

# 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*  
Advisors: 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-INSANA 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-INSANA-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*

- **Research! America Civic Engagement Microgrant** (\$1800)  
*Research! America, Arlington, Virginia*

- **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*

- **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*
- **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	● <b>Featured Speaker</b>   Distributed control of motor circuits for backward walking in <i>Drosophila</i> . Undergraduate Journal Club in Bucknell University, USA (Virtual)
08/2019	● <b>Talk</b>   Neuronal control of backward walking in <i>Drosophila melanogaster</i> Indian Institute of Science Education and Research (IISER) Pune, India
05/2018	● <b>Talk</b>   Neuronal control of backward walking in <i>Drosophila</i> ( <b>nominated</b> ) Junior Scientist Seminar Series, Janelia Research Campus, USA
<b>CONTRIBUTED</b>	
09/2023	● <b>Poster</b>   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	● <b>Poster Blitz &amp; Selected Poster</b>   Neuronal control of backward walking in <i>Drosophila melanogaster</i> . Rajyashree Sen, Till Bockemühl, Kaiyu Wang, Michael Dübber, Salil Bidaye, Ansgar Büschges and Barry Dickson. <i>Neural Circuits of the Insect Ventral Nerve Cord, Janelia Research Campus, USA</i>
10/2013	● <b>Selected Poster</b>   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	● <b>Selected Poster</b>   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>
<b>TEACHING</b>	
<b>LECTURER</b> Fall 2024	● <b>The Parental Brain (Columbia University's Prison Education Project)</b> <i>A collaboration among Hudson Link and Columbia University's Center for Justice, Department of Psychology &amp; Zuckerman Institute, USA</i> Adapted and taught a semester-long Columbia University course at <b>Taconic Correctional Facility</b> (medium-security women's prison).
<b>GUEST LECTURER</b> Fall 2023, Fall 2024	● <b>The Parental Brain (Seminar)</b> <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.
<b>TRAINING</b> 2017	● <b>Scientists Teaching Science (Nine Week Course)</b> <i>National Institute of Health</i> Participated as a student in this comprehensive pedagogical course designed to enhance the teaching skills of scientists.
<b>MENTORSHIP</b>	
02/2025 – present	● <b>Undergraduate:</b> Molly Rose Graff (Columbia University) <i>Current: Undergraduate at Columbia University</i>

02/2025 – present	<ul style="list-style-type: none"> <li>● <b>Undergraduate:</b> Sarafina Belafonte (Columbia University) <i>Current: Undergraduate at Columbia University</i></li> </ul>
01/2023 – present	<ul style="list-style-type: none"> <li>● <b>Research Assistant:</b> Alexander Medoff</li> </ul>
04/2024 – 11/2024	<ul style="list-style-type: none"> <li>● <b>Mentor for Black Undergraduate Mentorship Program (BUMP)</b></li> </ul>
05/2023 – 06/2023	<ul style="list-style-type: none"> <li>● <b>Undergraduate:</b> Fatma Albwardy <i>Current: Undergraduate at Columbia University</i></li> </ul>
01/2020 – 05/2023	<ul style="list-style-type: none"> <li>● <b>Research Assistant:</b> Mira Vanchiswar <i>Current: Graduate student at Cornell University, Ithaca</i></li> </ul>
01/2021 – 05/2023	<ul style="list-style-type: none"> <li>● <b>Undergraduate:</b> Emily Sun (Columbia University) <i>Current: Research Assistant at Columbia University</i></li> </ul>
01/2023 – 04/2023	<ul style="list-style-type: none"> <li>● <b>Undergraduate:</b> Lina Huang (Columbia University) <i>Current: Undergraduate at Columbia University</i></li> </ul>
06/2022 – 08/2023, 01/2023 – 02/2023	<ul style="list-style-type: none"> <li>● <b>Undergraduate:</b> Delaney Bessel (Franklin &amp; Marshall College) <i>Current: Research Assistant at MSK Cancer Center</i></li> </ul>
06/2021 – 07/2021	<ul style="list-style-type: none"> <li>● <b>Mentor for Summer Program for Undergraduate Rising Stars (SPURS)</b> Supervised Emmanuel Woredekal (Rutgers University) <i>Current: M.D. candidate, Sidney Kimmel Medical College, Philadelphia</i></li> </ul>
01/2018 – 03/2019	<ul style="list-style-type: none"> <li>● <b>Women/Non-Binary Peer Mentoring Group</b> <i>Janelia Research Campus, USA</i></li> </ul>
<b>TRAINING</b> 2024	<ul style="list-style-type: none"> <li>● <b>Research Mentor Training Workshop</b> <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.</li> </ul>
<b>WORKSHOPS</b> 10/2019	<ul style="list-style-type: none"> <li>● <b>Janelia Junior Scientist Workshop (selected)</b> <i>Mechanistic Cognitive Neuroscience</i> <i>Janelia Research Campus, USA</i></li> </ul>
10/2012 – 09/2015	<ul style="list-style-type: none"> <li>● <b>Marie Curie FLiACT Training Network Workshops on Fly Neuroscience</b> <i>Max Planck Institute for Chemical Ecology, Jena; Max Planck Institute of Neurobiology, Martinsried; KUL, Leuven, Belgium; Center for Genomic Regulation, Barcelona</i></li> </ul>
<b>ACADEMIC SERVICE</b> 01/2025 – 01/2026	<ul style="list-style-type: none"> <li>● <b>Columbia Neuroscience Seminar Series – Systems Neuroscience Selection Committee</b> <i>Columbia University, USA</i></li> </ul>
2019 – 2025	<ul style="list-style-type: none"> <li>● <b>Invited Reviewer:</b> eLife, Frontiers in Neuroscience</li> </ul>
<b>COMMUNICATION &amp; OUTREACH</b> <b>IMPROV COMEDY</b> 11/2023 – present	<ul style="list-style-type: none"> <li>● <b>Founder, producer &amp; performer in ‘The Lab’:</b> 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</li> </ul>

		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		● <b>Entertained large audiences</b> 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		● <b>Second City Conservatory</b> , <i>Second City New York, USA</i>
10/2019 – 10/2021		● <b>Upright Citizen's Brigade Diversity Scholarship</b> <i>Upright Citizen's Brigade, New York, USA</i>
<b>WRITING</b>		
07/2023		● <b>Writing Merit Scholarship – New York State Summer Writers Institute</b> <i>Skidmore College, New York, USA</i> Nominated by Zuckerman Institute's 2022 writer-in-residence Claire Messud
<b>PUBLIC SPEAKING &amp; ENGAGEMENT</b>		
07/2023		● <b>Invited Scientist Storyteller at Story Collider Show: Seismic Shifts</b> <i>Caveat, New York, USA</i>
06/2023		● <b>Invited Scientist at PowerPoint Roulette</b> (a show where comedians improvise a presentation using slides they have never seen before) <i>Caveat, New York, USA</i>
05/2022		● <b>Invited Scientist at National Jazz Museum Science and Jazz Talk Show: The Improvising Brain</b> <i>National Jazz Museum in Harlem &amp; Zuckerman Institute, New York, USA</i>
03/2020		● <b>Finalist, 2020 iBiology Young Scientist Seminars Series Competition</b> <i>iBiology &amp; Alan Alda Center for Communicating Science</i>

## REFERENCES

- **Richard Axel, M.D.** (*Postdoctoral Advisor*)  
Nobel Laureate, 2004  
Co-director & Investigator  
Zuckerman Institute of Columbia University  
Email: [ra27@columbia.edu](mailto:ra27@columbia.edu)  
Phone: +1 212-853-1010
- **Larry Abbott, Ph.D.** (*Postdoctoral Advisor*)  
Investigator  
Zuckerman Institute of Columbia University  
Email: [lfa2103@columbia.edu](mailto: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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