



INDIANA UNIVERSITY

DEPARTMENT OF ANATOMY AND CELL BIOLOGY
School of Medicine

MEMORANDUM

DATE: 5 March 2012

TO: Sherry Queener, Associate Dean IU Graduate School

FROM: Kathryn Jones, Chair, Anatomy & Cell Biology (ACB)
James Williams, Chair of ACB Graduate Studies Committee

RE: Addition of a new track for the Master of Science (M.S.) in ACB

Historically, we have adjusted the requirements of our master degree as an internal affair, but because we are adding a track to the degree, we would like to make sure that the changes we propose will not affect other programs, and that this fits within the parameters for the master of science degree, as perceived by the rest of the graduate faculty on campus. Thus we ask you to route this as you see fit, to the Graduate Affairs Committee if appropriate.

Our traditional M.S. in Anatomy and Cell Biology has at its core the three courses in anatomical sciences that we teach to the medical students. This is a very rigorous series that earns the student 17 hours of 800-level graduate credit, but the rigor in this core curriculum is not really reflected in the hours alone. For a graduate student to earn a B in one of these courses, he or she has to perform on the examinations at the same level as the upper echelon of medical students; that is, although the typical medical student can survive these courses by simply passing, we require our graduate students to meet a standard much higher than that.

These requirements have made our degree an excellent fit for those students who wish to improve their qualifications for entering professional school in one of the health sciences. Completion of our program shows prospective schools that the student can handle the intense curriculum of medical or dental school. However, this massive course load—much larger than its credit hours reflect—has limited our students in the amount of research that they can accomplish during their two years with us.

Thus, our M.S. degree has not been a good fit for students who seek to improve their qualifications to pursue a Ph.D. in biomedical sciences.

For example, admission to the IBMG program here on campus requires not only an excellent academic record, but also substantial experience in laboratory research. As the bar for admission to the IBMG has risen, we have received an increasing number of inquiries into our M.S. program as a mechanism for students to improve their admission qualifications for the Ph.D. program. As we have worked with these students to advise them on this, we have come to realize two deficiencies in our program for these potential applicants: First, we do not have room in our degree requirements to allow for extensive study of cell biology, which would be the field within our program that would best

prepare a student for a career in biomedical research. Second, the intense rigor of our core courses does not allow a student to gain as much research experience as they could in a two-year M.S. in which the courses reflected a more normal level of graduate excellence.

We do not want to alter our present requirements, as they are such a good fit for students wanting to apply to professional schools, but we do want to help the students wanting to head into biomedical research. Thus, we propose to offer our M.S. degree in two tracks, which we will call 'traditional' and 'research' tracks. These are compared side-by-side below.

Comparison of the two tracks for earning the Master of Science degree in Anatomy & Cell Biology

	Traditional Track	Research Track	Notes
Fall semester 1	D850 Gross Anatomy (8)	G715 Biomedical Science I. Biochemical Basis of Biological Processes (3) G716 Biomedical Science II. Molecular Biology and Genetics (3) G717 Biomedical Science III. Cellular Basis of Systems Biology (3)	Students in the Research Track may divide these classes between years 1 and 2 in order to allow for more research time during the first semester of year 1
Spring semester 1	D851 Histology (4) D861 Seminar (1) Electives (1-3)	G817 Molecular Basis of Cell Structure and Function (2) D861 Seminar (1) Electives (3-5)	
Summer sessions	Electives (3-6)	Electives (3-6)	
Fall semester 2	D852 Neuroscience and Clinical Neurology (5) G505 Responsible Conduct of Research (1) Electives (0-2)	G855 Experimental Design and Biostatistics (1) G505 Responsible Conduct of Research (1) Electives (4-6)	Both tracks include the G505 ethics course, but G855 statistics is required only for the Research Track
Spring semester 2	D861 Seminar (1) Electives (5-7)	D861 Seminar (1) Electives (5-7)	
Electives	Additional graduate-level courses, including up to 6 hours of D860 Research	Additional graduate-level courses, including up to 15 hours of D860 Research	
Total credit hours	30 credit hours	30 credit hours	
Final project	Paper; thesis optional	Thesis normally required	difference between the tracks reflects expected difference in amount of research that will be done by the student
Final examination	Oral, based on paper	Oral, based on thesis	
Committee	Three members of ACB graduate faculty	Three members of ACB graduate faculty	

In summary, the Traditional Track includes 20 credit hours of required courses and does include a significant research project that results in a paper written by the student and defended before the student's three-member committee. The Research Track includes 15 credit hours of required courses, and there is room for students to do quite a bit more research than can be accomplished with the Traditional Track. Students in the Research Track are expected to begin their research work during their first semester, and overall it is expected that the Research Track students will complete a larger research project, which is fitting with their focus on entering a Ph.D. program after completing their master degree.

The number of research hours in our proposed Research Track is high relative to many programs, but the Biology Thesis-Option M.S. has 20 hours of research, so this new track would not be the highest on campus. In addition, the research-option M.S. in Physiology allows up to 10 hours of research, so ours will not be much above that. To reiterate the argument made at the beginning of this memo, a primary purpose of this new track is to give the student credibility as a student researcher when applying for a PhD program, so the amount of research effort is appropriate, and allows the student to accomplish a significant amount of scientific work.

The new track in our master degree is fully endorsed by Dr. Patricia Gallagher, indicating that we have no competitive overlap with other programs in the bio-medical sciences.