

Soon people will see that just cutting loose agencies that now are part of departments [slated for elimination] is not logical. One plan would put NIST [the Commerce Department's National Institute of Standards and Technology] in the Treasury Department! The problem is that a lot of the freshmen don't want to be creating a new department. One way could be to convert the present Department of Energy into a Department of Science. You could add NASA, NSF, EPA [Environmental Protection Agency], NIST, and NOAA [National Oceanic and Atmospheric Administration]. I am willing to explore a number of ways to get there.

Q: How do you rate the chiefs of the agencies you deal with?

A: We've had good working relationships. [NSF's] Neal Lane expressed concerns about what we were doing in the social, behavioral and economic directorate, and I gave him more latitude than we originally decided to. That was a sign of respect for the job he's doing. [NASA's] Dan Goldin has been controversial, but I personally find him to be a visionary. He's been an excellent force.

I've had a good personal dialogue with

Jack Gibbons, but I think he has undermined the administration by overly politicizing these issues. We've gone out of our way to explain what we're doing. And I have gone out of my way not to name call and not to suggest the president isn't as interested in science as we are. It gets overly political when the science adviser accuses us of being book burners because we have different views of science policy. That has carried the debate a step too far.

Q: You and the speaker are cheerleaders for basic research. What has the scientific community done—or not done—to help?

A: We hear more from people who think they are about to be cut than from those getting their funding. The science community seems to think that as long as the money is flowing, I'm okay, you're okay, we're all okay, and doesn't get involved in setting priorities. That ensures that people who are not oriented toward basic research get an upper hand. And basic scientists say, 'What happened?' The fact is they didn't aggressively promote what they were doing—other than when they appear at committee hearings or think their ox is being goaded. They need to speak up.

Q: A group of scientific societies recently made a joint statement warning about cuts to federal research. Is this sort of coordinated effort helpful?

A: It's always useful to have the scientific societies speak. But it's also important for scientists to go in and visit with their local congressman. They should not just concentrate on whether or not the president of the society has met with the Science Committee chairman. Members of Congress respond most positively to constituents who explain why the basic research work in their own district is valuable to the national interest. My guess is there aren't three members of Congress who read that statement from the societies.

Q: Why has there been such a complete breakdown in the bipartisan spirit of the Science Committee, and what are the implications of this split?

A: Some of it is philosophical, and some of it is the two parties trying to find new roles. In the past, one party was always in charge and the Republicans had found a way to accommodate that—and to lose gracefully. Now the agenda is not theirs, it's ours. They haven't accommodated to the fact that we are probably going to win these battles.

GENE THERAPY

NIH Picks Three Gene Vector Centers

Almost 5 years have gone by since researchers conducted the first procedure designed to treat an intractable disease with engineered DNA. But gene therapy has not yet achieved the definitive success that its early proponents hoped for. One reason: It has been difficult to develop good "vectors"—the viruses and other agents that can slip new genes into human cells. Now, the National Institutes of Health (NIH) has decided it's time to make a big investment in tackling this problem. Last week, NIH announced that it is establishing three "national gene vector laboratories" to create and produce high-quality gene transfer agents for use by physicians around the country.

NIH will spend up to \$3.5 million on the three vector labs in 1995, and it will follow up with an unspecified amount over the next 4 years. The initial grants have been awarded to well-known experts in gene therapy: Kenneth Cornetta of the University of Indiana, Indianapolis, Gary Nabel at the University of Michigan, Ann Arbor, and James Wilson of the University of Pennsylvania. Wilson says the program is critically important for improving vectors, a technical-sounding task for which "we can never get" adequate funding "through traditional grant mechanisms."

One goal of these labs, according to an NIH policy statement, is to "reduce the cost barrier" that often stands in the way of clinical studies in gene therapy. In particular, NIH wants to make it easier for clinicians to get custom-designed vectors that can be used to treat single-gene defects such as Gaucher disease or adenosine deaminase (ADA) deficiency. Although private companies have provided vectors for many clinical trials al-

tens of ADA deficient patients in the world who might be eligible for therapy. But the centers are being asked to tackle more than just a production task, for researchers agree that every vector type needs refinement. The extent to which the program will support basic studies in such areas as virology remains to be determined.

Each center plans to focus on particular vectors. Cornetta says he will continue to concentrate on those derived from retroviruses and adeno-associated viruses. Nabel's center will work on non-viral vectors, including lipid-based DNA carriers and "naked DNA" systems. Nabel also hopes to establish a repository of vectors that have been pre-tested, for use by any eligible clinician. Wilson's center will specialize in adenoviruses and other DNA viruses.

In an unusual management arrangement, a steering committee composed of at least 10 members will make specific choices about which vectors to study and produce. Each of the four NIH institutes in the project will nominate one member of the panel, and one will come from each of the three academic centers. The academics will choose additional outside members. The group will develop procedures after its first meeting "early this fall,"

NIH NATIONAL GENE VECTOR LABORATORIES		
University	Investigator	Vector specialty
Indiana	Kenneth Cornetta	retroviruses, adeno-associated virus
Michigan	Gary Nabel	liposomes, naked DNA, DNA-coated pellets
Pennsylvania	James Wilson	adenovirus, DNA viruses

ready, they are interested primarily in developing therapies for large clinical groups, such as cancer or heart disease patients. After all, it costs about \$100,000 to make one batch of vector for an ADA clinical trial, according to Michael Blaese of NIH. Yet there are only

says Cornetta. It's not yet clear how outsiders will use center facilities, but all three directors say their doors will be open to any and all proposals, to be selected and funded in part by the program.

To spread the cost of supporting these new labs, NIH has asked four of its institutes to contribute. They include the National Center for Research Resources, which provides assistance to clinical centers throughout the country, the National Cancer Institute, the National Heart Lung and Blood

Institute, and the National Institute of Diabetes and Digestive and Kidney Diseases.

Even as the new centers get underway, however, they will face the scrutiny of a special committee on gene therapy chaired by genetics experts Arno Motulsky of the University of Washington, Seattle, and Stuart Orkin of Harvard University. In May, after NIH had invited applicants to apply for center grants, NIH Director Harold Varmus established the committee to conduct a major review of NIH's gene therapy programs

(*Science*, 5 May, p. 627). While Varmus says he supports the concept of national vector labs, he is asking the Motulsky-Orkin panel to take a closer look. "There's no doubt that there's a great deal of interest among those who do gene therapy to have [national vector labs]," says Varmus. But before the investment grows any further, "I would like to hear from an independent group whether that is a good way for us to be spending money." The panel will offer its answer in December.

—Eliot Marshall

INTELLECTUAL PROPERTY

Who Owns Results of Russian Science?

MOSCOW—The Russian government has drafted a decree intended to bring some clarity to Russia's confusing intellectual property system for state-funded research. Instead, it has stirred up parts of the country's scientific establishment. At the heart of the new decree is the establishment of a new nonprofit State Contract Agency for R&D, dubbed Goskontrakt, which would own the rights to the results of all state-funded research and control its further use and implementation by issuing contracts for commercialization. But even before the draft decree was circulated for comments, it came under fire from the Russian Academy of Sciences (RAS) and the Russian Foundation for Basic Research (RFBR), a 3-year-old Western-style granting agency funded by the Ministry of Science. Vladimir Pavlov, director of the RFBR's department of mathematics, mechanics and informatics, says the decree would give the state an unacceptable degree of control over basic research.

Russia's existing intellectual property laws are vague declarations of principles. The Duma, the lower house of Russia's parliament, wants to clarify the situation, but so far has only managed to muddy the water further. The few laws that it has already adopted contradict each other: One gives intellectual property rights to the body that finances the research, the other awards them to the institution that conducts it.

The new decree considers "all the results obtained in the course of the research funded either directly from the budget or through federal non-budget foundations" (such as the RFBR and RAS, in which the proportion of direct state funding does not exceed 40%) to be state property and therefore subject to the control of Goskontrakt. Although funding agencies such as the RFBR and RAS will still manage their own programs, their officials believe that the government's control of property rights through Goskontrakt will give it *de facto* control over all state-funded research. This, argues Pavlov, contradicts the principles of openness and diversity of funding sources for research declared by sci-

ence minister Boris Saltykov.

Other scientists, including RAS representatives, are unnerved by the vague wording of the decree, which says little about how Goskontrakt will operate. The decree's aim is to create a "market for the results of R&D" and protect the state's interests in this market. But critics argue that all it does is set up a new body in charge of guarding state property without specifying how this should be done. The new agency will be overseen by the Ministry of Science and staffed by employees of the ministry. Pavlov says that the whole document is vague and unclear, and will require much more work before the plan

A new agency would own rights to "all the results obtained [from] research funded ... directly from the budget or through federal foundations."

is in any way practical. This, he adds, will most likely be done by bureaucrats, without any input from the scientific community.

Vladimir Disson, one of the Ministry of Science officials who drafted the decree, told *Science* that, as Goskontrakt was originally devised, only applied research would fall under its aegis. However, he says, Saltykov later insisted that the new agency also control some basic research projects such as fusion research and particle physics, because they yield not only purely scientific results but also new technologies, "know-how," and facilities.

That does not placate critics like Alexander Konoshenko, head of the Finance and Economics Department of the RAS, who points out that distinguishing fundamental and applied research can be difficult. The draft has a list of the types of research results that are considered to be state prop-

erty, such as those coming from a state scientific program or out of a state scientific center, both of which are directly funded by the science ministry. But at the same time, RFBR officials say the vague terms in which the draft is written make it possible to include all research run by the RAS (and the former USSR Academy of Sciences) in its institutes, research in universities and colleges, and all R&D carried out with the support of RFBR and other foundations.

Critics also point to other holes in the decree. Pavlov says it lacks detail about Goskontrakt's strategy for managing intellectual property and what arbitration systems it will use to settle possible conflicts over rights ownership. He also noted that the decree allocates 1% of the science budget for the running of the new agency, but does not say how the money would be spent. The RAS has sent an official letter to the ministry, insisting that these points be clarified.

Still, the decree is clear enough about one thing: Goskontrakt would have complete control over the transfer of research results to a third party—another state agency or commercial body. "Suppose that the State Committee for Emergency Situations commissioned a seismic research project at an RAS institute," says Konoshenko. "If some other organization wanted to use the results it would have to apply to the contract agency who would be the owner of all the rights." He and other RAS officials say that arrangement is unacceptable.

Ministry officials say they plan to take the criticisms into account when they revise the decree, a task they expect to finish by the fall. And they add that Goskontrakt could draw up individual research contracts to allay researchers' concerns about intellectual property rights. Depending on the agreement between the agency and the scientific institution, Goskontrakt might hold onto the rights, or give them to the institution running the research, or share them with the scientists. As Saltykov puts it, "There are various kinds of contracts, used all over the world."

—Andrey Allakhverdov

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