

Label-free Detection of Single Cell Phenotype Using Raman Micro-spectroscopy

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Single cell biology is a high resolution biology which will open a new frontier for understanding the basic functional unit of life and usher potential application to cancer diagnosis and new gene discovery. Single cell Raman spectra (SCRS) can be regarded as a phenotypic fingerprint of individual cells which can be used to characterise cell type, physiological state and cell functionalities. SCRS has been successfully applied to the study of cancer cells and stem cells. We have also developed Raman activated cell sorting (RACS) and Raman activated cell ejection (RACE), which sort cells according to their Raman spectra. SCRS and RACS will revolutionise our ability to study single cells in their native states and pave the way for single cell ‘-omics’ including genomics, transcriptomics, proteomics and metabolomics.

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