

Reardon Group  
Undergraduate Research Position

## **INDUSTRIAL ENZYME PRODUCTION IN LIPID-ACCUMULATING MICROALGAE**

***Mentor: Justin Sweeley, PhD Student***

### **PROJECT DESCRIPTION**

This project will produce recombinant proteins in lipid accumulating microalgae. These experiments will be the first of their kind and have potential to change the economics of algal biofuel production. We intend to create a novel strain of *Chlamydomonas reinhardtii* capable of lipid accumulation and cellulase enzyme production. The lipids are readily converted to biodiesel, and the cellulase is highly valuable in the lignocellulosic ethanol industry. Our project aims to demonstrate that coproduction of lipids and enzymes can improve the economics of both.

The undergraduate researcher will be in charge of detailed measurements of algal growth and lipid accumulation. Researcher will take and analyze samples daily. For growth, we will use a spectrophotometer and haemocytometer. For lipid accumulation, we will use gas chromatography. Future research will involve moving this system into a new species of algae and examining the results with respect to our findings in *Chlamydomonas*. In addition, once the researcher has a firm understanding of the methods in lab, he/she will be encouraged to start an independent research project. The project will be completed with help from the mentor, but the scientific question, hypothesis, and research plan will be carried out by the student.

### **RESPONSIBILITIES**

The undergraduate researcher will perform routine lab maintenance while learning how to conduct experiments in an academic lab. Over time, the researcher is expected to master common molecular biology techniques including E. coli transformation, PCR, protein expression, Western blots, HPLC, and FPLC. The researcher will learn to apply these techniques to specific scientific problems. When proficient, student will be encouraged to undertake an individual research project to use for his/her honors thesis and/or publication in peer-reviewed journal.

### **QUALIFICATIONS**

**Required:** Sophomore or Junior standing. The ability to work 10-15 hours/week, preferably with morning availability.

**Desired:** Interest in molecular biology aspects of engineering. Available to start soon.

*Note: Hazardous waste training will be required for this position with training provided through CSU's Environmental Health Services program.*

### **START DATE**

This position is available immediately.

### **QUESTIONS AND APPLICATION**

Send questions and a Reardon Group Undergraduate Research application form (next page) to Justin Sweeley, [justin.sweeley@colostate.edu](mailto:justin.sweeley@colostate.edu)

**Application for undergraduate research position in the Reardon Group**  
(please return this form to the contact person shown for the specific position)

Which project are you applying for?

Name:

Email address:

Major:

Minor(s) (if any):

Expected graduation date:

1. What course topics do you like the most?
  
2. Are there particular research topics that interest you?
  
3. At this time, what are your career goals?
  
4. Have you thought about attending graduate school? In what field(s)?
  
5. What do you want to accomplish in a research project? (i.e., why do you want to do this?)
  
6. When would you like to participate in a research project?
  - Spring 2012
  - Summer 2012
  - Fall 2012
  - Spring 2013
  - Other:

