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
What BTP can do for You

• Build your professional network
  • Close interaction with faculty and industry professionals

• Develop your skills as a research professional
  • Research in progress meetings
  • Practicum – hands on experience with cutting-edge technology
  • Coursework to prepare for biotechnology research and be competitive (earn a Certificate in Biotechnology)
  • Industrial internship

• [Potentially] gain freedom in the design of your PhD research
  • Independent source of funding for your time
Two modes of participation and support

- **NIH Trainees**
  - Rising second-year PhD students in BME, ChBE, Chemistry, IBiS, or MSE
  - US citizens or permanent residents
  - Two years base stipend and tuition
  - $300 for conference, etc. and $1,000 for research per year

- **Cluster members**
  - Any year (second or third year preferred) and any NU PhD program
  - Two quarters base stipend and tuition during a 1-year period
  - Same activities, but internship is encouraged (not required)
  - NIH-eligible Cluster members can apply for one year of NIH Trainee support as a rising third-year PhD student
BTP Annual Activities Calendar

- **BTP Retreat** in August
- **Biotechnology Practicum** in August (Aug 22, 2019)
  - *Synthetic Biology in 2018; Data Visualization and Communication Practicum in 2019*
  - *Trainee-organized* and focused on NU core facilities
  - Morning lectures, lunch, and hands-on afternoon activities
- **IBiS Retreat** (optional for Cluster members) in September
- **NU Biotechnology Networking Reception (NEW)** in October 2018
- **Biotechnology Day** in spring
  - Panel discussions on diverse biotechnology career paths
  - Small group discussion and networking with panelists
  - Keynote speaker (Jeffrey Baker, FDA, 2018; Dr. Alicia Lößler, 2019)
  - Outreach to high school students as a panelist or experiment facilitator
- **Program evaluation survey and focus group** with Searle Center - spring
- **BTP-focused IDP** discuss with research preceptor first, discuss with BTP Program Directors (spring 2020)
- **Steering Committee meeting** with *one elected trainee member*
- **Biotechnology company site visit** – *Argonne National Laboratory in 2019*
BTP Monthly Activities

• **Biotechnology Seminars**: Wednesdays at noon with pizza
  - Weekly in spring; monthly the rest of the year
  - Speakers from a wide range of companies and research areas
  - *Small group meetings/meals with the speakers*
  - Trainee interests drive speaker selection
  - Opportunities for trainees to invite and host speakers

• **Research in Progress Meetings**
  - Practice your communication skills to a diverse audience
  - Get feedback and suggestions from different perspectives
  - Learn about many areas of biotechnology research

• **Networking and Social Events**
  - Get to know colleagues in departments across Northwestern
  - Discussions ranging from research and internships to ???
  - Refreshments to enhance the discussion
2018-2019 Biotechnology Seminars

• Emily Leproust, Twist Bioscience
• Erica Hartmann, Northwestern University
• Kimberly Lounds Foster, Celgene
• Chris Ramsborg, Juno Therapeutics / Celgene Therapeutics
• Holly Falk-Krzesinksi, Elseveir
• Alicia Löfler, Northwestern University
• Peter Fuhrken, Fujifilm Cellular Dynamics
• Michelle O'Malley, UC Santa Barbara
2018-2019 Biotechnology Seminars

- Michael Köepke, LanzaTech
- Melissa Dsouza, Commense, Inc.
- Nathan Brown, AbbVie
- Neha Kamat, Northwestern University
- Dante Pertusi, GSK
- Kirsten Benjamin, Amyris
- Julie Champion, Georgia Tech
- Kevin Whittlesey, 4D Molecular Therapeutics
Student Committees

• 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 to biotechnology research and/or practice

• Current Committees
  ▪ Social & Retreat Committee
  ▪ Alumni, Site Visit & Networking Committee
  ▪ Practicum Committee
  ▪ Seminar Speaker Committee
Course Requirements

• **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*
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
- 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
Industrial Internships
Current BTP Preceptors & Departments

• BME
  - Guillermo Ameer
  - Vadim Backman
  - Mitra Hartmann
  - Patrick Kiser
  - Milan Mrksich
  - Evan Scott
  - Igal Szleifer
  - Jason Wertheim
  - Hao Zhang

• ChBE
  - Luis Amaral
  - Neda Bagheri
  - Linda Broadbelt
  - Mike Jewett
  - Josh Leonard
  - Julius Lucks
  - William Miller
  - Danielle Tullman-Ercek
  - Keith Tyo

• Chemistry
  - Nathan Gianneschi
  - Neil Kelleher
  - Tom Meade
  - Chad Mirkin
  - SonBinh Nguyen
  - Teri Odom
  - Tom O’Halloran
  - Richard Silverman

Preceptors can be added for newly appointed trainees
Current BTP Preceptors & Departments

• Molecular Biosciences
  ▪ Erik Andersen
  ▪ Xiaomin Bao
  ▪ Jason Brickner
  ▪ Carol Labonne
  ▪ Rick Morimoto
  ▪ Christian Petersen
  ▪ Heather Pinkett
  ▪ Amy Rosenzweig
  ▪ Eric Weiss
  ▪ Sadie Wignall

• MSE
  ▪ Vinayak Dravid
  ▪ Mark Hersam
  ▪ Derk Joester
  ▪ Monica Olivera de la Cruz
  ▪ Ramille Shah
  ▪ Kenneth Shull
  ▪ Samuel Stupp

Preceptors can be added for newly appointed trainees
Program Requirements & Commitments

• Research Rotations
  ▪ Required for NIH Trainees (not required for Cluster)
  ▪ Two rotations prior to preceptor selection
  ▪ Rotations must be at least 4 weeks. Suggested dates in 2019:
    • 9/27 – 10/24 & 10/25 – 11/21
    • Rotation forms: single form used by CLP & BTP

• Trainee Progress Reports
  ▪ Twice per year (updatable form)
  ▪ Publications and presentations
  ▪ Fellowships and awards
  ▪ Progress in coursework, IDP, and qualifying exam
  ▪ Research progress
  ▪ Outreach activities
  ▪ Internship plans and experience (and jobs later)
Application to BTP

- **Application**
  - **Online portal:** [http://www.biotechtraining.northwestern.edu/application/](http://www.biotechtraining.northwestern.edu/application/)
  - **Deadline:** July 1, 2019
  - Single application (except for personal statements/letters) for
    - Molecular Biophysics Training Program
    - Biotechnology Training Program
    - CLP Predoctoral Training Program
  - Can apply to be considered for traineeship, cluster, or both
  - **Components** (see website for more detail)
    - 3 page (max) statement discussing motivation for participation in BTP, goals of research, and how you plan to meet program requirements (including courses and internship)
    - Copy of research rotation report (not required for IBiS students, Cluster-only applicants)
    - Copy of grad & undergrad transcripts (no GRE scores)
    - Letter of support from your advisor
    - Short CV, including honors, presentations, research experience, publications, etc.
Questions?

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