UCDAVIS

CLIMB

Collaborative Learning at the Interface of Mathematics and Biology

The **Collaborative Learning at the Interface of Mathematics and Biology** (CLIMB) program emphasizes hands-on training and research using mathematics and computation to answer state-of-the-art questions in biology.

What is CLIMB?

- a one year research-training program for UC Davis juniors in math or biology
- courses, seminars, and mentoring in September – June
- full-time collaborative research over the summer
- a chance to learn quantitative tools, enhance your biological knowledge, and conduct research as a member of an interdisciplinary team

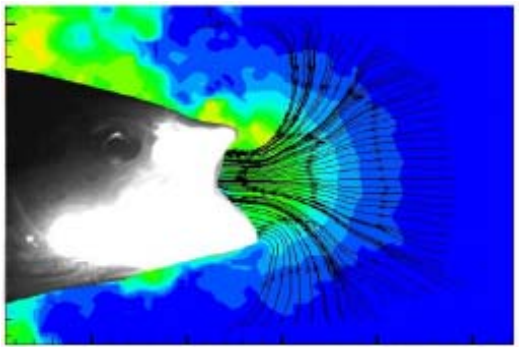
CLIMB undergraduate trainees will receive a stipend of up to $8,900 over the course of the year-long program.

Research Clusters

Research projects in CLIMB are grouped into clusters that integrate biology and mathematics. CLIMB projects will emphasize the relationships between:

- mathematics and biology
- the interplay between theory and data
- modeling and experimental observations.

Through CLIMB, you will learn to use an array of quantitative tools to address challenging biological questions as members of interdisciplinary research teams.



Computational studies help biologists gain insight into everyday phenomena. Image courtesy of T. Higham

CLIMB research clusters include...

- biofluid mechanics
- molecular motors
- phylogenetics
- fisheries and marine reserve design
- vertebrate sensory systems
- plant-insect interactions
- behavioral evolution
- dynamics of the rhizosphere
- gene regulation

Research may involve collecting data, analyzing it, constructing a model to predict experimental results...*or all three!*

The CLIMB Program

As a trainee, you'll participate in a year-long program that lays the foundations for doing research.

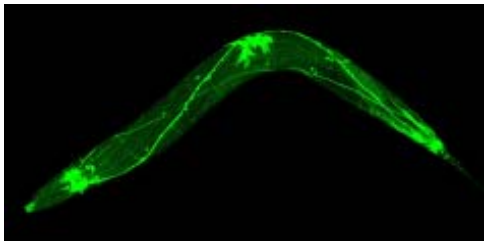
- *Fall*: a 4-unit course introduces emerging research problems at the interface of biology and mathematics through faculty research presentations, problem sets, and readings.

- *Winter*: trainees receive 3 units of credit for work on small-scale group projects drawn from the research clusters.

- *Spring*: teams consisting of both math and biology students will begin to formulate the problem for summer collaborative research, with help from faculty and graduate student mentors

- *Summer*: teams will carry out the collaborative project described below

To enhance their modeling skills, CLIMB trainees also are expected to take one mathematical biology course that surveys mathematical modeling methods applied to a wide range of biological problems:



The nervous system of *C. elegans* illuminated with green fluorescent protein. Image courtesy of J. Scholey.

- *Fall Option:* Introduction to Dynamical Models in Modern Biology, BIS 132 (prerequisites: calculus and one biology course)

- *Spring Option, even years:* Mathematical Biology, MAT 124 (prerequisites: linear algebra and differential equations).

Collaborative Project

The group project provides a capstone for CLIMB students. You'll work with your cohort to select a project from the research clusters, define a specific question, and do the research necessary to address it, with guidance from faculty and graduate student mentors. We'll include weekly brainstorm meetings, and once a month, you'll receive training in academic development to prepare for graduate school.

Students in the 2007-1008 CLIMB cohort and speakers at their symposium on avian influenza.

Life after CLIMB

Students in the 2008-2009 CLIMB cohort, with Professor Rick Grosberg

Seniors who have completed the CLIMB program are eagerly welcomed into the research laboratories of UC Davis faculty. The Intercollegiate Minor in Quantitative Biology and Bioinformatics also is ideal for CLIMB students.

Finally, you will be well-prepared to enter graduate school in biology, statistics, applied mathematics, or interdisciplinary programs that combine biology with mathematics or computation.

How to Apply

You can download an application from the CLIMB web page, climb.ucdavis.edu, which includes details about the application process. Send your application, a one-page personal statement, college transcripts, and one letter of recommendation to CLIMB, c/o Carole L. Hom, Section of Evolution and Ecology, University of California, One Shields Avenue, Davis CA 95616. Review of applications begins in April.

Questions?

Check out our web page, climb.ucdavis.edu, or contact the CLIMB academic coordinator, Carole Hom, at clhom@ucdavis.edu.

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