

ciple be millions of times more efficient.

"The programmatic requirements are daunting," concedes Goldin. But if researchers meet the challenge, "it opens up the prospects for some truly innovative missions," he says. "It may be a probe to sample the interstellar medium ... or a mission to explore the Kuiper Belt. But one thing is for sure: It will literally be out of this world."

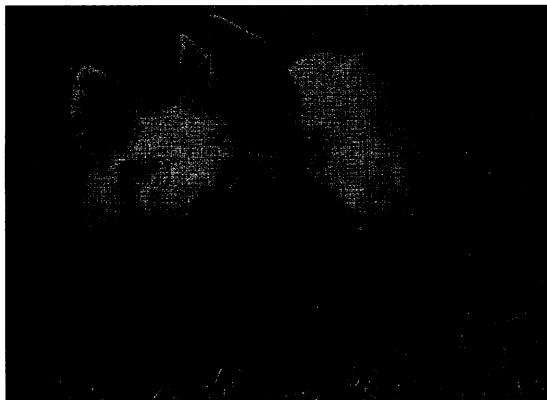
—JAMES GLANZ

BIOTECH REGULATIONS

Paving the Way for British Xenotransplants

The transplantation of animal organs into humans moved a step closer in Britain last week, when the government circulated to hospitals a set of national guidelines intended to ensure that proposed clinical trials don't put patients or the public at risk of new diseases. The proposed trials remain highly controversial, but by providing a regulatory framework, the new rules encourage companies to move ahead, say officials at Imutran, a Cambridge-based company working toward eventual xenotransplantation trials.

IMUTRAN



Safe for transplant? Tissue from these genetically engineered pigs sparks a reduced immune response from humans.

Xenotransplants could help meet a serious shortage of donor organs: Globally, only one person out of every three who need new organs will find a donor this year. Organs from animals such as pigs could make up the deficit. Although the human immune response would normally destroy transplanted animal tissue, researchers can now produce "humanized" animal organs from pigs; the pigs have been genetically engineered so that their tissue doesn't produce the molecules that trigger an early portion of the human immune response.

But there are concerns that animal tissues might harbor hidden pathogens, which might pass from animal to human and threaten patients or even the general public. For example, studies at the Institute for Cancer Research in London have found that in

the test tube, a pig retrovirus can infect human cells, raising fears that such retroviruses could pass to xenotransplant recipients. "It is a question of balancing the needs, which are real because there are never going to be enough human transplants, against the possible dangers of using animals," says Lord Habgood, chair of the U.K. Xenotransplantation Interim Regulatory Authority (UKXIRA) and a former bishop of York who trained as a pharmacologist.

In the United States, these worries have led the Food and Drug Administration to consider xenotransplants among the other biomedical technologies it regulates, but in Britain the regulatory machinery had lagged behind. Now Britain has its first national review procedures for assessing xenotransplant risks. All applications for clinical trials will be scrutinized by the authority, which will then make a recommendation to the health minister for a final decision. Human trials will take place only "if and when we are fully satisfied that the risks associated with such procedures are acceptable, taking account of all the available evidence at the time," Health Secretary Frank Dobson said. UKXIRA is also building up a long-term surveillance plan to monitor any infections arising from xenotransplants. Their recommendations are only advisory at the moment, but Dobson said that they may become legally binding if there's a great deal of public concern.

Animal rights organizations, which oppose the use of animals as organ donors, said the new rules were "a very backward step in terms of animal welfare [that] could pose serious health risks to the human population," as Mike Baker, chief executive of the British Union for the Abolition of Vivisection, put it. But biotech companies welcomed the new framework. Officials at Imutran, which is now a division of the Basel, Switzerland-based biotech giant Novartis, say that the path toward trials is now more straightforward, as it's easier to deal with a standardized national approach.

Imutran researchers are scanning for pig viruses in 160 patients worldwide who have received small portions of pig tissue, such as blood vessel valves; they are also studying monkeys that received pig grafts. If the results, expected later this year, are promising, the company will apply for a human trial. The first such trials may examine the benefits of using a "humanized" pig liver outside the body as temporary support for a patient awaiting a human organ.

—NIGEL WILLIAMS

SCIENCE POLICY

USGS Nominee Breaks Ground

The White House has tapped a new chief for the U.S. Geological Survey (USGS), the Interior Department's science agency. Last week President Clinton announced his intention to nominate Charles Groat, a geologist who's a familiar face in policy circles but little known among researchers.

Groat, associate vice president for research at the University of Texas, El Paso, has headed Louisiana's geological survey, served on several National Research Council panels, and spent 2 years as the American Geological Institute's executive director. Groat says it's a "fair appraisal" that his expertise lies in "applications of science to decision-making." He adds: "That's frankly what I think the survey needs more than anything else."



Top USGS stratum. Charles Groat.

Some grumble that Groat lacks the research muscle of past USGS directors. As a rule of thumb, "the best thing for the survey is someone whose scientific credentials are unimpeachable," says Debra Knopman, a former Interior official and USGS geologist now at the Progressive Policy Institute in Washington, D.C. "You want someone who's above the fray." Sources say Groat's name may not have been on a secret list of potential directors provided to Interior by the National Academy of Sciences. Interior Secretary Bruce Babbitt declined to comment, but defended Groat's scientific credentials: "Look at his bio—what he's done and where he's taught," he said.

Others say Groat could give the embattled agency a boost. His "policy experience will bring a new perspective to the role of USGS director," says Mary Lou Zoback, a USGS geophysicist in Menlo Park, California. USGS is coping with staff cuts and a drive to make it customer-oriented (*Science*, 19 September 1997, p. 1755). Moreover, the agency has always struggled to defend its mission, which includes mapping, hydrology, seismology, volcanology, and—since the National Biological Service was folded into it in 1996—biology. Indeed, 3 years ago Congress came within a hair of eliminating USGS. If confirmed by the Senate, Groat says he plans to "raise the profile" of the agency—without cutting science: "The issue is making sure the fundamental science is aligned with what the future needs are."

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—JOCELYN KAISER