

JAYEETA BASU

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Education and Training

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Presidency College, Calcutta, India	BSc (Honours)	09/1999- 09/2002	Physiology
International Max Planck Research School, Göttingen, DE	MSc	10/2002- 05/2004	Neuroscience Mentors: Christian Rosenmund, PhD Erwin Neher, PhD
Baylor College of Medicine	PhD	07/2004- 10/2007	Neuroscience Mentor: Christian Rosenmund, PhD
Columbia University	Postdoctoral	11/2007- 12/2014	Neuroscience Mentor: Steven. A. Siegelbaum, PhD

Positions and Honors

- 2015- Assistant Professor, Dept. of Neuroscience and Physiology, Neuroscience Institute,
New York University School of Medicine, New York, USA
- 2010-14 Associate Research Scientist, Dept. of Neuroscience, Columbia University, New York, USA
- 2007-09 Research Associate, Howard Hughes Medical Institute, Columbia University, New York, USA

Teaching-related

- 2016-17 Lecturer, Cellular Neuroscience Course, Neuroscience Graduate Program, NYU
- 2016-17 Lecturer, Medical School Nervous System Conferences 2016
Neurophysiology and synaptic transmission, NYU School of Medicine
- 2015-17 Course director and Lecturer: Research Adventures Electrophysiology and Imaging to study
neuronal activity
- 2011-12 Course director and Lecturer, Neuroscience, Science Honors Program, Columbia University, New
York
- 2005 Teaching Assistant, Analysis of Neuronal Function, Baylor College of Medicine, Houston

Major Research Interests

1. Long-range projection circuitry facilitating interactions between memory and sensory processing systems
 2. Excitatory and inhibitory transmission dynamics underlying associational plasticity and learning behaviors
- The overarching goal of the research program will be to identify synaptic and circuit-based mechanisms for activity dependent modulation of information flow in the cortico-hippocampal network. We combine electrophysiology and two-photon imaging approaches with molecular genetic manipulations and behavioral analysis to conduct these projects.

Publications

- 1) Camacho-Perez, M., **Basu, J.**, Trimbuch, T., Chang, S., Pulido, C., Chang, S., Dulubova, I., Rady, M., Rizo J. and Rosenmund C. Heterodimerization of Munc13 C2A domain with RIM regulates synaptic vesicle docking and priming. *Nature Communications* 2017; 8: 15293.
- 2) Basu, J., Zaremba J., Cheung, S.K., Hitti F.L., Zemelman, B.V., Losonczy, A., Siegelbaum, S.A. (2016) Gating of hippocampal activity, plasticity and memory by entorhinal cortex long-range inhibition. *Science: Vol. 351, Issue 6269.*
Featured in
 - Bray, N. (2016). "Learning and memory: Coordinating intervals." Nat Rev Neurosci.
 - Alexander, A. and I. Soltesz (2016). "Hippogate: a break-in from entorhinal cortex." Nat Neurosci.
 - Neuroscience News.com, Boston Globe
- 2) Kupferman, J., Basu, J., Russo, M. J., Guevarra, J.D., and Siegelbaum, S.A. (2014) Reelin signaling is required for the enrichment of ion channels in pyramidal neuron distal tuft dendrites. *Cell, 2014 (07) 035Sept 4.*
- 3) Basu, J., Srinivas K. V., Cheung, S.K., Taniguchi, H., Huang, Z. J., and Siegelbaum, S.A. (2013) A cortico-hippocampal learning rule enhances information flow through the hippocampal circuit by shaping local inhibitory microcircuit activity. *Neuron 79 (6) 1208-1221.* Cover Illustration. F1000 reviewed
- 4) Basu, J., Betz, A., Brose, N., and Rosenmund, C. (2007) Munc13-1 C1 domain activation lowers the energy barrier for synaptic vesicle fusion. *Journal of Neuroscience 27, 1200-1210*
- 5) Schluter, O. M., Basu, J., Sudhof, T. C., and Rosenmund, C. (2006) Rab3 superprimes synaptic vesicles for release: implications for short-term synaptic plasticity. *Journal of Neuroscience 26, 1239-1246*
- 6) Kalla, S., Stern, M., Basu, J., Varoqueaux, F., Reim, K., Rosenmund, C., Ziv, N. E., and Brose, N. (2006) Molecular dynamics of a presynaptic active zone protein studied in Munc13-1-enhanced yellow fluorescent protein knock-in mutant mice. *Journal of Neuroscience 26, 13054-13066*
- 7) Basu, J., Shen, N., Dulubova, I., Lu, J., Guan, R., Guryev, O., Grishin, N. V., Rosenmund, C., and Rizo, J. (2005) A minimal domain responsible for Munc13 activity. *Nature Structural Molecular Biology 12, 1017-1018.* F1000 Reviewed

Reviews, Books and Book Chapters

- 1) Zemla, R and Basu, J. (2017) "Hippocampal Function in Rodents." *Neurobiology of Learning and Plasticity, Current Opinion in Neurobiology* 2017, 43:187–197
- 2) Basu, J. and S. A. Siegelbaum (2015). *The Corticohippocampal Circuit, Synaptic Plasticity, and Memory. Cold Spring Harb Perspect Biol* 7(11).

PUBMED URL for full publication list: <http://www.ncbi.nlm.nih.gov/pubmed/?term=basu+jayeeta>

Honors and Awards

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| 2017 | Klingenstein-Simons Foundation Award |
| 2017 | Alfred P. Sloan Foundation Award |
| 2017 | America Epilepsy Society Junior Investigator Award |
| 2017 | Whitehall Foundation Grant Award |
| 2016 | Whitehead Fellowship for Junior Faculty in Biomedical and Biological Sciences |
| 2015 | wLeon Levy Fellowship Award |
| 2015 | Blas Frangione Foundation Award |
| 2012 | Anuradha Rao Memorial SFN Travel Award, Neuron |
| 2010 | NARSAD Young Investigator Award |
| 2010 | Travel Award, Young Investigators Meeting, India. |

- 2010 Poster Prize, Horizons in Molecular Biology International Symposium, Germany
- 2006 Course Stipend Award, Immunocytochemistry, In Situ Hybridization and Live Cell Imaging Course, Cold Spring Harbor Laboratory, New York, USA
- 2005 Paper of the Year, Dept. of Molecular Human & Genetics, Baylor College of Medicine, Houston (Basu, et. al. 2005)
- 2002 2nd in Physiology, BSc (Hons), Presidency College, University of Calcutta, Calcutta, India
- 2003 Best Lab Rotation Seminar, Neurosciences MSc-PhD Program, International Max Planck Research School, European Neuroscience Institute, Göttingen, Germany
- 2001 1st in Prof. A.K.Mukherjee Memorial Student Lecture, India.
- 2002 Industrial Stipend Award, Vossius & Partner, Munich, Germany.
- 2002 Max Planck Stipend, International Max Planck Research School, Göttingen, Germany
- 2001 Best Speaker, Inter College Debate Competition on Nutrition. National Nutrition Monitoring Bureau, Indian Council of Medical Research, India
- 2000 Ila Mukhopadhyay Medal for Best Human Quality, Presidency College, Calcutta, India

Invited Seminars and Lectures

- 2017 Dendritic Integration and Inhibition, Gordon Research Conference on Dendrites: Molecules, Structure & Function, March 25-31, 2017 Renaissance Tuscany Il Ciocco, Lucca (Barga), Italy
- 2017 TedX talk, On the Brink, New York University
- 2017 Reciprocal interactions between the hippocampus and entorhinal cortex memory circuit, Centre de Psychiatrie et Neurosciences, Inserm, Université Paris Descartes and the Centre Hospitalier Sainte Anne. May 13, 2017 Paris, France
- 2017 Reciprocal interactions between the hippocampus and entorhinal cortex memory circuit NeuroFrance, French Neuroscience Society, Not just a tri-synaptic loop: revisiting hippocampal circuits in health and disease. May 17-18, 2017 Bordeaux, France
- 2017 Dynamic interactions between circuits for memory and sensory processing, Advances in Memory Systems Meeting, Codes and Representations Session, Center for Learning, Memory and Emotion, NYU, New York, USA.
- 2017 Long-range Circuit Dynamics in the Entorhinal Cortex -Hippocampal Network, Gordon Research Conference on Inhibition in the CNS, June 25-30, 2017 Les Diablerets, Switzerland.
- 2017 Gating Hippocampal Activity with Cortical Long-range Disinhibition. Département des Neurosciences Fondamentales, Université de Genève - Faculté de Médecine. July 3, 2017.
- 2017 Gating Hippocampal Activity with Cortical Long-range Disinhibition. Blue Brain Project EPFL, Geneva. July 4, 2017
- 2016 Reciprocal interactions between the hippocampus and entorhinal cortex memory circuit, Leon Levy Fellows in Neuroscience Symposium, Icahn School of Medicine at Mount Sinai, New York
- 2016 Gating hippocampal activity through long-range inhibition. Sense to Synapse 2016, Rockefeller University, New York.
- 2016 Reciprocal interactions between the hippocampus and entorhinal cortex memory circuit, Dept. of Biological Sciences, Hunter College, City University of New York
- 2015 Synapses, circuits and learning, New York University Medical Center Information Technology Seminar, New York, NY, USA
- 2015 Tuning hippocampal activity, sensory coding and learning behavior with entorhinal cortex long-range inhibition, NYU Neuroscience Retreat, Mohonk, NY, USA
- 2014 Long-range inhibition in cortico-hippocampal sensory coding and learning behavior, Synaptic Transmission Gordon Research Conference, Waterville Valley, NH, USA
- 2014 Local and long-range GABAergic circuits for cortico-hippocampal mnemonic processing, New York University, New York, NY, USA.
- 2014 Local and long-range GABAergic circuits for cortico-hippocampal mnemonic processing, Vollum Institute, Portland, OR, USA
- 2013 A long-range GABAergic disinhibitory circuit for temporally precise mnemonic processing, Kavli Community Symposium Kavli Institute for Systems, Neuroscience, Norwegian University of Science and Technology, Trondheim, Norway
- 2010 Inhibitory inputs regulate the temporal fidelity and expression of input timing

- dependent plasticity in the hippocampus,
Max Planck Institute for Biophysical Chemistry, Göttingen, Germany
- 2010 Inhibitory inputs regulate the temporal fidelity and expression of input timing
dependent plasticity in the hippocampus, Neurocure, Charite University, Berlin, Germany
- 2010 Inhibitory inputs regulate the temporal fidelity and expression of input timing
dependent plasticity in the hippocampus, Synaptic Transmission Dynamics Nanosymposium,
Society for Neuroscience Meeting, San Diego
- 2010 The role of inhibition in input timing dependent plasticity in the hippocampus,
Young Investigator Meeting, Raichak, India
- 2008 Munc13- A biosensor for short term plasticity,
Gordon Research Conference for Synaptic Transmission, University of New England, USA.
- 2006 Molecular mechanism of Munc13 function in synaptic vesicle fusion,
Rush and Helen Record Forum, Galveston, USA
- 2003 Study of aggregation and phosphorylation of novel mutant Alzheimer's protein
Tau expressed in different cell lines, Graduate Student Symposium,
International Max Planck Research School, Göttingen, Germany

Research Support

Current:

Klingenstein-Simons Fellowship Award in Neuroscience Basu (PI) 07/1/17-6/30/20 2.4 cal months
The Esther A. & Joseph Klingenstein Fund, Inc. \$225,000 direct cost
Title: A Feedback Memory Circuit To Modulate Cortical Sensory Processing

Sloan Research Fellowship Basu (PI) 09/15/17-09/14/19 0.12 cal months
Alfred P. Sloan Foundation \$60,000 direct cost
Title: Dynamic Interactions of Circuits for Memory and Sensory Processing

American Epilepsy Society Junior Investigator Award Basu (PI) 7/1/2017-6/30/2018 1 cal month
American Epilepsy Society \$49,900 direct cost
Title: Establishing the dynamics and role of neurons born during adulthood epilepsy

Whitehall Three Year Research Grant Basu (PI) 12/01/16-11/30/19 3.0 cal months
Whitehall Foundation, Inc. \$225,000 direct cost
Title: Top-down modulation of sensory integration in the entorhinal cortex by hippocampal memory feedback

Childhood Brain Tumor Fund Award Basu (Co-PI) 09/01/16- 8/31/17
Childhood Brain Tumor Fund
Title: Reciprocal regulation of electroresponsiveness between glioblastoma and brain microenvironment

Whitehead Fellowship for Junior Faculty Basu (PI) 09/01/16- 8/31/17 .24 cal months
in Biomedical and Biological Sciences
New York University
Title: Do projections from the hippocampus mediate top-down modulation of sensory integration in the
entorhinal cortex?

Leon Levy Foundation Fellowship Basu (PI) 11/01/15-10/31/17 5.16 cal months
Leon Levy Foundation
Title: Characterizing the Functional Properties of Hippocampal Dendritic Spikes In vivo

Startup Funds Basu (PI) 01/01/15 – 01/01/18
Neuroscience Institute, NYU School of Medicine
Title: Synaptic and Circuit Mechanisms of Learning, Memory and Behavior

Completed Research Support:

Blas Frangione Young Investigator Research Grant Basu (PI) 01/01/16-12/31/16

Blas Frangione Foundation

Title: Assessing the Alterations In Excitation/Inhibition Balance and Network Activity in the Entorhinal Cortex during Alzheimer's disease

NARSAD Young Investigator Award 2010

Basu (PI) 07/15/11–07/14/13

Brain and Behavior Research Foundation

Title: The Role of Inhibition in Input Timing Dependent Plasticity

Trainees**Post-Doctoral Researchers:**

2015- Present Martial Dufour (American Epilepsy Society Fellow)

Graduate Students:

2017- Present Olesia Bilash (Sackler Graduate Program)

2017-Present Shannon Rashid (Medical Scientist Training Program)

2016- Present Rachel Swanson (Sackler Graduate Program, NSF awardee)

2016- Present Roland Zemla (Medical Scientist Training Program)

Masters Students:

2017- Present Rosanne Tuij

Research Associates and Technicians:

2017 Ariel Hairston

2015-2016 Margot Elmaleh

2015-2016 Stephanie Cheung

Undergraduate Student Researchers:

2015-2016 Ariel Hairston (Irene & Eric Simon Brain Research Fellow, 2016)

2015 – Present Sahaana Sundar (Dean's Undergraduate Research Fund Awardee, 2016)

2017 Anthony Graves (Summer Undergraduate Research Program (SURP) Awardee, 2017)

2016-Present Narissa Karima Hajratalli (Dean's Undergraduate Research Fund Awardee, 2017)

2015 Mayank Parashar

Rotation Students:

2015 Aaron Katzman

2015 Xingchen Liu

2015 Roland Zemla

2016 Rachel Swanson

2016 Naomi Lopez

2017 Alice Kwon

2017 Shannon Rashid

2017 Olesia Bilash