**THE BRYANT-HOWARD MEDICAL RESEARCH AWARD**

to The Johns Hopkins University School of Medicine

2020 Summer Internship Program

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**The Award:**

- Four University students will receive the prestigious 2020 Bryant-Howard Medical Research Award to attend the Johns Hopkins University School of Medicine 2020 Summer Internship Program (SIP), located in Baltimore, MD.
- Applications are open to all UD Majors.
- Students must have completed at least one-two years of college; seniors need not apply.
- The internship requires a full-time commitment for the ten week long program.

**Internship Includes:**

- $3,000 stipend
- Housing near the undergraduate campus, with shuttle service for convenient transportation between the Johns Hopkins Medical Institutions and the undergraduate campus.
- All program activities Fees, and
- Contribution toward expenses incurred traveling to/from the SIP campus.

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**Program Dates:**

Sunday, May 24 – Saturday, August 1, 2020

**Application Due Date:**

Wednesday, February 12, 2020

**Recipients Announced:**

Wednesday, March 4, 2020

**Eligibility:**

- Must have completed 1-yr of college and be a U.S. citizen to apply to the Pulmonary Medicine division of SIP
- Must have completed 2-yrs of college and be either a U.S. citizen or international student currently studying in the U.S. to apply to the Basic Science Institute and Bloomberg School of Public Health divisions of SIP.
- Basic Science Institute students must have an interest and potential to pursue a PhD degree.

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**The Gift of Opportunity**

The Bryant-Howard Medical Research Award is made possible by a gift from alumnus Dr. W. Michael Bryant, Class of ’59.

Advised and inspired by UD Professor Robert S. Howard to pursue a career in medicine, Dr. Bryant earned his medical degree in 1963 from The Johns Hopkins University School of Medicine.

Thanks to his faculty mentor, Dr. Bryant identifies his professional self as “A product of the University of Delaware and the Johns Hopkins University School of Medicine – and their values.”
Benefits

Acquire both theoretical knowledge and practical training in research and scientific experimentation and other scholarly investigations. The program runs ten weeks and a stipend of $3,000 is provided. Housing is included near the undergraduate campus; the University has a shuttle service that provides convenient transportation between the medical school and the undergraduate campus.

Overall, you can expect an experience similar to that of a first-year graduate student who does a three-month rotation in a laboratory or out in the community to become acquainted with the project, techniques, and people working in that area. Before arrival each intern receives several papers related to their specific research project. The goal of the project and its relationship to other work in the area will be discussed, and you will be instructed in the techniques necessary to conduct the research. As each technique is mastered, the responsibilities for seeing the procedure through will rest increasingly with you. Besides daily interactions with others at the project site, most groups have a more formal meeting once or twice a week to discuss research problems, and progress and developments reported in the literature. While the style and character of each research site varies considerably, all are composed of very dedicated and hardworking individuals who are more than willing to help others who are similarly committed to learning. The program concludes with a poster session by the interns describing their projects.

This summer internship program requires a full-time commitment. Interns should be prepared for long days and short weekends. It is not permissible to take academic classes or hold other employment during the internship. There are no vacations during the program.

We ask that students complete the application describing relevant course work, research experience and future plans regarding a career in science. Two letters of recommendation and official transcripts are required. **Deadline for application submission is Wednesday, February 12th, 2020.**

The Bryant-Howard Award Committee will inform applicants of admissions decisions by March 4th.

RESEARCH OPPORTUNITIES

Research Opportunities

Research opportunities available in each area of the program are described below – you may apply to three divisions indicating priority.

Basic Science Institute (BSI)

Research opportunities in the Institute for Basic Biomedical Science (IBBS) are available in all of our 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. Past program participants have participated in a broad array of projects from molecular and cellular analysis of the aquaporin water channels, molecular genetic basis of Down syndrome, genomics, neurobiology of disease, applications of polymeric biomaterials to drug delivery, gene therapy, and tissue engineering. Program activities include weekly journal clubs, semi-monthly professional development seminars and the program concludes with a poster session. The rich environment and guidance by our faculty helps prepare our students for successful careers as independent research scientists.
Bloomberg School of Public Health (BSPH)

As a leading international authority on public health, the Johns Hopkins Bloomberg School of Public Health is dedicated to protecting health and saving lives. Every day, the School works to keep millions around the world safe from illness and injury by pioneering new research, deploying its knowledge and expertise in the field, and educating tomorrow’s scientists and practitioners in the global defense of human life. At the Bloomberg School of Public Health, you will be mentored by some of the world’s leading authorities on public health issues. Some of our major research initiatives are in these areas: improving the health of women and children; identifying determinants of behavior and developing communication programs to promote healthy lifestyles; protecting our nation from bioterrorism; preventing and controlling AIDS; reducing the incidence and severity of injuries; elucidating the causes and treatment for mental disorders; preventing chronic diseases (heart diseases, stroke, cancer, diabetes); improving the health of adolescents; preventing and treating substance abuse; assessing the effect of environmental toxins on human health; making water safe and available for the world’s population; assessing the health needs of disadvantaged populations (rural, urban, refugees, US ethnic groups); and developing methods to better understand, manage and finance health care. Your research opportunity may take place in a laboratory, health department, clinic, office, or in a community setting.

Generation Tomorrow: Summer Health Disparity Scholars

Generation Tomorrow and the Johns Hopkins Center for AIDS Research (CFAR) are pleased to announce the launch of Generation Tomorrow: Summer Health Disparity Scholars in the summer of 2019. The program will be a summer experience 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. This program will have a special focus on undergraduate students that are underrepresented in nursing, public health, and medicine. The program will consist of the following components:

1. Three-day intensive HI and HCV testing and counseling training
2. Weekly lecture series
3. Health disparities related research (clinical, health services, biomedical)
4. HIV and/or HCV community-based organization or Johns Hopkins affiliated program internship/community outreach focused on health disparities

Institute for Cell Engineering - The Foundation for Advanced Research in the Medical Services Internships (FARMS)

Opportunities in the Institute for Cell Engineering (ICE) on one of our 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. The rich environment and guidance by our faculty helps prepare students for successful careers as independent research scientists. Interns are expected to participate in all 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.

Founded in 2005, the mission of the Institute for Computational Medicine is to develop mechanistic computational models of disease, personalize these models using data from individual patients, and apply them to improve disease diagnosis and treatment. ICM researchers work in four different application areas. Computational Molecular Medicine seeks to understand the function of highly interconnected molecular networks in health and disease. This knowledge is applied to enhance discovery of molecular disease networks, detection of disease, discrimination among disease subtypes, prediction of clinical outcomes, and characterization of disease progression. Computational Physiological Medicine seeks to develop highly integrative mechanistic models of biological systems in disease, spanning from the levels of cells to tissues and organs. These models are personalized using patient data, and apply them to improve disease diagnosis and treatment. Computational Anatomy is an interdisciplinary area of research focused on quantitative analysis of variability in biological shapes in health and disease. It is applied to imaging data to develop anatomic biomarkers for disease diagnosis. Computational Healthcare analyzes large-scale data sets from the electronic health record to discover new ways of improving individualized patient care.

The twenty ICM core faculty are appointed in departments of the Whiting School of Engineering, School of Medicine, and the Bloomberg School of Public Health. Our interdisciplinary labs offer students the opportunity to work with faculty in these four different research areas. Opportunities exist to work on computational, as well as combined computational and experimental/clinical studies. At the end of the summer students will present their work at a university-wide poster session. These internships provide a unique opportunity to gain research experience in the emerging discipline of computational medicine, and would be of great benefit to students interested in pursuing graduate research in this area, or in attending medical school.

Institute for Nano Biotechnology (INBT) - Nanotechnology for Biology and Bioengineering Research Experience for Undergraduates (REU)

INBT has created a unique model for training researchers at the interface between nanoscience and medicine. All of our summer labs are interdisciplinary labs that offer students the ability to work in both the physical sciences/engineering and biological sciences/medicine. With funding from the National Science Foundation (NSF), we recruit students from Biology; Bioengineering; Biomedical Engineering; Biophysics; Cell Biology; Chemistry; Material Science & Engineering; & Physics. Our summer students can choose to work in various research areas such as: nanotechnology, biomaterials, nanoparticles, microfabrication, tissue engineering, stem cells, drug delivery, particle synthesis, lab-on-chip devices and cancer research. INBT summer students are co-advised by faculty and senior lab personnel and work on current graduate level projects. Students can work on a specific project or multiple projects depending on their interest and background. During the 10-weeks of research students participate in lab research and attend educational and professional development seminars. At the end of the summer the students present their research at a university-wide poster session. The ultimate goal of the program is to give undergraduates a true perspective of graduate research with the hope that this experience will inspire a pursuit of a PhD. For more information on requirements, admissions and benefits-http://inbt.jhu.edu/education/undergraduate/reu/

Applicants should indicate the area(s) of research they are interested in (choose up to three areas of research):

Biomaterials; Biophysics & Bioengineering; Cancer; Drug/Gene Delivery; Nanofabrication; Neuroscience/Neurology; Stem Cells & Cell Engineering and Tissue Engineering
Students work on specific research projects under the supervision of an assigned mentor. Projects span a broad range of research, from the basic science of endothelial or epithelial cell biology to asthma epidemiology. In addition to the research experience, students participate in a weekly journal club, during which they present primary research articles to their peers and members of the faculty. Students also attend a seminar series featuring faculty members from Johns Hopkins and the NIH. This forum provides students with the opportunity to interact with faculty members and hear different perspectives on issues related to career development. Students interested in clinical medicine are given the opportunity to “round” with the Johns Hopkins Medicine residents, providing a glimpse of life in clinical medicine as a resident at an academic institution. At the end of the summer, students present their work in a poster session. We hope that through these activities students will gain first-hand knowledge of research and academic medicine, and ultimately pursue careers in the biomedical sciences.

**Rosetta Commons Research Experience for Undergraduates**

Interns in this geographically-distributed REU program have the opportunity to participate in research using the Rosetta Commons software. The Rosetta Commons software suite includes algorithms for computational modeling and analysis or protein structures. It has enabled notable scientific advances in computational biology, including de novo protein design, enzyme design, ligand docking and structure prediction of biological macromolecules and macromolecular complexes. **The Program:** One week of Rosetta Code School, where you will learn the inner details of the Rosetta C++ code and community coding environment, so you are fully prepared for the summer! Eight (8) weeks of hands-on research in a molecular modeling and design laboratory, developing new algorithms and discovering new science. The summer will finish with a trip to the Rosetta Conference, where you will present your research in a poster and connect with Rosetta developers from around the world. The sponsor, National Science Foundation (NSF), will provide housing, travel expenses and a stipend. College Sophomores or Juniors major in computer science, engineering, mathematics, chemistry, biology and/or biophysics. While not required, we seek candidates with some combination of experiences in scientific or academic research, C++/Python/*nix/databases, software engineering, object oriented programming, and/or collaborative development. Only US Citizens and permanent residents are eligible to apply per NSF guidelines.

[https://www.rosettacommons.org/about/intern](https://www.rosettacommons.org/about/intern)

**Summer Institute for Genomics & Society**

**Description:** Established in 1995, the mission of the Berman Institute of Bioethics (BI) is to “identify and address key ethical issues in science, clinical care, and public health, locally and globally.” The Berman Institute trains and mentors future leaders in bioethics through programs such as the undergraduate minor in bioethics, the Master of Bioethics Program, the Ph.D. concentration in bioethics and health policy, and the Johns Hopkins-Fogarty African Bioethics Training Program. Through the summer internship, our goal is to enhance the diversity of Ethical, Legal and Social Implication (ELSI) researchers and thus enrich ELSI scholarship by giving trainees opportunities to learn skills, be exposed to the range of possible training and career options in ELSI research, and with the guidance of a faculty mentor, work on issues in genomics and society. Summer trainees will be offered two types of formal, didactic research education opportunities: the first is a workshop/seminar designed specifically for them and their cohort; and the second is the opportunity to take foundational courses in the Berman Institute’s existing Summer Institute. These are in addition to those activities available to all SIP students, such as weekly journal club and the bimonthly seminars and professional development sessions. By the end of summer, students will be expected to be able to identify morally relevant
issues in science, medicine, research and public health, and to engage in sound reasoning about those issues. Participants will develop these core skills through exposure to foundational bioethics methodologies, the application of those skills and methodologies to important historical and contemporary cases, and to participants’ own interests.

For more information contact David A. Barlow, PhD – barlow@udel.edu
We ask that students complete the attached application describing relevant course work, research experience and future plans regarding a career in science/medicine. We require a minimum of two letters of recommendation and official transcripts.

Because of Dr. Bryant’s endowed gift of opportunity, four University of Delaware students will fill a reserved internship. Selection of the student Award recipients will be determined by the Office of the Dean of the College of Health Sciences. All University of Delaware students are welcome to apply.

Application deadline is Wednesday, February 12, 2020. Applicants will be informed of their status by March 4th. Inquiries should be directed to Dr. David Barlow by email [barlow@udel.edu]. Completed applications should be delivered to the following campus address:

David A. Barlow, Ph.D., Director  
Center for Premedical and Health Profession Studies  
University of Delaware  
105e Pearson Hall  
Newark, DE 19716  
Email: Barlow@udel.edu

For additional information go to https://www.hopkinsmedicine.org/som/Opportunities-High-School-Undergraduate-Postbac-Students/sip.html

### EDUCATIONAL GOALS and PROGRAM OF INTEREST

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### APPLICANT INFORMATION

Name: ____________________________________ UDEL Student ID#: ___________________

Campus Address: _________________________________________________________________

City: ___________________________ State: _____________ Zipcode: _________________

Permanent Address: _________________________________________________________________

City: ___________________________ State: _____________ Zipcode: _________________

Permanent Telephone: _____________ Cell Phone: _____________

E-mail: _____________________________ SS# (last four digits): _____________
UNIVERSITY OF DELAWARE EDUCATIONAL INFORMATION

College(s):___________________________________________________________________________________________

Academic Department(s): _________________________________________________________________________________

Major(s): _____________________________________________________________________________________________

Minor(s): _____________________________________________________________________________________________

Year/Level (Fr, Sp, Jr, Sn): _________________________________________________________________________________

Science GPA: __________________ Non-Science GPA: __________________

Advisor’s Name ___________________________ Department: _____________________

HEALTH AND EMERGENCY INFORMATION

Do you currently have health insurance? __________________________

Health Insurance Carrier: __________________________________ Policy Number: _____________

Emergency Contact Name & Telephone: __________________________

___________________________________________________________________________________________

DEMOGRAPHIC INFORMATION (optional)

The following questions relate to the University's voluntary efforts to enhance diversity in keeping with its education and research missions. They provide important data for assessment of our diversity initiatives and assist us in matching program applicants with appropriate funding sources. This information is not used in making any admission decision. All information is confidential.

Date of Birth: _______________ Sex (M/F): ____  Citizenship: _______________

Please indicate the group(s) listed below to which you belong:

Ethnic: ____Hispanic or Latino  ____ Not Hispanic or Latino

Racial Identifiers:

___ Alaskan Native ___ Indian/Pakistani ___ Other Pacific Islander

___ American Indian ___ Japanese ___ Puerto Rican (Mainland)

___ Black/African American ___ Korean ___ Puerto Rican (Commonwealth)
___ Chinese ___ Mexican American/Chicano ___ Southeast Asian (not Vietnamese)
___ Filipino ___ Native Hawaiian ___ Vietnamese
___ Hispanic/Other (including Cuban) ___ Other Asian ___ White/Caucasian

Disadvantaged Groups:
___ First Generation College ___ Low/moderate income

Do you have a disability? ____ Yes ____ No
If yes, please select disability?
___ Learning ___ Ambulatory
___ Hearing/Speech ___ Sight ___ Other

STATEMENT

Please describe your interest in the Summer Internship Program, including your science and research background, academic accomplishments and future science career plans and goals. Please be sure to include your name on each page attached to this application.

ACTIVITIES

Using a separate sheet, please send a resume that includes a list significant extracurricular activities in which you have been involved. Include specific events or accomplishment in areas such as publication, student government, music, sports, and church or community activities. List the Activity, Year of Participation, and Position Held and/or Honors Won.

Transcripts & Recommendations (2)

SIGNATURE

Signature: _________________________________ Date: _____________________