



STATEMENT OF OBJECTIVES & EXPECTATIONS OF THE MULLIN LABORATORY

INTRODUCTION

Welcome to Arkansas State University (A-State) and to my laboratory in the Department of Biological Sciences. If you are considering attending A-State, then this information will give you an idea of what to expect from me and from yourself. If you have already been accepted into the department's graduate program, then I expect you have already learned some of what appears below. I hope that your tenure here will be rewarding and enjoyable.

OBJECTIVES OF THE LABORATORY

The objectives of the Mullin lab are to: (1) train graduates who will be successful in their chosen careers; (2) produce high quality publications and theses/dissertations; and, (3) promote conservation of ecosystems and their components through providing information, expertise, and leadership.

WHAT I EXPECT FROM STUDENTS IN MY LAB

Goals – A thesis-based Master's degree is intended to educate you on how best to conduct scientific research. Your goal should be to produce an original thesis of publishable quality in a reasonable time period (2-3 years).

A Ph.D. degree is awarded to an individual because they have demonstrated the ability to think like a scientist. Your goal should be to (a) develop a project that incorporates some of your own interests and broadens your skill sets and, (b) with regular input from your major professor, see that project to completion.

In the case of either degree, an additional goal is to produce quality publications in peer-reviewed journals. Specific to the Ph.D., I expect that a student will have succeeded in having at least one chapter from their dissertation published prior to graduation (note that this is a more rigorous requirement than what is expected from the Graduate School).

Learning/training/grades – An important aspect of your training here will be in your classes. Additionally, you will learn a lot through interactions with fellow graduate students in this and other lab groups, other professors at A-State, colleagues at professional meetings, and me. Should you be employed as a teaching assistant (TA), you will gain experience in teaching. Finally, you will gain experience in leadership skills. Your courses will be selected so as to facilitate a better research project, and to better prepare you for your career.

Concerning grades, you must maintain at least a 3.0 GPA to keep any type of assistantship appointment. For this reason, I prefer that my students initiate their program in good academic standing, so I do not assign students many additional tasks during their first semester in the lab. By the same token, I expect my students to maintain their GPA, but I do not want courses to consume all of their time. Coursework should not be the most important part of graduate school. The objective is learning, not necessarily maintaining a "perfect" 4.0.

Time – I do not require any set hours or amount of time spent at school. This is not a factory,

and we do not have a time clock. If you are productive at home or elsewhere, then that can be satisfactory. However, there are certain things that can only be accomplished at school. For example, it is difficult to gain the advantage of interactions with fellow students (and me), and to cooperate on achieving goals, if you are not here. I do expect to be able to reach you if I should need to do so urgently – it is your responsibility to inform me of any extended absences from campus or changes in your contact information.

Aligned with this topic is that of departmental participation. The department is fortunate enough to schedule occasional seminar events where biologists from A-State or other institutions present their research to our department. In addition to learning about investigations in other areas of biology, these talks might feature state or federal employees whose agencies could present a future employment opportunity for you. As such, I trust that you will make every effort to attend these events. I also expect you to attend the defense seminars of your peers in the graduate program, regardless of their research focus – they will appreciate, and should reciprocate, your support.

Cooperation – You are not in competition with your fellow graduate students, even if they are from another lab. When I, or somebody from my lab group, receives recognition through a publication, grant, award, job, or similar circumstance, it reflects well on all of us. This philosophy also transcends to the department, college, and university level. Therefore, cooperation and teamwork are going to be more productive than competition (although a little friendly competition is healthy at times). Everyone in the lab should become familiar with everyone else's projects and, as your own schedule allows, I encourage students to collaborate and assist one another.

Ethical behavior – With rare exception, the research conducted in my laboratory involves vertebrate species. Guidelines from the Institutional Animal Care & Use Committee (IACUC) stipulate that all vertebrates will be treated in an appropriate manner and, if housed in the laboratory, that they will be provided with a certain minimum level of care (NAS 2011; and, <http://www.astate.edu/a/ortt/research-compliance/>). My standards are generally more rigorous than those set forth by the IACUC. As such, I expect that you will treat all living forms with the respect that they deserve and will not neglect any of your research animals that are maintained in captivity.

Although keenly interested and supportive of any research endeavor you undertake, I have neither the time nor the energy to watch each of my students gather every last data point. In addition to an independent working environment, what this means is that I am trusting you to gather all of the necessary information to complete your research project. Falsification of data is a surprisingly easy “trap” to fall into (see NAS 2017) and yet also a relatively easy phenomenon to detect. My philosophy is: “Do not even think that you would be able to get away with it.”

WHAT YOU CAN EXPECT FROM ME

Developing and conducting an innovative research project – As stated previously, the research project you conduct will be the cornerstone of your tenure here. You will be identified for some future time period by your research endeavor and the publication(s) that result from it. You can expect to work on a project that is not only interesting, but exciting. You should become familiar with the types of research I do because your project is likely to overlap those efforts to a certain degree. Nested within my research philosophy is the idea that you can make any project

exciting and truly your own by developing it yourself. Your creativity might have constraints, however, as would be imposed by a grant with specific objectives that are stipulated by the funding agency (in which case, your project is linked to those objectives). You may not simply take a funded proposal that I have written and use all components of it as your project.

For prospective doctoral students, it is worth stating that A-State is home to two Ph.D. programs that intersect with the biological sciences — Environmental Sciences and Molecular Biosciences. Of these, I feel more qualified to mentor students in projects that fall into the Environmental Sciences program. You should not expect me to serve as your major professor for a Ph.D. in molecular biosciences unless we agreed to having a co-advisor structure to your dissertation committee.

Assistantships – Unless there are unusual circumstances, I am reluctant to accept a student unless some financial support exists in the form of a research or teaching assistantship. A research assistantship (RA) entails doing research, usually related to the thesis or dissertation, for a monthly stipend. Other duties might be assigned to you, however, that are not directly related to your project. A teaching assistantship (TA) entails assisting a professor(s) with a few sections of a course(s) having a laboratory component (usually 6-9, but no more than 10, contact hours per week) for a monthly stipend.

Because either the thesis or dissertation is required in order to confer a degree, an RA is generally preferred by most graduate students. However, there are advantages to a TA: First, you gain teaching experience. Second, you often have more freedom in selecting your exact research project, because your study is not tied to a grant having obligations to a funding agency. Also, be aware that you might not have a choice in the matter – the type of assistantship awarded might depend on available funding during your time in the program. See the current edition of the Graduate Bulletin for more information:

<http://www.astate.edu/college/graduate-school/graduate-assistantship/>

At present, a Master's student awarded a TA earn approximately \$10,870⁰⁰ for a 9-month contract. Stipends for doctoral students start at \$14,900⁰⁰ for a 9-month contract and, in either case, amounts can be higher for students funded as RAs through external grants. The amount of time you allocate to TA duties during any given semester may depend on the courses that you are assigned. As mentioned previously, I do not maintain a log of your hours and neither should you. The "job" is goal oriented. That is, the total number of hours required is less important than achieving the goal of producing a quality thesis or dissertation whilst also satisfying the obligations of your assistantship contract.

Other financial and technical support – I have been reasonably successful in obtaining funding for various research projects. As such, my lab has accumulated a modest amount of "stuff" that is available for you to use. This includes field/sampling gear (*e.g.*, transponder systems, minnow traps, *etc.*), aquaria and husbandry cages, dissection scopes, and other items. Additionally, graduate students in our department have ample access to computers, GIS applications, and a biotechnology lab cluster. You should not hesitate to politely ask for time on equipment that is housed other labs, or that is part of the dept.'s centralized inventory. Our department also has several good biological specimen collections, and these can provide a valuable source of historic and comparative data.

There are numerous opportunities to obtain additional funding for your research. These include intramural (A-State) grants and fellowships, as well as extramural competitive grants and other sources. I encourage all of my students to try their hand at writing grant proposals to

obtain funds for their studies. This skill is often deemed essential by many employers, whether they be agencies, non-profit groups, or academic institutions.

Gaining experience and confidence – As you develop and conduct your research, you will gain experience and confidence in becoming knowledgeable about your particular topic. You can expect to have opportunities to attend conferences, present your results there, and interact with other experts, potential employers, and colleagues. Therefore, you will gain experience in the effective communication of science, plus the opportunity to cooperate with your peers in this regard. I view these as essential skills for professional biologists.

Moral support – Once you matriculate in my lab, you will have my support in just about any circumstance. You should not have to worry about failing or my losing confidence in you. The idea is to feel comfortable and accepted in your surroundings, without fear of failing, so you can focus on doing the best possible job in your degree program.

Assistance in getting jobs or further educational opportunities – One of the metrics I use to judge the success of my laboratory is the success of my students in getting good jobs or further educational opportunities. You can expect me to provide any contacts and information sources that I have to help you in this regard. You can also count on favorable, but honest, referrals to potential employers &/or mentors.

PRODUCTS OF THE LAB GROUP

Publication and authorship rules. – Students often have questions about who is entitled to be an author on a publication. Usually, the question does not involve the first author so much as who will be added as co-authors. This question has generated some lively discussion in scientific circles; but, that can be avoided as long as everyone has an *a priori* familiarity with the basic guidelines. There are several principles I try to follow; but, they are not etched in stone and might vary according to the particular situation. Generally, there are five components to preparing a scientific paper: (1) developing the original idea; (2) designing the study and, when possible, obtaining financial support; (3) collecting the data; (4) analyzing the data; and, (5) manuscript preparation. My lab policy is that anyone who contributes substantially to 2 or more of these 5 areas is entitled to be an author on the manuscript. As examples, a few publications from my lab have had multiple authors representing several collaborative interests: Bonnet et al. 2015; DeGregorio et al. 2018; Durso et al. 2022.

Generally, I view a student's thesis or dissertation topic as his or her own – as part of the degree requirements, that final document will be authored by the student alone. Providing that I have met the above principles, however, publications resulting from the thesis or dissertation will likely have both the student (primary author) and myself (secondary author) on the by-line. This is typically the case because I almost always contribute substantively to components 1, 2, and 5, above. Although not always true, funding arrangements through my laboratory (support ranging from minor equipment purchases to year-round research assistantships) are often essential to a student successfully completing his or her degree. As such, in the rare event that my contributions to the above-listed components of your thesis or dissertation are relatively minor, I would hope to be listed as an author on most of the published data collected during your tenure in my lab group.

Ownership of data – The disposition of intellectual property is another topic for which some clarification at the start of a student-mentor relationship can minimize any future misunderstandings. Technically, if you are employed by A-State whilst you are collecting data for a project, then those data belong to the University under my auspices. In truth, if your research is funded (even partially) by an extramural agency (*e.g.*, Arkansas Game & Fish Commission, U.S. Forest Service, *etc.*), then the data really belong to that agency. However, the funding source typically identifies A-State as the repository for the data. All of this notwithstanding, in these days of digital file-sharing, both the graduate student and the professor retain a copy of the data collected by the student. As such, I expect that you will provide me with both hard and electronic copies of all data that you collect during your time in the lab.

Following your graduation from the program, you will almost certainly be free to continue data analyses and publication. Indeed, I would hope that all graduate students share my enthusiasm to see their work in print. Occasionally, however, one's motivation to write up the data is overshadowed by other commitments after his or her degree has been awarded. Because publication is essential to the scientific process (Toft & Jaeger 1998) – committing data to public scrutiny in a permanent medium – I will, if necessary, see the "product" to completion. Therefore, should I fail to receive from you within two years of your graduation date, a draft of a publishable manuscript representing a portion of your research, then I will assume that you are uninterested in publishing your work. I will then take it upon myself to publish your research, listing myself as the primary author and you as the secondary author.

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Still have questions? Do not hesitate to refer to the Biological Sciences programs website: <http://www.astate.edu/college/sciences-and-mathematics/departments/biology/degrees/>or, contact me for additional information:

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