Labs 101

Brandeis Science Research Connection Club

Stephanie Zhang

President (she/hers)
Class of 2026
Goode Lab
Biochemistry and Biology Major

Cramer Gotthelf

Event Coordinator (he/him)
Class of 2026
Kurmangaliyev Lab
Biology and Neuroscience Major

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President (any pronours)
Class of 2026
Geophysics Group (Lawrence)
Physics and Theatre Arts Major

Sumayya Wafapoor

Event Coordinator (she/hers)
Class of 2027
Haber Lab
Biology and Neuroscience Major

Japhy Theobald

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Class of 2026
Kadener Lab
Biochemistry Major

Mia Warshaviak

Treasurer (she/hers)
Class of 2027
Bisson Lab
Biology and English Major

Shyla Patel

Media Coordinator (she/hers)
Class of 2029
Biology and HSSP Major

Mission Statement

BSRCC aims to introduce, connect, and help undergraduate students at Brandeis get involved with research labs in the science departments.

- Introduce the different labs at Brandeis, share research experiences in our own labs
- Connect and hold workshops with different resources at Brandeis (both for students that are looking to join a lab or have already joined one)
- Build a close community of undergrad researchers

Semester Plan

October

- *Science Trivia Night*

November

- *Graduate Student panel*

December

- *Summer Research Opportunities*

Interested in being involved with BSRCC E-Board?

- Attend 70% of the events to be able to vote for President and Vice-President
- Attendance of events will be weighed for applications for other positions

What Can University Research Do For You?

1) **Medical Field**

MD or MD/PhD

- Question: “Why medical school over research?”
- Can demonstrate skills necessary for medical school

2) **Academia**

Masters or PhD

- Continue research as a Graduate Student
- Defend thesis, get that Dr.
- A lot of independent work

3) **Industry/Public**

Clinical

- Do research for a company (R&D, Biotech, Biopharm, etc...)
- More team based
- Greater applications of science

Workday

Workday: Paid Research

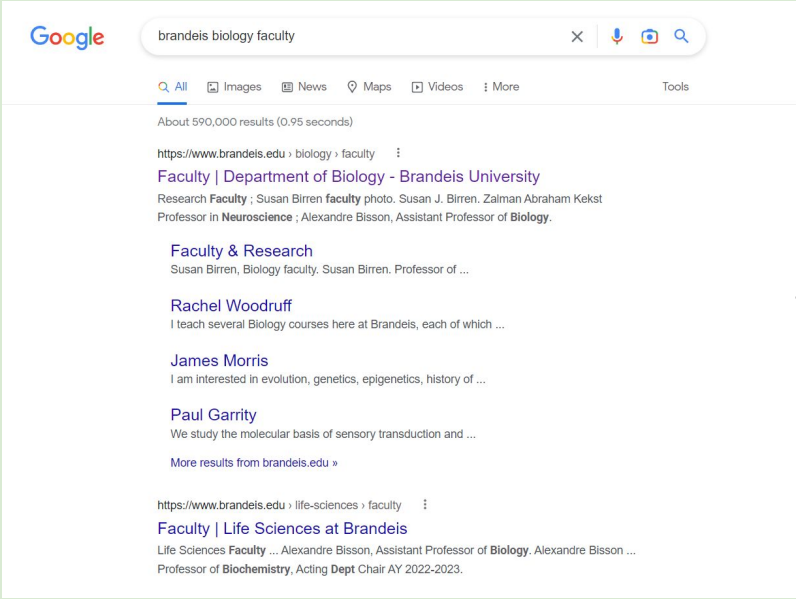
- Workday > Career > Find Jobs for Students
- Some labs hire through Workday for paid positions
- Lab assistant/Research assistant
- Will have limited labs (only the labs that have paid positions; many research positions are not paid)

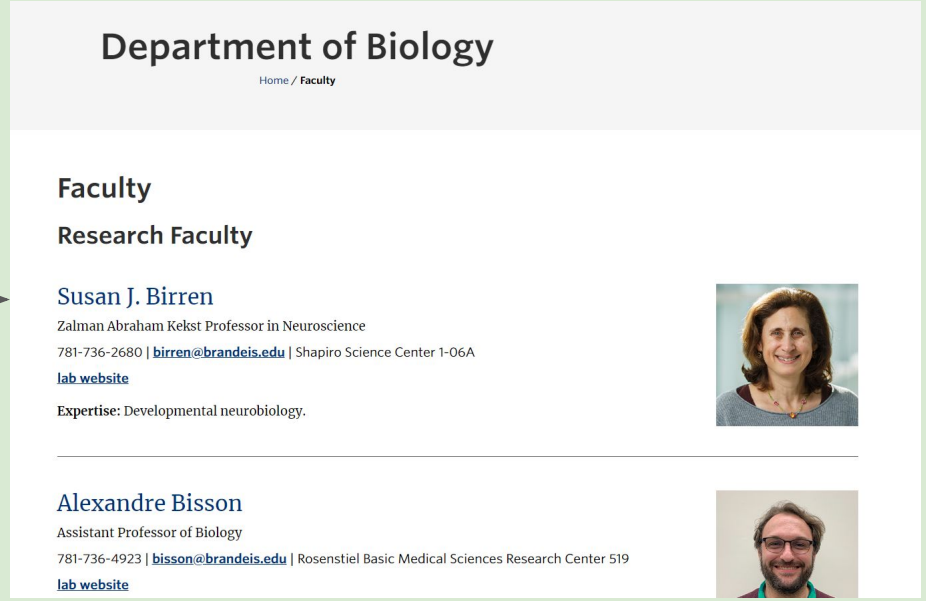
Networking

Approaching other Students

- Network through other undergraduate/graduate students
- Talk to your TA in lab classes
- Talk to your undergraduate peers in classes
- Ask:
  - What their research project is about
  - If their lab has any open positions
  - What type of PI the lab has
  - Best way to contact PI

Personalized Emails





Look in “Team” or “Members” page for current lab members. Info for contact can be found there or in “Contact” page

Each faculty member usually has link to lab website

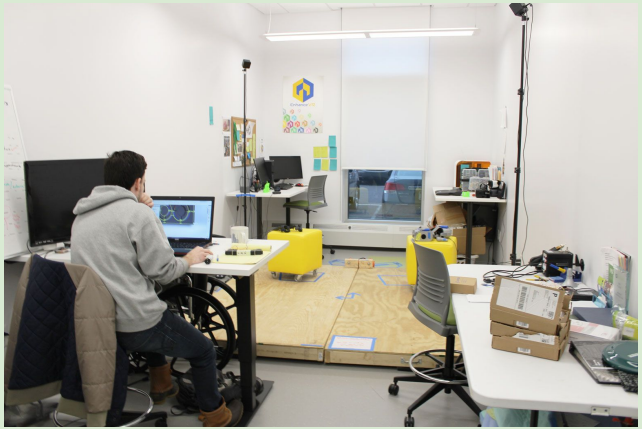
Cold Emailing

- Introduce yourself
- Read a couple of papers and express your interests in parts of their research - It's ok to not understand everything or anything, ask them about it (PIs LOVE talking about their research)
- Talk about previous experiences or relevant coursework
- Personalize your email to each PI (remember college apps?)
- PIs talk amongst themselves and they will definitely know if you copy and paste emails and switch out names

Dry Lab vs. Wet Lab

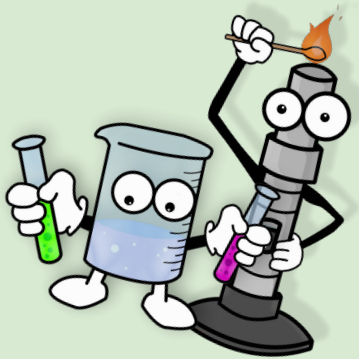
Dry (computational)

- Computer- based experiments
  - Chemistry, Physics, Math
  - Models and simulations
  - Computational mathematical analysis + coding



Wet (liquid substances- chemicals, reagents)

- Liquid-based experiments
- Chemistry, Biology, Biophysics, Neuro
- Tissue culture
- Cell + Protein experiments
- Working with animals



Lab Assistants vs Research Assistants

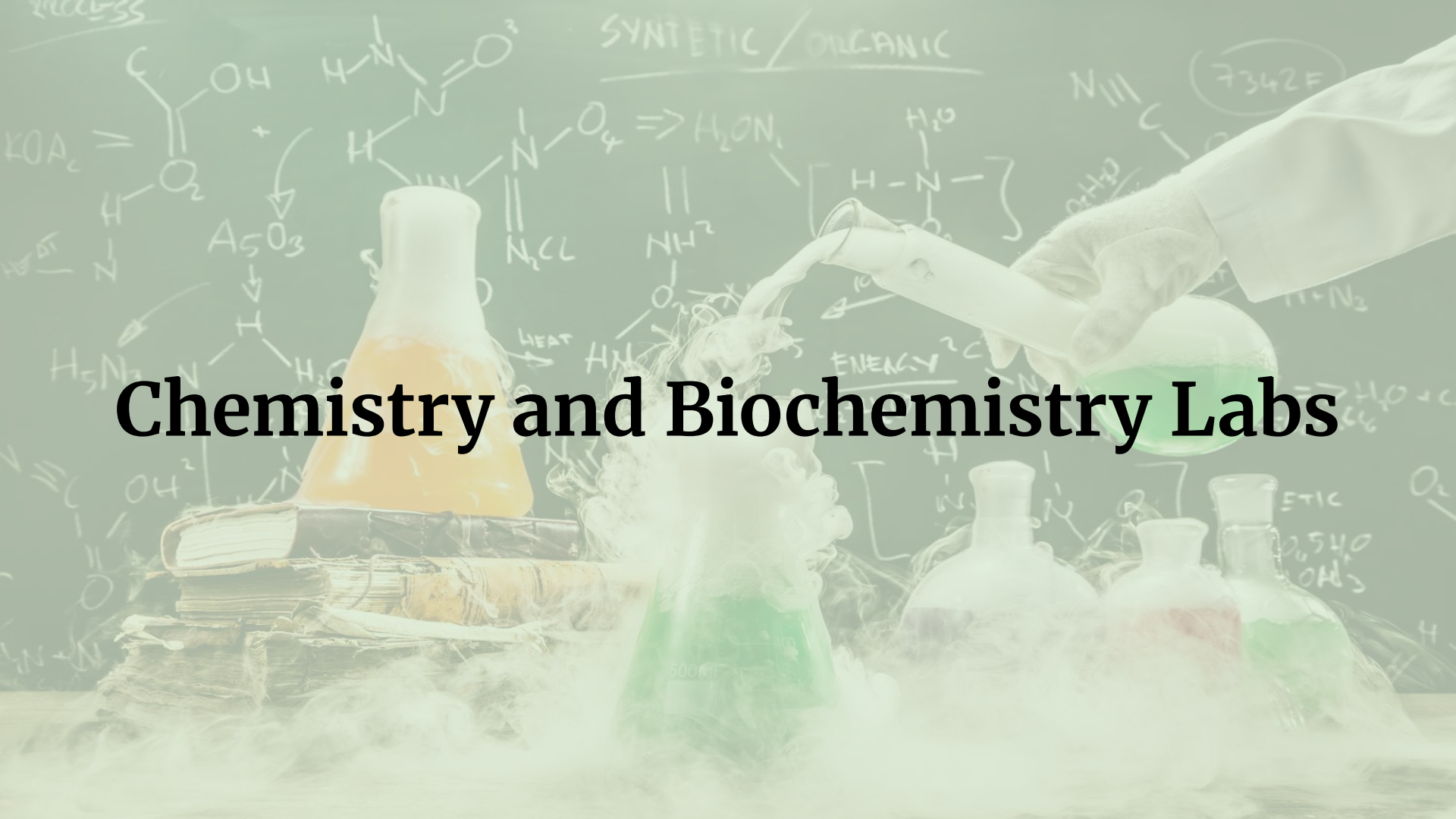
Lab Assistant/Technician

- Routine tasks (support)
- Cleaning
- Feeding model organisms
- Set up/operate equipment
- Prepare/test samples

NOT ACTIVELY RESEARCHING

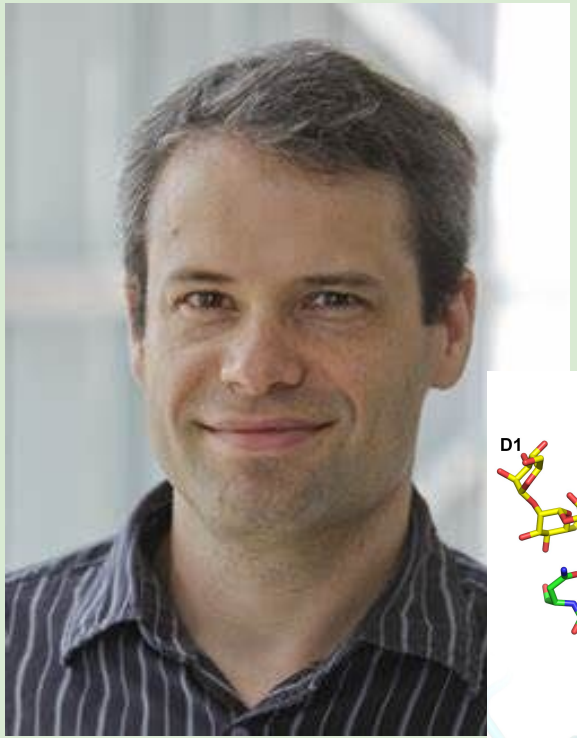
Research Assistant

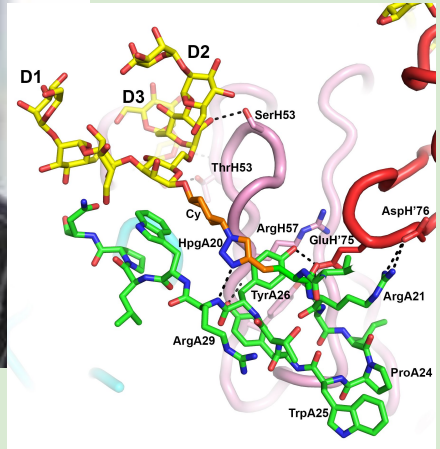
- More advanced tasks, assisting a mentor's project
- Plan, prepare and analyze experiments
- Keep detailed records on all experiments
- Have a specific focus on a field of research
- present /communicate findings



Chemistry and Biochemistry Labs

Krauss Lab (wet lab)





Isaac Krauss: Prof. of higher level chembio and organic chem courses

Research:

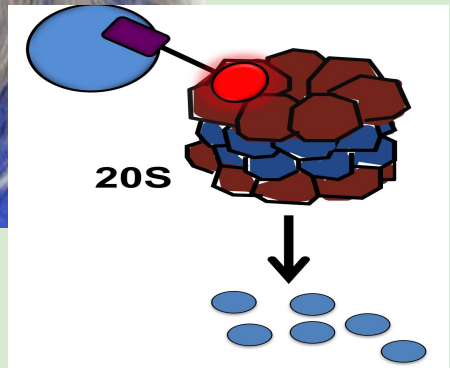
- Chemical Glycobiology- using carbohydrate synthesis to develop vaccine design methods for HIV
- Organic Synthesis- reactions which enable access to structural motifs that are difficult to access by other methods

Not planning to add undergraduates this semester but still worth reaching out to next semester for possible future position.

Hedstrom lab

Professor of biology and chemistry

- Works on target protein degradation where will create compounds to attach to protein in order to target it for degradation in the proteasome



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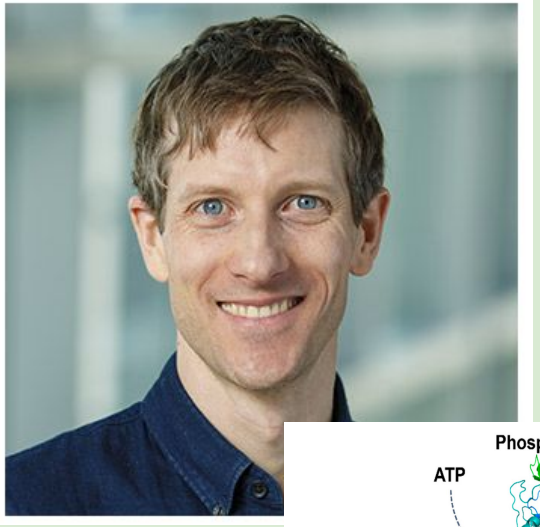
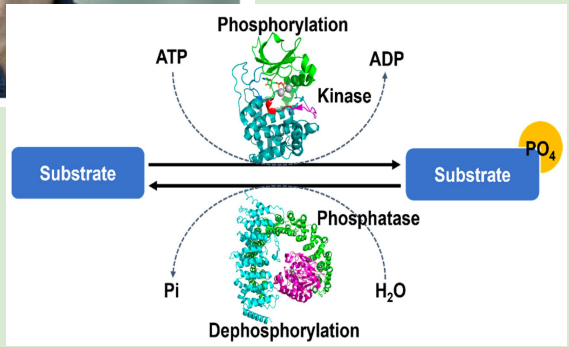
Niels Bradshaw Lab





Expertise: Regulation of Protein Phosphatases and Evolution of Cell Signaling

Goal: Investigate the conserved switch within the PP2C phosphatase domain that controls activity by recruiting a divalent metal cofactor in response to regulatory domain movement. A ***major future goal*** is to understand how this switch is exploited by diverse phosphatases to respond to different signals and execute crucial biological decisions.

Pandelia Lab

Expertise: Mapping the functional repertoire of (bio)inorganic systems and protein metallocofactors; paradigms of (bio)catalysts relevant to the human health and environment

Research: Focus on metalloproteins that are targets for new antiviral/anticancer factors, mediate DNA modifications or perform challenging chemical transformations.

Would like to determine how transition metal reactivity is controlled by protein structure, to map the functional and structural repertoire of (un)known metalloproteins and to establish their molecular mechanisms.

Source: https://sites.google.com/brandeis.edu/pandelialab/home?authuser=0

Jeff Gelles Lab

Expertise: Single-molecule biochemistry and biophysics; transcription and RNA processing; cytoskeletal networks and regulation

Research: Study fundamental chemical and physical mechanisms that molecular machines use to perform essential biological processes. Focuses on the function of the molecular machines essential to gene inheritance, gene expression and its regulation, particularly those that perform DNA replication and the synthesis and processing of messenger RNAs.

Additionally focuses on the function of molecular machines essential to the organization and utilization of the actin and microtubule cytoskeleton of eukaryotic cells.

Not planning to add undergraduates this semester but still worth reaching out for possible future position.

Source: https://gelleslab.org/research/

Biology Labs

Christine Grienberger Lab

Axonal two-photon Ca^{2+} imaging

Focus:

- Investigate fundamental principles underlying learning in the intact and diseased brain
- two-photon Ca^{2+} imaging, whole-cell patch-clamp recordings, and optogenetic perturbation of neuronal activity, to investigate the single-cell and population activity in various brain regions of mice actively engaged in a spatial memory task

Please contact Prof. Grienberger (cgrienberger@brandeis.edu) if you are interested in contributing to her research

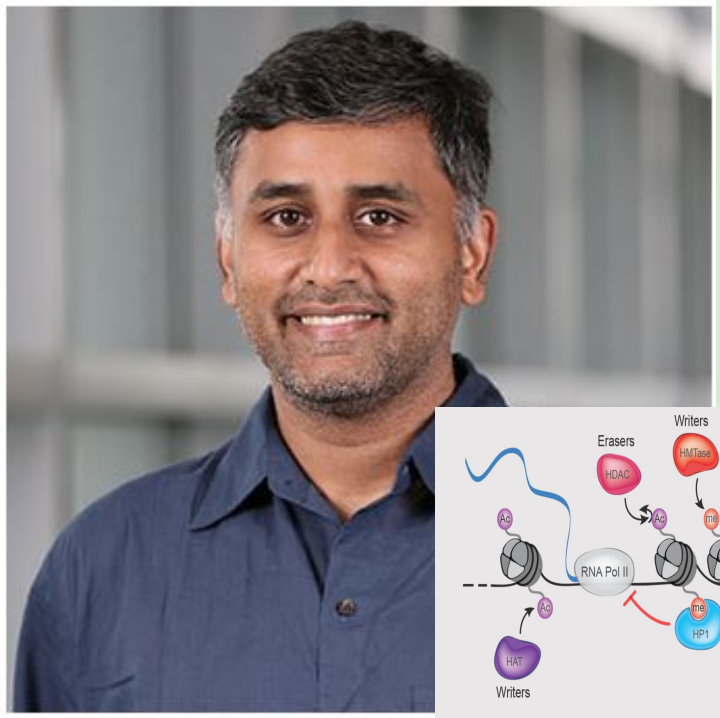
Sebastian Kadener Lab

Focus:

- how molecular processes in the brain determine behavior with special emphasis on RNA metabolism and what is the role of circular RNAs at the molecular and neural levels as well as the mechanisms underlying circadian clocks
- Circular RNA (circRNA), genomics and RNA metabolism, and circadian rhythms

Please contact Prof. Kadener (skadener@brandeis.edu) if you are interested in contributing to his research

Kaushik Ragunathan Lab



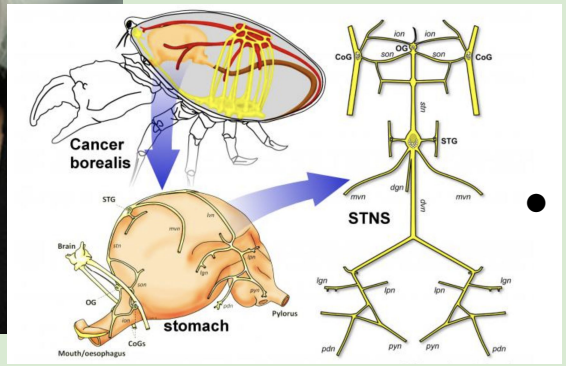
Focus:

- Interested in how histone modifications and its dynamic interactions with histone binding proteins encodes stable and heritable patterns of gene expression.
- Multidisciplinary perspective that synthesizes genetics, biochemistry and biophysical approaches to capture cellular processes across different spatial and temporal regimes.

Email Kaushik (kaushikr@brandeis.edu) with a brief statement of your interest, your career and research ambitions and your area of study (eg. genetics, biochemistry, biophysics etc.)

Neuroscience Labs

Marder Lab



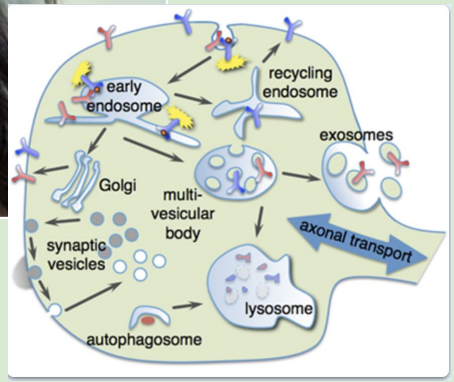
Focus:

- Understanding how circuit function arises from the intrinsic properties of individual neurons and their synaptic connections.
- Research Assistant and Lab Assistant work ranges from tank cleaning and making saline to immunohistochemistry, dissections, electrophysiology, and computational work.
- Works with the Jonah Crab, *Cancer Borealis*, and the American Lobster, *Homarus Americanus*.

Not planning to add undergraduates this semester but still worth reaching out for possible future position.

Jobs are not advertised on Workday. Email through the Marder Lab Website (marder@brandeis.edu)

Rodal Lab

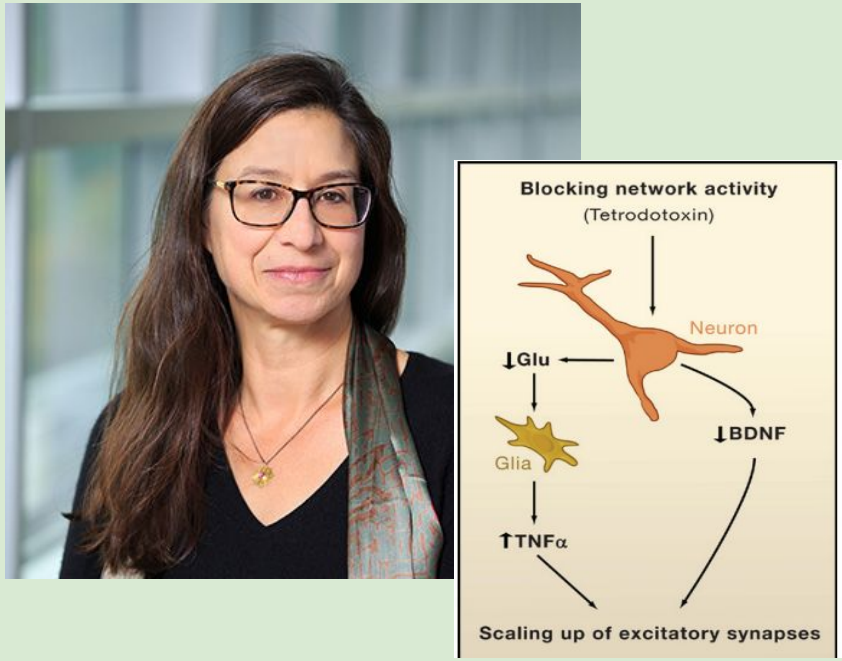


Focus:

- Our goal is to understand how neurons deploy membrane-remodeling machinery to build and regulate highly dynamic membrane structures.
- Using the fruit fly Drosophila, combine in vivo imaging of membrane traffic, mechanistic biochemistry, phenotypic analysis of mutants lacking this machinery, and evidence from disease models to study membrane trafficking.

Rodal lab accepts motivated undergraduate students on a rolling basis depending on current lab needs. Interested students should apply by emailing Prof. Rodal (arodal@brandeis.edu) directly.

Turrigiano Lab



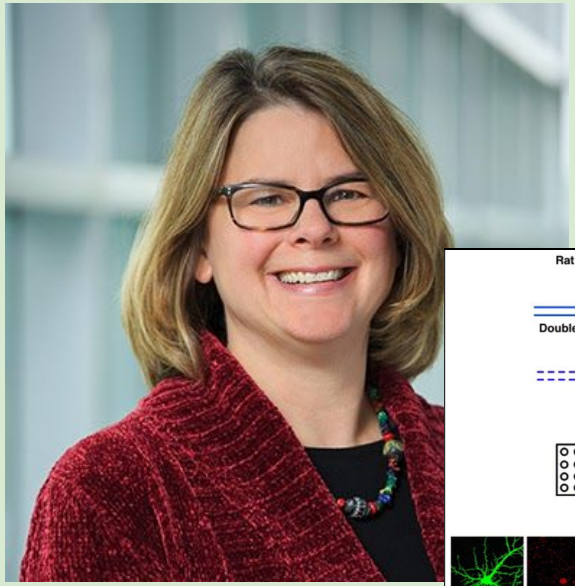
Turrigiano, 2008

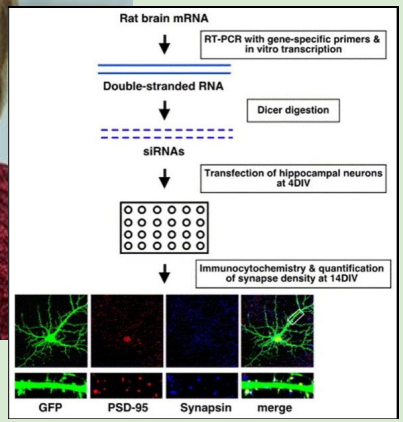
Focus:

- Mechanisms of homeostatic synaptic and intrinsic plasticity, and the role in the development of the cortex.
- Demonstrating the existence of “self-tuning” mechanisms that underlie brain disorders such as epilepsy and autism spectrum disorders. Works with mice as a model organism.

Accepts motivated undergraduate students on a rolling basis depending on current lab needs. Interested students should apply by emailing Prof. Turrigiano (turrigia@brandeis.edu) directly.

Paradis Lab



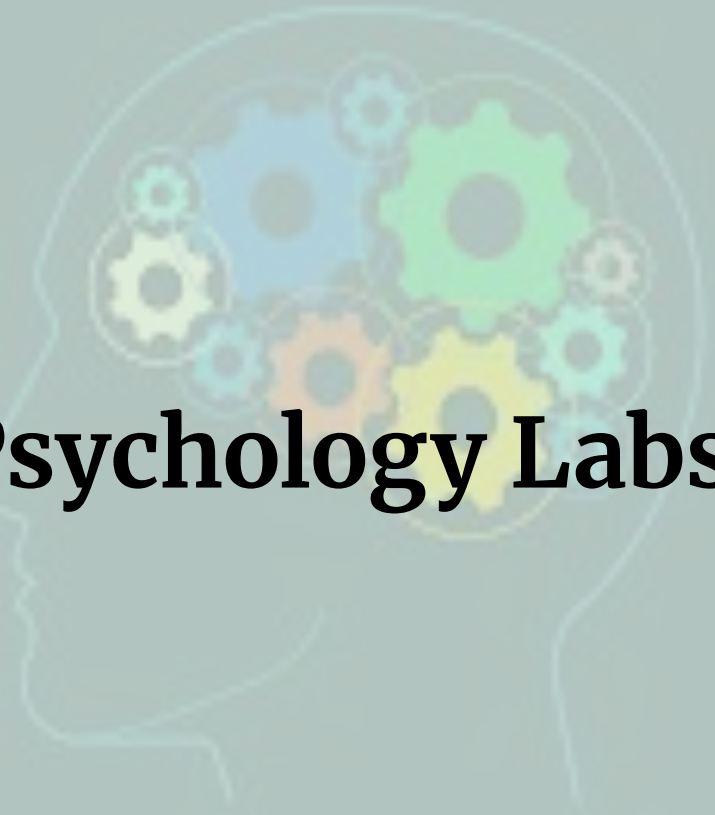


Paradis et al., 2007

Focus:

- To bridge the gap between molecular and systems neuroscience by defining the genes that instruct neurons to establish and modify their synaptic connections and dendritic morphology.

We accept motivated undergraduate students on a rolling basis depending on current lab needs. Both research-based and lab operations positions are available. Interested students should apply by emailing Prof. Paradis (paradis@brandeis.edu) directly.



Psychology Labs

Gutchess Lab

Aging, Culture, and Cognition Lab

Focus: Effects of age and culture on memory and social processes
Research:

- Age differences in specificity and accuracy of memory and in plasticity of neural resources that subserve memory processes
- Cross-cultural differences in cognitive and social processes across East Asian and Western cultures

Source: https://www.brandeis.edu/gutchess/

Not planning to add undergraduates this semester but still worth reaching out for possible future position.

Gutsell Lab

Social Interaction and Motivation Lab

Focus: Understanding how basic motivations and social biases shape the way we perceive and interact with others

Research:

- Neural cognitive processes involved in person perception, interpersonal sensitivity, and self-control.
- Current research examines how motivation and social biases influence action perception.

Not planning to add undergraduates this year but still worth reaching out for possible future position.

Source: https://www.brandeis.edu/psychology/gutsell/index.html

Howard Lab

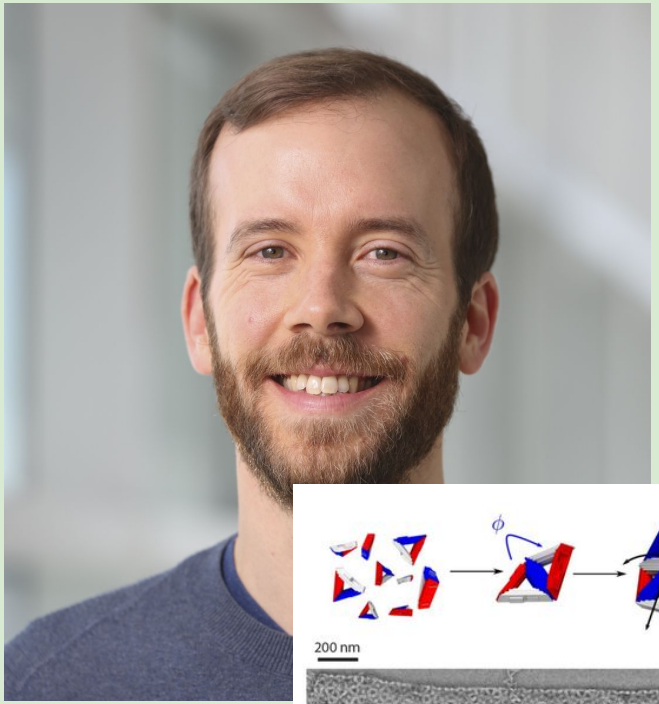
Focus: Cognitive neuroscience, reward, learning, decision-making, chemosensation.
Research:

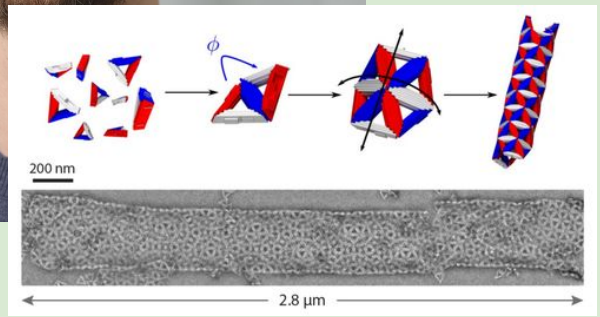
- Decoding the Content of Reward Prediction Errors
- Representation Mediated Learning
- Conditioned Olfactory Hallucinations
- The Mediodorsal Thalamus and Odor-Guided Learning
- Thalamocortical Substrates of Stimulus Decoding and Behavior

Source: https://www.thehowardlab.org/research

Physics Labs

Rogers Lab





Teaches: PHYS 20a

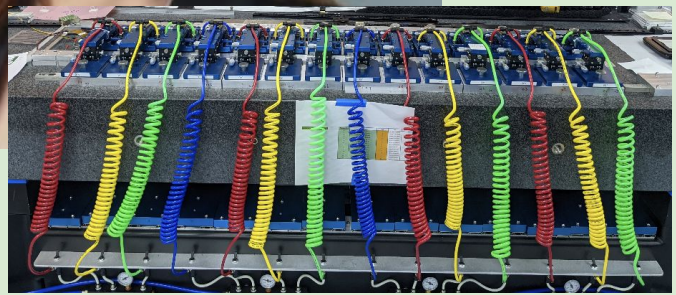
Focus:

- research interests include programmable self-assembly, DNA nanotechnology, membrane biophysics, and nucleic-acid folding/unfolding
- using modern techniques from experiment, simulation, and theory to solve important problems at the interface of soft condensed matter and biological physics

Not planning to add undergraduates this semester but still worth reaching out for possible future position.

Candidates should contact Ben at wrogers@brandeis.edu

Sciolla Lab



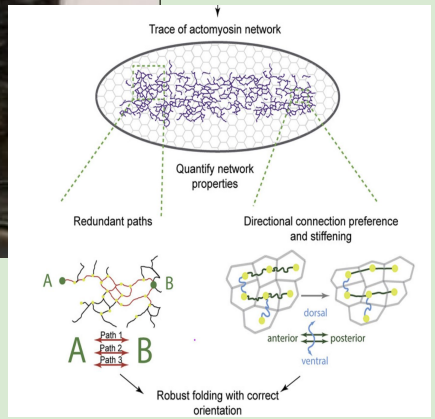
Teaches: PHYS 19a,b

Focus:

- Collide protons against protons to produce new elementary particles such as the Higgs Boson (observed) or, hopefully/maybe, Dark Matter particles (not observed yet in the lab)
- Focus on measurement of the properties of the Higgs Boson and search for new particles, such as the so-called Long-Lived particles, that are produced in pp collisions and can travel undisturbed in our detector for a few centimeters before decaying to regular particles.

Looking for first/second year students interested in doing experimental research during the summer at Brookhaven National Lab. Send your CV, Transcript, and a short description of yourself to sciolla@brandeis.edu

Yevick Lab



Teaches: PHYS 10a/b

Focus:

- Works primarily with cell culture and the fruit fly early embryos to uncover how cellular architecture, intercellular connectivity, and global tissue patterns impact collective dynamics during development.
- The physics of how populations of tissues and organs gain their final shape will shed light onto developmental defects that result from morphogenetic dysregulation.

Looking for fearless and creative undergrads! The Yevick Lab is hiring at all levels. Please send a CV and a description of your interests (yevicklab@brandeis.edu)


Computer Science Labs

Lotus Goldberg Lab

Focus:

- Computational linguistics
- Language acquisition and syntax
- How different languages handle concept such as verb placement, argument structure, and grammatical rules, and how this influences language development in children

If you are interested in joining, email (lmgold@brandeis.edu)

James Pustejovsky Lab

Focus:

- Computational semantics: Generative Lexicon Theory
- Developing a lexically oriented theory semantics based on a methodology making use of formal and computational semantics

If you are interested in joining, email (jamesp@brandeis.edu)

Sophia Malamud Lab

Focus:

- Indirectness in language is studied through speech acts, clause types, and intonation in English, Mandarin, Russian, and Heritage Russian, focusing on how meaning extends beyond literal words.

- Formal models like Decision and Game Theory explore pragmatics, while spoken language corpora (e.g., BiRCh, Russian, Hindi-Urdu) are developed to study language use.

If you are interested in joining, email (smalamud@brandeis.edu)

Jordan Pollack Lab

Focus:

- Dynamical & Evolutionary Machine Organization (DEMO) explores how the organization of complex systems can be harnessed to solve hard problems using a universal computational substrate, focusing on dynamical systems and recurrent neural networks with fractal state-spaces.

- The research aims to evolve machine structures and their neural networks, starting in simulations and advancing to real hardware, using methods like modulated mutation and simulated agents.

If you are interested in joining, email (pollack@brandeis.edu)

Nianwen Xue Lab

Focus:

- The Chinese Language Processing Group at Brandeis University focuses on research in natural language processing, developing new linguistic and statistical techniques, and creating new computational linguistic tools. Ongoing projects include semantic role labeling, statistical machine translation, chinese language processing, and temporal inference.

If you are interested in joining, email (xuen@brandeis.edu)

Any Questions?

Tell Us What You Thought About The Event!


Thank
you!