

REPRODUCTIVE SCIENCE

Human Cloning Plans Spark Talk of U.S. Ban

U.S. lawmakers have renewed their efforts to ban human reproductive cloning after hearing last week from two groups that say they intend to produce a human clone.

Several bills were introduced 2 years ago after a physicist, Richard Seed, made a widely publicized claim that he would attempt to clone a human. But scientists



Pushing the envelope. Fertility researcher Panos Zavos (right) promised to screen human embryos created by cloning for possible defects. MIT's Rudolph Jaenisch (left) says screening for some defects is impossible.

warned that loosely worded legislation could stifle a broad range of important health research, and no bill was passed (*Science*, 20 February 1998, p. 1123). More recently, the U.S. Food and Drug Administration (FDA) has said it would prohibit any attempts at cloning because the procedure is unsafe. But at a 28 March hearing of the House Energy and Commerce Subcommittee on Oversight and Investigations, lawmakers worried that FDA's authority could be struck down in court, or that it might not be able to prevent secretive efforts to clone a child. "It is my view that the risk is so grave ... that we will have to act," said panel chair Representative James Greenwood (R-PA).

The hearing featured several experts on animal cloning as well as representatives from two groups that say they are attempting to produce a human baby using nuclear transfer techniques. That's the technology used to create the sheep Dolly as well as cloned goats, cattle, mice, and pigs. Scientists remove the nucleus of an egg cell, replace it with a nucleus from the animal they wish to clone, and then jump-start embryo development with an electric shock or chemical signals.

Chemist Brigitte Bossilier of Clonaid, an organization founded by the Raëlian religious movement, spoke about the company's plans to transfer the nucleus of a frozen cell taken from a baby that died after surgery. Bossilier

testified that the company's scientists, working in a secret location in the United States, had been practicing removing nuclei from cattle eggs but have not yet begun to work with human cells. She told the panel that the developmental problems seen in animal clones would not necessarily occur in humans.

Infertility researcher Panos Zavos of the Andrology Institute of America in Lexington, Kentucky, who has announced his intention to produce clones for infertile couples, told the committee that he and his colleagues would carefully screen embryos for abnormalities during gestation. "We would not step on dead bodies or deformed babies" to pursue the technology, said Zavos, who is leading work in an undisclosed country.

But developmental biologist Rudolph Jaenisch of the Massachusetts Institute of Technology's Whitehead Institute told lawmakers that Zavos's and Bossilier's description of the risks was "totally irresponsible and misleading." He said he suspects that all animal clones so far—even those that seem normal—have subtle defects in the brain and other organs. Although scientists are not yet sure, Jaenisch thinks a gene regulation process called DNA methylation goes awry in the cloning process. Currently there is no test for methylation abnormalities, he said.

FDA's Kathryn Zoon testified that her agency has jurisdiction over human cloning as part of its oversight of biological products. But several lawmakers worried that her argument sounded similar to the FDA's justification for regulating tobacco, which courts struck down. Several members also questioned the agency's ability to act quickly. Despite extensive coverage of Clonaid in the press, it wasn't until 2 days before the hearing that the FDA told Bossilier in a letter that Clonaid must obtain FDA approval before proceeding with its cloning efforts. Bossilier has not yet responded.

The testimony "has raised our level of interest in legislating in this area," said Representative Billy Tauzin (R-LA), chair of the parent Commerce committee. Greenwood said that he and Tauzin would soon introduce legislation to regulate attempts at human cloning. On the day of the hearing, Representative Brian Kerns (R-IN) introduced a bill that would impose fines or prison terms for anyone who undertook human nuclear transfer experiments "with the intent of implanting the resulting cellular product into a uterus."

Tim Leshan of the American Society for Cell Biology says that Kerns's bill is narrow enough not to hobble mainstream research.

But he warned scientists to monitor its path closely. The wording "may seem fine in the beginning," Leshan says, "but you never know what could happen in committee or on the floor."

One scientist who testified said that he would favor a carefully worded ban on reproductive cloning. "We don't know how far human clinics have gone," explained developmental biologist and cattle cloning expert Mark Westhusin of Texas A&M University in College Station after the hearing. "For now ... it looks like we're going to need these types of regulations to get some control over it."

—GRETCHEN VOGEL

STEM CELL POLICY

Canadian Panel Aims For Middle Ground

OTTAWA—New guidelines proposed last week by a blue-ribbon committee would allow Canadian scientists to derive stem cells from embryos left over from fertility treatments or fetal tissue obtained from elective abortions. The proposal is less restrictive than U.S. guidelines currently under review by the Bush Administration.

Alan Bernstein, president of the Canadian Institutes of Health Research (CIHR), which formed the panel, says that the proposed guidelines would allow researchers to explore such questions as what makes a cell commit to becoming a particular type of tissue and whether stem cells can be used "to actually cure diseases." Adds Mick Bhatia, who works with blood stem cells at the John P. Robarts Institute in London, Ontario, "we certainly would be happy if the CIHR would



Tipping the balance. Janet Rossant says the panel weighed benefits and risks of using embryos.

fund research in this area."

U.S. policy, which is being reviewed by Health and Human Services Secretary Tommy Thompson, requires government-funded scientists to obtain embryonic stem cells from private sources. The Canadian panel took a more lenient approach, but it didn't go as far as U.K. rules, which allow scientists to create