

# The 2022 - 2023 BMCDB Handbook



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## Steps to the Ph.D. in BMCDB: A Guide for Graduate Students, Advisors and Faculty

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Current information about the Graduate Group can be found on the Graduate Studies Website at <https://grad.ucdavis.edu/programs/gbcb>.

All Graduate Studies forms can be found at <https://gradstudies.ucdavis.edu/forms>.

## Before the First Year

Prior to arrival on campus, you will receive a letter by early summer that will include:

1. Details of your financial aid package
2. A request from the BCB 220L instructor(s) to identify, schedule, and report your first rotation choice to the Graduate Coordinator
3. A list of CRNs for your fall coursework
4. A schedule of the mandatory orientations and events you must attend prior to the first day of class
5. The name and contact information of your advisor - you should reach out to them ASAP to schedule an initial meeting at the start of the school year.

### Orientation

On the Friday before the first day of fall quarter, there will be an orientation meeting for all first-year students. This meeting will be run by the Chair and Graduate Coordinator. At the meeting, you will be informed of:

- The schedule of activities for the first week, including reception for new students, TA training sessions, etc.
- The need to complete enrollment for the Fall Quarter
- If appropriate, how to get your paycheck
- Instructions for how to apply for California residency, if applicable
- General information about the BMCDB graduate program

### Meeting Your Advisor

You need to schedule a meeting with your advisor. In this meeting, you will address the following:

- Undergraduate preparation and the need for any remedial courses (see Appendix 1)
- Course schedule for the Fall Quarter
- Assessment of research interests
- The requirement for one quarter of TA experience

It is your advisor's responsibility to collaborate with you on an academic plan for the next two years that satisfies coursework requirements and prepares you adequately for your qualifying exam, to be taken at the end of the second year.

**Note:** Topics and examiners for the qualifying exam can be discussed at a subsequent meeting with your advisor, typically in fall or early winter of the second year.

## Annual Progress Reports: The SPA and IDP

Campus policy requires that you, your mentor, and graduate academic advisor complete an annual **Student Progress Assessment (SPA)**. In addition to the SPA report, the BMCDB Graduate Group requires trainees and their mentors to complete an **Individual Development Plan (IDP)**. These assessments must be completed **by June 30<sup>th</sup>** every year. To complete these items, you must meet with your PI complete the SPA and IDP, followed by a meeting with your advisor, who will determine:

- In the first year:
  - o The requirements for the degree that remain to be completed,
  - o If you are making normal progress toward the degree,
  - o That you have joined a lab,
  - o That you and your PI have agreed on how you will be supported for the remainder of your tenure in your PI's laboratory.
- In the second year:
  - o Topics for the qualifying exam (QE)
  - o Possible examiners for your QE; you get to choose 3/5 committee members
  - o Any remaining degree requirements, which must be completed before the oral exam and advancement to candidacy. Note that the TA requirement must be fulfilled prior to your QE; a grader or reader position does **not** satisfy the TA requirement.

On **April 1<sup>st</sup>** of each year, you will receive an automated notification that your SPA is available. You are responsible for completing the first portion, in which you self-assess your progress; the SPA is subsequently routed to your PI and advisor for feedback, and then back to you for final acknowledgment.

Please note that you need to meet with your advisor and review your IDP before they can sign off on your SPA. **The deadline to acknowledge your SPA is always June 30<sup>th</sup>.** The SPA is completed entirely online; a template of the IDP form can be found as an appendix to this Handbook, as well as at <http://bmcdb.ucdavis.edu/advisor-student-resources>.

## The Qualifying Exam and Advancing to Candidacy

### Scheduling the Qualifying Exam

You should take your qualifying exam (QE) in spring quarter or summer of your second year, once all program requirements are met. You may take it earlier if you wish. Only exceptional circumstances will exempt you from the summer deadline, which may include serious illness, temporary withdrawal from the academic program (PELP), or a change in major professor. For example, you cannot delay your QE because your PI requires additional data collected for a grant proposal/manuscript or you have travel planned.

You are required to email your QE application to the Graduate Coordinator, who will sign and submit it to Graduate Studies, **at least 30 days** before your proposed exam date. Your application will be denied if it is submitted late.

### Qualifying Exam Committees

Your committee will consist of five faculty who are recommended to Graduate Studies by the BMCDB Student Affairs Committee in winter quarter of your second year.

- Your PI cannot be a member of the committee.
- With the input of your PI and advisor, you will choose three committee members.
- If you are pursuing a Designated Emphasis (DE), one of the committee members you choose must be affiliated with the DE.
- You are allowed to select one committee member who is not affiliated with BMCDB; if you are interested in more than one, reach out to the Student Affairs & Advising Chair explaining your reasoning.
- Two faculty will be selected by the Student Affairs Committee to ensure coverage of the core areas of BMCDB (i.e., Biochemistry, Molecular Genetics, Cell Biology, and Developmental Biology).
- Please note that you are requested to not provide food or drink to the QE committee.

### The Qualifying Exam

The qualifying exam consists of two portions:

1. The student submits a **research proposal** to each member of their examining committee of no more than 5 pages, written in the format of the Research Plan of an NIH proposal, that outlines proposed thesis research.
  - o Note that extensive preliminary data is not required; the proposal is used to demonstrate to the examining committee that a student can formulate hypotheses and design means to experimentally

test them. The writing should be yours and not from your PI's research grant. Therefore, you will not be able to delay the oral exam if you have not generated what your or your PI consider sufficient preliminary data.

- o Research proposals should be distributed to the examining committee no later than 2 weeks prior.
- 2. The **oral portion** of the qualifying exam is intended to demonstrate the student's critical thinking ability, synthesis, and broad knowledge of the field of study. Questions will generally focus on the content of the written proposal that is presented by the student, as well as areas that emerge from questioning during the exam.

### Results of the Qualifying Exam

There are three possible results for the QE: Pass, Not Pass, and Fail. If you receive a Not Pass on your first try, do not be overly concerned, you are not alone as this is a common outcome! Your committee, advisor, and PI are here to help you navigate the next steps to receive a Pass. Please note that the guidelines for how to proceed are at the campus level, not specific to BMCDB; please see [the Graduate Studies website](#) for further guidance.

### Advancing to Candidacy

When you pass your QE, the committee chair and Graduate Coordinator will notify Graduate Studies; they will notify you a few weeks later that you are eligible to advance to candidacy.

You will be required to pay a candidacy fee online (\$90 for the 2022 - 2023 year) and fill out [the application](#); your advisor must confirm that you have satisfied all of the degree requirements necessary to advance, and you will list the members of your dissertation committee on the application.

Please note that you may have no more than one dissertation committee member who is not a member of the BMCDB Graduate Group.

If you are an international student or non-resident of California, it is especially crucial that you apply for candidacy as soon as possible after passing your QE, as your PI will no longer be charged non-resident supplemental tuition (NRST) once you have advanced to candidacy.

## **Your Post-Candidacy Progress: Dissertation Committee Meetings and Reports**

Once you have advanced to candidacy, you will be working full-time on your dissertation research, although you are still encouraged to participate in seminar courses and journal clubs. Your only formal requirement during this time is to meet yearly with the dissertation committee. The following is required for each dissertation committee meeting:

1. You will provide the committee with a written summary of the research accomplished in the previous year and work that must be finished, plus meet with the committee to provide an oral presentation of progress to date on your thesis research.
2. The dissertation committee will advise you about your progress, provide written comments on the Dissertation Committee Report (DCR) under "Recommendations to Student," and all members will sign the report. In addition, your PI must also sign the report, indicating your progress as satisfactory, marginal, or unsatisfactory.
3. Depending on what year you are in, you may or may not be working on your annual progress reports (i.e., SPA & IDP) at the same time as the dissertation committee meetings and report; your PI and advisor will not sign off on your SPA without your most recent IDP and DCR.
4. When your committee has signed your DCR, please email the DCR and written research summary to the Graduate Coordinator.

### **Third Years:**

- SPA, IDP, and your first DCR are due by the end of spring quarter.

### **Fourth Years:**

- DCR is due by the end of winter quarter.
- SPA and IDP are due by the end of spring quarter.

### **Fifth Years and Beyond:**

- Two DCRs are due: one by the end of fall and one by the end of spring quarter.
- Advisors may waive the fall meeting if they feel there is clear evidence of progress and graduation is imminent.
- IDP is due by the end of spring quarter.
- SPA is due by the end of spring quarter, unless you are graduating in spring or summer.

BMCDB does not require a certain number of publications for completion of the Ph.D. Rather, the status of thesis chapters is left to the discretion of the major professor and dissertation committee, and thus should be discussed the committee well in advance of when completion is expected. We recommend that students provide their committee with an outline of the thesis at least 6 months prior to the expected completion date that was noted on the last progress report. **Note:** A student's progress will be reported as unsatisfactory if they do not give an oral presentation of their research to their committee.



## Completion of Degree Requirements

A student will have completed all the requirements for the degree when the written dissertation is signed by the PI and the two other thesis committee members. While there are no explicit rules defining an adequate dissertation, it is the expectation that the research will be of publishable quality, and that the research represents a significant contribution to the research area.

The Office of Graduate Studies requires paperwork to be filled to process the completion of the degree. The required paperwork includes:

- [The dissertation title page with digital signatures.](#)
- A copy of the dissertation abstract.
- [UC Davis Thesis/Dissertation Release Agreement.](#)
- [Graduate Program Exit Information Form.](#)
- [Graduate Studies Exit Survey.](#)
- [National Science Foundation's Survey of Earned Doctorates.](#)
- [Designated Emphasis Report](#) (only for students who completed a designated emphasis).

The graduating student will also give an exit seminar. The exit seminar should be a widely advertised event held on campus.

A website with guidelines for completing the dissertation can be found at:  
<https://grad.ucdavis.edu/academics/finishing-your-degree/filing-thesis-or-dissertation>.

All Graduate Studies forms are here: <https://grad.ucdavis.edu/financial-support/forms#>.

## **Where to Go, and What to Do, If Problems Arise**

It is everyone's desire for students to successfully obtain their Ph.D. in a timely manner. The best way to ensure this is to take advantage of the resources available throughout your tenure in graduate school.

- Meet regularly with your advisor, especially in the early stages of the Ph.D. program. This will ensure that you are enrolled in the correct courses and are in good academic standing.
- Your advisor can also help you in selecting a lab in which to perform your thesis work.

The qualifying exam in the second year can be a very stressful experience. Here is what you can do to help manage the stress:

- Communicate with your PI about the time you need to study and prepare.
- Engage your fellow students and lab mates who can provide advice and help with studying general knowledge and practicing presentations.
- Hold mock QE exams, with a variety of people, to practice answering questions.

Once you have advanced to candidacy, yearly meetings with your thesis committee is essential to make sure you are on track to complete your degree. If necessary, more frequent meetings can be scheduled. If you find that you are not progressing as expected, or have conflicts with your major professor:

- Reach out to your committee. They can help to determine a course of action.
- Talk to your advisor for additional help and support; they can act as an impartial mediator throughout your graduate career and should be used as general resource if any questions or problems arise.
- The Graduate Coordinator has training in mental health crisis management, and can also help you find campus resources and report instances of discrimination, microaggression, and/or bias.
- In cases where you have a conflict with your PI and need guidance, you can also the BMCDB graduate group chair.

Finally, the university has counseling services free of charge. To learn more about the services provided by Student Health and Counseling Services, visit <https://shcs.ucdavis.edu/counseling-services>. You can also call (530) 752-0871 or visit 219 North Hall.

## **Physician Scientist Training Program**

Due to the nature of the PSTP program there are some differences with the normal course of progression to your Ph.D. In particular:

### **Core Courses:**

PSTP students in BMCDB will be required to take the Medical School 410B and BCM405 courses and the Graduate School BCB 210-215 (Molecular Genetics & Genomics, Biochemistry, Cell Biology, Developmental Biology, Molecular Biology, Readings Course, see attached). The IOR for Medical School 410A has agreed to accept B or better grades in the core courses for 410A credit. The BCM405 Medical School course can be taken to satisfy elective credits.

### **Lab Rotations:**

Students will complete four 5-week rotations in at least 3 different laboratories. These laboratory rotations will not be restricted to the fall and winter quarter and may include rotations taken as part of a required Summer PSTP Research Training Program immediately preceding formal matriculation. However, PSTP BMCDB students will be required to prepare a written and oral report of their research to be arranged during the subsequent fall or winter quarters in which BCB 220L is in session. Please note that PSTP students must be registered for BCB 220L for two quarters and present a total of 4 written and oral reports to fulfill the requirements; however, as the lab rotations will be spread out in time the presentations can be given in quarters in which the student is not registered for the course. It is the students' responsibility to contact the instructors of BCB 220L in the quarter they wish to present their rotation talks and to make sure that a record of participation is recorded in the BMCDB office

### **Teaching Assistant Responsibilities:**

Not required for PSTP Training grant funded students, but highly recommended.

### **Course and Advancement Requirements:**

PSTP students will have the same requirements as other BMCDB students with respect to other course and advancement requirements. This includes 2 electives and ethics training. These requirements can be fulfilled with Medical School courses. Please consult with your academic advisor about the specific courses that are eligible. Further, the qualifying exam will be conducted as with other BMCDB students.

## **Completion of the Program with an M.S. Degree**

Some students realize through their studies that they don't want to complete a Ph.D. If you are considering leaving the Ph.D. program, you should meet with your advisor to discuss your options. In many cases, it is possible for a student to exit the program with a Master's degree. If you make this decision before advancing to candidacy, you must decide whether a Plan I (thesis) or Plan II (exam) M.S. would be preferable for you. For those students who have advanced to candidacy, a Plan II M.S. is commonly pursued as the qualifying exam meets the exam degree requirements.

**Note:** For ALL candidates for the M.S. in BMCDB:

- Courses must be approved by the Student Affairs and Advising Chair.
- Only courses in the 100 or 200 series, for which a grade of A, B, C, or S is received, will satisfy the requirements.
- Cumulative grade point average in courses taken to satisfy the requirements for this degree must be 3.0 or greater.
- After completion of at least one half the required units, the student must file an official application for Advancement to Candidacy, available on the Graduate Studies website.

## BMCDB Course Requirement Form

Student Name: \_\_\_\_\_ Date: \_\_\_\_\_

Advisor Name: \_\_\_\_\_

### Graduate Courses at UC Davis:

Required Classes – Year One (Need 12 units per quarter)

Fall		Winter		Spring	
BCB 210	3 Units	BCB 212	3 Units	BCB 214	3 Units
BCB 211	3 Units	BCB 213	3 Units	BCB 215	3 Units
BCB 220L	5 Units	BCB 220L	5 Units	BCB 299	5 Units
MCB 291	1 Unit	MCB 291	1 Unit	MCB 291	1 Unit

Required Classes – Year Two (Need 12 units per quarter)

Fall		Winter		Spring	
BCB 299	1-10 Units	BCB 299	1-10 Units	BCB 299	1-10 Units
MCB 291	1 Unit	MCB 291	1 Unit	MCB 291	1 Unit
Elective or TA	1-5 Units	Elective or TA	1-5 Units	Elective or TA	1-5 Units
Elective or TA	1-5 Units	Elective or TA	1-5 Units	Elective or TA	1-5 Units

Students must earn a grade of B- or better in each of the six core classes. **Check whether alternate year classes are offered in that year.**

Student Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Graduate Advisor Signature: \_\_\_\_\_

Date: \_\_\_\_\_

## List of Approved Electives

BMCDB students are required to take two elective courses. The goal of these courses are to enhance your knowledge. While a list of approved electives has been provided below, please discuss which course you would like to take with your PI and your advisor to determine what course would be best for you to enroll in.

This list was compiled from both the most recent and an older General Catalog; some things may be out of date. Consult the most recent General Catalog for course availability. The General Catalog, including updates, can be found at <http://catalog.ucdavis.edu>.

Course	Course Name	Units
ABG 401	Ethics and Professionalism in Animal Biology	2
BCB 251	Molecular Mechanisms of Early Development	3
BCB 255	Molecular Mechanisms in Pattern Formation and Development	3
BCB 256	Cell and Molecular Biology of Cancer	3
BCB 257	Cell Proliferation and Cancer Genes	3
BCB 298	Computer Programming in Molecular and Cellular Biology	1-3
BCM 230	Practical NMR Spectro. And Imaging	1
BCM/BPH 231	Biological Nuc. Magnetic Res.	3
BIM 270	Biochemical Systems Theory	4
BIM 289D	Techniques in Molecular and Cellular Mechanics	4
BPH 200/MCB 200	Current Techniques in Biophysics	2-3
BPH 241	Membrane Biology	3
BST 226	Statistical Methods for Bioinformatics	4
CDB 205	Cell Biol. Of the Cytoskeleton	2
CHE 216+	Magnetic Resonance Spec.y	3
CHE 217	X-Ray Structure Determination	3
CHE 218	Macromolecules: Physical Principles	3
CHE 219	Spectroscopy of Organic Comps	4
CHE 221D	Special Topics in Organic Chemistry	3
CHE 221G	Special Topics in Organic Chemistry	3
CHE 234	Chemical & Molecular Neuroscience	3
CHE 237	Bio-organic Chemistry	3
CHE 238	Introduction to Chemical Biology	3
CHE 241C	Mass Spectrometry	3
CHE 245	Mechanistic Enzymology	3
CHE 261	Current Topics in Chemical Research	2
CHE 263	Introduction to Chemical Research Methodology	3
CHE 264	Advanced Chemical Research Methodology	6
CLH 212	Introduction to Stem Cell Biology	3
CLH 230	Congestive Heart Failure, Mechanism of Disease	3
CLH 231	Current Techniques in Clinical Research	2

CLH 250	Integrating Medicine Into Basic Science	6
ECS 124	Theory and Practice of Bioinformatics	4
EDO 240	Biochemical Endocrinology	3
ETX 214+	Mechanisms of Toxic Action	3
EVE 298	Group Study	1 - 5
FST 201	Food Chemistry and Biochemistry	4
FST 204	Advanced Food Microbiology	3
FST 210	Proteins: Functional Act. And Interact	3
FST 211	Lipids: Chemistry and Nutrition	3
GGG 201A	Advanced Genetic Analysis	5
GGG 201B	Genomics	5
GGG 201C	Molecular Genetics Mechanisms in Disease	4
GGG 201D	Quant. And Population Genetics	5
GGG 210	Horizontal Gene Transfer	3
GGG 291	Seminar in History of Genetics	2
GGG 295	Seminar in Molecular Genetics	1 - 3
IMM 201	Introductory Immunology	4
MCB 123	Anal. Of Enz. & Receptor Sys.	3
MCB 126	Plant Biochemistry	3
MCB 143	Cell and Molecular Biophysics	3
MCB 162	Human Genetics and Genomics	3
MCB 163	Developmental Genetics	3
MCB 182	Principles of Genomics	3
MCB 241	Membrane Biology	3
MCB 248	Seminar in Cell Biology	2
MCB 252	Cellular Basis of Morphogenesis	4
MCB 258	Seminar in Development	2
MCB 259	Literature in Developmental Biology	1
MCB 291	Current Prog. In Molec. & Cell. Biol.	1
MCB221B/CHE 221B	Mechanistic Enzymology/Enzymes and Metabolism	4
MCP 200L	Animal Cell Culture Laboratory	4
MCP 210A-210B-210C	Advanced Physiol.	4
MCP 219	Muscle Growth and Development	3
MCP 220	Gen. and Compar. Physiol. Of Repro.	3
MCP 222	Gametogenesis and Fertilization	4
MIC 200A	Biology of Prokaryotes	3
MIC 200B	Advanced Bacteriology	3
MIC 215	Recombinant DNA	3
MIC 250	Biology of Yeasts	5
MIC 262	Advanced General and Molecular Virology	3
MIC 263	Principles of Protein-Nucleic Acid Interactions	3
MIC 274	Seminar in Genetic Recombination	1
MIC 275	Seminar in DNA Repair and Recombination	1
MIC 276	Advanced Concepts in DNA Metabolism	3
MIC 292	Seminar in Bacterial Physiology and Genetics	1

MMI 200D	Mechanisms for Microbial Interactions with Hosts	3
MMI 280	The Endogenous Microbiota in Health and Disease	3
NPB 107	Cell Signaling in Health and Disease	3
NPB 212	Light and Fluorescence Microscopy	2
NPB 270/NSC 270	How to Write a Fundable Grant Proposal	3
NPB 287A	Topics in Theoretical Neuroscience	2
NSC 201	Neuroanatomy	3
NSC 219	Statistics for Modern Neuroscience	3
NSC 226	Molecular And Developmental Neurobiology	4
NSC/NPB 221	Cellular Neurophysiology	4
NUT 252	Nutrition and Development	3
PBI 208	Plant Hormones and Regulators	4
PBI 214	Higher Plant Cell Walls	3
PBI 217	Membrane Biology of Plants	3
PBI 219	Repro. Biol. Of Flowering Plants	3
PBI 220	Plant Developmental Biology	4
PBI 227	Plant Molecular Biology	4
PBI 229	Molecular Biology of Plant Reproduction	3
PHA 207	Drug Discovery and Development	3
PHA 208	Advanced Cardiac Physiology and Pharmacology	3
PHA 225	Gene Therapy	3
PHA 250	Functional Genomics: From Bench to Bedside	2-3
PLB 113	Molecular and Cellular Biology of Plants	3
PLP/BCM 217	Molecular Genetics of Fungi	3
PSC 209A	Introduction to Programming: Matlab	4
PTX 202	Principles Of Pharmacology And Toxicology 2	4
PTX 277	Molecular Mechanisms in Cancer & Disease	3
STA 100	Applied Statistics for Biological Sciences	4
STA 102	Introduction to Probability Modeling and Statistical Inference	4
STA 141	Statistical Computing	4
STA 205	Statistical Methods for Research	4
STA 237A	Time Series Analysis	4
STA 252	Advanced Topics in Biostatistics	4
VCR 220	Genomics & Biotechnology Of Plant Improv.	3



## Dissertation Committee Report

Name: \_\_\_\_\_

Date of Dissertation Committee meeting: \_\_\_\_\_

1. Title of dissertation or description of research project:
2. Progress Summary: (Student should attach a 2-3 page Research Progress Summary)
3. Check the progress that the student has made over the past academic year:

\_\_\_\_\_ Satisfactory                      \_\_\_\_\_ Marginal                      \_\_\_\_\_ Unsatisfactory

### **Comments regarding progress and recommendations to student from Dissertation Committee:**

This must be filled out by the Committee even if progress is satisfactory. In addition, if there are concerns or unsatisfactory progress, please specify why and explain either here or in an attached memorandum the precise conditions, including deadlines, the student must fulfill to achieve a satisfactory report and return to good academic standing. Use back if necessary.

Expected Completion Date: \_\_\_\_\_

Additional Comments (e.g., discussion of postdoctoral opportunities):

Major Professor	Signature
Committee Member	Signature
Committee Member	Signature

## Dissertation Committee Interim Report

Name: \_\_\_\_\_

Date of Dissertation Committee meeting: \_\_\_\_\_

### Progress Check:

Check the progress that the student has made in the past three to six months  
(please indicate time period/dates): \_\_\_\_\_

\_\_\_\_\_ Satisfactory                      \_\_\_\_\_ Marginal                      \_\_\_\_\_ Unsatisfactory

Note: If you indicated that the student is making marginal or unsatisfactory progress, please specify why and explain either here or in an attached memorandum the precise conditions, including deadlines, the student must fulfill to achieve a satisfactory at the next meeting (please specify a time period such as 3 or 6 months).

### Expectations Moving Forward:

List expectations for the student in the next few months -please indicate time period and use back if necessary. This must be filled out by the Committee even if progress is satisfactory. If there are concerns or unsatisfactory progress, please specify why and explain either here or in an attached memorandum the precise conditions, including deadlines, the student must fulfill to achieve a satisfactory report and return to good academic standing. Use the back if necessary.

Expected Completion Date: \_\_\_\_\_

Additional Comments (e.g., discussion of postdoctoral opportunities):

---

Major Professor

Signature

---

Committee Member

Signature

---

Committee Member

Signature

---

Graduate Advisor

Signature

## BMCDB Faculty Roster

Name	Email	College/School and Department
Albeck, John	<a href="mailto:jgalbeck@ucdavis.edu">jgalbeck@ucdavis.edu</a>	CBS: Molecular and Cellular Biology
Arsuaga, Javier	<a href="mailto:jarsuaga@ucdavis.edu">jarsuaga@ucdavis.edu</a>	CBS: Molecular and Cellular Biology
Atsumi, Shota	<a href="mailto:satsumi@ucdavis.edu">satsumi@ucdavis.edu</a>	L&S: Chemistry
Attardo, Geoff	<a href="mailto:gmattardo@ucdavis.edu">gmattardo@ucdavis.edu</a>	CAES: Entomology
Baar, Keith	<a href="mailto:kbaar@ucdavis.edu">kbaar@ucdavis.edu</a>	CBS: Neurobiology, Physiology, and Behavior
Baldwin, Enoch	<a href="mailto:epbaldwin@ucdavis.edu">epbaldwin@ucdavis.edu</a>	CBS: Molecular and Cellular Biology
Barlow, Jackie	<a href="mailto:jhbarlow@ucdavis.edu">jhbarlow@ucdavis.edu</a>	CBS: Microbiology and Molecular Genetics
Bäumler, Andreas	<a href="mailto:ajbaumler@ucdavis.edu">ajbaumler@ucdavis.edu</a>	SOM: Medical Microbiology and Immunology
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## **BMCDB Graduate Group Bylaws**

Approved by the Graduate Council January 28<sup>th</sup>, 2022

### **Article I. Objective**

**A. Degree(s) offered by the program:** The Graduate Group in Biochemistry, Molecular, Cellular & Developmental Biology (hereafter referred to as BMCDB or the Group) is organized primarily to establish and administer graduate education leading to the M.S. and Ph.D. degrees in conformance with the rules of the Graduate Council and the Office of Graduate Studies of the Davis Campus of the University of California. A function of equal importance is to provide a focus on research in molecular biology by facilitating the research interaction of graduate students, faculty and postdoctorals. Postdoctoral training is considered part of the group mission.

**B. Discipline:** The study of fundamental biological problems at a molecular level. Experimental approaches used to address these problems range from the atomic and ultra-structural levels to the cellular and organismal levels. Research in the group reflects traditional disciplinary strengths in biochemistry, molecular genetics, cell and developmental biology, as well as interdisciplinary approaches that combine biology, chemistry, physics, engineering, math and/or computational approaches.

**C. Mission of the Program:** The Group is organized to administer the graduate group in BMCDB. The Group may consider and act upon any matters pertaining to those programs. The Group functions as a mechanism for curricular structure in training students in molecular biology at UC Davis and fosters interactions and collaborations among faculty pursuing molecular biological research through different academic departments. BMCDB is committed to upholding the UC Davis Principles of Community and recognizes that efforts towards diversity, equity, and inclusion are a valuable means to advance science.

### **Article II. Membership**

#### **A. Criteria for Membership in the Graduate Program**

##### **1. Appropriate academic and teaching title.**

The Group consists of those faculty members of the Davis campus qualified to guide candidates for the M.S. and Ph.D. degrees in Biochemistry, Molecular, Cellular & Developmental Biology. Interested faculty having strong interest and expertise in biochemistry, molecular genetics, and cell & developmental biology whose appointment authorizes the direction of graduate work, may be elected to membership in the Group by the Executive Committee.

Members shall hold an appropriate academic title as (a) a member of the Academic Senate of the University of California (includes Professors, Lecturers with Security of Employment, Professors in Residence, Professors of Clinical “\_\_\_”, Professors Emeritus/a, and Research Professors), (b) Adjunct Professor, (c) Lecturer (without Security of Employment) or (d) Lecturer Without Salary. Academic staff with primary appointments as Cooperative Extension Specialists or in the Professional Research series are not eligible to be members of graduate programs unless they also hold an appropriate instructional title (normally Lecturer Without Salary).

**2. Active research, practice or teaching appropriate to the discipline(s) encompassed by the program.**

Members must have training in fields related to Biochemistry, Molecular Genetics, Cell and/or Developmental Biology and be engaged in an active research that meets the expectations of the University of California in order to provide appropriate guidance to graduate students. A member should have formal training in Biochemistry, Molecular Genetics, Cell & Developmental Biology, as evidenced by M.D., M.S. or Ph.D. degrees or peer-reviewed publications in Biochemistry, Molecular Genetics, Cell and/or Developmental Biology. Membership is independent and separate from academic department appointments. Membership is based upon disciplinary expertise and active research, so members throughout campus are eligible for consideration to membership in the group.

**3. Voting rights.**

All active members are eligible to vote on graduate matters, except those defined in Section C. Emeritus.

**B. Application for membership.**

**1. How Faculty May Apply**

Candidates apply directly to the Membership Committee. Admissibility shall be determined by the Membership Committee with review by the Executive Committee of the Group. If the Executive Committee does not concur with the decision of the Membership Committee, the final decision will be made by joint consideration of the two. A majority vote of both committees would then determine the applicant's membership.

The applicant should provide the following materials to the Membership Committee: BMCDB New Membership Application form and CV which includes the following:

- a. Education, training, and prior professional appointments
- b. The month and year of appointment to the UC-Davis faculty

- c. Peer-reviewed publications for at least the last three years
- d. External grant support, including source of funds and principal investigator
- e. Membership in other graduate groups
- f. The program enrolled in, year of graduation and current position of all students for whom candidate has served as major professor

**2. Anticipated contributions that graduate faculty members will perform as a member.**

Graduate faculty members are expected to contribute through any of the following:

- 1. Active role in the administration of the graduate group by serving on administrative committees; as a graduate Advisor (not to be confused with a major professor); or as an administrative officer of the group.
- 2. Providing graduate level instruction, as appropriate, in addition to research instruction.
- 3. Service on dissertation and qualifying examinations/Master's comprehensive examination committees, etc.

**C. Emeritus Status.**

Emeritus faculty who are members of the Group are afforded full rights, except Emeritus faculty who no longer run active research programs; they may attend and participate in Group activities, including meetings, but are not afforded the right to vote on policy and bylaw issues related to the Group. Emeritus faculty are eligible to teach in graduate courses and serve on student dissertation committees.

**D. Review of Membership**

The criteria for reviewing members of the program is the same for all members. Each faculty member's contributions to the Group shall be reviewed once every three years for the purpose of identifying faculty members who are not providing a minimal level of service to the Group. This review will be conducted by the Committee on Membership, who will shall review on a yearly basis one-third of the membership. When appropriate, the Executive Committee may request an early review of any member.

The review will focus on a) the areas defined in Section B. above, "Anticipated Contributions by Members" and b) satisfactory mentorship of BMCDB students. All members of the graduate group are expected to adhere to 1) the Mentoring Guidelines (MG) set by UC Davis Graduate Council and any modifications set by

the Student Mentorship Committee (see Article V, below), and 2) the UC Davis Principles of Community (POC). The Executive Committee may request an early review of any member if they are alleged to have violated the MG or POC.

Faculty whose record reflects poor performance in any of these areas will be subject to nonrenewal or to a probationary period in which greater involvement and/or improved student mentorship must be demonstrated as a condition of continuing membership.

### **E. Membership Appeal Process**

If membership is denied, a faculty can appeal to the Executive Committee. Applicants denied membership or renewal of membership may make a final appeal to the Dean of Graduate Studies.

## **Article III. Administration**

The academic leadership and management of the Group shall be vested in the Group Chair and an Executive Committee. The Chair is the chief officer and spokesperson for the Group and for the Executive Committee. Management of the Group shall be open and democratic.

## **Article IV. Graduate Program Chair**

### **A. Chair appointment process**

The Chair will be appointed in accordance with the Academic Personnel Manual policy UCD-245.B and the policies and procedures of the Graduate Council and the Office of Graduate Studies.

A “Nominating Committee” will be named by the Executive Committee to solicit nominations for Graduate Group Chair from the faculty and graduate students of the Group. Those nominated will then be contacted regarding their willingness to serve. The names of the nominees who have indicating a willingness to serve will then be submitted to the Group’s faculty and graduate students for comments. All comments will remain confidential.

The Nominating Committee will forward at least one name to the Dean of Graduate Studies along with all comments received on the nominees. All comments solicited from faculty and students of the group will be treated as confidential information by the Group’s Nominating Committee and by the Office of Graduate Studies.

If the Group puts forward more than one nominee, it may express a preference for one and, if it does, should indicate the basis for determining that preference. The nominee(s) may be interviewed by the Dean of Graduate Studies (or delegate) and will then forward their recommendation to the Chancellor for appointment. The normal term of the Chair’s appointment is three years, however what is recommended will be based on the nominees’ willingness to serve.

## **B. Duties of the Chair**

The Chair: a) provides overall academic leadership for the program; b) develops and implements policies for the program; c) represents the interests of the program to the campus and University administrators; d) calls and presides at meetings of the Executive/Program Committee; e) calls and presides at meetings of the program; f) is responsible for coordinating all administrative matters with the Office of Graduate Studies; g) manages the budgets of the program; h) submits course change or approval forms; i) is responsible for the accuracy of all publications related to the program including web pages and catalog copy; and j) nominates graduate Advisors for appointment.

The chair shall maintain liaison with biochemistry, molecular genetics, cell and developmental biology groups on other campuses of the University and with related groups on the Davis campus.

## **C. Vice Chair**

The Executive Committee shall select of and for itself, and for the Group, a Vice Chair to serve for a three-year term of service. The Vice Chair will vote on all issues brought before the Executive Committee. The Vice Chair will serve as chief officer of the Group in the absence of the Chair, for less than a quarter. If the Chair will be absent from campus for more than a quarter, the Chair appointment procedures must be followed.

## **Article V. Committees**

### **Executive Committee**

The Executive Committee shall consist of the chair of the Group, who serves as chair of the committee, plus seven faculty elected from the membership, plus the Master Advisor and one student appointed annually by the BMCDB Graduate Students' Association. To ensure broad participation, the Executive Committee shall have members from at least three different departments (tri-department rule) including at least one member each from the College of Biological Sciences and from the School of Medicine. All members have voting rights, including the student representative, unless the student does not participate in the discussion due to the nature of the item (see below). The faculty members of the Executive Committee shall be elected for a three-year term, which is renewable two times. Two members shall be elected each year.

Election of faculty members of the Executive Committee: nomination shall be made either by e-mail or from the floor at the annual Spring Quarter meeting of the Group. Elections shall be conducted by mail or electronic-mail ballot within two weeks of the annual Spring Quarter meeting. At election, each member of the Group shall vote for not more than the number of positions to be filled on a ballot provided, without weighing of choice. Those receiving the most votes will be declared elected. Ties will be resolved by lot.

Election results shall be communicated to the members of the Group promptly. Elected members shall assume their duties on July 1.

The principal duties of the Executive Committee shall be to determine and implement policy for the good of the Group, and to represent the interests of the Group generally to various universities and other agencies. The Executive Committee is also responsible for distribution of Block grant and work study funds.

The Chair of the Executive Committee may rule that an item of business is inappropriate for discussion in the presence of the student representative. That item of business will then be discussed in the absence of the student member of the Committee. More generally, The chair of any committee with a student member must excuse the student representatives from meetings during discussion about personnel actions or disciplinary issues relating to faculty, during rankings of existing students for funding, and for disciplinary issues related to students.

The Executive Committee shall meet at least quarterly. Additional meetings and executive sessions may be held as deemed necessary, or upon petition by five members of the Group.

The Executive Committee shall fill interim vacancies for the remainder of the current year.

### **Membership Committee**

The Membership Committee shall consist of five members appointed by the chair of the program for three-year terms, renewable two times. The Chair of the Membership committee is an Executive committee member appointed by the Chair of the program. The Committee on Membership shall review on a yearly basis one-third of the membership in addition to new applicants.

### **Educational Policy Committee**

The Educational Policy Committee shall consist of the members of the Executive Committee and two graduate advisors. There will be one student member appointed by the Group Chair for a one-year term. The chair of the program shall be the chair of the Committee on Educational Policy. The function of this committee shall include consideration of course offerings and recommendations regarding the graduate program and supervision of teaching assignments and teaching experience of graduate students, subject to restrictions of Article VI. The faculty members of the Educational Policy Committee will serve for a three-year term renewable two times.

### **Admissions Committee**

The Admissions Committee shall consist of the Vice Chair of the program, a minimum of five members appointed by the chair for three-year terms, and a minimum of one student appointed by the BMCDB Graduate Students' Association. The Vice Chair of the program shall be the chair of the Committee on Admissions. The functions of this committee shall include making recommendations of admission of students to the program and the

preparation of recommendations of their financial support for final approval by the Chair and Vice Chair of the group. The faculty members of the Admissions Committee shall serve for a three-year term.

### **Student Affairs Committee**

The Student Affairs Committee shall consist of the chair of the program, all graduate advisors, and the Master Advisor who shall be the chair of the Student Affairs Committee. The term of appointment encompasses the tenure of the Chair and advisors. This committee shall be responsible for (a) analysis of the results of the placement examinations for new entering students and determination of what remedial actions may be needed, (b) the assignment of all students to research advisors, (c) the recommendation of student Master's and Ph.D. qualifying exam committees, (d) the active overview of the status of student financial support during their entire period of study, and (e) the coordination of any changes in funding which may occur.

### **Fellowship Committee**

The Fellowship Committee shall consist of three faculty members appointed by the chair of the program for three-year terms renewable two times. The Chair of the Fellowship Committee is an Executive Committee member appointed by the Chair of the program. The functions of the committee include nomination and ranking of students for consideration of university fellowships and awards and identification of students to receive tuition waivers.

### **Recruitment Committee**

The Recruitment Committee shall consist of three members appointed by the chair of the program for three-year terms renewable two times, and a minimum of two students appointed by the Graduate Student Association. The Chair of the Recruitment Committee is an Executive Committee member appointed by the Chair of the program. The functions of the committee are to coordinate the hosting of selected applicants for visitation to the campus, to develop and administer programs for increasing the number, quality, and diversity of applicants to the program, and to generate suitable brochures and web sites to provide information to prospective applicants.

### **Student Mentorship Committee**

The Student Mentorship Committee shall consist of three members appointed by the chair of the program for three-year terms, renewable two times, and two students appointed by the Graduate Student Association. The Chair of the Student Mentorship Committee is an Executive Committee member appointed by the Chair of the program. The functions of the committee are to oversee: (i) modification of Graduate Council Mentoring Guidelines (<http://gradstudies.ucdavis.edu/gradcouncil/mentoring.pdf>) to fit the specific circumstances of the program, (ii) their adoption by the program, and (iii) distribution and notification to the students and faculty of where the Guidelines are posted.

### **Diversity, Equity and Inclusion Committee (DEIC)**

The Diversity Committee shall consist of two faculty members appointed by the Chair for three-year terms, renewable two times, and a minimum of two students appointed by the BMCDB Graduate Students' Association. The Chair of the DEIC is an Executive Committee member appointed by the Chair of the Group.

#### **Duties of the DEIC**

The committee will work to foster appreciation for the value of diversity in the Group, to create and sustain a supportive and inclusive environment for all members, and to diversify our membership. The specific functions of the committee are to 1) advocate for recruiting a diverse group of students through outreach and support of the Admissions Committee, 2) Support enrolled students by providing information resources and social events, 3) Foster an inclusive and vibrant training environment by organizing student and faculty trainings and webpage management to raise awareness of diversity issues, 4) Ensure that the Group is aware of and compliant with the Campus' Diversity and Inclusion Strategic Vision Plan, 5) Identify methods to increase student and faculty diversity in the Group and present these methods to the Executive Committee for consideration of adoption. Finally, the Student Wellness, Inclusion, and Retention Liaisons (SWIRL) subcommittee will function as liaisons to current students to help them navigate their graduate careers. The SWIRL committee will promote the mental and physical well-being of all students in the Group. The committee will work to foster appreciation for the value of diversity in the Group, to create and sustain a supportive and inclusive environment for all members, and to diversify our membership.

### **Article VI. Student Representatives**

Student representatives (who shall be in good standing academically) are appointed annually by the BMCDB Students' Association to the Executive, Admissions, Recruitment and Student Mentorship committees and have voting rights except on an item where they are excused from the discussion.

The Chair of any committee with student members must excuse the student representatives from meetings during discussion about other students, personnel actions or disciplinary issues relating to faculty, during rankings of existing students for funding, and for disciplinary issues related to students.

### **Article VII. Graduate Advisors**

Graduate Advisors will be appointed in compliance with policies and procedures of the Graduate Council and the Office of Graduate Studies. When selecting Graduate Advisors, nominations shall be solicited from Group members. Comments on nominees shall then be sought from Group members and students. The Chair and Executive Committee will



recommend nominees to be forwarded to the Office of Graduate Studies for review and appointment.

A minimum of 6 Graduate Advisors will be appointed. This will include a Master Advisor, a minimum of one Advisor each specializing in one of the four tracks (Biochemistry, Molecular Genetics, Cell, Development), and one Master of Science Advisor, who will advise Master's students. The Master Advisor will oversee and coordinate advising activities and serve on the Executive Committee. Two of the Advisors shall serve on the Educational Policy Committee, four Advisors will serve on the Student Affairs Committee.

Graduate Advisors will be appointed for a 2-year term, which is renewable for as long as the faculty is willing to serve.

### **Article VIII. Meetings**

The Group Chair shall call an annual meeting during Spring quarter for the purpose of electing officers and conducting other business. The Chair shall be privileged to call other meetings in the interest of the Group and shall be required to do so at the written request of three or more members. Notification will be emailed at least two weeks before the meeting. Faculty not on campus may participate by teleconference or other available technology.

### **Article IX. Quorum**

Fifty+ percent of the members of the Group constitutes a quorum for the conduct of business. In the absence of a quorum, issues requiring a vote will be taken up by e-mail balloting or other web-based balloting technology.

All issues that require a vote must be:

- 1) Voted on by 50+% of the available members who are eligible to vote (i.e., not on sabbatical or other approved leave).
- 2) On graduate program matters other than amendments/revision of bylaws: passage requires a 50+% supporting vote by those voting.
- 3) On amendments and revision of bylaws: require a two-thirds majority of those voting.

If balloting is conducted via email or web-based technology, 10 days must be provided for expression of opinions about the proposal prior to the acceptance of votes; the program must allow 14 days for votes to be returned or before the "polls are closed."

### **Article X. Order of Business for Meetings**

N/A

### **Article XI. Amendments**

Amendments to these bylaws may be made in accordance with program's quorum policy in Article IX. Program members may propose amendments by petition to the program Chair. The program Chair, or relevant program committee, may ask for revisions from the faculty who submitted proposed amendments before forwarding the revisions to the membership for review and voting. Quorum, voting and passage is prescribed in Article IX. All amendments and revisions must be submitted to the Graduate Council for review and approval; changes in the bylaws will become effective upon approval by the Graduate Council.

## **BMCDB Degree Requirements**

Approved by the Graduate Council May 14<sup>th</sup>, 2019

### **MS PROGRAM**

**1) Admissions Requirements:** Applicants for admission to BMCDB must meet the University of California minimum GPA requirement for admission (3.0 overall). Other requirements for admission include:

- Hold a Bachelor's degree: An undergraduate major in biology or chemistry is typical for BMCDB graduate students, but is not required. Prerequisites include calculus; statistics; physics; general chemistry; organic chemistry; biology; biochemistry; genetics.
- English proficiency examination for international applicants who have not studied at an English speaking University: TOEFL or other University approved examination. International applicants must meet the Office of Graduate Studies minimum TOEFL score requirement (or equivalent for other University-approved examination).
- Three letters of recommendation.
- Prerequisites: None
- Deficiencies: None

### **2) M.S. Degree, Master's Plan I and II:**

**Plan I.** This plan requires a minimum of 30 units of Advisor-approved, graduate and upper division courses (the 100 and 200 series only) in which the student receives a letter grade (B- or better) or S, and, in addition, a thesis. At least 12 of the 30 units must be graduate work in the major field.

**Plan II.** This plan requires a minimum of 36 units of Advisor-approved, graduate and upper division courses, of which at least 18 units must be graduate courses in the major field, and in which the student receives a letter grade (B- or better) or S. Not more than 9 units of research (299 or equivalent) may be used to satisfy the 18-unit requirement. A comprehensive final examination in the major subject is required of each candidate. No thesis is required.

### **3) Course Requirements: Core and Electives (see summary table)**

#### **a) Core Courses (15 units):**

- MCB 210, Molecular Genetics & Genomics (3 units)
- MCB 211, Macromolecular Structure & Interactions (3 units)
- MCB 212, Cell Biology (3 units)
- MCB 213, Developmental Biology (3 units)
- MCB 214, Molecular Biology (3 units)

**b) Additional required courses:**

MCB 215 (2 units) Directed Readings. The goal of this course is to develop critical reading skills for graduate students and to expose them to major paradigm advances in specialized fields of molecular and cellular biology. To advance active learning and participation, this course is designed to bring small groups of students together with faculty who are expert in a given area. Faculty (2/section) will choose papers that highlight major advances (technical and/or intellectual) and that form a narrative of discovery. Faculty will provide a historical background to the problem addressed by the paper, review special techniques used in the paper and challenge students to develop their own ideas for how to address the major questions in the field. The intensive meeting schedule and small group size are a critical to the goals of the course

Responsible Conduct of Research series (certificate-based). Review of basic skills required of contemporary scientists. Topics include scientific conduct, manuscript preparation, grant writing, seminar presentations and time management. Emphasis on responsibilities of scientists to factually and thoughtfully communicate results.

**c) Elective Courses (11 units Plan I; 8 units Plan II):**

Each student must take at least two additional letter graded advanced undergraduate or graduate courses to be selected in consultation with the academic Advisor and major professor (see attachment (b) for courses). Attention to the schedule on which such courses are offered is essential - many are offered only in alternate years

**d) Summary:**

A total of 30 units for Plan I and 36 units for Plan II (core, elective and research) are required. Students will enroll for 12 units per quarter including research, academic and seminar units. Courses that fulfill any of the course requirements may not be taken S/U unless the course is normally graded S/U.

Students must maintain a GPA of 3.0. If the GPA falls below 3.0, the student is placed on academic probation. If a student is on academic probation for more than three quarters, the student is subject to disqualification upon recommendation of the BMCDB Executive Committee to the Dean of Graduate Studies.

**4) Special Requirements:**

Students who have not obtained a previous degree at an approved English-medium institution or demonstrated English-language proficiency through an appropriate exam (e.g. TOEFL) are required to complete appropriate English-language courses, as

described in the policy Graduate Student Course Requirements – English as Second Language (GC2018-02). Courses taken in satisfaction of this requirement do not count towards the units required for graduation.

## **5) Committees**

### **a) Admission Committee**

Once the completed application, all supporting material, and the application fee have been received, the application will be submitted to the Admissions Committee. The Admissions Committee consists of six graduate group faculty and one graduate group student. Based on a review of the entire application, a recommendation is made to accept or decline an applicant's request for admission. That recommendation is forwarded to the Dean of Graduate Studies for final approval of admission. Notification of admissions decisions will be sent by Graduate Studies. Applications are accepted through December 15 of the previous year for the next Fall entering class.

### **b) Course Guidance/Advising/Major Professor Selection**

Upon entering the group, students will work with the Master degree Advisor to ensure the students enroll in the correct courses and remedy any deficiencies. The Master degree Advisor will also help place the student in a lab if research is to be undertaken (Plan I). A minimum of 12 units is required per quarter to maintain full time student status.

### **c) Thesis Committee or Comprehensive Examination Committee**

The student, in consultation with his/her major professor and graduate Advisor, nominate 3 faculty to serve on the Thesis (Examination) Committee. These nominations are submitted to the Office of Graduate Studies for formal appointment in accordance with Graduate Council policy (DDB 80, Graduate Council B.1.). The major professor serves as Chair of the thesis committee.

## **6) Advising Structure and Mentoring**

The Major Professor is the faculty member who supervises the student's research and thesis (Plan I); this person serves as the Chair of the Thesis Committee. The Master of Science Advisor, who is appointed by the Chair of the group, is a resource for information on academic requirements, policies and procedures, and registration information until the Course Guidance Committee is formed. A Student Mentorship committee will deal with any mentoring problems that arise. The Mentoring Guidelines can be found on the BMCD [Advising and Student Resources webpage](#).

## **7) Advancement to Candidacy**

Every student must file an official application for Candidacy for the Degree of Master of Science after completing one-half of their course requirements and at least one quarter before completing all degree requirements. The Candidacy for the Degree of Master form can be found online at: <http://www.gradstudies.ucdavis.edu/forms/>. A completed

form includes a list of courses the student will take to complete degree requirements. If changes must be made to the student's course plan after s/he has advanced to candidacy, the Graduate Advisor must recommend these changes to Graduate Studies. Students must have their Graduate Advisor and thesis committee Chair sign the candidacy form before it can be submitted to Graduate Studies. If the candidacy is approved, the Office of Graduate Studies will send a copy to: the Thesis Committee Chair, the appropriate graduate staff person, and the student. If the Office of Graduate Studies determines that a student is not eligible for advancement, the department and the student will be told the reasons for the application's deferral. Some reasons for deferring an application include: grade point average below 3.0, outstanding "I" grades in required courses, or insufficient units.

## **8) Comprehensive Examination and Thesis Requirements**

### **a) Thesis Requirements (Plan I)**

The Master's thesis is to be carried out under the supervision of a faculty member of the BMCDB Group and must represent a contribution to knowledge in biochemistry, molecular genetics, cell biology or developmental biology. The thesis is submitted to a committee of three faculty members recommended by the Advisor and appointed in accordance with the Academic Senate regulations. The topic of the thesis should be acceptable to all members of the committee when they agree to serve and a joint meeting of committee members and the student should be held at that time. For the thesis to be acceptable for the degree, all committee members must sign the title page. Instructions on preparation of the thesis and a schedule of dates for filing the thesis in final form are available from Graduate Studies; the dates are also printed in the UC Davis General Catalog

### **b) Comprehensive Examination (Plan II)**

The student must pass a comprehensive final examination in biochemistry, molecular genetics, cell and developmental biology. The comprehensive exam is taken after all coursework is finished, in the winter/spring of the 2nd year. The format is an oral examination administered by a committee of three faculty members nominated by the Advisor. A unanimous vote of the committee is required to pass a student. If a student does not pass the examination, the committee may recommend that she or he be re-examined one time. If the Graduate Advisor concurs, the student may be re-examined. A student who does not pass on the second attempt is subject to disqualification from further work as a graduate student. The results of all Master's examinations must be reported to Graduate Studies.

## **9) Normative Time to Degree**

The Normative Time to Degree for the M.S. program is six quarters (two years).

### 10) Typical Time Line and Sequence of Events

#### Year 1:

Fall	Winter	Spring
MCB 211	MCB 212	MCB 214
MCB 210	MCB 213	MCB 215
MCB 291	MCB 291	MCB 291

Advancement to candidacy in Winter or Spring

#### Year 2:

Fall	Winter	Spring
Elective(s)	Elective(s)	Elective(s)
Ethics	MCB291	MCB291
MCB291	M.S. Comprehensive Exam or preparation of thesis	

### 11) Sources of Funding

There is no guarantee of funding for the Plan I and Plan II Master programs. Master students can TA to support themselves. Faculty are NOT required to support a MS student.

### 12) PELP, In Absentia and Filing Fee Status.

Information about PELP (Planned Educational Leave), In Absentia (reduced fees when researching out of state), and Filing Fee status can be found on the [Graduate Studies website](#).

## Ph. D. PROGRAM

### 1) Admissions Requirements

Applicants for admission to BMCDB must meet the University of California minimum GPA requirement for admission (3.0 overall). Other requirements for admission include:

- Hold a Bachelor's or Master's degree: An undergraduate major or master's degree in biology or chemistry is typical for BMCDB graduate students, but is not required.
- English proficiency examination for international applicants who have not studied at an English speaking University: TOEFL or other University approved examination. International applicants must meet the Office of Graduate Studies minimum TOEFL score requirement (or equivalent for other University-approved examination).
- Three letters of recommendation
- Prerequisites:** None

- e) **Deficiencies:** If there are deficiencies in background, appropriate remedial undergraduate courses will be recommended; they must be completed prior to the Qualifying exam either by:
- 1) taking courses as approved by the Graduate Advisor, or
  - 2) by being a Teaching Assistant in the appropriate courses, and by attending the course lectures.

## 2) Dissertation Plan B

Three-member (minimum) dissertation committee, an optional final oral examination (decided by the dissertation committee), and an exit seminar.

## 3) Course Requirements

### a) Core Courses (17 units)

BCB 210, Molecular Genetics & Genomics (3 units)  
 BCB 211, Macromolecular Structure & Interactions (3 units)  
 BCB 212, Cell Biology (3 units)  
 BCB 213, Developmental Biology (3 units)  
 BCB 214, Molecular Biology (3 units)  
 BCB 215, Reading Course (2 units)

**Responsible Conduct of Research online series.** Review of basic skills required of contemporary scientists. Topics include scientific conduct, manuscript preparation, grant writing, seminar presentations and time management. Emphasis on responsibilities of scientists to factually and thoughtfully communicate results.

**BCB 220L, Laboratory Rotations (5 units).** Taken in both the fall and winter for a total of 10 units. Two, five-week rotations per quarter. At the end of each rotation, students give short presentations on their rotation projects to other first-year students, the instructor in charge and any other faculty and students who wish to attend. In addition, each student prepares a short written report.

**MCB 291, Current Progress in Molecular and Cellular Biology Seminar (1 unit).** Taken fall, winter and spring quarters of years 1 and 2 for a total of 6 units. Seminars presented by guest lecturers on subjects of their own research activities.

- b) **Elective Courses (6 units):** Each student must take at least two additional advanced courses (minimum of 6 units) to be selected in consultation with the academic Advisor and major professor (see attachment (b) for courses). Attention to the schedule on which such courses are offered is essential - many are offered only in alternate years



- c) **Summary: Total Minimum Unit Requirement = 72 units:** A total of 72 units (core, elective, and research) are required. Students will enroll for 12 units per quarter including research, academic and seminar units. Courses that fulfill any of the course requirements may not be taken S/U unless the course is normally graded S/U. Required core and elective courses constitute 41 units, the additional 31 units is enrollment in research credit (299).

Students must maintain a GPA of 3.0. If the GPA falls below 3.0, the student is placed on academic probation. If a student is on academic probation for more than three quarters, the student is subject to disqualification upon recommendation of the BMCDB Executive Committee to the Dean of Graduate Studies.

- 4) **Special Requirements: Teaching Assistantship (TA) requirement:** Participation in teaching is an essential part of training in the graduate program. In addition, teaching experience can be helpful later in obtaining employment. Students are required to TA one Advisor-approved undergraduate biochemistry, molecular genetics, cell biology or developmental biology lecture or laboratory course. It is expected that students fulfill this requirement during the third quarter of their first year or during the first two quarters of the second year. It must be fulfilled prior to the qualifying examination. While working as TAs, students must register for BCB 394 (1 unit) or equivalent. Teaching assignments may vary according to past teaching experience and source of support. Open positions are advertised quarterly across the campus. Application forms may be obtained from Departmental offices. In general, applications are current only for the quarters indicated on the form. New applications must be filed for subsequent consideration.

#### **English-Language Course Requirement:**

Students who have not obtained a previous degree at an approved English-medium institution or demonstrated English-language proficiency through an appropriate exam (e.g. TOEFL) are required to complete appropriate English language courses, as described in the policy Graduate Student Course Requirements – English as Second Language (GC2018-02). Courses taken in satisfaction of this requirement do not count towards the units required for graduation.

### **5) Committees**

#### **a) Admissions Committee**

Once the completed application, all supporting material, and the application fee have been received, the application will be submitted to the Admissions Committee. The Admissions Committee consists of six graduate group faculty and one graduate group student. Based on a review of the entire application, a recommendation is made to accept or decline an applicant's request for admission. That recommendation is forwarded to the Dean of Graduate Studies for final approval of admission. Notification of admissions decisions will

be sent by Graduate Studies. Applications are accepted through December 15 of the previous year for the next Fall entering class.

**b) Course Guidance/Advising/Major Professor Selection**

Upon entering the group, students are assigned an Academic Advisor based on their area of interest (Biochemistry, Molecular Biology, Cellular Biology, Developmental Biology). A minimum of 12 units is required per quarter to maintain full time student status. Selection of the dissertation Advisor (major professor) is normally accomplished by the end of the winter quarter, first year. The chair of BMCDB sends a letter to each first year student requesting that the student find a major professor with whom the student wishes to work and who is willing to take the student into the laboratory and to provide the necessary financial support. Students submit their requests to the BMCDB Student Affairs Committee, which approves and makes final assignments. Satisfactory progress in the BMCDB program is dependent upon assignment of a dissertation Advisor by the end of spring quarter in the first year.

**c) Qualifying Examination Committee**

Qualifying examination committees will consist of five faculty members who are recommended to Graduate Studies by the BMCDB Student Affairs Committee in the Winter quarter of the student's second year. The faculty members may all be in the program, but will come from at least three different departments. Three members will be selected by the BMCDB Student Affairs Committee with solicited input from major Advisors and students, who will be asked to recommend names of the members - ideally two of these faculty will also to serve on the student's dissertation committee. The remaining two faculty will be selected to ensure coverage of the core areas of BMCDB (i.e. Biochemistry, Molecular Biology, Cellular Biology, and Developmental Biology).

Qualifying examination committees are submitted to Graduate Studies and appointed in accordance with the Academic Senate regulations. The chair of the qualifying examination committee is expected to ensure that the student receives a fair examination. Qualifying Examination Committees may not include the major professor who will serve as chair of the student's dissertation committee. The area of the student's dissertation research will be considered so that at least one individual with expertise in this area is a member of the qualifying examination committee.

The student, in consultation with his/her major professor and graduate Advisor, nominate three faculty to serve on the Examination Committee. These nominations are submitted to the Student Affairs Committee and two additional faculty are chosen from the faculty at large. These names are forwarded to the Office of Graduate Studies for formal appointment in accordance with Graduate Council policy (DDB 80. Graduate Council B.1.).

## 6) Mentoring

The **Major Professor** is the faculty member who supervises the student's research and dissertation; this person serves as the Chair of the Dissertation Committee. The **Graduate Advisor**, who is appointed by the Chair of the program, is a resource for information on academic requirements, policies and procedures, and registration information until the Course Guidance Committee is formed. A Student Mentorship committee will deal with any mentoring problems that arise. The **Mentoring Guidelines** can be found on the BMCDB [Advisor and Student Resources webpage](#).

## 7) Advancement to Candidacy

After the qualifying exam is passed, a student must file an application for advancement to candidacy for the degree of Doctor of Philosophy. The chair of a student's qualifying examination committee is sent the application form for advancement to candidacy.

When the student has passed the examination, the chair signs and dates the form. The student then identifies a dissertation committee, provides a dissertation title, obtains signatures of the major professor and graduate Advisor, pays a fee, and files the form with Graduate Studies. Graduate Studies requires that students must be advanced to candidacy by the ninth quarter of academic enrollment to be eligible for continued appointment as a graduate student researcher or teaching assistant.

## 8) Preliminary Examination, Qualifying Examination and Dissertation requirements:

- a) The program requires an exit seminar of each student. Satisfaction of this requirement must be verified by the Dissertation Committee Chair.
- b) The dissertation committee may require a final oral examination; the decision is made on an individual student basis.
- c) Before advancing to candidacy for a doctoral degree, a student must have satisfied all requirements set by the graduate program, must have maintained a minimum GPA of 3.0 in all course work undertaken (except those courses graded S or U), and must have passed a Qualifying Examination before a committee appointed to administer that examination.
- d) All students will complete the course requirements before taking their Qualifying Examination.
  - The Qualifying Examination will consist of written and oral examinations.
  - The written research proposal should be provided to members of the qualifying examination committee at least 1 week before the qualifying exam. The qualifying exam should be taken by the Spring quarter of the second year and no later than the end of the Fall quarter of the third year after admission to the Ph.D. program.
  - According to university policy, graduate students cannot hold an academic title (e.g., Teaching Assistant, Research Assistant) for more than 9 quarters before passing their Qualifying examination.

- Passing this exam makes the student eligible for advancement to candidacy.
- e) **Written component of Qualifying Examination:** The goal of the dissertation research proposal is to provide a substantial and original contribution to the fields of biochemistry, molecular genetics, cell and/or developmental biology. The scope should be similar to that of a postdoctoral grant proposal. Written versions of the dissertation research proposal are to be prepared by the student and distributed to the committee at least one week prior to the examination. The format is that of an NIH postdoctoral fellowship proposal. Organize sections 1-5 of the research proposal to answer these questions: (1) Specific aims. What do you intend to do? (2) Background and significance. Why is the work important? (3) Preliminary studies. What have you already done? (4) Research design and methods. How are you going to do the work? (5) References. **DO NOT EXCEED 5 PAGES FOR SECTIONS 1-4.** The following distribution for length is recommended:
- (1) **Specific aims.** State briefly the broad, long-term objectives of the work. Then state the specific purposes of the proposed research. One-half page is recommended.
  - (2) **Background and significance.** Briefly sketch the background to the proposal. Critically evaluate existing knowledge, and identify the gaps that the project is intended to fill. State concisely the importance of the proposed research by relating the specific aims to the broad, long-term objectives. One page is recommended.
  - (3) **Preliminary studies** - dissertation research only. Describe the work you have already accomplished that is relevant to the proposal. A maximum of one page is recommended.
  - (4) **Research design and methods.** Outline the experimental design and the procedures to be used to accomplish the specific aims. Include the means by which data will be collected, analyzed and interpreted. Describe any new methodology and its advantage over existing methodologies. Discuss the potential difficulties and limitations of the proposed procedures along with alternative approaches to achieve the aims. Provide a tentative sequence for the investigation. Although no specific number of pages is recommended for this section, the total for sections 1-4 should not exceed 5 pages.
  - (5) **References.** Each citation must include the names of all authors, title of the article, name of the book or journal, volume number, page numbers and year of publication.
- Concepts within the research proposal can be discussed with others (such as the student's major professor and peers), but the writing of the proposal should be solely the student's work (i.e., no editorial assistance

is allowed) as the proposal will serve as evidence of the student's proficiency in scientific writing.

- The qualifying exam committee will be responsible for assessing that the student's writing proficiency is satisfactory before advancement to candidacy. Furthermore, the research proposal will provide information that may be discussed during the oral exam.
- f) Oral component of the Qualifying Examination: The oral portion of the qualifying exam is intended to demonstrate the student's critical thinking ability, synthesis, and broad knowledge of the field of study. It will start with ~ 20 min oral chalkboard presentation of the proposal; questions will be asked related to the research topic and then proceed to more general topics. The committee will evaluate the student's general qualifications for a respected position as an educator or leader as well as the student's preparation in a special area of study based upon relevant portions of the student's previous academic record, performance on specific parts of the examination, and the student's potential for scholarly research as indicated during the examination.
- g) Qualifying Examination Evaluations: There are three possible outcomes of the examinations - pass, not pass, and fail. Pass advances the student to candidacy for the Ph.D. Fail means that the student is disqualified. Not pass means that the student is required to retake all or part of the examination OR to satisfy another requirement. If requested, the second examination is to be scheduled at the earliest possible date and will be administered by the same committee. Satisfactory completion of this examination (or completion of the new requirement) will result in Advancement to Candidacy. Failure will result in a recommendation for disqualification. Note: To officially advance to candidacy, a fee must be paid to the Cashiers Office and the fully endorsed Advanced to Candidacy Petition can then be submitted to Graduate Studies.

## **9) Normative Time to Degree**

A minimum of three years is required for the Ph.D. but ordinarily a student should plan on four to five years to satisfy all requirements of the degree. Normative time, measured from the time a student begins graduate study at any level at UC Davis, is 5 years for the current groups.

## **10) Typical Time Line and Sequence of Events**

**Year 1:**

<i>Fall</i>	<i>Winter</i>	<i>Spring</i>
BCB 211 (3u)	BCB 212 (3u)	BCB 214 (3u) -
BCB 210 (3u)	BCB 213 (3u)	BCB 215 (2u)
BCB 220L (5u)	BCB 220L (5u)	Elective -
BCB 291 (1u)	BCB 291 (1u)	BCB 291 (1u) -

**Year 2:**

<i>Fall</i>	<i>Winter</i>	<i>Spring</i>
Elective	TA	BCB 299 -
Research Ethics	BCB 299 -	BCB 291 (1u) -
BCB 299	-	QE
BCB 290 (1u)		<b>Advancement to Candidacy</b>

**Year 3-5: BCB 299** (recommended)

**11) Sources of Funding**

Students are supported through block grant funds and/or fellowships for the first two quarters. Once a student has joined a lab, the Major Professor is responsible for supporting the student. This can be through GSR, TA or a combination of the above.

**12) PELP, In Absentia and Filing Fee Status.**

Information about PELP (Planned Educational Leave), In Absentia (reduced fees when researching out of state), and Filing Fee status can be found on the [Graduate Studies website](#).

**13) Leaving the Program Prior to Completion of the PhD Requirements.**

Should a student leave the program prior to completing the requirements for the PhD, they may still be eligible to receive the Masters if they have fulfilled all the requirements (see Master's section). Students can use the Change of Degree Objective form available on the [Graduate Studies website](#).