

Multiple PhD and Postdoctoral positions starting in Jan 2020:

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Our laboratory will be relocating to ETH-Zurich and the Paul Scherrer Institute, Switzerland in Jan 2020. I am currently recruiting multiple PhD and Postdoctoral scholars in the area of Mechano-Genomics. Candidates with strong backgrounds in Mechanobiology, Genomics, Single-Cell Analysis, Microfluidics, Bio-imaging, Correlative Microscopy, Image Analysis and Machine Learning are particularly encouraged to apply.

Our laboratory investigates how micro-environmental signals regulate genome architecture and cell-fate decisions using a multidisciplinary approach combining high resolution optical imaging, quantitative single-cell biology, machine learning and functional genomics. Our ongoing work has provided modular links between cell mechanics and its impact on transcription dependent 3D organization of chromosomes and gene expression. More recently, we discovered that sustained growth of cells by their lateral confinement, using micro-fabricated adhesive islands, induce cellular dedifferentiation and trans-differentiation programs. Our studies also have profound impact on developing single-cell nuclear biomechanical biomarkers for early disease diagnosis and therapeutic interventions.

Building on our ongoing work, future research themes in the laboratory include:

- 1) Developing correlative imaging methods combining light, electron and X-rays for analysing nanoscale 3D genome architecture and functional gene clustering within cells
- 2) Constructing a phase diagram linking cell mechanics, genome architecture and gene expression using engineered tissue organoids
- 3) Understanding single-cell heterogeneity and genome regulatory pathways during the mechanical induction of nuclear reprogramming
- 4) Implementing micro-fabricated platforms to mechanically control nuclear reprogramming and cellular rejuvenation for applications in regenerative medicine
- 5) Establishing physical biomarkers using nuclear and chromatin imaging combined with machine learning for early diagnostics including cancer and neurodegenerative diseases
- 6) Applying blood-cell chromatin biomarkers detected using microfluidic mobile microscope for early cancer diagnostics in large-scale field trials: A Public Health Project

PS: Please send your CV's to shiva.gvs@gmail.com

Current website: <https://mbi.nus.edu.sg/g-v-shivashankar/>