

nature biotechnology

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Database access crucial for developing countries

To the editor:

The Internet is often touted as a medium with the capacity to bring together researchers regardless of their financial and technological resources. Data collected from the Wellcome Trust Sanger Institute (Hinxton Hall, UK), as part of a report commissioned by the UK Government Commission on Intellectual Property Rights, indicate that commercial and academic scientists from developing countries lag behind their counterparts in richer nations in accessing freely available public genome databases. This situation does not bode well for the competitiveness of developing nations in commercializing and patenting discoveries from genome sequence data.

Despite efforts to ensure that "the vast potential of the publicly funded genome-sequence databases is fully exploited and freely available for all to use"¹ (such as the help desk newly established by the European Molecular Biology Laboratory; EMBL), the volume of hits from the developed world received by the EMBL website hosting genome databases

(<http://www.ensembl.org>) is vastly higher than that from developing countries (Table 1). This, coupled with the nature of patent applications being filed, and in some cases granted, in Europe and the United States, could mean a substantial loss of access to discoveries for research purposes for academic and commercial communities in developing countries.

As the system stands now, multinational companies in the developed world can and do take out the bulk of patents on the freely available data. The need to build the bioinformatics capacity of developing countries is a desperate one because rapid progress in the study of genetic bases of diseases of particular concern to developing nations is likely only if this technology empowers their study². Such capacity-building measures are indispensable but will take time. The alternative is to rely on incentives for research into diseases of the developing world, which have until now failed to deliver solutions to unmet medical needs in poorer nations.

Another, untried option may be to identify genetic information that is crucial for diseases that most affect developing countries and distribute it in such a way as to give research groups in the developing world preferential access. This would have to be done by an international body that has a vested interest in "affordable" healthcare. Keeping the regions of the world most affected by a certain disease as the locus of research into the disease would go some way toward ensuring that subsequent patents and product development were also locally based. This might be the only way to ensure the availability of genome sequence data as precompetitive information to promote the health needs of the world's poor.

Some rethinking of the direction of the patent system is also necessary.

Despite differences in US and European public policy stance, recent trends are toward patents on genomic "inventions" that monopolize information important for future research. Judicial interpretation of the scope of patents to only those uses disclosed in their patent applications must be encouraged. For example, in a judgment given in December 2001, the UK Court of Appeals³ invalidated a patent that claimed a vast class of compounds solely on the basis of the compounds' structure. In revocation proceedings, it was shown that many of the

claimed compounds did not actually exhibit the technical effect described. Holding the patent invalid for insufficiency, the court pronounced that the claims extended beyond the invention or technical contribution that the inventors had made and provided to the public.

This could indicate that reversal of some of the developments in the patent system may be possible. The issue is whether it will come soon enough to enable greater access to information for genetic research in resource-poor nations.

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1. Radda, G. *Nature* **412**, 9 (2001).
2. Sulston, J. *Workshop on Research Tools, Public partnerships and Gene Patenting*. Commission on Intellectual Property Rights, London, January 22 (2002).
3. *Pharmacia v. Merck*, WL 1612569 (CA) (2001).

Terminator no solution to gene flow

To the editor:

In their commentary "Liabilities and economics of transgenic crops" in the June issue (*Nat. Biotechnol.* **20**, 537–541, 2002), Smyth *et al.* make a compelling case that the inability to control gene flow is the Achilles heel of the biotech industry. The authors offer two examples in which the inability to manage gene flow has had "disastrous consequences." Rather than placing the liability firmly on the industry and regulatory bodies that brought these products to market, however, they reach the astonishing conclusion that "plants and people [farmers who save proprietary seed] cannot be trusted to do what markets require."

Unfortunately, the authors' shortsighted solution is to promote the terminator technology (genetic seed sterilization) as an environmental control mechanism. The authors fail to mention that 1.4 billion poor people depend on farm-saved seed as their primary seed source. The promotion of terminator seeds as a "green" solution to pollution by genetically modified (GM) crops is the Trojan Horse of agbiotech. If terminator wins market acceptance under the guise of biosafety, it will be used as a monopoly tool to prevent farmers from saving and reusing seed. The goal of terminator is now, and has always been, to maximize seed industry profits.

After more than 130 million acres of GM crops have been planted worldwide, we are told that we can prevent leaky genes by adopting an untested GM technology that has been widely condemned as an immoral

Table 1. Domains that most access www.ensembl.org*

| Domain suffix | Location of access | Number of times accessed per week |
|---------------|--------------------------------------|-----------------------------------|
| uk | United Kingdom | 59,951.6 |
| edu | US Educational | 49,420.0 |
| com | US Commercial | 40,344.9 |
| net | Network [§] | 31,302.4 |
| de | Germany | 23,640.9 |
| fr | France | 19,464.3 |
| org | Non-profit organization [§] | 7,634.7 |
| nl | Netherlands | 6,716.9 |
| ca | Canada | 3,923.1 |
| gov | US Government | 3,825.2 |
| es | Spain | 3,723.9 |
| dk | Denmark | 1,472.6 |
| za | South Africa | 724.24 |
| in | India | 230.2 |
| ar | Argentina | 175.15 |
| cn | China | 111.02 |
| co | Colombia | 79.02 |
| ph | Philippines | 14.95 |
| bo | Bolivia | 0.53 |

*The data cover a weekly average, ranging from January 1, 2001 to the week ending November 14, 2001. Data were obtained from the web team, Wellcome Trust Sanger Institute (Hinxton Hall, UK). [§]Non-country-specific domain suffixes.