Prolysis and Demuris: Spinouts founded on basic bacterial bioscience

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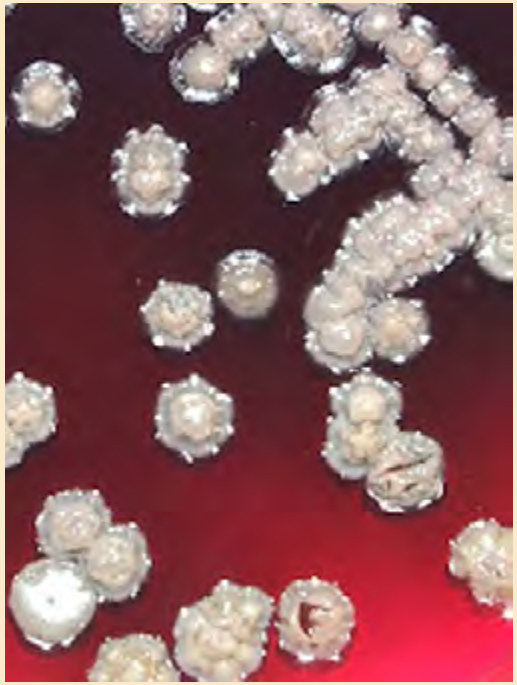
BBSRC-funded research into bacterial cell biology by Professor Jeff Errington[1], Director of the Institute for Cell and Molecular Biosciences[2] at Newcastle University has led to the creation of two spinout companies.

The first company, Prolysis, was founded in 1998 when Errington worked at the University of Oxford. Prolysis developed screening techniques patented by Errington to find novel antibiotics to tackle drug-resistant bacterial infections. So far, Prolysis has produced two promising compounds, one of which is about to enter preclinical trials. In 2009, Prolysis was acquired by Australian drug development firm Biota[3], who have continued to develop the two potential drugs.

Errington established his second company, Demuris[4], in 2007, after moving to Newcastle University. Demuris is using a unique collection of actinomycete bacteria to look for useful and valuable natural products, and has recently received investment from a local venture capital company[5].

The companies are still in the relatively early stages of drug discovery and development; according to a 2008 report from the Wellcome Trust, MRC and Academy of Medical Sciences, it takes around 17 years for such research to have an impact on health[6]. Despite this, they have both received significant investments and external interest.



Colonies of actinomycete bacteria. Credit: Dr Nick Allenby, Demuris Ltd

Target-led drug discovery

Much of the fundamental research into bacterial cell biology conducted by Errington and others at Oxford and Newcastle was supported by BBSRC. “The IP [intellectual property] and know-how comes from a lot of BBSRC-funded research,” says Errington.

Before establishing the two companies, Errington’s research focussed on fundamental questions about bacterial cell division and how bacterial cells develop and maintain their shape. “For a long time I was working on questions that were far removed from anything that could be applied,” Errington explains. “Then in the mid-nineties, pharmaceutical companies switched almost wholesale to a target-led approach to drug discovery.”

Using a target-led approach meant the pharmaceutical industry needed to understand the biochemistry and molecular biology of potential drug targets within bacterial cells. Errington’s laboratory at the University of Oxford, which received significant funding from BBSRC, had the knowledge and expertise the pharmaceutical companies required.

“All of the things my lab were working on turned out to be good targets,” says Errington. “So the cell division cycle, for example, was an area where there were a number of important, highly-conserved, essential genes in bacteria that were completely different from the equivalent in human cells. Everyone recognised these were good targets, potentially, for antibiotics.”

After a chance discussion with an industrialist at a conference in 1995, Errington filed several patents through Isis Innovation[7], the University of Oxford’s technology

transfer company, describing ways to identify novel antibiotics. However, "it never really came to anything," says Errington, "although we had a lot of ideas for interesting screening methods, they were very much laboratory-based." Although his methods worked well in the laboratory, they had not been tested in a high-throughput industrial setting.

To do so, Errington created the spinout company that eventually became Prolysis. He initially received investment from a company called Oxford Molecular, which was interested in moving into drug discovery. Prolysis subsequently received £15M of venture capital funding, as well as a BBSRC Applied Genomics LINK grant and funding from the Wellcome Trust Seeding Drug Discovery Initiative[8].

In 2009 Prolysis was acquired by Australian drug development company Biota, who have continued to develop the two promising drug candidates discovered by Prolysis. Errington now sits on the Biota Board.

Seizing the opportunity

Errington's second spinout company, Demuris, was founded in 2007[9]. At this point, Prolysis was primarily focused on drug development and, following his move to Newcastle, Errington realised there was an opportunity to continue screening for more potential new drug compounds. "Having done it [founded a spinout company] once or twice, you're always much more aware of the possibilities," Errington explains.

Demuris began as an antibiotics discovery company. However, the company gained a collection of actinomycete bacteria[10] from Newcastle University, which enabled it to hunt for a range of novel and useful natural compounds, including antibiotics. The collection had been built by world-leading actinomycete taxonomist Professor Mike Goodfellow[11], who also received support from BBSRC, and it was acquired by Demuris when he retired.

According to Errington, "We put together the fantastic actinomycete collection with the know-how around bacterial cell structure and function and combined that with the hope of producing a company that again can identify some really interesting and important drug leads."

Notes and references

1. http://www.ncl.ac.uk/camb/staff/profile/jeff.errington/#tab_research
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