Course Syllabus

BIOL 3900.001    Advanced Research in Life Sciences    FALL SEMESTER 2016
Research Topic:    Cell Biology, Biochemistry and Molecular Biology—LIFE A217
Instructor:    KD Chapman, Office, LSB414, 940-565-2969, chapman@unt.edu
Teaching Assistant:    Yingqi Cai, Ph.D. student, Office LSB440, yingqicai@my.unt.edu
(On occasion, Dr. Michael Scott Greer will attend and assist)

Times:    Tues/ Thurs- 12:30- 3:20 (5:00 pm), and other times as needed (THIS IS RESEARCH!!!!)

Objective
The objective of this course is to provide undergraduate students the opportunity to conduct research in
the areas of Cell Biology, Biochemistry and Molecular Biology. The research course will explore and test
whether enzyme pathways can be engineered in yeast and/ or plant systems to produce oils
(triacylglycerols) and high-value mammalian skin lipids-- O-acylceramides. Approaches will involve the
expression of proteins in yeast and plant systems, and the evaluation of lipid production by confocal
fluorescence microscopy and biochemical profiling. During the course, students will read the scientific
literature, design experiments and evaluate/interpret their own results. Emphasis will be placed on
critical thinking, data collection and analysis, and presentation of their scientific findings.

This course is based on real-world experimentation and will provide first-hand knowledge of the process
of scientific discovery with its triumphs and frustrations. Students will be part of research teams and
responsible for their own experimental results. It is expected that findings from student research will be
of the highest quality and suitable for research publication.

Prerequisites:    Elementary biochemistry, Cell Biology, Genetics, two semesters of Organic Chemistry
and/ or approval by the Instructor.

Expectations:
1. Attendance and participation are required.
2. Keep accurate, detailed lab notebook- Will be checked periodically for accuracy and completeness.
3. Read assigned papers and protocols (KEEP UP WITH READING)
4. Conduct experiments and collect data and record detailed observations—
Prepare a report of progress/results at two times during semester—discussion and feedback
5. Prepare group power point presentation of research results at end of semester
6. Write a scientific paper describing your findings and turn in lab notebooks- due Finals week.

Grade will be based on:
1. Attendance and participation- 20%
2. Lab Notebook - 20%
3. Lab Progress Reports and Meetings- 20% (10% each)
4. Group presentation - 20%
5. Final Paper - 20%
**Website:** Use of Blackboard for this course will be minimal. Instead, the schedule, protocols, resources and background literature will be found on class website, hosted by Erin O'Toole, Science Librarian. Reading assignments, sections for data viewing, important links and messages are on the website, so visit early and often.

http://guides.library.unt.edu/biol39002016

**Safety:** Observe proper laboratory safety and techniques at all times.
No food or drink in the lab.
No sandals, no gum, minimize jewelry and accessories.
Wear gloves, safety glasses when handling toxic/harmful chemicals. Be especially careful with ethidium bromide (known carcinogen).
Stay alert and be aware of your surroundings.
Dispose of biohazard and other hazardous wastes in appropriate containers.
Observe aseptic techniques and conditions when appropriate.
Wash hands with soap and water often.
Always ask, if you have any questions.

**Acknowledgements:** We are indebted to Dr. Michael Greer, Yingqi Cai and Jenifer Monico (Lycoming College) for diligent work over the summer to prepare molecular tools for this course and test gene constructs.