

Enhancing the economic benefit of academic research

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The UK academic research base provides a world leading resource for the development of new technologies. Effectively harnessing this resource is an essential part of the drive to ensure that the UK economy remains amongst the top 10 economies worldwide. At the University of Birmingham we are not only carrying out world leading research, but are also actively developing new methods that increase our efficiency in translating new discoveries into innovations that will benefit the UK economy.

The potential of these partnerships is extremely well illustrated by a novel University/Business partnership that uses cutting edge science to exploit new discoveries in clinical diagnostics. This aims to reduce the time taken to move an innovation to market. Achieving this will enhance market competitiveness while at the same time ensure real world challenges inform academic studies. As part of this new approach a novel pathogen detection system (produced in our laboratory) has recently begun the process of translation from discovery to commercial reality.

A synthetic biology solution to human pathogen detection

Microbial infections remain one of the most pressing threats to human health. For example in 2007 around 9000 people died of MRSA infections, while the E. coli outbreak in mainland Europe in 2011 killed 53 and is estimated to have cost food producers in Spain more than 200M US\$ a week.

These examples and others have motivated researchers at the University of Birmingham to develop a novel method to detect and identify potentially dangerous pathogens. This method is one of the first to result from a new area of science, synthetic biology. Synthetic biology, seen as a wholly new approach to innovation, aims to move technology away from a reliance on fossil fuels and to instead innovate using inspiration and materials provided by nature. Researchers in Birmingham are among the leaders in research in this revolutionary new field and its application to real life problems.

We have harnessed some of the unique properties of a biological material to develop a new nanoscale particle that can seek out and detect the presence of deadly pathogens. The particle, a virus that naturally attacks bacteria, has a very unusual noodle like shape. This shape allows the particle to become aligned in a stirred solution (much like spaghetti in a stirred pan). We are able to detect this alignment and any changes that occur when the particle encounters a chosen pathogen using a simple handheld device.

From a scientist's perspective the discovery itself is exciting but equally important has been the the rapid establishment of a spin out company, Linear diagnostics Ltd(a joint venture between Abingdon Health Ltd and the University of Birmingham) to enhance the commercial exploitation of this and other diagnostics technology for the future.

For us the relationship is hugely valuable. It ensures that cutting edge research is able to reach commercial application speedily. Having an established process for exploitation and innovation also provides a focus for our research. There is a general recognition that the UK Higher Education sector is crucial in developing new technologies to support industry. Models like ours demonstrate that even in an area as new as synthetic biology, discoveries can be translated into commercial applications. However, it is an area where additional investment would greatly help if we want to maintain the UK's proud record of innovation in engineering and biomedical science.