

Introductory Talks by New Researchers @ BioSym
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Cartilage regeneration using customized engineering scaffolds

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Date: 24th October 2016, Monday

Time: 12 pm to 1 pm

Venue: Perseverance Room, Enterprise Level 5



Abstract

Connective tissue such as cartilage has limited self-capacity due to its avascular nature and sparse population of chondrocytes within the extracellular matrix (ECM). Tissue engineering (TE) has emerged as a promising strategy that provides temporary support or scaffolds for cartilage regeneration. 3D-printing (3DP), which operates based on additive manufacturing technology, has been explored for TE purposes to fabricate patient-specific scaffold constructs. Indirect 3DP, in particular, allows the use of naturally-derived biomaterials and provides user-defined control through the use of a sacrificial mold. Using indirect 3DP, silk fibroin protein scaffolds with macro- & micro-sized morphologies, which serves to provide interconnected channels for nutrients diffusion & cell attachment respectively, were produced. Despite going through the multiple-step fabrication approach, the protein's intrinsic properties were preserved and it did not induce cytotoxicity. Results obtained from in vitro cellular studies demonstrated the TE constructs as suitable templates for chondrocyte attachment and proliferation.

Short Biography

Jolene joined SMART-BioSym in July 2016 as a postdoc in Krystyn's group. Her research interests include tissue engineering, 3DP, biomaterials & microcarrier fabrication using microfluidics technology. She completed her doctoral degree in School of Mechanical & Aerospace Engineering, Nanyang Technological University, under the supervision of Professor Chua Chee Kai who is the current executive director of the Singapore center for 3DP.