bioinformatics, according to group director Keith Elliston, and a distributed staff of about 20 more. One of the core group's jobs is to manage the flow of information from Merck's Gene Index, a public database containing human gene fragment sequences produced by academic researchers whom Merck supports (*Science*, 28 October 1994, p. 538). Elliston, who has been at Merck since 1988, says that his group "concentrates on analysis" of genetic data. In addition, it maintains an independent, proprietary database of sequence information, makes the information accessible to Merck researchers at four sites, and tailors software for intramural use.

Another pharmaceutical giant, Glaxo Wellcome of London, hired its first bioinformatics staffer 3 years ago, but its effort expanded in 1994, after the company recruited Rainer Fuchs, a well-known leader in the field, from the European Molecular Biology Laboratory in Heidelberg, Germany. Fuchs now heads a group at Glaxo's research center in Research Triangle Park, North Carolina, with "a strong genetics component," working on computer programs that will recognize "unexpected patterns" in sequence data representing new genes and proteins. Glaxo's European staff focuses primarily on protein modeling. Fuchs estimates that about 35 people are working full-time on bioinformatics throughout the company, including the protein group in Geneva and another group in Britain that supports Glaxo's databases.

But Fuchs says Glaxo is pacing itself: "We have been very careful in trying to choose people we hire; you won't see us advertising for 20 positions. We depend more on our informal networks, and we will use those networks to identify good people and bring them in." Nor is the company interested in supporting basic informatics research in-house, although Fuchs says staffers make basic discoveries as a "side effect" of the work they do.

Pfizer Inc., in Groton, Connecticut, is taking a similar tack. Ian Williams, group director of molecular sciences, says that the company will rely on researchers at universities and government-funded labs such as GenBank to do much of the fundamental work in bioinformatics, particularly developing new data-sorting algorithms. While the company will need staffers to "develop complex relational databases," integrate information from heterogeneous sources, and develop pattern-recognition software, Williams doesn't foresee a major intramural effort in this area. At present, Williams says, there are about six bioinformatics experts on staff.

Pfizer is, however, making some strategic investments in bioinformatics outside its own walls: It is one of seven pharmaceutical giants that have invested more than $100 million in Incyte Pharmaceuticals of Palo Alto, California. This small company has developed a proprietary collection of human gene sequences—similar to HGS's—and is marketing the information as a service. Pfizer, according to Williams, is also planning to spend about "one third of a million dollars" on bioinformatics research at academic centers, and possibly more, if the initial results look good.

Among the more recent bioinformatics initiatives is one by Wyeth Ayerst of Philadelphia, which recently advertised for four bioinformatics specialists, including a director of a new "core technology group," to help develop a research strategy for drug applications. Johnson & Johnson of New Brunswick, New Jersey, has called for a project manager and postdocs to develop new information systems to analyze sequence data.

As big companies consider how best to hire or borrow the number-crunching expertise they need, the medium and small fry are competing intensely with one another for scarce and increasingly expensive talent. Phil Green of the University of Washington, Seattle, says he's heard that recruiters are looking for bioinformatics experts for a slew of companies, including Darwin Molecular, Genentech, Mercator, Millennium, and Sequana. Zeneca Pharmaceuticals, Schering-Plough, and others are also searching for talent.

No one can predict, of course, whether the big investment in intramural staffing of the kind made by SB will pay off. But one thing is certain. As federally funded projects fill the public databases with human and mouse DNA sequences over the next few years, the demand for well-trained computational biologists who can make sense of this torrent of data can only increase.

–Eliot Marshall

NASA

Goldin Drops Plan for New Institutes

NASA has scrapped an ambitious plan to create a half-dozen nonprofit science institutes after failing to win White House support for the administrative and legislative changes required to get them up and running. The decision will force NASA Administrator Dan Goldin to find other ways to revitalize research at the agency's dozen centers through stronger ties with academia.

Last May Goldin and his top science managers announced their intention to convert civil servants into employees of nonprofit institutes, operated mostly by universities, that would focus on specific disciplines (*Science*, 26 May 1995, p. 1122). The goal was to shrink the size of NASA's payroll while broadening contact between agency researchers and the larger scientific community. In a 3 April letter to Jack Gibbons, the president's science adviser, Goldin explained that the institute idea "represent[s] a positive response to the Administration's budget challenges" as well as a means to preserve and improve the agency's science.

But opposition from other government agencies has forced Goldin to fold his tent. On 7 June he ordered his managers to halt work on an astrobiology institute at Ames Research Center in Mountain View, California, and a microgravity sciences institute at Lewis Research Center in Cleveland. Officials had already decided that plans to spin off two institutes at Marshall Space Flight Center in Huntsville, Alabama, and a third from Langley Research Center in Hampton, Virginia, required further study.

The idea of private institutes was never very popular among researchers, who felt that NASA had failed to define the concept clearly. "I didn't quite understand where the institutes were going," says Claude Canizares, chair of the National Research Council's Space Studies Board and a Massachusetts Institute of Technology astrophysicist. "It was all quite confusing."

However, what doomed the plan was its impact on the federal government's personnel and ethical-conduct policies, as well as fiscal uncertainties and skepticism from Congress (*Science*, 17 November 1995, p. 1109). The Office of Government Ethics was loath to exempt would-be employees of the institutes from conflict-of-interest regulations that apply to workers who leave government to work for private organizations that receive federal contracts. And the Office of Personnel Management objected to NASA's request that civil servants be exempt from laws that prohibit employees from retaining health benefits and contributing to their pension fund after leaving the government. "Without [legislation], it's not going to work," says a NASA official.

NASA

Slipping away. Institute may have continued Ames's blood-pressure work with snakes.

NASA's effort to construct an attractive benefits package to lure scientists to the new institutes was also hampered by uncertainty about the true cost of the institutes. "No one really knew the economics of this," complains one Administration official involved in the debate, who said NASA estimated the transfer could cost as much as $100,000 a person. Although only about 50 to 60 senior-level scientists were thought likely to balk at making the switch in the absence of such a package, the official said, they were seen as essential for getting the new institutes off to a good start.

NASA officials are trying to put the best face on the plan's defeat. They say the agency is still committed to improving its research activities, and that the debate has highlighted the importance of closer ties with academia. "There are a lot of activities we can pursue to achieve the same goals," says NASA Chief Scientist France Cordova. "The centers already are reaching out more to universities, and in a year's time, a lot of connections have been made," she notes, citing an increased number of joint center-university research proposals for the Discovery missions and other flight projects. NASA plans to continue to encourage such collaborations. "We really want to get away from criticism that the centers are too insular, that there is too much conflict of interest, and that they are too interested in bolstering themselves," she says.

The institute idea also helped to protect NASA research programs from drastic cuts proposed in a 1995 agency memo, she said. The plan focused attention on NASA's in-house science programs and convinced senior administrators of their value to the agency. "There is no talk of getting rid of those activities now," Cordova says.

NASA still intends to create a biomedical institute in Houston, home of Johnson Space Center. That project remains alive because the life-sciences researchers there are largely contractors and not NASA employees. The center has asked potential institute operators to submit proposals by 2 August; as many as four will receive $175,000 apiece to draw up their plans. NASA intends to select a winner next March. Agency officials are also exploring other ways to bring the centers into the mainstream of the scientific community. Ames, for example, may hire more outside scientists on a temporary basis, says David Morrison, chief of the center's space science division.

But providing more opportunities for collaboration is unlikely to stave off the harmful effects of a declining budget that threatens to take large bites out of its overall work force. To do that, Goldin will need to go back to the drawing board and find another approach to protect and revitalize research that is acceptable to federal bureaucrats and legislators.

–Andrew Lawler

FEDERAL FUNDING

Appropriators Bullish on Biomedicine

When biomedical research emerged from the 1996 congressional appropriations process with a larger increase than anything else in the Department of Health and Human Services (HHS), some analysts warned that it would be a hard act for biomedicine's supporters to follow this year. But last week, a key House subcommittee put on the first act of a repeat performance. It approved a 1997 HHS appropriation bill that would give the National Institutes of Health (NIH) a budget increase of 6.9%—more than Congress allowed in 1996 (5.7%) and much more than the 4% the Administration is requesting.

Working into the wee hours of 14 June, the House appropriations subcommittee for HHS, housing, and labor plowed through more than 20 amendments before voting on the bill. In the end, Chair John Porter (R–IL) got just about everything he wanted for NIH, whose champion he has become. Not only did the panel vote to increase NIH's 1996 budget of $11.9 billion by $819 million, but it endorsed an exceptional funding plan that could make it easier for NIH to rebuild the clinical center, its aging hospital. The subcommittee members also agreed to several policy changes that could give the NIH director more administrative flexibility while curbing the authority of NIH's Office of AIDS Research (OAR). And they approved an amendment by Representative Nita Lowey (D–NY) that would partly lift a ban on human embryo research imposed earlier this year by Congress.

The vote on the clinical center could be a watershed for NIH. The agency has been trying for years to get permission to begin constructing a replacement for the Warren Grant Magnuson Clinical Center, a decaying behemoth on NIH's campus. Congress pressed for cuts, and NIH responded by shrinking the proposed center from a billion-dollar project to one that is now expected to cost $310 million. But getting approval for even this scaled-back version has been difficult.

The main problem was an accounting rule adopted by the White House Office of Management and Budget that said that any agency undertaking new construction must include the full cost of the project in the first year's appropriation. This meant that NIH could only begin building the new clinical center by holding down all other expenditures, effectively preventing growth in its budget for research and grants. NIH director Harold Varmus and HHS Secretary Donna Shalala appealed to the White House to allow NIH to spread construction costs over several years. According to House staffers, Porter also began lobbying on NIH's behalf, with hopes of winning an exception for NIH's hospital. The result: This bill provides $90 million to start work on the new center, with a proviso that the project be paid for over 4 years. That would leave a 6.5% increase for research after construction funds are set aside.

In the policy area, one hotly contested change proposed by Porter would restrict the independent budget authority Congress gave OAR in 1993. Representative Nancy Pelosi (D–CA) and four other panel members unsuccessfully opposed Porter's proposal. However, the subcommittee did approve a compromise that one Capitol Hill staffer says aims to mollify AIDS activists and recognize the hard work of William Paul, OAR's director. The bill permits the OAR director "jointly with the director of NIH" to reallocate up to 3% of AIDS funding during the year from any institute to another program. Paul, although he would prefer greater authority, said this compromise "provides us with an enormous opportunity to do what we think should be done." The Senate is expected to seek to restore OAR's independent status.

Another provision—one that is likely to prompt intense debate later in the summer—is the change in embryo research policy. The revised version would continue to prohibit the fertilization of ova for research, but would permit studies on fertilized ova that would be discarded. And Porter may have bumped into an even nastier hornet's nest in challenging a congressional set-aside for small business. A law already in place requires NIH to devote 2.5% of research funds next year to "small business innovation research" or SBIR grants (*Science*, 17 May, p. 942). But biomedical groups such as the Federation of American Societies for Experimental Biology have argued that this set-aside—which cuts into funds available for basic science—is "anti-quality."

Hill staffers say that Porter first proposed capping SBIR. When the House Small Business Committee objected, he proposed that the set-aside be limited to "a pool of SBIR grants for which the median priority score is equal to or better than the median score of the pool of investigator-initiated grants." The panel approved this limit. But one Hill staffer warns: If this clause is really a spending cap, "Mr. Porter may be getting a whole lot of mail."

The Labor-HHS appropriation now goes to full committee, where it is likely to be approved this week, then to the House floor. Senate staffers say they don't expect to begin marking up the legislation until mid-July at the earliest, to be followed by a conference and final vote in late summer.

–Eliot Marshall