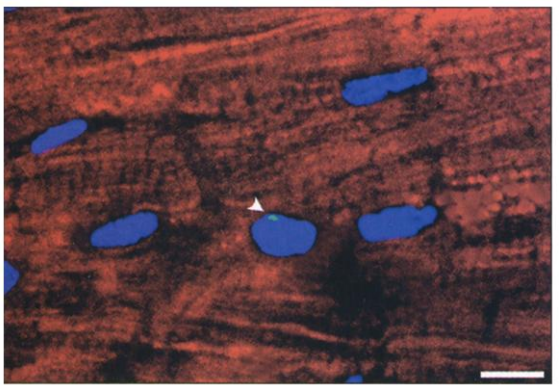
benefit in remodeling the heart and possibly improving cardiac function." Several types of cells appeared to regenerate, including cardiac muscle, smooth muscle, and endothelium, Anversa says. Cells containing the Y chromosome appeared "perfectly indistinguishable" from neighboring cells that lacked a Y.

Suspecting that healing the heart might be a job for stem cells, Anversa's group then searched the heart tissue for three molecular markers characteristic of the versatile cells. They found cells bearing these markers both in transplanted and control hearts, suggesting that undamaged hearts harbor populations of such cells. The transplanted hearts contained even higher numbers of the cells, some of which came from the donor and others from the recipient, suggesting that the heart recruits stem cells from other parts of the body to aid in regeneration.

But it is unclear whether these are bona fide heart-specific stem cells and, if so, exactly how they promote regeneration of heart tissue. Nor do the researchers know where the cells originate or how they migrate. Before they can claim to have found stem cells, Anversa says, the team must isolate the cells and demonstrate in vitro that they are self-replicating and capable of differentiating into many types of tissue—work that is now under way.

Discovering how the heart might repair damaged tissue could have enormous, if distant, implications for treating heart disease. But as yet it's not even clear that the new cells help the transplanted organ, Binkley cautions. "Having recipient cells enter the [heart] could have certain detrimental effects," Binkley says, such as clogging up blood vessels. Only additional studies, he says, can determine if such cells are more balm than bane.



Help from afar? A cell containing a Y chromosome (arrow) has taken up residence in heart tissue from a female donor.

—CAROLINE SEYDEL

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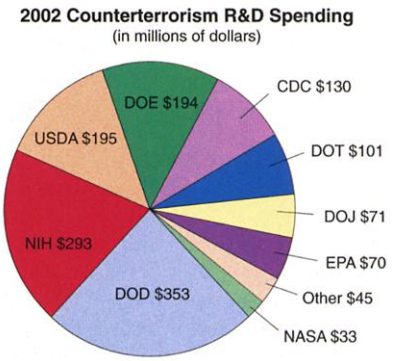
U.S. BUDGET

Spending Triples on Terrorism R&D

NASA may be best known for sending a man to the moon. Now it wants to show that it's no slouch when it comes to fighting terrorists. The U.S. space agency is one of 11 federal agencies (see pie chart) to share in a record $1.5 billion that Congress has showered on terrorism-related R&D for 2002 in response to the 11 September and anthrax attacks. The money—nearly triple last year's spending—will be used for everything from new laboratories for studying potential bioweapons to developing hacker-proof computer systems.



Spreading the wealth. Eleven U.S. agencies will share a record $1.5 billion in terrorism-related research funds.

The money is a windfall for researchers, who earlier last year were fighting to overturn proposed cuts in many terrorism-related R&D budgets. Even after the attacks, the White House paid scant notice to research in its $40 billion emergency recovery package that was approved by Congress. But the Senate took up the cause with a vengeance, labeling as urgent more than $800 million in new terrorism-related R&D projects. "We heard from everyone—university scientists, industry, [federal] researchers—about things they could do to reduce the threat if only they had some money," says an aide to one Senate Democrat.

The final package, mostly inserted late last month into the 2002 appropriations for the Department of Defense, contains $711 million for R&D. That freshet of funds, when combined with spending approved earlier, will push 2002 spending on terrorism-related R&D up 157% over the $579 million spent in 2001, according to an analysis by the American Association for the Advancement of Science (publisher of *Science*).

Most of the new money will be used to expand existing programs aimed at preventing terrorist attacks. The military, for example, gets a 50% increase for its multifaceted terrorism research efforts, to $353 million. The Centers for Disease Control and Prevention, which has played a high-profile role in investigating the anthrax mail attacks, gets $1 billion overall for security-related expenses, including $130 million for studying anthrax and other potential bioweapons. That 256% increase "is hopefully just a down payment for research too long neglected," says one science society lobbyist.

The bioterrorism budget at the National Institutes of Health will soar by nearly 500%, to $289 million. The total includes $75 million for a new highly secure laboratory to work with dangerous pathogens. The Department of Agriculture is also slated to get new laboratories; of $113 million in new funds, $73 million is set aside for an animal biocontainment facility at the National Animal Disease Laboratory in Ames, Iowa, and improvements at the controversial Plum Island Animal Disease Center in New York (*Science*, 26 May 2000, p. 1320). The Department of Energy will devote $78 million of its $126 million in new funds to help prevent nuclear terrorism.

The country's space agency gets $33 million for work on two fronts: information systems that terrorists can't penetrate, and imaging systems and other technologies to better detect enemies. And the Environmental Protection Agency gets $70 million to, among other things, develop better methods to clean up after any bioweapons are unleashed.

—DAVID MALAKOFF

STEM CELL RESEARCH

Rat Brains Respond to Embryonic Stem Cells

In the heated ethical debates over embryonic stem (ES) cells, Parkinson's disease often figures large. Advocates for more research say ES cells offer the best hope for treating or even curing this devastating and deadly disease, which gradually robs patients of their ability to move. The advocates hope that scientists will someday be able to turn ES cells into dopamine-producing cells, replacing those that are lost in the disease. So far, however, evidence that ES cells can make this switch has been limited to experiments in lab culture, not animals.

Now, in a paper published online on 8 January by the *Proceedings of the National Academy of Sciences*, a team of neuroscientists reports that, indeed, mouse ES cells can become dopamine-producing neurons in the brains of rats. These experiments are the first to show that the specific type of neurons missing in Parkinson's disease can develop from an ES cell in an animal's brain and lead to partial recovery.

But the work does not mean doctors will soon be injecting human ES cells into Parkin-

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