

Tracking white blood cells in microscope images

Overview

Polarity (ie cell shape and asymmetric distribution of molecules) is an important regulator of the fate of immune cells (T cells). To study this topic we place T-cells transfected/transduced to express fluorescently labelled proteins in culture with infected cells and image their activity with a microscope for periods extending from several hours to several days. These experiments provide us with rich sets of images in which the dynamic behaviour of tens to hundreds of T-cells can be observed simultaneously.

One of the problems associated with these experiments is that the T-cells are highly motile. They change shape rapidly and protein redistribution within the cells can occur on the scale of seconds or minutes (as opposed to hours in some cell types). This dynamicity coupled with the relatively large amount of cells imaged in a single experiment, make manual analysis of the movies difficult. In order to overcome this problem we are developing a software system that segments, tracks and registers the T-cells in the movies in order to automate analysis.

The goal of this project will be to develop and realise an algorithm for tracking the T-cells in the microscope images.

Requirements

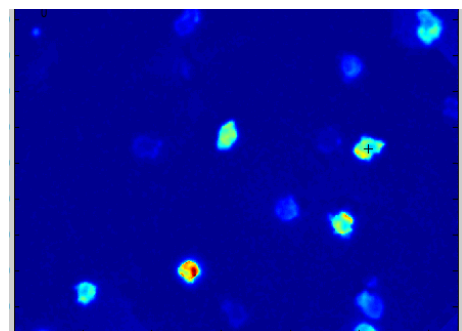
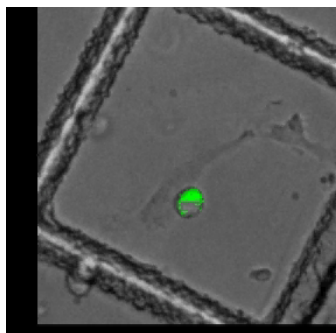
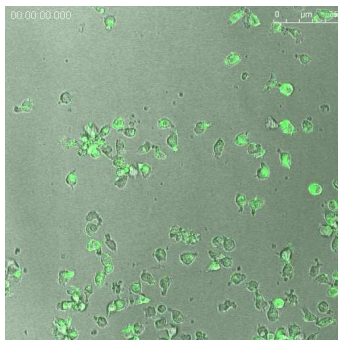
A course in image processing
Good knowledge in Matlab

Duration

1 semester

Contact

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This project is in collaboration with Prof. Sarah Russell, Peter MacCallum Cancer Centre, Melbourne, Australia