

**Doctor of Philosophy in  
Medical Science  
Interdisciplinary Program in  
Biomedical Sciences  
Academic Assessment Plan**

College of Medicine  
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*Office of the Provost*

*University of  
Florida*

*Institutional  
Assessment*

*Continuous Quality  
Enhancement*

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# Academic Assessment Plan for PhD in Medical Sciences

## College of Medicine

### A. Mission

#### **Mission of the College of Medicine Interdisciplinary Program in Biomedical Sciences**

The mission of the Interdisciplinary Program in Biomedical Sciences is to provide a predoctoral educational experience that will train experimentalists and scholars prepared for a wide range of careers in biomedical science. The curriculum is designed to provide maximum flexibility for the training of biomedical research scientists. The educational goals are to promote biological literacy by providing core and advanced curricula covering key chemical, biological and genetic principles using molecular, cellular and physiological approaches, and to promote scholarship in biomedical science through mentored, original research.

To achieve this mission we aspire to the following goals:

1. To recruit students of outstanding quality, from both national and international pools of applicants, and establish ethnic diversity in our graduate program.
2. To provide quality and breadth of classroom teaching in Biomedical Sciences.
3. To provide broad opportunities for research training.
4. To provide high quality research training.
5. To provide training and counseling for a wide variety of careers.

#### **Mission of the College of Medicine**

The College of Medicine strives to improve health care in Florida, our nation, and the world through excellence and consistently superior leadership in education, clinical care, discovery, and service.

To achieve this mission we aspire to the following goals:

1. To develop humanistic, skilled, intellectually disciplined, and authoritative medical professionals who are committed to the highest ideals and standards of the profession and who model an exceptional standard of care for those they treat, lead, and serve.
2. To educate and inspire the next generation of leaders in health care, biomedical sciences, health services research, and academic medicine to seek, provide and sustain unparalleled achievements in service, teaching, and research.
3. To provide comprehensive, patient-centered, culturally sensitive, compassionate, and innovative health care of the highest quality to all.
4. To develop and utilize innovative models of interdisciplinary health care delivery that optimize safety, service, outcomes, and resource use.
5. To provide leadership to the State of Florida, the nation, and the world in efforts to promote health, to predict and prevent disease, and to deliver care.
6. To improve our understanding of human health and disease through groundbreaking research and to translate these discoveries into new solutions that promote health, and improve health outcomes and quality of care.
7. To recruit, develop, and nurture a diverse and academically outstanding community of faculty, students, trainees, and staff, who each contribute to excellence in our missions.

8. To promote sustained, robust professional and personal growth, productivity, accountability, integrity, and synergistic collaboration, and synergy of Faculty, students, and staff

### **University of Florida**

It is the mission of the University of Florida to offer broad-based, exclusive public education, leading-edge research and service to the citizens of Florida, the nation and the world. The fusion of these three endeavors stimulates a remarkable intellectual vitality and generates a synthesis that promises to be the university's greatest strength.

The university maintains its dedication to excellent teaching and researching by creating a strong and flexible foundation for higher education in the 21st century. The university welcomes the full exploration of our intellectual boundaries and supports our faculty and students in the creation of new knowledge and the pursuit of new ideas.

Teaching is a fundamental purpose of this university at both the undergraduate and graduate levels. Research and scholarship are integral to the education process and to the expansion of our understanding of the natural world, the intellect and the senses. Service reflects the university's obligation to share the benefits of its research and knowledge for the public good.

### **Alignment of Missions**

The Mission Statements of the Interdisciplinary Program in Biomedical Sciences, College of Medicine, and University of Florida are in close alignment. We focus on excellence in research, teaching, and service, albeit service has different specific meanings at the different levels. Service in the biomedical sciences involves careers in research to promote health and discovery, teaching, and providing science expertise to the government and greater science community. Another common goal is leadership. By training excellent scientists in the IDP in Biomedical Sciences, we expect them to become leaders in their chosen careers and specialties, regardless of where they go. All of this is tied together through excellence in teaching, that is, the broadest interpretation of the overall educational experience, be it in a classroom, research laboratory, or seminar.

## **B. Student Learning Outcomes and Assessment Measures**

Knowledge			
	Outcomes	Delivery Method	Assessment Method
1	Students will identify and explain the core knowledge for the Interdisciplinary Program (genetics, cell biology, biochemistry/molecular biology) followed by concentration-specific core knowledge (genetics, molecular cell biology, immunology/microbiology, physiology/pharmacology, biochemistry/molecular biology, or neuroscience). At the most basic level, this will include recognizing and explaining fundamental facts in the disciplines. At the	Campus	IDP-wide core knowledge will be assessed in the core course of the fall semester of the first year via written examinations and small group exercises. Concentration-specific knowledge will be assessed in courses beginning in the spring semester of the first year and through the advanced courses afterwards. Assessments will be made through written

	intermediate level this will include explaining relationships between facts and explanation of mechanisms of biological processes. At the most advanced level this will include interpreting experimental data and designing experiments.		examinations in courses, small group exercises in courses, journal club participation and presentation, regular committee meetings, and ultimately in the written and oral qualifying examination for entry into candidacy. However, mastery of concentration-specific knowledge does not cease with the qualifying examination. Assessment continues throughout the candidacy period in committee meetings until the defense of the dissertation.
2	Students will use the discipline- and research project-related knowledge to complete their dissertation research by formulating hypotheses, designing experiments, interpreting results, and forming conclusions from their experiments.	Campus	Discipline and research-focused knowledge will be assessed at the qualifying examination, committee meetings of the student, and ultimately at the dissertation defense. (A committee meeting assessment form is included at the end as an example of a rubric.)
<b>Skills</b>			
	<b>Outcomes</b>	<b>Delivery Method</b>	<b>Assessment Method</b>
1	Students will read, interpret, and critically analyze the published literature of their field. They will present analysis of the literature in a formal, structured class-like setting to clearly convey the background, methods, results, and significance of the literature to faculty and students.	Campus	Skill in use of the literature will be assessed via journal clubs, which are mandatory for every semester throughout the tenure of the student. Journal clubs are evaluated by participating faculty members.
2	Students will use the scientific method: formulating hypotheses based on their ability to use the literature, their own experimental observations, and those of others; designing a technically sound and up-to-date experimental plan with appropriate controls; executing the experimental plan in a technically proficient manner; interpreting the data; and then reformulating hypotheses.	Campus	The scientific method will be assessed primary via the student's committee at regularly scheduled committee meetings, the qualifying examination, and ultimately the dissertation defense. However, certain formal courses may include assessment of mastery of the scientific method in exercises and examinations.
<b>Professional Behavior</b>			
	<b>Outcomes</b>	<b>Delivery Method</b>	<b>Assessment Method</b>

1	Students will be professional in their conduct of research, specifically knowledge of and adherence to ethical conduct in research and adherence to appropriate safety, administrative, and regulatory rules.	Campus	Professionalism will initially be assessed via the responsible conduct of research course taken by all IDP students. Professionalism will continually be monitored by the student's committee and all associated faculty. However, in terms of safety and adherence to regulations, it will be the primary mentor who will assess these behaviors in the laboratory setting.
2	Students will deliver professional presentation of their own research results in oral and written formats. These presentations will be clear in providing information at an appropriate level to the audience, complete in providing the necessary and relevant background from the literature, and will utilize appropriate audiovisual aids that are clearly constructed.	Campus	Oral and written presentation behaviors will be assessed by the student's primary adviser, the student's committee, and all associated faculty who contact the student during presentations such as research conferences, qualifying examinations, and the final defense.

### C. Research

As stated in the mission statement of the Interdisciplinary Program in Biomedical Sciences, our purpose is to train experimentalists for a wide range of careers in biomedical sciences. As such, research is at the core of the education and training of students pursuing the Ph.D. degree in medical sciences. Research training and aptitude are so central to our purpose that we do not even consider applicants for our program unless they have already performed a significant amount of research, either during their undergraduate studies, master's studies, or in their employment. We expect letters of recommendation from faculty members who can attest to the applicant's research aptitude, and a significant amount of the interview process is aimed at face-to-face probing of the applicant's strong desire for, understanding of, and ability in performing independent research.

Upon enrollment, students are immersed into the research experience with three research rotations in different laboratories over the first two semesters and a course, Essentials of Graduate Research & Professional Development. This course teaches everything from choosing a research project to the personal skills and attitudes needed to be a successful researcher. However, our program is based not on extensive course requirements but on the research experience of the students in the dissertation laboratories.

The research expectations are that the students will demonstrate mastery of the scientific method and independence through the production of a dissertation that describes significant new information in their chosen discipline. Some of the concentrations of the IDP in Biomedical Sciences have codified this by requiring that students publish at least one first-author paper before

they can receive their Ph.D. degree; however, consensus among the entire program has not been attained on this point.

Students are prepared to become researchers through introductory courses, such as the one mentioned above, through journal club and seminar courses and programs, through attendance and presentation at external research meetings, and by their mentored and supervised dissertation research. The graduate program monitors the research and academic progress of the students via the supervisory committee, which is chaired by the student's mentor. Committees are required to meet every six months to review the progress of the student and to offer advice and direction as necessary. Committee reports are reviewed by the concentration director and the associate dean for graduate education to ensure that supervisory committees are fulfilling their obligations.

#### D. Assessment Timeline

##### Ph.D. degree in Medical Sciences, Interdisciplinary Program in Biomedical Sciences, College of Medicine

SLOs	Assessment 1	Assessment 2
<b>Knowledge</b>		
#1	Results of core course (fall semester year 1); other courses (fall and spring semester, primarily years 1 and 2)	Committee meetings (every six months), qualifying exam (fall semester year 3), final defense (end of studies - usually 5 to 5 1/2 years)
#2	Committee meetings (every six months), qualifying exam (fall semester year 3), final defense (end of studies - usually 5 to 5 1/2 years)	
<b>Skills</b>		
#1	Participation in journal clubs (every fall and spring semester)	
#2	Committee meetings (every six months), qualifying exam (fall semester year 3), final defense (end of studies - usually 5 to 5 1/2 years)	
<b>Professional Behavior</b>		
#1	Responsible conduct of research course (spring semester year 1)	Committee meetings (every six months), qualifying exam (fall semester year 3), final defense (end of studies - usually 5 to 5 1/2 years), all interactions with faculty, staff, and students (daily)
#2	Committee meetings (every six months), qualifying exam (fall semester year 3), final defense (end of studies - usually 5 to 5 1/2 years)	Journal club presentations, research conference presentations, presentations at extramural meetings, Medical Guild Research competition (at least yearly for journal club and research conference, at least yearly for extramural meetings, fourth or fifth year for Medical Guild Competition)

## E. Assessment Cycle

Assessment Cycle for:

### Interdisciplinary Program in Biomedical Sciences, College of Medicine

#### Analysis and Interpretation:

Program assessment is on-going throughout the year, especially during monthly Advisory Board meetings (concentration directors and representatives of other major constituencies, e.g., M.D./Ph.D. program, Clinical Translational Science program) and with occasional Executive Board meetings (basic science department chairs). The associate dean for graduate education meets with the senior associate dean for educational affairs every other week. Completed by July 1 for upcoming academic year.

#### Program Modifications:

Modifications to the program in response to analysis and interpretation will be made on an ongoing basis; however, major changes to the program structure and curriculum, including recruiting and admissions, will be completed by August 1.

#### Dissemination:

Dissemination of results of review and any changes will be immediately disseminated upon the decision to make changes; however, notification of major changes to the program structure and curriculum, including recruiting and admissions, will be completed by August 1.

SLOs	Year	10-11	11-12	12-13	13-14	14-15	15-16
<b>Content Knowledge</b>							
#1		X	X	X	X	X	X
#2		X	X	X	X	X	X
<b>Skills</b>							
#1		X	X	X	X	X	X
#2		X	X	X	X	X	X
<b>Professional Behavior</b>							
#1		X	X	X	X	X	X
#2		X	X	X	X	X	X

## F. Measurement Tools

Direct:

Performance in core and concentration-specific courses.  
 Performance by participation and presentation at journal clubs every fall and spring semester.  
 Progress in academics and research assessed at semi-yearly supervisory committee meetings.  
 Performance in the qualifying examination during the third year.  
 Performance at the final defense at the end of the studies.

Indirect:

Student willingness and ability to present their research in both local and extramural meetings.



Publication records of students.  
Exit survey of graduating students.

### G. Assessment Oversight

Name	Department Affiliation	Email Address	Phone Number
Joseph Fantone, M.D.	Pathology	<a href="mailto:jfantone@ufl.edu">jfantone@ufl.edu</a>	273-7925
Paul A. Gulig, Ph.D.	Mol. Gen. & Microbiology	<a href="mailto:gulig@ufl.edu">gulig@ufl.edu</a>	273-8603

## Figure 1. University of Florida Graduate/Professional Program Assessment Plan Review Rubric

Related resources are found at <http://www.ua.assessment.edu>

Program:		Year:			
Component	Criterion	Rating			Comments
		Met	Partially Met	Not Met	
<b>Mission Statement</b>	Mission statement is articulated clearly.				
	The program mission clearly supports the College and University missions, and includes specific statements describing how it supports these missions.				
<b>Student Learning Outcomes (SLOs) and Assessment Measures</b>	SLOs are stated clearly.				
	SLOs focus on demonstration of student learning.				
	SLOs are measurable.				
	Measurements are appropriate for the SLO.				
<b>Research</b>	Research expectations for the program are clear, concise, and appropriate for the discipline.				
<b>Assessment Map</b>	The Assessment Map indicates the times in the program where the SLOs are assessed and measured.				
	The Assessment Map identifies the assessments used for each SLO.				
<b>Assessment Cycle</b>	The assessment cycle is clear.				
	All student learning outcomes are measured.				
	Data is collected at least once in the cycle.				
	The cycle includes a date or time period for data analysis and interpretation.				
	The cycle includes a date for planning improvement actions based on the data analysis.				
	The cycle includes a date for dissemination of results to the appropriate stakeholders.				

University of Florida Graduate/Professional Program Assessment Plan Review Rubric, continued

Component	Criterion	Rating			Comments
		Met	Partially Met	Not Met	
<b>Measurement Tools</b>	Measurement tools are described clearly and concisely.				
	Measurements are appropriate for the SLOs.				
	Methods and procedures reflect an appropriate balance of direct and indirect methods.				
	The report presents examples of at least one measurement tool.				
<b>Assessment Oversight</b>	Appropriate personnel (coordinator, committee, etc.) charged with assessment responsibilities are identified				

**Sample rubric (supervisory committee report form):** IDP Supervisory Committee Meeting: Summary from Mentor

Student name:

Mentor name:

Meeting date:

Virtual or in person?

*Please provide qualitative comments on the following aspects of the student's progress since the previous committee meeting:*

Progress in Laboratory Experiments/Completing Specific Aims:

Grasp of underlying science concepts of project:

Knowledge of relevant literature:

Writing skills and maintenance of data/lab notes:

Oral presentation skills:

Initiative, work ethic, and independence in benchwork:

Creativity and independence in experimental design and troubleshooting:

Supervision of another's work, if any (e.g. undergrad volunteer):

Initiative and involvement in professional activities (GSO, attending scientific conferences, AAAS membership, helping with IDP Discussion groups, etc):

Initiative and involvement with any collaborators:

Submission/acceptance of manuscripts (lead author or co-author):

Submission/funding of fellowship applications:

Plans for graduation and beyond (on track, preparing ahead):