

Earlier this year Ireland's newest pharmaceutical devices company, Blue Box Sensors was spun out by NUI Maynooth. Claire O'Connell spoke to Prof John Lowry, the Scientist who developed the sensor technology and Dr John Scanlan, Director of Commercialisation at NUI Maynooth to uncover the story behind launching the company.'

'When a scientist makes an important discovery, the natural instinct is to shout it from the rooftops. Which in scientific circles means publishing papers in esteemed and peer-reviewed journals. But for several years, Prof John Lowry, head of NUI Maynooth's chemistry department, has had to hold off on publishing in journals or presenting at conferences, despite developing an implantable brain sensor that can boost our understanding of brain behaviour and help develop effective drugs against devastating neurological conditions.

Lowry was using the sensors to unpick mechanisms behind energy metabolism in the brain when he took the chair of chemistry at NUI Maynooth in 2006, and the sensors caught the eye of the Director of Commercialisation, Dr John Scanlan. 'He was on the prowl) to see what researchers were doing and what might have commercial potential,' recalls Lowry, who had already been building contacts and earning a solid reputation with pharmaceutical companies such as Eli Lilly and Solvay Pharmaceuticals.

Orders were coming in from industry for the sensors, and Lowry and his team, including Laboratory Manager Maryanne Dalton, started to struggle to meet demand. So NUI Maynooth decided to spin out a company, and filed five patents on the technology to protect it. 'In terms of starting a company on something like this, there are several challenges and one is always the intellectual property,' explains Scanlan.

# BLUEBOX SENSORS

## IRELAND'S NEWEST PHARMACEUTICAL DEVICES COMPANY

Prof John Lowry Head of Chemistry, NUI Maynooth  
Dr John Scanlan, Director of Commercialisation, NUI Maynooth  
Claire O'Connell Interviewer

Why the silence? To protect the intellectual property underlying the sensors so the approach could be commercialised. Now his patience has paid off. This summer NUI Maynooth spun out BlueBox Sensors Ltd to manufacture devices that can track levels of chemicals in the brain in real time over the course of weeks or even months. The sensors offer fresh insight into the workings of the brain and stand to improve preclinical research and drug discovery for a range of diseases including Alzheimer's, Parkinson's and Schizophrenia.

Prof Lowry started developing the sensor platform for his doctoral research in the 1990s. 'I started using electrodes to investigate and study the brain. It was an exciting time - this was a new technology and it offered huge potential,' he recalls. 'My remit was to develop an electrode that would measure glucose in the brain - glucose being the main energy substrate - and by the end of my PhD I had a device that had passed all the test criteria in-vitro. So on the bench we were able to show it had a high sensitivity for glucose.'

Lowry continued to develop the sensor technology, moving to Oxford to validate measurements in animal models and tweaking the electrode surfaces to measure a range of key targets including oxygen, neurotransmitters (chemicals that allow brain cells to communicate) and by-products of brain metabolism. 'Over the last few years the focus has been on designing the chemistry of the surface of the electrode, to give selectivity for the molecule to be measured,' he explains. 'And validating the approach - a lot of blood sweat and tears goes into that.'

'John is heavily funded by Science Foundation Ireland, and, with that, comes pressure to publish. But if the work is published before being patented, it's out in the open and there's nothing left to commercialise.'

Scanlan commends Lowry on holding back publications within the context of a longer-term commercial goal. 'It's a major challenge for an academic. They get hammered if they hold back on publishing to develop clean IP (intellectual property). We need someone like John, who believes in the process and is willing to hold back publishing in the medium term because the work is too valuable. We know he is excellent in science but for someone to be brave enough to stand up and say I believe in the process takes a lot of courage.' With the commercial potential of the validated sensor platform technology becoming apparent, members of Lowry's team secured funding from Enterprise Ireland to move the sensors closer to market.

Building close contacts with pharmaceutical companies - the eventual customer base - provided an important compass for the enterprise, and having clean, patented IP, strengthened the opportunity further, notes Scanlan. 'We like to have market-informed research,' he says. 'In this instance we asked companies what was of interest to them, they wanted some way of measuring glucose and dopamine in real time when the animal is doing tasks. John [Lowry] closed the lab doors and figured out how to do it and came out and with the answer. It means we have clean IP and clean IP is essential, but it is also market informed so he knows that if he develops this, a pharmaceutical company will buy it.'

Meanwhile NUI Maynooth designed an agile company structure to dovetail with the scientific expertise, bringing in a management team with experience in the field. 'Part of the programme that has been developed here, which is relatively unique to NUI Maynooth, is that the academics don't start the companies,' explains Dr Scanlan. Instead they wait until they have clean IP and a sense of the customer base before headhunting managers with exemplary track records of starting new companies. 'The management team we have pulled into this have been involved in selling the technologies that this technology will replace,' comments Dr Scanlan. 'They are close to the market, close to the customers and know the market demand.'

Scanlan believes the company will grow organically, working towards building up a reputation within the industry and regulators with the aim of replacing the standard practice of microdialysis, which is limited by not being real-time and by not being as sensitive.

Their eyes are also on a powerful stamp of approval, according to Scanlan. 'The ultimate goal would be to have it FDA approved so that the FDA request data from Blue Box sensors, in the knowledge that the sensors provide the best data,' he says.

While it has been a long wait to publish for Lowry, the payoff is seeing the flood of articles now going into peer-reviewed journals, knowing it will make a difference.

'For me personally, through interacting with industry, I will probably deliver something that will be useful for patients, whether it's for psychosis or neurodegeneration, a lot quicker and something real than if I just stayed plugging away with State funding,' he says. 'These guys know how to do it, and academics can learn a huge amount from industry people.'

- Supported by Enterprise Ireland

