

The Bizarre World of Healthcare (3)

Counting Peas

Who is driving the advancement of knowledge?
Is academia really that much more innovative than industry?
How can this be measured accurately?

Some say it's very difficult, I would even say it's impossible to quantify technological innovation. The difficulties begin with the simple word "innovation". What in the world does innovation mean? It would probably be a bigger challenge to define the hackneyed phrase "innovation" than to measure it.

Anyway, the intellectual property firm Marks & Clerk (an international corporation of British origin) set itself the task of discovering who is driving the advances in biotechnology – or, in other words, who is driving innovation. Their measuring strategy was straightforward: the number of filed patents (see also opposite page 44).

After an analysis of worldwide biotech patents, filed between 2002 and 2006, Marks & Clerk made a startling discovery. It is not the big corporate businesses that press ahead with lots of patents. In fact, the leading players in drug discovery are universities and public research institutions.

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Europe's academia, however, seems to be lagging behind. The leading innovators are American and Japanese institutions. The most successful institution was the Japan Science and Technology Agency which filed 1,022 patent families (meaning groups of patents all linked to a single discovery). The University of California ranked second (543 patent families), and the U.S. government came in third (443 patent families), most coming from the National Institutes of Health.

The results for another grand U.S. institution were surprisingly low. The Massachusetts Institute of Technology (MIT) only ranks 10th but filed "the most high-profile patents, holding all or part of the three most frequently cited patents", according to Marks & Clerk.

Europe's public institutions are nearly invisible in this comparison. Oxford, the leading European university, runs Isis Innovations Ltd, a much-vaunted technology transfer subsidiary. With its 65 patent families, Isis ranks somewhere beyond the top 20, consisting of 18 U.S. and two Japanese institutions. Marks & Clerk note that Texas, Pennsylvania, Florida, Johns Hopkins, Stanford and Columbia universities all held more than twice as many patent families as glorious Oxford/Isis.

Gareth Williams, co-author of the report, criticised Europe's leading academic institutions for failing to translate their enormous skills base into a commercial reality: "Although Europe is making strong advances [...] through the development of spin-out companies and increased patent licensing, it needs to move from a position of growth to becoming a challenger on the international stage. Academic patents are very valuable and are often highly cited as they cover fundamental technologies. Yet Europe is still missing out enormously to the US in this area".



Only few private companies can be found in the list. According to Marks & Clerk, the busiest biotech company was Genentech who ranked fourth overall with 421 patent families. Millennium Pharmaceuticals (272), General Hospital (201) and Applera (195), three other U.S. companies, came in sixth, seventh and eighth.

Europe's surprising winner in the company class is Denmark. The small country with a population of only 5.6 million turns out to be a genuine giant in biotech innovation, due to the 162 patent families created by the Danish world leader in enzymes and microorganisms use, Novozymes A/S.

In addition, Danish companies and universities have trebled their filings from 75 in 2002 to 225 in 2006, the study shows. In 2006 Danish companies were the third largest country group in the study after the US and Japan.

The Marks & Clerk report says that the quality of the patents has grown significantly: "In 2002 patenting activity included a high level of speculative, sequence-based inventions related to genetic engineering. By 2006 this figure falls by 78 per cent and the focus of research becomes much more concentrated." The new areas of patenting are antibodies, gene therapy and stem cells.

Nevertheless, some of the statements from Marks & Clerk's masterminds should be scrutinised. In their report, they jump to certain absurd conclusions. They claim that "universities and public research institutes, rather than companies, are driving advances in biotechnology" and that the authors are "surprised at the dominance of the academic sector".

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That is jabberwocky! There is only one thing that drives advances in technology, and that is money. And who has pots of money? Not the academics, of course. Academia still acts as a cheap self-service store for industry – may be very innovative, but not a driving force.

Another thing to question is the Marks & Clerk approach: Simply counting filed patents can be delusive, because certain patents are worth far more than others.

For example, in its long 36-year history, the German Centre of Technology Transfer for Max Planck Institutes filed several thousands of patents – but a single one of these patents (the so-called FLASH technology for magnetic resonance imaging) has yielded more than half of the €100m, the Max Planck society has earned through patents to the present day.

WINFRIED KOEPELLE