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# Rutgers Biomedical Graduate Programs in New Brunswick/Piscataway

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School of Graduate Studies – New Brunswick/Piscataway

October 2023

# Overview of Rutgers

# Where are we?



## Rutgers Facts



- Member of Association of American Universities and Big10 Academic Alliance
- Ranked 15<sup>th</sup> for Public Universities in US News and World Report 2023-24
- Ranked 57<sup>th</sup> of 2000 to world universities 2022-23 by the Center for World University Rankings
- Rutgers brings more federal research dollars to New Jersey than all other New Jersey colleges and universities combined
- Top 6% of American universities in science and engineering research and development expenditures
- \$907.9 million in research grants and sponsored programs
- 470 clinical trials supported at any given time



University of Illinois

Indiana University

University of Iowa

University of Maryland

University of Michigan

Michigan State University

University of Minnesota

University of Nebraska-Lincoln

Northwestern University

Ohio State University

Pennsylvania State University

Purdue University

Rutgers University

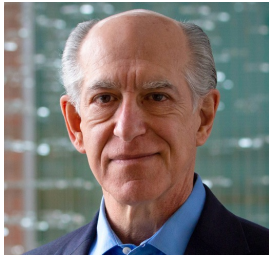
University of Wisconsin-Madison



## Our faculty hold prestigious positions

Rutgers has more faculty in the National Academy of Sciences and the American Academy of Arts and Sciences than any other public peer school in the Northeast.

Manny DiCicco-Bloom



Tara Matise



Renping Zhou



Richard Ebright



Andy Singson



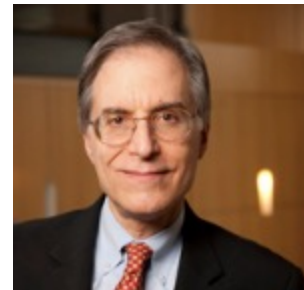
Ken Irvine



Masayori Inouye



Arnold Rabson



Suzie Chen



Charles Dismukes



Tony Kong



Peter Lobel



Pal Maliga



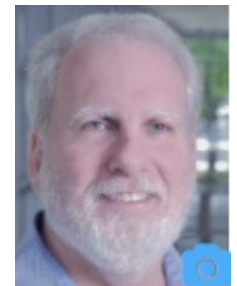
Chris Molloy



Monica Roth



Martin Yarmush



# Rutgers houses world-renowned resources



- Largest DNA and cell repository in the world for the study of genetics and autism, mental health, drug abuse, alcoholism, diabetes, and digestive and kidney disease.



- Host to the Protein Data Bank, the single worldwide repository for 3D protein structures.

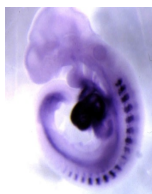


- A 550,000-square-foot, \$665 million project to bring scientists, doctors and patients together opening 2025

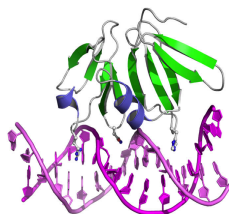
# Graduate Programs

## Biomedical Science PhD Programs in New Brunswick/Piscataway

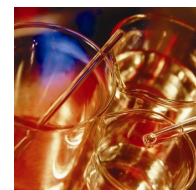
### Molecular Biosciences Umbrella Program



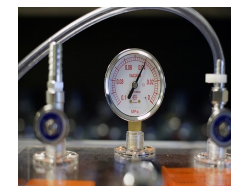
Cell and Developmental Biology



Biochemistry and Molecular Biology



Cellular and Molecular Pharmacology



Physiology and Integrative Biology



Molecular Genetics and Microbiology

### Individual Graduate Programs



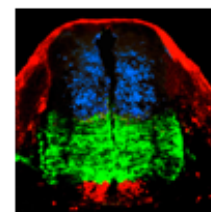
Biomedical Engineering



Exposure Science and Assessment



Toxicology



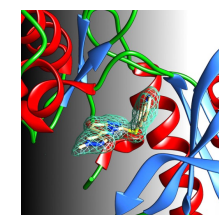
Neuroscience



Public Health



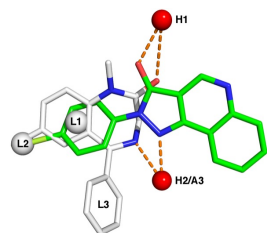
Nursing



Quantitative Biomedicine



Pharmaceutical Sciences



Medicinal Chemistry



Microbial Biology



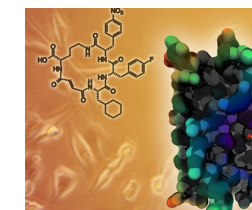
Endocrinology and Animal Biosciences



Nutritional Sciences



Chemical Biochemical Engineering



Chemistry and Chemical Biology

## NB/Pisc Masters Programs

<https://grad.rutgers.edu/academics/graduate-programs/biomedical-and-health-sciences-all-degree-programs/masters-programs>

- Master of Biomedical Science for students applying to medical or dental school who need to improve their application
  - 30 credits, 1 year program if full time, anatomy, capstone project with faculty member, Accelerated Application to RWJMS if criteria is met
- Master of Science in Biomedical Science for those interested in research
  - 30 credits, 2 year program, thesis instead of capstone

## MD/PhD program

Students receive both a MD and PhD degree - Treat and Cure

Structured program that reduces time for both degrees

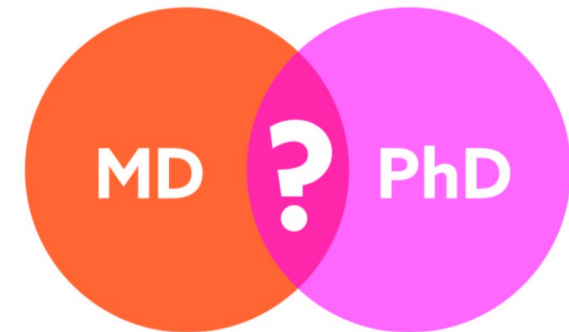
First 1.5 years of medical school

Followed by 3-4 years for PhD (multiple disciplines)

Ends with last 2.5 years of medical school

All medical school expenses are paid and the student also receives a stipend

Educational benefit: trained as a physician-scientist bringing medicine to science and science to medicine but only for students who are equally excited about medicine and research



## MD/PhD Rutgers and Princeton Joint Program

Unique collaborative environment between a state university and an Ivy League institution

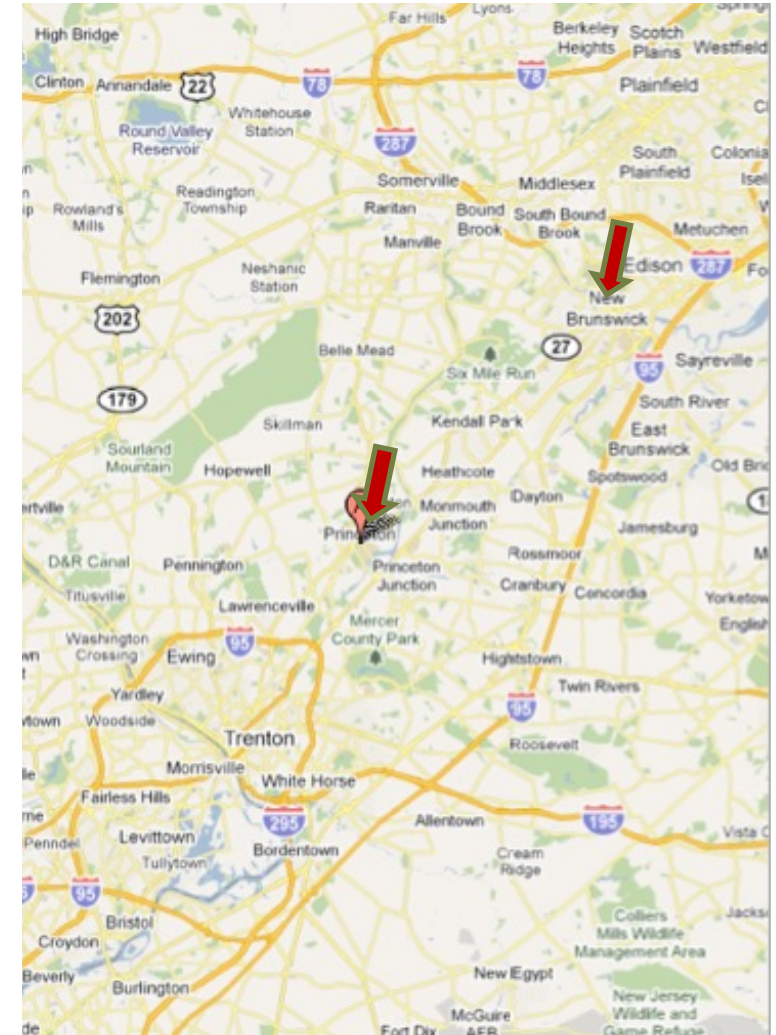
Rutgers: Leverage many resources of a large state university  
>450 faculty to choose from

Princeton: one of the most prestigious schools in the world  
Smaller without the post-graduate schools

Can pick a PhD that is not biology (e.g. anthropology, public health etc...)

Diversity (~50% women; 20% URM students)

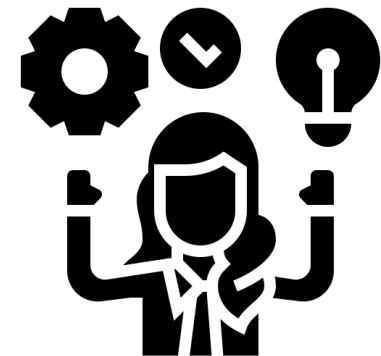
~70% enter research track or research intensive residencies  
(UPenn, Columbia, Mt Sinai)



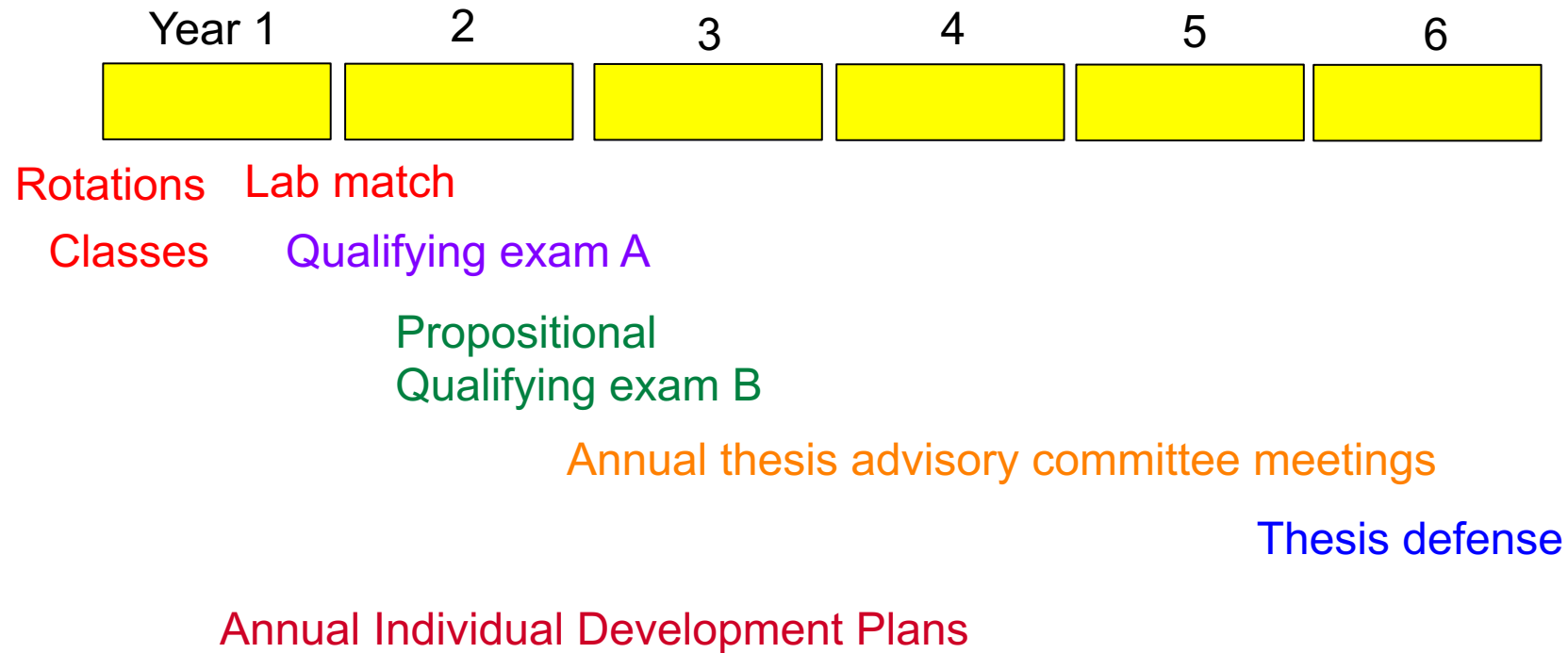
# Graduate Training and Mentoring

# Competencies learned in PhD programs – transferrable skills

- **Broad conceptual knowledge** - core courses
- **Deep knowledge of a specific field** - upper level courses, thesis work, and journal clubs
- **Critical thinking** - reading papers, planning experiments, reviewing grants and manuscripts. **Manuscript and grant writing workshops and groups**
- **Experimental skills** - rotations and thesis lab, collaborations
- **Responsible conduct of research** – **Ethical Scientific Conduct initial and refresher**
- **Rigor and reproducibility** - **Biostatistics classes**
- **Computational skills** – Computational courses and **Certificate in Computational Biology**
- **Collaboration/Teamwork** – working with other labs and within lab, **join student organizations**
- **Management and emotional intelligence skills** - manage your own project, **Individual Development Plans**, mentor undergraduates, interact with faculty and peers (AAMC documents)
- **Leadership and professionalism** – **volunteer for events and organizations, iJOBS**
- **Communication skills** - presentations in lab, university, and national meetings, writing manuscripts and fellowships, 3 Minute Thesis Competition, **Communicating science class**



# Typical PhD timeline



## Statistics:

Time to defense: ~5.7 years

# of publications: ~3 papers, ~1.4 first author

## Agreements between PhD Mentor and Mentee (AAMC documents)



### Compact Between **Biomedical Graduate Students** and Their **Research Advisors**

*A framework for aligning the graduate student mentor-mentee relationship*

January 2017

### Appropriate Treatment of **Research Trainees**

October 2021

Group on Research, Education, and Training

Association of  
American Medical Colleges

# Individual Development Plans (IDP)

- Educational research has shown that IDPs increase productivity
- NIH requires IDPs for all training grants and NIH Office of Management and Budget sent notice that grad students have dual roles and must engage in both training and career development.
- **First** and third year graduate students will do the AAAS online IDP (<http://myidp.sciencecareers.org/>) and upload to Canvas by Aug 31, 2023.
- Second and fourth year graduate students will complete Rutgers IDP and meet with an professional in potential career area.
  - Milestones and expectations for each year of grad school
  - SMART goals (Specific, Measurable, Achievable, Relevant, Time-Bound)



# Financial Support and Predoctoral Fellowships

- All accepted students receive full coverage of tuition, health insurance and fees plus stipend of \$40,635/year
- After first year, you can be covered by PI's grant, training grant (e.g IMSD, Biotech), Teaching Assistants, or your own external fellowship
- ~17% of current biomedical students have external fellowships
  - Application workshop every Fall
  - Specific Aims workshop every Spring
  - Courses on grant applications
  - Lots of templates and support materials
- GradFund also helps with fellowship applications
  - \$100 million in external fellowships and awards in the last 20 years
  - Help identifying funding sources
  - Virtual Office
  - Help with application logistics
  - Feedback, editing, and revising



*GradFund*

# Grant Writing Workshops



REGISTER HERE!



To Register, Click [here!](#)

## Where Should I Start? Building A Research Proposal



**March 3<sup>rd</sup>:** Participants will learn about constructing  
12-1:30 pm their proposal for submission as a NIH  
fellowship application

*This session will be held in-person for Rutgers students and postdocs  
in New Brunswick and Piscataway at EOHSI and CINJ. Others can  
participate via Zoom. Lunch will be served at 11:45 am.*



**March 16<sup>th</sup>:** Receive feedback on a NIH Aims page

12-1:30 pm *This optional session will be held on Zoom for trainees  
who submit their Aims pages by Mar 13<sup>th</sup>*



Supported by NIH Grants UL1TR003017, T32ES001748, T32CA257957,  
Rutgers School of Graduate Studies and the Rutgers Office of Postdoctoral Advancement

Boiler plate paragraphs for various  
sections of fellowships

## Grant Writing 101: NIH Grant Bootcamp

*Learn from grant writing coaches, recent  
awardees, and experienced peer reviewers.*



### Who can participate?

*Postdocs, residents, fellows, faculty, instructors,  
and clinicians working towards career (K) and  
research (R) grants for submission to NIH.*



### When and where?

*Rutgers Busch Campus,  
Piscataway, NJ  
In-Person only*

**July 11<sup>th</sup>**  
**9am-5pm**

### Welcome to All Types of Research



**Preclinical  
Science**



**Clinical &  
Translational  
Science**



**Population &  
Behavioral  
Science**

**SPOTS ARE  
LIMITED !**

**Submit your  
application  
to the bootcamp:**



**RUTGERS**

Environmental and Occupational  
Health Sciences Institute | EOHSI

Questions?  
Email Lauren Aleksunes at  
[aleksunes@eohsi.rutgers.edu](mailto:aleksunes@eohsi.rutgers.edu)



Other opportunities at:

<https://njacts.rbhs.rutgers.edu/education-training/workforce-development/grant-writing-training/>

# Training Grants to Support PhD Students

- NJ Alliance for Clinical and Translational Science (NJ ACTS)  
<https://njacts.rbhs.rutgers.edu/education-training/workforce-development/tl1-predoctoral-postdoctoral-training-awards/>
- Biotech training program <https://biotechnology.rutgers.edu/>
- Initiative for Maximizing Student Development  
<https://grad.rutgers.edu/academics/graduate-programs/biomedical-and-health-sciences/all-degree-programs/initiative-maximizing-student-development>
- Environmental Toxicology <https://jgpt.rutgers.edu/>
- Training in Translating Neuroscience to Therapies <https://rwjms.rutgers.edu/institutes/institute-for-neurological-therapeutics/mission>
- Training in Addiction Research – <https://www.addiction.rutgers.edu/announcing-a-new-nida-funded-t32-pre-postdoctoral-research-training-program-in-neuroscience/>



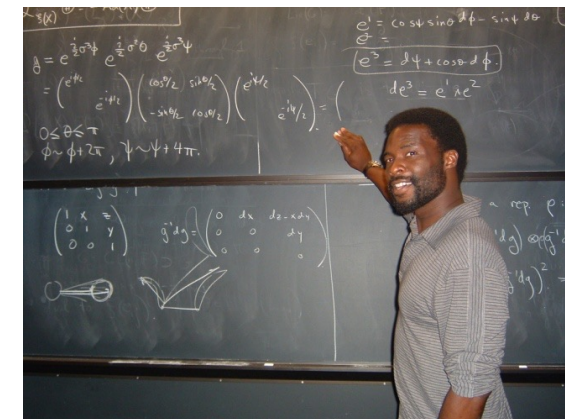
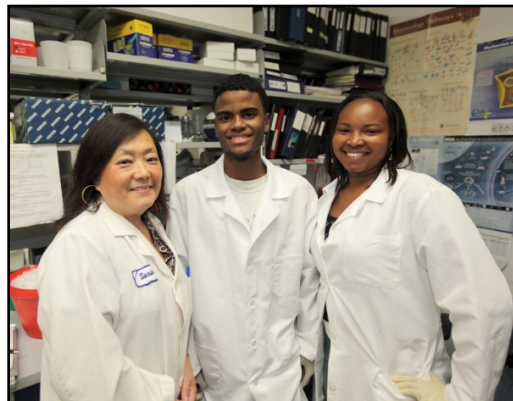
## Commitment to Diversity and Inclusion

- Training grants (e.g. IMSD) and pathway programs (e.g. RiSE) focused on graduate diversity
- Leadership at Rutgers are diverse and have created Division of Diversity Inclusion and Community Engagement
- Grad school strategic plan to enhance support for student from underrepresented groups
- Membership in organizations such as ABRCMS and SACNAS
- Inclusive teaching and mentoring
- Multicultural local and regional population

~22% of applicants get offered admission and 40% of those matriculate

~14% Black, Hispanic, and Puerto Rican

~51% Female



## International Scholars

Rutgers Global–International Scholar Services provides immigration services and advising to help international scholars maintain legal status throughout their time at Rutgers, and offers programs with an international focus for all members of the university community.

The center provides:

- Personal advising sessions on immigration, cross-cultural, and other personal matters
- Workshops immigration-related matters for international scholars
- A regular series of cross-cultural social programs to help you acclimate to U.S. and Rutgers culture, called the International Friendship Program (IFP)



Services at 30 College Avenue, New Brunswick are available 8:30am-5:00pm, five days a week, except on Wednesdays, when the office is not open to student walk-in visits. <https://global.rutgers.edu>

I also offer annual seminars with an Immigration Attorney to give the current status

# Graduate Student Organizations

- Molecular Biosciences GSO
- NeuroConnections
- Rutgers Association of Toxicology Students
- Biomedical Engineering Student Society
- Rutgers Exposure Science Student Association
- NJ Seeding Labs
- Society for Advancing Chicanos/Hispanics and Native Americans in Science (SACNAS)
- Black Graduate Student Organization
- Nutritional Sciences GSO
- Endocrinology and Animal Biosciences GSO
- Microbial Biology
- Quantitative Biology
- iJOBS blog
- Rutgers GSA – events for everyone



# Mental Health Resources

Counseling and Psychiatric Services (CAPS)

“Let’s Talk” drop-in every Thursday from 10am-12pm

Graduate Student Specific Workshops:

- Time Management and Life Balance
- Stress and Anxiety Reduction
- Building Resilience and Managing Expectations
- Health Communication and Assertiveness
- Mindfulness Meditation
- Yoga
- Cultivating Calm



Drop-in hours with Dana Simons every **Thursday from 10am-12pm in-person** in Center for Advanced Biotechnology & Medicine (CABM) Room 240, 679 Hoes Lane West, Piscataway. No appointment needed!

If you prefer by phone, call 848-932-7884 and press #2 to leave a message with your name, RUID, and phone number and Dana Simons will call you back.



“Let’s Talk” is a **FREE CAPS counseling service**. Conversations with experienced CAPS counselors are **private and confidential**.



No problem or stress is too small to share at a “Let’s Talk” Session

# **Professional Development and Career Exploration**

# Manuscript Writing Workshops

- Mastering the Art of Scholarly Publishing
- The Do's and Don'ts of Effective Figure Design
- Top Design Tips for Better Graphical Abstracts
- Manuscript Writing Workshop
- Top Tips for Better Posters
- Top Tips for Depicting Biological Pathways



**Writing Workshop**  
**September 15, 2023**  
**11.00am-1.30pm**

Center for Advanced  
Biotechnology & Medicine (CABM)  
Room #010  
Busch Campus, Rutgers University

**Postdocs and graduate students**  
*Join us for a writing workshop to learn  
how to go from blank paper to a  
manuscript, while incorporating  
sustainable and healthy writing practices*

**Lunch provided**

**Register here for the workshop:**  
**<https://rb.gy/76ln8>**

 **RUTGERS**  
THE STATE UNIVERSITY  
OF NEW JERSEY

**NATIONAL  
POSTDOCTORAL  
ASSOCIATION**

# Course in Communicating Science

<https://grad.rutgers.edu/academics/academic-enrichment-programs/communicating-science-course>

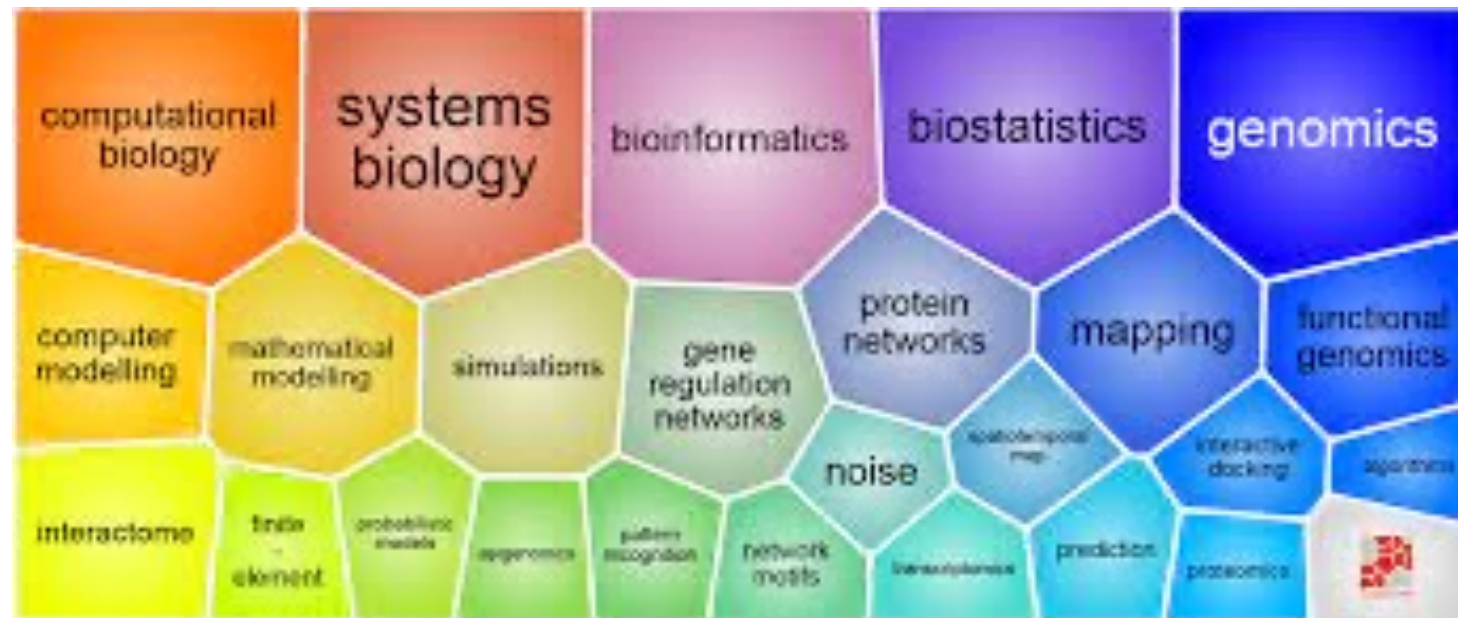
- Response to input from industry and academia
- Grant from Burroughs Wellcome Fund (Ponzio PI)
- Required for some postdocs on T32s
- Techniques from Alan Alda Center. Faculty from Mason Gross and Sciences
- 3 Minute Thesis
- Capstone project with mentor in field of interest



# Computational Biology Certificate

<https://grad.rutgers.edu/academics/graduate-programs/biomedical-and-health-sciences-all-degree-programs/computational>

- The goal of this 12-credit Certificate is to train biomedical Ph.D. students in Computational Biology. Upon its successful completion of this degree, the Certificate will be added onto the transcript in addition to the Ph.D. degree.
- Eligibility: PhD candidates in biomedical sciences affiliated with the following programs who are in their second year or higher of graduate school are eligible to apply for the certificates.
- Curriculum: Python, Bioinformatics, Computational Genomics, Machine Learning, Artificial Intelligence

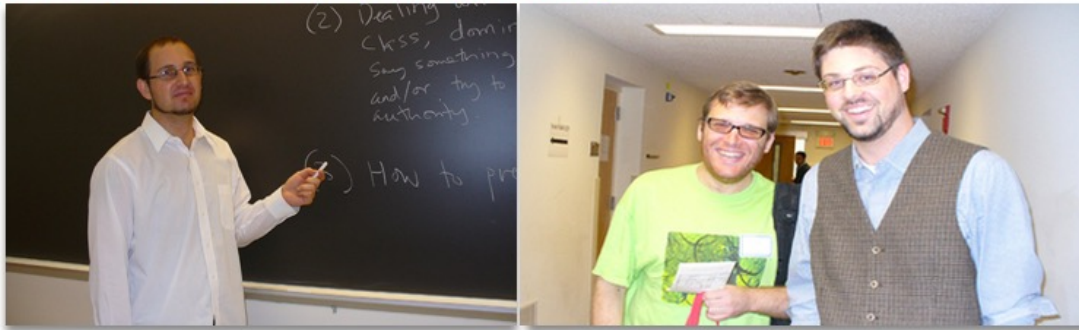


## Teaching and Leadership Opportunities



<https://tap.rutgers.edu/>

*Rutgers Academy for the Scholarship of Teaching and Learning*

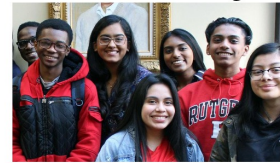


<https://grad.rutgers.edu/professional-development/rutgers-academy-scholarship-teaching-and-learning>

## STEM GRADS GIVING BACK *Upward Bound Math-Science*

**Rutgers graduate students - you can be the person who inspires a high school student to pursue college and the study of science!**

SGS is partnering with Rutgers Upward Bound Math-Science a pre-college program designed to assist and motivate first generation and low-income students to successfully graduate from high school, prepare for college admission, and complete their baccalaureate degree in STEM.



PreDoctoral Leadership  
Development Academy

<https://ol.rutgers.edu/programs/plda/>

# Mentoring Skills: Effective Mentoring of Undergraduates Microbadge



Rutgers Youth Enjoy  
Science Program (RUYES)

## Effective Mentoring of Undergrads

This active learning workshop for PhD students, Postdoctoral Fellows and Faculty will use techniques and case study discussions in breakout sessions to teach tools and skills to better mentor undergraduate students in a research setting. Attendees will also reflect upon approaches they would use to mentor trainees and employees when they are running a lab or research group in the future. An opportunity to earn a **Microbadge in Mentoring Undergrads** is available for those who wish to follow up with additional activities. The workshop is offered by Rutgers SGS in collaboration with RUYES.



**Friday, May 5, 2023**  
**10am-12pm**

**Registration link**

<https://virtualmentoringundergrads.eventbrite.com>

**Zoom link**

<https://rutgers.zoom.us/my/alderja> Passcode: Janet

Topics and interactive case studies led by Drs. Janet Alder, Evelyn Erenrich, and Xenia Morin from the National Research Mentoring Network (NRMN) and Entering Mentoring:

- Managing student projects
- Contract for undergrads
- Aligning expectations
- Dealing with anxiety
- Cultural sensitivity
- Assessing understanding
- Promoting motivation



The RUYES program is funded by the National  
Institutes of Health/National Cancer Institute grant  
1R25CA247785.



# Rutgers iJOBS

Founded by NIH Broadening Experiences in Scientific Training (**BEST**)  
Awards \$2 million for 5 years (2014-2019) to create  
**career and development program for PhD students and postdocs**

Rutgers U

Boston U

UC Davis

UC Irvine

UC San Francisco

U Chicago

U Colorado Denver

Cornell

U Mass Worcester

Michigan State

New York U

U North Carolina

U Rochester

Vanderbilt

Virginia Polytech

Wayne State

Emory/Georgia Tech

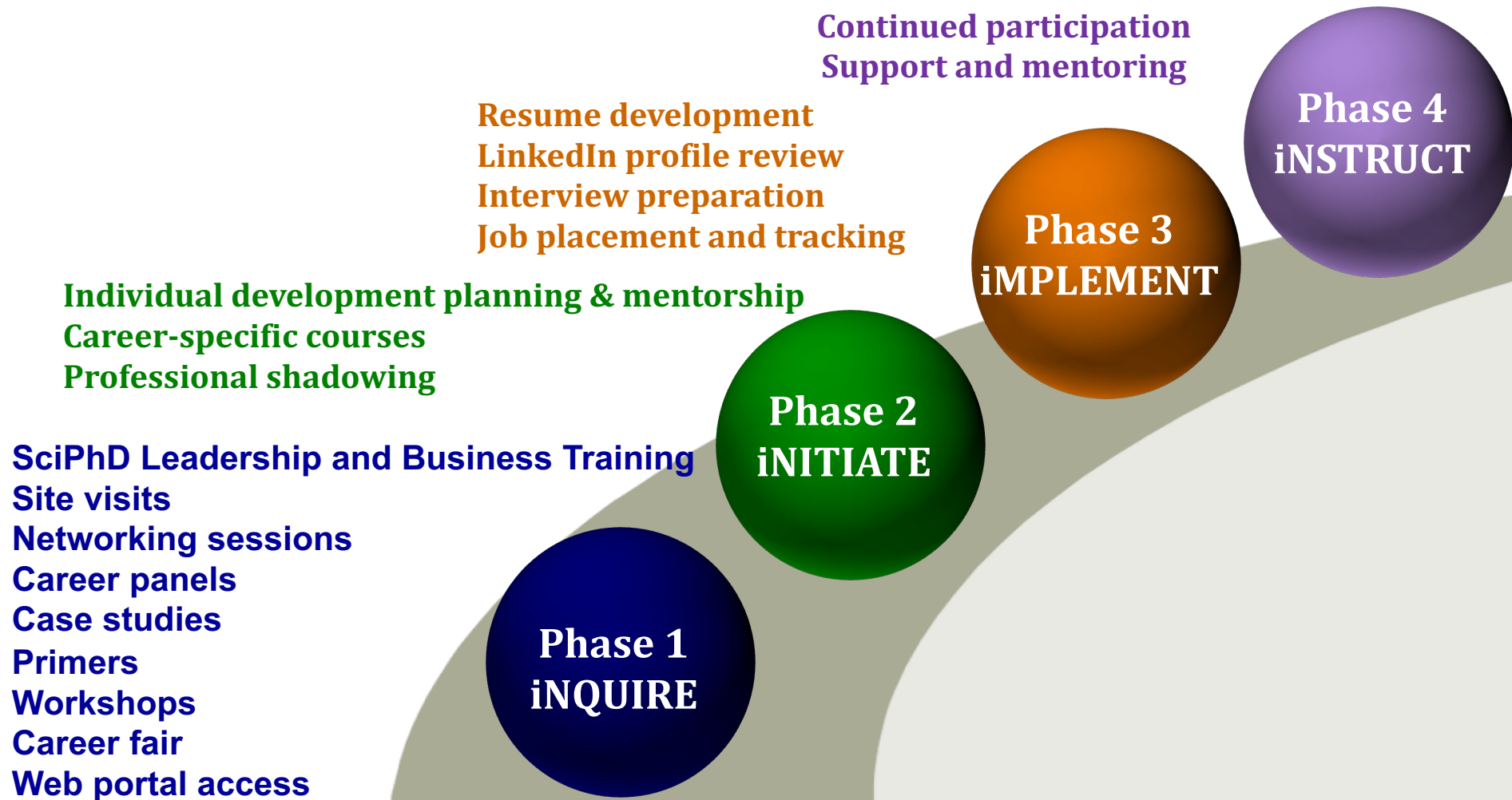


# Examples of Career Tracks

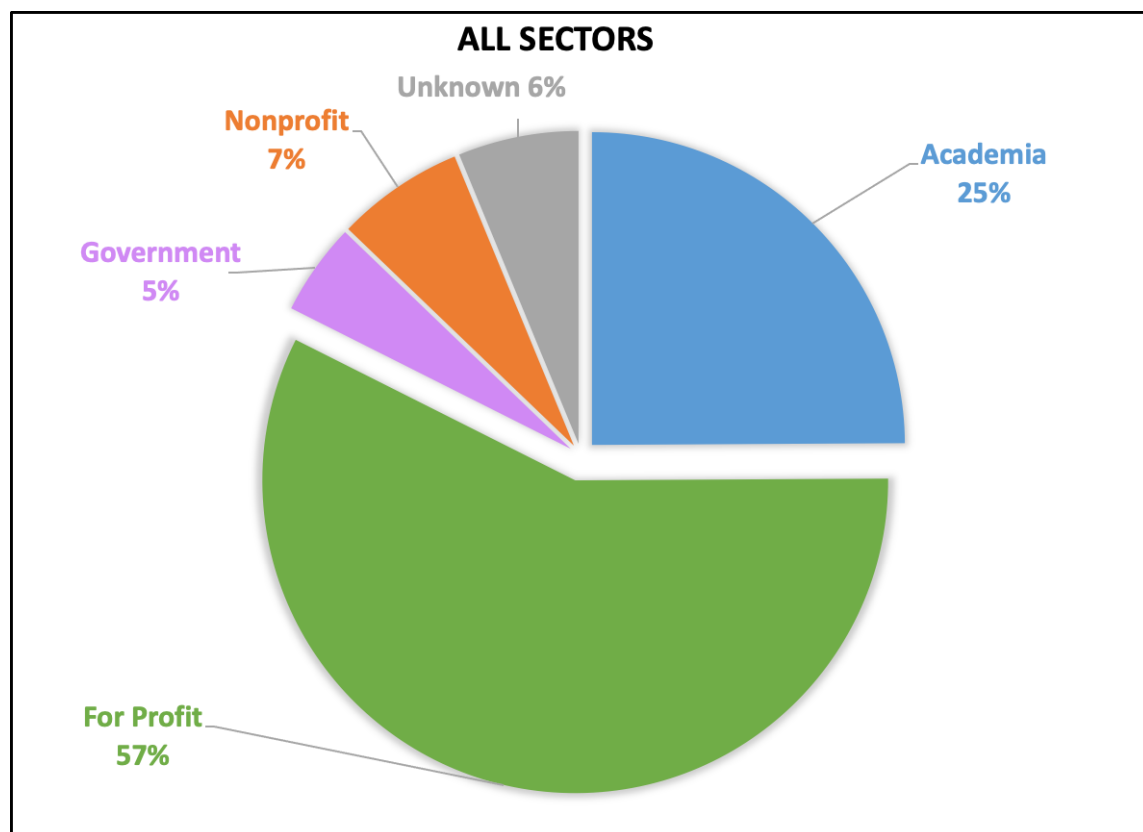
- Principal investigator and faculty at R1 university
- Faculty at Primarily Undergraduate Institutions
- Bench research Pharma or Biotech
- Government positions, (FDA, CDC, NIH)
- Entrepreneur
- Science and Health Policy
- Patent Law
- Tech Transfer and Business Development
- Clinical Research
- Regulatory Affairs
- Health and Science Data Analysis
- Business Consulting
- Scientific Writing and Medical Communications
- Medical Affairs
- Non-profit and Foundations
- Finance and Equity Research
- Publishing
- Food safety
- Journalism
- Teaching Education Outreach



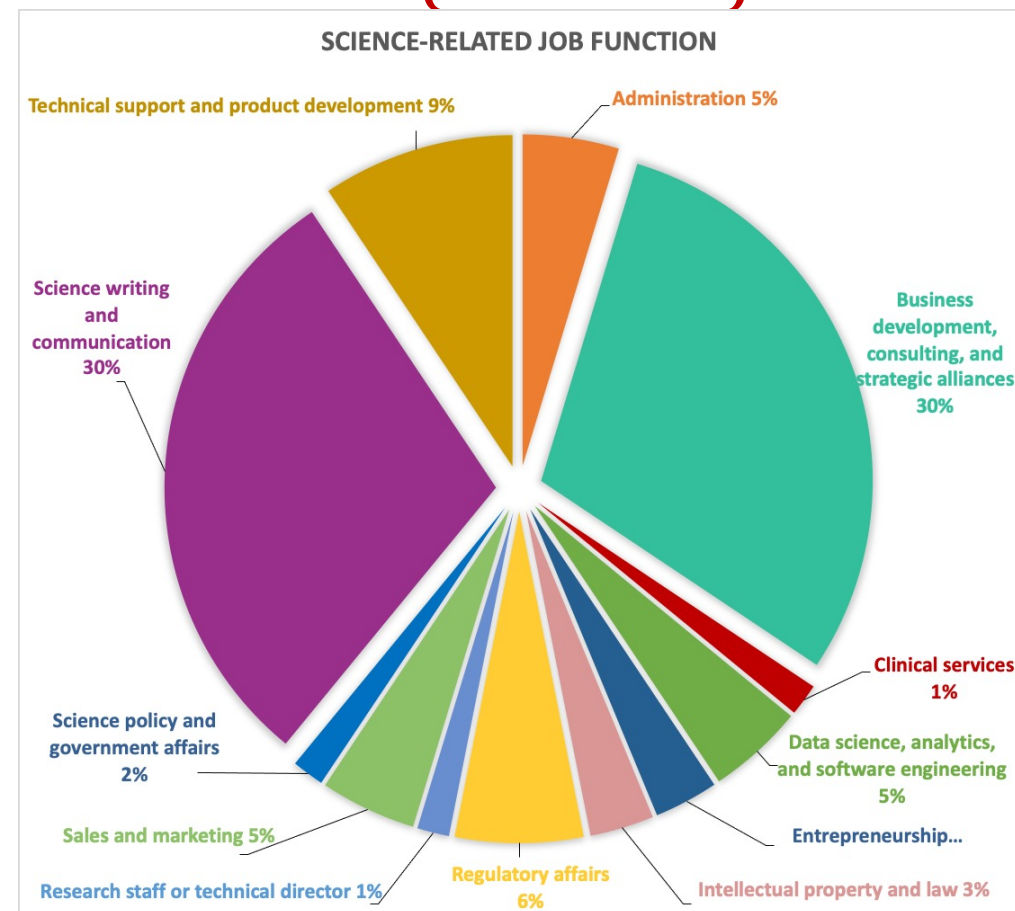
# iJOBS Phased Programming



## First Position of SciPhD Participants (n = 273)

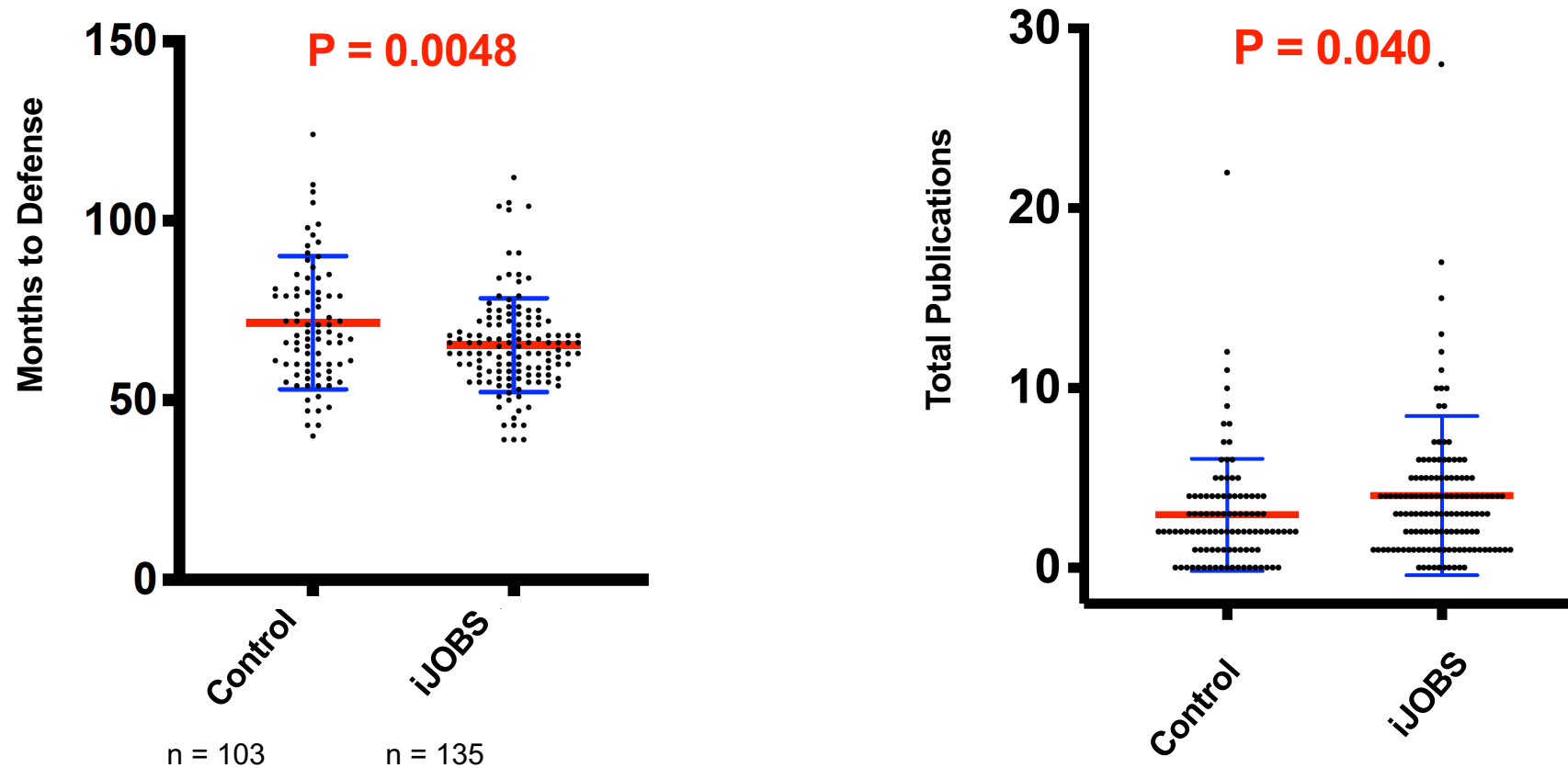


## First For-Profit Non-Research Positions (n = 273)



Data analyzed by Tracy Scott

## iJOBS Participants Have Decreased Time to Defense and Increased Total Publications



Measuring Effects of Trainee Professional Development on Research Productivity:  
A Cross-institutional Meta-analysis, Brandt et al., PLOS Biology, 2021

# Application Process

# Ready to Apply? Components of the Application

<https://gradstudy.rutgers.edu/apply/apply-now>



- Most PhD programs have deadline of December 1
- Application form including contact information
- Personal Statement
- Recommendations
- Curriculum Vitae (CV)
- Transcripts - If your school does not have a GPA system that was 4.0 scale, please enter 0.00 on the electronic application. GPA information is used for statistical purposes and your transcripts will clarify your academic achievement.
- GREs – not required
- TOEFL and IELTS – You are exempt from submitting TOEFL or IELTS scores if you are a Permanent Resident, US citizen, or an international applicant with a minimum of three years undergraduate studies or a masters degree with the mode of instruction being English.
- Application fee (\$70)
  - ★ Waived for McNair, Project 1000, GEM scholars, RiSE alumni
  - ★ We normally do not waive fees for others, but we may defer a fee under extraordinary circumstances. You can request a fee deferral by mailing us a statement of need and supporting evidence of need, such as tax returns or a letter from a financial aid officer from your school. Send to Linda Costa [smeds@ues.rutgers.edu](mailto:smeds@ues.rutgers.edu)

## Personal Statement

- What I have done in *proposed field of study*
  - ★ What got you interested in this field?
  - ★ Discuss *your* research project(s) to date
    - What were *your* most important contributions? Why are they important?
    - Talk about your hypothesis and big picture
  - ★ Details of *your* service or volunteer work, leadership only if relevant
- What I want to do and why
  - ★ Continue to study in-depth and *specify the topic*
  - ★ Become a researcher or scholar in *this field*
- Why Rutgers (or this school) and why this program?
  - ★ The strengths of the program in (*specify*) areas
  - ★ *Specific* faculty doing research that fits with your interests – WHY that faculty?
- Show ability to work independently but also on a team
- Stand out and use your own voice but be wary of humor and quotes
- Be clear and explain what you want to do, why you want to do it, how you are going to be successful, what you want to do after degree



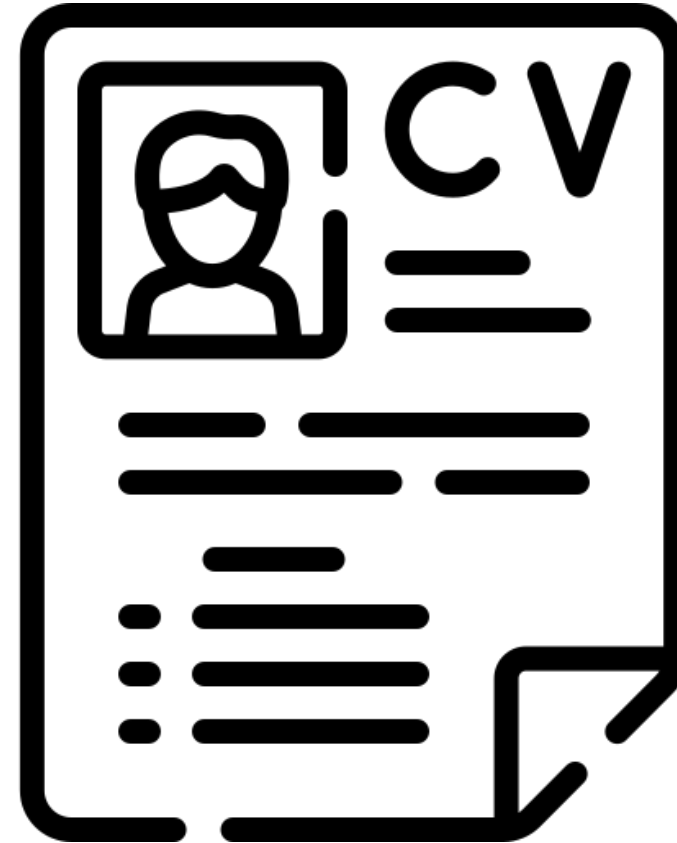
## Recommendations

- Usually 3
- People who know you well from
  - ★ Your research
  - ★ Advanced, inquiry-based courses
  - ★ Service or volunteer work (only if relevant)
- Examples of Someone who will be able to say more than “Susie got an A”
  - ★ Supervisor of summer research project(s)
  - ★ Professor in an upper level class where you participated actively and did independent work
  - ★ Should be high ranked person AND someone who knows you well
- Set up appointment
- Ask “*Are you comfortable writing a STRONG letter?*”
- Give writer info on both school and program
- Provide copies of statements and CV
- Explain anything you want writer to cover or emphasize
- Give ample lead time
- Have a back-up (4<sup>th</sup>) person



## Curriculum Vitae (CV)

- Contact information
- Education
- Relevant experience
- Publications
- Presentations (oral and poster)
- Honors and awards
- Qualifications and awards
- Grants received
- Institutional service
- Certifications
- Professional associations



## Interview days

- First one may be virtual
- If in person you will get your transportation and hotel covered
  - Be able to speak about your research
  - Research the school and who you will be meeting with
  - Be ready to ask the faculty and current students questions



# QUESTIONS?

[janet.alder@rutgers.edu](mailto:janet.alder@rutgers.edu)

<https://grad.rutgers.edu/academics/graduate-programs/biomedical-and-health-sciences-all-degree-programs>

