

2006 Summer Research Experience for Undergraduates

Core program dates: Full time 10 weeks, May 29-August 4, 2006. Some flexibility possible based on school schedules.

Positions available: 6

What is the Chloroplast 2010 Project?

Chloroplast 2010 is a collaborative Arabidopsis functional genomics project at Michigan State University funded by a National Science Foundation grant. Arabidopsis is a laboratory workhorse – a small and fast growing flowering plant whose entire 29,000 gene sequence is completely known. Despite its small stature, it is an excellent stand-in for larger and economically important plants used for food, fiber and biomass. The increasingly sophisticated functional genomics toolkit available for this organism has inspired researchers worldwide to attempt what has never been done for any plant or animal – cataloguing a function for each of its genes by the end of this decade (The National Science Foundation 2010 Project).

As the site of photosynthesis, the chloroplast is the defining organelle of green plants and may be thought of as the world's life-support system. It produces a wide array of molecules important to agriculture and human health, such as vegetable oils, starch, vitamin E and amino acids. If we completely understand the chloroplast it should be possible to engineer plants to be more productive harvesters of the sun's energy into biomass, and better able to make nutrients important to human health such as vitamins, healthy oils, and nutritionally limiting amino acids. The aim of this project is to determine functions for the ~4,400 nuclear genes predicted to encode chloroplast-targeted proteins in Arabidopsis.

What is the Chloroplast 2010 Summer Research Program?

The summer research program consists of coordinated activities with a variety of special visitors including guest faculty, secondary school teachers, and undergraduate students. Faculty, postdoctoral associates, and graduate students will act as mentors for all visiting participants. Students will contribute to the project by working in the laboratory alongside their mentors, participate in group meetings and activities, and attend weekly informal seminars and pizza lunches where participants and faculty will interact. At the end of the program, students will present short research project summaries of their work to the full project team.

Students will be placed in one of these participating labs:

- Dr. Christoph Benning, Dept. Biochemistry & Molecular Biology and Dept. Plant Biology, <http://bch.msu.edu/faculty/benning.htm>
- Dr. Dean DellaPenna, Dept. Biochemistry & Molecular Biology and Dept. Plant Biology, <http://www.bch.msu.edu/faculty/dellapenna.htm>.
- Dr. Robert Last, Dept. Biochemistry & Molecular Biology and Dept. Plant Biology, <http://www.bch.msu.edu/faculty/last.htm>
- Dr. John Ohlrogge, Dept. Plant Biology, <http://www.plantbiology.msu.edu/ohlrogge.shtml>
- Dr. Katherine Osteryoung, Dept. Plant Biology, <http://www.plantbiology.msu.edu/osteryoung/>
- Dr. Yair Shachar-Hill, Dept. Plant Biology, <http://www.plantbiology.msu.edu/shachar-hill.shtml>
- Dr. Andreas Weber, Dept. Plant Biology, <http://www.plantbiology.msu.edu/weber.shtml>
- Dr. Bill Wedemeyer, Dept. Biochemistry & Molecular Biology, <http://www.bch.msu.edu/faculty/wedemeyer.htm>

Participant support: Student will receive a stipend of \$3500 as well as a \$1000 housing allowance and \$250 travel allowance (if traveling from out-of-state).

Application requirements:

Students must be entering their junior year or later and have declared a relevant major. Students should not plan on taking any classes during the research program; these are full-time positions.

Interested students should submit a brief resume including up-to-date contact information, an official transcript from their college, and a letter of reference from a current or former teacher, mentor, or employer. Students should also include a 1-2 page letter introducing themselves and explaining why they are interested in joining our program.

Please focus on relevant prior scientific experiences in high school and/or college.

Application deadline: April 1, 2006

Send applications to:

Linda Savage, Outreach Coordinator
Chloroplast 2010 Project
Michigan State University
301 Biochemistry Building
East Lansing, MI 48824

For more information go to: <http://www.plastid.msu.edu>

