

Rajyashree Sen, Ph.D.

CURRICULUM VITAE

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EDUCATION

- 2012 – 2017 ● **Ph.D., Molecular Biology & Neuroscience (Highest Grade)**, University of Vienna, Austria & Janelia Research Campus, USA
Dissertation: Neuronal control of backward walking in *Drosophila melanogaster*
Advisor: Dr. Barry Dickson
- 2010 – 2012 ● **M.Sc., Biotechnology**, University of Hyderabad, India
Dissertation: Role of Hsp82 in the DNA damage response pathway
Advisor: Dr. Sunanda Bhattacharyya
- 2007 – 2010 ● **B.Sc., Microbiology**, St. Xavier's College Kolkata, India

PROFESSIONAL EXPERIENCE

- 12/2024 – present ● **Associate Research Scientist**, Zuckerman Institute of Columbia University
- 04/2019 – 11/2024 ● **Postdoctoral Research Scientist**, Zuckerman Institute of Columbia University & Howard Hughes Medical Institute (HHMI)
Neuronal basis of individual recognition and social hierarchies in mice
Advisor: Dr. Richard Axel
- 01/2018 – 03/2019 ● **Postdoctoral Research Associate**, Janelia Research Campus, USA
Distributed control of motor circuits for backward walking in *Drosophila*
Advisor: Dr. Barry Dickson
- 10/2018 – 12/2018 ● **Invited Visiting Scientist**, Institute of Zoology at University of Cologne
Quantitative analysis of joint kinematics in backward walking flies
Advisors: Dr. Ansgar Büschges & Dr. Barry Dickson
- 05/2011 – 07/2011 ● **IASc-INSa-NASI Summer Fellow**, Center for Cellular and Molecular Biology, Hyderabad (CCMB), India
Expression and Purification of FAAL10 from *Mycobacterium tuberculosis*
Advisor: Dr. Rajan Sankarnarayanan

HONORS

RESEARCH

- 01/2025 – 01/2027 ● **NARSAD Young Investigator Grant** (\$70,000)
Brain and Behavior Research Foundation
- 10/2012 – 09/2015 ● **Marie Curie Graduate Fellowship**
Marie Curie FP7 Programme FLiACT Training Network
- 08/2010 – 07/2012 ● **Fellowship for Masters in Biotechnology**
Full tuition, Department of Biotechnology (DBT), Government of India
- 05/2011 – 07/2011 ● **Summer Research Fellowship**
Indian Academy of Sciences-Indian National Science Academy-The National Academy of Sciences (IASc-INSa-NASI)

PEDAGOGY

03/2025

● Teresa Vilardi Scholarship

Institute of Writing and Thinking, Bard College

To attend the “New Kinds of Attention” workshop: “Introduction to Writing to Learn in STEM Disciplines”

PUBLIC ENGAGEMENT

02/2025 – 12/2025

● The Puffin Foundation Annual Artists Grant Cycle 2025 (\$2500)

The Puffin Foundation Ltd., New Jersey

01/2025 – 07/2025

● Research! America Civic Engagement Microgrant (\$1800)

Research! America, Arlington, Virginia

10/2023 – 05/2024

● Outreach and Public Engagement Seed Grant (\$750)

Zuckerman Institute's Public Engagement Program, Columbia University

Project: The Lab: Bridging Science and Community through Improv Comedy. Used the above grants to conceive, found and produce improv comedy shows inspired by live interviews with scientists. The goal of this project is to engage underserved communities in scientific discourse.

PUBLICATIONS

IN PREPARATION

- **Rajyashree Sen**, Alexander Medoff, Mira Vanchiswar, Larry Abbott, Richard Axel (2025). “Combined coding of social and spatial information in the mouse dorso-medial prefrontal cortex”

PEER REVIEWED

- Kai Feng, **Rajyashree Sen**, Ryo Minegishi, Michael Dübbert, Till Bockemühl, Ansgar Büschges, Barry J Dickson (2020). “Distributed control of motor circuits for backward walking in *Drosophila*” **Nature Communications**. 11(6166). DOI: <https://doi.org/10.1038/s41467-020-19936-x>
- **Rajyashree Sen**, Kaiyu Wang, and Barry J. Dickson (2019). “Two lumps ascending neurons mediate touch-evoked reversal of walking direction in *Drosophila*” **Current Biology**. 29(24): 4337-4344.e5. DOI: <https://doi.org/10.1016/j.cub.2019.11.004>
- **Rajyashree Sen**, Ming Wu, Kristin Branson, Alice Robie, Gerald M. Rubin and Barry J. Dickson (2017). “Moonwalker descending neurons mediate visually evoked retreat in *Drosophila*” **Current Biology**. 27(5): 766-771. DOI: <https://doi.org/10.1016/j.cub.2017.02.008>

PRESENTATIONS

INVITED

06/2024

- **Talk | Combined coding of individual identity and spatial locations in the mouse dorso-medial prefrontal cortex (dmPFC) (nominated)**
Zuckerman Institute Postdoctoral Seminar (ZIPS), Zuckerman Institute, Columbia University, USA

10/2020

- **Talk | Neurons that switch flies into reverse gear**
Modern Trends in Microbiology Chapter XVII, International Webinar St. Xavier's College Kolkata, India (Virtual)

11/2020	● Featured Speaker Distributed control of motor circuits for backward walking in <i>Drosophila</i> . Undergraduate Journal Club in Bucknell University, USA (Virtual)
08/2019	● Talk Neuronal control of backward walking in <i>Drosophila melanogaster</i> Indian Institute of Science Education and Research (IISER) Pune, India
05/2018	● Talk Neuronal control of backward walking in <i>Drosophila</i> (nominated) Junior Scientist Seminar Series, Janelia Research Campus, USA
CONTRIBUTED 09/2023	● Poster Exposure to different mice elicits different representations in the prefrontal cortex. Rajyashree Sen, Alexander Medoff, Mira Vanchiswar, Larry Abbott, and Richard Axel. <i>Howard Hughes Medical Institute Science Meeting, USA</i>
04/2018	● Poster Blitz & Selected Poster Neuronal control of backward walking in <i>Drosophila melanogaster</i> . Rajyashree Sen, Till Bockemühl, Kaiyu Wang, Michael Dübbert, Salil Bidaye, Ansgar Büschges and Barry Dickson. <i>Neural Circuits of the Insect Ventral Nerve Cord, Janelia Research Campus, USA</i>
10/2013	● Selected Poster Neural control of directed walking in <i>Drosophila melanogaster</i> . Rajyashree Sen, Salil Bidaye and Barry J. Dickson. <i>Emerging Techniques to Map and Functionally Characterize Neural Circuits in Drosophila, Janelia Research Campus, USA</i>
10/2013	● Selected Poster Neural control of directed walking in <i>Drosophila melanogaster</i> . Rajyashree Sen, Salil Bidaye and Barry J. Dickson. <i>Neurobiology of Drosophila Meeting, Cold Spring Harbor Laboratory, USA</i>
TEACHING LECTURER Fall 2024	● The Parental Brain (Columbia University's Prison Education Project) <i>A collaboration among Hudson Link and Columbia University's Center for Justice, Department of Psychology & Zuckerman Institute, USA</i> Adapted and taught a semester-long Columbia University course at Taconic Correctional Facility (medium-security women's prison).
GUEST LECTURER Fall 2023, Fall 2024	● The Parental Brain (Seminar) <i>Department of Psychology, Columbia University, USA</i> Developed a module for the course syllabus and led discussions of scientific papers using active learning techniques.
TRAINING 2017	● Scientists Teaching Science (Nine Week Course) <i>National Institute of Health</i> Participated as a student in this comprehensive pedagogical course designed to enhance the teaching skills of scientists.
MENTORSHIP	
02/2025 – present	● Undergraduate: Molly Rose Graff (Barnard College) <i>Current: Undergraduate at Barnard College, Columbia University</i>
02/2025 – present	● Undergraduate: Sarafina Belafonte (Columbia University) <i>Current: Undergraduate at Columbia University</i>

01/2023 – present	● Research Assistant: Alexander Medoff
04/2024 – 11/2024	● Mentor for Black Undergraduate Mentorship Program (BUMP)
05/2023 – 06/2023	● Undergraduate: Fatma Albwardy (Columbia University) <i>Current: Undergraduate at Columbia University</i>
01/2020 – 05/2023	● Research Assistant: Mira Vanchiswar <i>Current: Graduate student at Cornell University, Ithaca</i>
01/2021 – 05/2023	● Undergraduate: Emily Sun (Columbia University) <i>Current: Research Assistant at Columbia University</i>
01/2023 – 04/2023	● Undergraduate: Lina Huang (Columbia University) <i>Current: Undergraduate at Columbia University</i>
06/2022 – 08/2023, 01/2023 – 02/2023	● Undergraduate: Delaney Bessel (Franklin & Marshall College) <i>Current: Research Assistant at MSK Cancer Center</i>
06/2021 – 07/2021	● Mentor for Summer Program for Undergraduate Rising Stars (SPURS) Supervised Emmanuel Woredokal (Rutgers University) <i>Current: M.D. candidate, Sidney Kimmel Medical College, Philadelphia</i>
01/2018 – 03/2019	● Women/Non-Binary Peer Mentoring Group <i>Janelia Research Campus, USA</i>
TRAINING 2024	● Research Mentor Training Workshop <i>Center for the Improvement of Mentored Experiences in Research (CIMER)</i> Participated as a student in this two-day mentorship workshop designed to enhance the mentoring skills of scientists.
WORKSHOPS 10/2019	● Janelia Junior Scientist Workshop (selected) Mechanistic Cognitive Neuroscience <i>Janelia Research Campus, USA</i>
10/2012 – 09/2015	● Marie Curie FLiACT Training Network Workshops on Fly Neuroscience <i>Max Planck Institute for Chemical Ecology, Jena; Max Planck Institute of Neurobiology, Martinsried; KUL, Leuven, Belgium; Center for Genomic Regulation, Barcelona</i>
ACADEMIC SERVICE 01/2025 – 01/2026	● Columbia Neuroscience Seminar Series – Systems Neuroscience Selection Committee <i>Columbia University, USA</i>
2019 – 2025	● Invited Reviewer: eLife, Frontiers in Neuroscience
COMMUNICATION & OUTREACH IMPROV COMEDY 11/2023 – present	● Founder, producer & performer in ‘The Lab’: a science-inspired improv group and show. This project’s mission is to make neuroscience accessible and engaging through improv comedy. We interview scientists whose lives and work inspire our shows. Our shows aim to demystify neuroscience, humanize scientists, and provide practical advice to young people interested in scientific research.

- 2012 – present ● **Entertained large audiences** for over 10 years as a performer with various improv teams, including house teams at [Magnet Theater](#) (New York), [Washington Improv Theater](#) (DC), and Laugh Index Theater (DC).
- 07/2024 – present ● **Second City Conservatory**, *Second City New York, USA*
- 10/2019 – 10/2021 ● **Upright Citizen's Brigade Diversity Scholarship**
Upright Citizen's Brigade, New York, USA
- WRITING**
- 07/2023 ● **Writing Merit Scholarship – New York State Summer Writers Institute**
Skidmore College, New York, USA
Nominated by Zuckerman Institute's 2022 writer-in-residence Claire Messud
- PUBLIC SPEAKING & ENGAGEMENT**
- 07/2023 ● **Invited Scientist Storyteller at Story Collider Show: Seismic Shifts**
Caveat, New York, USA
- 06/2023 ● **Invited Scientist at PowerPoint Roulette** (a show where comedians improvise a presentation using slides they have never seen before)
Caveat, New York, USA
- 05/2022 ● **Invited Scientist at National Jazz Museum Science and Jazz Talk Show: The Improvising Brain**
National Jazz Museum in Harlem & Zuckerman Institute, New York, USA
- 03/2020 ● **Finalist, 2020 iBiology Young Scientist Seminars Series Competition**
iBiology & Alan Alda Center for Communicating Science

REFERENCES

- **Richard Axel, M.D.** (*Postdoctoral Advisor*)
Nobel Laureate, 2004
Co-director & Investigator
Zuckerman Institute of Columbia University
Email: ra27@columbia.edu
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- **Larry Abbott, Ph.D.** (*Postdoctoral Advisor*)
Investigator
Zuckerman Institute of Columbia University
Email: lfa2103@columbia.edu
Phone: +1 212-853-1065
- **Barry Dickson, Ph.D.** (*Graduate Advisor*)
Investigator
Queensland Brain Institute, The University of Queensland.
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