

Engineering Research in Diabetes

Summer Research Experience for Undergraduates (REU) Summer 2006

**Pritzker Institute for Biomedical Science and Engineering
Engineering Center For Diabetes Research and Education (www.ecdre.iit.edu)**

Approximately 21 million people in the United States and over 194 million worldwide suffer from Diabetes Mellitus. While a cure does not currently exist, biomedical engineering is providing important inroads to understanding and treating the disease and its many complications. The Illinois Institute of Technology (IIT) has recently established a unique multi-disciplinary center, the Engineering Center For Diabetes Research and Education (ECDRE). In the ECDRE, engineers at IIT collaborate with basic scientists and clinicians at the University of Chicago (UC) with the goal of applying engineering techniques to increase understanding and treatment of diabetes and its complications.



Research

The Biomedical Engineering Department at IIT in collaboration with the ECDRE



provide the foundation for this summer program. The primary goal of this program is for students to complete a diabetes related research project working with an engineering mentor from IIT. Students will be paired with faculty at IIT based on the interests of the student and the faculty's expertise. Diabetes is a complex disease that can lead to a number of health complications. The projects offered in this program reflect this diversity, with topics in biomaterials for islet cell encapsulation, software models of glucose metabolism, medical imaging techniques for prognosis/diagnosis of disease, tissue regeneration strategies for the treatment of ulcers and ischemic limbs, vascular changes in diabetic retinopathy, complications of thrombosis in islet cell transplantation, and many other topics (request an application for project titles).

Healthcare

Physicians at the University of Chicago play an important role in this program. In addition to collaborating on many of the research projects, clinicians will present on the impact of diabetes on patient health and the current status of clinical research and needs as a part of the program's weekly seminars. In addition, students will be given tours of the Transplant Center, the Ophthalmology Clinic, and a dialysis unit at the University of

Chicago. This will emphasize the health implications related to diabetes and its relevance to research being performed.

Ethics

Biomedical research presents complex ethical challenges. Ethics discussion and training will be integrated into all aspects of the student experience. These activities will be organized with IIT's Center for the Study of Ethics in the Professions.

Social

Students in the program get to spend a summer in one of the most dynamic cities in the United States. IIT's Mies van der Rohe designed campus is on the National Register of Historic Places, located just south of Chicago's Loop, and down the street from Cellular Field, home of the defending World Series Champion Chicago White Sox. The location allows students the opportunity to enjoy Chicago's extensive list of summer festivals, cultural events, and sporting events. Social activities are planned as part of the REU program, including a student/faculty cookout, weekly luncheons, and a trip to a White Sox game.



Dates

The program is 10 weeks, from June 2 – August 11. If conflicts occur with students on a quarter system, they have the option to arrive one week later and extend their stay an extra week.

Support

Students will receive a stipend, room and board, and travel coverage for the trip to and from Chicago.

Eligibility

1. Students should have a declared engineering or science (biology, chemistry or physics) major.
2. Students must have completed their sophomore year and have fulfilled one year of biology, chemistry, physics, and calculus as well as one year of laboratory coursework.
3. Students should have a minimum GPA of 3.25/4.00.
4. Selected applicants must be US citizens or permanent residents.
5. This proposal targets students at institutions where research opportunities in BME are limited
6. Women and students from underrepresented minority groups are encouraged to apply.

Information

For applications, see the ECDRE website at (www.ecdre.iit.edu) or contact Eric M. Brey, Ph.D. at brey@iit.edu