JOHNS HOPKINS
UNIVERSITY

Vivien Thomas Scholars Initiative

JHU STEM Summer and Post-baccalaureate Research Programs

Summer Undergraduate Research Program Opportunities

Amgen Scholars Program

The Amgen Scholars Program is an undergraduate summer research program in science and biotechnology. The Amgen Scholars Program is hosted by universities around the world and aims to provide undergraduates with the opportunity to engage in hands-on research. During the 10-week program, students will work full-time on independent research projects under the guidance of a Hopkins faculty member, where they will have the opportunity to conduct research, analyze data, network with their peers, and build a faculty-mentor relationship. In addition, selected scholars will participate in the weekly research workshops hosted by the Dean's Office for the Krieger School of Arts and Sciences. These workshops focus on professionalism and preparation for graduate school admission. There are also a number of community-building activities throughout the summer. This is an intensive residential research opportunity.

Basic Science Institute Summer Internship Program (BSI SIP)

BSI-SIP provides experience in research laboratories in the Institute for Basic Biomedical Science (IBBS) at the Johns Hopkins University School of Medicine. Research opportunities are available in all SOM basic science departments: Biological Chemistry; Biomedical Engineering; Biophysics and Biophysical Chemistry; Chemistry/Biology interface; Cell Biology; Molecular Biology and Genetics; Molecular and Comparative Pathobiology; Neuroscience; Pharmacology and Molecular Sciences; and Physiology. Program activities include substantive hands-on research, dedicated mentorship activities, journal clubs, and a range of professional development workshops and seminars on topics that include preparation for graduate studies and navigation of scientific careers. The program concludes with presentations by BSI scholars at a closing research symposium.

Biological Basis of Behavior – REU BEHAVE

The theme of the REU BEHAVE program is using comparative models for understanding behavior. The program includes faculty working on diverse taxa (bats, owls, primates and rodents) to answer fundamental questions on behavioral biology. Areas of research include ethology, neurobiology and neuroendocrinology. A unique focus of the program will be an emphasis on the power of using comparative models when tackling scientific questions, from evolutionary to mechanistic. A main goal of this program is for students to gain highly focused insight through research on specific projects while concurrently placing those activities into the larger context of biological evolution. The program additionally includes an in depth Scientific Foundations Course that includes Animal Welfare and

Research Ethics, How to Search the Literature, Experimental Design, Statistics, Scientific Writing, Oral Scientific Presentations, Poster Design and Big Topic Discussions on behavior, evolution and neuroscience; as well as professional development, including curriculum vitae writing, graduate school application preparation and a networking workshop.

Careers in Science and Medicine Summer Internship Program (CSM SIP)

CSM SIP is designed for undergraduates from low-income and either first-generation-college or single-parent-family backgrounds who seek a summer of challenging fulltime research and the scientific communication skill-building needed to achieve advanced careers in biomedical, medical, health-related or STEM professions. Students are each matched with a Hopkins professor doing research-of-interest in the Johns Hopkins School of Medicine, School of Public Health, School of Engineering, School of Nursing, or School of Arts & Sciences.

Computational Sensing and Medical Robotics (CSMR REU)

The REU program in Computational Sensing and Medical Robotics is an intensive ten-week program of laboratory research and instruction. Projects are available in electrical and computer engineering, mechanical engineering, biomedical engineering and computer science. Each student will be a part of a research team, including a faculty project supervisor and a graduate student mentor, to guide them through the summer. The projects will be designed to match each student's interest to maximize the potential for making a contribution during the session. Participating students also receive instruction on technical communication, oral presentation skills, and research ethics to aid in the completion of the required final research report and presentation. Additional activities will include tours and trips to other labs.

Diversity Summer Internship Program for Undergraduates (DSIP)

The Diversity Summer Internship Program (DSIP) at the Bloomberg School of Public Health is a 10-week summer program that provides undergraduates with a graduate-level, independent research project in the biomedical or public health field. The Diversity Summer Internship Program (DSIP) was established in 1995 to provide a graduate-level independent research experience in biomedical and/or public health research to undergraduate students under the direct mentoring of established Johns Hopkins researchers. Interns work one-on-one with faculty on research projects in their field of interest. In addition, interns attend public health awareness and professional development sessions. DSIP offers internship placements within various departments and centers in the Bloomberg School of Public Health and the School of Medicine.

The Foundation for Advanced Research in the Medical Services (FARMS)

FARMS offers opportunities in the Institute for Cell Engineering (ICE) in one of four program areas: Vascular Biology, Stem Cell Biology, Immunology or Neuroregeneration. Program participants may participate in a broad array of projects from computational biology, gene regulatory networks, immune system development, lymphoid malignancies, molecular and cellular mechanisms of oxygen regulation, molecular and cellular signals controlling neurodegeneration, neurogenesis, single cell biology, stem cell modeling, gene and stem cell therapies, MRI cell tracking techniques, or stem cell engineering. Interns participate in student related activities in ICE, conduct research and write a small progress report at the end of their internship or present their work in a poster session at the end of the summer.

Generation Tomorrow: Summer Health Disparity Scholars

Generation Tomorrow and the Johns Hopkins Center for AIDS Research (CFAR) are pleased to host Generation Tomorrow: Summer Health Disparity Scholars. The program is intended for undergraduate students interested in HIV and/or hepatitis C virus (HCV) health disparities and their intersection with substance use (addiction and overdose), violence, mental health, and the social determinants of health. The program will offer mentorship and training in HIV/HCV education, testing, and counseling; health disparities, cultural competence, and harm reduction. Through a lecture series, the program will also explore the intersection of HIV and/or HCV health disparities with the areas defined above. Students will be paired with a mentor for their research experience (clinical, health services, biomedical) based on their defined interest. Scholars also participate in community outreach events in the local community.

Henry A. Rowland Department of Physics & Astronomy Summer Research Fellowship Program

The Henry A. Rowland Department of Physics & Astronomy Summer Research Fellowship seeks to recruit a diverse cohort of rising sophomores and juniors for mentored independent research experiences. Each research fellow will work with JHU/Space Telescope Science Institute (STScI) faculty, research scientists, postdoctoral scholars, and PhD students on an original research project in astronomy & astrophysics, biophysics, condensed matter physics, cosmology, materials science, or particle physics (see the JHU research page and STScI research page). Actual projects will be based on a fellow's background and defined by the overlap of a fellow's and mentor's research interests. In addition, the fellowship offers weekly enrichment activities designed to enhance fellows' soft skills and to prepare them for future careers in research.

Institute for Computational Medicine (ICM) Internships for Undergraduate Scholars in Computational Medicine

The Institute for Computational Medicine provides extended research experiences for undergraduates who are interested in the development of quantitative approaches for understanding the mechanisms, diagnosis and treatment of human disease through applications of mathematics, engineering and computational science. An internship at the ICM provides a significant research opportunity that can lead to authored publications, presentations at conferences, and a competitive advantage for students who

pursue graduate programs and professional research-based careers. The Internships for Undergraduate Scholars in Computational Medicine provides extended research opportunities with ICM core faculty members who specialize in areas such as computational cardiology, medical imaging, computational neuroscience, computational genomics and big data science.

Materials Growth and Engineering/PARADIM REU

A Research Experience for Undergraduates (REU) position is available at the Platform for the Accelerated Realization, Analysis, and Discovery of Interface Materials (PARADIM) bulk crystal growth facility located on the Johns Hopkins University Homewood campus. The PARADIM Materials Discovery REU is a 10-week summer program designed to provide an intensive, mentored research experience for undergraduates, especially those attending institutions with limited research opportunities.

The Johns Hopkins Neuroscience Scholars Program (JHNSP)

The Johns Hopkins Neuroscience Scholars Program (JHNSP) is a multi-year, national program dedicated to mentoring underrepresented in science and deaf or hard-of-hearing (D/HH) undergraduates. It provides students in-depth exposure to the neuroscience field. Beginning in the summer, participants will attend professional development workshops, perform 10 weeks of intensive research, and network with other students. Throughout the academic year, scholars receive individualized advising in their paths to graduate school.

The Johns Hopkins NeuroHIV-Comobidities (Neurophytes) Scholars Program

The Johns Hopkins Neurophytes Scholars Program aims to significantly increase the motivation and persistence of undergraduates who reside in areas in the USA where the incidence/prevalence of HIV/AIDS remain high to pursue graduate training toward a research career focused on the complications of HIV infection of the central nervous system (NeuroHIV) and its associated comorbidities. Its mission is to expose highly motivated undergraduates, particularly those that reside in high HIV-1 incidence/prevalence regions, to an education-research mentoring institute focused on NeuroHIV and its associated comorbidities in order to serve those urban and rural communities most affected by the diseases.

NeuroSIP and Kavli SIP Summer Internship Program

Summer interns in the **NeuroSIP** program are hosted in laboratories of the primary faculty of the Department of Neuroscience. Please see the departmental website for brief descriptions of the projects of previous NeuroSIP interns. The Kavli Neuroscience Discovery Institute (Kavli NDI) at Johns Hopkins bridges neuroscience, physics, data science, computational neuroscience and engineering to solve the mysteries of the brain. The Kavli NDI supports summer internships for undergraduate students considering graduate studies in neuroscience, engineering, data science and related areas. **KavliSIP** summer interns are hosted in the laboratories of the faculty of the Kavli NDI. KavliSIP and NeuroSIP students enjoy neuroscience-focused programming and other content designed to help them delve deeper into this exciting field of study.

Post-baccalaureate Research Program Opportunities

Hopkins Post-baccalaureate Research Education Program (PREP)

The Hopkins Post-baccalaureate Research Education Program (PREP) is centered on developing a diverse pool of well-trained post-baccalaureates who will transition into and complete rigorous research-focused doctoral degree programs. Participants must have completed a baccalaureate degree in a relevant field within 3 years prior to starting PREP. Selected participants should intend to apply to research-focused doctoral degree programs (PhD or MD/PhD) during or immediately following completion of the program. It is the expectation that most PREP participants will transition to a rigorous research-focused doctoral degree program following the postbaccalaureate experience.

Hopkins PREP provides:

- Research experience: Scholars conduct hypothesis-driven research in their Mentor's lab, with day-to-day guidance by an experienced PhD student or postdoc. Scholars participate fully in weekly lab meetings, attend weekly research seminars in their department, and attend a vibrant PhD program retreat and a national conference of their choice.
- Community: Scholars come together each month for two-hour 'chalk-talk' events to present and discuss their research with Peer-Mentors (PhD students, postdocs) and faculty.
- Project ('mini-thesis') meetings: Scholars gain confidence by organizing, preparing for, and convening three one-hour 'mini-thesis' meetings with two subject-expert faculty, plus their research mentor and the PREP Director. Scholars benefit both scientifically and professionally by building strong working relationships with multiple faculty members at Johns Hopkins who are experts in their field of interest.
- Professional training and custom mentoring: Scholars participate in workshops designed to improve their scientific writing skills, and understand ethics in science, and can choose from many other workshops including communication and improvisation. Each scholar charts an individual development plan with the PREP Director, with custom mentoring both formal (monthly one-hour meetings) and informally as needed.
- Preparation for graduate school applications and interviews.

Doctoral Diversity Program (DDP)

The Doctoral Diversity Program (DDP) is the post-baccalaureate component of the Johns Hopkins Initiative for Careers in Science and Medicine (CSM Initiative). The CSM Initiative seeks to develop scholars from low-income and diverse backgrounds to help them build the accomplishments, skills, network, and support necessary to achieve advanced careers in STEM. Selected scholars spend up to 2 years in the DDP. While in the program, DDP Scholars join a research lab at Johns Hopkins and conduct rigorous original research that they often publish. Scholars receive course work in scientific scholarly writing and professional exam preparation as appropriate for each scholar. Scholars get clinician shadowing opportunities as desired and participate in a Lunch and Learn seminar series where they hear from accomplished members of the biomedical community who are from underrepresented in science/underrepresented in medicine backgrounds. Scholars benefit from peer mentorship and guidance from the DDP and CSM Directors during monthly 'Coffee Breaks' inclusive of small groups of DDP scholars. Scholars also meet individually with the DDP Director to identify specific areas to strengthen.

The scholar and research mentor form strong, productive bonds that foster the scholar's growth. The scholars also benefit from peer-to-peer mentorship.