



Duke Biochemistry
Duke University School of Medicine

2022-23
Graduate Student Handbook

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WELCOME TO DUKE BIOCHEMISTRY

The [Duke Department of Biochemistry](#) has a rich history of accomplishments at the cutting-edges of biological and chemical research. We also contribute to a broad educational mission, training and teaching undergraduate, graduate and medical students. Currently, the Department comprises 19 primary and 11 secondary faculty members, 7 active emeritus members, 4 adjunct members and ~45 graduate students and ~45 postdoctoral researchers and staff scientists. We occupy approximately 42,000 square feet of the Nanaline Duke Building and 5,000 square feet of the adjacent Sands Building.

Mission Statement

The mission of the Duke University Biochemistry Graduate program is to educate and mentor students from diverse backgrounds in the fundamentals of biochemical principles and practice through courses and research by (1) guiding students in their thesis research project, and (2) preparing them for a career in research, education, or other disciplines. The program promotes a commitment to excellence in research scholarship and fosters a spirit of creativity, service, and respect, within an environment that is ethical, inclusive, and diverse.

Faculty Expectations for Completion of a Ph.D. Degree

To earn the Ph.D. degree in Biochemistry, the Department Faculty expect each graduate student to produce an **independent body of original, high-quality scientific work**. Though circumstances vary, this work will result in authorship on typically two peer-reviewed publications, including those on which the student is first author, prior to or soon after graduation.

Timeline to Degree for Biochemistry Ph.D. Students

Students begin their graduate studies (G1) exploring different areas of research and mentoring styles with at least 3 hands-on rotation research projects. Trainees learn about the department's available and ongoing research projects through the introductory faculty talks during Orientation, as well as from our retreat and informal 1-on-1 meetings between students and mentors. In Spring of their 1st year, G1 students either choose a thesis lab (with permission from the mentor and the department) or continue with rotations until settling into a thesis lab. Students must also complete 24 graded coursework credits by the end of G2 (with the exception of students coming in with a Master's or as part of the MSTP program). Students typically complete the 1 semester teaching assistant (TA) requirement during G2.

The Preliminary Examination for candidacy must be completed by the end of the student's third year (G3) and expires after five years (G8). Extensions of the Preliminary Exam deadline must be approved by the DGS and Associate Dean for Academic Affairs. Students who have not completed their Preliminary Examination by the end of G4 will be withdrawn.

Dissertation examinations are expected by the end of graduate year seven (G7) and **must be completed by the end of graduate year eight (G8)**. For students who are in G8 prior to graduation, the annual progress report and a plan for dissertation completion must be approved by the student, committee chair, and DGS and submitted to the Associate Dean for Academic Affairs.

DEPARTMENT CONTACTS

Biochemistry Graduate Studies Office (BGSO):

The DGS and DGSA serve as advocates for graduate students and should be approached with any school-related and/or personal concerns. Issues will remain confidential according to university policy guidelines. Students may meet with the DGS and/or DGSA during their regular office hours or can schedule an appointment.

Director of Graduate Studies (DGS) – The DGS is the official departmental or program administrator of the rules and regulations of the Graduate School, the designated advocate of the needs of the graduate program and graduate students within the department and in the University, and the advisor of all matriculating graduate students prior to research group affiliation.

DGS: Meta Kuehn, PhD
Office: Room 220A Nanaline Duke
Phone: 919-684-2545
Email: kuehn@duke.edu

Assistant to Director of Graduate Studies (DGSA) – The DGSA provides assistance with all graduate issues outside of the actual study of Biochemistry including: registration, payroll, financial aid, visa services, health insurance, parking, program requirements, exam scheduling, room reservations, counseling, etc.

DGSA: TBD
Office: Room 251 Nanaline Duke
Phone: 919-681-8770
Email: bgs@biochem.duke.edu

Biochemistry Department Administrative Office:

Biochemistry Chair – The Biochemistry Chair is the official link between the department and the dean. The Chair leads the department in planning, recommends allocation of space, and is responsible for budget preparation, annual faculty evaluations including promotion and tenure, assignment of academic and nonacademic staff, assignment of teaching loads and student advising, and adherence to departmental bylaws.

BCH Chair: Dick Brennan, PhD
Office: Room 242A Nanaline Duke
Phone: 919-684-9471
Email: richard.brennan@duke.edu

Administrative Assistant to the BCH Chair: Peggy Wilkison
Office: Room 255 Nanaline Duke
Phone: 919-681-8804
Email: prw2@duke.edu

Department Business Manager: Floyd Borden
Office: Room 254A Nanaline Duke
Phone: 919-684-5326
Email: floyd.borden@duke.edu

CAMPUS RESOURCES FOR ACADEMICS AND ASSISTANCE

Duke Graduate School

[Website](#)

This resource has a wealth of up-to-date information on topics including Graduate student living, Wellness, Finances, Academic policies, and Career development.

Duke Student Affairs

[Website](#)

Student Affairs engages in all aspects of students' lives and collaborates with students, faculty, staff, alumni, parents, and many others in the delivery of key services and support. Student Affairs provides programs and services that supports the growth of Duke students by enhancing their intellectual, social, cultural and physical development. Resources complement Duke's academic excellence by providing opportunities for students to experience education and explore interests beyond the classroom.

Office of Biomedical Graduate Education (OBGE)

[Website](#)

The Office of Biomedical Graduate Education in the Duke School of Medicine coordinates activities that impact all School of Medicine graduate students. They coordinate the RCR ([Responsible Conduct of Research](#)) Fall [courses](#) for new students and implement policies within the biomedical graduate programs. OBGE is the administrative home for the IDEALS Office (Inclusion, Diversity, Equity, Advancement, and Leadership in the Sciences), provides career and professional development, and is the administrative home for several interdisciplinary biomedical programs.

OBGE is directed by the Associate Dean for Research Training, [Beth Sullivan, Ph.D.](#) and the Director of the Office of Biomedical Graduate Education, [Amy Kostrewa](#).

Admission to all PhD programs is through the Duke Graduate School. In addition to matriculating directly into Biochemistry, students can enter into the departmental labs via our faculty's additional appointments in School of Medicine departments and interdisciplinary programs such as:

[Cell Biology](#)

[Molecular Genetics and Microbiology](#)

[Neurobiology](#)

[Pharmacology & Cancer Biology](#)

[Chemistry](#)

[Computational Biology and Bioinformatics](#)
[University Program in Genetics and Genomics](#)
[Cell and Molecular Biology](#)

IDEALS (Inclusion, Diversity, Equity, Advancement, and Leadership in the Sciences)

[Website](#)

The IDEALS Office contributes to the diverse scientific climate within the Biomedical Graduate Programs in the School of Medicine. The office works to bring talented underrepresented graduate students and postdoctoral scholars to the Duke University School of Medicine and to enrich their experiences over the course of their training and studies.

BioCoRE (Biosciences Collaborative for Research Engagement)

[Website](#)

Under IDEALS, The Duke BioCoRE Program builds a supportive community of scientists and provides opportunities for student research and career development. BioCoRE boasts a wide variety of scientific programs, including community-building activities, paid research opportunities, conference travel, symposia, and seminars. BioCoRE is open to all members of the Duke Biosciences community, and both undergraduate and graduate scholars are selected on a competitive basis.

BioCoRE benefits during Early Start include: Full stipend for August, beginning your research project, and community building activities.

Other benefits include: Enhanced advising and specialized mentoring, a scientific conference travel fund, scientific and career development programs, social events, and synergy with PhD Graduate Programs.

Individuals with Disabilities

The Duke Biochemistry Department is committed to providing reasonable accommodations for qualified individuals with disabilities in compliance with Section 504 of the Federal Rehabilitation Act of 1973, the Americans with Disabilities Act (ADA) of 1990 and the ADA Amendments Act of 2008, as well as applicable state regulation and federal and state privacy laws.

Student Disability Access Office: (SDAO) explores possible coverage and reasonable student accommodations that comply with the Americans with Disabilities Act (ADA) and the Rehabilitation Act. They provide and coordinate accommodations, support services, and auxiliary aids for qualified students. To begin the process, students must provide documentation. Faculty and students may find this [page](#) useful in working with students with Disabilities. **Disabilities include:** Asperger's Disorders, Attention Deficit Hyperactivity Disorders, blindness/low vision, deafness/hard of hearing, learning disabilities, mobility and chronic health, psychological disorders and other impairments. Phone: 919-668-1267

Please Note: *If you believe you may need and qualify for reasonable accommodations, please visit [Duke's Disability Management System](#).*

Cultural, Personal and Academic Assistance

Below is an alphabetical listing of resources to assist you in solving a problem, concern, or conflict. Contact the main DukeReach line at (919-681-2455) or the Dean of Students Office at (919-668-3853) to speak with someone during regular business hours. For after-hours emergencies contact the Dean on Call pager (919-970-4169) or Duke Police (919-684-2444).

Academic Resource Centers assists students with time management, provides peer tutoring, and special services for students with ADD or ADHD. It is located on the second floor of the Academic Advising Center on East Campus. Phone: 919-684-5917

Career Center provides services that attend to all aspects of a students' career development and life planning including: information about internships, Career Week, choosing a major, life after graduation, job search, and career counseling. Phone: 919-660-1050

Center for Multicultural Affairs (CMA) supports students of color and cultural communities and provides programs, services, and resources for the Duke community. Phone: 919-684-6756

Center for Sexual and Gender Diversity provides advocacy, education, and resources for faculty, staff, students, and alumni. If you know a student who is struggling with sexual identity or experiencing conflict because of homophobia or sexual orientation, the Center can help. The Center also provides programs and resources for the entire community. Phone: 919-684-6607

Gender Violence Services are offered through the Office of Gender Violence Prevention and Intervention in the Women's Center. If you are a student at Duke University (of any gender) and are a victim-survivor of gender violence, and it is a non-emergency issue, visit their [website](#), call 919-684-3897, email WCHelp@duke.edu, or walk in—no appointment necessary. After hours, weekends, holidays: Page the Women's Center staff at 919-970-2108 or email WCHelp@duke.edu. If this is an emergency situation and you feel you are in danger, call 911 or Duke Police at 919- 684-2444.

Discrimination and Harassment Student Resource Tool

[Website](#)

This tool helps graduate students with the options and the processes for reporting harassment, discrimination and other concerns.

Housing, Dining & Residence Life (HDRL) provides on-campus housing for undergraduates and some graduate students. Phone: 919-684-4304

International House provides educational services and advocacy to Duke's international population and to the Durham community. IHouse offers extensive cross-cultural programming and information to enhance the global mission of the university. Phone: 919-684-3585

Jewish Life at Duke strives to enrich the lives of Jewish students through social, educational,

religious, cultural, social-action, and community-service activities. They provide programs, Shabbat and holiday services, and student resources. Phone: 919-684-6422

Mary Lou Williams Center for Black Culture has programs and resources for faculty, students, and staff that foster consciousness on the significance of Black experiences. Phone: 919-684- 3814

Office of Institutional Equity sits under the auspices of the President and provides institutional leadership in sustaining a respectful and inclusive environment. It provides information on Diversity & Equity, EEO/Affirmative Action, Harassment Prevention, Policies, and Resources. Phone: 919-684-8222

Ombudsperson

Phone: 919-684-5917

- Provides a neutral, safe, and confidential environment to talk
- Listens to concerns and complaints and discusses appropriate options
- Helps to evaluate those options
- Assists students in resolving problems
- Mediates conflicts, convenes meetings, engages in "shuttle diplomacy"
- Refers students to appropriate campus resources
- Provides information about university resources

Religious Life is part of Duke Chapel and provides resources and connections to over 25 campus ministries affiliated with Duke University. It also runs the Pathways program to help college students engage in their spiritual development. Phone: 919-684-2909

Women's Center fosters diverse learning and living environments that are safe and empowering for all Duke women and men through education outreach, and advocacy. The staff is committed to a campus culture that provides access, fosters agency and self-determination for all, and creates transformative experiences to understand and resist patriarchal oppression. Phone: 919-684-3897. (After hours pager: 919-970-2108)

DUKE ID, BUILDING ACCESS, ROOM RESERVATIONS, AND MAIL:

DukeID Card

[Website](#)

Please see the DGSA prior to getting your DukeCard. Visit the DukeCard website for more information and office locations. You will need a DukeCard with a **Proxchip**. If your card does not contain a Proxchip, please see the DGSA. If you have a Proxchip, please bring your card to the DGSA and they will request after-hours access to the Nanaline Duke, Sands, Jones, and CARL buildings. Your first DukeCard is free, but a fee will be charged for replacements.

Email: Before you arrive on campus for Orientation, you should have received your official Duke NetID email log-in and password. We encourage you to use this account, but should you change your email address, please notify the BGSO immediately. You will also use your NetID log-in to register for classes each semester.

Mail: All mail sent to the faculty, staff, department, DGS, BGSO, or Administrative Office must include «Box 3711 Biochemistry» to guarantee delivery.

Computers/Printers/Photocopiers/Fax: Computers and printers are located in 252 Nanaline Duke (Biochemistry Student Lounge). The password for these computers is: *nd251bc*. The departmental copier requires a pass code. To use the color copier near the cold room on the 2nd floor of Nanaline Duke (near Oas Lab), please use code 44120. The fax machine is in the BCH Administration Office (255 Nanaline Duke) and is available during office hours. The fax # is 919-684-8885. If you have a long-distance fax, you will need a fax code that can be obtained from your lab manager/staff assistant

Room Reservations

Contact	Room (occupancy)
Patricia Bunn patricia.bunn@duke.edu 681-8770	247 Nanaline Duke (20) 147 Nanaline Duke (100-110) 209 Nanaline Duke (10) 252B Nanaline Duke (25) 279 Sands (18)
Jodi Belanger jodi.belanger@duke.edu 684-8085	384 Nanaline Duke (25) 437/439 Nanaline Duke (25-30) 465 Sands (22) unlocked 472 Sands (18) locked
Jennifer Goins immunologydept@mc.duke.edu 684-3578	117A Jones (small room) 354 Jones (small room) 321 Jones (small room)
Med Center Room Reservations: 25Live For questions call 684-9026 or email mcedrooms@mc.duke.edu	143 Jones (150) 103 Bryan Research (190) 001 MSRB (70)
Learn more about Duke University Event Management	

FINANCES, STIPEND, VACATION & HEALTH INSURANCE

The Duke University Graduate School and the Biochemistry program offer a wide array of financial support from annual awards funds, instruction, endowed fellowships, foundations and other private support, as well as federal research and training grants. (*Graduate School and University Contacts are listed in Appendix II*)

Financial Support Summary and Disbursement

[Website](#)

Financial support for continuing Ph.D. graduate students in the Department of Biochemistry is typically provided over a 12-month period. You can find yearly financial support dollar amounts and disbursements on the biochemistry [website](#), along with the tuition charge per semester, pay dates, and the change in tuition remission in year 4.

Recreation Fee

The student recreation fee in the first 5 years of study is paid by the Graduate School for use of the campus facilities. For the 2022-23 AY, students beyond G5 must opt in to have this fee paid and for continued access. All 5th+ year students will receive an email on how to “opt in” at the beginning of each academic year. If you choose to “opt in”, your student account will be charged a recreation fee of \$171.00 per six-month period (July 1–December 31 and January 1–June 30). The Department has decided to pay this fee for students who choose to opt-in for the 2022-23 AY and will be posted directly to your Bursar account. Please notify the DGSA if you are a 5th+ year student and want to opt-in.

Research Assistantship Stipend Payment Schedule:

[Website](#)

Beginning in G3, financial awards will be supported by the PI’s grants & funding and will be paid through the monthly faculty/staff payroll in 12 equal monthly payments on the 25th day of each month.

Please Note: Annual award letters will be sent in May detailing new stipend and fee amounts.

Students have ultimate responsibility for ensuring their tuition and fees are paid and should regularly review the Bursar’s Office statements and quickly resolve any problems or questions. For questions about bursar accounts, contact the [DGSA](#), the [Bursar’s Office](#), or the Graduate School [Office of Budgets and Finance](#).

Students must be enrolled in the Graduate School to receive fellowship or assistantship support. Our department works cooperatively with the Graduate School and School of Medicine to ensure financial support for six consecutive, 12-month academic years, provided the student has made continued satisfactory progress in our graduate program.

As a member of an outstanding graduate community, we also strongly encourage students to apply for other institutional and outside fellowships. Awards of this type add distinction to your graduate record and enhance our ability to support additional highly qualified students in graduate programs at Duke.

Duke@Work

For those students that are paid on the 25th of each month, you will now have the option of accessing your pay statements through the on-line [Duke@Work](#) system on the Duke HR website.

You can also use Duke@Work to do the following:

- View current and past pay statements.
- Change your home address.
- Update your work address (physical location).
- Set-up or change bank accounts for direct deposit.
- Change Federal and North Carolina tax withholding amounts (if required).

Please Note: The Duke Payroll system and the Duke Hub system are NOT connected. A change in information submitted in one system will not automatically change the same information in the other. If you make a home address change in Duke@Work, you will need to make the same change in Duke Hub.

Duke Corporate Payroll

Graduate student stipend payments are distributed from the Duke Corporate Payroll office. Corporate Payroll operates a customer service center which provides the following: issuing payments for salaries and corresponding benefits, as well as voluntary and involuntary deductions; fellowship and scholarship payments to Duke students; distributing annual tax forms, IRS Forms W-2, 1042S and 1099 forms; providing wage verification requests for mortgage companies or governmental agencies; and offering training for departmental payroll representatives, human resources managers, and business managers. Email corporate [Payroll](#) or call 919-684-2642.

Taxes

Under the Tax Reform Act of 1986, both fellowship & assistantship stipends are taxable and are reportable as income with the exclusion of tuition, fees, books and equipment required for educational support. The university has no reporting or withholding requirements on fellowships; however, you may choose to have taxes withheld by completing a W4 form with the payroll office. We encourage you to read the [IRS' publication](#) concerning Tax Benefits of Education and the taxation of scholarships and fellowships, or to consult with your tax advisor concerning this financial aid package.

For U.S. citizens, fellowship stipends may be reduced, for tax purposes, by the amounts paid for tuition, fees, and required books, supplies, and equipment. For general information about the taxability of scholarships and fellowships see [IRS publication 970](#).

For international citizens, stipend payments are subject to withholding of federal and state income taxes based on existing [tax treaties](#) between the student's country and the USA. In addition, there is an IRS requirement that tuition payments for foreign students must be reported to the federal government.

Please Note: Each student's tax situation is unique, and the [Payroll Office at Duke](#) provides assistance to enrolled students regarding withholding requirements.

Graduate Student Vacation & Sick Leave Policy

Website

Vacation policy ensures that all Ph.D. Research Assistants (years 3+) are allowed a minimum amount of paid time off each year, and the policy outlines the request process.

It is expected that Teaching and Graduate Assistants, and Duke-funded fellows, will have ample vacation time during periods when classes are not in session.

- I. Graduate students who are funded by research projects on a twelve-month stipend schedule are allowed, at minimum, twelve working days of vacation each year. Students who wish to take vacation must apprise their advisor of their intentions at least two weeks before the planned absence.
- II. Students wishing to take additional periods of time off, paid or unpaid, must receive the approval of their advisor. If payroll changes are necessary, the advisor will notify the department or program business office prior to the payroll deadline for the affected pay period of any such arrangements. Approval for additional periods of paid time off may be subject to funding agency restrictions.
- III. University observed holidays and time away for professional activities (conferences, workshops, interviews) do not count against vacation. Ph.D. Research Assistant holidays will follow the [Holiday Schedule for University Staff](#). **Please Note:** *The Graduate School policy on religious holidays corresponds broadly to that of Trinity College. Students who wish to observe religious holidays must inform their advisor in advance, must plan to make up any missed work, and cannot be required to take the religious holiday as a vacation day.*
- IV. Unclaimed vacation cannot be carried over to a subsequent year nor will any unclaimed vacations days be paid out if not used by the year-end or upon termination of the research position. The annual cycle for determining available vacation will be August 1 to July 31 of the following year.

Sick Leave Policy: Graduate students are allowed a minimum of 12 working days per year. Students wishing to take additional sick leave, paid or unpaid, must receive approval from their advisor.

Please Note: *You cannot carry over or payout unclaimed sick days.*

Health and Dental Insurance & Health Fees

Health insurance is required for all Duke students. If you choose to enroll in Duke's student medical insurance plan (Duke SMIP), the Graduate School will cover the premium cost. Read more here for information on the [Duke SMIP](#).

International students, those holding F-1 or J-1 visas, must enroll in the Duke SMIP. Domestic students may choose not to enroll in the Duke plan; however, those who do not enroll must meet the waiver criteria and provide proof of comparable alternative insurance coverage. If you do meet the waiver criteria, the Graduate School will provide a \$600 stipend supplement that will be included in your October paycheck.

At the beginning of the fall semester Duke students must provide proof of coverage by an adequate medical insurance policy or the Duke SMIP. If you have a US-based medical insurance plan, it is important to review your policy to assure proper coverage. Always have your insurance card and prescription drug card with you when seeking health care to facilitate filing insurance claims.

Leave of Absence, Graduation, and Termination: Students who terminate from the Ph.D. program, take a personal leave of absence, or complete their degree/graduate will have the option to continue their health insurance coverage for the remainder of the plan year at their own pro-rated expense. Otherwise, the Graduate School premium payment continues through the last day of the month in which the student graduates (see more detailed info on p.50). If a student chooses to maintain Duke medical insurance coverage, the student is expected to pay the balance of the plan term premium through their Bursar's account. If the student wishes to terminate the Duke insurance plan, they must complete the [Petition to Terminate Coverage form](#) and submit it to the Student Health Insurance Manager in the Student Health Center.

For questions concerning enrollment and termination, email [Duke SMIP](#), call 684-1481, or contact the Duke Student Health Center at (919) 681-WELL.

Dental Insurance:

[Website](#)

Dental services are available through the Duke Wellness Center. All students enrolled in the Student Health Insurance Plan are also eligible for discounted dental visits through BASIX. [DentalBlue](#) insurance is also available for purchase.

Health Fee: Biochemistry graduate students have their health fee and health insurance paid by the University and/or their faculty advisor for their first 6 years. The health fee is separate from comprehensive health insurance and covers most of the services at the Student Health Center (SHC), if medically indicated and rendered by a Student Health Provider.

LIVING IN & AROUND DUKE

Living at Duke is about the people, places and opportunities on campus. It is also about you, so take advantage of all that life on campus has to offer, and don't forget to take care of yourself.

Useful Links:

[Student Affairs](#)

Dining

[Locations \(including menus, food trucks, mobile ordering, and Merchant On Points\)](#), [Shabbat Dinners](#),

Getting Around

[Campus Map](#), [Duke Buses](#), [Enterprise CarShare](#), [Triangle Region Transportation & Routes](#)

Important Student Information Resources

[Graduate Student Affairs](#), [Graduate and Professional Student Government \(GPSG\)](#)

Engaging in the Community

[Duke Groups](#), [The Hub](#), [Bikes](#), [Duke Intramurals](#), [Jazz at the Mary Lou](#)

Safety and Conduct

[Duke Community Standard](#), [Safety & Security at Duke](#), [Incident Reporting](#), [Conflict Mediation](#), [Duke Vans](#)

Help Resources

[Managing Stress Workshop](#), [Counseling & Psychological Services](#), [DukeReach](#), [Gender Violence Prevention and Intervention](#), [Substance Abuse Prevention](#), [Center for Sexual and Gender Diversity](#), [Duke Police](#), [Duke EMS](#)

Visit

[Discover Durham](#) for more information

The Duke Student Survival Guide

Any Duke student can post or access useful information about life at Duke and Durham on this [wiki resource](#). You'll find everything from parking on-campus to coffee shops around town. Duke NetID and password required for access.

Housing

Website

Housing, Dining, & Residence Life (HDRL) is a campus resource for students to find rental housing in the Durham area. Most graduate students rent **off-campus housing** from private landlords. See the HDRL online [database](#) of available rentals.

Off-Campus Housing for Graduate Students

For those seeking off-campus accommodations, Duke has resources for students, faculty, and staff to find and advertise rental-housing options in the Durham area. The listing is only a service, is not comprehensive and does not screen landlords nor guarantee quality.

You may never have rented real estate before—and renting in the Durham area may be different than in your hometown. We've put together this guide to help you have a trouble-free experience.

Please Note: *Apartments near Duke (and popular with current students) are listed on the next several*

pages. To search for properties and rooms for rent, visit the following sites:

- [For Rent Near Duke](#)
- [The Chronical: Near Duke](#)
- [Apartment Finder](#)

On-Campus Housing for Graduate Students

[Website](#)

Limited **on-campus housing** is available to full-time graduate students.

Subsidized Housing

[Website](#)

Duke is offering subsidized off-campus housing for graduate and professional students at Lancaster Commons for 2022-2023, with priority given to incoming international students.

Parking at Duke

[Website](#)

Most graduate and professional students commute to Duke and parking is provided in mid- to low-priced [commuter lots](#) throughout campus. Visit the [Duke University Parking and Transportation Services](#) for information on how to acquire a permit for campus parking, bus stops, and routes that serve apartment communities. Parking permit fees are charged to each student's Bursar account for payment.

GRADUATE STUDENT FELLOWSHIPS & FUNDING OPPORTUNITIES

Department of Biochemistry: Fellowship for Graduate Studies

Biochemistry graduate students who are in good standing are eligible for a Biochemistry Fellowship for Graduate Studies. This award covers the balance of the stipend not covered by the Graduate School or PI resources and aids in the pursuit of the student's education. No work services are expected in return.

Internal and External Competitive Funding Opportunities for Graduate Students

Biochemistry graduate students are urged to compete for Duke University, national, international, and foundation awards available for graduate study. These awards reflect well on the students' graduate record and often provide additional funding for conferences and educational resources. The Department of Biochemistry provides a cash **bonus** to any graduate student, who obtains an external graduate fellowship that covers at least two years of her or his graduate career.

IMPORTANT: Please notify your lab grant manager when you apply for outside funding or award/fellowship. Also notify your grant manager of your application's outcome (if you have or have not received the award/fellowship).

Duke Competitive Fellowships for Continuing Students

[Website](#)

Applications are available in mid-September. Fellowship awardees are notified in late-March.

Office of Research Support (ORS):

[Website](#)

Duke's ORS lists awards from a variety of federal and private sources, and awards funded by the university. External awards typically replace departmental or Graduate School awards.

Conference Travel Awards & Fellowships

Graduate School – Conference Travel Fellowship:

[Website](#)

The Conference Travel Fellowship is available to any graduate student enrolled in a Ph.D. granting program or department. To be eligible, students must have passed the preliminary exam and must actively participate in the conference (i.e., present a paper or poster, or lead a discussion). Students are limited to one travel fellowship per year (June 1 – May 31). The application must be completed and submitted at least one month prior to the conference date. Visit the website for award amounts and application.

Biochemistry Department – Kamin Travel Fellowship:

[Website](#)

Biochemistry graduate students, who are awarded a Graduate School Conference Travel Fellowship will be automatically eligible for an additional Kamin Fellowship. This fellowship can be used in addition to the Graduate School Travel Fellowship. Please submit a copy of your completed

[Graduate School Conference Travel Application](#) and DGS approval along with your paper/poster abstract to the DGSA. .

Please Note: Graduate students who are unable to obtain a Graduate School Travel Fellowship can apply for a Kamin Travel Fellowship by submitting this application to the DGSA, but the award is not automatic. In this case, you should also include a brief letter of intent with relevant details of the trip and the reason(s) for not applying or receiving the Graduate School award.

Important information for International Travel: Students who are traveling internationally are required to complete the Graduate & Professional Students Travel Registration [form](#). Make sure to have your flight, destination and passport information available before you log in (per Duke Travel Policy).

GRADUATE STUDENT REPRESENTATION

Biochemistry Graduate Student Council (BGSC)

[Website](#)

The Biochemistry Graduate Student Council (BGSC) is composed of five members elected to represent the student body in an annual, student-wide election. Four members serve as core BGSC representatives, while the fifth is the Graduate and Professional Student Council (GPSC) Biochemistry representative.

At monthly meetings, the BGSC and interested students discuss upcoming events hosted by the BGSC including: science-oriented volunteer activities, social events, and Duke student life activities. The BGSC also helps identify and solve issues related to graduate student life by communicating with the department and with the Graduate School.

For more information on how to participate in the BGSC and information on upcoming and past events hosted by the BGSC, visit their [Facebook page](#). Contact the [BGSC](#) with ideas for events, concerns or questions.

Graduate and Professional Student Government (GPSG)

[Website](#)

The Graduate and Professional Student Government of Duke University is the umbrella government organization for Duke's nine graduate and professional schools. The GPSG advocates on behalf of all graduate and professional students and works to support all individuals and groups by releasing written statements of support in response to events and legislation related to the well-being of our student population.

STUDENT HEALTH AND MENTAL WELLNESS

Duke Student Health

[Website](#)

It is important to take responsibility of your health and wellness. The friendly and knowledgeable staff at the Duke Student Health Center can help with your needs while at Duke.

Quick Information:

Student Health Center

Location: 305 Towerview, next to Penn Pavilion.

Regular appointments: Call 919-681-WELL (9355) Option #1 or book online through Duke MyChart

Same Day / Urgent Care Visits: If you have an urgent medical concern and need to be seen the same day, please call the triage line at 919-681-9355, Option #2.

Duke University Student Health Services (SHS) is the primary source for a variety of services, many that are covered by the Student Health Fee. The Center's mission is to provide comprehensive, first-class health care and patient education in a manner that is respectful of diversity.

Medical issues can arise any time, thus Student Health's urgent care services allow students to see a healthcare provider and receive treatment in a timely fashion— usually same day or within 24 hours—depending on availability. Students needing urgent care will be given priority. For non-urgent health concerns or chronic medical problems, students should make a regular appointment.

Medical Services are provided by board-certified faculty physicians, physician assistants, nurse practitioners, and resident physicians under faculty supervision. Students are encouraged to use our center as their medical home and to access other health resources as needed, including the specialty clinics at Duke University Medical Center. This will help with coordinating and providing cost-effective healthcare.

Student Health Services offers general medical care, nutritional counseling, laboratory services, immunization and allergy clinics, sexual health counseling, and a variety of other services.

- Allergy Clinic
- Campus Center Pharmacy
- Dental Care
- Immunizations
- International Travel Clinic
- Laboratory
- Physical Therapy
- Primary Care

Duke Student Mental Health Services

Student Wellness and Professional Development Coaching

[Website](#)

Coaches address concerns that get in the way of achieving optimal well-being.

Counseling & Psychological Services (CAPS)

[Website](#)

CAPS helps Duke students successfully live, grow, and learn in their personal and academic lives. They offer services including brief individual counseling/psychotherapy, consultation, couples and group counseling, assistance with referrals, and more. CAPS staff also provide outreach education programs to student groups, particularly for at-risk populations.

DukeReach

[Website](#)

DukeReach directs students, faculty, staff, parents, and others to the resources that help students in need. Located in the Dean of Students Office, it works with departments and groups across campus and in the community, including Housing, CAPS, Student Health, community health providers, the Academic Resource Center, and more.

DuWell

[Website](#)

Works with Duke students and administration to promote good decision making around health issues, alcohol and substance use. They run campus-wide discussions and programs with faculty and staff emphasizing the impact that high-risk substance use/abuse has on a community. Additionally, the Center links students to programs and services. Phone: 919-681-8421

Blue Devils Care

[Website](#)

Provides 24/7 mental telehealth support to all Duke students at no cost.

Student Health & Wellness

[Website](#)

Provides resources to take care of your physical, mental, and social wellbeing.

Prescription for Persistence

[Website](#)

Provides tips to help you succeed in grad school.

CAREER DEVELOPMENT RESOURCES & CERTIFICATES

Professional Development Series

[Website](#)

This series includes individual workshops, talks, and presentations that help students prepare for the professional doors their graduate degree will open. Programs broaden the student's career options and develop competencies in communication, self-awareness, professional adaptability, and leadership. Questions or suggestions? Contact [Dr. Melissa Bostrom](#), Assistant Dean for Graduate Student Professional Development.

Curriculum Enhancement Programming

Certificate in College Teaching (CCT) is an approximate one-year program that prepares PhD students to teach. Students receive formal documentation upon the program's completion, which helps make them more competitive when applying for faculty positions. (See **Appendix III**).

Emerging Leader Institute is open to Graduate School students and postdocs and helps them develop communication, self-awareness, professional adaptability, interdisciplinary teamwork, and leadership skills.

Preparing Future Faculty (PFF) is a year-long [program](#) that provides graduate students and postdocs with workshops and mentors to prepare them for the multiple roles they may play as faculty members at their academic institutions.

Bass Instructional Fellowship Program provides endowed fellowships for graduate students to gain high-quality teaching experience as instructors of record, instructional teaching assistants, and online apprentices.

For a list of the Professional Development Series workshops and events, visit the Graduate School's [professional development events calendar](#). Check back frequently during the semester!

The Graduate School Scientific Writing Resource

[Website](#)

Provides online course material that teaches how to write effectively. The material is not about grammar or punctuation but about *communicating to the reader*. It can be used either in a science class or by individuals and is intended for science students at the graduate level.

WISE (Women in Science and Engineering)

[Website](#)

Serves as a liaison between women science and engineering students and the administration. They sponsor events for women faculty members and students in science and engineering to come together and share experiences and ideas for change.

Student Affairs Career Center

[Website](#)

The center provides services, programs, events, online tools and resources for undergraduates, graduate students and alumni up to four years after graduation from Trinity College, Duke's Pratt School of Engineering and the Graduate School.

BIOCHEMISTRY DEPARTMENT ACADEMIC & SOCIAL EVENTS

Weekly Biochemistry Department Seminars

[Website](#)

Seminars are scheduled on Fridays at 12:00 noon in room 147, Nanaline Duke Bldg. unless otherwise noted. Coffee is served in the lobby at 11:45 am.

Monthly Biochemistry Department Research Forums

[Website](#)

These Friday seminar presentations highlight recent research accomplishments and ongoing research activities of faculty and their research groups.

Annual Nozaki Distinguished Lecture:

A Biochemistry graduate student committee solicits nominations from the students then selects, invites, and hosts a distinguished speaker to visit the department and present a seminar. Supported by the Dr. & Mrs. Yasuhiko Nozaki Lectures Fund of the Triangle Community Foundation.

Annual Department Retreat

Members of the department, including faculty, students, post-docs, and technicians come together at a location at the North Carolina beach or mountains. The weekend is full of poster sessions, lab presentations, karaoke, and fun.

Annual Student Recruitment Visits

Early in the spring semester, the department hosts potential graduate students to visit the Biochemistry Department. Current and prospective students meet, talk about the department's research opportunities, and tour Duke and Durham's unique culture and community. Current students can volunteer to help with recruitment events by contacting the BGSO.

Annual Duke Basketball Ticket Lottery

All graduate students can participate in the annual lottery for Duke Basketball Season Tickets. Interested graduate and professional students can apply for an opportunity to purchase season basketball tickets.

Monthly Biochemistry Happy Hour

The first Friday of each month, socialize with your fellow department members! Happy Hour happens at 4 pm on the Nanaline Duke Patio (weather permitting) or in the 1st floor lobby of Nanaline Duke. Everyone is welcome for beverages and snacks.

Annual Holiday Party

In early December, the Biochemistry department hosts an annual pot-luck for the department and their families. If you enjoy cooking, it's a great chance to share your favorite dish or just pick up something convenient on the way there. There are also dancing, fun, and door prizes!

Annual Biochemistry Department Night at the Durham Bulls

This family-friendly event in late spring/early summer includes seats to watch the baseball game in a reserved party deck, plus dinner, beverages and fireworks after the game.

BIOCHEMISTRY DEPARTMENT CORE FACILITIES

Faculty and students have access to state-of-the-art instrumentation, including X-ray crystallography, cryo-electron microscopy, protein and lipid mass spectroscopy, multidimensional nuclear magnetic resonance, computer graphics, circular dichroism spectroscopy, electron microscopy, isothermal calorimetry, and support facilities like peptide and oligonucleotide synthesizers, sequencing, RNA center, optical microscopy, and imaging systems.

Cryo-Electron Microscopy Center

[Website](#)

Duke's Shared Materials Instrumentation Facility is home to a new cryo-transmission electron microscope: The FEI Krios. The microscope joins the FEI Talos Arctica (located at the National Institute of Environmental Health Sciences, NIEHS) as part of the Research Triangle's Molecular Microscopy Consortium (MMC). This consortium is a partnership between NIEHS, Duke University, and the University of North Carolina at Chapel Hill. Director, Mario Borgnia, leads the MMC which is supported by a core team of expert personnel from participating institutions. The MMC is a space where scientific collaborations are carried out with members of the Core Team.

3D Macromolecular Structure Analysis & Kinemage

[Website](#)

The Richardsons' Lab supports the 3D Macromolecule Analysis & Kinemage.

Duke Magnetic Resonance Spectroscopy Center

[Website](#)

The Duke Magnetic Resonance Spectroscopy Center (DMRSC), provides access to high-field NMR instrumentation, training in the use of NMR methods, and expert consultation on advanced NMR applications.

X-Ray Crystallography Center

[Website](#)

The DHVI Macromolecular X-ray Crystallography Shared Resource offers services in determining and publishing macromolecular crystal structures—from crystallization trials through data collection, structure phasing, refinement and analysis on a fee-for-service basis. Facility or staff can assist with any and all steps in the process.

ANNUAL TIMELINES FOR BIOCHEMISTRY STUDENTS

2022-23 Important Dates for 1ST Year Biochemistry Students (G1)	
Aug. 22– 26	New Student Orientation & Advising, Research Talks, Course Registration
Aug. 26	BIOTRAIN 750 (4 RCR Credits) all day
Aug. 29	Fall Semester begins; Required courses: BCH 790S, BCH 745S, BCH 593
Sep. 1	BIOTRAIN 701 (4 RCR Credits) Thur. 8:30 – 9:30 am/9 weeks
Sep. 5 – Oct. 21	1 st Rotation – Lab Rotation forms are due in T3 by August 31st
Oct. 24 – Dec.16	2 nd Rotation – Lab Rotation forms are due in T3 by October 19th
Early Nov.	Spring BCH Course Open House/Biochemistry Advisory Meetings/Spring Registration Begins
Jan. 11	Spring Semester begins; Required classes: BIOTRAIN 751 (4 RCR Credits), BCH 746S, BCH 593
Jan. 9 – Mar. 3	3 rd Rotation – Lab Rotation forms are due in T3 by January 4th
Mar. 6 – Apr. 28	4th Rotation (optional)– Lab Rotation forms are due in T3 by March 1st
Mar. 10	Advisor/Lab Choice due to the BGSO <u>or</u> Discuss further rotations with DGS. Lab choices are approved by the DGS. Financial Support Forms are given to students to be signed by Advisor(s) & Department representatives.

2022-23 Important Dates for 2nd Year Biochemistry Students (G2)	
During Year 2 or 3	BIOTRAIN 753 (2 RCR Credits): Students complete a self-paced online course via Duke LMS
Aug. 29	Fall Semester begins; Required courses: BCH 745S, BCH 593
Before Dec. 16th	Student submits a Committee Nomination Form to the BGSO with recommended faculty for Supervisory Committee.
Jan. 11	Spring Semester begins; Required courses: BCH 746S, BCH 593
mid-January	DGS approves the Committee and assigns one Biochemistry faculty from each student's Prelim Committee to be the Prelim Chair
Feb. – May	Student schedules the Initial Committee Meeting and informs the BGSO of the date.
At least 1 week prior to Initial Meeting:	Student submits 2-3 page written document which includes an Introduction to the Thesis Area and Preliminary Aims to all committee members.
Before May 30th	Student holds Initial Committee Meeting (Pre-prelim), 1 hour (max).

2022-23 Important Dates for 3rd Year Biochemistry Students (G3)

During Year 2 or 3	BIOTRAIN 753 (2 RCR Credits): Students complete a self-paced online course via Duke LMS
Aug. 29	Fall Semester begins; Required course: BCH 745S
No later than Sep. 5 th	Student schedules oral preliminary exam and <u>informs DGSA of the date.</u>
At least <u>6 weeks</u> prior to exam:	Student submits written prelim exam proposal to DGSA for format check.
At least <u>4 weeks</u> prior to exam:	Student submits the format-approved Written Proposal to all Committee Members.
1 week after initial proposal submission:	Student requests feedback from the Prelim Committee Chair to ask whether the Written Proposal is Accepted or Needs Revision.
At least 1 week prior to exam:	Student submits revised Written Proposal to all Committee Members (if necessary). Student sends a reminder to all members of their Committee informing them of the Date/Time/Place of the Exam.
Before Dec. 16th	Supervisory Committee administers the Preliminary Exam.
Jan. 11	Spring Semester begins; Required course: BCH 746S
Before May 5th	Graduate School requires all G3 students complete qualifying exams by the end of the Spring semester unless approved by the Dean. Prelim retakes must be completed by this date.

2023-23 Important Dates for 4th Year Biochemistry Students (G4)

Before May 5th	Student schedules and completes the Annual Progress Meeting with their Ph.D. Supervisory Committee. BGSO must be notified of meeting date. Student updates their IDP. Student submits 2-3-page written summary and updated CV to all committee members by email and T3 at least 1 week prior to meeting.
Jan. 11	Spring Semester begins; Required course: BIOTRAIN 754 (4 RCR Credits)

2022-23 Important Dates for 5th Year Biochemistry Students (G5+)

5th+ Years	RCR Elective Forum (2 RCR Credits)
Before May 6th	Student schedules and completes the Annual Progress Meeting with their Ph.D. Supervisory Committee. BGSO should be notified of meeting date. Student updates their IDP. Student submits 2-3-page written summary and updated CV to all committee members by email and T3 at least 1 week prior to meeting.

2022-23 IMPORTANT DATES FOR THE DISSERTATION & DEFENSE

Graduation Date	Submission of Intention to receive degree ¹	Submission of Initial Electronic Dissertation ²	Final Day to hold Oral Defense ³	Final Submission of Dissertation into UMI/T3 ³
Sep. 2022	Jun. 14	Jul. 5	Jul. 19	Aug. 2
Dec. 2022	Oct. 15	Nov. 14	Nov. 29	Dec. 12
May 2023**	Jan. 31	Mar. 15	Mar. 31	Apr. 14

¹Submission of the Intention to receive degree

Student must file an intention to receive degree on-line: Log-in to [Duke Hub](#) and click on the “Forms and Requests” tab. Then click the “Apply for Graduate” button. The student’s advisor must Initiate Defense Milestone in T3.

²Initial Electronic Submission of the Dissertation Defense

At least two weeks before your defense, but prior to the *initial submission deadlines* for each semester, submit your dissertation to UMI/ProQuest

³Dissertation Defense Date/Final Submission of the Dissertation

Final submission of your dissertation must occur within 30 days of your defense; however, if you defend within 30 days of the semester deadline of your graduation date, you must adhere to the semester deadline and do not have 30 days to complete your final submission. Final version of the dissertation is due to UMI/ProQuest by 3:00 pm on the Due Date. T3 is due by 5:00 pm on the Due Date.

****Deadlines subject to change:** You can download a [PDF](#) of the deadlines or visit the [Duke Graduate School](#) for deadlines.

THE FIRST YEAR (G1)

There are three main elements involved in the first year of graduate study in biochemistry:

- **3 Lab rotations (optional 4th rotation)**
- **Choosing a research advisor**
- **Required Courses: BCH790S Topics, BCH745S/746S Seminar, BCH593 Ind study, and BIOTRAIN 701/750/751 (12 RCR Credits)**

2022-23 Important Dates for 1ST Year Biochemistry Students (G1)	
Aug. 22– 26	New Student Orientation & Advising, Research Talks, Course Registration
Aug. 26	BIOTRAIN 750 (4 RCR Credits) all day
Aug. 29	Fall Semester begins; Required courses: BCH 790S, BCH 745S, BCH 593
Sep. 1	BIOTRAIN 701 (4 RCR Credits) Thur. 8:30 – 9:30 am/9 weeks
Sep. 5 – Oct. 21	1 st Rotation – Lab Rotation forms are due in T3 by August 31st
Oct. 24 – Dec.16	2 nd Rotation – Lab Rotation forms are due in T3 by October 19th
Early Nov.	Spring BCH Course Open House/Biochemistry Advisory Meetings/Spring Registration Begins
Jan. 11	Spring Semester begins; Required classes: BIOTRAIN 751 (4 RCR Credits), BCH 746S, BCH 593
Jan. 9 – Mar. 3	3 rd Rotation – Lab Rotation forms are due in T3 by January 4th
Mar. 6 – Apr. 28	4th Rotation (optional)– Lab Rotation forms are due in T3 by March 1st
Mar. 10	Advisor/Lab Choice due to the BGSO <i>or</i> Discuss further rotations with DGS. Lab choices are approved by the DGS. Financial Support Forms are given to students to be signed by Advisor(s) & Department representatives.

OBGE Trainee Tracking Tool (T3) - Creating a T3 Profile

T3 tracks progress and assesses student learning, milestones, and development throughout the graduate training and includes the OBGE Faculty Research Series, a repository of SOM graduate faculty research profiles with easy access to faculty research, training program affiliations, mentoring philosophies, and rotation availability. Use the instructions below to register each lab rotation via T3. Access T3 [here](#).

- Sign in with NetID and password
- Navigate to Resource Library in the left-hand menu
- Select “Registering a Rotation in T3 – Student Quick Guide”
- Follow steps in “Quick Guide” to register rotation information

Lab Rotations

Biochemistry students complete 3 lab rotations during Fall and Spring semesters. At orientation, faculty give research presentations that help students choose the labs for their rotation projects. Students should choose rotations in diverse research areas to sample the de variety of scientific research and methodology. G1 students will present their rotation project background and results to graduate student peers in an oral presentation as part of BCH745S/746S.

Coursework & Registration

Incoming students register for fall courses during Orientation Week. The Biochemistry Advisory Committee will meet with each G1 student to discuss course selection. A Course Open House to discuss Spring semester courses will be scheduled in early November when students can meet with the Biochemistry Advisory Committee. Spring Registration instructions will be sent by the BGSO in November. Get instructions on registering for courses on [Duke Hub](#). Additional DukeHub Portal Navigation & "How to" Documentation can be found at this [website](#).

Typically, graduate Biochemistry students take 3-4 classes and two seminar courses each semester. (See **Appendix I**). These core courses are designed to develop the student's ability to critically read and analyze literature; orally present literature and analysis; demonstrate a firm grasp of conceptual foundations of modern biochemistry; and complete written reports, oral presentations, and/or exams. Students customize their plan of study with help from faculty advisors and their research mentors, choosing from a broad list of available courses in the biomedical science graduate curriculum.

Required Courses in the Biochemistry Program:

- BCH790S Topics (Graded, Fall semester G1) for 2 units
- BCH745S/746S Seminar (Graded, Fall and Spring, G1, G2, and G3) for 6 units
- BCH593 Research Independent Study (Graded, Fall and Spring, G1 and G2) for 8 units
- At least 30 hours coursework (24 hours of graded*+ 6 hours RCR/ungraded) in the first 2 years of study.
- BIOTRAIN (RCR Training) 20 contact hours (See page 52)

**Students coming into the program from the MSTP or matriculating with an MA/MS degree may be exempt from the full graded coursework requirement.*

Choosing a Research Advisor

- After completing at least 3 lab rotations, students will choose their thesis lab and graduate research advisor. Students should consult with professors they intend to or have rotated with to determine whether they will have a position available. Students may wish to contact the Chair and/or the DGS before making this decision. The thesis advisor choice form should be submitted to the BGSO in early March, after completion of the 3rd rotation. Approval of the thesis research advisors will be made by the Chair and DGS no earlier than March 10th, regardless of lab choice submission date. If you are doing more than 3 rotations, submit your thesis advisor choice form to the BGSO upon completion of your final rotation.

Statement of Financial Support Form: If a research advisor is chosen, whose primary faculty appointment is outside Biochemistry, the Statement of Financial Support Form is required by the School of Medicine and will be emailed by the BGSO. Each form must be signed by the following: 1) Advisor, 2) DGS of the PhD Granting Department, and 3) the Advisor's Primary Department Chair and Business Office. Names of the required signees will be listed on the forms.

THE SECOND YEAR (G2)

These principal events occur during the second year of biochemistry graduate study:

- **Required Courses: BCH745S/746S, BCH593; BIOTRAIN 753 (2 RCR Credits) in G2 or G3**
- **Teaching Assistant requirement (Fall, Spring, or Summer Semester)**
- **Supervisory committee selection, Prelim Exam Chair assigned**
- **Initial committee meeting (also called the “Pre-Prelim”)**

2022-23 Important Dates for 2nd Year Biochemistry Students (G2)	
During Year 2 or 3	BIOTRAIN 753 (2 RCR Credits): Students complete a self-paced online course via Duke LMS
Aug. 29	Fall Semester begins; Required courses: BCH 745S, BCH 593
Before Dec. 16th	Student submits a Committee Nomination Form to the BGSO with recommended faculty for Supervisory Committee.
Jan. 11	Spring Semester begins; Required courses: BCH 746S, BCH 593
mid-January	DGS approves the Committee and assigns one Biochemistry faculty from each student’s Prelim Committee to be the Prelim Chair
Feb. – May	Student schedules the Initial Committee Meeting and informs the BGSO of the date.
At least 1 week prior to Initial Meeting:	Student submits 2-3 page written document which includes an Introduction to the Thesis Area and Preliminary Aims to all committee members.
Before May 30th	Student holds Initial Committee Meeting (Pre-prelim), 1 hour (max).

Teaching Assistant Requirement

The Biochemistry department requires that all graduate students serve as a teaching assistant (TA) for at least one semester, usually during the second year of study. The department currently provides TAs with the following courses: BIOCHEM 301 and 302 (Introduction to Biochemistry I and II) and BIOCHEM 658/659 (Structural Biochemistry I & II). TA positions are assigned by the DGS prior to the start of G2.

Supervisory Committee Selection

No later than January 31st, each student, after consultation with her/his mentor and each proposed committee member, provides the BGSO with a [Committee Nomination Form](#) with a list of faculty members they recommend to join their Supervisory Committee.

- The Committee recommendations should **consist of five members (including their advisor)** plus:
 - at least three graduate faculty members with expertise in the major field of study
 - at least one graduate faculty member from a minor area from outside the degree program or from a clearly differentiated subfield within the Biochemistry Department (the MAR, Minor Area Representative*).
 - At least two members of the committee, including the Advisor, must be faculty with a primary or secondary appointment in the Biochemistry Department.

- Students with co-mentors should check in with the DGS to ensure compliance with their Prelim exam committee composition; co-mentors cannot take part in the Oral exam
- Interdisciplinary program students should also pay attention to program-specific committee requirements.

***MAR Justification requirement:** On the Supervisory Committee Nomination Form, include 1-2 sentences describing how this faculty's expertise is appropriate but lies *outside* of the main research topic.

IMPORTANT: Students are responsible for ensuring that all faculty members nominated for a prelim/dissertation committee are members of the **Graduate Faculty**. Students can verify membership using the following [website](#). If a professor is requested to be on the committee who is not a member of the Graduate Faculty (as are most faculty members from another university), their current CV must be submitted to the BGSO along with the committee nomination form. The BGSO will then submit a "Nomination Form for Term Membership on the Graduate Faculty" to the Graduate School for approval.

The Chair of the Pre-Prelim meeting and the Preliminary Examination Committee **is not the student's research advisor (or co-advisor)**. The Chair will be a primary Biochemistry faculty designated from the remaining member of the student's Committee by the DGS in consultation with the department Advisory Committee as needed.

The recommendations are reviewed by the DGS, in consultation with the department Advisory Committee for departmental approval. If approved, the BGSO will submit a Committee Nomination Form to the Graduate School for the Associate Dean's approval (***no later than 30 days before the Preliminary Examination date***). If one or more members nominated by the student are not approved, the student will be informed by the DGS and asked to submit additional nominations.

The Initial Committee Meeting ("Pre-Prelim")

The initial meeting takes place before **May 31st** of the student's second year. Many students and faculty like the When2Meet [website](#) to find a consensus date and time. The overall purpose is to acquaint the faculty members with the student and the student's proposed research project in both a written and oral format. It is not an exam. The meeting Chair is an assigned member of the student's committee who will also serve as the Chair for the Prelim exam.

Please note: *The student is responsible for scheduling the meeting (usually 1 hour), reserving the meeting space or setting up the virtual meeting and informing the Committee and the BGSO of the meeting date, time and place. For virtual meetings, the student will also be responsible for setting up the Zoom meeting link and sending the link to the Committee. To reserve space for the meeting, please see page 11 for available rooms & contacts).*

Although preferred, the entire Committee does not have to be present at this meeting. Students should schedule 1-on-1 meetings with any absent faculty to discuss their plans.

Written Summary (~2 pages): Students prepare and submit a brief (~2 page) summary to all Committee members and the BGSO at least 1 week prior to the meeting date. The summary includes an Introduction to the research area, the potential Preliminary Aims for the project, the Significance of the research, and Preliminary Data supporting the Aims (if available). This document should help development of the student's Prelim proposal and PhD research.

Oral Summary (~20 minutes) and Committee Discussion (~20 min): The student prepares a brief Oral Presentation to present the Background, Significance, Preliminary Data, and potential Preliminary Aims for their proposed project. This is not an exam but is intended to elicit useful comments and feedback regarding the student's proposed research topic, scope, and goals and to help them develop a successful Preliminary Exam proposal. The student should expect and can solicit oral and written suggestions from their committee regarding their proposed line of research and for suggestions of particular topics they should master for their Preliminary Examination.

Initial Meeting Feedback for Students: Note that T3 will not be used for our Biochemistry initial committee meeting. For an in-person meeting, the student should obtain from the BGSO: The Record of Initial Meeting Form, Initial Meeting Feedback/Comments Forms, and the student's Graduate Course Transcript. Each Committee Member should sign the Record of Initial Meeting Form and complete an Initial Meeting Feedback/Comments Form. At the conclusion of the meeting, the student and Thesis Advisor should discuss the Committee's feedback and comments. The student may make and retain copies of the feedback forms if they wish, but the **original forms must be turned in to the BGSO**. The student should also submit the signed Record of Initial Meeting Form and return the student's academic information to the BGSO.

Development of Initial Individual Development Plan (IDP)

In G2, the student should begin to develop an Individual Development Plan (IDP) (*see also Appendix IV*) with initial career goals and objectives. To help develop an IDP use the AAAS online tool to help you assess areas of interest (these are likely to change over time during the graduate school years). The student must complete an IDP by Spring G3. (*Detailed information about the IDP is in Appendix IV*). Students should plan to discuss their IDP with a Career Planning Mentor (could be any faculty, although it is highly recommended that the Mentor is someone familiar with the student, such as their Research Advisor or member of their Thesis Committee). Discussions can be one-on-one or as part of the student's annual committee meeting. The student informs the DGS of their choice of IDP faculty Mentor.

THE THIRD YEAR (G3)

Prior to or during the third year of biochemistry graduate study, students complete the Preliminary Examination (the "Prelim"). Successful completion is a requirement of the Graduate School for "Advancement to Candidacy", the process by which a student is officially deemed a Candidate for a Ph.D. In the Department of Biochemistry, the Prelim consists of two parts: A Written Proposal describing the student's thesis research and an Oral Exam. The Preliminary Exam is a Milestone event administered by the student's Supervisory Committee. By the end of G3, students are also required to have completed an Individual Development Plan (IDP).

2022-23 Important Dates for 3rd Year Biochemistry Students (G3)	
During Year 2 or 3	BIOTRAIN 753 (2 RCR Credits): Students complete a self-paced online course via Duke LMS
Aug. 29	Fall Semester begins; Required course: BCH 745S
No later than Sep. 5 th	Student schedules oral preliminary exam and <u>informs DGSA of the date.</u>
At least <u>6 weeks</u> prior to exam:	Student submits written prelim exam proposal to DGSA for format check.
At least <u>4 weeks</u> prior to exam:	Student submits the format-approved Written Proposal to all Committee Members.
1 week after initial proposal submission:	Student requests feedback from the Prelim Committee Chair to ask whether the Written Proposal is Accepted or Needs Revision.
At least 1 week prior to exam:	Student submits revised Written Proposal to all Committee Members (if necessary). Student sends a reminder to all members of their Committee informing them of the Date/Time/Place of the Exam.
Before Dec. 16th	Supervisory Committee administers the Preliminary Exam.
Jan. 11	Spring Semester begins; Required course: BCH 746S
Before May 5th	Graduate School requires all G3 students complete qualifying exams by the end of the Spring semester unless approved by the Dean. Prelim retakes must be completed by this date.

Oral Prelim Examination

Scheduling: Student are expected to schedule the Oral Exam date before or during the Fall semester of G3. Many students and faculty like the When2Meet [website](#) to find a consensus date and time. The student is responsible for scheduling the exam, reserving the meeting space or setting up the virtual meeting (if appropriate), and informing the committee and the DGSA of the exam date. The Prelim Exam should take place no later than December 16th of G3.

Students must be registered during the term in which they take the Preliminary Exam. During the Fall & Spring terms, students are allowed to schedule a Preliminary Exam on a date when classes are not in session (e.g., Fall Break, Spring Break, etc.). In the Summer term, a Preliminary Exam may be scheduled only between the opening and closing dates of the summer session. To view the official Duke academic calendars, visit this [website](#).

IMPORTANT: *All Committee members must be present to administer an Oral Exam.*

Changes to the Prelim Examination Committee: If a student requires a change to their Examination committee, the BGSO will need to be notified by email at the earliest convenience **and at least 5 weeks prior to the Prelim Examination.** This email should include an updated Committee Nomination Form which can be found on the Biochemistry [website](#). Before any request is sent, the student should consult with her/his mentor and the faculty member(s) they are planning to remove/add. *All faculty on the committee must be current members of the **Graduate Faculty**.* Students can verify membership using the following [website](#).

If a last-minute emergency arises such that a Committee member is suddenly unable to attend, the Exam may proceed **pending the Expedited Approval of the revised Committee composition by the Graduate School Associate Dean.** Note that the Examination Committee at minimum **must still** consist of the Committee Chair (a primary Biochemistry faculty, who is not the Advisor) and the Thesis Advisor; and the committee must have at least 4 members, with two major area representatives and one minor area representative.

Extension of the Preliminary Exam deadline beyond the end of the Spring Term of G3: Extensions must be approved by both the DGS and Associate Dean for Academic Affairs (Dr. John Klingensmith), for an examination on a specific date in the fall semester of the fourth year. Students who have not completed their preliminary examination by the end of G4 will be withdrawn.

Written Prelim Proposal Submission & Approval Checklist

- **At least 6 weeks prior to the exam: Written Proposal Format Check.**
 - Students submit the written proposal as a PDF file to the DGSA for **format approval**.
 - Once approved, the student will receive a copy of the **Prelim Exam Cover Sheet** for the Written Proposal. The Cover Sheet should be included with the Written Proposal when it is distributed electronically to each member of the supervisory committee.

Non-adherence to the formatting guidelines will require a revision before the document is approved for submission to the Prelim Committee.

- **At least 4 weeks prior to the scheduled exam and with approval of the written format from the BGSO: Written Proposal Submission to Committee.**
 - Students should upload **into T3** their Written Proposal and updated CV
 - Students should distribute their Written Proposal with Cover Sheet **by email** directly to the faculty.

- **1 week after submission of the Written Proposal to the Committee: Student Receives Written Proposal Approval or Requests for Revision.**
 - Ask Committee Chair for requested revisions from committee members, if they haven't already contacted you. Each Committee member either votes to Approve the document or Request Revisions. Approvals/Requests for Revisions will be assembled by the Prelim Committee Chair (see Cover Sheet), who will then contact the student with requested revisions.

- **At least 1 week prior to the Oral Exam: Revised Written Proposal Due to Committee.**
 - If the proposal Requires Revisions: The student should confer with the Committee Chair regarding the Committee's specific revision requests and, depending on the number of revisions, either:
 - Complete minor revisions in 2 weeks and submit a Revised Proposal to all Committee Members **by email and submit in T3** at least 1 week prior to the Oral Exam.
 - Take more time to prepare a revised Proposal if the requested revisions are extensive. In this case, the Oral Exam can be delayed/rescheduled, but *must still be completed by February 1st*.

Written Format of the Prelim Exam Proposal Document

The goals of the written portion of the prelim exam are as follows:

- 1) To demonstrate proficiency in the student's field of interest with respect to understanding pertinent literature, applying appropriate techniques, posing incisive questions or hypotheses, and designing experiments to address them.
- 2) To familiarize the student with preparing a formal, peer-reviewed research grant proposal.

The following guidelines and requirements will help students write a clear, well-supported proposal that highlights their ability to identify and explain important problems and design approaches to solve them.

General Prelim Exam Information:

- Use 11-point *Arial, Georgia, Helvetica or Palatino Linotype font, single space with at least 0.50-inch margins on ALL sides*. Figures, charts, tables, figure legends, and footnotes may be smaller in size but must be legible.
- Follow all page limits: 17 pages total excluding References, with specific page limits for each of the subsections listed below.
- The wording of the proposal should originate from the student and should not come from previously written proposals or manuscripts.
- **Role of the Thesis Advisor:** The Thesis Advisor is encouraged to participate in the preparation and editing of the Written Proposal. Students are urged to ask their Advisor to read the Proposal and make suggestions to improve the document's style, language and clarity prior to distributing to the committee. The Advisor may also provide assistance to assure that the Proposal conforms to the format and style guidelines. Such participation will increase the probability that the proposal will be acceptable to the committee and minimize revisions.
- Students must submit the written proposal to the BGSO for a **format check at least 6 weeks prior to Prelim Exam date** (2 weeks prior to distribution to the Committee). Non-adherence to formatting guidelines will require revisions *before* the document is approved for submission to the Prelim Committee.
- After submitting to the committee, the faculty are likely to request specific revisions to the written Prelim document. The student has ~2 weeks to make revisions prior to resubmitting the Final Revised Written Prelim. If extensive revisions are required, the student can delay their Oral Exam (as long as it is completed by February 1st of G3).

Written Prelim Exam Content Requirements

Section 1 (Page 1): Title, Summary, Narrative

A) Descriptive Title 200 character, max)

- Is limited to 200 characters including spaces and punctuation.

B) Project Summary/Abstract (30 lines, max)

- This is a **succinct description** of the proposed work and should be able to stand on its own (separate from the application). This section should be informative to other persons working in the same or related fields and understandable to a scientifically literate reader. Avoid using the first person.
- State the broad, **long-term objectives** and **specific aims**. Describe the general **research design** and **methods** for achieving the stated goals. Be sure that the project summary reflects the key focus of the proposed project.

C) Project Narrative (~3 sentences)

- Describe how, in the short or long term, the research **would contribute to fundamental knowledge** about the nature and behavior of living systems **and/or the application of that knowledge** to enhance health, lengthen life, and reduce illness and disability.

Section 2 (Page 2): Specific Aims

- Introduce the **background** and **importance** of the research area. State concisely the **goals** of the proposed research and summarize the expected **outcome(s)**, including the **impact** that the proposed research results will have on the involved research field(s).
- Succinctly list the **basis** and **specific objectives** of the research proposed (e.g., to test a stated hypothesis, create a novel design, solve a specific problem, challenge an existing paradigm, address a critical barrier to progress in the field, or develop new technology).

Section 3 (Page 3): List of Abbreviations

- List all abbreviations used in the proposal

Section 4 (Pages 4 – 17 max): Research Strategy

A) Background and Significance (4 pages, max)

- Describe the background and foundational studies for the proposed research in this field. Include preliminary results, if any, that are pertinent to presenting the background (data collected by others in the lab may be included with appropriate acknowledgement).
- Explain the importance of the problem, and/or critical barriers to progress that the proposed project addresses. Describe how the project will improve scientific understanding, clinical knowledge, and/or technical capability in one or more broad fields.
- Describe how the research proposal is innovative: explain how concepts, methods, or

technologies, that drive this field will be changed if the proposed aims are achieved.

B) Approach (10 pages, max)

This section should include:

- An **overarching hypothesis or goal**
- A **hypothesis or goal for each Specific Aim**
- **Objectives/Sub-aims within each Specific Aim** that will be used to examine the hypothesis/hypotheses or accomplish specific scientific goals
- A description of the **Methods, Approaches, and/or Techniques** to be used in each aim. Include how the data will be collected, analyzed, and interpreted. Include **preliminary studies**, if any, that are pertinent to the feasibility and/or progress towards the objectives/aims (data collected by others in the lab may be included with appropriate acknowledgement). If the project is in the early stages of development, describe the strategy to **establish feasibility**, and address the **management of any high-risk aspects** of the proposed work. Briefly outline plans for the **statistical analyses** of the data (including power calculations prior to experimental design), whenever appropriate.
- A discussion for each Aim and **how the data/results will be interpreted, limitations of the approaches/methods, possible problems, and alternative approaches** that would be tried if the initial approaches do not work.

Section 5 (no page limit): References

- List **all** authors unless the number of authors exceeds 10, in which case “*et al*” may be used. Include **titles** in citations.
- While there is not a page limitation, it is important to be selective, and include the most **appropriate** and **current** literature references pertinent to the proposed research.

Oral Prelim Exam

After the committee has approved the Written Proposal portion of the Prelim Exam, or the student has submitted a Revised Proposal to the Committee, the student will meet with the committee for an Oral Examination. **The Student's Prelim Committee, Revised Prelim Proposal, Updated CV, Prelim Date, Time, and Location *must* be entered in T3 prior to the Oral Exam.**

Please Note: *To prepare, students are encouraged to arrange "mock" oral exams with members of the student's lab and other graduate students.*

Presentation and Examination Questions: During the first ~30 minutes of the exam, the student presents an uninterrupted seminar primarily on the research project and obtained results. The student's thesis advisor(s) will then be asked to leave, as they are not present during the second part of the exam. The student is then asked questions by the Prelim Committee. The range of questions in this Oral Exam are in the general area of biochemistry and are related to, but are not restricted to the student's proposal.

Recommendation by the Prelim Committee: At the end of the exam, the student will leave the room while the Committee discusses the results. The mentor may be asked to join the committee for consultation. At this time, each Committee member will evaluate the Prelim in T3 indicating whether the student Passes or Fails, generating the Final Preliminary Exam Evaluation document which will be approved by the DGS and forwarded to the Graduate School. The DGSA cannot submit the official Report of the Doctoral Preliminary Examination form to the DGS for his/her signature and transmission to the Graduate School until all evaluations are completed.

Evaluation: *The student is informed of the Committee's decision and advice at the exam's conclusion. The T3 evaluation and comments should be discussed by the student and their research advisor.*

Re-taking the Preliminary Exam

A student who fails the preliminary examination may apply, **with consent of all of the members of the students Prelim Exam Committee and the Dean of the Graduate School**, for the privilege of a re-examination.

Graduate School Re-examination Requirements:

- Re-exam must occur no earlier than 3 months and no later than 6 months after the original exam date.
- Exam must be held by the end of the Spring Semester of G3 unless specifically requested and approved in writing by the Dean.
- All members of the student's original Prelim Committee must serve on the re-examination committee.
- Successful completion of the second examination requires the affirmative vote of all Committee members. Failure on the second examination will render a student ineligible to continue for the Ph.D. degree at Duke University.

THE FOURTH YEAR & BEYOND (G4+)

During the fourth year and subsequent years of graduate study in biochemistry, students are primarily responsible for conducting their research. Students must arrange a meeting with their Dissertation Committee on an annual basis, beginning in the fourth year of study.

- **Annual Progress Meeting, enter summary and CV into T3**
- **Required Course RCR (BIOTRAIN 754/ Elective Forum; 4⁽⁺⁾ RCR Credits)**

<u>2023-23 Important Dates for 4th Year Biochemistry Students (G4)</u>	
Before May 5th	Student schedules and completes the Annual Progress Meeting with their Ph.D. Supervisory Committee. BGSO must be notified of meeting date. Student updates their IDP. Student submits 2-3-page written summary and updated CV to all committee members by email and T3 at least 1 week prior to meeting.
Jan. 11	Spring Semester begins; Required course: BIOTRAIN 754 (4 RCR Credits)
<u>2022-23 Important Dates for 5th Year Biochemistry Students (G5+)</u>	
5th+ Years	RCR Elective Forum (2 RCR Credits)
Before May 6th	Student schedules and completes the Annual Progress Meeting with their Ph.D. Supervisory Committee. BGSO should be notified of meeting date. Student updates their IDP. Student submits 2-3-page written summary and updated CV to all committee members by email and T3 at least 1 week prior to meeting.

Annual Progress Meetings

The Committee should use these meetings to note adequate progress, or to provide help and/or advice. Students should have this meeting completed no later than May 5th.

Complete the following for your annual committee meeting:

- Schedule the meeting with your committee faculty. Many students and faculty like the When2Meet [website](#) to find a consensus date and time. Annual progress meetings are typically 1-1.5 hours (more extensive discussions can be held with faculty individually). The meeting will be held virtually or in-person. Be sure to send all your committee members the meeting date and time to confirm, as well as a Zoom link for virtual meetings.
 - **At least 2-3 weeks prior to the annual meeting:** Contact the DGSA with the date and time so that it can be uploaded into T3 in time to generate reminders and links for your committee. Be sure your committee members are correct in T3.
 - **At least one week prior to the meeting:** Log into T3 and upload:
 - Your annual progress meeting document (2-3-page summary)
 - Your current CV
 - Your updated Professional Development Activities (papers, talks, etc)

- Your committee members will receive an automated email reminder via T3 both one week and one day prior to your meeting date that includes a link to your T3 record.
- You should prepare a ~30 min oral presentation summarizing research accomplishments as well as plans for the next year.

At the Annual Progress Meeting:

1. Prior to the student's oral presentation, the Research Mentor will take a few minutes to discuss the student's progress privately with the Committee.
2. The student presents ~30 min oral summary of research accomplishments and plans.
3. The committee discusses progress and provides advice to the student.
4. The student will also be given time to privately discuss any issues with the Committee without the Research Mentor.
5. Each faculty member will complete the evaluation forms in T3. The comments are automatically released to the student once **all** members of the committee have completed an evaluation.
6. The student and the mentor discuss the Committee evaluations. If you do not receive the email feedback, this means at least 1 committee member has not completed the evaluation yet. The student may prompt the Mentor/Chair to request faculty for evaluations.

Please Note: For annual progress meetings all of your committee members do not need to be present, however **all** of your committee members still need to sign off in T3 to evaluate your annual progress. If a faculty member cannot attend the meeting, meet individually with that faculty within a week of your meeting.

Changes to the Supervisory Committee

Check your supervisory committee listing in Duke Hub and T3 and make sure it matches the committee that will be present at your defense. If a student requires a change to their Prelim/Dissertation supervisory committee, notify the BGSO by email at the earliest convenience. This email should include an updated [Committee Nomination Form](#) which can be found on the Biochemistry [website](#). Before any request is sent, the student should consult with her/his mentor and the faculty member(s) they are planning to remove/add.

Please Note: The Committee must consist of at least four members of the graduate faculty (including their advisor, a committee of five members is recommended. The committee must also include at least two members with expertise in the major field of study and at least one from a minor area (the Minor Area Representative or MAR)*, being from outside the degree program or from a clearly differentiated subfield within the Biochemistry Department. At least two members of the committee, including the Advisor, must be faculty with a primary or secondary appointment in the Biochemistry Department.

***MAR Justification Requirement:** Provide a 1-2 sentence explanation about how this faculty member's expertise is **appropriate and distinct from** the major area of the thesis on the [Committee Nomination Form](#).

Required Extension Request for G8 students

For students beginning their eighth year (G8 which begins the summer term after May of the G7 Academic Year), an Extension Request must be filed with the Graduate School. An annual progress report and a **specific timeline for completion of the dissertation** must be signed by the student, committee chair and DGS and submitted to the Associate Dean for Academic Affairs. If the dissertation is not defended by the new deadline, the student will be withdrawn from candidacy.

The Dissertation Seminar & Defense

The dissertation is expected to be a mature and competent piece of writing, embodying the results of significant and original research. Please see the *Guide to Graduation on page 45* for detailed requirements on writing and submitting your dissertation, along with all other important information for completing your defense (i.e., scheduling your seminar/defense, degree deadlines, etc.).

<u>2022-23 IMPORTANT DATES FOR DISSERTATION & DEFENSE</u>	
Apply for Graduation/Submission of the Intention to receive degree	
Jun. 14 for Sep. 2022 Graduation	Student must file an intention to receive degree in Duke Hub
Oct. 15 for Dec. 2022 Graduation	
Jan. 31* for May 2023 Graduation	
Initial Electronic Submission of the Dissertation	
Jul. 5 for Sep. 2022 Graduation	Initial submission must take place at least 2 weeks before your defense and no later than 5:00 PM on the deadline date (see left). Submit your dissertation to UMI/ProQuest
Nov. 14 for Dec. 2022 Graduation	
Mar. 15 for May 2023 Graduation	
<u>Defense, Final Submission of the Dissertation, and Certificate</u>	
Final submission of your dissertation must occur within 30 days of your defense; however, if you defend within 30 days of the semester deadline of your graduation date, you must adhere to the semester deadline, and do not have 30 days to complete your final submission. Your Graduation Certificate will be generated by T3 after your entire committee approves your Defense. The Certificate is then automatically sent for approval by the DGS and is submitted to the Graduate School.	
Jul. 19 for Sep. 2022 Graduation	Final day to hold the dissertation defense.
Aug. 2 for Sep. 2022 Graduation	Final day for the dept. to send Graduation certificate by 5:00PM; submit final dissertation to UMI/ProQuest by 3:00PM.
Nov. 29 for Dec. 2022 Graduation	Final day to hold the dissertation defense.
Dec. 12 for Dec. 2022 Graduation	Final day for the dept to send Graduation certificate by 5:00PM; submit final dissertation to UMI/ProQuest by 3:00PM.
Mar. 31* for May 2023 Graduation	Final day to hold the dissertation defense.
Apr. 14* for May 2023 Graduation	Final day for the dept to send Graduation certificate by 5:00PM; submit final dissertation to UMI/ProQuest by 3:00PM.
<i>*Please Note: Deadlines subject to change. You can find the most up-to-date deadlines here.</i>	

Changes to the Supervisory Committee

Check your supervisory committee listing in Duke Hub and T3 and make sure it matches the committee that will be present at your defense. If a student requires a change to their Prelim/Dissertation supervisory committee, notify the BGSO by email at the earliest convenience. This email should include an updated [Committee Nomination Form](#) which can be found on the Biochemistry [website](#). Before any request is sent, the student should consult with her/his mentor and the faculty member(s) they are planning to remove/add.

Please Note: *The Committee must consist of at least four members of the graduate faculty (including their advisor, a committee of five members is recommended. The committee must also include at least two members with expertise in the major field of study and at least one from a minor area, being from outside the degree program or from a clearly differentiated subfield within the Biochemistry Department (the Minor Area Representative or MAR)*. At least two members of the committee, including the Advisor, must be faculty with a primary or secondary appointment in the Biochemistry Department.*

***Outside Committee Member(s) Selection:** The Graduate School requires justification for choosing the MAR you would like to serve on your committee. Provide a 1-2 sentence explanation about how this faculty member's expertise is appropriate and distinct from the major area of the thesis research to include on the Supervisory [Committee Nomination Form](#).

Scheduling your dissertation seminar & defense

The Dissertation Seminar and the Oral Defense are generally given on the same day during consecutive time slots. The **seminar** is given first and is an hour-long presentation of the dissertation research. It is open to all members of the department and is held virtually or in a seminar room. The **Oral Defense** follows the seminar and is closed to the public and held in a smaller conference room. This question & answer session with the student's Thesis Committee is chaired by the Thesis Advisor and typically lasts ~2 hours. Once your seminar and oral defense are scheduled, the BGSO should be notified of the date and time with a zoom link (if appropriate). To reserve space for your seminar and defense (a 3-hour block), please contact the BGSO (see [page 11 for rooms and contacts](#)).

The **final examination** (oral defense) must be administered by ALL members of the supervisory committee and can be considered invalid unless all members of the defense committee are present. If one committee members cannot make it to the exam (even if four members remain), the student should inform the BGSO *immediately* so that arrangements for virtual attendance or a substitution can be made. The final exam should never be held with a committee other than the one approved by the Graduate School.

IMPORTANT: You must be registered during the term in which you defend. During the fall & spring terms, students will be allowed to schedule a defense on a date when classes are not in session (fall break, spring break, etc.). In the summer term, a defense may be scheduled only between the opening and closing dates of the summer session. View the official Duke academic calendars [here](#).

Please Note: See Graduate School degree deadlines [here](#).

Biochemistry Guide to Graduation

1. Check your supervisory committee listing in both DukeHub and T3:

Make sure it matches the committee that will be present at your defense (which must contain at least four graduate faculty members). Your Research Advisor should be indicated as Chair. If you need it updated or you need to change your committee, notify the DGSA immediately. Changes require **30 day advance** approval by the Graduate School of a DGS-signed Committee Nomination Form which can be found on the Biochemistry [website](#).

2. Apply for Graduation (Intention to receive degree):

When a student and his/her advisor have agreed that the student is ready to finish within a semester, the student will need to **Apply for Graduation** at least two weeks prior to his/her defense *and* no later than the initial submission deadline for his/her graduation term.

- Log into the [Duke Hub](#) and navigate to Academics. Scroll down to Program/Degree Selection and click to open the application for graduation, which should include a list of degree programs for which you are eligible to apply.
- If you applied to graduate in the previous term but did not, you will need to apply again for the current term.
- If you are completing a certificate program, you must apply to graduate separately in DukeHub.

By Applying for Graduation, you inform the Graduate School that you are planning to graduate in a given semester. An “Apply for Graduation” form is good for only one semester and does not carry over to the next. Thus, if you file in the fall and do not defend, you must file a new form in the spring. Click [here](#) for the latest Application for Graduation deadlines.

3. The Written Dissertation:

The Graduate School has very specific guidelines for the written dissertation’s format, and strongly recommends all students use the templates (available in MS Word or LaTeX) to reduce the chance of serious formatting problems that could delay graduation.

The dissertation templates and the Guide for Electronic Submission of Thesis and Dissertations, along with other helpful information can be found [here](#).

A. Initial Electronic Dissertation Submission (“Format Check”):

The initial submission must take place at least two weeks before your defense and no later than 5:00 p.m. on the deadline date. **Note:** If you submit your initial dissertation/thesis on the deadline date, you cannot defend until 14 days after that. Initial submission of the dissertation or thesis means that the document is complete.

View the [Initial Submission deadlines](#) for each semester

Submit your dissertation [here](#). The initial submission of your dissertation to UMI/ProQuest is to check the format. The information you provide at the initial submission will be forwarded first to the Graduate School Administrator for approval. Do not destroy the original file from which you created the PDF, you will need this version for revision purposes. Revisions of your thesis/dissertation may be uploaded after your defense. More information about Electronic Theses and Dissertations (ETDs) can be found at the [Graduate School Site](#).

After you submit your electronic dissertation/master's thesis to ProQuest, you will receive an email informing you of any formatting problems and provide a link to request an optional format check meeting with your assigned ETD administrator.

B. Dissertation Submission to the Supervisory Committee:

One month (no less than 3 weeks) prior to your exam date, submit a complete copy of your dissertation to each committee member (generally by email, but provide printed copies upon request), and **upload into T3**. Also, upload an updated version of **your CV into T3**. **If students do not meet this deadline, their oral defense date is subject to postponement.**

4. Advisor Letter & Official Defense Announcement:

No later than one month prior to your exam date, or at the time of the initial submission of your dissertation:

A. Send an email to the [DGSA](#) with the following information for creation of the Departmental Defense Announcement:

- **Date, time and place of dissertation seminar & defense**
- **Your name** (as it appears on your dissertation title pages)
- **Title of dissertation** (including any special fonts/symbols)
- **Your Advisor's name**

B. The DGSA will then ask your advisor to initiate the **T3 Milestone for the Dissertation Defense**. This will automatically generate an Advisor Letter and the Official Defense Announcement via the T3 portal. These documents will automatically be sent from T3 to the Graduate School. Please email the [Graduate School](#) with any questions.

***Note:** For Students Who Have Co-Advisors, only one is needed to initiate the Defense Milestone in T3, but that one should have an appointment in the Biochemistry department.*

Additional Information about ETDs) For submission procedures and guidelines, see the Graduate School [ETD Guidelines](#) For MS Word or Adobe Acrobat help, call the OIT Help Desk at 919-684-2200. For technical help with the PDF submission, contact UMI [support](#) or visit the [Graduate School](#).

ETD Copyright Information: **When you submit your thesis/dissertation electronically, you will** also permit Duke University to make it available online through [DukeSpace](#) at Duke Libraries. View the following links for additional information about [ETD Availability](#) and the [Non-exclusive Distribution License and Dissertation Availability Agreement](#), including the options to request an embargo. For more information see: [Copyrights](#), [Publishing Concerns](#), [Resources and Guidelines](#)

5. Dissertation Seminar Flyer:

One month (but no less than three weeks) prior to your defense, the DGSA will create a **Dissertation Seminar Flyer** and email it to all department faculty, graduate students and post-docs. The DGSA will also post flyers in the Nanaline Duke Bldg. If you would like copies to post at other campus locations, please notify the [DGSA](#).



Provided you have done the following...

- Submitted your Applied for Graduation form (entered via DukeHub)
- Have an approved Dissertation Committee (Graduate Faculty membership verified and Committee submitted to GS for Dean's approval at least 30 days prior to defense)
- Given the DGSA information for your Official Defense Announcement (DGSA entered into T3)
- Checked with your Advisor/DGSA for the Advisor Letter (Advisor entered into T3)
- Submitted your dissertation (formatting approved by the GS, submitted to your committee, and entered into T3)

...you are ready to defend!



6. The Dissertation Defense:

The Defense consists of a public hour-long **seminar** held in a seminar/classroom or virtually. Following the seminar, a **final examination** of the written and oral presentations of the thesis is required to be administered by ALL members of the supervisory committee. At the conclusion of your defense, the supervisory committee will confer and vote, and the completed T3 evaluations will be forwarded to the DGS for approval. This will generate the Final Exam Certificate which will be sent to the Graduate School by the DGSA.

7. Final Submission:

Final submission of your revised dissertation must occur within 30 days of your defense; however, if you defend within 30 days of the semester deadline of your graduation date, you must adhere to the semester deadline. **Deadlines are subject to change, so be sure to check.**

a. Submit revised PDF file to UMI/ProQuest:

The final version of your dissertation, taking into consideration the revisions required by the Graduate School **and** the revisions required by your committee. You will receive notification when the Graduate School has accepted your dissertation.

b. Submit the following materials to the Graduate School after your defense:

- i. Completed "Survey of Earned Doctorates."
- ii. Signed "Non-Exclusive Distribution License and Dissertation Availability Agreement"

Note: *If, at the end of the semester/term, the student cannot meet the deadlines, the student will need to register for the next term or semester in which the degree will be awarded and apply for Graduation again for the new term.*

==> Please also complete the **Graduate School's computer-based Ph.D. Exit** Survey that will be automatically sent to you upon completion of your dissertation.

ADDITIONAL INFORMATION FOR GRADUATES

Bound Copies of Dissertations

If you would like a personal copy, you can order through ProQuest or print out your dissertation and bring it to the Textbook Store in the Bryan Center for binding. Please note that imageresolution will be higher on the self-printed copy brought to the Textbook Store than on the copy ordered through ProQuest.

Commencement

Graduation exercises are held once a year in May, when degrees are conferred on and diplomas are issued to those students who have completed requirements by the end of that spring. Those who complete degree requirements by the end of the previous fall or the summer term receive diplomas dated December 30 or September 1, respectively. September and December graduates are invited to attend the May graduation ceremonies but must register online for the Ph.D. Hooding Ceremony. More information on graduation exercises can be found [here](#).

Health Insurance Information for Graduates

Website

Students who complete their degree/graduate will have the option to continue their health insurance coverage for the remainder of the plan year at their own pro-rated expense. Otherwise, the Graduate School payment of the premium will continue through the last day of the month during which the graduation became effective (see more detailed info below). If a student chooses to maintain his/her Duke medical insurance coverage, the student will be charged for, and expected to pay, the balance of the plan term premium through his/her Bursar's account. If the student wishes to terminate his/her Duke insurance plan, he/she must complete the Petition to Terminate Coverage form and submit it to the Student Health Insurance Manager in the Student Health Center.

Spring (May) Graduates are eligible to continue their health insurance coverage for the remainder of the plan year at the Graduate School's expense (through July 31st)*. No action is required on the part of the student to continue this coverage. However, students are strongly encouraged to make sure they secure alternative health insurance coverage by July 31st, the end of the Duke SMIP year.

**This includes students who choose to defend earlier in the semester (i.e. Jan, Feb) for Spring graduation. They will continue to receive health insurance through the remainder of the plan year (until July 31st), since their tuition remission & fees have already been paid in full.*

Summer (September) Graduates are technically enrolled through the end of August, but the Duke SMIP plan year ends on July 31st, therefore, these students may be without health insurance for their last month of study and are given the option of extending their coverage for one month, through August 31st. If the Graduate School paid the student's Duke SMIP premium for the prior year, the Graduate School will also cover the premium for the August extension. If the student was responsible for the prior year premium, and opts to extend coverage for the month of August, the student will be responsible for the additional premium payment.

Fall (December) Graduates will have the option to continue their health insurance coverage for the remainder of the plan year at their own pro-rated expense. Graduate School premium

payments continue through December 31st. If a student chooses to maintain his/her Duke medical insurance coverage through the seven remaining months of the plan year (through July 31st), the student is expected to pay the balance of the plan term premium through his/her Bursar's account. If the student wishes to terminate his/her Duke insurance plan, he/she must complete the Petition to Terminate Coverage form and submit it to the Student Health Insurance Manager in the Student Health Center.

Please Note: *Your policy will remain in effect unless you complete and submit the Petition to Terminate Coverage form!*

Option to Continue Coverage: Graduating students who have been covered by the [Duke SMIP](#) for at least the six months immediately prior to graduation are eligible to extend their SMIP coverage for an additional six months after graduation, at their own pro-rated expense. The Student Blue link will be made available in the month of July and will include details on continuing premium rates and instructions for enrollment. All matters pertaining to continuation will be handled between the student and Student Blue. If you have any questions that are not answered on the website concerning enrollment and termination please email [Student Health](#). Alternatively, you may call and leave a message at 919.684-1481. Due to high message volumes, please allow up to 2 business days for a response.

Dental Insurance: Although dental services are not available through Duke Student Health Center, all students enrolled in the Student Health Insurance Plan are eligible for discounted dental visits through BASIX. Visit their [website](#) for participating practices. You can also purchase dental insurance through [Dental Blue](#).

REQUIREMENTS FOR THE MASTER'S DEGREES

Students may, under certain circumstances, receive a terminal Master's degree if they choose to end their study before finishing their Ph.D. The Biochemistry department awards two types of Master's degrees: Master of Arts, M.A. (without a thesis), and Master of Science, M.S. (with a thesis). At Duke, individual departments decide whether the M.A./M.S. program may be completed by submission of an approved thesis or by other academic exercises. In Biochemistry, the recommendation for a student to proceed towards earning a terminal M.A. or M.S. is granted by the advisor, the DGS, the Chair, and/or the student's committee.

Formal Graduate School Requirements:

- 1) A minimum of 30 units of credit registration, at least 24 of which must be graded.
- 2) Continuous registration.
- 3) A master's exam or alternative, such as a thesis or other formal written exercise.

Course Requirements

Thirty units of graduate credit constitutes minimum enrollment for the M.A. and M.S. degrees. Students must present acceptable grades for a minimum of 24 units of graded course work, 12 of which must be in the major subject. A minimum of six units of the required 24 is normally in a minor subject or in a related field, which is approved by the student's major department. In Biochemistry, these course requirements are typically satisfied from coursework taken in the first two years of graduate training.

Completing the "Apply to Graduate" Process for an MS or MA

When a student and his/her advisor have agreed that the student is ready to finish with a Master's, the student will **Apply for Graduation** at least two weeks prior to the thesis defense (if applicable) *and* no later than the initial submission deadline for the graduation term.

- Log into the [Duke Hub](#). Open the Academics tab and then Program
- Click on Apply for Graduation

Please Note: *By Applying for Graduation, you inform the Graduate School that you are planning to graduate in a given semester. An "Apply for Graduation" form is good for one semester and does not carry over to the next semester. Thus, if you file in the Fall and do not defend, you must file a new form in the Spring.*

Declaration of Intention Letter: The declaration of intention letter, which should be sent to the Graduate School, presents the title of the thesis or specifies alternative academic exercises on which the degree candidate will be examined. Alternative academic exercises can include written or oral exams on a prescribed reading list or body of material; oral exams on a paper or set of papers submitted by the student; or oral exam on a research project or memo. **The doctoral preliminary examination may also serve as the final examination for the master's degree.** You should inform the Graduate School which type of examination the department will use. The declaration must have the approval of the DGS in the major department and chair of the student's advisory committee

M.S. Thesis Requirements

For an M.S., the thesis should demonstrate the student's ability to collect, arrange, interpret, and report pertinent material on a research problem. The thesis must be written in an acceptable style and should exhibit the student's competence in scholarly procedures. Copies of the document should be distributed by the student, to all members of the examining committee **at least one month prior to the exam date**.

Requirements and formats are set forth by the Graduate School and can be found at this [website](#). The Guide for the Preparation of Theses and Dissertations can be downloaded at the Graduate School [website](#).

The thesis must be submitted in an approved form to the Graduate School **at least two weeks before the scheduled date of the final examination or no later than the initial submission deadline for that semester**. Submission deadlines can be found at this [website](#).

The Master's Degree Examining Committee and the Examination

The department's DGS, with the student, recommends an examining committee normally composed of three members of the graduate faculty, one of whom is the MAR, usually from a department other than the major department or from an approved minor area within the major department. Nominations for committee membership are submitted on the appropriate form for approval to the Dean of the Graduate School **at least one week preceding the MS exam**. The committee will conduct the examination, certify the student's success or failure, and the exam certificate will be sent to the Graduate school by the DGSA.

RESPONSIBLE CONDUCT OF RESEARCH (RCR)

Academic integrity and research ethics are fundamental to the practice of science. We have created a rigorous program to train students in the highest standards for conducting research. All biomedical PhD students are required to participate in in-person and online RCR courses for a total of 20 contact hours. To receive credit for RCR training, students complete written assessments and course credit is formally tracked by the university registrar to ensure that all RCR requirements are met prior to graduation. The following [requirements](#) apply to students that matriculate in Fall 2020 or later. If you matriculated prior to Fall 2020, transitional requirements are outlined [here](#).

	Year 1	Year 2	Year 3	Year 4	Year 5+
Fall	BIOTRAIN 750*	BIOTRAIN 720			2 RCR Forum Electives* OR
	BIOTRAIN 701	BIOTRAIN 753*			
Spring	BIOTRAIN 751*			BIOTRAIN 754*	BIOTRAIN 755

First Year

- **Introduction to RCR Concepts:** All first year biomedical PhD students will participate in [BIOTRAIN 750](#), a one-day event during Orientation week in August. Topics include conflict management, choosing a mentor, integrating well-being into graduate school, data management, identifying and reducing biases, and diversity, equity and inclusion at Duke. This will provide 4 RCR credit hours.
- **Foundations of Professionalism for Biomedical Scientists:** In the Fall, all first-year students will participate in [BIOTRAIN 701](#). This course is held on Thursdays from 8:30am-9:30am from Sep. 1-Nov. 3. Classes include in-person seminars, online content, and Gateway Group discussions consisting of interdisciplinary small groups of students led by one faculty mentor and one peer mentor. This will provide 4 RCR credit hours.
- **The Responsible Scientist I:** In the Spring, all first-year students will participate in [BIOTRAIN 751](#), a semester long course that utilizes online lectures/modules, in-person lectures and small group discussions, and focuses on Responsible Conduct of Research (RCR) and Rigor & Reproducibility (R&R) topics for early-stage graduate students. Each topic is accompanied by a short assessment and bi-monthly small group sessions. This will provide 4 RCR credit hours.

Second and Third Years

- **Data Management and Quality for Biomedical PhD Students:** At some point during the second or third year of the PhD program, every student will complete a self-paced, online [BIOTRAIN 753](#). This course is offered via Duke LMS (Learning Management System) in partnership with [DOSI-ASIST](#) and includes a set of 3 online interactive modules, each accompanied by an assessment. This will provide 2 RCR credit hours.

Fourth Year

- **The Responsible Scientist II:** In the Spring of the 4th year, all students will participate in [BIOTRAIN 754](#), a semester long course that utilizes online lectures/modules, in-person lectures and small group discussions, and focuses on Responsible Conduct of Research (RCR) and Rigor & Reproducibility (R&R) topics for advanced graduate students. This will provide 4 RCR credit hours.

Fifth Year and Beyond

- Students in years 5 and beyond will participate in two [RCR elective forums](#). These are held throughout the year on a variety of topics to allow students to choose forums that relate to their personal interests and experience. These forums include PhD students from the humanities and social science and often provide a broader view of RCR than offered in previous training years. Each elective forum will provide 2 RCR credit hours.

The Responsible Scientist Teaching Assistant - BIOTRAIN 755:

- School of Medicine PhD students in years 4+ may earn BIOTRAIN 755 credit (replacing one of two required RCR Forums) by serving as a teaching assistant in BIOTRAIN 751: The Responsible Scientist I. School of Medicine PhD students in years 3+ may earn up to two semesters of BIOTRAIN 755 credit (replacing up to two of two required RCR Forums) by serving as an OBGE Graduate Student Peer Mentor over the course of one academic year, including participation in BIOTRAIN 701: Foundations in Professionalism.

RCR Resources

- [Animal Care and Use Program](#)
- [Duke Office of Translation and Commercialization](#)
- [Duke Policy and Procedures Governing Misconduct in Research](#)
- [Duke Research Integrity Office](#)
- [Human Resource Department](#)
- [Institutional Review Board: Human Subjects Research](#)
- [Introduction to the Responsible Conduct of Research](#), by Nicholas H. Steneck, PhD
- [Office for Institutional Equity](#)
- [Responsible Conduct In Research \(RCR\) Training and Regulations](#)
- [Trent Center for Bioethics, Humanities, & History of Medicine](#)
- [US Office of Research Integrity \(ORI\)](#)

Questions?

Feel free to contact OBGE@duke.edu if you would like more information about RCR.

RESOURCES FOR INTERNATIONAL STUDENTS

International House

[Website](#)

The IHouse mission is to provide educational services and advocacy to the international population at Duke as well as outreach to the Durham community. They offer extensive cross-cultural programming and information to enhance the global mission of the university.

Visa Services Office

[Website](#)

Visa Services is a nexus for monitoring and shaping legislation, regulations, and policies at the federal, state and local levels that affect international educational exchange, and for interpreting and applying those directives and controls in the Duke environment in support of the teaching, research, patient care, and community service goals of the university, medical center, health system and affiliated institutions.

Department liaisons work primarily with international students, staff and faculty for university, medical center, health system and affiliated institutions. Visa Services liaison for the Department of Biochemistry: Contact [Pamela Billie](#) for more information.

English For International Students (EIS)

[Website](#)

EIS provides resources to:

- Help students succeed in their academic programs
- Help students build a community that actively seeks the intellectual and cultural contributions of international students and scholars
- To help students and scholars fully participate in the academic community and become global ambassadors for Duke

EIS Placement Exams: All international graduate students whose native language is not English are **required** to take writing and oral/speaking exams through the EIS program per the Graduate School and the Department. The Graduate School's policy is for students to take any required English courses early in their academic careers for maximum benefit.

Writing Studio: Students can make appointments for both face-to-face and e-tutoring. Several tutors have ESL experience and all tutors have had some training in working with international students. Click [here](#) to request a specific tutor and make an appointment.

Oral Skills Coaching: Students may make appointments with an experienced ESL speaking coach to develop and rehearse any type of oral presentation, practice discussing their field and research, or practice specific speaking skills. Download this [PDF](#) for more information,

Applying for a Social Security Number (SSN or Individual Tax Identification Number (ITIN))

Duke international graduate students, who are offered a Graduate Awards fellowship, (a stipend for which this is no specific work obligation such as teaching or research), are eligible to apply for an ITIN#.

When a student begins their third year of study and is hired as a Research Assistant, supported by their PI funds, they can apply for an SSN. This should be done very soon after being formally hired as a Research Assistant.

***Please Note:** When a student has received their ITIN# or SSN card, please bring it to the DGSA, in the BGSO. She will need to make a copy for your payroll files and send a copy to the Corporate Payroll office.*

Transportation to Social Security Office:

For those without a car, Duke University's International House provides transportation to the Social Security Office at 3004 Tower Blvd., Durham, NC 27707. The shuttle to the SS office departs at 10am each Wednesday from the International House at the corner of Anderson and Campus Drive on Duke's West Campus.

Appendix I: Courses of Interest to Biochemistry Graduate Students

A full list of courses offered by Basic Science Departments can be found on the School of Medicine Office of Biomedical Graduate Education [website](#).

Biochemistry Dept Courses, Fall Semester

Refer to [Duke Hub](#) for days/times/locations

BIOCHEM 593-01 – Independent Study (2 units) Graded

Individual research by graduate students in a field of special interest under the supervision of a faculty member. The student will demonstrate data collection, critical analytical skills and interpretation of results of research on a faculty mentor-approved topic.

BIOCHEM 658 – Structural Biochem I (2 units) Graded – first-half semester

Structure of Macromolecules – Principles of modern structural biology. Protein-nucleic acid recognition, enzymatic reactions, viruses, immunoglobulins, signal transduction, and structure-based drug design described in terms of the atomic properties of biological macromolecules. Discussion of methods of structure determination with particular emphasis on macromolecular X-ray crystallography NMR methods, homology modeling, and bioinformatics. Students use molecular graphics tutorials and Internet databases to view and analyze structures.

BIOCHEM 659 – Structural Biochem II (2 units) Graded – second-half semester

Molecular Biology I – Continuation of BCH 658. Structure/function analysis of proteins as enzymes, kinetics of binding, catalysis and allostery, protein folding, stability and design protein-protein interactions. This is an introductory course to learn how to use quantitative methods to understand biological structure and function.

BIOCHEM 681 – Biophysical Methods (3 units) Graded

A structure-based introduction to the role of thermodynamic driving forces in biology. An overview of experimental sources of structural and dynamic data, and a review of the fundamental concepts of thermodynamics. Both concepts are combined to achieve a structural and quantitative mechanistic understanding of allosteric regulation, and of coupled ligand binding and conformational change. Statistical thermodynamics is used to develop ensemble models of protein and nucleic acid dynamics. This treatment leads into specific examples and general principles of how to interpret structural and dynamic information toward the purposes of other research.

BIOCHEM 562 – Advanced Topics in Biochemistry–High Resolution CRYO-EM Image

Analysis (3 units) Graded

This Advanced Topics course will focus on the image analysis aspects of cryo-electron microscopy (EM), including image enhancement, reconstruction, classification and movie processing used to determine the high-resolution structure of proteins from cryo-EM images. The course will provide an overview of the

cryo-EM structure determination pipeline, focusing primarily on the data analysis aspects of the technique and covering the full breadth of reconstruction strategies. Prerequisites: Students should have a background in either protein structure/molecular biology or computer vision/image processing.

BIOCHEM 745S – Biochemistry Seminar (1 unit) Graded

Required of all G1, G2 & G3 Biochemistry graduate students. The primary goal of this course is for students to learn how to orally present the background, data, conclusions and future prospects of their research clearly and concisely. G1 students present rotation projects. G2 and G3 students present their research annually (in the fall or spring term), with students providing peer evaluations of each presenter.

BIOCHEM 790S – Seminar (Topics) (2 units) Graded

This is a 2-credit discussion-based course covering selected topics in Biochemistry. Topics and instructors announced each semester.

BIOLOGY 701 – Graduate School 101–Succeeding in Graduate School in the Biological Sciences (0.5 units) CR/NC

Weekly lecture and Q&A on choosing a thesis advisor, the grant proposal and scientific manuscript peer review processes, and other topics related to succeeding in graduate school.

Fall Courses Offered by Other Departments in the Biomedical Sciences

***Please Note:** Biochemistry G1 students typically do not have time to take additional courses beyond the recommended Biochemistry courses in the Fall semester. After their first year, students interested in broadening their foundations in Biological Sciences may consider enrolling in the following courses during the Fall term G2 or G3.*

CMB 710 - Cell & Molecular Biology (1 unit/module)

This modular course offers 27 topic areas covering a wealth of cell and molecular biology in a flexible modular format. Each 2-week module topics emphasize either in-depth critical discussion of the primary literature, an emphasis on developing quantitative/mathematical approaches to the biology, or both. Each module is registered for and graded independently, and students can take any number of modules during the semester.

UPGEN 778 (MGM/CMB 778) – Genetic Solutions to Biological Problems (1 unit/module)

This course offers 2-week modules in 24 focus areas covering a wealth of genetics and genomics areas, including, Quantitative Genetics and Genomics, Model Organism Genetics and Genomics, and Topics in Genetics and Genomics. Each module is registered for and graded independently, and students can take any number of modules during the semester

BIOLOGY 723 – Statistical Computing for Biologists (3 units)

Statistical computing for the biological sciences with an emphasis on common multivariate statistical methods and techniques for exploratory data analysis. The goal of the course is to help graduate students in the biological sciences develop practical insights into methods they are likely to encounter in their research. Provides introductions to "R" statistical computing environment and Python programming language.

CELLBIO 710 – Papers and Grant Writing Workshop [Scientific Writing] (3 units)

Introduction to grant and fellowship writing; writing assignment of two proposal topics; evaluation and critique of proposal by fellow students.

CBB 520 – Genome Tools and Technologies (3 units)

The course introduces the laboratory and computational methodologies for genetic and protein sequencing, mapping and expression measurement. Prerequisites: Students are expected to have some background course work in genetics, molecular biology, biochemistry, and a modern programming language.

CBB 574 – Modeling and Engineering Gene Circuits (3 units)

This course discusses modeling and engineering gene circuits, such as prokaryotic gene expression, cell signaling dynamics, cell-cell communication, pattern formation, stochastic dynamics in cellular networks and its control by feedback or feedforward regulation, and cellular information processing. The theme is the application of modeling to explore "design principles" of cellular networks, and strategies to engineer such networks. Students need to define an appropriate modeling project. At the end of the course, they're required to write up their results and interpretation in a research-paper style report and give an oral presentation. Prerequisites: Biomedical Engineering 260L or consent of instructor.

CMB 797 – Modern Techniques in Molecular Biology (2 units) – first-half semester

This course introduces the fundamental laboratory techniques used in basic research. It is divided into two sections. One section covers techniques used for protein purification, analysis, and the study of protein-protein interactions. The second covers nucleic acid-based techniques, including a review of basic nucleic acid chemistry, enzymatic modification, qualitative and quantitative PCR, nucleic acid sequencing, cloning strategies, vectors, and measurement of transcript expression including microarray techniques. This course is built around a team-based learning model. Course reading material and recorded lectures are provided to students to review before class and class time is spent reinforcing the material through problem sets and group discussion.

MGM 720 – Computational Tools in Next Generation Genomic Analysis (3 units)

This one semester course is an intensive in computer skills necessary to carry out analysis of next generation genomic data. The philosophy for this course is that we are training PhD students, and they should have a fairly in-depth understanding of how this analysis is carried out. This course offers that understanding. The course will involve only a small amount of lecture and be primarily a hands-on laboratory with extensive discussion. Permission number from Instructor required for registration. Class size is limited to 6 students.

MOLCAN 818/PHARM 818 – Molecular Mechanisms of Oncogenesis (2 units)

This course is a lecture presentation and discussion on the molecular mechanisms underlying cancer development in which students complete periodic tests, present a paper, and work in a group to write and defend a grant proposal. The objective of the course is to provide an opportunity for in-depth discussions of molecular mechanisms underlying the development of human cancers. The course is intended for second-year students who have already taken the course of Cell Signaling. Instructor consent required.

PHARM 835 – Innovations in Drug Development (1 unit)

Introduction to major issues in developing a drug to treat a disease in an interdisciplinary lecture-based and team-based learning environment. Translation of principles in biomedical sciences, biomedical engineering, and chemistry along with innovative approaches to develop a hypothetical drug for treating a disease of choice. Hypothetical development of model compounds, target analysis, and in vitro and in vivo models to test drug efficacy. The 1st half of the course will include lecture/discussion from experts (including faculty from Duke departments, and others from industry) on topics relevant to drug development—from target identification to market. The 2nd half of the course will be a team-based learning approach as students "develop their drug" and share their discovery with the other teams. Course requires one of the following (or equivalent): Pharm 533, Chem 518, or BME 577. This course is for G2+ students.

SBB 682T – Advanced Physical Biochemistry (3 units)

Transient kinetics, computational methods, multidimensional NMR, x-ray crystallography, and thermodynamics of association. Prerequisite: Structural Biology and Biophysics or consent of instructor.

Statistics Course Designed for Advanced Graduate Students (G3+) in Biological Sciences

Please Note: This course usually has a waiting list, so interested students must contact Dr. Slotkin and plan ahead.

PHARM 733-01 (733-02, 733-03) – Experimental Design and Biostatistics (2 units)

Experimental Design and Biostatistics for Basic Biomedical Scientists: The use and importance of statistical methods in laboratory science, with an emphasis on the nuts and bolts of experimental design, hypothesis testing, and statistical inference. Central tendency and dispersion, Gaussian and non-Gaussian distributions, parametric and nonparametric tests, uni- and multivariate designs, ANOVA and regression procedures. Ethical issues in data handling and presentation. Student presentations in addition to formal lectures. Intended for third-year graduate students. Instructor consent required. (*Sections 733-01, 733-02 & 733-03 run concurrently*)

Biochemistry Dept Courses, Spring Semester

BIOCHEM 593-01 – Independent Study (2 units) Graded

Individual research by graduate students in a field of special interest under the supervision of a faculty member. At the conclusion of rotation research projects, the student will present an oral report containing analysis and interpretation of a faculty mentor-approved topic. If in a thesis lab, the student will prepare ongoing oral and written analyses of the proposed project and accumulated results and interpretations.

BIOCHEM 746S – Biochemistry Seminar (1 unit) Graded

Required of all G1, G2 & G3 biochemistry graduate students. The primary goal of this course is for students to learn how to orally present the background, data, conclusions and future prospects of their research clearly and concisely. G1 students present rotation projects. G2 and G3 students present their research annually (in the fall or spring term), with students providing peer evaluations of each presenter.

BIOCHEM 622 – Structure of Biological Macromolecules (3 units) Graded

How to get the most out of experimental and computational 3D structure: a) 3D Molecular Literacy: Computer and physical molecular models of proteins and nucleic acids; worksheets and hands-on exploration. b) Data bases and the data itself: gaining familiarity with the PDB (Protein Data Bank) in general, the EDS (Electron Density Server), and the peculiarities, caveats, and reliabilities of different categories of molecular data. c) Computational methods for studying and depicting macromolecules: Model building in structural biology, Molprobit and all-atom contact analysis, and methodologies for multiple conformations, ensembles, and mobility. d) Student Projects: interactive 3D illustration of some scientific point about macromolecules, using kinemages or other molecular graphics programs often with short non-interactive introduction. Reports are given at end of the semester, progress shown periodically. Once a week in-class presentations, discussion, and hands-on work with physical and computer molecular models. Homework includes worksheets and individual student projects.

BIOCHEM 631 – Membrane Biology (CMB631, NEURO631, PHARM631) Contemporary topics in Membrane Biology (2 units) Graded

This course will highlight modern topics regarding biological membranes and membrane proteins that are important for human physiology and disease. Topics include structure and dynamics of biological membranes, structure and function of membrane proteins that play critical roles in cell signaling, diseases related to dysfunction of membrane and membrane proteins, and current efforts on drug discovery. Major techniques used in membrane research will also be covered. The format will be a combination of lectures

and discussion of primary literature. Students will be evaluated based on their class participation and performance at the final presentations.

BIOCHEM 667 – Biochemical Genetics I (2 units) Graded

Topics include DNA and Genome Stability – Chromatin and chromosome structure, replication, repair, genetic recombination, mutation and chromosome rearrangement. The major emphasis will be on reading and discussing primary research papers in depth. The idea is to explore how new concepts have been developed in nucleic acids biology and biochemistry and what types of experiments have made advance possible. Each section of the course will consist of background lecture material presented as needed by the faculty member. Additionally, paradigm papers selected by the faculty will be presented by students orally using figures from the papers along with explanatory background. Students will be asked to prepare an 8-10-page research paper or an oral talk to demonstrate proficiency in the topics.

BIOCHEM 668 – RNA Biology (3 units) Graded

The major emphasis will be on reading and discussing primary research papers in depth. The course will explore new concepts in mechanisms of transcription, splicing, catalytic RNA, RNA modification, RNA editing, mRNA stability & translation. Each section of the course will consist of background lecture material and discussion of selected paradigm papers. Students will be asked to prepare presentations and discussions to demonstrate proficiency in the topics.

BIOCHEM 695 – Understanding NMR Spectroscopy (4 units) Graded (Even years)*

Course aimed at graduate students who have some familiarity with high-resolution NMR who wish to deepen their understanding of how NMR experiments actually 'work'. Introduces quantum mechanical tools needed to understand pulse sequences, with emphasis on obtaining good understanding of how experiments actually work. Course also covers advanced biomolecular NMR experiments that enable structural and dynamic characterization of biomolecules. For roughly half of course, students will be expected to follow online lectures that accompany course textbook, with class meetings emphasizing concepts, group discussion, and problem solving. Instructor consent required.

BIOCHEM 696 – Macromolecular Crystallography (4 units) Graded (Odd years)*

Theoretical and practical principles of macromolecular X-ray crystallography. Topics covered include crystal symmetry, space group theory and determination, diffraction theory, a practical understanding of crystallization, X-ray intensity data collection and data processing, phase determination, refinement and model validation. Consent required - contact course director for permission number.

* **Note:** *BIOCHEM 695 and 696 will be offered in Spring semester, alternating years*

BIOCHEM 536 (CHEM 536) – Bioorganic Chemistry (4 Units) Graded

Basic enzymology, mechanisms of enzymatic reactions, cofactors, oxidoreductases, C1 chemistry, carbon-carbon bond formation, carboxylation/decarboxylation, heme, pyridoxal enzymes, thiamine enzymes.

Spring Courses Offered by Other Departments in the Biomedical Sciences

SBB 546S – Structural Biology and Biophysics Seminar (1 unit) Graded

Each week a student presents a paper on their research. Attendance is open to all graduate students, faculty and postdoctoral students who have an interest in structural biology. Required of all SBB certificate students.

CBB 511 – Journal Club/Research in Progress (1 Unit)

A weekly series of discussions led by students that focus on current topics in computational biology. Topics of discussion may come from recent or seminar publications in computational biology or from research interests currently being pursued by students. First and second year CBB doctoral and certificate students are strongly encouraged to attend as well as any student interested in learning more about the new field of computational biology.

CBB 540 (STA 613) – Statistical Methods for Computational Biology (3 Units) Graded

Methods of statistical inference and stochastic modeling with application to functional genomics and computational molecular biology. Topics include: statistical theory underlying sequence analysis and database searching; Markov models; elements of Bayesian and likelihood inference; multivariate high-dimensional regression models, applied linear regression analysis; discrete data models; multivariate data decomposition methods (PCA, clustering, multi-dimensional scaling); software tools for statistical computing. Prerequisites: multivariate calculus, linear algebra and Statistics 611.

CBB 561 (COMPSCI 561) – Computational Sequence Biology (3 Units) Graded

Introduction to algorithmic and computational issues in analysis of biological sequences: DNA, RNA, and protein. Emphasizes probabilistic approaches and machine learning methods, e.g., Hidden Markov models. Explores applications in genome sequence assembly, protein and DNA homology detection, gene and promoter finding, motif identification, models of regulatory regions, comparative genomics and phylogenetics, RNA structure prediction, post-transcriptional regulation. Prerequisites: basic knowledge algorithmic design (Computer Science 532 or equivalent), probability and statistics (Statistical Science 611 or equivalent), molecular biology (Biology 118 or equivalent). Alternatively, consent instructor.

CELLBIO 730 - Stem Cell Biology (3 Units) Graded

The course is designed for first-year graduate students to learn the fundamentals of stem cell biology and to gain familiarity with current research in the field. The course will be presented in a lecture and discussion format based on the primary literature. Topics include: stem cell concepts, methodologies for stem cell research, embryonic stem cells, adult stem cells, cloning and stem cell reprogramming and clinical applications of stem cell research.

CMB 640 (UPGEN 640) – Quantitative Approaches to Biological Problems: From Cartoon Models to System Behavior (3 Units) Graded

This class is aimed at biologists who want to gain an appreciation of how mathematical approaches can supplement experimental approaches. We will teach you how to convert cartoon diagrams to differential equations, and re-familiarize you with some basic concepts from math and physics that help us develop a better intuition of how the world works. Then we will discuss how quantitative approaches can yield insights into how control systems behave. The class will use calculus at an elementary level and an occasional computer simulation, but we will focus more on concepts and applications.

IMM 800 – Comprehensive Immunology (3 Units) Graded

An intensive course in the biology of the immune system and the structure and function of its major components. In sectioned lectures, we will have leading experts to discuss with you, in depth, the major challenges, major discoveries, as well as major confusions in listed areas of immunology. Specifically, we will focus on the evolution of our understandings: what was the original question, how it was approached and what is still missing to complete the picture. These lectures were largely split into three sections: T cell biology, B cell biology, and immune regulation. There will be three individual take-home exams and your final grade will be compiled with results from all three exams. This is a required course for students specializing in immunology. Consent of instructor required for registration.

MGM 552 – Virology (3 Units) Graded

MGM 582 – Microbial Pathogenesis (3 Units) Graded

Modern molecular genetic approaches to understanding the pathogenic bacteria and fungi. Underlying mechanisms of pathogenesis and host-parasite relationships that contribute to the infectious disease process.

MGM 732 (UPGEN 732) – Human Genetics (3 Units) Graded

Topics include genetic mechanisms of disease (rare and common genetic risk variants, multi-factorial inheritance, epigenetics, cytogenetics), as well as disease-specific examples including neurogenetics, cancer genetics, pharmacogenetics, complex diseases and gene therapy. Lectures plus weekly discussion of assigned papers from the research literature. Prerequisites; UPG 778 or equivalent, and graduate status or consent of instructor.

PATHOL 785 – Molecular Aspects of Disease (3 Units) Graded

This course is based upon the study of the background, investigative method and recent advances in understanding the molecular basis of selected diseases, with an in-depth focus on a small number of diseases where defects are known at genetic or molecular levels.

PATH 786 – Translational Aspects of Pathobiology (3 Units) Graded

Translational Research in Pathobiology is an integrated multidisciplinary course designed to provide students with the necessary tools to understand the principal components of the research processes involving patients or materials obtained from a human source. This course reflects the Department of Pathology's unique Integration of traditional pathology research with experimental therapeutics in an environment that seeks to bridge the basic sciences and clinical medicine.

PHARM 755 – Neurotoxicology (3 units) Graded

Adverse effects of drugs and toxicants on the central and peripheral nervous system; target sites and pathophysiological aspects of neurotoxicity; factors affecting neurotoxicity, screening and assessment of neurotoxicity in humans; experimental methodology for detection and screening of chemicals for neurotoxicity.

SBB 682T – Advanced Physical Biochemistry (3 units) Graded

Transient kinetics, computational methods, multidimensional NMR, x-ray crystallography, and thermodynamics of association. Prerequisite: Structural Biology and Biophysics or consent of instructor. Tutorial – contact Course Director.

Appendix II: Duke Graduate School Student Resources

The Graduate School

[Website](#)

The overall mission of the Graduate School is to provide research-based training that will help you learn the analytical skills to become future leaders in a wide variety of professions. Although many of our graduates enter academia, the education you will obtain is intended to be applicable to any job that involves the discovery, creative application, and teaching of new knowledge. The Graduate School exists in large measure to support the research and educational missions of faculty interested in the frontiers of knowledge, and, in so doing, to advocate for the primacy of scholarship throughout the University.

Office of the Dean

- Serves as the senior administrator in The Graduate School
- Is responsible for all policies and procedures in the graduate programs

Dr. Paula D. McClain

Dean of the Graduate School & Vice Provost

Senior administrator in the Graduate School. Responsible for all policies and procedures in the Graduate Programs.

Tel: (919) 681-1560

Read The [Dean's Message](#) and see the Graduate School [Organizational Chart](#)

Graduate Student Affairs (GSA)

[Website](#)

The GSA Collaborates with graduate departments, student organizations, and other administrative units to provide services that enhance the academic, social, personal, and cultural needs of graduate students. They also provide support services that address the specific needs of a diverse student body. Email the [GSA](#).

Office of Academic Affairs

[Website](#)

The Office of Academic Affairs is responsible for academic and program administration, including:

- Defining and interpreting all Graduate School academic policies, procedures, and regulations, particularly time limitations, forming examination/advisory committees, and disciplinary matters
- Establishing criteria for new academic degrees or certificate programs with the Executive Committee of the Graduate Faculty (ECGF)
- Coordinating internal and external program reviews to ensure academic quality and maintain accreditation
- Providing training in Responsible Conduct of Research (RCR) for all doctoral students
- Offering courses, workshops, and programs in Teaching and Technology in collaborations

- with the Center for Instructional Technology
- Managing the English for International Students (EIS) program
 - Providing general academic advising for students seeking help outside their degree program
 - Participating in national initiatives and/or research projects to identify 'best practices' in graduate education.

More Information

[Graduate School Student Handbook](#)

[Graduate School Academic Policies and Forms](#)

[Childcare Subsidies](#)

Dr. John Klingensmith

Associate Dean for Academic Affairs

Dr. Klingensmith is responsible for administration of the academic regulations of the Graduate School, particularly those involving time limitations, forming examination/advisory committees, and all disciplinary matters. He also serves as general academic advisor for students outside their own graduate degree programs.

[Email](#) and Tel: (919) 681-1559

Offices of Finance & Administration

[Website](#)

The **Office of Finance & Administration** is responsible for all aspects of Graduate School financial management, admissions, student record keeping, degree requirement auditing, and other administrative functions such as human resource management, payroll, and facilities management.

Shanna Fitzpatrick

Associate Dean for Finance and Administration

[Email](#) and Tel: (919) 681-3249

The Office of Budgets & Finance

[Website](#)

Oversees the payments of all institutional fellowship awards and payments from federal financial aid programs and national fellowships. They also help students obtain their education with little financial stress while adhering to the guidelines and policies set forth by the University, government agencies, and funding institutions. The office has an open-door policy and places a high value on customer service.

Iryna Merenbloom

Assistant Dean, Budgets and Finance

[Email](#) and Tel: (919) 684-1555

Caroline Morris

Fellowship Coordinator

[Email](#) and Tel: (919) 681-4665

Office of Admissions

[Website](#)

The Graduate School Office of Admissions develops the graduate school policies and procedures. The office also communicates with applicants regarding requirements, application

status, and final admissions decisions and handles issues related to the preparation of visa documents for incoming international students.

Office of Admissions [Contact Form](#)

Nancy Wines

Program Coordinator

[Email](#) and Tel: (919) 668-0424

- Develops, edits, and manages admissions communications
- Communicates final admissions decisions to applicants
- Responds to prospect, applicant, and admitted student inquiries
- Matriculates admitted students

Tyler Read

Communications Specialist

[Email](#) and Tel: (919) 684-5737

- Develops, edits, and manages admissions communications
- Communicates final admissions decisions to applicants
- Responds to prospect, applicant, and admitted student inquiries
- Matriculates admitted students

Office of the University Registrar

[Website](#)

The Duke University Office of the University Registrar supports the overall educational goals of the university and facilitates the educational process by providing:

- A welcoming and encouraging service environment, in person and via other modes of contact
- Accurate and timely processing of data related to course offerings, registration, and academic records
- Support and advice regarding academic policies and procedures
- Data to a variety of constituents, in support of the academic decision-making process
- Security and privacy for the university's academic records, including advice and training for faculty and staff on privacy issues
- Leadership in the areas of technological development as related to student administrative services and systems

[Email](#) and Tel: (919) 684-2813

Bursar's Office

[Website](#)

The Bursar's Office assists students with their bursar accounts and functions as a depository for the University's departments. The office mails statements to students, manages the collection of the student receivables, and records departmental deposits.

[Email](#) and Tel (919) 684-3531

Appendix III: Certificate in College Teaching

Certificate in College Teaching (CCT)

[Website](#)

This university-wide teaching certificate program is for enrolled PhD students in any department or program of study and makes use of departmental training and resources as well as Graduate School programming. The officially endorsed, Duke University Graduate School Certificate will appear on the transcript of PhD students who complete its requirements. It is offered in order to recognize and validate professional development activities undertaken by PhD students and add competitiveness and value to Duke PhDs. The program requirements take about a year to complete, but may vary as opportunities for gaining teaching experience vary across departments. CCT work may be done alongside other classes, research, or work on a dissertation, and should not significantly interfere with their timely completion. After applying to the CCT program, the program director will meet with the student to go over the requirements and completion timeline.

Coursework

[Website](#)

Participants must successfully complete two courses in college teaching, which includes any combination of Graduate School and/or discipline specific pedagogy courses offered by a Department or Program. You can complete the coursework requirement at any time, either before or after enrolling as a CCT participant. Ideally, you would take the courses immediately before or in conjunction with your teaching experience.

1. Teaching Experience & Observation

[Website](#)

Participants should have at least one semester in a formal teaching role that takes place **after** enrolling in the CCT program (i.e., previous teaching experience is not applicable.)

A formal instructional role can include the following:

- Being the instructor of record of a class
- Being an officially designated TA who leads a discussion, lab or recitation section that meets regularly (at least four times) throughout the semester with you as the primary leader/facilitator of those meetings
- Being a guest lecturer on at least four separate sessions, each at least an hour long, in the same term or semester and working with that course's instructor of record
- Other types of teaching experience approved by the CCT program director before the term in which it occurs.

The following are *not* considered formal instructional roles:

- Being a guest lecturer in a class where the instructional contact is less than four contact hours spread out through the term (e.g., two guest lectures in the week a lecturing professor is at a conference would not qualify)
- TAs limited to grading, office hours, or administrative tasks

2. Online Teaching Portfolio

Website

Your portfolio should be appropriate for use in a job search and can be completed after the other CCT requirements so you have enough material to create it (with, e.g. Word Press, Dreamweaver, Google Sites, etc.). You may also include a current CV, a teaching statement, and other materials as appropriate to the student's discipline. A number of Duke PhD student portfolios can be found on the [GS 760 website](#).

Appendix IV: Individual Development Plan (IDP)

We encourage all students to complete an IDP as soon as possible in their graduate career. We suggest that students with their mentor use the AAAS online [tool](#) as a communication tool and springboard to assess areas of interest and develop an initial plan. The plan is expected to change over time.

Students draft a plan or an outline of a plan and select and contact a Career Planning Faculty Mentor. The Career Mentor should be familiar with their skills, personality, and interests (i.e., their Thesis Advisor or Committee member). **Each year the student can meet and consult with their Career Mentor, either individually or at their annual IDP meeting with their committee.** The contents of these meetings may be held confidentially at the request of the student. In many cases, students find it beneficial to discuss their IDP (or elements of it) at their Annual Committee meeting.

The IDP maps out your general path and helps match skills and strengths to your career choices. It is a living document, since needs and goals will almost certainly evolve. The aim is to build upon current strengths and skills by identifying areas for development and providing a way to address these. **The IDP objectives encourage students to:**

1. Reflect on their training and career goal
2. Self-assess their skills and competencies
3. Discuss their goals and competencies with their mentor
4. Develop short- and long-term training goals

Rubric Questions

What are your career goals?

What are your strengths and weaknesses?

- *Ability to design and plan experiments to address questions and test models*
- *Technical/bench skills*
- *Ability to analyze data and interpret results*
- *Ability to work independently*
- *Ability to complete projects*
- *Command of the literature in your field*
- *Creativity and vision*
- *Writing skills*
- *Oral communication skills*
- *Personnel management skills*
- *Teaching skills*

How can you hone your skills for you career option(s)?

What are your 1-month goals, 6-month goals, and 1-year goals, in terms of experiments, learning analysis strategies, writing papers, writing grants, attending meetings, teaching, mentoring undergraduates, etc.?

Step 1. Conduct a Self-Assessment

Assess your skills, strengths, and areas that need development. (See *Assessment Tools*)

- Realistically look at your current abilities and weaknesses. Ask your peers, mentors, family and friends what they see as your strengths and weaknesses.
- Outline your long-term career objectives. (For useful information see *Resources: Career Opportunities at the end of this document*)

Ask yourself:

- What type of work would I like to be doing?*
- Where would I like to be in an institution or organization?*
- What is important to me in a career?*

Step 2. Survey Opportunities with Mentor

- Identify career opportunities and select those that interest you.
- Identify developmental needs: compare current skills and strengths with those needed for your career choice.
- Prioritize developmental areas and discuss how to address with your mentor

Step 3. Implement Your Plan

- The plan is the beginning of the career development process and serves as a road map.
- Put your plan into action
- Revise and modify the plan as necessary. The plan is not cast in concrete; it will need to be modified as circumstances and goals change. The challenge of implementation is to remain flexible and open to change
- Review the plan with your mentor regularly. Revise the plan on the basis of these discussions

Additional sites with IDP information for students:

[NIH Individual Development Plans](#)

[AAAS IDP Tool](#)