



Sharing information is preferable to patenting

The US Supreme Court ruling on gene patents is a welcome boost to efforts to increase the free exchange of scientific information, says Colin Macilwain.

The prevailing commercial ethos in the life sciences over the past 30 years has been that academic biologists hold their results close to their chests and keep an eye out for patent opportunities. This approach took root after the 1980 passage of the Bayh–Dole Act, a US law that allowed publicly funded intellectual property to be handed over to universities and private companies without strings, and so gave birth to the biotechnology industry.

Some of the strings were reattached last Thursday, when the US Supreme Court finally said ‘no’ to human gene patenting — ending a three-decade charade in which the US Patent and Trademark Office (PTO) liberally issued patents on single genes. The court’s judgment struck down the patents on breast-cancer susceptibility genes held by Myriad Genetics in Salt Lake City, Utah, but still allows the patenting of synthesized complementary DNA (see page 281). It may make little difference to the patent landscape in the short term. But the 13 June ruling is of great symbolic significance, for it happens to coincide with a general retreat from patenting as the goal and driving force for biological discovery.

I never did understand the PTO’s position on such patents. The analogy that worked for me was with the periodic table: patenting a gene from nature is akin to patenting a chemical element from nature, which seems absurd. It turns out that the US Supreme Court agrees.

The decision marks a great victory for patent ‘sceptics’ such as the Public Patent Foundation, based in New York, which has been fighting the Myriad patents for years. These groups see patent protection as a restriction on the freedom to innovate, rather than a spur to do so.

The drug and biotechnology industries will continue, of course, to seek patent protection for everything that moves. But the trend I see is one that moves in the opposite direction — towards the free sharing of scientific information and open innovation.

At least three global developments vouch for this. One is the decline of biology’s single-laboratory approach, and its growing reliance on large, collaborative groups sharing huge volumes of data. Under this massively collaborative approach — which is closer to how much of engineering and the physical sciences already operates — patenting loses its sway, as everyone relies on everyone else’s techniques and ideas.

The second is the fact that the powerful nations in the new world order — India, Germany, Brazil and China — are each, in their own ways, less committed to patent protection than is the United States, whose property-fixated founders even wrote it into the national constitution. The United States twisted these nations’ arms to sign the Trade-Related Aspects of

Intellectual Property Rights (TRIPS) agreement, negotiated in 1994 and implemented in 2001, that committed them to adhere to patent protection along US lines. But as US military and economic dominance fades, so will TRIPS and its consequences.

The third factor is the rise of the ‘open innovation’ movement, which is making solid gains. ResearchGate, a Berlin-based information-sharing portal backed by Microsoft founder Bill Gates, has already attracted 2.9 million participants worldwide, most of them working in medicine or biology. And the open-access policy of the London-based Wellcome Trust, the world’s largest biomedical research charity, was extended in April to require much Wellcome-funded work to be published with the least restrictive Creative Commons licence, allowing the papers’ free dissemination by others — including for commercial gain.

The idea of open innovation is already well entrenched in information technology and other high-tech sectors, where companies find that they can meet customers’ needs faster by building on each others’ ideas. In many cases, broad cross-licensing agreements sweep patent obstacles out of the way.

The biotechnology and pharmaceutical industries argue that medicines are a special case, and that without patent protection, no-one would bear the costs of obtaining regulatory approval for new drugs and devices. These regulatory barriers are so high in the first place, of course, because of industry’s persistent and sometimes reckless attempts to circumvent them.

The patent-based model of innovation in biotechnology, as it stands, does bear occasional fruit in oncology, in which, as a biotech analyst once earnestly informed me, ‘successful’ drugs will extend a patient’s life by six months, at US\$10,000 a month. But our most

pressing public-health needs are for new antibiotics and treatments for conditions such as Alzheimer’s, which will never generate such windfall profits.

In genetic testing, Myriad’s model of charging \$3,000 for its test will be, it turns out, a bizarre one-off. The future public-health need will be for low-cost, multiple-gene tests, uninhibited by thickets of patents.

Efforts to develop an intellectual-property model that bypasses patents, such as the one proposed by the Biological Innovation for Open Society initiative in 2004 (see *Nature* 431, 494; 2004), have not progressed very far, and established models of innovation will not be overturned in a day. But they surely will evolve in ways that reflect the interests of the public, which is, after all, paying for the research, the diagnostics and the medicines. ■

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