Institute for Biomedical Sciences
Program Handbook 2020-2021

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The Institute for Biomedical Sciences provides organization and oversight for the biomedical science PhD programs at GW School of Medicine and Health Sciences. The IBS common IBS core curriculum includes interdisciplinary cell and molecular biology and physiology courses, biostatistics, and professional skill courses in scientific writing, biomedical careers and responsible conduct. Foundation courses in each PhD program begin in the second semester. All students participate in three rotations in the first year of graduate training, in order to identify a faculty research advisor. Program-specific graduate program directors then guide and oversee students through completion of remaining coursework, a grant-style qualifier examination, and dissertation research. Over 100 faculty members participate in one or more of the 5 PhD programs. Our current student enrollment numbers approximately 70. Our alumni go on to research careers in academia, industry/biotech and government/nonprofit, as well as careers in science communication, science teaching and science policy.

Program Features

The admissions committee seeks students with broad interests and experience in research. Our PhD programs use the George Washington Columbian College of Arts and Sciences graduate application. Candidates are accepted after review of the written application and individual interviews. The Ph.D. programs in the biomedical sciences require year-round participation beginning with the fall semester of the entering year.

The common IBS core curriculum includes interdisciplinary cell and molecular biology and physiology courses, biostatistics, and professional skill courses in scientific writing, biomedical careers and responsible conduct. Foundation courses in each PhD program begin in the second semester. The required and elective didactic work is designed to meet the specific program's requirements and the student's needs in preparation for dissertation research. Students are expected to complete approximately 9-12 credits of course work in each semester for the first two years (or 45 hours before the qualifier and full-time dissertation research).

Research rotations are critical for students to become familiar with ongoing research projects and selection of the dissertation laboratory. In addition, rotations broaden student research skills, and rotation mentors may become research collaborators and committee members. Students and mentors are informed by the Compact Between Graduate Students and Their Research Advisors.

Three, ten-week rotations are carried out in the first year, and must be performed in different laboratories. Any PhD Trainers in IBS may serve as laboratory rotation mentors, and only one rotation student may be in a faculty lab at a time. For students who have previous experience with an IBS trainer laboratory, only one rotation may be performed in that laboratory. By the end of the first year, it is expected that the student will have selected a program and will have identified a research mentor and PhD program.

Students complete a grant-style qualifier examination, generally at the end of the second year. The examination is “on-topic”, allowing students to prepare a strong thesis project. Following successful passage, PhD candidates form a thesis advisory committee consisting of the research mentor and at least two other faculty members.

After successful completion of the qualifier, students pursue dissertation research, with periodic thesis advisory committee meetings and reports due every 6 months to ensure good progress. Following satisfactory completion of the dissertation and oral defense of the dissertation research, the PhD is conferred.
Learning Outcomes for Biomedical Science PhD

- Discipline-specific knowledge, including a review of existing literature, an understanding of current working models and the articulation of gaps in knowledge.
- Research skill development, including the design of rigorous experiments to test hypotheses, technically perform reproducible studies, critically analyze and interpret data
- Research communication skills, including the ability to write and speak effectively about science and research to a variety of audiences
- Research leadership, including the ability to form and manage teams of diverse participants to achieve project goals, self-assessment to identify interests and strengths, and agency to seek professional and career opportunities.
- Research professionalism, including the responsible conduct of research, authorship, research with human, animal or large datasets, laboratory safety and skills as mentor and mentee.

PhD Programs and Graduate Program Advisors

PhD programs in the biomedical sciences are designed to meet key goals in contemporary graduate research education including 1) discipline-specific knowledge, 2) research skill development, 3) research communication skills, 4) research leadership and 5) research professionalism, and to prepare graduates for a variety of research careers.

Each PhD program has at least two Graduate Program Directors (GPDs), approved by IBS, who are available for academic and career planning. Academic advising, available research rotation faculty, and progress in each PhD program is overseen by the GPDs, who implement important IBS policies and procedures with oversight from the IBS Director. Students are assigned a graduate program advisor upon arrival, based on initial interests, and should contact advisors in any area at any time as desired for information. Once a PhD program is selected, the associated GPD will work with IBS leadership to ensure timely progress.

Cancer Biology PhD Program

The Cancer Biology PhD Program is designed to develop research scientists with expertise in the principles of cancer immunology and immunotherapy; targeted therapies and epigenetics; and cancer engineering and technology. Contemporary approaches include tools of cell and molecular biology, molecular signaling, genomics, proteomics, epigenetics, flow cytometry and high resolution imaging.

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Genomics and Bioinformatics PhD Program

The Genomics and Bioinformatics Ph.D. program is designed to develop research scientists with expertise in the principles and methods of genetic and epigenetic basis of diseases, chromatin remodeling, post-translational modification, systems and “omics” approaches to complex disorders including cardiovascular and pulmonary diseases. Approaches include genomics, bioinformatics, micro
RNA processing, biomarkers, molecular biology, and next-gen sequencing as applied to the study of various diseases.

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*Microbiology and Immunology PhD Program*

The Microbiology and Immunology PhD program is designed to develop research scientists in the areas of molecular virology, molecular parasitology, and immunology. The program’s current research strengths and training opportunities include the study of host-pathogen relationships, inflammation and inflammatory disorders, vaccine development, cancer immunology, molecular parasitology, HIV and HIV immune response, and microbial genomics and proteomics.

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*Neuroscience PhD Program*

The Neuroscience PhD program is designed to develop research scientists in the areas of anatomical organization of the brain, neurotransmitter signaling, molecular activity of ion channels; synaptic, network and metabolic changes in the living brain, brain circuit development; and mapping human genes, as well as human brain structure, activity and behavior.

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Pharmacology and Physiology PhD Program

The Pharmacology and Physiology PhD program is designed to develop research scientists in research programs focused on cardiovascular and renal systems, including autonomic and respiratory control of brainstem function, cardiovascular function, neural control of blood pressure and heart rate, post-traumatic stress, hypertension and pharmacogenetic determinants of drug response.

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General graduate policies are bound by the CCAS Graduate Program Policies and this IBS program information. The program of study for the IBS PhD programs is outlined here.

Academic Policies

Good Academic Progress and Academic Probation

- If a student earns below a 3.0 average in any semester, on the first occasion they will receive a written letter of warning from the Associate Dean for Graduate Studies in the Columbian College of Arts and Sciences and will be required to meet with the academic advisor to remedy the situation. If the student obtains below a 3.0 average for a second semester the matter goes to the dean, who makes a decision whether the student’s program should be terminated. If a student receives a grade below a 3.0 in a required core IBS course(s), the student is subject to academic probation.
- If a student does not satisfactorily complete the required first year IBS requirements during the first academic year, the student is subject to academic probation. This includes a grade of “Incomplete” for any core course. Academic Probation requires a meeting of the student with the IBS Graduate Program Director Committee. Courses of action can include remediation of course work, loss of stipend and/or tuition benefits, or dismissal from the program.
- Once in dissertation years, research mentors will grade dissertation research 8999, as satisfactory/unsatisfactory. In the unlikely event of two consecutive Unsatisfactory grades a student review will occur, and can be cause for separation.

Registration Policies

- Courses offered by the IBS and SMHS basic science departments generally apply towards the required or elective PhD curriculum (course codes ANAT, BIOC, BMSC, CANC, GENO, MICR, NRSC, and PHAR). External courses not included in the previous list and offered outside SMHS (such as BISC, BME, CTS, HSCI, PUBH, RAFF, and SPHR) require IBS program director approval before registration and may be counted as electives for the PhD. IBS tuition awards are only applicable to courses relevant to the study of biomedical science and in compliance with IBS policies, as determined by the IBS leadership.
- All registration plans must be pre-approved by the appropriate graduate program director. Students should consult DegreeMap each semester to track your progress in meeting program requirements when planning your courses. Refer to the online schedule for detailed information on each course you plan on taking. Registration is completed in the Gweb system. Registering after the first day of classes incurs a late fee which students are responsible for paying.
- Schedule changes can be made in Gweb through the second week of classes, and via a paper form through the fourth week of classes. However, be aware that if you drop a class without replacing it [i.e. net reduction in the number of credits you are taking] on the first day of classes or beyond, you will have to personally pay a drop fee that your award doesn’t cover! Additionally, any class dropped after the fourth week of classes will remain in your transcript with a “W” grade. All schedule changes must also be approved by the appropriate graduate program director and/or the IBS office.

Key Takeaways: (1) The IBS does not cover late fees or drop fees, they are the student’s responsibility. (2) All registration plans (and any changes) must be approved in advance by the appropriate program director and/or the IBS office to ensure they comply with graduation and tuition award requirements. Unapproved courses may not be counted towards the PhD or eligible for tuition award funding.
Curriculum – Year 1

In the fall semester, all students take Genes to Cells, Systems Physiology, and Molecular Basis of Human Disease, along with the first lab rotation (approximately September-December) and the first career skills course, which focuses on scientific writing and speaking.

**Fall, First Year**
- Genes to Cells (3 credits)
- Systems Physiology (3 credits)
- Molecular Basis of Human Disease (3 credits)
- First Laboratory Rotation (2 credit)
- Career Skills: Scientific Writing and Speaking (1 credit)

Students may not enroll part-time or take courses out of order in the core curriculum without special permission.

<table>
<thead>
<tr>
<th>COURSE</th>
<th>TIME</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMSC 8210 – Genes To Cells</td>
<td>Mon-Tues-Wed 8:30-10:00am [8/31-10/14]</td>
<td>Ross 643</td>
</tr>
<tr>
<td>BMSC 8212 – Systems Physiology</td>
<td>Mon-Tues-Wed 8:30-10:00am [10/19-12/7]</td>
<td>Ross 643</td>
</tr>
<tr>
<td>BMSC 8230 – Molecular Basis of Human Disease</td>
<td>Mon-Wed 10:30am-12:00pm</td>
<td>Ross 643</td>
</tr>
<tr>
<td>BMSC 8216 – Scientific Writing</td>
<td>Tues 10:30am-12:00pm</td>
<td>Ross 643</td>
</tr>
<tr>
<td>BMSC 8215 – Lab Rotations</td>
<td>Rotation # 1 mentor beginning Sept 14</td>
<td></td>
</tr>
</tbody>
</table>

In the spring semester, students take the second lab rotation (approximately January-April), and the second career skills course, which focuses on ethics and grantsmanship. They also begin to choose from courses specific to the various PhD programs.

**Spring, First Year**
- Second Laboratory Rotation (2 credits)
- Career Skills: Ethics and Grantsmanship (1 credit)
- One or more Foundation courses:
  - Basic Science of Oncology (3 credits)
  - Introduction to Genomics, Proteomics and Bioinformatics (3 credits)
  - Infection and Immunity (3 credits)
  - Foundations of Experimental Neuroscience (3 credits)
  - Pharmacogenomics and Personalized Medicine (3 credits)
- Plus other electives

In the “summer” of the first year (approximately April-June), all students take a third lab rotation and the Careers in Biomedical Sciences seminar. Coursework and rotations are expected to assist in guiding the student toward the ultimate choice of Ph.D. programs.

All students should complete an Individual Development Plan using MyIDP and discuss with their mentor.
Summer, First Year

- Third Laboratory Rotation (2 credit)
- Career Skills: Biomedical Science Careers (1 credit)
- Select research mentor and PhD program

Laboratory Rotations

Research rotations are critical for first year students to identify important research questions, choose the dissertation lab, and to select thesis committee members and collaborators. In addition, rotations broaden the student research experience and familiarize students with on-going research projects. Use the Rotation Form here.

- Three, ten-week rotations are carried out in the first year, and must be performed in three different laboratories. Exceptions will not be made. Any approved IBS PhD trainer may serve as laboratory rotation mentors, and only one rotation student may be in a faculty lab at a time. The student is expected to be in the lab 30 hrs/week. A fourth rotation will be granted only in the event that the student did not find a suitable mentor. The rotation mentor will guide the student during the rotation by having frequent meetings to discuss the research project both conceptually and experimentally. Both the student and the mentor are expected to attend the rotation mini-symposia.
- For any students who have previous experience with an IBS trainer laboratory, only one rotation may be performed in that laboratory. By the end of the first year, it is expected that the student will have selected a program and will have identified a research mentor and PhD program.

Setting up a Rotation

- Students are assigned initial Graduate Program Directors based on their interests, and should seek advice of any GPD for potential rotations in the same or other areas.
- Laboratory rotations can occur only with IBS approved PhD trainers. Students will receive a list of PhD trainers seeking students at the beginning of the year.
- Students should contact potential rotation advisors. This is often done by email introductions with an associated CV. If you do not receive a response within 48 hours, follow up with another email or contact your GPD. Prepare for your meeting by reading the mentor’s latest papers, available from PubMed.
- At the meeting, be ready to discuss your background, research experience, any abstract or papers you have published, and share with the mentor your research interests. Ask the mentor about potential rotation projects, experimental procedures used in the laboratory. Ask how the lab operates, such that you can assess whether you will enjoy rotating in this laboratory. Finally, ask if the mentor anticipates an opening for a potential student position in his/her laboratory.
- Once you have confirmed your rotation decision with the mentor, email the other mentors you interviewed with of your decision, so they might offer any rotation slot to another student. Remember, a mentor can only accept one first year graduate student at a time to rotate in his/her laboratory.
- Have the lab rotation mentor sign the BMSC 8215 Lab Rotation Commitment Form. Sign it and return the signed form the IBS office by the stated deadline.

Rotation Presentations and Grading

- BMSC 8215 Laboratory Rotations is a pass/fail course.
- At the end of each rotation, all first year students will give a brief power point presentation (maximum 8 slides), which includes a brief introduction and main goal of the research project,
methods, results, discussion and major conclusions. Each presentation will be followed by a short question session.

- In-class PowerPoint presentations are MANDATORY, and therefore failure to give an in-class presentation will result in no credit for the course (BMSC 8215)
- Students are also required to submit a lab report, according to the PNAS guidelines. The mentor will guide the writing and revision of the student’s report. The research report will be composed of: 1) a short introduction to give a brief background on the system studied, what is known in the field, and outline the major objective of the study. 2) Materials & Methods: to describe the different methods used in the study by following the guidelines of a PNAS manuscript. 3) Results & Discussion: to describe the results obtained during the study and discuss them in the context of the field of interest. 4) References. 5) Figures & Tables: each figure or table should include a title and a complete legend (see PNAS guidelines). The lab report must be formatted as a PNAS manuscript with two column- format and figures integrated in the paper.

To receive credit for your rotation, all the following requirements must be fulfilled:

- Spend 30 hours per week in the laboratory.
- Objectives set by mentors for the rotation must be satisfied.
- The mentor and student evaluation forms must be submitted by the due date
- PowerPoint presentations must be given in class and on the day specified
- Laboratory rotation reports must be turned on due date

PhD Mentor and PhD Program Selection

Selection of the thesis research mentor, and associated PhD program, generally occurs at the end of the first year. In exceptional cases, additional rotations in the summer or fall are required. Please use the Program Selection Form.

Curriculum – Year 2

In the fall semester, all students take applied biostatistics for basic research, a PhD program-specific seminar series, and readings and research with their research mentor, as well as remaining required and elective courses specific to the various PhD programs. Students are strongly encouraged to take electives across different biomedical PhD programs that are relevant to their research. See the PhD program courses here.

Fall, Second Year

- Readings and Research 8998 (with mentor, 1-3 credits)
- Applied Biostatistics for Basic Research (2 credits)
- Seminar course for the specific PhD program (1-2 credits)
- Additional Required and Elective courses for the specific PhD program

In the spring semester, students continue the program-specific seminar series and readings and research with their research mentor, as well as remaining required and elective courses specific to the various PhD programs. See the PhD program courses here. Students should begin planning their grant-style qualifier.

Spring, Second Year

- Readings and Research 8998 (with mentor, 1-3 credits)
- Seminar course for the specific PhD program (1-2 credits)
- Additional Required and Elective courses for the specific PhD program
Summer, Second Year

- Complete grant-style qualifier examination, advance to candidacy

The grant-style proposal is both a training exercise to develop research competencies and serves as a qualifying exam for the PhD advancement to candidacy. Details of the exam follow below and provide details for both the roles of the faculty members and the guidelines for the students. Please use the Qualifier Exam Form.

The successful grant-style qualifier document serves as the Research Proposal for thesis committee meetings. Typically, students propose a project that will represent the thesis project, and faculty who supervise the qualifier may be invited to serve on the dissertation committee. Following completion of the qualifier, students and their mentors should plan on regular thesis committee meetings to occur every six months, regardless of level of progress, and must provide the committee meeting summary form to the IBS within two weeks of each meeting.

Curriculum – Year 3 and Beyond

Students are required to prepare progress reports at six-month intervals, and present these to their Dissertation Research Committee prior to a committee meeting. At these meetings, progress will be evaluated and compared to the proposed timeline, stumbling blocks identified, and alternate strategies developed to help the student achieve his/her goals as necessary. This may include suggestion of an alternate technique to one that is not yielding results, recommending other faculty or outside scientists who might be able to assist in overcoming technical obstacles, etc. If the student has no technical problems, but is not progressing at the anticipated rate, reasons are explored and the student advised of strategies to improve progress. If at any time it appears that the student is not progressing steadily, the student may be advised that to remain in active status in the program, certain timelines must be met. If they are not met, the student may be dismissed following review by the GPD and IBS leadership. If a problem arises regarding incompatibility of the student and mentor, another possible mentor may be identified.

Research mentors will grade dissertation research 8999, as satisfactory/unsatisfactory. In the unlikely event of two consecutive Unsatisfactory grades, the IBS will review the student’s progress with possible cause for termination from the program.

Grant-Style Qualifier Examination

Effective preparation of fellowship grant applications is required for a successful career in academic research, and garnering support for research ideas is key in additional career sectors. Thus, the grant application component of the graduate program is both a training exercise to develop research competencies and serves as a qualifying exam for the PhD advancement to candidacy. Students should be able to develop a novel line of research, propose a hypothesis, and develop a series of experiments to test that hypothesis. A student must also be able to defend the proposal at an oral examination. At the time of the oral defense, the student should also demonstrate knowledge of the larger field of the general area of the proposal and material covered in completed coursework. The ability of a student to accomplish this endeavor will represent the qualifying exam. This document is designed to provide details for both the roles of the faculty members and the guidelines for the students.

Selection of Exam Topic

The qualifier exam topic is to be based on the student’s proposed thesis project. The student will develop the specific aims and scientific focus of the proposal. The student is encouraged to interact with his/her advisor and the exam committee members in focusing the specific aims. While the specific aims
and proposal should serve as a sound starting point for the student’s dissertation research, the student is likely to modify those aims following completion of the qualifier with the guidance of the thesis committee as the student’s research develops. These aims are not “binding” for the dissertation.

The student will submit the proposal title and specific aims to the advisor and committee members according to the timeline (see below). During the period of topic selection and development of specific aims, students are expected to maintain full-time involvement in coursework and laboratory activities. The student is responsible for meeting all deadlines and for setting a time and place for the oral examination.

**Qualifying Committee**

The Qualifying Committee will be composed of three GW faculty (not including the mentor) approved by the IBS Graduate Program Director (GPD) overseeing the student’s area of specialization. The majority of the committee must be IBS PhD Trainers.

One member will be designated as “Chair” of the Qualifying Committee. The Chair is responsible for the conduct of the examination, and for the preparation of correspondence; critique of the written proposal and reporting progress and results to the IBS.

The student’s research advisor is expected to approve the topic, specific aims, and the final written qualifier proposal, but the advisor will not serve as a voting member of the examining committee. The student’s faculty advisor is expected to attend the oral examination as a non-examining, non-voting, and generally non-contributing observer. At the request of the committee, the advisor may provide information to clarify an area of confusion; in these situations, the advisor serves as a resource to the committee but may not participate by examining or answering for the student.

**Examination Timeline**

On a typical timeline, specific aims will be submitted to the committee by June 1, accepted within two weeks, and the completed grant application will be submitted July 20 (for 5 weeks of writing) although this does not preclude earlier submission. Students may begin the qualifying process at any time after January 1 of their second year. Should a committee require revisions to the specific aims or proposal submitted by a student, the clock is re-set for that component from the date of notice. Oral defense of the proposal is expected within a month of completion but can be completed as soon as practical for the committee. The entire qualifying examination including oral defense should be completed by September 15 of the student’s third year of graduate work.

**Timeline Summary**

<table>
<thead>
<tr>
<th>DATE/DEADLINE</th>
<th>OBJECTIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>January-February</td>
<td>Orientation of students to qualifier &amp; discussion of hypothesis and aims with advisor</td>
</tr>
<tr>
<td>March-April</td>
<td>Selection and Approval of Qualifying Committee members</td>
</tr>
<tr>
<td>June 1</td>
<td>Specific aims submitted to Qualifying Committee for rapid feedback/revision</td>
</tr>
<tr>
<td>June-July</td>
<td>Approved aims used to develop full proposal (5 week writing period)</td>
</tr>
<tr>
<td>July 20 (latest)</td>
<td>Student submits written proposal to Qualifying Committee</td>
</tr>
<tr>
<td>August 5 (latest)</td>
<td>Qualifying Committee returns any comments to student</td>
</tr>
<tr>
<td>September 15* (latest)</td>
<td>Oral defense of proposal</td>
</tr>
</tbody>
</table>
Students must have an approved written proposal before the Fall semester of their third year begins. Depending on committee member availability, the oral defense may be held shortly after the start of the semester. If the defense cannot be scheduled over the summer according to the prescribed timeline, the extension time must be allocated between proposal approval and oral defense, and not in the previous stages.

**Written Qualifier Proposal**

**A. Specific Aims.** The specific aims page should contain an introductory section (typically 0.5 page) that places the experimental aims in context, identifying the current “gap” in knowledge and the student’s approach to address the gap. The specific aims page should include a hypothesis and the proposed experimental approaches/measures, model systems, and/or population/data resources to be used in testing that hypothesis. In addition, students are encouraged to include a brief statement of the impact of their results assuming successful completion of the proposed aims (typically at the bottom of the page). Minor modifications to the specific aims may be made as the written proposal is prepared but major changes should be approved by the examining committee. In its final form, the specific aims will be the first page of the written proposal (1 page specific aims plus 6 pages research strategy).

Because the aims form a crucial part of the proposal, they will be reviewed and approved by the students Qualifying Committee before full development of the proposal. The one-page aims will be reviewed within a week with the criteria below, with feedback given to the student, and any revised aims are due from the student within two weeks.

The following are the criteria for evaluation and approval of the specific aims:

i) Is studying and writing about the topic of the proposal likely to be a sound educational experience for the student? The qualifying exam should enhance knowledge and understanding in fields related to the student's Ph.D. dissertation project.

ii) Do the aims address important questions in the field? In general, aims should be "hypothesis driven" rather than descriptive.

iii) Are the proposed methods reasonable and feasible using current technology? If not, has the student proposed new approaches that have a reasonable probability of succeeding?

iv) Can the proposed experiments be completed within the timeframe of a student's Ph.D. candidacy?

v) Is the style and level of detail of the specific aims appropriate for a doctoral fellowship application (e.g. NIH NRSA F31)?

**B. Research Strategy.** The six-page written portion of the qualifying examination is a research proposal written by the student. The research strategy section follows the aims page. Once the student’s specific aims page has been approved, the student will have 5 weeks to complete the written proposal. The proposal should be written entirely by the student, and not resemble proposals by the mentor (the advisor may be asked to document any funded grant proposals for comparison). The student should make clear if there are any proposed collaborations, material transfer agreements, or key supplies needed to complete the studies. Scientific evaluation of the written proposal is the responsibility of the Qualifying Committee, not the advisor. However, the written proposal must be approved by the advisor before it may be submitted to the Qualifying Committee. The advisor should not approve the proposal if it is difficult to understand due to the writing style, grammatical errors, or a failure to provide sufficient background or experimental detail. Of course, in writing the proposal, the student may not copy from grant applications or elsewhere; such plagiarism is grounds for dismissal from the program.
Written Proposal Format.

i) The entire research proposal (one page Specific Aims and six page Research Strategy) is limited to seven total pages, and not including references cited. No materials may be included in any appendix, and proposals exceeding the page limit will be returned to the student without review.

ii) Typeface size – NIH rules (11pt min) Arial

iii) The proposal should be single-spaced.

iv) Margins must be at least 0.5” on all sides (eg “narrow”).

v) All pages should be numbered.

vi) A list of cited references should be included after the research strategy section. There is no length limit for the reference list. Citations in the reference list should be complete, and contain all authors’ names, full title, year of publication, journal, journal volume, and page numbers. Students are urged to cite original references rather than review articles.

vii) Citations in the text of the proposal can either be numbered or use the author/year format.

viii) Inclusion of relevant figures and tables is encouraged. Any figures and tables and their description should be embedded in the text and must fit within the overall page limit.

ix) The Chair of the Qualifying Committee should examine the proposal for compliance with format requirements as soon as possible after receiving it. Proposals which do not adhere to all format specifications will be returned to the student without evaluation. In such situations, the Chair should provide written guidelines to the student and advisor describing why the proposal is being returned. The Chair should also inform the student about the amount of time available for bringing the proposal into compliance with the format requirements. It is anticipated that most modifications needed to bring the proposal into compliance can be completed in less than a week. This does not constitute the one permitted revision of the written proposal.

Written Proposal Organization. The research strategy should contain the following subsections:

i) **Significance.** Explain the importance of the problem or question the proposal seeks to address. Describe the scientific premise for the project, including any preliminary data supporting the proposed hypotheses and/or approaches. Explain how completing the proposed project will improve scientific knowledge and impact the field of study (approx ½ page length).

ii) **Innovation.** Describe any novel approaches, methodologies, or theoretical frameworks to be developed or used, and their advantages over existing resources. Explain how the proposal challenges current research paradigms (approx ¼ page length).

iii) **Approach.** For each Aim, describe the proposed experiments, including the rationale, the methods to be used, and the likely outcomes and interpretations of the experiments. Proposals may contain a “Preliminary Results” section in the approach since the topic may be based on dissertation research. The experimental plan should be divided into sections that correspond to the specific aims. The qualifier should propose a body of work that can be completed by a single person in a three year period.

   • Provide experimental detail sufficient for the committee members to understand the experimental approaches planned and possible limitations or concerns with using the planned approaches. Do not provide excessive details of standard techniques and approaches; more detail can be provided for novel approaches. Students should consult the examining committee Chair if they have questions about how much experimental detail to include.

iv) **Timeline.** A timeline should be included that outlines what work will be done in each year of the project.

Evaluation and Defense of the Proposal

The completed written proposal must be submitted by the established deadline and will be reviewed within two weeks by the Qualifying Committee, using the criteria below. The committee may
recommend progression to an oral defense or major revision. An initial decision on the written proposal may be deferred if the committee believes that the application has merit but requires major rewriting. The major reason for such a decision will be that the student would benefit from additional practice at formulating ideas and presenting them in a clear and succinct proposal. The revised proposal must then be resubmitted within a month, and the committee may recommend oral examination.

i) It is expected that an oral defense (if recommended) will occur within approximately one month of the recommendation to proceed.

ii) If the committee requests major revision of the written proposal, written critiques will be synthesized by the Chair from the concerns and suggestions from all committee members. The written critique should provide feedback to the student on specific areas where the proposal needs improvement. The student is advised to discuss with the Qualifying Committee Chair how to address the concerns raised in the written critique.

Specific criteria that will be evaluated in the written proposal include:

a. Adherence to length and format rules. Noncompliant proposals will be returned without review.

b. Is there sufficient detail to understand and evaluate the proposed experiments?

c. Is the rationale for each experiment clearly described?

d. Is sufficient – and not excessive – detail on methodology provided?

e. Are potential outcomes and interpretations of possible outcomes described?

f. Have alternative approaches been considered if the method of choice does not work?

g. Is the grant written in a style appropriate for a research grant?

h. Is the timetable for the work provided by the student realistic?

**Oral Examination**

The Chairperson should read the Defense Guidelines (below) at the outset of the meeting, and be willing to guide the proceedings. A key activity is to insure equal time for committee members to ask questions so that no one person dominates the discussion. This could be done by A) allowing student to make a presentation, then allowing each member to ask questions in turn, or B) allowing each member to ask questions at intervals in the presentation.

At the oral defense, the student will present a brief overview of the proposal, and describe the approaches and anticipated outcomes for each aim, using perhaps up to 10 slides, as desired. The student should be prepared to address any related scientific or technical aspects that the committee may raise. A major goal of the defense is to determine the student’s knowledge and ability to “think on his/her feet.” The committee will confer in advance of the oral defense to define the most pertinent questions that warrant appropriate answers, aiming for an exam not to exceed 2 hours length. Based on the response to these questions, and the overall quality of the application, the committee may recommend an overall exam pass or fail.

If the decision following oral defense is “fail,” the student has the opportunity to revise the written document and re-defend the proposal one time. The second administration of the oral should occur within one month after the first oral examination. If a second failure occurs, the student will not be advanced to candidacy for the Ph.D. degree, and normally will be unable to remain in the Ph.D. program. The final determination for this will be subject to review by the IBS director and graduate program directors.

Successful completion of the qualifier examination will allow the student to advance to candidacy. The proposal will be considered to meet the requirement for an approved dissertation topic. If a student instead decides to withdraw from the PhD program, he/she may have the opportunity to earn a MS based on completed coursework and the Master’s Qualifying Exam, consisting of a 30 minute research talk.
Defense Guidelines.

i) The student will present a brief overview of their written proposal, and describe the approaches and anticipated outcomes for each aim, using no more than 10 slides.

ii) Committee members will address questions to the student regarding scientific or technical aspects of their proposal, topics of general significance, background knowledge, alternative approaches and hypothetical outcomes.

iii) Committee members should take turns presenting their questions to ensure equal time is granted to all participants.

iv) Questions will be asked (Option B): throughout the student’s presentation OR (Option A): once the student has finished their presentation.

v) The role of the mentor and co-mentor is observational only. They should sit apart from the examination participants.

vi) The committee will consult following the examination to determine the outcome and provide feedback on the student’s performance.

Oral Exam Preparation.

i) The student should be familiar with the theoretical and factual background relevant to the proposal at a level expected for a second year PhD student. All members of the Qualifying Committee are free to ask questions broadly related to the proposal and to areas that constitute the background for the proposal. The student should be able to place the topic of their proposal in the context of the broad field of integrative biomedical sciences. If the student has been informed by the examining committee that a revised written proposal still has substantial deficiencies, the student should be prepared to address these during the oral examination.

ii) Students should be conversant with the literature in the field(s) covered by their proposal, including those papers that deal with matters of general significance as well as those that relate directly to the proposed research at a level expected for a 2nd year doctoral candidate. The committee will expect the student to have an appreciation of the development of ideas (historical perspective) in this field and the potential role of current ideas in guiding the field in the future.

iii) Students should be able to consider and generate alternative approaches and should be prepared to interpret hypothetical outcomes proposed by examiners.

iv) Students should be thoroughly familiar with the technical aspects of their proposal. They should have a solid understanding of the techniques they propose to use. They should be aware of the advantages and limitations of these techniques. They should be prepared to defend why they have chosen a particular technique or approach rather than alternative ones that might be available.

v) The committee may also test the following aspects of the student’s background and ability:
   - Is the student able to critically evaluate original scientific articles?
   - Has the student designed experiments that address the stated specific aims and which have the potential to add new and useful information to the field of investigation?

Prior to submission of the topic and specific aims, students are expected to maintain full presence in the lab and coursework. It is not acceptable, for example, for students to disappear from the lab for weeks or months for the purpose of generating the aims for the qualifying exam. Students are encouraged to begin the discussions and background reading needed to select a topic early in their second year of study. Prior to writing their proposal, students are expected to discuss their research schedule with their advisor since it is understood that writing the qualifying exam will take a considerable amount of time and effort. Students should anticipate that several weeks are required to do the background reading needed to select a topic and to formulate specific aims. It is strongly recommended that students begin reading and planning early, perhaps during the summer between the first and second years of graduate study. The entire process may be completed sooner than the designated dates, and this is encouraged.
Departures from the timeline for the qualifying exam specified here require the prior approval of the IBS Director and Graduate Program Directors.

Adapted from materials on the Qualifying Exam at Geisel School of Medicine at Dartmouth, 2017

**Dissertation Progression to Graduation**

Thesis Advisory Committee. After successful passage of the qualifier and advancing to candidacy, students should select a thesis advisory committee, consisting of the mentor, co-mentor if applicable, and two additional faculty members (one of whom should act as the committee chair). The committee must have a majority of approved IBS trainers who must all be GW faculty (with the exception of the mentor for students at external sites). A minimum of 2 committee meetings should be held per year (approximately every 6 months), and the committee chair must submit the Thesis Committee Meeting Summary form to the IBS office after each discussion.

As students reach the completion stages of their dissertation research goals, they should consult with their thesis committee and obtain their permission to write. Such permission should be noted in the Thesis Committee Meeting Summary form.

All dissertations are submitted electronically. Gelman Library provides detailed instructions on formatting and submitting your dissertation. As a reminder, abstracts should be limited to 350 words or anyone ordering a paper copy in future will receive a truncated version. Students are encouraged to work with mentors during the writing process. Most mentors are happy to receive sections and provide feedback as writing progresses. In addition, the students are encouraged to meet with their Program Director for general advice on dissertation writing and the expectations of the committee at the defense.

**Dissertation Defense**

Towards the end of the writing process, students should identify the faculty they wish to serve on their dissertation defense committee. The defense examination committee composition is set by the University, and must have at least 6 members, distributed as follows:

- **THE DISSERTATION COMMITTEE [3-4 members]** — A director, co-director [if applicable] and two readers who have advised the student during the dissertation research process (these are your 2 thesis advisory committee members).

- **TWO EXAMINERS [1 Inside, 1 Outside]** — Examiners cannot have had a direct role in the dissertation research process. One examiner must be from within the academic unit [the student’s PhD program/department], with the other examiner coming from outside of the academic unit. The outside examiner may be at GW in another program/department, at another university, or at another institution. The student may be required to submit the outside examiner’s CV.

- **CHAIR** — The examination is chaired by a member of the academic unit in which the student is enrolled. The chair cannot be drawn from the dissertation committee or examiners. It is recommended that the Graduate Program Director, if not an examiner or on the dissertation committee, serve as chair. The chair takes no part in the examination itself, except, if asked, to pose an introductory question to elicit an opening summary from the student.

It is important that the student also identify a mutually agreeable date and time for the defense to take place while confirming their committee members. The defense will require 3 hours – a 1-hour seminar open to the public, followed by a 2-hour defense restricted to the GW academic community.
After the mentor has seen the dissertation, it should be distributed to the full committee at least one month prior to the scheduled seminar and defense. Students should also contact the IBS office who will assist in securing a room and preparing a brochure and advertisement.

The process of defending and submitting a dissertation takes a significant amount of time and involves collaboration among the student, mentor, and IBS faculty and staff to complete all of the requirements in a timely manner. The IBS office publishes and distributes detailed Graduation Guidelines each semester which describe the relevant requirements and deadlines that students must meet.

**IBS PhD Trainers**

**Mentor Eligibility.** The list of PhD trainers posted online is updated regularly. In general, PhD trainers are expected to have a high quality independent research program, recent publications, available funding for student support and an interest in fostering the next generation of researchers. The IBS program has identified the following criteria for PhD trainers:

- **Expertise in biomedical sciences.** An IBS trainer should direct a biomedical science research program with a focus specific to human biology. For faculty with multiple projects, the biomedical project should be identified for IBS students.
- **Robust, independent research program.** A PhD Trainer should be leading an independent project, that may be reflected in independent publications, grants, and facilities. Faculty with a mentored award (eg NIH K award) are not eligible to serve as PhD training faculty.
- **GW faculty appointment.** PhD Trainers should be "regular faculty," and not research faculty or staff scientists (eg research assistant professors, etc). Any faculty who leave GW must retain an adjunct appointment while students complete their degrees.
- **Extramural funding for research.** A PhD trainer should have a record leading NIH, NSF or federal funding or other substantial biomedical foundation funding. This criterion may be waived for junior faculty, with Chair recommendation.
- **Administrative approval.** Because PhD trainers assume financial responsibility for students following institutional support, IBS insures that administrative staff, Chairs, Division Directors and Deans are aware of, and support faculty commitments to PhD training.
- **Mentor development.** PhD trainers should receive guidance from experienced mentors, as well as ongoing mentor development. Faculty who have not trained a student through the PhD are required to include an experienced co-mentor.

In any particular year, not every PhD trainer will have an opening for a graduate student. Faculty who wish to become PhD Trainers should forward their CV including their training history and current funding to the IBS office for review.

**Mentor Responsibilities**

The primary PhD research mentor plays a major role in the development of the student. A good mentor is a coach, guide, confidant, supporter and problem-solver. The mentor is also the first person for help with financial support. Biomedical researchers who accept doctoral students for PhD study rely on a variety of approaches to advising, and may adopt different approaches for different students.

Because training doctoral students is among the most important academic functions, we articulate several basic principles. PhD Trainers should strive to:

- Know the basic rules of the program, especially concerning the courses, rotations, the qualifier, and the dissertation defense. The Graduate Program Directors and the IBS office provide additional resources for this information.
• Commit themselves to regular communication with advisees, to discuss issues relating to the course of study, research progress and broader professional development. Such communication should include one-on-one meetings at least twice a month.
• Provide prompt feedback on research and manuscripts. Advisors should provide timely reading and feedback on manuscripts, abstracts, and dissertation drafts, as well as advice about strategies for publication.
• Take reasonable steps to pass along information about conferences, and where appropriate, to connect their students to other relevant scholars.
• Offer advice about how to develop and sustain a research program, how to handle the job market, and how to build a career. This activity can be enhanced by discussion of the student's IDP.
• Write letters of recommendation on behalf of their students for grants, fellowships, and employment opportunities.
• Provide students respect and candor about their performance and prospects in all communications, both verbal or written.
• Graduate advisors should demonstrate discretion and respect for the student's privacy.

A basic agreement includes the AAMC Compact, here. All faculty members who work with graduate students need to take note of and abide by the university's policies on harassment and discrimination.
Fellowships & Graduate Research Assistant Awards

First-year IBS students are given funds to cover their living costs initially via IBS Fellowship stipends, and then by Graduate Research Assistant Award salaries in Year 2+, which are distributed via monthly payments. Current stipend/salary amounts are $33,000 for Year 1, $34,000 for Year 2, $35,000 for Year 3, $36,000 for Year 4, and $37,000 for Year 5+ (periodic review of the NIH NRSA stipend levels and cost-of-living analyses affect these amounts). IBS Fellowships and GRA awards also include full tuition (24 credits each in Year 1 and Year 2, and the final 24 credits divided amongst the student’s remaining time in the program), and health insurance as specified below. Funding can be renewed annually with good progress.

- Fellowship stipends are disbursed in advance of the month they cover. The first stipend payment (Month 1) covers Sept 1 – 30 of the first year, and is deposited around Aug 28. The last stipend payment (Month 10) covers the period June 1- 30 and is deposited around May 28.
- Students are strongly encouraged to enroll in direct deposit to receive their stipend/salary payments. As fellows, you must use this form. Payroll asks that you attached a voided check or online printout of your routing and account numbers to avoid any errors.
- The university does not deduct any state or federal taxes for stipend payments. Therefore, in Year 1, students should set aside something each month to cover estimated taxes. We can’t give tax advice, but here are the resources where you can find the information we can provide: here, here and here.
  - You may owe 15% for FICA, plus perhaps state and federal income tax
  - The IRS requires that you pay an estimated amount of your income tax each quarter, and your state might also require quarterly payments (DC – MD – VA)

Beginning in Month 11, (July starting Year 2 of the program), the mentor provides funding for the student’s salary, which is provided via a Graduate Research Assistant Award (usually awarded for the fiscal year, July 1 – June 30). Important notes about GRA Awards:

- Unlike fellowship stipends, GRA salaries are paid after the work period. This creates an unavoidable 8-week gap between paychecks during the transition from Year 1 IBS Fellowship to Year 2 GRA Award. The pay for Month 10 (June) is received around May 28, and the pay for Month 11 (July) is received around July 28. Once GRA award payments begin, there should be no further interruption in compensation.
- Again unlike fellowship stipends, federal and state taxes are withheld from GRA salaries. Because of this, the GRA award requires similar paperwork to a regular job. Students entering Year 2 and starting their first GRA Award at GW should complete the following tasks (they only need to be done once, not each year).
  - Financial Forms: You will need to visit the FSSC in the Marvin Center to complete I-9, W-4 and state tax forms (DC – MD – VA). This will require 2 forms of ID.

Faculty & Staff Service Center (FSSC)
Marvin Center, Suite 242
800 21st Street, NW | Washington, DC 20052
Phone: 202-994-8500 | Email: FSSC@gwu.edu
Hours: Monday - Friday 8:00AM - 5:00PM

- SmartBenefits: As GRAs you are eligible to sign up for pre-tax SmartBenefits deductions for your transit expenses. To sign up, you will need to submit the form to Payroll (payroll@gwu.edu). Please note, the payroll office has advised that it will take 2 pay cycles to activate SmartBenefits
deductions, so if you submit the form by June 15 (for your first GRA paycheck in July), it will be effective in September.

- **Background Check:** All first-time GRAs are required to complete a background check. Some time after you receive your award letter, you will receive an email notification from the university’s background check provider to submit your required details online (please do so as soon as possible as you cannot get paid until your background check is complete). The Office of Graduate Student Assistantships and Fellowships administers this process (not the IBS), and the university covers the cost. You only have to do the background check once, you do not have to renew it each year.

- **Email:** As a GW GRA, you will have both the student type (@gwmail.gwu.edu) and the employee type (@email.gwu.edu) of email accounts activated. This creates complications because emails send to the @gwmail account will not show up in the @email account, and vice versa. Therefore, you MUST decide which account you will check regularly, and forward the other one to that account. That is the only way that you will receive emails to both accounts in one place. You should also combine your @gwmail and @email calendars so that you don’t miss out on important meetings and events.

- **CNHS students should consult their research center administrator to determine the required tasks for CNHS GRA onboarding. Please coordinate with Ljuba Caldovic and Nathan Schlabach [Nathan.Schlabach@childrensnational.org](mailto:Nathan.Schlabach@childrensnational.org) for initial onboarding forms and clearances.**

**Tuition**

The IBS provides tuition funding for students at all sites. IBS Fellowships and GRA awards also include full tuition (24 credits each in Year 1 and Year 2, and the final 24 credits divided amongst the student’s remaining time in the program).

**Full Time Certification**

Students in the dissertation phase (Year 3+) generally register for 1-6 credits per semester depending on their situation. This falls below the 9-credit threshold for automatic designation as a full-time student. However, all dissertation-phase students are eligible to request that their status be manually updated to Full Time. This can only be done by special petition each Fall and Spring semester.

- Shortly before the start of each semester, the IBS office will send out a request for dissertation-phase students to complete the Certification petition – please pay attention and return the form in a timely manner.
- Please keep in mind that the registrar can only process these petitions as of the first day of classes for the semester, so that is when it will take effect. After the petition has been processed, you can request a letter of certification from the registrar which will show your status as a full-time student for the semester in question.
- Students who have full-time certification may be eligible to defer any outstanding student loan and request exemption from FICA taxes, but each individual’s situation may vary.

**Conflict of Commitment Policy for Students working on Industry-Sponsored Projects**

Doctoral students are free to choose their research projects in consultation with their dissertation mentors. Students are never to be assigned to projects sponsored by industry, and any associations with industry-sponsored projects must be voluntary. Moreover, faculty who have their own consulting practices or companies must be sensitive to conflict of interest issues if they contemplate involving students voluntarily in their activities and should discuss such issues openly with the student(s).

Students must be able to discuss their work with teachers, advisors and committee members. Students must also be able to present their work at seminars that may be a component of their required
curriculum, as well as in written progress reports to their Dissertation Research Committees or PhD programs as required.

Doctoral students must have the full traditional freedom to publish and present promptly all results of research. Reasonable delays will be accommodated for consideration of filing patent applications. The delay should be no more than 60 days. Delay may be extended by up to 90 days if the reasons are specifically stated in a formal agreement between the sponsor and the University.

Doctoral students are expected to be engaged in full-time research, with the exception of attending or preparing for seminar or classes, or preparing manuscripts on their own research. Regardless of the sponsorship of their work, and with the understanding that not every experiment will necessarily become a part of the dissertation, they are not to be employed excessively for technical assistance for work unrelated to their own projects.

**Health Insurance**

The IBS covers the cost of each student’s health insurance in the first year during the Fellowship term, and covers insurance costs for students in Year 2+ who are based in SMHS labs. Students in Year 2+ in other schools or at CNHS have health insurance covered by those entities.

IBS Fellows and SMHS-based senior students have the option to (1) enroll in GW’s Student Health Insurance Plan [GW SHIP] or (2) select an external plan and request reimbursement up to the cost of GW SHIP.

The [GW SHIP](#) is a gold-level plan according to Affordable Care Act guidelines. The university has negotiated a special process for Fellows and GRAs to access the SHIP at the reduced price. The enrollment process is managed by GW’s Office of Graduate Student Assistantships and Fellowships. OGSAF will email all Fellows and GRAs with an enrollment form each summer. If you want to enroll in this plan, it is very important that you complete the OGSAF form on time! This is a once-a-year opportunity - if you miss it they will not let you sign up late. SHIP enrollment covers one year and you must complete OGSAF’s form annually in order to continue your coverage for subsequent years.

For students who elect the GW SHIP, the fee will be charged to their student account. The IBS will place an award on the student account to cover this cost, meaning that the student does not have to make any payment themselves. Dental (~$350) and vision (~$200) SHIP add-ons are provisionally planned to be available at the student’s expense. You also have the ability during enrollment to add qualified dependents (spouse/children) to the GW SHIP at your own expense.

**External Plans**

Instead of enrolling in the GW SHIP, some students may want to secure health insurance coverage from a different source. Examples of external plans are those that you find on the Affordable Care Act state exchanges or a parent’s or spouse’s plan. In this case, you can request reimbursement from the IBS up to the cost of the Fellow/GRA insurance which is currently $2180 per year. Having a joint or family plan (as opposed to an individual plan) does not affect your eligibility, however we can only reimburse you for the portion of the plan cost which is determined to cover the student (as calculated by the IBS office, and subject to the overall maximum).

The cost is covered through reimbursement requests only. You may email the IBS office your documentation as follows:
1. If the IBS student is the primary insurance holder on the plan, you may request reimbursement on a monthly basis, if that is how you make your payments. Required documents for individual plans:
   a. Proof of enrollment (needed once until/unless plan changes)
   b. Brochure showing price of the plan you are enrolled in (needed once until/unless plan changes)
   c. Receipts for each payment you are requesting reimbursement for (you can send throughout the year once we have your proof of enrollment and brochure on file)

2. If the IBS student is not enrolled as the primary insurance holder, but is covered under another person’s (i.e. parent/spouse) health insurance, then we will process reimbursements at the end of each semester. Save your receipts showing payment and submit them to us the at end of the semester for reimbursement as follows:

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<tr>
<th>SEMESTER</th>
<th>COVERAGE TERM</th>
<th>SUBMISSION DEADLINE</th>
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<tbody>
<tr>
<td>Fall</td>
<td>Sept 1 – Dec 31</td>
<td>January 10</td>
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<tr>
<td>Spring</td>
<td>Jan 1 – May 31</td>
<td>June 10</td>
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<td>Summer</td>
<td>June 1 – Aug 31</td>
<td>Sept 10</td>
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Required documents for group plans:
   a. Proof of enrollment (needed once until/unless plan changes)
   b. Brochure showing price of the plan you are enrolled in and all price options (i.e. individual vs. spouse vs. family) – needed once until/unless plan changes
   • The IBS office will calculate the portion of the insurance cost which is applicable to the student (i.e. spouse plan cost minus individual plan cost) to determine the amount that we are able to reimburse.
   c. Receipts for each payment you are requesting reimbursement for (send at the end of each semester once we have your proof of enrollment and brochure on file)
   • If the health insurance premiums are deducted as an employee, please submit pay stubs as your receipts, with everything redacted except the name, date and health insurance deduction.

External Stipend / Research Fellowship Opportunities

We strongly suggest IBS students pursue external fellowships that can support stipend or research during the PhD. Effective preparation of fellowship grant applications is required for a successful career in academic research, and garnering support for research ideas is key in additional career sectors. Many students adapt their successful qualifier written proposal and submit an external fellowship application to the NIH F31 or other predoctoral funding opportunities.

Please see the SMHS Research / Funding and Support section for details on the NIH F31 Fellowship PA-20-246, Diversity Supplements to NIH awards PA-20-222, grant writing resources, etc. In addition, Dr. Hall will make available template materials for several institutional components of these awards, and will work with you one-on-one and with your mentor as desired.

Review available PhD Fellowships and Postdoctoral Fellowships

• ORCID establishes a persistent digital identifier that distinguishes you from everyone else so you can link GW research education with papers as a student, postdoc and faculty member. Please register to get your unique identifier, and then add your information (linking to Scopus or LinkedIn, if you like).
• **Pivot** is a searchable database of funding opportunities available to GW graduate students, postdocs and faculty. With Pivot, researchers can easily explore new avenues for funding and view funding opportunities uniquely matched to their scholar profile. Explore Pivot and other funding sources on your own, or take a short orientation class at Himmelfarb library.

**Travel Grants**

Doctoral students are strongly encouraged to provide an oral or poster presentation of their work at conferences in their fields. Research recognition and exposure to well-known scientists are essential for research professional development. *The research advisor should be the primary support for student travel.* In an effort to expand available opportunities, students are directed to professional societies, and even the conferences themselves that offer travel grants to doctoral students for meeting presentations. The IBS has limited funds to assist advisors in supporting student presentation travel.

**Explore Conference Travel Grants.** Research advisors can assist with the identification of important venues for presentations, as well as societies that may offer student support for meetings. Additional GW funding resources for conferences include the **CCAS Travel Awards** and the **Shenkman Career Services Fund**.

Some common travel grants include:

- AACR travel grants
- SFN travel grants
- American Association of Immunologists travel grants
- Keystone Symposia Scholarships
- Biolegend

**IBS Travel Award Application.** The IBS program has limited funding available to support doctoral student travel for presentations. Submit the completed application no later than 2 months prior to travel, and if awarded, retain receipts for reimbursements. A conference report (up to 2 pages) must be provided to the IBS within a month of the presentation.

- Award amounts will vary. Awards amounts are: Up to $500 for travel within the United States, and up to $700 for international travel.
- Students should have passed their candidacy exam in order to qualify for an award.
- A maximum of one award per student during the course of the PhD is permitted.
- Grants are unlikely to be awarded for course tuition if GW provides a similar course.
CAREER DEVELOPMENT

A PhD in biomedical sciences can lead to exciting careers in academic research, research in the biotechnology industry, research at federal laboratories, as well as positions in science teaching, science communications, and science policy. We update and post the career outcomes of our biomedical PhD graduates on the IBS website and include many essential skills in required courses in science writing, ethics and grantsmanship and an annual career panel.

Competencies. PhD training emphasizes development of the core competencies noted by the National Postdoctoral Assn, including 1) discipline-specific knowledge, 2) research skill development, 3) communication skills, 4) professionalism; 5) leadership and management skills, and 6) responsible conduct of research.

Teaching. GW Biomedical Science PhD programs provide financial support to allow you to focus on your research, and do not require you to serve as a teaching assistant. Some students and postdocs wish to gain some teaching experience while at GW. Occasionally, there are teaching assistant opportunities available in the Biology and Chemistry departments.

- Instructional opportunities are restricted to students in Year 3+ in good standing. They may only TA with permission of their faculty mentor, the IBS office, and the Office of Graduate Student Assistantships and Fellowships.
- Please note, university regulations require that any compensation received for serving as a TA be offset with a corresponding deduction in your GRA award (i.e. if you receive $2000 for serving as a TA, your GRA award amount and “work service” hours will be reduced by $2000).

Exploring Scientific Careers. The IBS Science and Professional Development workshops are offered monthly and focus on Individual Development Plans, setting SMART goals, fellowship preparation, and other topics. Take an active role in exploring your career and building skills for success.

- Get involved with GW COMPASS, a student organization specifically for grad students in STEM fields, which provides a community of professional support to facilitate the advancement of students by hosting networking engagements, fostering mentee and mentor relationships, and highlighting career opportunities for post-graduate life.
- Visit the GW Center for Career Services that provides extensive programming and services to graduate students, including the Handshake program to find a job. Many events are posted by RSS feed on the IBS homepage.
- Update your Individual development plan. Many fellowships suggest that candidates complete and update an Individual Development Plan, described here. All PhD students must complete an IDP and consider SMART goals in preparation for the Careers in Biomedical Sciences course panel. A useful approach is to use MyIDP which links to AAAS Science Careers.
- Try the 3 Minute Thesis Competition
- Learn and hone ways to talk about your work to technical (national meeting?) and public (outreach?) audiences. It takes practice to eliminate jargon, get attention and state relevance. Here’s a good blog with resources.
- Attend the GW chapter of Toastmasters International and refine your communication skills.

Student Organization. IBS students are represented in the campus student life system by the GW Student Organization of Biomedical Scientists (GW-SOBS). GW-SOBS serves as a student government to provide a forum for the advancement of, and advocacy for, Institute of Biomedical Sciences (IBS) graduate students intellectually, professionally, academically, and socially. IBS students will receive information from GW-SOBS on a variety of academic, professional development, and social events, and are encouraged to actively participate in the initiatives and endeavors designed to foster a collaborative and collegial environment in our programs.
Some of our PhD Trainers have labs located at our partner Children’s National Hospital, which also forms the GW Department of Pediatrics. Students must follow the steps below to obtain the CNHS Volunteer Service Office’s approval prior to starting in any CNH lab. This process takes an average of 3-4 weeks to complete, so we recommend reviewing and starting the process prior to arriving for orientation.

All information and forms are available on the CNHS Special Volunteer Application website:

• Review the orientation packet and confidentiality agreement
• Complete the application, following these guidelines where indicated:
  o **Supervisor Information**
    ▪ Department Name: Center for Genetic Medicine Research
    ▪ Cost Center: 30200
    ▪ Supervisor Employee ID #: 28223
    ▪ Name: Ljubica Caldovic
    ▪ Phone: 202-476-5819
    ▪ Email: LCaldovic@childrensnational.org
  o **Will you participate in research?** check YES
  o **Position Description**
    ▪ Dates: 9/14/20-6/4/21
    ▪ Duties & activities: GW Institute for Biomedical Sciences PhD student research
  o **Volunteer Role:** select “Research Trainee”
• Complete the online safety quiz and error prevention training
• Review the medical requirements and submit the necessary documentation to ohvolunteers@childrensnational.org
  o The medical forms require that the volunteer have two tuberculosis skin tests (also known as TB or PPD tests) in the past year (at least one will need to be from current year), vaccination records, and a health assessment that is completed AFTER the two TB tests. The TB tests take up to three weeks to complete.
  o Once the completed medical forms are reviewed, Occupational Health will send a single-page medical clearance slip to the Volunteer Services office. If you have any questions about the medical requirements, please don’t hesitate to contact Occupational Health at 202-476-2035 or through the above email.
• Complete the background check request which you will receive from CNHS after completing the first part of the volunteer application*
• All forms must be submitted by email and Volunteers may not begin their assignment nor receive an ID badge until they receive an acceptance email from the Volunteer Services Department.
• Following approval, all volunteers are required to attend a mandatory Error Prevention Safety Training as a part of a corporate safety transformation initiative.

*Note: The Volunteer Services Office will send an email with information for submitting the background check after they receive the completed supervisor form and safety quiz from either the applicant or the supervisor. The supervisor will be responsible for collaborating with the volunteer to build their volunteer program, including their start/end date, weekly schedule, and responsibilities.

You do not have to have a rotation mentor identified to start the volunteer application process. Because it can take a month or longer to obtain approval, we recommend submitting an application if you have any interest at all in a rotation at CNHS so that you are not faced with a delay in starting your rotation.
Travel to CNH

The CNH main campus is located in the northeastern part of DC, north of Union Station. There is a shuttle between Ross Hall that makes several trips daily. CNH also operates their own shuttles from the Brookland, Union Station, and Columbia Heights metro stations.
• The Admitted Graduate Student page provides guidance on academic resources, life in DC and student services at the university.

• The Resources for Graduate Students page provided by the Center for Student Engagement contains information pertaining to workshops, support services, student organizations and more.

• IBS students fall under the administrative purview of the Columbian College of Arts & Sciences, although our programs are closely intertwined with the School of Medicine & Health Sciences. Our office works in conjunction with the CCAS graduate services team to process requests related to registration, transfer credits, graduation, etc. The CCAS Academic Policies page contains information on the administrative policies and procedures applicable to your program.

• GW’s Colonial Health Center (CHC) provides integrated confidential, student-centered services in an accessible, safe, culturally sensitive, and supportive environment. The CHC seeks to promote healthy lifestyle choices and to holistically support the physical and emotional well-being of students in order to achieve academic success. Visit them in the Marvin Center [ground floor] or call 202-994-5300 (24/7)

• Preventing Sexual Harassment and Sexual Violence – you will receive an email from GW’s Haven office to complete this mandatory online training. The Haven website lists the resources available to the GW community related to sexual harassment, sexual assault, dating or domestic violence and stalking.

• The Code of Academic Integrity is a part of the Guide to Student Rights & Responsibilities. All students – undergraduate, graduate, professional, on-line, full time, part time, law, etc. – must be familiar with and abide by the provisions of this policy. The Code of Academic Integrity:
  - Sets minimum standards for academic student conduct
  - Defines the rights of students charged with an academic disciplinary violation
  - Lists the procedures for resolving academic disciplinary matters
  - Provides guidance for academic disciplinary sanctions
  - Addresses other issues regarding academic student conduct

• Disability Support Services (DSS) at GW works collaboratively with students, faculty and staff across the campus to foster a climate of universal academic excellence, while also promoting disability culture and GW’s broader diversity and inclusion initiatives. Their office facilitates accommodation for disabilities as well as provides training and tools for academic and professional skill development. If you need further information about disability accommodation, please contact their office as soon as possible.

• MyGW is the gateway to an array of useful tools such as the schedule of classes, Blackboard, the university directory and events calendar, the academic calendar and Banner [GWeb info system].

• The Himmelfarb Health Sciences Library has outstanding resources on how to write an abstract, how to make a poster, how to do a literature search, and—through the library website—electronic access to hundreds of scientific journals.

• Blackboard is used as a learning and communication tool in most of your courses. Blackboard class sites are generally opened up for students during the first week of classes or just before, so don’t be worried if you are not seeing anything yet when you sign into Blackboard.
• Official student records are housed in the Banner system. You will use Banner to register, view your grades, transcript and DegreeMap, and update your official contact information if necessary.

• For information on the university’s operating status [e.g. inclement weather closures] and emergency situations, visit the Campus Advisories website.

• Blue light call boxes are located around the Foggy Bottom campus which you can use to summon the GW Police in the event of an emergency or if you feel your safety is threatened.

• You can sign up to receive municipal emergency alerts sent out by local governments in the DC area by visiting the Capitalert website.

• For general information updates, connect with the IBS [Twitter | LinkedIn] and the university [Facebook | Twitter | Instagram | Snapchat | LinkedIn] via social media.

• The university’s IT division provides a number of useful resources for students. First and foremost please review the Student Technology Guide to get up and running for the start of the semester. IT also provides free software (yes, FREE!) such as Microsoft Office 365, Adobe Creative Cloud and Symantex antivirus. They have an online Support Center as well as a physical help desk, Tech Commons, located in the basement of Gelman Library. They can also assist you if you have problems accessing any of your university accounts.

Contact:

Colleen Kennedy
IBS Program Manager
Ross Hall 561 | 202-994-2179 | gwibs@gwu.edu