**(5):887-892.

Sémon M, Wolfe KH. 2007. Consequences of genome duplication. *Current Opinion in Genetics & Development* **17**:505-512.

Conant GC, Wolfe KH. 2008. Turning a hobby into a job: how duplicated genes find new functions. *Nature Reviews Genetics* **9**:938-950.

Katju V, Bergthorsson U. 2013. Copy-number changes in evolution: rates, fitness effects and adaptive significance. *Frontiers in Genetics* **4**:Article 273.

LECTURES

1. **Convergent evolution** (Casola: Feb 27 & March 4)
2. **Hybridization** (Murphy: March 20 & March 25)
3. **Gene and genome duplication in evolution** (Katju: March 27 & April 1)

Written assignment associated with assigned reading. One or two papers will be assigned for each Monday lecture. We will discuss these papers in class. For one of the assigned papers, students will do the following: (1) identify the three key take-home messages (no more than 100 characters for each take-home message), (2) write a 200 word summary, (3) identify the paper's biggest strength (4-5 sentences) and (4) its biggest weakness (4-5 sentences). **This write-up**

must be submitted to the instructor by eCampus no later than 8 am on the Monday the paper will be discussed.

A computer take-home quiz will be available through eCampus by noon the day following a lecture and will be due before the start of class the day of the discussion (next Monday).