Dr. Lakshmi Revathi Perumalsamy
Associate Professor (Biomedical Sciences)
Faculty of Biomedical Sciences and Technology

ORCID: https://orcid.org/0000-0002-8811-4795
Scopus ID: 16507076400
Google Scholar:**https://scholar.google.com/citations?user=sxzPqcQAAAAJ&hl=en**
Email: lakshmirevathi@sriramachandra.edu.in **PhD/Post Doc supervision slots available: 4**

Personal Profille

My research is focussed on elucidating the molecular mechanisms governing cell fate determination and its implications for human health, with a particular emphasis on cancer and spine biology. Building on a fifteen-year foundation in cell and molecular signal transduction, I have investigated the intricate interplay of developmental pathways in shaping cellular destinies across diverse biological contexts. My expertise in in vitro assays, signal transduction tool development, advanced microscopy, and biochemical techniques has equipped me to dissect the complexities of these processes.

Currently, at SRIHER I am committed to translating fundamental research into clinical applications by discovering novel biomarkers and developing effective therapeutic strategies for these non communicable diseases. My laboratory is dedicated to understanding how dysregulation of cellular signaling networks contributes to cancer initiation, progression, and metastasis, as well as to the pathogenesis of spinal disorders. By integrating omics, molecular editing, and imaging, we aim to identify critical molecular interactions that drive disease progression and to develop targeted interventions to restore homeostasis.

Key Research Areas

Cancer Biology: Unraveling the molecular underpinnings of cancer initiation, progression, and metastasis, with a focus on identifying novel therapeutic targets and biomarkers.

Spine Biology: Investigating the cellular and molecular mechanisms contributing to spinal disorders, including degenerative disc disease and spinal cord injury, to develop innovative treatment strategies.

Signal Transduction: Characterizing the role of signaling pathways in regulating cell fate, proliferation, differentiation, and death in both cancer and spinal biology contexts.

Biomarker Discovery: Identifying novel molecular markers for early cancer detection and disease progression monitoring, as well as for predicting treatment response.

Funding Agency [Past and Present]

India Alliance DBT wellcome

SERB POWER

iNSERB DIA

AO SPINE

CelSignet Laboratory

Lab Members

Present

PhD Scholars:
Amrutha Arjunan – RAS effectors in Gastric Cancer
Devi Maigandan – Notch Signaling in metabolic regulation of Breast Cancer

JRF :
Remya Pradeep – Wnt-DDX20 and ROS signaling in TNBC

Chancellor summer Research fellows :
1.Srishti Satyanarayanan - "Formaldehyde – induced model of Amyotrophic Lateral Sclerosis (ALS)
2.Harini Anna – Exploring the Dexamethasone mechanism : Effect on Wnt in Monocyte-Macrophage differentiation

Past Members
Naveen Perumalsamy (TA 2021-2022) – Masters student at University of Queensland, Brisbane, Australia
Thulasi S Rajasekaran (Summer Research fellow 2020-2021–Masters student at Teachers College, Columbia University, USA
Suchita Ganesan (Summer Research fellow 2022-2023) –Masters student at University of Southern California, USA
Harshada Bharadwaj (Summer Research fellow 2022-2023) – Applying for Masters in USA

M.Sc Thesis: Dharshini (Medgenome) Faisal (New college), Ranjani,
B.Sc (Hons) thesis: Srinidhi (UK), Ketan (UK), Koushik (USA), Shraddha (Germany), Yazeer (South Korea), Bagan(India), Aravind [USA], Ashwin (Germany), Santhosh(Canada)

Statement on lab values/ethics:
Integrity, transparency, respect, and equal opportunity are the cornerstones of our work. We are dedicated to conducting rigorous, ethical, and collaborative research that drives innovation. We are committed to an inclusive environment where every team member's contributions are valued and their potential is maximized through mentorship.We adhere to strict scientific standards, from experimental design to data collection, analysis and reporting. We prioritize safety, adhere to strict institutional guidelines, and employ rigorous methodologies. Furthermore, uphold intellectual property and maintain academic integrity.

Vacancies available:
Ph.D students: Applications are through the SRIHER PhD Program.
Details are found at https://www.sriramachandra.edu.in/university/entrance-exam-for-phd.
Exceptional students with INSPIRE, CSIR-NET or DBT-BET JRF fellowships can apply directly. If interested please write directly to me at lakshmirevathi@sriramachandra.edu.in with a copy of your CV.
Post-doctoral Fellows: If you are interested in post-doctoral research in our lab, please write directly to me at lakshmirevathi@sriramachandra.edu.in in with a copy of your CV, and a description of what you would like to do If you join the lab. You will be supported to apply for several postdoctoral fellowships.

Internship opportunities
Interns, summer students and trainees/JRFs: We accept a limited number of summer students or UG/PG thesis students to work on projects for periods of 1 months to 1 year. Interested can write to lakshmirevathi@sriramachandra.edu.in with details on what interests you in our work and a short proposal on what you would like to learn/study in the lab.

Selected Publications

- **Ganesan S, Dharmarajan A, Sudhir G, Perumalsamy LR. Unravelling the Road to Recovery: Mechanisms of Wnt Signalling in Spinal Cord Injury. Mol Neurobiol.2024 Feb 29. doi: 10.1007/s12035-024-04055-1. PMID:38421469.**
- **Peri SS, Narayanaa Y K, Hubert TD, Rajaraman R, Arfuso F, Sundaram S, Archana B, Warrier S, Dharmarajan A, Perumalsamy LR. Navigating Tumour Microenvironment and Wnt Signalling Crosstalk: Implications for Advanced Cancer Therapeutics.Cancers (Basel). 2023 Dec 14;15(24):5847. doi: 10.3390/cancers15245847. PMID:38136392; PMCID: PMC10741643.**
- **Y KN, Perumalsamy NK, Warrier S, Perumalsamy LR, Dharmarajan A. Wnt antagonist as therapeutic targets in ovarian cancer. Int J Biochem Cell Biol.2022 Apr;145:106191. doi: 10.1016/j.biocel.2022.106191. Epub 2022 Mar 7. PMID:35272015.**
- **Golla H, Kannan A, Gopi S, Murugan S, Perumalsamy LR, Naganathan AN.Structural-Energetic Basis for Coupling between Equilibrium Fluctuations and Phosphorylation in a Protein Native Ensemble. ACS Cent Sci. 2022 Feb 23;8(2):282-293. doi: 10.1021/acscentsci.1c01548. Epub 2022 Jan 27. PMID:35233459; PMCID: PMC8880421.**
- **Marcel N, Perumalsamy LR, Shukla SK, Sarin A. The lysine deacetylase Sirtuin1 modulates the localization and function of the Notch1 receptor in regulatory Tcells. Sci Signal. 2017 Apr 4;10(473):eaah4679. doi: 10.1126/scisignal.aah4679. PMID: 28377411.**
- **Garg M, Perumalsamy LR, Shivashankar GV, Sarin A. The linker histone h1.2 is an intermediate in the apoptotic response to cytokine deprivation in T-effectors. Int J Cell Biol. 2014;2014:674753. doi: 10.1155/2014/674753. Epub 2014 Feb 13. PMID: 24688545; PMCID: PMC3943393.**
- **Gupta S, Marcel N, Talwar S, Garg M, R I, Perumalsamy LR, Sarin A, Shivashankar GV. Developmental heterogeneity in DNA packaging patterns influences T-cell activation and transmigration. PLoS One. 2012;7(9):e43718. doi: 10.1371/journal.pone.0043718. Epub 2012 Sep 5. PMID: 22957031; PMCID:PMC3434176.**
- **Perumalsamy LR, Marcel N, Kulkarni S, Radtke F, Sarin A. Distinct spatial and molecular features of notch pathway assembly in regulatory T cells. Sci Signal. 2012 Jul 24;5(234):ra53. doi: 10.1126/scisignal.2002859. PMID: 22827997.**
- **Perumalsamy LR, Nagala M, Sarin A. Notch-activated signaling cascade interacts with mitochondrial remodeling proteins to regulate cell survival. Proc Natl Acad Sci U S A. 2010 Apr 13;107(15):6882-7. doi: 10.1073/pnas.0910060107. Epub 2010 Mar 25. PMID: 20339081; PMCID: PMC2872423.**
- **Perumalsamy LR, Nagala M, Banerjee P, Sarin A. A hierarchical cascade activated by non-canonical Notch signaling and the mTOR-Rictor complex regulates neglect-induced death in mammalian cells. Cell Death Differ. 2009 Jun;16(6):879-89. doi: 10.1038/cdd.2009.20. Epub 2009 Mar 6. PMID: 19265851.**