Professional Assessment Statement
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I. Teaching

The Rollins Biology Department defines "excellent teaching" as "performing **excellent teaching**, in which students are challenged to develop skills as well as learn a body of knowledge and in which the instructor demonstrates a high competence in his/her field and an ability to communicate this knowledge to students." Through my teaching goals, articulated teaching philosophy, classroom practices and course evaluations I have demonstrated excellent teaching as defined by the Rollins Biology Department.

My ultimate goal as an educator is to develop critical thinking skills in my students by emphasizing problem solving. The challenge is to make these skills interesting, interactive, thought provoking, and relevant. Critical reasoning abilities transcend student skill level and ought to be put into practice early in a student's academic career, for both majors and non-majors alike. It is my responsibility to equip students with a skill set that will allow them to be life-long students, inquisitive informed citizens, and objective problem solvers.

My teaching philosophy is to work with students to master the fundamentals of biology. The seemingly complex content too often bogs down students, and this leads to an aversion to science. Instead, I present science as nothing more than a few simple rules (albeit rules that can change) and vocabulary, and if they can master these, they can apply them to increasingly complicated scenarios. Regardless of student level, I strive to help students see the "big picture" and recognize themes that are constant across topics and disciplines. For example, in every course I discuss what a gene is and how genes "code" for an individual's characteristics. Regardless of whether I am teaching a student destined for medical school or a non-major student, they can use these principles to explain how differences in specific genes dictate whether or not an individual is susceptible to disease. I realize that in a non-major's course students are not likely to be studying diseases in the future, but through this lesson students are exposed to the process of science and learning about logical organizational schemes, information processing, and how to decode information. In my assessment of student learning, I ask a question about these processes and how they relate to information storage and retrieval. Using this instructional technique, I've found that students see the importance of being inquisitive, looking for relatable themes, and using evidence to draw conclusions. Students have commented that I am an "effective, enthusiastic teacher that is very engaging," which is in line with my teaching goals and philosophy. One transformative opportunity that has shaped and extended by teaching philosophy was working one-on-one with a student requiring significant academic accommodations for a science laboratory, N-credit. The student had limited experience with science and forced me to closely examine my pedagogy. I have learned to slow down my delivery and carefully use language, pictures, and cadence as tools to ensure understanding. This experience has also made me realize the power of simplicity; how even the "simplest" scientific principle might completely change the way someone else views the world.

To put my teaching philosophy into practice, I must help our students to transition from memorization towards synthesis, application, and interpretation of information, that is, to ask good questions and then apply that knowledge to reach a meaningful conclusion. Even in introductory courses, I rarely give assignments that consist solely of material that is easy to memorize, as these exercises promote "binge and purge" learning. Students have picked up on this and have commented positively; "He did not make the course solely about memorizing things it was all about learning how to understand the material and interpret things." To bring the focus to interpretation over memorization, my strategies include a combination of critical thinking questions and group activities to foster objective problem solving, peer learning, and practical application. One example is our Synthesis and Application problem sets in our General Biology series, which are upper level questions designed to initiate critical thinking in our more novice students. Students have commented that these exercises help them see the relationships between topics and our theme and that these questions push them to see how all the pieces connect, although some students comment that these questions are too difficult. These problems are challenging for students as indicated by course evaluations, however as they progress through the major, I

think students realize the benefit of the exercise, as being able to think critically and analyze are essential components of their education. This emphasis on critical thinking is at the forefront of my upper division courses, which are almost solely based on application of content. I use open-ended exam questions concerning experimental design and the interpretation and evaluation of data. Although students claim that these exams are difficult (and I agree), I have heard positive feedback that these experiences allow them to see how ideas come together to advance the field and how to deal with ambiguity among data.

My "mastering the basics" approach can also be found in how I structure my classes and provide feedback to students. I do not move linearly through the textbook; instead, my courses are constantly updated with the newest applications, critical thinking questions, and primary data. In fact, in my Molecular Biology course, the syllabus states that I might contradict the book because the discipline moves so quickly. Since students have said the text is not necessary for my upper division class, I have recently removed it from the required materials. I recognize that learning can and should take many forms (written, visual, auditory, etc.); therefore, I strive to make my courses encompass as many different learning styles as possible so that students can see materials in multiple ways. My visuals contain text, diagrams, and videos. I punctuate my teaching with discussion and questions. Importantly, I do not always include these higher order questions in posted lecture materials, forcing students to attend class and actively engage in their education. I also try to include plenty of pictures and anecdotes to aide in student recall. I've received positive feedback about my style, and students often comment "everyone uses [your] PowerPoints," and that, "your examples and stories make difficult topics easy to understand." One technique that I have added is the "gamification" of my courses; after each lecture, students compete in a short, pub-trivia style interactive game. These quizzes focus on lower level Bloom's taxonomy and are intended as a self-reflection on how well students are mastering the facts. Using this tool, I can get instant feedback, and with this information I can stop and review or encourage individuals to attend office hours. This practice has been extremely helpful with "taking the temperature" of the class and figuring out different ways to present information. When I am confident with the class's strong grasp on the basics, we are able to push forward and discuss higher-level concepts. Despite my attempts to give constant feedback, students have commented that sometimes it is not nearly enough; or that I can be too "blunt" or "honest." Yes, I am a very straight forward person, however in my experience being clear and direct with students is the best way for them to move forward from any missteps and clarify expectations moving forward.

In the teaching laboratory, "mastering the basics" is accomplished by actually performing science, in constantly evolving investigative labs. I am a proponent of course-based undergraduate research experiences (CUREs), where I collaborate with students to ask novel questions and dig into all aspects of the scientific method. I have developed inquiry-based laboratories in both General Biology and Molecular Biology where students work on their experimental design skills in addition to scientific writing and communication. In General Biology, my main focus in the lab is how to ask good, testable scientific questions by encouraging students to explore the primary literature. In Molecular Biology, my focus shifts to technical skill development and experimental theory. I have discovered that no amount of lab skill can help if students cannot master asking good questions. Investigative labs may have higher degrees of experimental failure; however, it is well documented that the benefits of thinking critically about experimental design, troubleshooting, and interpreting data far outweigh any semblance of laboratory success found in verification labs. Importantly, less tangible items like effort, thoughtfulness, and attention to detail can be weighted just as heavily as getting the "correct" or desired answer. I have received positive student responses from this laboratory style, with one student commenting, "I loved having the opportunity to use cutting edge techniques and learning about emerging research in the field." Even in courses that do not have a lab (BIO201, BIO344, RCC), I stress the use of the scientific method to arrive at meaningful answers. For example, in my RCC course, the major writing assignment was to generate a hypothesis and design an experiment to test that hypothesis. Finally, investigative labs allow me to work with students on an individual basis to ascertain how to best reach each student, and this personal connection often carries over to both the classroom and my office hours. Although I have not yet taught an rFLA course due to scheduling limitations, I intend to use investigative laboratories here as well.

`I think an essential aspect of this job is to remain motivated to improve my craft, gaining a variety of teaching

experiences in terms of differing course topics, student skill levels, and pedagogical methods. I absolutely love learning new things and have made an effort to teach courses and topics that are outside my area of expertise, such as BIO120. I've discovered that putting myself in the shoes of the learner gives me a better sense of what is likely to confuse students. Being educated on a topic, but not an expert, is extremely humbling especially when a student poses an excellent question that is beyond my knowledge. Admitting that I don't know is liberating and allows me to foster a discussion on how information is generated and how conclusions are made. My personal drive to constantly refine my teaching and my whole-hearted enthusiasm for the topic are immediately conveyed to the students, and together, we create a rich learning environment.

II. Scholarship

While at Rollins I have demonstrated a pattern of professional activity and development pursuant with the granting of tenure and promotion as outlined by the Biology Department at the time of my hire (criteria were approved by FEC in 2012). The criteria for promotion for Biology states requirements as, "…**one paper in a peer-reviewed journal or book**…as well as maintaining currency in one's field by "**presenting research or participating in professional development workshops, at a minimum of two regional, national, or international conferences."** Additionally, promotion criteria clearly state, **"work must be done either in a biological discipline or a pedagogical paradigm,"** and **"… be based on professional activity performed since beginning service at Rollins."**

My professional activities have resulted in three separate peer-reviewed publications (2 pedagogical and 1 research; see Pieczynski et al. BAMBED 2019, Kee et al. CourseSource 2019, and Magaletta et al. FASEB BioAdvances 2019). Importantly, these publications contain contributions from student authors. The scholarship that I have developed since joining the Rollins Biology Department has been presented at six different international conferences. I have mentored ten different students in my laboratory, many of whom are co-authors and presenters at the above-mentioned conferences. I have been active in the student-faculty collaborative research program. Students trained/mentored in my lab have gone onto be successful medical and graduate students.

Essential life processes in animals require a highly functioning nervous system that can both register input and provide output in an efficient and timely manner to respond to their environment. Neurons are professional cells that specialize in transmitting information. Importantly, signaling molecules most be deposited in neurons at the appropriate place and time to facilitate proper and efficient transduction of the neuronal impulses. A class of proteins, called motor proteins, are responsible for the movement of signaling molecules through neurons. Motor proteins literally walk along a cellular "interstate" system of structures called microtubules, where they deliver cargoes that allow the nervous system to function. My research seeks to understand how motor proteins function in an intact, whole living organism, utilizing the model system, *C. elegans*. *C. elegans* are a small (< 1 mm) round worm and a widely used model because they have a complete nervous system and share many biological properties with humans. Work in my lab has identified a motor protein that when altered, causes over-excitation of neurons and locomotive defects. This work has resulted in one research publication. (Magaletta et al FASEB BioAdvances 2019).

I have incorporated original research projects into my BIO341 (Molecular Biology) course and am planning on implementing course-based research into BIO121. BIO341 students have been using genetic editing technology (CRISPR/Cas9) to make targeted mutations in genes of interest in both cultured cells and *C. elegans*. My entire laboratory manual from my Rollins BIO341 course has been reviewed and will be published online in 2019 (Kee et al. CourseSource 2019). This pedagogical publication was a considerable time investment; developed and refined over five semesters at Rollins. Additionally, a collaborator and I have developed another laboratory based on the same technology, where we inactivate genes in bacteria causing them to lose fluorescence (Pieczynski et al. BAMBED 2019). These articles have achieved significant impact in the molecular biology/genetics' pedagogy, have been presented at multiple conferences, and have led to numerous

collaborations, both nationally and internationally. In addition, I will be acting as an instructor at a professional developmental workshop in the summer of 2019, where we will be using laboratories that I have developed at Rollins.

I expect that both my biological research on motor proteins and my pedagogical research on innovative lab practices will continue post tenure. I plan on expanding my biological studies into different types of neurons and muscles, looking at the interface between neuronal signaling and movement, and how motor proteins contribute. This question is the basis for large-scale genetic screens, where students can be heavily involved in identifying new genes that regulate motor protein movement and behavior. Integrating my research and my teaching has been a successful strategy to generate much needed molecular reagents and pilot initial experiments to drive my scholarship forward, in addition to the learning benefits of involving more students in an original research project. In this context, students can engage in my research through either genetic or behavioral analyses, making my research a good fit for students who like biology, molecular biology, or neuroscience.

III. Service

The Biology Department criteria for promotion states, "Two primary means of **satisfying service related to the College are through committee service and advising**.

Notably, I spent two years as the Math/Science Division representative on the Curriculum Committee (CC, formerly AAC). During my time on CC, I served as secretary and as a member of the Academic Appeals Subcommittee. This service position has provided me with the opportunity to understand the curriculum and policies of the College. As part of the CC, I was also a member of the strategic planning task force investigating the imbalance of majors at Rollins and how to best organize the College in line with our mission. Additionally, as part of the strategic planning initiative, I was also a member of the post-graduation success strategic task force. I organized a subcommittee, proposing career and life planning initiatives for third and fourth year students. In the future, I look forward to taking on a leadership role by becoming chair of a standing committee for the College. Additionally, I was a faculty representative on the Library Director Search Committee. This valuable experience has provided me with the opportunity to observe the administrative side of higher education, in addition to building relationships with other departments on campus.

I also play an active role as an academic advisor. I routinely carry approximately 20 or more advisees across the Biology and Biochemistry Molecular Biology majors. As of June 1, 2019, I have been the Program Director for the BMB majors. Also, I unofficially advise a number of Biology minors and students interested in health-related careers. Despite having official pre-health advisors on campus, I have become well versed in the different requirements for various health tracks and graduate schools. I find it very rewarding to see students move onto a career they are passionate about and look forward to working closely with Dr. Marissa Fuse in the future. I have spearheaded an advising and registration organizational procedure for the Math/Science Division to make student registration more efficient and ensure on-time graduation. As part of my advising duties, I was previously Rollins College Advising Mentor (RCAM) Fellow. My role as in this position is to be an advocate and provide support for faculty-student advising relationships and to answer advising questions for the campus concerning Biology and BMB majors.

In addition to my standing committee and advising work, I also have extended my service to the campus as a whole. I have participated in numerous Rollins recruiting events. I routinely volunteer my time at events such as SPARC Day, the post Hurricane Irma campus clean up, and the Scholars Interview Weekend. I served on numerous thesis committees within the Biology, BMB, and Marine Biology programs, as well as for the Physics and Sociology Departments. I also volunteer my time to chaperone a departmental sponsored field experience to the Florida Keys and the Everglades and continue acting as the Biology Department's safety officer. Besides service work on campus, I am also involved with the Genetics Society of America and the American Society of Cell Biology. I have given presentations and led round tables about teaching and research for these professional societies.