PROGRAM IN
NEUROSCIENCE &
COGNITIVE SCIENCE

Welcome!

Everything undergraduate students need to know about seeking a research position for experience

NACS DEI

Who are we?

NACS DEI Committee Members

Selin Zeytinoglu, postdoc @ Child Development Lab

Rachel Thompson, PhD student@ Language and Music Cognition Lab

Rose Ying, PhD student @ Caras Lab

Undergraduate Research Assistants:

Cansu Erkan @ Child Development Lab (PI: Nathan Fox) & Neurocognitive Development Lab (PI: Tracy Riggins)

Joyce Milandu (CCNLab, PI: Bernat)

Lilianne Blaize (CCNLab, PI: Bernat)

Overview of Session

Motivation to join:

- **Why join a lab? And, how to start *early*?**
- **How you benefit the labs & how they will benefit you?**

General info about labs:

- **How do labs work? How are they structured?**
- **What kind of labs are there?**
- **What are some opportunities once you are in a lab? (i.e., scholarships, research days, conferences etc)**

How to join:

- **How to join a lab? (i.e., initial contacts via emails, CVs)**
- **How to interview for undergraduate RAship positions**

Ask questions during the panel!!

Why join a lab?

Helps prepare for research-based graduate work

✓ **Develop research relationships** (e.g., letter writers)

✓ **Enhance knowledge:** asking good research questions & gain knowledge

✓ **Develop skills:** collecting, processing, and analyzing data

✓ **Dissemination:** posters, theses, and/or papers

Finding your next job

✓ post-bac RA positions, lab manager, PhD student, OR other jobs

Help make career decisions

How do you and labs benefit from this relationship?

- **You are very valuable for the labs!** Often a first ‘job’.
- **You do important tasks** like data collection & processing.
- **2-way beneficial relationship** (i.e., apprentice model)

- **Starting early is important!** It takes time to train & be useful.
- **Apply early!** Don’t take it personally if you don’t get it.
- **Self-advocacy & knowing about your goals**

How Labs Work: Lab Group Structure

- **People**
  - PI (Principal Investigator)
  - Associated faculty
  - Postdocs
  - Grad Students
  - Postbaccs
  - UGRAs

How do they operate?

- Assigned to work on a project with PI, faculty, postdoc or graduate student
  - (check lab websites for ongoing projects/lab research interests!)
- Regular Lab meetings/Project meetings

How Labs Work: Skills can you learn

- **Programming**
  - Statistics
  - Languages (e.g., Matlab, Python)
- **Data Collection**
  - e.g., Electrophysiology, participant interaction
- **Data Analysis**
- **Dissemination**
  - Undergraduate Research Day
  - Posters/Papers

- **Grant writing and administration**
  - Developing ideas
  - Proposing new projects

- **Professional development**
  - Career choices
  - Different paths to goals

How Labs Work: Paths to Research Opportunities

Funding

- Volunteer
- Work-study
- Research credit
- Fellowships, etc. (UMD, others)
- Paid Positions (often limited)

NOTE: People often serve in multiple ways across their time in a lab.

How Labs Work: Things to Apply For

Things undergrad students can apply for:

- Summer Research Programs (SRPs)
- BSOS summer
- REACH (Research Equity and Access in Communication and Hearing)
- MINDs (Mid-Atlantic Diversity Scholars Program)
- Look around!

Process of Finding and Joining a Lab

What Kind of Lab?

Finding the right lab begins with asking yourself what kind of lab you want to devote your time to.

- **Basic Research** - aims to understand how nature works.
- **Translational Research** - aims to adapt what's learned in basic research and apply it to developing solutions to medical problems.
- **Clinical Research** - aims to investigate these options or solutions through clinical trials.

They work together to create a continuous research cycle that converts ideas into action in the form of novel therapies and tests, as well as progresses cutting-edge advancements from the lab bench to the patient's bedside and back.

What Kind of Lab?

Basic Research

- **Animals** (Rodents, Flies, Zebrafish, Sea Slugs, Worms, Squirrels, Cats, Bats, Owls, Non-Human Primates)
  - **Molecular and Cellular Neuroscience** explores the genes, proteins, and other molecules that guide how neurons function.
  - **Developmental Neuroscience** describes how the brain forms, grows, and changes.
  - **Neurophysiology** describes the study of the nervous system itself and how it functions.
  - **Neurogenetics** focuses on inherited changes to neurons, including studies of certain genetic diseases, such as Huntington's disease and Duchenne muscular dystrophy.
  - **Systems Neuroscience** identifies how neurons form networks; encode or decode information about the external world or our internal states.

NICHD; NYU Langone Health

What Kind of Lab?

Basic Research

- **Humans**
  - **Cognitive Neuroscience** is about how the brain creates and controls thought, language, problem-solving, and memory.
  - **Cognitive Science** is about understanding how the mind represents and manipulates knowledge and how mental representations and processes are realized in the brain.
  - **Behavioral Neuroscience** examines the brain areas and processes underlying how animals and humans act.
- **Computational**
  - **Computational Neuroscience** advances our understanding of information processing in the brain and often work in tandem with experimental neuroscientists to continually refine their models.

NICHD; NYU Langone Health; Johns Hopkins University

What Kind of Lab?

Translational Research

- **Translational Neuroscience (Animals and Humans)**
  - Focuses on understanding how basic neuroscience findings relate to disease states, testing theories of disease progression, and developing novel strategies for putative therapies.

Clinical Research

- **Clinical Neuroscience (Humans)**
  - Explores how to treat and prevent neurological disorders by applying the most current approaches to provide top-of-the-line care to patients.

Where to Find a Lab?

General Overview of the Research of Interest:

- **Based on the field or area of research you are most interested in, search for keywords in that specific field or area on search engines.**
  - Example: “Developmental Neuroscience Labs in the US”
- **If you already have universities in mind where you want to pursue your graduate studies and are considering the graduate programs’ ranking, you can check some national or global ranking websites and then find the labs that interest you within those specific graduate programs.**
  - Example: U.S. News & World Report - Best Neuroscience and Neurobiology Programs
- **Check the career databases of the professional organizations in that specific field of interest.**
  - Example: Society for Neuroscience (SfN) and Federation of European Neuroscience Societies (FENS)

Where to Find a Lab?

Finding Laboratories of Interest at UMD:

- **Search UMD College's or Department's List of Principal Investigators (PIs)/Faculty.**
  - Example: UMD NACS PhD Program - List of Principal Investigators and Adjunct Faculty
- **Look into the graduate research databases at UMD.**
  - Example: UMD Office of Undergraduate Research - Maryland Opportunities for Research Experiences (MORE)
- **Subscribe to blogs.**
  - Example: UMD PSYC E-News Blog and UMD Neuroscience Blog

Process of Finding and Joining a Lab: Contacting the lab

Initial email contact

- PI, grad student, or contact listed in posting
- Contact early (1st year is not too soon!)
- If not accepted at first – gain skills and keep applying!

Keep your emails short and informational

- Make sure your email matches the lab description!
- Describe what you're interested in and why
- Share what skills you can bring to the lab

Additional information

- Do what they ask (e.g. application online).
- Develop CV
  - UMD Career Center

Process of Finding and Joining a Lab: Contacting the lab

Example email template

Dear Dr. _____,

My name is Rose Ying, and I'm currently a sophomore in the Neuroscience Major. I'm looking for research opportunities and I am particularly interested in your lab because I hope to study the underlying neurobiological mechanisms of perception. I became fascinated in this topic while taking Neuroscience 101, where I learned about how attention can change sensory perception. I have since taken Neuroscience 201, where I gained experience in basic wet lab techniques, and learned about methods such as electrophysiology and optogenetics. In the future, I am considering applying to graduate school and I hope to study perceptual plasticity and learning using these tools, which is why I believe your lab could be a good fit.

If you are looking for new undergraduate students, I would greatly appreciate it if you would consider my application. I have also attached my CV for reference.

Thanks for your time, and I look forward to hearing from you.

Sincerely,
Rose Ying

Process of Finding and Joining a Lab: Contacting the lab

Example email template

Introduce yourself

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Sincerely,
Rose Ying

Process of Finding and Joining a Lab: Contacting the lab

Example email template

Dear Dr. _____,

Include how/why you're interested in the topic

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Sincerely,
Rose Ying

Process of Finding and Joining a Lab: Contacting the lab

Example email template

Dear Dr. _____,

Mention any relevant research/class experience

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Thanks for your time, and I look forward to hearing from you.

Sincerely,
Rose Ying

Process of Finding and Joining a Lab: Contacting the lab

Example email template

Dear Dr. _____,

Mention interest in a specific technique/question

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Sincerely,
Rose Ying

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Example email template

Dear Dr. _____,

Thanks them for their time/consideration

My name is Rose Ying, and I'm currently a sophomore in the Neuroscience Major. I'm looking for research opportunities and I am particularly interested in your lab because I hope to study the underlying neurobiological mechanisms of perception. I became fascinated in this topic while taking Neuroscience 101, where I learned about how attention can change sensory perception. I have since taken Neuroscience 201, where I gained experience in basic wet lab techniques, and learned about methods such as electrophysiology and optogenetics. In the future, I am considering applying to graduate school and I hope to study perceptual plasticity and learning using these tools, which is why I believe your lab could be a good fit.

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Sincerely,
Rose Ying

Process of Finding and Joining a Lab: Interview

What the lab will ask about you

- Any previous skills, projects, presentations
- Your goals
- Time commitment

What you should ask about the lab

- What projects will I work on/who will I work with?
  - Does this research suit your interests and motivate you to go to the lab?
- Are there any non-research opportunities I can participate in?
  - Lab meetings, conferences, etc.
- What is the lab environment like?
  - What kind of relationship does the supervisor have with their lab members?
  - Do lab members collaborate with each other?

Real-Life Examples from Undergraduate RAs

Cansu Erkan @ Child Development Lab (PI: Nathan Fox) & Neurocognitive Development Lab (PI: Tracy Riggins)

Joyce Milandu (CCNLab, PI: Bernat)

Lilianne Blaize (CCNLab, PI: Bernat)

Your Turn to Ask Questions!!!

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Thank You for Attending!

— NACS DEI Committee —

NACS DEI

Please don’t hesitate to reach out to us; we would love to know more about you and your aspirations to contribute to the fields of neuroscience and cognitive science research.

UNIVERSITY OF MARYLAND

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