

Cell and Molecular Basis of Disease (CMBD) Training Program

Trainee Handbook

2022-2023



Image credit: Gloria Alvarado

CMBD Program Goals and Benefits to Trainees

The mission of the Cellular and Molecular Basis of Disease (CMBD) Training Program is to prepare pre-doctoral students in the early stages of their scientific careers to conduct multidisciplinary research that is ethically responsible, rigorous, and reproducible. It does so by facilitating the development of not only those skill sets needed to advance science in general, but also those that require expertise in cutting-edge technologies, as well as deep analytical and quantitative reasoning skills.

CMBD's trainee learning objectives are organized into three interrelated areas:

- **Foundational Biomedical Training and Education**
 - develop a broad understanding of the disparate disciplines required for biomedical research
 - develop a strong quantitative foundation for modeling and analyzing data (analytical skills)
 - develop expertise in the practical application of contemporary methods (technical skills)
- **Communication and Collaboration in Research**
 - expand oral and written communication skills
 - cultivate skills in teamwork and collaboration
 - grow abilities in leadership and management
- **Career Exploration and Development**
 - explore diverse biomedical careers and reflect on career goals and interests
 - build essential interpersonal and networking skills

The overarching goal of the program is to set students on a trajectory towards independence in thought and action, developing skills that are compatible with a broad spectrum of intellectually intensive careers in academia, industry, and beyond.

Advice and Guidance from the CMBD Leadership

The Director, Co-director, and Steering Committee members have an open-door policy for trainees, both current and former, to drop by and share any thoughts or concerns related to their training and journey through graduate school. Trainees should not hesitate to reach out and/or drop by.

CMBD Leadership and Contacts

Director: Rich Carthew (Molecular Biosciences, IBiS); r-carthew@northwestern.edu

Co-Director: Greg Smith (Microbiology-Immunology, DGP); g-smith3@northwestern.edu

Steering Committee:

Shelby Blythe (Molecular Biosciences, IBiS); shelby.blythe@northwestern.edu

Dan Foltz (Biochemistry and Molecular Genetics, DGP); dfoltz@northwestern.edu

Eva Gottwein (Microbiology-Immunology, DGP); e-gottwein@northwestern.edu

Laura Lackner (Molecular Biosciences, IBiS); laura.lackner@northwestern.edu

Keara Lane (Molecular Biosciences, IBiS); keara.lane@northwestern.edu

Brian Mitchell (Cell and Developmental Biology, DGP); brian-mitchell@northwestern.edu

Clara Peek (Biochemistry and Molecular Genetics, DGP); c-peek@northwestern.edu
Alec Wang (Molecular Biosciences, IBiS); awang@northwestern.edu

CMBD Administrator:

Abbi Witherspoon (Molecular Biosciences); abbi.witherspoon@northwestern.edu

External Advisory Committee:

David Kovar (The University of Chicago)
Ilaria Rebay (The University of Chicago)

Graduate Program Interface:

Catherine Prullage (IBiS); c-prullage@northwestern.edu
Pamela Carpentier (DGP); pamela.carpentier@northwestern.edu

Finance:

Ginger Gilmore (Life Science Financial Services); g-gilmore@northwestern.edu

Preceptors:

A list of current preceptors can be found [here](#).

Trainee Expectations

- Attend the CMBD Retreat in September
- Attend monthly Research in Progress (RIP) meetings and present a RIP talk once a year
- Attend and actively participate in all other CMBD sponsored events, which include the symposium, workshops, trainee-sponsored seminars, and career and alumni events
- Engage with fellow Trainees and Steering Committee Members at CMBD events
- Participate in at least one of the CMBD Trainee Committees
- Complete the CMBD course requirements
- Complete an annual IDP
- Keep CMBD up to date on any career and service/outreach activities as well as publications, honors, and awards

CMBD Trainee Committees

Purpose:

- Trainee committees provide opportunities for trainees to have substantial contributions to CMBD activities and directions.
- Trainee committees are a leadership opportunity. They allow trainees to champion a cause, innovation, or activity related to biomedical research and/or practice.

Current Committees:

- Social and Retreat Committee
- Symposium Committee
- Alumni and Networking Committee

- Workshop Committee

Trainee Requirements for Committee Service:

- All trainees are required to sign up for at least one committee during the CMBD Retreat in the fall.
- Each committee should be composed of at least 4 trainees.

CMBD Communication

Slack:

- The CMBD Slack Channel will be used for all internal communications.
- Trainees will be invited to join cmbdgroup.slack.com.
- The slack channel will be used for quick communications and organization between all current members (trainees, leadership, and administration) of CMBD.

Google Calendar:

- A Google calendar will be used to keep track of Research in Progress (RIP) meetings and all other CMBD events.
- Trainees will be invited to join the shared calendar by email.

RIP Meeting Agenda Google Doc:

- A google document will be used to collectively compose and annotate agendas for the RIP meetings.
- Trainees will be invited to join the google doc by email.

CMBD Activities

Research in Progress (RIP) Meetings

Participation:

- All CMBD trainees are required to attend RIP Meetings with the Program Director and the other 9 faculty in the Steering Committee.
- The trainees' thesis advisors are required to attend the meetings in which their own student presents their research.

Logistics:

- RIP meetings take place on the 3rd Thursday of each month over the nine months of the academic year. Meetings alternate between the Evanston and Chicago campuses.
- The meetings start at 5 PM when held in Evanston and 5:15 PM when held in Chicago.
- Two trainees present at each meeting so that each trainee has two opportunities to present their research during their 2-year traineeship.
- Dinner is provided. Two trainees (different from those assigned to present but who work on the campus where that meeting is being held) are assigned to work with the CMBD Administrator and place the food order as follows:
 - The assigned trainees must let the CMBD Administrator know what and where to order no later than 3 PM on the Monday of the week that the RIP meeting is scheduled.

- The CMBD Administrator will place and pay for the order. The assigned trainees must pick up the order or accept delivery on the day of the RIP meeting and lay it out in the meeting room.
- The following format will be used for meetings:
 - Discussion of program business - if you have something you would like discussed at the meeting, please post it on the RIP Meeting Agenda google doc prior to the meeting
 - Trainee Presentation 1
 - Trainee Presentation 2

Presentation Format:

- All presentations are chalk-talk in format; no slides are allowed. Each speaker will be given a total of 45 min. Please plan for a roughly 30 min presentation to allow ample time for questions and discussion. (*Note - if meetings need to be switched to a virtual format, modifications to the presentation format will be discussed.*)
- The presentation should include background, results, conclusions, future directions, and a discussion of rigor and reproducibility (more info below).
 - For trainees that are just starting their project, the talk can be focused on what you are planning to do with your project going forward.
 - Given the wide range of researchers that participate in the CMBD training program, it is essential that talks are made as accessible as possible. This means providing background, defining key terms and techniques, avoiding jargon as much as possible, and focusing on the critical aspects of your research without going into all the nitty gritty details - explain why this research is interesting, compelling, and important.
- Include a discussion of issues related to rigor & reproducibility (R&R) in your project. Examples may include:
 - Practices that you and your laboratory use to ensure R&R
 - Challenges that you have encountered related to R&R
 - Challenges that your field faces related to R&R
- Asking the group for advice on any aspect of your research is strongly encouraged!

Questions and Feedback:

- Asking questions, for reasons of inquiry as well as clarification, throughout the presentation is strongly encouraged!
- Formal feedback will be provided by steering committee members and a few trainees. A rubric will be used to provide each trainee with constructive, standardized, written feedback. The feedback will be sent to the presenting trainee and their mentor, who will review together the written feedback and discuss how to improve both the scientific approaches to the trainee's research and their presentation skills.

Symposium

- A day-long symposium is held each year, typically in the spring, and is organized and led by members of the Trainee Symposium Committee.
- Each symposium is centered around a theme or discipline, and the choice of each year's symposium theme is collectively made by all of the trainees. First, ideas for themes are nominated by trainees; then a vote is held to select the theme.

- Each symposium features keynote presentations by highly distinguished scholars in the field as well as podium and poster presentations by current trainees, former trainees, and others in CMBD preceptor labs.
- The symposium is advertised to the general Northwestern University community, and symposium attendance is open to all.
- A member of the Steering Committee will work closely with the Symposium Committee to aid with programmatic issues and other logistics.
- CMBD administrative staff arrange travel, lodging, booking seminar and conference rooms, and advertising, in close consultation with the Symposium Committee.
- Previous symposium schedules are available for reference.

Retreat

- Each September, the Trainees, Steering Committee, and External Advisory Committee convene for a 1.5 day retreat at the Q Conference Center in St Charles, Illinois.
- The Retreat is organized by the Social and Retreat Organizing Committee with guidance from the Program Director and help with booking logistics from the CMBD Administrator.
- The purpose of the Retreat is several-fold:
 - The retreat allows the newly appointed trainees to become quickly acquainted with second-year trainees and steering committee faculty.
 - The retreat strengthens the social and professional bonds between trainees and faculty.
 - The retreat is an intensive immersion into multidisciplinary research by the program members.
- The retreat program includes the following:
 - A team-building exercise that is overseen by Q Center staff
 - The first two RIP presentations of the academic year are given by two second-year trainees
 - 4-minute "elevator pitch" chalk-talks (plus 1 minute for questions) are presented by all trainees (with exception to those presenting RIP talks) and steering committee faculty
 - Talks are given by one or two outside people (often CMBD alumni), in which they share their experiences in academia, industry, teaching, and other biomedically relevant career paths
 - A town hall forum in which trainees provide constructive criticism, feedback, and suggestions for changes to the program

Workshops

- At least one workshop per year is organized by the Workshop Committee.
- Workshop themes are chosen by the trainees after a number of ideas for workshops are nominated by trainees.
- The goal of the workshops is to improve the technical and professional skills of the CMBD trainees.

Alumni Career Event

- This is an annual event that brings one or two CMBD alumni back to Northwestern for a two-day visit and is organized by the Alumni and Networking Committee.
- Alumni are chosen by CMBD trainees by nomination and voting.

- The visiting alumnus gives career talks on both campuses over a two day period to allow for all CMBD trainees plus other Northwestern students and postdocs to have access to their insights and advice.
- CMBD trainees have dinner, lunch and/or breakfast with the alumni to get additional time for networking interactions.

Trainee-Sponsored Seminars

- CMBD trainees are encouraged to choose, invite, and host prominent seminar speakers in the broad areas of basic biomedical research.
- Trainee-sponsored seminars occur as part of an academic department's seminar series based on which department fits most closely to the speaker's field. If a trainee or group of trainees has a scientist they would like to invite, they should coordinate with the CMBD Director to determine the best way to proceed.
- CMBD administrative staff arrange the travel and lodging for the invited speakers.

Social Events

- In addition to the Retreat, two social events are held each year. The events are tentatively scheduled to follow the December and June RIP meetings.

CMBD Course Requirements

The CMBD Program-specific curriculum will comprise five Core Courses and one Elective Course that are to be completed during the first two years of graduate training.

Core courses

Required:

- Responsible Conduct in Research (IBiS423 or DGP494)
- Rigor and Reproducibility in Research (IBiS421 or DGP484/494/496)

Choose three from:

- Molecular Biology (IBiS402 or DGP410)
- Cell Biology (IBiS406 or DGP405)
- Statistics (IBiS432 or DGP484)
- Genetics (IBiS407 or DGP430)
- Quantitative Biology / Biochemistry (IBiS410 or DGP401)

Elective Courses

Choose one from:

- Protein Structure and Function (BIOSCI361) or Structural Basis of Signal Transduction (DGP466)
- Bioinformatics (BIOSCI323 or DGP486)
- Developmental Biology (IBiS491 or DGP456)
- Systems Biology (IBiS404)
- Synthetic Biology (ChemE376)
- Virology (DGP475)

Trainee Funds

General information about trainee funds

The time frame in which trainees can spend supply and travel funds is complicated by how CMBD is funded by the NIH. There are some behind-the-scenes financial considerations that are handled by the Life Sciences Financial Office, which means that, while everyone gets access to the same amount of funds, there may be differences in when trainees can use the funds. Therefore, while there are general rules that will apply to most of the trainees, a few trainees will have access to the funds at different times.

Supply funds

- First year trainees will have funds that can be used for research expenses (consumable supplies only).
- Most trainees will be notified in early March regarding the funds. It is necessary that all of the funds are spent by the trainees (orders placed and received) no later than the date that will be provided in the notification email. For the few trainees that fall into a different financial timeline, the CMBD Administration will let you know when your funds become available and when they must be spent by.
- Trainees will be notified of the amount they can spend and also be sent an order form that needs to be completed for the order(s) to be placed. Completed order forms (one vendor per form) need to be emailed to ALL of the following people:
 - Ginger Gilmore; g-gilmore@northwestern.edu
 - Alex Villatoro; a-villatoro@northwestern.edu
 - Eric Villamiel; e-villamiel@northwestern.edu
 - Abbi Witherspoon; abbi.witherspoon@northwestern.edu
- **IMPORTANT:** The orders need to be placed and items need to be received by the deadlines provided in the notification email.

Travel funds

- Each trainee can request travel funds up to \$300 for each year they are active on the training grant.
- Travel funds are typically available starting March 1st during the first year of appointment to the training grant. For the few trainees that fall into a different financial timeline, the CMBD Administration will let you know when your funds will become available.

Trainee funds questions

- Please direct any questions regarding use of funds, order placement, etc. to Ginger Gilmore; g-gilmore@northwestern.edu.

Trainee Reappointment

A trainee's initial appointment to the CMBD Program is for one year. Each trainee must apply for re-appointment to a second year. For reappointments, the application package will include:

- A one-page progress report summarizing research accomplishments and plans for the next year
- A list of the core and elective courses taken and passed to fulfill CMBD requirements. If the CMBD course requirements are not yet fulfilled, a statement must be added describing which course(s) will be taken and when in order to fulfill the Program requirements.
- A one-page updated statement of career goals and IDP. A copy of the trainee's personal myIDP form (<https://myidp.sciencecareers.org/>) can be updated from the prior year.
- Letter from the research mentor evaluating the mentee's progress and confirmation that (a) the mentor has reviewed the trainee's progress report, (b) the mentor has met and discussed the mentee's IDP with the trainee and (c) the mentee has passed the qualifying exam (if applicable) and is in good academic standing.
- Documentation provided by the Program Administrator that the trainee has complied with Program attendance and participation as well as helped with Program organization in some capacity.

Funding Acknowledgements

- Trainees must acknowledge CMBD (T32GM008061) for publications on research done while supported by the CMBD.
- The NIH public access policy requires scientists to submit final peer-reviewed journal manuscripts that arise from NIH funds to PubMed Central immediately upon acceptance for publication. Please make sure that all publications that acknowledge the CMBD Training Program are compliant with the NIH public access policy. More information can be found [here](#).

Program Evaluation

To hold the CMBD Training Program accountable for its stated training mission as well as allow for improvements to be made to the Program based on open and honest feedback from the Program's Trainees, Northwestern's Program Evaluation Core will be handling evaluations of the CMBD Training Program. Evaluations will take the form of surveys, questionnaires, focus groups, and climate surveys. Both current and former CMBD Trainees are expected to participate in these evaluations. The feedback provided is critical for the growth, development, and future success of the CMBD Training Program.

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