

Introduction to Medical Student Research

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Assistant Dean for Research

September 26, 2023

Plan for our discussion

- Introductions
- Self-reflection
- Organization of the research program
- Overview of opportunities (focus on this year)
- How to find a mentor
- Upcoming meetings
- Questions

Introductions

- Appointed Assistant Dean for Research summer 2021
- Faculty member in Biochemistry & Cell Biology since 2007
- Previously Assistant Professor Harvard Medical School (Pulmonary and Cardiovascular divisions—BWH DOM)
- Our lab is interested in the mechanisms of organ fibrosis.

Current research projects adipose tissue remodeling in obesity, vascular remodeling & fibrosis, and a project on the genetic causes of Ehlers Danlos syndrome related to extracellular matrix assembly

Medical Student Research Program Organization

→ Overall goal is to facilitate high-quality research experiences for medical students

- **Oversight:** Dean Antman, Deans: Medical Education, Research, Student Affairs, Finance
- **Program Steering Committee:** program directors, faculty, registrar, students
Student representatives:
Sherry Ershadi (M3), Amos Mwaura (M2), Mason McDowell (M2), Rose Zhao (MD-PhD)

Committee sets policies for the research program, evaluates outcomes, and reviews applications

Start off with a bit of self-reflection

- Do you want to include research in your medical education?
 - definitely
 - lean to yes
 - probably not
 - no
 - unsure
- If interested in research, what types of projects are you interested in?
 - Clinical/Translational
 - Mechanisms of disease/basic science
 - Public health
 - other
 - unsure

Motivations to participate in research?

- What are your goals?
- What are your expectations?
- What is the time commitment?
- What are the expected deliverables?
- What about authorship?
- How important is the mentor relationship?

Where to find information?

Medical Student Research Webpage

<https://www.bumc.bu.edu/medstudentresearch/>

- Research Opportunities
- Research News
- Resources for identifying mentors
- Applying for opportunities

Research Hub—Student Affairs Friday Digest

RESEARCH HUB



September 26 at noon
Bakst Auditorium

Introduction to Medical Student Research

M1 students—please join Matthew Layne, PhD—Assistant Dean for Research for an Introduction to Medical Student Research. We will discuss the research programs and strategies to identify mentors. Q&A session to follow.

Welcome to the Research Hub section of the weekly digest. We will highlight research opportunities, programs, workshops, and events related to medical student research. Please also visit our webpage below to learn about new opportunities.

If you have any questions please reach out to
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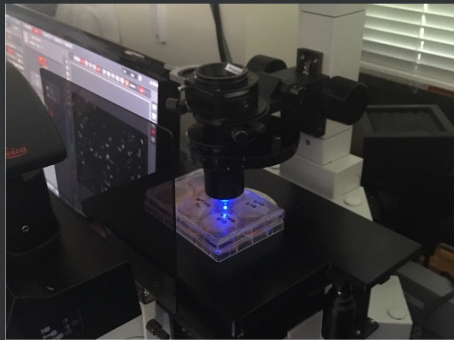


[Read more here](#)

Research opportunities

<https://www.bumc.bu.edu/medstudentresearch/>

Medical Student Research Opportunities @ BU Chobanian & Avedisian School of Medicine



Medical Student Summer Research Program

Work full-time on mentored research projects during the summer between the first and second year of medical school

[Learn More](#)



Longitudinal Research Program

Intensive mentored research projects that span your time as a BU medical student

[Learn More](#)



Research Year

Opportunity to undertake a full year of research as part of your medical education

[Learn More](#)



3rd & 4th Year Electives

Short research experiences during the 3rd and 4th year curriculum

[Learn More](#)

Medical Student Summer Research Program (MSSRP)

- There will be a separate meeting on the LEADS research track and MSSRP this fall....
- Overview—full time in person research next summer with BU/BMC faculty
 - Stipend \$4000
 - Workshops: Responsible Conduct of Research, IRB, presentation skills, faculty panels
- Applications due early February 2024
 - Applications submitted through portal: <https://wwwapp.bumc.bu.edu/MSRO/>
 - Name, email, ORCID#
 - Mentor name, details
 - Project title, purpose, hypothesis or research question, methods of data collection, statistical analysis, anticipated results
 - Application routed to mentor for additional information
 - Routed to our committee for review

LEADS—Research track

- Know you want to dedicate a significant amount of time & commit to a research project over the next 2 years
- Identify a mentor this fall
- Current plan is for applications to be due November 2023
 - Applications are submitted through portal (same application as MSSRP)
<https://wwwapp.bumc.bu.edu/MSRO/>
 - Name, email, ORCID#
 - Mentor name
 - Project title, purpose, hypothesis or research question, methods of data collection, statistical analysis, anticipated results
- Includes participating in MSSRP (stipend \$4000)
- Expectation 10-12 hours/week research outside of LEADS weeks

Questions so far?

→ Next, how to find a mentor

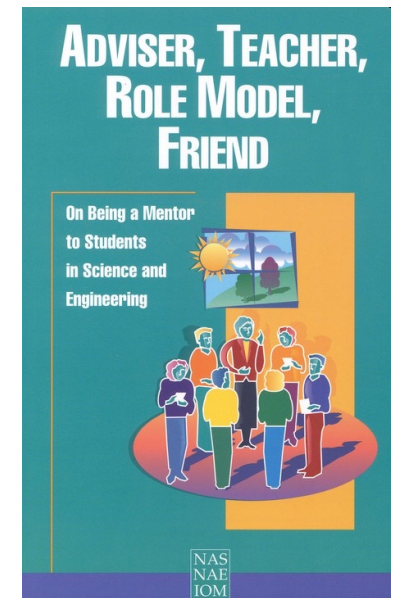
What is a mentor?

Attributes of a great mentor

- Accomplished researcher with sufficient resources
 - Oversees research and trainee development toward independence
 - Practical knowledge and commitment to trainee's well-being
 - Frequent interactions, sets expectations for the team
 - Shares knowledge and skills, oversees the trainee's research, assists trainee to connect with other researchers and often experienced with career counseling.
- The best mentors often put the needs of the trainee above their own

There are also advisors & role models

- We all need many mentors, at different career stages
- Advisors may be focused on the well-being of the advisee. And at times no personal interest in the research or involved in the problems



<https://nap.nationalacademies.org/catalog/5789/adviser-teacher-role-model-friend-on-being-a-mentor-to>

Defining your own needs in a mentor

What are your short- and longer-term goals?

- Continuum of involvement: day to day → weekly → monthly → rarely
- Do you need help in skill building or do you just need space and resources?
- Personality of mentors can vary greatly

Examples great mentoring experiences

Examples not so great mentoring experiences

Why do you want to do research?

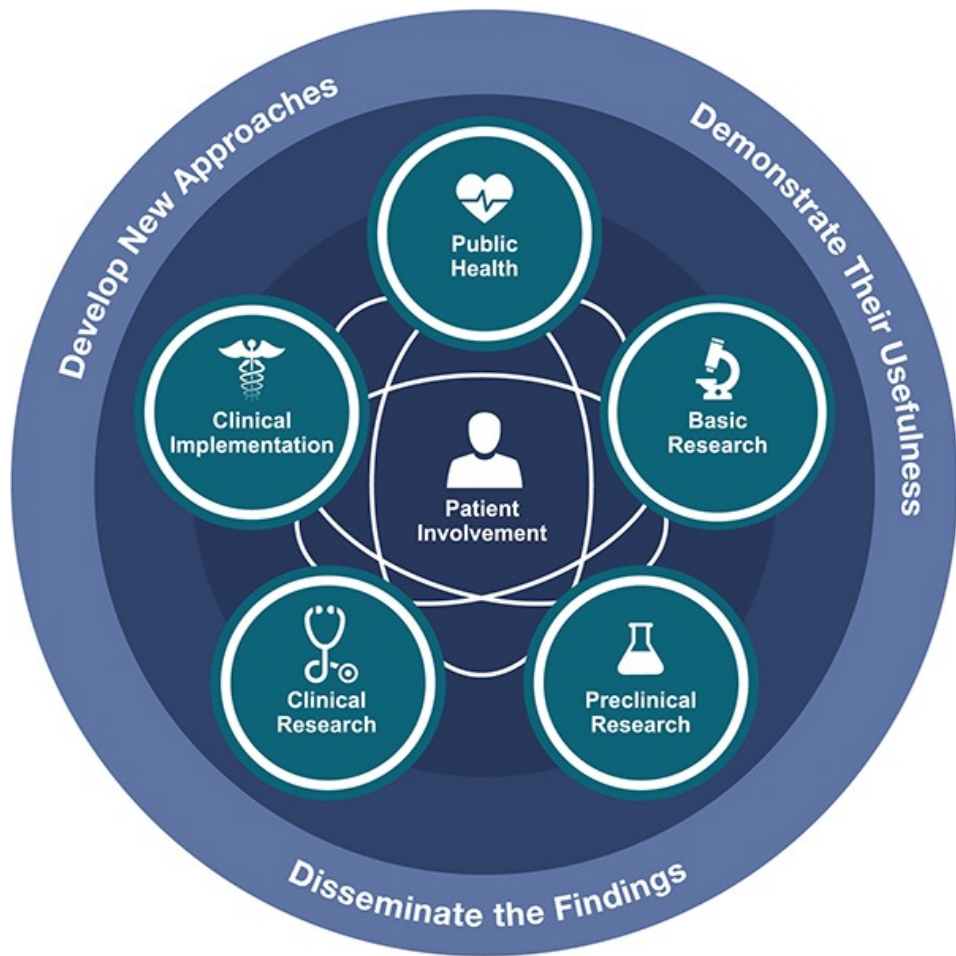
POTENTIAL MOTIVATIONS

- Curiosity
- Want to identify the cause of disease
- Want to determine how to cure disease
- Believe research is necessary to achieve next set of goals (residency/career satisfaction)
- Other

RESEARCH

- systematic process of applying the scientific method to discover something new
 - want to find a problem or project that you are passionate about....

Research flavors



Credit: National Center for Advancing Translational Sciences

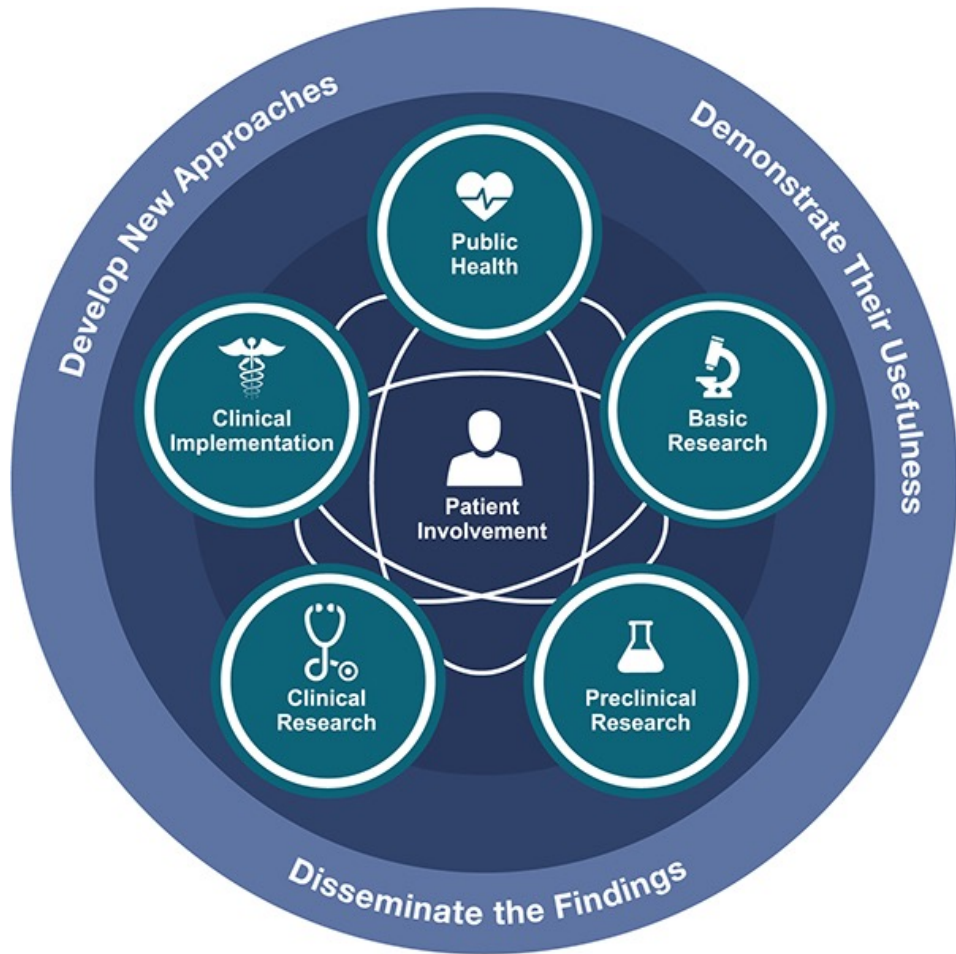
<https://ncats.nih.gov/translation/spectrum>

Basic research involves scientific exploration that can reveal fundamental mechanisms of biology, disease or behavior. Every stage of the **translational research** spectrum builds upon and informs basic research.

Preclinical Research connects the basic science of disease with human medicine. During this stage, scientists develop model interventions to further understand the basis of a disease or disorder and find ways to treat it. Testing is carried out using cell or animal models of disease; samples of human or animal tissues; or computer-assisted simulations of drug, device or diagnostic interactions within living systems.

Clinical research includes studies to better understand a disease in humans and relate this knowledge to findings in cell or animal models; testing and refinement of new technologies in people; testing of interventions for safety and effectiveness in those with or without disease; behavioral and observational studies; and outcomes and health services research. The goal of many clinical trials is to obtain data to support regulatory approval for an intervention.

Research flavors



Clinical Implementation stage of translation involves the adoption of interventions that have been demonstrated to be useful in a research environment into routine clinical care for the general population. This stage also includes implementation research to evaluate the results of clinical trials and to identify new clinical questions and gaps in care.

Public Health, researchers study health outcomes at the population level to determine the effects of diseases and efforts to prevent, diagnose and treat them. Findings help guide scientists working to assess the effects of current interventions and to develop new ones.

Credit: National Center for Advancing Translational Sciences

<https://ncats.nih.gov/translation/spectrum>

Triangles of responsibility



- Point is you should not design a project and try to find a mentor to supervise that project
- Join an established team, develop skills, and then new ideas and projects will develop (in the theme and expertise of the group)

Using BU profiles to find/vet mentors

<https://profiles.bu.edu/search/>

- Where to start?
 - Name, department, topic, other?
- Want to determine:
 - current projects
 - mentoring experience
 - publications
 - funding
 - other
- Research group web pages → what is the research team structure

2 parts to this equation

1. Personal
2. Practical

Self-directed mentor search with BU profiles

Find people by keyword

Keywords Search

Find people by name/organization

Last Name

First Name

Institution

Department

Division

Faculty Type **Be sure to select Assistant, Assoc, Prof faculty (eliminates students and other trainees)**

→ See how many this returns. If the number is large, add more key words, if few returned delete key words

Faculty name

Photo

Academic rank
Department
Degree and where from

Websites

Research group website

Focus on these green arrows

- Research
- Publications
- Mentoring



Overview

Other Positions

Research

Publications

Honors

Keywords

Mentoring

Contact Info

Research description (note some may not be up to date)

Research & Publications



Overview

Other Positions

Research

Publications

Honors

Keywords

Mentoring

Contact Info

- **Research tab** gives current and past research funding information. Name of project and dates

- Click this to read the abstract of the project and goals
- Funding is essential for research

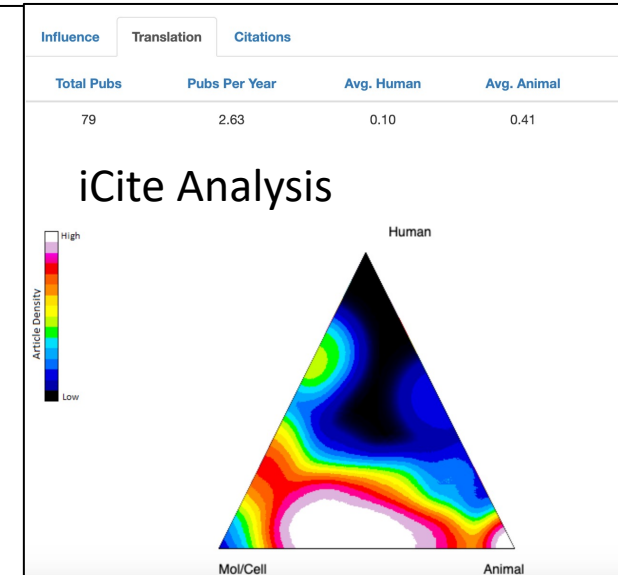
- **Publications tab**- tells you what type of research the group does.

- Recent publications? In well-respected journals?
Is the research contributing to the field?
- Is the potential mentor listed last on these papers (senior author)?
- Click timeline graph to see the recent work and history
- Click the iCite Analysis, then Influence and translation
Determine the type of work they do (human, Animal, Basic)

List Timeline Graph Timeline Data

Publications listed below are automatically derived from... can login to make corrections and additions.

iCite Analysis Copy PMIDs To Clipboard



Let's run through an example

<https://profiles.bu.edu/search/>

NIH reporter

- What are the project Aims?
- What are the broad objectives of the research
- Good idea to read before meeting with faculty

<https://reporter.nih.gov/>

THE LETTERS

- F are trainees (F31, F32)
- T are for trainees (T32)
- K are career development (K01, K08, K23, K99) → trainees/junior faculty
- R are independent research (R01, R03, R21)
- P are big projects

Posted projects

Current research opportunities

<https://www.bumc.bu.edu/medstudentresearch/getting-involved-in-research/research-opportunities/>

Research Opportunities



The searchable and sortable table below provides the current research projects from our BU Chobanian & Avedisian School of Medicine faculty/mentor members. Interested medical students are encouraged to directly contact the mentors listed for more information.

Additional tips for finding and contacting mentors: [How to find a mentor](#)

Please type inside the search table below the disease, the specific project grant name, name of faculty/mentor or any other keywords to find more information about research projects available for medical students.

These are the current NIH research project grants: [Boston Medical Center](#) and [BU School of Medicine](#).



NIH projects (BU and BMC)

Additional list of clinical department grants: [Clinical department grants](#)

Search table...



Search here

Department	Research Project	Mentor	Month Posted
Anatomy & Neurobiology	<p>Project Title: The Role of X-chromosome-linked Genes in Down Syndrome and Alzheimer's Disease-related Pathology.</p> <p>Project Goals: The project will be focused on the contribution of X-chromosome-linked genes that are dysregulated in Down Syndrome to the pathological cellular phenotypes and Alzheimer's disease-related pathology. The project's main goal will be to perform gene editing to</p>	Ella Zeldich BU Profile	February

Put it all together

- Are the research projects interesting?
- Potential resources to support the research?
(research costs \$ → project supplies, publication charges, conferences)
- Is the mentor experienced? Mentor committed to my development
(examples from prior mentees)
- Read the abstracts...ideas of papers to be able to discuss at interview
(shows interest, motivation, questions)
- Most faculty want to know what you will be able to contribute to the team.
This is an interview process.
If the mentor invests in you, will you help the team advance the science?

Tips for contacting faculty

<https://www.bumc.bu.edu/medstudentresearch/contacting-faculty-about-research/>

It is important to prepare before contacting faculty about potential research opportunities. Below are a few tips to help the process go smoothly.

1. Update your CV +
2. Write the email +
3. Now you wait +
4. Prepare to meet in person +
5. After the meeting +
6. Next steps +

Upcoming events

- All posted in the Student Affairs Friday Bulletin → Research Hub
- Research lunches with faculty....more info and signup to come
Oct 17, Oct 27, Oct 30
Nov 2, Nov 8
- Meeting on applying to the LEADS Research track & MSSRP

Questions & Contact

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