PROGRAM IN
NEUROSCIENCE &
COGNITIVE SCIENCE

Welcome!

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

Who are we?

NACS Belonging & Support Committee Members

Mine Muezzinoglu, PhD student @ Language Development Lab (PI: Rochelle Newman) & Language, Music, and Cognition Lab (PI: Bob Slevc)
Isabel Wilder, PhD student @ Neurocognitive Development Lab (PI: Tracy Riggins)

Undergraduate Research Assistants:

Aditi Mohapatra @ Language Development Lab (PI: Rochelle Newman), Food Microbiology Lab (PI: Debabrata Biswas) & fMRI Lab (PI: Jeremy Purcell)
Shreeshanth Kokatam @ Neurocognitive Development Lab (PI: Tracy Riggins)
Silvia Romero @ Language Development Lab (PI: Rochelle Newman)
Rachael Blum @ Clinical and Cognitive Neuroscience Laboratory (PI: Ed Bernat)
Britney Salinas @ Clinical and Cognitive Neuroscience Laboratory (PI: Ed Bernat)
Manushri Posa @ Roesch Lab (PI: Matt Roesch)

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**

Undergraduate 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
  - Lab manager/techs
  - 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/Theses

- **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
- Summer scholarships/Fellowships, etc. (UMD-often paid, 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, Maryland Summer Scholars)
- BSOS Summer Research Initiative (SRI)
- UMD McNair Scholars Program
- REACH (Research Equity and Access in Communication and Hearing)
- Look around!

Questions?

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?

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

Keep it concise

Dear Dr. _____,

My name is Isabel Wilder, 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,
Isabel Wilder

Process of Finding and Joining a Lab: Contacting the lab

Example email template

Introduce yourself

Dear Dr. _____,

My name is Isabel Wilder, 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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Thanks for your time, and I look forward to hearing from you.

Sincerely,
Isabel Wilder

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

Sincerely,
Isabel Wilder

Process of Finding and Joining a Lab: Contacting the lab

Example email template

Dear Dr. _____,

Mention any relevant research/class experience

My name is Isabel Wilder, 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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Thanks for your time, and I look forward to hearing from you.

Sincerely,
Isabel Wilder

Process of Finding and Joining a Lab: Contacting the lab

Example email template

Dear Dr. _____,

Mention interest in a specific technique/question

My name is Isabel Wilder, 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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Thanks for your time, and I look forward to hearing from you.

Sincerely,
Isabel Wilder

Process of Finding and Joining a Lab: Contacting the lab

Example email template

Dear Dr. _____,

Thanks them for their time/consideration

My name is Isabel Wilder, 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,
Isabel Wilder

Process of Finding and Joining a Lab: Interview

What the lab may ask about you

- Any previous skills, projects, presentations
- Your goals, motivations for joining
- Time commitment

Approach this like a real interview!

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?
- What kinds of **activities** can I participate in?
  - Research Activities: Data collection, lab meetings, conferences, etc.
  - Research dissemination: posters, presentations, papers (over the long term)
- 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?

Questions?