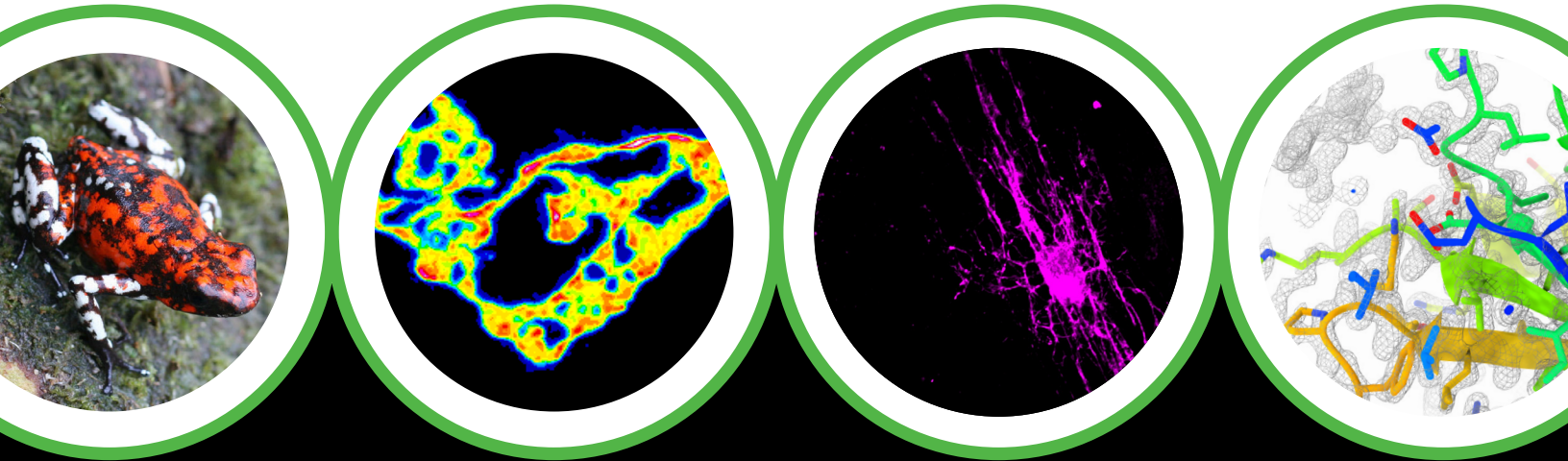


 **Gilliam
Fellows
Program**

2024 Program Announcement



Application Opens

October 19, 2023

Application Deadline

December 7, 2023

Award Notification

June 2024

Fellowship Term Begins

September 1, 2024

Contents

Eligibility	3
Fellowship Term	3
Conditions of Appointment	3
The Award	4
Evaluation And Selection	4
Application	5
Deadline	6
Cover Image Captions	7

Howard Hughes Medical Institute

www.hhmi.org

The Howard Hughes Medical Institute (HHMI) plays a powerful role in advancing scientific research and education in the United States. The Institute is committed to [six core values](#): Excellence, Collaboration, Innovation, Integrity, Inclusion, and Developing Others.

Excellence in science depends on the development of scientists and students from all backgrounds, including people who have been excluded from science because of their background, disability, ethnicity, or race. HHMI initiatives foster scientific environments that are equitable and inclusive for all people. The responsibility for creating an equitable and inclusive environment where everyone can learn, contribute, and thrive rests primarily with the faculty and administrators of the educational institution.

The James H. Gilliam, Jr. Fellows Program

www.hhmi.org/gilliam

The James H. Gilliam, Jr. Fellows Program (the Gilliam Fellows Program) is an initiative of the HHMI Center for the Advancement of Science Leadership and Culture. The Gilliam Fellows Program supports pairs of graduate students and their faculty advisers who, together, embody scientific leadership, an important component of which is a commitment to building an equitable and inclusive science culture.

The program was created in 2004 in honor of the late James H. Gilliam, Jr., a charter Trustee of HHMI and chair of its Audit and Compensation Committee. Mr. Gilliam was a respected business and civic leader who spent his life nurturing excellence and diversity in science and education.

Eligibility

HHMI's Gilliam Fellows Program is open to eligible pairs of thesis advisers and PhD students ("adviser-student pairs").

- » Students must be currently enrolled and in good academic standing in a biomedical or life sciences PhD program at an accredited institution of higher education in the United States or U.S. territory.
- » Students applying for the Gilliam award will be in their second or third year of a PhD program at the time of application and have at least two full years of study remaining as of September 1, 2024. Students enrolled in or affiliated with a dual-degree program (e.g., MD-PhD) are not eligible to apply.
- » The adviser-student pair must be studying scientific problems in biomedical sciences, life sciences, or biological questions in related disciplines. This includes basic research on a variety of biological systems and at all scales including at the molecular, cellular, organismal, ecological, and behavioral levels.
- » The prospective Fellow must be a U.S. citizen, U.S. permanent resident, undocumented childhood arrival, or undocumented individual who has been granted temporary permission to stay in the U.S. (e.g., DACA).¹
- » Each member of the adviser-student pair should be committed to advancing equity and inclusion in science, as demonstrated by responses to questions provided as part of the holistic application.

We welcome applications from eligible persons of all identities.

1. <https://www.uscis.gov/archive/consideration-deferred-action-childhood-arrivals-daca#guidelines>

Fellowship Term

The Gilliam Fellows Program will support students for up to three years of their thesis research, typically in years 3–5 of their PhD studies. The term of the fellowship is for up to three consecutive years unless a deferment of one year or leave of absence is granted by the fellowship institution and approved by HHMI. Advisers and Fellows are expected to participate fully in HHMI programming even if they defer activation of the award.

Conditions of Appointment

Recipients of the Gilliam Fellows Program award will begin the fellowship on September 1, 2024. Gilliam Fellows are required to be enrolled and in good academic standing in a program leading to a PhD in eligible disciplines. During the fellowship term, Fellows are not permitted to receive funds from another extramurally funded fellowship, scholarship, or similar award.

Adviser-Specific Conditions

The dissertation adviser plays a key role in developing graduate students and fostering an inclusive scientific training environment.

As part of the Gilliam award, the adviser is required to complete a year-long course in scientific professional development that focuses on developing mentorship skills that support persons from all backgrounds. The mentorship course is developed and taught by the HHMI Scientific Mentorship Initiative in collaboration with the Center for the Improvement of Mentored Experiences in Research (CIMER). The adviser is required to participate in all activities, including monthly online interactive webinars from October 2024 through March 2025 and two in-person workshops—the first in Spring 2025 and the second in Fall 2025. The mentorship skills development activities will be arranged and paid for by HHMI. If the adviser is unable to participate in the mentorship skills development course in 2024–25, they may request a one-year delay and take the course in 2025–26 even if their student has graduated.

If the adviser has previously completed HHMI's Gilliam mentorship skills development course within the last two years, they are welcome to enroll in the course again. Alternatively, they may choose a faculty colleague (e.g., a member of the Fellow's thesis committee) from their institution to participate in their place; such a substitution must be approved by HHMI.

The Gilliam award includes an Adviser's Allowance to be used by the adviser to support activities aimed at building a healthy and inclusive training environment for graduate students in the adviser's department or institution. While student input is encouraged, it is the responsibility of the adviser to plan and lead the activities. The Allowance may not be used to support additional personnel in the adviser's group, student research stipends, student recruiting, or community outreach.

Fellow-Specific Conditions

During the period when this grant is active, the Fellow is required to participate in the Gilliam Annual Meeting at which the Fellow will present their research and participate in leadership development activities. In addition, in the second and third years of the fellowship term, the Fellow is encouraged to attend one HHMI Science Meeting per year where they will have the opportunity to present their research in a poster session and participate in career-oriented discussion sessions with senior scientists. Travel and accommodations for these meetings will be arranged and paid for by HHMI.

Responsible Conduct

Activities associated with this grant must be conducted in a responsible manner. The Fellow and the thesis adviser(s), and all other persons supported by the grant will be expected to conduct activities according to the highest scientific and ethical standards and in compliance with all applicable laws and regulations and Grantee Institution policies, and the Institute's policies, including those regarding an inclusive and respectful workplace, protection of human research subjects, humane care and use of laboratory animals, and laboratory safety. This extends to activities away from campus, including, for example, participation at meetings and workshops.

In the application and the acceptance of the award and Terms and Conditions, the principals of the application/award will be required to certify, to the best of their knowledge, that there is no formal complaint against or finding of misconduct by any of the principals including the student, adviser, and (if applicable) co-adviser.

The Award

For the 2024 cohort, the total amount awarded will be \$53,000 per year for up to three years. The grant will be paid to the institution, which in turn, will disburse funds to the adviser and Fellow. Annually, the grant includes:

- » The Fellow's stipend of \$36,000;
- » In addition to the stipend, a \$4,000 Fellow's discretionary allowance is provided to support the Fellow's professional development, such as attending scientific meetings, workshops, and courses. The discretionary allowance may be used to pay for health insurance, non-elective medical, dental, and vision

care costs, and expenses associated with mental and emotional well-being. Up to \$1,000 annually may be used to defray food or housing insecurity. A portion of the discretionary allowance may be used to purchase electronic computing equipment for professional purposes to support the Fellow's research and scholarship;

- » An institutional allowance of \$10,000 in lieu of tuition and other fees (including university-sponsored health insurance premiums/coverage). If the cost of tuition and fees exceeds \$10,000, the institution must agree to cover or waive any amount greater than \$10,000; and
- » An Adviser's allowance of \$3,000 to support activities, led by the Adviser, that improve the health and inclusivity of the graduate program (see above).

Gilliam grant funds may not be used to provide supplemental funding or indirect costs, nor may they be used to pay the costs of the Fellow's research including consumable supplies and equipment; payment of these costs is the responsibility of the adviser. Visiting researcher fees or other costs for the Fellow conducting research at an institution other than their own school cannot be charged to this award.

Evaluation and Selection

Each Gilliam application will be evaluated on four criteria by panels of scientists and leaders in graduate education and student training.

1. The demonstrated ability of the student to formulate and creatively pursue interesting scientific problem(s), and their ability to clearly communicate these ideas;
2. The commitment of the student to advancing equity and inclusion in science as demonstrated by their activities and/or their unique experiences that have shaped their leadership philosophy on equity and inclusion, and communication of how they plan to contribute to equity and inclusion in science in their future career;
3. The demonstrated commitment of the thesis adviser to develop as an effective mentor; and
4. The demonstrated commitment of the adviser to advancing equity and inclusion in science and their role in helping to foster a healthy academic scientific ecosystem for all constituencies (e.g., students, postdocs, early career faculty) at their institution.

Application

The adviser serves as Lead Applicant and Project Director for the application. The application will be available after October 19, 2023 through the HHMI Pathway grants management system. Visit pathway.hhmi.org to create or access your Pathway account and to complete the application. The adviser is responsible for adding to the application the name and contact information of the student. The adviser may also add a co-adviser to the application if the student's research plan crosses areas of expertise, or if a co-adviser would strengthen the student's research training experience. Once the student gains access to the system, they will be responsible for adding the name and contact information of an individual other than the adviser who will provide a letter of support.

Detailed information is available on the application form viewed on Pathway. Applicants are encouraged to log on to the system early in the application period to review the prompts and add the student to the application. Materials submitted by the adviser, student, and letter writer will be critical elements in the evaluation of the application.

From the Thesis Adviser

To learn about how the adviser will support the student applicant and other doctoral students in their academic and career trajectory, and to ascertain the adviser's commitment to help create an equitable and inclusive academic scientific environment, the thesis adviser will be asked to provide:

- » Confirmation of the student's eligibility for this program including current enrollment, academic standing, year in program, scientific discipline, and citizenship status (see above, ELIGIBILITY);
- » A biosketch that includes the adviser's academic background and training, contributions to science, adviser-authored publications relevant to the student's research project, and a list of prior trainees and their career outcomes;
- » A list of current and pending research support, specifying the support that will fund the student's project for the duration of their degree program;

- » A letter of support for the student that details evidence of the student's:
 - Promise as a scientist;
 - Potential for leadership in the scientific community and;
 - Commitment to advancing equity and inclusion in science (limit 2 pages);
- » A mentoring plan that:
 - Is tailored to the individual student applicant including a discussion of strengths and areas to be further developed;
 - Includes a description of how the adviser mentored the student in development of their research plan;
 - Describes the adviser's general approach to mentoring individuals in their research group;
 - Includes a description of the mental health/well-being resources on campus;
 - Includes a conflict resolution strategy; and
 - Includes a narrative on what the adviser hopes to gain from the HHMI mentorship skills development course and how they will assess the impact of the course on their mentoring.
- » A statement on what equity and inclusion in science mean to the adviser, and their role in helping to foster a healthy academic scientific ecosystem including a description of specific ways the adviser has engaged in efforts to advance equity and inclusion during their career; and
- » A description of how the adviser plans to use the Adviser's Allowance. Note: Refer to The Award section, Item 4 for allowable uses.

PLEASE NOTE: As part of the application process, the adviser must certify to the best of their knowledge that there is no formal complaint against or finding of misconduct by any of the principals including the student, adviser, and (if applicable) co-adviser.

From the Prospective Fellow

To learn about the student's potential for leadership in science, the prospective Fellow will be asked to provide:

- » Applicant information, including educational history (transcripts are not required);
- » An annotated bibliography of up to five contributions to science, which, for example, can include publications, presentations, and participation in organized activities;
- » A brief overview of the student's dissertation research project written to be understood by a scientist outside the applicant's field, with relevant literature cited. The total length of this document may not exceed three pages, inclusive of text, figures, diagrams, and references;
- » A reflection statement that describes the applicant's commitment to advancing equity and inclusion in science, as evidenced by activities and/or experiences, and their plans to advance equity and inclusion in science in their future career;
- » A career statement that describes: (i) the applicant's professional and personal goals and how the Gilliam award will help the student explore and/or achieve those goals; (ii) their plan for identifying and working towards short- and long-term career goals, including how they are working with their adviser and others to do so; and
- » A description of the emotional and mental well-being resources available to the student on campus and a conflict resolution strategy.

The prospective Fellow will also identify a person other than their adviser who will provide a letter of support on their behalf. This referee should be familiar with the student's experience in science and can be, for example, a former research mentor, a member of the student's dissertation committee, or a person familiar with other aspects of the student's professional experiences and activities. The student is responsible for ensuring that the letter is submitted directly by the referee to the Pathway system. The letter should provide evidence of the student applicant's: (i) promise as a scientist; (ii) potential for leadership in the scientific community; and (iii) commitment to advancing equity and inclusion in science.

Deadline

Application Materials

(from the adviser, student, and reference):

**December 7, 2023 | 2 p.m.
(Eastern Standard Time)**

All eligibility, application materials, and the letter of support must be submitted via HHMI's online application system (HHMI Pathway) by the above deadline.

For more information: www.hhmi.org/gilliam

All inquiries and other correspondence regarding HHMI's Gilliam Fellows Program should be directed to:

Gilliam Fellows Program
Howard Hughes Medical Institute
4000 Jones Bridge Road
Chevy Chase, MD 20815-6789

Email: gilliam@hhmi.org

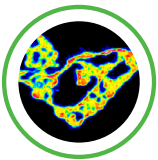
This announcement sets forth basic program information. All awardees are subject to the provisions outlined in the Terms and Conditions

Cover Image Captions



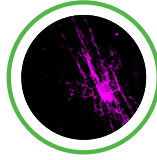
Organisms must evolve behaviors and physiology to cope with and succeed in their environments, which often occurs through the repurposing of molecular components. Poison frogs exhibit massive behavioral diversity, which allows us to explore how behaviors and their mechanisms emerge. For instance, diablito poison frog (*Oophaga sylvatica*, pictured here) mothers perform the majority of parental care, including provisioning of unfertilized egg meals to begging tadpole offspring. This contrasts with closely related species in which only fathers – or both parents – perform care. Poison frogs also exhibit drastic changes in their physiology to overcome environmental challenges, including their namesake sequestration of toxic alkaloids in their diet. We use poison frogs to have an organismal perspective on the molecular machinery that metabolizes and repurposes dietary toxins. In summary, emerging models, such as poison frogs, can offer us unique perspectives into fundamental neural and physiological principles.

(Courtesy of Billie Goolsby, HHMI Gilliam Fellow, Stanford University. Mentor: Lauren O'Connell, PhD)



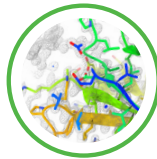
Eukaryotic cells secrete a vast collection of proteins and lipids to sense, react, and adapt to diverse environments and rapidly changing environmental cues. The Golgi apparatus is an evolutionarily conserved organelle that plays crucial roles in the processing and transport of these molecules to ensure their functional integrity and accurate delivery to subcellular locales. In mammalian cells, the Golgi is composed of stacks of flattened membrane disks called cisternae. These stacks laterally connect to each other to create an intricate ribbon (pictured here). Different cisternae within a stack have specialized functions, such as oligosaccharide transfer, proteolytic cleavage, and protein sorting and export. Despite active investigation for over 100 years, key fundamental questions regarding the organization and basic mechanism of Golgi function remain unsettled and are intensely debated today. By combining advanced 4D microscopy of live cells with pulse-chase assays and genome editing, we aim to determine how proteins and lipids move through the different compartments of the Golgi, and how the diverse functions of the Golgi are coordinated in space and time. Answering these questions will enable us to generate a unified model of Golgi function across species.

(Courtesy of Fernando Valbuena, HHMI Gilliam Fellow, The University of Chicago. Mentor: Benjamin Glick, PhD)



Myelin, a lipid rich substance, provides insulation to neurons by wrapping around axons, allowing for fast and efficient transfer of communication between neurons. During early brain development, oligodendrocyte progenitor cells undergo a carefully timed process involving differentiation, maturation, and migration to properly myelinate the brain. This process is critical for brain connectivity and function. Our lab uses stem cell models to understand cell transitions during early brain development. To study early myelination patterns, we generate oligodendrocytes from human pluripotent stem cells and maintain the cells on nanofiber culture systems, which serve as a substitute for axons. Here is an oligodendrocyte in magenta generating myelin and wrapping around nanofibers in vitro.

(Courtesy of Melanie Gil, HHMI Gilliam Fellow, Vanderbilt University. Mentor: Vivian Gama, PhD)



Pseudomonas aeruginosa is a ubiquitous Gram-negative bacterium best known for infecting the lungs of cystic fibrosis (CF) patients and is one of the major causes of chronic nosocomial infections across the globe. *P. aeruginosa* is highly versatile and can grow either planktonically or within a biofilm. Biofilms are complex microbial structures capable of providing an advantageous protective quality that allow bacteria to become significantly more resistant to antibiotic treatments, representing a major health threat. A novel two-component signal transduction system, BqsR/S, regulates biofilm formation and decay in *P. aeruginosa* through the sensing and binding of environmental ferrous iron (Fe²⁺). However, neither of these proteins have been structurally characterized, the details of how and to what extent these proteins interact with Fe²⁺ remain unknown, and it is unclear how environmental Fe²⁺ is linked to biofilm formation and dispersion. Our aim is to understand the structure and the function of this two-component system, with the ultimate goal of providing additional targets for the development of novel therapeutics. In our work, we have expressed, purified, crystallized, and determined the structure to 1.3 Å resolution of the N-terminal phosphorylation domain of the *P. aeruginosa* response regulator BqsR. This structure (depicted here in cartoon form) reveals a canonical (β₅)₂ response regulator assembly that consists of a central five-stranded parallel β-sheet surrounded by five α-helices. This structure is the first of its kind to be determined for this important two-component system. Future work will provide additional structural and mechanistic insight into this key *P. aeruginosa* two-component system, ultimately providing therapeutic targets to treat this problematic and increasingly antibiotic-resistant pathogen.

(Courtesy of Alexander Paredes, HHMI Gilliam Fellow, University of Maryland, Baltimore County. Mentor: Aaron Smith, PhD)