

MONITORING PROTEIN-PROTEIN INTERACTIONS IN LIVING, DYING, AND INFECTED CELLS. **Olivier Julien**, University of Alberta, Department of Biochemistry, 4-020C Katz Group, Edmonton, AB T6G 2H7, Canada.

Proteases regulate key biological processes, such as apoptosis, cell differentiation and viral infections. The dysregulation of caspases, for example, underlies several human diseases including cancer and autoimmunity. A better understanding of these enzymes is therefore of great interest toward the design of new therapies and improved elucidation of disease mechanisms. One key step towards our understanding of protease functions is through the identification of their substrates. In short, we use a rationally engineered peptide ligase enzyme called *subtiligase* to attach biotinylated ester peptide probes to free *N*-termini, allowing site-specific identification and quantification of cleavage sites in complex mixtures by LC-MS/MS. Using functional proteomics approaches, we aim to identify protease substrates and find ways to modulate their proteolysis and associated biological processes. Proteomics results identifying hundreds of apoptotic and non-apoptotic caspase substrates will be presented, as well as proteolysis occurring in virus infected cells.