

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

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), 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 *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

02/2025 – present

● **Undergraduate:** Molly Rose Graff (Barnard College)
Current: Undergraduate at Barnard College, Columbia University

02/2025 – present

● **Undergraduate:** Sarafina Belafonte (Columbia University)
Current: Undergraduate at Columbia University

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)
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 Woredokal (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**
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 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

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● **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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