

# Rakshita Balaji

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## EDUCATION

University of Maryland (UMD), College Park

Anticipated Graduation: May 2023

Major: Neuroscience - Cellular, Molecular, and Physiological Track

GPA: 3.681 / 4.00

**Academic Honors:** Dean's List (5 semesters), Honors College: University Honors Program

## RESEARCH EXPERIENCE

*Undergraduate Researcher* - Caras Lab (PI: Dr. Melissa Caras)

UMD, College Park

December 2019 – Present

**Biology Department Honors thesis** under Dr. Melissa Caras and Dr. Alexandra "Alexa" Bely.

Investigate auditory perceptual learning in the Mongolian gerbil.

- Create and refine novel appetitive auditory discrimination task for gerbils using food reward
- Assess perceptual learning using behavioral analyses based on signal detection theory
- Analyze psychometric data by writing and adapting MATLAB scripts
- Use vibratome to slice and mount tissue for imaging connections in auditory pathway

*Intern* – Keller Lab of Sensory Perception (PI: Dr. Asaf Keller)

University of Maryland School of Medicine, Baltimore, MD

October 2018 – August 2019

Studied behavioral and physiological effects of perinatal fentanyl exposure on somatosensory development in mice.

Worked full-time (40 hrs/wk) as a paid research intern from July – August 2019.

- Analyzed patch-clamp electrophysiology data using MiniCLAMP
- Conducted stereotaxic surgery to implant wireless EEG devices for recording neural activity
- Conducted behavioral assays of tactile sensation in mice

## PUBLICATIONS

Alipio, J. B., Haga, C., Fox, M. E., Arakawa, K., **Balaji, R.**, Cramer, N., Lobo, M. K., & Keller, A.

(2021). Perinatal fentanyl exposure leads to long-lasting impairments in somatosensory circuit function and behavior. *The Journal of Neuroscience*, JN-RM-2470-20.

<https://doi.org/10.1523/JNEUROSCI.2470-20.2020>

## TEACHING

*Course Facilitator* – Introduction to Python Programming for the Life Sciences

UMD, College Park - Student Taught Instructional Course (STIC) program

April 2021 – Present

Co-teacher for introductory Python programming course at UMD, continuation of course created in Fall 2021 by UMD alumnus.

- Reviewing and revising Google Colab notebook activities, lecture presentations, discussion board assignments, weekly quizzes, and exams for second iteration of course
- Leading a course of 24 students during in-class instruction and supporting student success in course
- Collaborating with fellow course facilitator to administer instruction and feedback to students in a timely and effective manner

*Teaching Assistant* – Introduction to Neuroscience Summer Course

International Youth Neuroscience Association (IYNA)

June 2022 – July 2022

Member of instructional team of undergraduate and graduate students supporting students in a free, online international introductory Neuroscience course (July 1st – August 5th 2022)

- Led two weekly recitation sessions of 8 students per week to review principles of Neuroscience (4h/wk)
- Held office hours to address student questions about course material (1h/wk)

- Provided written feedback on student homework assignments in timely manner
- Provided written feedback on class materials to improve the MYELIN curriculum
- Guided students through development of final project poster presentations based on scholarly research papers
- Answered student questions as a moderator in class-wide discussion channels

*Undergraduate Teaching Assistant* – NEUR305: Neural Systems and Circuits

UMD, College Park

August 2021 – December 2021

Member of instructional team led by Dr. Amanda Chicoli who delivered undergraduate neuroscience course to 49 students.

- Created and delivered lecture presentation to teach strategies for reading academic papers
- Assisted office hours and provided verbal feedback to students
- Provided written feedback to students through grading and answering questions in discussion boards
- Tracked and announced relevant neuroscience opportunities for student engagement outside the classroom

## LEADERSHIP & CAMPUS INVOLVEMENT

*Contributor* – Student Science Blog, [The Scribe](#)

UMD, College Park

September 2021 - Present

Write about science seminars and research for general audiences.

- Recent Article: [Growing Up Without Breaking Down: Reviving Critical Period Neuroplasticity in the Visual System of the Aging Brain](#)
  - More articles can be found here: <https://thescribeumd.home.blog/?s=rakshita+balaji>

*Student Ambassador* – Neuroscience Department

UMD, College Park

August 2021 – Present

Serve on a team of student representatives of the UMD Neuroscience Major to support prospective and current students.

- Write profiles highlighting experiences and careers of neuroscience ambassadors and faculty members
- Manage outreach about academic and career-related opportunities for neuroscience students
- Answer questions from prospective students on Accepted Students Day
- Help organize and run events to recognize and promote Neuroscience majors and their achievements

*Honors Ambassador* – Honors College

UMD, College Park

October 2019 – Present

Serving on a team of student representatives of the UMD Honors College to support prospective and current students.

Served as a **Team Captain** from October 2020 – May 2021

- Answering questions on panel presentations for prospective UMD students at open houses and information sessions
- Communicating general advice and experiences for success in college, particularly to first-generation students
- Worked with Chantelle Smith, Coordinator of Recruitment and Programming for the Honors College, on outreach and organization of a first-generation student “Welcome” video in Spring 2022 to support first-generation students coming to UMD in the Fall

*Co-President* – Rising Researchers

UMD, College Park

October 2019 – Present

Teaching high school and early college students about tenets of science research and careers in STEM.

- Creating modules about careers in STEM and academic research for use in workshops and for free access on [website](#)
- Co-created and co-managed Instagram infographic posts for @risingresearchersumd during Fall 2021 semester

- Co-organized and co-hosted virtual Q & A in June 2020; presented module about reading research papers to biology classes at Walter Johnson HS in Bethesda, MD, in January 2020

## AWARDS

CMNS Alumni Association Undergraduate Summer Research, Travel, and Educational Enrichment Award  
 UMD CMNS Alumni Association Summer 2022

This award is intended for use by undergraduate students within CMNS to help defray costs related to conducting research over the summer in order to expand student's educational and professional development. Awarded \$750.00 in April 2022.

Maryland Summer Scholars Award  
 UMD Center for Undergraduate Research Summer 2022

The Maryland Summer Scholars Program (MSS) provides opportunities and financial support for UMD undergraduate students who will work closely with faculty mentors on ambitious research, scholarly, or artistic projects during the summer. Awarded \$3,000.00 in April 2022.

## PRESENTATIONS

Balaji, R. (2019, April). *"The Brains Behind the Addiction"* [Conference session]. Howard County Student Learning Conference (SLC), Johns Hopkins Applied Physics Laboratory, Laurel, MD.

## SKILLS

### Rodent Behavioral Paradigms

Training gerbils on aversive conditioned go no-go auditory stimulus detection task  
 Training gerbils on appetitive auditory stimulus discrimination task

### Rodent Surgical Procedures

Mouse Stereotaxic Wireless EEG Implant

### Spoken Languages

Tamil (*Fluent in speaking*)  
 Spanish (*Beginner in speaking, writing, reading*)

### Programming languages

Python (*Intermediate*)  
 MATLAB (*Beginner*)

### Histology

Slicing and mounting tissue using Vibratome  
 Preparing slides using fluorescence staining protocol

## EMPLOYMENT

*Hourly Employee* – Department of Biology

UMD, College Park

January 2022 – May 2022

Paid laboratory work in Dr. Melissa Caras' lab outside of Honors Research credit hours (6 credit hours/week).

*Community Assistant* – Capstone On Campus Management (COCM)

The Courtyards, UMD, College Park

August 2021 – December 2021

Served student housing community as a front desk receptionist.

- Logged, inventoried, and distributed packages and loaner keys to students
- Answered phone calls and questions about housing from students and families
- Organized apartment utilities bills and entered values into organized Excel spreadsheets
- Handled check-in and key distribution during move-in week

*Paid Intern* - Keller Laboratory of Sensory Perception

University of Maryland School of Medicine, Baltimore, MD

July 2019 – August 2019

Paid laboratory work (40 hrs/wk for 5 weeks) during Summer 2019.