

ENTO428
Insect Biotechnology
Fall 2013

Course Description and Learning Outcomes:

The course is intended to provide students with an introduction to concepts, terminology and applications of tools of molecular biology and biotechnology as it applies to entomology. We will cover structure and function of nucleic acids and proteins, DNA replication, transcription and translation, gene cloning, DNA sequencing and sequence analysis, heterologous expression of genes, genomics and proteomics. We will also learn applications of molecular techniques to insect population genetics, forensic entomology, plant-insect interaction, insect-pathogen interaction, systematics, insect behavior and physiology, and applications of genetic engineering of insects and plant hosts for pest and disease control.

Students will be able to define and properly use basic terms in molecular biology and biotechnology in written and oral forms, describe key concepts associated with genetic manipulation technologies, demonstrate the ability to evaluate scientific methods, interpret evidence and draw conclusions and develop logical arguments in debating scientific, social and ethical issues surrounding biotechnology.

General Information:

Instructors: Keyan Zhu-Salzman
Borlaug Center 127
458-3357
ksalzman@tamu.edu

Time: MWF 9:10 – 10:00 a.m.
Place: Heep 102
Office Hrs: Friday 3:00 – 5:00 p.m.

Grading:

The evaluation methods for student learning are through exams, quizzes, Powerpoint presentation, as well as attendance and participation of class discussions.

Quizzes/activities (8)	80 (10 pts each)
Attendance guest lectures	20
Exam 1	50
Exam 2	50
Exam 3	100
Presentation, Attendance, Written	50 (25+8+17)
Total:	350 points

Final grades: A: 300 to 350
B: 263 to 299
C: 227 to 262
D: 193 to 226
F: 192 or below

The exams/quizzes will include multiple choice and short answer questions. **Makeup exams/quizzes will be given only for university-authorized excuses** (<http://student-rules.tamu.edu/rule07>), which include: a University-authorized activity, illness, death in the immediate family, and legal proceedings requiring the student's presence. All excuses should be presented to the instructor prior to the test date, if at all possible. At the latest, excuses must be discussed with the instructor by the next day of class. All make-up exams will be given as oral exams in the instructor's office.

Powerpoint Presentation:

Every student is required to participate in a presentation given by their four-person group. Each group should give a 20-min presentation. Articles can be from peer reviewed journals such as Insect Molecular Biology, Insect Biochemistry and Molecular Biology etc. where research applies molecular tools and biotech in insect-related areas. Written assignments will be evaluated by your peers. Attending other groups' presentations and participating in discussions will be part of the presentation credits.

Textbooks (optional):

Molecular Biotechnology-principles and applications of recombinant DNA, by Bernard Glick and Jack Pasternak, 4th edition

Hoy, M. A. 2003. Insect Molecular Genetics: An introduction to Principles and Applications, 2nd edition, Academic Press, NY.

Prerequisites:

GENE 301

Americans with Disabilities Act (ADA) Policy Statement:

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 that you have a disability requiring accommodation, please contact the Department of Student Life, Services for Students with Disabilities in Cain Hall or call 845-1637.

Academic Integrity Statements:

AGGIE HONOR CODE "An Aggie does not lie, cheat, or steal or tolerate those who do".

Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor System. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the TAMU community from the requirements or the processes of the Honor System (www.tamu.edu/aggiehonor/).

Tentative Schedule:*(note: dates of guest lectures are subject to change)*

Date	Day	Topic
08/28	W	Introduction: course goals and outline, Quiz #1: assessment
08/30	F	The molecules of life (1)
09/2	M	The molecules of life (2)
09/4	W	Plant transformation for pest control (1), Quiz #2
09/6	F	Plant transformation for pest control (2)
09/9	M	Gene cloning
09/11	W	PCR and applications (1)
09/13	F	PCR and applications (2), Quiz #3
09/16	M	Restriction digestion of DNA
09/18	W	Agarose gel electrophoresis, Quiz #4
09/20	F	DNA sequencing
09/23	M	Insect 'omics
09/25	W	Dr. Levy: Molecular tools to study insect vector-pathogen interactions (1)
09/27	F	Dr. Tamborindegy: Potato psyllid-Liberibacter interaction
09/30	M	Dr. Levy: Molecular tools to study insect vector-pathogen interactions (2)
10/2	W	Review, Group ppt presentations & evaluation criteria, Group discussion
10/4	F	Insect population genetics, Quiz #5
10/7	M	Dr. Medina: Using AFLP markers to differentiate parasitoids
10/9	W	<i>Exam #1</i>
10/11	F	Regulation of gene expression
10/14	M	Molecular tools to study insect –plant interactions
10/16	W	Dr. Yuan: Volatile mediated plant defense against herbivores
10/18	F	Molecular insect systematics
10/21	M	Elevated environmental CO ₂ on insect-plant interactions, Activity #1
10/23	W	Mr. Helms: Biotechnology in Agriculture
10/25	F	Molecular mechanisms of insect response to environmental stresses
10/28	M	Molecular mechanisms underlying insect behavior & physiology
10/30	W	Dr. Tarone: Molecular forensic entomology
11/1	F	Dr. Tarone: Next-gen sequencing in forensic applications
11/4	M	<i>Exam #2</i>
11/6	W	Insect gene silencing and applications (1)
11/8	F	Insect gene silencing and applications (2) Quiz #6
11/11	M	Watch movie “The Future of Food” (on your own time), and write a 200-
11/13	W	word comment (Activity #2, due 11/22). [ESA meeting]
11/15	F	Student presentations (1, 2)
11/18	M	Student presentations (3, 4)
11/20	W	Student presentations (5, 6)
11/22	F	Student presentations (7), Activity #2 due; Q&A for Exam 3
11/25	M	<i>Exam # 3</i>

