

Research Theme: Genome Structure and Function

Research Project Title: Understanding chromatin and epigenetic basis of gene regulatory landscape in development and disease

Principal Investigator/Supervisor: Asst Prof. Amartya Sanyal

Co-supervisor/ Collaborator(s) (if any): NA

Project Description

a) Background:

All cells in an organism contain essentially the same DNA sequence. However, cell types and their functions differ considerably due to differences in gene expression. Therefore, gene-regulatory mechanisms are at the heart of differentiation, development and pathological conditions. Epigenetic modifications and higher-order chromatin folding are known to influence gene expression. These processes are dynamic and potentially reversible which make them attractive target for manipulation. Therefore, understanding how modulation of chromatin features influence gene expression is essential for deciphering mechanistic insights of cellular state transition.

b) Proposed work:

Multiple projects are available in the laboratory to understand the role of chromatin architecture in the regulation of genome and epigenome in the context of development and disease.

- Understanding the epigenetic regulation of cancer chemoresistance
- Identifying and targeting epigenetic vulnerabilities of cancer cells
- Deciphering the epigenomic landscape of hepatocyte during aging and chronic liver disease

We employ NGS based high throughput genomics techniques (ChIP-seq, Hi-C based methods, RNA-seq, etc.), CRISPR-based genome editing tools and imaging in combination with bioinformatics and computational approaches to address these challenging questions.

Talented, motivated and enthusiastic students, with creative ideas and eager to work in interdisciplinary and collaborative environment, are strongly encouraged to apply. Due to the nature of the project, students are required to learn both wet lab research and dry lab techniques during the course of study.

We welcome students from all disciplines and background such as genomics, computer science, polymer physics, bioinformatics, genome engineering, cell biology, molecular biology, etc.

For further enquiry about the projects, the motivated applicants are encouraged to send an email, including a statement of research interests, career goals, and a CV.



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If you have questions regarding this project, please email the Principal Investigator: Amartya Sanyal (asanyal@ntu.edu.sg)

SBS contact and how to apply:

Associate Chair-Biological Sciences (Graduate Studies) : AC-SBS-GS@ntu.edu.sg

Please apply at the following:

<http://admissions.ntu.edu.sg/graduate/R-Programs/R-WhenYouApply/Pages/R-ApplyOnline.aspx>