SRINIVASA SUBRAMANIAM

Associate Professor - Neuroscience

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Academic record

National College, University of Bangalore — *Bengaluru, India*
Bachelor of Sciences (B.Sc.) — *1989 – 1992*
- Chemistry, Botany, Zoology

Central College, University of Bangalore — *Bengaluru, India*
Master of Sciences (M.Sc.) — *1994 – 1996*
- Biochemistry

University of Heidelberg — *Heidelberg, Germany*
Ph.D. (Summa Cum Laude) — *2001 – 2004*
- Neuroscience
- Mentor: Prof. Klaus Unsicker

Johns Hopkins University — *Baltimore, MD, USA*
Postdoctoral fellow — *2006 – 2011*
- Neuroscience
- Mentor: Prof. Solomon Snyder

Positions held

08-1996 – 06-1998	**Lecturer**, Department of Chemistry and Biochemistry, MLA College, Bengaluru, India
06-1998 – 11-1999	**Project Assistant**, Department of Biochemistry, Indian Institute of Science, Bengaluru, India
11-1999 – 11-2000	**Research Assistant**, Institute for Experimental Pathology, University of Muenster, Germany
07-2004 – 02-2006	**Research Assistant**, Interdisciplinary Center for Neuroscience, University of Heidelberg, Germany
03-2006 – 02-2011	**Postdoctoral Fellow**, Department of Neuroscience, Johns Hopkins University School of Medicine, Baltimore, Maryland, USA. Mentor: Prof. Solomon Snyder
03-2011 – 03-2012	**Research Associate**, Department of Neuroscience, Johns Hopkins University School of Medicine, Baltimore, Maryland, USA
04-2012 – 04-2016	**Assistant Professor**, Department of Neuroscience, The Scripps Research Institute, Jupiter, Florida, USA
04-2013 – present	**Affiliate Research Professor**, Center for Molecular Biology and Biotechnology (CMBB), Charles E Schmidt College of Science, Florida Atlantic University, Florida, USA
03-2015 – present	**Affiliate Associate Professor**, Biomedical Science, Charles E Schmidt College of Science, Florida Atlantic University, Florida, USA
04-2016 – 04-2022	**Associate Professor**, Department of Neuroscience, The Scripps Research Institute, Jupiter, Florida. USA
04-2022 – present	**Associate Professor**, Department of Neuroscience, The Werthiem UF Scripps Biomedical Research, Jupiter, Florida, USA
11-2024 –	**Associate Professor**, Stiles-Nicholson Brain Institute, Department of Chemistry/Biochemistry, Jupiter, Florida, USA

Academic Achievement

During my master's degree, I focused on chemistry as my major. Following that, I decided to specialize in neuroscience for both my Ph.D. and postdoctoral studies. The primary focus of my research lies in cell death, cell signaling, protein-protein interaction, motor behavior, and the development of novel approaches for investigating neuronal communication in the brain. My 2004 thesis examined the early instances of signaling that enhanced plasma membrane and DNA damage in a particular set of neurons. Between 2006 and 2012, my primary area of concentration was the examination of the processes behind Huntington disease (HD) and the atypical motor behavior linked to Parkinson disease (PD). Through applying biochemical, molecular biology, and mouse behavior techniques, I have demonstrated that the vulnerability of the striatum in HD and the compromised signaling in PD may be attributed to the interaction between disease-associated proteins and proteins abundant in the striatum. These studies provided evidence of the brain mechanisms underlying neurological disease, whereby widespread changes may occur, yet significant abnormalities arise in a tissue-specific mechanistic way.

As a faculty member at UF Scripps (2012–present), I have employed cell and animal models and biochemical and molecular techniques to analyze the motor abnormalities and neurodegenerative pathways involved in HD and PD dyskinesia. We analyzed the swift initiation of protein networks within neurons to reveal the fundamental processes of motor action. We have identified a novel protein-protein network named the "Rhesactome," which is specifically involved in inhibiting motor activity in the striatum. In addition, we have created a distinctive mouse model to investigate the regulation and consequences of aberrant mTOR signaling in neurodegenerative disorders. Unexpectedly, we stumbled onto the "Rhes tunnel," a membranous conduit akin to tunneling nanotubes (TNT) that facilitates cargo transportation between neuronal cells. Our discovery demonstrates, for the first time, that the brain-specific protein Rhes can migrate between neurons both in laboratory conditions (in vitro) and in living organisms (in vivo). This finding highlights the role of TNT-like communication in this process. Additionally, we found that Rhes-mediated tunneling nanotubes (TNTs) can function as a "mitochondrial surveillant" to salvage impaired mitochondria. These latest discoveries revealed that contrary to accepted knowledge about intracellular signaling, the striatum can support a whole new class of membranous intercellular pathways that could affect the striatum's primary activities, such as motor, cognitive, and mental processes.

We have recently employed the RiboSeq tool in HD for the first time. This technique captured a comprehensive view of all the ribosomes actively translating in a cell at a particular moment. Our findings identified novel molecular targets for therapeutic intervention and aberrant translational and post-transcriptional pathways in the HD model. Theses independent research initiatives are supported by competitive R01 and R21 funding from the National Institutes of Health (NIH) and foundation funding from the Cure-for-Huntington Disease and Alzheimer's disease.I have authored more than 40 original research papers, with 24 of them being published after I transitioned into an independent investigator role.

Publications

Published (Reverse Chronological Order)

1. Dagar S, Sharma S, Tsaprailis G, Tapia CG, Crynen G, Joshi SG, Shahani N, **Subramaniam S**. Ribosome Profiling Reveals a Dichotomy Between Ribosome Occupancy of Nuclear-Encoded and Mitochondrial-Encoded OXPHOS mRNA Transcripts in a Striatal Cell Model of Huntington Disease. *Mol Cell Proteomics.* 2024 Apr;23(4):100746.PMID: 38447791

2. Rivera O, Sharma S, Shahani N, Ramírez-Jarquín UN, Crynen G, Karunadharma P, McManus F, Bonneil E, Pierre T, **Subramaniam S**. Rhes, a Striatal Enriched Protein, Regulates Post-Translational Small-Ubiquitin-like-Modifier (SUMO) Modification of Nuclear Proteins and Alters Gene Expression. *Cell Mol Life Sci.* 2024. Apr 8;81(1):169.PMID: 38589732

3. Park S, Ramírez-Jarquín UN, Shahani N, Rivera S, Sharma M, Joshi SG, Hansalia A, McManus FP, Thibault, **Subramaniam S**. SUMO Modifies GβL and Mediates mTOR Signaling. *J. Biol. Chem.* 2024. Apr;300(4):105778.PMID: 38395307

4. Dagar S, **Subramaniam S**. Tunneling Nanotube: An Enticing Cell-Cell Communication in the Nervous System. *Biology (Basel)* 2023 Sep 27;12(10):128. PMID: 37886998. *Invited Review.*

5. **Subramaniam S**, Boregowda S. Curbing Rhes Actions: Mechanism-based Molecular Target for Huntington's Disease and Tauopathies *CNS Neurol Disord Drug Targets* 2024 23(1):21-29. PMID: 36959146. *Invited Review.*

6. **Subramaniam S**. Striatal Induction and Spread of the Huntington's Disease Protein: A Novel Rhes Route. *J Huntingtons Dis.* 2022 Jul 18. PMID: 35871361. *Invited Review.*

7. Ramírez-Jarquín UN, Sharma M, Shahani N, Li Y, Boregowda S, **Subramaniam S**. Rhes protein transits from neuron to neuron and facilitates mutant huntingtin spreading in the brain. *Sci Adv.* 2022 Mar 25; 8(12):eabm3877. PMID: 35319973.*

8. De Rosa A, Di Maio A, Torretta S, Garofalo M, Giorgelli V, Masellis R, Nuzzo T, Errico F, Bertolino A, **Subramaniam S**,

Rampino A, Usiello A. Abnormal RasGRP1 Expression in the Post-Mortem Brain and Blood Serum of Schizophrenia Patients. *Biomolecules.* 2022 Feb 18;12(2). PMID: 35204828.

9. Ramírez-Jarquín UN, Sharma M, Zhou W, Shahani N, **Subramaniam S**. Deletion of SUMO1 attenuates behavioral and anatomical deficits by regulating autophagic activities in Huntington disease. *Proc Natl Acad Sci USA.* 2022 Feb 1;119(5). PMID: 35086928.*

10. Heikkinen T, Bragge T, Kuosmanen J, Parkkari T, Gustafsson S, Kwan M, Beltran J, Ghavami A, **Subramaniam S**, Shahani N, Ramírez-Jarquín UN, Park L, Muñoz-Sanjuán I, Marchionini DM. Global Rhes knockout in the Q175 Huntington's disease mouse model. *PLoS One.* 2021;16(10):e0258486. 2021. PMID: 34648564.

11. **Subramaniam S**. Ribosome traffic jam in neurodegeneration: decoding hurdles in Huntington disease. *Cell Stress.* 2021 May 3;5(6):86-88. PMID: 34124583. *Invited Review.*

12. Eshraghi M, Karunadharma PP, Blin J, Shahani N, Ricci EP, Michel A, Urban NT, Galli N, Sharma M, Ramírez-Jarquín UN, Florescu K, Hernandez J, **Subramaniam S**. Mutant Huntingtin stalls ribosomes and represses protein synthesis in a cellular model of Huntington disease. *Nat Commun.* 2021 Mar 5;12(1):1461. PMID: 33674575.*

13. Ramírez-Jarquín UN, Shahani N, Pryor W, Usiello A, **Subramaniam S**. The mammalian target of rapamycin (mTOR) kinase mediates haloperidol-induced cataleptic behavior. *Transl Psychiatry.* 2020 Oct 2;10(1):336. PMID: 33009372.

14. Sharma M, Rajendrarao S, Shahani N, Ramírez-Jarquín UN, **Subramaniam S**. Cyclic GMP-AMP synthase promotes the inflammatory and autophagy responses in Huntington disease. *Proc Natl Acad Sci USA.* 2020 Jul 7;117(27):15989-15999. PMID: 32581130.

15. **Subramaniam S**. Rhes Tunnels: A Radical New Way of Communication in the Brain's Striatum?. *Bioessays.* 2020 Jun;42(6):e1900231. PMID: 32236969. *Invited Review.*

16. Eshraghi M, Ramírez-Jarquín UN, Shahani N, Nuzzo T, De Rosa A, Swarnkar S, Galli N, Rivera O, Tsaprailis G, Scharager-Tapia C, Crynen G, Li Q, Thiolat ML, Bezard E, Usiello A, **Subramaniam S**. RasGRP1 is a causal factor in the development of l-DOPA-induced dyskinesia in Parkinson's disease. *Sci Adv.* 2020 May;6(18):eaaz7001. PMID: 32426479.*

17. **Subramaniam S**. Exaggerated mitophagy: a weapon of striatal destruction in the brain?. *Biochem Soc Trans.* 2020 Apr 29;48(2):709-717. PMID: 32129826. *Invited Review.*

18. **Subramaniam S**. Selective Neuronal Death in Neurodegenerative Diseases: The Ongoing Mystery. *Yale J Biol Med.* 2019 Dec;92(4):695-705. eCollection 2019 Dec. PMID: 31866784. *Invited Review.*

19. Sharma M, Ramírez Jarquín UN, Rivera O, Kazantzis M, Eshraghi M, Shahani N, Sharma V, Tapia R, **Subramaniam S**. Rhes, a striatal-enriched protein, promotes mitophagy via Nix. *Proc Natl Acad Sci USA.* 2019 Nov 19;116(47):23760-23771. PMID: 31676548.

20. Sharma M, **Subramaniam S**. Rhes travels from cell to cell and transports Huntington disease protein via TNT-like protrusion. *J Cell Biol.* 2019 Jun 3;218(6):1972-1993. PMID: 31076452.

21. Shahani N, Huang WC, Varnum M, Page DT, **Subramaniam S**. Forebrain depletion of Rheb GTPase elicits spatial memory deficits in mice. *Neurobiol Aging.* 2017 Feb;50:134-143. PMID: 27960107.

22. Shahani N, Swarnkar S, Giovinazzo V, Morgenweck J, Bohn LM, Scharager-Tapia C, Pascal B, Martinez-Acedo P, Khare K, **Subramaniam S**. RasGRP1 promotes amphetamine-induced motor behavior through a Rhes interaction network ("Rhesactome") in the striatum. *Sci Signal.* 2016 Nov 15;9(454):ra111. PMID: 27902448.

23. Klionsky…………**Subramaniam S**…………et al., Guidelines for the use and interpretation of assays for monitoring autophagy (3rd edition). *Autophagy.* 2016;12(1):1-222. PMID: 26799652.

24. Swarnkar S, Chen Y, Pryor WM, Shahani N, Page DT, **Subramaniam S**. Ectopic expression of the striatal-enriched GTPase Rhes elicits cerebellar degeneration and an ataxia phenotype in Huntington's disease. *Neurobiol Dis.* 2015 Oct;82:66-77. PMID: 26048156.

25. Shahani N, Seshadri S, Jaaro-Peled H, Ishizuka K, Hirota-Tsuyada Y, Wang Q, Koga M, Sedlak TW, Korth C, Brandon NJ, Kamiya A, **Subramaniam S**, Tomoda T, Sawa A. DISC1 regulates trafficking and processing of APP and Aβ generation. *Mol Psychiatry.* 2015 Jul;20(7):874-9. PMID: 25224257.

26. Tyagi R, Shahani N, Gorgen L, Ferretti M, Pryor W, Chen PY, Swarnkar S, Worley PF, Karbstein K, Snyder SH, **Subramaniam S**. Rheb Inhibits Protein Synthesis by Activating the PERK-eIF2α Signaling Cascade. *Cell Rep.* 2015 Feb 10;10(5):684-693. PMID: 25660019.

27. Pryor WM, Biagioli M, Shahani N, Swarnkar S, Huang WC, Page DT, MacDonald ME, **Subramaniam S**. Huntingtin promotes mTORC1 signaling in the pathogenesis of Huntington's disease. *Sci Signal.* 2014 Oct 28;7(349):ra103. PMID: 25351248.

28. Narayanan KL, **Subramaniam S**, Bengston CP, Irmady K, Unsicker K, von Bohlen und Halbach O. Role of transient receptor potential channel 1 (TRPC1) in glutamate-induced cell death in the hippocampal cell line HT22. *J Mol Neurosci.* 2014 Mar;52(3):425-33. PMID: 24242951.

29. Shahani N, Pryor W, Swarnkar S, Kholodilov N, Thinakaran G, Burke RE, **Subramaniam S**. Rheb GTPase regulates β-secretase levels and amyloid β generation. *J Biol Chem.* 2014 Feb 28;289(9):5799-808. PMID: 24368770.

30. Mealer RG, Murray AJ, Shahani N, **Subramaniam S**, Snyder SH. Rhes, a striatal-selective protein implicated in Huntington disease, binds beclin-1 and activates autophagy. *J Biol Chem.* 2014 Feb 7;289(6):3547-54. PMID: 24324270.

31. Mealer RG, **Subramaniam S**, Snyder SH. Rhes deletion is neuroprotective in the 3-nitropropionic acid model of Huntington's disease. *J Neurosci.* 2013 Feb 27;33(9):4206-10. PMID: 23447628.

32. **Subramaniam S**, Napolitano F, Mealer RG, Kim S, Errico F, Barrow R, Shahani N, Tyagi R, Snyder SH, Usiello A. Rhes, a striatal-enriched small G protein, mediates mTOR signaling and L-DOPA-induced dyskinesia. *Nat Neurosci.* 2011 Dec 18;15(2):191-3. PMID: 22179112.

33. **Subramaniam S**, Snyder SH. Huntington's disease is a disorder of the corpus striatum: focus on Rhes (Ras homologue enriched in the striatum). *Neuropharmacology.* 2011 Jun;60(7-8):1187-92. PMID: 21044641. *Invited Review.*

34. *Subramaniam S*, Mealer RG, Sixt KM, Barrow RK, Usiello A, Snyder SH. Rhes, a physiologic regulator of sumoylation, enhances cross-sumoylation between the basic sumoylation enzymes E1 and Ubc9. *J Biol Chem.* 2010 Jul 2;285(27):20428-32. PMID: 20424159

35. **Subramaniam S**, Unsicker K. ERK and cell death: ERK1/2 in neuronal death. *FEBS J.* 2010 Jan;277(1):22-9. PMID: 19843173. *Invited Review.*

36. **Subramaniam S**, Sixt KM, Barrow R, Snyder SH. Rhes, a striatal specific protein, mediates mutant-huntingtin cytotoxicity. *Science.* 2009 Jun 5;324(5932):1327-30 PMID: 19498170.

37. Alavian KN, Sgadò P, Alberi L, **Subramaniam S**, Simon HH. Elevated P75NTR expression causes death of engrailed-deficient midbrain dopaminergic neurons by Erk1/2 suppression. *Neural Dev.* 2009 Mar 16;4:11. PubMed PMID: 19291307.

38. Narayanan KL, Irmady K, **Subramaniam S**, Unsicker K, von Bohlen und Halbach O. Evidence that TRPC1 is involved in hippocampal glutamate-induced cell death. *Neurosci Lett.* 2008 Dec 3;446(2-3):117-22. PubMed PMID: 18822346.

39. **Subramaniam S**, Strelau J, Unsicker K. GDNF prevents TGF-beta-induced damage of the plasma membrane in cerebellar granule neurons by suppressing activation of p38-MAPK via the phosphatidylinositol 3-kinase pathway. *Cell Tissue Res.* 2008 Feb;331(2):373-83. PMID: 18071753.

40. Shahani N, **Subramaniam S**, Brandt R. Purification of MINUS: A negative regulator of microtubule nucleation in a variety of organisms. *Int J Biol Macromol.* 2006 Aug 15;39(1-3):15-22. PMID: 16420961.

41. Shahani N, **Subramaniam S**, Wolf T, Tackenberg C, Brandt R. Tau aggregation and progressive neuronal degeneration in the absence of changes in spine density and morphology after targeted expression of Alzheimer's disease-relevant tau constructs in organotypic hippocampal slices. *J Neurosci.* 2006 May 31;26(22):6103-14. PMID: 16738255.

42. **Subramaniam S**, Unsicker K. Extracellular signal-regulated kinase as an inducer of non-apoptotic neuronal death. *Neuroscience.* 2006;138(4):1055-65. PMID: 16442236. *Invited Review.*

43. **Subramaniam S**, Shahani N, Strelau J, Laliberté C, Brandt R, Kaplan D, Unsicker K. Insulin-like growth factor 1 inhibits extracellular signal-regulated kinase to promote neuronal survival via the phosphatidylinositol 3-kinase/protein kinase A/c-Raf pathway. *J Neurosci.* 2005 Mar 16;25(11):2838-52. PMID: 15772344.

44. **Subramaniam S**, Zirrgiebel U, von Bohlen Und Halbach O, Strelau J, Laliberté C, Kaplan DR, Unsicker K. ERK activation promotes neuronal degeneration predominantly through plasma membrane damage and independently of caspase-3. *J Cell Biol.* 2004 May 10;165(3):357-69. PMID: 15123736.

45. Schölzke MN, Potrovita I, **Subramaniam S**, Prinz S, Schwaninger M. Glutamate activates NF-kappaB through calpain in neurons. *Eur J Neurosci.* 2003 Dec;18(12):3305-10. PMID: 14686903.

46. **Subramaniam S**, Strelau J, Unsicker K. Growth differentiation factor-15 prevents low potassium-induced cell death of cerebellar granule neurons by differential regulation of Akt and ERK pathways. *J Biol Chem.* 2003 Mar 14;278(11):8904-12. PMID: 12514175.

47. Schuster N, Bender H, Philippi A, **Subramaniam S**, Strelau J, Wang Z, Krieglstein K. TGF-beta induces cell death in the oligodendroglial cell line OLI-neu. *Glia.* 2002 Oct;40(1):95-108. PMID: 12237847.

Bibliography: https://www.ncbi.nlm.nih.gov/myncbi/srinivasa.subramaniam.1/bibliography/public/

Book

Subramaniam S. Drug Discovery for Neurodegenerative Disease. World Scientific Publishing Co. Pte. Ltd.. In preparation.

Prepration/Pre-print

1. Ramírez-Jarquín UR, Shahani N, Eshragi M, Dagar S, and **Subramaniam S**. Fragile X mental retardation protein (FMRP) interacts with huntingtin and promotes Huntington disease pathogenesis. *in preparation.*
2. Eshragi. M, Shahani N, Sharma M, Rosa AD, Errico F, Clipperton-Allen AE, Page D, Usiello A, and **Subramaniam S**. Striatal-enriched protein Rhes interacts with Shank3 and coordinate motor and social behaviors. *in preparation.*
3. Dagar S, Hansalia A, Shahani S, **Subramaniam S**. Polyproline and penultimate CAA sequence regulates huntingtin protein products. *in preparation.*
4. Jennifer Hernandez, Neelam Shahani, Supriya Swarnkar, **Srinivasa Subramaniam**. Rhes Deletion Prevents Age-Dependent Selective Motor Deficits and Reduces Phosphorylation of S6K in Huntington Disease Hdh150Q(CAG) Knock-In Mice. *bioRxiv.* 2021.06.16.448681; doi: https://doi.org/10.1101/2021.06.16.448681.

Mentoring experiences

High School Interns

Nikhil Patwardhan (Suncoast High School, February 2013 – August 2013) worked as a Research Assistant at the Subramaniam Lab, where he investigated the role of the mTOR pathway in Huntington's disease-mediated striatal damage. At the University of Central Florida, he researched the signaling systems underpinning the etiology and pathophysiology of neurodegenerative illnesses. Subsequently, Nikhil earned a bachelor's degree in nursing and began working at the Delray Medical Center as a Progressive Care Nurse.

Sofia Karabasevic (Suncoast High School, June 2013 – August 2013) worked as a Summer Trainee in the Subramaniam Lab before being accepted into the Summer Undergraduate Research Fellows (SURF) Program at the Scripps Kellogg School of Science and Technology. Sofia investigated the molecular connection between Rhes and RasGRP1, a GEF that stimulates ERK and mTOR signaling. Using recombinantly pure E. coli proteins, Sophia demonstrated that Rhes interacts directly with RasGRP1. Sofia's focus at Dartmouth College was on neurobiology. She is employed by Oscar Health as a Product Operations Manager II.

Katherine Heatzig (Pine Crest High School, June 2018 – August 2018) worked as an intern in the lab studying the effect of Rhes expression on mitochondrial changes in cells with Huntington's disease. Kate meticulously demonstrated that Rhes modifies mitochondria by increasing their spherical shape in HD cells but not control cells. This research is consistent with our PNAS-reported concept that Rhes influences mitophagy in the HD model. At Cornell University in Ithaca, Kate is majoring in computer science.

Benjamin Cohan (Katz Yeshiva High School, June 2021 – August 2021) was a Kenan intern in the Subramaniam lab who addressed the ribosome stalling process of autophagy regulation. Ben investigated whether a protease that cleaves LC3A and LC3B is recruited to the ribosomes, based on our previous work demonstrating differential occupancy of ribosomes on the autophagy regulators. Ben isolated proteins from a sucrose gradient containing ribosomes and demonstrated that Atg proteases appear to be recruited to LC3A mRNA, although additional mechanistic elucidation of this phenomenon is required.

Vikram Saxena (Suncoast High School, June 2022 – August 2022) was a Kenan fellow who studied huntingtin (HTT) mRNA ribosome stalling. Vikram overexpressed HTT mRNA ribosome stalling reporter constructs into HEK 293 cells, followed by western blot analysis to detect HTT products. Vikram demonstrated that ribosomes stall on HTT mRNA, showing the existence of translation control mechanisms. Vikram is a senior who plans to pursue an MD-PHD degree.

Sophie Strickler (Wellington Community High School, June 2022 – August 22 and June 2023-Aug 2023). Sophie was a Kenan fellow who focused on mitochondrial translation abnormalities in Huntington's disease. Sophie extracted mitochondria from control and HD cells and performed an in vitro puromycin incorporation experiment (translation assay) to demonstrate that HD cells exhibit decreased mitochondrial translation despite increased ribosome occupancy. Sophie is a high school student who is interested in neurodegenerative research in the future.

Ijeoma Nwankwo (Palm Beach Central High School, June 2023 – August 23). Ijeoma, a Kenan fellow, conducted research on ribosome stalling specifically on mHTT RNA, which is relevant to Huntington's disease. Ijeoma acquired proficiency in cell culture, conducted western blotting, and executed DNA isolation procedures. Ijeoma is an aspiring high school student with a keen interest in pursuing research in the field of life science in the future.

Bhavya Kumar (Downtown Doral Charter Upper School, June 2023 – August 23). Bhavya researched the isolation of tunneling nanotubes for the purpose of identifying biomarkers for TNT. She has successfully isolated approximately 500 TNTs and acquired fundamental knowledge in the fields of microscopy and laser capture of minuscule protrusions.

Undergraduates, Thesis work

Lindsay Gorgen (FAU, 2012-2014) received a bachelor's degree in biology at Florida Atlantic University. She wrote her thesis on the "new role of Rheb in protein synthesis inhibition via the PERK pathway." She demonstrated that Rheb, an enzyme that may play a crucial part in the go/stop signal for a cell to produce new proteins via the endoplasmic reticulum-associated enzyme PERK, produces new proteins. Lindsay's thesis advisor at The Scripps Research Institute was Dr. Srinivasa Subramaniam. Her co-authored study was published in the journal Cell Reports. Lindsay is employed at the Washington Department of Health.

Vincenzo Andrew Giovinazzo (FAU, 2014-2016) was a Neuroscience major in the FAU Honors College. Under the guidance and supervision of Dr. Srinivasa Subramaniam, he conducted his thesis study at Scripps. His thesis, entitled "Dissecting the Stability of Rhes; a striatal protein implicated in Huntington's disease," sought to understand the Rhes protein's degradation mechanism. A portion of his work at the Subramaniam lab was published in Science Signaling. At FAU, Vincenzo is pursuing a medical degree.

Jennifer Hernandez (FAU, 2014-2016) worked as a Research Intern in the Subramaniam Lab. She earned a Bachelor of Science in Neuroscience and Behavior from Florida Atlantic University in May 2016 and is pursuing a medical degree at Temple University in Philadelphia. Her dissertation was titled "The in vivo involvement of Rhes in the knock-in mice model of Huntington's disease." Her dissertation and additional contributions are published in BioRxiv and Nature Communications.

Oscar Rivera (FAU, 2014-2017) joined as an intern in the Subramaniam Lab and worked on his FAU undergraduate thesis on "The transcriptional role of Rhes as modified by SUMO." Using biochemistry and mass spectrometry, Oscar demonstrated for the first time that Rhes is SUMO-modified. Oscar continued to work as a technician and contributed to several lab projects. In addition to Rhes–SUMO, Oscar focused on SUMO's role in mTOR signaling. His studies have appeared in BioRxiv, Science Advances, and the Proceedings of the National Academy of Sciences. Oscar is earning a Doctorate at Florida Atlantic University (FAU).

Veronika Zaloginova (FAU, 2024-present) is a second-year student at the FAU Honors College who has shown a keen interest in neurological diseases. She desires to undertake an undergraduate thesis project that centers on the translational deficiencies observed in Huntington disease. She is becoming acquainted with cell culture, western blotting techniques, and ribosome profiling.

Isabella Zuniga (FAU, 2024-present) is a freshman at the FAU Honors College and has shown a keen interest in studying neurological diseases. She desires to engage in undergraduate thesis research that specifically examines the role of the DNA damage sensor cGAS in Huntington disease. She is becoming acquainted with cell culture, molecular biology, and animal behavioral research, including rotarod, beam walk, and open field.

Alexandra Fernandez (FAU, 2024-present) Alexandra is a sophomore student in the FAU Honors College. She is currently actively pursuing her thesis by immersing herself in various approaches and biological inquiries that the lab is prioritizing.

Graduate/Rotating Student

Sophia Park (2015-2017) After a rotation period, Sophia became a graduate student in my lab as part of the Scripps program. She conducted research on the role of mTOR signaling in the brain's regular functioning. Sophia was awarded an NSF scholarship for a project proposal she submitted with supervision from Subramaniam. Due to unavoidable circumstances, she is pursuing her graduation in Switzerland.

Madison Jones (July-Sep 2023) is a student in the class of 2023 (UF Scripps). She expressed curiosity in our study pertaining to neurodegenerative disorders. Madison had conducted studies specifically focused on the release of extracellular vesicles. Madison used laser capture microscopy to separate TNT and made important contributions to the first mass-spectrometry study of proteins. Additionally, Madison has coauthored future reviews focused on the treatment methods for Huntington disease

Master's Thesis Student

Preksha Joshi (May-Dec 2023) was a postgraduate student specializing in biochemistry at MS Baroda University in India. She conducted her thesis research in my laboratory, with a specific focus on elucidating the role of SUMOylation in mTOR signaling. In addition to discovering new connections between SUMO and protein synthesis, she made significant contributions to two published papers and is currently working on a review article about HD.

Aayushi Hansalia (July-Nov 2023) was a master of biochemistry student at MS Baroda University in India. She conducted her thesis research at my laboratory, with a specific focus on unraveling the mechanism of ribosome stalling in mHTT mRNA, which is relevant to the etiology of HD. In addition to her primary topic, she has made contributions to the field of SUMO-mTOR signaling and is currently working on a forthcoming review of HD.

Medha Mahindra (Jan-May 2024) was a master of biochemistry student at Dayanand Sagara University in India. She worked on characterizing the interaction between Rhes and Slc4a7 using simulation and biochemical experiments to understand how this interaction promotes cell-cell communication via tunneling nanotubes.

Postdoctoral Fellows

Dr. William (Bill) Pryor (2012–2015) was a postdoc in the Subramaniam Lab. In 2012, Bill earned his doctorate in Physiology from the University of Georgia. As a postdoctoral researcher, Bill worked to decipher the molecular events underlying Huntington's and Alzheimer's diseases and examined protein synthesis regulators, which have implications for neurodegenerative diseases. He has published several significant papers in Science Signaling, JBC, Cell reports, and Neurobiol. Disease, and Transl Psychiatry and has been recognized by F1000. Bill is now a Medical Science Liaison at Abbvie.

Dr. Supriya Swarnkar (2012–2015) worked as a postdoc in the Subramaniam Laboratory. The CSIR-Central Drug Research Institute awarded her a doctorate in 2012. She investigated the mechanisms underlying striatal susceptibility in mice models of Huntington's disease, emphasizing the small GTPase Rhes, and published her findings in the Neurobiology of Disease journal. Supriya has published in Science Signaling, JBC, Cell reports, and Science Advances. She is currently a Program Manager with Agilent Technologies.

Dr. Vindhya Nawaratne (2016–2017) was a Research Associate in the Subramaniam Lab. She earned a Bachelor of Biomedical Science and a Doctor of Philosophy in Pharmacology from Monash University in Australia. As a postdoc, she focused on SUMO control by Rhes and SUMO substrate identification for Rhes. She continues her postdoctoral research at the University of Miami.

Dr. Megan Varnum (2016–2017) was a Research Associate in the Subramaniam Lab. She graduated from the University of Massachusetts Amherst with a Bachelor of Science in Psychology/ Neuroscience. Megan examined the intricate functions of Rheb and BACE1 in the production of beta-amyloid in Alzheimer's disease as a postdoc in the Subramaniam lab, a project funded by the Alzheimer's Association. Presently, she is working as Principal Consultant with BBC Entrepreneurship Training Consulting LLC.

Dr. Sumitha Rajendra Rao (2017-2018) worked as a postdoc in the Subramaniam Laboratory. Sumitha received her doctorate from India's National Institute of Mental Health and Neurosciences. While in the Subramaniam Lab, she was interested in utilizing stem cell capabilities to investigate the pathogenic pathways behind neurodegenerative disorders. She modeled Huntington's disease in a dish using HD Embryonic Stem Cells and patient fibroblasts. Her main objective was to determine the function that abnormal mTORC1 signaling plays in causing the condition. Her contribution has been published in the journal of the PNAS. She works as a principal investigator at India's Syngene International Limited.

Dr. Mehdi Eshraghi (2017-2019) joined as a Postdoctoral Research Associate at the Subramaniam Lab. Mehdi received his Doctor of Philosophy in Neuroscience from the Université of Ottawa. As a postdoctoral researcher, Mehdi investigated how mRNA translation is impacted in Huntington's disease and how the absence of striatum-specific RasGRP1 GEFs impacts L-Dopa Induced Dyskinesia (LID) in a mouse model of Parkinson's disease. His research appears in Science Advances and Nature Communications. Presently, he is a researcher at Columbia University in the United States.

Dr. Manish Sharma (2017-2021) was a Postdoctoral Research Associate at the Subramaniam Lab. Manish received his bachelor's degree in 2016 from the Translational Health Science and Technology Institute (THSTI) in Faridabad, India. Manish examined the physiological significance of Rhes, a striatal-specific protein implicated in Huntington's disease. Manish uncovered the unexpected role of Rhes and its cell-cell transmission in the brain. His research has appeared in J. Cell. Biol. PNAS, Science Advances, and Nature Communications. Manish is Scientist at Frederick National Lab, Maryland, USA.

Dr. Uri Nimrod Ramírez-Jarquín (2018-2021) was a Postdoctoral Research Associate at the Subramaniam Lab. Uri received his Doctorate in Biomedical Science from Universidad Nacional Autónoma de México (UNAM). As a postdoctoral researcher, he explored the mTOR pathway components in a transgenic model of Huntington's disease and Parkinson's disease. Using biochemical and electron imaging techniques, he evaluated the mitophagy function of Rhes in 3-Nitropropionic acid-based models of HD in vivo. His research has appeared in PNAS, Science Advances, and Translational Psychiatry. Uri is a faculty at the UNAM Department of Molecular Neuropathology, Mexixo. USA

Dr. Sunayana Dagar (2022-present) holds the position of postdoctoral associate in my laboratory. She is primarily interested in analyzing and studying the deficiencies in the transfer and transmission of information in individuals with Huntington's disease. She employs cellular and animal models of Huntington's disease (HD) to analyze the functions of cGAS in HD, as well as the processes involved in Rhes-mediated tunneling nanotube (TNT) synthesis. She utilizes a combination of cellular, molecular, and systemic approaches to decipher the underlying mechanisms in HD. She has one first-author publication and two co-authored articles.

Teaching Activities

My history and reflection on my own experiences, particularly those teachers who left a positive effect, have heavily informed my view of the importance of teaching. Mr. Gowda, a chemistry instructor, was one of the most influential teachers in my personal educational career. Through his guidance, this teacher attempted to assist me in achieving my goal of attending university by improving my self-esteem and confidence. Unsurprisingly, instructors' most intellectually advantageous setting appears to present the most straightforward opportunities for students to grasp the abilities required for effective test performance and managing challenges in life outside of the classroom.

After graduating with my MSc, I worked in a pre-university college for one and half years, where I taught introductory chemistry and lab experiments in a class of 60 students. Besides the teaching, the binding effect of molecular conformation- the three-dimensional arrangement of atoms in a molecule, I taught its ubiquitous role in biology and its importance in the binding of macromolecules that govern life. The biological significance of proteins attracted my scientific curiosity in exploring their role and characteristics in biological functions. I claimed the research career ladder supported by research scholars, students, and professors. In my Ph.D. studies at the University of Heidelberg, I co-mentored MD/Ph.D. students to conceive the original idea and plan the experiments. Here, I have planned seminars in which doctoral students are invited and encouraged to participate.

As a postdoc at Johns Hopkins University, I continued to provide hands-on research training and thesis project expertise to MD/PhD students in a particular field of their choice. Beginning as an assistant professor at Scripps, I taught neurodegenerative disease courses at Skaggs Graduate School and observed and mentored rotating graduate students. I oversaw fellowship and diversity grants to recruit students. I fostered close interactions with Florida Atlantic University by creating research opportunities for undergraduate students. Over the years, I have served as a chair and dissertation committee member, interviewing and providing structured rubrics to students. In 2022, I worked with Palm Beach State College to submit a proposal to the NSF to create a curriculum to improve Course-based Undergraduate Neuroscience Research Experiences (CUREs-Neuroscience) for students at a community college. Even though the proposal was reviewed positively, the PO asked for it to be resubmitted to get a score that would make it possible to fund. Scientific discovery combined with teaching has been the most satisfying adventure I have undertaken, where I have made multiple discoveries and published over 40 original research pieces. I would like to continue teaching and have a positive influence on the lives of the students.

Invited Talks

2004 **UCSD**, San Diego, USA
Children Hospital, Boston, USA
The University of Southampton, Southampton, UK
2005 **Stanford Burnham**, San Diego, USA
The Miami Project to Cure Paralysis, Miami, USA
The Johns Hopkins University, Baltimore, USA
The Emory University, Atlanta, USA
2009 **Johnson and Johnson**, Pennsylvania, USA
2010 **University of Southwestern Dallas**, Texas, USA
2011 **University of Kentucky**, Kentucky, USA
Indian Institute for Science Education and Research, Pune, India
Indian Institute of Science, Bengaluru, India
National Center for Biological Sciences, Bengaluru, India
Case Western Reserve University, Ohio, USA
The Scripps Research Institute, Florida, USA
2012 **Florida Atlantic University**, Boca Raton, USA
2013 **Boomers Conference**, Boca Raton, USA
Florida Atlantic University, Boca Raton, USA
University of South Florida, Gainesville, USA
Indian Institute of Science, Bengaluru, India
2014 **Alzheimer's Community Care Symposia**, West Palm Beach, USA
Indian Institute for Science Education and Research, Pune, India
2015 **Albany Medical School**, New York, USA
University of Trento, Trento, Italy
University of Naples, CEING, Naples, Italy
University of Osnabrueck, Osnabrueck, Germany
University of Freiburg, Freiburg, Germany
GTC-Bio 9th Neurodegenerative Conditions Research & Development Conference, Philadelphia, USA
2nd Zing Neurodegeneration Conference, Cancun, Mexico

2016 **The Institute for Stem Cell Biology and Regenerative Medicine INSTEM**, Bengaluru, India
The Jawaharlal Nehru Institute for Advanced Studies, Bengaluru, India
10th CNS Neurodegenerative Conditions Meeting, Boston, USA
Indiana University, Indianapolis, IN
Mount Sinai Medical School, New York, NY
Rochester School of Medicine and Dentistry, Rochester, NY
Tri-Institutional Neuroscience Seminar (TINS), Jupiter, FL

2017 **JSS Medical University College**, Mysuru, India
National Institute for Neurological and Mental Sciences, Bengaluru, India, SFN, Bengaluru Chapter, India

2018 **Central College, Department of Biochemistry**, Bengaluru, India
Department of Biochemistry, Tumkur University, Tumkur, India
Department of Gnanabarathi, Bangalore University, Bengaluru, India

2019 **Department of Genetics, Emory University**, Atlanta, USA
Institute of Cellular Nanoscience, University of Osnabrueck, Osnabrueck, Germany
Gordon Research Conference triplet disorder meeting, Barga, Lucca, Italy
Interdisciplinary Center for Neuroscience, University of Heidelberg, Heidelberg, Germany
University of Cape Town, Cortex Club, Cape Town, South Africa
Faculty of medicine of Antananarivo, Antananarivo, Madagascar
NGBT 2019: Nextgen Genomics, Biology, Bioinformatics and Technologies Conference, Mumbai, India
University of Mysore, Mysuru, India
American Society for Cell Biology, ASCB, 2019, Special Focus Group: tunneling and other cell protrusion: structure, composition and role in inter-cellular communication and disease

2020 **MindMusicMovement Foundation for Neurological Disorders**, Palm Beach Gardens, FL, USA

2021 **UK Dementia Research Institute HQ**, "Expanded repeat disorders: from mechanisms to therapies"
4th Annual Neural engineering symposium, The Miami Project, Miami, USA

2022 **Protein Folding on the Ribosome' meeting**, Baltimore, USA
Ribosome structure and function meeting, Bordeaux, France
ZMBH, University of Heidelberg, Germany
Regional Biotechnology Center, Delhi, India
University of Vadodara, Baroda, India
National Center for Biological Sciences, Bengaluru, India
University of Bergen, Bergen, Norway
University of Uppsala, Uppsala, Sweden
Max Delbruck Center, Berlin, Germany
Invitee, 2-day in-person CHDI Academic Workshop on HTT RNA structure, RNA-protein interactors, and HTT translation, LA, USA

2023 **Ribosome stalling in Huntington disease**, Tumkur, India
University of Gottingen, Gottingen, Germany
University of Manipal, Bangalore, India
Uni AT North Carolina, Greensboro, USA
Florida Atlantic University, Boca Raton, USA
UNAM, Mexico, Mexico city
Uni AT North Carolina, Greensboro, USA
Florida Atlantic University, Florida, USA
Annual Indian Neuroscience Meeting, Gwalior, India
Dayananda Sagara University, Bengaluru, India

2024 **Tumkur University**, Tumkur, India
National Institute of Mental Health and Neuroscience, Bangalore, India
Oxford College of Life Science, Bangalore, India
MS Baroda University, Vadodara, India
The Indian Institute of Science Education and Research, Pune, India
NRCCS Ist. Neurologico Mediterraneo Neuromed, Pozzilli (IS) Italy
Instituto de Investigación Sanitaria del Principado de Asturias, Asturias, Spain
The Indian Institute of Science Education and Research Kolkota (IISER Kolkota, Kolkota, India, upcoming
University of Mysore, Mysore, India, upcoming

Roles in organizing scientific meetings

2016 I was invited to work as a moderator to chair a "Rare and Orphan CNS Disorders" session at the 10th GTC Neurodegenerative Conditions Research & Development. Boston. Massachusetts, USA.

2022 I was invited to organize and chair a ”neurodegenerative disease and cognition” session at the Florida Consortium on the neurobiology of cognition (FCNC).” Tallahassee. Florida, USA.

2023 I was elected as a co-chair to organize the annual FCNC meeting.

2024 I was elected as executive member of FCNC.

Memberships on journal editorial boards and grant review panels

2012 - present **Peer Reviewer:** Neuron, Science Advances, PNAS, Journal of Neuroscience, Science Signaling, Biological Psychiatry, Cell and Tissue Research, FASEB Journal, Molecular Neurobiology, Neurobiology of Aging, Neurodegenerative Diseases, Scientific Reports, Journal of Clinical Investigation, NeuroMolecular Medicine, JOVS, Nature Communications, Bioscience Reports, Acta Neuropathologica, Journal of the Neurological Sciences, Cellular and Molecular Neurobiology. npj Aging and Mechanisms of Disease. Progress in Neuropsychopharmacology, Human Molecular Genetics, Molecular Neurobiology. PLOS biology, Front pharmacology, Translational Psychiatry, Journal of Advanced Research, Biomolecules. Genome biology, Journal of Molecular Biology. Neurobiology of disease, Plos one, Heliyon, Eur Journal of Pharmacology, Neuroscience letters, iScience

2013 **Grant reviewer:** Australian Federal Grant agency (NHMRC) and Dunhill Medical Trust. U.K.

2015 **Grant reviewer:** Alzheimer’s Association.

2016 NIH study section, CMND (ad hoc member)

2020 **Grant reviewer:** The French National Research Agency, France.

2021 **Grant reviewer:** Czech Science Foundation, Czech Republic.

2022 **Grant reviewer:** Neurological foundation, New Zealand.

2022 **Grant reviewer:** Medical Research Council (MRC) London Institute of Medical Sciences.

2022 **Grant reviewer:** Fondazione Telethon foundation, Italy.

2023 **Grant reviewer:** Fondazione Telethon foundation, Italy.

2023 **Grant reviewer:** Neurological foundation, New Zealand.

2023 **Grant reviewer:** Department of Biotechnology, Gov of India.

2023-May **Grant reviewer:** NIH ZRG1 F02B-Y, NI H study section.

2023-Oct **Grant reviewer:** NIH ZRG1 F02B-Y, NIH study section.

2024-Mar **Grant reviewer:** NIH ZRG1 F02B-Y, NIH study section.

2024-June **Grant reviewer:** NIH ZRG1 F02B-Y, NIH study section.

2024 **Grant reviewer:** DFG, German Research Foundation.

2024 **Elected Executive Member:** Florida Consortium on the Neurobiology of Cognition.

Research Support

Ongoing Research Support

1. R01NS128225-01, Role: PI. Total cost; $2,312,500, direct cost; $1,250,000.
   Rhes–SUMO Pathway in Huntington disease ((09/21/2022–5/31/2027) NIH/NINDS.
   The molecular cause for striatal-specific degeneration in Huntington disease is unclear. The study uses biochemical, molecular, and animal models to examine the role of the Rhes-SUMO pathway in orchestrating striatal-specific neuronal dysfunction.

2. R21NS128564-01, Role: PI. Total cost; $508,750, direct cost; $275,000
   Validation of the cGAS-STING pathway as a drug target in Huntington disease mouse model (06/01/2022–5/31/2024, NCE). NIH/NINDS. The project based on strong preliminary data tests the hypothesis that cyclic GMP–AMP synthase (cGAS)–stimulator of interferon genes (STING), a major innate immunity response pathway, is a disease modifier in HD pathogenesis.

3. NIH/NINDS, 1R01NS138278-01, Role: PI, Total cost; direct cost; $1,250,000
   Mechanisms of Translational Deificts in Huntington disease, ((07/01/2024–7/01/2029). NIH/NINDS. The project aims to understand protein synthesis aberration in Huntington disease.

PENDING RESEARCH SUPPORT

1. NIH/NINDS, under review, Role: Co-PI, Total cost; 2.5M Total;
   Mechanisms of Rhes-mediated cell-cell transmission of proteins

COMPLETED RESEARCH SUPPORT

1. 1R01NS087019-01A1 (Subramaniam, PI) (06/1/2015 – 5/31/2020) NIH/NINDS $2.27M
   mTOR Signaling in Striatum: Regulation and Function
   The main objectives of this study were to examine the biochemical and functional interactions between RasGRP1 and Rhes, two striatal-enriched proteins involved in the regulation of mTORC1, to investigate the potential significance of mTOR SUMOylation in this regulation, and to analyze the effects of mTOR level changes on striatal motor function and L-DOPA-induced dyskinesia in Parkinson disease using a mouse model of $mTOR^{flox/flox}$.
2. 1R01NS094577-01 (Subramaniam, PI) (02/15/2016 – 1/21/2020) NIH/NINDS $1.68M
   Rhes-SUMO Circuitry in Huntington Disease (HD) Pathogenesis
   The objectives of the proposed study were to elucidate the physiological function of SUMO1, a main moderator of mHTT by Rhes in HD, and to find novel SUMO substrates of Rhes that may have consequences in HD. Rhes is a striatal-enriched SUMO E3 ligase.
3. Alzheimer's Association International Research Grant (Subramaniam, PI) (Apr 2015 – Apr 2017) $200K
   RHEB Overexpression as a Gene Therapy in Alzheimer's Disease (AD) Mouse Model
   The major goal of this project was to evaluate the beneficial effects of hippocampal RHEB overexpression in AD-related memory deficits in a mouse model.
4. Cure for Huntington Disease Initiation (CHDI) (Subramaniam, PI) (2/1/18-2/1/21) $1M
   Role and Mechanisms Aberrant mTOR Signaling in Huntington Disease (HD)
   This study dissected the mechanistic details of hyperactive mTOR signaling in HD, using human patient-derived ES cells, generating novel HD mice in which mTORC1 was genetically suppressed selectively in the brain.
5. The Community Foundation Fellowship Grant 2017-2020 $60K
   Age-associated cellular signaling contributes to Alzheimer's disease
   Using cell and animal models, this support was used to clarify how Rheb-mTORC1 cellular signaling contributes to Alzheimer's disease-like phenotype.

Academic honors and prizes

1996 **2nd Prize**, Best Lecture "Embryonic Body Plan in Drosophila," Bangalore, India
2002 **Pre-Doctoral Fellowship**, German Research Foundation, Germany
2004 **Summa Cum laude**, University of Heidelberg, Heidelberg, Germany
2005 **Invited Young Scientist**, 55th Meeting for Nobel Laureates, Germany
2005 **Wolfgang-Bargmann Prize**, Anatomical Society, Germany
2005 **Young Investigator Award**, University of Heidelberg, Heidelberg, Germany
2009 **Travel Grant Award**, Gordon Triplet Disorder Research Seminars, USA
2009 **Travel Grant Award**, Gordon Triplet Disorder Research Conference, USA
2010 **Daniel Nathan's Research Award**, Johns Hopkins School of Medicine, USA
2015 **Alzheimer's Association International Research Award**, Alzheimer's Association
2024 **Editorial board member**, Biology, Neuroscience
2024 **Editorial board member**, Journal of Clinical and Translational Research

Non academic honors and prizes

1991 **Bronze Medal**, State Taekwondo Championship, Bengaluru, India
1992 **Silver Medal**, State Taekwondo Championship, Bengaluru, India
1992-96 **Instructor**, YPR Taekwondo School, Bengaluru, India
1994 **State Referee**, World Taekwondo Federation, Bengaluru, India
1994 **Participant**, National Games, Pune, India
1994 **Gold Medal**, South India Taekwondo Championship, Kadappa, India
1995 **Gold Medal**, State Taekwondo Championship, Bengaluru, India
1996 **Gold Medal**, State Open Taekwondo Championship, Bengaluru, India

2003 **Secretary**, Heidelberg Indian Student Association, Heidelberg, Germany
2004 **President**, Samatva Trust for Promoting Rural-Children Education, Jupiter, FL, USA
2009 **Winner**, "Kaveri Idol" by Kaveri Washington/Maryland Association, USA
2011 **Runner up**, "Kaveri Idol" by Kaveri Washington/Maryland Association, USA
2013 **Featured in "Palm Beach Post"**, Accent section, West Palm Beach, FL, USA
2013 **Featured in "Boomer Times Radio Show"**, Boca Raton, FL, USA
2016 **Opinion letter The New York Times**, in response to "In Rural India, Barriers to Education and Better Jobs"
2020 **Opinion letter The New York Times**, in response to "India's Latest Covid Wave Is Disturbingly Different"
2023 **StarMaker**, 59 times No.1 rank holder, singing records

Outreach Activities

Services

2018 **Thesis advisor**, Scripps graduate program
2019 **Career advice speaker**, Postdoctoral office
2019 **Laboratory ethics seminar speaker**, Postdoctoral office
2021-present **Advisory committee member**, Proteomics core
2022 **Chair**, Neuroscience seminar committee
2022 **Member**, Neuroscience faculty search committee
2023 **Chair**, Neuroscience seminar committee

Promoting Education for Underprivileged Children

As a child growing up in India, I shared a room in our house with my two brothers and a sister. During the monsoon, when it rained heavily, water entered the room because our home had a leaky roof made of broken mud tiles. My parents had no money to repair the roof. We kept buckets in our room to collect the water, covered ourselves in a gunny bag for warmth, and waited to go back to sleep until the rain stopped. We wished it would rain only during the day. As a child, education was a distant dream for me. However, once I was in high school, I realized education is the only way out of poverty.

There are millions of underprivileged children in India who struggle to gain education. During my Ph.D. studies at the University of Heidelberg, Germany, with prize money of 2000 euros, I started a foundation, with my college friends, called the Samatva Trust, to provide educational opportunities for needy children in India. Samatvam in the ancient Tamil language means "toward equality." Every year, the Samatva Trust, which is a 501(c)3 non-profit organization, supports hundreds of children, providing them with financial support, arranging science seminars and science experiment competitions in rural schools, and recognizing the best rural schoolteachers for their dedication and hard work. Among the prominent Samatva success stories are a student who became a lecturer and another who became a chief nurse and now treats COVID-19 patients. More information about the Samatva Trust can be found at www.samatvatrust.org. Over the years we raised USD150,000.