Mentoring plan Example (for a postdoctoral mentee)

Mentoring Philosophy
As a mentor I strive to assess the background, interest and long-term goals of the mentee and assign them an independent project aligned with their research interests. I provide my mentees with a diverse set of opportunities in research, teaching and outreach and encourage them to discover their passions and strengths. I ask them to periodically self-reflect about their short- and long-term career goals. After discussions with my mentees, we develop a clear set of guidelines with expected milestones for the upcoming year (e.g., trainings, conference presentations, manuscripts, proposals etc.). I ensure that my mentees make adequate progress in their research projects and am available to advise, troubleshoot protocols or suggest alternative approaches as applicable. I help my mentees find additional resources, internships, and collaborators to advance their projects and develop new research directions. In addition, I encourage them to collaborate and learn from each other as well as serve as a mentor for incoming graduate and undergraduate students. I also mentor them to write manuscripts and fellowship/applications to obtain financial support. All my mentees (graduate students and a postdoc) have published journal articles as primary authors, presented their findings at national meetings and have been well placed after graduation in a career of their choice. A significant number of my graduate students have won awards and fellowships. I also believe that building the professional network of my mentees is key to their future advancement. I therefore encourage them to attend/present at multiple national meetings and involve them in meetings with our collaborators. As a strong advocate of diversity and inclusion, I recruit mentees from a diverse background including women, veterans, underrepresented minoritized, and international students. I also had the experience of advising students who suffered from mental health issues due to their disadvantaged backgrounds or broken families. These experiences have provided me with invaluable insight into dealing with struggling students and has helped develop my mentoring skills. I foster an environment in which all my trainees feel comfortable bringing up anything to my attention. I continuously strive to learn best practices in mentoring such as the research mentor training and facilitator training workshops offered by the Center for the Improvement of Mentored Experiences in Research (CIMER). I was honored to receive the Elizabeth L. Gross award for outstanding faculty mentor by the Biophysics program in 2018 and am humbled to be nominated for the 2022 Presidential Awards for Excellence in Science, Mathematics and Engineering Mentoring (PAESMEM).

I believe effective communication is key to maintaining and managing a productive research program. I encourage both formal and informal communication between myself and my mentees through multiple channels (in-person, emails, zoom and phone etc.). We have weekly lab meetings to discuss progress and pitfalls. In addition, I meet one-on-one with each of my mentees at least every month to discuss specific plans and details of their project(s), their interests and aspirations and professional development opportunities. I engage in frequent informal chats with my mentees to become aware of underlying issues or problems in their professional (and sometimes personal lives). I often model vulnerability by sharing my own failures and fears with my mentees. I commend successes through spoken and written messages and empathize with the failures and struggles of my mentees. I adopt a growth mindset and offer constructive criticism with a conscientious effort to fix and learn from a problem and not belittle the person. To encourage technical communication, I have each lab member present either a journal article or their upcoming conference presentation/manuscript/grant proposal at our weekly journal club. I provide constructive criticism in a safe group setting to enhance their technical communication skills. A
similar approach is adopted for technical writing where I provide examples and comments to help improve written text and figures for manuscripts, posters, and proposals. I pay careful attention to both the quality and timeliness of my feedback. I encourage my mentees to reach out of their comfort zone and communicate with our collaborators as well as develop new lines of communications with authors of journal articles and seminar speakers. Finally, I appreciate the diversity in people and how cultures, ethnicity, race and personalities can affect one's communication styles. I strive to learn effective communication strategies through workshops (on diversity and mentoring) and by reading books (e.g. Quite, Crucial Conversations, etc.).

Aligning Expectations
When trainees join my lab, I give them the opportunity to read and make comments on a Mentor-Mentee agreement. This document outlines my general expectations for the trainee (taking into account their training level) and what the trainee can expect from me. I am willing to adjust and negotiate items on the agreement. This usually happens in one of the first individual meetings I have with the trainee once they have joined the lab and they have had an opportunity to review the document. This is very helpful in reducing misunderstandings in the future.

Mentee Career Goals
John Doe would like to become an independent investigator in the field of nano-biomechanics and microscopy with a niche in biological AFM (atomic force microscopy). The goal during his postdoc is to acquire proficiency in a variety of experimental approaches in the field of nano-biomechanics and gain experience in teaching and mentoring. To develop independent research directions in biomedical research and obtain funding to transition to a semi-independent position. After this, Dr. Doe aims to obtain an independent research position in a research-intensive academic institution or as a staff scientist in a leading industry.

Research Skill Development

Research Project
Collagen type IV (Col IV) is the major component of the basement membrane lining the endothelial cells in our blood vessels. Col IV forms a network like structure and communicates with the cells with specific cell-surface receptors. As compared to fibrillar collagens (e.g., Collagen type 1), much less is understood about the interactions of Col IV and how it influences cell and tissue behavior in health and disease. This is even more important for diseases characterized by mutations in Col IV such as the Gould syndrome.

The proposed research aims to examine the binding site(s) of two major Col IV receptors, namely DDR1 and integrins $\alpha_1\beta_1$ and $\alpha_2\beta_1$. This will be achieved by single molecule imaging via atomic force microscopy (AFM) and transmission electron microscopy (TEM). In addition, the ultrastructure and mechanical properties of the underlying basement membrane will be examined in mice lacking DDR1 (or integrins) via AFM and TEM based approaches. The proposed research will have an independent component (on DDR1) in the Agarwal lab (on DDR1) and a collaborative component (on integrins) with Dr. Douglas Gould (at UCSF). Besides answering key questions on Col IV, the mentee will also involve in refining AFM methods and protocols for biological samples.

Anticipated Presentations
The mentee will present at the following platforms which will also be attended by the mentor:
Lab meeting (monthly): the lab meetings are held weekly. The mentee will present a journal article, research results or planned proposal at this forum every month.

MAE Bioengineering seminar (annually): The mentor’s home department hosts a seminar series in Bioengineering. The mentee will present his research at least once in this seminar series to solicit feedback from departmental faculty and students.

Local conferences and symposium on campus (twice a year): The mentee will present their research at local forums such as the Institutes of Materials Research (IMR) symposium, May 2022 or the Chronic Brain Injury symposium (December 2023).

National conferences (annually): the mentee will present their research at least one national conference such as the Biophysical Society meeting (Feb 2022), Gordon Conference on Collagen (June 2023) or the biennial meeting of the American Society of Matrix Biology (September 2023).

AFM workshop (annually): several AFM workshops are offered by companies like Bruker and Asylum research throughout the year to showcase latest research with their equipment. The mentee will present at one AFM workshop every year.

Anticipated Publications
The mentee will compile and submit at least one first-author manuscript (with mentor as senior author) in their first year on analysis of DDR1 and Col IV binding. He will also assist with other manuscripts involving collaborative AFM and TEM work where the mentee (and mentor) will be co-authors. Towards the end of the first year, the mentee is expected to develop a second first-author manuscript (with mentor as senior author) on biomechanical analysis of murine aorta from DDR1 knock-out (KO) mice.

Timeline for Planned Grant or Awards Submissions
As the mentee is not a US citizen, he will not be eligible to submit independent federal grants in his initial year(s). Nevertheless, the mentee is eligible and will submit a post-doctoral fellowship proposal to the American Heart Association (AHA) in Jan 2022. As another venue for proposal writing, the mentee will involve in the collaborative effort of the mentor with Prof. D. Gould (UCSF), who together have submitted a multi-PI NIH-RO1 in October 2021. The mentee will assist the mentor in re-submission of this NIH-RO1 (if needed) and other grant proposals (to NSF and NIH) in the upcoming year. In subsequent years he will apply for federal grants such as the K99/R00 award.

The mentee will be beginning his first post-doctoral training and will not be at an appropriate stage for Postdoctoral Scholar to Faculty grants in the next two years.

By the end of the first year, it is expected that that the mentee will develop a unique research identity with a niche in biological AFM and will gain visibility across our campus. To enhance this identity the mentee will be encouraged to present his research at major AFM and matrix biology meetings as well as compile and submit a review article on latest methods for biological AFM.

Career Development

Professionalism
Instruction in professional practices will be offered to the mentee by via the following platforms:
Participation in FAST panels: The mentor’s home department offers specialized training opportunities for graduate students to enter academia via the Future Academic Scholars (FAST) panels. The FAST panels consist of a series of 14 well-designed weekly discussion forums which are led by faculty and a wide range in topics like skills and background required to obtain faculty positions, types of faculty positions and US academic institutions, preparing a strong application package, funding opportunities for junior faculty, mentoring students, intellectual property, conflicts of interest and research misconduct. The mentor will encourage the mentee to participate in FAST panels during his first year and in subsequent years serve as a mentor for FAST panels.

Postdoctoral Professional Development Program Certification: The Office of Postdoctoral Affairs (OPA) offers a professional development program that includes activities designed to enhance professional acumen and advance postdoctoral scholars’ careers. The goal of this curriculum is to equip postdoctoral scholars with the skills necessary to navigate their postdoctoral training and prepare for many different types of careers. Each component of the certification program offers several options: in person events, live webinars, or static online resources. The mentee will be encouraged to complete the basic component and the academic track module, participants receive a certification that can be listed on their resume or CV. The list of options can be found here.

Mentorship and Leadership Skills

Supervised mentorship by mentee: the mentee will be an integral part of the AFM core facility directed by the mentor. In this capacity, the mentee will be uniquely positioned to assist with design, training and troubleshooting other AFM users for their projects. Such an opportunity will enable the mentee to enhance his mentoring and communication skills and develop into an independent mentor for new AFM users. To encourage formal classroom teaching, the mentor will encourage the mentee to deliver a guest lecture in her graduate course ME6194 on Microscopy in Biomechanics.

Mentorship/leadership skills at Ohio State: the mentee will avail of the trainings and resources offered by the OPA at Ohio State such as the Addressing Equity and Inclusion in Your Research Mentoring and Better Research Through Better Mentoring workshops. The Postdoctoral Professional Development Program mentioned above offers several opportunities for leadership training on and off campus. Monthly Postdoctoral Scholars Orientation, information for international scholars and professional development events. He will network with other postdoctoral scholars in Engineering to enhance his social and professional network.

Mentoring/leadership training outside Ohio State: the mentee will be encouraged to join the National Postdoctoral Association and avail of its numerous training and professional development opportunities.

Development of Communication, Time Management, and Related Skills

The mentor will meet periodically with the mentee to provide candid feedback on his technical communication (both oral and written), research progress and time management. A more formal annual review will also be provided with attention to strengths and a plan to address areas of improvement. The Postdoctoral Professional Development Program Certification includes programs to gain formal tips and training in communication and time management. Since the mentee will be interacting with a number of
AFM users, including those from underrepresented minority backgrounds, he will be encouraged to enroll for trainings (e.g. Implicit Bias) and workshops offered through the Office of Diversity and Inclusion and aspire for the Inclusive Excellence certificate offered by the College of Engineering. These trainings and experiences will help enhance the mentees communication skills.

**Training in the Responsible Conduct of Research**

Briefly describe plan for training in specific topic areas to include: 1) conflict of interest, 2) data acquisition and ownership, 3) peer review, 4) responsible authorship, 5) research misconduct, 6) researcher/trainee responsibilities, 7) collaborative science.) Note: Contact the Research Officer in your college to inquire about courses and workshops available on this topic.

The mentee will undergo the following trainings in the first two months of his arrival with subsequent renewal of these trainings every 1 to 2 years.

<table>
<thead>
<tr>
<th>Training</th>
<th>Major Topics</th>
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<tbody>
<tr>
<td>Collaborative Institutional Training Initiative (CITI) training</td>
<td>Authorship, Collaborative Research, Conflicts of Interest, Data Management.</td>
</tr>
<tr>
<td>Responsible Conduct of Research [RCR] (OSU RCR Core)</td>
<td>Mentoring, Peer Review, Research Misconduct, and Plagiarism</td>
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<tr>
<td>Responsible Conduct of Research [RCR] (Engineering)</td>
<td>Using Animal Subjects in Research, and Research Involving Human Subjects</td>
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<tr>
<td>Responsible Conduct of Research [RCR] (Biomedical)</td>
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<tr>
<td>Human Subjects Protection [HSP] (Biomedical)</td>
<td>Belmont Report, Informed Consent, Research Involving at Risk Populations, HIPAA, ethical concerns with human subjects</td>
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<tr>
<td>Good Clinical Practice [GCP] (US FDA Focus)</td>
<td>Drug development and FDA regulations</td>
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<tr>
<td>Institutional Data Policy [IDP]</td>
<td>Responsibilities for accessing and handling institutional data</td>
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<tr>
<td>Title IX Training</td>
<td>Sexual Misconduct Prevention</td>
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In addition to the above the following trainings specific to the proposed research will be undertaken:

**Working With the IACUC:** this is a required CITI module to be completed by all personnel involved in animal research at the Ohio State University. It involves both the online version as well as a hands-on training in handling animals (mice).

**Research Safety and Biosafety trainings:** these trainings are offered by the office of Environmental Health and Safety (EHS) and focus on management and regulatory compliance involving the research laboratories at The Ohio State University. The mentee will complete the Biological Safety Training for BSL2, Bloodborne Pathogens Training, Building Emergency Action Plan (BEAP) and Lab Standard Training.

**Mentoring Network**

I will encourage my mentee to identify additional mentors while in my lab. I will help him connect with researchers on my campus, beyond my department, and with others in the field at conferences or when they are invited to campus to give seminars. We will use a mentoring map for him to identify what mentors he already has and what kinds of mentors he needs moving forward. I will encourage his participation in the OPA’s Postdoctoral Scholars Orientation, and the Postdoctoral Association. He will network with other post-doctoral scholars in Engineering to enhance his social and professional network.