

DMMC Course PROTEOMICS: METHODS & APPLICATIONS

1615, Tuesday 6 June 2006. UCD Conway Institute Lecture Theatre

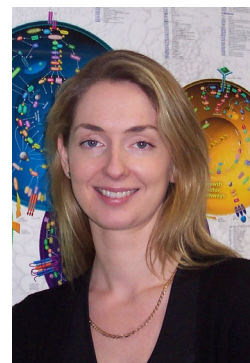
Practical Applications of Liquid Chromatography & Gel Based Proteomics Dr Patricia B. Maguire, UCD Conway Institute

Abstract

Newly developed proteomic technologies now permit the routine identification of hundreds or even thousands of proteins in a single experiment. However, the global study of any proteome has unique challenges that set it apart from comprehensive studies of genes and transcripts. The detection of low-abundance, biologically relevant proteins poses a particular challenge, especially given that the dynamic range of proteins in cells is estimated to be 10^6 or greater. Nevertheless, the incorporation of proteomics into functional biochemical and biological investigation has proved to be a powerful tool when applied to cellular biology. This presentation will highlight recent proteomic approaches using multi-dimensional liquid chromatography and gel based strategies to answer biological questions including the characterisation of over 300 proteins released from activated platelets. This releasate comprises a multitude of inflammatory and vasoactive substances, many novel to the platelet, which can attract atherogenic leukocytes from the circulation, activate endothelial cells and by infiltrating the vessel wall, stimulate vessel growth and repair. Furthermore, neutralisation of these platelet-derived pro-inflammatory factors may become an interesting means for therapeutic or preventative intervention in atherosclerosis.

Biography

Patricia Maguire studied Pharmacology & Genetics at University College Dublin and obtained a PhD in Pharmacology in 1998. After a year as Research Manager with Procter & Gamble in Brussels, she returned to Dublin to take up a Research Fellowship in the Proteomics Core at The Royal College of Surgeons in Ireland. In 2004, Patricia moved to University College Dublin, where she works in the UCD Conway Institute of Biomolecular & Biomedical Research as a Research Fellow/Proteomics Collaboration Scientist. Dr Maguire's research interests centre on the application of proteomics to disease characterisation and identification of drug targets.



5 Most Relevant Publications

1. Kelly P, **Maguire PB**, Bennett M, Fitzgerald DJ, Edwards RJ, Thiede B, Treumann A, Collins JK, O'Sullivan GC, Shanahan F, Dunne C. (2005). Correlation of probiotic *Lactobacillus salivarius* growth phase with its cell wall-associated proteome. *FEMS Microbiol Lett.* 252, 153-159.
2. **Maguire P.B.**, Moran N., Cagney G & Fitzgerald D.J. (2004). Application of proteomics to the study of platelet regulatory mechanisms. *Trends Cardiovasc. Med.* 14, 207-220.
3. Coppinger J.A., Cagney G., Toomey S., Kislinger T., Belton O., McRedmond J., Cahill D., Emili A., Fitzgerald D.J. & **Maguire P.B.** (2004). Proteomic characterization of the proteins released from activated platelets leads to localization of novel platelet proteins in human atherosclerotic lesions. *Blood* 103, 2096-2104.
4. McRedmond J., Park S., Reilly, D., Coppinger J.A., **Maguire, P.B.**, Shields, D. & Fitzgerald D.J. (2004). Integration of transcriptomics and genomics in platelets: a profile of platelet proteins and platelet-specific genes. *Mol. Cell. Proteomics* 3, 133-144.
5. **Maguire P.B.**, Wynne, K.J., Harney, D.F., O'Donoghue, N.M., Stephens, G. & Fitzgerald, D.J. (2002). Identification of the phosphotyrosine proteome from thrombin activated platelets. *Proteomics* 2, 642-648.