

## BioSyM Seminar Series 2017

### Application of Biophysically Sorted Chondrocyte in Articular Cartilage Regeneration

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**Time** : 12 pm to 1 pm  
**Venue** : Level 5, Perseverance Room



### **Abstract**

Articular cartilage has zonal properties that vary in term of cell size, chondrocyte morphology, matrix composition and collagen organisation. The conventional method to isolate zonal chondrocyte by manually cutting full thickness articular cartilage into three regions is time-consuming and labor intensive. In this project, zonal chondrocyte is isolated by inertia microfluidic device based on cell size. Isolated small, medium and large chondrocyte have the phenotype of superficial, middle and deep zone respectively according to their gene expression level. However, sorted chondrocytes tend to lost its phenotype during 2D expansion while expansion in a crucial step in tissue engineering to obtain sufficient cell number. Therefore, the aim of this project is to develop expansion strategies that could maintain the phenotype of the different population of sorted chondrocyte. Approaches including manipulation of cell's environment such as microcarrier culture with and without mechanical stimulation, or the provision of substrate topography will be studied. Lastly, the cartilaginous function of sorted-expanded chondrocyte will be validated in a 3D multilayer hydrogel construct.

### **Short Biography**

**Tee Ching Ann** received Bachelor of Engineering (Bioengineering) degree from School of Chemical and Biomedical Engineering at Nanyang Technological University (NTU) in 2016. In the same year, she joined this group as a graduate student under Singapore-MIT Alliances for Research and Technology (SMART) Centre and School of Medicine at National University Singapore (NUS).