Biomedical Sciences
PhD and MS Orientation

Jim Millonig, PhD - Senior Associate Dean
Janet Alder, PhD - Assistant Dean
School of Graduate Studies – New Brunswick/Piscataway

August 26, 2020
Agenda for today

• 10:00-11:00 – Overview of resources and opportunities for biomedical graduate students

• 11:00-11:20 – Meet the Graduate Student Organizations and ice breaker

• 11:20-11:35 – Libraries

• 11:35-12:00 – Academic and Research Integrity
Staff of the School of Graduate Studies – Biomedical and Health Sciences in New Brunswick/Piscataway

RWJMS Research Tower R-102

James Millonig, PhD, Senior Associate Dean

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Starting Graduate School in the Era of Covid-19

Rutgers at the forefront of science

New Rutgers Saliva Test for Coronavirus Gets FDA Approval

Emergency use authorization granted for new biomaterial collection approach

We can do this together if we stay safe!
Biomedical Science Programs in New Brunswick/Piscataway

- Molecular Biosciences Umbrella Program
  - Cell and Developmental Biology

- Individual Graduate Programs
  - Biomedical Engineering
  - Exposure Science and Assessment
  - Toxicology
  - Neuroscience
  - Microbial Biology
  - Endocrinology and Animal Biosciences
  - Nutritional Sciences

- Biochemistry and Molecular Biology
- Cellular and Molecular Pharmacology
- Physiology and Integrative Biology
- Molecular Genetics and Microbiology
Rutgers Facts

- Member of Association of American Universities and Big10 Academic Alliance

- Ranked 41st of 994 top US universities by the Center for World University Rankings (2019) and 50th of 2000 to world universities 2020-21

- $658 million annually in research R&D expenditures, among the top 20 public universities in the nation

- Among the top 3 public universities in the Northeast in receipt of Sloan Research Fellowships and National Science Foundation Faculty Early CAREER development awards.

- Top 10% of American universities in science and engineering research and development expenditures.

- Top 3 nationally in National Science Foundation Integrative Graduate Education and Research Traineeship funding.
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.

In last 2 years, 11 biomedical faculty selected to AAAS and 1 to National Academy

Martin Yarmush  Masayori Inouye  Arnold Rabson  Suzie Chen  Charles Dismukes

Tony Kong  Peter Lobel  Pal Maliga  Chris Molloy  Monica Roth
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.
Your Education and Academic Resources
Competencies learned in graduate school – 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
- **Experimental skills** - rotations and thesis lab, collaborations
- **Responsible conduct of research** – Ethical Scientific Conduct initial and refresher
- **Rigor and reproducibility** - biostatistics classes
- **Computational skills** – computer programming class in R and Python
- **Collaboration/Teamwork** – working with other labs and within lab, student organizations
- **Management and emotional intelligence skills** - manage your own project, supervise undergraduates, interact with faculty and peers
- **Leadership and professionalism** – join student organizations, volunteer for events, iJOBS
- **Communication skills** - presentations in lab, university, and national meetings, writing manuscripts and fellowships, 3 Minute Thesis Competition, Communicating Science class
Introduction to Virtual Platforms for Studying

Group Study the old fashion way!
What is essential here?
We work together!!!

We need tools to help bring physically separated students together so they can work TOGETHER!!!
Introduction to Virtual Platforms for Studying

Microsoft Teams
- Central Meeting Hub
  - Bulletin Board
  - Student questions
  - Video Conferencing, chat
  - Collaborative editing of Slides, study guides, etc.

Microsoft Whiteboard or Microsoft PowerPoint
- One-on-one or Group Study meeting supplement
  - Joint editing of a whiteboard with Save and Share
  - Can be used concurrently with Zoom

Zoom
- One-on-one or Group Study meetings
MS Teams as a Study Hub

Lecture Specific Discussions

- Call for and create a study group
- Ask questions/Get answers
- Collaborate on a topic using a whiteboard
- Communicate and plan with your group
- Archive Group work
Typical timeline of Graduate School

Year 1
- Lab match
- Qualifying exam A
- Propositional
- Qualifying exam B
- Annual thesis advisory committee meetings

Year 2

Year 3

Year 4

Year 5

Year 6

Statistics:

Time to defense: ~5.7 years

# of publications: ~3 papers, ~1.4 first author
Individual Development Plans (IDP)

- Educational research has shown that IDPs increase productivity (e.g. http://postdoc.sigmaxi.org/results/)

- 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 Sakai by Aug 31, 2021.

  - Second and fourth year graduate students will complete Rutgers IDP modeled from the ones at Scripps and UCSF and meet with an IDP committee (outside member in potential career area)
School of Graduate Studies

Some recent manuscripts by grad students

Austin Graves – *Journal of Immunology*, July 2020. “Human Hepatitis B viral infection outcomes are linked to naturally occurring variants of H:A-DOA that have altered function.


Urmi Basu - *Journal of Biological Chemistry*, May 2020. “The C-terminal tails of the mitochondrial transcription factors Mtf1 and TFB2M are part of an autoinhibitory mechanism that regulates DNA binding.”


Dahea You - *Drug Metabolism and Disposition*: the biological fate of chemicals, March 2020. “Epigenetic Regulation of MDR1 and BCRP Transporters by HDAC Inhibition.”

Recent pre-doctoral fellowship awardees

Sierra Swords and Mai-uyen Nguyen - NIH F31’s in June 2020


Breann Coffaro - Air Pollution Educational and Research Grant in September 2019.

Anton Omelchenko - NJ Commission on Brain Injury Research Fellowship in April 2019
Courses for writing

Grant Writing Basics spring course
Guidance and practice in writing a biological research grant proposal focusing on Specific Aims. 16:681:601

Advanced Studies in Neuroscience or Psychology to write an NRSA F31 Grant Proposal
The purpose of the course is to facilitate each student's submission of an F31 application for the December deadline. 16:830:504

Graduate Courses in Writing

355:506 Writing for Publication
Focuses on overall organization of published work as well as writing and editing at the level appropriate for a journal submission in the student's graduate field.

355:508 Writing the Dissertation
Focuses on writing at the level appropriate for a dissertation in the student’s respective field.

355:502 Graduate Writing
Focuses on writing for abstracts, reviews, conferences
SGS resources for fellowship writing

• ~17% of current students have external fellowships

• Meeting every September with students and mentors who have been successful obtaining funding and faculty from study section

• Boiler plate paragraphs for various sections
  
  http://rwjms.rutgers.edu/gsbs/student_affairs/fellowship.html

See below for some materials and please contact Janet Alder (janet.alder@rutgers.edu) for additional help if needed.

• RCR training
• Rigor and Reproducibility training
• iJOBS career development program
• Individual Development Plans
• Description of Institutional Environment and Commitment to Training and Additional Educational Information
• Sample successful NIH F applications, NSF, EPA, AHA, NJ state fellowships as well as diversity supplements upon request.
• $45 million in external fellowships and awards in the last 17 years
• Help identifying funding sources
• Virtual Office hours
• Help with application logistics
• Feedback, editing, and revising

http://gradfund.rutgers.edu/
Clinical and Translational Opportunities

NIH Clinical and Translational Award (CTSA)

NJ Alliance for Clinical and Translational Science (NJ ACTS) (PI: Rey Panettieri MD)

**Goal:** $25M award to improve clinical and translational research across NJ

**Institutions:** Rutgers, Princeton and NJIT

**Training Grant support:** Kathy Scotto PhD

**Educational Goal:** to provide the curriculum and the resources so teams of researchers (PhD students, post-docs), physician scientists (MD-PhD students) and clinicians (MD students and clinical fellows) can tackle large medical issues

**New educational initiatives (Clinical and Translational Certificate):**
- Grant writing
- Computational courses
- Biostatistics
- Communication
- Team Science
- Human Body 101
- Clinical shadowing opportunities
- Capstone Project
Cognitive Skills

http://rwjms.rutgers.edu/education/medical_education/student_support/cognitive.html

**Individual Consultation**

- Confidential individual consultation regarding learning, time management and job performance.
- Diagnostic evaluation of study practices and their effectiveness.
- Structured intervention to increase learning productivity and efficiency.
- Individual preparation programs for course, board, and licensure examinations.
- Learning disabilities.

**Seminars**

- Effective study strategies, test taking and time management.
Teaching, Mentoring and Leadership Opportunities

TAPproject
https://tap.rutgers.edu/

Rutgers Academy for the Scholarship of Teaching and Learning
https://gsnb.rutgers.edu/rastl

BIO Links
http://rwjms.umdnj.edu/education/gsbs/student_affairs/BIOLinksTheMolecularBiosciences.html

Mentoring Resources & Training
http://gsnb.rutgers.edu/profdev

PreDoctoral Leadership Development Academy
https://ol.rutgers.edu/programs/plda/

http://rwjms.rutgers.edu/gsbs/student_affairs/career.html
Aaron Shatkin Award 2019

Vrushank Bhatt, Alejandra S. Laureano, Valdir Barth

Awarded to 3 or 4 graduate students annually for distinguished research work over the applicant's tenure at Rutgers University
Graduation Awards 2019

Urmimala Basu, PhD
Stanley S. Bergen Medal of Excellence

Anna Giarratana, MD/PhD candidate
Fulbright grant for Interdisciplinary Studies in Switzerland
Your career
Rutgers - iJOBS

NIH Broadening Experiences in Scientific Training (BEST) Awards
$2 million for 5 years to create infrastructure (2014-2019)

Boston U  
UC Davis  
UC Irvine  
UC San Francisco  
U Chicago  
U Colorado Denver  
Cornell  
Emory/Georgia Tech  

New York U  
U North Carolina  
U Rochester  
Vanderbilt  
Virginia Polytech  
Wayne State
iJOBS Participation

Rutgers Graduate Students
- SGS (New Brunswick/Piscataway/Newark)
- GSN (Newark)
- GSC (Camden)

Rutgers Postdocs
- RWJMS
- NJMS
- SAS New Brunswick
- SoE
- SoP
- SEBS
- SAS Newark
- SAS Camden

Free shuttle transportation provided
Examples of Career Tracks

- Principal investigator
- Bench Research in Government, Pharma or Biotech
- Teaching-intensive careers in academia
- 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
- Entrepreneur
iJOBS Phased Programming

**Phase 1 iNQUIRE**
- Site visits
- Networking sessions
- Career panels
- Case studies
- Primers
- Workshops
- Career fair
- Web portal access

**Phase 2 iINITIATE**
- Individual development planning & mentorship
- Career-specific courses
- Professional shadowing

**Phase 3 iMPLEMENT**
- Resume development
- Interview preparation
- Job placement and tracking

**Phase 4 iNSTRUCT**
- Continued participation
- Support and mentoring

SciPhD Leadership and Business Training

Support and mentoring
Phase 1 iNQUIRE
SciPhD: Leadership and Business Skills for Scientists

Provided by Human Workflows, LLC
Every Jan/Feb since 2015 - 35 hours

- The Business of Science
- Major Leadership Styles
- Successful Communications as a Scientist
- Developing Your People
- Networking and the Interview Process
- Team Performance Tools
- Negotiations
- Financial Literacy
- Strategic Project Management for Scientists
Representative Site Visits

- Merck (4)
- Genewiz (3)
- Bristol-Myers Squibb (4)
- Novartis (3)
- GlaxoSmithKline (2)
- Regeneron (4)
- Eli Lilly (2)
- Celgene (2)
- Janssen (2)
- Commercialization Center for Innovative Technology (2)
- Institute for Life Science Entrepreneurship (2)
- Enterprise Development Center
- Sanofi Aventis
- Covance
- Kashiv
- Ferring Pharmaceutical
- NJ Dept. of Health (3)
- Stryker
- Colgate-Palmolive
- Envigo
- Ethicon
- McCann Health (2)
- Bayer (2)
- PTC Therapeutics
- Nanion Technologies
Representative Job Simulations

- Entrepreneur – what is involved in starting a biotech
- Science Policy – write a policy memo
- Business Development – decide whether to acquire a new company
- Pharma R&D - design preclinical trial to optimize clinical success
- Publishing – decide whether to accept a manuscript
- Pharma Market Research Analysis – report on whether drug is worth pursuing
- Medical Affairs – Medical Informaticist vs MSL role play
- Consulting – recommend approach to launch new clinical trial
- Regulatory Writing – prepare an Investigative Brochure
- Medical Communications – create slide deck for physician
- Patent Law – rewrite patent to demonstrate originality
- Mergers and Acquisitions – decide how much to bid on a new company
Representative Workshops

- Targeted resumes
- LinkedIn profiles with photo shoot
- Networking skills
- Transferrable skills
- Interviewing skills
- Informational interviews
- Job search using staffing agencies
- Finding and applying for an internship
- Goal setting and time management
- How to prepare for job fairs
- International students seeking employment in USA
- Self assessments (StrengthsFinder, Birkman)
- Emotional Intelligence and influencing others
Phase 2
INITIATE
Career Track Example Skill
Classes
One 40-Hour Class

- Programming Methodologies for Numerical Computing
- Drug Discovery through Preclinical Development
- Introduction to Public Administration; Public Policy Formation
- Clinical Trials, Adverse Event Reporting, Post-Marking
- Practical Aspects of Clinical Trial Design
- Bioengineering in Biotech and Pharma Industries
- Fundamentals of Regulatory Affairs

- Project Management; Perspectives in Drug Development
- US Healthcare System ad Pharma Managed Markets
- Drug Development: From Concept to Market
- Project Management
- Pharma Product Management
- Organizational Behavior
- Innovation and Entrepreneurship
Professional Shadowing and Mentoring

- Each trainee is matched to a mentor and a shadowing opportunity relevant to their chosen track with industrial, institutional or governmental partners. 72 hours over a whole semester or over 2 weeks.

- Each trainee uses the Individual Development Plan (IDP) as a framework for growth.
Communication Platforms

Email listserve: 1500 members

Website: ijobs.rutgers.edu

iJOBS Past Events and Resources

7 September 2016
IJOBS Workshop: Job Search Using Staffing Agencies
Hear from representatives from companies such as Aerotek, Hays and Proteus to learn how staffing agencies work and how to best utilize them in your job search at different phases in your career. There will be an opportunity to meet with the representatives after their presentations to get general feedback.
Click here to view the speaker Bios for this event

22 June 2016
IJOBS Career Panel: Identifying and Protecting Emerging Technology/New Business for Pharma
Hear from two Rutgers alumni who now work as the Senior Manager of Global Business Insights and Competitive Intelligence at Celgene and an Associate in Life Sciences for IPGyous Inc. To view the agenda and speaker bios, please click here.

14 June 2016
IJOBS Site Visit: Celgene
Visit the manufacturing site for the cellular therapeutics branch of Celgene. Hear from Greg Russel, PhD Vice President of Tech Ops and hear from other Celgene employees. To view the agenda and speaker bios, please click here.
iJOBS Program Registration

Phase 1
• iJOBS programming open to all pre and post-doctorates as well as recent alumni.
• Some events have limited capacity; participants register on a first come, first served basis.

Phase 2
• Graduate students should have completed propositional qualifying exam. Postdocs are eligible at any time.
• Trainee application approval based upon Phase 1 participation (12 hours), letter of intent, letter of recommendation. PI approval for participation is required with application.
• Applications open every April and program starts in September for 1 year
First Position of SciPhD Participants (n = 165)

- Academia: 29%
- For Profit: 53%
- Nonprofit: 7%
- Government: 6%
- Unknown: 5%

Current For-Profit Non-Research Positions

- Business development, consulting, and strategic alliances: 34%
- Data science, analytics, and software engineering: 12%
- Science writing and communication: 22%
- Science policy and government affairs: 4%
- Science education and outreach: 2%
- Technical support and product development: 4%
- Sales and marketing: 12%
- Entrepreneurship: 2%
- Intellectual property and law: 6%
iJOBS Participants Have Decreased Time to Defense

- Control: $n = 103$
- iJOBS: $n = 135$

**Months to Degree**

- $P$ value = 0.08

**Months to Defense**

- $P$ value = 0.0048
iJOBS Participants Have More Total Publications

P value = 0.04

Total Publications

P value = 0.23

First Author Publications
Non-Academic Resources
Website: your resource for everything
http://rwjms.rutgers.edu/gsbs/

Join our groups and also email us your news to post!

Google calendar
- Seminars
- Career development events
- Thesis defenses
- Workshops
- Can link to your calendar

LinkedIn has alumni contacts – important for career development
https://www.linkedin.com/groups/3679494/
Important Websites and Information

Resources for Graduate Students:
http://graduatetestudentlife.rutgers.edu/university-resources/

- Bias reporting and prevention
- Violence Prevention and Victim Assistance (VPVA)
- Title IX
- Food pantry
- Office of Disability Services (slides)
- Career Exploration and Success (slides)
Have Fun!
Rutgers is less than an hour to NYC and Philadelphia by train
School of Graduate Studies

Delaware and Raritan Canal

Poconos Mountains

Jersey Shore
Reach Out if You Need Help - CAPS

Counseling and Psychiatric Services (CAPS)
Monday-Friday 9am-4pm: 848-932-7884 Evenings and weekends: 1-855-654-6735

Let’s Talk drop every Thursday from 11am-1pm with Dana Weinstock

-CAPS Website - http://health.rutgers.edu/medical-counseling-services/counseling/
-http://health.rutgers.edu/education/self-help/virtual-workshops-resources/
-Do Something Link: http://health.rutgers.edu/do-something-to-help/
-The Trevor Project (crisis hotline for LGBTQ Youth): 866-488-7386
-Crisis Text Line (CTL): Text KNIGHTS to 741741 & include "STEVE" for People of Color on any smart phone (available 24/7)
-Acute Psychiatric Services (APS: available 24/7) Dial 1-855-515-5700. If you are out of the New Brunswick/Piscataway area, call 911
-NJ Hopeline, 24 hour crisis phone line: 855-654-6735 (Available within NJ 365/24/7)
-Rutgers Hopeline: 855-654-6735
-RUPD: 848-932-7211
-National Suicide Prevention Lifeline: 1-800-273-TALK (8255)
Dana Weinstock - Community Based Counselor
RU HERE:

COURSE ATTENDANCE

You are registered for the fall 2018 semester. Please confirm your enrollment below.

I confirm my attendance for the fall 2018 semester.

[Yes, I am attending]

I will not attend the fall 2018 semester and understand that I must complete the formal withdrawal process.

[No, I am not attending]
We Are Here for You

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Janet Alder: janet.alder@rutgers.edu
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)
- Nutritional Sciences GSO
- Endocrinology and Animal Biosciences GSO
- Microbial Biology
- Quantitative Biology
- iJOBS blog
- Rutgers GSA – events for everyone