

## Research Stimuli

Red Herring Magazine, April 1, 1999

When someone does research that results in a breakthrough in biotechnology, millions of people can benefit. It's important, therefore, to have a system that gives researchers strong incentives to invent new drugs and medical devices. What should the government do, and what should we do, to ensure biotechnology's optimal development? Here are some dos and don'ts for government and for us. A common thread throughout all of them is one of the most important principles in economics: Incentives matter.

### Gravity™

One incentive is a patent, which, in the United States, gives the holder a 20-year monopoly on the new product. The economic justification for patents is straightforward. If there were no patents, then people who invested time and money in creating new products would not get much of a return on their research even if the products proved to be very valuable. The reason: others could imitate the invention and drive prices down to the point that the inventor couldn't recoup the cost of invention. Knowing this, potential inventors would be less likely to invent. Am I saying that inventors care just about money, and not, say, about the joy of discovery? Not at all. For patents to motivate inventors, inventors need only care somewhat about money. And we can be very sure of that.

A nice aspect of the patent system is that the patent's value is directly related to the product's value to society, which means that patents help direct inventive activity and investment into the areas where it is most valuable. Of course, there is a trade-off: when someone has a 20-year monopoly on something and prices it accordingly, the item is used less often than if competition were allowed.

For the patent system to work, the thing patented must be "appropriable"; that is, the owner of the patent must be able to identify possible uses of the patented item and charge the user accordingly. You might think that discoveries of fundamental principles of nature -- in physics, for example -- should not be patented. I did, too, until recently. But I can't seem to persuade myself that these discoveries present a special problem. If a product could not have been

developed had a certain principle not been discovered, the makers of that product could, for the duration of the patent, be required to pay a royalty. Francis Crick and James Watson, for example, discovered the double helix structure of DNA. The creation of a frost-resistant strawberry using recombinant DNA would have been impossible without the discovery. So the inventors of the new strawberry (who, incidentally, patented it) could have been required to pay a royalty if their invention had occurred within 20 years of the original DNA breakthrough. Wouldn't a patent on such discoveries slow progress that piggybacks on them? Absolutely, just as patents on inventions slow piggyback inventions. That's the downside of all patents. But that downside is offset by the increased incentive to discover.

### **Going Private**

One way to avoid the downside of patents is through private funding. Philanthropists who want to leave a legacy or, in some cases, to help cure diseases that they or loved ones have suffered from often pour millions into medical research. Jon Huntsman, for example, a chemical-industry magnate and a cancer survivor, has donated \$100 million to nonprofit organizations to find a cure for cancer. According to The Wall Street Journal, private donations to medical research totaled \$13.9 billion in 1996 -- slightly more than the budget of the National Institutes of Health.

With all this philanthropy and the existing patent system, a case can be made for abolishing government subsidies of basic research. Such subsidies reduce the freedom of the hapless taxpayer who has no choice but to fund the research. However, the subsidies do sometimes lead to valuable research that would otherwise not have been carried out. Let's say you think such benefits are enough to justify the encroachment on freedom. That still doesn't justify having the government throw money at research. As the economist Gordon Tullock noted in his 1965 classic, *The Organization of Inquiry*, there are two good ways for governments to fund research. Both draw on the principle of incentive. The first is to give money to researchers who have a track record of valuable discoveries.

The second is to award large cash prizes to people who come up with new discoveries.

Accompanying this list of dos and don'ts is one major "undo": abolish the Food and Drug Administration's literal monopoly power over pharmaceuticals. As Henry Miller, a research fellow at the Hoover Institution, has documented (see October 1998's Think Tank), FDA regulation has slowed down drug development by years. Bringing just one drug to the U.S. market now costs more than \$500 million, which is a strong disincentive to invent. Whatever the FDA's expertise on drugs, it is a rank amateur on your risk preferences. If the FDA's hold were loosened, those who value its judgment could continue to buy only FDA-approved drugs. The rest of us -- the majority, I believe -- could rely on the European Medicines Evaluation Agency or on the private certifiers that would inevitably emerge. The result would be faster development and more drugs.