Personal Statement – Boone M. Prentice (Department of Chemistry)
2024-2025 Doctoral Dissertation Mentoring/Advising Award

Lab Summary: I direct a research program that develops new analytical mass spectrometry technologies and gas-phase chemistries to study a wide variety of biomolecules, biological tissues, and diseases. This involves supervision of graduate and undergraduate students as well as occasional visiting high school researchers. Since starting in 2018, **6 Ph.D. and 3 M.S. degree students have graduated** from my group, and all have obtained excellent positions following graduation. My publication record is highlighted by contributions from ~100 unique authors. We have received numerous external grants and awards to support the research of **25 graduate students**, 16 undergraduate students, 4 REU students, and 3 visiting high school students to date.

Vision: My research lab is committed to ensuring a safe, friendly, and accepting environment for everyone. This diversity includes backgrounds of differing race, color, religion, national origin or citizenship status, gender or gender identity, pregnancy, sexual orientation, age, disability, and military status. In particular, I view the equity and inclusion of underrepresented persons as a moral obligation. To further these goals, I am actively involved in multiple initiatives focused on the mentorship of underrepresented and/or young scientists, including serving as a mentor for the American Chemical Society (ACS) Project Summer Experiences for the Economically Disadvantaged (SEED) high school students, a mentor for UF's undergraduate University Multicultural Mentoring Program, a mentor for Females in Mass Spectrometry (FeMS), a mentor for a University/Guatemala REU program, a mentor for UF's high school researcher Student Science Training Program (SSTP), and obtaining supplemental NIH funding to support a LatinX undergraduate researcher. Personally, I was fortunate to have an immensely informative undergraduate research experience and very supportive mentors at every stage of my education, and I aim to "pay it forward" by continuing to train young scientists throughout my career. I view it as an important responsibility to mentor young scientists, specifically those underrepresented in chemistry and who have historically not had equal access to opportunities.

Prentice Lab Educational Activities: The Prentice Lab is a highly collaborative research environment that places a high value on effective communication. Our lab motto is "Work Hard, Be Thoughtful." I encourage thoughtful approaches to both interpersonal interactions (*i.e.*, approaching relationships professionally and respectfully) as well as scientific experimentation (*i.e.*, positioning ourselves for discovery and serendipity). These ideals are crystalized in our Lab Manual and these skills are cultivated via regular educational activities:

- Biweekly 1-on-1 Meetings: I hold 1-on-1 meetings with all graduate students to discuss project design, research progress and priorities, data, obstacles, resources, and mental health.
- Weekly Subgroup Data Meetings: Informal data meetings are held twice each week: one focused on Fundamental Research and one on Biochemical Applications. Here, students present new results and raw data, which provide excellent training opportunities to learn mass spectral interpretation and critical thinking skills. All group members provide feedback, which develops management and interpersonal skills. This process frequently initiates collaborations between students and leads to new ideas and project directions.
- Weekly Group Meetings: Formal group meetings are held during which two students deliver 25-minute presentations on their recent research progress or on a relevant literature article. These presentations foster development of communication and presentation skills. Research updates encourage students to structure and defend their ideas to critical peer analyses and article presentations help students stay up-to-date on scientific literature.

- Monthly Collaborator Meetings: All graduate students have at least two major projects: one fundamental project that consists of instrumentation or method development conducted in the Prentice Lab and a second project that applies their fundamental developments to a biochemical challenge in collaboration with a clinical or biological lab. The fundamental project is designed to increase foundational analytical chemistry skills and encourage scientific independence, while the applied project fosters interdisciplinary communication and translational thinking. Monthly collaborator meetings are conducted via Zoom involving the PIs and students from both laboratories for each project. Students are also encouraged to attend lab meetings of collaborators, which provide excellent training opportunities in other scientific fields (*e.g.*, immunology, microbiology, pharmaceutical chemistry, pathology, endocrinology, neurology).
- Mentoring Structure: Senior graduate students in the lab mentor younger graduate students and undergraduate researchers, guiding project direction, technical training, and data interpretation, which refines their own management skills. Mentees mature into mentors for the next generation of students in the group.
- Informal Communication: I have an open-door policy and trainees routinely drop by to ask questions. I am also in the lab regularly to discuss projects, check on progress, and work with students. The lab has a cork "Data Board" in the hallway where students pin up recent exciting results. This board serves as a nucleation site for discussion and encourages student progress. I am also in frequent communication with all trainees via the group Slack when not in the lab (*e.g.*, due to traveling). Overall, there is a very cooperative atmosphere in the lab, with active exchanges of ideas and technical advice between junior and senior lab members.
- Lab Culture Activities: I regularly and randomly hold team-building exercises with the group. These have included "vulnerability exercises," elevator pitch practice sessions, group mission statement mapping, catch phrase brainstorming, and a "favorite song" exercise. These activities help to build a group environment where members feel safe to both present new ideas and disagree respectfully on scientific arguments. As a young professor, I have found that investing in the members of my team individually and as a collective can ensure both their personal and professional development and leads to a more productive research group.
- Individual Development Plans (IDPs): All graduate students complete IDPs and annual research reports. I meet with each student to discuss their progress, growth, and career goals.
- Weekly Reports: All students submit 1-page written reports to me each week describing their research progress, setbacks, and identifying goals for the next week. These reports help me stay informed on issues with their projects, but also keep students goal-oriented, help them organize and plan experiments, and provide short, low-stakes opportunities to practice scientific writing.

Student Achievement: All students in the group present their research at scientific conferences. These conferences provide exceptional opportunities to hone communication skills, network with experts, and expand scientific worldviews. Trainees from my lab have delivered **>150 conference oral and poster presentations** since I began my independent career at UF in 2018. Graduate students have been recognized with numerous awards, including the Winefordner Summer Fellowship (2x), Bates Graduate Fellow (3x), Laitinen Graduate Fellow (3x), CLAS Dissertation Fellowship, Grinter Fellowship (2x), UF GSF (3x), and numerous travel and conference awards. The lab alumni are now employed at Eli Lilly and Company (Xizheng Diao, Ph.D 2023; Jonathan Specker, Ph.D. 2023; Zhongling Liang, Ph.D. 2024), Amgen (Tingting Yan, Ph.D. 2024), Harvard Medical School (Julia Bonney, Ph.D. 2023 – postdoctoral fellowship with Prof. Nathalie Agar), Tessera Therapeutics (Yuzhuo Ji, M.S. 2021), the USAF (David Donndelinger, Ph.D. 2024; Matthias Born, M.S. 2019), and Tennessee Valley Authority (Chelsey Mertens, M.S. 2021).