

## **2021-2022 ASSESSMENT REPORT**

### **IU SCHOOL OF MEDICINE GRADUATE DIVISION**

#### **Scope of Assessment Report**

The PhD and MS programs supported by the Graduate Division are degrees awarded by the University Graduate School and are the focus of the Division's missions within the School, and will be the focus of the report. There are two exceptions to this. First, the Division supports one professional masters degree (MS in Anesthesiology for Anesthesiologist Assistants) that is independently accredited through ARC-AA. Second, the Division also supports a professional certificate in Innovation and Implementation Science that is not independently accredited and is included in this report. Where appropriate, these two programs will be mentioned; the rest of this report will primarily focused on the PhD and masters programs in biomedical science that are research-focused degree programs.

Additionally, because all of our programs are graduate programs (or professional programs in two cases), the IUPUI Profiles will not be discussed as they do not apply in these instances. Our program review process does ask programs to align their program-level desired outcomes with the Principles of Graduate and Professional Learning, and all programs that have completed a review are expected to have a matrix representing this alignment.

Finally, given that we only re-established a focus on assessment as a Division in 2016, we are still in the process of re-developing a culture of assessment and re-establishing processes. This report does not have current data to report; instead, we will document our process, the structures we have put into place, our program review process, and next steps for data collection and tracking assessment data.

#### **Unit Overview**

##### **Graduate Programs Supported by the Graduate Division**

The Graduate Division of the IU School of Medicine provides administrative oversight and support to Doctor of Philosophy (PhD) and Master of Science (MS) programs, along with one professional masters program and one professional certificate program. The research programs under our purview as of the writing of this report are listed below in Table 1. Also, our Division supports a professional Master of Science in Anesthesia (MSA) degree, a professional certificate in Innovation and Implementation Science, a graduate certificate in Clinical Research, and a graduate certificate in Medical Dosimetry (currently inactive; no students). Finally, the Graduate Division supports the PhD phase of the IU School of Medicine's combined degree MD/PhD program. Students accepted to the MD/PhD program are enrolled in once of the PhD programs listed below, though they complete their PhD program between their second and third years in the Doctor of Medicine program. Enrollment counts by program can be found in Table 2 below. Please note that the data in Table 2 are based on student data collected on September 1, 2021.

**Table 1**

List of existing graduate research degrees supported by the Graduate Division listed by degree type

<b>Doctor of Philosophy (PhD)</b>	<b>Master of Science (MS)</b>
Anatomy, Cell Biology, & Physiology <ul style="list-style-type: none"> <li>• PhD in Translational Biomedical Research (track)</li> <li>• PhD in Anatomy and Physiology Education (track)</li> <li>• PhD in Anatomical Science (track)</li> </ul>	Anatomy, Cell Biology, & Physiology <ul style="list-style-type: none"> <li>• MS in Translational Biomedical Research (track)</li> <li>• MS in Clinical Anatomy (track)</li> <li>• Pre-Professional Studies MS (track)</li> </ul>
Biochemistry & Molecular Biology	Biochemistry & Molecular Biology
---	Clinical Research
Medical & Molecular Genetics	Medical and Molecular Genetics (program) <ul style="list-style-type: none"> <li>• MS in Medical &amp; Molecular Genetics, Research Track</li> <li>• MS in Medical &amp; Molecular Genetics, Genetic Counseling Track</li> </ul>
PhD in Medical Neuroscience	Medical Neuroscience <i>Note: used only as an exit masters or in cases of student transfers from another institution</i>
Microbiology & Immunology	Microbiology & Immunology
Musculoskeletal Health	
Pathology (program is inactive; no students)	Pathology (all tracks inactive; no students)
Pharmacology & Toxicology <ul style="list-style-type: none"> <li>• PhD in Pharmacology</li> <li>• PhD in Toxicology</li> </ul>	Pharmacology & Toxicology <ul style="list-style-type: none"> <li>• MS in Pharmacology &amp; Toxicology, research track <i>Note: used only as an exit masters or in cases of student transfers from another institution</i></li> <li>• MS in Translational Toxicology (no current students)</li> </ul>
Regenerative Medicine & Technologies (Program approved in 2021; not yet active)	Regenerative Medicine (Program pending approval in 2022; not yet active)
Translational Cancer Biology (program pending approval in 2022; not yet active)	---

**Table 2**

Student enrollment in programs supported by the Graduate Division by type of degree/certificate

<b>Department hosting programs</b>	<b>PhD Students</b>	<b>MD/PhD Students</b>	<b>MS Students</b>	<b>Certificate Students</b>	<b>Total Students</b>
Anatomy, Cell Biology & Physiology	23	1	32	--	56
Biochemistry & Molecular Biology	41	6	10	--	57
Medical & Molecular Genetics	19	7	24	--	50
Medical Neuroscience	35	12	0	--	47
Microbiology & Immunology	25	6	5	--	36
Musculoskeletal Health	5	0	0	--	5
Pathology & Laboratory Medicine	0	0	0	--	0
Pharmacology & Toxicology	18	1	0	--	19

First-Year Students (IBMG Program)	31	--	--	--	31
No assigned program (MD/PhD students in first MD phase)	--	11	--	--	11
MD/PhD students completing their PhD through Purdue University West Lafayette (Biomedical Engineering)	--	18	--	--	18
Anesthesia	--	--	45	--	45
Center for Health Innovation and Implementation Science	--	--	--	13	13
Indiana Clinical and Translational Science Institute (CTSI)	--	--	23	5	28
<b>Totals</b>	<b>197</b>	<b>62</b>	<b>139</b>	<b>18</b>	<b>416</b>

### **IBMG Program For PhD Study**

In addition to the degrees and certificates that we support, our office includes the Indiana Biomedical Gateway (IBMG) Program for PhD Study. PhD students are admitted to the IBMG Program for a shared first-year experience with common first-semester coursework and the opportunity to explore different programs and research labs through a series of rotations before committing to a particular PhD program at the end of their first year of study. The IBMG Program is the means of admitting PhD students in all of the PhD tracks listed above except for the Anatomy & Physiology Education Track, Anatomical Sciences Track, and the PhD in Regenerative Medicine & Technologies

The first year of study in the IBMG Program for Ph.D. Study is built around a core curriculum leading to a choice of modular electives that match the student's research interest, a variety of laboratory research experiences, and strong support and mentoring.

#### Fall Semester

- a shared curriculum of core components in biochemistry, cell biology, genetics, molecular biology, and systems biology
- meetings, laboratory visits, research retreats, and open days with Ph.D. program directors, graduate research faculty, and students
- an eight-week laboratory rotation in one of hundreds of world-class laboratories associated with the nine IU School of Medicine Ph.D. programs and many research centers and institutes
- strong emphasis on support and mentoring

#### Spring Semester

- interactive study of research methods, professional skills, and scientific understanding
- two additional eight-week laboratory rotations
- a modular curriculum of classes that allows students to align study with a potential Ph.D. program and student's interest

- at the end of the spring semester, choose a research laboratory, mentor, and the Ph.D. program from which the student will ultimately receive a degree

During the three research rotations that occur within the first year of graduate study, the faculty integrates each student into their research group and the student and faculty create a formal agreement of goals consistent with the research area for the student to achieve during the rotation. Minimally, the student will engage in readings and apprenticeship work with the faculty and other students in that group. The goal is twofold. First, the goal is to engage in research with the faculty (typically at a beginning level) and to decide if this person is a potential advisor for the student's dissertation work. The second is to ensure the student has a view of the research area from at least two faculty perspectives. Ultimately, this year of research exploration and laboratory rotations culminates in the student's decision to complete their degree in one of nine biomedical sciences Ph.D. degree programs.

### **Medical Scientist Training Program**

As mentioned above, IU School of Medicine offers a highly selected combined degree program partially funded through the NIH Medical Scientist Training Program (MSTP), which allow students accepted to the program to complete a Doctor of Medicine (MD) and Doctor of Philosophy (PhD) degree while at the School. This program is the result of a partnership between IU School of Medicine and the Weldon School of Biomedical Engineering at Purdue University West Lafayette. The Graduate Division supports MD/PhD students during the PhD phase of their combined degree program, which begins after the completion of their second year of the MD curriculum and ends before they begin the third year of the MD curriculum. IN

## **Division-Level Strategy for Assessment**

### **Overview**

Prior to November 2015, assessment of PhD and masters programs were exclusively monitored at the program level, with regular program reviews as an opportunity for the School and IUPUI campus to monitor program outcomes. After 1997, however, program reviews for Graduate Division programs were no longer conducted, and accountability for program-level assessment decreased. Prior to November 2015 there was no one assigned to either monitoring assessment nor a formal process in place. With the hiring of a Director of Trainee Services (currently Lauren Easterling), the first step towards establishing a process has been to restore a regular cycle of program reviews. Because all of the Division's PhD programs except three participate in the IBMG Program for PhD Study, synchronizing and aligning the program review efforts is important given that students admitted to PhD programs come from the IBMG first-year program and then move into a PhD program afterwards. In addition to focusing on improving the quality and quantity of student data collected (in cooperation with the Dean's Office, IU School of Medicine), a strategy to re-establish an active culture of assessment began with three components: re-establishing a robust program review cycle with a school-level focus on programmatic desired outcomes; changing the charges of existing faculty committees to prioritize the monitoring of programs, courses, and

student achievement in both; and defining and establishing the Graduate Division's role in monitoring programmatic and student outcomes.

### **Program Review as Means to Re-Establish a Culture of Assessment**

Currently, the key element of the Division's assessment strategy is establishing and standardizing the program review process as part of re-establishing a culture of assessment in research-focused graduate programs in the IU School of Medicine. Given a near twenty-year gap between program reviews, it has been necessary to educate faculty, department chairs, program advisors, and others on the process and establish regular program reviews that include an examination of student learning, student vitality, and alignment of programmatic goals and desired outcomes with programmatic realities.

The re-establishing a program review cycle, this took place in multiple stages. During 2016, the Division developed an internal set of expectations and a process for program reviews, in addition to working with the IUPUI Office of Planning and Institutional Improvement. In 2017, initial meeting with programs were conducted, followed by programs developing their self-studies, the conducting of a site visit by a review team, a post-visit report, and a program response to the report. All programs were expected to follow this general process, with variations specific to each program taking place along the way. This is the same process created by and co-administered by the IUPUI Office of Planning and Institutional Improvement. Round one of program reviews took place from December 2017 to December 2019, are these specific reviews by department sponsoring each program is listed in Table 3 below.

One variation of note is related to the collection of student data for self-surveys. For most of the program reviews (before Spring 2019), programs individually created questionnaires for students enrolled in their programs – each designing their own survey instruments. Beginning with the Spring 2019 review, the Graduate Division provided a template for these surveys of students, to provide a more consistent means of comparing responses over time and across programs.

**Table 3**

*List of program reviews conducted to date (round 1)*

<b>Semester</b>	<b>Department/Center</b>	<b>Degrees Granted By Program</b>
Fall 2017	Pharmacology & Toxicology	<ul style="list-style-type: none"> <li>• PhD in Pharmacology</li> <li>• PhD in Toxicology</li> <li>• MS in Pharmacology and Toxicology (exit masters, with very few occasional direct admits)</li> </ul>
Spring 2018	Anatomy & Cell Biology <i>Program has since merged with Cellular and Integrative Physiology</i>	<ul style="list-style-type: none"> <li>• PhD in Anatomy and Cell Biology – Research Track</li> <li>• PhD in Anatomy and Cell Biology – Education Track</li> <li>• MS in Anatomy and Cell Biology – Clinical Anatomy Track</li> </ul>

<b>Semester</b>	<b>Department/Center</b>	<b>Degrees Granted By Program</b>
		<ul style="list-style-type: none"> <li>MS in Anatomy and Cell Biology – Research Track</li> </ul>
Spring 2018	Medical & Molecular Genetics	<ul style="list-style-type: none"> <li>PhD in Medical and Molecular Genetics</li> <li>MS in Medical and Molecular Genetics</li> <li>MS in Medical and Molecular Genetics – Genetic Counseling Track (independently accredited)</li> </ul>
Fall 2018	Cellular & Integrative Physiology <i>Program has since merged with Anatomy &amp; Cell Biology</i>	<ul style="list-style-type: none"> <li>PhD in Cellular and Integrative Physiology</li> <li>MS in Cellular and Integrative Physiology (exit masters)</li> <li>MS in Cellular and Integrative Physiology – Pre-Professional Program Track</li> </ul>
Fall 2018	Microbiology & Immunology	<ul style="list-style-type: none"> <li>PhD in Microbiology and Immunology</li> <li>MS in Microbiology and Immunology</li> </ul>
Spring 2019	Biochemistry & Molecular Biology	<ul style="list-style-type: none"> <li>PhD in Biochemistry and Molecular Biology</li> <li>MS in Biochemistry and Molecular Biology</li> </ul>
Fall 2019	Medical Neuroscience	<ul style="list-style-type: none"> <li>PhD in Medical Neuroscience</li> <li>MS in Medical Neuroscience (exit masters)</li> </ul>
Fall 2019	Pathology & Laboratory Medicine	<ul style="list-style-type: none"> <li>PhD in Pathology and Laboratory Medicine</li> <li>MS in Pathology and Laboratory Medicine – Laboratory Science Track</li> <li>MS in Pathology and Laboratory Medicine – Experimental Pathology Track</li> <li>MS in Pathology and Laboratory Medicine – Pathologists’ Assistants Track (independently accredited)</li> </ul>
Spring 2022 <i>Delayed from Spring 2020 due to COVID-19</i>	Health Innovation and Implementation Science	<ul style="list-style-type: none"> <li>Professional Certificate in Innovation and Implementation Science</li> </ul>

As of this report (January 2022), we have a plan in place for Round 2 of program reviews beginning in Spring 2023. Note that this cycle was to begin in Fall 2021 but was delayed due to COVID-19. The first program review included elements requested by the Graduate Division: documentation that programs have aligned their course and program outcomes; data on student recruitment and retention in general and across different student identities, including those from historically marginalized identities; descriptions of how programs have aligned all outcomes with the IUPUI Principles of Graduate and Professional Learning, and evidence that programs have

created a means of monitoring whether or not students are completing the programs to programmatic expectations.

The second program review cycle will ask programs to continue these tasks, but will also include: evidence that programs have reviewed every existing, active course to ensure that these courses align meet programmatic and student needs; documentation of how qualifying exams are evaluated, and as applicable, any rubrics used; and explanations of how programs are tracking student/alum career outcomes and related data to date. The first addition is related to the Division’s ongoing efforts to encourage programs to both align all courses with programmatic desired outcomes. The second addition in the second round of reviews addresses an area of student assessment of learning that has had minimal documentation of how qualifying exam results were determined by asking programs to include all processes and rubrics that are used by student advisory committees when assessing student learning as part of the qualifying exam process. The third addition is tied to an increasing expectation by the National Institutes of Health (NIH) on career development and tracking career outcomes of alums of PhD programs in the submission and renewal of many extramural research and training grants. Students in research-focused PhD programs are usually funded either by their faculty mentors’ grants (including NIH research grants) or institutional training grants from the NIH, meaning ensuring that sufficient data related to career development and career outcomes is collected to meet NIH expectations.

During the second round of program reviews, the programs will be expected to produce and compare data related to student academic achievement, retention, and completion between the first and second reviews. This comparison will serve as a baseline for collecting and monitoring data as part of program-level assessment cycles, for those programs that were a part of the first round of reviews. Note that since the first round of program reviews programs have been added or merged, and these programs will be undergoing their first reviews as noted in Table 4 below. Notable changes include the merger of the Department of Anatomy and Cell Biology with the Department of Cellular and Integrative Physiology, resulting in a merging and re-aligning of programs offered by the new Department of Anatomy, Cell Biology, and Physiology; the creation of a PhD and MS program in Musculoskeletal Health; the creation of a PhD and MS program in Regenerative Medicine (MS program approval pending); and the proposal of a new PhD program in Translational Cancer Biology, currently awaiting approval by the IU Board of Trustees. See Table 4 below for a list of programs and a projected plan for review.

**Table 4**

*List of planned program reviews beginning in Spring 2023 (round 2)*

<b>Semester</b>	<b>Program</b>	<b>Program Review Round</b>	<b>Degrees Granted By Program</b>
Spring 2023	IUSM Graduate Division (Office Program Review)	First	<ul style="list-style-type: none"> <li>• IBMG Program for PhD Study</li> <li>• Career and Professional Development</li> </ul>
Spring 2023	Anatomy, Cell Biology, and Physiology	Second for individual degrees, first	<ul style="list-style-type: none"> <li>• Translational Biomedical Research PhD</li> <li>• Anatomy and Physiology Education Track PhD</li> </ul>

<b>Semester</b>	<b>Program</b>	<b>Program Review Round</b>	<b>Degrees Granted By Program</b>
		as combined department	<ul style="list-style-type: none"> <li>• Anatomical Sciences PhD</li> <li>• Translational Biomedical Research MS</li> <li>• MS in Clinical Anatomy</li> <li>• Pre-Professional MS</li> </ul>
Fall 2023	Pharmacology and Toxicology	Second	<ul style="list-style-type: none"> <li>• PhD in Pharmacology</li> <li>• PhD in Toxicology</li> <li>• MS track in Translational Toxicology</li> </ul>
Fall 2023	Medical and Molecular Genetics	Second	<ul style="list-style-type: none"> <li>• PhD in Medical and Molecular Genetics</li> <li>• MS in Medical and Molecular Genetics</li> <li>• MS in Medical and Molecular Genetics – Genetic Counseling Track</li> </ul>
Spring 2024	Microbiology and Immunology	Second	<ul style="list-style-type: none"> <li>• PhD in Microbiology and Immunology</li> <li>• MS in Microbiology and Immunology</li> </ul>
Spring 2024	Clinical Research	First, omitted from first round	<ul style="list-style-type: none"> <li>• MS in Clinical Research</li> <li>• Graduate Certificate in Clinical Research</li> </ul>
Fall 2024	Biochemistry and Molecular Biology	Second	<ul style="list-style-type: none"> <li>• PhD in Biochemistry and Molecular Biology</li> <li>• MS in Biochemistry and Molecular Biology</li> </ul>
Spring 2025	Medical Neuroscience	Second	<ul style="list-style-type: none"> <li>• PhD in Medical Neuroscience</li> </ul>
Spring 2025	Musculoskeletal Health	First	<ul style="list-style-type: none"> <li>• PhD in Musculoskeletal Health</li> </ul>
Fall 2025	Pathology & Laboratory Medicine	Second	<ul style="list-style-type: none"> <li>• PhD in Pathology and Laboratory Medicine</li> <li>• MS in Pathology and Laboratory Medicine</li> </ul>
Spring 2026	Regenerative Medicine and Technologies	First	<ul style="list-style-type: none"> <li>• PhD in Regenerative Medicine and Technologies</li> <li>• MS in Regenerative Medicine and Technologies</li> </ul>
Spring 2026	Translational Cancer Biology	First	<ul style="list-style-type: none"> <li>• PhD in Translational Cancer Biology</li> </ul>
Spring 2027	Innovation and Implementation Science	Second	<ul style="list-style-type: none"> <li>• Professional Certificate in Innovation and Implementation Science</li> </ul>

## **Faculty-Led Committees as Monitors of Program Design and Outcomes**

Second to this process has been to standardize the process and mechanisms for curricular oversight and revision. While there had been a Graduate Oversight Committee and a Graduate Curriculum Committee, the areas of focus for these two committees and their functions within the assessment cycle were not clearly defined until 2016 for the Graduate Oversight Committee and 2017 for the Graduate Curriculum Committee. The Graduate Oversight Committee is responsible for establishing and reviewing policies specific to Division programs and for approving new programs or changes to existing programs. The Graduate Oversight Committee consists of: one voting representative from each department or center that supports a PhD program; an at-large representative for the MD/PhD combined degree program; an at large representative for masters programs not represented by a PhD program representative; a representative of the Anatomy & Physiology Education Track PhD program (distinct from the research track programs offered); a non-voting PhD student representative; a non-voting postdoctoral scholar representative; and Graduate Division leaders. In 2016 a process was established for the review of all changes to existing programs and approval of all new programs. As a result of this process, this committee examines the necessity for program changes, suggests revisions to proposed changes or new programs, and acts as an additional layer of accountability at the program level

At the course level, the Graduate Curriculum Committee is charged with overseeing, creating, and reviewing courses related to the IBMG Program for PhD Study – a shared first-year experience for research-track PhD students across Graduate Division programs. The Graduate Curriculum Committee consists of: representatives of each research-track PhD program that participates in the IBMG gateway program (for admissions and first-year experience); a representative of the MD/PhD combined degree program; a non-voting student representative; and Graduate Division leaders. The Graduate Curriculum Committee was re-tasked in 2017 with conducting a complete review of all courses offered as part of the IBMG Program. Course directors for each course were consulted, and course syllabi were redesigned. Additionally, course learning outcome statements were examined, aligned with assessments and course schedules, and reviewed by the committee to align with program goals. The Graduate Curriculum Committee continues to review core IBMG Program courses on an annual basis, meeting with course directors. Additionally, the Committee reviews and provides informal feedback on courses offered by each research-track PhD program, and these new course requests are forwarded to committee members to include them in updates to courses and curricula across the Division.

## **Graduate Division Role in Monitoring Programmatic and Student Outcomes**

Finally, all changes to existing programs, development of new programs, changes to existing courses, and development of new courses across all programs supported by the Graduate Division are reviewed by the Director of Trainee Services. Any concerns are forwarded to the Associate Dean for Research and Graduate Education, and the Director of Trainee Services consults with programs on any necessary changes that should be made to bring courses in alignment with IU, IUPUI, and School of Medicine expectations for courses. Additionally, the Director of Trainee Services manages approval of student academic progression at the School-level, allowing her to monitor how students are progressing through the current version of each program, is able to

report to the Associate Dean and both committees on how programs are functioning, and provide data on student progress. The Director of Trainee Services works closely with Graduate Division staff responsible for student academic progression document processing and the IUPUI Graduate Office to monitor both student progress and academic program operation. The Director of Trainee Services is a non-voting member of both the Graduate Oversight Committee and the Graduate Curriculum Committee and is the Division liaison with the IUPUI Program Review and Assessment Committee (PRAC). The Associate Dean for Research and Graduate Education is a member of the IUPUI Graduate Affairs Committee and serves as the Division's connection to the greater graduate and professional education enterprise at IUPUI.

### **Next Steps for Tracking Student and Programmatic Outcomes**

At this point, we do not have data to report on programmatic or student outcomes. In consultation with both Stephen Hundley and Caleb Keith, Office of Planning and Institutional Improvement, we are writing this report to document our process to date establishing a cycle of program review and the process that will result in data related to programmatic and student outcomes once the second cycle of program reviews begin in 2023. This delay in data is due to the more decentralized nature of our programs and the need to assist each program as they both monitor their programmatic desired outcomes and student progression through programs. The second round of program reviews will also include an expectation that programs monitor and share with the Graduate Division regular updates on achievement of program-level desired outcomes and update the Division on student academic progress from their perspective. These data will assist us in future versions of this assessment report.

*Report Submitted January 31, 2022*

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