Prof Brian MacCraith and Dr Tony Killard

Two major inter-institutional collaborations underway at the Biomedical Diagnostics Institute

Prof Brian MacCraith and Dr Tony Killard at the Biomedical Diagnostics Institute in DCU have recently secured substantial funding from Enterprise Ireland for the establishment of two national inter-institutional collaborations. The two programmes, one in the area of biomedical diagnostics and the other in the area of bioprocess development, have both emerged from new industry-led research initiatives established by Enterprise Ireland. The total value of the two programmes is in excess of €2 million.

The industry-led research initiative emerged from recommendations in the O'Driscoll Report produced by the Enterprise Strategy Goup. This new approach to applied research in Ireland draws together interested parties from a particular industrial sector to define their research and development needs and to identify how these needs can be met by the available research expertise in Ireland. The consultation process for the bio-sector began early in 2005 with industrial representatives being asked to define their research priorities. Two priority research areas emerged from this process: bio-diagnostics and bioprocess analysis. Arising from this, a team of academic researchers with the relevant expertise was assembled to deliver the defined programmes of research.

This process of consultation and project definition was a significant challenge in itself. Dr Killard and Prof MacCraith co-ordinated the establishment of the bio-diagnostics programme, which also includes research groups from NUIG, UL, UCC and the Tyndall National Institute. In addition, they assisted in the establishment of the bioprocess programme, led by Prof Brian Glennon at the School of Chemical and Bioprocess Engineering at UCD.

One of the main needs of the bio-diagnostics sector is the development of rapid diagnostic devices for a range of applications. The bio-diagnostics programme, entitled POCit (point-of-care immunotechnology) will deliver a professional use point-of-care immunodiagnostic device for detecting elevations in a range of cardiac markers. These markers are routinely used to assess the cardiac status of patients suspected of suffering heart attacks or related cardiovascular conditions. The device will allow physicians to get timely information at the patient's bedside to allow for rapid, early intervention. It is also intended that the technology will be sufficiently generic to be applicable to veterinary and other applications.

The bioprocess programme, entitled BIOMON (Bioprocess Monitoring), aims to produce a range of technologies that will benefit the biopharmaceuticals industry. At present, the bioprocess development process still relies heavily on the monitoring of a small number of variables, such as pH and dissolved gases, and a number of biochemical analyses such as glucose consumption, protein concentration and cellular analysis. Many of these tests are slow and cumbersome and need to be performed away from the bioreactor (off-line). The outputs from BIOMON will allow these types of analyses to be performed within (in-line), or close to the bioreactor (at-line), again giving timely and detailed process information that will aid the course of process development.

In this regard, the DCU team will produce novel laser-based technologies for monitoring glucose and other species within the bioreactor. This work will also be performed in collaboration with DCU's campus company, Archport, which will provide bioprocess expertise to the programme.

– Tony Killard