

***Infrared Study of Single Cells in Aqueous Media***

Graeme Clemens, Caryn Hughes, Francis J Ball, Alex Henderson, Stephan  
Mohr, Andrew Whiting, Stefan A. Przyborski, Gianfelice Cinque  
and Peter Gardner

Manchester Institute of Biotechnology (MIB), Manchester University, Manchester,  
131 Princess Street, M1 7DN, UK

Using FT-IR micro-spectroscopy, we are able to discriminate between pluripotent stem cells and their differentiating derivatives based each cells spectral fingerprint. With a new algorithm created using MATLAB, we are now able to accurately remove out the buffer contribution (water/PBS contribution) from IR spectra recorded from fixed and live cells in an aqueous environment. With accurate pure cell absorption spectra being produced from cells in an aqueous environment, spectral analysis of live single cells is now possible, opening the door for live stem cell screening using infrared microspectroscopy, in an environment close to the *in vivo* conditions of the cells.

[1] G. Clemens, K. R. Flower, A. P. Henderson, A. Whiting, S. A. Przyborski, M. Jimenez-Hernandez, F. Ball, P. Bassan, G. Cinque and P. Gardner, *Molecular BioSystems* **9**, 677 (2013).