

## **DMMC Course      PROTEOMICS: METHODS & APPLICATIONS**

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### **Medical Applications of Gel-based Proteomics**

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#### **Abstract**

The ability of two-dimensional gel electrophoresis (2-DE) to simultaneously separate several thousand proteins from a complex biological sample, combined with the availability of highly sensitive agents for visualisation and computer systems for the quantitative analysis of the resulting protein profile, and the ease with which proteins of interest can be identified and characterised by mass spectrometry, makes it the method of choice for many biomedical proteomic studies. Quantitative studies of differential protein expression in human tissue samples from healthy and diseased individuals can provide important new insights into the molecular processes underlying cellular dysfunction in disease, and have the potential to identify new disease biomarkers and therapeutic targets. Such studies can be usefully complemented by proteomic studies of appropriate *in vivo* animal models and *in vitro* cellular systems that are amenable to experimental manipulation. Proteomic analysis of body fluids (serum, plasma, urine, cerebrospinal fluid, etc) has great potential for the discovery of disease biomarkers that can be exploited as minimally-invasive diagnostics and/or prognostics. The lecture will be illustrated with examples from my proteomics research in the areas of heart disease, cardiac transplantation and psychiatric disorders.

#### **Biography**

Mike Dunn is Professor of Biomedical Proteomics at the Conway Institute of Biomolecular and Biomedical Research, University College Dublin, where he and his team are carrying out a programme of proteomics research into cardiovascular disease, solid organ transplantation and neurological disease. The emphasis is on understanding molecular processes involved in disease and on identification of novel biomarkers of disease that can be developed as diagnostic markers and/or therapeutic targets. Mike is the current President of the British Society for Proteome Research. He has an extensive bibliography and has contributed to many texts in the area of gel electrophoretic and proteomics technologies and applications. Mike is the Editor-in-Chief of the international journal, *Proteomics*.

