



# NUIM OFFICE OF COMMERCIALISATION

CONNECTING EXPERTISE AND INDUSTRY

NATIONAL UNIVERSITY OF IRELAND MAYNOOTH, MAYNOOTH, CO KILDARE IRELAND

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Welcome to the latest edition of the information sharing newsletter from the NUI Maynooth Commercialisation Office. Our goal is to share the latest news and activities on the commercialisation of NUIM research. We hope you enjoy the newsletter and find it informative. Comments or questions to [commercialisation@nuim.ie](mailto:commercialisation@nuim.ie).

## ENTERPRISE IRELAND 'ONE TO WATCH' AWARD 2010



Above: Fergal O'Morain, Enterprise Ireland, Minister Conor Lenihan and Ross O'Neill (left to right)

Dr. Ross O'Neill was presented with the Enterprise Ireland "One to Watch" Award 2010 by Minister Conor Lenihan earlier this month. Dr. O'Neill who is a Research Fellow based in the Hamilton Institute, NUI Maynooth, is working on a revolutionary treatment for Tinnitus. **"This is an excellent example of commercialisation of research"** the Minister stated. The Awards were presented at the Enterprise Ireland Applied Research Forum in front of 250 academic researchers and business people gathered to look at ways to increase commercially valuable research that is transferred from third level institutions into Irish industry.

Tinnitus is a distressing condition commonly known as "ringing in the ears", which affects up to 1 in 7

people. Tinnitus is the perception of sound in the ears or head where no external source is present. It can be heard as ringing, hissing, static, screeching, whooshing, roaring, pulsing, buzzing or even music. A recent study for the Irish Tinnitus Association by Pat Naughton PhD found that at any one time, 15,000 to 20,000 people Irish people have persistent tinnitus where it has a negative effect on their quality of life and can lead to anxiety, insomnia, and depression.

While it is more prevalent in older people, tinnitus is the most commonly reported injury arising from the conflicts in Afghanistan and Iraq and is experienced temporarily by 75% of 18 to 30 year-olds who go to nightclubs and concerts. The initial research involved was funded by Science Foundation Ireland and is currently being funded by the National Digital Research Centre and Enterprise Ireland.

There is currently no known cure for the condition but Dr. O'Neill and his collaborator Mr Brendan Conlon, a Surgical Ear Nose & Throat Consultant in St. James's Hospital Dublin, are confident that the technology will change that.

Dr. O'Neill's development has the potential to dramatically improve the lives of millions of people living with Tinnitus. His work with fellow researchers in the Hamilton Institute at NUI Maynooth and his collaboration with clinicians and industry in the area is now being commercialised.

It is anticipated that a spin-out company to commercialise the project will be established in 2011. Accepting the award, Dr. O'Neill, said: 'I am delighted to accept this award on behalf of the team who have contributed to the development of this treatment for tinnitus. The clinical trials of our technology will be happening soon. This is one of the final steps in getting this product to the marketplace. I look forward to making available a product to help the millions of tinnitus sufferers out there'. For more information please contact Dr. Ross O'Neill email: [ross.oneill@nuim.ie](mailto:ross.oneill@nuim.ie)

## RESEARCHER SPOTLIGHT: JOHN MCGINLEY



Above: John Mc Ginley

Dr. John McGinley is a lecturer in the Department of Chemistry. His research interests are based in coordination chemistry, with particular emphasis on drug design.

The principles of drug design are well developed for organic molecules. Given a well characterised protein target, well established methods are available to the medicinal chemist for identification and optimisation of compounds that affect the function of that protein. In contrast, the

principles of drug design applicable to inorganic molecules are poorly understood. The process of discovery is largely serendipitous, with the understanding of metal metabolism and toxicity mechanisms being limited. On the other hand, the range of properties of the inorganic elements suggests that there may be opportunities for drug discovery that cannot be met by organic chemistry alone. The need for new agents in cancer chemotherapy is apparent from the inability to predictably cure or induce remissions in common tumours, such as lung, breast, renal or prostate cancer. To gain commercial interest, new compounds should be clearly differentiated from the current choices for cancer therapy, *Cis-platin* and Carboplatin, which are limited in their usage as a result of drug-resistant cancer cells and toxicity issues. Current research in his group has led to a series of transition metal complexes which target cancer-resistant cell lines, as well as a wide range of cancer cell lines. This is the core of a patent application at present.

Several metal-based complexes, as well as the simple ligands themselves, were screened against breast, lung, liver and

prostate cancer cell lines, as well as some drug resistant cancer cells lines. Two of the metal complexes gave a complete kill across the concentration range of the study, which is rare with toxicity testing. Both of these complexes are very toxic to prostate, renal and breast cancers. In addition, they are marginally better on metastatic (cells that spread readily to form secondary tumours) cancer cells of the breast and prostate. Based on the results, it appears that they would not be actively removed from cancer cells, but would remain inside to kill the cells, a characteristic which is exactly right for an anti-cancer drug. We are currently doing testing to see if they induce apoptotic cell death, the form of death that you would want a drug to induce. More recent work on the metal complexes of ligands containing a slightly different chemical structure have shown even better anti-cancer results.

The overall goal of this project is to explore pathways for developing new anti-cancer therapeutic agents. The current complexes that we have synthesised have several advantages over platinum-based cancer drugs. Foremost of these is that they are cheap and easy to synthesise. Two of the major issues of metal-based drugs have been poor solubility and toxic side effects. The lack of solubility means that the drug is not getting to the required site and so causes problems elsewhere by killing normal cells rather than cancerous cells. The challenge is the development of a metal complex system while retaining the required toxicity to act as a therapeutic agent.

This project is a collaborative venture with Drs Adrienne Fleming and Denise Egan at the Institute of Technology Tallaght Dublin and Dr. Kevin Kavanagh of the Biology Department, NUIM.

## AN ACADEMICS PERSPECTIVE: RONAN FARRELL



Above: Ronan Farrell

Commercialisation of research is an objective that is increasingly encouraged yet there are no clear cut ways to achieve it. Success at commercialisation requires a number of things to go right, and then you need perseverance and some luck. The following opinions are based on my own experience, I'm sure every case is unique but I hope there are some general points that will be useful. I don't think most people start with the plan to develop a commercially viable technology. In my case with Socowave, I started on a project for an SFI CSET proposal that had a good research challenge but was commercially relevant. The project commenced like any other, a PhD student was hired and the work progressed. The project was about antenna arrays - an area I had limited knowledge but I think it was this different perspective which led us to think of a different solution. We knew it had value, so we patented it. I think getting to this point is where most researchers, in industry and academia, are comfortable and can excel. If you talk to the industry people at the start, you can get a commercially-relevant topic area, do the research and get the papers and patents.

We applied for Enterprise Ireland commercialisation funds, won a Proof-of-Concept and went and built a demonstrator. In hindsight, we would not have been able to commercialise this technology by ourselves. I didn't know how, it was a global market where I had no access to the major players. You'd need a brass neck and the gift at speaking to pull it off. I think this is where luck came in. Joe Moore, the founder of Socowave, was looking for commercialisation opportunities and he came to Maynooth and we met and he liked what he saw. Joe had experience in the area, he had the contacts and he could sell. Without Joe, the technology would have stayed on the shelf and gathered dust. With Joe, the company is making an impact with the major players, has hired staff and I'm very confident of their future. Enterprise Ireland now has a programme to produce more venture partners. I could never do what he does, nor do I think I will ever want to, but together we were the right balance of technical and business expertise.

Dealing with business partners is a challenge. They will challenge you, doubt your wonderful research, ask questions that you hadn't considered and for which you have no answers. Some are very confident people who have made their millions - a different world from most academics. However, it is also worth remembering that they are people too. They are going to be putting time and likely their own money into your research. They do not have the technical expertise to fully understand the results - hence the questions. It's a risky time for them too, and that's before ever coming to personality clashes. The reality is that it can work if you invest in the relationship. Both sides need each other, and only together can anyone benefit. For me, the people aspect is the most interesting bit, and the most stressful. To quote an old saying "if it isn't hurting, it's not working".

To conclude, commercialisation is hard to set out to do. You can start with the right projects and get good results. The next steps require finding the right partners and a bit of luck. There is help out there through the commercialisation office to find the partners, use them. After that it's down to luck. It is however a numbers game, not all will succeed, but if enough try often enough, then eventually enough will to make a difference.