

SENTHIL ARUMUGAM

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Academic Positions

- 10/ 2019 - *present* **Group leader**, European Molecular Biological Laboratories (EMBL) Australia Partner Laboratory Network and **Senior Research Fellow**, Anatomy and Developmental Biology Monash Biomedicine Discovery Institute, Monash University
- 09/ 2016 - 09/ 2019 **Group leader**, Single Molecule Science node, University of New South Wales, Sydney, Australia
- 05/ 2016 - 07/ 2016 **Visiting Researcher**, Mayor Lab, National Centre for Biological Sciences, Bangalore, India.
- 01/ 2013 - 03/ 2016 **Post-doctoral Researcher** at Marie Curie Institute, Paris, France. Advisors: Ludger Johannes and Patricia Bassereau.
[Pierre-Gilles de Gennes fellow, Laboratories of Excellence fellow]
- 03/ 2015 - 05/ 2015 **Visiting Researcher**, Kirchhausen Lab, Harvard Medical School, Boston, United States of America.
- 09/ 2012 - 10/ 2012 **Post-doctoral Researcher**, Max Planck Institute for Biochemistry Martinsried, Germany.

Academic Qualifications

- Aug 2008 – Aug 2012 **PhD degree** from Max Planck Institute for Cell Biology and Genetics and Technical University of Dresden, Dresden, Germany. Thesis advisor: Prof. Petra Schwille .
[Dresden International Graduate School fellow]
- June 2011–Aug 2011 Physiology Course, Marine Biological Laboratory, Woodshole, MA, United States of America.
[Frank R Lillie fellowship. Jacques Loeb Founders fellowship, Physiology National Institute of Health (NIH grant)]
- July 2005 – June 2008 **Master of Science** from Tata Institute of Fundamental Research, Mumbai, India. Thesis advisor: Prof. Sudipta Maiti
[Junior Research Fellowship]
- April 2002 – April 2005 **Bachelor of Science** (Chemistry) from Sardar Patel University, Anand, India.
[Indian Academy of Sciences Fellowship]

Research Interests

Cell Biology, Cytoskeleton, Self-organization phenomena, Emergent properties central to life, Advanced Imaging technologies, Developmental Biology, endosomal Trafficking.

Research Publications

h.index: 13 (google scholar) i10-index: 14

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Scopus ID: 47461018100

2020

20. *Combination of photo-activation with lattice light-sheet imaging reveals untemplated, lamellar ruffle generation by PA-Rac1*

Finian Leyden, Sanjeev Uthishtran, U K Moorthi, H M York, A Ptil, H Gandhi, E P Petrov, **S Arumugam***

BioRxiv, 10.1101/2020.09.01.276824, 2020 (In revision)

19. *To be more precise, the role of intracellular trafficking in development and pattern formation.*

Harrison York, Joanne Coyle, **Senthil Arumugam***

Biochemical Society transactions, 2020

18. *Rapid Whole Cell Imaging Reveals An APPL1-Dynein Nexus That Regulates Stimulated EGFR Trafficking*

Harrison York, Amandeep Kaur, Abhishek Patil, Aditi Bhowmik, Ullhas K Moorthi, Geoffrey J Hyde, Hetvi Gandhi, Katharina Gaus, **Senthil Arumugam***

BioRxiv, 10.1101/481796, 2020 (In revision)

2019

17. *The Set1 complex is dimeric and acts with Jhd2 demethylation to convey symmetrical H3K4 trimethylation*

Rupam Choudhury, Sukhdeep Singh, **Senthil Arumugam**, Assen Roguev, A Francis Stewart
Genes and Development, 2019

16. *A toolbox of diverse linkers for navigating the cellular efficacy landscape of stapled peptides*
wu, yuteng; Kaur, Amandeep; Fowler, Elaine; Wiedmann, Mareike; Young, Reginald; Galloway, Warren; Olsen, Lasse; Sore, Hannah; Chattopadhyay, Anasuya; Kwan, Terence; Xu, Wenshu; Walsh, Stephen; de Andrade, Peterson; Janecek, Matej; **Arumugam, Senthil**; Itzhaki, Laura; Lau, Yu Heng ; Spring, David

ACS Chemical Biology, 2019

15. *Ordered and Disordered Segments of Amyloid- β Drive Sequential Steps of the Toxic Pathway.*

Barun Kumar Maity, Anand Kant Das, Simli Dey, Ullhas Kaarthi Moorthi, Amandeep Kaur, Arpan Dey, Dayana Surendran, Rucha Pandit, Mamata Kallianpur, Bappaditya Chandra, Muralidharan

Chandrakesan, **Senthil Arumugam*** and Sudipta Maiti*,

ACS Chemical Neuroscience, 2019

2017

14. *The Lipids of the Early Endosomes: Making Multimodality Work.*

Senthil Arumugam* and Amandeep Kaur

ChemBioChem, Jun 19;18(12):1053-1060, 2017.

2016

13. *Mechanism of Shiga Toxin Clustering on Membranes.*

Weria Pezeshkian†, Haifei Gao†, **Senthil Arumugam†**, Ulrike Becken, Patricia Bassereau, Jean-Claude Florent, John Hjort Ipsen, Ludger Johannes, Julian C. Shillcock

† Equal contributions

ACS Nano 11 (1), 314-324, 2016.

12. *Quantum dot-loaded monofunctionalized DNA Icosahedra for single particle tracking of targeted endocytic pathways in living cells.*

Dhiraj Bhatia, **Senthil Arumugam**, Michel Nasilowski, Himanshu Joshi, Ved Prakash, Prabal Maiti, Ludger Johannes, Benoit Dubertret & Yamuna Krishnan

Nature nanotechnology 11 (12), 1112-1119, 2016.

2015

11. *Cytoskeletal pinning prevents large-scale phase separation in four-component membranes.*

Senthil Arumugam, Eugene Petrov and Petra Schwille.

Biophysical Journal 108 (5), 1104-1113, 2015.

10. *Membrane nanodomains: contribution of curvature and interaction with proteins and cytoskeleton*

Senthil Arumugam and Patricia Bassereau

Essays Biochem. 57, 1–11, 2015.

9. *Endophilin-A2 functions in membrane scission in clathrin-independent endocytosis.*

Henri-François Renard, Mijo Simunovic, Joël Lemière, Emmanuel Boucrot, Maria-Daniela Garcia-Castillo, **Senthil Arumugam**, Valérie Chambon, Christophe Lamaze, Christian Wunder, Anne Kenworthy, Anne Schmidt, Harvey McMahon, Cécile Sykes, Patricia Bassereau and Ludger Johannes.

Nature 517 (7535), 493-496, 2015.

8. *Galectin-3 Drives Glycosphingolipid-Dependent Biogenesis of Clathrin-Independent Carriers.*

Ramya Lakshminarayan, Christian Wunder, Ulrike Becken, Mark T. Howes, Carola Benzing, **Senthil Arumugam**, Susanne Sales, Nicholas Ariotti, Valérie Chambon, Christophe Lamaze, Damarys Loew, Andrej Shevchenko, Katharina Gaus, Robert G. Parton and Ludger Johannes.

Nature Cell Biology, Jun;16(6):595-606, 2015.

2014

7. *MinCDE exploits the dynamic nature of FtsZ filaments for its spatial regulation.*

Senthil Arumugam, Zdenek Petrasek and Petra Schwille.

PNAS. Apr 1;111(13): E1192-200, 2014.

F1000 recommended.

2013

6. *MinCDE drive counter-oscillation of early cell division proteins prior to Escherichia coli septum formation.*

Paola Bisicchia, **Senthil Arumugam**, Petra Schwille, and David Sherratt.

mBio. Dec 10;4(6): e00856-13, 2013.

2012

5. *Surface Topology Engineering of Membranes for the Mechanical Investigation of the Tubulin Homologue FtsZ.*

Senthil Arumugam, Grzegorz Chwastek, Elisabeth Fischer-Freidich Carina Ehrig, Ingolf Moensch and Petra Schwille.

Angew Chem Int Ed Engl. Nov 19;51(47):11858-62, 2012.

4. *The dynamics of somatic exocytosis in monoaminergic neurons.*

Bidyut Sarkar, Anand Kant Das, **Senthil Arumugam**, Sanjeev Kumar Kaushalya, Arkarup Bandyopadhyay, Jayaprakash Balaji and Sudipta Maiti.

Front Physiol. 3:414, 2012.

2011

3. *Protein-membrane interactions: the virtue of minimal systems in systems biology.*
Senthil Arumugam, Grzegorz Chwastek and Petra Schwille.
Wiley Interdiscip Rev Syst Biol Med. May-Jun;3 (3):269-80, 2011.

2008

2. *Three-photon microscopy shows that somatic release can be a quantitatively significant component of serotonergic neurotransmission in the mammalian brain.*
Kaushalya SK, Desai R, **Arumugam S**, Ghosh H, Balaji J, Maiti S.
J Neurosci Res. Nov 15;86(15):3469-80, 2008.

1. *A high-resolution large area serotonin map of a live rat brain section.*
Kaushalya SK, Nag S, Ghosh H, **Arumugam S**, Maiti S.
Neuroreport. May 7;19(7):717-21, 2008.

Fellowships and Funding

03/ 2017 - 03/ 2019	L'Oreal research funding , 195,000 AUD.
01/ 2015 - 12/ 2015	Pierre-Gilles de Gennes Foundation fellowship , Paris, France.
01/ 2014 - 12/ 2015	Laboratories of Excellence (LABEX) fellowship , Curie Institute, Paris, France.
07/ 2012 - 12/ 2012	MPI Biochemistry Post-doctoral fellowship , MPI Biochemistry, Martinsried, Germany.
08/ 2012 - 12/ 2012	Dresden International Graduate School for Biomedicine Bioengineering Fellowship , MP-CBG Dresden, Germany.
06/ 2011 - 08/ 2011	Frank R Lillie fellowship. Jacques Loeb Founders fellowship. Physiology National Institute of Health (NIH) grant.
07/2005 - 06/ 2008	Junior Research fellowship , Tata Institute of Fundamental research, Mumbai, India.
05/ 2004 - 06/ 2004	Indian Academy of Sciences Summer Research Fellowship , Indian Institute of Science, Bangalore, India.

Major Invited Talks and Seminars

01/ 2019	Department of Physics, University of California , San Diego, USA
09/ 2018	International Microscopy Congress - 2019 , Sydney, Australia.
05/ 2018	Department of Physics, California State University , Fullerton, USA
05/ 2018	Allen Institute , Seattle, USA.
05/ 2018	Department of Physics, University of Utah , Colorado, USA.
03/ 2018	Hunter Cell Biology Meeting , Hunter Valley, NSW, Australia.
12/ 2017	National Workshop on Fluorescence Correlation Spectroscopy , Indian Institute of technology, Guwahati, India.
09/ 2017	Annual Imaging Conference , Centre of Excellence for Advanced Imaging, Torquay, Australia.
06/ 2017	Institute of Molecular & Cell Biology, Agency for Science Technology & Research (ASTAR) , Singapore.
02/ 2017	42nd Lorne Conference on Protein Structure and Function , Lorne, Australia.
04/ 2016	Indian Institute of Science Education and Research , Pune, India.

- 04/ 2016 **Tata Institute of Fundamental Research**, Mumbai, India.
- 10/ 2015 **ICFO - The Institute of Photonic Sciences**, Castelldefels, Spain.
- 11/ 2014 **Physics of Cells and Tissues GDR 3070**, Obernai, France.
- 04/ 2014 **Circle Meeting on Biological Physics**, Dresden, Germany.
- 08/ 2012 **EMBO workshop on 'Reconstitution of Prokaryotic Cell Biology'**, Madrid, Spain.
- 08/ 2012 **Department of Plant Biology, Michigan State University**, East Lansing, USA.
- 08/ 2012 **Department of Mechanical Engineering, Johns Hopkins University**, Maryland, USA.

Graduate and Thesis Supervision

- Ullhas K Moorthi (**PhD**, Ongoing) *Endosomal Regulation and Trafficking*.
- Abhishek Patil (**PhD**, Ongoing) Developing Image Analysis for volumetric movies.
- Harrison M York (**Hons.** 2018) *Maturation Processes in Endosomal Trafficking*.
- Harrison M York (**PhD**, Ongoing) *Endosomal trafficking and signal processing*.
- Joane Coyle (**PhD**, Ongoing) Phase transitions in biology.
- Eugene Obeng (**PhD**, Ongoing) Nanobodies for studying cell biology.
- Matthew Payor (**Hons.**, 2019) Machine Learning to detect endosomal conversions.

Teaching Duties

- 06/ 2019 European Molecular Biology Laboratories Australia (EMBLA) PhD course, Hobart, Tasmania.
Biological Time Keeping - Concepts and Imaging Approaches.
- 07/ 2018 European Molecular Biology Laboratories Australia (EMBLA) PhD course, UNSW, Sydney.
Biological Microscopy - Where are we going?
- 07/ 2017 European Molecular Biology Laboratories Australia (EMBLA) PhD course, Monash University, Melbourne.
Single Molecule Techniques and Live Cell Imaging.
- 04/ 2017 **Microscopy for Biologists**, Single Molecule Science, University of New South Wales, Sydney. Tailored course for introduction of advanced microscopy to biologists.
- 01/ 2014 Instructor for **Fluorescence Correlation Spectroscopy**, INSERM Membrane Biology Workshop, Curie Institute, Paris, France.
- 07/ 2009- Research Supervisor for MSc program in Molecular Bioengineering and
08/ 2012 Nanobiophysics, Technical University of Dresden, Dresden, Germany.
- 09/ 2011 Teaching Assistant for the 8th International Brain Research Organization, School of Neuroscience, Tata Institute of Fundamental Research, Mumbai, India.