

**LLOYD B. MINOR, MD**

CARL AND ELIZABETH NAUMANN DEAN OF THE STANFORD UNIVERSITY SCHOOL OF MEDICINE

Professor of Otolaryngology—Head and Neck Surgery

Professor of Neurobiology and of Bioengineering, by courtesy



May 3, 2021

Sylvia K. Plevritis, PhD  
Professor and Chair, Biomedical Data Science  
James H. Clark Center  
318 Campus Drive  
Stanford, CA 94305

Re: National Library of Medicine T15 Training Grant

Dear Sylvia,

I am pleased to offer the enthusiastic support of the School of Medicine for your NLM T15 application to renew the Biomedical Informatics (BMI) Training Program at Stanford, in response to RFA-LM-21-001. Through its forty-year history, the BMI Training Program has produced accomplished graduates who have made significant contributions to biomedicine and health through data-driven and computationally-derived scientific discoveries and advances. One of my first actions as Dean of the Stanford School of Medicine (SOM) was to create the Department of Biomedical Data Science (DBDS), approved by the Stanford Board of Trustees in 2015. In addition, my office has been making substantial investments in resources and infrastructure to enable biomedical informatics and data science research. Today our trainees have access to unprecedented amounts of biomedical data that span our entire biomedical enterprise, and empowered by their training in biomedical informatics and data science, they are enabled to address challenges ranging from advancing life sciences to improving clinical care. Your exciting proposal for the future of BMI training at Stanford harnesses the opportunity to produce the next generation of researchers who will advance precision medicine through innovations in translational bioinformatics, health care informatics and clinical research informatics.

As chair of DBDS and director the BMI program since 2019, you are providing outstanding leadership on multiple fronts, including the seamless alignment of BMI and DBDS as evidenced recently through the very positive University review of the BMI program. On the basis of this review, the Faculty Senate of Stanford University approved DBDS to grant the PhD and MS degrees in Biomedical Informatics, effective August 31, 2021. Going forward, DBDS will serve as a critical nexus to increase the education and research opportunities for BMI trainees, enabling opportunities that leverage activities across our entire campus. The interdepartmental and interschool basis of your proposed BMI training program fully captures the interdisciplinary nature fundamental to biomedical data science research. As with all our training programs, the BMI students will continue to be able to work with any qualified faculty member at Stanford and will certainly not be restricted in their freedom to select mentors and projects. In addition to specially-designed course offered by the BMI core faculty, the BMI curriculum will continue to benefit from expanding course offerings and faculty research interests in data science across our campus. Through these efforts and others, Stanford remains a fertile environment for biomedical informatics and data science training.

Below I highlight the extensive institutional support offered to training grants and their trainees in the School of Medicine (SOM):

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

### Rigor and Reproducibility:

Our goals are to enhance graduate and postdoctoral 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. The schools provide Responsible Conduct of Research (RCR) coursework and workshops, which cover research integrity and experimentation. In addition, we offer 58 graduate-level courses on experimentation and statistics, which include courses taught by the BMI Program Faculty. We highlight the following opportunities for trainees:

- Foundations of Statistics and Reproducible Research is a planned mini-course customized for first year bioscience students covering basic principles of experimental design, analysis, and statistical reasoning as well as tools and practices to make research reproducible.
- 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 publication.
- Data Studio provided by your Department of Biomedical Data Science (DBDS) and led by BMI Core Faculty Dr. Ying Lu, offers specialized focus in rigor and reproducibility for our students and postdocs. Most sessions are an extensive and in-depth consultation for a researcher based on research questions, data, statistical models, and other material prepared by the researcher with the aid of a facilitator. During the Data Studio, the researcher explains the project, goals, and needs. Experts in the area across campus are invited to contribute to the brainstorming. Drop-in consulting is also available pairing students and postdocs with DBDS faculty experts to provide assistance with research questions and data analysis.
- Stanford Biosciences Grant Writing Academy supports over 100 graduate students (2<sup>nd</sup> years and beyond) and postdocs annually in creating proposals and providing productive writing practice as preparation for F and K fellowship applications. R&R is a significant component and trainees are guided to incorporate R&R into their proposals.
- The Stanford Library offers regular workshops with the Center for Open Science on Reproducibility, which cover writing useful project documentation, employing version control, creating pre-analysis plans, and enhancing scientific workflows by implementing opensource tools. Moreover, the Meta-Research Innovation Center at Stanford (METRICS), which aims to transform research practices to improve the reproducibility, efficiency and quality of scientific investigation, offers courses and webinars on methods, evaluation, reporting, and reproducibility that are available to all. These offerings are enhanced by the NIH training modules on Rigor and Reproducibility, which are made known to all trainees on training grants requiring that content.

### Responsible Conduct of Research:

All Stanford graduate students and postdoctoral trainees are required to receive instruction in the responsible conduct of research. For all our trainees, this formal training takes place through the Stanford Center for Biomedical Ethics. During their first year, every trainee takes MED 255 (The Responsible Conduct of Research), 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. Topics 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.

In addition to offering MED 255, the Center offers programs, seminars, and journal clubs in a number of areas including Neuroethics, Stem Cells and Society, Bioengineering and Integration of Research on Genetics and Ethics, as well as a program in Bioethics and Film. These programs are among many similar programs available for any interested trainees to attend. Our trainees also have the opportunity to enroll in other ethics-related courses, of

which the SOM offers 22 additional courses related to research ethics. The School of Education offers 2 courses related to ethics and the Law School offers 1 research ethics course.

I am pleased that the BMI Program Faculty have taken the lead with specially designed courses and seminar series on how to make Artificial Intelligence (AI) reliable, fair and transparent when developed in the real world, how to address biases, and how to monitor and inspect AI products.

## **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 SOM policy, start-up funds are provided and documented in faculty offer letters. The Office of Academic Affairs and Faculty Compensation reviews offer letters to ensure startup funds are adequate. Start-up funds cover research expenses typically for the first 3-4 years, including supplies, equipment, and personnel. In SOM departments, start-up also includes assistance with housing and salary (if not covered by funding). Bridge funding is provided in the case of a hiatus in funding. In SOM basic science departments, which include DBDS, investigators can access bridge funding up to \$200,000 total.

## **3. Core facilities and technology resources that support the NLM T15 BMI Training Program**

As detailed in your application, the trainees benefit from outstanding facilities and resources provided by Stanford University and its schools. 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 teaching and research environments.

For example, the Li Ka Shing Center for Learning and Knowledge (LKSC) is a 4-story, 120,000-square-foot building that brings together cutting-edge education and advanced technology. The fourth floor is dedicated exclusively to students (graduate and medical), and provides them with a variety of study, reflection, and social spaces in which to work, connect with their peers, exercise, and relax. A lounge, kitchen, entertainment area, and a rooftop terrace create a stress-free environment to complement a large variety of study spaces, and a project rehearsal area provides students with a state-of-the-art space to practice key presentations.

For the BMI program, we have space for first year students who are still taking classes to congregate and study together, before they join a faculty lab. This space is in the Medical School Office Building provided to the Department of Biomedical Science. The space includes desks, chairs, monitor/keyboard hookups for laptops, a lounge area, two small 3-4 person meeting cubicles, a shared kitchenette and a shared printer/copy room. This space is key for programmatic cohesiveness by providing shared study space for students who are taking tough courses together.

## **4. Providing adequate staff, facilities, and educational resources to the NLM T15 BMI Training Program**

Our graduate education curriculum aims to empower students both academically and professionally. In the summer prior to the first year, our students participate in an online orientation led by faculty and senior students. The orientation is designed to help them transition from undergraduate and other pre-graduate school pursuits and to hit the ground running. Throughout their training, our students have the opportunity to enroll in mini-courses that are one- to three-week intensive classes that give them an opportunity to learn more about a specific biosciences field or develop a new skill.

Our home programs and training programs are committed to providing academic advising in support of graduate student scholarly and professional development. In his role as Advising Dean of Graduate Education and Postdoctoral Affairs, Dr. David Schneider meets with trainees regularly and advises them on issues ranging from

academics to wellness. In addition, the BMI training has a designated executive director staff role responsible for the strategic and operational management of the program, as well as academic advising and mentoring. In this role, Dr. Erika Strandberg interacts with all BMI graduate students, facilitates faculty and student interactions, and plays a key mentoring role in multiple areas including coursework, curriculum components, qualifying exam, academic advising, and diversity.

In the BMI Training Program, a member of the BMI Executive Committee is assigned to each newly matriculated student to serve as academic faculty mentor and help the student design their academic program; this role transitions to the PhD advisor once trainees join a laboratory. Academic faculty advisors are expected to guide students in key areas such as selecting courses, designing and conducting research, developing teaching skills, navigating policies and degree requirements, and exploring academic and professional opportunities. When most effective, this advising relationship entails collaborative and sustained engagement by both the advisor and the advisee.

The office of Dr. Sheri Krams, Senior Associate Dean (SAD) for Graduate Education and Postdoctoral Affairs, centrally tracks all Thesis Committee meetings to ensure our graduate students receive the guidance and support they deserve. This SAD office has also structured a systematic Individual Development Plan (IDP) program for all Biosciences PhD candidates and postdoctoral scholars. The IDP program was developed through extensive consultation with multiple groups of faculty, students and staff. Standardized IDP forms, specifically tailored to each stage of a trainee's progress through graduate school and postdoctoral training, comprehensively assess each trainee's academic, professional and career progress, and create a clear action plan toward achieving goals and milestones in those areas. Stanford has a web-based tracking system to ensure every NIH supported Biosciences PhD candidate completes an IDP and meets at least once annually with his/her/their advisor for discussion. Through the Office of Graduate Education (OGE), we aim to help train and empower the next generation of leaders and innovators within and beyond academia and industry. Our functional areas include operations and administration, wellness and development, curricula, admissions, and diversity and inclusion.

Through BioSci Careers, we support graduate students and postdoctoral scholars with individualized counseling, curriculum, career mentoring, and connections, including BioSci Connect, a new online Biosciences alumni mentoring platform to connect alumni to our PhD students and postdocs in support of their professional and career development. Moreover, the Office of Graduate Education and Postdoctoral Affairs, supports all training grant directors by hosting a quarterly meeting to share best practices and discuss topics of interest, and by carrying out official program reviews, including interdepartmental, departmental, and training program reviews. In addition, in her role as Senior Associate Dean of Graduate Education and Postdoctoral Affairs, Dr. Sheri Krams is in frequent contact with students and postdocs in all of the Biosciences home and training programs to address any concerns or suggestions about student training.

My office supports the Office of Postdoctoral Affairs (OPA), with eight staff members. OPA is the hub for all postdoctoral appointments at Stanford and supports postdocs in all aspects of their training as they develop their independent careers. OPA sponsors multiple programs addressing career skills for academic research, entrepreneurial endeavors, mentoring, and communication. Programs include talks and workshops on setting up a lab, negotiating job offers, teaching, writing grants and fellowships, and conflict resolution. Quarterly orientations, held in conjunction with the Stanford and School of Medicine career centers, provide a wide range of information on Stanford, resources available to postdocs, and career planning. Postdocs can and do audit graduate courses, including our newly minted Mini-courses, which allow a deep dive into or exploration of a new area with a limited time commitment. Postdocs also have access to a range of workshop and course offerings from Lane Library, the School of Medicine Biosci Careers office and BEAM, Stanford Career Education.

### **5. Supporting the PDs/PIs and other key staff associated with the NLM T15 BMI Training Program**

The program faculty of the BMI Training Program consists of 34 individuals with outstanding records of scholarship. The program selects faculty mentors from 16 departments and divisions within the University, dedicated to research, mentoring and teaching and is well-balanced between senior faculty with established track records in graduate training and junior faculty. The program assigns a supportive mentor from the senior faculty to each Assistant Professor to ensure that students are well trained and mentored. My office gives full authority to the training program directors to remediate or remove participating faculty from the program who are poorly performing mentors based on their set of guidelines and policies. In addition, the program has administrative staff dedicated to student support.

### **6. Ensuring that faculty with a role in the proposed program have time available to devote to their responsibilities to the NLM T15 BMI Training Program**

Each faculty member's percent effort with respect to teaching (mentoring, training), research, clinical care, and administration is articulated and reviewed regularly (usually annually) by their department. SOM recognizes the critical importance of mentoring trainees and faculty and will ensure that you will have adequate time as part of your 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 to enhance their skills in leadership, teaching, and mentoring.

Training grant faculty are also given the necessary time to excel as faculty mentors and are encouraged to participate in institutional mentor training workshops, launched in January 2020 from the office of Senior Associate Dean Krams. Topics include Mentor/Mentee Communications; Trust, Conflict Management, Building Better Communication; Trainee Career and Professional Development; Addressing Equity and Inclusion; Culturally Sensitive Mentoring; Ethics and Responsible Research; Supporting Trainee Wellness; and Negotiation.

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

For the University Tenure Line (UTL) faculty appointments, excellence in scholarship, teaching, and mentoring (and clinical care, if applicable) is an important prerequisite for a tenured appointment at Stanford because the University is dedicated to outstanding achievement in all of these domains. 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 UTL appointment is promise – or a record demonstrating – that the candidate is capable of sustaining a first-rate teaching program during his/her/their Stanford career.

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. It is recognized that many tenure-line faculty in clinical departments teach in small group sessions or with individual trainees.

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

Stanford Biosciences is committed to fostering a diverse community in which all individuals are welcomed, respected and supported to achieve their full potential. These diversity commitments complement the many programs at the SoM and Stanford including the diversity inclusion initiative IDEAL (Inclusion, Diversity, Equity,

and Access in a Learning Environment) launched in 2018. IDEAL works across the entire University community to ensure that diversity of thought is represented, that all members of Stanford feel that they belong, are supported, and have access to opportunities and benefits of the University. 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. Building on the framework of the IDEAL initiative, the Department of Biomedical Data Science has a Justice, Equity, Diversity and Inclusion (JEDI) Committee, which meets monthly and includes BMI student representatives.

Stanford commits substantial resources and effort toward recruiting a diverse student cohort to its Biosciences PhD programs. Since 2014, diversity in our student population has increased (~22-25% URM incoming students in recent years). Successful PhD recruitment programs and mentoring programs are listed below:

- Stanford Summer Research 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% went on to pursue an advanced degree.
- 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.
- The Diversity Excellence Program, led by the Biosciences Diversity Advisory Council (with eight faculty) and Ayodele Thomas, 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, employing measures beyond traditional assessments such as GPA/GRE.
- 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.
- In addition, the Diversity Center of Representation and Empowerment, or D-CORE, was established in October 2017 to provide a physical location where any member of the Stanford Medicine community interested in issues of inclusion and diversity can hold meetings or support groups, or just hang out and study. Diversity-focused staff hold regular office hours to increase engagement with and support for students of all backgrounds.

Through the Stanford Postdoctoral Recruitment Initiative in the Sciences and Medicine (PRISM), Stanford commits substantial resources and effort toward recruiting a diverse postdoctoral population. We invite graduate students, and especially those from backgrounds underrepresented in academia, to apply for a PRISM interview opportunity. Underrepresented groups include, but are not limited to: African Americans, Latinos, Native Americans, Pacific Islanders, Filipinos, those with disabilities or from disadvantaged backgrounds, and those underrepresented on the basis of gender identity or expression or sexual orientation. Stanford PRISM invites students to explore our training environment and to consider whether advanced training at Stanford would support their career goals.

Stanford School of Medicine's newly formed Propel Postdoctoral Scholars Program seeks to 1) attract and train talented postdocs from backgrounds typically underrepresented in the sciences, 2) provide postdoctoral funding support and professional development programs that will prepare individuals to assume leadership roles as

faculty in academia, and, in so doing, 3) champion a culture of belonging and inclusion in science and academia, within and beyond Stanford.

The following on-campus postdoc groups are diverse and critical to our institution:

- Stanford University Postdoc Association (SURPAS) is the umbrella organization of all postdoctoral scholars at Stanford. SURPAS' mission is to work with university administration in enriching the lives and the career development of postdocs; in addition, SURPAS organizes social and academic events.
- Stanford Black Postdoc Association (BPA) builds community among black postdocs that will lead to a professional network to support and promote diversity. BPA provides information about conferences, workshops, seminars, grants/fellowships, travel awards, and volunteer opportunities related to diversity.
- Stanford Latinx Postdoc Association (SLPA) strives to improve, enhance, and enrich the Latinx postdoc experience at Stanford through community building, professional development and networking. SLPA supports the presence and growth of the community through the promotion of diversity and inclusion in higher education.
- Out in Science, Technology, Engineering, & Mathematics (oSTEM@Stanford) is part of the national student (and postdoc) society dedicated to increasing the participation and visibility of people who identify as lesbian, gay, bisexual, transgender, or queer (LGBTQ+) in disciplines related to science, technology, engineering, or mathematics.
- Science and Engineering Graduate Women's Association (SEGWA) is the umbrella organization for all graduate women in science and engineering at Stanford. SEGWA promotes interdisciplinary communication and collaboration between women and women's organizations for increased efficiency and impact of organizational efforts.

In addition, the Diversity Center of Representation and Empowerment, or D-CORE, was established in October 2017 to provide a physical location where any member of the Stanford Medicine community interested in issues of inclusion and diversity can hold meetings or support groups, or just hang out and study. Diversity-focused staff hold regular office hours to increase engagement with and support for students of all backgrounds.

The Office of the Vice Provost for Faculty Development and Diversity (VPFDD) has a guidebook for departments when conducting faculty searches, "Building for Excellence: Inclusive Practices for Faculty Recruitment and 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; 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. 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 Environmental Health and Safety 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 accessibility of research facilities to trainees with disabilities**

The School of Medicine supports the recruitment, enrollment and graduation of students and postdoctoral fellows 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 includes students who have disabilities. The Office of Accessible Education (OAE) provides resources to all students and postdocs 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 and postdocs. The Campus Access Guide is an online system of maps detailing accessibility information for buildings on campus, including research buildings.

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

The SOM provides an environment of personal and professional exploration, allowing students and postdocs to define and follow their own path to success. The 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 School of Medicine, School of Humanities and Sciences and School of Engineering. The following SOM programs are also instrumental in enriching the research and training environment for students from all backgrounds:

- The Stanford Biosciences Grant Writing Academy, sponsored by the office of Senior Associate Dean Krams, 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 NIH fellowships to our students have doubled since the Academy was founded.
- The Wellness Matters program, sponsored by Dean Krams' office, provides curricula, peer mentoring, programs, and events targeted to the wellness needs of the Biosciences graduate students, and promotes self-care, resilience skills, and holistic health behaviors, helping to create an environment in which all graduate students can thrive. Popular events include Wellness First Fridays which features community building events once a month, and Mid-Quarter Recharge which provides stress-relieving activities. Additional successful events include wellness workshops, yoga/fitness classes, art, improv and trivia.
- For healthcare, mental health and counseling services, our graduate students have full access to Vaden Health Services on campus, and CAPS-Counseling & Psychological Services. Graduate students also have access to a Mental Health Team of therapists and a psychiatrist through the SOM.

- For housing our students are guaranteed housing with three options: (1) single graduate housing; (2) couples without children housing and (3) students with children housing at Stanford.
- 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, 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. Our multi-faceted mentoring approach allows graduate students and postdocs to be matched with peer and/or professional mentors of their choosing in addition to their faculty advisor. Trainees can opt to be matched with multiple mentors, thereby increasing the breadth of advice they receive.

The following university units are also essential in providing a supportive trainee environment:

- 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. 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.
- BEAM, Stanford Career Education also offers a complementary set of programs and events for our PhD and postdoc communities that focus on the academic track and the non-academic track. Examples include Jumpstart Your Academic Job Search, Academic Job Search: Negotiating Faculty Job Offers, and PhD Pathways.
- Two key student organizations – the Stanford Biosciences Student Association (SBSA) and Biomedical Association for the Interest of Minority Students (BioAIMS) – welcome students from all backgrounds. In addition, Stanford has excellent centers committed to coordinating students' extracurricular and cultural activities and professional development. These centers include the Graduate Student Center and Cultural Community Centers for students from (or with interest in) the Latino, African American, Native American, Asian American, International, and LGBTQ communities on campus.

## **12. Ensuring that proper policies, procedures, and oversight are in place to prevent discriminatory harassment and other discriminatory practices and to appropriately respond to allegations of such discriminatory practices, including providing any required notifications to NIH**

Stanford has long shared NIH's concerns regarding issues of harassment and discrimination. We take pride in welcoming students, faculty, staff, and postdocs of any race, color, national or ethnic origin, sex, age, disability, religion, sexual orientation, gender identity, veteran status, or marital status. Like the NIH, Stanford prohibits unlawful harassment including sexual harassment and sexual violence. Stanford also does not tolerate unlawful discrimination on the basis of these or any other characteristic protected by applicable law in the administration of the University's programs and activities.

Stanford's Nondiscrimination Policy provides: Stanford University prohibits discrimination and harassment and provides equal opportunities for all community members and applicants regardless of their race, color, religious creed, national origin, ancestry, physical and mental disability, medical condition, marital status, sex, age, sexual orientation, gender identity, veteran status or any other characteristic protected by law.

Additionally, Stanford's prohibition on Sexual Harassment provides: Where sexual harassment has occurred, the University will act to stop the harassment, prevent its recurrence, and discipline and/or take other appropriate action against those responsible.

Specifically, to provide assurances as required by NOT-OD-19-029, on behalf of the University, we assure Stanford's institutional commitment in the following areas:

- Stanford University has proper policies, procedures, and oversight in place to prevent discriminatory harassment and other discriminatory practices;
- Stanford responds appropriately to allegations of discriminatory practices; ● Stanford has developed a protocol to inform NIH/the Office for Civil Rights in compliance with NOT-OD-15-152; and
- Stanford has adopted and will follow its institutional protocol for requesting NIH prior approval of a change in the status of the Program Director/Principal Investigator (PD/PI) or other key personnel to continue their role on the NIH award described in the training grant application as described in NOT-OD-18-172.

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

The SOM covers all student expenses not provided by the training grant, including a stipend considerably higher than the training grant minimum to reflect the high cost of living in the Bay Area. These funds are provided centrally via the Biosciences Scholars Program to allow students the ability to carry out research in their lab of choice across all our Home Programs, so that students have the opportunity to pursue their passions in research topics and lab. We prioritize top students for training grant support and encourage all eligible students to apply for external fellowship support; SOM will provide all support for Biomedical Informatics students when they are not appointed by the training grant, and when they transition off the training grant. For students in year 5 and up, the PIs are responsible for their funding support. The University offers Stanford Graduate Fellowships which supports exceptional incoming graduate students with full tuition and stipend for 3 years.

### **14. Providing resources and expertise for evaluating program training**

In 2015, in partnership with our 14 home programs, Stanford Biosciences developed a central repository of PhD alumni information to track alumni outcomes from those that graduated since 2000. We organize alumni data to include geographic representation, employers, job sectors, academic details, and industry details. To date, we have evaluated outcomes for 1,593 alumni from 2000 to 2018 including training grant participants. Our goal is to track our PhD alumni annually to understand their career choices, including job sectors, job titles, employers, and geographic locations. All data is stored in the Graduate Student Tracking Alumni Module and shared with the home programs. In addition, we have invested resources into developing websites to highlight training grant alumni outcomes.

In summary, I remain fully committed to support the future for the Biomedical Informatics Training Program as proposed in your T15 renewal application. I look forward to continuing to work with you to advance teaching and research in biomedical informatics and data science that will solve fundamental challenges in biomedicine and health.

Sincerely,



Lloyd B. Minor, MD