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

07/2025 – 01/2027 **Alzheimer's Disease Research Center Research Education Scholar**
Alzheimer's Disease Research Center, Taub Institute, Columbia University

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

07/2025 — **Teresa Vilardi Scholarship**
Institute of Writing and Thinking, Bard College
To attend the July Weeklong teaching workshop: "Introduction to Writing to Learn in STEM Disciplines"

03/2025 — **Teresa Vilardi Scholarship**
Institute of Writing and Thinking, Bard College
To attend the 1-day workshop: "Teaching for Transfer: Helping Students Remember What They Already Know"

Public Engagement

02/2025 – 12/2026 — **The Puffin Foundation Annual Artists Grant** ($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 the general public in scientific discourse.

PUBLICATIONS

Preprints

Valentine Andreu, **Rajyashree Sen**, Nour El Houda Mimouni, Eun Ji Lee, Dianne-Lee Ferguson, Alexis Stutzman, Bianca J. Marlin (2025). "Early postpartum development of pup urine preference in mothers"**.** ***bioRxiv***.
DOI: https://doi.org/10.1101/2025.09.01.673527

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). "Twolumps 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, 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 *Drosophila. Undergraduate Journal Club in Bucknell University, USA (Virtual)*

08/2019 **Talk |** Neuronal control of backward walking in *Drosophila melanogaster*
Indian Institute of Science Education and Research (IISER) Pune, India

05/2018 **Talk |** Neuronal control of backward walking in *Drosophila* **(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.
Howard Hughes Medical Institute Science Meeting, USA

04/2018 **Poster Blitz & Selected Poster |** Neuronal control of backward walking in *Drosophila melanogaster.* Rajyashree Sen, Till Bockemühl, Kaiyu Wang, Michael Dübbert, Salil Bidaye, Ansgar Büschges and Barry Dickson.
Neural Circuits of the Insect Ventral Nerve Cord,Janelia Research Campus, USA

10/2013 **Selected Poster |** Neural control of directed walking in *Drosophila melanogaster.* Rajyashree Sen, Salil Bidaye and Barry J. Dickson.
Emerging Techniques to Map and Functionally Characterize Neural Circuits in Drosophila, Janelia Research Campus, USA

10/2013 **Selected Poster |** Neural control of directed walking in *Drosophila melanogaster.* Rajyashree Sen, Salil Bidaye and Barry J. Dickson.
Neurobiology of Drosophila Meeting, Cold Spring Harbor Laboratory, USA

TEACHING

Lecturer

Fall 2024 **The Parental Brain (Columbia University's Prison Education Project)**
A collaboration among Hudson Link and Columbia University's Center for Justice, Department of Psychology & Zuckerman Institute, USA
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)**
Department of Psychology, Columbia University, USA
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)**
National Institute of Health
Participated as a student in this comprehensive pedagogical course designed to enhance the teaching skills of scientists.

MENTORSHIP

07/2025 – present **Research Assistant:** Baihe (Lily) Zhang

02/2025 – present **Undergraduate:** Molly Rose Graff (Barnard College)
Current: Undergraduate at Barnard College, Columbia University

02/2025 – 07/2025 **Undergraduate:** Sarafina Belafonte (Columbia University)
Current: Undergraduate at Columbia University

01/2023 – 08/2025 **Research Assistant:** Alexander Medoff

04/2024 – 11/2024 **Mentor for Black Undergraduate Mentorship Program (BUMP)**

05/2023 – 06/2023 **Undergraduate:** Fatma Albwardy (Columbia University)
Current: Undergraduate at Columbia University

01/2020 – 05/2023 **Research Assistant:** Mira Vanchiswar
Current: Graduate student at Cornell University, Ithaca

01/2021 – 05/2023 **Undergraduate:** Emily Sun (Columbia University)
Current: Research Assistant at Columbia University

01/2023 – 04/2023 **Undergraduate:** Lina Huang (Columbia University)
Current: Undergraduate at Columbia University

06/2022 – 08/2023, 01/2023 – 02/2023 **Undergraduate:** Delaney Bessel (Franklin & Marshall College)
Current: Research Assistant at MSK Cancer Center

06/2021 – 07/2021 **Mentor for Summer Program for Undergraduate Rising Stars (SPURS)**
Supervised Emmanuel Woredekal (Rutgers University)
Current: M.D. candidate, Sidney Kimmel Medical College, Philadelphia

01/2018 – 03/2019 **Women/Non-Binary Peer Mentoring Group**
Janelia Research Campus, USA

Training

2024 **Research Mentor Training Workshop**
Center for the Improvement of Mentored Experiences in Research (CIMER)
Participated as a student in this two-day mentorship workshop designed to enhance the mentoring skills of scientists.

WORKSHOPS

07/2025 – 08/2025 **Methods in Computational Neuroscience (selected)**
Marine Biology Laboratory, Woods Hole, USA

10/2019 **Janelia Junior Scientist Workshop (selected)**
Mechanistic Cognitive Neuroscience
Janelia Research Campus, USA

10/2012 – 09/2015 **Marie Curie FLiACT Training Network Workshops on Fly Neuroscience**
Max Planck Institute for Chemical Ecology, Jena; Max Planck Institute of Neurobiology, Martinsried; KUL, Leuven, Belgium; Center for Genomic Regulation, Barcelona

ACADEMIC SERVICE

01/2025 – 01/2026 **Columbia Neuroscience Seminar Series – Systems Neuroscience Selection Committee**
Columbia University, USA

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 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 – 07/2025
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 Live Show & Podcast
Breaking Barriers – Stories About Succeeding Despite the Odds
https://www.storycollider.org/stories/2025/3/13/breaking-barriers-stories-about-succeeding-despite-the-odds
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
Phone: +1 212-853-1010

Stefano Fusi, Ph.D. *(Postdoctoral Co-advisor)*
Investigator
Zuckerman Institute of Columbia University
Email: sf2237@columbia.edu
Phone: +1 212-853-1076

Larry Abbott, Ph.D. *(Postdoctoral Co-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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