

We are offering Master projects as well as research training with both wet and dry lab in the Chen Lab at molecular tools of IGP.

The recent advance in single cell technologies (e.g, single cell ATAC-seq and single cell RNA-seq)made it possible to understand the cell heterogeneity by characterizing the epigenetics, transcription or protein expression in the single cell, but the sampling of just one molecular type from individual cells provides incomplete picture since a cell's state is determined by the complex interplay of molecules within its genome, epigenetics, transcriptome and proteome. To completely understand the cell heterogeneity, we need characterize multi-layers information, including nucleus architecture, epigenetics, transcriptome and protein expression, as a circuitry loop from the exactly same cell.

We had focused on single cell technology development in the past, had invented Assay of Transposase Accessible Chromatin-with visualization (ATAC-seq, Chen, X et al, Nature Methods, PMID: 27749837, 2016) and protein index single cell ATAC-seq (pi-ATAC, Chen, X et al, Nature Communications, PMID: 30389926, 2018). Both technologies are single cell technologies and could be used to analyze multi-layers of cell features at the same time either in vitro or in situ.

In our group, we are fascinated why cells in our body contain the exactly same DNA sequence but turn into different fates, e.g, some cells in the human bodies become cancer not the others; stem cells could differentiate into totally different cell types. We are aiming to understand the role of epigenetic in control the cell fate in human disease by 1) deciphering the tumor microenvironment across multiple primary clinical cancer types with single cell technologies and 2) developing the start-of-art single cell technologies. The insight from our research could give us better knowledge of cancer progression at single cell level, and provide a potential clinical diagnosis toolkit, and reveal a target for cancer therapy in the long term.

Group website link: <https://xingqichen2015.wixsite.com/mysite>
http://igp.uu.se/research/molecular_tools/xingqi-chen/

Please contact PI for the detail of the project: xingqi.chen@igp.uu.se if you are interested.