

Mentoring statement, September, 2018

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Research is an extremely exciting endeavor that is rewarding and fun, but the steps to discovery and innovation can come with challenges, and research training can be a high-stress occupation. It has been my experience that effective communication can promote and enhance the research experience and focus normal stress into something productive, while lack of effective communication can hinder the process and add stress that limits productivity and student development. Therefore, I believe in an open and dynamic dialog and that students should be active participants in the research endeavor. No two students learn the same way nor respond the same way to a rigid mentoring approach; therefore I seek to have an individualized mentor-mentee relationship with each trainee. As we collectively seek to address fundamental questions in cancer biology or address an unmet clinical need, I encourage students to leverage their unique backgrounds and current training to develop creative and rigorous approaches to generating new knowledge and strategies to improve human health. This document summarized key points of my advising philosophy, and the expectations and responsibilities for my advisees and for myself.

My role: I am neither infallible nor am I possessed with expert insights into personnel management, although after 20 years of lab experience I have picked up a few skills. I strive to treat all members of the group with respect and fairness. I will hold you to a high standard both in terms of research quality, integrity, and productivity, and professional conduct. My own job in the group is to provide overall guidance of the research direction(s) and lab structure, to ensure the availability of adequate resources to accomplish outstanding research, to provide reasonable guidance to students as they complete all of the tasks necessary to obtain their degrees, and to assist each student as much as I can in finding a follow-on position that excites them.

Research Expectations: Graduate students span a terrific range of ability and experience and thus the graduate experience, while very rigorous and challenging, should be one of the most academically exciting times in your career. Some key expectations during this time are as follows:

- In the first year, some of your time will be engaged in coursework and becoming familiar with the techniques required for your research. During the academic semester, performing well in your courses is certainly important, but should not cause a lack of productivity in your research. You should become familiar with the literature pertaining to your project, and with the wider literature in general and start conducting focused experiments that you or you and I plan together.
- By your second year, you should be making significant progress on your projects leading into your preliminary exams and in generating foundational data for manuscripts and fellowship applications. You should push for (and I will try to afford you) all of the freedom that you can handle in terms of defining your own research space within the lab's mission and funding.
- In your third year, we will have attempted to define all of the science that you need to accomplish in order to complete your degree, although it is important to keep in mind that projects and research directions / questions evolve as data emerges. In all years you are expected to make steady progress towards your research goals at all times. Part of that process includes being active in setting short and medium term goals including milestone dates and deliverables.
- As you progress to a more senior student you will be assigned many additional lab responsibilities (oversight, mentoring etc.). At this stage you should be developing, or have developed, the ability to plan and conduct research more independently. During this time you should continue to publish and this should be a very productive time as you work toward your dissertation defense. Journal publications are the most important way to share your knowledge and creativity with the scientific community. These are essential to professional development and progress. Although each case is different, students pursuing a doctoral degree will be expected to author at least two impactful first-author journal papers before the final thesis defense.

Professional Conduct and Advancement

Members of the lab should have many of the qualities of a professional position, including both its responsibilities and privileges. The highest ethical standards are required in all research and/or scholarly work. The Engineering for Oncology Lab, i.e. the Provenzano lab, should be a collegial environment for the sharing of research ideas and accomplishments and working hard to positively impact science and fight human disease. Indeed, I value hard work and strong work ethic. Core values of our lab are a hunger to contribute to our understanding of human disease and help patients, a hunger to succeed and to help others succeed, and a hunger to improve. Along these lines, reliability is important. It is important that you strive to do what you say you will do and if this is not possible then communicate this as early as possible so that we can work together to overcome barriers, adjust the direction, etc. If this is to be successful you must be willing to accept feedback and learn. I will constantly strive to provide constructive feedback of things you and I can improve upon both when things are going great and when we are working through tough times. I sincerely appreciate the same feedback from each person in the group. This is how we maintain a growth mindset where we are all constantly working to get better. Certainly, be happy and proud of your accomplishments and work to date. Be happy where you are at, just don't be content staying in that place; consistently work for growth. Furthermore, work to communicate effectively and in a constructive manner. Study tact and work to utilize diplomacy in different situations to help navigate difficult conversations and interactions to consistently produce constructive interactions and provide constructive feedback. By working together for common goals we are all most successful.

A more detailed discussion of these points, and additional requirements for success and development, are provided to group members in the form of a complete Provenzano Group Guidelines document.