

# Biophysics and Biophysical Chemistry

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2020 – 2021 Student Handbook

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## BBC Graduate Student Milestones by Year

### Year One

Below, we provide a summary of major first year activities and dates (as of August 18, 2020). It is both *incomplete* (because we cannot include the occasional small things that come up during the academic year—especially the coming academic year) and *subject to change*. Thus, you should use these dates *only as a rough outline* and use this [Google calendar](#) for current information.

Importantly, when such changes occur you will likely get emails or announcements from instructors, TAs, administrators and staff, or the Program Director. It is your responsibility to assimilate these changes into your schedule. If you have any doubt, confirm with instructors, administrators, staff, and each other.

#### 2020–2021: An extraordinary year

Because of the COVID-19 pandemic, schedules and activities in this handbook differ from past years. For example, all three rotations will occur in winter/spring of 2021. The module schedule is also affected, and re-adjustments may occur throughout the year, as demanded by circumstances. Watch for announcements!

### Fall Semester

Schoolwide Orientation (on-line on blackboard)	Aug 21
Program Orientation	Aug 21
Institute for Biophysical Research Retreat Part 1	Aug 24
On-line Safety Course (MyLearning)	Aug 25 – 26
On-line "Avoiding Plagiarism" course (MyLearning)	Aug 27 – 28
Computational Bootcamp	Aug 31 – Sep 30
Statistics and Data Analysis Module	Oct 1 – Oct 7
Faculty Research Forum	dates TBA
Physical Chemistry of Biological Macromolecules	Aug 31 – Dec 09 (Final TBA)
Proteins and Nucleic Acids 1	Aug 31 – Dec 09 (Final TBA)
Analyses of Macromolecules	Aug 31 – Dec 09 (Final TBA)
Macromolecular Simulation module	Nov 16 – 20
Biophysics Seminars	Sep – Dec
Student Evening Series	Sep – Dec
Institute for Biophysical Research Retreat part 2	Dec, TBA
Self-study in Biochemistry, Cell & Molecular Biology	

### Intersession

Single-Molecule Module	Jan 4 – Jan 8
X-ray crystallography module	Jan 11 – Jan 15
Rotation 1	Jan 18 – Feb 26 (rotation talks Mar 2)
Self-study in Biochemistry, Cell & Molecular Biology	

## Spring Semester

Proteins and Nucleic Acids 2	Jan 25 – Apr 30
Rotation 2	Mar 1 – Apr 9 (rotation talks on Apr 13)
Rotation 3	Apr 12 – May 21 (rotation talks on May 21)
Biophysics Seminars	Jan – May
Student Evening Series	Jan – May
Self-study in Biochemistry, Cell & Molecular Biology	
Join Thesis Laboratory	May 22
Proficiency Evaluation	May 24 – 25
NMR Module	May 26 – 28, Jun 1 – 3

## Summer

Solution biophysics module	Jun 7 – Jun 15
RCR Course	TBA

## Year Two

### Fall Semester

Elective*	
Biophysics Seminars	Sept – Dec
Student Evening Series	Sept – Dec

### Intersession

RCR Workshop

### Spring Semester

Elective*	
Proposal writing workshop	TBA
Savvy Seminars workshop	TBA
Biophysics Seminars	Jan – May
Student Evening Series	Jan – May
Graduate Board Oral Examination	April/May

\*One full semester elective (equivalent to three academic electives) is required and can be taken either in the fall or spring semester. Courses taught at the School of Medicine are typically half semester course, so two of those courses are needed to complete the elective requirement. Ideally, the elective will be taken in the second year, although in extenuating circumstances, a student may wish to take a specialized elective course that is essential to his/her thesis that is only offered in the student's third year. Courses required from the first-year proficiency evaluation count as electives. Electives (and third-year requests) must be approved by both the student's thesis advisor and by the BBC program director, Dr. L. Mario Amzel.

## Year Three

### Fall Semester

Thesis Proposal Seminar (and practice talk)	Oct –Dec
Student Evening Series	Sep – Dec

### Intersession

RCR Workshop

### Spring Semester

Student Evening Series	Jan – May
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## Year Four

### Fall Semester

Thesis Advisory Committee Meeting	Nov
Student Evening Series	Sep – Dec

### Intersession

RCR Workshop

### Spring Semester

Student Evening Series	Jan – May
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## Year 5 to Final Year

### Fall Semester

Thesis Advisory Committee Meeting	Nov
Student Evening Series	Sep – Dec

### Intersession

RCR Workshop

### Spring Semester

Thesis Advisory Committee Meeting	May
Student Evening Series	Jan – May

## Final Year

### Fall Semester

Thesis Advisory Committee Meeting	Nov (as applicable)
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### Intersession

RCR Workshop (as applicable)

## Spring Semester

Thesis Advisory Committee Meeting  
Private thesis defense to thesis committee  
Submit final dissertation to MSEL  
Thesis seminar (mandatory one-month waiting period from date of private defense)

May (as applicable)

## Administration

### Administrative Structure

Dr. L. Mario Amzel is the Director of the Biophysics and Biophysical Chemistry (BBC) Program. Dr. Albert Lau is the Co-director and Director of Admissions. They are jointly responsible for the day-to-day operations of the program. Major policy questions and serious issues concerning the status of individual students are addressed by the BBC Steering Committee.

### School and Departmental Affiliation

Faculty members of the BBC department, including secondary appointees, are part of the program.

### Summer Registration

In order to maintain full-time student status (for tax and undergraduate loan deferment purposes), students must register for research during the summer session.

### Financial Support

Students in the program should secure funds for stipend and medical insurance support for their first two years from the Department. Once a student begins thesis work, stipend and medical expenses are normally borne by research grants to the individual laboratory. Some back-up support mechanisms exist to cover financial emergencies for the thesis advisor. It is anticipated that financial support covering living costs will be made available to all accepted students throughout their thesis work years, provided that satisfactory progress towards the degree is being maintained.

### Employment

Pre-doctoral education is a full-time activity and does not permit additional employment besides Teaching Assistantships at Johns Hopkins University.

### University Computer Policy

The University's policy for student use of shared information technology resources is available online. This policy has been officially adopted by Johns Hopkins University. Similar criteria apply to **all** students affiliated with Hopkins biophysics graduate programs. Consult the following website for additional detail:

<http://it.jhu.edu/policies/>

## Leave

BBC follows NIH policies for vacations, holidays, parental, and sick leave. See section 11.3.16 of <https://grants.nih.gov/grants/policy/nihgps/nihgps.pdf>

### Vacations and Holidays

Trainees and fellows may receive the same vacations and holidays available to individuals in comparable training positions at the grantee or sponsoring institution. Trainees and fellows shall continue to receive stipends during vacations and holidays. **At academic institutions, the times between semesters or academic quarters (e.g., winter, spring, and summer break) are considered an active part of the training period.**

In line with other programs, we interpret these rules to mean that students receive **10 days** of vacation each year, plus normal University holidays, such as Thanksgiving. Nevertheless, additional vacations may be negotiated with their faculty advisors.

### Sick Leave

Trainees and fellows may continue to receive stipends for up to 15 calendar days (3 weeks) of sick leave per year. Under exceptional circumstances, this period may be extended. Sick leave may be used for medical conditions related to pregnancy and childbirth. Unused days may not be carried over into the following 12-month period and are not payable upon departure. Sick leave may not be subtracted from any paid leave earned through the policy above. At the department's or advisor's discretion, may require the student to submit verification of the need for sick leave from their healthcare provide to the University Health Service Center for review. Any documents containing a student's medical information must be kept separate from his/her academic file.

Extended absences (more than two weeks) must be reported by student and/or advisor to program administrator as quickly as possible. If the illness requires extended absence, the student may apply for a leave of absence, as described in the [Policy for Graduate Student Leave and Voluntary Leave of Absence at the School of Medicine](#).

### Parental Leave

Trainees and fellows may receive stipends for up to 60 calendar days (equivalent to 8 work weeks) of parental leave per year for the adoption or the birth of a child when those in comparable training positions at the grantee organization have access to this level of paid leave for this purpose. Either parent is eligible for parental leave. The use of parental leave must be approved by the training Program Director.

Students should notify their advisor in a timely manner when requiring sick leave and should provide medical documentation when appropriate. Students should also notify their advisors well in advance when planning parental leave.



## Administrative Contacts

### Program Directors

Dr. L. Mario Amzel, Director  
Department of Biophysics and Biophysical Chemistry  
WBSB 606  
Johns Hopkins School of Medicine  
phone: 410-955-3955  
fax: 410-955-0637  
mamzel@jhmi.edu

Dr. Albert Lau, Co-Director  
Department of Biophysics and Biophysical Chemistry  
WBSB 706  
Johns Hopkins School of Medicine  
phone: 443-287-4528  
fax: 410-955-0637  
alau@jhmi.edu

### Program Coordinator

Tammy Hubbe  
Department of Biophysics and Biophysical Chemistry  
WBSB 608D  
Johns Hopkins School of Medicine  
phone: 410-614-3279  
fax: 410-955-0637

### Department Administrator

Teri Pennington  
Department of Biophysics and Biophysical Chemistry  
WBSB 608E  
Johns Hopkins School of Medicine  
phone: 410-955-5032  
fax: 410-955-0637  
tpenning@jhmi.edu

## Student Advising

### Academic Advisor

Students are advised to discuss questions about the program, minor academic problems, and other issues that may arise with the BBC academic advisor. Dr. L. Mario Amzel will serve as academic advisor for first-year BBC students. Dr. Albert Lau will serve as academic advisor for all other BBC students. Faculty advisors and students should review mentoring expectations, available [here](#).

## Faculty Research Interests

It is important that students have an opportunity to learn about current faculty research interests. An annual retreat for the Hopkins biophysics community is held in the fall, giving first-year students a full picture of the research taking place in BBC laboratories and a chance to think about rotation possibilities. Program faculty are always happy to talk to interested students individually about their work. All students are encouraged to contact faculty about research options.

## Participation in Scientific Meetings

### Annual Retreat

The annual retreat is sponsored by the Institute for Biophysical Research (IBR, the broader community of biophysics researchers at the University) and brings together IBR laboratories from departments throughout the Schools of Arts & Sciences, Engineering, Medicine, and Public Health. Both platform presentations and a poster session are scheduled, and students and postdoctoral fellows are strongly encouraged to participate. All BBC students are expected to attend the IBR retreat every year. BBC students in their fourth years will give short “lightening” talks. BBC students at the start of their fifth years will typically give full platform talks on their thesis research. In addition to providing an opportunity for BBC students to present their research and practice speaking, the retreat gives faculty and students within the Institute the opportunity to hear about current research in other laboratories.

### 2020–2021: An extraordinary year

Owing to the COVID-19 pandemic, the 2020 retreat will be held in two parts. In the first part, on Monday, August 24th, we will have a keynote address, introductions, and a student panel. In the second part, to be scheduled in December, we will have several presentations by faculty and students.

### Travel to Meetings

The Department of Biophysics and Biophysical Chemistry provides limited funds to allow students to attend meetings. Such travel is not an automatic right but must be justified (to present a poster, for example). Students must apply to the Director for permission. To minimize costs, we encourage students to attend meetings in Baltimore or DC.

## Participation in Program Evaluation and Assessment

To continue to improve and modernize the BBC Program, and to be sure students are advancing in their thesis research, all students will be asked to participate in various polls and surveys throughout their time in the program. There are two types of surveys. The first is focused on programmatic components of BBC, such as coursework, rotations, opportunities for advancement, resources for career placement, and overall program satisfaction. These surveys will be

administered periodically by the University, including upon completion of the Ph.D. These surveys are anonymous.

The second type of survey is an annual evaluation of each student's thesis advisor, starting in year two. Thesis advisor evaluations are conducted by the Office of Academic Assessment at the School of Medicine. These evaluations are used in two ways. First, they are used to inform the Program Director and Steering Committee on overall mentorship from the student perspective, as well as breadth of mentorship styles and commitment to training. For this purpose, survey results are anonymized in terms of both students and their advisors. Second, when individual surveys indicate a problem between the student and advisor, the Office of Academic Assessment communicates these surveys directly to the Program Director, revealing the identities of the student and the advisor. In such cases the Program Director and co-Director work directly with the student to mediate a workable solution.

## Program Requirements

### General Expectations

In their first year, students are expected to divide their time equally between coursework and rotation laboratory work, *spending approximately 25 hours on each during the first rotation. For rotations two and three (spring semester), students should shift additional effort (~35 hours) to their rotation work, given the lighter course load in the spring, and the shorter duration of these two rotations.* The most important decision made during the first year is the choice of a thesis advisor, so attention to rotation work is essential. The first summer is normally devoted entirely to thesis research. Less coursework is required in the second year, with the expectation that students will spend 75% or more of their time conducting thesis research in the semester they take their elective, and 100% in all other semesters. The first thesis review will take place in the fifth semester, where students will be evaluated on research progress made in their second year, as well as their ability to articulate the importance of their thesis project. Subsequent thesis reviews will occur on a yearly (year 4) and half-yearly (years 5 and beyond) basis. The Ph.D. dissertation defense is conducted in a private session with the Thesis Defense Committee. One month after successful defense and submission of the corrected thesis to the library, the student presents a public thesis seminar required by the program.

In addition to these BBC-specific milestones, there are general university-wide responsibilities that graduate students at Johns Hopkins University are expected to adhere to, as well as rights that graduate students can expect. A detailed list of these rights and responsibilities, which include subjects such as accessibility, academic freedom, and professional relationships with advisors and other students, are available at

[http://web.jhu.edu/administration/provost/initiatives/phd\\_board/rights\\_responsibilities](http://web.jhu.edu/administration/provost/initiatives/phd_board/rights_responsibilities)

### Core Courses

As of August 2017, the following courses are required of all entering BBC students. Because of curriculum upgrades, some changes may apply, to be communicated when available.

- Physical Chemistry of Biological Macromolecules (*García-Moreno & Staff, Homewood*)
- Proteins and Nucleic Acids 1 (*Woodson/Bowman, Homewood*) or Analyses of Macromolecules: Energetics, Structure, and Function (*Frueh & Staff, JHMI*)
- Proteins and Nucleic Acids 2 (*Berger & Staff, JHMI*)
- Introduction to Computing (*Bowman & Staff, Homewood*)
- Safety Course (*online*)
- Avoiding Plagiarism Module (*online*)
- Responsible Conduct of Research (*Staff, Homewood*)
- Modules in Molecular Biophysics (*Barrick & Staff, Homewood*)
- Biophysics Seminar (*Wu & Staff, JHMI*)
- Savvy Seminars (*Fleming, Homewood*)
- Writing Workshop (*Barrick, Bowman*)
- Elective (except under special circumstances, review/seminar courses do not qualify as required elective)

All students are expected to attend every lecture and turn in assignments on time. Failure to attend classes could result in a failing grade for the course or a probation period.

## Seminars

Seminars at the University serve as more than just a set of unrelated talks on specialized topics. Each department's seminar series is put together as a whole, integrating speakers and topics into a single series. As a whole, the seminar series knits the department together, providing a common intellectual experience for students, postdocs, faculty, and staff. During your scientific career, you should make it a priority not only to attend the seminars that are of interest to you personally, but to attend your department's seminar series as a whole.

To help establish this habit, there are requirements for attending seminars in BBC. During their first year, students are required to attend **at least** the biophysics seminars on the campus where they are doing their rotations, and all named lectures and *Chalk It Up* series (see below).

Homewood biophysics seminars are held on Mondays, 12 noon; SOM biophysics seminars are held on Wednesdays, 1:30 PM. **Repeated absences will result in a failing grade for the seminar course.**

During their second year, students are required to attend **at least** the biophysics seminars on the campus where they are doing their thesis work, and all named lectures and *Chalk It Up* series (see below).

Beyond the second year, students are expected to attend as many seminars as possible, and all named lectures and *Chalk It Up* series (see below).

## Policy on Grades

- Students must receive a grade above a C+ in any of the required courses or the course must be repeated.
- Failure to receive a grade above a C+ in two required courses is grounds for termination from the program.

- Failure to receive a grade above a C+ in a required course a second time is grounds for termination from the program.

During each semester, students must keep a grade point average of 3.0 (B) for all courses. Falling below the GPA of 3.0 for one semester will result in a warning to the student; falling below it for two semesters is grounds for termination from the program (see Probation and Dismissal from the Program, below).

This requirement is not intended to discourage students from taking advanced courses in other disciplines, such as physics, chemistry, and mathematics. Such courses can be exempted from the “B” requirement by arrangement with the Academic Advisor and Program Director.

When courses are not taken, dissertation research must be completed with a passing (P) grade. A failing grade(F) will lead to probation (see Probation and Dismissal from the Program, below).

### Academic Integrity and Student Conduct

Students are expected to know and abide by University policies governing student conduct and academic integrity. Those who impair the University’s mission are subject to expulsion.

- **Academic Integrity:** In all aspects of their work, students assume an obligation to conduct themselves in a manner appropriate to Johns Hopkins University’s mission as an institution of higher education. The Johns Hopkins School of Medicine academic integrity policy is available [here](#). A student must refrain from acts that he or she knows, or under the circumstances has reason to know, may impair the academic integrity of the University. Violations of academic integrity include, but are not limited to: cheating, plagiarism; submitting as one’s own the same or substantially similar work of another; knowingly furnishing false information to any agent of the University for inclusion in the academic records; dishonesty in discharging teaching assistant duties; falsification; forgery.
- **Student Conduct:** The University expects all students to respect the rights of others, and to refrain from behavior that impairs the University’s mission of teaching, research/scholarship, and outreach to the local, national, and international community. Violations of appropriate student conduct may include but are not limited to: harassment (physical or verbal), intimidation or verbal abuse, actions that are a danger to one’s own personal safety or that may harm others, and actions that destroy, impair, or wrongfully appropriate property.

A Johns Hopkins University guide, Academic Ethics for Undergraduates, is included as an appendix to the BBC Student Handbook. While the guide is written for undergraduates, the principles regarding academic integrity apply to all students in the University.

Procedures for handling allegations of misconduct by full-time and part-time graduate students in the School of Medicine can be found [here](#).

## 2020–2021: An extraordinary year

Additional rules of conduct, related to public health, must be followed as prescribed by the university. For information and updates, visit <https://covidinfo.jhu.edu/>

## Responsible Conduct of Research

Conducting research with the highest ethical standards is essential both for good science and for maintaining the public trust of science and scientists. BBC strives to impart such standards on all trainees through regular classroom instruction in the Responsible Conduct of Research (RCR).

In addition, all trainees and fellows beyond the first year must attend a yearly mandatory RCR workshop. These workshops take place at the beginning of the calendar year during intersession.

## Laboratory Rotations

Perhaps the most important decision each student will make in their time at Hopkins is in which lab they will conduct their thesis research. The three first-year laboratory rotations are the primary means by which students will inform this key decision. Thus, the main goal of each rotation is to give the student experience with particular research and the feel for a laboratory and campus. Each student is required to complete three laboratory rotations during their first academic year. Owing to the COVID-19 pandemic, all three rotations will be held in winter/spring of 2021. Each rotation lasts six weeks. Since students are only taking one class (PNA2) during part of this time, students are expected to put most of their effort (~35 hours/week) into their rotations. Although these rotations are short on the timescale of scientific discovery, students should strive to advance their projects and make scientific advances in each.

*All three of these rotations must be performed in the laboratories of BBC faculty members, without exception.*

At the end of each rotation period, students will present 10-minute talks with their rotation advisors and other 1<sup>st</sup>-year students present. All other BBC faculty and students will be invited to attend.

Students are expected to choose a laboratory and begin their thesis research immediately following the completion of their third rotation. In unusual circumstances, the Program Director may authorize a fourth rotation (see Probation and Dismissal from the Program, below). Occasionally, incoming students spend part of the summer before their first year working in the laboratory of a BBC faculty member. These students are registered as graduate students, but *the summer period does not substitute for one of the student's three rotations*. However, such students may choose to do their first (or a subsequent) rotation in that same laboratory. It is expected that students will work diligently during each rotation, regardless of their choice of thesis laboratory.

First-year BBC students meet individually with the program director to review their overall progress and adjustment to graduate school. The program director also discusses each student's first rotation experience and possible trajectory to ensure that s/he is on a path toward identifying a thesis advisor and lab. For year 2020–2021, the individual meetings are likely to take place after the first rotation (in March), although this may change.

## Rotation Evaluations

The rotation advisor must complete a form evaluating the student's effort, interest, comprehension, and skill. This form will become part of the student's departmental academic file. An evaluation with unsatisfactory rankings will result in a warning letter to the student, and a second rotation with unsatisfactory rankings is grounds for dismissal (see Probation and Dismissal from the Program, below). The form is appended at the end of the handbook.

At the end of each rotation, students must meet with their rotation advisors and discuss their rotation evaluation form. Students should expect a frank and open discussion of both strengths and any weaknesses perceived by their rotation advisors. Although it is sometimes difficult to discuss weaknesses, students should view such feedback as constructive, and should work on improving these areas in future rotations and beyond.

## Biochemistry, Cell and Molecular Biology Placement

Proficiency in biochemistry, cell, and molecular biology is evaluated formally with an interview, in mid-May of the first year. Students who have never taken courses in these areas are welcome, but not required, to take courses during their first year. Tutorials or self-directed study provide alternative avenues for preparing for the evaluation. The proficiency interview functions as a placement evaluation. If a student performs poorly in one or more areas, the examiners will recommend coursework to help the student gain a better understanding of those areas. Another purpose of the proficiency interview is to provide the students with an opportunity to experience an oral exam similar to the Graduate Board Oral examination required by the University. In that sense, we refer to it as an exam, although no grade is associated with it and failing has no consequence other than a course recommendation. Performing poorly on the exam does not jeopardize a student's standing in the program.

Any student who does not pass the exam in May will be given the opportunity to study during the summer and take it again in September.

## Seminar Series

It is an essential part of the educational process for students to attend seminars, both in the area of biophysics and in other areas. Some of these are listed below.

- The Department of Biophysics & Biophysical Chemistry sponsors a series of seminars from invited outside speakers. These are held on Wednesdays at 1:30 PM in the School of Medicine.
- *Chalk it up to Biophysics* seminars are held four to five times per year, as part of the Jenkins Department of Biophysics seminar series and as part of the Department of Biophysics & Biophysical Chemistry Series. They are presented by BBC faculty and emphasize the conceptual basis behind the work of an individual laboratory. Students past their second year are expected to attend. Attendance is mandatory for first- and second-year students.
- The seminar course *Topics in Macromolecular Structure and Function* (ME100.804), offered by the Department of Biophysics & Biophysical Chemistry, meets Wednesday mornings at 9:15. The seminar course has a different theme each semester, and classes (seminars) are presented by both students and faculty covering different topics relevant to the theme. Auditors are welcome.



## Savvy Seminars

An oral presentation is one of the main forms by which scientists communicate their findings. Whether in the context of the classroom, the relatively informal lab meeting or as an invited speaker at an international colloquium, the ability to effectively present scientific results is an important skill to master. To develop these presentation skills, students will participate in a class designed to cover the planning and execution steps necessary to produce an engaging oral presentation. Students will learn to articulate the big biological questions, tell a story that stimulates interest in their chosen subject, and effectively convey their experimental findings. Key methodological steps in planning will guide students on how to create slides with compelling visuals, and how to use technology to their advantage. Students will each prepare, present, and receive feedback on a 15-minute talk on their thesis project in the style of the Biophysical Society short talks. In addition, each student will receive and evaluate a video of their presentation so they can see themselves through the eyes of others.

## Writing Workshop

Writing is a critical part of the enterprise of science. To develop formal writing skills, BBC students will participate in a workshop in the spring of their second year that helps them develop their scientific writing skills. Students will meet with faculty over approximately two months to develop a set of "Specific Aims" and a five-page research proposal that describes the goals, background, significance, and details of their thesis project. The workshop will cover best practices in topics ranging from grammar and sentence construction, organization of paragraphs, the main sections in a research proposal and their functions, and creating and placing figures and tables. Students and faculty will meet in groups and in one-on-one sessions, and will get direct feedback on their written proposal from faculty, students, and in the course of preparing their proposal, their faculty mentors.

In addition to developing writing skills, the proposal students generate in the Writing Workshop will be used, with minor tweaking, as part of the Thesis Proposal Presentation and Review in the fall of their third year. In addition, it is hoped that students will use this proposal the starting point for submission of an NIH F31 predoctoral fellowship. These fellowships not only provide research support to the student's thesis lab, they are prestigious awards that provide significant advantage to the recipient student in applying for postdocs, postdoc research fellowships, and subsequent professional positions.

## Student Evening Series

To provide students with additional speaking opportunities and feedback on their research, and to build and maintain camaraderie, selected students will organize an evening series in which all students will participate, and third-year students will present their thesis projects to other biophysics students. As the name implies, these seminars are held in the evening. Frequency is approximately once per month and the setting, if in-person, will depend on the location of the presenter's lab (Homewood or East Baltimore Campuses). Participation in the student evening series, both as a third-year presenter and an all-year participant, is a BBC requirement.



## Semi-annual career workshop.

Starting in the fall of 2021, a semi-annual all-day event will be held where a Hopkins alum from a particular career path is brought to Hopkins to discuss their career path and best ways to prepare position for a career in their area, and best practices for identifying, applying for, and getting a job in their area. This event will include a presentation by the speaker, group discussions, and opportunities for one-on-one meetings. These career workshops are currently supported by the Provost's office and are organized by Dr. Cynthia Wolberger. First and second year students are not required to participate.

## Graduate Board Preliminary Oral Examination

- **Oral exam requirements:** The Graduate Board of Johns Hopkins University requires all Ph.D. programs to administer an oral examination to their students. For BBC students this examination is either a preliminary one, to be taken in April/May of the second year, or a Final Oral taken during the Final thesis review. All students are required to take both exams, one as a Graduate Board requirement, and the other as a program requirement.

The GBO examining committee consists of five primary members, with two alternates. The Graduate Board requires that two members of the examining committee be from outside the student's department or program. The composition of the committees is decided by the Program Director in accordance with the spirit of the Graduate Board.

It is BBC's policy that the student's faculty advisor cannot be a member of the examining committee and cannot be present during the examination. The advisor will be asked to make a brief presentation about the student to the examining committee prior to the examination without the student present.

- **Scope of the exam:** The preliminary oral examination is designed to test the breadth and depth of the student's knowledge and reasoning abilities. The exam does not focus extensively on the student's thesis research area, although GBO committees often ask for a brief description of their project to provide some background. Although the topics covered in the GBO can in principle be quite broad, the BBC GBO focuses first and foremost on molecular biophysics. The materials that students have encountered in their first-year curriculum, and in particular, biomolecular structure, function, physical chemistry, and methods of inquiry related to these topics are central. Students can also expect some coverage of material from the proficiency evaluation, though the central focus is molecular biophysics.
- **Setting up the oral exam:** Students will be notified of when they are scheduled to appear by the program administrator.
- **Outcome of the oral exam:** The Graduate Board requires that the GBO examining committee report the results of the examination in written form. The reporting form allows for a "pass", "conditional pass", or "fail." An option to retake may also be offered. If the decision is a "conditional pass," the conditions (nature of the work, deadline, etc.) will be stipulated by the committee at the end of the examination.

## Thesis Proposal Seminar

At the end of the 5<sup>th</sup> semester (October–December), students will present their thesis project both orally and in written form. This review is composed of a public presentation outlining the thesis project, and a question–answer session with the Thesis Review Committee. (See “Third-year thesis seminar and review”, pages 22–23, for details).

## Leave of Absence

BBC students may apply for up to four semesters of leave of absence (not including the summer term) when medical conditions, compulsory military service, or personal or family hardship prevents them from continuing their graduate studies. Financial difficulty alone does not warrant a leave. To be approved for a leave of absence (LOA), graduate students must complete the LOA application, available on the Graduate Board website:

<https://www.hopkinsmedicine.org/som/education-programs/graduate-programs/academics/academic-resources/GraduateStudentLeaveLOAMarch2019.pdf>

Students must provide the proper documentation for their given situation:

- **Medical Condition:** a letter from a physician (this may be a letter from a doctor at the Student Health and Wellness Center), the Counseling Center or the Office of Student Disability Services
- **Military Duty:** a letter or verification from the Armed Forces
- **Personal or Family Hardship:** a letter from the applicant explaining the hardship

During a leave of absence, students do not receive a stipend, regardless of whether they are supported by funding from their advisor or through their own fellowship. A leave of absence will be granted for a specific period of time, not to exceed a total of two years. When approved for a leave of absence, the Chair of the Graduate Board will notify the student. During the leave period, a student may not be enrolled at another university. Before applying, students should consult their department for information regarding funding for when they return from their LOA. Prior to requesting the LOA, it is also highly recommended that the student contact the Health Insurance Coordinator in the Registrar’s Office for information on how the LOA will affect their health insurance coverage. When on an approved LOA there is no tuition charge; the period of leave is simply regarded as an interruption of the degree program.

A student on a leave of absence is not to make use of any University services or facilities (e.g., counseling center, health center, library, athletic facilities, etc.). A student on a leave of absence who wishes to continue working at the University is not eligible to be paid through the Student Payroll Office. Therefore, he or she must be hired through the Human Resources division of the department employing them. No exceptions can be made.

The BBC Director may decline to approve a student’s request for a leave of absence, in which case the student may appeal directly to the Graduate Board or the Dean of Graduate Education.

## Returning from Leave of Absence

When returning from leave of absence, a graduate student must complete and submit the Application to Return from Leave of Absence before registering for classes. The form must be

accompanied by a letter (from one of the sources below) for their given situation that explains what progress has taken place in the student's absence that would enable him/her to be successful upon return.

- **Medical Condition:** a letter from a physician (including the Student Health and Wellness Center), the Counseling Center or Office of Student Disability Services
- **Military Duty:** a letter or verification from the Armed Forces
- **Personal or Family Hardship:** a personal letter

Any additional letters of support (e.g., from an advisor, department chair, etc.) are welcome. When approved for returning from a leave of absence, the Chair of the Graduate Board will notify the student.

## Probation and Dismissal from the Program

The program Director, Co-director and faculty will make every effort to help a student who is performing poorly. However, if a student's performance remains unsatisfactory, the Director or thesis review committee will take the following actions:

The student will receive a letter of warning and may be placed on probation.

If the student's performance does not improve, s/he will receive a second letter stating a fixed date of termination from the program.

Before a student is terminated from the program, the Steering Committee will be consulted to review the grounds for dismissal.

Unsatisfactory performance includes coursework grades that are below expectations, unsatisfactory rotation evaluations, and unsatisfactory dissertation research (see Policy on Grades and Rotation Evaluations, above). In addition, if no mutually agreeable arrangements for thesis research between a BBC faculty member and a student have been made by the end of July in the first year, the Director will consult with the Steering Committee as to whether the student should be permitted to continue looking for an advisor or asked to leave the program.

## Thesis Requirements

### Thesis Advisor

Students are expected to choose a thesis advisor from among the BBC faculty at the conclusion of their third rotation. This is a critical choice for both student and advisor, and it should be made with care. Faculty are not required to accept all students interested in their laboratories. In unusual circumstances, the Director may authorize a fourth rotation (see Program Requirements).

### Annual Thesis Reviews

To ensure progress toward degree, every student undergoes regular thesis reviews. The first review is administered by the Thesis Review Committee (TRC). Subsequent reviews are administered by the Thesis Advisory Committee (TAC). The frequency is once a year in Year 3 (by the TRC) and 4 (by the TAC), and twice a year beyond Year 4 (TAC).

All students enrolled in the program must have a yearly thesis review unless the advisor, student, and thesis committee chair all agree it is not necessary. In general, the only circumstance in which a thesis committee meeting is not necessary will occur when (i) the student has completed all work to be included in the thesis, (ii) the student is actively writing the thesis, (iii) the TAC has previously indicated that the student was likely to graduate within six months. In this case, the TAC and student will agree on an outline of the thesis.

Actual writing of the dissertation is monitored by the advisor.

### **Third-year thesis proposal seminar and review**

In the fall of their third year, BBC students will present a public seminar describing their thesis project, which will be immediately followed by a closed-door discussion with a committee of program faculty. This Thesis Proposal Seminar and Review (TPSR) serves several purposes. 1) It helps the student to think critically about their thesis project, from the background and premise to the feasibility of experiments to the larger impacts that will result from their research. 2) It provides the student with experience in making an oral seminar-style presentation. 3) It serves as a first thesis review by a committee of faculty. An important additional component of this seminar/evaluation is a written thesis proposal prepared by the student in the writing workshop in the spring of the second year. Students will be evaluated typically in a fixed morning time slot (currently Wednesdays at 9:30 AM).

The reviewing committee (the TPSRC) will consist of a core group of two BBC faculty, the thesis advisor, and one ad hoc faculty chosen by the student and thesis advisor (the ad hoc member must not be a core committee member). Both members of the core group will be from the same campus as the student for scheduling reasons; the same core will evaluate all students in a given campus in a given year and the senior member of the core group will serve as the chair of the committee. The core committee will be selected by the BBC Director, each member serving for two years. The BBC Director will coordinate with the core group, student and thesis advisor to find a date that works within the seminar schedule. Once this date has been established, the student will ask the selected ad hoc committee member to serve on their committee. It is the student's responsibility to confirm the scheduling with the BBC director (Dr. L. Mario Amzel), the program coordinator (Tammy Hubbe), and the seminar coordinator (Casey Jacobs).

The student must provide a 5-page research proposal to the TPSRC one week prior to the review. In addition, each student must schedule an evening practice talk with their BBC classmates no later than one week prior to their public presentation. Students should coordinate with Tammy to be sure there are not conflicts with other program activities and events. These practice talks are a great way to get feedback on narrative, slides, and speaking style, and are a program requirement both for the presenter and for participation by all students. The student should also arrange a meeting with the thesis advisor to discuss matters related to the Individual Development Plan and complete the IDP questionnaire (information included in appendix).

*Format:* Third-year thesis reviews will be unique in that they will begin with a public presentation (seminar format) describing the thesis project. The presentation is expected to last ~30 minutes. The date of each student's seminar will be determined by the Program Director in consultation with departmental seminar coordinators and staff.

Following the presentation, the TPSRC will meet with the student in private to discuss the thesis proposal and preliminary data. This phase of the third-year thesis review should take 30 minutes. Additional time should be reserved for the committee to meet with advisor and student individually. Scheduling should therefore allow for ~1h 30 min. The student will bring the completed IDP questionnaire to the meeting for discussion with the committee. The TPSRC will also briefly critique the seminar, and the reading faculty member will critique the written proposal and provide edits to help the student improve their writing.

*Outcome:* The committee chair will write a letter to the student summarizing the committee discussion and any recommendations or requirements. The TPSRC can require that a student provide periodic written reports or have an additional thesis review during the year, if it is felt that there are deficiencies in the project, the seminar, or the written proposal.

### Mid-stage thesis review

In years four and beyond, students meet one-on-one with their Thesis Advisory Committees (TAC) to discuss their progress with their research and their future research and career plans. Mid-stage review happens once in year four (in the fall), and twice in years five and beyond (fall and spring). The object of the thesis review is to provide detailed discussion and specific guidance about the ultimate content of the thesis. The Program Director must approve the Thesis Advisory Committee (TAC) composition prior to the first meeting.

The TAC will consist of the student's advisor, the ad hoc member from the TPSRC, and two more BBC faculty. Exceptions may be considered if additional expertise relevant to the thesis topic is absolutely required and is not represented by any of the BBC faculty. In any case, members of the committee must appear on the list of faculty approved to serve on GBO committees by the Graduate Board. The TAC will meet with the student in the Fall of Year 4 and Year 5, and then every six months until they hear the final thesis defense, at which time a fifth member, also from BBC faculty, will be added.

Prior to every review, the student should arrange a meeting with the thesis advisor to discuss matters related to the Individual Development Plan and complete the IDP questionnaire (information included in appendix).

*Format:* TAC meetings will consist of a closed presentation to the TAC presentation of less than 30 minutes. This presentation should include relevant background, results, challenges, and future plans to complete the thesis. This presentation will be interrupted by questions and suggestions from the committee. The meeting ends with a discussion of the student's long-term plans after leaving BBC and steps the student has taken to achieve those goals. In total, the meeting should last no longer than 1.5 hours. The student must provide a one-page research summary at least one week in advance. The student will bring the completed IDP questionnaire to the meeting for discussion with the committee.

*Outcome:* The committee chair, appointed by the Program Director, will write the student a letter summarizing the discussion and any specific recommendations. This letter will become part of the student's permanent record.

**It is the responsibility of each student to schedule his or her TAC meeting within a given window of time, i.e., October–November in the fall of year 4 and beyond, and April–May in**

**the spring of year 5 and beyond. No review can be scheduled during June–August.** The Academic Program Administrator will keep track of each student's committee meetings in the same way s/he keeps track of student GBOs. **Failure to schedule a timely review meeting will result in a grade of F for dissertation research. Repeated failures will result in academic probation.**

### **Career Counseling and Individual Development Plan (IDP)**

Fourth-year students are required to attend the annual NIH Career Symposium normally held in May. The requirement is repeated in year six. Third and fifth year students are welcome to attend as well. In addition, the **Professional Development Career Office (PDCO)** at the School of Medicine (see <https://pdco.med.jhmi.edu/>) holds an annual university-wide "career development day" with talks and workshops to provide students with information about a variety of careers in biomedical science. This day-long event is typically held in November (this year Nov 8th, 2019). All students are encouraged to attend, particularly those in years 3 and beyond. The PDCO also has many other events throughout the year that are focused on specific aspects of career development. Students are encouraged to regularly check the PDCO website or to follow the PDCO twitter feed (@jhuphdcareers). Recently, a new career development program was launched on the Homewood campus called the "**Phutures**" (a mash-up of PhD and Futures). The Phutures program provides support and activities that are complementary to PDCO. As with the PDCO, the Phutures program is available to all BBC students; students should sign up for announcements to learn about events and activities. See <https://provost.jhu.edu/integrative-learning-and-life-design/life-design/phutures/> for more information.

At the TPSR and all subsequent reviews, the TPSRC and TAC panel will expect to hear from each student about career and training plans following completion of his/her dissertation, as well as long-term plans. If a student plans to do a postdoc, the student should discuss general research areas and any thoughts on specific labs that are of interest, starting in the 4th year (the first TAC review). If a student is considering a non-postdoc path, the student should discuss interests and any initial investigations into the chosen area, including possible internships.

### **Thesis Defense Committee (TDC) and Final Oral Examination**

The final oral examination committee, or Thesis Defense Committee (TDC), must consist of five faculty members (plus one alternate). The TDC will be composed of the four members of the student's TAC plus one additional faculty member and one alternate of the student's choosing. Exceptions will be considered if additional expertise is absolutely required. In any case, members of the committee must appear on the list of faculty approved to serve on GBO committees by the Graduate Board.

Two of the five members of the TDC will serve in the official capacity of "readers" of the thesis. In all but the rarest of circumstances (which must be approved by the Program Director), the primary or "first" reader is the student's advisor. In consultation with the student's advisor, the student chooses one faculty member from the remaining four TDC members to serve as second reader, and must obtain approval from that member. As described below, the two readers vouch for the thesis in its entirety in a letter to the graduate board. As such, the two readers must read the thesis in its entirety. **This is particularly important for the advisor (first reader),** who should read the



thesis and provide necessary edits to make the thesis presentable **prior** to its circulation to the TDC.

To ensure balance, the committee composition must be approved by the Program Director. The Program Director will choose the committee chair. Once the committee is approved and the advisor agrees that the thesis is ready to be distributed, the student may schedule the exam. It is the student's responsibility to contact the faculty members on the exam committee and to schedule the date, time and place of the exam. **Students who have scheduled their defense must provide the information to Tammy Hubbe as soon as available.** All five committee members and the alternate receive a copy of the dissertation **at least two weeks prior to the exam.**

The final oral exam is a closed-door exam and serves three purposes:

- To evaluate the quality of the dissertation (if approved, the 1<sup>st</sup> and 2<sup>nd</sup> readers would sign a letter of acceptance addressed to the Graduate Board at this time);
- To determine that the student's knowledge in the immediate scientific area of his/her dissertation is sufficient; and
- To authorize the student to go forward with presenting the thesis seminar.
- If the exam committee concludes that the student's knowledge is insufficient or the dissertation needs additional work, the student can be asked to return for a re-examination. The student's final exam committee has the authority to ask for substantial changes in the thesis.

The student should be prepared to make a presentation during the final oral exam which highlights the major findings of the dissertation, approximately 40–50 minutes in length. The presentation should not be the same as the one-hour thesis seminar (see below). TDC members are expected to interrupt throughout the presentation to discuss various points and again, in this regard, the defense presentation differs from the public thesis seminar. In general, this oral examination will last 2 hours.

It is the intention of the Steering Committee that the examining faculty conduct a rigorous assessment of the student's scientific knowledge and evaluate the dissertation research in a substantive and critical manner. Therefore, to allow time for any thesis revisions the committee may require, **there is a mandatory minimum wait period between the final oral exam and the thesis seminar.** The normal wait period is one month. In extraordinary circumstances related to the student's next position and the extent of necessary revisions to the thesis document, the TDC may allow a shorter wait period.

### Thesis Approval

The final thesis must be approved, in a form specified by the Graduate Board, by two thesis readers, one of whom is normally the advisor. The student and advisor decide on the faculty member most suited to serve as 2<sup>nd</sup> reader. If the final oral examination committee approves the student's dissertation, the two readers will sign the letter accepting the thesis at that time. This letter is then submitted to the Graduate Board. There are many detailed requirements about the format and submission of the thesis. Guidelines are available from Casey Jacobs.

## Thesis Seminar

After the student has passed the final oral exam and the readers' letter accepting the thesis has been submitted to the Graduate Board, the student is required to present a seminar on the work contained in it. The seminar will be scheduled after the thesis has been approved and announced by the Department. The thesis seminar should be scheduled at a time when a majority of the faculty from the TDC can be present.

## Granting of Degree

The Director of the Department of Biophysics & Biophysical Chemistry will consider that a student has fulfilled the requirements for the Ph.D. and sign the Certificate of Completion granting the degree only after the following conditions have been met:

- Passing the final oral examination. (Note: this examination is a program requirement, not a Graduate Board requirement. Each student satisfies the Graduate Board Oral requirement by passing the Graduate Board Oral exam (GBO) taken at the end of the second year.)
- Submission to the Graduate Board of an approval letter signed by two readers accepting the thesis as partial fulfillment of the requirements for the Ph.D.
- Submitting a final, corrected and revised thesis that has been approved by the two thesis readers to the library. In some cases, approval by the entire thesis committee may also be requested. In timing the submission of the student's thesis to the library, the student should be aware of graduate board deadlines for awarding of degrees. Sometimes delaying submission by one day can delay degree conferral by four months.
- Presentation of the student's thesis seminar.

## Internships

Although there is no BBC requirement for an internship, students who are thinking about pursuing a career path outside of academic research and teaching are encouraged to do an internship. These include internships in Science Policy (both with the federal government and private organizations), Biotechnology and Pharma (with private companies), and Science Writing.

Students should not consider internships until they have made significant progress with their thesis research, and are getting high-quality, publishable results. Ideally, by the time a student goes for an internship, he/she will have one or more manuscripts submitted for publication. Students who are struggling to get their thesis project on track should first focus on their research. Choosing the right time should be made in consultation with the thesis advisor and members of the student's TAC.

All internships must be approved both by the student's thesis advisor and by the program director. The main goal of Internships is to allow a student to determine whether a particular career path is right for them, and to make some connections within that path. This can effectively be achieved in three months or less. As a result, it is highly unlikely that an internship longer than three months will be approved by the program director. It is important that students understand that they will *not* be paid a stipend by their thesis advisor or by the program while they are on internship. Instead, interns are typically provided a stipend by the organization hosting the internship. However, a student's university health insurance coverage will remain active through the internship period.



## Anti-discrimination Stand

### JHU/BBC and anti-discrimination

BBC is against all forms of discrimination. As presented by the Office of Institutional Equity: “The Johns Hopkins University is committed to equal opportunity for its faculty, staff, and students. To that end, the university does not discriminate on the basis of sex, gender, marital status, pregnancy, race, color, ethnicity, national origin, age, disability, religion, sexual orientation, gender identity or expression, veteran status or other legally protected characteristic. The university is committed to providing qualified individuals access to all academic and employment programs, benefits and activities on the basis of demonstrated ability, performance and merit without regard to personal factors that are irrelevant to the program involved.”

Go to <https://oie.jhu.edu/discrimination-and-harassment/equal-opportunity-statement.html> for the full statement.

### BBC and race equity

BBC strives to achieve race equity in all its activities and foster an anti-racist culture. The Biophysics Race and Equity Group (Biophysics REG) was founded in the wake of the events of May 2020.

- The mission of the Biophysics REG is to foster a welcoming and inclusive climate that celebrates the contribution of each of its members, regardless of race.
- The Biophysics REG partners with the BBC steering committee to develop and implement anti-racist and anti-discriminatory policies.
- The Biophysics REG is invited to share its findings and recommendations with the Steering Committee during its biannual meetings.
- The Biophysics REG organizes regular events open to BBC students, faculty, and staff, and to all members of the Hopkins Biophysics community. These events include workshops, presentations from outside speakers, and discussions of books, films, and scholarly publications related to racism and inequity at large and in the STEM fields.
- The Biophysics REG is initiating an annual climate survey to assess the well-being of students.
- The Biophysics REG is open to all interested parties and welcomes new members at any time. Drop an email to [pmb@jhu.edu](mailto:pmb@jhu.edu) to indicate your interest.

## General Resources for Graduate Students

### Graduate Student Association

The GSA is the major graduate student organization of The Johns Hopkins University School of Medicine. For more information, visit

[http://www.hopkinsmedicine.org/som/students/life/graduate\\_student\\_association.html](http://www.hopkinsmedicine.org/som/students/life/graduate_student_association.html)

## Student Health & Wellness Center

Graduate school can be stressful. Research is challenging, and experiments often don't work. Multiple times. Students often feel pressure from family, from their advisor or committee, from fellow students, or from competition with another research group. In addition, planning life after BBC can be stressful. Should I postdoc? Where should I postdoc? Will I get a position in industry? Policy? These and other uncertainties are hard to deal with, and can lead to anxiety, fatigue, anger, and detachment. In short, like many of life's challenges, graduate school can lead to depression. There are a lot of simple techniques and activities that can help counteract these feelings. These include exercise, hobbies, meditation, journaling, and socializing with friends. We encourage you to develop and maintain habits that will work for you.

However, for some students, even the best habits may not be enough to maintain mental wellness. In such cases, students may experience a variety of signs of depression, including continued stress and anxiety, sadness or anger, difficulty sleeping, difficulty focusing on lab work and/or classwork, and detachment from their social network. If students find themselves suffering from one or more of these symptoms, they should take them seriously, and get help. Students should understand three things about depression: 1) it is far from abnormal, 2) it is treatable, and 3) Johns Hopkins has excellent resources for dealing with depression and promoting mental health. Students who are struggling with these issues are encouraged to speak with their advisors. If students are uncomfortable speaking with their advisors for professional (or any other) reasons, they should speak with people in the BBC program, in particular, Program Director L. Mario Amzel and Administrator Teri Pennington. These conversations will be confidential and will be used to 1) get students to mental health experts and 2) work towards a solution that allows the student to engage in long-term laboratory research at the highest level for the duration of graduate school. In addition to taking action within BBC, students are referred to the Health and Wellness Center and to Counseling centers described below.

The health and wellness of students are of utmost importance to us here at Johns Hopkins. If you are struggling with anxiety, stress, depression, or other wellbeing-related concerns, please consider contacting the Johns Hopkins Student Assistance Program (JHSAP). If you are concerned about a friend, please encourage that person to seek out counseling. JHSAP can be reached at 443-287-7000 or [jhsap.org](http://jhsap.org). Additional resources are available at <https://www.hopkinsmedicine.org/getting-help>

Students also have access to [SilverCloud](#), an online mental wellness service, provided by Johns Hopkins.

If you have a disability or any health issue and may require accommodations in this course, please contact the Disabilities Services Coordinator for graduate students in the School of Medicine (Kristina Nance, [GradDisabilityOffice@jhmi.edu](mailto:GradDisabilityOffice@jhmi.edu), 667-208-8058) to discuss your specific needs.

## Counseling Centers

Students on the East Baltimore campus are eligible for services through the Johns Hopkins Student Assistance Program (JHSAP). 443-287-7000, [jhsap@jhu.edu](mailto:jhsap@jhu.edu). For more information, visit <http://jhsap.org/>.

## **Sexual Assault Response & Prevention**

Johns Hopkins University is committed to promoting a safe and supportive environment for each and every member of our community. The website provides clear and consolidated information on sexual assault policies and available services and support in the event of an incident of sexual assault. Sexual Assault Helpline 410-516-7333, <http://sexualassault.jhu.edu/>.

## **Office of Institutional Equity**

This office oversees concerns relating to sexual harassment, discrimination/compliance, and disability services. <http://web.jhu.edu/administration/jhuoie>; Wyman Park Building, Suite 515, office telephone 410-516-8075, disability support services 410-516-8949.

## **JHMI Professional Development Career Office (PDCO)**

The PDCO, located on the East Baltimore campus, works with graduate students, as well as postdoctoral fellows, and early-career faculty to help them explore and prepare for a variety of career paths, and is available to students on the Homewood and the East Baltimore campuses. For more information, see <https://pdco.med.jhmi.edu/>; 1830 E. Monument St., Suite 2-107, 410-502-2804, [jhmipdo@jhmi.edu](mailto:jhmipdo@jhmi.edu).

## **KSAS Phutures Program**

The Phutures Program, located on the Homewood campus, serves similar roles as the PDCO, and is also available to all BBC students. See <https://provost.jhu.edu/integrative-learning-and-life-design/life-design/phutures/> for more information. The provost office is in Garland Hall, Suite 265, 410-516-8070.

Disclaimer: **This is not a legal document.** This booklet presents current guidelines and practices in the Biophysics and Biophysical Chemistry Program. The Directors and Steering Committee reserve the right to modify requirements, create new ones, and otherwise alter graduate program practices without advance notice.