A Burning Issue

Ireland has the THIRD LARGEST RATE OF MALIGNANT MELANOMA IN THE EU and the incidence of melanoma is increasing each year – early detection is vital as treatment options are limited. UCD's *Professor William Gallagher* leads the new Target-Melanoma project, which aims to develop new therapies to improve patient outcomes. In conversation with **UCD Connections**, he outlines the programme.

Less than 20 years ago, malignant melanoma was described as a genetic 'black box'; meaning that from the outside-in, we couldn't see what was the basis of this deadly disease. At the time, the biological factors (ie genes) that control the initiation, invasion and spread of the disease were unknown, which also meant there were few options for treatment. This is just beginning to change, and several key melanoma-linked genes have been identified; however, there is still some way to go before an efficient treatment or cure is available.

A striking feature of melanoma is the speed at which it spreads throughout the body, to vital organs, eventually causing death if not caught early enough. Melanomas have a propensity to spread when they are greater than 1mm in depth, hence small tumours may not be detected or presented to doctors until it is too late, leading to bad prognosis and poor survival for patients. To make matters worse, melanomas do not respond to conventional anti-cancer drugs. The race is on to find an effective treatment.

Cue Professor William Gallagher and an ambitious UCD-based project. In an attempt to identify the genetic basis underlying this difficult-to-treat disease, researchers at UCD have obtained EU funding for a pan-European project called Target-Melanoma. This project, funded under the Marie-Curie Industry-Academia Partnerships and Pathways (IAPP) programme, is co-ordinated by Professor Gallagher at the Cancer Biology and Therapeutics (CBT) laboratory (www.cbtlab.ie), based in the UCD Conway Institute. Target-Melanoma aims to discover new biomarkers (ie indicators) and potential targets for therapy and involves collaboration between seven partners across five EU countries, including five academic institutions and two small/medium-sized enterprises (SMEs).

This project endeavours to advance the management and treatment of melanoma patients, using molecular profiling techniques to examine the genetic background of melanoma cells and tissues from patients. One of the main areas of research in the project is centred on identifying genes that are what's called 'DNA methylated', whereby the cancer cells silence key cancer-controlling genes. By "turning off" these genes, the cancer cells can become more advanced. The project also aims to investigate genes that promote cancer, which are "switched on" during tumour progression. Once identified, these genes could be potential targets for therapy.

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The interplay between industrial, basic science and clinical spheres is key to this project. The academic groups are bringing expertise in relation to melanoma progression and genetics, as well as providing access to tumour samples, while the SMEs are providing access to, and training in, advanced technologies. This project also benefits the two Irish SMEs involved. OncoMark Ltd (www.oncomark.com), a spin-out molecular diagnostics company from the UCD Conway Institute founded by Professor Gallagher, has a major role within Target-Melanoma, in identifying genes involved in tumour progression and drug development.

"The Target-Melanoma project is of key importance for OncoMark, providing support for our ongoing R&D and opening up new avenues and market possibilities. It also allows us to interact with key academic collaborators around Europe" says Gallagher's colleague, Dr Mairin Rafferty, Senior Project Manager at OncoMark.

The Target-Melanoma project also interacts with breast cancer research which is ongoing in the CBT laboratory. Professor Gallagher is part of the Science Foundation Ireland-funded Strategic Research Cluster, Molecular Therapeutics for Cancer Ireland (MTCI; www.mtci.ie), which is a large, nationally funded, collaborative cancer research project. The primary aim of MTCI, co-ordinated by medical oncologist Professor John Crown, is to develop a co-ordinated, integrated cancer drug discovery and development programme at a national level, as well as foster collaborations in the wider European context. A Newman Clinical Professor at UCD, Professor Crown is also founder of the Irish clinical trial organisation, ICORG, which conducts clinical trials for both melanoma and breast cancer, among other tumour types. "Large-scale multi-partner, multi-sectorial projects are the way forward, particularly for clinical projects in oncology," says Crown. "In order for Irish research centres and hospitals to compete on the world stage and contribute to state-of-the-art drug development, they must collaborate with the best international scientific players and pharmaceutical companies in the field."

Target-Melanoma is also timely in view of the development of the Charles Institute of Dermatology in the Belfield campus. This state-of-the-art facility will be the first institute fully focused on disorders of the skin, including skin cancer. ■ *See overleaf for the story of the Charles Institute.*