**Current Training Grants at UGA**

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UGA has a **T32 Genetics Training Program grant** from **NIH** (current end date 6/2027).The mission of the Genetics Training Program (GTP) in the broadest sense is to train eight Ph.D. students who will become successful life scientists who can work as independent researchers and educators in academic or industrial jobs. More specifically, the GTP seeks to (i) help a diverse cohort of students develop the research and professional skills to become leaders in the biomedical workforce, and (ii) create a supportive training environment where all students have the potential to succeed. To this end, our program of study provides graduate training across a broad range of modern genetics subdisciplines, coupled with professional development and career awareness. Foundational to our training goals, our program strives to maintain a training environment that is welcoming and inclusive and to prioritize the holistic development of both trainees and their mentors. The 51 trainers come from 10 departments and span the breadth of genetics research. Trainers are committed to mentoring and providing a supportive and inclusive training environment, and the program has mechanisms in place to support trainers as they continue to develop their own mentoring skills. GTP students enter UGA through one of two umbrella programs that employ a holistic admissions process. The GTP core curriculum is required for trainees and is open to all students in GTP trainer laboratories. This curriculum includes training in genetic methods and analyses, quantitative and analytical skills, and oral and written communication. Courses emphasize cohort-building and use active learning strategies, and skills are mastered through iterative practice. The importance of rigor and transparency, and of responsible conduct in research, are introduced in specialized foundational classes and then reinforced through integration into subsequent coursework and thesis research. Professional development opportunities expose students to the diverse career options available to them and help students gain the skills and networking opportunities needed to access these positions. Student progress is monitored through regular assessment, and students are guided toward increasing research independence through active mentoring. Students graduate with advanced genetics knowledge, strong analytical and communication skills, and the confidence to lead and succeed in the biomedical workforce.

The objective of UGA’s **T32** **Glycoscience Training Program (GTP)** from **NIH** (current end date 06/2027) for Predoctoral Students is to train the next generation of glycoscience researchers and prepare them for impactful careers in the biomedical workforce. No other T32 training program in the United States focuses on glycans; thus, the GTP broadens the scope of NIH-supported training programs. The GTP capitalizes on the uniquely rich environment for carbohydrate research that exists at the University of Georgia. Twenty-four researchers from eight departments serve as trainers for a diverse group of pre-doctoral students. Trainees are selected from a pool of applicants that enter the university’s graduate program either through the Integrated Life Sciences (ILS) umbrella program or through admission into the Department of Chemistry. The grant provides stipends for six trainees per year for two-year appointments. The university provides funding for two additional trainees per year to expand the impact of the GTP. The principal objective of this program is to provide a broad background in glycoscience with the ability to carry that knowledge forward into a variety of careers. Training emphasizes scientific reasoning, rigor in research design, quantitative skills, and data analysis. All trainees enroll in professional development courses on the Responsible Conduct of Research and on Rigor, Reproducibility, and Transparency, and take foundational courses in Glycochemistry and Glycobiology. All these courses are open to any student, broadening the impact of the GTP beyond the T32-supported trainees. Trainees can select from a variety of courses to build knowledge and skills in analytical, computational, or biological methods. Opportunities are provided to develop strong written and oral communication skills in coursework, journal clubs, and seminar programs. The trainers provide a supportive, inclusive, and diverse training environment, and are committed to continuous improvement as mentors through participation in workshops and training programs on topics such as effective mentoring, safe space in the workplace, and implicit bias. In addition, emphasis is placed on recruiting students from underrepresented minorities.

UGA has an **LSAMP** **grant** from **NSF** (07/2022 – 06/2027). The **Louis Stokes Alliances for Minority Participation (LSAMP)** program assists universities and colleges in diversifying the STEM workforce through their efforts to significantly increase the number of students successfully completing high-quality degree programs in science, technology, engineering, and mathematics (STEM) disciplines. Particular emphasis is placed on transforming STEM education through innovative recruitment and retention strategies and experiences in support of groups underrepresented in STEM disciplines: African Americans, Alaskan Natives, American Indians, Hispanic Americans, Native Hawaiians, and Native Pacific Islanders.

The Peach State Louis Stokes Alliance for Minority Participation consists of Fort Valley State University (FVSU, an HBCU), Georgia State University Perimeter College (GSU-PC, a two-year institution), Georgia Institute of Technology (GT), Kennesaw State University-Kennesaw Campus (KSU-K), Kennesaw State University-Marietta Campus (KSU-M) and Savannah State University (SSU, an HBCU).

Peach State LSAMP leverages funding, resources, partnerships, and commitments of each member institution to provide academic, social, professional, and financial support and programming for LSAMP populations pursuing baccalaureate degrees in STEM fields of study. Over five years, the Alliance is conducting scholarly research to understand the impact and student outcomes for LSAMP students as they engage in research through a Vertically Integrated Project (VIP) program. The LSAMP VIP program is a transformative approach for engaging undergraduate and graduate students in ambitious, long-term, large-scale, multidisciplinary project teams led by faculty solving real-world problems.

The Peach State LSAMP program is comprehensive and designed to enhance academic and research outcomes, including well-prepared and successful professionals underrepresented in STEM disciplines, evidence-based mentoring and student retention models, and a sound and rigorous evaluation plan. The program leverages its institutional research infrastructure and collaborates with other organizations and industry partners to help students underrepresented in STEM transition into applied and research-based STEM careers.

The student academic and professional development interventions implemented in this project have transferable value for STEM students and other institutions worldwide. The long-lasting impacts from outcomes achieved are creating a more diverse and inclusive environment on college campuses and in the STEM workforce. Ultimately, the Peach State Alliance will contribute significantly to preserving and improving the United States’ competitiveness in overcoming key global technology, health, and economic development challenges.

**UGA** has an **NRT grant** from **NSF** titled **Quantum Networks Training and Research Alliance in the Southeast (ending in 06/2027).** Quantum networks enable more efficient information processing, promising functionality that is faster and more secure than the classical networks that undergird current communication technologies. Research on quantum networks has the potential to contribute to fundamental discoveries in quantum science as well as key applications in cybersecurity, quantum sensors, and quantum computing. However, to realize the promised advantages of a quantum Internet, many fundamental science and engineering challenges must be overcome. Tackling these challenges requires a convergence of expertise from science and engineering disciplines and the development of a well-trained, interdisciplinary quantum networks workforce. The overarching goal of this NSF Research Traineeship (NRT) project is to advance the design and development of components and applications of quantum networks and to establish the first comprehensive, interdisciplinary quantum information science and engineering (QISE) training program in the Southeast. Representing a collaboration between the University of Georgia and the University of Tennessee at Knoxville, this training program serves 54 master’s and doctoral students, including 34 funded trainees in science and engineering.

This project carries out quantum networks research in three key areas. The first centers on quantum network building blocks: single photon emitters, qubit realization, quantum photon measurement, quantum information theory, and cybersecurity. The second encompasses quantum devices: networked quantum computing, networked quantum sensors, and materials for quantum network components. The third area considers scientific and engineering applications: space-based entangled photon sources, quantum random number generators, the power grid, quantum resource estimation, and on-chip technology. These three research thrusts are bridged by three cross-disciplinary research perspectives: experimentation, simulation, and engineering. The training program and workforce development significantly contribute to fulfilling the pressing need for a skilled QISE workforce in academia, national laboratories, and industry. It includes components uniquely designed to increase the involvement of diverse students in QISE. It strengthens existing ties that the two collaborating institutions have with historically Black colleges and universities and the Louis Stokes Alliances for Minority Participation (LSAMP) Leadership and Academic Enhancement Program for robust recruitment, mentoring, and retention of women and minority students from groups underrepresented in the field. In addition, it engages potential undergraduate recruits with QISE topics via introductory QISE courses that can be taken for credit across institutions. This traineeship model creates an interdisciplinary, workforce-aligned program integrating experimental, simulational, and engineering experiential learning to galvanize a diverse community of graduate students toward careers in QISE.

UGA’s **R25 SISTEMAS** grant from **NIH** (05/2022 – 03/2027) supports and equips underrepresented students, with a particular focus on Latinx Multilingual Learners (LML), to enter the STEM pipeline and persist. The proposal addresses the issue at the beginning of the pipeline when children often decide whether they can do science and math and whether they can become future scientists. The research team hypothesizes that if students are exposed to inclusive, strategically designed learning environments in which they develop their scientific literacy and 21st-century problem-solving skills, more students will consider science as a possible career choice. The project is articulated in four specific aims that include: (1) creating two new versions of Virtual Vet, a narrative rich read aloud version and Spanish version, to reach a more diverse student population with the international, award-winning serious game; (2) developing a new immersive environment, Virtual Vet Middle Grades, that targets a deeper understanding of the human body through the study of genetics; (3) creating a responsive and customized environment in Virtual Vet that leverages deep learning approaches to provide timely feedback to students and teachers; and (4) developing a 5-day STEM camp on the campus of the University of Georgia in the Genetics department to provide inclusive and ambitious science learning experiences specifically supporting LML students by providing instruction in English and Spanish. Through a partnership with six school districts, more than 6,000 students garner access to Virtual Vet and Virtual Vet Middle Grades. This sample size equips the research team to examine student knowledge, attitudes toward science, interest in pursuing a science field, and students' mindset toward learning with a particular focus on how novel translanguaging supports equip LML learners to succeed in science in a digital environment.

UGA has a **USDA training grant** that focuses on **Crop Genetics and Genomics II: Promoting Diversity in Agriscience** through Undergraduate Mentoring in Research and Extension (03/2022-02/2027). This project aims to empower undergraduate Fellows to help shape the future of the AgroSciences by building their research self-efficacy, scientific competencies, and expectations that they will realize positive outcomes by pursuing agriscience careers. Building on a previous REEU, the program supports fifty Fellows from underprivileged communities in Georgia and the Southwest over five years. Additional efforts are made to increase the diversity of Fellows, mentors, and the REEU support community and provide mentors with professional development. Fellows undertake hands-on research in crop genetics and genomics and are trained in research ethics and science communication. Fellows attend plant breeding and organic farm field trips to learn different crop production systems and how genetic and genomics research is used to improve crops. Fellows participate in a service-learning project to develop an understanding of the connection between research, extension, and crop production. Fellows incorporate their research and service-learning experiences into a public communication and outreach blog and write articles for the UGA Extension newsletter to discuss the farm-to-table concept. A weekly career counseling series exposes Fellows to career options in extension, industry, government, and academia, including meetings with different plant research graduate student communities. Formative and summative assessments through focus groups, interviews, skills assessments, and pre-/post-program surveys yield evaluation data useful for making improvements and documenting outcomes and impacts in consultation with the advisory group. Our primary mission is to develop plant scientists who can address the challenges facing U.S. agricultural competitiveness and food production.

UGA has an **R25** **grant**, **ESTEEMED**, from **NIH’s Institute of Biomedical Imaging and Bioengineering** (07/2021-06/2026). Led by a diverse multiple PI team, the UGA ESTEEMED program leads ESTEEMED scholars along a path of increasing challenges — a path that includes the application of biomedical research — toward the goal of interest and success in doctoral work. The scholars enter the ESTEEMED program through a summer bridge curriculum and a co-located biomedical living-learning community, which ensures that they are engaged and networked. In their first year, they join an engineering senior design team mentored by clinicians and engineers and focused on biomedical design for underserved communities, to experience how knowledge is transformed from observations about nature to products that can change lives. They work with peer mentors to apply science to solve real-world problems in ways consonant with industrial practices, learning how to listen, question, and answer business — and ultimately research — questions through personal communication. The scholars are coached during a summer outreach project to appreciate how their skills and solutions can impact a community. These experiences inspire the scholars to develop a research inquiry mindset as they start developing big ideas and solutions. The scholars learn the vocabulary and infrastructure of research and have a sense of belonging to the research community. They learn about biomedical sciences through the lens of animal medicine/regulation and participate in One Health design challenges, teaming with ESTEEMED scholars at other institutions who are learning about biomedical sciences through the lens of human medicine (Georgia Tech) and through the physiological environment (Savannah State University, an HBCU). They engage in mentored research projects that cement their belief that they can make valuable contributions. Upon “graduation” from the ESTEEMED program, the scholars enter the LSAMP or McNair honors programs.

The **NIH T32 grant Training in Tropical and Emerging Global Diseases (TTEGD)** program (current end date 2025) trains graduate students and postdoctoral scholars to become independent research scientists who study parasitic diseases in the context of global health. The research program seeks fundamental insights into protozoan and helminth parasites and their interaction with their mammalian hosts and invertebrate vectors. It combines cutting-edge bench and field science with perspectives on the global challenges and opportunities for the control and elimination of parasitic diseases. These perspectives are grounded in firsthand experience by trainers and collaborators around the world. Every year protozoan and helminth parasitic diseases of humans are responsible for more than a million deaths, many millions more cases of severe morbidity, and hundreds of millions of cases of subtle morbidity due to chronic infections. UGA is uniquely positioned as a training ground for the next generation of parasitology/tropical disease researchers and the TTEGD is the central basis of their training and development. The Center for Tropical and Emerging Global Diseases (CTEGD) within UGA is home to perhaps the largest number of parasitology research laboratories in the U.S. that collectively cover the full gamut of parasitic diseases. The program instills trainees with the ability to translate basic scientific findings into tool development and the implementation of interventions and foster their ability to identify and formulate a fundamental research question out of the context of parasitic disease itself. Selected students and postdocs participate in a number of activities tailored to their preparation for their future success in science careers. New initiatives for this funding period include new requirements for postdoc trainees, more rigorous training of new trainers, new postdoc recruitment strategies to increase diversity, new strategies to recruit underrepresented minorities, potential expansion of the program with the use of matched trainee lines, and new themes offered to trainees on large data mining and computer science.

UGA’s **Diversity in Neuroscience** **NIH R25 grant** (8/2018-7/2024) addresses the NINDS Neuroscience Development for Advancing the Careers of a Diverse Research Workforce R25 program to support educational activities that enhance the diversity of the biomedical, behavioral, and clinical research workforce by (1) increasing the pool of current and future Ph.D.-level research scientists from diverse backgrounds that are underrepresented in biomedical neuroscience research and (2) facilitating the career advancement/transition of the participants to the next step of their neuroscience careers. Rapid advances in technology and scientific knowledge coupled with the increasingly global workplace environment call for a neuroscience workforce that is not only technically advanced in the discipline, but is also culturally and experientially diverse, capable of reaching beyond the traditional laboratory, working across disciplines and within diverse communities to advance the understanding, diagnosis, and treatment of recognized and emerging diseases of the brain. Providing a collaborative, supportive, and inclusive environment for all our students is a core value, and we are dedicated to broadening the participation of students from diverse backgrounds who are underrepresented in neuroscience research training. To address the overarching goals of this FOA, we leverage a number of resources currently available at UGA along with newly proposed strategies to develop a network of synergistic activities aimed at broadening the participation of underrepresented students in our neuroscience graduate training program and preparing a diverse neuroscience workforce for the 21st century.

UGA has an **IGE** **grant**, **Toward an Interdisciplinary Blueprint for Open Science Graduate Education from NSF (end date 06/2024).** The bedrock of any scientific enterprise is the ability to reproduce experiments: following the same set of instructions with the same instruments and obtaining the same results. Unfortunately, there are numerous obstacles in contemporary scientific research that preclude universal reproducibility. These range from key omissions or vague instructions in the experimental description to journals that require subscriptions and thus restrict access to the entire scientific product. Open Science is a principled, albeit abstract, approach to scientific research that emphasizes openness and reproducibility. Its practices are difficult and time-consuming to adopt, and the culture surrounding research has not been sufficiently incentivized to change, nor has the practice of Open Science been defined as a concrete process. This 3-year IGE project studies how to catalyze a cultural and institutional shift toward an open and transparent approach to science. Students and faculty in a variety of STEM disciplines participate in a series of workshops to obtain a formal understanding of Open Science. Participating faculty sustain this curriculum through their own Open Science training with external experts, course modifications, and an interdisciplinary graduate certificate program formalizing the coursework and standards for training in Open Science principles and practices. This establishes a network of influencers to effect broad institutional change, further facilitating a cultural shift toward adoption of Open Science. The project establishes new curricula, creating new opportunities for future students and faculty as well as endowing them with skills that are highly sought in a variety of fields.

UGA has an **IGE grant**, **Enhancing Imaginative and Collaborative STEM Capacity through Creative Inquiry from NSF (ending in 03/2024).** Advanced scientific and technical training is insufficient to position the leaders of tomorrow to solve the complex problems we face. They must also be able to think creatively, collaborate across disciplines, and work with people with different perspectives, knowledge, and values. There is compelling evidence that creativity training can stimulate both scientific creativity and interdisciplinary collaboration, but to date, little attention has been given to creativity training in STEM graduate education. This IGE award brings a diverse group of graduate students together from STEM and arts disciplines to address issues in the local watershed using creativity-based training methods from the arts. This project investigates the impact of targeted creativity training on the ability of STEM students to frame problems in new ways and help diverse teams solve complex problems. If successful, widespread adoption of these methods will contribute to equipping STEM graduates across the country with communication and collaboration skills and ultimately increase creative and innovative solutions to complex global environmental challenges.

This project recruits a cohort of ten students per semester in the early stages of graduate study, five from STEM disciplines who self-identify as interested in environmental science and five from arts disciplines. Cohorts meet for six workshops facilitated by two faculty members from STEM and arts disciplines. Workshops are designed to build core creative competencies and develop skills for collaborative interdisciplinary practice. Students gain practical experience sharing disciplinary viewpoints, creating analogies from scientific concepts, and developing collaborative frameworks for complex problem solving. The final workshop results in a set of proposed solutions to a local watershed problem, collaboratively identified by students and stakeholders. Complementary quantitative and qualitative methods are used to examine students' abilities to shift thinking (increase "cognitive flexibility"), generate novel ideas, and effectively communicate and collaborate with one another. This project seeks to fundamentally enhance how STEM students are educated by engaging them in creative processes related to their research topics. Successful elements are incorporated into a scalable training model that is widely disseminated and available for adoption at other institutions.

UGA has a **PREP R25 grant** (current ending date of 03/2024) from **NIH NIGMS** to provide post-baccalaureate training in infectious diseases research. The University of Georgia’s Post-baccalaureate Training in Infectious Diseases Research Program provides intensive research training experiences to recent post-baccalaureate underrepresented minority and disabled students as an avenue for these students to gain the skills and attributes necessary for gaining admission to biomedical graduate programs and attaining successful careers in biomedical research. UGA PREP draws on UGA's remarkable strength in infectious diseases research, as well as strong graduate programs in several of its biology-related departments and mathematics, to provide intensive research experiences for eight underrepresented minority and disabled trainees each year. Since the program’s inception in 2014, 45 faculty drawn from the UGA Faculty of Infectious Diseases, who belong to the departments of Biochemistry and Molecular Biology, Cellular Biology, Ecology, Engineering, Entomology, Environmental Health, Forestry & Natural Resources, Genetics, Infectious Diseases, Mathematics, Microbiology, and Population Health, have incorporated UGA PREP trainees into their laboratories, providing a unique, structured, and mentored one-year research experience.

UGA has an **REU grant** focused on **Genomics and Computational Biology** from **NSF** (4/2020-3/2026). This REU Site supports the training of 13 students for 10 weeks during the summers of 2023-2025. A total of 39 students, primarily from schools with limited research opportunities or from an under-represented group, are trained in the program. The program is run in partnership with Clark Atlanta University, an HBCU located in Atlanta, GA. The program has been in existence for 22 years and has trained over 200 REU participants who have contributed to fundamental discoveries about telomerase, gene regulation, the biological clock, and the biochemistry of red tides.

The scientific focus of this program is on genomics, computational biology, systems biology, metabolomics, proteomics, and glycomics. Faculty mentors come from various departments and centers, including Genetics, Biochemistry and Molecular Biology, Institute of Bioinformatics, Computer Science, Physics and Astronomy, Plant Biology, Plant Pathology, Complex Carbohydrate Research Center, Microbiology, and Communication. Students from groups under-represented in STEM and those from schools with limited research opportunities are especially encouraged to apply.

UGA has an **REU grant** focused on **Interdisciplinary Research Experiences in Nanotechnology and Biomedicine** from **NSF** (02/2020-03/2026), with research projects co-mentored by faculty in nanotechnology and biomedicine. Nanobiotechnology research is an emerging interdisciplinary area at the interface of nanotechnology and biomedicine. This three-year project provides an interdisciplinary research experience to undergraduate students, leveraging diverse interdisciplinary expertise, resources, and training opportunities. Ten REU students over a 10-week summer program each year participate in interdisciplinary research projects that apply nanotechnology to specific biomedical questions. The existing world-class programs, facilities, collaborative research culture, and inclusive environments at UGA create a strong setting for this interdisciplinary site.

Students are recruited nationwide with particular emphasis on students who are underrepresented/underserved minorities (URM) and females from STEM-limited institutions. Research mentors also gain expertise in mentoring URM and female students in interdisciplinary research. This recruitment contributes to broadening participation within the next generation of scientists and engineers in interdisciplinary research endeavors.