

Case Western Reserve University School of Medicine Biochemistry MS Program Student Handbook

The MS degree program is designed for students who wish to acquire expertise in biochemistry, with a view to working in the biotechnology industry or in research labs in academia or government. The MS degree is also excellent preparation for further education. The program consists of coursework and optional research in faculty laboratories. In addition, the Experimental Biotechnology track provides focused training in current techniques in biochemistry, cell biology and molecular biology. **Note: the Experimental Biotechnology track is likely to become unavailable beginning in Fall 2024.**

Getting Started

Incoming students should contact the Director of MS Programs in Biochemistry (currently Dr. Susan Wang) and the Graduate Education Coordinator (Ms. Cynthia Ernst) as soon as possible and meet with both to discuss the academic and administrative details of joining the program. International students must supply their home address to the federal Department of Homeland Security and must check in with CWRU's VISA office (Crawford Hall 215; <https://case.edu/visa/>; visa@case.edu). Please get your I-20 and schedule your visa appointment as early as possible. Some visas can take over 8 weeks to process.

All students who plan to work in a research lab or take the biochemistry lab series must complete lab safety training offered by CWRU's Environmental Health and Safety program (<https://case.edu/ehs/>) before they can begin work. All students should complete “Laboratory Safety” and “Biosafety” as early as possible during their first semester. Initial training is typically done on Zoom as of Fall 2023. More information on training including how to register is at <https://case.edu/ehs/training/>. Additional training may be required based on the research lab a student joins and should be arranged in consultation with the research faculty mentor.

Students register for courses using the online Student Information System (SIS; sis.case.edu). Registration must be completed before the start of the semester. Before students may register, they must meet with the Director of MS Programs to discuss potential coursework and to remove their SIS advising hold. Late fees, which are the responsibility of the student, are assessed after classes start. The first two weeks of the semester, ending the second Friday of classes, are the Drop/Add period. Students can change their registration during this time freely and without penalty. The academic calendar (case.edu/registrar/dates-deadlines/academic-calendar) lists these dates for each semester.

Coursework

Requirements

The MS degree requires 36 credit hours of coursework (18 graded; currently (August 2023) SIS indicates 12, which is incorrect). As of academic year 2023-24, the program has several required courses:

BIOC 407: Introduction to Biochemistry: From Molecules To Medical Science (4 credits)

BIOC 408: Molecular Biology (4 credits)

BIOC 500: Biotechnology Laboratory: Molecular Biology Basics (1 credit)

BIOC 501: Biochemical and Cellular Techniques for Biotechnology (3 credits)

Case Western Reserve University School of Medicine Biochemistry MS Program Student Handbook

One of either BIOC 502A or B: Biotechnology Laboratory: Molecular Biology and Biochemical Techniques (A) or Biotechnology Laboratory: Eukaryotic Molecular and Cellular Biology (2 credits)

EXAM 600: Master's Comprehensive Exam (1 credit)

The remainder of the curriculum is chosen from advanced biochemistry courses and/or offerings from other departments (e.g. Biology, Pathology, Neurosciences, Systems Biology). Independent laboratory research may be carried out for credit (BIOC 601) for a maximum of 3 credits/semester and 12 total credits.

Students with significant laboratory experience may complete a laboratory proficiency exam to be exempted from completing BIOC 500; an additional credit of coursework is needed to replace this credit.

Dual-degree students (e.g., JD/MS) and university employees should consult with the Director of MS Programs to discuss whether BIOC 500 and/or BIOC 502A/B are appropriate/necessary.

Full-time students (enrolled in at least 9 credits/semester) complete the program in 4 semesters. This can be done in 21 total months if the students do not enroll during the summer between their first and second years, or in 15 months if the students enroll for the summer as well. (Please note that relatively few classes are offered during summer session.) Part-time students usually complete the program within 3 years. Sample schedules are shown in the table below.

International students are required to maintain full-time enrollment each semester. Thus, international students must be enrolled in at least 9 credits/academic semester (Fall/Spring) except the semester in which they complete EXAM 600. Typically international students may not withdraw from classes because they would drop below full-time.

**Case Western Reserve University School of Medicine Biochemistry MS Program
Student Handbook**

Sample Schedules for the Biochemistry MS Program	
21 month program	15 month program
Year 1, Fall BIOC 407 Introduction to Biochemistry: From Molecules To Medical Science (4) BIOC 501 Biotechnology Laboratory: Molecular Biology Basics (1) BIOC 501 Biochemical and Cellular Techniques for Biotechnology (3) BIOC 511 Practice and Professionalism in Biotechnology OR BIOC 601 Research OR BIOC 611 Biochemistry Seminar	Year 1, Fall BIOC 407 Introduction to Biochemistry: From Molecules To Medical Science (4) BIOC 501 Biotechnology Laboratory: Molecular Biology Basics (1) BIOC 501 Biochemical and Cellular Techniques for Biotechnology (3) BIOC 511 Practice and Professionalism in Biotechnology OR BIOC 601 Research OR BIOC 611 Biochemistry Seminar Elective (3)
Year 1, Spring BIOC 408 Molecular Biology (4) BIOC 502A or B Biotechnology Laboratory Elective (3)	Year 1, Spring BIOC 408 Molecular Biology (4) BIOC 502A or B Biotechnology Laboratory Elective (3)
Year 2, Fall Electives (9)	Year 1, Summer Electives (6)
Year 2, Spring Electives (8) EXAM 600 (1)	Year 2, Fall Electives (8) EXAM 600 (1)

The Experimental Biotechnology Track This track prepares students for employment opportunities in biotechnology and as researchers in academic or government laboratories. Beyond the requirements for all MS students, the track requires completion of 2 additional laboratory courses (the second of BIOC 502A/B and BIOC 502C) and BIOC 511. BIOC 500-502ABC introduce common techniques used in biochemistry labs and standard operating procedures (SOPs) as defined in the biotechnology industry, and give students extensive hands-on experience and training in structured teaching labs. BIOC 511 covers issues of practice and professionalism in academic and industrial labs. These courses may be taken in the first or second years. The table below shows a suggested schedule for students completing the program in 2 academic years. Completion of the track is recorded on the student's transcript upon request; the track is NOT automatically recorded.

**Case Western Reserve University School of Medicine Biochemistry MS Program
Student Handbook**

YEAR 1			
Fall		Spring	
BIOC 407	Introduction to Biochemistry: From Molecules To Medical Science (4)	BIOC 408	Molecular Biology (4)
BIOC 500	Biotechnology Laboratory: Molecular Biology Basics (1)	BIOC 502 A, B, & C	Biotechnology Laboratory: Biochemical and Cellular Techniques for Biotechnology (2,2,1)
BIOC 501	Biochemical and Cellular Techniques for Biotechnology (3)		
BIOC 511	Practice and Professionalism in Biotechnology (1)		
YEAR 2			
Fall		Spring	
Electives	(9)	Electives	(8)
		EXAM 600	Master's Comprehensive Exam (1)

Focus Areas

To help guide students in their studies, we have created three optional focus areas, which are suggested course sequences in areas of interest. These focus areas leave room in student schedules for research and additional electives. In general, students can begin taking these courses in Spring of their first year. Each course below is 3 credits.

Molecular Structure and Function

BIOC 412: Proteins and Enzymes (Spring); BIOC 415: Biological Membranes and Their Proteins (Spring); BIOC 434: Structural and Computational Biology (Fall)

Molecular Basis of Infectious Disease

BIOC 410: Microbial Physiology and Therapeutic Opportunities (Spring); BIOC 411: Antimicrobial Therapies and Resistance (Fall)

Cancer Biology

BIOC 450: Molecular Basis of Cancer (Fall); BIOC 453: Biochemical Pathways in Cancer Therapeutics (Spring); BIOC 460: Advanced Technologies for Cancer Research (Spring)

Dual Degrees

The MS program is part of several dual degree programs. These dual degrees are for students with broad interests that include biochemistry. They include:

JD/MS in Biochemistry. This program is designed for students interested in intellectual property law. The biochemistry portion of the degree provides students with the science background to practice intellectual property and patent law specializing in the biomedical sciences.

Case Western Reserve University School of Medicine Biochemistry MS Program Student Handbook

MA in Patent Practice/MS in Biochemistry. This program combines the unique one-year Patent Practice degree offered in the Law School, with the MS in Biochemistry. This program provides individuals with scientific knowledge allowing them to pursue careers in this area of patent practice.

MBA/MS in Biochemistry. This program is for students who are interested in the business aspects of the health and biomedical science fields (hospitals, pharmaceuticals, biotechnology, etc.).

Please consult with the Director of MS Programs for more details about dual-degrees.

Grades

According to the School of Graduate Studies, MS students must have at least a B average (GPA ≥ 3.0) to graduate. Passing grades are A, B, C, or S. Research, seminar courses, and select other courses are graded pass/no pass (P/NP). Students must retake a required course if they fail to earn a passing grade.

The Comprehensive Exam

Biochemistry MS students write their comprehensive exam in their last semester in the program. This activity is done as EXAM 600 (1 credit). The student writes an NIH-style research proposal in an area of their choosing. If the student is in a research lab and/or is enrolled in BIOC 601, the proposal should be based upon their current research and include “preliminary data” based on the student’s research results. The goal is to pose a scientific question or hypothesis and propose experiments that will answer the question or test the hypothesis. The student submits their proposal, which is then read by a committee of three faculty including the Director of MS Programs, the student’s laboratory research mentor (if applicable), and another Biochemistry faculty member. The student then presents their proposal to the faculty committee in an oral examination. For MS students who start in the fall semester and plan to graduate in 2 academic years, the EXAM 600 defense is scheduled in late March of the final spring semester. This is done relatively early because the School of Graduate Studies typically requires graduation paperwork at the end of the first week of April. If you plan to graduate in either spring or summer, consult with the Director of MS Programs to determine the appropriate deadline.

Students can use their independent research (BIOC 601) as the basis for their proposal. They can also base the proposal on another topic. Appendix 1 contains a detailed description of the comprehensive exam.

Departmental Seminars

The Biochemistry Department has two weekly seminar series that are held in the fall and spring semesters. MS students are strongly encouraged to attend these seminars. Attendance at these seminars is required for students enrolled in BIOC 611 (fall semester) and BIOC 612 (spring semester). These seminars are excellent opportunities to learn about research carried out in the Biochemistry program, at CWRU, and by scientists around the world. MS students can use these seminars to increase their understanding of research techniques and scientific advances; these are particularly valuable for students who wish to continue to PhD programs. MS students are NOT required to present their work.

Monday PhD Student Seminars- PhD students give seminars on their thesis research to the program every year on Mondays at 11:40 AM. This is an opportunity to learn about the work by student colleagues working in labs in the Biochemistry Program.

Case Western Reserve University School of Medicine Biochemistry MS Program Student Handbook

Thursday Biochemistry Research Seminars-The Biochemistry Department sponsors a research seminar series on Thursdays at 4 PM. Speakers from CWRU and outside the university present their research work. The speaker often has lunch with students either Thursday and/or Friday. These are great opportunities to network and meet other scientists. Please contact Cynthia Ernst if you are interested in having lunch with a Thursday seminar speaker.

Authorship and Credit for Work

Students must receive credit for their scientific work in publications. In a collaborative effort in which a student makes the major scientific contribution, the student's name should be the first author. Students should receive co-authorship for lesser contributions. Everyone who supervises the work of graduate students should work to ensure that students receive proper credit. If a student believes that proper assignment of credit has not been made, the questions should first be discussed among the collaborators. If agreement is not reached, the dispute should be submitted to the Graduate Education Committee.

Leaving the Program After Graduation

All research materials generated during a student's on-campus research are the property of the university by the rules of federal funding agencies. Because others will use these materials in future experiments these materials (cells, proteins, plasmids, etc.) must be cataloged and shared with others in the lab. After consultation with their advisor, the student may discard all materials that do not have further use. Similarly, all research records (notebooks, computer files, etc.) are the property of the university. They must be cataloged and left in the advisor's laboratory. Students may make copies of their research records. All university materials (ID card, keys, etc.) should be returned following CWRU procedures.

STUDENT LIFE

**Portions of this section are based on the student handbook of the Physiology and Biophysics program.*

Office of Graduate Student Life

This office provides several resources for graduate students; please visit <https://case.edu/studentlife/graduate/> for more details.

International Students

International students often face additional challenges, especially if they are first-time visitors to the US. The Center for International Affairs (<https://case.edu/international/international-student-services>; Tomlinson Hall 143; global@case.edu) provides information and support for incoming and current international students. They can also help with a wide range of non-academic issues (housing, personal, financial, legal) that international students may encounter during their studies at CWRU. The VISA office (Crawford Hall 215; <https://case.edu/visa/>; visa@case.edu) provides assistance with immigration and visa issues.

Health Insurance

All students must have health insurance. Students can purchase coverage through the University's health plan. If a student has their own coverage (through a spouse, their family, or a third-party

Case Western Reserve University School of Medicine Biochemistry MS Program Student Handbook

supplier), they may waive coverage through the University (case.edu/studentlife/healthcounseling/medical-planwaiver-information/health-waiver-process). University Health and Counseling Services (UHCS, Dental Research Building 1st and 2nd floors) provides health coverage to our students. CWRU also has an outside insurer for the Student/Dependent Medical Plan (<https://case.edu/studentlife/healthcounseling/medical-plan>); details of plan coverage can be found online. UHCS is staffed by health professionals with an interest in student health. These include physicians, nurse practitioners, psychologists, psychiatrists, social workers, and registered nurses.. More information may be obtained by visiting the UHCS website (<https://case.edu/studentlife/healthcounseling/>) or by calling one of these numbers:

General Information:	216 368-5872
After Hours/Weekends Nurse On-Call:	216-368-2450
After Hours/Weekends Counseling	216-368-5872

Virtual appointments are available through TimelyCare (timelycare.com/cwru). Students should seek care through UHCS before utilizing other providers because many preventive and regular well-person services can be obtained at no cost through UHCS.

Dental Care

The CWRU School of Dental Medicine has dental clinics to provide training for pre-doctoral dental health professionals. Participants in the Student/Dependent Medical plans are eligible to receive free and discounted care through the School of Dental Medicine. Treatment is administered by pre-doctoral and doctoral dental students under the close supervision of experienced dental health professionals. Services through the School of Dental Medicine are often significantly less expensive than going to a private practice dentist. More information is available at: <https://case.edu/studentlife/healthcounseling/medical-planplan-information/dental-coverage>.

University Health and Counseling Services (UHCS)

Graduate school is a time of tremendous self-exploration and change. At times these changes are intentional and understandable; at other times they are unpredictable, chaotic and upsetting. Each year hundreds of students seek out University Counseling Services to help them gain perspective and to lay the groundwork for personal change. For many, the change can become a ‘Turning Point’ in their lives. UCS (case.edu/studentlife/healthcounseling/) offers students help with their personal counseling and behavioral health needs, including individual, couples and group counseling, psychiatric medication management, stress management and recovery support. Its offices are staffed with psychologists, social workers and consulting psychiatrists: and group counseling, psychiatric medication management, stress management and recovery support. Most services are provided without cost.

<https://case.edu/studentlife/healthcounseling/>

Dental Research Building: Health Services, 1st Floor; Counseling Services, 2nd Floor
uhcs@case.edu; (216) 368-5872

Legal Services

The *Milton A. Kramer Law Clinic Center* at CWRU provides legal services to members of the community unable to afford legal counsel. Third-year law students act as the primary legal counsel

Case Western Reserve University School of Medicine Biochemistry MS Program Student Handbook

in matters related to civil, community development, immigration, and health law. Go to:
<https://case.edu/law/practical-training/law-clinic>

Housing

CWRU does not provide university housing (“dormitories”) for graduate students. Most graduate students rent housing in one of the many nearby neighborhoods. Please visit the Off-Campus Housing website at <https://offcampus.case.edu/> for more details. Many neighborhoods also have housing offices as well as guided tours of available rental properties. Contact local city governments for further information. Another alternative is the Steiner House Cooperative, which is a student-run organization offering housing for graduate students (steinerhouse.org).

Parking

Parking Services (case.edu/parking) manages the University's parking program. All commuter students are eligible for parking permits upon enrollment. Students who need parking should contact *Access Services* (368-2273, parking@case.edu, lower level, Crawford Hall). Most graduate students park in surface lots or the Veale Garage (S-53) which are closest to the School of Medicine.

Shuttle Services

There are many free shuttle bus routes that serve the campus, University Circle, and some neighborhoods in Cleveland Heights. Visitors may use UCI's public routes to reach various University Circle institutions. Service is provided approximately 18 hours per day Monday through Friday, with reduced service on weekends and holidays. Bus route schedules and maps are available at (case.edu/access-services/transportation/shuttles). There is also an app (TransLoc Rider) for mobile devices that shows the locations of buses in real time (case.edu/access-services/transportation/shuttles/shuttle-tracking).

Safe Ride Program

This program (case.edu/access-services/transportation/shuttles/safe-ride-program) provides safe transportation around campus and the surrounding CWRU community between 7 pm and 3 am. The goal is to provide students with safe transportation late at night. You can request a pickup at saferide.case.edu or 216-368-3000.

Building and Department Access

All Medical School buildings require ID card access. Biochemistry office personnel get card access for you using your University ID. Activation usually takes 24 to 48 hrs. If you have forgotten your ID or your ID will not activate the card reader during evening hours, you can call the CWRU Police Department at 368-3333, and an officer will be dispatched to let you in. You can also stop by the Biomedical Research Building (BRB) security desk on the ground floor and ask security personnel there to let you into the Wood Building. You will need to present a picture ID.

Campus Security

The University provides a variety of security and safety programs to help ensure a safe educational environment. These programs are directed by *the CWRU Division of Public Safety* (<http://police.case.edu>), located at 1689 E. 115th St. Security personnel patrol the campus and

Case Western Reserve University School of Medicine Biochemistry MS Program Student Handbook

respond to emergencies, fire alarms, and routine security incidents. The Police Department can be reached at 216-368-3333 for emergencies and 368-3300 for non-emergencies.

CWRU has a safe campus, but everyone needs to contribute to their own safety. We strongly encourage everyone to:

- Be aware of your surroundings
- Use *Safe Ride* late at night
- Install the Rave Guardian app on your mobile device, which lets you communicate directly with CWRU police
- Sign up for safety alerts (text, email, voice). Go to getrave.com to sign up.

Academic Support Services for Students (<https://case.edu/studentlife/academicresources/>)

The university provides several opportunities for students to get assistance with coursework beyond their instructors. Options include supplemental instruction (SI) and peer tutoring. Many of these options are focused upon undergraduate students, but graduate students are welcome and encouraged to utilize these opportunities if necessary. If you need help with a class, **talk to your course instructor first**. MS students who are successful in BIOC 407 and 408 can consider becoming peer tutors for those classes in their second year.

Disability Resources and Office of Accommodated Testing Services (OATS)

Disability Resources (402 Sears Building) assists students with disabilities to maximize their CWRU experience. The OATS office provides testing accommodations for students who qualify. For more information, contact Disability Resources directly at disability@case.edu; 216-368-5230; <https://case.edu/studentlife/disability/>.

<https://case.edu/studentlife/academicresources/>

Non-Discrimination Policy (from the Office of Equity/Title IX regulations; <http://case.edu/equity>; Nursing Research Building, Suite 1180; titleix@case.edu; 216-368-3066)

Case Western Reserve University does not discriminate in recruitment, employment, or policy administration on the basis of race, religion, age, sex, color, disability, sexual orientation or gender identity or expression, national or ethnic origin, political affiliation, or status as a disabled veteran or other protected veteran under U.S. federal law. In addition, the university expects all employees, students, vendors and associates to comply with the policy of non-discrimination. The university intends to maintain an environment free of sexual harassment and will not tolerate any form of harassment of its employees, faculty or students. Retaliation against persons raising concerns about discrimination, sexual harassment or harassment of any kind is prohibited and will constitute separate grounds for disciplinary action up to and including discharge or expulsion from the university.

No Retaliation Policy

Retaliation is prohibited and will constitute separate grounds for disciplinary action. Retaliation is the act of taking adverse action against a complainant, a respondent, or any other person involved in the process under this policy based on the person's reporting or participation in the process under

Case Western Reserve University School of Medicine Biochemistry MS Program Student Handbook

this policy. Retaliation includes behavior on the part of the respondent or the complainant and other related persons, including, but not limited to, acquaintances, friends, and family members. Although independent action will be taken against anyone engaging in retaliation, the complainant and the respondent are responsible for discouraging such actions and will also be held responsible to the extent of their involvement in the retaliation. An individual who believes they have experienced retaliation should contact the Office of Equity under this policy, and the university will investigate the complaint.

Diversity and Inclusion

It is the intent that all students regardless of their background and perspective be well-served by this program. Further, material whose content is respectful of diversity (gender identity, sexuality, disability, age, socioeconomic status, ethnicity, race, nationality, religion, and culture) should be delivered in a way that respects these differences as well. We expect that all students, instructors and guests will help foster an atmosphere of respect, trust and safety in the classroom.

If you have suggestions for how to make classes, the program, or the environment more inclusive, or have specific incidents to report, please reach out to course instructors or the Director of MS Programs. If you are not comfortable reaching out to your faculty, please reach out to someone else, such as the School of Medicine Graduate Education Office (som-geo@case.edu) or the Office of Diversity, Equity, and Inclusive Engagement (oideo@case.edu).

More information on University policy and resources are available on OIDEO's website (<https://case.edu/diversity/>).

Computer Information and Tips for Biochemistry Students

E-mail–You must activate your CWRU net e-mail account: The University has created an email account for you. You must be able to receive mail sent to this address! We will use this address to send you information about classes, rotations and program activities. Because this is the address that is published in the University directory, faculty members and other students will also use the address. You can either check mail directly in this account or you can have it forwarded to another address (see below).

Activating your account: You should have received an email from the School of Graduate studies that describes how to activate your account.

Your email address: Each email account can be addressed in several different ways. Your account name (e.g abc123) or firstname.lastname are accepted. You can also create other aliases (its-services.case.edu/mailalias/).

How to check your e-mail: All email accounts are run through Gmail. You can check your mail either using the web (webmail.case.edu) or using a separate mail client. If you already have another e-mail account that you wish to keep using, you can have your CWRU mail forwarded to that account. From webmail.case.edu, click the Settings link. You'll see a tab that lets you set up automatic forwarding of your mail. **Just remember that you must monitor mail sent to your CWRU account in a timely way.**

Google Apps

Case Western Reserve University School of Medicine Biochemistry MS Program Student Handbook

CWRU provides applications from Google (G Suite) that include many useful functions. You can learn about them at <https://case.edu/utech/help/knowledge-base/google-workspace-education/google-workspace-education-information>.

Connecting your computer

Laptop computers can connect to the University network either through a wireless or ethernet connection. Go to <https://its-services.case.edu/NetworkTools/IPDB/systemRegistrationForm.html> to register your computer for a wired ethernet connection. For wireless connections, use CaseWireless and log in with your network ID and password. If you use this connection, you are considered an on-campus user. For any other wireless connection (including CaseGuest), you are an off-campus user. You will need VPN (virtual private network; vpnsetup.case.edu) to access some services including the Software Center (see below). CaseGuest now requires a user acknowledgement every 24 hours of use.

The Help Desk

The University operates a Help Desk staffed with people who are both knowledgeable and helpful about technology issues. You reach the help desk in several ways: Call 368-4357 (HELP) or go to help.case.edu. Their staff (UTech) can answer most questions about computers, software and networking. In person assistance is available at the UTech CARE Center (<https://case.edu/utech/help/utech-care-center>) in Kelvin Smith Library.

On-Campus Printing

The wepa cloud printing network allows students to print materials for a fee on campus. For more information visit <https://my.case.edu/My/Services/Wepa/>. Note that none of these printing locations are on the Health Sciences Campus portion of the CWRU Campus. The closest printing locations are Bingham, Clapp, Millis, and Sears/Nord, all on the main quad (west of Adelbert Road).

Electronic Journals

Electronic journals can be accessed from any CWRU net computer through the Health Sciences Library. Go to case.edu/chslibrary/electronic-resources/electronic-journals on the Health Sciences Library web site for a complete listing. This page will take you to sites that will let you download articles as PDF files. This is the surest way to find online journals. Other links (e.g. the ones in Pubmed that take you to the publishers' sites) don't always work because they don't recognize the University's subscriptions.

The University purchases licenses for electronic journals. Most e-journals can be accessed through OpenAthens (<https://researchguides.case.edu/discovery>) without use of a VPN. Instructions for setting up the CWRU VPN can be found at vpnsetup.case.edu.

PubMed

PubMed, which indexes biomedical literature through the National Library of Medicine, is available to you over the web in many different ways. Using the Cleveland Health Sciences Library link https://www.ncbi.nlm.nih.gov/pubmed?holding=cwruclib_ft_ndi&otool=cwruclib should allow you to access articles accessible to CWRU users through SSO.

Electronic Resources for Learning and Research

Case Western Reserve University School of Medicine Biochemistry MS Program Student Handbook

Many other electronic resources are available through the University library. For more information go to: <http://library.case.edu/ksl/index.html> (Kelvin Smith Library) or <https://case.edu/chslibrary/> (Cleveland Health Sciences Library). The Electronic Books link at this site contains a list of sites with texts and protocols. In addition to the obvious ones, AccessMedicine and MDConsult have basic science textbooks.

Software

There's a lot of useful software for your personal computer that is either free or available at greatly reduced cost at softwarecenter.case.edu. To use the Software Center you must connect from a University ethernet connection, CaseWireless, or with a VPN connection.

Some software titles can only be downloaded once. If you start a download and then cancel it, this counts as a download, so be careful!

Case Western Reserve University School of Medicine Biochemistry MS Program Student Handbook

Policy for Biochemistry MS students transferring to the Biochemistry PhD Program (revised March 2023, updated Summer 2023)

Note: As of Summer 2023, after completing the process outlined below and approval by the Department of Biochemistry Graduate Education Committee, students must apply through the BSTP portal (case.edu/medicine/bstp) and receive final approval from the Vice Dean for Graduate Education.

Many students in the Biochemistry MS program wish to earn PhDs and enter the MS program to prepare for further study. Some students complete their MS degrees and apply to PhD programs at CWRU and other universities. Other students perform research with CWRU faculty mentors and transfer into the Biochemistry PhD program and perform their thesis work in the mentor's laboratory. MS students who have gone on to PhD programs through both routes have been very successful. This document provides guidelines for MS students who wish to transfer to the Biochemistry PhD program¹.

Policy:

Qualified MS students can transfer to excellent labs to pursue their PhD degrees. At the same time, we need to be certain that students are qualified to complete their degrees and that the mentor/student match is a good one. The policy includes the following:

1. A MS student who wishes to transfer to the Biochemistry PhD program must find a faculty mentor who is willing and able to accept them as a PhD trainee in their labs. This is accomplished by working as a research student in the mentor's lab (BIOC 601). The mentor must be an existing trainer in the Biochemistry PhD Program. To ensure that the placements are appropriate, students must have worked with the research mentors for at least one semester before they transfer.
2. Students must have completed at least one year in the MS program. Students in their first year may not transfer.
3. The request to transfer must be submitted by the student and the prospective mentor to the director of the Biochemistry PhD program. The request will be reviewed by the department's Graduate Education Committee and the BSTP admission committee or equivalent. The review will include evaluation of the student's qualifications and the training environment in the mentor's laboratory. The student's academic achievements should be comparable to applicants to the BSTP. As of 2023, the student's master's GPA should be 3.6 or above to be comparable to BSTP applicants.
4. The student will be placed as a PhD student with that mentor and will not need to perform additional research rotations.
5. Students who transfer to the PhD program will not complete their MS degrees. They can petition the School of Graduate Studies to count their MS coursework toward the PhD degree.

¹ Biochemistry MS students may transfer to other CWRU PhD programs. In that case, the transfer is governed by the policies of the PhD program that is accepting the student.

Case Western Reserve University School of Medicine Biochemistry MS Program Student Handbook

- The financial commitments for accepting a PhD student will be reviewed and approved by the PhD faculty mentor's department chair and administrator. The financial commitments are described in a separate document.
- If a student's research mentor is a trainer in another School of Medicine PhD program and not in Biochemistry, the student and mentor must work with the Graduate Program Director or equivalent of that department's program and follow the policies of that program; the student will not obtain a Biochemistry PhD.

Financial Commitments

The faculty mentor will begin paying the student's PhD stipend in the month when the transfer occurs. The mentor will begin paying other costs (tuition, health insurance, activity fee) in the next semester.

Mentor's financial commitments (for 2022-23 AY):

Stipend: The stipend is currently \$33,500/year. The stipend is expected to increase by \$500/year.

Health Plan: The fee is currently \$3,306/year. It is expected to increase by 6.5%/year.

Activity Fee: Currently \$40.

Tuition: The tuition cost depends on the total number of credits taken by the student. This depends on how the student enters the program. The current net charge per credit hour is ~\$775/credit hour. This will increase in coming years.

Entry Route	Total Required Credits	Approximate <u>Total</u> Tuition Cost
Enter with MS degree	36	\$27,900
Transfer from MS to PhD	~36	\$27,900

The number of credits taken by students will vary from year to year. Before students advance to PhD candidacy, they may take up to 18 credits/year. Once they advance to candidacy, students may take as few as 2 credits/year.

Entry via the BSTP

When students enter through the BSTP, the finances are slightly different. All the costs for the first year are paid by the SOM; after that the mentor assumes all the costs noted above.

For example, if a Biochemistry MS student earns their degree and then enrolls in the BSTP, the SOM will pay for:

**Case Western Reserve University School of Medicine Biochemistry MS Program
Student Handbook**

Stipend (\$33,500), health plan (\$3306), activity fee (\$40), and tuition (up to \$13,500). This represents a saving for the mentor. Students need an addition 36 credit hours (similar to the other entry routes).

From the second year on, the mentor pays all costs as listed above.