

Focused Seminar Series on Microdevices in Biological Studies 25 Jul 2016 – 10 Oct 2016

Single Cell Applications in Rare Cell Events

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Date: 22nd August 2016, Monday

Time: 4pm to 5pm

Venue: CREATE Theatrette, Level 2 of CREATE
Tower @ UTown, S'138602



Abstract

Single cell analysis presents opportunities to study health related issues with finer resolution and sensitivity. It allows the capture of inter-cellular variances that might be missed with conventional population averaged studies. Indeed, personalized medicine is gearing towards single cell analysis to better profile patients at the molecular level.

Our work centers on the development of microfluidic devices to prepare quality samples for downstream cellular and molecular analysis. We see a critical need in the area of rare cell events and traditional methodologies do not suffice to handle the challenges. We have demonstrated in our clinical preliminary trial that the device is helpful for single circulating tumor cell (CTC) analysis. Resistance to drug therapy is a major concern in cancer treatment. Here we showed that the isolated single CTCs was representative of dominant EGFR mutations such as T790M and L858R found in the primary tumor. Tracking the emergence of T790M mutation is especially important as it confers resistance to tyrosine kinase inhibitor therapy. The mutation is likely acquired as a response to treatment, which might be absent during initial diagnosis on the primary tissue. With this single cell recovery device, we can potentially implement personalized treatment not only through detecting genetic aberrations at the single cell level, but also through tracking such changes during an anticancer therapy.

Short Biography

Tan Swee Jin currently heads the technical efforts on single cell applications in Clearbridge Mfludics Pte Ltd.

He has a 1st class honours degree from the department of Mechanical Engineering and PhD from the department of NGS, National University of Singapore. His background expertise centers on microfluidic systems for biomedical applications and have published numerous scientific publications and book chapters. He has been accorded with numerous accolades which includes IES (Institution of Engineers Singapore) Prestigious Engineering Achievement Award 2010, Young Investigator Award (GOLD), 6th World Congress on Biomechanics (WCB 2010) and Tan Kah Kee Young Inventors' Award, Merit Award (Open Section).