



Connections



HARVARD INTEGRATED LIFE SCIENCES

Harvard Kenneth C. Griffin Graduate School of Arts and Sciences, 2026–27

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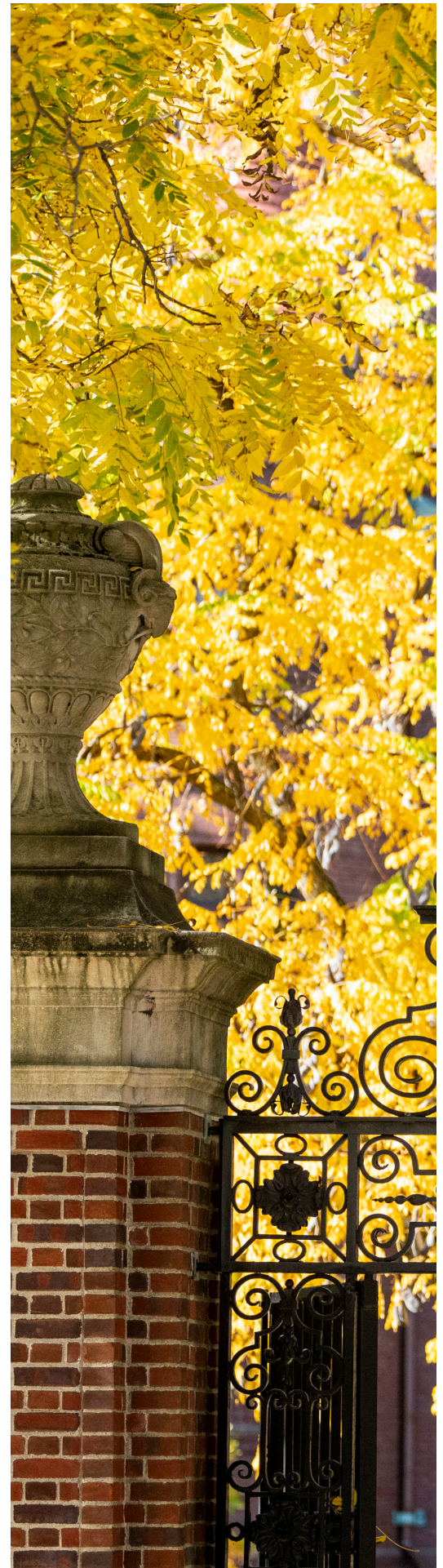
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Harvard Integrated Life Sciences

Harvard Kenneth C. Griffin Graduate School of Arts and Sciences (Harvard Griffin GSAS) offers life sciences PhDs in 13 areas of study across three Harvard faculties—Harvard Faculty of Arts and Sciences, Harvard T. H. Chan School of Public Health, and Harvard Medical School. HILS programs offer students a diverse range of options to find the best fit in regards to subject area, program structure, and size. While there is a lot to choose from, the fact that each program has its own identity allows students and faculty to be integrated into supportive communities while also being able to take advantage of all that Harvard has to offer.

Visit gsas.harvard.edu/programs/life-sciences to learn more.

Harvard Life Sciences PhD Programs

- Biological and Biomedical Sciences
- Biological Sciences in Public Health
- Biomedical Informatics
- Biophysics
- Chemical Biology
- Chemistry and Chemical Biology
- Immunology
- Molecular and Cellular Biology
- Neuroscience
- Organismic and Evolutionary Biology
- Speech and Hearing Bioscience and Technology
- Systems, Synthetic, and Quantitative Biology
- Virology

The HILS Faculty Directory

1. Scan the QR code.
2. Type in words related to your research interests.
3. Browse HILS faculty, noting their research descriptions and PhD program affiliations.



HILS Faculty Directory

Studying the Life Sciences at Harvard

Harvard Griffin GSAS provides exceptional opportunities for study across the breadth and depth of the life sciences through the Harvard Integrated Life Sciences (HILS) alliance. Whether you are interested in conducting research on virus structures at the atomic level or on environmental impact in large ecosystems, you will find a good fit for your academic goals in one of HILS's 13 life sciences PhD programs.



What HILS Offers

As a HILS student, you will have access to University-wide training resources and facilities and more than 800 affiliated faculty. HILS offers flexibility including options to take courses, do laboratory rotations, and even choose a dissertation advisor from across HILS, subject to specific program requirements and lab availability. However you customize your training, HILS is with you every step of the way.



Harvard Integrated Life Sciences PhD Programs

Biological and Biomedical Sciences (BBS)

BBS combines a broad choice of research topics and labs with the cohesiveness of special-interest communities: biological chemistry and molecular pharmacology, cancer biology, cell biology, developmental and regenerative biology, genetics, human biology and translational medicine, microbiology and immunobiology, stem cell and regenerative biology, and therapeutics.



Biological Sciences in Public Health (BPH)

Rooted in the rich environment of the Harvard T.H. Chan School of Public Health, BPH trains students in individual fields of biological research with a focus on understanding, preventing, and treating human diseases affecting large populations. The program provides students with research training opportunities in a wide range of areas including the metabolic basis of health and disease, infectious diseases, gene-environment interactions, and immunology and inflammation.



Biomedical Informatics (BMI)

BMI PhD students pursue one of two tracks: Bioinformatics and Integrative Genomics (BIG) or Artificial Intelligence in Medicine (AIM). The BIG track focuses on developing novel approaches and new technologies to address fundamental biomedical questions, whereas the AIM track focuses on harnessing real-world health data and AI methods to transform health care.



Biophysics

The biophysics program prepares students with diverse scientific backgrounds for independent research careers in which the concepts and methods of physical science are applied to biological problems. Applicants should have sound preliminary training in a physical or quantitative science, especially chemistry, physics, computer science, or mathematics.



Chemical Biology (ChemBio)

ChemBio is a rapidly growing field that combines the rigor and quantitative aspects of traditional chemistry and biochemistry programs with the excitement and medical relevance of modern molecular, cellular, organismic, and human biology. The ChemBio program equips PhD candidates with the appropriate experimental and theoretical knowledge to use chemical tools—such as single-molecule measurements, single-cell imaging, and the use of exogenous molecules to modulate the activity of cellular components—to understand biological processes.



Harvard Integrated Life Sciences PhD Programs

Chemistry and Chemical Biology (CCB)

CCB offers a PhD in chemistry at the frontiers of research in the chemical and life sciences. Research and training opportunities are offered in many subdisciplines of chemistry, including chemical biology, inorganic, organic, physical, and theoretical. Housed at Harvard's Cambridge campus, CCB admits students with a record of classroom and laboratory training in biological, organic, inorganic, and physical chemistry.



Immunology

The immunology program offers PhD students an education in basic biology, a sophisticated training in immunology, and exposure to the immunological and non-immunological problems of disease. The program offers multidisciplinary training that exposes students to traditional fields of medical biology as well as to all major areas in the expanding field of immunobiology including transplantation, neuro-immunology, autoimmunity, stem cell biology, infection and immunity, human translational immunology, tumor immunology, immunobiology, and mucosal immunity.



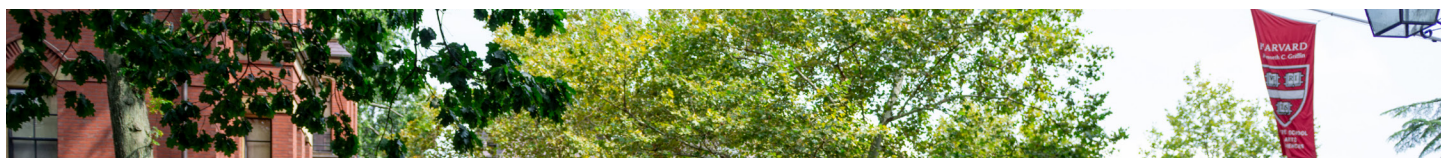
Molecular and Cellular Biology (MCB)

MCB hosts the molecules, cells, and organisms (MCO) graduate program that trains future leaders of scientific research in all areas of modern biology. Research and teaching in the MCO graduate program is organized along four tracks: biochemistry, chemical, and structural biology (BCSB); cellular, neuro and developmental biology (CND); genetics, genomics and evolutionary biology (GGE); and systems and computational biology (SCB). MCB also hosts a program in engineering and physical biology (EPB).



Neuroscience (PiN)

The program in neuroscience (PiN) offers graduate students comprehensive training across the spectrum of neurosciences including cellular and molecular processes at the foundation of neural development and function to integrative processing in the central nervous system, and mechanisms and treatment of human neurologic disease. PiN is an interdepartmental program, and students have access to neuroscientists across the entire University—including a large group of clinical and basic science faculty at Harvard Medical School, Harvard-affiliated hospitals and research centers, and the Faculty of Arts and Sciences.



Harvard Integrated Life Sciences PhD Programs

Organismic and Evolutionary Biology (OEB)

The members of the department of OEB share a common interest in understanding the structure, function, and variation of biological systems. Research interests of OEB faculty include the flow of energy and material through ecosystems; the development and structure of communities and populations; the diversity of plant, animal, and microbial groups; and the mechanisms that have permitted diversity to evolve. There is representation in anatomy, behavior, biogeochemistry, development, functional morphology, physiology, paleontology, population genetics, molecular evolution, systematics, and the biology of global change.



Speech and Hearing Bioscience and Technology (SHBT)

SHBT provides multidisciplinary PhD research training in basic, clinical, and applied approaches to the study and treatment of all aspects of human communication and its disorders. SHBT seeks students who share an interest in speech and hearing in its broadest definition—the belief that progress in this area requires the coordinated effort of engineers, scientists, and clinicians, and the understanding that real-world applications require coupling the discoveries and the people behind them with appropriate industrial partners.



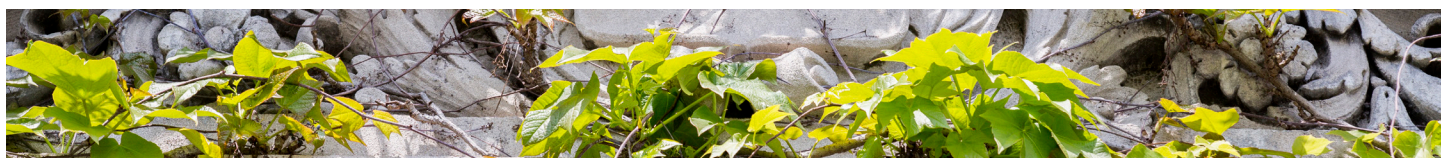
Systems, Synthetic, and Quantitative Biology (SSQB)

The SSQB program engages graduate students in explaining how the higher-level properties of complex biological systems arise from the interactions among their parts. This field requires a fusion of concepts from many disciplines, including biology, computer science, applied mathematics, physics, and engineering. Students with backgrounds in any of these disciplines are encouraged to apply.



Virology

Virology includes research on biochemical mechanisms of cell growth control, transformation, signal transduction, and transcriptional regulation; the molecular genetics, molecular biology and molecular pathogenesis of latent, persistent, or cytolytic virus infections; the characterization of virus-receptor interactions and the mechanisms of cell entry; structural studies of viruses and viral proteins; the use of viruses vectors for heterologous gene expression and for gene therapy; the interaction of viruses with cells involved in non-specific or specific immune responses; the pathogenesis of viral infection; and rational antiviral drug design.



Enrichment and Certificate Programs

Students in Harvard Integrated Life Sciences (HILS) PhD programs can also join optional, interdisciplinary concentration programs. These programs allow students to become members of more specialized communities that come together through shared intellectual interests. The rigor and commitment of these concentrations vary considerably, from no formal requirements whatsoever to an additional application process with course requirements that yield a certificate. Students may join one or more concentrations or none at all. Some are open to all HILS students, others are restricted to those in specific PhD programs.

Developmental and Regenerative Biology

The **Developmental and Regenerative Biology** program (DRB) provides a rigorous and innovative training experience in stem cell, developmental and regenerative biology for Harvard graduate students. The DRB program also offers professional development opportunities, including a Student-Faculty Seminar series, mentoring meetups, and an annual student-organized retreat. Students meet for data club and happy hour once a month, and the broader DRB community also gathers quarterly for a variety of fun social activities.

More information: drb.hms.harvard.edu



Graduate Program in Bacteriology

The **Graduate Program in Bacteriology** (GPiB) is a graduate concentration that aims to create community, collaboration, and career development support for students working on diverse aspects of bacteriology at Harvard. The program includes courses and provides students with opportunities to engage with each other in data clubs, journal clubs, social hours, peer mentoring events, and more. In addition, the program provides supplementary advising and hosts career chats with alumni and other events to help prepare students for their next steps after graduation.

More information: bacteriology.hms.harvard.edu



Infectious Diseases Consortium

The **Infectious Diseases Consortium** (IDC) is made up of students, fellows, and faculty from the Harvard community who share an interest in understanding infectious diseases and their effects on people and societies. IDC activities include a J-term “Intro to Infectious Diseases” boot camp course, seminars, mentoring events with infectious disease professionals in diverse careers, social activities, data clubs, peer mentoring, and an annual retreat.

More information: idc.hms.harvard.edu



Landry Cancer Biology Consortium

The **Landry Cancer Biology Consortium** (LCBC) was created in order to bring students and faculty from across the Harvard community together through a shared interest in all of the multidisciplinary aspects of cancer biology research. Community events include annual symposia that highlight cutting edge cancer research, student-driven data clubs, student-faculty happy hours, career and networking events, and more.

More information: landrycancer.hms.harvard.edu



Leder Human Biology and Translational Medicine

The **Leder Human Biology and Translational Medicine** Program (LHBTM) is a 1.5-year program that provides PhD students with a working knowledge of the fundamentals of human biology and disease through a series of courses designed to enrich their training in translational science. The program aims to demystify the culture and practice of medicine, facilitating future collaborations between clinicians and basic scientists. Students who successfully complete the LHB Program will receive certificates in Human Biology and Translational Medicine with their PhDs.

More information: lhbtm.squarespace.com



Molecular Mechanistic Biology

Molecular Mechanistic Biology (MMB) is an interdisciplinary community whose members are driven by the molecular-level study of biochemical, biophysical, and cellular mechanisms. The goals of MMB are (1) to extend students' breadth of knowledge beyond their coursework and thesis laboratories and (2) to expand their professional networks beyond their individual departments and graduate programs. Opportunities including the annual symposium and monthly work-in-progress talks enable students to hear about each other's work and to receive feedback from peers and faculty mentors throughout the HMS community. MMB is sponsored by the departments of Biological Chemistry and Molecular Pharmacology (BCMP) and Cell Biology under the MCD2 training grant.

More information: mmb.hms.harvard.edu



Therapeutics Graduate Program

The **Therapeutics Graduate Program** (TGP) provides students with the scientific, laboratory, computational, and professional skills needed to excel in academic and biopharmaceutical careers. TGP offers rigorous multidisciplinary training in the sciences relevant to therapeutics discovery, development, and applications to improve the treatment of disease. We provide students with hands-on experiences and networking opportunities that will open fulfilling careers and leadership trajectories in the field of therapeutics.

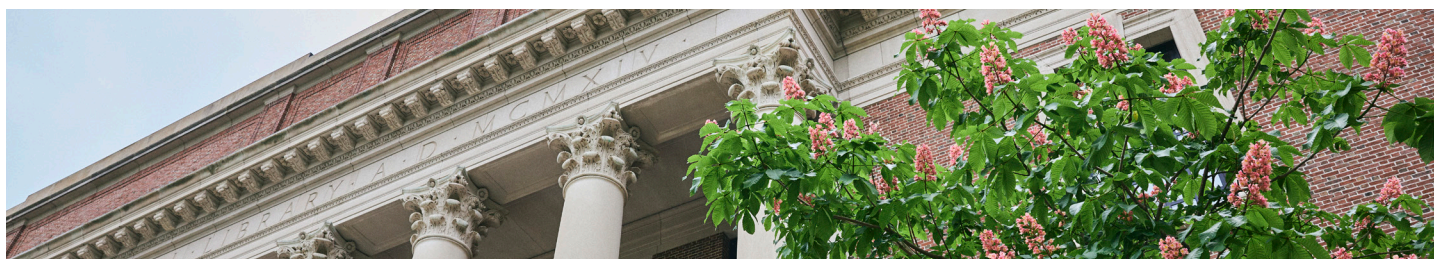
More information: tgp.hms.harvard.edu



Program in Genetics and Genomics

The **Program in Genetics and Genomics** (PGG) offers many opportunities to meet students, fellows, and faculty from across multiple HMS departments who share an interest in genetics and genomics. Membership is open to all Harvard BBS students. In addition to being exposed to a wide variety of cutting-edge research, students receive individualized research mentoring and develop effective communication skills. Many PGG events are student-run, so events directly meet student needs. There is no formal application process for admittance.

More information: projects.iq.harvard.edu/pgg



Signal of Strength



ANITA REDDY, PHD '24

BIOLOGICAL AND BIOMEDICAL SCIENCES

*Member of the Minority Biomedical Scientists Association
of Harvard Griffin GSAS*

Let's say you go to the gym and lift weights. The strain creates microtears in muscles that signal to a wide variety of cell types—including immune cells, motor neurons, and satellite cells—that play a role in muscle regeneration. But what are those signals? Where do they come from? And what is their vehicle?

Those are some of the questions that Anita Reddy, PhD '24, and her colleagues in the lab of Harvard Medical School Assistant Professor Edward Chouchani wanted to investigate.

"We found that during exercise, the metabolite succinate is selectively released from exercising muscles," Reddy says. "It signals to non-muscle cells—specifically stromal cells—that play an important role in muscle repair. When succinate is released, there is an increase in the muscle motor neurons and the strength of mice in our experiments. That's really important because increased muscle innervation leads to increased strength—and increased strength helps with the prevention of arthritis and bone fractures."

**"I feel incredibly supported
by the people in my lab."**

—ANITA REDDY

The daughter of Indian immigrants, Reddy says she chose Harvard Griffin GSAS because she wanted to work with brilliant people at facilities as good as any in higher education. As a student of color, she also wanted to be part of a community in which she felt she belonged. Fortunately, Reddy says she's found both at Harvard Griffin GSAS.

"We can run some experiments in a day that might take a month at other institutions," she says. "And as a member of the Minority Biomedical Scientists Association of Harvard Griffin GSAS group, I've found people that I can really look up to and confide in as well—even about non-lab-related things."



Stopping Cervical Cancer Before It Starts

ALTON GAYTON, PHD '26

VIROLOGY

Member of the Leder Human Biology and Translational Medicine Training/Certificate Program



Cervical cancer remains one of the most preventable forms of cancer, and it is one of the few cancers that can be prevented before it develops. Even still, human papillomavirus, commonly abbreviated as HPV, continues to affect hundreds of thousands of women worldwide. Existing vaccines are highly effective at preventing infection, but they offer little help once someone has already contracted the virus.

Harvard virologist Alton Gayton took matters into his own hands, examining pre-cancer but post-infection intervention methods as the focus for his doctoral research.

Working in the laboratory of Professor Gaurav Gaiha at the Harvard Medical School, Gayton formulated a therapeutic vaccine designed to train the immune system to recognize and eliminate cells infected with HPV. Rather than targeting tumors after they form, Gayton's approach intends to intervene earlier.

**"It's a very different approach...
and seeing it work so
effectively in the lab was one
of the highlights of my PhD."**

—ALTON GAYTON

So far, the results have been promising. In preclinical studies with a cervical cancer model, the vaccines demonstrated a powerful ability to prevent the growth of tumors and eliminate existing ones. While reflecting on his research experience, Gayton expressed that "it's a very different approach from what has been tried before, and seeing it work so effectively in the lab was one of the highlights of my PhD."

Raised in Raleigh, North Carolina, Gayton originally planned to study nuclear chemistry in college, though his biology class inspired him to approach science from a new perspective. "HPV stuck out to me because it was the perfect marriage of my interests: a tiny virus that causes a massive problem like cancer," rationalized Gayton. Inspired by his mother's role as a third-grade teacher, Gayton's love for learning and teaching evolved; in fact, he became the first person in his extended family to get a PhD.

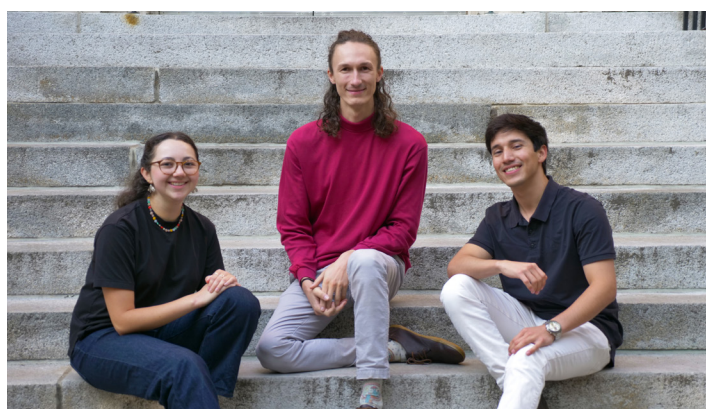
"Being able to work on something that could potentially prevent cancer for millions of women is exactly why I wanted to become a scientist," elaborated Gayton. "And doing it here at Harvard? Like I told my grandmother, I still can't believe it." Alton Gayton's pioneering work to treat and preclude cervical cancer is inspirational, paving the way for other researchers to devise new strategies to prevent diseases before they begin.



A Welcoming Community

Different points of view are critical to life sciences research, in which advancing knowledge often requires bringing a new perspective or approach to a problem. At Harvard Griffin GSAS, we strive to create a welcoming community where all students can thrive and grow academically and personally. The School is proud of its vibrant and inclusive community, where individuals bring a wide range of perspectives, experiences, and backgrounds that enrich the learning environment, and welcomes applications from individuals from all backgrounds.

Visit gsas.harvard.edu/culture-community-and-engagement to learn more or contact the Harvard Griffin GSAS Office of Culture, Community, and Engagement at gsas_recruitment@fas.harvard.edu.

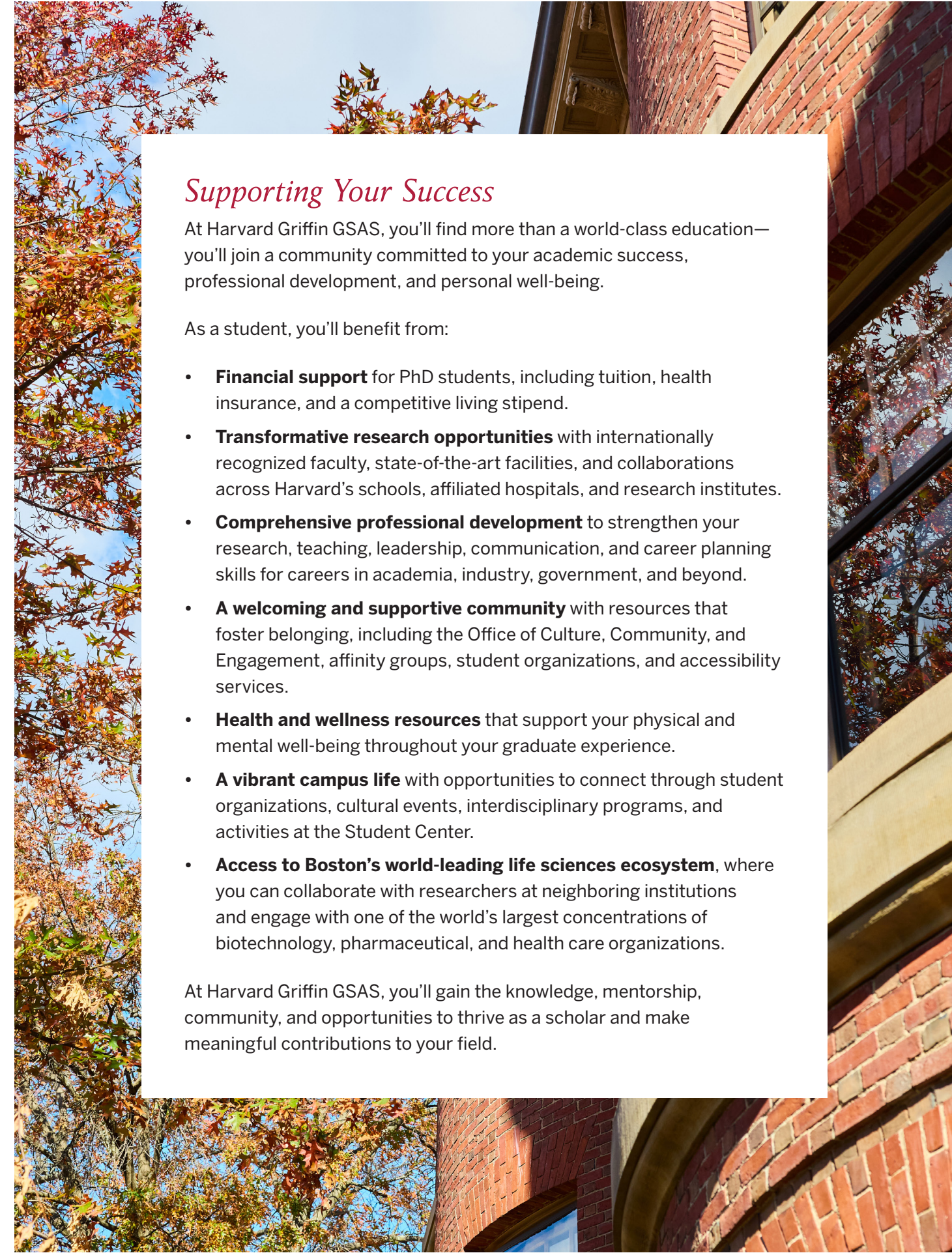




Finding Your Place in Harvard Life Sciences

We are looking for creative people from a variety of backgrounds who are passionate about the life sciences, have enjoyed a previous research experience, and are ready to dedicate time to identifying and investigating new ideas. If this describes you, we encourage you to explore the cutting-edge science and training opportunities in the HILS programs and apply.





Supporting Your Success

At Harvard Griffin GSAS, you'll find more than a world-class education—you'll join a community committed to your academic success, professional development, and personal well-being.

As a student, you'll benefit from:

- **Financial support** for PhD students, including tuition, health insurance, and a competitive living stipend.
- **Transformative research opportunities** with internationally recognized faculty, state-of-the-art facilities, and collaborations across Harvard's schools, affiliated hospitals, and research institutes.
- **Comprehensive professional development** to strengthen your research, teaching, leadership, communication, and career planning skills for careers in academia, industry, government, and beyond.
- **A welcoming and supportive community** with resources that foster belonging, including the Office of Culture, Community, and Engagement, affinity groups, student organizations, and accessibility services.
- **Health and wellness resources** that support your physical and mental well-being throughout your graduate experience.
- **A vibrant campus life** with opportunities to connect through student organizations, cultural events, interdisciplinary programs, and activities at the Student Center.
- **Access to Boston's world-leading life sciences ecosystem**, where you can collaborate with researchers at neighboring institutions and engage with one of the world's largest concentrations of biotechnology, pharmaceutical, and health care organizations.

At Harvard Griffin GSAS, you'll gain the knowledge, mentorship, community, and opportunities to thrive as a scholar and make meaningful contributions to your field.



How to Apply

Interested students should visit gsas.harvard.edu/programs/life-sciences to identify the program that best suits their interests and research experience and to learn more about the application process and requirements.

Some factors to consider to find the best fit include: subject area, curriculum, program size, learning environment, and affiliated faculty. You can visit the individual program websites and compare each program's offerings and requirements.

One of the benefits of applying to study at Harvard is the ability to truly explore the scope of the life sciences by expressing interest in more than one area. Harvard Griffin GSAS will accept up to three applications to different degree programs in a single year. Each application must be unique, containing a separate statement of purpose, transcripts, recommendations, and test scores; each application also requires a separate application fee. Please note that each submitted application counts toward the lifetime maximum of three applications per degree program.

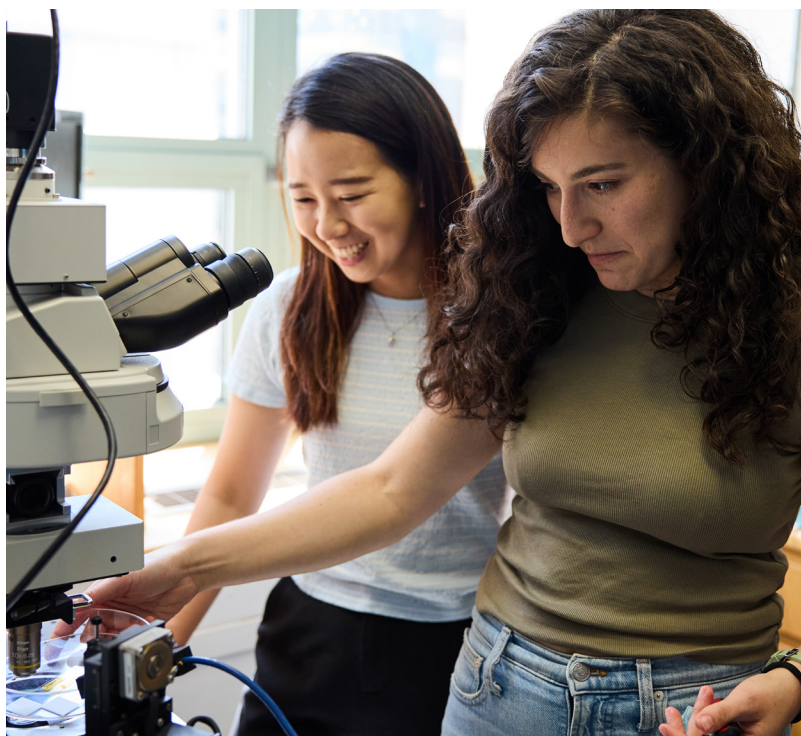
While each program has its own admissions requirements and committee, all HILS programs take an integrated look at each application, holistically evaluating all aspects of the application rather than relying on any single factor to determine admission.

Visit gsas.harvard.edu/apply to apply.

Application Checklist

- ❑ Application Fee
- ❑ GRE*
- ❑ Letters of Recommendation
- ❑ Statement of Purpose
- ❑ Transcripts
- ❑ Personal Statement*

* if applicable



Connections

HARVARD INTEGRATED LIFE SCIENCES

Harvard Kenneth C. Griffin Graduate School of Arts and Sciences does not discriminate against applicants or students on the basis of race, color, national origin, ancestry, or any other protected classification.

For more information about Harvard Integrated Life Sciences:

PROGRAMS gsas.harvard.edu/programs/life-sciences

APPLY gsas.harvard.edu/apply

CULTURE, COMMUNITY, AND ENGAGEMENT gsas.harvard.edu/culture-community-and-engagement

CONTACT HILS hils@fas.harvard.edu

Professor Rosalind Segal, Co-Director

Professor Elena Kramer, Co-Director

Samantha Reed, Executive Director

Xavier du Maine, PhD, Assistant Director of Culture, Community, and Engagement

Nicole Santorella, HILS Coordinator



HARVARD Kenneth C. Griffin
GRADUATE SCHOOL OF ARTS AND SCIENCES



**Scan to express your
interest in HILS at
Harvard Griffin GSAS!**