Universities need to tear down bureaucracy within their organisations and be less risk averse. Universities need to invest more in innovation within their organisations and be more explicit about both its value to society and its role in enhancing the university mission. Finally, universities need to get better at working with business, seeing long-term collaborations as an investment, rather than a source of short-term income.

WHAT CAN GOVERNMENT DO?

Government has a key role. Firstly, it needs to recognise our universities' strengths, rather than simply assuming that all good innovation happens overseas. Secondly, we need continued investment in translation and innovation, but not at the expense of funding for basic research. We have a wide range of effective instruments in place: HEFCE, Research Councils, the Technology Strategy Board (TSB) and Capital for Enterprise, so let us use them rather than invent new ones. Thirdly, government needs to focus on policy initiatives that will benefit the UK, rather than those – such as IP giveaways and ill-considered open access requirements – that will benefit our competitors' economies. Fourthly, we need a coherent and modern approach to industrial strategy, and we need to create the conditions for individuals to succeed: backing, not picking, winners. Our business community needs a simpler approach to regulation, improved infrastructure, a skilled workforce and an attractive tax environment. Finally, we need to make it clear we are open for business, and that means competing effectively for global talent and making the UK the destination of choice for world-class innovators, entrepreneurs and employees wherever they come from.

SUMMARY

Commercialisation of the intellectual property generated through research is an important part of the knowledge exchange landscape in the UK. Despite this, at present there are significant barriers, which impede the UK's academic entrepreneurs. If we are to unleash the entrepreneurial spirit and potential of the academic community, we need concerted effort from universities, from government and from business partners.

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SIN: Overseas Champions of UK Science and Innovation

Sam Myers

In today's competitive and evolving global marketplace for science and innovation, the Government's global Science and Innovation Network (SIN) is harnessing opportunities for the UK through international partnerships. In this article, Sam Myers explains how SIN is championing UK science and driving growth through collaboration and influence overseas. Sam has worked for SIN since 2007, establishing the strategy for Britain's engagement with Southeast Asia and now leading the Asia Pacific region from Beijing, China.

The international marketplace for science and innovation has never experienced such competition and upheaval as in recent years. Established players in Europe and the USA have been challenged and in many cases displaced by newcomers in the Gulf, South America and Asia Pacific. Despite the excellent funding settlement secured for the UK science budget, our proportion of GDP spent on R&D stands at 1.8% (£26bn), less than half that of Finland. China's growth in science demonstrates the challenge facing the UK: Chinese R&D investment has increased 20% annually for over a decade, reaching £100bn in 2012. This has propelled them into second place globally by research publication volume.

. . . China's growth in science . . .

However, it is not time to hang up our British lab coats yet. Our scientific heritage continues to serve us well: with just 1% of the world's population, we publish 14% of the world's highest impact science, and are home to a fifth of the world's top 20 Universities. Pound for pound British researchers are the most efficient in the G8, and this attracts more foreign-funded R&D to the UK than any other country.

So Britain is in the global innovation race. But how do we make sure we lead the pack? And how do we support UK companies to source the best technologies and attract further

inward investment? Part of the answer lies in the Government's Science and Innovation Network (SIN), which champions UK science and innovation on the global stage.

SIN is a network of 90 experts based in 28 countries. We combine British and local talent and are embedded in Embassies, High Commissions and Consulates across the world. SIN's mission is to identify and help harness the value of science and innovation discoveries and investments overseas for the benefit of the UK. Our small size and regional structure enables us to respond quickly to local opportunities. The Science and Innovation Network spans four regions: the Americas, Europe, Middle East/Africa/India, and Asia Pacific. And we have three key roles: influencing, informing, and collaborating.

. . . British researchers are the most efficient in the G8 . . .

With the emerging science powers, influencing is central to securing new UK innovation opportunities. For example, through our network we have achieved significant improvements in intellectual property protection and the Chinese government now recognise the benefits of reform. Our work has paved the way for deals in research and innovation, like a £45m joint R&D fund between Research Councils UK and Chinese counterparts, and a mapping deal for a British satellite company worth £110m.

. . . improvements in intellectual property protection . . .

And we have improved our performance in joint scientific research: the UK has risen from third to second place partner of choice for China, beaten only by the USA.

SIN has an important role in reporting information and analysis from around the world back to UK policymakers. Our expertise and access is critical to inform UK domestic policy and direct our international strategy. For example in recent years SIN teams have helped the Government to understand where competitor nations are focusing their R&D efforts, to help UK Ministers direct public R&D expenditure to the right areas. We have also reported on new innovation policy interventions and shaped the roll-out of Britain's *Catapult* centres, which are bringing together the best of academic and private sector science to develop new products and economic growth.

SIN works with British organisations to stimulate new science and innovation partnerships overseas. In India, we have supported Research Councils UK to agree over £100m deals in joint programmes including green energy, stem cells and food security. We have also supported new partnerships in Southeast Asia, where top British food researchers are working on a £300k joint programme with Vietnam to develop new strains of rice that are resistant to climate change. And a new partnering programme in China has already attracted £6.5m Chinese funding into British technologies including heat-sensing coatings to prevent baby burns.

SIN officers are located close to the best opportunities and with the right skills and mission to deliver for the UK. Other established science powers like France and Germany deploy more staff and funding into overseas R&D engagement than we do. But SIN's responsive network and focus on innovation means we are better placed to help Britain go for gold.

Readers of Science in Parliament are invited to make contact with the Science and Innovation Network teams – to find out more, please visit: https://www.gov.uk/global-science-and-innovation-network

FRENCH RESEARCH AND HIGHER EDUCATION REFORM

Matthew Houlihan

In March 2013, the French government published a draft law aimed at reforming its university and public research systems which have been criticised for being state-centric, bureaucratic and complex. What are the main measures and what could this mean for the UK?

RESEARCH AND HIGHER EDUCATION IN FRANCE

France has a strong, well-financed research system. The OECD calculates that the equivalent of $51bn was spent on R&D in France in 2011 when public and private sector expenditure is totalled up. This compares to $39bn in the UK, and $19bn in Spain. This investment produces internationally renowned researchers – in March this year, for example, Louis Pouzin was announced as a co-winner of the Queen Elizabeth Prize for Engineering for his ground-