

## Curriculum Vitae

**Name:** Nagendran Ramalingam  
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### Education:

1994 - 1997	BSc	Botany	Bharathidasan University Trichy, India
1997 - 1999	MSc	Biochemistry	Bharathidasan University Trichy, India
2003 - 2009	PhD	Biology (Advisor: Michael Schleicher, PhD)	Ludwig-Maximilians-University Munich, Germany

### Positions:

10/2000 - 06/2003	Research Assistant	Jawaharlal Nehru Center for Adv. Scientific Res, Bangalore, India	
10/2009 - 12/2013	Postdoctoral Research Fellow	Pathology (Advisor: Gregg Gundersen, PhD)	Columbia University New York, NY
01/2014 - 01/2017 05/2017 - 06/2021	Associate Research Scientist Research Fellow	Neurology Neurology (Advisor: Ulf Dettmer, PhD)	Columbia University, New York Brigham and Women's Hospital, Harvard Med School, Boston, MA
07/2021 - 06/2024	Instructor	Neurology	Brigham and Women's Hospital, Harvard Med School, Boston
07/2024 – 01/2026	Assistant Professor	Neurology	Brigham and Women's Hospital, Harvard Med School, Boston
02/2026 – present	Assistant Professor	Molecular Medicine and Neurology	University of South Florida, Morsani College of Medicine

### Honors and Prizes:

1994 - 1997	Outstanding Academic Performance	Bharathidasan University, Trichy, India	BSc
1997 - 1999	Best Academic Performance	Bharathidasan University, Trichy, India	MSc
2003 - 2005	PhD scholarship	Max von Pettenkofer- Institute, Munich, Germany	PhD proposal
2005 - 2009	PhD scholarship	Elite Network of Bavaria, Bavarian State Ministry of Science and the Arts	PhD proposal
2017	Travel Award	American Society for Cell Biology	Presentation
2019 - 2021	Travel Fellowship	Program for Interdisciplinary Neuroscience, Brigham and Women's Hospital	Collaborative proposal

### Invited talks (select):

- 2020 Activity-dependent  $\alpha$ -synuclein homeostasis  
Leveragen, Worcester, MA
- 2023 Dynamic physiological  $\alpha$ -synuclein Ser 129 phosphorylation is driven by neuronal activity  
Selected oral presentation, ADPD International Conference, Gothenburg, Sweden
- 2023 Activity-dependent  $\alpha$ -synuclein homeostasis in health and disease  
University of Nebraska Medical Center, Omaha, NE
- 2023 Neuronal  $\alpha$ -synuclein homeostasis in health and disease  
New York University, New York, NY
- 2023 Distinguishing  $\alpha$ -synuclein S129 phosphorylation in health and synucleinopathy Invited presentation  
Columbia University, New York, NY
- 2024  $\alpha$ -synuclein dynamics in health and disease  
Drexel University, Philadelphia, PA
- 2024 Beyond synucleinopathies: the normal life of  $\alpha$ -synuclein  
Center for Stroke and Dementia Research, Ludwig Maximilians University Munich, Germany
- 2024 Physiological  $\alpha$ -synuclein serine-129 phosphorylation is not an oxymoron  
University of Medicine, Gottingen, Germany
- 2024 Beyond synucleinopathies: the normal life of  $\alpha$ -synuclein  
Max Delbrück Center, Berlin, Germany
- 2024 Distinguishing  $\alpha$ -synuclein S129 phosphorylation in health and disease  
Barrow Neurological Institute, Phoenix, AZ
- 2025 Beyond synucleinopathies: the normal life of  $\alpha$ -synuclein  
National Institute of Mental Health and Neurosciences, Bangalore, India
- 2025 Distinguishing  $\alpha$ -synuclein S129 phosphorylation in health and disease  
India Institute of Science, Bangalore, India
- 2025 Beyond synucleinopathies: the normal life of  $\alpha$ -synuclein  
University of Edinburgh, UK
- 2025 Beyond synucleinopathies: the normal life of  $\alpha$ -synuclein  
University of Bern, Switzerland
- 2025 Distinguishing  $\alpha$ -synuclein serine-129 phosphorylation in health and Lewy body diseases  
Selected oral presentation, Synuclein International Conference, Cambridge, UK
- 2025 Beyond synucleinopathies: the normal life of  $\alpha$ -synuclein  
Gordon Research Conference – Parkinson’s Disease. Session: Normal functions of  $\alpha$ -synuclein.  
Waterville Valley, New Hampshire
- 2025 Beyond synucleinopathies: the normal life of  $\alpha$ -synuclein  
Chester Stephens Lecture, Neurology Grand Round. University of South Florida, Tampa, Florida

### Publications:

1. Ranga U, Shankarappa R, Siddappa NB, Ramakrishna L, **Nagendran R**, Mahalingam M, Mahadevan A, Jayasuryan N, Sathishchandra P, Shankar SK, Prasad VR. Tat protein of human immunodeficiency virus type 1 subtype C strains is a defective chemokine. *J Virol.* 2004 Mar;78(5):2586-90.
2. Arasada R, Son H, **Ramalingam N**, Eichinger L, Schleicher M, Rohlf M. Characterization of the Ste20-like kinase Krs1 of Dictyostelium discoideum. *Eur J Cell Biol.* 2006 Sep;85(9-10):1059-68.
3. Joseph JM, Fey P, **Ramalingam N**, Liu XI, Rohlf M, Noegel AA, Muller-Tauberberger A, Glockner G, Schleicher M. The actinome of Dictyostelium discoideum in comparison to actins and actin-related proteins from other organisms. *PLoS ONE.* 2008 Jul 9;3(7):e2654.
4. **Ramalingam N**, Zhao H, Breitsprecher D, Lappalainen P, Faix J, Schleicher M. Phospholipids regulate localization and activity of mDial formin. *Eur J Cell Biol.* 2010 Oct;89(10):723-32.
5. Bartolini F, **Ramalingam N**, Gundersen GG. Actin capping protein promotes microtubule stability by antagonizing mDial’s actin activity. *Mol Biol Cell.* 2012 Oct 23(20):4032-40.

6. Morris EJ, Nader GPN, **Ramalingam N**, Bartolini F and Gundersen GG. Kif4 interacts with EB1 and stabilizes microtubules downstream of Rho-mDia in migrating fibroblasts. *PLoS ONE* 2014 Mar 21;9(3):e91568.
7. **Ramalingam N**, Franke C, Jaschinski E, Winterhoff M, Lu Y, Bruhmann S, Junemann A, Meier H, Noegel AA, Weber I, Zhao H, Merkel R, Schleicher M, Faix J. A resilient formin-derived cortical actin meshwork in the rear drives actomyosin-based motility in 2D confinement. *Nat Commun.* 2015 Sep 29;6:8496.
8. Bartolini F, Andres-Delgado L, Qu X, Nik S, **Ramalingam N**, Kremer L, Alonso MA, Gundersen GG. An mDia1-INC2 formin activation cascade facilitated by IQGAP1 regulates stable microtubules in migrating cells. *Mol Biol Cell.* 2016 Jun 1;27(11):1797- 808.
9. Dettmer U, **Ramalingam N**, von Sauken VE, Kim TE, Newman AJ, Terry-Kanter E, Nuber S, Ericsson M, Fanning S, Bartels T, Lindquist S, Levy OA, Selkoe D. Loss of native  $\alpha$ -synuclein multimerization by strategically mutating its amphipathic helix causes abnormal vesicle interactions in neuronal cells. *HumMol Genet.* 2017: Sep 15;26 (18):3466-3481.
10. Sun X, Aime P, Dai D, **Ramalingam N**, Crary J, Burke R, Greene L, Levy OA. Guanabenz promotes neuronal survival via enrichment of ATF4 and parkin expression in models of Parkinson's disease. *Exp Neurol.* 2018:Feb 9;303:95-107.
11. Litschko C, Bruhmann S, Szisar A, Stephan T, Dimchev V, Damiano-Guercia J, Junemann A, Korber S, Winterhoff M, Nordholz B, **Ramalingam N**, Peckham M, Rottner K, Merkel R, Faix J. Functional integrity of the contractile actin cortex is safeguarded by multiple Diaphanous-related formins. *Proc Natl Acad Sci USA.* 2019 Feb 26;116(9):3594-3603.
12. Imberdis T, Fanning S, Newman A, **Ramalingam N**, Dettmer U. Studying  $\alpha$ -synuclein conformation by intact-cell cross-linking. *Methods Mol Biol.* 2019;1948:77-91.
13. Fanning S, Haque A, Imberdis T, Baru V, Barrasa I, Nuber S, Termine D, **Ramalingam N**, Ho GPH, Noble T, Sandoe J, Lou Y, Landgraf D, Freyzon Y, Newby G, Soldner F, Terry-Kantor E, Kim TE, Hofbauer HF, Becuwe M, Jaenisch R, Pincus D, Clish CB, Walther TC, Farese, Jr. RV, Srinivasan S, Welte MA, Kohlwein SD, Dettmer U, Lindquist S, Selkoe D. Lipidomic analysis of  $\alpha$ -synuclein neurotoxicity identifies stearoyl coA desaturase as a target for parkinson treatment. *Molecular Cell.* 2019 Mar 7;73(5):1001-1014.
14. Imberdis T, Negri J, **Ramalingam N**, Terry-Kantor E, Ho G, Fanning S, Stirtz G, Kim TE, Levy O, Young-Pearse T, Selkoe D, Dettmer U. Cell models of lipid-rich  $\alpha$ -synuclein aggregation validate modifiers of  $\alpha$ -synuclein biology and identify stearoyl-CoA desaturase. *Proc Natl Acad Sci USA* 2019 Oct 8;116(41):20760-20769.
15. Terry-Kantor E, Tripathi A, Imberdis T, LaVoie Z, Ho G, Selkoe D, Fanning S, **Ramalingam N\***, Dettmer U\*. Rapid  $\alpha$ -synuclein toxicity in a neural cell model and its rescue by a stearoyl-CoA desaturase inhibitor. *Int J Mol Sci.* 2020 July 22. (\*corresponding authors).
16. Ho G, **Ramalingam N**, Imberdis T, Wilkie E, Dettmer U, Selkoe D. Upregulation of cellular palmitoylation mitigates  $\alpha$ -synuclein aggregation and neurotoxicity. *Mov Disord.* 2020 Oct 26
17. **Ramalingam N\*** and Dettmer U\*. Temperature is a key determinant of alpha- and beta-synuclein membrane interactions in neurons. *J Biol Chem.* 2021 Jan 8 (\*corresponding authors).
18. Kim TE, Newman AJ, Imberdis T, Brontesi L, Tripathi A, **Ramalingam N**, Fanning S, Selkoe D, Dettmer D. Excess membrane binding of monomeric alpha-, beta-, and gamma-synuclein is invariably associated with inclusion formation and toxicity. *Hum Mol Genet.* 2021 July 12.
19. Tripathi A, Alnakhala H, Terry-Kantor E, Newman A, Liu L, Imberdis T, Fanning S, Nuber S, **Ramalingam N**, Selkoe D, Dettmer U. Pathogenic mechanisms of cytosolic and membrane-enriched  $\alpha$ -synuclein converge on fatty acid homeostasis. *J. Neurosci.* 2022 Mar 9.
20. **Ramalingam N\***, Jin S, Moors TE, Fonseca-Ornelas L, Shimanaka K, Lei S, Cam HP, Watson AH, Brontesi L, Ding L, Hacibaloglu DY, Jiang H, Choi SJ, Kanter E, Liu L, Bartels T, Nuber S, Sulzer D, Mosharov E, Chen WV, Li S, Selkoe DJ, Dettmer U\*. Dynamic physiological  $\alpha$ -synuclein S129 phosphorylation is driven by neuronal activity. *NPJ Parkinsons Dis.* 2023 Jan 16. (\*corresponding authors).

21. Brontesi L, Imberdis T, **Ramalingam N\***, Dettmer U\*. The effect of KTKEGV repeat motif and intervening ATVA sequence on  $\alpha$ -synuclein solubility and assembly. *J Neurochem*. 2023 Jan 10. (\*corresponding authors).
22. Jin M, Wei Z, **Ramalingam N**, Xiao M, Xu A, Yu X, Song Q, Liu W, Zhao J, Zhanf D, Selkoe DJ, Li S. Activation of  $\beta$ 2-adrenergic receptor prevents AD-type synaptotoxicity via epigenetic mechanisms. *Molecular Psychiatry*. 2023 June 26.
23. **Ramalingam N\***, Brontesi L, Jin S, Selkoe DJ, Dettmer U\*. Dynamic reversibility of  $\alpha$ -synuclein S129 phosphorylation is impaired in synucleinopathy models. *EMBO Reports*. 2023 Oct 23. (\*corresponding authors).
24. **Ramalingam N\*** and Dettmer U\*.  $\alpha$ -synuclein serine129 phosphorylation - the physiology of pathology. *Molecular Neurodegeneration*. 2023 November (\*corresponding authors).
25. Shimanaka K, Shi B, Brontesi L, Alnakhala H, Subramanian K, **Ramalingam N**, Tripathi A, U Dettmer. The cytosolic half of the  $\alpha$ -synuclein amphipathic 3-11 helix: Consequences of adding hydrophobicity or positive charges. *FEBS Letters*. 2023 Nov 22.
26. Li JZ, **Ramalingam N**, Li S. Targeting epigenetic mechanisms in amyloid- $\beta$ -mediated Alzheimer's pathophysiology: unveiling therapeutic potential. *Neural Regeneration Research*. March 2024.
27. White AJ, Clark KA, Alexander KD, **Ramalingam N**, Young-Pearse TL, Dettmer U, Selkoe DJ, Ho GPH. A stem cell-based assay platform demonstrates  $\alpha$ -synuclein dependent synaptic dysfunction in patient-derived cortical neurons. *NPJ Parkinsons Dis*. 2024 May 21.
28. Lam I, Ndayisaba A, Lewis AJ, Fu Y, Sagredo GT, Kuzkina A, Zaccagnini L, Celikag M, Sandoe J, Sanz RL, Vahdatshoar A, Martin TD, Morshed N, Ichihashi T, Tripathi A, **Ramalingam N**... Khurana V. Rapid iPSC inclusionopathy models shed light on formation, consequence and molecular subtype of  $\alpha$ -synuclein inclusions. *Neuron*. 2024 July 29.
29. **Ramalingam N\***, Haass C, and Dettmer U\*. Physiological roles of  $\alpha$ -synuclein serine-129 phosphorylation — not an oxymoron. *Trends in Neurosciences*. 2024 July. (\*corresponding authors).
30. Bolsinger M, Moors TE, Brontesi L, Nuber S, Dettmer U\*, **Ramalingam N\***. Acute lipid droplet accumulation induced by the inhibition of the phospholipase DDHD2 does not affect the level, solubility, or phosphoserine-129 status of  $\alpha$ -synuclein. *Metabolic Brain Disease*. 2025 Jan 24. (\*corresponding authors)
31. Jin S, Bellier J, Wells A, Liopis PM, Anekal PV, Tresback JS, Caldarone BJ, Liu L, Li S, Dettmer U, **Ramalingam N**, Selkoe D. Inhibition of hippocampal mossy fiber plasticity and episodic memory by human A $\beta$  oligomers is prevented by enhancing cAMP signaling in Alzheimer mice. *Alzheimer & Dementia*. 2025 April 21.
32. Eubanks E, VanderSleen K, Mody J, Pater N, Sacks B, Darestani F, Wang J, Elliott J, Jaber N, Akçimen F, Bandres-Ciga S, Helweh F, Liu J, Archakam S, Kimelman R, Sharma B, Socha P, Guntur A, Huang Y, **Ramalingam N**, Guadagno E, Bartels T, Dettmer U, Mouradian MM, Bahrami AH, Dai W, Baum J, Shi Z, Hardy J, Kara E. Increased burden of rare risk variants across gene expression networks predisposes to sporadic Parkinson's disease. *Cell Reports*. 2025 May 2.
33. Yang T, Xu YR, Jin S, **Ramalingam N**, Bellier JP, Lish AM, Ostaszewski BL, Toung-Pearse T, Liu L, Yang HS, Chhatwal JP, Lawton TL, Selkoe DJ. An improved immunoassay detects A $\beta$  oligomers in human biofluids.: their CSF levels rise with tau and phosphotau levels. *Alzheimers Res Ther*. 2025 Jul 12.
34. Al-Azzani M, Weber S, **Ramalingam N**, Ramón M, Shvachiy L, Mestre G, Zech M, Sicking K, de Opakua AL, Jayanthi V, Amaral L, Agarwal A, Chandran A, Chaves SR, Winkelmann J, Trenkwalder C, Schwager M, Pauli S, Dettmer U, Fendández CO, Lautenschläger J, Zweckstetter M, Busnadiego RF, Mollenhauer B, Outeiro TF. A novel alpha-synuclein K58N missense variant in a patient with Parkinson's disease. *Mov Disord*. 2025 Sep 4.
35. Brücke C, Al-Azzani M, **Ramalingam N**, Ramón M, Sousa RL, Buratti F, Zech M, Sicking K, Amaral L, Gelpi E, Chandran A, Agarwal A, Chaves SR, Fendández CO, Dettmer U,

- Lautenschläger J, Zweckstetter M, Busnadiago RF, Zimprich A, Outeiro TF. A novel alpha-synuclein G14R missense variant is associate with atypical neuropathological features. *Molecular Neurodegeneration*. 2025 Sep 26.
36. Cevallos J, Eubanks E, Jung S, Huang Y, Guadagno E, Suvvari NR, Doshi A, Ravinutala N, Mosera A, **Ramalingam N**, Tripathi A, Bartels T, Dettmer U, Kara E. Lipid droplets promote the aberrant liquid-liquid phase separation of alpha-synuclein leading to impaired energy homeostasis. *bioRxiv*. 2025 Nov 21
37. Li B, Anderson AK, Levy OA, **Ramalingam N\***, Dettmer U\*. Quantifying the acute toxicity of alpha-synuclein membrane-accumulation in a cell-based assay. *Res Sq*. 2026 Jan 21 (\*corresponding authors)
38. Choi SJ, Frank A, Ben-Johny M, Tang G, Bendig J, Fanourakis S, Hobson BD, **Ramalingam N**, Dettmer U, Kanter E, Sulzer D, Mosharov EV.  $\alpha$ -Synuclein expression is required for somatodendritic dopamine release and immediate early gene induction. *Sci Adv*. 2026 Jan 30

### **Research support:**

**Active:** ~ \$2.5M over 2022 to 2028

2022 - 2027	NIH RF1 1NS122880-01: Polo-like-kinase-2-dependent $\alpha$ -synuclein Serine-129 Phosphorylation: A Physiological Role During Synaptic Activity Role: PI (other PI Ulf Dettmer) \$999,978 (direct cost - my portion)
2023 - 2028	NIH RF1 NS133979-01: How serine-129 phosphorylation status affects the spreading of $\alpha$ -synuclein pathology-in vivo: a study in knock-in animals Role: PI (other PI Ulf Dettmer) \$1,213,023 (direct cost- my portion)
2024 - 2026	NIH R21AG085401-01A1: Distinguishing $\alpha$ -synuclein serine129 phosphorylation in health and Lewy body dementia Role: PI \$275,000 (direct cost)

### **Project submitted for funding:**

2026-2028 (resubmitted)	Delaying the onset of Parkinson's disease by improving the rapid-eye-movement sleep behavior disorder NIH R21 Principal Investigator; \$275,000 direct cost – Investigator initiated; <i>original submission score 10<sup>th</sup> percentile</i> . The major goal of this project is to decipher how REM sleep behavior disorder contributes to PD and whether improving the cortical oscillation during REM sleep would delay the onset and progression of PD.
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### **Narrative Report**

Nagendran Ramalingam is an Assistant Professor in Molecular Medicine and Neurology at University of South Florida, Morsani College of Medicine. He is a trained cell biologist with a background in biochemistry, and his research focuses on understanding alpha-synuclein ( $\alpha$ S) homeostasis in health and disease.

Nagendran earned his bachelor's and master's degrees in Botany and (Plant) Biochemistry, respectively, from Bharathidasan University, India. He subsequently obtained his Ph.D. in 2009 from Ludwig-Maximilians University, Munich, Germany, under the mentorship of Dr. Michael Schleicher. His doctoral research focused on the role of the actin cytoskeleton signaling in cell migration. Following his Ph.D., Nagendran joined the Gundersen lab at Columbia University as a postdoctoral research scientist, where he expanded his expertise in cytoskeletal biology, focusing on microtubule dynamics. His fascination with cytoskeletal dynamics in neurons ultimately led him to the field of Neurobiology.

In 2014, Nagendran accepted his first faculty position as an Associate Research Scientist in the Department of Neurology at Columbia University, working with Dr. Oren Levy. During this time, he began investigating cytoskeleton dysfunction in Parkinson's disease and later explored the cause and consequence of serine-129 phosphorylated  $\alpha$ S "pS129", a major hallmark of Parkinson's Disease (PD) pathology. This work was

conducted in collaboration with Dr. Dennis Selkoe and Dr. Ulf Dettmer at the Ann Romney Center for Neurologic Diseases at Brigham & Women's Hospital.

In 2017, Nagendran relocated to Boston to formally join the Dettmer lab as a Research Fellow and was subsequently appointed as Instructor in Neurology at Harvard Medical School in July 2021. He was promoted to Assistant Professor of Neurology at Harvard Medical School in July 2024.

In February 2026, Nagendran started his new role at University of South Florida, where he established the Synuclein Interest Group at the Byrd Alzheimer's Center and Research Institute. He remains committed to balancing his research on the physiological and pathological roles of  $\alpha$ S to advance our understanding of PD and Lewy body dementias.

Nagendran is fully committed to creating an ideal environment for educating next-generation scientists and teachers. He believes that "*science is for everyone*".