

Library

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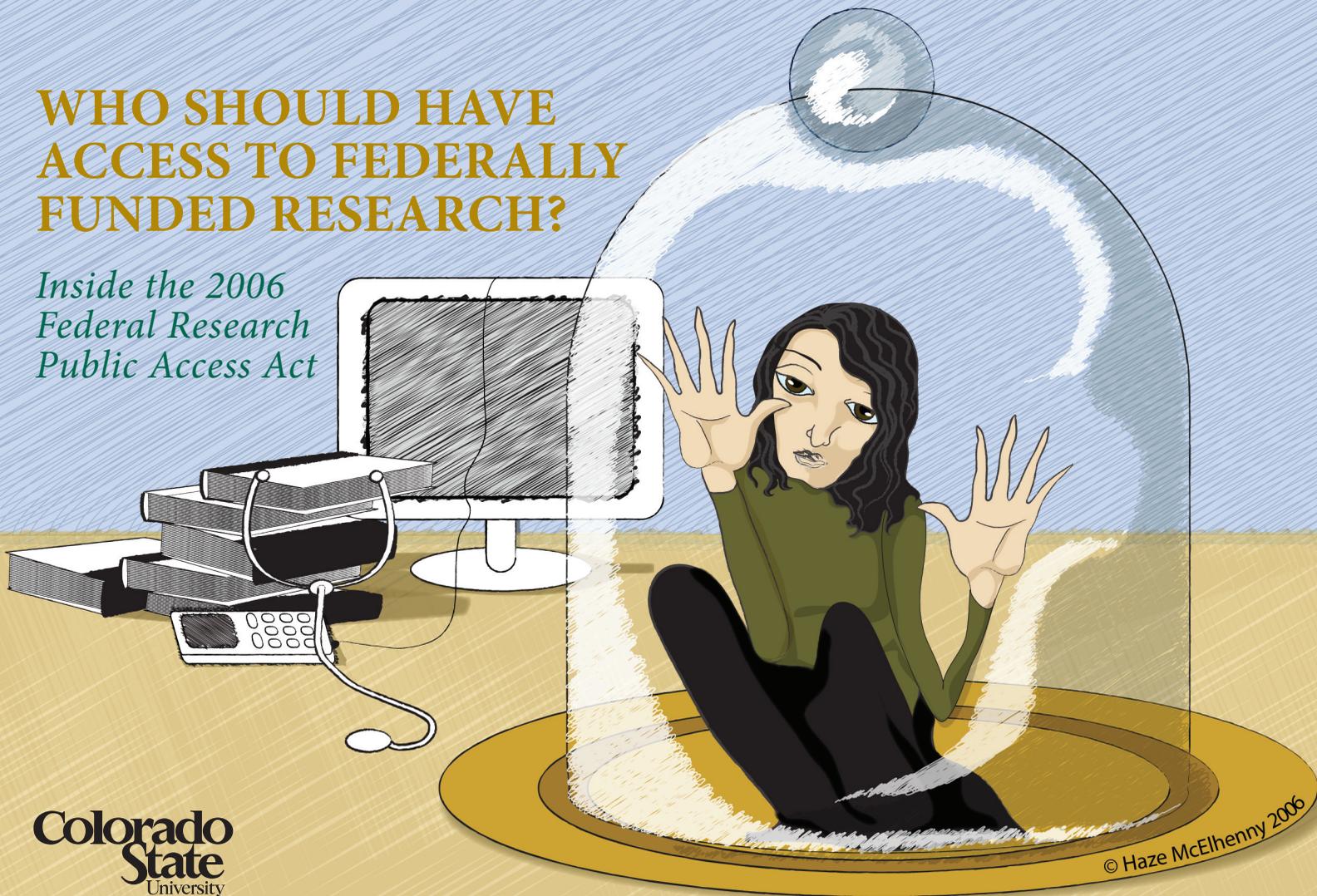
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Connection



WHO SHOULD HAVE ACCESS TO FEDERALLY FUNDED RESEARCH?

*Inside the 2006
Federal Research
Public Access Act*



Who should have access to federally funded research? Researchers? Professors? Students? Taxpayers? Should research findings be freely available on the Internet? What would be the impact if colleagues in all fields could exchange information with the click of a mouse and without the barriers of membership, subscriptions, or dues?

These questions have recently been brought to the forefront by the introduction of the Federal Research Public Access Act (FRPAA), a bill that would have eleven federal agencies, funding research across a broad spectrum of disciplines, require grant recipients to publish their work—online and free—within six months of publication elsewhere. Introduced in May by Senators John Cornyn (R-Texas) and Joseph Lieberman (D-Connecticut), the legislation aims to answer the growing concern that scholars, researchers, professionals, and the taxpaying public have limited access to significant research discoveries funded by federal agencies.

Last year alone, Colorado State University received more than \$159 million in research funding from federal sources, leading to important advances in veterinary medicine, infectious disease, the treatment of debilitating illnesses, and more. Now, as the 2006 legislative session draws to a close, legislators on both sides of the aisle may push this bill to a floor vote. Advocates of the legislation see this bill as an opportunity to facilitate open exchange among researchers and rapidly increase the impact of research findings. Opponents have attacked the bill, claiming it is bad for research. This issue of *Library Connection* explores the fundamentals of the Federal Research Public Access Act (FRPAA) and asks: Who should have access to publicly funded research? And what would be the impact of this bill's passage on the CSU campus and beyond?

Opening Access

Exploring the Federal R

If Only Someone Else Had Heard

After his experiences on the battlefields of World War I, Alexander Fleming made a shocking discovery—bacteria could be an even deadlier force than enemy artillery. In the startling conditions of trench warfare, infection caused 15 percent of war-related fatalities, or roughly 5.5 million out of 37 million total deaths. Fleming returned to his London laboratory driven to find some way to prevent these deaths. His pursuit eventually led to the discovery that mold, specifically penicillin, could kill bacteria. Today, penicillin has become one of our most successful defenses against infectious disease; however, when Fleming published his findings in the *British Journal of Experimental Pathology* in 1928, his work raised little interest and was nearly lost to scientific obscurity.

It was not until 1938, ten years later, that British scientist Ernst Chain and Australian scientist Howard Florey rediscovered Fleming's article. On the eve of World War II, they began to test the effectiveness of Fleming's "miracle" mold on human subjects. Chain, Florey, and an expanded team of scientists, later known as the Oxford Group, took their discoveries to America where USDA scientists perfected the production process, manufactured the drug in mass quantities, and distributed it to Allied forces. The new "wonder drug" saved countless lives that would have otherwise been lost to infection on the battlefields of Europe and Asia. In fact, after the introduction of penicillin, deaths from infection virtually disappeared. Since then, penicillin has saved millions more lives worldwide and is one of the most widely prescribed antibiotics.¹

Many of our most profound scientific discoveries share similarly humble beginnings. Anyone working in laboratories knows that it takes more than just one scientist, working in the predawn hours to unlock the secrets of the world. It takes another scientist, and then another, and then another to move from a first significant discovery to the practical application of research. Communication between researchers has long been the key to advancing research and accelerating the real world impact of those discoveries. Fortunately, the research community—with the assistance of scholarly associations, publishers, and libraries—has moved worlds beyond shouting "Eureka!" and running through the streets. Yet in today's world, with information increasingly at one's fingertips, it is amazing to note that some of the very same barriers that resulted in the ten-year delay of penicillin research and countless other discoveries still exist.

1. Maurois, A. *The Life of Sir Alexander Fleming, Discoverer of Penicillin*. Trans. Gerard Hopkins. New York: E.P. Dutton & Co., Inc., 1959.

Access:

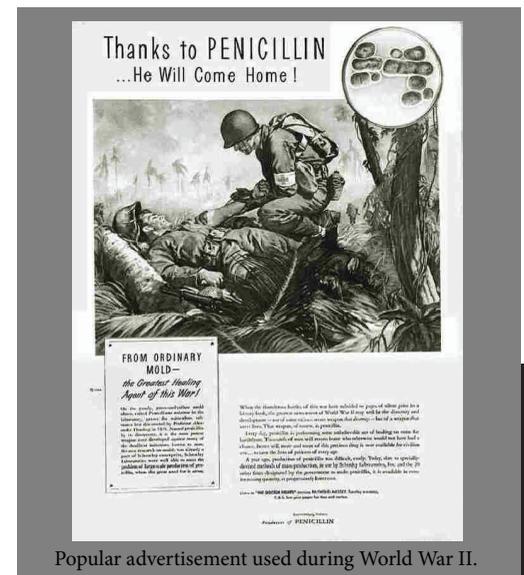
Research Public Access Act (FRPAA)

Scholars in all fields communicate their discoveries, ideas, and innovations largely through publication in peer-reviewed journals. Many of those scholars, working in universities around the country, depend on their university libraries to provide access to those journals through subscriptions. However, with journal prices escalating at rates that are two to three times greater than general inflation, this mode of communication is becoming increasingly impractical. Colorado State University Libraries provides the campus with over 31,000 current serials, including more than 23,000 full-text online journals, at a cost of approximately \$3.6 million per year. That's roughly 65 percent of the Libraries' materials budget solely dedicated to supplying the campus with scholarship published in journals, leaving only 35 percent to spend on books and other important resources.

Unfortunately, in the past five years CSU Libraries has gone through two major journal cancellation projects due to exploding journal costs. Although the Libraries continues in its efforts to provide access to significant research findings via consortial partnerships, which permit the bulk purchase of journal titles in association with other universities, and an ever-expanding interlibrary loan effort, which vastly improves access to articles not in CSU's own collection, access is shrinking—not growing—in a way that contradicts modern advances in technology.

The Internet should enable instantaneous, immediate communication between researchers and scholars. Just imagine if Fleming could have sat down at a computer and told colleagues in England and beyond about the miracle mold that could knock out staph bacteria. In fact, the number of visitors to digital content on Web sites so far outnumbers traditional journal circulations that the potential to broadly, widely, and immediately impact the scientific community via publishing online is nearly limitless. Take, for example, the journal *Science*. *Science* is one of the most commonly cited journals and boasts 130,000 print subscriptions. Yet its Web site, which contains a mix of free and subscription-required portions, receives 1.8 million weekly visits.²

While many publishers are choosing to offer their materials electronically, the need for costly subscriptions, even for materials available online, continues to limit access. Such barriers to the exchange of information between scholars and researchers ultimately threaten to stifle research worldwide.



Popular advertisement used during World War II.

2. Young, T. *Science Representative*. Telephone interview, 23 October 2006.

Public Access Denied

Coupled with the strain on researchers is a growing movement to grant taxpayers access to research that is funded with taxpayer dollars. Led largely by the Alliance for Taxpayer Access (<http://www.taxpayeraccess.org>), an organization in which CSU is a founding member, the movement insists on developing open, online access to federally funded research. Its main advocates include universities, libraries, consumer groups, and perhaps most notably a long list of patient advocate groups including the Genetic Alliance (<http://www.geneticalliance.org>), a coalition of 600 disease-specific organizations that advocates for better healthcare treatments.

Sharon Terry became the coalition's president after she and her husband encountered astounding barriers to research literature that would help them understand the debilitating genetic disorder from which both of their children suffered. The Terrys worked around those barriers by volunteering at a hospital and gaining access to the hospital's library. Armed with the research that they were first denied, the Terrys became experts on their children's disorders and, working with a network of scientists, became co-discoverers of the gene responsible for the disorder.³ Although it is uncommon for lay individuals to make such a significant impact in the research community, 80 percent of taxpayers, according to a recent Harris interactive poll, support a right to "open access" and have a strong desire not necessarily to view research findings themselves, but rather to feel the real-world benefits reflected when their own doctors, pharmacists, and other practitioners have better access to cutting-edge discoveries.⁴

What Everyone Should Know

The use of Prozac to treat depression in teenagers is a prime example of the kind of information arising from government funded research that the public needs and wants to know. In 2002, 11 million antidepressant prescriptions were written for U.S. children. However, no large scale study had been conducted on the impact of using those drugs in the younger population. Fortunately, a team of researchers at Duke University Medical Center conducted a study of adolescents taking antidepressants and found overwhelmingly that Prozac combined with talk therapy was the most effective means to substantially improve teen depression. However, the federally funded research study also revealed an increased likelihood for teens on Prozac to engage in harmful behaviors, including suicide attempts.

The results of the study were first published in August 2004 in the *New England Journal of Medicine*. It was not until two months later, in October of 2004, that the FDA issued warnings about the drug's risks and not until March of the following year that drug manufacturers issued "black box" warning labels for Prozac. NDC Health Inc. reported a 20 percent overall drop in prescriptions after the warning was issued.⁵ It is difficult to know how many suicides or attempted suicides were impacted by the FDA's warnings. Regardless, teens, their parents, and their doctors had a stake in understanding the risks and benefits of the drug. This controversy illustrates an important point for those in favor of FRPPA and similar legislation: delayed communication of research findings can result in more than just intellectual stagnation and can have a costly, even devastating, effect on communities.

3. English, R. and M. Raphael. "The Next BIG Library Legislative Issue." *American Libraries*. 37 (8)2006: 30-33.

4. *Ibid*, 31.

5. Elias, M. "New Hope, New Dread." *USA Today*. 27 December 2005:D6.

The Voluntary Experiment

Advances in technology, combined with a desire for researchers to broaden the impact and scope of their work and the public outcry for access to research funded from their own pockets, have spurred advances in open access to federally funded research. The National Institutes of Health (NIH), whose \$28 billion budget accounts for one-third of all federal dollars spent on research and which funds an estimated 65,000 peer-reviewed journal articles each year, adopted an open access policy in May of 2005. The NIH policy requests and strongly encourages all investigators to make NIH-funded research available to other scientists and the public through the NIH National Library of Medicine's *PubMed Central* (PMC) database immediately after the final date of peer-reviewed journal publication. The NIH has developed a password protected, Web-based NIH manuscript submission system that requires a simple uploading of a PDF version of final manuscripts; however, only 3 percent of researchers have participated in this program.⁶

It is unclear why the NIH's voluntary submission policy did not work, particularly since it was created by a balanced panel of publishers, scientists, patient advocates, scientific associations, and other organizations in conjunction with the NIH's director, Dr. Elias A. Zerhouni. Advocates of the NIH's policy quickly realized that the voluntary submission process may need to be mandatory in order to serve the research community and reach the Institute's open access goals.⁷

In May of this year, one year after the voluntary deposit experiment was launched with little success, Senators Cornyn and Lieberman introduced the Federal Research Public Access Act (FRPAA), a bill that would have federal agencies require grant recipients to publish their papers—online and free—within six months of their publication elsewhere.

Key Features of FRPAA

At its core, FRPAA aims to expand access to research in order to improve information exchange between researchers, help prompt new advancements, broaden impact of discoveries, avoid duplications, and support a greater return on taxpayer investment. The bill impacts federal agencies with an annual research budget of more than \$100 million. This includes the Departments of Agriculture, Commerce, Defense, Education, Energy, Health and Human Services (which houses the NIH), Homeland Security, Transportation, the Environmental Protection Agency, the National Aeronautics and Space Administration, and the National Science Foundation.

The key difference between FRPAA and the current policy is that the bill would *require* grant recipients to deposit their papers, post peer-review and post publication, in an online repository maintained by the granting agency that ensures free, online, worldwide access and long-term preservation. The anticipated expectation is that these repositories would be similar to that of *PubMed Central*, which is searchable, stable, and easy to use. "The goal is to share information...and help spur new ideas which down the road can mean new treatments and cures for researchers, medical professionals, and patients," noted Lieberman in a joint press release to announce the bill. "It will help accelerate scientific innovation and discovery," added Cornyn.

6. National Institutes of Health. Open Access Policy. 29 September 2006 <<http://publicaccess.nih.gov>>.

7. Alliance for Taxpayer Access. Key Advisory Group Reaffirms that NIH Public Access Policy Should Be 6 Months and Mandatory. Alliance for Taxpayer Access Press Release. 13 April 2006 <<http://www.taxpayeraccess.org/media/Release06-0413.html>>.

Read FRPPA for Yourself

The actual wording of the bipartisan bill can be found online at: <<http://cornyn.senate.gov/index.asp?f=record&lid=1&rid=237171>>.

Impact on the CSU Campus

If FRPPA were to pass today:

- CSU students, faculty, and staff would have unlimited access from home, office, or campus computers to the more than 65,000 scholarly articles published as a result of research supported by federal funds.
- CSU faculty, staff, and students working on federally funded projects would be guaranteed a highly visible, easy-to-access venue in which to publish their work.
- The scholarly work of the CSU community would reach millions of people worldwide.
- The research findings of the CSU community would be preserved and protected to influence the discovery and scholarship of the future.

A Good Idea, So Why the Debate?

Given the significant impact that online technology has had on improving research, proponents contend that expanding the use of that technology to increase global access would no doubt have a positive effect on scholarship; however, the legislation has sparked a fierce debate. At the heart of that debate lies questions of how the policy will impact peer-review, challenge current publishing policies, and impact the budgets of the federal agencies.

The American Chemical Society (ACS), the world's largest scientific society, and the Association of American Publishers (AAP), with some 260 member publishers around the country, are two of the most vocal forces opposing the bill. In letters to Senators Cornyn, Lieberman, and Susan Collins (R-Maine), opponents argue that the bill would destroy the peer-review system, which ensures journal quality, and would pit federal agencies as competitors against scholarly publishers.⁸ The ACS's publications arm and the Chemical Abstracts Service (CAS), a rich database of chemical information and literature, in 2004 earned \$40 million for the society after accounting for the divisions' publication expenditures.⁹ If their arguments against the bill hold water, the ACS has much at stake, at least commercially. But what of their societal mission "to encourage in the broadest and most liberal manner the advancement of chemistry and all its branches"?¹⁰ During their national conference in August of 2005, after ACS came out against the NIH's open access database *PubChem*, a growing number of ACS members began to challenge the society's leadership, citing the contradiction in the society's stance. "I am growing increasingly upset with their direction," said Chris Reed, an inorganic chemist at the University of California, Riverside in a 2005 article published in *Nature*.¹¹ Some members have even wondered how the society could support limits to free access when it would benefit their own research.

Proponents of FRPAA note that the bill stresses the deposit of manuscripts post-peer review and implements a six-month embargo on public access, to acknowledge publishers' contributions and to avoid competition with their subscribers. According to the bill's FAQ, authored by Senator Cornyn, "The six month embargo will preserve the important role of journals and publishers in the peer review process. This provision balances important interests and ensures that research is widely available while it still is useful."¹²

In addition to the bill's own provisions, the idea that open access will damage subscriptions remains an open-ended question with some evidence pointing to the contrary. The few scholarly societies that have chosen to allow their authors to publish online, open access versions of their work after publication demonstrate that open access has had little effect on their ability to sell subscriptions in addition to the content they offer for free. A key example of this is the American Physical Society (APS). More than 30,000 articles a year are submitted to the APS, with some institutions paying upwards of \$20,000 for full access to their publications. The society

8. Letter to Senators Cornyn, Lieberman, & Collins. 7 June 2006. <<http://opa.faseb.org/pdf/CornynLieberman-CollinsLettersJune7.pdf>>.

9. Maris, E. "Chemical Reaction." *Nature*. 437 (6) 2005: 807-809.

10. *Ibid.* 807.

11. *Ibid.* 807.

12. United States Senate. Office of Senator Cornyn. Federal Research Public Access Act FAQ. Basic Facts. 2 May 2006. <http://cornyn.senate.gov/doc_archive/05-02-2006_FRPPAFAQs.pdf>.

allows physicists to post their work anywhere that allows free access and without any delay. The editor, Martin Blume, notes that their policy has forced him to improve their publications and that subscribers, especially institutions, are still willing to pay. Since APS's journals date back to 1893, there is little or no comparison between what subscribers get access to for a fee and what an open access government depository could provide.¹³ Some argue that with postings that include and credit the article's original publisher, the federal agency would seem to serve less as a competitor and more as a means to attract subscribers seeking the wealth of past publication that only for-fee services currently provide.

Although proponents argue that the bill protects peer-review by definition, some add that broadening access to scholars worldwide may also result in increased scrutiny of published work, which would in turn ensure greater quality control in scholarship. The January 2006 scandal of South Korean scientist Dr. Hwang Woo-suk, whose fabricated cloning research was published in the highly reputable *Science*, has brought speculation on the peer-review practice as a whole. Robert Terry, senior policy adviser at the U.K. medical charity the Wellcome Trust, suggests that adopting open access publishing models could be the key to detecting plagiarism and other problems. "We think it would be harder for people to plagiarize work once you can do extensive word searches and access more material free on the Internet," said Terry in an interview with the BBC in 2006, shortly after the scandal broke.¹⁴ Scrutiny by a community of experts, made possible by increased access, may in fact be the extra checks the peer-review practice needs to shore up the process of ensuring accuracy in research.

Opponents also contend that creating and maintaining the required online depositories would divert dollars away from supporting research.¹⁵ The NIH's *PubMed Central* depository, according to agency estimates, has cost the agency less than 1 percent of its overall budget.¹⁶ It is, perhaps, a very small price to pay for the potential impact of opening the doors to such important scholarship.

Take a Stand

Logon to the *Library Connection* Weblog (<http://lib.colostate.edu/blogs/libraryconnection>) to post your comments on this issue.

Contact Congress (<http://www.congressmerge.com/online/db/powersearch.htm>)

13. Jaschik, S. "In Whose Interest?" *Inside Higher Ed*. 15 June 2006. <<http://insidehighered.com/news/2006/06/15/open>>.

14. Rincon, P. and J. Amos. Interview. *BBC News*. United Kingdom, 10 January 2006.

15. Baum, R. "Take a Stand." *Chemical & Engineering News*. 84 (23) 2006.

16. *New England Journal of Medicine*. 352 (2005) 17.

Discover More About FRPAA

Additional information about FRPPA and broadening access to research can be found at:

Create Change (<http://www.createchange.org>), an educational initiative that examines new opportunities in scholarly communication, advocates changes that recognize the potential of the networked digital environment, and encourages active participation by scholars and researchers to guide the course of change.

Alliance for Taxpayer Access (<http://www.taxpayeraccess.org>), a diverse and growing alliance of organizations representing taxpayers, patients, physicians, researchers, and institutions that support open public access to taxpayer-funded research.

Federal Research Public Access Act (<http://cornyn.senate.gov/index.asp?f=record&lid=1&rid=237171>), offers information and the text of the bill.

Open Access News (<http://www.earlham.edu/%7Epeters/fos/fosblog.html>), a blog maintained by Peter Suber about the open access movement.

Point-Counterpoint: Open Access (<http://pubs.acs.org/cen/government/8310/8310openaccess.html>), presents a debate between scientists about the issue.

What Are Your Thoughts?

Log on to the *Library Connection* Weblog (<http://lib.colostate.edu/blogs/libraryconnection>) to post your comments on this issue.

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