



George Freeman, the government's life sciences adviser discusses how and why life sciences could offer a good source of growth for the UK's economy

LIFE'S BETTER

A sustainable recovery from the crash of the credit-fuelled boom will need to be driven by real businesses making and selling products and services the world needs. We can't borrow our way out. We will need to trade our way out. With the Eurozone in crisis, I believe that the pace of development in the fastest growing emerging economies creates a real opportunity for us to sell them the things we have developed in our advanced and mature economies which they will increasingly need (advanced science and innovation, professional legal/financial services, infrastructure) to help support their development. The life sciences (the 'appliance of bio-science' to solve societal problems – principally in the three core markets of medicine, agriculture and energy) have a key role to play. Today, these nations need public health, agriculture and food, water and basic energy supplies. In the coming decades they will develop into major markets for more sophisticated (Western) bio-medicines, sophisticated foods and clean energy.

So coming to parliament after a 15-year career helping to start fast growth companies in the bioscience sector, I eagerly accepted the invitation from the prime minister and David Willetts to work as life science adviser to help co-ordinate policies for this key sector. In



government, life science until now has referred only to the bio-pharmaceutical sector of healthcare. It's a big and high growth sector (£50bn turnover, 158,000 employees, and over 1,000 companies) but one which is going through major global restructuring with the risk that the UK ceases to be a major global destination for R&D.

My role has been to advise the government through David Willetts, minister for science and universities and the Office for Life Sciences, on the latest trends in the life science sector, helping the minister and officials reach out and open channels of communication with people at the cutting edge of the sector, liaise with industry and help develop policies to support economic growth. Following the Pfizer announcement, I was asked to help the government set out a long-term strategy for the UK life science sector which anticipated the changes to the sector which Pfizer heralded, and set out what needs to be done to maintain a world-class UK life science sector. The strategy was announced by the PM in December last year. The central idea is that by better integrating our academic research base with the NHS and its reservoirs of public health data on health outcomes, we can position the UK at the forefront of the next wave of 'translational', 'targeted' and 'personalised' biomedicine, to the benefit of UK patients, the NHS and the economy.

The new era

A new era is dawning for the pharma industry. For the last 50 years, its model has been principally around the hunt for 'blockbuster' 'one size fits all' medicines. But as the cost and regulatory hurdles in drug discovery have grown, advances in genetics, pharmacodynamics and epidemiology have shown us

that different patients react differently to disease and reduced the size of target markets. The pharma industry is in trouble. Falling productivity, rising costs, fragmenting markets and pressure on Western economies' healthcare budgets is creating a perfect storm. The response is a new approach to medicine discovery and development focused much more closely around patients. By embedding R&D in a much more clinical setting and informing it much more by studies of disease and treatment data, genetics and clinical science, the idea is that we can reduce the time and cost of medicine discovery and accelerate access to new medicines for patients.

This creates a huge opportunity for the UK: We are one of the few places with the combination of world-class university and clinical science, a centrally-organised healthcare system, a highly respected ethical framework, historic reservoirs of data on disease and drug response, and a well-established industry and financing sector.

NHS as a data source

Putting patients back at the heart of medical discovery means closer collaboration between hospitals, universities and industry, and much closer involvement of patients and disease charities. To achieve this we need to encourage an ecosystem in which 'every patient is a research patient', with the NHS automatically contributing anonymised data on disease and drug side-effects to better design and target medicines for patients. We need to make it easier for patients to access the many benefits of being involved in research, particularly earlier access to innovative treatments.

The NHS serves an average of one million patients every 36 hours. In 2010, more than 400,000 patients were involved in clinical trials. The NHS collects data on hundreds of millions of patient treatments per year. This data is invaluable in giving the UK a world-leading edge on advancing our medical research and application.

Bringing hospitals, universities and industrial researchers together to accelerate the search for 'targeted' medicines and new diagnostics, devices and preventive treatments is good for patients, good for universities and the NHS, and good for UK plc.

Over the last few years through the vision of UK leaders in the translational medicine field, in particular excellent work by the National Institute for Health Research, research charities and others, a world-class network of academic health science centres, biomedical research centres and invaluable clinical research infrastructure has been established.

Clearly there is a huge amount of work still to be done. We need to implement the measures in our strategy. Unless the NHS is open as a centre for trialling and validating new treatments, we will struggle to persuade global businesses to invest here. We must protect our basic science base, invest in our medical research infrastructure and incentivise clinicians and scientists to work with industry. I am working with the life science 'Champions' Sir John Bell and Chris Brinsmead, appointed by the PM to oversee implementation, and I am confident that we are making important progress. Nearly £1bn has been raised in a series of new venture funds for UK research and development in the last six months alone.

I believe a similarly ambitious and joined-up strategy can and should be adopted in our agricultural research sector – for too long the 'Cinderella' life science. The world has changed profoundly since the cuts and reforms to the sector in the 1980s. Gone are the Common Agricultural Policy surpluses. China's growing population is quickly developing a more advanced diet, a billion people are hungry and food prices are rising.

The challenge of food security and sustainable development so starkly set out in the recent Foresight report is clear: Over the next 30 years, the world's population will rise to nine billion and we have to nearly double world food production with roughly half as much land, water and energy as we use today. Officials are already working on a strategy to tackle this huge challenge, which is also a golden opportunity for the UK to put our world-class agricultural science base to work for the benefit of agriculture here and abroad. ■

George Freeman, government life sciences adviser

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