Raunak Basu, Ph.D. | *Curriculum Vitae*

Contact Information

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Date of Birth: 12th July 1986
Citizenship: Indian

Current Position

- **The Edmond and Lily Safra Center for Brain Sciences (ELSC)**
  The Hebrew University of Jerusalem, Israel
  Senior Lecturer (Assistant Professor) from Oct 2022.

Education

- **University of Utah**, Salt Lake City, Utah, USA
  Ph.D., Neurobiology and Anatomy, 2012 – 2017
  Thesis: "Role of cadherins in mediating synapse specific properties in the hippocampus"
  Advisor: Dr. Megan E. Williams

- **Indian Institute of Technology Kharagpur**, Kharagpur, India
  Bachelor of Technology in Biotechnology and Biochemical Engineering, 2004 - 2008
  Thesis: "*In silico* modelling and characterization of *E.histolytica* chitinase"
  Advisor: Dr. Sudip K. Ghosh

Past Positions

- **Max Planck Institute for Brain Research,** Frankfurt am Main, Germany
  Postdoctoral researcher, July 2017 – September 2022
  Humboldt postdoctoral fellow, March 2019-February 2021
  Project: "Role of prefrontal cortex and hippocampus in representation of goal location"
  Advisor: Dr. Hiroshi T. Ito

- **University of Utah**, Salt Lake City, Utah, USA
  Graduate Research Assistant, 2009-2012
  Project: "Studying the biochemical interactors of HIV-1 Gag"
  Advisor: Dr. Wesley I. Sundquist

- **Indian Institute of Science**, Bangalore, India
  Research Assistant, August 2008 - November 2008
  Project: "Algorithm to detect internal repeats in protein structures"
  Advisor: Dr. K. Sekar

Grants received

1. **Recipient of ERC Starting grant 2023**
   Grant # 101117542 (ChoiceSpace)
   Awarding organization: European Research Council
   Amount: EUR 1 499 721
   Period of grant award: 2024 -2029
   Title: Task-relevant cognitive maps and their role in spatial decision-making

Role: PI

2. **Recipient of Abisch-Frenkel Foundation grant for the Promotion of Life Sciences**
   Awarding organization: Abisch-Frenkel Foundation
   Amount: 195,000 USD
   Period of grant award: December 2023-December 2026
   Title: Role of prefrontal-striatal pathway in age-dependent decline in flexible strategy switching
   Role: PI
3. **Recipient of "Humboldt Research Fellowship for Postdoctoral Researchers"**
   Awarding organization: Alexander von Humboldt Foundation
   Amount: EUR 82 800
   Period of grant award: March 2019 - February 2021
   Title: Distributed representation of reward location across the orbitofrontal cortex and the hippocampus for goal-directed spatial navigation
   Role: Postdoctoral fellow

Honors and Awards

1. Recipient of FENS-IBRO/PERC Travel Grant for FENS Forum 2022
2. Recipient of "2021 Postdoc Science Discovery" award given by the 'Friends of Max Planck Institute for Brain Research'.
3. Best poster award (2nd place) at "Neural Circuits and Connectomes" symposium 2016, Snowbird, Utah.
4. Graduate student travel assistant award, University of Utah, 2015.
5. Thomas N. Parks Student Travel Award, University of Utah, 2013.
6. Biological Chemistry Program Fellowship, University of Utah, 2009-2010.

Research Interest

- Decision-making, spatial navigation, action planning, communication between brain regions, and analysis of high dimensional neural data.

Peer reviewed Publications

1. **Basu, R.***, Mozaffarilegha, M., Bölükbaşi, I., Üstüner, C., and Ito, H.T* (2025). The orbitofrontal cortex forms a context-generalized spatial schema that preserves topology and distance. **bioRxiv** 10.1101/2025.09.15.676202 (https://www.biorxiv.org/cgi/content/short/2025.09.15.676202v1). * *Corresponding authors*

2. **Basu, R.***, and Ito, H.T* (2023). A Goal Pointer for a Cognitive Map in the Orbitofrontal Cortex. **Curr. Opin. Neurobiol** *83*, 102803. (* *Corresponding authors*)

3. **Basu, R.***, Gebauer, R., Herfurth, T., Kolb, S., Golipour, Z., Tchumatchenko, T., and Ito, H.T.* (2021). The orbitofrontal cortex maps future navigational goals. **Nature** *599*, 449-452. (* *Corresponding authors*)

4. **Basu, R.**, Duan, X., Taylor, M.R., Martin, E.A., Muralidhar, S., Wang, Y., Gangi-Wellman, L., Das, S.C., Yamagata, M., West, P.J., Sanes, J.R., Williams, M.E. (2017). Heterophilic

Type II Cadherins Are Required for High-Magnitude Synaptic Potentiation in the Hippocampus. **Neuron** *96*, 160–176.e8.

5. Martin, E.A., Muralidhar, S., Wang, Z., Cervantes, D.C., **Basu, R.**, Taylor, M.R., Hunter, J., Cutforth, T., Wilke, S.A., Ghosh, A., Williams, M.E. (2015). The intellectual disability gene Kirrel3 regulates target-specific mossy fiber synapse development in the hippocampus. **eLife** *4*, e09395.

6. **Basu, R.**, Taylor, M.R., and Williams, M.E. (2015). The classic cadherins in synaptic specificity. **Cell Adh Migr** *9*, 193–201.

7. Sabarinathan, R.*, **Basu, R.***, and Sekar, K. (2010). ProSTRIP: A method to find similar structural repeats in three-dimensional protein structures. **Comput Biol Chem** *34*, 126–130. (**co-first authors*)

8. Dey, T., **Basu, R**., and Ghosh, S.K. (2009). Entamoeba invadens: cloning and molecular characterization of chitinases. **Exp. Parasitol**. *123*, 244–249.

Invited Talks

1. Invited speaker at the European Neuroscience Institute, Germany, 2025
2. Invited speaker at the University of Haifa, Israel, 2025
3. Invited speaker at Institut des Neurosciences Paris-Saclay (NeuroPSI), France, 2024
4. Invited speaker at the Institute of Science and Technology, Austria, 2024
5. Invited speaker at the Institute of Psychiatry and Neuroscience of Paris (IPNP), France, 2024
6. Invited speaker at the Paris Brain Institute, France, 2024
7. Invited speaker at the Weizmann Institute of Science, Israel, 2024
8. Symposium speaker at the CRCNS meeting, Tel Aviv, Israel, 2023
9. Invited speaker at the 'Efficient coding and processing for perception and action' conference, SISSA, Italy, 2023
10. Symposium speaker at Computational and Systems Neuroscience meeting (Cosyne), Canada, 2023.
11. Invited speaker at the National Center for Biological Sciences, India, 2023
12. Invited speaker at the Indian Institute of Science (Center for Neuroscience), India, 2023
13. Invited speaker at the Indian Institute of Technology Kharagpur, India, 2023
14. Invited speaker at the University Medical Center Hamburg-Eppendorf (UKE), 2022
15. Invited speaker at INMED, Marseille, France, February 2022.
16. Invited speaker at the 'Emerging Talent' Seminar series, Max Planck Institute for Neuroscience, Florida, USA, December 2021.
17. Invited speaker at Bernstein Center for Computational Neuroscience, Munich, July 2021.
18. Symposium speaker at Computational and Systems Neuroscience meeting (Cosyne), 2021.
19. Invited speaker at University of Utah, USA, February 2020.
20. Symposium speaker at Mechanistic Cognitive Neuroscience workshop, Janelia Farm Research Campus, USA, October 2019.
21. Symposium speaker at Experimental Biology conference, Chicago, USA, April 2017.

Poster Presentations at Conferences

1. Federation of European Neuroscience Societies (FENS) Forum, Austria, 2024
2. OFC Meeting, France, 2024
3. Nordic Neuroscience Meeting, Denmark, 2024

4. Society for Neuroscience Meeting, USA, 2022
5. Gordon Research Conference on 'Frontal Cortex', USA, 2022
6. Federation of European Neuroscience Societies (FENS) Forum, France, 2022
7. Computational and Systems Neuroscience Meeting (Cosyne), USA, 2020
8. "Mechanistic Cognitive Neuroscience" workshop at Janelia Farm Research Campus, USA, 2019
9. Society for Neuroscience Meeting, USA, 2019
10. Network Meeting of the Alexander von Humboldt Foundation, Germany, 2019
11. Society for Neuroscience Meeting, USA, 2016
12. "Neural Circuits and Connectomics" symposium at Snowbird (Utah), USA, 2016
13. "Neuronal Circuits" meeting at Cold Spring Harbor Laboratory, USA, 2016
14. "Wiring the brain" meeting at Cold Spring Harbor Laboratory, USA, 2015
15. Society for Neuroscience Meeting, USA, 2013

Mentoring Experience

1. Mr. Aayush Banerjee (currently pursuing his PhD in my lab at The Hebrew University)
2. Mr. Abhishek Jangid (currently pursuing his PhD in my lab at The Hebrew University)
3. Ms. Miada Abu Salih (currently pursuing her PhD in my lab at The Hebrew University)
4. Mr. Francis Mitri (currently pursuing his PhD in my lab at The Hebrew University)
5. Ms. Malak Esmaeel (former undergraduate student in my lab at The Hebrew University)
6. Ms. Jisoo Kim (former Master student in the lab of my postdoc supervisor whom I co-advised)
7. Ms. Ipek Bölükbaşi (former Master student in the lab of my postdoc supervisor whom I co-advised)

Teaching Experience

1. Instructor of a tutorial course on "Selective topics in neural computation" at the Hebrew University of Jerusalem (2022-2024). In 2022, I chose the topic of high-dimensional neural dynamics. The course comprised both lectures and discussion of relevant papers. In 2023, the course was shared with other instructors, and I lectured on cognitive maps. In 2024, the course focused on hands-on high dimensional neural data analysis.

2. Co-instructor of a course (along with Dr. Hiroshi Ito) on "Space and time representation in the brain" offered by the Max Planck Institute for Brain Research (2021 and 2022).

3. Teaching Assistant in Molecular Biology Bootcamp organized by the Department of Neurobiology and Anatomy at the University of Utah (2015).

4. Teaching Assistant in a course of Advanced Biochemistry taught at the University of Utah (2011).

5. Taught mathematics to high school students as a part of National Service Scheme of India (2004-2005).

Administrative duties

1. Participated in the process of screening candidates for ELSC's PhD program.

2. I currently serve as a thesis committee member of three PhD students at ELSC - Mr. Mousa Karayanni, Ms. Haneen Rajabi, and Mr. Imri Lifshitz.

3. I am co-leading a committee that organizes the ELSC departmental retreat.

Reviewing duties

I have served as a reviewer for eLife, Nature Neuroscience, Exp. Brain Research, and Cosyne.

Outreach Activity

1. I presented at the "Bar of Science" event organized by the Max Planck Institute where scientists talk about their research to a non-academic audience to create awareness about the basic science research conducted at the institute (2018).

2. I gave introductory lectures to high school students in Germany as a part of the Max Planck Institute's outreach program 'Meet the Science' (in 2018 and 2020). These lectures included a high-level explanation of the kind of research performed in our lab including a tour of the various behavior setups and instruments used in our research.