Post-doctoral Fellow on Mechanotransduction in Stem Cell Biology in the School of Biomedical Sciences, HKU

Applications are invited for appointment as Post-doctoral Fellow in the School of Biomedical Sciences, to commence as soon as possible for one or two years, with the possibility of renewal. Applicants should have a Ph.D. degree preferably in Biology, Biomedical Sciences, Medical Engineering or a related discipline. Experience in cell and molecular biology would be preferred. Applicants should also be organized, self-motivated, committed to the project schedule, and able to work independently and in a team. The appointee will participate in multidisciplinary RGC funded Collaborative Research Fund (CRF) project (see below) relating to the influence of the extracellular matrix on lineage directed differentiation of human embryonic stem cells to intervertebral disc cells stem cells. For further information, please contact Professor Kathryn Cheah (kathycheah@hku.hk) or Dr. Cheng-Han Yu (chyu1@hku.hk). The appointee will gain experience in stem cell biology, functional genomics and single cell biology. A highly competitive salary commensurate with qualifications and experience will be offered, in addition to annual leave and medical benefits.

Project: **Analyses of progenitors and differentiation trajectories in the nucleus pulposus and their relevance in intervertebral disc degeneration**

Intervertebral disc disease (IDD) and associated low back pain is an ageing disorder of major clinical burden. A likely disease-causing mechanism of IDD is impairment of the reparative capacity of the intervertebral disc (IVD) tissues in the spine. The nucleus pulposus (NP) forms the central hydrated gelatinous core of the IVD. In IDD the mechanical strength and shock-absorbing capacity of the NP in the disc declines. But there is limited knowledge of the influence of the extra cellular environment on the molecular characteristics and function of these cells in maintaining a healthy disc.

In this project we aim to study the role of extracellular matrix stiffness and mechanotransduction in NP cell differentiation and fate. Mechanical loading of the IVD is one of the key factors to induce cellular stress, matrix stiffening and fibrosis that contribute to disc degeneration. Stiffened microenvironment can promote cell differentiation, proliferation and expression of adhesion and ECM proteins. We will determine the impact of altering matrix stiffness after culturing in the stiffness-defined functionalised matrices, on the differentiation of human embryonic stem cells to NP cells and their transcriptome and gene regulatory network . The insights will be linked and applied to the ongoing meta-analyses of genomic data on IDD.