

BioSyM Seminar Series 2017

Probing the effect of the protein corona on nanoparticle permeability in cancer medicine

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Venue : Level 4, BioSyM Seminar Room



Abstract

The protein corona is a naturally occurring phenomenon whereby proteins in a protein rich environment adsorb non-specifically onto a nanoparticle's (NP) surface. Once thought to be undesirable, recent works demonstrating the successful loading and triggered release of drugs from corona coated NPs have resulted in a growing appreciation in the use of these corona coated NPs in various biomedical applications. Till date however, there exists no study investigating the effect of the protein corona on NP permeability. The permeability characteristics of a NP has important implications in its efficacy, given how intravenously administered NPs need to escape the vascular flow and extravasate into the interstitial space before it can move towards its target site for its intended application. My work therefore involves a systematic study investigating three aspects of the protein corona: (1) the effect of the protein corona on a NP's paracellular permeability through investigating the effect of protein coronas on a NP's aggregation and size; (2) the effect of the corona on a NP's transcellular permeability; and (3) the effect of the corona on a NP's cellular internalization, intracellular localization, and cell membrane adhesion, and how this relates to its transcellular permeability when compared to PEGylated NPs.

Short Biography

Yan Teck is a graduate student with NUS's Graduate School for Integrative Sciences and Engineering. He graduated from the National University of Singapore with a Bachelor's degree in Bioengineering. He started working in BioSyM ever since his senior year in 2012 before moving on to work under the co-supervision of Professor Roger Kamm in 2014.