



Stanford Institutes of Medicine Summer Research Program (SIMR) for High School Students

Dr. P.J. Utz, Cindy Limb

School of Medicine



Cancer Center

Institute for Immunity, Transplantation
and Infection

Cardiovascular Institute

Institute for Neuro-Innovation
and Translational Neuroscience

Institute for Stem Cell Biology
and Regenerative Medicine

Abstract

The Stanford Institutes of Medicine Summer Research Program (SIMR) seeks to train the next generation of researchers and to inspire and provide opportunities for high school students to participate in medical research. This K-12 grant targets recruiting and funding under-represented minority (URM) students into the program. We will leverage established SIMR infrastructure for soliciting applications (in particular targeting URM students), organizing lectures and safety training sessions, and placing students in laboratories. In the SIMR program, the students perform independent research and design/carry out hypothesis-driven experiments under the direct tutelage of a graduate student or fellow in a laboratory of their choice. In addition, students are given the opportunity to hear lectures, participate in field trips, and present their work at a poster session which is attended by the Stanford community.

Education Challenge

- **America's Lab Report: Investigations in High School Science** (National Research Council, 2005) concluded that the laboratory experience in science in the U.S. is in a dismal state. Pre-college research programs may be a promising way to increase students' interest in science research.
- The SIMR Program recognizes a compelling need to **promote diversity in the biomedical and life sciences**, and the importance of beginning this initiative at the high school level. The National Science Foundation reports that of 4047 earned doctorates in the biological sciences in 2003, 2.6% were African American, and 4.3% were Hispanic.

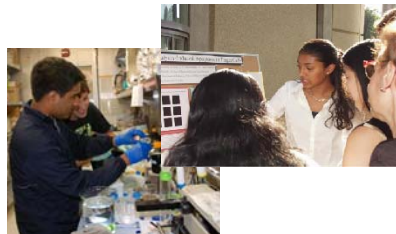
Project Goals

Aim #1: EMPHASIS ON UNDER-REPRESENTED MINORITY (URM) STUDENT RECRUITMENT

Major effort will be placed on recruiting 20 students who are URMs, and students in schools in districts located in rural or urban areas that have fewer opportunities for high quality science experiences.

Strategies for Recruitment and Matriculation of URM students.

- Merger with the Cancer Biology H.S. Summer Program (all URM students in the past)
- Partnership with the Stanford Medical Youth Science Program (SMYSP)
- Application Solicitation
- Partnership with the School of Education and Office of Science Outreach at Stanford



AIM #2: SUPPORT AND RETENTION OF URM STUDENTS IN THE SIMR PROGRAM

Strategies to support admitted URM students and promote their retention in the program:

- One on one mentorship in the lab
- Peer support group
- Developing social network with other students
- Enrichment opportunities through special seminars

Project Design



SIMR is an **8 week** summer program (formerly the CCIS/ITI Summer Intern Program in Immunology). In 2009, the program will expand to include labs from all 5 Institutes in the School of Medicine (Immunity, Transplantation and Infection (ITI), Neuroscience, Cardiovascular, and Stem Cell Institutes and Cancer Biology). Recruited URM students will fully participate in the expanded SIMR Program which consists of:

- **Laboratory research** in different areas of medicine. Students are mentored directly under graduate students or postdoctoral fellows within each Institute.
- **Lectures:** 10 Institute-specific lectures by selected Faculty and graduate students, 10 joint lectures from renowned speakers.
- **Comprehensive safety training** sessions/library orientation.
- **Field trip** to a local biotech company or Hopkins Marine Station (Monterey).
- **Poster session** presentation at Stanford.
- **Presentation at The Tech Museum** in San Jose.

Results and/or Plans for 2009

- **Merger with the Cancer Biology Program** : Cancer Biology will be the 5th Institute in SIMR in 2009.
- **Partnership with SMYSP:** SIMR recruited 3 of SYMSP's former students in the summer of 2008. Joint events included a science career options seminar and talks by Nobel Laureates (Dr. Roger Kornberg and Dr. Andrew Fire). For 2009, at least 9 former SMYSP students will be applying.
- **Partnerships with the School of Education and Office of Science Outreach**
We are working with the STEP Program and OSO to establish contacts with local partner schools in East Palo Alto, Redwood City, San Jose, and San Francisco.
- At least a 5-fold increase in URM applications from the previous year.



Jessica Saal Award winners- Julia Ransohoff (Intel Finalist 2009) and Akachimere Uzozike

SUMMER 2009 PLANS

- Host 35-40 students in SIMR, 20 of which will be URM students.
- Strong collaborative efforts with the SMYSP group in terms of summer seminars, social support.
- Student presentations at the on-campus poster session and exhibits at The Tech Museum.

Impact and Future Directions

IMPACT

- We increase the diversity of the next generation of scientists by increasing the number of underrepresented minority students exposed to science research.
- In Jan. 2009, 3 SIMR students were named semi-finalists in the Intel competition; and one became a Finalist. In previous years, we've had another Finalist plus 10 other semi-finalists in the Intel and Westinghouse competitions.
- In previous years, over 18 students have co-authored papers in well known scientific journals including Science, Nature, Cell, Journal of Immunology, Nature Medicine.
- 197 students have been trained in the past 9 years. Program materials have been disseminated to 5 other centers (UCLA, UCSD, UCSF, McGill, UNC).

FUTURE DIRECTION

- Continue active recruitment of URM students through further partnerships.
- Develop stronger collaborative ties with SMYSP with respect to recruitment, program elements to support URM students and evaluation.
- Dissemination of program materials to other interested sites around the country.



SIMR summer interns- 2008