BioSyM Seminar Series 2017
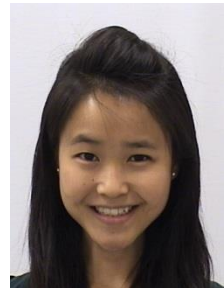
On-Chip Elucidation of the Role of Monocytes in T cell Immunotherapy

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Date   **: 03rd April 2017, Monday**

Time   **: 12 pm to 1 pm**

Venue   **: Level 4, BioSyM Seminar Room**

Abstract

T cell immunotherapy holds promise as the next breakthrough in cancer treatment. In virus associated cancers, therapy can take the form of cytotoxic T cells which are directed by a T cell receptor (TCR) to specific viral peptides that are expressed on the cancer cell surface. There is increasing evidence, however, that monocytes in the tumor microenvironment undermine T cell activity. Studies further suggest a role for programmed death-ligand 1 (PD-L1) in monocyte-mediated suppression of T cells. However, the mechanism of PD-L1-mediated cellular interactions remains unclear for TCR-redirected T cells and might be efficiently unraveled through a rationally designed multi-cellular microfluidic platform. Therefore, in this work, the impact of monocytes on the anti-tumour efficacy of TCR-redirected T cells is investigated in a 3D microfluidic system. The study employs a model of Hepatitis-B associated Hepatocellular Carcinoma (HBV-HCC), where T cells are redirected to HBV-specific peptides that are presented by a cancer cell line. In addition to elucidating a differential role of monocytes depending on the method of T cell production, we further demonstrate the importance of a 3-D context to observe immune cell interactions.

Short Biography

Sharon is a graduate student with the NUS Yong Loo Lin School of Medicine, and is part of the Singapore-MIT Alliance for Research and Technology Program. She graduated from the National University of Singapore with a Bachelor's degree in Biomedical Engineering. Sharon started working in BioSyM as a final year undergraduate where she worked with microfluidics, studying the margination behaviour of nanoparticles. Since then, she has moved on to applying microfluidic technologies for investigations in tumour immunology. She is jointly supervised by Dr Wong Siew Cheng (Singapore Immunology Network, A*STAR) and Professor Roger Kamm (MIT).