

The Chemistry Biology Interface (CBI) Training Program

The Chemistry Department administers the Chemistry-Biology Interface Training Program (CBI) for students pursuing interdisciplinary research in chemical biology. The CBI is a multidisciplinary Ph.D. program funded by a grant from the National Institutes of Health. While all students are automatically considered for support under this grant, recipients must have an exceptional undergraduate record and be highly motivated to pursue research on critical biological problems from a chemical perspective.

The Chemistry Biology Interface (CBI) Training Program, a unique multidisciplinary Ph.D. training program, focuses on the fundamental underlying chemical principles that govern all biological processes. This dynamic new program emphasizes mechanistic and synthetic aspects of research at the chemistry biology interface and leads to a Ph.D. degree in either **Chemistry, Biological Chemistry, Medicinal Chemistry and Pharmacology**. Students enrolled in the program will gain a broad appreciation of the chemical foundations of biology including synthesis, analysis, and theory and will be prepared to pursue research on a vast array of critical biological problems in academic or industrial settings.

Distinguished faculty members from four different University of Michigan departments- **Chemistry, Biological Chemistry, Medicinal Chemistry and Pharmacology**-have combined strengths to create this challenging new program. Each student's course of study is tailored to suit his or her individual goals and includes laboratory rotations in at least two of the participating University departments. To learn more about research in an industrial setting, students will also be encouraged to perform a rotation at the Pfizer Global Research and Development Laboratories adjacent to the University's North Campus.

Research and Training Areas

Faculty members in the CBI Training Program represent a rich and diverse spectrum of academic departments. Their research interests pertain primarily to the characterization and mechanism of biochemical reactions, the control of cellular metabolism, and the mechanism of cell replication. The CBI faculty is engaged in a number of existing multi- disciplinary research efforts at the chemistry biology interface as well as individual research programs in the core disciplines. The principal themes of this research include:

- Structure and mechanism of metalloproteins and model systems
- Design and synthesis of biologically active compounds
- Biomolecular recognition
- Signal transduction
- Mechanisms of chemical and biological catalysis
- Nucleic acid structure-function

The CBI Training Program offers students the unique opportunity to participate in laboratory rotations at the Pfizer Global Research and Development Laboratories in the following areas:

1. Medicinal chemistry
2. Peptides
3. Structure-based design chemistry
4. Exploratory chemistry
5. Computational chemistry
6. Molecular modeling
7. Bioorganic chemistry
8. Structural biology
9. Analytical research
10. Combinatorial chemistry

Financial Support

The CBI Training Program provides trainees with twenty-four months of financial support during their tenure in the graduate program. In order to continue to receive this support, students must make satisfactory progress toward the Ph.D. degree. Following completion of the first two years in residence with support from the CBI Training Grant, students receive aid through a combination of teaching and research assistantships, and fellowships. Support includes a generous stipend, full tuition, and excellent health care benefits.

The multidisciplinary curriculum of the CBI Training Program focuses on the application of chemistry to the solution of biological problems, and includes courses in bioanalytical, bioinorganic, bioorganic, and biophysical chemistry. A yearly series of cross-campus seminars, journal clubs, and symposia enhances these courses. Additionally, students enrolled in CBI will participate in an annual core course stressing the multidisciplinary chemical and biological study of a central topic, such as Metals in Biology, Molecular Recognition, Signal Transduction, or Protein Dynamics and Catalysis. Through their work in the core course, students will have the opportunity to investigate relevant fundamental chemistry, biological principles and diversity, chemical modeling, and structural approaches. Each year's core course will culminate in a symposium featuring a panel of renowned experts from outside institutions who will discuss the year's central topic.

In addition to these opportunities, CBI students will have the chance to hear and meet a variety of prominent national and international scientists throughout the year during regularly scheduled seminars on the University of Michigan campus. Because student interaction is a key component of CBI, students from individual research groups will also share the results of their latest work during periodically scheduled informal gatherings and at poster sessions that occur at the end of each laboratory rotation period and involve all students and faculty in the Program.

Application

With the emergence of PIBS as the major recruiting vehicle for Biological Chemistry, CBI will work with Dr. Engelke to identify both incoming students and continuing students (2nd year) who have expressed interest in the CBI program. **Students apply between December and March, with an official cut-off date for applications of February 15. However, some applications are accepted after that date.** Between February and March our admissions committee meets to review applications. In April, the Program committee for the grant decides which students to nominate for support by the training grant

An Application would include:

- 1.) Student's 1st Year Academic Record**
- 2.) Student's initial application for admission to PIBS (from PIBS office)**
- 3.) Memo from Dr. Engelke and/or the student's research advisor attesting to the student's excellence and enthusiasm for the training program.**

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