

# CHARVEE RAVICHANDRAN

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## RESEARCH INTERESTS

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Mechanobiology, Mechanics of tissue morphogenesis

## EDUCATION

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### Doctor of Philosophy

*Jan 2021 - present*

Supervisor: Dr.Maithreyi Narasimha, TIFR, Mumbai

### Bachelor of Science, Master of Science (BS-MS)

*2015-2020*

IISER Pune

*CGPA: 8.3/10*

## CURRENT PROJECT

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### Role of cell-extracellular matrix interaction in driving tissue unfolding during germband retraction (GBR) in *Drosophila*

*June 2021 - present*

Dr. Maithreyi Narasimha, TIFR Mumbai

Integrin-mediated interaction between cells and extracellular matrix (ECM) has been shown to be necessary for the retraction of the germband during drosophila embryogenesis. This project aims to discover the dynamic role of integrins in influencing cellular-level and tissue-level behaviours that might contribute to this retraction process (For detailed description, please refer to my statement of purpose)

## SHORT TERM PROJECTS

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### Understanding role of ribosome exit tunnel in protein folding

*April-June 2021*

Dr. Debasis Das, TIFR Mumbai

This project aimed to understand if and how the aminoacid composition of the ribosome exit tunnel may influence its interaction with the translating protein to affect its folding

### To study factors that determine behaviour of synaptic vesicles at branch points

*March-April 2021*

Prof. Sandhya Koushika, TIFR Mumbai

This project aimed to understand the factors that may influence vesicle behaviours and decision-making at branch points in *C.elegans* neurons

### Investigating the role of myosin in regulating microtubule dynamics during pulsed apical constriction

*Feb - March 2021*

Dr. Maithreyi Narasimha, TIFR Mumbai

In this project, we wanted to investigate the effect of cellular tension, mediated by actomyosin machinery, on the growth and organisation of microtubules during dorsal closure stage of *Drosophila* embryogenesis

## UNDERGRADUATE PROJECTS

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### To establish stable cellular models in Chromosome Biology Laboratory, IISER Pune to study the effect of cell constraints on nuclear architecture and the interplay with metabolic cues

*Jan 2020- March 2020*

Dr. Kundan Sengupta, IISER Pune

I worked with Dr. Kundan Sengupta to establish working models to study Nuclear Mechanobiology paradigms within IISER Pune

### The role of mechanical interactions between fibroblasts and normal epithelial cells in the initiation or tumour in the epithelial cells

*May 2019- Dec 2019*

Prof. G.V. Shivashankar, MBI, NUS, Singapore

Through this project, we explored a possible mechanism of tumour initiation in epithelial cells solely dependant on the mechanical interactions with the stromal cells inspired from the well known mechanism of metastasis-pulling of cancer cells by fibroblasts through ECM.

## **Role of exogenously expressed SATB1 in differentiation**

*Aug 2018- Apr 2019*

Prof. Sanjeev Galande, IISER Pune

This project aimed at investigating the role of SATB1 on differentiation at different stages of mouse embryonic stem cells differentiation.

## **To study the mutual effect of fibroblasts and cancer cells on lateral confinement induced reprogramming when co-cultured**

*May 2018-Jul 2018*

Prof. G.V. Shivashankar, MBI, NUS, Singapore

Lateral confinement induced reprogramming has been observed in cancer cells and fibroblasts independently. This project aimed to understand the mutual effect of the fibroblasts and cancer cells on such a method of reprogramming.

## **iGEM IISER Pune team 2017: TB or Not TB**

*Apr 2017-Dec 2017*

Dr. Chaitanya Athale, IISER Pune

Represented IISER Pune at Hughes Convention Center, Boston. Presented the results of a project that aimed at building a module to identify Tuberculosis faster, using cheaper and minimal technical methods. IISER Pune bagged silver medal in this competition.

## **The role of karyoplasmic ratio in aggressiveness of cancer cells**

*Dec 2015 - Dec 2016*

Dr. Kundan Sengupta, IISER Pune

This project aimed at investigating if the deviation of karyoplasmic ratio in cancer cells from the average karyoplasmic ratio of a eukaryotic cell i.e. 0.08, can correlate with the aggressiveness of the type of cancer.

## **TECHNICAL SKILLS**

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<b>Microscopes</b>	Confocal Microscope, Epifluorescence Microscope
<b>Image analysis softwares</b>	ImageJ and Imaris
<b>Programming Language</b>	Python

## **ACADEMIC ACHIEVEMENTS**

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CSIR-UGC NET (All India Rank 49)

*December 2019*

iGEM IISER-Pune 2017 team, Silver Medal at Giant Jamboree, Boston

*November 2017*

INSPIRE scholar

*Aug 2015- July 2020*

## **MAJOR CONFERENCES ATTENDED**

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Phenotypic Heterogeneity in Cancer  
Genomes and AI

*January 2020 - Attendee - IISc Bangalore*

*October 2019 - Volunteer - NUS Singapore*