APPLICATION FOR ENROLLMENT

BACHELOR’S ESSAY

Student’s Name:  Kirk McIntosh  Student’s ID Number:  20060517

Course ID Number:  BIOL 499

Total Credit Hours: 6

Credits to be posted*: 3 credit hours in Fall 17 (yr)

3 credit hours in Spring 18 (yr)

Faculty Supervisor: Giacomo DiTullio

Project Title: DMSP Lyase activity in Emiliana huxleyi

Bachelor’s Essay Enrollment Checklist for Student (required)

___ Check with academic department about regulations governing intended Bachelor’s Essays.

___ Begin a dialogue and have a commitment from the faculty supervisor at least one semester in advance.

___ Ensure that this form is filled out completely.

___ Attach a detailed project description and/or syllabus. Faculty supervisor must provide a grading rubric and a plan for assessing the student learning outcome.

___ Attach Degree Audit. (For Faculty Supervisor Use)

___ Submit application to your Academic Department.

Bachelor’s Essay Enrollment Policies

➢ This form is to be completed and signed by the student, faculty supervisor, and department chair.

➢ Students enrolling in HONS 499 must obtain the signature of the Honors College Dean in lieu of the department chair.

➢ A detailed project description and/or syllabus must accompany all Application for Individual Enrollment forms. The means by which the faculty supervisor will grade the course must be included in the description or syllabus and a plan for assessing the student learning outcome.

   (This includes zero credit courses.)

➢ Only if the Bachelor’s Essay does not span two terms will the deadline for submission to the Office of the Registrar be the Individual Enrollment Deadline for the specified term.

➢ This is the only Application for Enrollment in the Bachelor’s Essay form that will be accepted by the Office of the Registrar.

➢ This form cannot be submitted by the student.

THE OFFICE OF THE REGISTRAR WILL NOT ACCEPT FAXED APPLICATIONS

*If the Bachelor’s Essay spans two terms, the Office of the Registrar will enroll the student in the consecutive semester. The student is responsible for ensuring that the course is reflected on their degree audit. Contact the Office of the Registrar at registration@cofc.edu if it is not.

APPROVAL SIGNATURES (ALL SIGNATURES REQUIRED FOR PROCESSING)

Student  

Faculty Supervisor

(Include a syllabus and a Plan for Assessing the Student Learning Outcome)

Chair of Department or Dean of Honors College

8/17/17  Date

8/30/17  Date

RO Signature/CRN/Date (fall)  8/17/17  Date  RO Signature/CRN/Date (spring)  09/12/16
Bachelor’s Essay
Biology 499
3 Credit hour
Fall, 2017

Student: Kirk McIntosh (ID# 20060517)
Faculty Supervisor: Giacomo DiTullio
Project Title; Dimethylsulfide lyase activity in *Emiliania huxleyi*

Project Description: Biogenic sulfur compounds such as dimethylsulfoniopropionate (DMSP) are produced by several groups of marine phytoplankton, most notably the haptophytes. DMSP can serve various physiological cellular functions including acting as an antioxidant to relieve oxidative stress. This project will investigate the potential of two strains (EH 373 and 374) of the marine haptophyte, *Emiliania huxleyi* to produce DMSP under growth rate limiting conditions imposed by Nitrogen and Vitamin B12 limitation. These strains are markedly different in their ability to breakdown DMSP to produce dimethylsulfide (DMS) via the DMS lyase enzyme. This project will compare the DMS lyase activity in these two strains under growth limiting conditions. Experiments will be conducted under nitrogen and Vitamin B$_{12}$ limitation to determine the impacts on the production of both DMSP and DMS using a proton transfer reaction mass spectrometer (PTR-MS).

Student Learning Outcomes:

- Student will grow several strains of the marine coccolithophorid, *Emiliania huxleyi* under various physiological states including Nitrogen and Vitamin B12 limitation.
- Student will then measure dimethylsulfide (DMS) using a membrane inlet mass spectrometer (MIMS) and PTR-MS.
- Student will then quantify the DMS lyase activity using headspace sampling techniques.
- Student will write a proposal and perform experiments in the first semester (Fall, 2017).
- Student will analyze the data and write the Bachelor’s Essay in the second semester (Spring, 2018).
- Student will also present the results at the SSM Poster Day in April 2018.
Grading:

A: Student is able to master all six of the Learning Outcomes and the research was deemed to be of *superior* quality.
B: Student is able to perform the six outcomes and the quality of research was rated as *very good*.
C: Student is able to perform the six outcomes but the quality of research was only rated as *average* in quality.
D: Student is able to perform the six outcomes but the quality of research was *below average* in quality.
F: Student does not meet the six learning outcomes and goals of the project.