Sreeja Sasidharan

Post-Doctoral Fellow, Lehigh University
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Nationality: Indian

Academic Timeline

Post Doctoral Fellow (2022 Jan - Present),
Lehigh University, PA
Advisor : Prof. Aurelia Honerkamp-Smith

Post Doctoral Fellow (2020 Nov - 2021 Oct),
Indian Institute of Technology Bombay, India
Advisor : Prof. Anirban Banerjee

Ph.D. in Physics (2013 Aug- 2020 Apr),
Raman Research Institute, Bangalore, India
Advisor : Prof. V. A. Raghunathan
Thesis Title : Influence of some bioactive molecules on the structure and phase behavior of lipid membranes

M.Sc. Physics (2011 June- 2013 June),
Indian Institute of Technology Madras, India
CGPA : 7.8/10

B.Sc. Physics (2008 June- 2011 May),
Nirmala College,
M.G. University, Kottayam
Percentage : 97.2/100
Stood university third rank for B.Sc. Physics exam conducted by M.G. University, Kottayam

Plus two- Science with Mathematics, Physics, Chemistry and Biology(Kerala State Syllabus) (2006 June- 2008 May),
St. Augustine's G.H.S.S, Muvattupuzha
Percentage : 91.4/100

SSLC (Kerala State Syllabus) (2005),
St. Augustine's G.H.S.S, Muvattupuzha
Percentage : 92/100

Areas of specialization & expertise

Membrane physics, Synthesis of multicomponent unilamellar vesicles using of electroformation and extrusion, Preparation of supported lipid membrane (SLB). Basic knowledge in Cell biology, cloning, protein expression and purification.

Technical Skills

Small Angle X-ray diffraction
Wide Angle X-ray diffraction
Aligned 2D X-ray diffraction
Confocal Florescence Microscopy
Differential Scanning Calorimetry
Atomic Force Microscopy
Raman Spectroscopy
Cryogenic - Scanning Electron Microscopy
Fluorescence Spectroscopy
Fourier Transform Infrared Spectroscopy
Gel electrophoresis
Polymeric Chain Reaction
Western blot and SDS PAGE
Protein expression and purification

Data analysis softwares & Programming Languages known

X-ray data analysis and model fitting using Mathematica
MATLAB
Image analysis and processing using imageJ
Data analysis using Origin
Basic knowledge on C++, Fortran and LabView

Grants, honors & awards

2020 Institute Postdoctoral Fellowship, IIT Bombay
2013 Junior Research Fellowship through national level JEST 2013 exam
2011 Cleared IIT JAM exam and obtained PG admission in IIT Madras
2011 Stood third rank for BSc. Physics Examination in MG University Kottayam

Publications & talks

Journal articles

Oct 2019 Soft Matter (2019), 15, 8129-8136, 'Interaction of mononucleotide UMP with a fluid phospholipid bilayer', S. Sasidharan, S. Pochinda, P.N. Elgaard-Jorgensen, S. Rajamani, H. Khandelia and V. A. Raghunathan

Jan 2020 Bull. Mater. Sci. (2020) 43:184, 'Direct imaging of rippled structures of lipid-cholesterol membranes using Cryo-SEM and AFM', S. Sasidharan and V. A. Raghunathan.

Feb 2021 J. Mol. Liq. (2021), 324 114770, 'Mesomorphic Triphenylene Polyanion-Surfactant Complexes', K.Swamynathan , S. Sasidharan, Sandeep Kumar and V. A. Raghu- nathan.

July 2021 Biochim Biophys Acta Biomembr., (2021),1863,'Effect of pH on the phase behavior of DMPC bilayers', A. Chowdhury, S. Sasidharan, P. Xavier, P. Viswanath and V. A. Raghunathan

Oct 2022 J. Phys. Chem. B, (2022),126, 42, 8486–8494, ,'Molecular Mechanism of Hydrotropic Properties of GTP and ATP', M. P. Pandey, S. Sasidharan, V. A. Raghunathan, and H. Khandelia*

Mar 2023 Science Advances, (2023),Vol 9, issue 12, 'A novel innate pathogen sensing strategy involving ubiquitination of bacterial surface proteins', S. Apte, S. Bhutda, S. Ghosh, K. Sharma, T. E. Barton, S. Dibyachintan, O. Sahay, S. Tang, A. R. Sinha, J. Rakshit, S. Roy, A. Datey, S. Santra, J. Joseph,S. Sasidharan, S. Hammerschmidt, D. Chakravorthy, M. R. Oggioni, M. K. Santra, D. R. Neill, A. Banerjee

May 2023 Biophysical Journal, (2023),122, 1720–1731, 'Measuring flow-mediated protein drift across stationary supported lipid bilayers ', A.M. Ratajczak, S. Sasidharan, X. I. Rivera Gonzalez, E. J. Miller, L. Socrier, A. A. Anthony, A. R. Honerkamp-Smith

Oct 2024 Biophysical Journal(2024), 123, 3478-3489, 'Microfluidic measurement of the size and shape of lipid-anchored proteins ' S. Sasidharan, Leah Knepper, Emily Ankrom, Gabriel Cucé, Lingyang Kong, Amanda Ratajczak, Wonpil Im, Damien Thévenin, A. R. Honerkamp-Smith

Manuscripts under preparation

Jan 2025 Manuscript under preparation 'Live cell imaging of flow induced lateral transport of outer plasma membrane proteins of Cos-7 cells', S. Sasidharan, L. Knepper, S. Pash, A. Antony,L. Socrier, D. Thevenin, A. R. Honerkamp-Smith

Posters and Talks given

2024 'Microfluidic measurement of the size and shape of lipid-anchored proteins' invited talk at SRM university, AP, India.

2023 'Passive and reversible area regulation of supported lipid bilayers in response to fluid flow' Poster presented at BPS 2023.

2022 'Hydrodyamics Vs Memnbrane drag : A competition in protein advection ' talk given at Upstate NY softmatter symposium Meeting 2022.

2022 'Systematic measurement of interleaflet friction' talk given at MARM Meeting 2022.

2018 'Interaction of mononucleotide with lipid bilayers' talk given at University of Southern Denmark (SDU), Curie Institute, Paris, Max Planck Institute of Colloids and Interfaces, Potsdam, Germany.

2018 'Interaction of mononucleotide with lipid bilayers' Poster presented at Julich Soft Matter Days 2018.

2017 'Interaction of mononucleotide with lipid bilayers'. Poster presented in COMPFLU-2017 at IIT Madras, Membrane Meeting 2017 at IISc, Bangalore

2016 'Phase separation in lipid bilayers induced by interaction of mononucleotide with lipid bilayers'. Poster presented at International conference on Soft Matter ICSM-2016 Jaipur,India

Teaching

Lehigh University

Guided two undergraduate and three summer students in various projects.
Collaborated with three graduate students for their Ph.D. work.
Handled some classes of undergraduate course : Classical mechanics.

IIT Bombay

Taught protein purification, expression to first year Ph.D. students.

Raman Research Institute

Guided three MSc. projects.
'Determination of the Splay Elastic Constant of a Nematic Liquid Crystal' by Ms. Andria J. Crasta of St. John's college, Bangalore.
'Determination of Critical Micellar concentration of surfactant solutions by conductivity method' by Rashmi Sudhakar and Vanishree S of St. John's college, Bangalore.
Teaching Assistant for 'Experimental Techniques in Softmatter'- course conducted by SCM department, RRI during 2016-2017.

References

Post Doc Supervisor:
Prof. Aurelia Honerkamp-Smith,
Department of Physics,
Lehigh University, PA,18015
email:auh216@lehigh.edu

Post Doc Supervisor:
Prof. Anirban Banerjee
Department Biosciences and Bioengineering
IIT Bombay, Powai, 400076
email:abanerjee@iitb.ac.in

Ph.D. Supervisor :
Prof. V. A. Raghunathan,
SCM group,
Raman Research Institute, Bangalore-560080,
email:varaghu@rri.res.in

Collaborator
Prof. Himanshu Khandelia
Department of Physics, Chemistry and Pharmacy
University of Southern Denmark, Denmark.
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