Sub-classification of colorectal cancer using surface antigen antibody microarray and fluorescence multiplexing


THE UNIVERSITY OF SYDNEY SCHOOL OF MOLECULAR BIOSCIENCES

Background

Colorectal cancer (CRC) is the second most frequent cause of cancer deaths in Australia. Even after resection up to 50% of patients relapse. In an attempt to prevent recurrences of cancer deaths in Australia. Even after resection up to 50% clinical course for individuals with as few as 10-20% patients genuinely benefit because the chemotherapy is administered to high risk patients. However, Cancer specific biomarkers have played crucial roles in cancer characterisation and prediction. Surface molecules (also known as CD antigens) make ideal biomarkers, as their expression often evolves with tumour progression or interactions with other cell types, such as tumour infiltrating lymphocytes (TILs) and tumour associated macrophages (TAMs).

Our study describes a method for the rapid processing of surgical CRC samples and profiling of the intestinal epithelial cells and lymphocytes. The CRC DotScan microarray takes a surface antigens control intestinal mucosa for the profiling of CRC from surface profiles

Results

1. Mixed population of viable cells expressing antigens binds to corresponding antibody dot on array

2. 30 min fixation and thorough washing

3. Optical scan shows surface antigens present in a mixed cell population

4. Captured cells are multiplexed with a mixture of fluorescently labelled antibodies (EpCAM and CD3) against particular cell types

5. Use laser scanner to obtain fluorescent dot patterns against specific cell populations (e.g. TILs, cancer cells) on a single array

Conclusion

- Surface profiles determined for mixed populations of cells in CRC tissue
- Working towards a molecular approach to the sub-classification of CRC
- Quantification and profiling of the T lymphocyte population within tumours
- Increased number of samples should enable accurate sub-classification of CRC from surface profiles

