



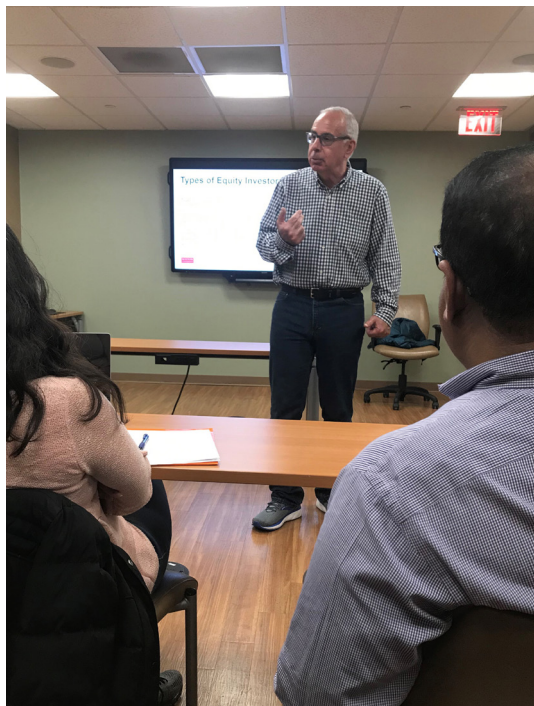
# BU's BEST

*Training for tomorrow, today*

## The BEST Five Years Broadening Experiences in Scientific Training

2014-2019

BOSTON  
UNIVERSITY



## MISSION

BU's BEST provides opportunities for career exploration and skill development and aims to inspire and empower predoctoral trainees, postdoctoral scholars and their mentors to contribute to the biomedical workforce in a wide spectrum of careers.



## VISION

Building tomorrow's biomedical workforce today.

## THE GRANT

# BU Awarded Five-year NIH BEST Grant to Catalyze Change

A landmark study by an advisory committee to the Director of the NIH reported that only ~ 23% of the biomedical workforce was engaged in tenured or tenure-track faculty positions, leaving nearly 80% of biomedical professionals in non-traditional positions. This led to the recognition that the tenured track position was becoming an “alternative” career.

One of the recommendations made by the advisory committee challenged the NIH to invest in an experiment to test different methods of improving training opportunities for predoctoral trainees and postdoctoral scholars to prepare them for the changing biomedical workforce. This led to the “NIH Director’s **B**roadening **E**xperiences in **S**cientific **T**raining (BEST)” awards and the building of a national network of awarded institutions.

As one of only 17 BEST institutions selected to be a BEST hub in the national network, Boston University is enhancing biomedical career development curricula and services to inspire and empower biomedical predoctoral students and postdoctoral scholars to explore wide-ranging careers both inside and outside academic research.

One of BU’s BEST Program strategies is to build an evolving curriculum that is responsive to workforce needs. We work closely with partners to align programming with real-time skill demands of the workforce, fostering training curricula that best position highly qualified individuals for current open positions in varied career pathways.

Another strategy is to advance programming and services that expose our trainees to varied biomedical career paths that they have yet to consider in industry research, academic research, law and regulatory affairs, science teaching, communications, policy, and business and administration.

BU’s BEST programming and services are open to all biomedical predoctoral trainees and postdoctoral scholars at Boston University. Departments & programs with active participants include:

- Anatomy & Neurobiology
- Behavioral Neuroscience
- Biochemistry
- Bioinformatics
- Biology/Molecular Cell Biology & Biochemistry
- Biomedical Engineering
- Brain, Behavior and Cognition
- Chemistry
- Epidemiology
- Genetics & Genomics
- Graduate Program for Neuroscience
- Health Sciences
- Immunology Training Program
- Medicine
- Microbiology
- Molecular & Translational Medicine
- Nutrition & Metabolism
- Oral Biology
- Pathology & Laboratory Medicine
- Pharmacology & Experimental Therapeutics
- Physiology & Biophysics
- Program in Biomedical Sciences

Nearly 80% of biomedical PhDs are in non-tenure track positions.

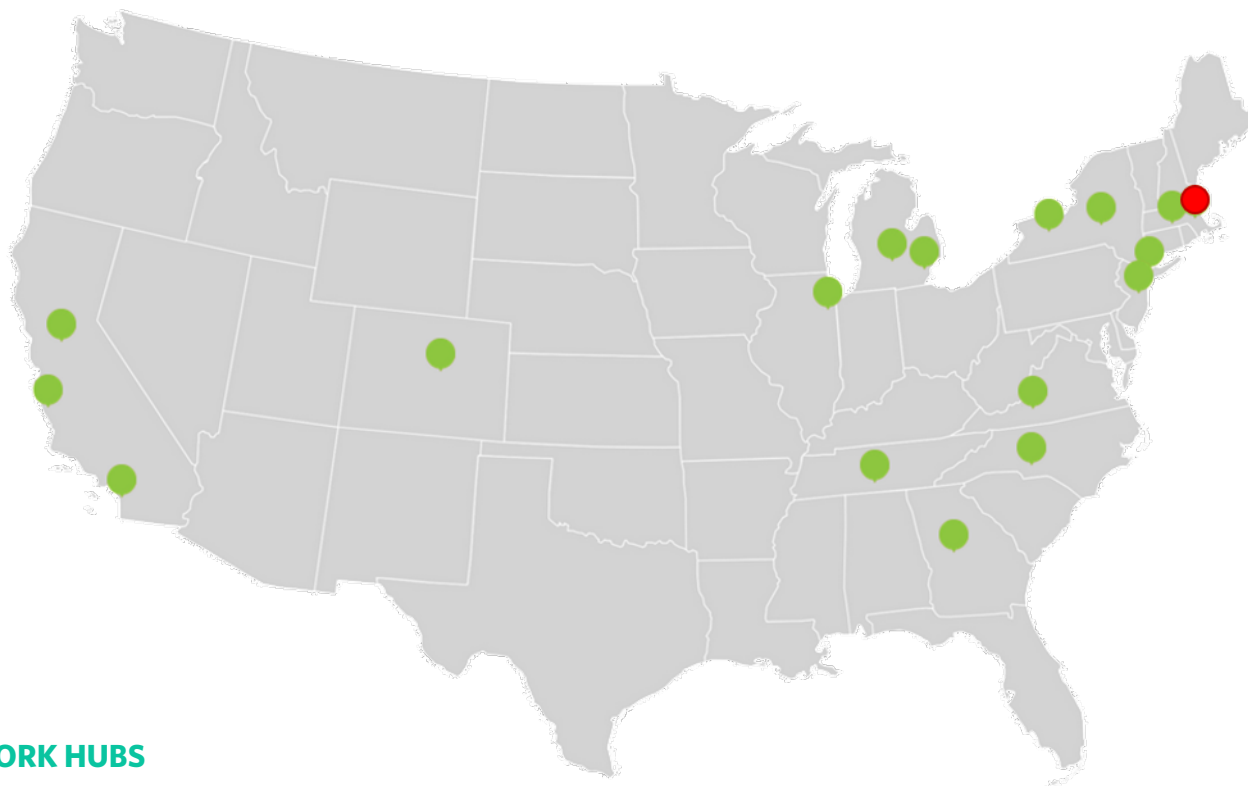


## THE NETWORK

# Career Development in a National Network

BU is an integral member of the National BEST Consortium

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### NETWORK HUBS

- Boston University
- Cornell University
- Emory University
- Michigan State University
- New York University
- Rutgers University
- University of Chicago
- University of Colorado - Denver
- University of North Carolina - Chapel Hill
- University of California - Davis
- University of California - Irvine
- University of California San Francisco
- UMass Medical School
- University of Rochester
- Vanderbilt University
- Virginia Tech
- Wayne State University

### BU NETWORK ACTIVITIES

- ✓ Published papers and book (in press) on outcomes, lessons learned and best practices
- ✓ National- and local-level workshop presentations using program strategies linked to outcomes data
- ✓ Hosted colleagues from BEST Network at BU for workshops that fostered cross-hub engagement
- ✓ Leadership team joined national policy changing groups with other leaders in the field
- ✓ Regional analysis reports of workforce data to support trainee use for goal setting & hub use for career development planning of programming
- ✓ Created another network within the BEST consortium to bridge network to underrepresented groups in undergraduate STEM

## COLLABORATION

# BU's BEST Engages Collaborators Across the University & Boston

to strengthen a shared vision for biomedical career development and implement innovative programming grounded in real-world settings.

**ALUMNI AFFAIRS** | Working to engage alumni in interactions with our biomedical trainees

**ARROWS** | Working together on programming to advance women in STEM

**DATA OUTCOMES** | Keeping track of our trainees job outcome data

**DEVELOPMENT** | Bringing successful alumni to BU to network with our trainees and talk about their career paths

**DIVERSITY, EQUITY & INCLUSION INITIATIVE**  
Co-sponsoring events

**FEDERAL RELATIONS** | Co-sponsoring and co-facilitating events to serve our biomedical trainees

**GRADUATE AFFAIRS** | Co-sponsoring and facilitating workshops

**INDUSTRY ENGAGEMENT** | Sponsoring lunch & learns and facilitating industry scientists access to the future pool of training

**INNOVATE@BU** | Hosting workshops for scientists interest

**PROFESSIONAL DEVELOPMENT & POSTDOCTORAL AFFAIRS** | Providing postdoctoral scholars with career development curriculum and services

**PROPOSAL DEVELOPMENT OFFICE** | Working together to host NRSA workshops for trainees

**RESPONSIBLE CONDUCT OF RESEARCH** | Co-sponsoring workshops

**SCHOOL OF PUBLIC HEALTH** | Sharing best practices in career development

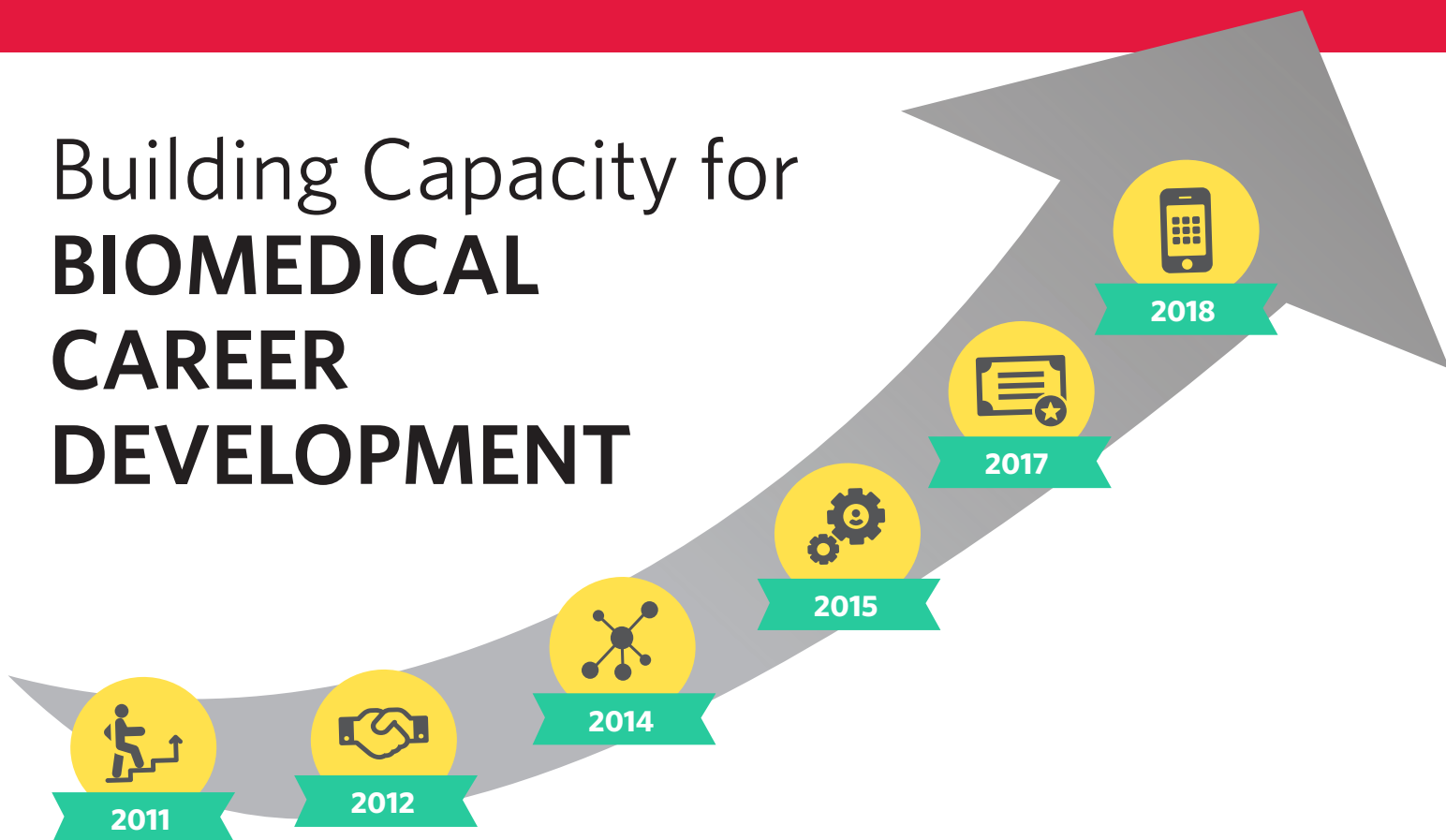
**STUDENT ORGANIZATIONS** | Working together on career exploration events

**TECHNOLOGY TRANSFER** | Participating in panel discussions and hosting internships

## ORGANIZATIONS WHO HAVE MET WITH OUR STUDENTS

- 23andMe
- AAAS Science & Technology Policy Fellowship
- Acceleron Pharma, Inc.
- Addgene
- Alnylum
- Alan Alda Communicating Science
- ALS Therapy Development Institute
- Amgen
- AstraZeneca
- Aviagen
- Axcella
- Back Bay Life Science Advisors
- BeiGene
- Biogen
- Bluebird Bio
- Boston QSP
- Boston Scientific
- Broad Institute
- BUMC
- C4 Therapeutics
- Celerion
- Cell Press
- Cell Reports
- Cell Signaling Technology
- Center for International Studies, MIT
- CHDI
- Cholate, Hall & Stewart
- Cisco Systems
- Cooley LLP
- CRISPR Therapeutics
- Data Carpentry
- Decision Resources
- DT Ward PC
- DynaMed Plus
- Eli Lilly
- Editas Medicines
- Excelyrate Capital
- Finnegan, Henderson, Farabow
- Garrett & Dunner, LLP
- Flagship VentureLabs
- Futures in Life Sciences (FILS) Events
- GSK
- Hamilton, Brook, Smith & Reynolds
- Homology Medicines, Inc.
- ImmuneXcite
- INSIGHT
- Insulet
- Ixcela
- Jackson Laboratory
- Janssen Prevention Center
- Journal of Molecular Biology
- JoVE
- Kiniksa
- LabCentral
- Lathrop Gage's Intellectual Property Division
- Lewis-Burke Associates
- Mass Innovation Labs
- MassBio
- MassBioEd
- Merck
- Moderna Therapeutics
- National Institute of Biomedical Imaging and Bioengineering
- Navigant
- Neuroendocrine Tumor Research Foundation
- Northeastern University
- Novartis Institutes for Biomedical Research
- Nutter McClennen & Fish LLP
- Ohana Biosciences
- Outcome Capital
- PA Consulting Group
- PDPA
- Pfizer
- Philips Research North America
- Propel Careers
- Saint-Gobain
- Sanofi
- Scholar Rock
- Science from Scientists
- Shire
- Simon-Kucher & Partners
- Smart Labs
- Stonehill College
- Structural Genomics Consortium
- Sunstein Kann
- Sunovion
- Sunovion Pharmaceuticals
- Synlogic
- Syros Pharmaceuticals
- Takeda
- Trinity Partners
- Vertex
- Wave Life Sciences

# Building Capacity for **BIOMEDICAL CAREER DEVELOPMENT**



## **2011**

Postdoctoral Affairs Office launched by Graduate Medical Sciences to provide biomedical postdoctoral scholars with career development curriculum and services.

## **2012**

Postdoctoral Affairs Office builds partnership with Propel Careers to provide biomedical predoctoral trainees and postdoctoral scholars career coaching and networking with life sciences leaders, industry researchers and entrepreneurial organizations in diagnostics, therapeutics and healthcare.

## **2014**

Graduate Medical Sciences receives NIH award to expand biomedical career development programming and services to biomedical predoctoral trainees and postdoctoral scholars. BU becomes one of 17 institutions in a new national network called the BEST Network to disseminate innovations and best practices.

## **2015**

Professional Development and Postdoctoral Affairs (PDPA) launched by Boston University to provide professional development programming across all disciplines melds with Postdoctoral Affairs Office. BU's BEST begins collaborative activities with PDPA.

## **2017**

Graduate Medical Sciences gets NSF award that expands the BEST Network's innovations and best practices to STEM undergraduates in five minority serving institutions.

## **2018**

Graduate Medical Sciences gets Burroughs Wellcome Fund and Digital Education Initiative awards to develop a phone app (called TOTAL) in collaboration with local partners to enable biomedical predoctoral trainees and postdoctoral scholars expanded access to career development programming across Boston area institutions.



# Strategies to

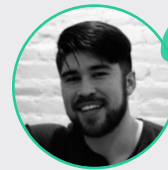
# ENGAGE

## predoctoral students and postdoctoral scholars to explore careers

Over **100 trainees and scholars** participated in one-on-one career coaching offered to tailor resumes and cover letters, search for the right jobs and highlight skills gained at BU.



More than **70 trainees** have attended **18 site visits** since 2017.



“The Industry Trek was very inspiring and motivating. I learned a lot and look forward to joining industry upon the completion of my PhD.”

Jess Floro  
PhD Candidate, MTM



Over **50 internships** offered, spanning many biomedical career tracks.



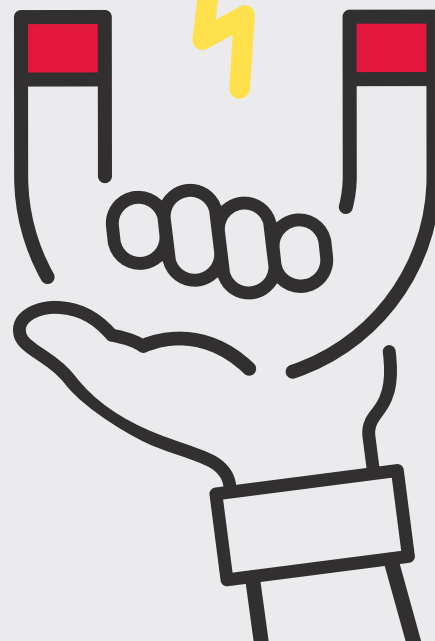
“As a postdoc, I took advantage of internships to learn and build skill sets around teaching, which is a really great experience for us to apply to our career.”

Sarah Mazzilli, PhD  
Assistant Professor,  
Medicine, BUSM



Over **162 workshops:**

- 90 Career Exploration
- 70 Skill Enhancement



## THE CURRICULUM

# Driving Career Development Curriculum

for predoctoral trainees and postdoctoral scholars to explore multiple career tracks

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BU's BEST has hosted **over 160 workshops** attended by **700+ trainees**, including both skill development and career exploration workshops. The career exploration workshops span the seven career tracks: academic research, business & administration, communication, industry research, law and regulatory, policy, and teaching. Many career exploration workshops have engaged Boston University alumni to speak with trainees about their careers and act as alumni mentors. This has offered a great opportunity for the University to engage with over **200 alumni** and keep them connected with Boston University. Program data show strong positive feedback from participants.

Examples of programing in these tracks:



### TRACK 1 | **Academic Research**

- Grant Writing Course
- Career Panel



### TRACK 2 | **Business**

- Entrepreneurship Workshop
- Medical Affairs Lunch & Learn



### TRACK 3 | **Communication**

- Narrative Writing Workshop
- Pro Tips From A Cell Press Editor



### TRACK 4 | **Industry Research**

- Lunch & Learn
- Boston QSP Panel



### TRACK 5 | **Law**

- Science Law Panel Discussion
- Overview of Health Product Regulation Course



### TRACK 6 | **Policy**

- Lunch with S&T Policy Fellow for the CA State Legislature
- AAAS Case Study



### TRACK 7 | **Teaching**

- Teaching in the BioSciences Panel Discussion
- Teaching at Undergrad Institutions



# Biomedical Workforce Data 2018

Information from Labor Insight™ allows educational institutions to analyze the job market to identify demand for specific jobs, as well as the skills and credentials employers are seeking to fill the jobs. The data enable analysis of regional demand and job trends and allow educational institutions to plan programming to meet employer needs. Trainees can use the data to identify opportunities that will best prepare them to achieve their career goals.

## ACADEMIC RESEARCH

- **Number of Job Postings**  
10,099
- **High Demand Areas**  
New York, Los Angeles, Chicago
- **Top Job Titles**  
Postdoctoral Fellow, Research Scientist, Director of Research

## BUSINESS

- **Number of Job Postings**  
8,728
- **High Demand Areas**  
New York, Boston, San Francisco
- **Top Job Titles**  
Medical Science Liaison, Analytics Consultant, Program Manager

## COMMUNICATION

- **Number of Job Postings**  
3,095
- **High Demand Areas**  
Boston, New York, San Francisco
- **Top Job Titles**  
Medical Writer, Marketing Manager, Communication Manager

## INDUSTRY RESEARCH

- **Number of Job Postings**  
13,371
- **High Demand Areas**  
Boston, San Francisco, New York
- **Top Job Titles**  
Scientist, Development Associate, Clinical Trial Manager

## LAW

- **Number of Job Postings**  
1,898
- **High Demand Areas**  
Boston, New York, San Francisco
- **Top Job Titles**  
Corporate Counsel, Attorney, Safety Officer

## POLICY

- **Number of Job Postings**  
673
- **High Demand Areas**  
Washington, D.C., New York, Boston
- **Top Job Titles**  
Survey Statistician, Policy Analyst, Science Research Analyst

## TEACHING

- **Number of Job Postings**  
2,496
- **High Demand Areas**  
New York, Los Angeles, San Francisco
- **Top Job Titles**  
Professor, Instructor, Lecturer

# SITE VISITS



## Back Bay Life Science Advisors | February 26, 2019

Back Bay Life Science Advisors is a consulting firm located in Boston. Predoctoral trainees and postdoctoral Scholars had the opportunity to interact with PhDs at the firm about their career paths and practice consulting skills via case study. Trainees used the case information to create a positioning summary statement and assess commercial potential and the valuation and exit considerations.



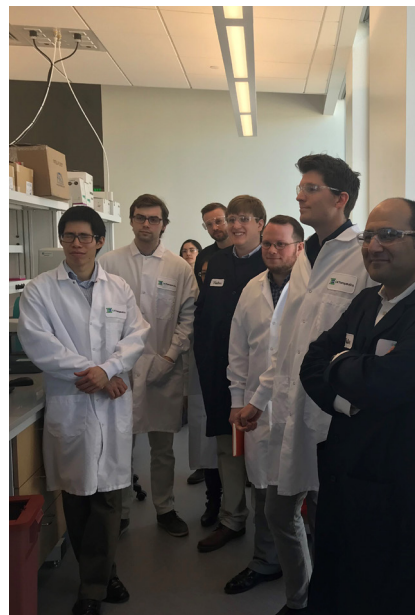
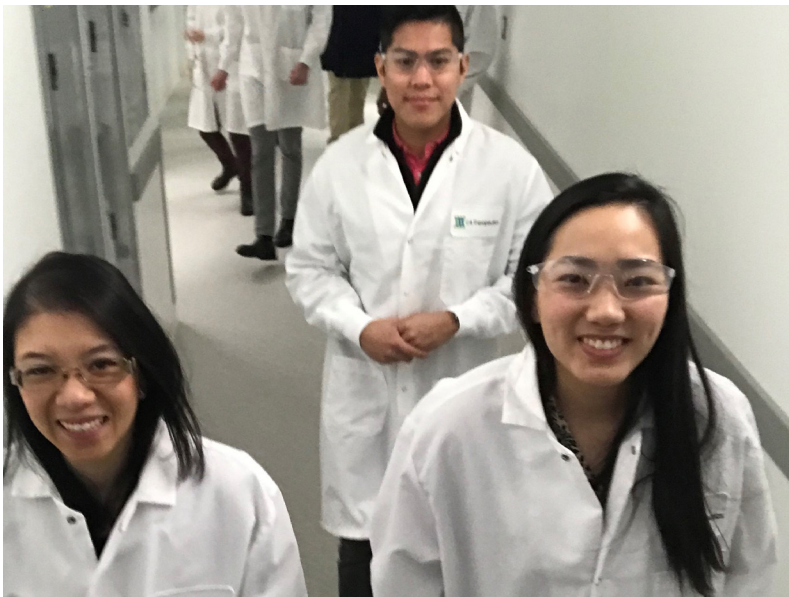
## Cell Press | March 29, 2018

Cell Press publishes over 40 scientific journals. Their mission is to communicate and promote the advancement of science. BU's BEST predoctoral trainees and postdoctoral scholars learned about the ins and outs of how publishing in the scientific arena operates and what a day in the life of an editor is like. They were able to tour the facility and network with PhDs at Cell Press.



## C4 Therapeutics | March 13, 2019

C4 Therapeutics is a growing biotech company in the Boston area. Attendees had the opportunity to tour the lab, engage in round table discussions with chemistry, biology, legal and project management teams, and listen to presentations from PhDs in a variety of career tracks.



# Novel Programming Linked to Labor Skill Needs



### AAAS CASE Annual Workshop in Washington D.C.

Empowering trainees to become a voice for basic research and exposing them to science policy



### Alan Alda Communicating Science Workshop Series

Empowering scientists to effectively communicate their work to others



### Data Carpentry Workshop Series

Giving scientists the basic bioinformatics skills they need to work with big data



### Drug Discovery & Pharmacology Workshops with Industry

Imparting key knowledge and skills sought after in industry



### Industry Lunch & Learns

Connecting trainees and scholars with industry scientists



### Innovate@BU Entrepreneurship Workshop Series

Inspiring scientists to think like entrepreneurs



### Introduction to Leadership for Biomedical Education Course

Empowering leadership practices in order for participants to lead



### Mentoring Circles

Enabling scientists to engage with professionals in their career track of interest



### Narrative Writing Program for Scientists

Stimulating trainees and scholars to write and express their work beyond the confines of scientific publications

# CELEBRATING

## SERVICE, DIVERSITY & INCLUSION



## Dr. Erika Ebbel Angle Community Service Award

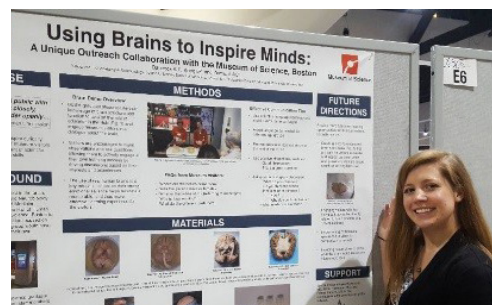
Dr. Erika Ebbel Angle is a 2012 graduate of the Department of Biochemistry. She is the founder and Executive Director of Science from Scientists, which aims to teach and inspire the next generation to identify and solve real-world problems by improving STEM literacy. Angle also is the co-founder and CEO of Ixcela, a health and wellness company that helps individuals improve their internal health.

In the Fall of 2018, BU's BEST launched a new award in honor of an alum, Dr. Erika Ebbel Angle. This award recognizes current predoctoral trainees and postdoctoral scholars that are actively engaged in STEM community service and/or outreach. The selection committee had an extremely hard time choosing the winner, as there were many worthy applications. The recipients for the 2019 Dr. Erika Ebbel Angle Community Service Award are:

**Katharine Babcock**, a first year PhD Candidate in the Department of Anatomy and Neurobiology was awarded first place for her work with *Embedding Brains to Inspire Minds*. She is using the financial support from the award to create a permanent collection of normal and pathological brain specimens to use at various outreach events in the community. She was inspired to apply for this award after her experience providing brain demonstrations at the Museum of Science last year, where it was clear members of the public wanted to handle the specimens but were not allowed to because of their fragility.

**Alicia Wooten**, a sixth year PhD Candidate in the Pulmonary Center, was awarded second place for her work with Atomic Hands. She is using the financial support of the award towards an organization she co-founded, Atomic Hands. Founded by two Deaf scientists, Atomic Hands was created to bring together the Deaf STEM community and showcase the amazing world of science in an entertaining and accessible way. By increasing public accessibility to STEM through American Sign Language (ASL), we aim to foster collaborations and networking opportunities among current and future Deaf STEMists.

**Ryan Quinton, Josiane Fofana and Whitney Manhart** all received honorable mentions in this award.



ATOMIC HANDS

# BEST BET NETWORK

Broadening Experience in Scientific Training - **B**eginning **E**nhancement **T**rack (BEST BET) is funded by a National Science Foundation (NSF) initiative called Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (INCLUDES).

BEST BET is a pilot project to scale-up the BEST Network by harnessing the biomedical career development programming and expertise of five BEST research-intensive institutions across the country including Boston University; Cornell University; University of Colorado, Denver; University of North Carolina, Chapel Hill; and Wayne State University.

One aim of the program is to engage traditionally underrepresented undergraduate students studying science in early career exploration. Another aim is to build capacity of minority-serving undergraduate institutions to provide career resources that will increase underrepresented minority student awareness of and motivation for pursuing STEM careers/ advanced degrees.

The program also offers shadowing experiences (or “site visits”) that will provide undergraduates with the opportunity to attend a multi-day event at one of our partner sites during the spring, summer or fall semester. Each BEST BET partner site has put together a unique schedule that will enable participants to do more than just attend a seminar or panel discussion.

In March 2019, BU’s BEST collaborated with BEST BET to host nine undergraduates from minority serving institutions including the University of Massachusetts Lowell, Shaw University and the University of Puerto Rico at Carolina. The undergraduates were paired with predoctoral trainees from BU. Program data show repeated strong satisfaction ratings with programming and student reporting of improved understanding of what it is like to be a graduate student and work in a lab to do research.



# THE TEAM

## LEADERSHIP



Linda E. Hyman, PhD



Barbara M. Schreiber, PhD

## PROGRAM ADMINISTRATION



Amanda Bolgioni-Smith, PhD



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Jean Spencer, PhD



Sanae ElShourbagy Ferreira, PhD



Jorge Fortin



Kimberly Arena

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Deborah M. Fournier, MS, PhD



Sarah C. Hokanson, PhD



Kimberly A. McCall, PhD

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Sarah Mazzilli, PhD



BOSTON  
UNIVERSITY

GMS  
Professional Career  
Development Office

**T H E B E S T**

IS YET TO COME!

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We are grateful to our partners who have helped us serve our trainees. BU's BEST continues to grow with exciting initiatives (BEST BET) and spinoffs (TOTAL). We look forward to working with our trainees and helping them explore a variety of careers and gain career development skills.

We are excited to partner and collaborate with you in the future!

**Please reach out to us:**

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[www.bu.edu/best](http://www.bu.edu/best)