

NovaBiotics' journey to commercialization of novel immune-based therapies



The Biochemist spoke to Deborah O'Neil, the CEO and founder of NovaBiotics, to find out about her journey to commercialization of her research. A biotechnology entrepreneur and immunologist by training, Deborah has over two decades of experience in drug discovery and development and was named as one of the 20 women leaders in European biotech in 2019. In 2020, Deborah was made OBE in the Queen's Birthday Honours list for services to biotechnology, industry and charity. Deborah studied at University College London and then worked in postdoctoral positions in internationally acclaimed laboratories in San Diego and Ghent before moving to Aberdeen (to the Rowett Research Institute, now part of the University of Aberdeen) where she founded NovaBiotics in 2004.

Tell us a bit about what your company, technology and why your work is important.

NovaBiotics is a clinical-stage biotechnology company designing and developing novel, immune-based therapies for medically unmet, life-threatening and life-limiting diseases. NovaBiotics has the ambition to transform treatment paradigms in inflammatory, infectious and respiratory disease. In addition to the company's lead (phase 3) NM002 programme for community-acquired pneumonia and other late-stage assets (NM001 for pulmonary exacerbations of cystic fibrosis and NP213 for onychomycosis), NovaBiotics has developed a robust pipeline of earlier stage, high-value drug candidates including NP339 for life-threatening and drug-resistant invasive and respiratory fungal disease and NP432 for multi-drug resistant bacterial infections.

NovaBiotics was a spin-out from the University of Aberdeen. Tell us the story of how the company developed to where it is today

I had the potential to obtain a small amount of grant funding during my tenure as a postdoc at the Rowett Research Institute (now part of the University of Aberdeen) – thanks to a number of government and economic development agency incentives at the time – to test the concept of novel peptide antimicrobials as therapies which soon after 'became' NovaBiotics. This had been an idea of mine for some years. Aberdeen was the right place at the right time. I soon realized that NovaBiotics could not just be a side project to my core academic work and that 100% of my time and effort needed to be invested if it was to be a success. I made the decision to leave my academic post and spin the company out in 2004 and it was absolutely

the right thing to do. The business is now a global leader in anti-infectives and respiratory therapy development.

What made you realize that you were working on something with commercial potential? Were you actively seeking the right opportunity, or was there a 'lightbulb' moment?

I am an immunologist by training and had been researching the role and regulation of endogenous antimicrobial peptides for a number of years. I was always convinced of their potential as a 'blue-print' for novel classes of antifungal and antibacterial therapies – therapies that, importantly, could mitigate drug resistance. I also believed that the innate immune system was an untapped resource of many other classes of effector molecule with therapeutic potential in infectious and inflammatory disease. The critical need for such new treatments has been further exacerbated by an antimicrobial resistance crisis and a coronavirus pandemic, both of which have turned the world's attention very much back to infectious-inflammatory disease and its global consequences.

You've previously been a postdoctoral scientist and now you're a CEO. What are the main differences in academic versus commercial research? Are there any major benefits/disadvantages of going commercial?

Great science has to be at the core of both commercial and academic research and so there's certainly no difference there. Quality standards and regulatory guidelines are amongst the factors which frame the conduct of commercial research in the later stages of a

product's development. Academic research outputs can be patented and licensed out (generally at a very early stage) from academic institutions to biotechnology or pharmaceutical companies and so spinning-out isn't always the way to commercialize technology. The disadvantage/benefit lost here could be a 'better deal' by not developing that technology further and advancing it through the spin-out company, plus the opportunity for the inventor to develop new skills by being part of the spin-out process and the company (see response to question below).

What has been the greatest challenge on your journey so far with NovaBiotics?

Swimming against the tide for a period of time and financing a drug development company focused on infection, inflammation and respiratory disease when these therapy areas were not commercially attractive. Hard to believe as that may be in 2021! Moving the business forward and hitting key data milestones with shorter cash runways than an oncology-focused business, for example, and constantly be out fundraising has been a challenge but perseverance and patience are key attributes in bioentrepreneur.

And what has been the greatest highlight?

It's cumulative. Developing the breadth and depth of potentially game-changing therapy candidates for a range of unmet medical conditions, all of which have been generated from our proprietary immunology platforms.

What excites you about NovaBiotics' future?

The potential of our technology and therapy candidates to benefit patients by revolutionizing the treatment of inflammatory, respiratory and infectious disease at a point in time where innovation in these therapy areas is needed more than ever.

What advice would you give to others who want to commercialize their research that you wish you'd known when you started out?

That it will most likely take much longer and cost much more than anticipated, but will be more rewarding – and afford you more opportunities to develop new skills – than you could ever have imagined. ■