serve programs like ATP. Its conclusions also contrast with a recent National Academy of Sciences (NAS) report that was cautious in its assessment of governmentindustry partnerships. That study, chaired by former NAS President Frank Press, concluded that the federal government "should encourage, but not directly fund, private-sector commercial technology," unless it would benefit government missions or open up a broad new market only with government help. The Council on Competitiveness study "will be used as ammunition by those who want to counter the Press report," predicts one congressional staffer.

Last month, a group involved in the study shared its findings at a dinner with five senators, including Mark Hatfield (R–OR) and Ernest Hollings (D–SC), who have been advocates of such partnerships. But council of-

LIFE SCIENCES\_

## **Animal Activists Target NASA Mission**

A multinational space project to examine the effects of weightlessness on rhesus monkeys has come under heavy fire from animalrights activists, and as a result, its planned launch this fall may be in jeopardy. Members of Congress are asking questions about the project, and National Aeronautics and Space Administration (NASA) chief Daniel Goldin has ordered a complete review of its scientific justification and ethical implications. Last week, he told a congressional panel "I would like to withhold judgment" on the research until the review is completed next month.

The controversy pits the political muscle of animal-rights activists and their allies who have called the experiments "one giant leap backward for mankind"—against NASA life scientists eager to conduct the first comprehensive examination of the effects of weightlessness on muscles, bones, the immune system, and coordination. The Russian Space Agency is providing the Bion capsule and the launcher, while the Russian Institute of Biomedical Problems is responsible for training the rhesus monkeys that will be used on two flights. U.S. and French researchers will conduct the bulk of the experiments.

The campaign against the project is being led by People for the Ethical Treatment of Animals (PETA), which argues that the project is both scientifically unnecessary and inhumane. PETA has run newspaper ads urging readers to call Goldin and express outrage at what it calls "mutilation, torture, and killing of monkeys." NASA and members of Congress have received hundreds of letters and calls from PETA members in recent months protesting the Bion mission, say NASA officials and congressional staffers. And the campaign has caught the interest of lawmakers.

"There is a lot of concern being expressed by my colleagues," Representative Jerry Lewis (R–CA), who chairs the House Appropriations subcommittee that oversees NASA's budget, told Goldin at a hearing to review NASA's proposed 1997 budget. Goldin responded that he has not yet decided whether to endorse the project's scientific merit, the need to use monkeys, or the quality of animal care. "We should not be flying in an inhumane fashion," he added.

NASA officials say they are confident Bion will pass its next test. "I welcome a review by any unbiased group," says Joan Vernikos, director of NASA's life and biomedical sciences and applications division. NASA has gone out of its way to ensure Bion meets U.S. standards of animal care and to ensure highquality science, she says: "We've put on all the bells and whistles."

Many of the experiments planned for the Bion program, which includes a second flight in 1998, were drawn up several vears ago to

fly on a U.S. shuttle mission. When that flight was canceled 2 years ago, U.S. and French scientists hooked up with a Russian program that has launched five missions involving rhesus monkeys. As a result, says Vernikos, most of the planned Bion experiments have gone through four peer reviews.

The latest review, completed in February by 13 U.S. and French life scientists from outside NASA, concluded that "the use of rhesus monkeys in the proposed studies is well

justified" and that "the quality of animal care appears excellent." The panel, noting that "the studies planned for Bion 11/12 would not be possible in humans during space flight," expressed no major concerns with procedures to be carried out in Russia. These include four separate surgeries and two other medical procedures to implant brain electrodes and eye and ear coils and other apparatus in each monkey. And it said there was no evidence that the monkeys would suffer any permanent injuries.

The panel ranked 15 of the 18 projects as outstanding or excellent, and Vernikos says that NASA has dropped experiments that fell below those grades. Four others were jettisoned because of budget constraints, technical problems, and a decision to focus on musculoskeletal research, she adds.

The major weakness of the program, accord-

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ficials and those responsible for the study insist they do not want to get involved in the political battles over funding such activities. "We want to emphasize the importance of partnerships, not whether or not we get more money," says McTague, who attended the dinner. "We just want to get the message out about the most effective way to reach desired national outcomes," he says.

-Andrew Lawler

ing to the report, is the lack of communication between the United States and Russia. There is no formal mechanism for sharing data, NASA scientists lack a good working knowledge of Russian procedures, and Russian modifications have not been relayed to experimenters, it says. The panel recommends that a senior scientist be named to oversee the project.

"We're trying to tighten the management," says Vernikos, noting that U.S. managers are discussing with their Russian counterparts the need for one scientist to be in charge. Coordinating peer review with Russia has also been a problem. The Russian Academy of Sciences reviewed the Russian Bion ex-



blitz. PETA's ads have sparked letters to Congress

iewed the Russian Bion experiments last fall, but Vernikos says she has not seen all the results. Joint protocols on animal care and use should be completed in May, she adds.

In contrast, PETA officials see the February report as vindicating their concerns and say its comments show that the program is flawed. Mary Beth Sweetland, PETA's director of research, investigations, and rescue, wrote to Goldin on 21 March that the report contains "startling condemnations" of the science on Bion.

"We ask you again to intervene immediately to stop a project that has already embarrassed NASA and continues to do so," she wrote. In a previous letter to Goldin, Sweetland said the experiments amount to "grotesque neurological assaults" and that most monkeys would suffer from "painful postsurgical complications." NASA officials disagree, and Vernikos says that none of the 10 monkeys flown by Russia on previous missions has suffered permanent injuries.

For U.S. and French researchers, Bion represents their best chance to do such research before 2004, when the space station's animal habitats are in place. Vernikos believes the work is essential: "You can't be in this field without using animals for research." But Goldin must first convince lawmakers that Bion deserves to get off the ground.

-Andrew Lawler