OMB director Jack Lew warning of "a number of negative, unintended consequences." Co-signers include Representatives Vernon Ehlers (R–MI), an influential Science Committee member, and John Porter (R–IL) and James Walsh (R–NY), who chair the House Appropriations subcommittees that oversee the budgets for NIH and NSF. They might revisit the issue in this year's appropriations bills.

But congressional aides caution against betting that lawmakers will undo the FOIA requirement as nonchalantly as they enacted it. Some members want to let the process work and see if OMB can come up with a rule that the scientific community can live with, says one Science Committee staffer. That doesn't seem likely. No matter how imaginative OMB may be, it will be hard to soften the meaning of the words "all data."

–BRUCE AGNEW

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GENOMICS

India Prepares Research, Policy Initiatives

CHENNAI, INDIA—Senior government officials and scientists last week endorsed a series of steps to bring India into the mainstream of global genomics research. But the proposals—which include studies of human diversity and plant genomes, participation in an international rice genome project, and new laws to permit the patenting of novel genes—seem likely to face vocal opposition on social, ethical, and political grounds.

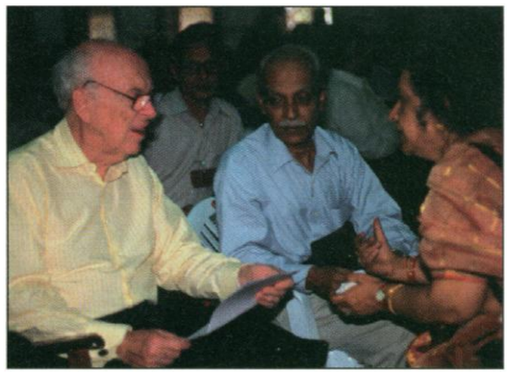
"Biotechnology will be the key to India's future, both for modern agriculture and the pharmaceutical industry," Nobelist James Watson, emeritus director of New York's Cold Spring Harbor Laboratory, told some 5000 Indian scientists gathered last week at a daylong Genome Summit held as part of the annual Indian Science Congress here. "India should take DNA technologies far more seriously if it does not want to be left behind." At the same meeting, Manju Sharma, secretary of the government's Department of Biotechnology, promised to strengthen "our nascent genomics program ... so that India can put the right foot forward into the next millennium."

Sharma has asked the government for up to $40 million for genomics research annually for the next 10 years, some 16 times more than the present rate of funding. Part of that would create a national network of centers of excellence to coordinate the expertise needed to understand the human genome, starting with a Center for Human Genetics Research in Bangalore planned for later this year. The Congress endorsed her request, which is currently before the prime minister.

Biotechnology advocates say that India is a "living laboratory" for studying human genetics. A recent study by the Anthropological Survey of India found "4635 distinct human communities like castes and tribes, including as many as 75 endangered tribal groups, 324 functioning languages, and 25 scripts." But there is great concern that any information obtained from such a diverse population will be exploited by multinational drug and food companies and not benefit the Indian public. Vandava Shiva, head of the Research Foundation for Science, Technology, and Ecology, wants a 5-year moratorium on commercial transgenic products "to ensure biosafety and protect the rights of small farmers." The near absence of domestic industry involved in genomics work to date is another major stumbling block to progress, as are antiquated laws on intellectual property.

The new network would build on several tentative steps India has taken recently to stimulate genomics research. In 1994, for example, it began a $2.5 million initiative to explore the genetic diversity of its people and to study the country's most common genetic diseases. The initiative has created 14 genetic counseling centers across the country for molecular diagnosis and treatment of a variety of genetic disorders, including thalassemia and muscular dystrophy. Sharma also would like to expand the number of counseling centers.

A small plant genome program has also been started. Last year India put up $250,000 for a Plant Genome Research Center at the Jawaharlal Nehru University in New Delhi, but debate continues on whether the first plant to be targeted should be an edible legume, rice, or a medicinal plant. Last week Rajendra S. Paroda, director-general of the Indian Council of Agricultural Research in New Delhi, told *Science* that the country "will participate as an equal partner in the rice genome initiative," an international effort led by Japan. Although details of the program are still sketchy, experts hope that India will take up work on sequencing at least one chromosome.



Gene pool. James Watson (left) meets with geneticist Sharat Chandra and Manju Sharma at Genome Summit.

CREDIT: P. BAGLA

Agreeing on the need for genomics research doesn't remove the obstacles facing scientists, however. India still does not recognize product patents in the areas of agriculture, pharmaceuticals, and medicines, and patenting life-forms is prohibited. In addition, most biotech companies are involved in vaccine development and tissue culture, not genomics. "India should get its local industry onboard and should be looking seriously at private sector funding for its genome program," says Watson, the former head of the genome project at the U.S. National Institutes of Health, adding that his "biggest mistake [there] was not to appreciate the commercial value of the human genome."

Although the political climate is not hospitable to a quick change in patent law, India's status as a founding member of the World Trade Organization requires it over the next several years to recognize product patents and to harmonize its policies with the rest of the world. And there are signs that officials may be ready to mount such an effort. Breaking a long-standing taboo on even discussing the subject, Sharma told *Science* that "India should start permitting the patenting of genes, and rules should be so changed that our scientists can patent the novel genes and products they find."

In addition to possible legal reforms, there remains a need to educate the public about genetically modified organisms. The possible introduction of the so-called "terminator gene" in Indian crops has sparked numerous protests, and on 2 December farmers' organizations destroyed seven sites in southern India that were testing a transgenic variety of cotton developed by the Monsanto Co. M. S. Swaminathan, a geneticist and chief of the M. S. Swaminathan Research Foundation here, says "good bioethics, biosafety, and biosurveillance policies and practices are needed to dispel these fears." Last week, at a national meeting sponsored by the foundation in conjunction with the Congress, more than 100 scientists and policy-makers proposed a high-level and independent National Commission on Genetic Modification of Crop Plants and Farm Animals to advise the government.

Government officials declined to comment on the value of such an initiative. But Sharma warned that prompt action is needed. "India has a billion mouths to feed, and there is no question of increasing the arable land. The only option is to increase productivity through the judicious use of biotechnology."

–PALLAVA BAGLA