What Is the Public’s Right to Access Medical Discoveries Based on Federally Funded Research?

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Many important medications available today have been developed with public dollars and are costly to patients and other payers. Manufacturers justify these prices on the basis of the substantial research investment required to develop new drugs and conduct clinical trials demonstrating their utility and safety. But this rationale is more problematic when the government has funded a great deal of the seminal research leading to a particular product. Federal resources, primarily through the National Institutes of Health (NIH), have directly contributed to the discovery of some of the most transformative (and costly) medicines developed in the past 25 years, including imatinib (Gleevec), paclitaxel (Taxol), and erythropoetin alfa (EpoGen).1

To spur translational development of federally funded inventions, Congress enacted the Bayh-Dole Act in 1980, which allowed universities to patent the results of federally funded research and then license these patents to commercial entities.2 The legislation included an escape clause to protect the public interest, providing funding agencies with so-called march-in rights to reclaim the invention and offer new licenses if the original licensees did not bring the product to market adequately or otherwise failed to meet the needs of US consumers. This march-in power could be used in 4 circumstances, including to meet a pressing public health need, if the licensee failed to adequately implement application of the invention such that it was made available to the public on “reasonable terms,” if a licensee failed to satisfy a requirement for a government-funded invention for public use, or if a licensee violated its agreement regarding manufacture of the product in the United States (eTable 1 in Supplement). Any party concerned that one of these statutory criteria is met can petition for march-in rights to the federal agency that provided the funds leading to the disputed intellectual property.

Since the Bayh-Dole legislation was passed in 1980, public interest groups or policy makers have sought to use these march-in rights to address exceedingly high prices or inadequate supply of interventions whose development was based heavily on government funding, particularly pharmaceutical products and medical devices. For example, in July 2013, Senator Patrick Leahy (D, Vermont) asked the NIH to exercise march-in rights to expand the availability of Myriad’s genetic tests to identify BRCA1 and BRCA2, which predict especially high risk of breast and ovarian cancer. His rationale was that the essential discoveries that made the test possible were developed with government funding and that the cost of the test (more than $3000) had become unaffordable for millions of women.3 However, in the 33 years since the passage of Bayh-Dole, such march-in rights petitions to the NIH have been seriously considered for only 4 products—and were rejected each time (eTable 2 in Supplement).

The first instance occurred in 1997. A petition was submitted to the NIH on behalf of CellPro, a start-up company that had developed Ceprate SC, an undifferentiated stem cell separation technology used in bone marrow transplants ultimately approved by the US Food and Drug Administration in 1996. Ceprate was based on a CD-34 antibody discovered at Fred Hutchinson Cancer Center. However, CellPro’s technology infringed patents originally filed by a pediatric oncologist from Johns Hopkins, who had discovered a different antibody binding the same antigen. Baxter had acquired the patents and was developing a competing product (called Isolex), so it refused to offer CellPro reasonable cross-licensing terms. The NIH ultimately rejected CellPro’s petition, noting that it was wary “of forced attempts to influence the marketplace for the benefit of a single company.”4 However, Baxter agreed to let Ceprate remain on the market until Isolex was approved in 1999.

The second and third petitions were submitted in 2004 for ritonavir, a human immunodeficiency virus protease inhibitor, and for latanoprost, a glaucoma drug. The drugs were developed after government funding to Abbott Laboratories and Columbia University, respectively. The petitioners argued that the expense of the drugs—up to 4 to 5 times greater than in other high-income countries—caused disparities in access and reduced patient adherence. The petitions were rejected by the NIH, which concluded that the manufacturers met the standard for achieving practical application because the drugs were available for sale and in widespread use. The NIH contended that “the extraordinary remedy of march-in is not an appropriate means of controlling prices…[That should be] left for Congress to address legislatively.”5 Abbott did agree to exempt certain government purchasers from the price increase and expanded the eligibility criteria for patients seeking ritonavir through its charity program.

In a more recent case, patients with Fabry disease requested an open license for agalsidase beta (Fabrazyme), an enzyme replacement therapy developed with government funding at Mount Sinai School of Medicine and licensed to Genzyme. The petition arose because in 2009, viral contamination in Genzyme’s manufacturing facility caused a significant decrease in production that left the manufacturer able to meet only 38% of the US demand. The petitioners presented evidence that Genzyme nonetheless diverted algalidase beta to Europe to compete with Shire’s agalsidase alfa (Replagal)—which had been approved only in Europe—to the detriment of US patients. The NIH rejected the petition because it saw no way another manufacturer could use a new government-granted license to produce a US Food and Drug Administration–approved version of algalsidase in time to address the US shortage.
The NIH has thus never exercised the march-in rights originally included in the Bayh-Dole Act to facilitate patients’ access to products stemming from publicly funded research grants. The NIH perceives that the march-in rights clause does not extend to pricing cases. This is consistent with claims from some involved with the legislation—including Senators Bayh and Dole—that pricing was not a consideration in creating this provision; however, during the bill’s evolution, legislators discussed reasonable pricing as an aspect of the “reasonable terms” language. Yet the NIH also did not invoke march-in rights in the 2 nonprice cases involving access to federally funded discoveries. In those cases, the NIH may have had concerns about creating uncertainties in the translational science market and deterring private companies’ willingness to license and develop federally funded patents. However, federally subsidized technology is a high-cost, cost-effective resource that often forms the basis for therapeutic development. There are few data to support the contention that judicial exercise of march-in rights would chill private-sector interest in commercializing the best ideas arising from university-based settings.

The past 3 decades of experience suggests that march-in rights will never effectively combat excessive pricing or inadequate supply of medical products emerging from government funding. These rights may be useful only as a safeguard to prevent federally funded inventions from being acquired and left fully undeveloped—although that unlikely circumstance has not been documented to have occurred since 1980—or as a negotiating tool to extract minor concessions from patent holders.

If policy makers seek to apply the march-in rights provision to a broader array of cases, it would require reforms at several levels. Review could be reassigned to another government agency more equipped to assess market mechanisms and access issues. The Federal Trade Commission, for example, has economic expertise and capacity for analyzing market dynamics and could be in a better position to evaluate the benefits and risks of exercising march-in rights, with the NIH in a consultative role.

The NIH’s rejection of march-in-rights petitions does not leave the government powerless; Congress can issue compulsory licenses, giving permission to other companies to produce any patented product in times of extraordinary patient need. During the anthrax scare of 2001, the government considered issuing a compulsory license in the face of rising prices for ciprofloxacin (Cipro) so it could build a stockpile for bioterrorism threats. In response, the manufacturer substantially lowered its price.

Change could also be achieved through local action. In addition to profit for their institutions, university technology transfer offices consider the public health benefit of their patented products. If universities issued more nonexclusive licenses of their products, there would be less need to rely on march-in rights. Even though nonexclusive licenses may bring lower royalty rates, they can be successful in helping bring to market essential therapeutic technologies. For example, the Axel patents of Columbia University claimed the method for introducing foreign proteins into cells, and Stanford and the University of California’s Cohen-Boyer patents covered methods of gene cloning and expression. Because these discoveries were made before the Bayh-Dole Act, which supported universities’ authority to create exclusive relationships, the universities pursued numerous nonexclusive licenses instead of exclusive licenses. Ultimately, many companies developed and utilized these technologies, leading to a variety of useful therapeutic products. The Axel licenses earned more than $800 million in revenue, and the Cohen-Boyer licenses earned more than $250 million, for their universities. Although nonexclusive licensing of their intellectual property has gained support among some university researchers, most companies consider nonexclusive licenses less attractive investments. Thus, other legislative strategies may be needed to incentivize nonexclusive licensing of drugs and other products for which development was based heavily on federal support to spur translational science, increase collaborative innovation, help limit rising health care costs, and ensure patient access.

Congress passed the Bayh-Dole Act to make the fruits of publicly funded research broadly available, and included provision for federal “march-in rights” to ensure that the products of such investment would be available to patients on reasonable terms to meet their health needs. Since then, hundreds of essential medical products have been developed from such federal investment by the NIH and other taxpayer-supported entities; some of these products ended up having enormous prices, limited access, or both. Yet march-in rights have been formally considered in only 4 cases and have been rejected each time. As federally funded research continues to contribute to the discovery of important new medications and health care costs continue to increase, policy makers will need to revisit the Bayh-Dole Act to fashion a better safety net to ensure equitable access to taxpayer-funded discoveries.

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