

**RESOURCE:
RESEARCH TRAINING AND
CAREER DEVELOPMENT OPPORTUNITIES**

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RESOURCES: RESEARCH TRAINING AND CAREER DEVELOPMENT OPPORTUNITIES

I. BACKGROUND

The Human Genome Project (HGP) is perhaps the greatest scientific endeavor of the 21st century and will change the way research is conducted and medicine is practiced in the future. Therefore, the National Human Genome Research Institute (NHGRI) wants to ensure that ALL populations are knowledgeable about the science underpinning the HGP and have the opportunity to participate in various ways, such as becoming research scientists, research participants and policy makers. It is also important for everyone to be informed about the HGP and understand the ethical, legal and social implications (ELSI) resulting from genetics and genomics research.

In the spring of 2001, the NHGRI set out a process to increase the number of underrepresented minority groups¹ participating in genomics and ELSI research. This meeting resulted in the development of an Action Plan, see <http://www.genome.gov/page.cfm?pageID=10001707>, which was endorsed by the National Advisory Council for Human Genome Research at its May 2001 meeting. The Action Plan laid out a strategy that included the extramural and intramural programs² and the Office of the Director. The Action Plan was very specific about what is expected of our grantees. Training was heavily emphasized in the Action Plan, and is viewed as the primary way to increase the number of individuals from underrepresented minority groups participating in genomics and ELSI research.

The purpose of this document is to provide a resource for students, faculty and NHGRI grantees interested in training opportunities.

II. RESOURCES FOR STUDENTS

A. NHGRI Supported Programs

1. Predocctoral Fellowship Awards for Minority Students--F31 (PA-00-069)

This is a NIH wide initiative that provides support for research training leading to the Ph.D. or equivalent research degree; the combined M.D./PhD. degree; or other combined professional doctorate/research Ph.D. degrees in the biomedical or behavioral sciences. These fellowships are for well-qualified students from minority groups found to be underrepresented in the biomedical and behavioral sciences in the United States.

<http://grants.nih.gov/grants/guide/pa-files/PA-00-069.html>

¹ Underrepresented minority groups include African Americans, Alaskan Natives, Hispanic Americans, Native Americans and Pacific Islanders.

² Extramural is research supported in universities and research institutions outside of NIH. Intramural is research supported in laboratories on the NIH campus in Bethesda, MD.

2. Dissertation Research Grants For Underrepresented Minorities In The Ethical, Legal, And Social Implications (ELSI) Of Genetics Research

The purpose of this program announcement (PA) is to stimulate and encourage underrepresented minority doctoral candidates from a variety of academic disciplines and programs to conduct research related to the ethical, legal, and social implications (ELSI) of genetics, genomics, and gene-environment interaction research. It is hoped that this program will facilitate the entry of promising new minority investigators into the field of ELSI research.

<http://grants.nih.gov/grants/guide/pa-files/PA-02-048.html>

3. Research Supplements for Underrepresented Minorities (PA-01-079)

This program is part of an NIH initiative to increase the number of underrepresented minorities in biomedical research. Underrepresented minority groups include African-Americans, Hispanics, Native Americans, and Pacific Islanders. The program provides support for research experiences at grantee institutions for minorities throughout the education continuum from high school to the faculty level. Under this program, travel funds are awarded as supplements to active NIH research grants that are relevant to fundamental or applied genomics research. NHGRI can supplement grants made by other NIH institutes and centers, if the research is genome-relevant.

<http://grants2.nih.gov/grants/guide/pa-files/PA-01-079.html>

4. Minority Travel Award Program (MITAP)

The MITAP for Genomics and ELSI-Related Research has been established to increase the participation of students and faculty from minority institutions in human genome research and research training programs. This award supports students and faculty in minority institutions to attend scientific meetings, courses and workshops or visit laboratories to learn techniques relevant to genomics research. Under this program, travel funds are awarded as supplements to active NIH research grants that are relevant to fundamental or applied genomics research. NHGRI can supplement grants made by other NIH institutes and centers, if the research is genome-relevant.

<http://grants.nih.gov/grants/guide/notice-files/not99-002.html>.

B. NHGRI SUPPORTED PROGRAMS WITH TRAINING COMPONENTS OR OPPORTUNITIES

Students interested in training opportunities in these research labs are encouraged to contact the principal investigators or her/his designee about possible positions.

1. Research Training Programs (T32)

- Harvard Medical (I. Kohane – isaac_kohane@harvard.edu)
- Stanford University (R. Myers - myers@shgc.stanford.edu)
- University of California, Berkeley (D. Rokhsar - rokhsar@physics.berkeley.edu)
- University of California, Los Angeles (K. Lange - klange@ucla.edu)
- University of Michigan (M. Boehnke - boehnke@umich.edu)
- University of Pennsylvania (W. Ewens - wewens@sas.upenn.edu)
- University of Washington (B. Trask - btrask@u.washington.edu)
- Washington University (S. Eddy - eddy@genetics.wustl.edu)

2. Centers of Excellence in Genomic Sciences (CEGS)

- Molecular Science Institute (R. Brent - brent@molsci.org)
- Stanford University (W. Talbot - talbot@cmgm.stanford.edu)
- University of Washington (D. Meldrum - deedee@ee.washington.edu and M. Olson - mvo@u.washington.edu)
- Yale University (M. Snyder - michael.snyder@yale.edu)

3. Production Sequencing Centers

- Baylor College of Medicine (R. Gibbs - agibbs@bcm.tmc.edu)
- Washington University, St. Louis (R. Waterston - bwaterst@watson.wustl.edu)
- Whitehead Institute (E. Lander - lander@genome.wi.mit.edu)

4. Databases

- California Institute of Technology (P. Sternberg - pws@caltech.edu)
- Harvard University (W. Gelbart - gelbart@morgan.harvard.edu)
- Jackson Laboratory (J. Eppig - ite@jax.org)
- Stanford University (M. Cherry - cherry@stanford.edu)
- University of California, Santa Cruz (D. Haussler – P.I.; contact A. Pace - pace@soe.ucsc.edu)

C. COURSES

There are several institutions that provide courses/workshops to learn genomics techniques. Those attending these courses/workshops that have NIH support may be eligible for support from the NHGRI through the Minority Travel Award Program. <http://grants.nih.gov/grants/guide/notice-files/not99-002.html>

- Carnegie-Mellon University - Training In Sequence Analysis Using Supercomputers (Contact: H. Nicholas, nicholas@psc.edu)
- Cold Spring Harbor Laboratory - Computational Genomics Course and Advanced Genome Sequence Analysis Course (Website: <http://www.cshl.org>)
- Duke University - Genetic Analysis Methods For Medical Researchers (Contact: M. Speer, march@chg.mc.duke.edu)
- Rockefeller University - Advanced Linkage Analysis Courses (Contact: S. Leal, lealsm@rockvax.rockefeller.edu)
- The Jackson Laboratory - Genome Sequence Analysis: Theory and Practice (Website: <http://www.jax.org>)
- Woodshole Marine Biology Laboratory (Website: <http://www.mbl.edu/>)

D. NON-NIH TRAINING RESOURCES

1. Alfred P. Sloan Foundation Minority Ph.D. Program

This is a program to increase number of minority students earning Ph.D.s by 100 per

year. The scientific disciplines targeted are mathematics, engineering, physical sciences and the life sciences. The goal is to recruit 115 new additional minority Ph.D. students annually, with an expectation that 85 will earn their Ph.D.s, and 25 additional B.Sc. and M.S. students going on into Ph.D. programs annually from the feeder component, with an expectation that 15 will earn their Ph.D.s.

Program Contact: Ted Greenwood; Alfred P. Sloan Foundation, greenwood@sloan.org
Website: http://www.sloan.org/programs/edu_phd.shtml

2. Biology Undergraduate Scholars Program

The purpose of this program is to increase the number of UC Davis underrepresented minority undergraduate students who successfully pursue careers in the biological sciences. This is an intense mentoring program for non-remedial students, which sets high standards, and prepares students for the freshman year by providing supportive learning groups, extensive research opportunities and financial support.

Program Contact: Dr. Gina Holland; Univ. of California, Davis gdholland@ucdavis.edu
Website: www.dbs.ucdavis.edu/eeop/#busp

3. Calculus Advising Program, University of Arizona

This mentoring program is for students enrolled in calculus courses and has the objective of encouraging these students to declare mathematics as a major. Mentors discuss the student's course schedule; talk about career goals and encourage the student to create a resume; talk about the importance of internships; and point out funding opportunities available in graduate schools.

Program Contact: William Yslas Velez, Department of Mathematics, Univ. of Arizona; velez@math.arizona.edu
Website: <http://www.math.arizona.edu/~velez/>

10. Center for the Advancement of Hispanics in Science and Engineering Education (CAHSEE)

CAHSEE is an organization, created by Latino engineers and scientists, dedicated to the advancement of Hispanics in science and engineering careers. CAHSEE's efforts are concentrated in preparing Latino youth to enter and succeed in science and engineering schools and to complete graduate degrees, and in mentoring young Latino scientists and engineers to assume leadership positions in Corporate America, academia, research government labs, and government. Our goals include the development of a cohesive national network of Latino engineers and scientists working together to achieve success in the professional and civic arenas.

Website: http://www.cahsee.org/public_html/programs.html

5. Graduate Degrees for Minorities in Engineering and Science, Inc. (GEM)

GEM offers opportunities for URM students to obtain MS and PhD degrees in engineering and PhD. degrees in the sciences through summer internships and graduate financial assistance.

Website: <http://www.nsbe.org/programs/gemfellowship.htm>

6. Joint Alliance for Minorities in Mathematics (JAMM)

This is an annual summer conference whose purpose is to expose minority students to issues involving mathematics and applications in new areas such as mathematical biology and computational sciences. Each year, approximately 40 minority students majoring in mathematics attend these conferences.

Program Contacts: Raymond Johnson, Department of Mathematics, Univ. of Florida; rlj@math.umd.edu; and James Turner, Florida State Univ.; jturner@csit.fsu.edu

7. Meyerhoff Scholarship Program

The Meyerhoff Scholarship Program is located at the University of Maryland, Baltimore County. It is a national model for talented students in the areas of science, engineering, mathematics and computer science. It is also distinguished for promoting cultural diversity in the sciences.

Website: <http://www.umbc.edu/Programs/Meyerhoff/>

8. Society for Neuroscience (Minority Fellowship Program)

The NMF goal is to increase the diversity of individuals participating in mental health related neuroscience research and teaching programs by recruitment and training of outstanding individuals of traditionally underrepresented racial and ethnic minorities.

Website: <http://web.sfn.org/content/Programs/DiversityinNeuroscience/mnfp/>

9. Summer Research Institutes for Undergraduate Mathematics Students

There are two summer programs for undergraduate mathematics students, one at Cornell University in Ithaca, NY and the other at the University of Puerto Rico-Humacao. The objectives of the program are to 1) encourage undergraduate students to pursue advanced degrees in mathematics and the sciences; and 2) to facilitate access to graduate studies for Chicano, Latino, Native American and other minority students through a training program which includes a series of small group research projects. The programs are based on mathematical training and mentorship.

Websites: <http://www.biom.cornell.edu/MTBI/index.html>, and <http://cuwww.upr.clu.edu/~simu>

III. RESOURCES FOR POSTDOCTORAL FELLOWS – NHGRI Supported Programs

A. Individual National Research Service Postdoctoral Awards-- F32 / F33 (PA-99-122)

These fellowships support individuals who have earned a doctoral degree and who wish to pursue postdoctoral research training in the biomedical sciences. This fellowship supports new and established holders of doctoral or other professional degrees.

<http://grants1.nih.gov/grants/guide/pa-files/PA-99-122.html>

B. Research Supplements for Underrepresented Minorities (PA-01-079)

See Resources for Students for details (section I.A.3).

<http://grants.nih.gov/grants/guide/pa-files/PA-00-069.html>

C. Minority Travel Award Program (MITAP)

See Resources for Students for details (section I.A.4.).

<http://grants.nih.gov/grants/guide/notice-files/not99-002.html>

IV. RESOURCES FOR FACULTY - NHGRI Supported Programs

A. Individual National Research Service Postdoctoral Awards-- F32 / F33 (PA-99-122)

See Resources for Postdoctoral Fellows for details.

<http://grants1.nih.gov/grants/guide/pa-files/PA-99-122.html>

B. Minority Travel Award Program (MITAP)

See Resources for Students for details (section I.A.4.).

<http://grants.nih.gov/grants/guide/notice-files/not99-002.html>

C. Research Supplements for Underrepresented Minorities (PA-01-079)

See Resources for Students for details (Section I.A.3.).

<http://grants.nih.gov/grants/guide/pa-files/PA-00-069.html>

D. Career Development Awards

1. Mentored Research Scientist Development Award (K01)

These K01 awards are intended to foster the career development of individuals with expertise in scientific disciplines that would further technological developments critical to the success of the Human Genome Program and the understanding of the genetic basis of diseases. Eligibility is limited to individuals with degrees in computer sciences, mathematics, chemistry, engineering, physics and closely related scientific disciplines, such as bioinformatics, computational biology, statistics, biomathematics, and bioengineering.

Awardees are expected to enter a structured, phased developmental program, including a designated period of didactic training followed by a period of supervised research experience. It is expected that at the end of the career development period, individuals will transition successfully into positions as independent investigators.

http://www.nhgri.nih.gov:80/Grant_info/Funding/Training/par98061.html.

2. Genome Scholar Development and Faculty Transition Award (K22)

The purpose of the National Human Genome Research Institute (NHGRI) Genome Scholar Development and Faculty Transition Award is to enable promising new genome researchers to establish an independent research program in genomic research and analysis and to secure a tenure-track appointment in an academic institution in the United States. This is accomplished by providing the necessary resources to initiate an independent research program as a Genome Scholar in an extramural or a National Institutes of Health (NIH) intramural laboratory for up to two years followed by funding of their extramural research program for up to four years

at an extramural institution to which she/he has been recruited as tenure-track faculty. The total number of years for both phases of the award cannot exceed five. This award has two phases--a Genome Scholar Development Phase and a Faculty Transition Phase. Applicants may apply for both phases or for the Faculty Transition Phase only. It is anticipated that awardees will subsequently obtain a research project grant (R01) to support the continuation of their research.

http://www.nhgri.nih.gov:80/Grant_info/Funding/Training/PAR-99-022.html.

V. INFORMATION FOR NHGRI GRANTEES PREPARING RESPONSES TO THE ACTION PLAN

A. POTENTIAL PLACES TO RECRUIT STUDENTS

1. Colleges/Universities

- American Indian Graduate Center: <http://www.aigc.com/>
- Hispanic Serving Institutions: http://www.hacu.net/hacu_members/hsi.shtml
- Historically Black Colleges: <http://www.edonline.com/cq/hbcu/>
- Registered Inventory of College and High School Excellent Students (RICHERS): http://www.minorityaccess.org/programs/riches_prog.htm
- Tribal Colleges: <http://www.collegefund.org/colleges/colleges.shtml>

2. NIH Supported Minority Programs

- **Annual Biomedical Research Conference for Minority Students (ABRCMS)**

This is an annual scientific conference to which the students and faculty from minority programs supported by NIGMS come to present their research, discuss funding opportunities and learn about grantsmanship.

Website: <http://www.abrcms.org/>

- **NIGMS Bridges to the Baccalaureate and Doctoral Degree**

The Bridges to the Future Program is designed to facilitate the transition of underrepresented minority students between 2- and 4-year colleges and between M.S. and Ph.D. degree programs in areas of science relevant to biomedical research. It is central to the success of Bridges programs that students move between partner institutions without facing unnecessary regulations or barriers.

Website: <http://www.nigms.nih.gov/funding/grntmech.html - bridges>

A list of BRIDGES supported institutions can be found at:

<http://www.nigms.nih.gov/funding/bridges.html - doc>

- **Minority Access to Research Careers (MARC)**

This is a research-training program supported by NIGMS. Its goals are to increase the number and capabilities of scientists from underrepresented minority groups who are engaged in biomedical research and to strengthen science curricula and student research opportunities at institutions with substantial minority enrollments in order to prepare minority students for research careers.

Website: <http://www.nigms.nih.gov/funding/trngmech.html#h>

A list of MARC-supported institutions can be found at:

<http://www.nigms.nih.gov/funding/marc.html>

- **Minority Biomedical Research Support (MBRS)**

Grants are awarded to educational institutions with substantial minority enrollments to support research by faculty members; strengthen the institutions' biomedical research capabilities; and increase the interest, skills, and competitiveness of students and faculty in pursuit of biomedical research careers.

Website: <http://www.nigms.nih.gov/funding/grntmech.html#d>

A list of MBRS-supported institutions can be found at:

<http://www.nigms.nih.gov/funding/mbrs.html>

- **Research Centers in Minority Institutions (RCMI) Program**

This program is designed to expand the national capability for research in the health sciences by providing grant support to predominantly minority institutions that offer the doctorate in the health professions or in a health-related science. This program is limited to institutions within the United States and its territories. Funding can be used for improvements to institutional infrastructure, including renovation of laboratories and animal facilities. The grants also support recruitment of new faculty members, support staff, pilot projects, and updated materials and equipment.

Website: http://www.ncrr.nih.gov/resinfra/ri_rcmi.asp

A directory of RCMI institutions can be found at:

<http://www.ncrr.nih.gov/ncrrprog/rcmidir.asp>

3. Professional Societies/Organizations with URM Interests

- **American Chemical Society**

The ACS's Committee on Minority Affairs is responsible for: overseeing ACS programs devoted or related to minority issues; developing a long-range plan to ensure increased participation of minority chemical profession and in the Society at all levels; studying and making recommendations on the current status of minorities in the ACS and in the chemical sciences; promoting and recognizing the professional accomplishments of minorities in the chemical sciences and in ACS; and increasing the interest of minority chemical professionals in the work of the Society.

Program Contact: Yvonne Curry - y_curry@acs.org

Website: <http://www.chemistry.org/portal/Chemistry>

- **American Physiological Society**

APS is devoted to fostering scientific research, education, and the dissemination of scientific information.

Program Contact: Martin Frank, PhD - mfrank@the-aps.org

Website: http://www.the-aps.org/education/minority_prog/index.htm

- **American Society for Cell Biology**

The goal of the ASCB Minority Affairs Committee is to significantly increase the involvement of underrepresented minority scientists in all aspects of the Society by promoting the professional development and recruiting of minority scientists.

Program Contact: William Eckberg, PhD - weckberg@howard.edu

Website: <http://www.ascb.org/>

- **American Society for Human Genetics**

The objectives of ASHG are to bring together investigators in the many areas of endeavor that involve human genetics (researchers, academicians, clinicians, laboratory practice professionals, genetic counselors, nurses and others involved in human genetics), and to encourage and integrate their efforts by providing a forum for sharing research findings, accomplished primarily through the Society's annual meeting and its official monthly publication.

Program Contact: Bernice Morrow, PhD - morrow@aecom.yu.edu

Website: <http://www.faseb.org/genetics/ashg/ashgmenu.htm>

- **American Indian Science & Engineering Society (AISES)**

A national, nonprofit organization that nurtures building of community by bridging science and technology with traditional Native values. Through its educational programs, AISES provides opportunities for American Indians and Native Alaskans to pursue studies in science, engineering, and technology arenas. The trained professionals then become technologically informed leaders within the Indian community. AISES' ultimate goal is to be a catalyst for the advancement of American Indians and Native Alaskans as they seek to become self-reliant and self determined members of society.

Program Contact: Judy Gobert, PhD - Judy_Gobert@skc.edu

Website: <http://www.aises.org/>

- **Association of Minority Health Professions Schools (AMHPS)**

AMHPS aims include 1) the fostering of research on health problems of special importance to minority populations; 2) the expansion of minorities in faculty and leadership positions in health professions schools; 3) to provide health services to minority and underserved populations in relationship to their educational and research missions; and 4) to strengthen and enhance the capabilities of minority schools to fulfill their educational and other missions.

Website: <http://svmc107.tusk.edu/amphs2.html>

- **Federation of American Societies for Experimental Biology (FASEB)**

FASEB is dedicated to enhancing the ability of biomedical and life scientists to improve, through research, the health, well-being, and productivity of all people.

Program Contact: Jacquelyn Roberts - jroberts@faseb.org

Website: <https://ns2.faseb.org/careerutilities/grantprg.htm>

- **The Leadership Alliance**

The Leadership Alliance is a consortium of 29 institutions of higher including leading education, research and teaching colleges and universities, dedicated to improving the participation of underrepresented students in graduate education programs. It was founded in 1992 and is the premiere coalition in the nation addressing the shortage of underrepresented minorities, especially African Americans, Hispanics, Native Americans and Pacific Islanders, in graduate school, the professorate, the public and private sectors.

The Alliance seeks to create a core of outstanding leaders and role models for coming generations by providing excellent educational opportunities through its activities and initiatives. These include undergraduate internships and mentoring programs; graduate support programs and fellowships; faculty development opportunities; and research exchanges. Striving toward global competitiveness, the Alliance also sponsors international research programs in the sciences, social sciences and humanities in 16 countries on five continents.

Program Contact: Sara Tortora, PhD - Sara_Tortora@brown.edu

Website: <http://www.theleadershipalliance.org/>

- **Mathematical Association of America (MAA)**

Striving to advance the mathematical sciences, especially at the collegiate level. With NSF support, MAA has launched the new WELCOME project (Web Educators Library Collection of Mathematical Explorations). The project continues MAA involvement in three areas: 1) educational technology, 2) professional development, and 3) efforts to increase the participation by members of underrepresented groups. The primary goal is to bring technology to mathematics classrooms in minority-serving institutions.

Program Contacts: Thomas Rishel, PhD - trishel@maa.org or

James White - mathwrig@gte.net

Website: <http://www.maa.org/summa/archive/prjwlc.htm>

- **National Action Council for Minorities in Engineering (NACME)**

NACME provides both leadership and support for the national effort to increase the representation of successful African American, American Indian and Latino men and women in engineering and technology and in mathematics and science-based careers.

NACME's goal is diversity with equity, our metric is parity in the workforce and our methodology is the formation of partnerships with those corporations, educational institutions, foundations and governmental bodies that share a commitment to these aims. NACME and its partners will foster research-based changes in policies and

practices that ensure equal opportunities for the preparation and participation of all Americans in science, engineering and technology.

NACME conducts research, analyzes and advanced public policies, develops and operates pre-college, university and workforce programs, and disseminates information broadly through publications, conferences and the Internet. NACME is also the nation's largest private source of scholarships for minorities in engineering. Since 1980, more than 7,000 talented men and women have gone through college with NACME scholarships and are now leaders in industry, government and academia.

Program Contact: Aileen Walter - awalter@nacme.org

Website: www.nacme.org

- **National Organization of Black Chemists and Chemical Engineers (NOBCCHE)**

NOBCCHE is dedicated to the professional advancement of Black chemists and chemical engineers.

Website: <http://www.nobcche.org/>

- **National Association of Mathematicians (NAM)**

The NAM objective is the promotion of excellence in the mathematical sciences and the promotion of the mathematical development of underrepresented American minorities".

Program Contact: Leon Woodson, PhD - woodson@jewel.morgan.edu

Website: <http://mathforum.org/library/view/12332.html>

- **National Society of Black Engineers (NSBE)**

The NSBE objectives are 1) to stimulate and develop student interest in the various engineering disciplines; 2) to increase the number of minority students studying engineering at both the undergraduate and graduate levels; 3) to encourage members to seek advanced degrees in engineering or related fields and to obtain professional engineering registrations; 4) to encourage and advise minority youth in their pursuit of an engineering career; 5) to promote public awareness of engineering and the opportunities for Blacks and other minorities in that profession; and 6) to function as a representative body on issues and developments that affect the careers of Black Engineers.

Website: <http://www.nsbe.org/>

- **Science and Engineering Alliance, Inc. (SEA)**

Addressing the challenge of establishing an ethnically diverse technical workforce, prepared to compete in today's global marketplace, SEA's unique program is dedicated to ensuring that African Americans play a vital role in the nation's scientific and engineering future.

Program Contact: Robert Shepard, PhD - shepard@sea2.org

Website: <http://www.llnl.gov/sea/>

- **Society for the Advancement of Chicanos and Native American Scientists (SACNAS)**

The mission of SACNAS is to encourage Chicano/Latino and Native American students to pursue graduate education and obtain the advanced degrees necessary for research careers and science-teaching professions at all levels.

SACNAS provides strong national leadership in improving science and math education, as well as expanding opportunities for minorities in the scientific workforce and academia. SACNAS' Annual National Conference and Teacher Workshops, summer research opportunities, E-mentoring program, and online internship/job placement resources are tools that help a diverse community of students, professors, administrators, and K-12 educators achieve expertise within their discipline.

Program Contact: jerry@sacnas.org

Website: <http://www.sacnas.org/>

- **Society for Industrial and Applied Mathematics (SIAM)**

The organization's policy is to 1) advance the application of mathematics and computational science to science, engineering, industry, and society; 2) promote research that could lead to effective new mathematical and computational methods and techniques for science, engineering, industry, and society; and (3) provide media for the exchange of information and ideas among mathematicians, engineers, and scientists.

Program Contact: Terry Herdman, PhD - herdman@icam.vt.edu

Website: <http://www.siam.org/>

- **Society for Neuroscience - (Minority Fellowship Program)**

The NMF goal is to increase the diversity of individuals participating in mental health related neuroscience research and teaching programs by recruitment and training of outstanding individuals of traditionally underrepresented racial and ethnic minorities.

Program Contact: Joann Berger-Sweeney, PhD - jbergers@wellesley.edu

Website:

<http://www.sfn.org/content/Programs/DiversityinNeuroscience/mnfp/index.html>

- **Society of Mexican American Engineers and Scientists (MAES)**

MAES was founded in 1974 for the purpose of increasing the number of Mexican Americans and other Hispanics in the technical and scientific fields. Originally, the focus was on the professions, but as the organization grew, so did the scope of its activities and interests. The Society now represents the Mexican American community in the all-important technological arena on issues related to education, economics, environment and research. As a mature organization with a national membership representing all the engineering and scientific disciplines, the society now has turned its focus on the youth of our people. Many of its programs, with the financial help of members, companies and government agencies, are now directed at increasing the number of students at all grade levels who will study and prepare

to enter our technical professions.

Program Contact: Martin Martinez - execdir@maes-natl.org

Website: <http://www.maes-natl.org/>

4. Minority on-line Information Service (MOLIS)

MOLIS is an on-line source that provides information on minority institutions and minority targeted opportunities. Utilizing appropriate technology, MOLIS provides value-added services that promote education, research, and diversity on a national level for Minority Institutions in partnership with government, industry, and other sectors.

Website: <http://content.sciencewise.com/molis/molis.htm>

B. Model Research/Academic Enhancement Programs

The NHGRI Action Plan encourages grantees to come up with programs to increase the number of minorities participating in genomics and ELSI research. In an effort to stimulate creative ideas, individuals who had developed different types of programs talked about what made their programs successful. The following are selected examples of these research experiences/training programs

1. American Psychological Association's Research Training Program

This is an example of a traditional NIH training program that is managed by a professional society, rather than an academic institution, although the actual training is provided in the academic setting. This type of management has many positive attributes: it has access to a large membership base; it is not constrained by geography; and it has access to the society's resources and communication network. The APA has several training models, but all include a summer institute where students learn critical skills and a mentoring network. The APA has sponsored NIH-supported training programs since 1974. - Dr. Kim Nickerson, American Psychological Association

Website: <http://www.apa.org/>

2. Meyerhoff Scholars Program

This program was started in 1988. It originally started as an undergraduate program and has recently been extended to encompass a graduate program. The elements of the program that make it so successful are: (1) the program is open to top mathematics and science students nationwide. (2) Students cannot apply for the program, their high school guidance counselor or other school official must nominate them. (3) Students must have a summer research experience that can be pursued nationally or internationally. (4) Monetary support is provided. (4) Group learning is encouraged. (5) Students, usually as a group, must participate in a community service project. (6) Students must attend cultural arts activities of their choosing. (7) The program has a large and committed group of mentors from the faculty and local area professions.

The program has a strong monitoring and mentoring plan. A full-time academic advisor works with freshmen and sophomores. Incoming freshmen meet with their advisor three times in the first semester. The advisors also assist graduates of the program with graduate or professional school placement.

The overall 12-year retention rate is approximately 95 percent. Eighty-four percent of the participants are enrolled in graduate or professional degree programs. - Ms. Mary Ellen Jackson, Meyerhoff

Scholars Program, University of Maryland, Baltimore Campus

Website: <http://www.umbc.edu/Programs/Meyerhoff/>

3. Mathematical and Theoretical Biology Institute for Undergraduate Research

This is an eight to nine week summer program for students majoring in mathematics who wish to have a research experience prior to graduate school. The academic environment is grade free and students work in groups and select their own research project. The program also exposes students to a survival course. Other program enhancements include living together in a group home and group trips and recreational activities. Since 1996, MTBI students have produced 60 papers and have received recognition at major scientific meeting for their research. Each year, approximately 11 students enter graduate school. The students are monitored for six years following the completion of the program. If a student is having a problem in graduate school, they are invited back to the summer institute for a refresher course. - Dr. Carlos Castillo-Chavez, Mathematical and Theoretical Biology Institute for Undergraduate Research, Cornell University

Website: <http://biom.cornell.edu/MTBI/home.html>

4. Bridges Program for Native Americans

The Bridges Program provides a research experience in an academic research institution to students enrolled in two-year colleges. This particular program is a partnership between Kansas University and Haskell Indian Nations University. In addition to a research experience, tutoring and special classes are provided in courses that are critical to success in graduate school-mathematics, chemistry and biology. The key elements of this partnership are: strong institutional commitment; adequate funding from NIH; faculty willing to host American Indian students; faculty willing to adjust to the academic and cultural needs of the students; a commitment to ongoing friendship between the two institutions; a commitment to the development of all students; and close geographic location. - Dr. Marigold Linton, Kansas University and Haskell Indian Nations University

Program Contact: mlinton@ku.edu

For additional information about the BRIDGES and other minority training and research programs supported by the National Institute of General Medical Sciences, please visit this website: http://www.nigms.nih.gov/about_nigms/more.html

5. Vanderbilt/Meharry Consortium

The terms of this alliance were finalized in 1999 under a Memorandum of Understanding that was signed in 1998. The alliance is built on trust and is implemented by student-faculty and faculty-faculty interactions. The terms of the agreement include the mutual benefits to both institutions, allows both parties to enhance educational, scientific collaborations at and between institutions, seeks to minimize duplications of programs and establishes linkages in complementary areas. The consortium currently holds several training grants from NIH; the program directors of the training programs

are approximately evenly divided between the two institutions. Under the consortium, students can take courses or chose research mentors from either institution. - Dr. Maria F. Lima, Meharry/Vanderbilt Consortium, Meharry Medical College

Website: <http://www.mmc.edu/news/MeharryVuAlliance.htm>