



Microtentacle imaging in patient tumor samples

Summary

Free floating microenvironments are relevant to many aspects of healthcare and research. However using currently available technologies, it is difficult to utilize non-adherent cells for research and diagnostic purposes due to harsh processing steps (e.g. centrifugation, washing) or artificial substrates (e.g. plastic, glass) that change cell behavior. This technology is a diagnostic tool to observe and study non-adherent cells in a free-floating environment that will preserve the biological behaviors of non-adherent cells.

Key Investigator

Stuart Martin

Field

Oncology Diagnostic, CTC

Technology

Oncology Diagnostic
 Research Tools
 Microfluidics

Advantages

Microfluidic platform: Ability to immobilize individual or populations of live cells for analysis using a label-free, low-cost platform

Status

Exclusively licensed for the field of diagnostic products in oncology and research tools. Available for licensing in other fields.

Patent Status

SM-2013-121: EU 15 772
 64037 filed 11/2/2016, US
 15/301,587 filed
 10/3/2016

SM-2015-011:
 PCT/US2015/054571 filed
 10/7/2015

UMB Docket Reference

SM-2013-121, SM-2015-011

External Reference

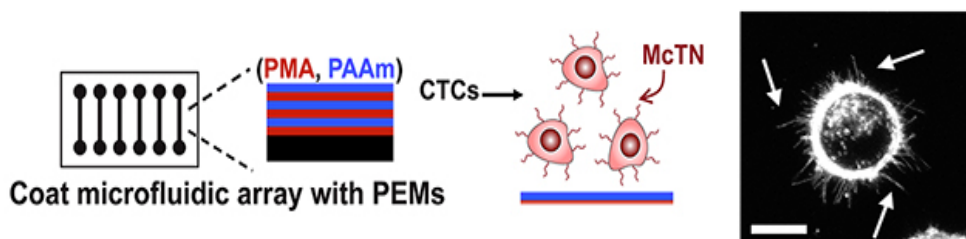
[Oncotarget. 2016 Mar 1;7\(9\):10486-97](#)

Market

The primary application for this technology is as a live cell capture and imaging microfluidic device (i.e. microscopy platform slide or lab-on-a-chip) to examine the behavior of cells in a non-adherent, free-floating state. This would apply to native non-adherent cells (i.e. immunocytes) as well as rare cells or scarce samples such as CTCs, stem cells, and other anchorage-independent cancer cells.

Technology

This technology is a polyelectrolyte multilayer (PEM) surface coating designed with specialized lipids to tether cells to microfluidic substrates such as microscope slide platforms and cell culture surfaces. The PEM coated slides have been used to image cell membrane protrusions (microtentacles) that form on the surface of free-floating tumor cells, allowing for the precision image capture of dynamic membrane structures. Microtentacles aid tumor cell reattachment to blood vessel walls and retention of circulating tumor cells (CTCs) in lung capillaries during metastasis. To date, this technology has been used to successfully conduct non-adherent cell based analysis and screening on cancer cell lines and patient CTC samples.



Technology Status

- Initial POC completed
- microfluidic platform design and software in progress