

SIMULTANEOUS CONFOCAL-SCANNING PROBE MICROSCOPY IMAGING OF CELL SURFACE PHENOMENA

James Shaw¹, Kim Hodgson², Christopher M Yip¹; ¹University of Toronto, 407 - 4 Taddle Creek Rd, Toronto, Ontario M5S 3G9 Canada, ²University of Victoria, Canada

The cell membrane defines the boundary between the cell and its environment. Events occurring at the cell surface can be therefore be extremely important for the survival of a single cell or a multi-cellular organism. For example, binding of an extracellular ligand to a transmembrane receptor is a common mechanism for triggering an intracellular signalling cascade. It is therefore critical that appropriate techniques be developed that can study membrane structure and function in real-time, and ideally with molecular scale resolution on living cells. Epifluorescence and confocal laser scanning microscopies have certainly provided tremendous insights into cell dynamics, protein localization and membrane structures. Coupling these techniques with scanning probe microscopy would create a powerful imaging modality capable of, for instance, assessing the interactions between soluble proteins and the cell membrane, and the consequences of such interactions on cell viability. We have coupled commercially available scanning probe and confocal microscopes into a single imaging platform to study the pore-forming action of several peptides on bacterial biofilms. Our goal is to develop a model protocol for screening novel anti-microbial agents by monitoring both local changes in cell surface morphology and global effects on cell viability via coaxial real time confocal-scanning probe imaging.