GPILS Intercampus Graduate
Program in Biochemistry and Molecular Biology

Student Handbook and
Program Information Guide
2024 - 2025

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Program Co-Director: Michael F. Summers, PhD
Program Administrator: Koula Cozmo, B.S.

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Note: This document is not a contract and all information is subject to change at any time at the sole discretion of the Combined Graduate Program in Biochemistry and Molecular Biology.

A Message from the Directors

We would like to take this opportunity to welcome you to the Combined PhD Program in Biochemistry and Molecular Biology. You have been selected from many applicants from the United States as well as many countries including the People's Republic of China, Taiwan, Korea, Russia, India, Sri Lanka, and many others. The faculty members of this program are very excited that you have chosen to participate in our Program in Biochemistry & Molecular Biology.

This is a very unique Graduate Program. The Combined PhD Program in Biochemistry consists of faculty from two University of Maryland campuses. The University of Maryland, Baltimore, School of Medicine, is located in the heart of metropolitan Baltimore. In the last five years, the UMB campus has been almost completely rebuilt and occupying extensive modern facilities spread over an entirely renovated, several-block area. The University of Maryland, Baltimore County (UMBC), is also highly equipped with state-of-the-art facilities and growing quickly. This campus is located on the periphery of the Baltimore metropolitan area, approximately 15 minutes away from Downtown Baltimore on a 500-acre campus area.

Graduate study in the Combined PhD Program in Biochemistry & Molecular Biology is governed by rules established by the Graduate School of the University of Maryland, Baltimore (UMB). We encourage you to learn these rules, which are described in the most recent graduate catalog. Furthermore, this Joint program is within the Graduate Program in Live Sciences (GPILS) run by the School of Medicine at UMB. Similar to other graduate programs within the Graduate School, however, there are certain additional expectations and programmatic considerations. These are important matters, and it is the responsibility of the student to become familiar with them by reading and understanding this Handbook.

This Student Handbook is designed to answer any questions you may have regarding our program, the course of study, qualifying rules and any exceptions to these rules. If after reviewing this handbook you have any questions, please feel free to discuss them with us.

Very special thanks go to Ms. Kathleen Reinecke and Ms. Foyeke Daramola for the long hours and expert assistance they have provided in making this handbook come to fruition. We wish you the best of luck in your studies and research endeavors.

Governing Committee for 2023 - 2024

Director:

Aikaterini Kontrogianni-Konstantopoulos, PhD
Professor
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Co-Director:

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Department of Biochemistry and Molecular Biology
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The Combined PhD Program in Biochemistry & Molecular Biology

A. Summary/Timeline for getting a PhD

In your first year, you will concentrate on your core coursework and three laboratory rotations. By the end of your first year (summer) you should have chosen a Research Advisor. In your second year you will concentrate on the advanced courses relative to your Dissertation research as well as do research. At the end of the second year (June) you will write an NIH style research proposal on your Dissertation research topic and defend it in an oral qualifying examination. During this exam you will also be asked to answer questions in four major subdivisions of Biochemistry & Molecular Biology. You may apply for candidacy to the Graduate School after successfully defending the research proposal and passing the oral qualifying exam. Once you have applied for candidacy, you must complete your Dissertation defense within four years. Prior to your Dissertation defense, it is required that you continue to have regularly scheduled committee meetings. You must also present a short Research Seminar to the Program within the 18 months prior to defending your Dissertation, and a full seminar immediately before your Dissertation defense. After completing these programmatic requirements, you must then complete the guidelines put forward by the Graduate School for the publication of your Dissertation prior to Graduation.

B. New Student Orientation

New student orientation occurs within two weeks of the beginning of your first semester in the program. You will attend faculty presentations for three to four weeks at both the UMB and UMBC campuses. These presentations will allow you to learn more about the faculty and their research, who are interested in obtaining a new student in their laboratory.

C. Graduate Student Association

UMB - The Graduate Student Association offers several programs for incoming graduate students. You are encouraged to participate in these programs. These programs include a Big Brother/Big Sister and Orientation programs, available to all graduate students. For more information regarding the GSA and the name of your representative, please consult the bulletin board in Room 111, 108 N. Greene Street. The Graduate Student Association also offers special services for graduate students including a writing service for preparing manuscripts and grants. The Graduate Student Association provides such services as scholarships, travel fellowships, and use of laptop computers. If you are interested in becoming an active member or representative in the GSA, please contact Koula Cozmo for further information.

UMBC - For specific information regarding the Graduate Student Organization at UMBC, please contact the Graduate Student Office, (410) 455-2773 or consult the bulletin board in Room 326 University Center. Other student services are available through the University Office of Student Affairs. Specific offices that comprise the University Office of Student Affairs include the Athletic Center, Counseling Center, Records and Registration, Resident Life, Student Development, Student and Employee Health, Student Financial Aid, Student Life and Student Union.

D. Registration

New student registration for those students on the UMB campus (MBIC) will be handled by Koula Cozmo in the first semester of your studies only. From then on, you will be contacted via notices posted by Koula as to when and where you should register. It is yours together with your advisors (if chosen) responsibility to make sure you are taking the correct courses. However, it is strongly suggested that new students contact one of the Program Directors to discuss in detail the courses that you should be taking in your first year. New student registration for those students on the UMBC campus (BIOC) will be contacted by the Registrar's Office as to where and when registration will take place. New students should contact Nicole Seabolt in the Department of Chemistry and Biochemistry Office at UMBC (410-455-2491) to schedule an appointment to meet with one of the program directors prior to registration. In your second year, you should discuss your course selections with your mentor. When choosing your courses, please keep in mind the four areas of biochemistry that you will be tested on in your oral qualifying examination. They are molecular biology, enzymology, and bio-organic chemistry, physical and structural biochemistry and metabolism and regulation.

E. Coursework and Research Seminar Attendance

The coursework requirements for the first and second years of studies will be as follows.

1. Core course requirement: Students will have the option to choose from either the GPILS core course (GPLS 601; 8 credits) or the 2 semester Biochemistry course at UMBC (CHEM 437, 638; 8 credits). The decision regarding the core course(s) for a student will be based upon their grades in previous Biochemistry courses as an undergrad and consultation with the Program Director.

2. All program students will be required to take the following courses in addition to the core course requirement:
   - Advanced Biochemistry (GPLS 709; Spring)
   - Advanced Molecular Biology (GPLS 701; Fall)
   - 2 semesters of Adv Topics in Biochem (GPLS 713 Spring years 1 and year 2)
   - 2 advanced courses (at least 1 at UMBC; i.e. with CHEM numbering)
   - Lab rotations (GPLS 609 or CHEM 602)
   - 2 semesters of Biochemistry Seminar (GPLS 608 or CHEM 713)
   - 1 semester of Research Ethics (CIPP 907)

Year 1 - Fall Semester

GPLS Core (credits)	**Biochem Core (credits)**
GPLS 601 (8)	CHEM 437 Biochem I (4)
GPLS 609 Lab Rotations (3)	GPLS 609 Lab Rotations (3)
or CHEM 602 Lab Rotations (3)	or CHEM 602 Lab Rotations

Year 1 - Spring Semester

GPLS Core (credits)	**Biochem Core (credits)**
GPLS 709 Adv Biochem (3)	CHEM 638 Biochem II (4)
Adv course #1 (UMBC or UMB)*	GPLS 709 Adv Biochem (3)
GPLS 713 Adv Topics in Biochem (2)	GPLS 713 Adv Topics in Biochem (2)
GPLS 608 or CHEM 713 Seminar (1)	GPLS 608 or CHEM 713 Seminar (1)

Year 2 - Fall Semester

GPLS Core (credits)	**Biochem Core (credits)**
GPLS 701 Adv Molecular Biology (3)	GPLS 701 Adv Molecular Biology (3)
Adv course #2 (UMBC or UMB)	Adv course #1 (UMBC or UMB)
GPLS 608 or CHEM 713 Seminar (1)	GPLS 608 or CHEM 713 Seminar (1)

Year 2 - Spring Semester

GPLS Core (credits)	**Biochem Core (credits)**
GPLS 713 Adv Topics in Biochem (2)	GPLS 713 Adv Topics in Biochem (2)
CIPP 907 Research Ethics (1)	CIPP 907 Research Ethics (1)
	Adv course #2 (UMBC or UMB)

Year 3 though Finish

Doctoral Research (12 total credits)	Doctoral Research (12 total credits)
GPLS 899 or CHEM 899	GPLS 899 or CHEM 899
Attend Weekly Seminars and Dissertation Defenses	Attend Weekly Seminars and Defenses

*The advanced courses can be taken in any semester of the 1st two years; a maximum of 20 credits/yr can be taken. Above is just one option for scheduling the two advanced courses; however, all courses must be completed at the end of the Spring of year 2.

ADVANCED COURSES (a partial list; at least one CHEM designation must be chosen, and at least 5 credits in total)

CHEM 601	Special Topics in Chemistry (i.e. NMR, X-ray, subject varies) (3)
CHEM 631	Chemistry of Proteins (3)
CHEM 633	Biochemistry of Nucleic Acids (3)
CHEM 635	Biochemistry of Complex Carbohydrates (3)
CHEM 640	Special Topics: Molecular Structure (3)
CHEM 642	Physical Biochemistry (3)
CHEM 644	Molecular Modeling in Biochemistry (3)
CHEM 672	Enzyme Reaction Mechanisms (3)
CHEM 684	Special Topics in Chemistry (subject varies) (3)
GPLS 616	Molecular Mechanisms of Signal Transduction (3)
GPLS 624	Oncopharmacology (3)
GPLS 625	Ion Channels (3)
GPLS 626	Membrane Carrier Transporters (3)
GPLS 630	Fundamentals of Biostatistics (3)
GPLS 665	Cancer Biology: From Basic Research to the Clinic (3)
GPLS 702	Basic Immunology (4)
GPLS 710	Microbial Pathogenesis (3)
GPLS 714	Muscle Contractility and Excitation (3)
GPLS 715	Muscle Cell Biology and Development (3)
GPLS 716	Genomics and Bioinformatics (3)
GPLS 769	Advances in Immunology (2)
GPLS 790	Advanced Cancer Biology (3)

For updated courses & descriptions at UMB, check the current Graduate Catalog at:
https://www.graduate.umaryland.edu/policies/

For updated courses & descriptions at UMBC, check the UMBC Graduate Catalog at:
https://chemistry.umbc.edu/graduate/handbook-and-catalogue/

ADDITIONAL COURSES. Although your formal coursework is completed after the second year, you may be required by your advisor or training program to take an additional course.

ATTEND RESEARCH SEMINARS AND CPBMB DISSERTATION DEFENSE SEMINARS. Students are required to attend weekly seminars in the Department where you reside as well as attend all of the Dissertation Defense Seminars of Program Students in your School (i.e. UMBC students attend CPBMB student defenses at UMBC and UMB students attend CPBMB student defenses at UMB).

F. Laboratory Rotations

Each student is required to participate in **three** laboratory rotations. The duration of the laboratory rotation should be 8 to 10 weeks. If you have a Master's Degree from a University in the United States or have significant research experience, you may request permission (in writing) from the Governing Committee to waive one of the three required rotations.

Students should choose a laboratory rotation in accordance with his or her interest, with the purpose of pursuing their dissertation research in that laboratory. Students are encouraged to attend the orientation sessions to learn more about the research of a particular lab/mentor. Students are also encouraged to seek out PIs and talk with them one on one, particularly if the PI did not participate in an orientation session for some reason. Since many faculty members are involved in more than one graduate program, the labs tend to fill quickly. Therefore, you should arrange your rotations as early as possible in advance. It is also important to verify before a rotation is selected, whether the faculty member has funding to support student(s) following your first 15 months in the Program; the program director, co-director and/or program coordinator will assist you with obtaining this information, and any other information that may be needed.

When arranging laboratory rotations, students should keep Koula Cozmo informed so that records of the rotation can be kept. Specifically, a "pre-rotation" description of what is going to be done and a short post-rotation report describing what was accomplished is to be written by the student (with some input from the rotation advisor). This paperwork is to be kept by the rotation advisor, who will then evaluate the rotation, and forward both the student and advisor reports to Koula at the completion of the rotation. The advisors report should be no more than a paragraph or two describing whether the student met, exceeded, or failed to meet expectations (see two forms on next page).

Pre-Rotation Proposal (Student completes)

Student Name: _____

Mentor Name: _____

Proposal title: _____

Mentor Signature: _____

Student Signature: _____

Rotation Start date: _____

Continue on additional on additional pages if necessary

Post-Rotation Report (Student completes)

Student Name: _____

Mentor Name: _____

Proposal title: _____

Mentor Signature: _____

Student Signature: _____

Rotation Start/End dates: _____

Continue on additional on additional pages if necessary

ROTATION EVALUATION FORM (MENTOR completes)

NAME of STUDENT: _____

NAME of MENTOR: _____

SEMESTER OF ROTATION: _____

OVERALL GRADE: Pass or Fail

Please evaluate the student=s performance in your laboratory.

The mentor should comment on the student's quality of experimental work and understanding of the project, ability to draw conclusions, ability to communicate, ability to interact with others in the lab, ability to manage/use time, quality of record keeping and written work, motivation, perseverance, maturity, and the student's outlook for completing a PhD as well as any other issues relating to the rotation.

Advisor Signature: _____

Rotation Start/End dates: _____

Continue on additional pages if necessary

G. Choosing a Mentor for Thesis Dissertation Work

By the second year in the program, you should have selected a research advisor from one of your laboratory rotations. Your advisor must be a graduate faculty member of the Combined PhD Program in Biochemistry & Molecular Biology either at the UMB or UMBC campus, or, under special circumstances, a faculty member from one of the affiliated training programs at UMB and UMBC; Membrane Biology Training Program, Interdepartmental Training Program in Muscle Biology, Interdisciplinary Training in Cardiac & Vascular Biology, or Meyerhoff Graduate Fellows Program. It is important that when choosing an advisor that he or she is financially able to support you, beginning 15 months after the date that you entered the PhD program and continuing through the completion of your research project. The Program Director, Co-Director, and/or Program Administrator will help you obtain this and/or any information you may need to help you make this very important decision. Students may also apply for funds through pre-doctoral grants offered by the NIH or other agencies, but this is not required. Once you have chosen an advisor, you will need to get final approval from the Program Director and/or Co-Director prior to joining the laboratory. At this point, you are ready to form your PhD Advisory committee.

H. Advisory/Dissertation Committee

Your Advisory Committee should be formed at the start of your second year. The student must have an Advisory/Dissertation Committee made up of at least five faculty members, four of whom are members of the Combined PhD Program in Biochemistry and Molecular Biolgy. One of these members must be the student's advisor, and at least one must be from the other campus from that at which the student undertakes thesis work (UMB or UMBC). The Dissertation Committee must have an additional member outside the program/department for a total of five members (a requirement of the Graduate School). Additional members can also be included on the Advisory Committee, including any faculty members in the program and/or suitably qualified individuals from other programs or institutions. The names of the members of the Advisory Committee must be submitted to and approved by the Governing Committee or Program Director prior to the student taking the Oral Qualifying examination. It is strongly recommended that the student and his or her advisor determine and assemble the Advisory Committee as soon as the student makes the decision on choice of advisor, and that the Advisory Committee meet with the student at regular intervals (at least one per year) to assess progress and suitability for candidacy prior to taking the Oral Qualifying examination. Should you encounter any problems with your advisor and/or project, you should consult the members of your Advisory Committee and/or the Program Director and/or Program Co-Director.

I. Qualifying Exam and Admission to Candidacy

The committee will consist of the Research advisor and at least 4 committee members. One of the committee members needs to be from outside the Biochemistry Graduate Program, and members from both UMBC and UMB must be represented on the committee. The outcome of the meeting can be: (1) pass; (2) Fail, with retake within 3 months; or (3) Fail, with the possibility of being awarded a terminal MS (MS is awarded only if in good academic standing with 3.0 or better GPA).

The following qualifications must be met to advance to candidacy:

1. Successful completion of program course requirements with at least a 3.0 average.
2. Must have an Advisory committee chosen and approved by the director.
3. Students will be required to pass an oral qualifier exam no later than 6 months following the completion of their course requirements. The oral exam will consist of two components including:

   (a). Orally defending a written research proposal and
   (b). Answering questions in four areas of Biochemistry & Molecular Biology
      i. Molecular Biology
      ii. Enzymology and Bioorganic Chemistry
      iii. Physical and Structural Biochemistry
      iv. Metabolism and Regulation

Two weeks prior to the oral qualifier exam, the students will be required to submit an NIH-style research proposal to their Advisory Committee that is based on their proposed PhD research. The format of this proposal will follow the page-limits and any other rules and regulations of an actual NIH pre-doctoral fellowship proposal. Students may submit this proposal to the NIH or another appropriate granting agency (i.e. American Cancer Society, American Heart Association, etc); although, this is not required (sample site https://grants.nih.gov/grants/guide/pa-files/PA-21-051.html). The research proposal will be defended orally to their Committee as part of their oral qualifier exam.

Specific Instructions for the Written Research Proposal (7 pages maximum)

1. The research proposal must be an original document written by the student that describes the PhD research project that the student intends to pursue. Students are permitted to seek advice and consult their advisor or other experts, but the proposal must be the student's own (see also section O. Student and Academic Misconduct, below). The student will certify the proposal as his or her own work on the cover page.

2. Read and follow the instructions carefully to avoid delays and misunderstandings. In preparing the application, avoid jargon; not all examiners will be familiar with your specific area of research. For terms not universally known, spell them out the first time they are used, with the appropriate abbreviation in parentheses; the abbreviations may be used thereafter. Define all terms. Remember that it is your job to make your proposal clear and comprehensible to the examiners. They should not be expected to do background preparation for the examination.

3. The maximum length of the proposal is 7 pages, not including Literature Cited. Don't feel obligated to reach the maximum limit. All tables, graphs, figures, diagrams, and charts must be included within the 7 page limit and legible. Prepare the application single-sided and single spaced, staying within one-half inch margins. The print must be clear and legible. Use a standard **Arial font and a minimum size of 11 point.**

4. Harold Varmus, one of the NIH's best directors in recent history, provided a set of guidelines for writing and evaluating NIH grants, which is very important to think about when you write a grant in the future, and it wouldn't hurt to start thinking about them now, when applicable. They include:

Significance: Does the study address an important problem? If the Aims of the application are achieved, how will scientific knowledge be advanced? What will the effect of these studies on the concepts or methods that drive this field?

Approach: Are the conceptual framework, design, methods, and analyses adequately developed, well-integrated, and appropriate to the aims of the project? Does the applicant acknowledge potential problem areas and consider alternative tactics?

Innovation: Does the project employ novel concepts, approaches, or methods? Are the aims original and innovative? Does the project challenge existing paradigms or develop new methodologies or technologies?

Investigator: Is the investigator appropriately trained and well suited to carry out this work? Is the work proposed appropriate to the experience level of the principal investigator and other researchers (if any)? (Note: this would include the advisor and committee in our case!).

Environment: Does the scientific environment in which the work will be done contribute to the probability of success? Do the proposed experiments take advantage of unique features of the scientific environment or employ useful collaborative arrangements? Is there evidence of institutional support?

More information on review criteria for fellowship grants (particularly useful if you and your mentor decide to submit your proposal to apply for external funding!) can be found through the NIH website, particularly at: http://grants.nih.gov/grants/peer/reviewer_guidelines.htm#f_awards.

5. The **WRITTEN PROPOSAL** must contain the following sections:

a. Title and Abstract: The first page of the application is the title page with your name, affiliation and lab name. Please keep the title brief and to the point. The abstract should summarize the proposal in less than 350 words on the same page (which does not count towards 7 page limit).

b. Specific Aims: In a brief paragraph, list the broad, long-term objectives, the significance of the research, and what the specific research proposed in this application is intended to accomplish. State the hypotheses to be tested and or the question that is to be answered. This paragraph should be followed by no more than two or three specific aims.

(Tip: Top-notch research proposals are driven by strong hypotheses. Think of your hypothesis as the foundation of your application -- the conceptual underpinning on which the entire structure rests. Generally, applications should ask questions that prove or disprove a hypothesis rather than use a method to search for a problem or simply collect information).

c. Background and Significance: In a concise, cogent, and logical way, sketch the background leading to the present proposal, critically evaluate existing knowledge, and identify the relevant gaps, roadblocks, and opportunities in the field. Demonstrate familiarity with the field and knowledge about research being done, referring to relevant scientific literature. State concisely the importance and biomedical/health relevance of the research by relating the specific aims to the broad, long-term objectives. Why is the work important? What has already been done? How is it relevant? One and one-half to two pages are recommended.

d. Research Design and Methods: Explain how you are going to do the work. Include sufficient information for a full evaluation of the project, independent of other documents. Be specific and informative and avoid redundancies. Include discussion of what results you anticipate and what your interpretations will be if you do or do not obtain those results. Also discuss potential pitfalls and alternative strategies. Be sure to mention, where appropriate, which statistical methods you plan to use. Four to five pages are recommended. (see Hints below too).

Note on Preliminary Data: Most granting agencies (including the NIH) no longer have a specific section for preliminary data, however, it is normally advantageous to include some if you want. Examiners are aware that you have only been in the laboratory for a short time, so they will not expect an extensive array of data. Keep in mind that the primary purposes of your preliminary data are to provide experimental support for the hypotheses to be tested and to demonstrate the technical feasibility of the project. Its purpose is not to show everything that you have done since you arrived.

e. Literature Cited: List all references that are relevant to your proposed work. Each reference must include the title, names of authors, book or journal, year of publication, volume number, and page numbers. In addition, highlight the 5 references that are most central to your proposal. These should be the papers that form the theoretical and methodological foundation upon which your proposal rests (choose carefully: your ability to identify these papers will in part indicate your understanding of the field). Examiners may test your understanding of these papers, both their strengths and weaknesses, as part of the exam.

Hints: The following is an abbreviated checklist from the NIH for suggestions about the Research Design and Methods.

General

Does each experiment correspond to one of the specific aims, and are they stated in the same order?
Do the experiments follow a logical sequence?
Did I use flow charts and decision trees to show paths of experiments and how they will progress?
Have I included sufficient detail to show I understand and can handle the research?
Have I only included information that is needed to state my case, i.e., have I avoided including anything I don't plan to do?
Have I cited references wherever possible?

Approach

Did I state the expected outcome of my research?
Did I list each set of experiments in the same order as my specific aims, linking my experiments to the aims?
Are the methods I chose appropriate to achieve the specific aims?
Did I show why each experiment is important or how it is relevant to the hypothesis?
Are the experiments in a logical sequence, flowing from one to another with clear end points?
Will reviewers think I am knowledgeable about my methods?
Did I justify my choice of methods in detail?
Did I outline my methods in detail?
Did I support my methods with data?
Did I provide solutions for potential problems?
Is my proposed model system appropriate?
Did I address difficulties I may encounter with the proposed approaches, show I can handle them, and propose solutions and alternatives?
Did I consider how the limitations of the approaches may affect my results and data?
Did I address possible problems and limitations of the procedures, and propose solutions?
Did I estimate how much I expect to accomplish each year of the grant and state any potential delays?
Did I use enough detail?
Did I include all relevant controls?
Did I anticipate reviewers' questions about the feasibility of what I propose, e.g., how I will gain access to reagents, equipment, or animals?
Are the figures clearly presented and do they provide the reader with the story of the grant, so one can relatively easily follow the proposal by looking at the figures/tables/charts etc?
Does my grant read like a "fishing expedition"? If so – take a close look at it again!

Results

Did I show I am aware of the limits to, and value of, the kinds of results I expect?
Have I convinced the reviewers that I will be able to interpret my results?
Are statistical methods used appropriately?
Did I define the criteria for evaluating the success or failure of a specific test?
Did I state the conditions under which my experimental data would support or contradict my hypothesis?
Did I state the limits I will observe in interpreting results?

Organization of the Oral Qualifying Exam (including prior to the meeting).

1. Two weeks prior to the meeting, the research advisor and committee should receive a packet from Program Coordinator, Koula which includes:
    a. Updated transcript of Student
    b. Updated Curriculum Vitae (CV) of Student
    c. Final version of the Research Proposal
    It is the student's responsibility to get a current transcript of their grades, updated CV, and their proposal to Koula Cozmo at least 2 weeks prior to the date of the exam.

2. Prior to the meeting, the advisor should communicate with the other committee members about who is going to ask questions from the 4 general areas of Biochemistry & Molecular Biology including (the student might want to remind him/her about this!):
    a. Molecular Biology
    b. Enzymology and Bioorganic Chemistry
    c. Physical and Structural Biochemistry
    d. Metabolism and Regulation

3. At the oral exam, a pre-meeting to discuss the student should occur prior to the start of the exam with the student stepping outside the room. At this 3-5 minute pre-meeting the Research Advisor should confirm the questioning procedures agreed upon and discuss any topics that should be stressed during the exam. Once the exam starts, the student will present and defend their research proposal and questions should be asked regarding the proposal itself and/or the 4 general areas. At the end of the presentation, the research advisor should make sure that all four general areas have been tested and that the committee is satisfied that the exam is complete. If not, then additional questions should be posed relating to each area and/or relating to the proposal itself. The student should then step outside the room for the final discussion and the decision regarding the outcome of the exam needs to be made.

The three options are: (1) the student passes and is recommended to be admitted to candidacy; (2) the student fails and must retake the exam within 3 months, with specific stipulations if the committee so desires; or (3) the student fails and cannot retake the exam. In such cases where a student fails and cannot retake the exam, it will be determined by the Program Director whether the student qualifies for a terminal master's degree.

In summary, a typical meeting should be run as follows:

- Committee discussion (without student)
- Student presentation about 40 minutes
- Questioning from committee throughout the presentation and/or afterwards
- Post discussion of committee to reach a decision (without student)
- Discussion between Committee and student about the outcome of exam
- Advisor and committee members complete the paperwork which includes;
    - Oral Qualifying Decision Form (all students)
    - First Committee Meeting form (if passed exam)
    - Admission to candidacy form (if passed exam)
- Forms will be given to the Program Coordinator for signature by the Program Director.

Paperwork after qualifying exam: The necessary paperwork includes (Forms are on following pages):

1. Oral Qualifying Exam Decision Form
2. 1st Committee Meeting Form (if passed exam)
3. Form to be turned into the Graduate School (if passed exam)

If the student passes the Oral Qualifying Exam, all three forms need to be completed and it is the student's responsibility to confirm his or her acceptance to candidacy (i.e. check up on the Graduate School until your letter from the Graduate School arrives). Be sure a copy of the letter from the Graduate School is given to Koula Cozmo for your file as well as a copy to your payroll officer so that your payroll can be changed to reflect the next pay step.

Student/Advisor Checklist for Oral Qualifying Exam

Student: _____

Advisor: _____

Member: _____ **Member: _____**

Member: _____ **Member: _____**

Member: _____ (optional)

Note – One member must not be in Biochemistry & Molecular Biology Graduate Program; at least one member must be from UMBC and at least one member must be from UMB.

Program Director/Co-Director Approved Committee? _____ (>>2 weeks ahead)

Updated Transcript to Committee? _____ (≥2 weeks ahead; GPA≥3.0)

Updated CV to Committee? _____ (≥2 weeks ahead)

Written Proposal to Committee? _____ (≥2 weeks ahead; <10 pgs)

Advisor needs to Organize Questioning prior to the Oral Exam

1. **Questions regarding Proposal** **Everyone on Committee**
2. **Questions regarding Basics** **At least 1 committee member/topic**
   a. Molecular Biology _____
   b. Enzymology and Bioorganic Chem _____
   c. Physical and Structural Biochem _____
   d. Metabolism and Regulation _____

Exam Organization (< 3 hrs should be target time)

1. _____ Committee discussion (without student)
2. _____ Student presentation (about 40 minutes)
3. _____ Questioning throughout (proposal & basics)
4. _____ Post discussion (w/o student)
5. _____ Decision Form completed (w/o student)
6. _____ 1st Com mtg form completed (if pass)
7. _____ Adm to Candidacy form (if pass)
8. _____ Bring Student Back into room
9. _____ Outcome Discussion (all present)
10. _____ Forms given to Pgm Coordinator

ORAL QUALIFYING EXAMINATION DECISION FORM

Upon completion of your Oral Examination, this form must be signed by each member of your Advisory Committee.

Student Name: _____

Date of Exam**:** _____

	Print Name	**Signature**
Research Advisor:	_____	_____
Committee Member:	_____	_____
Committee Member:	_____	_____
Committee Member:	_____	_____
Committee Member:	_____	_____
Committee Member: (optional)	_____	_____

Note – One member must not be in Biochemistry & Molecular Biology Graduate Program; at least one member must be from UMBC and at least one member must be from UMB.

_____ **Pass**

_____ **Retake exam in 3 months*** **(the requirements for the second examination are listed below by the committee)**

_____ **Fail, award terminal MS if eligible (requires good academic standing (3.0 GPA) and course requirements completed)**

***Note: A student may retake the exam only once; therefore, at the 2nd exam, a Pass or a Fail grade must be given. One cannot take the Qualifying exam a 3rd time.**

Approved: _____ **Date:** _____

Aikaterini Kontrogianni-Konstantopoulos
Program Director
Michael F. Summers
Program Co-Director

Comments (use separate sheet if necessary):

First Committee Meeting Scheduling Form

If the student passes the Oral Qualifying Examination, the first committee meeting needs to be scheduled. The Committee has decided that the next meeting will be in:

_____ 6 months from date of oral exam

_____ 12 months from date of oral exam

ADVISORY COMMITTEE NOMINATION

and

ORAL QUALIFICATION APPROVAL FORM

The purpose of this form is to name your Advisory Committee which should include at least five (5) faculty members; student's mentor, 2 faculty members or the Combined Biochemistry PhD Program, 1 faculty member outside the program, 1 faculty member from the other campus from that at which the student undertakes thesis work (UMB or UMBC). The names of the members of the Advisory Committee must be submitted to and approved by the Program Director or Program Co-Director prior to the student taking the Oral Qualifying Examination.

Student Name: _____

Date of Oral Examination: _____

Research Advisor: _____

Committee Member: _____

Committee Member: _____

Committee Member: _____

Committee Member: _____

Committee Member: _____

Approved: _____ Date: _____
Program Director/Co-Director

University of Maryland Graduate School, Baltimore

Application for Admission to PhD Candidacy

- Read the requirements for the Doctor of Philosophy degree in the Graduate School catalog
- Familiarize yourself with the specific PhD requirements established by your program
- Complete this application
- Obtain approval signatures from your primary adviser and graduate program director
- Attach your unofficial transcript printed from SURFS to this application; cross out courses that will not count toward this PhD degree
- Submit this application and transcript to: Graduate School Dean's Office, 620 West Lexington Street, fifth floor

Last Name:	First Name
Student ID Number: @	E-mail address:
Mailing Address: Street City State ZIP	
Graduate Program:	Date admitted to Graduate Program:
Number of credits earned toward this PhD Degree (not including 899):	List course(s) in which a incomplete (I) or no mark (NM) was earned:
List course(s) earned at other institutions which will count towards this PhD degree (grade earned must be ≥B, attach official transcript):	

APPROVAL SIGNATURES **Please** type and sign		
Adviser:	**Signature:** Graduate Faculty Status: ☐Regular ☐Associate ☐ Special	**Date:**
Graduate Program Director/Co-Director:	**Signature:**	**Date:**
Graduate School Dean: **Dr. Erin Golembewski**	Submit application to Graduate School Dean's Office for **Signature:**	**Date:**

J. Advisory/Dissertation Committee meetings

We look forward to students completing an outstanding dissertation and publishing in peer-reviewed journals. It is required that students have regularly scheduled committee meetings to achieve these goals (with at least 3 committee members present). Prior to each committee meeting, a student report is given to Koula who will pass it out to the committee at least 1 week prior to the scheduled meeting. This will include an updated CV, published manuscripts, published abstracts and citations for meeting presentations, and a brief synopsis of progress made, including manuscripts in preparation, since the last meeting. This information should be provided by the student to Koula 1 week prior to the meeting.

The following is a format for the committee meetings, which should not last more than **1 hour**. At the 1st committee meeting, the committee will select a chair (other than advisor). A typical meeting should be planned as follows:

- opening discussion (without student)
- student presentation (approx. 40 minutes)
- post discussion (without student)
- discussion between committee and student
- chair and committee write report and decide schedule for next meeting (6 or 12 months) (without student and advisor)
- report submitted to Director or Co-Director and signed
- report submitted to Program Coordinator (Koula)

The committee chair (which should be different from the advisor) will send his/her report to Koula the same day of the meeting and it will then be forwarded onto the student and advisor. Koula will then schedule the next meeting for 6 months (if decided to be necessary by the committee) or 12 months (if report is very good) at that time. A quorum of faculty would be 3 out of 5/6 committee members.

The committee report should include a statement as to the overall progress of the student as well as address specific points including, but not limited to, the following issues: (see form on next page)

- Scientific progress since last meeting
- Fundamental understanding of results including related literature
- Quality of Experimental design including controls and rationale for the experiments presented (i.e. hypotheses)
- Quality of presentation skills including the ability to organize the data
- Statement regarding work ethic including ability to achieve and set goals
- Ability to answer questions and understand the “big picture”
- Timetable for completion of defense
- Next meeting is scheduled (six or twelve months)

Policy for a student who has passed the qualifying exam, but who is not making adequate progress as judged by the advisory committee. If a student is not making adequate progress, then they are required to meet with the Program Director (Dr. Kontrogianni-Konstantopoulos) within 2 weeks of the committee meeting. In addition, a follow-up committee meeting must be scheduled within 3 months. If, after these 3 months, the committee and/or the advisor are still not satisfied that the student is making adequate progress, then the committee should submit a proposal to the Governing Committee. The Governing Committee will vote to either dismiss the student with a terminal MS, have the student to change labs, or allot additional time for the student to demonstrate progress to the committee.

If you are planning the defense of your dissertation, the thesis related paperwork required from the Graduate School is listed at the website below. Please take careful note of the deadlines for submitting this paperwork, which should be a topic of the last committee meeting prior to the defense. The website that addresses such formatting/paperwork issues is: http://www.graduate.umaryland.edu/Current-Students/Information-for-Graduating-Students/

Committee Meeting Report

Student Name: _____

Date of Meeting: _____

Advisor: _____

Committee Chair: _____

Committee Members Present: _____

_____

The Committee Report should comment on the following:
The committee report should have a statement as to the overall progress of the student as well as address specific points including, but not limited to, the following issues:

- Scientific progress since last meeting
- Fundamental understanding of results including related literature
- Quality of Experimental design including controls and rationale for the experiments presented (i.e. hypotheses)
- Quality of presentation skills including the ability to organize the data
- Statement regarding work ethic including ability to achieve and set goals
- Ability to answer questions and understand the "big picture"
- Timetable for completion of defense
- Next meeting is scheduled (six or twelve months)

Is the student making adequate progress? Yes_____ No_____

If a student is not making adequate progress, a meeting with the Program Director (Dr. Kontrogianni-Konstantopoulos) needs to be arranged within 2 weeks of the committee meeting. In addition, a follow-up committee meeting must be scheduled within 3 months. If, after these 3 months, the committee and/or the advisor are still not satisfied that the student is making adequate progress, then the committee should submit a proposal to the Governing Committee. The Governing Committee will vote to either dismiss the student with a terminal MS, have the student change labs, or allot additional time for the student to demonstrate progress to the committee.

If the student is making adequate progress, please select one of the following:

Date of Next Meeting (six months):_____

OR

Date of Next Meeting (12 months): _____

Timetable for completion of defense: _____

Committee Chair Report (continue on extra page, if necessary):

_____ Director or Co-Director signature

K. Senior Seminar

Post-candidacy students are required to present a seminar in the departmental/program seminar series sometime during the 18-month period leading up to their anticipated thesis defense. The seminar is 15-20 minutes in length with 5-10 minutes for discussion, for a total of no more than 25 minutes. Typically, two students would present their seminars in a one-hour session. Students studying in UMB labs present during a regular slot for the Biochemistry and Molecular Biology Seminar Series, held Mondays at 4 pm. Students studying in UMBC labs are welcome to participate in this forum or can satisfy this requirement in a comparable activity at UMBC. This seminar requirement provides an important opportunity for students to strengthen their oral presentation skills, including their ability to discuss and defend their work as they field questions from an audience comprising a broad spectrum of expertise.

L. Dissertation, Dissertation Defense & Dissertation Seminar

In addition to scheduled committee meetings, students are advised to meet individually with your Dissertation advisor and Advisory Committee members on a regular basis to review your progress and obtain suggestions/advice as needed to plan experiments, develop your research projects, write manuscripts, and/or to prepare the dissertation. In preparing the dissertation, students must refer to their respective campus' Graduate School websites for the required formats & forms:

UMB: http://www.graduate.umaryland.edu/Forms/

UMBC: http://www.umbc.edu/gradschool/etd/index.html

The Dissertation must be distributed to the Dissertation Committee at least 2 weeks prior to the Defense; although, the designated Readers of the Dissertation (Advisor, two other committee members) should see chapters well ahead of this deadline.

Students are also required to give a seminar to the Department of Biochemistry and Molecular Biology (UMB) or Department of Chemistry and Biochemistry (UMBC), at least two weeks before or within 2 weeks after the completion of your dissertation defense. Most students choose to do the Dissertation Seminar directly prior to the Dissertation Defense and this is encouraged, so the committee only needs to listen to the seminar once; however, there are circumstances, in some cases, that make this format difficult, so on occasion the Seminar is given on a different date.

After presentation of the Dissertation research, the student then defends his/her work orally in a question-and-answer session with the Dissertation Committee. The Dissertation Committee then decides whether the student successfully defended the Dissertation. If the student successfully defends the Dissertation, then the Dissertation committee decides whether a major re-write of the dissertation is necessary or whether only minor revisions are needed. If major revisions are needed, then the Dissertation needs to be approved by the designated Readers of the Dissertation and/or by the entire committee (if that is decided by the committee). It can also be decided that the student is required to orally defend the dissertation again, if necessary. If only minor revisions are needed, then only the advisor is required to make sure all the necessary revisions are completed. Students have two chances to defend the Dissertation.

M. Preparing for Graduation

Please be sure to consult the Graduate School website for your campus for the current forms and deadlines. Also, it is important to check the UMGSB Graduation Requirements Timetable, which is posted on the graduate school website for UMB students at http://www.graduate.umaryland.edu/Current-Students/Information-for-Graduating-Students/

For UMBC students the timetable is posted at https://gradschool.umbc.edu/graduation/reqs/doctoral/. You can also call the Graduate School at 706-3100 (UMB) or 455-2537 (UMBC) for the upcoming semesters' application for diploma deadlines.

Also, please remember when applying for graduation that you must be registered for at least one research credit in that semester. This includes summer and winter graduation. Ordinarily, students are not registered in the summer and winter sessions, so please make sure that if you are planning to graduate in the summer or winter, you are registered, or you will not be able to graduate.

N. Transferring among GPILS programs

GPILS applicants/students who wish to transfer from one program of GPILS to another program of GPILS are required to meet the new program's requirements PRIOR to the transfer. For example, transfer into the Biochemistry program from one of the other GPILS programs must be approved by the Biochemistry Governing Committee. AFTER such a transfer is approved, the transferring student must then meet all the curriculum and program requirements of the new program, which may result in taking additional coursework and thus perhaps a lengthier stay in GPILS.

O. M.D./PhD Program Requirements

M.D./PhD students have the same requirements as PhD students with the following exceptions. First, the M.D./PhD students are only required to do two lab rotations within the Program. If they have had a year of prior research experience and/or if they had completed other rotations in the M.D. Program, they may be exempt from one rotation requirement at the discretion of the Governing Committee. M.D./PhD students are required to take GPLS 701 (Advanced Molecular Biology) and GPLS 709 (Advanced Biochemistry), two advanced courses (one at UMBC), one semester of seminar (GPLS 608 or CHEM 713), CIPP 907 (Research Ethics), and one semester of GPLS 713 (Advanced Topics in Biochem Seminar). They do not have a core course requirement. Any exceptions to this will be discussed on a case-by-case basis. Therefore, a typical M.D./PhD student can finish coursework within the first year. An example of a course schedule that meets the requirements for M.D./PhD students is as follows:

Sample MD/PhD Course schedule (Year 1)

FALL SEMESTER	**SPRING SEMESTER**
Seminar	Research Ethics
Adv Molecular Biology	Adv Biochemistry
Adv Course #1	Adv Topics in Biochem Seminar
	Adv Course #2

(one of the Advanced courses must be taken at UMBC)

P. Student and Academic Misconduct

Students pursuing a PhD in Biochemistry are expected to perform within the norms of academic and scientific ethics. Please refer to the policies regarding academic and research misconduct listed under "Academic Affairs Policies" at http://www.umaryland.edu/policies-and-procedures/library/academic-affairs/policies/. A course on Scientific Ethics is presented by CIPP 907 "Responsible Conduct of Research"; successful completion of this course is a requirement for graduation.

Plagiarism is the most common form of academic misconduct. A student can be accused of plagiarism if he or she quotes someone else, either verbatim or in extensive paraphrasing without proper citation of that quote. Plagiarism is misconduct no matter where it appears (i.e. in a classroom assignment, paper, review, research paper, etc). In preparing for a classroom assignment or when writing a paper, if you are not aware of the proper procedure in avoiding plagiarism, please discuss this with your mentor and/or the course director.

Q. Responsibilities as a Graduate/Research Assistant

As a graduate/research assistant in your first year, you are expected to attend class, seminars and perform laboratory rotations. If you are assigned duties as a Teaching Assistant, you are expected to perform any duties prescribed by the faculty member in charge of the course. By the end of your first year's course work, you should have chosen a mentor and laboratory in which to pursue your dissertation work. Beginning at that time, you will be supported by your mentor and therefore, you should discuss your benefits as to time expected in the lab, sick time, vacation time, stipend and health coverage. As stated in the "Graduate Assistant Policies and Guidelines", (refer to your respective campus' Graduate School website) you are not eligible for vacation or sick leave. However, each mentor has their own policies which may or may not allow such flexibility for vacation or sick time. The granting of these benefits is at the discretion of your mentor.

Please also note that the "Graduate Assistant Policies and Guidelines" states that a full-time graduate or research assistant need only work 20 hours per week. This limited commitment applies only to those students who must work outside their mentor's laboratory. Such a situation is not common to the students in the Combined PhD Program in Biochemistry. When a student is receiving a stipend for his or her doctoral training in a laboratory, it is expected that a student commit to at least 40 hours or more of work per week (refer to your respective campus' Graduate School website). PhD candidates supported by a stipend are not to have other jobs or job commitments.

R. Student health, behavioral health, and employee assistance programs.

If you have any health-related problems and/or if you or one of your peers is in need of confidential professional assistance with workplace problems and/or problems associated with times of stress and/or personal unrest, we have many outstanding professionals here at the University of Maryland, Baltimore and at UMBC who are available for consultation. Please do not hesitate to contact these offices and/or recommend them to anyone who you feel would benefit from such services:

Student Counseling & Health Centers

i. **UMB** Student Counseling Center — Contact: 410-328-8404
HS/HSL Library
601 W. Lombard St., Suite 440
Baltimore, MD 21201; Fax 410 328 5291
http://www.umaryland.edu/counseling/

ii. Employee Assistance Program (**UMB**) — Contact: 667-214-1555
419 West Redwood St
Suite 560
Baltimore, MD 21201
www.umms-eap.org

iii. Student Health Services (**UMB**)
408 W. Lombard St.
between Eutaw and Paca St.
http://www.umaryland.edu/health/

Contacts in Student Health Services:
667-214-1899 To schedule an appointment.
667-214-1800 To discuss an urgent medical condition with a physician after hours.
667-214-1883 To arrange pick-up of records or to ask procedural questions about Student Health, such as the time of walk-ins for immunization, TB- testing, and allergy shot administration.

iv. University Counseling Services (**UMBC**) Contact: 410-455-2472
Student Development & Success Ctr.
between Chesapeake and Susquehanna Halls
http://www.umbc.edu/counseling/

v. Peer Health Advocates (**UMBC**) Contact: 410-455-1558

S. Student Stipends, Fees, Tuition and Benefits

The rate of student stipend is determined by the Graduate School and revised each fiscal year (July 1 – June 30) or academic year (September 1 – August 31). The most current stipend levels are as follows:

Level I	$34,325
Level II	$36,325 (following admission to candidacy)

T. Web Sites

The Graduate Program in Life Sciences http://lifesciences.umaryland.edu contains information about the academic program and faculty research. The UMB Graduate School Web Site www.graduate.umaryland.edu contains information about the academic policies and news and events for the campus community.

U. Core facilities.

There are numerous core research facilities here at the University of Maryland that are available to do state-of-the-art research. Descriptions and contact information on all Core Facilities are at the following Website: http://medschool.umaryland.edu/CIBR/.
(This is an extremely important website for all graduate students to examine closely!!).

V. Signature Page **(Please make a copy of this page and give the original signed version to the Program Coordinator).**

I have read the contents of this handbook and understand the policies of the GPILS Combined Program in Biochemistry & Molecular Biology:

Printed Name: _____

Signature: _____

Date: _____

For updated information on our Faculty, please go to the following websites:

https://lifesciences.umaryland.edu/about/Faculty--Staff/Graduate-Program-Faculty/#Biochemistry%20&%20Molecular%20Biology

https://chemistry.umbc.edu/