The Predoctoral Biotechnology Training Program and Cluster is an interdisciplinary and interdepartmental program that provides select students with greater research and training opportunities than those available through the individual departments/units.

The BTP is supported by the National Institutes of Health (NIH/NIGMS) and the Cluster is supported by the Northwestern University Graduate School.

www.biotechtraining.northwestern.edu
btp-info@northwestern.edu
Our goals for today

• Get to know BTP leadership, current trainees, and some past trainees

• Summarize BTP program components, requirements, and expectations of trainees

• Learn about research performed by other trainees, and in other preceptors’ labs
The Northwestern Predoctoral Biotechnology Training Program is an interdisciplinary and interdepartmental program that provides Trainees and Cluster members greater research and training opportunities than those available through the individual departments.

It promotes interdisciplinary education in biotechnology, interactions among faculty and students with interests in biotechnology, and provides a substantial exposure of students to industrial biotechnology research.

Students trained through this program are better prepared to enter the biotechnology industry or pursue careers in academic and governmental biotechnology research.
BTP: Program Goals

- Foster a community of researchers at Northwestern University interested in the development and application of biotechnologies for therapeutic and diagnostic applications in medicine.
- Instill outstanding biotechnology trainees with the fundamentals underlying current and emerging technologies.
- Introduce trainees and the biotechnology community to a range of biomedical problems for which technologies have influenced or could influence the treatment of patients.
- Introduce trainees to leaders in biotechnology within academia and industry to facilitate the development of their personal network, which can be instrumental in launching a successful career.
- Help trainees develop communication, oral presentation, scientific writing, and grant writing skills essential to their success as independent scientists.
- Educate trainees in the ethics of science and responsible conduct of research.
BTP Leadership and Contacts

• **Director** Josh Leonard (ChBE)
• **Co-Director** Heather Pinkett (IBiS, Molecular Biosciences)
• **Program Coordinator** Emily Kocevar
• **Steering Committee:** Guillermo Ameer (BME), Adam Silverman (BTP Trainee-**outgoing**), Jason Brickner (IBiS, Molecular Biosciences), Mike Jewett (ChBE), Derk Joester (MSE), Teri Odom (Chemistry)
• **Preceptors** from the participating graduate programs
• **Trainee committees** (more on this next)
Purpose

- Trainee committees provide opportunities for trainees to have substantial contributions to BTP activities and direction.
- Leadership opportunity: Champion a cause, innovation, or activity related biotechnology research and/or practice

Current Committees

- Social and Retreat Committee
- Alumni, Site Visit & Networking Committee
- Practicum Committee
- Seminar Committee

Will learn more and join a committee later today!
Get Connected

• Slack
  ▪ We have two slack teams that we will use for internal BTP communications
    • btp-nu.slack.com (main BTP team page)
    • btp-alumni.slack.com (for networking with with BTP alumni)
  ▪ Emily will invite you to join both teams; please join and consider downloading the Slack app.
  ▪ Usage: We’ll use slack for quick communication and coordination. Formal requests that require communication will go out by email.
  ▪ The “Resources” channel includes quick-links to many shared resources

• Google Calendar
  ▪ We use the google calendar to announce RIP meetings, seminars, and other internal BTP events.
  ▪ Emily will invite you to join our shared calendar by email
Get Connected

• LinkedIn
  ▪ All trainees are required to join LinkedIn.
  ▪ Please confirm your registration with Emily by sharing your link (e.g., https://www.linkedin.com/in/joshuanleonard/) at which time you will be invited to join our group: “Northwestern University Biotechnology Predoctoral Training Program”

• ORCID iD
  ▪ All trainees are required to register at https://orcid.org/register
  ▪ Please confirm by sending your ORCID iD to Emily by email

• Google Drive
  ▪ We have a shared Google Drive folder accessible to anyone with the link. This folder is for sharing materials between trainees, leadership, and alumni. Resources posted include RIP agendas, running lists of speakers, site visits, rosters, and internships, and these slides!
  ▪ See Slack for the link under #resources
BTP Monthly Activities

- Biotechnology Seminars
- Research in Practice Meetings
- Networking and Social Events
Biotechnology Seminars

- Wednesdays at noon with pizza/sandwiches during Fall/Winter
- Weekly in spring as part of *Advances in Biotechnology* course; monthly the rest of the year (summer, fall, winter) (with coffee hour following the seminars)
- **Industrial speakers** from a wide range of companies, product areas and job functions
- **Academic speakers** from a wide range of research areas
- *Small group of trainees have breakfast and lunch with the speakers*
- Trainee interests drive speaker selection (through Seminar Speaker Committee)
- *Opportunities for trainees to invite and host speakers*
Research in Progress (RIP) meetings

• Practice motivating and presenting your research project to a diverse audience
  ▪ Long-format presentations
  ▪ Elevator pitches / chalk talks
• Get feedback and suggestions from different perspectives, connect to resources on campus
• Learn about many areas of biotechnology research activity on campus
• Rigor & Reproducibility
  ▪ NIH recognizes the need for “rigorously designed published preclinical studies, to ensure that such studies can be reproduced”
    https://www.nih.gov/research-training/rigor-reproducibility
  ▪ May include invited faculty/preceptor talks
  ▪ Trainees are encouraged to integrate into presentations (next slide)
Guidelines for RIP talks

Over the course of this year, you will have the opportunity to give several types of presentations, each of which is designed to develop and practice distinct presentational skills that you will use throughout your career.

Long-format Presentations

- **Send a brief title and abstract to Emily 1 week before your presentation**
- Plan on talking for 25-30 minutes with 5 - 10 minutes for questions
- Please include an overview of your research area and your specific project, talk about results you have obtained, and about future directions of your research
- **It is essential that you make your talk as accessible as possible to the entire audience**, which means providing background, defining key terms and techniques, and avoiding jargon as much as possible. Explain why this research is interesting, compelling, and important.
- If you are just starting your project the talk can be about what you are planning to do with your project going forward. Asking advice from the group is highly encouraged
- Be sure to explain salient 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 advice from the group is highly encouraged!
Guidelines for RIP talks (cont.)

Elevator Pitches / Chalk Talks

• Plan on talking for 5 minutes with 5 minutes for questions. You will be cut off after the five minute mark.

• Just like in the longer presentation, you must explain your research project to your peers, including why this project is interesting, compelling, and important.

• You may include illustrations, drawn “live” within the 5 minute window, on the whiteboard (i.e., a “chalk talk”)

Fall 2019
Regular Networking Opportunities

• Quarterly or monthly BTP Social Events
  ▪ Get to know colleagues in departments across Northwestern
  ▪ Discussions ranging from research and internships to ???
  ▪ Refreshments to enhance the discussion

• Interact with seminar speakers. Some logistics:
  ▪ Hotel, Car Service
  ▪ Meals (Trainee Breakfast & Lunch, Faculty dinner)
  ▪ Speaker meetings
  ▪ Venue
  ▪ Reimbursements
BTP Annual Activities Calendar

• BTP Retreat in August/September
• Biotechnology Practicum in August/September
• IBiS Retreat (optional for Cluster members) in September
• NU Biotechnology Networking Reception (NEW) launched in September 2018, aiming for spring 2020
• Biotechnology Day in winter/spring
• Program evaluation survey and focus group with Searle Center - spring
• BTP-focused IDP discuss with research preceptor first, then have individual meeting with BTP Program Directors (summer 2019). For trainees completing the program, this comprises an exit interview.
• Steering Committee meeting with one elected trainee member
• Biotechnology company site visit
Biotechnology Practicum

• The central objective of the practicum is to provide hands-on training in current and emerging biotechnologies. In particular, this program is designed to empower students to learn about cutting-edge technologies and to catalyze the integration of these methodologies into their own research projects and laboratories. The Practicum is a full day event divided into theoretical (morning) and experiential (afternoon) components.

• Practicum Topics
  - 2011 High-Throughput Technologies
  - 2012 Imaging Strategies and Capabilities
  - 2013 Bionanotechnology
  - 2014 From Bench to Bedside – Small Molecule and Protein Production in Molecular Hosts
  - 2015 A Practical Guide for Designing and Implementing CRISPR Experiments
  - 2016 Next Generation Sequencing
  - 2017 Imaging Modalities
  - 2018 Biosensors
  - 2019 Data Visualization and Communication
IBiS Retreat

• Purpose (for BTP trainees)
  ▪ Network with interdisciplinary group of faculty, grad student, and postdoc colleagues across the fundamental and applied life sciences research spectrum at Northwestern
  ▪ Present research in progress to a diverse audience
  ▪ Foster new collaborative interactions with a community working on a range of biomedical problems for which technologies could influence fundamental research and treatment of patients
  ▪ Foster interactions to build both informal and formal mentoring relationships

• Recently revamped format
  ▪ Focus on presentations from students, rather than faculty
  ▪ Choose your own career/mentoring sessions
  ▪ More free time

Fall 2019
• First held in Sep 2018; aiming for Spring 2020 based upon feedback last year
• This event will provide opportunities to interact with faculty, students, postdocs, and alumni drawn from across the Biotechnology community at Northwestern, with posters showcasing the breadth of biotechnology research conducted across the university.
• In addition to registering your attendance for this event, we are planning to distribute a dossier of all attendees, to facilitate networking before and after the event.
Biotechnology Day

- Co-sponsored with the MS in Biotechnology Program
- Participate in outreach to high school students interested in biotechnology with NU OSEP via career panel and activities
- Panel discussions on diverse biotechnology career paths
- Small group discussion and networking with panelists
- Keynote speaker or special event
- Networking reception with colleagues and panelists
  - Panel discussions on diverse biotechnology career paths
  - Small group discussion and networking with panelists
  - Keynote speaker (Dr. Alicia Löffler, INVO, 2019)
  - Outreach to high school students as a panelist or experiment facilitator
BTP Individual Development Plan (IDP)

- **Career goals**: What are your long- and short-term career goals? What skills and competencies do you need to develop to meet these goals, and how do you plan to do so?

- **Research goals**: What are your short- and longer-term research goals, and what will be required to achieve these goals?

- **Industrial internship and additional training goals**: What are your goals for an industrial internship, as well as your additional training goals and needs, and what are your plans for achieving these goals?

- Revise at least annually and review with your advisor (to be sure you are in agreement)

- Discuss with BTP Directors when desired, dedicated meetings in Spring

- Template available for download from BTP website; IBiS students can use the IBiS form.
BTP Annual Reports

• Completed in June and updated in the early fall quarter (updatable form)
• Career outcomes
  ▪ Fellowships and Awards
  ▪ Internship plans and experience (and jobs later)
  ▪ Progress in coursework, IDP, and qualifying exam
  ▪ Research progress
  ▪ Outreach activities
• Publications
  • All publications MUST be in compliance
  • Acknowledge BTP (T32GM008449) for publications on research done while supported by the BTP.
    ▪ Template in appointment letter and BTP website. Note that text is different for NIH-funded trainees and cluster members.
  • Submit to pubmed central (i.e., get a PMCID). Recommendation: submit to PMC as soon as your paper is published.
Course Requirements (website: updates)

- **Biology Courses**: 2 of the following 6 courses:
  - IBiS 402 (Molecular Biology; can sub 300 level class if needed)
  - IBiS 403 (Proteomics)
  - IBiS 404 (Systems Biology)
  - IBiS 406 (Cell Biology; can sub 300 level class if needed)
  - IBiS 410 (Quantitative Biology); required for IBiS students
  - IBiS 416 Practical Training in Chemical Biology Methods and Experimental Design

- **Responsible Conduct in Research**: 1 of the following classes:
  - IBiS 423 (Ethics in Biological Research)
  - GEN ENG 519 (Responsible Conduct of Research)
  - CHEM 519 (Responsible Conduct of Research Training)

- **Responsible Conduct in Research refresher course (after 4 years)**
  - IBiS 519 (Ethics in Biological Research – Refresher Course)

- **Rigor & Reproducibility in Research** (IBiS 421)
- **Advances in Biotechnology** (ChBE 478)
- **Electives**: 3 biotechnology-related classes (many options)

*These classes fulfill the requirements for the TGS Certificate in Biotechnology. Don’t forget to apply for this!*
Industrial Internships

• Internships provide trainees the opportunity to obtain first-hand experience in industrial research or development
  
  ▪ NIH Trainees are required to pursue an industrial internship before degree completion; during appointment preferred
  
  ▪ Cluster Trainees are encouraged to pursue an industrial internship

• Work with your mentor on internship timing; they may also have industry contacts related to your research

• BTP Directors and alumni can help you find an internship. See BTP Google Drive folder for a list of past internships.

• Apply for crown family fellowship (McCormick CRDV 510) during internship to maintain student status and health insurance
  
  ▪ Available to both Cluster Trainees and NIH Trainees
T32 Trainee Funds

$1,300 for training-related expenses

- Allowable
  - Lab supplies/chemicals/reagents
  - Biotech conference (AIChE, WBC) Travel: funds can be used for travel to internships, or travel to biotechnology related conferences. You can be reimbursed for your air travel, taxi, lodging, meals, and registration fees.*Membership dues can be reimbursed if: 1) the membership is necessary for you to attend/present at the conference, or 2) if the cost of purchasing a membership results in a larger decrease in the registration than the cost of the membership itself. Otherwise membership dues are unallowable.
  - Computers/Laptops: to use while training at NU
  - Software (Prism, GraphPad, SPSS)

- Unallowable
  - Airfare upgrades, Alcohol, Commuting between home and campus, Passports, vaccinations, and visas, Personal Entertainment, Travel Insurance

- How to order:
  - Place order/reimbursement through home department.
  - Send Emily (e-kocevar@northwestern.edu) a copy of expense for quick approval turnaround
  - All items will need to be shipped/received by 6/30/20
  - All travel must be complete by 6/30/20

- Please do not wait until the last minute to utilize these funds
Summary of BTP Trainee Expectations

- Attend the BTP retreat, practicum, and Biotech Day
- Attend the IBiS retreat (Cluster optional)
- Complete class requirements for Biotechnology Certificate
- Attend and *actively participate* in all RIP meetings & seminars
- *Meet with at least half of the BTP seminar speakers*
- Participate in annual BTP survey and focus group session
- Complete annual June progress report and fall update
- Complete industrial internship (Cluster optional)
- Engage with fellow Trainees in BTP events
- Discuss IDP with advisor(s) and BTP Directors
- Keep us posted on career, publications, honors, awards, and service/outreach activities
- Publicize the BTP among incoming and first-year PhD students
- Respond promptly to emails from the directors & coordinator
Questions and Resources

j-leonard@northwestern.edu
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e-kocevar@northwestern.edu
Finding the right internship

- Develop a network of contacts from BTP seminar speakers, as well as at Biotech Day, meetings, and conferences
- Build on your mentor’s and other faculty contacts in industry
- Search for interesting companies and positions on the web; connect with professionals at these companies via LinkedIn to learn about the company and positions (don’t ask for a job!)
  - Good opener: “I’d love to learn more about your fascinating job and career!”
- You can also connect with BTP alumni and other NU graduates via LinkedIn (Group: Northwestern University Biotechnology Predoctoral Training Program)
- Connect with (former) BTP Trainees and other NU graduate students who have completed internships for leads
- Review info. on past internships of BTP Trainees (see Google Drive folder)
- Connect with Northwestern Career Advancement, McCormick Career Development
- EBRC Internship Portal (Synthetic Biology) (see BTP Website for link)
First and foremost, I want to say that I loved my internship, and it was a critical piece of my grad school experience. I tried something new, got a look at the mystery of "industry", found excellent mentors, and learned a lot about my likes and dislikes. Ultimately, I decided that research is not a good fit for me (academic nor industry) after experiencing my internship, and I am so glad I discovered this before I started a career in research!
Advice from the field: Shannon Brady

- I interned at NanoString Technologies in Seattle, WA. I was on the protein detection technologies team within the R&D branch of the company. I learned about the company through my PI's contact who worked for the company. She asked around NanoString to see if any departments had an internship available. So, this internship wasn't posted anywhere, it was sort of tailored to what was available and what I was interested in doing.

- Application process: It was very difficult for me to find an internship, and I think that was the most surprising part of the process. Many large companies (i.e. Genentech) have summer internships, but a fall internship worked best with my experiment schedule. I cold-applied to ~30 positions and heard back from very few of them (all were eventually "no"s). I reached out to contacts at 5 companies and at least heard back from those companies, so I highly recommend finding some sort of person who can at least ask their coworkers about openings. In the end, I was offered an internship with 3 companies and went with the one with the most desirable compensation and location.

- Industry vs Academia: I was surprised by certain aspects of the "industry" such as: 1. My team still had weekly group meetings, similar to academia 2. People actually did work 9-5, in fact I was scolded for working more than that amount of time -- most surprisingly, I was bored with a 40-hour week! 3. At least at NanoString, the amount of money that was available for purchasing equipment/supplies was shockingly higher than I was used to in academia. This meant that I could get whatever I needed, essentially without having to clear it with higher-ups. Unfortunately this meant that there was not a great way of tracking what supplies were already available and where to find them, which was very different from my lab's well-documented inventory.

- Timeline (for the internship I took): Reached out to my contact in July, heard back from the team looking for an intern in August, had a phone interview in late August, had a final phone conversation with my to-be mentor in late September, started at the end of October. This timeline will be much longer if you are applying to a larger internship program, as applications are usually due much earlier.

General advice:
1. Feel empowered to negotiate your salary. Especially if you are moving to another city, you want to be sure you have enough money to cover your moving expenses (this is also a great way to negotiate - ask for a relocation allowance). The internship should not be a stressful time for you financially. Also, know that you can turn down an offer if it doesn't seem like the right fit for you.
2. Go somewhere outside of Chicago, if possible. What other time in your life can you test out a new city for 3-6 months? However, if you are leaving Chicago, keep in mind that it is VERY difficult to get someone to sublet your apartment for 3 months in the winter (learned that the hard way). For this reason, I found that summer internships are more manageable if you're trying to sublet your Chicago place.
3. Find a company that does something you find interesting. You don't need to be an expert by any means. I used my internship as a chance to try something new (I did my PhD in worm genetics and did nothing with proteins at all). I'm so glad I had this experience to round out my scientific skills.
4. Dive in when you get there. Sit in on meetings that don't involve you. Have lunch dates with people of different departments. Find a way to make your current skills useful (I helped people do basic stuff in R, and it made me feel so smart!)
5. Leverage Elysse Longiotti at NU career services for help on all things resume/cover letter/internship related. She is fantastic. Bill and Josh are also very well connected, so if you have a company/field of interest you should ask them if they have connections there.
Mission:
The social committee aims to foster a sense of community among BTP Trainees and Cluster Students by organizing social and team building activities throughout the year.

Responsibilities and expectations of committee members:
• The responsibilities of the social committee are to plan quarterly extracurricular activities in order to build camaraderie amongst trainees, cluster members, and faculty. In addition, the social committee also plans the BTP retreat which welcomes new joining members.
• Examples of events planned by the social committee are: Lunches, dinners in downtown Chicago, trivia, and game nights.
• Time commitments for the social committee are approximately 6-8 hours per month throughout the academic year.

Benefits of serving on this committee:
• Build camaraderie with BTP members and faculty
• Gain experience in event planning
• Personally enrichen membership experience in BTP

Current roster:
Slava Butkovich  
Sara Rigney  
Sam Gowland  
Adam Silverman  
Alec Castinado
**Mission:**
Organize the BTP Practicum

**Responsibilities and expectations of committee members:**
- Plan, organize, and run the annual BTP practicum held in the late summer/early fall
  - Select the practicum topic (winter)
  - Invite guest speakers (spring)
  - Schedule and organize the event (spring/summer)

**Benefits of serving on this committee:**
- Networking opportunity with invited speakers
- Experience organizing a large event
- Have the ultimate say in the practicum topic

**Current roster:**
- Justin Peruzzi
- Katie Warful
- Sophia Li
- Kate Dray
- Clay Dilks
Seminar Committee

Mission:
The seminar committee coordinates with BTP faculty advisors to invite speakers for the BTP hosted seminars, including the Advances in Biotechnology class, throughout the year. The committee exists to gauge BTP member interest in various topics and research areas and to communicate that information to BTP advisors in order to guide which speakers are invited for the year.

Responsibilities and expectations of committee members:
• Send out survey to gauge fellow BTP member interest in various topics
• Meets quarterly (or more if necessary) with BTP faculty advisors to coordinate speaker invitations
• Optional: Personally invite and co-host speakers

Benefits of serving on this committee:
• Help guide selection of speakers and topics for seminars
• Opportunity to invite and host a speaker from a company/field you are interested in

Current roster:
Alex McFarland
Kirsten Jung
Hailey Edelstein
Erika Arvay
Mission:
The Alumni committee fosters connections between alumni and current trainees with the aim to improve industrial connections between the BTP and the larger biotechnology community. We do this by facilitating industrial site visits, an annual networking event, and managing alumni resources and contact information.

Responsibilities and expectations of committee members:

• Plan an annual networking event (late summer)
  § Organize poster session
  § Plan dinner/reception
  § Invite speakers
• Plan at least one industrial site visit to local biotech company (Spring)

Benefits of serving on this committee:

• Improved connections with industry
• Opportunity for stronger connections with BTP alumni

Current roster:
Jon Strutz
Nolan Kennedy
Clare Harper
Grant Rybnicky
Jason Cain
Committee To-Do List

Task 1: Schedule a hand-off meeting with the previous committee members!

We will discuss this at our first RIP meeting during “committee updates”