SCIENCE POLICY

Cloning Bills Proliferate In U.S. Congress

Since members of the Raëlian religious movement announced in March that they plan to clone a baby in the United States (*Science*, 6 April, p. 31), anticloning bills have multiplied in both houses of the U.S. Congress. Several scientific organizations fear, however, that legislative attempts to ban reproductive cloning will also block research on "therapeutic" cloning that aims, for instance, to produce genetically matched embryonic stem (ES) cells and coax them to develop into a specific cell type to treat diseases such as Parkinson's.

Opposed. Senator Sam Brownback (R–KS) would like to outlaw all human cloning in the United States.

That's just what Senator Sam Brownback (R–KS) wants. He has been an outspoken critic of ES cell research as well as cloning because it involves destruction of an embryo. (To produce genetically matched cells, researchers would use nuclear transfer to create an embryo with the same DNA as a patient, allow the embryo to grow for a few days, and then culture a line of stem cells.) Brownback, who presided over a 1 May hearing of the Senate Commerce subcommittee on Science, Technology, and Space, has introduced legislation that would outlaw both types of human cloning, imposing a $1 million fine and 10 years in prison on anyone convicted of transferring a human cell nucleus into an egg.

At the hearing, Carl Feldbaum of the Biotechnology Industry Organization in Washington, D.C., and developmental biologist Rudolph Jaenisch of the Whitehead Institute for Biomedical Research at the Massachusetts Institute of Technology in Cambridge agreed that reproductive cloning would be unsafe and unwise. But they argued that therapeutic cloning holds great promise for treating certain diseases and urged that any legislation allow such work to continue.

Countering that view, several witnesses argued that therapeutic cloning is immoral and unnecessary because, they asserted, stem cells derived from adult tissues are as promising as embryonic cells. Some also argued that therapeutic cloning was bound to lead to reproductive cloning. The hardest task scientifically, said bioethicist Leon Kass of the University of Chicago, is creating the embryonic clone; transferring it to a womb is easy. Kass, who helped draft Brownback's bill, told the hearing that a ban on all nuclear transfer experiments with human cells "is the only realistic chance we have of preventing [reproductive] cloning."

Three of the four other bills introduced to date to regulate human cloning are less draconian than Brownback's. In the House, a bill sponsored by Brian Kerns (R–IN) would prohibit only "reproductive cloning," outlawing the transfer of an embryo created by nuclear transfer into a womb. A second, introduced by Cliff Stearns (R–FL), would prohibit federal funding for therapeutic or reproductive human cloning research. A third, sponsored by Vern Ehlers (R–MI), would outlaw all nuclear transfer in human cells "unless the nucleus of the human somatic cell has been modified so that the cell cannot develop to completion." In the Senate, Ben Nighthorse Campbell (R–CO) has introduced a bill that would prohibit the use of cloning techniques "for the purpose of initiating or attempting to initiate a human pregnancy." Another bill is expected in the next few weeks from Representative James Greenwood (R–PA) that would prohibit reproductive cloning, according to his spokesperson, but allow research on obtaining stem cells.

It is too early to know which bills, if any, might make it to the floor for debate, says David Moore of the Association of American Medical Colleges, much less whether any might pass. Science advocates will be following them closely. –GRETCHEN VOGEL

CREDITS: (TOP TO BOTTOM) DAVID EULITT/*TOPEKA CAPITAL-JOURNAL*/AP; NASA/DLR

STEM CELLS

DFG Gives Embryo Research a Boost

BONN—Germany's main research funding agency issued new guidelines last week paving the way for researchers to import human embryonic stem (ES) cells from other countries. The Deutsche Forschungsgemeinschaft (DFG) also recommended that Parliament pass a law, if needed, that would allow German researchers to derive their own stem cell lines from surplus embryos from in vitro fertilization (IVF) clinics. "The new guidelines are an important step ahead," says Oliver Brüstle, a stem cell researcher at Bonn University. "This is more than we hoped for 1 year ago."

But scientists hoping to start working with these cells may still have to wait. Germany's

ScienceScope

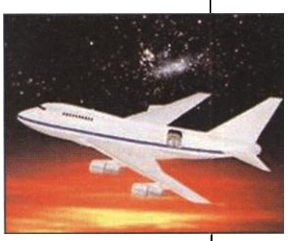
Megamerger Advances A major science publishing merger has cleared a key regulatory hurdle. Anglo-Dutch publishing giant Reed Elsevier said this week that the U.S. Department of Justice will not challenge its $4.45 billion acquisition of U.S. publisher Harcourt General. Research librarians had asked regulators to block the deal, which will give Elsevier control of more than 1500 journals, saying it will drive up prices (*Science*, 3 November 2000, p. 910).

The Association of Research Libraries in Washington, D.C., which represents 120 of the largest research collections in North America, expressed disappointment with the decision. But officials noted that U.K. officials must still sign off on the merger.

Thinking Again Criticism from researchers has prompted the World Medical Association (WMA) to reconsider new guidelines that would restrict the use of placebos in clinical trials. The group last week announced that it will review its 6-month-old interpretation of the Declaration of Helsinki, which urges researchers to avoid using placebos and instead provide test volunteers with either an experimental therapy or the best available current therapy (*Science*, 20 October 2000, p. 418).

But some experts have strongly objected, saying that approach would make it difficult to test certain new drugs. In response, the WMA will "investigate whether the guidelines are likely to restrict good, ethical research in any way," says WMA Secretary-General Delon Human. If rewording is needed, the matter will go to the WMA general assembly this fall.

Grounded A joint U.S.-German flying telescope won't get off the ground until December 2004—2 years later than scheduled. Costs for the Stratospheric Observatory for Infrared Astronomy (SOFIA) have taken off, however. NASA officials say the price of SOFIA, which will put a 2.5-meter infrared telescope aboard a modified Boeing 747 (above), has risen more than 20% to $366 million. Skyrocketing labor costs and technical difficulties are to blame, NASA Administrator Dan Goldin told a House panel last week.



flexibility needed to build and advance large international projects in Germany," such as the planned TESLA accelerator.

The dispute is likely to come to a boil next week, when the center directors are expected to take a position on the restructuring plan. Their stance will set the tone for a meeting on 25 May of the Helmholtz Senate, which includes representatives of the Research Ministry, the Science Council, and outside experts. Ganten predicts that both groups will ratify the overhaul, which would begin by changing the Helmholtz's legal status. In principle, individual centers could refuse to join the new entity, but the government could then assert its power to overrule any rebellious centers. Even so, some scientists are hoping to stop the juggernaut. Says DKFZ cell biologist Werner W. Franke: "We are fighting for the most precious thing we possess: the individual scientist's freedom of decision." –ROBERT KOENIG

With reporting by Richard Stone.

DRUG ADDICTION

Zapping Memory Center Triggers Drug Craving

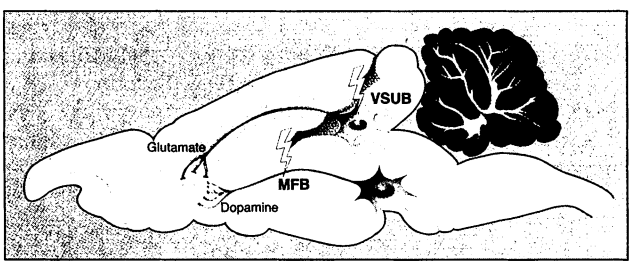
Stimulate a memory area of the brain in a rat that has kicked a cocaine habit, and the animal will desperately try to get another fix. In contrast, stimulation of the area that produces the high itself has little effect. Those findings, reported on page 1175 of this issue, show for the first time that the brain registers the high from cocaine in a separate place from where it retains the memory of, and craving for, the drug. The research opens up the possibility of new targets for anti-craving medications.

Attempts to develop new drugs to treat addiction usually focus on the brain's all-purpose "reward" area—a dopamine-rich pathway called the medial forebrain bundle in the rat. But in recent years, scientists have found indications that the reward function operates independently of craving for a drug. That's now been confirmed by the new study. "We have anatomically located the relapse circuits in the brain," says neuroscientist Stanislav Vorel of the Albert Einstein College of Medicine in New York City. And the main chemical implicated is not dopamine but glutamate, an excitatory neurotransmitter found throughout the brain.

The Einstein team, with Eliot Gardner of the National Institute on Drug Abuse (NIDA) in Baltimore, Maryland, first got rats hooked on cocaine by hitching them to intravenous catheters that delivered a dose of the drug every time they hit one of two levers in the cage. After establishing the rats' drug habit, the researchers made them go cold turkey by substituting a saline solution for the cocaine. Within a week, the rats stopped pressing the levers.

Human cocaine users who are trying to stay clean are often tempted to relapse by what psychologists call triggers, such as an emotion, a social situation, or a visual cue that brings back memories of being high. The researchers found that they could trigger an apparently analogous craving in the rats by juicing up part of their memory circuitry. When the researchers stimulated a glutamate-rich part of the hippocampus called the ventral subiculum, the rats furiously pressed the former cocaine lever for 5 minutes or so, apparently until it became clear that they weren't going to get a fix. Electrical stimulation of the reward center, in contrast, had no such effect, even though rats happily self-administer those jolts when given the opportunity.

Peter Kalivas of the Medical University of South Carolina in Charleston, who does research on how glutamate mediates drugs' effects on neural plasticity, says, "What makes this a wonderful model of craving is that it can trigger craving even with no drug present." He notes that although electrical stimulation of either brain area leads to dopamine release, it's "only when the signal originates in the hippocampus that it triggers the memory that is integral to craving."



Relapse circuit. Stimulation of the ventral subiculum (VSUB), but not the medial forebrain bundle (MFB), spurs drug hunger.

NIDA director Alan Leshner says this experiment adds to a picture that has become clearer over the past decade: that addiction entails two separate processes. One is "passive neuroadaptation"—that is, changes in circuitry that are the direct result of drug-taking; the other is "the laying down of memory traces," which occurs at a higher level of the limbic system, namely the hippocampus.

"A lot of people say the whole thing is dopamine," says Leshner. But in the search for medications to stem drug craving, he points out, substances targeted at glutamate may be more likely to get to the root of the matter.

–CONSTANCE HOLDEN

ILLUSTRATION: MODIFIED FROM S. R. VOREL AND WILLIAM PAREDES

ScienceScope

New Face France's science ministry has chosen a new research director. The government last week named Ketty Schwartz, a geneticist who specializes in the molecular biology of heart diseases, to replace geophysicist Vincent Courtillot, who is returning to his Paris laboratory (*Science*, 5 January, p. 27).

Schwartz told *Science* that it is "too early" to outline her agenda. But the appointment of a biomedical scientist, she says, is in line with the "accent and priority" that research minister Roger-Gérard Schwartzenberg has put on beefing up life sciences research. Courtillot says that Schwartz's biggest challenges will include boosting research at universities—which lag behind France's public research agencies—and increasing the number of scholarships for doctoral students.

Big Gift Malaria research is getting a charitable boost. Johns Hopkins University in Baltimore, Maryland, this week announced that an anonymous donor has given it $100 million to fund a new research center aimed at developing malaria drugs and vaccines. The school will use the money over the next decade to recruit a dozen top scientists from fields including bioinformatics and immunology and to build facilities. The cash infusion is "wonderful," says Myron Levine of the University of Maryland's Center for Vaccine Development in Baltimore. "Malaria research has been starving for serious funds."

On the Dole A coalition of animal-rights groups aiming to expand government regulation of laboratory mice, rats, and birds has recruited a high-profile ally: former Republican politician Bob Dole, who as a senator helped write portions of the federal Animal Welfare Act (AWA), which sets animal care rules.

Biomedical groups fighting the new rules—which are currently blocked by Congress (*Science*, 4 May, p. 830)—have argued that the law doesn't cover rodents. But in his letter, printed as an advertisement from the Working Group to Preserve the AWA in the Washington newspaper *Roll Call*, Dole calls the claim "preposterous.... We certainly did not intend to exclude [from regulation] 95 percent of the animals used in biomedical research." The letter is sure to be discussed at a 2-day National Academy of Sciences workshop on the issue set to start 21 May in Washington.

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