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Pipeline survives the big one

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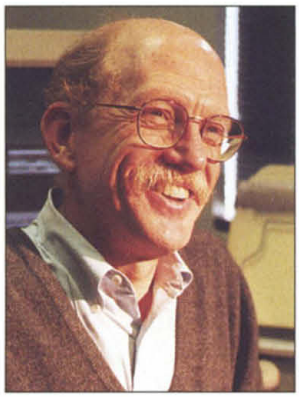
Killer antibodies

GENOME RESEARCH

# A Tussle Over the Rules For DNA Data Sharing

The matter-of-fact tone of the letter on page 1333 calling for unconditional sharing of DNA data gives no hint of the intensity of the debate that precipitated it. In the letter, the advisers to the international DNA sequence databases reiterate a long-standing policy: Any and all data deposited in GenBank or its counterparts in Japan and Europe are immediately and freely available to any researcher, for any purpose, no exceptions.



**Respect.** Robert Waterston says scientific courtesy has been lacking.

Behind that letter is a bitter and sometimes acrimonious struggle over scientific credit. Some scientists at the big genome centers, including the one at Washington University in St. Louis, Missouri, claim that sequencers are being "scooped" by researchers, usually computational biologists, who snatch the unpublished data off the Web and publish a "global" analysis—defined roughly as a look at a whole chromosome or genome. They protest that they, as originators, should get the first shot at a publication—and the credit. They think they can preserve that right and ensure open access if the databases will let them post a single caveat: No one should publish a "global" analysis without asking for permission. It's scientific etiquette, they say.

Many bioinformaticists are not convinced. The goal of the Human Genome Project was to create this fabulous resource for the scientific community to use, they say. And that's what the community is doing. Yes, sequencers deserve credit, which has sometimes been missing, but no special privileges.

More than egos are at stake, people on both sides agree. Until the issue is resolved, data will continue piling up on Web sites at various sequencing centers, where some researchers are storing their work pending publication and sharing it only with trusted colleagues or more broadly with some restrictions on its use. "There is a demimonde of data out on Web sites that are not part of public corpuses," says Ewan Birney, a computational biologist at the European Bioinformatics Institute in Cambridge, U.K.

This protective response was triggered by a "small number" of abuses, says Robert Waterston, head of the sequencing center at Washington University. "But people are using those abuses as justification not to put up data."

"It's a real societal issue the community must grapple with," says Gerald Rubin of the Howard Hughes Medical Institute in Chevy Chase, Maryland, who led the *Drosophila* genome sequencing project.

From the outset, the publicly funded Human Genome Project prided itself on its policy of immediate data release. According to the 1996 "Bermuda conventions," as a condition of funding, all members of the public sequencing consortium must post their data on GenBank within 24 hours of generation (*Science*, 16 February 2001, p. 1192). Openness became a key justification for continuing to fund the public project rather than using information from companies such as Celera Genomics, which has more restricted access.

But sequencing has gotten faster and cheaper since then. A big group can now do a mammalian genome in 6 to 8 months, notes James Battey, director of the National Institute on Deafness and Other Communication Disorders and co-chair of a committee that coordinates genome issues across the National Institutes of Health (NIH). And that creates a dilemma. "If you put it out on the street within 24 hours, then bioinformaticists and others who had no role in producing the sequence can get a paper out before the sequencing center can."

**Access.** DNA databases will not allow restrictions, says Daphne Preuss.

Some resent what they consider to be the free riders. "People have increasingly taken advantage and published without consultation or permission," says Waterston. "I literally reviewed a paper that purported to analyze the human genome before the data were published."

As the mouse genome neared completion about a year ago, such concerns prompted Francis Collins, director of NIH's National Human Genome Research Institute (NHGRI), to suggest a fix. He proposed to David Lipman, director of the National Center for Biotechnology Information, which runs GenBank, that the mouse data be freely available—with one condition: No one should publish a global analysis, within a defined time frame, say, 6 months or a year, without permission of the data producers.

Battey thinks the request is reasonable. "There is no other area of science where those who generate data don't get first right to publish," he says, adding that the community owes the scientists who sequenced the human genome "a huge debt of gratitude."

But Lipman didn't buy it. In the end, GenBank got the mouse data with no special conditions. "I was surprised that [Collins] asked for restrictions on the mouse data, particularly since they had been battling for years that data should be immediately available without restrictions," says Lipman.

What's imperative, says Lipman, is for NIH to decide whether sequence production is "research or a resource." If it's a resource, he adds, then NIH should be "clear up front what the rules on data submission and sharing should be." Rubin notes that, for the big genome endeavors, the community might be moving toward contract sequencing.

Like Lipman, the advisory body to the international databases rejected special protection for sequencers. Inundated with requests from both big and small labs, says committee member Daphne Preuss, a molecular geneticist at the University of Chicago, the advisers decided to "remind the community" of a long-standing policy. "I feel data should be

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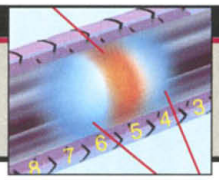




released immediately, and any group who wants to analyze and write them up should do so—with appropriate credit," she explains.

But the letter signed by Preuss and leaders of the International Nucleotide Sequence Databases is only fueling the flames. Although Birney agrees with its broad outlines, he would prefer a more flexible approach. Data producers, data users, and database managers "have to all get into a room and figure out the best structure" to ensure access but give credit to sequencers, so that they "don't just become unseen supporting cast." The U.K. biomedical charity Wellcome Trust hopes to do just that at a meeting it is organizing this January. **–LESLIE ROBERTS**

U.S. SCIENCE POLICY

## GOP Takes Senate, Budget Uncertain

U.S. science advocates face a new political landscape in Congress. When voters handed Republicans control of the Senate last week, ending a brief era of divided government, they put President George W. Bush in a stronger position to advance policies—from a ban on human cloning to a permanent tax break for corporate research spending—with implications for scientists. The shift could also delay pending budget increases for the National Institutes of Health (NIH) and other science agencies.

For the past 18 months, Democrats have held a single-vote majority in the 100-member Senate, giving them control of all committees and the legislative agenda. But the election will give Republicans at least 51 seats when Congress reconvenes in January. Republicans also strengthened their small majority in the House of Representatives.

The upheaval could temporarily disrupt the flow of grants to researchers if congressional leaders decide to put off final action on spending bills that fund NIH, the National Science Foundation (NSF), and other science agencies until the new Congress convenes. Those bills, which would provide double-digit increases for NIH and NSF, cover the fiscal year that began 1 October, but none have yet been passed and the agencies are running on a temporary spending measure. If lawmakers, back in town this week for a special postelection session, decide to extend the temporary spending measure until the end of January, NIH and other agencies will be forced to delay awards for a slew of new grants—including bioterrorism research—planned for early next year.

In the long term, lobbyists don't expect the Republican takeover to reverse growing bipartisan support for government spending on science. Key spending panels, for instance, are expected to be led by Republicans with a pro-research slant, including familiar faces such as Senators Arlen Specter (R–PA) and Kit Bond (R–MO).

Republican control does worry some biomedical research groups that are opposed to a ban on research involving human cloning, however. The White House and the House of Representatives have backed legislation that would ban not just reproductive cloning but the use of cloning techniques to create embryos for research or therapies, but outgoing Senate Majority Leader Tom Daschle (D–SD) helped a bipartisan group block the bill in the Senate. The expected new majority leader, Trent Lott (R–MS), is believed to be more willing to bring the issue to a vote. "It certainly will be easier to get [a cloning ban] on the floor," worries Anthony Mazzaschi, a lobbyist for the Association of American Medical Colleges in Washington, D.C.

Republican leaders might also speed up action on other bills of interest to researchers. One creates a new Department of Homeland Security, which would back terrorism-related R&D. Another is a massive energy bill that authorizes extensive new research programs. The Bush Administration has also discussed making permanent an existing tax break for corporate spending on R&D.

The new Congress will be missing some veteran science advocates, chief among them Representative Connie Morella (R–MD), whose district includes NIH and the National Institute of Standards and Technology. She lost a close race to lawyer Chris van Hollen. But the House's "physics caucus" remains intact: Representatives Vernon Ehlers (R–MI) and Rush Holt (D–NJ), the body's two academically trained physicists, won reelection easily.

**–DAVID MALAKOFF**

**THE 2003 SPENDING LOGJAM**

| Appropriations bill | Last step cleared | |
|---|---|---|
| | By House | By Senate |
| Labor-HHS (NIH) | No action | Floor approval |
| VA-HUD (NSF, EPA) | Committee approval | Committee approval |
| Energy | Committee approval | Committee approval |
| Interior | Floor approval | Committee approval |
| Commerce (NIST) | No action | Committee approval |
| Agriculture | Committee approval | Committee approval |
| Defense | Signed by president | |

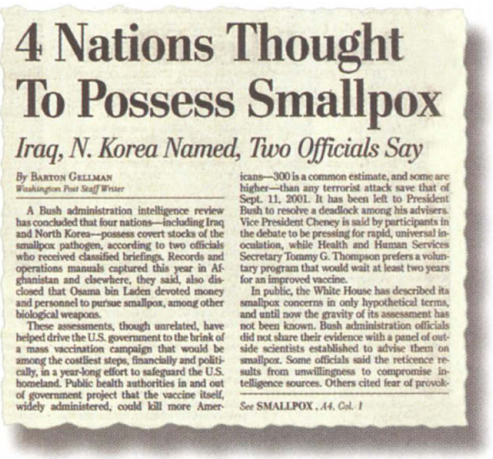
CREDITS: (LEFT TO RIGHT) SOURCE: U.S. CONGRESS; *THE WASHINGTON POST*

SMALLPOX

## Leaks Produce a Torrent of Denials

*France?* That's how many researchers and policy-makers reacted when they read a page one *Washington Post* story on 5 November that listed France, along with Russia, North Korea, and Iraq, as countries that U.S. intelligence sources believe hold clandestine stocks of smallpox virus. French officials had an even stronger reaction: A statement issued by France's Ministry of Foreign Affairs categorically denied the assertion "in the strongest terms."

The World Health Organization (WHO) declared in 1980 that its vaccination program had eradicated smallpox from the human population, and WHO member states agreed to destroy all but two stocks of the virus: one held at the U.S. Centers for Disease Control and Prevention in Atlanta, Georgia, and the other at VEKTOR in Koltsovo, Russia. Experts have suspected, however, that samples of the virus might be in the hands of ill-



4 Nations Thought To Possess Smallpox

*Iraq, N. Korea Named, Two Officials Say*

By Barton Gellman
*Washington Post Staff Writer*

A Bush administration intelligence review has concluded that four nations—including Iraq and North Korea—possess covert stocks of the smallpox pathogen, according to two officials who received classified briefings. Records and operations manuals captured this year in Afghanistan and elsewhere, they said, also disclosed that Osama bin Laden devoted money and personnel to pursue smallpox, among other biological weapons.

These assessments, though unrelated, have helped drive the U.S. government to the brink of a mass vaccination campaign that would be among the costliest steps, financially and politically, in a year-long effort to safeguard the U.S. homeland. Public health authorities in and out of government project that the vaccine itself, widely administered, could kill more Americans—300 is a common estimate, and some are higher—than any terrorist attack save that of Sept. 11, 2001. It has been left to President Bush to resolve a deadlock among his advisers. Vice President Cheney is said by participants in the debate to be pressing for rapid, universal inoculation, while Health and Human Services Secretary Tommy G. Thompson prefers a voluntary program that would wait at least two years for an improved vaccine.

In public, the White House has described its smallpox concerns in only hypothetical terms, and until now the gravity of its assessment has not been known. Bush administration officials did not share their evidence with a panel of outside scientists established to advise them on smallpox. Some officials said the reticence results from unwillingness to compromise intelligence sources. Others cited fear of provok-

See SMALLPOX, A4, Col. 1