pose a threat, and the U.S. Department of Energy (DOE) will provide initial funding of roughly $40 million over the next 2 years to track them down. Lending extra urgency to the initiative—which will be organized and managed by the International Atomic Energy Agency (IAEA) in Vienna, Austria—are revelations about the legacy of a secret Soviet research program to spray radioactive cesium on agricultural fields.

Because there are "literally millions" of radiological sources that could be used in a dirty bomb, "it is crucial to focus limited resources on those that could pose the most dangerous potential terrorist threat," says Matthew Bunn of Harvard University's Belfer Center for Science and International Affairs. "Russian openness on data about how many sources of what types were produced, and where they went, will be crucial to success."

The hunt is on. These hot Georgian generators raised dirty-bomb fears.

Vague fears that a terrorist might try to concoct a dirty bomb from radiological materials and conventional explosives gained a measure of credibility last week, when the U.S. government trumpeted the news that it had foiled an alleged al Qaeda plot to steal radioactive materials from an undisclosed U.S. facility. Far more worrisome to many observers, however, is the possibility that terrorists could obtain stray radioactive materials in former Soviet republics. The magnitude of this threat is unknown, mainly because Russia has not been forthcoming about the Soviet nuclear legacy out of fears that it could be held liable for materials outside its borders after the Soviet Union dissolved, says IAEA's Abel Julio González. At the same time, the U.S. government has focused on the threat posed by former Soviet fissile materials.

But the demands for better information grew urgent after the 11 September attacks. "The U.S. got very nervous" about radiological sources, says Kenneth Luongo, executive director of the Russian American Nuclear Security Advisory Council in Washington, D.C. According to Bunn, DOE launched a series of classified studies on the impact of potential radiological terrorist attacks and assessments of which materials posed the most serious threats. Ratcheting up anxiety levels was the recent discovery of Soviet-made thermoelectric generators packed with strontium-90 that IAEA and the Republic of Georgia recovered last February near the breakaway Abkhazia region (*Science*, 1 February, p. 777).

A newly recognized threat could come from loose cesium chloride. The radioactive form of this salt has a variety of uses, including sterilizing medical supplies, and is kept under strict control because it is manufactured as a talcumlike powder that's easy to disperse. González told *Science* that IAEA has learned from reliable Russian sources that the Soviet Union ran a secret program in which farmers spread radioactive cesium chloride powder on their fields. Experts speculate that the purpose of the program, code named Gamma Kolos (*kolos* is Russian for "ear," as in ear of corn), was to see if the powder would alter germination rates or induce beneficial mutations in corn. At least four trucks packed with the substance turned up recently in Moldova, a tiny and impoverished former Soviet republic, and recent photos of similar trucks have surfaced in the Republic of Georgia. The cesium-137 in each truck has an activity of about 3500 curies—"a very significant amount," notes González.

As scary as that sounds, Bunn and others warn that stepped-up efforts to track down radiological sources should not come at the expense of securing "hotter" fissile materials that could be used to create far more devastating nuclear bombs. "Radiological terrorism could be expensive to clean up, but it would not mean tens of thousands of people dead and the heart of a major city incinerated in a flash," Bunn says. But the dirty bombs are easier to produce—and the threat is finally being taken seriously. **–RICHARD STONE**

GERMANY

Gruss Takes Max Planck Helm

HALLE AN DER SAALE, GERMANY—Peter Gruss's honeymoon period as president of Germany's premier research organization, the Max Planck Society (MPG), could not have been shorter. He spent his first full day on the job waiting to hear whether he would have to rein in the organization's budget. But discussions on Monday between the federal and state governments eased what Gruss called his "first worry": The society got a 3% budget increase. MPG was spared, at least for now, from the nationwide belt-tightening that most German agencies are expecting in response to the sluggish economy.

Observers had already predicted that flat

ScienceScope

France's High Flyer French conservatives are riding high after their crushing victory in France's 16 June legislative elections. So it's not surprising that Prime Minister Jean-Pierre Raffarin reached for the stars in choosing a new science chief. Claudie Haigneré, Europe's only woman astronaut and a veteran of missions to the Mir and international space stations, has been tapped as minister of research and new technologies. She replaces interim research chief François Loos and will report to philosopher Luc Ferry, who was earlier named head of a "superministry" for youth, education, and research.

The appointment puts Haigneré "in a key position to shape the future of Europe's science and technology," says Antonio Rodotà, director-general of the European Space Agency. But French researchers say it's too early to know whether Haigneré—a doctor and neuroscientist who commanded a Soyuz space capsule on its return from Mir in 1999—will be able to pilot France's research effort out of its current financial doldrums. Indeed, some scientists say they are keeping a closer eye on newly appointed finance minister Francis Mer. The former steel industry executive is a well-known advocate of research and development spending. Says the head of one major research institute: "I am not too worried about the new government—at least not yet."

Thinking Ahead Congress hasn't yet finished work on the 2003 budget, but the Bush Administration is already thinking about adding some "life" to its 2004 request. The White House budget office late last month released its annual budget guidance to research agencies, and "molecular-level understanding of life processes" is one of six areas—and the only new idea—identified as a priority.

Agency officials are just beginning to work out what the bioscience initiative might look like, who would be involved, and how much it might cost. "We're in the brainstorming phase," says one National Institutes of Health researcher. The other priorities are continuations of current multiagency initiatives, ranging from homeland defense and nanotechnology to information technology and climate change.

Whatever plan emerges later this summer, the White House insists it must be "relevant" to national needs, have measurable performance criteria, and be funded through a competitive process.

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or even declining budgets would threaten Gruss's main goal: to keep MPG in the top ranks of global science. He wasted no time confronting the government over the matter in his inaugural speech at MPG's annual meeting last week. Although he acknowledged that German scientists can't expect a windfall similar to the 5-year budget doubling that the U.S. Congress has promised the National Institutes of Health, Gruss said a budget cut would send exactly the wrong signal to German scientists and to the rest of the world. "We can save anywhere except in shaping our future," he said.

All yours. Peter Gruss (left) takes reins of the Max Planck Society from Hubert Markl.

Gruss, a prominent developmental biologist who has been a director at the Max Planck Institute for Biophysical Chemistry in Göttingen since 1986, has little political experience, but he has not been reluctant to jump into political debates. In remarks to the press last week, he strongly criticized Germany's compromise law on the use of human embryonic stem cells passed by parliament earlier this year (*Science*, 8 February, p. 943). Although the law allows basic research to go forward by permitting researchers to work on existing stem cell lines, he pointed out that the compromise rules out any therapeutic applications because these lines have been exposed to mouse cells and would not be safe for implanting in humans. He has also said that he would welcome final passage of a controversial immigration law in Germany, saying it would remove obstacles to recruitment of top foreign scientists.

Outgoing MPG president Hubert Markl leaves the organization in the hands of one of his former students. At the 14 June handover ceremony, Markl joked that Gruss "showed good judgment at an early age" when he chose a different field after hearing Markl's lectures in zoology.

Markl's 6-year term was dominated by rapid expansion. The society founded more than a dozen new institutes in the former East Germany, bringing the total up to 80. Now, with 18 institutes and one research station in the new *Länder*, the "buildup of the east" is all but completed, Markl said at a press conference. East-West divisions are gone, he said, and "the Max Planck Society is now a unified organization." Markl also earned praise during his term for encouraging the society to examine the darker periods of its history. Last summer, he offered the first explicit apology to victims of abuses during the Nazi era by scientists of the Kaiser Wilhelm Society, the forerunner of MPG (*Science*, 15 June 2001, p. 1979).

Gruss told the MPG meeting that one of his top priorities will be strengthening connections with German universities, especially through the new International Max Planck Research Schools, which are jointly funded and run by Max Planck institutes and cooperating universities. Establishing the interdisciplinary graduate schools "is one of the best things Markl did" as president, says Wieland Huttner of the Max Planck Institute for Molecular Cell Biology and Genetics in Dresden. Gruss said he hopes to strengthen the existing 19 schools and launch seven new ones already in the planning stages.

–PHILIPP WEIS AND GRETCHEN VOGEL

Philipp Weis is a science writer in Berlin.

IMMUNOLOGY

Plant a Few Cells, Sprout a Thymus

Shriveling as it ages, wedged between the heart and the thyroid, the raisin-sized thymus is an unlikely warrior. Still, without one, people wouldn't last long. The thymus attracts a blank slate of stem cells from the bone marrow and transforms them into infection-fighting T cells. Now, two teams have found that a tiny subset of cells from a mouse embryo can be grown into a full-blown thymus and beget a healthy immune system in the recipient mice. The finding suggests that it might be relatively easy, as far as regenerating organs goes, to give a failing thymus a boost.

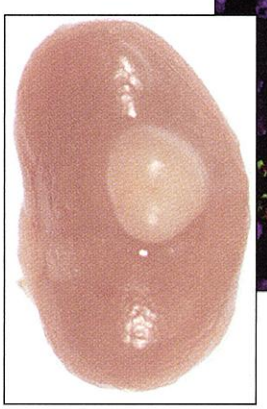
"What's interesting is the ability to generate an organ from a small population of cells," says Nancy Manley, a developmental biologist at the University of Georgia, Athens, who was "totally floored" when she first heard about the work.

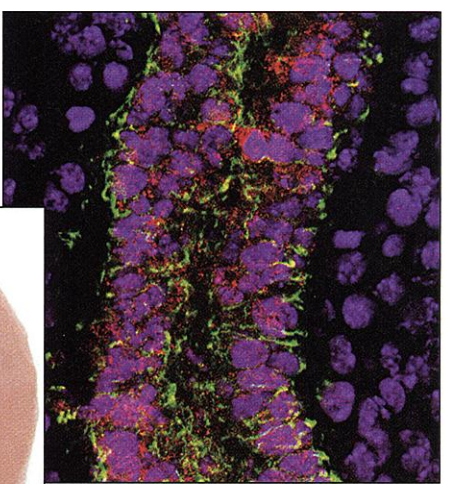
Both groups, one at Monash University Medical School in Melbourne, Australia, and the other at the Centre for Genome Research at the University of Edinburgh, U.K., are quick to say that they haven't found the putative "thymic stem cell": a single cell that, by itself, can produce a fully functioning thymus. Both used hundreds of cells to jump-start the thymus-growing process. However, the teams say the work strongly suggests that such a stem cell, whose existence is a source of passionate debate in the thymus world, is buried somewhere amid the cells they isolated.

The Monash group, led by immunologists Richard Boyd and Jason Gill, and the Edinburgh group, led by developmental immunologist Clare Blackburn, started with cells that met two criteria. They had to belong to the set of functional cells in the thymus, called thymic epithelial cells. And they had to flourish early in development but fade from the picture later on—a pattern a stem cell would follow. Both groups used monoclonal antibodies, which bind to specific molecules on a cell surface, to home in on epithelial cells that fit the profile. These cells were marked by two proteins, MTS20 and MTS24.

In mouse embryos, so-called MTS20/24 cells make up about a third of the cells in the developing thymus. The researchers grafted clusters of these cells onto the kidneys of adult mice and watched what happened. Whether 40,000 or 1000 MTS24 epithelial cells were implanted made little difference, says Gill: "We put them underneath a kidney from a mouse, then pat it on the head and let it run around for 4 or 8 or 6 weeks, then we open up the mouse and lo and behold, there's a plump, juicy, functioning thymus." Gill and his colleagues, who grew the organs in mice that had their own thymuses, found a host of T cell types within the new tissue.

Blackburn and her colleagues implanted even fewer cells, less than 500, into four "nude" mice that lack a thymus altogether. This allowed them to test the new-grown thymus's powers by examining distant lymph





Organ transplant. A class of young thymus cells in a mouse embryo (stained red) grow into a working thymus when grafted onto another animal's kidney (*inset*).

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