

nature biotechnology

What Brexit means for biotech

Following the bombshell UK vote to leave the EU, *Nature Biotechnology* offers some cheer to the UK's former life sciences chief, George Freeman.

Dear George,

It has been a tough few weeks. Yes, all hell did break loose after the country decided to raise the drawbridge and retreat from Europe. The pound went belly up. Captain Cameron abandoned ship. Boris got on his bike. Farage ran for cover. And then, to add insult to injury, the new lot axed your job—the first and only minister for the life sciences—and reassigned your responsibilities elsewhere.

But there is a silver lining. You are now chair of the Prime Minister's Policy Board. You have the ear of Theresa May, the new prime minister. Below we have jotted down a few ideas for you. We think they will help put British biotech back on the global map (the sector, not the company).

Policy recommendation 1. Provide assurance that basic life science research will continue to be funded generously.

As you know, high-quality UK research attracts both international support and industrial investment, despite a relatively modest spend of 1.7% gross domestic product on R&D, well below the Organization for Economic Cooperation and Development's average of 2.4%, and far behind the United States' and Germany's. The UK received 1.6 times as much back in science funding from the EU between 2007 and 2013 than it had put into the pot. Why? Because Britain excels in innovative research that leads to billion-dollar products: DNA sequencing (Sanger and Solexa), monoclonal antibodies, penicillin, Dolly and stem cell cloning, *in vitro* fertilization, graphene, and the odd drug or two (e.g., Humira and Viagra). Don't let this wither on the funding vine.

You must not only maintain existing levels of support, but also replace any funding lost in renegotiations with Europe. That means ensuring that UK scientists retain access to the EU's funding programs, or at the very least, providing UK government-guaranteed equivalent funding schemes if—god forbid— negotiations go south.

Policy recommendation 2. Focus industrial strategy on internationalization not protectionism.

The *de facto* post-Brexit devaluation of the pound has already made investment in UK commercial life sciences at least 20% more attractive to foreign and UK investors alike. That ought to propel extra venture capital into Britain and increase the attraction for multinationals of investing in UK resources.

Where UK biotech really needs support is in maintaining or establishing exports. Breaking down the British insular mindset requires leadership and action. Ironically, now that Britain is out of the EU, British companies will have to be more outward looking. Smaller UK biotech firms may recognize the wisdom of establishing mainland European offshoots to maintain unfettered access to European R&D and small and medium-sized enterprises programs. Larger firms may move operations

to Europe because Britain will now be a smaller second-tier market. In any case, life science firms will have to Europeanize their sales and marketing operations, employing more non-UK European nationals to ease their access to what is still the world's second-biggest healthcare market.

Policy recommendation 3. Assure EU scientists in the UK that they can stay and encourage even greater immigration of skilled researchers.

Yes, we know. This one is hard to swallow. Your colleagues want to “keep 'em out!” But Brexit was a vote to leave or remain in Europe, not a vote on freedom of movement (even if that was the toxic undercurrent of UKIP's campaign). Simply put, Brexit presents an opportunity. While in the EU, other EU citizens had the right to work and live in the UK. Those rights, combined with the government's self-imposed quotas on immigration, made it much more difficult for companies and academic research institutions to make a strong case for employing non-EU personnel. It was just easier to offer jobs to EU candidates. This is unfair and unwise, particularly in a world where more and more of the best and brightest come from emerging countries outside the EU. Why shouldn't the UK outcompete Europe in attracting the finest scientific minds and managers from, say, China, India or the US to both boost its research and business, and forge stronger international links?

Policy recommendation 4: Capitalize on the National Health Service.

The National Health Service (NHS) is an underutilized resource for human research—one that could be envied by the world. Why not exploit the NHS' IT system to mobilize patient power and gather data on day-to-day experiences with treatments, adverse events, drug efficacy, diet, exercise and lifestyle. A system for patient-led monitoring, perhaps incentivized by early access to safe treatments of uncertain efficacy, could provide feedback from a million or ten million treated individuals, a huge resource to guide patients, physicians and, indeed, politicians making decisions on healthcare.

Then there are clinical trials. A decade after the EU's strangling Clinical Trials Directive made human testing in Britain and Europe ridiculously tortuous, post-Brexit UK can now escape its tentacles. Even if the touted £350 (\$460) million a week going back into NHS funding has gone up in smoke, extensive phase 4 trialing might be a way for Britain to afford to put new medicines on the market. Furthermore, Brexit-related currency exchange shifts have magically made it cheaper than a year ago for foreign sponsors paying in dollars or euros to run clinical trials in Britain.

So chin up. Brexit was a giant step back. But it's also the first time in history that the British have left somewhere and people desperately want them back! Biotech is a global enterprise. You and your government should do everything in your power to keep it that way.

Best regards to you and Theresa!