

Jennifer R. Cochran
Professor & Chair of Bioengineering, Professor, by courtesy of Chemical Engineering
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Dear Dr. Cochran:

We are writing to express our strong and enthusiastic support for your T32 application for the Biotechnology Training Program (BTP) at Stanford. BTP is integral to Stanford's efforts to provide a highly enriched, multi-disciplinary training experience in biotechnology for predoctoral students from a broad variety of departments across the university. In addition, the co-localization and integration of top-rated academic departments and research laboratories, business school, design school, and surrounding industries in the Bay Area create an unparalleled environment for biotechnology training for predoctoral students that is leveraged through this program. Stanford University is committed to continuing this program's innovative graduate experience and to promoting our trainees' success. We also look forward to your start of a biotechnology focused affiliates program to further connect this important community. In showing of support, the School of Medicine (SoM), School of Engineering (SoE), and School of Humanities and Sciences (H&S) are pleased to continue supplementary support for this program to \$25,000 per year for 5 years, for a total of \$125,000 each, per year (\$375,000 in total commitment). This commitment will help support administrative costs and program activities for this valuable training program.

The thirteen areas of extensive institutional support that we offer for training grants and their trainees in the SoM, SoE, H&S, and Stanford University broadly are discussed below:

1. Developing and promoting a culture that advances the highest standards of scientific rigor, reproducibility and responsible conduct of research

Rigor and Reproducibility (R&R)

Our goals are to enhance graduate training in experimental design and data collection, organization, and analysis. The University maintains a Research Policy Handbook, which describes policies on the conduct of research, faculty responsibilities to staff and students, authorship, non-discrimination in research agreements, misconduct, and retention and access to data. These policies are the guiding principles for research at Stanford University and are publicly available. Schools offer a combined 58 graduate-level courses on experimentation, correct use of techniques and model systems, and statistics. A major reason for the lack of rigor leading to irreproducible data is lack of awareness on the part of the researcher. Trainees are encouraged to take courses on proper technique execution, statistics, and experimentation. Courses and trainings to highlight are:

- Ethics in Bioengineering course for first-year graduate students focuses on the development and application of new technologies in the biology and medicine. R&R training has been incorporated throughout this understand the basic principles of ethics when thinking about how the technologies they develop can and should be applied.
- Principles and Tools for Metrology in Biology emphasizes tools used to parse biological measurement problems. Students learn to identify and quantitatively address the critical sources of variability and bias using the core concepts of uncertainty, traceability, and validation.
- Biosecurity and Bioterrorism Response focuses on the most pressing biosecurity issues as they related to scientists, innovators, clinicians and technology companies.
- Introduction to R for Data Analysis teaches R, an open-source programming language for statistical analysis, focusing on the computational aspects of reproducible research and transparency in scientific publication.
- Representations and Algorithms for Computational Molecular Biology teaches students how to properly use large data sets with an emphasis on bioinformatics, computational biology and integrating the scientific method into computer programming.

- Biostatistics for the Life Sciences teaches students to minimize sample size, maximize study power, and avoid false discovery errors with an emphasis on the reproducibility crisis.
- Introduction to Probability and Statistics for Clinical Research teaches students to evaluate medical literature.
- Translational Bioinformatics teaches computational methods to translate biomedical data into diagnostic, prognostic, and therapeutic applications in medicine.
- Problem Choice and Decision Trees in Science and Engineering teaches students to develop a framework for choosing research problems and navigating a project's decision tree using intuition building and stepwise analysis of assumptions.
- Stanford Biosciences Grant Writing Academy supports over 100 graduate students (2nd years and beyond) and postdocs annually in creating proposals and productive writing practice as preparation for F and K fellowship applications. R&R is a significant component of these applications and trainees are guided on incorporating R&R into proposals.

Responsible Conduct of Research (RCR)

All Stanford graduate students and postdocs are required to receive instruction in the responsible conduct of research. For our trainees, this formal training takes place through the Stanford Center for Biomedical Ethics. During their first year or second year, every trainee takes MED 255 (RCR), an 8-hour course taught by the Center's professional staff. MED 255 is offered in multiple sections throughout the academic year; each session meets from 9 am-5 pm on a Saturday or Sunday during the year. This facilitates timely participation of trainees, and helps avoid scheduling conflicts with other activities. The course is available in two tracks, one for basic researchers, which is taken by our trainees, and one for clinical and medical researchers. Current instructors include David Magnus, PhD (Thomas A. Raffin Professor of Medicine and Biomedical Ethics), Holly Tabor, PhD (Associate Professor of Medicine), Maren Grainger Mosen, MD (Senior Research Scholar), and Katrina Karkazis, PhD (Senior Research Scholar). The course website is at <http://bioethics.stanford.edu/education/rcr/>. The topics covered by each session include: (1) conflict of interest; (2) policies regarding human subjects; (3) mentor/mentee responsibilities; (4) collaborative research; (5) peer review; (6) data acquisition; (7) research misconduct; and (8) contemporary ethical issues. Our students also have the opportunity to enroll in other graduate level ethics-related courses offered through the University. There are 19 graduate level research ethics courses offered across all schools at Stanford, including SoM, SoE, and H&S. These courses span a broad array of topics: stems cells, patient care, health economics, quality control and safety assurance, scientific management, physician social responsibilities, and data privacy.

2. Ensuring sufficient start-up funding to permit early-stage faculty to participate in training, and bridge funding to ensure that training may continue if a mentor experiences a hiatus in funds

Per University policy, faculty start-up funds are provided and documented in offer letters. Start-up funds and bridge funding are determined by the department. The Dean of the School and Provost approve faculty salaries and start-up funds. Start-up funds cover research expenses typically for the first 3-4 years, including supplies, equipment, and personnel. In some departments, start-up also includes assistance with housing and salary (if not covered by funding). Bridge funding may be provided in the case of a hiatus in funding. Specifically, in basic science departments of the SoM, investigators can access bridge funding up to a total of \$200,000. The SoE provides bridge funding to faculty and funding support for students if a faculty advisor experiences a hiatus in funding. The SoE does not specify funding limits for either mechanism of support. In H&S, funding beyond the start-up package is determined at the department level.

3. Supporting core facilities and technology resources, and describing how they can be used to enhance training

As detailed in this application, the predoctoral trainees in this program benefit from outstanding facilities and resources provided by Stanford University and its schools (see <http://corefacilities.stanford.edu/>). The extraordinary level of investment of the University and schools in the research environment – new buildings, centers and institutes, shared instrumentation facilities, and other research resources – has played a large role in building outstanding laboratory research environments.

The University contributes in many ways to the support, success, and advancement of our graduate students. Stanford University's unique environment fosters training of the very best students in interdisciplinary research. The SoM, SoE, and H&S infrastructure, facilities, and resources are among the best in the world and are in close proximity, helping sponsor frequent interactions and collaborations.

4. Providing adequate staff, facilities, and educational resources to the planned program

Our graduate education curriculum aims to empower students both academically and professionally. The institution and schools have the necessary resources to support the planned program and ensure student success. BTP leadership and staff work with schools and partner departments to support the training program. The program administrator manages the daily BTP operations and tracks program metrics in partnership with the Program Director, who provides the overall strategy and direction of the program, supports faculty affairs, and also serves as a network advisor for trainees to help them design their biotechnology experience via industry. Faculty advisors are expected to guide students in key areas such as selecting courses, designing and conducting research, developing of teaching skills, navigating policies and degree requirements, and exploring academic and professional opportunities.

University-wide resources that support graduate students are offered through Office of the Vice Provost for Graduate Education (VPGE) and the Vice Provost for Student Affairs. The Graduate Life Office (GLO) and Student Services Center are both part of Student Affairs within the VPGE. The GLO plans and executes New Graduate Student Orientation each fall and provides advice on being a graduate student at Stanford. In conjunction with New Graduate Student Orientation, the VPGE maintains the Gateway for New Graduate Students online resource page and organizes the Graduate Student Information Center, which is a physical location that graduate students visit during orientation. Throughout the year the VPGE offers multiple workshops and services ranging from mentoring, communication, leadership, management, and wellness to students and faculty. The Office of the Vice Provost for Student Affairs supports career services, campus community centers, student engagement, academic services, and the campus health center.

Each of our 9 partner departments provides tailored support to students. Partner programs hold new student orientation, have dedicated Student Services Managers, and supplement scientific training with professional development. The SoM offers further resources and services to students, such as an online orientation completed prior to matriculation, the "Foundations in Experimental Biology" course designed to facilitate students' critical first steps toward becoming independent scientists, as well as a career services office. Importantly, the SoM has established a Graduate Student Tracking system to confirm thesis committee meetings and IDP completion. BTP follows these practices to track IDP meetings for their students. Additionally, the SoM Dean's office supports all T32 training grant directors by hosting a quarterly meeting to share best practices and discuss topics of interest. Our BTP leadership participates in these activities. Together University and home department resources provide essential services to all graduate students and enable the BTP training staff and faculty to focus on field specific resources and support, such as RCR, technique trainings, coursework selection, and laboratory rotations.

5. Supporting the PDs/PIs and other key staff associated with the planned training program

BTP Faculty Mentors consist of 37 individuals with outstanding records of scholarship in chemistry, biology, engineering, and medicine. Stanford's Vice Provost for Faculty Development and Diversity (VPFDD) provides professional development for faculty. New faculty participate in New Faculty Orientation each fall. Junior faculty are paired with senior faculty mentors within their departments to supplement orientation. The VPFDD offers workshops on research management, mentoring, leadership, inclusion, and teaching throughout the academic year. Each home department supports faculty through individual meetings with the Chair and monthly departmental meetings. The SoM Office of Faculty Development and Diversity provides specific faculty development focused on medical research and education. Workshop series include team science, granting writing for the NIH, interpersonal skill building, and obtaining research funding as junior faculty. The SoE provides grant support for faculty through the Engineering Research Administration and faculty development through the SoE Office of Faculty Affairs. H&S provides grant support for faculty through the H&S Research Administration team.

The BTP Program selects faculty mentors dedicated to research, mentoring and teaching and is well-balanced between senior faculty with established track records in graduate training and junior faculty. Institutional mentor

trainings are provided to our T32 faculty on a regular basis. Topics include but are not limited to Mentor/Mentee Communications; Trainee Career and Professional Development; Addressing Equity and Inclusion; Ethical Behavior to Foster Responsible, Rigorous Research; and Supporting Trainee Health and Wellness. Stanford University supports professional development for staff as well as students and faculty. Stanford provides each staff member annual professional development funds to support continued training.

6. Ensuring faculty have protected time devoted to mentoring, training, and research

Each faculty member's percent effort with respect to teaching (mentoring, training), research, and administration is articulated and reviewed regularly (usually annually) by the department. Each school recognizes the critical importance of faculty mentoring trainees, while also maintaining active research programs. The schools will ensure that faculty have adequate time as part of their University and department roles to direct this outstanding training program. Training grant faculty are also given the necessary time to excel as faculty mentors and are encouraged to participate in various programs discussed throughout this letter to enhance their skills in leadership, teaching, and mentoring. Importantly, ensuring that faculty have protected time for mentoring and research directly relates to faculty appointments, tenure decisions, and retention. Departments are encouraged by the University to implement retention strategies, such as limiting service for junior faculty and providing resources on tenure.

7. Considering activities integral to excellent graduate training (such as teaching and mentorship) in tenure and promotion decisions

Stanford University maintains academic appointment and promotion policies and criterion in the Faculty Handbook. The Faculty Handbook is published by the Provost's Office. Excellence in scholarship, teaching, and mentoring (and clinical care, if applicable) is an important prerequisite for a tenured appointment at Stanford. The University is dedicated to outstanding achievement in all of these domains and excellence is a commonality for all tenured faculty. The purpose of the appointment, reappointment, or promotion evaluation is to appraise, on the basis of the record to date, the candidate's standing in and impact on his or her scholarly discipline (broadly defined) and the candidate's quality as a teacher and mentor (and as a clinician, if applicable). The second criterion for a University Tenure Line (UTL) appointment is promise – or a record demonstrating – that the candidate is capable of sustaining a first-rate teaching program during his or her career at Stanford. Initial tenure line appointments take into account criteria for tenure and whether the candidate will realistically be able to obtain tenure according to Stanford's standards.

Scholarship refers to: scholarly activity and productivity, impact and innovation of work, and recognition in the field. Importantly, the ability of a faculty member to work in a team, effectively communicate with colleagues, staff, and students, as well as professionalism and compliance are considered aspects of scholarship. Trainees who were directly mentored by faculty are asked to provide letters for the tenure application. These practices ensure that the quality of mentoring and professionalism are considered rather than assuming strong scholarly performance indicates strong mentoring and teaching skills. Teaching is broadly defined to include: the classroom, laboratory, or clinical setting; advising; mentoring; program building; and curricular innovation. Teaching may include undergraduates, graduate students, medical students, residents, postdoctoral fellows and in postgraduate and continuing medical education.

The VPFDD provides key resources to faculty to support their development within UTL criterion. The office plans and executes New Faculty Orientation each fall. The office also provides faculty professional development including mentoring and leadership. Stanford's Center for Teaching and Learning provides faculty with resources and programs on course design, working with TAs, and technology and inclusivity in the classroom. Additionally, the SoM's Teaching and Mentoring Academy promotes excellence in teaching and mentoring by developing, supporting and recognizing dedicated educators and mentors to ensure world-class training for the next generation of physicians, researchers, and educators.

8. Promoting diversity and inclusion at all levels of the research training environment (trainees, staff, faculty, and leadership)

The BTP Program, partner schools, and Stanford as a whole are committed to fostering a diverse community in which all individuals are welcomed, respected, and supported to achieve their full potential. We value diversity because we believe that interaction with people with unique backgrounds and life experiences allows us to reach a new level of innovation in education, scientific research, and medicine. Further, we believe that a student and

faculty body that is highly qualified and diverse – in gender, race, ethnicity, socioeconomic background, sexual orientation, and work-life experiences – is essential to a deep and transformative educational process. This essence is captured in Stanford’s strategic plan and in the diversity inclusion initiative (IDEAL) launched by the Provost in 2018. IDEAL (Inclusion, Diversity, Equity, and Access in a Learning Environment) works across the entire University community to ensure the diversity of thought is represented, that all members of Stanford feel that they belong and are supported, and all members of Stanford have access to opportunities and benefits of Stanford. Recruitment of a diverse campus community of faculty, staff, and students is a University-wide goal.

Stanford commits substantial resources and effort toward recruiting diverse student and faculty cohorts to STEM departments. Since 2010, diversity in the graduate student population has increased from 10-12%. Within SoM, SoE, and H&S, graduate programs average 11% URM students, with SoM demonstrating the highest increase in URM recruitment over the last 9 years. Successful PhD recruitment programs and mentoring programs are listed below:

- Stanford Summer Research Program (SSRP)/Amgen Scholars Program, a fully funded residential internship program for underrepresented minority undergraduates who are interested in pursuing PhD programs in the biomedical sciences. Since the program’s inception, Stanford has trained more than 500 talented undergraduate students from diverse backgrounds, and 97% of the participants went on to pursue advanced degrees.
- Stanford Preview, a three-day program jointly sponsored by the Stanford Biosciences and the Stanford Black Bioscience Organization, is designed to introduce sophomores and juniors from diverse backgrounds to the Stanford campus and to provide guidance for the graduate school admissions process.
- GRAD Diversity Day, an invitation only event for admitted and promising applicants to PhD programs in the schools of Business, Humanities & Sciences, Engineering, Earth Sciences, and Education.
- The Diversity Excellence Program, led by the Biosciences Diversity Advisory Council and the Associate Dean for Graduate and Career Education and Diversity, provides financial support to interview a diverse group of students and encourages departments to proactively identify diverse and high achieving candidates by employing measures beyond traditional assessment tools, such as GPA and GRE scores.
- ADVANCE, an eight-week intensive summer transition program, supports the success and retention of incoming graduate students from underrepresented and disadvantaged backgrounds. Participants in the program engage in activities centered on academic development, professional development, and community building – all of which seek to prepare them for a successful graduate career at Stanford. The program strives to foster community, leadership, and excellence in an interactive learning environment.
- Graduate Application Fee Waivers, enable prospective applicants to receive a fee waiver for applications to PhD programs in the schools of Earth Sciences, Education, Engineering, Humanities & Sciences, and medicine.
- VPGE Departmental Recruitment Support, provides funds for departments to defray travel costs for diverse applicants

Once students arrive on-campus, they are supported via a variety of programs and resources. Partner schools and home departments include Diversity Officers to support prospective applicants and students. Stanford houses a number of on-campus community centers and student groups to serve the diverse University identities. The GLO is an on-campus resource for students and provides support to promote health, wellness, and a positive graduate student experience. Stanford maintains the Diversity Works website, which centralizes diversity and inclusion resources, programs, and opportunities available at Stanford. Importantly, the VPGE offers funding opportunities for diverse students who want to pursue academic careers in order to promote diversity at the faculty level.

Stanford has implemented best practices for the recruitment of diverse faculty and staff. HR and the Diversity and Access Office maintain guidance on creating a diverse search plan, organize staff community groups, and plan an annual Multicultural Springfest to celebrate staff diversity at Stanford. VPFDD provides guidance on faculty recruitment and has developed “Building for Excellence: Inclusive Practices for Faculty Recruitment and Searches”, a guidebook for departments when conducting faculty searches. The University also funds programs to recruit diverse faculty to Stanford: the Faculty Incentive Fund supports incremental appointments that bring diversity to departments and schools; Gabilan Provost’s Discretionary Fund ensures that resources are available

to recruit women in the sciences and engineering; Faculty Development Initiative recruits outstanding faculty whose research expands the mission of the Center for Comparative Studies in Race and Ethnicity; Target of Opportunity allows departments to waive the faculty search process when an outstanding individual who would increase diversity on-campus is identified. VPFDD provides faculty retention strategies with a concentration on department climate, salary and compensation, and access to University resources.

9. Ensuring the research facilities and laboratory practices promote the safety of trainees

Safety is a core value at Stanford, and the University is committed to continued advancement of an institutional safety culture with strong programs of personal safety, accident and injury prevention, wellness promotion, and compliance with applicable environmental and health and safety laws and regulations. The Department of Environmental Health and Safety (EH&S) is the principal health and safety office on campus. EH&S works closely with University Safety Partners, faculty, managers in the research community, operations units, safety coordinators and committees, and departmental administrators. University Safety Partners (USP) represent schools or departments in the coordination of environmental, safety, and health activities. USPs encourage best practices and are responsible for the implementation of policies, incident reporting, communicating with stakeholders, and local safety support. USPs ensure that inspection records are maintained and researchers, including students, are aware of hazards related to their work. All new members of the Stanford community are required to complete the “General Safety, Injury Prevention, and Emergency Preparedness” course offered by EH&S within 14 days of starting at the University. Researchers are required to complete laboratory specific training as determined by their role and project. EH&S provides guidelines on developing a laboratory specific training checklist for PIs to track lab member safety trainings and provide structured information on who to contact and what to do when an incident occurs. Stanford University makes all reasonable efforts to: (1) promote occupational and personal safety, health and wellness; (2) protect the health and safety of Stanford University faculty, staff, and trainees; (3) provide information to faculty, staff, and trainees about health and safety hazards; (4) identify and correct health hazards and encourage faculty, staff, and trainees to report potential hazards; (5) conduct activities in a manner protective of the environment, and inform the Stanford community regarding environmental impacts associated with institutional operations; and (6) maintain a risk-based emergency management program to reduce the impact of emergency events to the Stanford community.

Faculty, staff, and trainees are responsible for: (1) keeping themselves informed of conditions affecting their health and safety; (2) participating in safety training programs as required by Stanford policy and their supervisors and instructors; (3) adhering to health and safety practices in their workplace, classroom, laboratory, and student campus residences; and (4) advising of or reporting to supervisors, instructors, or EH&S potentially unsafe practices or serious hazards in the workplace, classroom or laboratory. Stanford’s program for providing a safe workplace for faculty, staff, and trainees includes: facility design; hazard identification, workplace inspection, and corrective action; shutdown of dangerous activities; medical surveillance; and emergency preparedness.

10. Ensuring the research facilities are accessible to trainees with disabilities

The BTP Program, partner schools, and home departments support the recruitment, enrollment and graduation of students with disabilities. The Diversity and Access Office (DAO) ensures that the entire Stanford community has equal access to resources, facilities, and opportunities. The DAO provides technical assistance, training on assistive technology, transportation, lodging, recreation, community resources, event, and evacuation plans. The Vice Provost for Graduate Education’s diversity statement (<http://vpge.stanford.edu/diversity/>) includes students who have disabilities. The Office of Accessible Education, which provides resources to all students on campus who have disabilities, such as classroom and housing accommodations. All of Stanford’s research facilities are fully accessible to researchers with disabilities, and we are fully committed to providing any necessary accommodations for disabled students. The Campus Access Guide is an online system of maps detailing accessibility information for buildings on campus, including research buildings. Representatives from the Office of Accessible Education attend orientation events and distribute materials on disability accommodations.

11. Ensuring a positive, supportive and inclusive research and training environment for individuals from all backgrounds

Diversity and inclusion are central to Stanford’s mission. The SoM, SoE, and H&S and the Stanford research community as a whole provide an environment of personal and professional exploration, allowing students to define and follow their own path to success. The BTP Program brings together trainees with a variety of

undergraduate degrees (chemistry, biology, bioengineering, materials sciences) and diverse tracks prior to joining the BTP program. Stanford offers multiple programs and resources to support students from varied undergraduate environments and life experiences. The Inclusion, Community, and Integrative Learning portfolio within Student Affairs provides a centralized resource for students to receive support and is directed by the Associate Vice Provost for Inclusion, Community, and Integrative Learning. Within the portfolio are specific resources: Diversity and First-Gen Office; Centers for Equity, Community, and Leadership; BEAM (Bridging Education, Ambition, and Meaningful Work) career services, Fraternity and Sorority Life, Office of Student Engagement. The GLO within Student Affairs maintains a resource page for graduate students who are parents. Resources for student-parents are the WorkLife Office, Early Childhood Education Programs, and the Graduate Community Center. Stanford has financial assistance programs to help student-parents with housing and living costs, such as the Escondido Village Family Fund and the Stanford Family Grant.

Stanford graduate students have full access to the undergraduate, graduate, and medical curricula to supplement and enhance their educational and training experience. Throughout their PhDs, our graduate students have the opportunity to enroll in courses in the SoM, H&S, and SoE. Our unique location in the middle of Silicon Valley – as well as the co-location of SoM, SoE, and H&S within one campus– allows for diverse connections to interdisciplinary collaborations and opportunities in and out of the lab. The curriculum reflects this interdisciplinary perspective by also offering access to courses in other schools including Business, Education, and Law. Stanford faculty, alumni and staff offer trainees the mentoring and resources to succeed in a wide range of careers.

The following programs and units are also instrumental in enriching the research and training environment for students from all backgrounds:

- The Office of the Vice Provost for Graduate Education (VPGE) offers a complementary set of programs and events for Stanford graduate students in any discipline to help students grow academically and professionally. In addition, VPGE sets policy and provides programs related to advising and mentoring, diversity, professional development, interdisciplinary learning, and funding opportunities. VPGE has provided guidelines for advising relationships between faculty and graduate students. In making expectations explicit, faculty advisors and students gain a shared understanding of Stanford's commitment to best practices that establish clear communication within faculty-student advising relationships.
- The Stanford Biosciences Grant Writing Academy, sponsored by the SoM, supports trainees in creating proposals and productive writing practice; teaches trainees to write and edit efficiently; empowers trainees to elicit and provide effective feedback; and provides coaching, editing, and review of proposals and scientific writing. Proposals submitted by SoM graduate students have nearly doubled since the Academy was founded in 2014. The applicant success rate has remained stable at almost 30%, hence awarded NIH fellowships to graduate students have doubled since the Academy was founded.
- The Wellness Matters program, sponsored by the SoM, provides curricula, programs, and support for our graduate students that promote self-care, resiliency, and holistic personal health, helping to create an environment in which all graduate students can thrive. On a related note, all students have access to health insurance, counseling, and psychological services.
- The mission of the Student Outreach to Alumni Resources (SOAR) Mentor Program is to foster mentorship opportunities across the Stanford Biosciences community. This comprehensive mentoring program exposes students and postdocs to a breadth of career options and pathways, promoting greater community and collaboration with alumni.
- The Solidarity, Leadership, Inclusion, Diversity (SoLID) Mentorship Program connects graduate students with faculty who can provide additional mentorship to guide and support students on issues that may be largely outside of their research, such as mental health and wellness, academic activism, microaggressions, and imposter syndrome, among others.

Student organizations also play a key role in supporting students. Three key student organizations – the Stanford Biosciences Student Association (SBSA), Biomedical Association for the Interest of Minority Students (BioAIMS), and Chemistry Association for the Interest of Minority Students (ChemAIMS) welcome students from all backgrounds. SBSA's mission is to represent students studying biosciences at Stanford in the SoM, SoE, and H&S, and to enhance their quality of life by hosting social and academic events. BioAIMS and ChemAIMS

address the needs and concerns of current minority graduate students in the biosciences and chemistry through advocacy and programming. An additional 22 student organizations exist within the SoE and serve graduate students from diverse backgrounds who are pursuing engineering degrees.

12. Ensuring that trainees will continue to be supported when they transition from the training grant to other sources of support

Stanford University determines the tuition, stipend, teaching assistantship, and research assistantship rates for their students. Faculty advisors cover the funding gap between the training grant maximum and School determined rates to provide similar support to all BTP trainees for 2 years. Stanford tuition and stipend rates reflect the high cost of living in the Bay Area. When not funded by the training grant, students across all Schools are supported by a combination of departmental funds, teaching assistantships, research assistantships, advisor funding, external fellowships (NSF), and University fellowships.

13. Providing resources and expertise for evaluating program training

In partnership with students' home departments and Schools, the BTP program is able to gather important data for tracking and evaluation. The BTP Program staff work closely with home departments to collect admissions, enrollment, and graduation data. The BTP program surveys students annually to evaluate coursework requirements, monthly meeting speakers, social activities, professional development opportunities, and the symposium. This data is collected and analyzed through a SWOT framework by the Director of Bioscience Strategic Initiatives. Importantly, the BTP Program tracks alumni data through requesting information about employment, how the Training Program influenced professional choices and opportunities, and suggestions for the current program based upon alumni experiences in the workforce. Importantly, Stanford Biosciences developed a central repository of PhD alumni information to track alumni outcomes from those that graduated since 2000. This information is routinely provided to the BTP Steering Committee for review and recommendations. The newly formed BTP Student Advisory Committee will also have a central role of informing BTP leadership of the most desired changes and effective aspects of the program from a trainee perspective. Together surveys and committee recommendations inform changes to the Training Program.

Furthermore, we are impressed with the metrics that you describe in your program plan. This unique program, (running since 1991), supports graduate students from 9 departments. Trainee PhD completion corresponds to a 97% completion and retention rate. Moreover, 100% of graduating students over the past 10 years are employed and 83% of those are in jobs related to the biotechnology sector. Historically, the program supports ~30% URM, and ~50% female students, highlighting your commitment to recruiting and training future leaders who will add diversity to STEM fields. Additionally, nearly 80% of graduate students participating in the program have completed a 3-month industry-funded internship to enrich their graduate training, which is a coveted highlight of your program.

In sum, we share your enthusiasm for promoting the best possible research and training in the areas of biotechnology by facilitating and cementing interdepartmental and interschool ties among trainees and faculty in these areas. Thus, we support your application in the strongest possible terms, and we hope that the NIH will support this highly successful and innovative program.

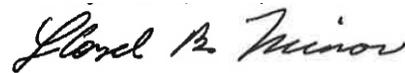
Sincerely,



Dr. Jennifer Widom, Dean, School of Engineering



Dr. Debra Satz, Dean School of Humanities and Sciences



Dr. Lloyd Minor, Dean, School of Medicine