MAJOR COLLABORATIVE INITIATIVES BY CANCER BIOLOGY GROUP

The following are key initiatives, stimulated by collaborative interactions between the Conway cancer biology Group (*members of the group indicated by italics):

1. **HRB Programme Grant 2005-2010 (960k euro):** Four members of the Group (*Prof. Joe Duffy*, *Dr. William Gallagher*, *Prof. Finian Martin* and *Prof. Peter Dervan*) were recently awarded a 5 year programme grant from the HRB entitled "*Breast Cancer Metastasis: Biomarkers and Functional Mediators*". This represents a significant achievement given that only 3 of these grants were given out this year.

   This project will seek to identify and validate novel breast cancer markers and therapeutic targets in a systematic manner, primarily through the use of tissue array and RNA interference technologies. In addition, the project has strong linkages to the clinical sphere, with investigators from the Mater Misericordiae University Hospital and St. Vincent's University Hospital being actively involved. Finally, this project is further bolstered by a recently successful submission to the Swedish Human Proteome Resource, whereby antibodies against >250 putative breast cancer markers will be made and provided on a non-cost basis, with there being a significant element of intellectual property to be derived from this activity.

2. **Prostate Cancer Research Consortium:** Created in October 2003 with funding from the Irish Cancer Society (650k euro), the *Prostate Cancer Research Consortium* is a multi-disciplinary, trans-institutional collaboration that is building a shared prostate cancer biocollection in Dublin (with leadership provided from UCD by *Dr. William Watson* and TCD by Prof. Mark Lawler under the organisational structures of the DMMC). The consortium has established the first prostate cancer biocollection in Mater Misericordiae University Hospital, St. Vincent's University Hospital and St. James's Hospital, and is on target to achieve its bioresource goal of 300 samples by 2006.

   This bioresource is fuelling integrated prostate cancer research across UCD, TCD and their affiliated teaching hospitals. An additional application has now been submitted to the Irish Cancer Society to further expand this consortium to Adelaide & Meath incorporating the National Children's Hospital (AMNCH), Beaumont Hospital and Mercy Hospital, Cork for an additional three years (2006-2009). The biocollection represents a key resource both in terms of the clinical material available for research and crucially the availability of clinical information linked to the clinical material. This annotated tumour bank allows for significant questions to be answered in relation to disease diagnosis and recurrence, providing it with a competitive advantage over other collections worldwide where follow up data and reliable clinical information is not available. These samples are now being used to address the consortium's ultimate research aims of developing novel diagnostic and therapeutic approaches for prostate cancer.

   Specifically, preliminary examination of novel biomarkers in early disease detection, as well as the determination of clinically significant disease and the molecular classification of disease stage and disease progression phenotypes have been established with the initial funding from the Irish Cancer Society. In addition to significant scientific success, the consortium has demonstrated the effectiveness of cross-institutional collaboration and has become a model for collaborative research in other cancers. Standard operating procedures have been established and applied to the collection of tissue, serum, plasma and urine. It has created a unique network of collaboration involving the surgeon, pathologist, research nurse and scientist working together to identify patients, obtain ethical consent, record clinical details, collect and store blood and urine directly from the patients and tissue sampled from the prostate gland by the pathologist. Local databases manage this resource at each site and a central database is now been constructed which will be available to all

members in order to search for specific patient groups available. The expansion of the consortium has resulted in the need for significantly larger and more complicated databases which has formed the bases of a Health Research Board submission to support such IT requirements.

3. **HRB Equipment Grant 2004 (Automated Slide Scanning and Image Analysis System; 280k euro):** Following receipt of a major HRB Equipment Grant in 2004 (Applicants: *Dr. Amanda McCann*, *Dr. William Gallagher* and Prof. Elaine Kay) and several months of in-depth evaluation, UCD Conway Institute will soon acquire an Aperio T3 Automated Digital scanner.

   This instrument will allow for high-throughput image acquisition of formalin-fixed paraffin-embedded (FFPE) tissue sections. The instrument utilises line scanning technology and images can be acquired at 10-80X. We also intend to provide a secure repository for all images acquired using the scanner. We would see exciting possibilities for interaction with experts in image analysis within UCD, as well as in bridging the basic science and clinical spheres. This is the first system of its kind to be located within an academic environment within the Republic of Ireland.

4. **ProteinChip/SELDI facility:** The group was instrumental in establishing Ireland's first core facility in ProteinChip/SELDI analysis, funded again under a major equipment grant from the Health Research Board of Ireland (260k euro; Applicants: *Dr. William Gallagher*, *Prof. Finian Martin*, and Prof. Cliona O'Farrelly). The aquired instrumentation utilises surface enhanced laser desorption/ionisation (SELDI) technology, in combination with mass spectrometry, to facilitate protein profiling of complex biological and clinical samples.

   This facility represents a valuable addition to the clinical proteomics suite of UCD Conway Institute Proteome Research Centre, with >25 Conway/DMMC researchers having being trained in-depth on the use of this instrument. Moreover, this facility has provoked collaborative interactions across the wider Irish scientific community. See http://www.ucd.ie/conway/technology_seldi1.html for further details.

5. **Xenograft facility:** Following a pressing need to carry out functional studies *in vivo*, several members of the group have worked together to establish a dedicated xenograft facility within the Conway core technology structure. This facility will become fully operational in early 2006, with there being capacity for several relatively large-scale tumour model studies.

   In addition, *Dr. William Gallagher* and *Dr. Donal O'Shea* acquired significant internal equipment funds in 2004 to allow for purchase of a non-invasive whole animal imaging system, which was commissioned in July 2004. Overall, this facility will provide us with an ideal opportunity for translational research activities, especially in terms of fast-tracking preclinical validation of in-house derived anti-cancer therapeutics. Once fully opened, the UCD Conway Institute Xenograft facility will be the largest of its kind in the Republic of Ireland, and would allow investigators to perform key *in vivo* studies in house.

6. **Breast Cancer Research Portal:** *Dr. Leonie Young*, Dr. Peadar O'Gaora, and *Dr. William Gallagher* received funds (150k euro) under the HRB Information Infrastructure programme in 2004 to establish a research-oriented communication portal focused on breast cancer-related work activities. This system is set to roll out in mid June 2006 and will be a key resource to foster to integration of breast cancer research across the Irish research community.

7. **Marie Curie Transfer of Knowledge (ToK) Industry-Academia Partnership:** *Dr. William Gallagher* and *Prof. Joe Duffy* secured 500k euro under this EU programme, which aims to harness the wealth of transcriptomic and other '–omic' data emerging from molecular analysis of human breast tumours. The ToK programme will provide advanced training to post-doctoral fellows, as well as exchange unique skills between academic and industrial sectors, in the areas of transcriptomic and bioinformatic analysis, along with tissue microarray and RNA interference technologies. The current consortium brings together 6 participant institutions from academic and industrial sectors across 4 EU countries.

8. **EMBO Conference:** *Dr. William Gallagher* and *Prof. Finian Martin* have secured funding from EMBO to organise a high-profile international conference on common molecular mechanisms of mammary gland development and breast cancer progression (to take place in June 2006).