

The OSBP Handbook

Summary of Procedures and Requirements

Ohio State Biochemistry Program



THE OHIO STATE UNIVERSITY

2019-2020

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Preface

The OSBP Handbook contains a summary of the rules, policies, and guidelines of the Ohio State Biochemistry Program (OSBP). The rules that govern students in a particular entering class year are determined by the version of the handbook that is in effect on the first day of the Autumn semester in the academic year in which the students begin the OSBP curriculum.

OSBP is governed by three documents: its Charter, the *Graduate School Handbook*, and *The OSBP Handbook* (formerly called *The OSBP Student Handbook*). The Graduate Studies Committee is charged by the Graduate School and the Charter to make and enforce the specific policies and rules for the program on behalf of the Graduate Faculty, within the policies and rules set forth by the Graduate School and the Charter. While no rule promulgated by the program may contradict rules of the Graduate School, some OSBP policies are more stringent than the basic policies of the Graduate School. Where no specific policy is stated in this handbook, Graduate School rules apply.

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I. Program of Study

The Ohio State Biochemistry Program (OSBP) is an interdisciplinary graduate program with participating faculty from colleges throughout The Ohio State University.

OSBP offers a course of study leading to a doctoral degree (Ph.D.). Biochemistry is a diverse field, and the program is flexible to accommodate that diversity. Students are expected to expend a significant effort on a research problem that culminates in a dissertation and at least one original first-author research publication. To this end, students take a core curriculum and approved biochemistry electives, advance to candidacy by writing a proposal and passing a general oral exam, conduct laboratory research, prepare and present a dissertation, and demonstrate that it adds significant new knowledge to some area of biochemistry.

By rule of the Graduate School, students who have advanced to doctoral candidacy may receive a master's degree with the approval of the Graduate Studies Committee (GSC) and subject to certain conditions (see Section VIII).

II. Admission

a. Application Procedures

OSBP only accepts students who intend to pursue a doctoral degree. In general, only applications for matriculation in the Autumn semester are accepted. Domestic students may elect to begin their studies in the Summer term before the Autumn semester of admission to carry out a laboratory rotation (early start) with the approval of the GSC Chair. All admission applications are due December 1. Students will be invited to visit and interview on a rolling basis, with most visits in early to mid-February. Most applicants will receive their admission decisions between mid-February and mid-March. Graduate School fellowships and traineeships (training grant positions) are typically announced between late February and late March. Enrollment decisions are due by April 15.

Applications must be made online at the Graduate Admissions web site. Applicants must upload a statement of intent, curriculum vitae or resume, and three letters of recommendation. The statement of intent should describe the applicant's interest in graduate studies in biochemistry and any undergraduate research experiences. It should also describe reasons for interest in OSBP, as well as the specific areas of interest and some example faculty of interest. Official transcripts from all institutions must be uploaded to the Graduate Admissions web site.

The GRE general test and/or subject tests are not required for application or admission to OSBP. You may submit scores from the GRE general test, or subject tests in Biochemistry, Chemistry or Biology to be considered in support of your application, if desired. If you choose to submit scores, these should be submitted directly by ETS using institutional code 1592 and department code 0000.

The TOEFL is required for international students unless they are U.S. citizens or have obtained a 4-year bachelor's degree or higher from an institution in the U.S. (or an approved English-speaking country: Australia, Belize, the British Caribbean or British West Indies, Canada except Quebec, England, Guyana,

Ireland, Liberia, New Zealand, Scotland, and Wales). The TSE is not required. Applicants who do not submit a TSE score will have an opportunity to take the SPEAK test at Ohio State. TOEFL scores should be submitted directly by ETS using institutional code 1592 and department code 99.

Students may not be directly admitted to a particular preceptor's lab. All students are expected to conduct a minimum of three 7-week laboratory rotations with three different advisors before selecting a preceptor.

b. Entrance Requirements

Students must have successfully completed some undergraduate coursework in chemistry (at least through organic chemistry, with some physical chemistry desired), general biology, and the necessary prerequisite physics and mathematics (including some calculus). Nearly all OSBP students will have taken at least one semester of undergraduate biochemistry; biochemistry lab and coursework in molecular biology or molecular genetics are highly recommended. Most OSBP students are biochemistry or chemistry majors, but that is not required. Previous research experience in biochemistry or a related area is highly desired.

Applicants must have earned a baccalaureate or professional degree from an accredited college or university by the date of entry. The Graduate School requires a minimum 3.0 GPA on a 4.0 scale in all previous undergraduate and graduate work. Students admitted to OSBP in recent years had a median GPA of about 3.6. For international students, OSBP requires a TOEFL score of 620 (paper) or 105 (IBT), and Speaking scores of 26-30 are desired. The TSE is not required. The program typically admits approximately 30 students per year.

c. Transfer

Students may transfer from another Ohio State graduate program to OSBP by applying through the Graduate and Professional Admissions website and selecting the Intra-University transfer application. The GSC requires: (1) a letter from the student explaining the reasons for seeking the transfer; (2) a copy of the original application materials submitted to the Graduate School and unit from which the student is transferring; (3) two current letters of reference; (4) a current curriculum vitae; and (5) an advising report and any other relevant information on the student's performance in the original program. Transfer students must meet the same entrance requirements as other applicants.

Transfer students are accepted to OSBP as first-year students, meaning that they are admitted to start in Autumn semester with program financial support and are expected to carry out a minimum of three 7-week laboratory rotations before joining a lab. Students may not directly transfer into a particular preceptor's lab. (Summer term early start for the first lab rotation is possible with the permission of the GSC Chair.) Transfer students may request that prior coursework counts toward OSBP degree requirements, and that graduate credit earned at another university be transferred to this university. In general, core courses will be accepted with essentially identical course material, but electives will not. Graduate credit transfer is subject to the rules in Section 4.2 of the *Graduate School Handbook*. In general, transfer students are expected to complete a master's degree in their initial graduate program before the transfer. Doctoral candidacy status does not generally transfer from any other program or institution. Exceptions to these rules will be considered by petition to the GSC, such as for students who move to Ohio State with a faculty

member newly admitted to the OSBP Graduate Faculty. Note that by rule of the Graduate School a student with a master's degree in the same field from another university must transfer the degree to Ohio State, and all students with a master's degree must take at least 50 graduate credit hours beyond the master's degree.

d. Admissions Procedures

Complete applications to OSBP are reviewed by the standing Admissions committee. In general, domestic students will be recommended for admission only after an interview. An interview by phone or internet (e.g., Skype) is required for international students. The admission of students to the Graduate School is the dual responsibility of the Graduate Studies Committee and the Graduate School. However, the Graduate School has the final authority for making admission decisions. Graduate Admissions is also responsible for sending the official admission decision.

III. Financial Support

Students who are admitted to OSBP receive a commitment for full financial support (including: stipend, tuition and academic fees with the associated required benefits) for the entire time they are working towards their degree, provided they maintain a 3.0 GPA and make reasonable progress toward doctoral degree requirements.

In the first year, students are supported either through Graduate Associate (GA) appointments provided by the program, through Graduate School fellowships (such as University Fellowships or Graduate Enrichment Fellowships), or through Traineeships supported by NIH Training Grants. OSBP program support is guaranteed for one year, meaning three terms. For most students, this means Autumn, Spring, and the Summer semesters following the first Spring. Students who elect to start a first lab rotation in the Summer term before their first Autumn semester instead receive support for that early-start Summer, and then the Autumn and Spring semesters. Summer start students may only be appointed as a GA or Fellow with a start date of June 1 for a 9-week rotation. Some students may be admitted with external fellowships or as self-supported students (such as if their employer is paying their tuition and fees), with terms to be set at the time of the offer of admission by the GSC.

After the first-year support provided through OSBP ends, student financial support is the sole responsibility of the preceptor. Students may be supported as Graduate Research Associates (GRA), Graduate Teaching Associates (GTA), Trainees through the support of NIH Training Grants, or Fellows of the Graduate School, other University entities, or outside entities. The advisor commits to providing an equitable stipend, tuition and academic fees (along with required benefits), but the exact stipend level is at the discretion of the advisor in accord with the policies of the appointing unit. The Graduate School mandates a minimum stipend of \$1,920 per month for GAs. OSBP encourages its faculty to support post-candidacy students at the life sciences IGP rate, which is \$2,515 per month in 2019-2020. It is not uncommon for pre-candidacy students, and students supported on TA in general, to be paid at a lower rate, such as the rate of the appointing unit (for example, the Department of Chemistry & Biochemistry pays GTAs \$2,300 per month in 2019-2020). It is recommended to supplement such appointments from grants or other sources.

The preceptor must affirm on the Preceptor Agreement Form that it is her or his sole responsibility to ensure

continuous financial support after the first year of study (i.e., after program support ends). In the event that the preceptor no longer has sufficient grant resources or access to GTA appointments to support the student, it is the sole responsibility of the preceptor, not the responsibility of the student or program, to identify interim funding from the preceptor's department or other source so that the student is continuously supported, so long as reasonable progress is being made towards the degree. OSBP does not have resources to provide support for students after the first year of study.

Students may expect continued support from their research advisor as long as they meet the following criteria:

1. Students must be registered each term for at least the minimum number of credits required by the Graduate School for their status (see Section IV).
2. Students must remain in good academic standing, maintaining a GPA of at least 3.0.
3. Students must be making reasonable progress toward their degree, as determined by the Graduate Studies Committee with the advice of the research advisor and Advisory Committee (see Section V).

Students who do not meet the above criteria may no longer be eligible for support, and their continued registration in the program may be in jeopardy.

Students and advisors should be aware that in the event of student or faculty initiated separations, the student generally has until the end of the current term to find a new preceptor, and that the current appointment must be maintained until the original end date of the appointment. In the event of faculty-initiated separations, terminations before the end of the appointment are possible only with the written approval of the Graduate School for specific reasons, such as performance of GA duties unsatisfactory to the employing unit (see Section 9.2 of the *Graduate School Handbook*). OSBP considers it reasonable for the new preceptor to assume responsibility for the appointment of the student at the time the student joins the new lab, when that is practical.

The appointment periods for 2019-2020 are August 16-December 31 for Autumn, January 1-May 15 for Spring, and May 16-August 15 for Summer.

OSBP Travel Grant program

Subject to availability of funds, OSBP will provide up to one travel grant of up to \$500 during the student's tenure in the program. Grants are offered on a competitive basis for conference travel, subject to eligibility rules and application timelines set by the program. Eligible expenses include registration fees, transportation, or lodging, all subject to OSU travel policy. To be eligible for award of a travel grant:

- Students must be post-candidacy and in good standing with the program.
- Students must be presenting a poster and/or talk at a national/international conference/meeting.
- Only one travel award will be given within a research group for any individual conference.
- If more applications are received than the program can fund in any given year, preferential consideration will be given to students who meet program deadlines and perform acts of service to the program.

To apply for an OSBP travel award, students must submit an application to osbp@osu.edu that includes: an updated OSBP Activity Report, current Advising report, and an abstract for the student's conference presentation, indicating whether it has been submitted for oral or poster presentation. Information about deadlines for applications will be provided to all OSBP students at the beginning of each academic year.

IV. Registration and Scheduling

OSBP students are required to be continuously enrolled in all terms (Autumn, Spring and Summer semester) up to and including the term in which the student graduates. In exceptional circumstances, the GSC may (by petition) allow students not to enroll for a term due to illness or a serious family issue. The Graduate School requires that all post-candidacy students be registered in all Autumn and Spring semesters (but see Section IX.c below for information on family and medical leave). Under no circumstances will a student be allowed to “volunteer” in a lab; any student working towards the degree must be enrolled in that term and appointed as outlined in Section III.

Before advancing to candidacy, students appointed as Graduate Associates (GRA, GTA or GAA) must enroll in at least 8 credit hours per semester, and at least 4 credit hours in the Summer term. All pre-candidacy students appointed as Graduate Fellows or Graduate Trainees must enroll in at least 12 credit hours per semester and at least 6 in the Summer term.

All post-candidacy students must enroll in at least 3 credit hours per term. The Graduate School only mandates enrollment in Autumn and Spring, but requires Summer enrollment if the student is actively working toward the degree on campus during the Summer term. OSBP requires enrollment in all terms, except by petition.

A minimum of 80 graduate credit hours beyond the baccalaureate degree is required to earn a doctoral degree (or 50 additional graduate credit hours beyond the master's degree). Pre-candidacy students should enroll in closer to the maximum number of credit hours each Autumn and Spring semester (18 credit hours) to ensure they will have sufficient credits by the time of graduation. There is no cost difference to the appointing unit between 8 and 18 credit hours during the Autumn and Spring semesters.

In general, students should only take classes that are part of the approved curriculum. First-year students must obtain permission from the GSC Chair to take classes outside the normal curriculum; classes that are recreational or unrelated to biochemistry (such as physical education or a foreign language) will not be allowed. Such classes are discouraged after the first year, but may be taken at the discretion of the advisor. First-year students must also obtain the permission of the GSC Chair to enroll in more than the minimum number of credit hours (4) in the Summer term.

Students registering after published deadlines will incur substantial late registration penalties. Students paying fees after the published deadlines are assessed late fees and their registration may be canceled if fees are not paid by the second Friday of the term. The student is responsible for payment of any late fees incurred. ***It is every student's responsibility to check the Graduate School and Registrar's web sites for***

the most current rules, regulations, and deadlines.

V. Academic Standards

The *Graduate School Handbook* describes the academic standards for all graduate students (see Section 5). Students are expected to follow the Graduate School standards as well as the OSBP guidelines.

Students are considered to be making satisfactory or reasonable progress toward their degrees if they follow the curriculum and other program requirements on the prescribed timeline, unless alterations are approved by the Graduate Studies Committee, and maintain a GPA of at least 3.0 in graduate classes.

Attendance at seminars (OSBP 7890 MLS Seminar or other series after the second year), required student seminars (OSBP 7600 and 7700), and required program events such as the annual IGP Symposium are important parts of satisfactory and reasonable progress. Receiving two unsatisfactory grades in any OSBP core or elective courses is considered lack of reasonable progress, and will be reported to the Graduate School and a warning will be issued (*Graduate School Handbook* Section 5.4). Further unsatisfactory grades may result in denial of registration (*Graduate School Handbook* Section 5.5).

Satisfactory and reasonable progress toward doctoral research must be maintained, as evidenced by satisfactory grades (S) in graduate research courses and advisor comments on the Post-Candidacy Progress Report (see Section VI.e). Two unsatisfactory grades (U) in graduate research courses (OSBP 7193 or any 8999 course) will lead to dismissal from the program. Any student who receives an unsatisfactory grade in graduate research will be required to appear before their Student Advisory Committee, GSC Chair, and/or the full GSC to discuss the reasons for the unsatisfactory progress. Unsatisfactory progress reported on the Post-Candidacy Progress Report will also result in a meeting with the GSC Chair and/or full GSC and possible warnings from the GSC and/or Graduate School, which could lead to dismissal.

Students who fail to meet program deadlines for joining a lab, filing annual activity reports, selecting a committee, advancing to candidacy, meeting with advisory committees and filing annual post-candidacy progress reports, or graduating within the five-year candidacy period will be considered to be failing to make reasonable progress toward the degree, which will trigger warnings from the GSC and/or the Graduate School, with possible denial of further registration. By rule of the Graduate School, students who do not raise their GPA above 3.0 after two consecutive terms of probation, students who fail the candidacy exam twice, or students who fail the final oral exam twice are automatically dismissed from the Graduate School.

VI. Advising and Rotations

a. First-Year Advising

The GSC Chair acts as a temporary advisor for incoming students until they have completed the required lab rotations and selected a permanent research advisor, which is normally done before the end of the second semester. Each first-year student should meet with the GSC Chair at least once throughout the academic year to discuss his or her progress. Students are required to take the core courses in the first year. Each student's undergraduate course work is reviewed and individualized programs are arranged for any student

with deficiencies. Also, students who have completed a master's degree at an accredited U.S. university may be eligible to receive credit for some of the core courses based on a review of the courses by the Graduate Studies Committee with the advice of the standing Curriculum committee. While all students are expected to take the core courses, the elective courses are chosen by the student upon conferring with the advisor to correspond to the student's area of interest and specialization.

b. Laboratory Rotations

All students must participate in at least three 7-week laboratory rotations with three different OSBP faculty members before selecting a preceptor (research advisor). Most students will do this by completing rotations in Session 1 and Session 2 of Autumn semester and Session 1 of Spring Semester, and joining a lab in mid-Spring. Students who select the early start option carry out their first rotation for at least 9 weeks in the Summer term before the first Autumn, and then must complete rotations in Session 1 and Session 2 of Autumn, typically joining a lab before the beginning of Spring semester.

Students must enroll in 3 credit hours of OSBP 7193 under the faculty member's name for the term and session corresponding to each rotation. OSBP 7193 is graded on a Satisfactory/Unsatisfactory basis based on fulfillment of the expectations set out in the rotation contract. The student should meet with the rotation advisor before or in the first week of the rotation, and a copy or scan of the rotation contract must be provided to the OSBP office (osbp@osu.edu) by the second Friday of the session or term. At the end of the rotation, the form is completed by the student and signed with comments by the potential advisor at an exit meeting. The fully completed rotation form must be turned in to the OSBP office (or a scan provided to osbp@osu.edu) by Friday of the last week of the session. The rotation contract form is available on the OSBP web site (see the Handbook, Forms, and Deadlines page).

Students who do not match to an advisor after three rotations may complete a fourth rotation, but must meet with the GSC Chair before doing so. Further rotations are possible with the permission of the GSC Chair, but the student must have a permanent research advisor by the end of the program support period (for most students, the end of the first Summer term; for early-start students, the end of the first Spring semester). Students who fail to match to an advisor after four rotations will receive a warning from the Graduate School about lack of reasonable progress. Students who fail to match to a lab by the end of the first year are not making reasonable progress, and will be barred from enrollment in the following term. OSBP financial support is not available after the first year.

OSBP students may only rotate in the lab of an OSBP faculty member. Faculty are not eligible to take rotation students on a provisional basis while their status in OSBP is under consideration; they must wait until final approval from the Graduate School is received confirming their status (see Section XIV).

Certain NIH Training Programs allow students to rotate with faculty from multiple graduate programs. OSBP students in these training programs may only do so with the permission of the GSC Chair, and only for the third rotation if the student is confident that she or he has found a matching advisor among the OSBP faculty in the first two rotations. Note that some training programs have similar rules (for example, CMBP requires that at least two rotations be with CMBP faculty members); it is the trainee's responsibility to ensure that his or her rotations comply with the necessary rules.

c. Joining a Lab

Students are encouraged to join a lab as soon as possible after completion of the third rotation. Students who start in the Autumn should complete their advisor selection within 2 weeks after the end of Spring Session 1, or, if no match is possible, meet with the GSC Chair and initiate a fourth rotation by that same date. Early-start students should complete advisor selection by the end of the Autumn final exam period, or, if no match is possible, meet with the GSC Chair and select a fourth rotation to begin the first day of the Spring term.

A student formally selects a preceptor when the preceptor signs the Preceptor Agreement Form and it is approved by the preceptor's department chair (or designee) and the GSC. The Preceptor Agreement Form is a Memorandum of Understanding between OSBP, the preceptor, and the preceptor's home department in which the preceptor agrees to be responsible as the academic advisor, to supervise the conduct of research and preparation of the dissertation, to assure that the student adheres to program requirements, to administer the candidacy and final exams in accordance with program rules, and to accept full responsibility for ensuring financial support to the student through graduation provided the student is in good academic standing and making reasonable progress toward the degree. The Preceptor Agreement Form must be filled out and signed electronically; see the Handbook, Forms, and Deadlines page of the OSBP web site for details.

If there are no concerns about the student-advisor match and the advisor's department chair approves the form, the GSC Chair will typically approve the form on behalf of the GSC. If the advisor's department chair will not approve the form, the GSC will also not approve it, and the student must find a different advisor. The GSC may also independently refuse to approve the form if there are serious concerns that the student will not be successful with the selected advisor. Serious concerns might include, but are not limited to, inability to ensure the financial support of the student, an excessively large number of students joining the lab at one time, a history of students who fail to meet program deadlines or other requirements, or a history of students who have repeatedly left the lab without completing a degree.

OSBP students must select an OSBP faculty member as preceptor (advisor). OSBP does not recognize co-advisor relationships for its students. Even if the student carries out experiments in a collaborator's lab or is financially supported using the resources of a collaborator, the preceptor accepts full responsibility for academic advising, supervising research and preparation of the dissertation, ensuring adherence to program policies, administering the candidacy and final exams, signing the exam forms, dissertation and final approval as the advisor, and supporting the student financially.

d. Advisor Selection – Best Practices

Some of the most important factors in selecting an advisor are the project the student will work on, the ability of the student and advisor to work together, the advisor's funding situation, and the affinity of the student for the particular lab environment. Students can be successful in small or large labs, or with very hands-on advisors or advisors who prefer very independent students. But individual students will probably thrive in only a subset of the possibilities. It is worth exploring labs that run differently during rotations.

Rotations are also time for the student to refine his or her interests, and some exploration of topics is necessary to make a good decision. However, students who rotate in labs that work on three vastly different things often have a difficult time matching, probably in part because there is no meaningful basis for comparison among the choices. A targeted search is usually most effective.

What should happen during the rotation? The best answer to this question is to talk in detail with the potential advisor and make sure that expectations match up. If the lab typically starts work early in the morning, plan to start work early in the morning. If that's not something you can do, you're probably looking at the wrong lab. However, it also may mean that your expectations about graduate school need calibration. Successful graduate students in biochemistry in the U.S. typically work and study much more than 40 hours per week—more like 60 hours is not uncommon. Obviously part of that time will be needed for class work and seminars, and if you are eventually supported by GTA part of that time will be needed for teaching and preparation. You should try to plan these things to occur during the beginning and end of the day so that you can focus on lab work when other people are in the lab. Some advisors will just have rotators read papers, attend meetings and observe or work with another student or postdoc; others will have an actual small independent project for the student to complete. Agreeing on what is reasonable is the motivation for filling out the top of the rotation contract early. In any event, some combination of reading literature, experimental work, attending research meetings, and giving presentations is typical, and spending at least 20 hours per week in the lab would be quite common. Expectations for some work/study time early, late or over the weekend are not unusual.

Typically, 80+% of students match to a lab at the end of three rotations, and nearly all match to a lab after four rotations. Students should be aware that most students join a lab in mid-Spring, and many faculty members may not have additional funding or space to commit to additional students after that time. Advisor selection is a momentous decision in the career of the graduate student, and it should not be rushed. On the other hand, while most students who do not find an advisor in three rotations are still successful, students must also accept the practical reality that it gets harder to find an advisor as time goes on after three rotations.

The student-advisor matching process works best if all the necessary facts are out in the open and there is clear communication. Students who are not interested in joining a lab after a rotation should say so to free up the advisor to consider additional students; conversely, if you're pretty sure you want to join the first lab you rotate in, say so. Similarly, faculty should be up front about the number of students they intend to take, how many other students are interested in the lab, the amount of funding available, and how the student will be funded over the course of her or his career. Faculty should not host lab rotations if they are not certain that they will have funding available at the time of the rotation. Students should inquire about these things if the advisor does not volunteer the information.

Faculty should be realistic about their ability to support their students both academically and financially. Taking more than 2 or 3 first year students in a year is likely to be risky for all but a few labs that have the kind of funding and infrastructure to support that. OSBP is a large program with many more faculty interested in taking students than the program can bring in; when in doubt, it is more helpful not to take a risk with the student's advising and future support.

e. Student-Advisor Separations

The vast majority of students complete a degree with the advisor they select first. Inevitably, some student-advisor relationships run into problems that cannot be easily resolved.

Student-Initiated Separation

If a student wishes to terminate the relationship with his or her advisor, the student must request a meeting with the GSC Chair, or if this represents a conflict of interest, another member of the Graduate Studies Committee. This meeting will be held in confidence. If the student so desires, the GSC Chair (or another member of the Graduate Studies Committee) will attempt to arbitrate differences between the student and the advisor, and may involve the Student Advisory Committee. If the student does not wish to confront her or his advisor, she or he will be allowed to leave the advisor with no stated reason. However, all research materials, complete copies of notebooks, and any supplies provided by the advisor must remain with the advisor.

The student must transfer to a new advisor (who is a member of the OSBP faculty) during the same academic term as the separation. The program bears no responsibility for financial support of the student during the separation. The appointment of the student must be maintained through the end of the term. However, it is reasonable for the support of the student to transfer to the new advisor before the end of the term when that is practical. If a student does not identify a new advisor affiliated with the program within the academic term of the separation, the student must leave the program. OSBP does not have guaranteed funds to support students who have separated from their preceptor.

Advisor-Initiated Separation

If an advisor wishes to terminate the relationship with a student (resign as preceptor), he or she must follow the rules of the Graduate School and the rules of the program. OSBP requires that the advisor must document dissatisfaction with a student's performance or progress in a written letter to the student, with a copy sent to the GSC Chair. If unsatisfactory progress in research is an issue, this must be documented by a U grade in the advisor's graduate research course under which the student is registered. A meeting of the student's Advisory Committee should be held to allow the student the opportunity to present his or her progress, and the student must meet with the GSC Chair or the full GSC as deemed necessary. If the advisor has documented her or his dissatisfaction with the student as above, and no resolution can be found, the advisor may resign as the student's preceptor in writing to the student and the GSC Chair.

In general, the student's appointment must be maintained to the end of the term. Graduate School rules state that GA appointments may not be terminated prior to the end of the appointment period without written approval from the Graduate School, and only for a limited number of reasons (see Section III and *Graduate School Handbook* Section 9.2). The appointment period is determined by the contract signed between student and advisor kept with the hiring department, and may be set for a specific academic term or annually, as defined by their appointment letter. Terminations at the end of the appointment period do not require permission of the Graduate School.

When the advisor resigns as the student's preceptor, the GSC will determine whether the student will be allowed to identify a new advisor, or whether further enrollment will be barred after the end of the term. Students who receive two U grades in graduate research courses will be dismissed from the program (see Section V). If the student is allowed to seek a new advisor, they must identify an OSBP faculty member as preceptor by the end of the term in which the advisor resigned, or leave the program. OSBP does not have guaranteed funds to support students who have separated from their preceptor.

f. Student Advisory Committee

In the Summer term at the end of the first year, after the advisor assignments are made, students consult with their new advisors to select a Student Advisory committee. The purpose of the advisory committee is to assist in advising the student of appropriate elective courses to take in order to complete the doctoral program; to provide advice on scholarly matters throughout the student's tenure at the university, and to review the annual progress of the student. Students should meet with their Advisory Committee at least once a calendar year for this purpose. The Student Advisory Committee also serves as the Candidacy Examination Committee, the Dissertation Committee, and the Final Oral Exam Committee. *Note that although the Graduate School requires only the advisor and two Graduate Faculty members for the Dissertation Committee and Final Oral Exam Committee, the program requires the entire Student Advisory Committee, except by petition to the GSC.*

The advisory committee consists of the student's advisor and three additional faculty members. At least two of the additional members must be members of the OSBP faculty, and all three must be members of the Graduate Faculty of the University. Students may optionally appoint a fifth member to the advisory committee who is not required to be a member of the Graduate Faculty, but permission of the GSC and the Graduate School is required to appoint a Non-Graduate Faculty member (see the Committee and Examination Petition on the gradforms.osu.edu web site).

Students submit their choices in writing to the GSC Chair (through osbp@osu.edu) for review by June 30 of their first year. The student or advisor must ask potential members to serve on the committee before submitting their choices to the program. The GSC may request changes to the committee, or will provide confirmation of the committee choices to the student and advisor. The Committee Selection form is filled out and signed electronically as directed on the OSBP web site (see the Handbook, Forms, and Deadlines page), and is typically approved by the GSC Chair on behalf of the GSC unless there are concerns about the committee assignments. The student will make the Graduate School aware of his or her committee members when the student schedules the candidacy exam. The Application for Candidacy must be filled out and approved electronically through the gradforms.osu.edu web site.

g. Post-Candidacy Progress Report

Students who have completed their candidacy exam are required to meet with their Advisory Committee at least once per calendar year to complete and submit the Post-Candidacy Progress Report based on the findings of each meeting. These meetings should generally occur in the Summer or Autumn term and the report is due by December 31 of each post-candidacy year. No report is required immediately after advancing to candidacy; the candidacy exam serves as the advisory committee meeting in the second year.

Advisory Committee meetings should explicitly address a schedule for publication of first author papers and graduation, as well as career goals and actions that can be taken to further those goals. If the report indicates that unsatisfactory or unreasonable progress is being made towards timely degree completion upon review of the report by the GSC Chair or if a student receives unsatisfactory grades in her or his graduate research course, then action will be taken as outlined in Section V on Academic Standards. A Microsoft Word .doc format version of the report form is available on the OSBP web site.

VII. Doctoral Degree

a. Curriculum

The doctoral curriculum consists of core courses, biochemistry electives, first year student orientation, student seminar and colloquium in the first and second years, and laboratory rotations.

Students must take **core courses** in molecular biology, protein and nucleic acid structure and function, enzymes, and membranes and lipids (9 credit hours). Students must enroll in all of these courses in the first year. Students may not drop any of these courses without the permission of the GSC Chair. Students who are allowed to drop a core course must successfully complete it in the second year to qualify for candidacy. The courses currently accepted as OSBP core courses are listed in Appendix B.

A minimum of **6 credit hours of approved graduate biochemistry electives** is required. Typically these are at the 6000-level or above, and only 3 credit hours may come from lab courses. These courses should generally be completed by the end of the second year. These courses must be graded A-E. Students may choose from the list of approved electives provided in Appendix C and updated frequently on the OSBP website. Students wishing to count electives that are not on the approved list towards their required biochemistry elective credits must submit the proposed elective course description (syllabus) with an explanation from the student and advisor as to why the course is necessary towards coursework completion of the doctoral degree to the GSC Chair. Students are allowed and encouraged to take additional electives outside the field of biochemistry that will contribute to their understanding of their research projects (such as statistics or math), but these will not be approved for the required biochemistry elective credits.

First year students must sign for up the **First Year Student Orientation** (OSBP 7600, 1 credit hour), which is offered in the Autumn semester and graded on an S/U basis. This is a special mentoring seminar course given by the faculty of OSBP and partner graduate programs.

First and second year students must take the **Student Seminar** (OSBP 7700, 1 credit hour) in the Autumn and Spring semesters. First-year students should generally enroll in OSBP 7700.01, graded on an S/U basis in the Autumn, and OSBP 7700, graded on an A-E basis in the Spring (when they will deliver presentations). Second-year students should generally enroll in and OSBP 7700, graded on an A-E basis in the Autumn (when they will deliver presentations), and OSBP 7700.01, graded on an S/U basis in the Spring. Deviations from this schedule of enrollment may occur if needed to balance student presentations across the two semesters.

First and second year students must take the **Colloquium – Advanced Biochemistry Topics** OSBP 7890

class (1 credit hour), for participation in the MLS Seminar Series. After the second year, students must register in some seminar series approved by their advisor each Autumn and Spring term; see below.

First year students will also enroll in 3 credit hours of OSBP 7193 for each **laboratory rotation** (and for the balance of the Spring semester; thus, 6 credit hours per semester, see Section VI.b). First year students should also enroll in the necessary number of credit hours (usually 3-6) of OSBP 7193 under the GSC Chair to bring the total course load to 18 credit hours in the Autumn and Spring semesters. The credits under the GSC Chair are awarded for progress toward of first-year program requirements.

A minimum of **80 graduate credit semester hours** (or 50 credit hours beyond the master's degree) is required to graduate with a Ph.D. See Section IV for registration guidelines by student status.

All curricular decisions are the responsibility of the GSC, with the advice of the standing committee on Curriculum.

b. Seminar and Symposium Requirement

After the second year, all students must participate in some formal colloquium or seminar series every academic semester (Autumn and Spring). The colloquium must be associated with a class, and students should register for 1 credit of the class per semester.

Students are required to give a public oral research presentation during their third year. This requirement can be satisfied by presentation in multiple different venues as long as the talk is open to a broad audience (such as in a departmental seminar series, at the Life Sciences IGP symposium, or at a large scientific meeting). Presentations at group meetings are not acceptable to fulfill this requirement. A limited number of slots for OSBP 3rd year presentations may be available through the Department of Chemistry and Biochemistry's biochemistry division seminar (CHEM 8892). Students who are interested in presenting in this course to fulfill the requirement should contact the OSBP Director.

All students must register for and attend the annual Life Sciences IGP Symposium each year. The symposium is typically during May. Students in the fourth year and beyond must submit an abstract and present a poster or oral presentation.

c. Qualifying Policy

After completing the core courses, each student's record is evaluated by the GSC Chair. Students are normally expected to complete the core courses by the end of Spring Semester of the first year, and they must be complete to advance to candidacy (i.e., before the oral candidacy exam occurs). In order to remain in good standing and to be eligible to take the Candidacy Examination, students must have a cumulative grade point average of at least 3.0 in all graduate courses (i.e., the student cannot be on academic probation when they advance to candidacy). Students who have not completed the core courses or students who do not have a 3.0 grade point average will not be allowed to take the Candidacy Examination.

d. Candidacy Examination

All OSBP students must advance to candidacy by the end of the second year (i.e., no later than the last day of Summer term their second year). The Student Advisory Committee serves as the Candidacy Exam Committee, and the Advisor serves as the chair of the committee. The exam contains both written and oral portions, and the written exam must be evaluated before the oral exam; however, candidacy is determined based on both portions together.

Written Portion

The written portion of the exam is a research proposal focusing on the student's proposed dissertation topic. The proposal should be in the general format of a predoctoral fellowship application, such as an NIH F31 fellowship (as defined by the Candidacy Committee), and it should be 8-10 pages of 11 point Arial text (including figures but exclusive of references).¹ The proposal should include three specific aims, and at least one of these aims must be a novel and creative aim (the "independent aim") developed by the student, that is not assigned by the advisor, or present in the advisor's grant proposals. To be clear, the entire proposal must be the independent work of the student in his or her own words; the independent aim must be a completely independent idea of the student. The specific aims page should be submitted to the exam committee for their approval, and the advisor should provide assurance to the rest of the committee that one of the aims is completely independent. The committee will evaluate the aims document within one week. If the aims are deemed unacceptable, the student will return revised aims to the committee within one week.

After the aims are approved, the student should submit the complete proposal to the committee within four weeks. Each committee member will provide an assessment and comments on the proposal within two weeks using the OSBP Candidacy Written Exam Evaluation Form found on the OSBP website. Completed forms will be sent ***directly to the advisor, who will communicate the consensus evaluation of the committee (including all comments) to the student and the rest of the committee.*** The committee will choose one of these options when evaluating the written proposal: (1) Major Rewrite; (2) Revise: minor changes are required to the document; or (3) Approved as submitted. This process is repeated for each required revision until the document is approved.

It is left to the discretion of the committee how many revisions will be allowed, but the advisor should consult with the GSC by contacting the GSC Chair if more than one Major Rewrite is required. According to the *Graduate School Handbook* Section 7.5:

If, based on evaluating the written portion, the advisor or another member of the candidacy examination committee see no possibility for a satisfactory overall performance on the candidacy examination, the student may be advised to waive the right to take the oral portion. The candidacy examination committee may not, however, deny a student the opportunity to take the oral portion.

If the student decides to waive the right to take the oral portion, a written statement requesting the waiver must be presented to the candidacy examination committee. In such a case, the candidacy examination committee records an "unsatisfactory" on the Report on Candidacy Examination form

¹The GSC intends that students will be able to edit this document to submit predoctoral fellowship applications, when allowed, but evaluation of the student for candidacy is the most important purpose of the document.

and submits a copy of the student's waiver request to the Graduate School.

Oral Portion

When the committee approves the final version of the written proposal, the student may then formally schedule the Oral Examination through the graduate school. It is permissible to reserve a tentative date for the exam with the committee before the final written approval is obtained, with the understanding that the date may need to be rescheduled if the required approval is not obtained from the committee prior to the two week deadline mandated by the Graduate School (see below). The Application for Candidacy form must be filled out and approved electronically through gradforms.osu.edu. The form must be filed at least two weeks before the exam—the *Graduate School makes no exceptions to this rule*. The oral portion normally must be taken within one month of approval of the written portion, and it must occur during normal University business hours, Monday through Friday and exclusive of University holidays.

The oral portion of the candidacy exam lasts approximately two hours. According to the Graduate School Handbook Sections 7.4 and 7.6, "The candidacy examination is a test of student's comprehension of the field, allied areas of study, capacity to undertake independent research, and ability to think and express ideas clearly... Questioning of the student should occupy the entire period of the examination." The oral exam is a general exam that should focus on the topic of the proposal and the larger field of biochemistry. The committee will ask the student to explain the proposal, but this explanation will be interrupted by questions throughout the exam. The entire committee must be present for the entire exam.

The Report on Candidacy must be filed through gradforms.osu.edu. It is important that all committee members are present for the discussion of the exam results (with the student out of the room). The decision of the committee, which is based on both the written and oral portions together, should be communicated to the student in person after this discussion, and each committee member must enter their decision online within 24 hours. The decision of the committee must be unanimous for approval for the overall decision to be Satisfactory. The *Graduate School Handbook* establishes policy for what happens if the overall result is Unsatisfactory (see Section 7.7). The Graduate School will appoint an outside Graduate Faculty Representative for the exam if a second attempt at the oral exam is required.

Candidacy Rubric

Completion of the OSBP Candidacy Rubric is a requirement for all OSBP students completing candidacy and the results will be used for program assessment. The Rubric forms are available on the OSBP webpage and students should bring printed copies for each candidacy committee member to the oral exam. Each member of the candidacy examination committee must complete the assessment page, which will be collected by the student immediately after the exam. Students are responsible for submitting the signed pages to the OSBP office (either hard copy or scanned to osbp@osu.edu) by 5pm the day after completion of the candidacy exam.

The information collected on the candidacy rubrics are NOT used to evaluate the results of any specific exam, but will be aggregated for all students in the program to enable assessment of student learning, particularly focused on the learning outcomes that have been established for all students in OSBP. OSBP

expects most students to achieve at least medium performance in the majority of categories listed on the candidacy rubric, but it remains solely up to the committee's discretion to decide the result of an individual student's exam. Committee members are nevertheless strongly encouraged to incorporate their evaluations into post-exam discussions with the students to help students identify areas of strength and weakness for their own improvement.

e. Candidacy Exam – Best Practices

The advisor is the chair of the exam committee, and is responsible for coordination and communication of ALL decisions regarding the candidacy document to the rest of the committee and the student. All communication, from either the student or committee members, should be copied to the advisor.

Students should review Appendix D, which contains proposal writing information from the NIH web site. It is common, but not required, for one aim to describe work in progress, one aim to describe a related project or a significant extension that will round out the dissertation, and the final aim to be related but a significant expansion outside of the work of the preceptor's laboratory. For example, a student in a structural biology lab might consider proposing a cell-based or animal model. While the independent aim must be scientifically sound, it is not expected that the student will necessarily carry out the aim.

The point of the review of the specific aims page is not to get the exact wording perfect; rather, it is to approve the topics of the written exam. It is appropriate to identify issues that need to be addressed in the full proposal at this time. It makes most sense for the student to get comments from all committee members and produce a single unified revision of the aims, as needed. *It is strongly suggested that second-year students submit the aims page to the committee in the Autumn semester and obtain approval by the end of the calendar year.* Faculty often travel during semester breaks and summer, and initiating the process on time is the best way for students to proactively avoid any scheduling delays that could interfere with timely completion.

Each committee member should submit his or her review of the full proposal using the required Candidacy Written Evaluation Form to the chair (advisor) with the recommendation (major rewrite, revise, approve), **and the chair should communicate a single decision along with all comments to the student.** It is acceptable for each committee member to copy her or his individual comments to the entire committee and/or the student.

This is not an editing process; it is an exam. The student should not simply send a bunch of minor edits to each individual faculty member as they are suggested. The process should be coordinated by the chair, and the committee should speak in one voice about each revision. It is acceptable, but not required, for the student to discuss critiques with committee members for clarification. It is important that this process is not a clinic on writing proposals; it is an examination to determine which students are capable of writing and defending a Ph.D. dissertation. On the other hand, advancement to candidacy is determined by the totality of the written and oral portions of the exam; an approvable proposal is not necessarily flawless and may contain issues to be addressed as questions in the oral portion of the exam.

It is strongly suggested that second-year student students have the written portion of the exam approved no later than the end of Spring semester.

It is permissible, when practical, for the chair to put a tentative date on the calendar for the oral exam at any time during the process. The Application for Candidacy form cannot be filed until the committee approves the written portion of the exam, and the oral exam cannot be held until 2 weeks after the form has been filed. It is therefore important for the student and advisor to consider a realistic timeline for the writing, evaluation, and editing process and to avoid any appearance of influencing the exam results to meet a pre-determined timeline.

The oral exam cannot include an uninterrupted presentation of the proposal; the entire period must consist of questions from the committee. Consequently, while handouts or PowerPoint-type slides are permitted, they should be limited to approximately five (5) slides and used throughout the exam, not as a presentation at the beginning of the exam period.

Committee members should either enter the results at the exam on a laptop or mobile device in the exam room immediately after the discussion, or return to their offices and post the results as soon as possible.

It is highly recommended that the oral exam is completed by the end of May. Due to faculty travel, it becomes very difficult to schedule oral exams in the summer.

f. Post-Candidacy

After advancing to candidacy, students will continue working on their original research projects, which will be the basis of the dissertation.

OSBP requires continuous enrollment and appointment of its students in all terms. Post-candidacy students should enroll in 3 credit hours per term. Post-candidacy students should generally enroll mostly in 8999-type research courses, and must enroll in 1 credit hour of a seminar course each Autumn and Spring semester. Third year students must present a public oral research presentation (see Section VII.b). Post-candidacy students must continue to attend the IGP Symposium each year, and students in the fourth year and beyond must present a poster or oral presentation. It is typical for post-candidacy students to attend workshops and conferences, present posters and oral presentations at regional and national meetings, publish papers, and begin drafting the dissertation. OSBP students must publish at least one original first author research paper to graduate (see Section VII.h).

Post-candidacy students must meet with their Advisory Committees at least once a calendar year (starting the year after advancement to candidacy), typically in the Summer or Autumn term, and turn in a Post-Candidacy Progress Report to the OSBP office by December 31 of each year (see Section VI.g). The report should be turned in within a week of holding the committee meeting. These meetings should include an explicit discussion of the timeline for graduation, including specific recommendations concerning the completion of the dissertation. They should also include an explicit discussion of the student's career goals and action items that will be pursued to further those goals.

Students must graduate within five years of advancement to candidacy, or the student's candidacy will be canceled. Procedures for re-admission are specified in the *Graduate School Handbook* Section 7.8. In general, the OSBP GSC will not allow re-admission to candidacy. In the rare case that a supplemental candidacy exam is approved, the advisor must consult with GSC on the nature of the exam, and the GSC has final authority in determining its format. Students re-admitted to candidacy must graduate within two years, but the GSC may (and likely will) limit the second candidacy period to a shorter term.

The average time to graduation from OSBP over the preceding five years was 5.8 years in 2019. We anticipate this number will decrease with the earlier (second-year) candidacy mandated starting in 2012, in part because all students must now graduate by the end of the seventh year to avoid cancellation of candidacy. The GSC believes that the significant majority of students should be able to graduate in 5-6 years.

g. Dissertation and Final Oral Exam

When the student and advisor, in consultation with the Student Advisory Committee, feel the dissertation is ready to be defended within one term, and all other requirements have been met, the student must file the Application to Graduate, which is filled out and approved through gradforms.osu.edu. The Dissertation Committee is the Student Advisory Committee. (Note that OSBP requires the full Advisory Committee for this, even though the Graduate School only requires the advisor and two other Graduate Faculty members.) The form must be filed by the date established by the Graduate School early in the term (the third Friday). On the form, the student must indicate if she or he plans to defend and file the dissertation by the "regular" deadlines, which results in conferral in the same term, or by the end-of-semester (EOS) deadline, which results in conferral in the next term. If the student indicates he or she will graduate by the regular deadline, but does not file until some date after that but before the EOS deadline, email the Graduate School Graduation Services at Grad-SchoolGraduationServices@osu.edu to notify that there is a change in your expected graduation. Consequently, it is usually better to indicate filing by the regular deadline, and then inform the Graduate School of the delay if the deadline. You can always move your graduation date later, not earlier, once an Application to Graduate is filed.

OSBP also requires that the Ready-to-Graduate Checklist be filled out, signed by the student and advisor, and turned in to the OSBP office at least 48 hours before the Application to Graduate deadline. The Checklist can be found on the OSBP web site on the Handbook, Forms, and Deadlines page. Note that a copy of the student's advising report and a copy of the student's original first-author publications must be included with the Checklist.

When a complete draft of the dissertation is ready, it must be provided to the Dissertation Committee, who will judge whether it is of sufficient merit to warrant holding the final oral exam. Students are responsible for ensuring that committee members have sufficient time to evaluate the draft dissertation. The draft document should be provided to the committee to allow no less than one week for this evaluation, but possibly more, depending on committee members' availability. Once the draft is approved by the committee, the student must file the Application for Final Exam through gradforms.osu.edu. This form must be approved by all the committee members no later than two weeks before the scheduled date of the Final Oral Exam—the Graduate School will not make any exceptions to this rule. The student must also bring a copy

of the approved complete draft to the Graduate School for format pre-approval no later than two weeks before the Final Oral Exam date. Note that formatting guidelines and template files are available at the Graduate School web site; follow these guidelines carefully to avoid filing delays.

An OSBP student's dissertation may include work of a collaborative nature that was completed with contributions from colleagues within or outside of Ohio State. If the results of collaborative studies are included in the dissertation document, the defending student's individual contribution to the work must be clearly indicated, and appropriate acknowledgements of additional contributors must be made. Although the format of this separate author contributions section is decided at the discretion of the individual dissertation committee, OSBP strongly suggests including explicit author contribution statements placed prominently at the beginning of each dissertation chapter to clarify the role that the defending student and others have played in the conduct of the thesis work.

The Final Oral Exam Committee consists of the Dissertation Committee (i.e., the Student Advisory Committee) plus a Graduate Faculty Representative (GFR), assigned by the Graduate School. The approved draft of the dissertation must be provided to the GFR as soon as possible after he or she is assigned.

The final oral exam lasts approximately two hours. The exam should consist of a presentation of the dissertation followed by a private (student and Final Oral Exam Committee only) period of questions and answers for at least one hour. The presentation portion may be public or private, but when practical, OSBP requires the presentation portion to be public. The OSBP program coordinator should be notified when the date, time and location of the presentation has been set, in order to provide sufficient notice for publication to the entire OSBP community. OSBP students and faculty are encouraged to attend dissertation presentations whenever possible. The exam includes but is not limited to the dissertation; it should test the quality of the research as well as its originality, independence, significance and perspective in field. The work must be deemed by the committee to be a significant scholarly contribution to knowledge in biochemistry.

The final oral exam must take place during University business hours. All members must participate for the entire exam. The decision discussion occurs in private in the absence of the student. The decision of the committee is considered to be Satisfactory only when the committee unanimously votes affirmatively. The GFR participates in the decision discussion and vote. The first question of the discussion should be whether the GFR thought the exam was fair and of the quality expected by the Graduate School. Committee members must record their votes on the Report on Final Examination on gradforms.osu.edu, either on a laptop or mobile device after the decision is reached, or immediately thereafter upon the member's return to his or her office. The result must be recorded within 24 hours, but the student should be informed of the result in person immediately after the discussion. If the student fails the final oral exam, the committee must determine whether a second exam may be scheduled. If not, or if the student fails the exam a second time, the student will be dismissed from the Graduate School. A second exam, if necessary, must have the same exam committee.

After the exam, the student must make any changes required by the Dissertation Committee, and that committee may then give final approval, which is indicated by the Report on Final Document through

gradforms.osu.edu. Committee members other than the advisor, who do not wish to see an amended document, should approve the Report on Final Document at the same time as the Report on Final Examination to prevent the student from missing the filing deadline. Once the advisor approves the final draft of the dissertation on the Report on Final Document, the dissertation must be uploaded to the OhioLINK Electronic Theses and Dissertations web site. The Report on Final Document must be fully approved and the Graduate School must approve the final document for formatting for the dissertation to be considered filed.

Students who pass the oral exam or file the dissertation after the “regular” deadlines, but by the EOS deadline (the last business day prior to the first day of classes of the following term) will have their degree conferred in the following term, but do not need to register in the following term. Note that students may only participate in Commencement in the term of conferral.

h. Graduation Requirements

In order to graduate, students must (1) have a cumulative GPA of at least 3.0 in all graduate classes; (2) have completed all required courses, including core and biochemistry elective classes; (3) have final grades recorded for all courses by the published deadline; and (4) have met all requirements of the OSBP doctoral degree described in this handbook, including publication of at least one original peer-reviewed first-author research paper by the time of graduation. Co-first author publications are acceptable. Review articles are not acceptable. The paper must be published, in press, or unconditionally accepted; submitted manuscripts, manuscripts “in preparation,” and theses or abstracts may not be counted toward the publication requirement.

The GSC Chair may provisionally sign the Application to Graduate if a first-author paper is not yet accepted by the deadline for that form, but the paper must be accepted by the regular “approved thesis and dissertation documents” deadline (as published by the Graduate School) for the student to graduate that term. If the paper is accepted too late to participate in regular graduation, but before the EOS deadline, the degree can only be conferred on an end-of-semester basis—meaning, the degree is actually conferred in the next term, and the student is not eligible to participate in Commencement until the term of conferral. If the GSC Chair is not confident that the paper will be accepted by the end-of-semester deadline (for example, if a draft of the paper is not available by the deadline to file the Application to Graduate), she or he may decline to approve the application. Note that if the first author paper is not accepted by the EOS deadline, OSBP cannot certify the degree. In that case, the student must be registered for the following term, and all subsequent terms until the paper is unconditionally accepted, for the degree to be conferred.

i. Leaving the University

Be advised that any student who completes all graduation requirements and chooses to leave their graduate associate position prior to the end of the semester will be charged by the university for the remaining tuition and fees for that semester. If you are unable to make arrangements with your advisor to stay until the end of the term or have a new position that requires you to leave the university earlier than the end of the term, please contact the OSBP director and program coordinator as soon as possible to attempt to make alternate arrangements with the Graduate School to avoid any additional fees.

j. Annual Activity Report

All students are required to submit an Activity Report at the end of each academic year that describes honors and awards, fellowship and grants, publications, presentations, workshops and conferences attended, and other notable events in the format of a *curriculum vitae*. The report is due to the OSBP office (or a scan to osbp@osu.edu) by May 15. Format details are available on the Forms and Deadlines page of the OSBP web site.

VIII. Master's Degree

OSBP is a graduate program leading to a doctoral degree. By rule of the Graduate School, students who pass the candidacy examination may earn a master's degree if (1) it is recommended by the student's advisor and the GSC; (2) the student does not already have an equivalent master's degree in the same field; (3) the student files the Application to Graduate through gradforms.osu.edu by the published deadline; (4) graduation deadlines set by the Graduate School are met; and (5) candidacy has not expired. It is possible to receive the master's degree in the same term as passing the candidacy exam by filing the Application to Graduate on gradforms.osu.edu by the published deadline (the third Friday of the term) at the beginning of the term (which can be provisionally approved by the GSC Chair). See Section 6.1 of the *Graduate School Handbook*.

In general, the program does not recommend filing for the master's degree if the student intends to continue on to complete the doctoral degree.

Students who have not advanced to candidacy are not eligible for a master's degree in the program.

IX. Vacation and Work Policies

a. Vacation Policies

Graduate students do not get extended breaks between terms as undergraduates do; graduate student appointments cover the entire calendar year. Graduate students may take holidays, vacations and leaves within the rules set by the University, Graduate School, program, appointing unit, and advisor. In general, students should not plan to take vacations during classes in the Autumn and Spring semesters, or during May, to facilitate required attendance in course work, seminars, and the annual IGP symposium.

First year students must be in town from the first day of orientation (typically 10 days before Autumn classes begin) to the last day of final exams in the Autumn, and from the first day of classes in the Spring semester to the last day of the first month of the summer session (typically around the end of May). For students who begin in the Autumn, OSBP is the appointing unit for the summer following the spring term. Vacations during this period are at the advisor's discretion, but in general students should not take more than a total of three weeks (15 working days) of vacation in the first year. Students who do a lab rotation in the early-start Summer term before the first Autumn semester must work in the lab at least 9 weeks,

starting from June 1 by policy of the Graduate School, and must be in town for the first day of orientation.

After the first year, vacation policies are at the discretion of the advisor and the appointing unit, so long as they do not conflict with Graduate School, program or curricular requirements. As point of reference, full time Ohio State professional staff members generally get 10 paid holidays and accrue 12 days of vacation per year.

Please inform the OSBP office (osbp@osu.edu) of vacations in excess of two weeks. International students should inform the OSBP office of any trips outside of the U.S. Please provide contact information in case you need to be reached during such extended trips.

b. Work Policies

OSBP students may not hold outside employment without the permission of the GSC (i.e., by petition). Outside employment is generally not allowed. Even if the GSC grants permission, such employment is at the discretion of the advisor and subject to the policies of the appointing unit.

c. Family and Medical Leave

Family and medical leave policies are governed by the Graduate School and the Human Resources policies of the appointing unit. It is important to understand that even GA-appointed students are not eligible for the protections for workers under the Family and Medical Leave Act (FMLA), because GA appointments are 50% appointments and do not exceed 1,250 hours per year. Moreover, Ohio State faculty and staff leave policies do not apply to students.

GAs with at least a 50% FTE appointment, who have completed at least two consecutive semesters of GA appointment and are in good academic standing, are eligible for up to 6 weeks of paid leave for birth mothers and up to 3 weeks of paid leave for fathers and adoptive parents, up to the last day of the appointment. Similarly, qualified GAs are eligible for up to six week of paid leave (up to the end of the appointment) for serious health conditions or to care for a family member with a serious health condition. “Paid leave” here means maintenance of 100% of stipend, fee authorization and other benefits associated with the appointment. Short term absences (usually 1-3 days but possibly up to 2 weeks as warranted) are generally available to GAs, fellows and trainees for personal illness or in the event of the death of an immediate family member with the permission of the advisor and other relevant immediate supervisors (such as a TA coordinator). See Appendix E of the *Graduate School Handbook* for more information.

Although GAs are not governed by the same benefits rules as faculty and staff, OSBP encourages advisors and appointing units to work to achieve reasonable and equitable solutions for student family and medical issues. As a point of reference, full-time biweekly staff at Ohio State accrue the equivalent of 15 sick days per year. FMLA entitles eligible 60+% FTE employees who have worked longer than a year to take 12 weeks of unpaid, job-protected leave per year for birth of a child, adoption, care of a spouse, child or parent who is seriously ill, or serious illness of the employee; Ohio State extends this leave to all 50+% FTE faculty and staff. Full-time Ohio State faculty and staff are eligible for six weeks of paid parental leave for a birth mother or three weeks of paid leave for a father or adoptive parent.

d. Effects of Fellowships and Other Funding

Fellows and trainees funded by external agencies are also subject to vacation, work and leave policies established by the funding agency.

X. Safety

It is the responsibility of the research advisor, including laboratory rotation advisors, to ensure that OSBP students have fulfilled any necessary safety training requirements before beginning work in the laboratory. However, students should proactively verify at the beginning of each rotation and upon joining a lab that the necessary requirements have been met.

At a minimum, students should take the EHS Online training modules deemed necessary by the advisor in accord with relevant University, college and departmental policy. OSU requires that all lab personnel take the OSU Building Emergency Action Plan and Laboratory Standard Training modules. OSBP additionally recommends the Personal Protective Equipment and Chemical Safety modules. Biological Safety Training for BSL2, Bloodborne Pathogens Initial Training, and Infectious Waste Disposal should also be considered. The advisor must ensure that students receive all required training, including additional chemical safety, biosafety, laser and radiation safety, electrical safety, or in connection with animal or human subjects work or other specialized research.

The Department of Chemistry and Biochemistry offers a 1 credit hour laboratory safety course (CHEM 6781) as an evening course during Autumn semester Session 2. Students interested in enrolling in this course should consult the OSBP Director.

XI. Ethics and Misconduct

a. Academic and Research Misconduct

Students must be familiar with standards for ethical scientific and academic conduct set by the University and accepted broadly both nationally and internationally. OSBP 7600 forms the core training for responsible conduct of research, and conducting research with rigor and reproducibility. Additional training in these areas may be required by the advisor, training program, or other support mechanism (such as a fellowship sponsor).

All faculty, staff and students who conduct research at Ohio State are required to complete Responsible Conduct of Research (RCR) training by the CITI RCR online course. Students are provided with a link to the required training module during OSBP orientation (<http://orc.osu.edu/regulations-policies/rcr/>) and instructed to complete the online course for biomedical research prior to beginning their first laboratory rotation.

The Code of Student Conduct is available at the Office of Student Life website (studentlife.osu.edu/csc) and should be reviewed by all students (especially rule 3335-23-04 Prohibited Conduct). Academic

misconduct allegations are adjudicated by the Committee on Academic Misconduct (oaa.osu.edu/academic-integrity-and-misconduct). Materials for all OSBP program requirements are expected to be the student's own work and in the student's own words, with proper attribution of borrowed ideas. Plagiarism is the representation of another's words or ideas as one's own, and it is prohibited by the Code. Plagiarism includes unacknowledged word-for-word use or close paraphrasing of another person's work, or unacknowledged use of another person's ideas.

Research misconduct means fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results. The University Policy and Procedures Concerning Research Misconduct is available at the Office for Research website (http://orc.osu.edu/files/Misconduct_Policy.pdf) and should be reviewed by all students. Research misconduct allegations are adjudicated by the Office of Research Compliance at the direction of the Vice President for Research.

Sanctions for academic misconduct in graduate classes or program requirements (such as candidacy or the dissertation), or for research misconduct, are likely to entail dismissal from the program and University, but in some cases may involve failing grades, probation, or other measures.

The Graduate Student Code of Research and Scholarly Conduct (Appendix C of the *Graduate School Handbook*) states:

Graduate students and Graduate Faculty aspire to professional behavior that is consistent with the highest ethical and moral standards. The Graduate School at The Ohio State University expects that graduate students will demonstrate responsibility and integrity in pursuing their creative and scholarly interests. The academic enterprise is dependent upon such behavior. Graduate students are responsible for learning about appropriate standards for ethical research and scholarly conduct and for following all university policies related to ethical research and scholarly conduct.

When graduate students join the Ohio State community, they become members of disciplinary, scholarly, and professional communities that extend beyond the university. Graduate students are expected to learn, respect, and abide by the professional codes of ethics and responsibilities that are commonly accepted in their field of study or area of research. These codes include but are not limited to the following: a responsibility to contribute an original body of work to one's chosen discipline and the recognition that one's work is based on the work of others which must be respected and properly acknowledged. Graduate students also have the responsibility to treat university faculty, staff, and other students respectfully and professionally.

Graduate Faculty, advisors, and graduate programs should actively encourage their students to participate as members of their chosen disciplinary, scholarly, and professional communities. Graduate students should be encouraged to seek and share knowledge wherever and whenever possible. Academic advisors and other faculty members should educate graduate students through example and discussion, addressing such issues as academic honesty, research, publication, recruitment, and hiring practices, and applicable fellowship and graduate associateship responsibilities. Disciplinary codes of ethics and norms should be discussed among graduate students and faculty. Such communication is a means of setting high standards of behavior in

graduate study and beyond.

b. Responsible Research Practices

Advisors are responsible for assuring that students receive proper training for the ethical conduct of research involving animals and human subjects, and in the conduct of research involving recombinant DNA, or hazardous or regulated biological materials. Information about the Institutional Animal Care and Use Committee (IACUC), Institutional Review Board (IRB), and Institutional Biosafety Committee (IBC) and their associated policies, procedures and training can be found on the web site of the Office of Research Compliance (orc.osu.edu).

c. Sexual Harassment and Title IX

The University policy on sexual misconduct states:

Members of the university community, vendors, and visitors have the right to be free from all forms of sexual misconduct. Sexual misconduct is conduct of a sexual nature that is nonconsensual, or has the effect of threatening, intimidating, or coercing a person. Sexual misconduct includes sexual harassment, sexual violence, and relationship violence. Sexual misconduct impedes the realization of the university's mission of distinction in education, scholarship, and service. All members of the university community are expected to conduct themselves in a manner that does not infringe upon the rights of others and maintain an environment free from sexual misconduct.

All university employees have an obligation to report sexual assaults. Many OSU employees in human resources and supervisory positions (including faculty members) have an obligation to report sexual harassment. The university strongly discourages romantic and/or sexual relationships between faculty and graduate students in the same department. Relationships between supervisors and employees or between students and others in a supervisory, teaching, evaluation, or advising position are prohibited. The full policy on sexual misconduct can be found on the Human Resources (hr.osu.edu) or Title IX (titleix.osu.edu) websites.

XII. Petitions, Grievances and Crises

a. Petitions

Petitions to deviate from OSBP policies stated in this handbook should be sent to the GSC Chair and are decided by the GSC.

b. Grievances

Grievances related to program activities and requirements should be sent to the GSC Chair, or, if that represents a conflict of interest, another member of the GSC (typically the Associate Director). The GSC Chair (or other GSC member) will attempt to resolve the grievance, with the help of other GSCs members as necessary. The GSC Chair or other GSC member contacted will keep the initial discussion of the

grievance confidential; however, the GSC Chair or other GSC member will break this confidence if she or he believes that the student or someone else is in imminent danger, or if University policy or applicable law compels disclosure. Complaints of discrimination or harassment (sexual or otherwise) or allegations of academic or research misconduct must be directed to the appropriate offices (Office of Student Conduct, Office of Human Resources, Committee on Academic Misconduct, or Office of Research Compliance) as specified by University policies. Grievances related to graduate examinations and graduate associate appointments are reviewed by the Graduate School.

c. Crises

The Counseling and Consultation Service (CCS) of the Office of Student Life provides services to undergraduate, graduate and professional students (and their spouses/partners if covered by CSHI) for issues such as stress management, anxiety, depression, relationship problems, transitions in life, identity exploration, substance use, eating concerns, feeling overwhelmed, and academic adjustment. Student should call 614 292-5766 to schedule an appointment.

If you or someone you know is in imminent danger to themselves or others, go to the nearest ER or call 911. If you are feeling suicidal, please contact someone who can help you, such as the Columbus Suicide Prevention Hotline (614 221-5445) or the National Suicide Prevention Lifeline (800 273-TALK). Students who are experiencing a psychological crisis should call CCS at 614 292-5766 during business hours and will be contacted by a trained clinician by the end of the next business day.

Faculty who are concerned about non-emergency mental health issues with students can contact the director of CCS, Micky Sharma, Psy.D., at sharma.369@osu.edu or by calling 614 292-5766. ***For mental health emergencies, call 911.***

XIII. Program Governance

a. Program History

The Ohio State Biochemistry Program was first formed in 1983 to combine the graduate faculty resources of the Department of Biochemistry (College of Biological Sciences), the Department of Physiological Chemistry (College of Medicine), and the Department of Chemistry (College of Mathematical & Physical Sciences), at the direction of the Provost. In 1988, the program was re-organized according to a set of principles set forth by the Dean of the Graduate School, and a Charter based on those principles was ratified in 1990. The reorganization opened the program to biochemists from across the university. In 1996, an Ohio Board of Regents review of all biomedical programs in the state affirmed OSBP as the sole mechanism for integration of biochemical graduate training at OSU, effectively merging the departmental graduate programs from the Department of Biochemistry and Department of Medical Biochemistry into OSBP. In 1998, an administrative reorganization of the Interdisciplinary Graduate Programs shifted the oversight of the program from the Graduate School to the Council of Life Sciences Deans, and the program operated this way for over a decade.

In 2009, the program faculty amended the charter to shift greater responsibility to the Department of

Biochemistry, the Department of Molecular & Cellular Biochemistry, and the Department of Chemistry in appointing the director and managing the program. In 2010, the Colleges of Biological Sciences and Mathematical & Physical Sciences were integrated into the re-unified College of Arts & Sciences, and in 2012, the Department of Biochemistry and the Department of Chemistry merged into a single department. At the same time, in 2008, the Graduate School's doctoral program assessment resulted in the formation of a Task Force on the Life Sciences, and their 2009 report recommended the formation of the Life Sciences Network as an umbrella administrative structure for the interdisciplinary graduate programs through the Graduate School. The LSN was implemented in the fall of 2011. The life sciences IGPs were returned to the direct supervision of the Graduate School in the summer of 2015. Also, the Department of Molecular & Cellular Biochemistry merged with the Department of Pharmacology to form the Department of Biological Chemistry & Pharmacology in 2015.

b. Current Practice

OSBP is currently administered through the Graduate School. It still mainly functions according to the 1990 Charter, but with key changes from the 2009 amendment to the Charter (especially Part B) shifting key program management responsibilities to the Department of Chemistry & Biochemistry and the Department of Biological Chemistry & Pharmacology. Briefly, current practice is:

- The Director of the program and all committee members are drawn from the Graduate Faculty of the program.
- The Director is selected by the Chairs of the Department of Chemistry & Biochemistry (C&B) and the Department of Biological Chemistry & Pharmacology (BCP), and appointed at the Graduate School. The Director serves as the Graduate Studies Committee Chair. The Director is appointed for a 3-year renewable term commencing on September 1. Common practice has been to alternate between C&B and BCP faculty members.
- The Graduate Studies Committee is made up of the Director/Chair and the chairs of the four standing subcommittees. If none of the standing subcommittee chairs is from outside C&B and BCP, an ad hoc outside member is appointed by the chair. The Graduate Studies Committee has final responsibility for all graduate studies matters, and in particular enforces program rules and adjudicates petitions to deviate from those rules.
- The four standing subcommittees of the GSC are Admissions, Curriculum, Recruiting, and MLS Seminar. The chair and three members of each committee are appointed by the Director in consultation with department chairs and should seek to include representation from C&B and BCP, as well as OSBP faculty from other affiliated departments. Committee terms commence on September 1.
- The Admissions committee is responsible for the review of all admissions files, interviewing applicants during recruitment visits, and recommending fellowship nominees.
- The Curriculum committee is responsible for advising the GSC on all curricular issues, including approval of core and elective classes, transfer credit, and individual petitions on curricular issues. It also oversees program assessment.
- The Recruiting committee is responsible for planning and organizing programs to improve the size and quality of the applicant pool, and in particular helps organize the interviews and recruiting visits and the creation of materials such as posters and slide presentations for recruiting.

- The MLS Seminar committee is co-administered by the Molecular, Cellular, and Developmental Biology graduate program, and the chair of the committee alternates between the programs on an approximately 3-year basis. This committee is responsible for setting policies for the MLS seminar, approving seminar speakers, and overseeing the administration of the series.
- The Director appoints two faculty members per semester to instruct the Interdisciplinary Student Seminar, one each from Arts & Sciences and College of Medicine. The Director serves as one of the instructors of the First Year Mentoring Class.
- OSBP is administered by a Program Coordinator who reports to the Director and is appointed at the Graduate School. The Program Coordinator also works with the other life sciences IGP Program Coordinators and Graduate School staff on cooperative activities.
- Faculty members eligible for the Graduate Faculty of the University may apply to join the Graduate Faculty of the program (P status) by presenting evidence of training and research in biochemistry. Beginning in 2009, faculty must hold at least a courtesy appointment in C&B or BCP to apply to join the OSBP faculty. Faculty are admitted by majority vote of the GSC.
- All OSBP faculty are evaluated at least every three years by the GSC for continued qualifications, participation and mentoring record. Faculty can be removed by majority vote of the GSC.

c. Director History

- Jane Jackman, Dept. of Chemistry & Biochemistry, 2017-present
- Thomas Magliery, Dept. of Chemistry & Biochemistry, 2013-2017
- Michael Ibba, Dept. of Microbiology, 2012-2013
- Jill Rafael-Fortney, Dept. of Molecular & Cellular Biochemistry, 2009-2012
- Ross Dalbey, Dept. of Chemistry, 2004-2009
- Donald Dean, Dept. of Biochemistry, 2001-2004
- Russ Hille, Dept. of Molecular & Cellular Biochemistry, 1998-2001
- Robert Brueggemeier, College of Pharmacy, 1994-1998
- Ron Trewyn, Dept. of Medical Biochemistry, 1989-1991, 1993-1994

XIV. Faculty Membership

a. Joining the OSBP Faculty

Since the OSBP charter amendment approved in 2009, only faculty of the Department of Chemistry & Biochemistry or Department of Biological Chemistry & Pharmacology may newly apply to join the program faculty. Courtesy or regular salaried appointments are satisfactory. OSBP only accepts doctoral students, so only tenure-track and research-track (not clinical) faculty may be admitted to the OSBP faculty (as required by the Graduate School for P status, see the *Graduate School Handbook* Section 15.1). To apply for membership, eligible faculty must provide a cover letter explaining interest in the program and highlighting biochemical expertise and a full curriculum vitae to the GSC Chair. Faculty members are admitted by simple majority vote of the GSC.

b. Review and Responsibilities of Faculty

All faculty members are reviewed on a 3-year cycle, or more frequently if needed. Review items include program participation, mentoring record, and maintenance of membership admission standards. Lack of response for request of review materials, after reasonable reminders are issued, is sufficient reason for removal from the program faculty. Faculty are removed by majority vote of the GSC.

All OSBP faculty are expected to attend the LS-IGP Symposium each year. Faculty with current advisees will automatically be signed up for abstract, poster, or oral presentation judging, and all faculty are encouraged to volunteer for judging duties.

c. Emeritus and Other Retired Faculty

Emeritus faculty may retain their status on the Graduate Faculty by written request and approval of the GSC, the department chair and dean of the college, in specified, renewable terms of no longer than five years. In general, retirees or faculty who leave the university may otherwise remain advisor to or on the dissertation committees of doctoral students who have advanced to candidacy, but may not serve as the advisor to a new student. See the *Graduate School Handbook* Section 15.1 for more details.

d. Current Faculty Membership

The most up-to-date listing of OSBP Graduate Faculty is available on the web site (Faculty tab). The active faculty membership as of September 1, 2019, is:

Federica Accornero, Dept. of Physiology & Cell Biology
Gunjan Agarwal, Dept. of Biomedical Engineering
Juan Alfonzo, Dept. of Microbiology
Irina Artsimovitch, Dept. of Microbiology
Kedryn Baskin, Dept. of Physiology & Cell Biology
Charles Bell, Dept. of Biological Chemistry & Pharmacology
David Bisaro, Dept. of Molecular Genetics
Dennis Bong, Dept. of Chemistry & Biochemistry
Rafael Brüsweiler, Dept. of Chemistry & Biochemistry
Christin Burd, Dept. of Molecular Genetics
Craig Burd, Dept. of Molecular Genetics
Arthur Burghes, Dept. of Biological Chemistry & Pharmacology
Jeffrey Chalmers, Dept. of Chemical & Biomolecular Engineering
Long-Sheng Chang, Dept. of Pediatrics (Nationwide Children's)
James Cowan, Dept. of Chemistry & Biochemistry
Ross Dalbey, Dept. of Chemistry & Biochemistry
Harold Fisk, Dept. of Molecular Genetics
Mark Foster, Dept. of Chemistry & Biochemistry
Kurt Fredrick, Dept. of Microbiology
Michael Freitas, Dept. of Cancer Biology & Genetics
Kalpana Ghoshal, Dept. of Pathology

Jonathan Godbout, Dept. of Neuroscience
J. Aaron Goldman, Dept. of Biological Chemistry & Pharmacology
Venkat Gopalan, Dept. of Chemistry & Biochemistry
Patrick Green, Dept. of Veterinary Biosciences
Chen Gu, Dept. of Biological Chemistry & Pharmacology
Howard Gu, Dept. of Biological Chemistry & Pharmacology
Tsonwin Hai, Dept. of Biological Chemistry & Pharmacology
Patrice Hamel, Dept. of Molecular Genetics
Earl Harrison, Dept. of Human Nutrition
Tina Henkin, Dept. of Microbiology
Paul Herman, Dept. of Molecular Genetics
Amanda Hummon, Dept. of Chemistry & Biochemistry
Michael Ibba, Dept. of Microbiology
Jane Jackman, Dept. of Chemistry & Biochemistry
Christopher Jaroniec, Dept. of Chemistry & Biochemistry
Sissy Jhiang, Dept. of Physiology & Cell Biology
Kou-San Ju, Dept. of Microbiology
Michael Kearse, Dept. of Biological Chemistry & Pharmacology
Stephen Kolb, Dept. of Neurology
Joseph Krzycki, Dept. of Microbiology
Dmitri Kudryashov, Dept. of Chemistry & Biochemistry
Comert Kural, Dept. of Physics
Jeffrey Kuret, Dept. of Biological Chemistry & Pharmacology
George Kyriazis, Dept. of Biological Chemistry & Pharmacology
Beth Lee, Dept. of Physiology & Cell Biology
Chien-liang “Glenn” Lin, Dept. of Neuroscience
Steffen Lindert, Dept. of Chemistry & Biochemistry [pending Graduate School approval]
Jianjie Ma, Dept. of Surgery
Thomas Magliery, Dept. of Chemistry & Biochemistry
Kamal Mehta, Dept. of Biological Chemistry & Pharmacology
Maria Mihaylova, Dept. of Biological Chemistry & Pharmacology
Karin Musier-Forsyth, Dept. of Chemistry & Biochemistry
Kotaro Nakanishi, Dept. of Chemistry & Biochemistry
Stephen Osmani, Dept. of Molecular Genetics
Jennifer Ottesen, Dept. of Chemistry & Biochemistry
Andre Palmer, Dept. of Chemical & Biomolecular Engineering
Hay-Oak Park, Dept. of Molecular Genetics
Mark Parthun, Dept. of Biological Chemistry & Pharmacology
Mark Peebles, Dept. of Pediatrics (Nationwide Children’s)
Dehua Pei, Dept. of Chemistry & Biochemistry
Michael Poirier, Dept. of Physics
Jill Rafael-Fortney, Dept. of Physiology & Cell Biology
Matthew Ringel, Dept. of Internal Medicine
Natividad “Natacha” Ruiz, Dept. of Microbiology

Daniel Schoenberg, Dept. of Biological Chemistry & Pharmacology
Zac Schultz, Dept. of Chemistry & Biochemistry
Hannah Shafaat, Dept. of Chemistry & Biochemistry
David Somers, Dept. of Molecular Genetics
Marcos Sotomayor, Dept. of Molecular & Cellular Biochemistry
Wen Tang, Dept. of Biological Chemistry & Pharmacology
Li-Chun Tu, Dept. of Biological Chemistry & Pharmacology
Claudia Turro, Dept. of Chemistry & Biochemistry
Frederick Villamena, Dept. of Biological Chemistry & Pharmacology
Noah Weisleder, Dept. of Physiology & Cell Biology
David Wood, Dept. of Chemical & Biomolecular Engineering
Jian-Qiu Wu, Dept. of Molecular Genetics
Lai-Chu Wu, Dept. of Biological Chemistry & Pharmacology
Zhengrong “Justin” Wu, Dept. of Chemistry & Biochemistry
Vicki Wysocki, Dept. of Chemistry & Biochemistry
Yong Xia, Dept. of Internal Medicine
Shang-Tian Yang, Dept. of Chemical & Biomolecular Engineering
Sung Ok Yoon, Dept. of Biological Chemistry & Pharmacology
Dongping Zhong, Dept. of Physics

Appendix A: Typical Schedule and Timeline of Events

a. Typical Schedule

Full course names and numbers are given in Appendix B. Approved elective options are given in Appendix C. Electives should ideally be finished by Spring of the second year, and must be completed by graduation. For half-term (7-week) courses, the relevant session is indicated by (S1) or (S2), corresponding to Session 1 or Session 2, respectively. Credit hours are indicated in brackets. Graduate research is 8999 in most departments.

Yr	Autumn	Spring	Summer
1	6701 Molecular Biology [3] 6761 Macromolecules [3] 7193 Rotation 1 [3] (S1) 7193 Rotation 2 [3] (S2) 7193 Director [3] 7600 Mentoring [1] 7700.01 Student Seminar [1] 7890 Colloquium [1]	6762 Enzymes [1.5] (S1) 6763 Lipids [1.5] (S2) Elective [1.5] (S1) Elective [1.5] (S2) 7193 Rotation 1 [3] (S1) 7193 Rotation/Advisor [3] (S2) 7193 Director [4] 7700 Student Seminar [1] 7890 Colloquium [1]	8999 Research [4]
2	Elective [1.5] (S1) Elective [1.5] (S2) 7700 Student Seminar [1] 7890 Colloquium [1] 8999 Research [5+]*	7700.01 Student Seminar [1] 7890 Colloquium [1] 8999 Research [8+]**	8999 Research [4]
3	Seminar [1] 8999 Research [2]	Seminar [1] 8999 Research [2]	8999 Research [3]
4	Seminar [1] 8999 Research [2]	Seminar [1] 8999 Research [2]	8999 Research [3]
5	Seminar [1] 8999 Research [2]	Seminar [1] 8999 Research [2]	8999 Research [3]

* The number of 8999 research credits can be adjusted to fit the minimum enrollment needs of the student according to his/her appointment. The minimum of 10 total credit hour to maximum of 18 credit hour enrollment is recommended so that the student will earn the 80 credit hours required for graduation prior to the end of the 5th year.

b. Timeline of Events

Year 1

- Fulfill necessary safety training
- Complete core courses and attend first year orientation (OSBP 7600)
- Attend Student Seminar (OSBP 7700) in Autumn and Spring, and give a presentation in the Autumn/Spring
- Attend MLS Seminar (OSBP 7890 Colloquium)
- Complete two 7-week laboratory rotations in Autumn semester

- Complete a third 7-week laboratory rotation in Spring semester (or 1-7 week early start rotation in Summer)
- Choose a faculty research advisor and begin dissertation research in Spring semester
- Submit an Activity Report by May 15
- Attend IGP Annual Symposium in May
- Select a Student Advisory Committee by June 30

Year 2

- Complete elective courses
- Attend Student Seminar (OSBP 7700) in Autumn and Spring, and give a presentation in the Autumn/Spring
- Attend MLS Seminar (OSBP 7890 Colloquium)
- Continue dissertation research
- Submit proposal aims to Candidacy Committee in Autumn
- Submit proposal to Candidacy Committee in Spring and file Application for Candidacy
- Submit an Activity Report by May 15
- Attend IGP Annual Symposium in May
- Take Oral Candidacy Exam and advance to candidacy no later than end of Summer

Year 3

- Enroll in a seminar series
- Give a research presentation
- Continue dissertation research
- Submit an Activity Report by May 15
- Attend IGP Annual Symposium in May
- Meet with Advisory Committee in Summer or Autumn and submit Post-Candidacy Progress Report by December 31

Year 4 and additional years if necessary

- Enroll in a seminar series
- Continue dissertation research
- Submit an Activity Report by May 15
- Attend IGP Annual Symposium in May and give a poster or oral presentation
- Meet with Advisory Committee in Summer or Autumn and submit Post-Candidacy Progress Report by December 31

Dissertation Year (typically Year 5 or Year 6)

- Enroll in a seminar series
- Continue and conclude dissertation research
- Write dissertation
- Submit an Activity Report by May 15
- Attend IGP Annual Symposium in May and give a poster or oral presentation

- If necessary, meet with Advisory Committee in Summer or Autumn and submit Post-Candidacy Progress Report by December 31
- Publish one first-author research paper
- Complete the Application to Graduate on gradforms.osu.edu and the OSBP Ready-to-Graduate Checklist
- Submit dissertation to committee and file Application for Final Examination
- Publicly present dissertation and take final oral exam
- Obtain final approval for dissertation and submit to OhioLINK

Appendix B: Core Classes

Beginning with the 2014 incoming class, the following courses are accepted to meet the OSBP core requirements:

Molecular Biology

Biochem 6701 or Biophrm 6701 (these are the same class, sign up for either)

Advanced Biochemistry: Molecular Biology

Autumn – 3 credit hours

- *For students entering in 2012 or earlier, Biochem/Molgen 5701, or Molgen 701 and Biochem 702, were accepted for this requirement. Students entering in 2013 had a choice of Biochem/Molgen 5701, Molgen 5650, or Micro 6020 to meet this requirement.*

Proteins and Nucleic Acids

Biochem 6761 or Biophrm 6761 (these are the same class, sign up for either)

Advanced Biochemistry: Macromolecular Structure and Function

Autumn [3 credit hours]

- *Previously, Chem/Molbioc 761 and Biochem 766 were accepted for this requirement.*

Enzymes

Biochem 6762

Advanced Biochemistry: Enzymes

Spring – Session 1 [1.5 credit hours]

- *Previously, Chem/Molbioc 762 was accepted for this requirement.*

Membranes and Lipids

Biochem 6763

Advanced Biochemistry: Membranes and Lipids

Spring – Session 2 [1.5 credit hours]

- *Previously, Chem 763 was accepted for this requirement in the area of bioenergetics.*

Note: *On the quarter calendar, Molbioc 764 Metabolism was a required core class. There is no longer a metabolism requirement for OSBP. Molbioc became Biophrm in 2016.*

Appendix C: Approved Biochemistry Electives

Below is a list of classes approved to fulfill the biochemistry elective requirement. Students wishing to count electives that are not on the approved list towards their required biochemistry elective credits must submit the proposed elective course description (syllabus) with an explanation from the student and advisor as to why the course is necessary towards coursework completion of the doctoral degree to the GSC Chair. Elective courses must generally be at the 6000 level or above and graded A-E.

Biochemistry (BIOCHEM)

Plant Biochemistry I

Course Number: 5735

3 credits

Advanced Biochemistry: Physical Biochemistry

Course Number: 6765/.01

1.5 or 3 credits

Advanced Biochemistry: Protein Engineering

Course Number: 7770/.01

1.5 or 3 credits

Special Topics in Biophysical Chemistry

Course Number: 7775

1.5 or 3 credits

Advanced Biochemistry: Nucleic Acids

Course Number: 7766/.01

1.5 credits

Advanced Biochemistry: Biomolecular NMR

Course Number: 8900/.01

1.5 or 3 credits

Advanced Topics in Biochemistry

Course Number: 8990

1 or 1.5 credits

Biological Chemistry & Pharmacology (BIOPHRM)

Advanced Biochemistry: Integration of Metabolism 1

Course Number: 7764

1 credit

Advanced Biochemistry: Integration of Metabolism 2

Course Number: 7765

1 credit

Gene Expression: Post-Transcriptional Control

Course Number: 7807

3 credits

Cell Death and Cancer Immune Environment

Course Number: 7823

2 credits

Signaling Pathways and Human Disease

Course Number: 7828

2 credits

Eukaryotic Genome: Structure and Expression

Course Number: 7831

2 credits

Biomedical Informatics (BMI)

Introduction to Bioinformatics

Course Number: 5730

3 credits

Cancer Biology & Genetics (CBG)

Cellular and Molecular Immunology

Course Number: 7010

3 credits

Human Cancer Genetics and Epigenetics

Course Number: 7340

2 credits

Molecular Biology and Pathogenesis of Viruses

Course Number: 7741

5 credits

Mass Spectrometry and Proteomics
Course Number: 8040
3 Credits

Biochemical Mechanisms of Carcinogenesis
Course Number: 8270
2 credits

Current Topics in Human Cancer and Human Genetics
Course Number: 8310
2 credits

Chemistry (CHEM)

Basic Organic Reaction Mechanism
Course Number: 6410
1.5 credits

Stereochemistry and Conformational Analysis
Course Number: 6420
1.5 credits

Introduction to Organic Synthesis
Course Number: 6430
1.5 credits

Introduction to Physical Organic Chemistry
Course Number: 6440
1.5 credits

Thermodynamics
Course Number: 6520
1.5 credits

Kinetics
Course Number: 6530
1.5 credits

Mass Spectrometry
Course Number: 7150
3 credits

Inorganic Biochemistry
Course Number: 7360
1.5 credits

Kinetics, Catalysis, and Transition State Theory
Course Number: 7440
1.5 credits

Advanced Organic Reaction Mechanisms
Course Number: 7460
1.5 credits

Computational Chemistry
Course Number: 7470
1.5 credits

Advanced Topics in Analytical Chemistry
Course Number: 8199
1.5 credits

Chemical & Biomolecular Engineering (CBE)

Molecular Informatics
Course Number: 5734
3 credits

Food Science & Technology (FDSCTE)

Food and Nutritional Toxicology
Course Number: 7620
2 credits

Food Carbohydrates and Proteins
Course Number: 7640
3 credits

Food Flavors and Lipids
Course Number: 7650
3 credits

Microbiology (MICRBIO)

Microbial Physiology and Biochemistry
Course Number: 6020
3 credits

Advanced Microbial Genetics
Course Number: 6080
3 credits

Cellular and Molecular Immunology
Course Number: 7010
3 credits

Advanced Topics in Molecular Microbiology
Course Number: 7060
2 credits

Antibiotics
Course Number: 7070
3 credits

Advanced Cellular Immunology
Course Number: 8032
1 credit

The RNA World
Course Number: 8050
2 credits

Molecular Genetics (MOLGEN)

Analysis and Interpretation of Biological Data
Course Number: 5650
3 credits

Systems of Genetic Analysis
Course Number: 5700
3 credits

Advances in Cell Biology
Course Number: 5705
2 credits

Developmental Genetics
Course Number: 5715
2 credits

Human Genetics
Course Number: 5733
2 credits

Plant Biochemistry
Course Number: 5735
3 credits

Current Topics in Signal Transduction
Course Number: 5796
1 credit

Reproductive Biology of Flowering Plants
Course Number: 6741
2 credits

Special Topics in Molecular Genetics
Course Number: 6795
1 credit

Molecular Biology and Pathogenesis of Viruses
Course Number: 7741
5 credits

Gene Expression: Transcriptional Control
Course Number: 7806
2 credits

Neurological Surgery (NEURSGY)

Biology of the Tumor Microenvironment
Course Number: 8250
2 credits

Physics (PHYSICS)

Special Topics in Biophysics
Course Number: 8809.01
3 credits

Appendix D: Proposal Writing Information

This information about writing NIH grant proposals should be useful in preparing the Candidacy proposal. The exact format of your proposal, within the rules set in Section VII.d, is at the discretion of the Advisor and the Candidacy Exam Committee.

Selected From the *SF424 (R&R) Application Guide for NIH and Other PHS Entities*:

<https://grants.nih.gov/grants/how-to-apply-application-guide/forms-e/general-forms-e.pdf>

Specific Aims...

State concisely the goals of the proposed research and summarize the expected outcome(s), including the impact that the results of the proposed research will exert on the research field(s) involved.

List succinctly the specific objectives of the research proposed, e.g., to test a stated hypothesis, create a novel design, solve a specific problem, challenge an existing paradigm or clinical practice, address a critical barrier to progress in the field, or develop new technology.

Research Strategy...

Organize the Research Strategy in the specified order using the instructions provided below. Start each section with the appropriate section heading—Significance, Innovation, Approach. Cite published experimental details in the Research Strategy section and provide the full reference in the Bibliography and References Cited section...

(a) Significance

- Explain the importance of the problem or critical barrier to progress in the field that the proposed project addresses.
- Explain how the proposed project will improve scientific knowledge, technical capability, and/or clinical practice in one or more broad fields.
- Describe how the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field will be changed if the proposed aims are achieved.

(b) Innovation

- Explain how the application challenges current research or clinical practice paradigms.
- Describe any novel theoretical concepts, approaches or methodologies, instrumentation or interventions to be developed or used, and any advantage over existing methodologies, instrumentation, or interventions
- Explain any refinements, improvements, or new applications of theoretical concepts, approaches or methodologies, instrumentation, or interventions

(c) Approach

- Describe the overall strategy, methodology, and analyses to be used to accomplish the specific aims of the project. ...[I]nclude how the data will be collected, analyzed, and interpreted as well as any resource sharing plans as appropriate.

- Discuss potential problems, alternative strategies, and benchmarks for success anticipated to achieve the aims.
- If the project is in the early stages of development, describe any strategy to establish feasibility, and address the management of any high risk aspects of the proposed work.
- Point out any procedures, situations, or materials that may be hazardous to personnel and precautions to be exercised...

If an applicant has multiple Specific Aims, then the applicant may address Significance, Innovation and Approach for each Specific Aim individually, or may address Significance, Innovation and Approach for all of the Specific Aims collectively...

For new applications, include information on preliminary studies, if any. Discuss the applicant's preliminary studies, data and/or experience pertinent to this application. When applicable, provide a succinct account of published and unpublished results, indicating progress toward their achievement.

Selected From *NIH Grants & Funding – Writing Your Proposal* Web Page

http://grants.nih.gov/grants/writing_application.htm

NIH Peer Review Criteria...

Significance. Does the project address an important problem or a critical barrier to progress in the field? If the aims of the project are achieved, how will scientific knowledge, technical capability, and/or clinical practice be improved? How will successful completion of the aims change the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field? ...

Innovation. Does the application challenge and seek to shift current research or clinical practice paradigms by utilizing novel theoretical concepts, approaches or methodologies, instrumentation, or interventions? Are the concepts, approaches or methodologies, instrumentation, or interventions novel to one field of research or novel in a broad sense? Is a refinement, improvement, or new application of theoretical concepts, approaches or methodologies, instrumentation, or interventions proposed?

Approach. Are the overall strategy, methodology, and analyses well-reasoned and appropriate to accomplish the specific aims of the project? Are potential problems, alternative strategies, and benchmarks for success presented? If the project is in the early stages of development, will the strategy establish feasibility and will particularly risky aspects be managed? If the project involves clinical research, are the plans for 1) protection of human subjects from research risks, and 2) inclusion of minorities and members of both sexes/genders, as well as the inclusion of children, justified in terms of the scientific goals and research strategy proposed? ...

Important Writing Tips...

- The instructions require that materials be organized in a particular format. Reviewers are accustomed to finding information in specific sections of the application. Organize your application to effortlessly guide reviewers through it. This creates an efficient evaluation process and saves reviewers from hunting for required information.
- Think like a reviewer. A reviewer must often read 10 to 15 applications in great detail and form an opinion about each of them. Your application has a better chance at being successful, if it is easy to read and follows the usual format. Make a good impression by submitting a clear, well-written, properly organized application.
- Start with an outline following the suggested organization of the application.
- Be complete and include all pertinent information.
- Be organized and logical. The thought process of the application should be easy to follow. The parts of the application should fit together.
- Write one sentence summarizing the topic sentence of each main section. Do the same for each main point in the outline.
- Make one point in each paragraph. This is key for readability. Keep sentences to 20 words or less. Write simple, clear sentences....
- Be realistic. Don't propose more work than can be reasonably done during the proposed project period. Make sure that the personnel have appropriate scientific expertise and training. Make sure that the budget is reasonable and well-justified.
- Capture the reviewers' attention by making the case for why NIH should fund your research. Tell reviewers why testing your hypothesis is worth NIH's money, why you are the person to do it, and how your institution can give you the support you'll need to get it done. Be persuasive.
- Include enough background information to enable an intelligent reader to understand your proposed work. ...
- Use the active, rather than passive, voice. For example, write "We will develop an experiment," not "An experiment will be developed."
- Use a clear and concise writing style so that a non-expert may understand the proposed research. Make your points as directly as possible. Use basic English, avoiding jargon or excessive language. Be consistent with terms, references and writing style.
- Spell out all acronyms on first reference.
- Use sub-headings, short paragraphs, and other techniques to make the application as easy to navigate as possible. Be specific and informative, and avoid redundancies.
- Use diagrams, figures and tables, and include appropriate legends, to assist the reviewers to understand complex information. These should complement the text and be appropriately inserted. Make sure the figures and labels are readable in the size they will appear in the application.
- Use bullets and numbered lists for effective organization. Indents and bold print add readability. Bolding highlights key concepts and allows reviewers to scan the pages and retrieve information quickly. Do not use headers or footers.
- Identify weak links in your application so the application you submit is solid, making a strong case for your project...

Proofreading and Final Edits

- Allow sufficient time to put the completed application aside, and then edit it from a fresh vantage point. Try proofreading by reading the application aloud. ...
- Have zero tolerance for typographical errors, misspellings, grammatical mistakes or sloppy formatting. A sloppy or disorganized application may lead the reviewers to conclude that your research may be conducted in the same manner.
- Prior to submission, perform a final proofread of the entire grant application.