1. Introduction
2. IDP Organization
3. Expectations
4. Schedule
5. Important Dates
6. Curriculum
7. Coaches for Courses
8. Academic Probation
9. Laboratory Rotations
10. Dissertation Lab Selection
11. Qualifying Examination
12. Symposium and Written Reports
13. IDP Committees and Membership
14. Recruitment
15. Mental Health and Wellness
16. Sick and Vacation Time
17. SharePoint
18. IDP Leadership
INTRODUCTION TO HANDBOOK

MISSION OF THE INTERDISCIPLINARY PROGRAM IN BIOMEDICAL SCIENCES

The mission of the Interdisciplinary Program in Biomedical Sciences (IDP) is to help extraordinary students discover their potential while expanding knowledge through coursework and biomedical research. The goal of the IDP is to train the next generation of graduate students to be productive, well-rounded scientists that are able to contribute substantively within the contemporary workforce. Within the IDP, students are exposed to a combination of required and elective didactic courses, laboratory rotations, and professional development/scientific writing and presentation activities which help students gain proficiency in several Core Competencies and Qualities.

HISTORY OF THE INTERDISCIPLINARY PROGRAM IN BIOMEDICAL SCIENCES

The IDP is an 18-month umbrella program that began at MCW in 1999 under the leadership of Dr. Paula Traktman, then the chair of the Department of Microbiology and Molecular Genetics. The conception of the program reflected a nationwide shift to a more integrated education in the biomedical sciences. The five basic science departments comprising the current IDP are:

- Biochemistry
- Biophysics
- Cell Biology, Neurobiology & Anatomy
- Microbiology & Immunology
- Pharmacology & Toxicology

Dr. Traktman led the program for 11 years and was succeeded by Dr. Joseph Besharse, then the chair of the Department of Cell Biology, Neurobiology and Anatomy, who became the Director in 2010. In 2014, Dr. John Corbett, chair of the Department of Biochemistry became the third Director. In 2018, Dr. Tom Zahrt of the Department of Microbiology and Immunology became the fourth and current Director. Julie Arthur has been the Program Coordinator since 2011. The IDP class size has ranged from 15 to 26. There are currently 119 faculty members participating in the IDP; these individuals hold a Graduate Faculty appointment within one of the Graduate Programs aligned with these five basic science departments. The IDP also includes faculty from the Blood Research Institute and the Children's Research Institute.

In 2019, the IDP underwent a major revision in content and structure that included substantive modifications to courses, laboratory rotations, and the qualifying examination. Importantly, aspects of this modernized curriculum were adopted by the Neuroscience Doctoral Program and the Physiology Graduate Program, leading to an inclusive and integrated curriculum that now spans molecules to cells to systems.

The IDP is one of six PhD programs through which students directly enter the Graduate School of Biomedical Sciences at MCW. Dr. Ravi Misra is the current Dean of the Graduate School of Biomedical Sciences.
Sciences and has held this position since 2010. The IDP organizational structure currently consists of the following seven committees:

- Program Directors Group
- Committee Chairs Group
- Recruitment Committee
- Admissions Committee
- Mentoring Committee
- Course Directors Group
- Executive Evaluations Committee

Each committee includes an appointed faculty representative from each of the 5 basic science departments. The function of each committee can be found in a subsequent section of the handbook.

Please review contents of this document and visit the D2L Faculty Site to gather more information regarding the IDP program. The IDP website is also a good source of information for new faculty members to learn more about the program: http://www.mcw.edu/BiomedicalGraduateProgram.htm
IDP ORGANIZATION

ORGANIZATION CHART

President
John Raymond, Sr., MD

Dean, Medical School
Joseph Kerschner, MD

Dean, Graduate School
Ravi Misra, PhD

Dean, Pharmacy School
George MacKinnon, III
PhD, MS, RPh

PhD programs

Master’s programs

Director
Tom Zahrt, PhD

Program Coordinator
Julie Arthur

Currently Participating Departments

Biophysics
Biophysics
Cell Biology, Neurobiology & Anatomy
Microbiology & Immunology
Pharmacology & Toxicology

Committee

Chairs

Group

Recruitment Committee

Admissions Committee

Mentoring Committee

Course Director’s Group

Executive Evaluations Committee

Program Directors Group

Committee Chairs

Nan Hogg
Amy Hudson
Candice Hug
Ming Song Liu
Chris Olson

Committee Chairs

Jin Li
Katherine Clarkson
Chris Olson

Committee Chairs

Amelia Ziegler
Mike Edelstein

Committee Chairs

Subra

Committee Chairs

Michael

Committee Chairs

Marianne

Committee Chairs

Patti Robin

Committee Chairs

Tuny Fung

Committee Chairs

Randy

Committee Chairs

Eric Lui

Committee Chairs

Karen Schatz

Committee Chairs

Greg King

Committee Chairs

Scott Tameue

Committee Chairs

John Aschampach
John Corbett
Blake Hill
Candice Klug
Brian Link
Tom Zahrt
(aron Gears, Cheryl Stucky, consulting members)
EXPECTATIONS

STUDENTS

Students are expected to:

- Actively participate in scientific activities in the rotating department, the IDP program, and/or the Graduate School
- Be on time and attend all IDP classes
- Attend and participate in IDP symposium and other IDP-sponsored meetings and functions
- Participate in IDP events including IDP recruitment weekends
- Spend an average of 4 hours per day doing lab-related work within the laboratory during research rotations
- Seek out assistance in courses or the laboratory when needed
- Assume the primary responsibility for the successful completion of their degree
- Be committed to graduate education in the classroom and the research laboratory by maintaining a high level of professionalism, self-motivation, engagement, scientific curiosity, and ethical standards
- Meet regularly with the IDP mentor, rotation advisor, or research mentor and provide him/her with updates on progress within the program and/or laboratory.
- Following identification of a dissertation laboratory, work with the research mentor to develop a dissertation project and establish a timeline, including deadlines, for completing various stages of the project
- Discuss with the IDP mentor, rotation advisor, or research mentor any potential limitations that may preclude you from conducting dissertation work in the lab (including physical, ethical or religious) prior to joining the lab
- Following identification of a dissertation laboratory, work with the research mentor to select a Dissertation Committee, and commit to meeting with this committee at least annually (or more frequently, according to program guidelines)
- Be knowledgeable of and commit to meeting the policies and requirements of the graduate program, graduate school, and institution
- Attend and participate in laboratory meetings, seminars and journal clubs that are part of the educational program
- Comply with both the letter and spirit of all institutional safe laboratory practices and animal-use and human-research policies at the institution
- Participate in the institution’s Responsible Conduct of Research Training Program and practice those guidelines in conducting their dissertation research
- Be a good lab citizen and take part in shared laboratory responsibilities including maintaining a safe and clean laboratory space
- Maintain a detailed, organized, and accurate laboratory notebook
- Discuss policies on work hours, sick leave and vacation with the IDP mentor, rotation advisor, and research mentor, and consult with these individuals and fellow lab members in advance of any planned absences
• Following identification of a dissertation laboratory, discuss policies on authorship and attendance at professional meetings with the research mentor, and work with the mentor to submit all relevant research results that are ready for publication in a timely manner

FACULTY

Faculty are expected to:

• Provide an updated bio annually that describes current research programs and potential rotation projects if accepting IDP students
• Participate in IDP committee work, teaching and/or grading responsibilities and/or recruitment activities when asked including interviewing students, attending social mixers, and/or coordinating research tours on campus
• Meet with the student prior to a research rotation to discuss projects and establish expectations
• Discuss with the graduate student experimental models used in the lab if they will or may be expected to utilize as part of their work. Also discuss with the student lab use of biohazards, radiation, infectious agents, animals (survival surgery, non-survival surgery, euthanasia), human tissues and cells, clinical trials, and use of fetal tissue or fetal tissue derived products; and how these may relate to their work
• Meet with the student after the research rotation to debrief and discuss student performance during the rotation
• Respect the requirements that students must attend class daily from 8:30 – 10:30 am and are expected to study after class and in the evenings.
• Respect the guidelines that students are expected to be in lab on average 4 hours per day
• Allow students to attend and participate in IDP-sponsored activities
• Attend the Annual IDP All-Faculty Meeting and IDP Faculty Retreat (as space allows)
• Be committed to the continued mentoring of the graduate student, including the education and training of the graduate student as a future member of the scientific community
• Be committed to the research project of the graduate student, and help plan and direct the graduate student’s project, set reasonable and attainable goals, and establish a timeline for completion of the project.
• Recognize the possibility of conflicts between the interests of externally funded research programs and those of the graduate student, and not let these interests interfere with the student’s pursuit of his/her dissertation research
• Be committed to meeting one-on-one with the student on a regular basis
• Be committed to providing financial resources for the graduate student as appropriate or according to the institution’s guidelines in order for him/her to conduct their rotation project or dissertation research
• Be knowledgeable of, and guide the graduate student through, the requirements and deadlines of his/her graduate program as well as those of the institution
• Help the graduate student select a Dissertation Committee (upon selection of the research mentor), and ensure that the committee meets at least annually (or more frequently, according to program guidelines) to review the graduate student’s progress
• Lead by example and facilitate the training of the graduate student in complementary skills needed to be a successful scientist, such as oral and written communication skills, grant writing, lab management, animal and human research policies, the ethical conduct of research, and scientific professionalism
• Not require the graduate student to perform tasks that are unrelated to his/her training program and/or professional development
• Discuss authorship policies regarding papers with the graduate student, acknowledge the graduate student’s scientific contributions to the work in the laboratory, and work with the graduate student to publish his/her work in a timely manner
• Discuss intellectual property issues with the student with regard to disclosure, patent rights and publishing research discoveries
• Encourage the graduate student to attend scientific/professional meetings and make an effort to secure and facilitate funding for such activities (when appropriate)
• Provide career advice and assist in finding a position for the graduate student following his/her graduation (when appropriate)
• Provide honest letters of recommendation for the student when queried, and be accessible to give advice and feedback on career goals
• Provide for every graduate student under my supervision an environment that is intellectually stimulating, emotionally supportive, safe, and free of harassment
• Be supportive, equitable, accessible, encouraging, and respectful of graduate students during their training within the laboratory
• Foster the graduate student’s professional confidence and encourage critical thinking, skepticism and creativity
## SCHEDULE

### 2019-2020

#### 2019

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday, August 12</td>
<td>Begin first rotation</td>
</tr>
<tr>
<td>Monday, August 12</td>
<td>Classes begin</td>
</tr>
<tr>
<td>Friday, September 13</td>
<td>Selections for second rotation due</td>
</tr>
<tr>
<td>Monday, September 23</td>
<td>Begin second rotation</td>
</tr>
<tr>
<td>Monday, October 14</td>
<td>Spring/Summer 2020 registration begins</td>
</tr>
<tr>
<td>Friday, October 25</td>
<td>Selections for third rotation due</td>
</tr>
<tr>
<td>Monday, November 4</td>
<td>Begin third rotation</td>
</tr>
<tr>
<td>Friday, December 6</td>
<td>Selections for fourth rotation due</td>
</tr>
<tr>
<td>Friday, December 13</td>
<td>Last exam in first semester</td>
</tr>
</tbody>
</table>

#### 2020

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday, January 6</td>
<td>Begin fourth rotation</td>
</tr>
<tr>
<td>Monday, January 6</td>
<td>Classes begin</td>
</tr>
<tr>
<td>Monday, February 17</td>
<td>Begin fifth rotation (if needed)</td>
</tr>
<tr>
<td>Monday, March 30</td>
<td>Begin sixth rotation (if needed)</td>
</tr>
<tr>
<td>Friday, May 1</td>
<td>Last exam in second semester</td>
</tr>
<tr>
<td>May 2020 (exact date TBD)</td>
<td>Symposium</td>
</tr>
<tr>
<td>By June 30 (approximately)</td>
<td>Evaluation of students with GPA &lt; 3.0</td>
</tr>
<tr>
<td>Mid-August</td>
<td>2nd year classes begin</td>
</tr>
<tr>
<td>September</td>
<td>Submission of Abstract for Research Proposal</td>
</tr>
<tr>
<td>Last week of October</td>
<td>Research Proposal Due (this date is subject to change)</td>
</tr>
<tr>
<td>Late November/early December</td>
<td>Oral Qualifying Exam</td>
</tr>
</tbody>
</table>
# IMPORTANT DATES

## 2019-2020

### Rotations

<table>
<thead>
<tr>
<th>Rotation</th>
<th>Start Date</th>
<th>End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>August 12</td>
<td>September 20</td>
</tr>
<tr>
<td>2</td>
<td>September 23</td>
<td>November 1</td>
</tr>
<tr>
<td>3</td>
<td>November 4</td>
<td>December 13</td>
</tr>
<tr>
<td>4</td>
<td>January 6</td>
<td>February 14</td>
</tr>
</tbody>
</table>

### Optional Rotations

<table>
<thead>
<tr>
<th>Rotation</th>
<th>Start Date</th>
<th>End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>February 17</td>
<td>March 27</td>
</tr>
<tr>
<td>6</td>
<td>March 30</td>
<td>May 8</td>
</tr>
</tbody>
</table>

### Symposia

May 2020 (exact date TBD)

### Interviews

- Friday, January 17, 2020
- Friday, February 14, 2020
The training component of the IDP includes both core and elective didactic course work, laboratory rotations, professional development courses, and scientific writing and presentation activities.

During the first 24 weeks of the IDP curriculum (18 weeks of fall semester and first 6 weeks of spring semester), students complete four independent 6-week courses in Foundations in Biomedical Sciences (FBS1-4). These courses cover a variety of fundamental topics ranging from molecules to systems. Students also take required courses in Biostatistics and Techniques in Molecular and Cell Biology, and complete 4 x 6-week laboratory rotations. Evaluation of student commitment within the laboratory is assessed through the Introduction to Biomedical Sciences (IBR) course.

The 4 laboratory rotations allow students to identify the best match for their dissertation work, and allow for broad exploration of the research environments available to students within the program. Flexibility is built into the rotation schedule to allow for optional fifth and sixth rotations for students who desire more options. At the end of each rotation, students prepare a written rotation summary facilitating improvement of their written communication skills. Students also participate in an end-of-year research symposium which supports enhancements of oral presentation skills.

Upon completion of the 4th laboratory rotation, students may select a research mentor and begin work on their PhD dissertation. During the remaining 12 weeks of the spring semester, students complete elective courses that align with their research interests or that fill in identified knowledge gaps. Students also carry out research in the laboratory of their chosen mentor. Evaluation of student commitment within the mentor’s laboratory is assessed by the mentor through the Readings & Research course.

During the summer semester ending their first year and fall semester of their second year, students complete courses in ethics and integrity, and scientific writing and presentation. Enrollment in the IDP culminates at the end of the fall semester of year 2 with the successful preparation and defense of an NIH F31-style dissertation proposal document that is based on the student’s dissertation research project.
**CORE COURSES (OFFERED EVERY YEAR)**

16215, 16216, 16217, 16218. Foundations in Biomedical Sciences I-IV

Foundations in Biomedical Sciences (FBS) is broken into 4 course modules and represents the bulk of the didactic core coursework for first year IDP students. Each course module presents students with integrated and immersive cellular/molecular and systems/physiological level course material. This challenging, high-paced set of courses engage students in the major research interests and teaching philosophies of the participating departments which helps prepare students with a strong foundation for their journey into their elective courses that will ultimately guide their PhD dissertation work.

16242. Techniques in Molecular and Cellular Biology

The objective for the Techniques course is to provide a theoretical and practical foundation underlying a number of the most common experimental techniques required for biomedical research. The information presented in this course will introduce procedures and experimental strategies that are commonly used in biomedical research projects and will facilitate students’ comprehension of the scientific literature even if they don’t use the techniques in their own research. The lecture materials present the theory behind each technique, the practical limitations of each techniques, and the types of questions that each technique addresses, with emphasis on how each can be applied to generate new insight into biomedical research questions.

16290 & 16291. Professional Development 1 and 2

This course is taken in the fall and spring semesters of the first year and incorporates a multifaceted approach to introduce students to important elements of Professional Development. The course will incorporate lectures, active learning, and team-based approaches to such topics as preparing a laboratory notebook, scientific writing and reviewing, how to structure an effective hypothesis, research ethics, formulating an individual development plan, and presentation skills. Students will also participate in Responsible Conduct in Research training activities and engage in peer review discussions of the four laboratory rotation reports.

16210. IBR (Introduction to Biomedical Research)

This course reflects student's participation in laboratory research rotations and their attendance at seminars and/or journal clubs.
16245. Statistics for Basic Sciences

This course is designed to provide graduate students working in the research laboratory or studying the experimental sciences with fundamental knowledge in biostatistics. It will focus on descriptive statistics, elements of probability theory, estimation, tests of hypotheses, methods of categorical data tabulation and analysis. After completion of the course, students should be able to develop an appropriate study plan to explore a biomedical research question and execute simple statistical analysis of the data collected in the study. Emphasis will be placed on understanding concepts as well as learning to apply the covered statistical techniques. Students will also learn how to read, interpret, and critically evaluate statistical concepts in the literature.

16292. Writing a Scientific Paper & Writing a Proposal

These courses span the summer of the first year and fall of the second year. The goal of these courses is to enhance specific skill sets related to scientific writing and presentation. These courses will focus on the processes important for the preparation of scientific manuscripts and an NIH F-type research proposal. These courses will include didactic components, and will require students to work individually, or in small groups. Students will also engage in peer review activities to improve interpersonal, professionalism, and leadership skills.

10222. Ethics and Integrity in Science

This course provides the basis for understanding the ethical issues related to basic scientific and medical research, including animal and human subject research, fraud and misconduct, and governmental, institutional, and researcher responsibilities. This course provides the necessary research ethics instruction required to satisfy the United States Public Health Service Policy on Instruction in the Responsible Conduct of Research for institutions receiving research funds from the Department of Health and Human Services.

ELECTIVE COURSES

16273. Advanced Cell Biology (every other year)

Advanced Cell Biology is an upper level, 3-credit hour cell biology course that focuses on a variety of advanced topics in contemporary Cell Biology. Students will gain an in depth understanding of specific selected topics through the use of a variety of resources including webinars and podcasts, detailed in-class discussion of papers from the scientific literature and through preparation and presentation of a lecture on a cell biological topic directly relevant to the student’s own research interests. Lectures by faculty will be minimized.
**16266. Bacterial Diversity and the Microbiome (every other year)**

This interdisciplinary course will provide students with a solid foundation in the molecular and physiological basis of bacterial diversity with a particular focus on those organisms that comprise the gut microflora. The interaction between bacteria and viruses or phages will also be highlighted. The course will be paper based with chalk-talk style discussion sessions designed to promote discussion of the literature.

**16269. Basic Immunology (every year)**

The purpose of this course is to introduce basic concepts in immunology through lectures, readings from texts and current journals. The course is geared toward students interested in contemporary concepts of cellular and molecular immunology. The course has been designed to integrate fundamental concepts in immunology with the goal of students being able to understand and critically evaluate the complex nature of immune interactions and immune dysfunction regardless of their specific research focus. The participating faculty are from diverse backgrounds with unique expertise. Students will learn fundamental concepts in immunology with topics including innate and adaptive immunity, the cellular basis of the immune response, antigens presentation and antibodies, molecular basis for generating immunologic diversity, and regulation of immune responses. In the final block of the course, students will integrate their knowledge of the immune system and apply it to disease.

**Cognitive Neuroscience (every other year)**

Cognitive neuroscience examines human brain information processing at the level of large-scale neurobiological systems. Some examples include information processing that underlies learning and retrieving concepts, comprehending and producing language, directing and maintaining attention, and recognizing sensory objects. Each session in this course will begin with a 1-hour contextual lecture, followed by review and discussion of two relevant landmark papers, sometimes with opposing views. Emphasis will be placed on understanding the processing models central to each domain, the extent to which these models are supported by empirical evidence from neuroimaging, and the relevance of the field to a variety of human brain disorders.

**16271. Fundamentals of Neuroscience (every year)**

Fundamentals of Neuroscience follows a multidisciplinary approach to current knowledge about the structural and functional properties of the nervous system. The mechanisms of the nervous system are described at the molecular, cellular, systems and complex brain function levels. The course includes in-class lectures, seminars from prominent scientists (video archives), and written assignments. The purpose of this course is to introduce 1st year graduate students to the structure and function of the human nervous system.
16272. Graduate Neuroanatomy (every year)

Graduate Neuroanatomy is a lab-based course intended to accompany MCW course Fundamentals of Neuroscience. The purpose of this course is to introduce 1st year PhD students to the anatomy of the human nervous system.

16270. Integrated Microbiology and Immunology (every year)

The purpose of this course is to introduce basic and integrated concepts in immunology and cellular microbiology through lectures, readings from texts and current journals. The course is geared toward second year students matriculating into the Microbiology and Immunology (MI) Graduate Program as well as any student interested in contemporary concepts of cellular microbiology, immunology, and host-pathogen interactions. The course has been designed to integrate fundamental concepts in immunology and microbiology with the goal of students being able to understand and critically evaluate the complex nature of host-pathogen interactions and immune dysfunction regardless of their specific research focus. Students will learn fundamental concepts in immunology and gain an appreciation of the basic properties of bacteria and virus structure, replication, and pathogenesis. In the final block of the course, students will integrate their knowledge of pathogens and the immune system.

Mass Spectrometry (every other year)

The goal of the course is to provide a comprehensive overview of how mass spectrometry can be used in modern biomedical research. This course is designed for students without prior mass spectrometry experience and will introduce fundamental concepts regarding instrumentation, experimental design, and analysis of peptides, proteins, small molecules, lipids, metabolites, and glycans.

16274. Metabolism (every other year)

This course will be mainly a didactic based course that will comprehensively review subjects important to metabolism. The topics covered will range from carbohydrate metabolism to oxidative phosphorylation to lipid and amino acid metabolism. There will be a strong focus of these topics in health and disease, especially as they related to the cardiovascular system, cancer, diabetes and immune system function. The depth of coverage within each topic will not necessarily be comprehensive, but there may be a few aspects of each topic that will be highlighted by focusing on landmark studies or recent developments from published articles.

16267. Protein Chemistry-Applications (every year)

Suitable for all students interested in developing critical thinking skills through literature examples of protein activity and its regulation. Students and instructors will discuss literature that illustrates the in vitro reconstitutions, proteins structure/activity, and methods and logic of experimental design
including critical control experiments. In addition, the discussions will include methods learned in the first-year curriculum that might have been applied, but were not. From these analyses, students will hone their critical thinking and communication skills.

**16268. Protein Chemistry-Principles (every year)**

Suitable for all students interested in developing critical thinking skills through literature examples of protein activity and its regulation. In this course, students and instructors will use the primary literature to learn and apply the practical formalisms in protein chemistry – including thermodynamics, kinetics, enzymology, and chemical biology – to the regulation of protein activity. Biology is governed by thermodynamic and kinetic principles, but these principles are often abstract to students. The purpose of this course is for students to develop utility in thermodynamic and kinetic principles and apply them to biological systems. The course will emphasize literature examples and expect students to learn these principles by working through problem sets provided by instructors. Students will be able to differentiate when thermodynamics or kinetics likely govern a given biological system and have a framework by which to analyze new systems. In addition, the discussions will include methods learned in the first-year curriculum that might have been applied, but were not.

**16275. Understanding Cell Signaling through Therapeutic Drugs (every year)**

This course will present advanced concepts in cellular signaling by analyzing the molecular mechanisms responsible for the therapeutic benefit, unanticipated toxicity, and limited effectiveness of particularly well-known drugs that target specific signal transduction pathways. The topics are designed to promote an enhanced understanding of the complexities of multiple signaling pathways, and a sophisticated appreciation of how these pathways are integrated to produce cellular responses. The course has a translational emphasis by focusing on the multiple molecular actions of current FDA-approved drugs, as well as discontinued drugs that were removed from the market due to unanticipated toxicity or limited effectiveness. The lectures will provide an advanced analysis of the molecular responses that led to the success or failure of these drugs, encouraging students to develop sophisticated analytical skills that will allow them to define how different signaling pathways are integrated. Lectures presented by the instructors will provide an in-depth overview of different signaling pathways, and manuscript discussions will promote additional advanced analysis that will creatively engage the students.
Successful students in graduate school do the following:

- Participate in study groups with classmates. This is a great way to both learn and teach other as well as learn study habits from others.
- Talk to individual faculty to get specific questions about lectures answered/clarified
- Refer to the recommended or required texts for each course
- Refer to the recorded lectures to review material

If a student has utilized all the above suggestions and needs assistance with coursework, the student should seek out his or her first year mentor to talk about being matched with a student coach. A student coach is a second- or third-year student who has excelled in the first-year courses and can help the first-year student through the studying process. A coach is not a tutor.

The Program Coordinator will contact the potential coach to set up the first meeting. It is up to the student and coach to determine the coaching schedule thereafter.
ACADEMIC PROBATION

Students will be subject to Graduate School policies on probation and dismissal due to academic standing that are in effect when they enter the program.

Students with a grade point average (GPA) of 3.0 or above are in good academic standing. Students with a GPA of less than 3.0 will be notified by the Graduate School that they are on probation and counseled appropriately. The IDP director, along with other graduate faculty members as deemed appropriate, will meet with the student at that time.
LABORATORY ROTATIONS

STRUCTURE

The 4 laboratory rotations allow students to identify the best match for their dissertation work and allow for broad exploration of the research environments available to students within the program. Flexibility is built into the rotation schedule to allow for optional fifth and sixth rotations for students who desire more options. At the end of each rotation, students prepare a written rotation summary facilitating improvement of their written communication skills. Students also participate in an end-of-year research symposium which supports enhancements of oral presentation skills.

ROTATION SELECTION PROCESS

STUDENTS

Any time during school year: Students meet with available faculty members to discuss the faculty member’s research and lab environment and the student’s interest in the lab. Students are encouraged to discuss their options with their mentors.

By the following deadlines, students submit a list of three faculty member names in rank order of preference to their mentor for each rotation.

- August 7, 2019 1:00 pm
- September 13, 2019 1:00 pm
- October 25, 2019 1:00 pm
- December 6, 2019 1:00 pm

Students must discuss the possibility of a rotation with a faculty member prior to submitting his/her name for each rotation selection, except for the first rotation.

The Program Coordinator will coordinate the matches between students and faculty members. All matches are final.

FAQ:

When can I meet with faculty?

Students are encouraged to set up meetings with faculty members any time during the school year.

How do I know which faculty members are accepting rotation students?

The list of available labs will be available in course 16210 in Brightspace.

Can I submit more than three names?
When will I find out which lab I will rotate in?

The Program Coordinator will email the students and faculty members within two school days following the deadline.

What if I don't get matched?

Students who are unable to be matched with their initial set of faculty member choices will be given a list of available faculty members interested in a rotation student. Students will meet with available faculty members and make their selection before the rotation begins.

Can I rotate in a lab more than once?

Yes. Students are allowed to rotate in one lab twice, with approval of faculty member.

FACULTY

IDP faculty members are eligible for rotation students if he/she has the willingness and funding to support a student to work in the lab the following academic year. (Student stipends are supported by the graduate school for the first 18 months of the students’ graduate careers; thus, faculty members are responsible for paying the stipend beginning in the spring of the second year.)

1\textsuperscript{st} ROTATION PROCEDURE

In August before school starts, students are emailed a list of the IDP faculty members who have indicated to the Program Coordinator they are willing and able to take a first rotation student. Each student will investigate those labs by visiting the IDP website’s faculty member page. Each student will email the program coordinator a list of their top three choices, in rank order.

Students are then matched by the Program Coordinator such that as many students as possible get matched with one of their three choices.

2\textsuperscript{nd}, 3\textsuperscript{rd}, 4\textsuperscript{th} ROTATION PROCEDURE

- \textbf{Any time during the school year}: Students meet with available faculty to discuss the faculty member’s research, lab environment, and the student’s interest in the lab.
- \textbf{By the following deadlines}, students submit three faculty member names in rank order of preference for each rotation:
  - September 13, 2019 1:00 pm
  - October 25, 2019 1:00 pm
  - December 6, 2019 1:00 pm
- \textbf{On the afternoon of each deadline}, the Program Coordinator will contact (by email) the faculty members whose names were submitted by the students. Faculty members who decide that a particular student would not be a good fit for their lab may refuse that student by
responding to the email by the following **Monday at 3:00pm**. It will be assumed that faculty members who do not respond by the deadline will be happy to accept any of the prospective students who ranked his/her lab.

- The Program Coordinator will coordinate the matches between the students and faculty members. *All matches are final.*

**FAQ:**

**When can students meet with me?**

Students may set up meetings with faculty members any time during the school year.

**What if I don't want a student to rotate with me?**

If a faculty member believes a particular student is not a good fit for the lab, this should ideally be communicated during the meeting with the student so the student does not rank the faculty member as one of their choices. Alternatively, *notify the program coordinator immediately upon receipt of notification that a student you do not want lists you as a possible rotation mentor so she does not match you up in the final match.* Students will not be officially notified that a faculty member does not accept them. If the Program Coordinator does not get a response by Monday at 3:00pm from a ranked faculty member, it will be assumed that the faculty member is open to rotating any of the students who ranked him/her. *All matches are final.*

**Am I able to rotate more than one student during each rotation?**

Yes, you may rotate up to two students during each rotation period, at your discretion.

**Why don't I get to pick the students who rotate in my lab?**

The Program Coordinator will email each faculty member with the names of the students who have ranked him/her for each rotation. Faculty members may say no to any student.

**When will I find out which student has been matched with my lab?**

The Program Coordinator will email the students and faculty members two school days after the deadline.
What if I don’t get a student?

Students who are unable to be matched with their initial set of faculty member choices will be given a list of available faculty interested in a rotation student. These students will then meet with faculty members still open to rotation students and will make their matches before the next rotation begins.

Can a student rotate in my lab more than once?

Yes. Students are allowed to rotate in one lab twice, with approval of faculty member.
At the end of the fourth rotation, students will discuss their choices for research advisors with the appropriate faculty and with their first-year mentors. Student and faculty “matches” will be established directly by mutual agreement between the student and the prospective faculty advisor. Student assignments are subject to final approval by the Chairman of the proposed faculty member’s department. There is no restriction on the number of students that a faculty member can accept into their laboratory for dissertation work.

The deadline for selection of a lab will be February 21, 2020. If needed, additional 6-week rotation(s) may be completed to secure a dissertation lab. Students who are unable to secure a dissertation advisor will not be able to continue in the program.
The IDP Qualifying Examination will be held fall Y2 and will be based on a formal evaluation of the student’s overall development within the IDP. The examination will consist of a written NIH-style Grant Proposal focused on the student’s research, a 45 min oral presentation of the written proposal, and an assessment of the student’s knowledge of curricular material and background information related to the proposal. The qualifying examination will be overseen by the student’s Dissertation Committee along with a representative from the Executive Evaluation Committee (EEC). The EEC representative will chair the qualifying examination.

Grant Proposal

The Proposal will consist of four written components: (i) summary, (ii) a one-page Specific Aims page, (iii) a maximum 6-page Research Strategy section based on the student’s work in the mentor’s laboratory, and (iv) a Literature Cited page (no page limit). The Proposal should be developed in consultation with the mentor and the student’s Dissertation Committee; however, the written document should reflect the original thoughts and writings of the student. When warranted, students may consult materials presented in the Manuscript Writing Course (summer Y1) and Grant Writing Course (fall Y2). The style and content of the Grant Proposal will conform to the current requirements for an F31 NIH fellowship grant application which includes 0.5-inch margins, at least 11-point Arial or Helvetica font, single-spaced, no more than 6 lines per inch and no more than 15 characters per inch for all sections.

1. **Summary.** 30 lines, Arial 11, 0.5” margins. Describe the significance, knowledge gap, and outcome as the basis for your dissertation research/fellowship application.

2. **Specific Aims (1 page).** The Specific Aims page should contain the background of the project, a statement of the hypothesis being tested, and at least two specific aims. The Specific Aims page should concisely state the goals of the proposed research and summarize the expected outcomes. The Specific Aims page should be developed in consultation with the student’s Dissertation Committee and must be approved by the EEC before the student may begin preparation of the full Grant Proposal.

3. **Research Strategy (max 6 pages).** The Research Strategy section should include the following sections: (i) Significance and (ii) Approach. The Significance section should delineate the importance of the problem or the critical barrier that the proposed research addresses, how the proposed project will improve scientific knowledge, and how the proposed work will drive or change the field if the specific aims are achieved. The Approach section should describe the overall research strategy, methodology, and analyses that will be used to accomplish the proposed Specific Aims. Details about how data will be collected, analyzed, and interpreted should also be delineated. Individual Specific Aims should include
details about potential problems and any proposed alternative approaches that may be pursued. Finally, preliminary data can also be included in this section to bolster feasibility of any proposed work.

4. Literature Cited (no page limit). The Literature Cited page should include the list of publications referenced in the grant Proposal document.

Oral Presentation

The student will present details of the Grant Proposal to the examination committee via a PowerPoint presentation. The presentation should last no more than 45 minutes and should include sufficient information for the examination committee to assess various details of the proposal including the background, the significance, preliminary data, the experimental strategy, and any potential limitations and/or alternative approaches.

Assessment of the student’s knowledge of curricular material and background information related to the proposal

The examination committee will probe the student’s general scientific knowledge about topics covered within the IDP curriculum, as well as pertinent information related to the student’s Grant Proposal.

Outcome of Qualifying Examination

There are three possible outcomes to the IDP Qualifying Examination: (1) Unconditional Pass, (2) Conditional Pass, and (3) Fail. Students receiving a conditional pass may be required to complete some remedial work. If the performance of the student is deemed unsatisfactory (i.e. the outcome is a fail), then the student may be required to redo or retake one component of the Qualifying Examination. If the second examination is not passed, the student will be ineligible to continue in the program.

Timeline of the Qualifying Examination

1) The student is encouraged to form a Dissertation Committee by June 1. It is essential for successful completion of the qualifying examination that students establish a dissertation committee as soon as possible to guide and assist in the qualifying process. Students without an approved dissertation committee by the first day of the Writing an Individual Fellowship course (fall Y2) will be unenrolled in that course and ineligible to take the IDP qualifying exam (which will result in dismissal from the program). Composition of the Dissertation Committee must conform to the rules/regulations of the graduate program to which the mentor belongs. This committee (along with an ad-hoc representative from the EEC – see below) will be
responsible for conducting the Qualifying Examination which will take place in late November/early December of Y2 and will be guided by the IDP. As per grad school rule, the composition of the Dissertation Committee can be adjusted as work progresses to fit with focus changes.

2) During the summer Y1 and fall Y2, the student, with guidance from the mentor and the Dissertation Committee, will develop a Grant Proposal that is based on the work they are conducting in the mentor's laboratory. The proposal is designed so that the student could submit a potential fellowship application to an outside funding agency in Y2/3 if desired. If deemed appropriate by the mentor and the mentor's graduate program, the written proposal document may also serve as the student's Dissertation Outline required by the graduate school for formal PhD candidacy into the graduate program to which the mentor is associated.

3) The student will be required to take the courses on Writing a Scientific Paper (summer Y1) and Writing an Individual Fellowship (fall Y2). These courses will provide the student with the necessary tools and knowledge to write a Grant Proposal based on an F-31 style NIH fellowship.

4) Following the timeline defined in the Grant Writing course (fall Y2), the student will submit their completed Summary to the Course Director.

5) At the beginning of October (Y2), the EEC will assign one of its members to serve in an ad-hoc role on the student’s Dissertation Committee. The EEC member will chair the Qualifying Examination.

6) By the middle of October (Y2), the student and the Qualifying Examination Committee will finalize a date and time to hold the Qualifying Examination. The examination should be scheduled so that it takes place during the end of November/beginning of December (Y2). Students should expect the examination to take ~3 hrs. It is the responsibility of the student to communicate the date and time of the examination to the IDP coordinator who will reserve a room for the examination.

7) The completed Grant Proposal must be submitted to the Qualifying Examination Committee at least two weeks prior to the date of the Qualifying Examination.

8) At the beginning of the Qualifying Examination, the student will give a no more than 45-minute oral presentation outlining the Grant Proposal.

9) The Qualifying Examination will include an assessment of the written proposal and a question and answer session by the committee on the student's knowledge of curricular material and background information related to the proposal. The examination will emphasize creative thinking and problem solving in addition to curricular knowledge.

10) If deemed appropriate by the specific graduate program associated with the student's mentor, the IDP Qualifying Examination may also serve as the student's advancement to PhD candidacy. The representative from the EEC will not participate in evaluation of the student's advancement to PhD candidacy unless they are a formal member of the student's Dissertation Committee.

11) Any necessary retakes of the IDP Qualifying Examination will occur in January of Y2. A student is not allowed to formally matriculate out of the IDP until he/she has received an unconditional pass from the Qualifying Examination Committee.
SYMPOSIUM

There will be one student symposium per academic year, in May, after final exams. All students will present an oral presentation on the lab they have chosen to do their dissertation work in at that time.

WRITTEN REPORTS

Each student will submit four written reports based on their rotation projects in the first year. These presentations/reports will showcase that the student has a grasp of the scientific questions being investigated in the host laboratory and will help his/her gain skills in presenting and interpreting data. The IDP coordinator has examples or resources with suggestions if needed.

**Written Reports:** Written reports should be approximately four double-spaced pages in length. Four pages of text are equivalent to approximately 1200 words. In addition to the text, include figures presenting your data and/or provide models or flow-charts that you feel are important. Figures are not included in the page limitation. Also include at the beginning of the document: the title of the report, your name, your rotation lab name, and the date. Your rotation mentor must have input into this document; do not submit a report without getting advice and input from your rotation faculty member.

**Deadline:** email report to the Program Coordinator by 8:30 am on the Monday following the end of the rotation

**Oral Presentations:** Oral presentations should be ten minutes in length, with an additional five minutes scheduled for questions. Please prepare a Power Point presentation. Your rotation mentor must have input into this presentation; do not present without consulting with your rotation faculty member.

**Deadline:** load onto the symposium room computer by 15 minutes prior to symposium start time.

**Organization:** Include the following:

- **Significance and Background:** Provide a discussion on the importance of the overall topic.
- **Hypothesis or Question:** What question or hypothesis were you trying to test?
- **Specific Aim(s):** Describe what you were trying to accomplish.
- **Methods:** What was your experimental design? What techniques were you using?
- **Results:** Describe the results you obtained. Provide figures that illustrate the data.
- **Interpretation and Discussion:** What was learned from your work? Did it help to answer the question you were asking? If your studies didn’t “work,” what went wrong? What technical or conceptual problems were there? What would somebody following up on the work do next?

**References:**

*Written report:* Cite a small number of key references in the document text and provide a bibliography at the end of the document.

*Oral presentation:* Cite references on each slide as appropriate.
IDP COMMITTEES AND MEMBERSHIP

ADMINISTRATION

Program Director: Dr. Tom Zahrt
Program Coordinator: Julie Arthur
Participating Departments: 
- Biochemistry
- Biophysics
- Cell Biology, Neurobiology, & Anatomy
- Microbiology & Immunology
- Pharmacology & Toxicology

PROGRAM DIRECTORS GROUP

Composition: Graduate program director from each of the participating departments
Current Members: 
- John Corbett (Department Chair Representative, Biochemistry)
- Brian Link (Cell Biology)
- Blake Hill (Biochemistry)
- Candice Klug (Committee Chair, Biophysics)
- Tom Zahrt (Program Director, Microbiology)
- John Auchampach (Pharmacology)

Responsibilities:

- Strategic planning
- Liaise between degree granting program faculty and the IDP
- Feasibility assessment for plans and policy changes put forward by committees of the IDP
- Advise IDP leadership regarding national graduate education changes and trends

COMMITTEE CHAIRS GROUP

Composition: Chair of each of the committees listed below
Current Members: 
- Chris Olsen (Recruitment)
- Qing-song Liu (Admissions)
- Neil Hogg (Executive Evaluations)
- Candice Klug (Mentoring and Program Director’s Group Chair)
- Amy Hudson (Course Director’s Group)

Responsibilities:

- Communicate and coordinate with each of the committees regarding current best practices and to discuss new proposed policies of the IDP.
**RECRUITMENT COMMITTEE**

**Composition:** One representative from each department

**Current Members:** Iris Kassem (Cell Biology), Brian Smith (Biochemistry), Chris Olsen (Committee Chair, Pharmacology), Chris Kristich (Microbiology), Jeannette Vasquez-Vivar (Biophysics)

**Responsibilities:**
- Consider methods to increase numbers of qualified applicants and ways to move qualified applicants to matriculating students
- Serve as a liaison between IDP faculty, IDP leadership, and the Graduate School regarding issues related to recruitment
- Work with the Graduate School to design IDP informational materials
- Provide the Graduate School with an informational letter for distribution to potential applicants
- Interact with interested students prior to application and interviews to provide information about IDP or Departmental PhD programs
- Participate in Graduate School Open House events
- Provide an informational session for applicants at the start of interview weekends
- Interview applicants
- Attend IDP recruitment events including receptions and dinners
- Interact with those accepted to IDP to encourage accepted applicants to choose MCW for graduate training

**ADMISSIONS COMMITTEE**

**Composition:** One representative from each department

**Current Members:** Michaela Patterson (Cell Biology), Jimmy Feix (Biophysics), Subramaniam Malarkannan (Microbiology), Brian Volkman (Biochemistry), Qing-song Liu (Committee Chair, Pharmacology)

**Responsibilities:**
- Represent the IDP program at Open Houses held in October and November (Chair)
- Review applications
- Work with the IDP coordinator to invite applicants and arrange interviews (Chair)
- Interview applicants
- Provide IDP Overview presentation and Q and A session on interview days (Chair)
- Follow up with applicants post-interview (Chair)
- Recommend students for acceptance by the Graduate School
- Follow up with students after acceptances are emailed

**MENTORING COMMITTEE**

**Composition:** One representative from each department

**Current Members:** Candice Klug (Committee Chair, Biophysics), Allison Ebert (Cell Biology), Amy Hudson (Microbiology), Wai-Meng Kwok (Pharmacology), Daisy Sahoo (Biochemistry)
Responsibilities:

- Mentor/counsel students during the first two semesters of graduate study
- Provide support during selection of faculty for rotations
- Maintain chair-approved faculty availability list
- Monitor rotation and coursework performance
- Participate in evaluation of 1st year students
- Sign monthly time sheets
- Attend welcome events, quarterly symposia, and quarterly mentor meetings

### COURSE DIRECTORS GROUP

**Composition:** One course director from each participating department

**Current Members:** Michele Battle (Cell Biology), Neil Hogg (Biophysics), Amy Hudson (Microbiology), Alison Kriegel (Physiology), Adriano Marchese (Biochemistry), Chris Olsen (Pharmacology)

**Responsibilities:**

- Evaluate current coursework for format and content
- Assess proposals brought forth by faculty to improve curriculum

### EXECUTIVE EVALUATIONS COMMITTEE

**Composition:** One representative from each department

**Current Members:** Neil Hogg (Committee Chair, Biophysics), Xiaowen Bai (Cell Biology), Al Girotti (Biochemistry), Guan Chen (Pharmacology), Scott Terhune (Microbiology)

**Responsibilities:**

- Assess and vet Mock Proposal abstracts
- Chair and assign faculty members to each Student Evaluation Committee for the Qualifying Examination.
- Evaluate student performance on the Qualifying examination and communicate results to the student and their mentor. Formulate any remedial work necessary as a condition of qualification.
- Assist in retesting students who failed the initial examination

### COMMITTEE APPOINTMENTS

To appoint/replace a faculty member on an IDP committee, the chair of the committee must obtain approval from the Department Chair first. Approval should be communicated via email or letter and include CC to the IDP Director.
RECRUITMENT

FOR STUDENTS

As you may remember from when you interviewed for the IDP program, interview weekends are a busy time on campus!

As a current student you have the unique and dynamic opportunity to interact with applicants to the IDP program by serving as an interview volunteer. There are many opportunities throughout the three days, whether you’d like to volunteer for an on-campus post or something around the city. Julie Arthur, the Program Coordinator, will touch base with the current students in November proceeding interview season to ask for volunteers.

The IDP program is thankful to all volunteers who helps make each interview weekend a success! Thank you for being a proud ambassador of our school and program.

FOR FACULTY

The IDP holds two main interview dates during the winter each year, in conjunction with the Neuroscience Doctoral Program. The dates for 2020 are as follows:

January 17, 2020

February 14, 2020

Please block off time from 10am to 3pm on each of these dates at this time, knowing that the program may contact you to interview one (or more) applicants. Specific interview times are not decided until a few weeks before the interview date. For example, you could expect to be contacted in late December to see if you’re available to interview for the January interview times. Interviews are held with the members of the IDP Admissions and Recruitment committees, but also with faculty members the applicants identify having an interest in meeting.

Participating in the interviews is a benefit to a new faculty member, as it helps integrate you into the culture and climate of the IDP right away. After you interview a student, you are asked to provide an evaluation as soon as possible. The IDP strives to provide timely feedback to candidates on their admission status and receiving faculty feedback is an important part of this process.

Applications are submitted to the Graduate School through an online portal called Slate. You will be given a Slate account and will need to participate in two short training sessions to be able to access the student applications. The Program Coordinator will contact you in advance with instructions on how to complete the training exercises. You are asked to fully review the electronic application file of any applicants you are interviewing.
Interview weekends are a bustling time on campus, with a three-day span of activities for the applicants. Here is a short summary of the weekend:

<table>
<thead>
<tr>
<th>Day</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday</td>
<td>Lab tours, then dinner and Q&amp;A session with current graduate students</td>
</tr>
<tr>
<td>Friday</td>
<td>Faculty symposium, four interviews, lunch, campus reception, and then an off campus dinner with current graduate students and faculty</td>
</tr>
<tr>
<td>Saturday</td>
<td>Brunch in town and city tours</td>
</tr>
</tbody>
</table>

Dr. Qing-song Liu is the Admissions Committee Chair who works very closely with the Program Coordinator to make these interview weekends happen, but it’s also the cooperation and availability of the IDP faculty who help to make these weekends a success.

Each year, IDP interviews approximately 50 applicants to fill a class ranging from 18-20 students.

If you have questions or comments about interview weekends, please contact Qing-song Liu or Program Coordinator Julie Arthur (jarthur@mcw.edu).
MENTAL HEALTH AND WELLNESS

Information on Student Mental Health Services can be found in the Graduate Student Handbook: https://www.mcw.edu/education/graduate-school/current-students

More information can also be found on the Student Services website: https://www.mcw.edu/education/academic-and-student-services/student-wellness
SICK AND VACATION TIME

SICK TIME

If a student is sick and will miss class or an IDP event, s/he must email the Program Coordinator as soon as is feasible of the absence. The absence must also be recorded in myTime. If a student is sick and will miss lab, s/he must notify the lab.

Missed Exam policy can be found in the MCW Graduate Student Handbook: https://www.mcw.edu/education/graduate-school/current-students

VACATION TIME

Students are given ten days of vacation through the Graduate School per academic year. Students may not take vacation that interferes with required class and lab work. They are encouraged to take advantage of their vacation time beginning in May 2020, after the student symposium. Students are reminded that their dissertation advisor must agree on the timing of the vacation.

December 2019/January 2020

Students are encouraged to take a much-deserved break during the two weeks following the last exams in December. They may also continue working on the third rotation project during this time if the mentor agrees. This time does not count against the vacation time allowed by the Graduate School.
# SHAREPOINT PAGES

## FOR FACULTY

The **SharePoint IDP Faculty Page** is a resource for all things IDP for our faculty.

https://mcwo.sharepoint.com/sites/IDPFacultyPage

## FOR STUDENTS

The **SharePoint IDP Student Page** is a resource for all things IDP for our students.

https://mcwo.sharepoint.com/sites/IDPStudentPage
**Tom Zahrt, PhD**  
Program Director  
tzahrt@mcw.edu

**Candice Klug, PhD**  
Program Directors Group Chair  
& Mentoring Committee Chair  
candice@mcw.edu

**Julie Arthur**  
Program Coordinator  
jarthur@mcw.edu

**TBD**  
Recruitment Committee Chair

**Qing-song Liu, PhD**  
Admissions Committee Chair  
qsliu@mcw.edu

**Neil Hogg, PhD**  
Executive Evaluations Committee Chair  
nhogg@mcw.edu

**TBD**  
Course Directors Group Chair
Ravi Misra, PhD
Dean
rmisra@mcw.edu

Angela Backus, MS
Director of Enrollment & Student Affairs
abackus@mcw.edu

Neil Hogg, PhD
Associate Dean
nhogg@mcw.edu

Tony Perez, MS Ed
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