SCIENTIFIC AMERICAN.COM

June 09, 2003

Terms of Engagement

Irving Weissman directs a new institute dedicated to the cloning of human embryonic stem cells. Just don't call it cloning

By Sally Lehrman

In a human biology classroom this past March, stem cell biologist Irving Weissman described his Jewish grandparents' flight to the U.S. for religious freedom. He turned to his host, William Hurlbut, a fellow Stanford University professor and member of President George W. Bush's Council on Bioethics, and accused him of attempting to tie American public policy to his own religious beliefs. A student raised his hand and asked, "But once you get rid of religion, do you have any guide other than popular opinion?"

The Hippocratic oath, answered Weissman, who graduated from Stanford's medical school. "You shall not as a doctor allow any of your personal ethical, religious, even moral concerns stand between you and care of the patient," he paraphrased. "I interpolate this to mean not only the patient you might treat but future patients that might be helped by your research."

Weissman, director of Stanford's new Institute for Cancer/Stem Cell Biology and Medicine, has relied on Hippocrates and a careful definition of terms as he navigates the controversy surrounding human embryonic stem cell research. Already known on Capitol Hill for his defense of free scientific inquiry, Weissman found himself a target for attack when he declared that the privately funded Stanford institute would explore human nuclear transplantation--commonly known as cloning.

Weissman's institute, the first of its kind at a university, will not create human clones; rather it will generate new stem cell lines for research. At first, Stanford biologists would most likely derive these from existing lines and use mouse embryos to study ways to "reprogram" transplanted nuclei so that they behave like embryonic nuclei. But a $12-million anonymous donation frees the institute to move into cloning as quickly as it likes. Private funds are also helping sizable programs at the Burnham Institute in La Jolla, Calif., and at the University of California at San Francisco to sidestep the federal funding ban on work with stem cell lines created after August 9, 2001. California has legislation that will provide additional funding.

Despite such backing, scientists here and across the country sit uncomfortably at the focal point for religious and moral qualms about the direction and power of bioscience. This past February the House passed a bill that would impose a $1-million penalty and 10 years in jail for any human embryonic cloning. Several states, including Iowa and Michigan, have enacted bans. Fearing criminalization of their work, some biologists devote a third of their time to lobbying and education. Bioethicist-physicians and the American Association for the Advancement of Science (AAAS) have begun compiling suggestions for self-regulation.

Weissman places his faith in scientists' ability to one day clearly demonstrate the technology's promise. He plans to forge ahead by hiring an expert in nuclear reprogramming. He also wants to explore the possibility of retrieving viable oocytes from oophorectomies instead of using donated eggs. Eventually the institute would combine these two initiatives. But do not consider the transfer of cell nuclei to be "cloning," Weissman insists. Moreover, he states, an "embryo" is not the result.

Weissman hopes to prod the public toward a language that steers clear of dire imagery such as cloned fetuses grown for spare parts. "Whenever we asked people, even scientists, to draw an embryo, they'd usually draw a fetus with legs, head, and so on," he explains. Referring to a National Academy of Sciences cloning panel he chaired, he adds: "Nobody drew a ball of 150 cells." Redefining the terms of the debate won't win Americans over, he thinks. But vague language contributes to a merging of stem cell research with concerns about manipulating human life. "As soon as they start using catchphrases that don't describe what's going on, it's easier for people to say we're cloning human beings," Weissman says. "You're always going to pay if you accept language that is incorrect."

Although two NAS reports press the same point, some researchers worry that Weissman's parsing

may be counterproductive. Investigators have toyed with terms over the years, even floating the short-lived "clonote." But "to change the vocabulary now at this point for public consumption--it would be taken badly," remarks John Gearhart, who led the Johns Hopkins University team that isolated human pluripotent stem cells. Scientists are losing the debate, he fears: "'Cloning' is used; 'embryo' is used. Let's try to deal with that and not avoid it."

Indeed, terminology has become a touchstone for both sides. When the AAAS brought together 33 experts in early March to begin discussing a regulatory scheme, the gulf between advocates and opponents included an inability to agree on the definitions of "blastocyst," "embryo" and "viability." When Weissman announced the institute's plans last December, Leon Kass, chair of the president's bioethics council, attacked his words as "artful redefinition." He reminded Weissman that a majority of his committee (including Stanford's Hurlbut) had called for a four-year moratorium on biomedical cloning. Kass went on to chastise the university for attempting to obfuscate the nature of its work and trying to race ahead without public scrutiny.

Nigel Cameron, director of the Council for Biotechnology Policy, which is affiliated with the Christian think tank Wilberforce Forum, suggests that Weissman and others are digging in their heels because they fear a trend of regulation and resistance. Biology's rebellion against public unease, Cameron predicts, will sow distrust for decades to come. "We now have a major university willing to give its name to something many people regard as unethical science," Cameron says. "There seems to be no regard for public conscience."

The 63-year-old Weissman says it would be unethical not to proceed. He tells those who would halt embryonic stem cell research that they are responsible for the lives that could have been saved by future therapies. Based on his 20-plus years with stem cells--he was the first to isolate mouse blood-forming stem cells, then those of humans--he is adamant that stem cells from adults cannot evolve into a variety of tissues, as those from embryos can. Further, he points out, the existing embryonic lines came from white, well-to-do, infertile couples and so have limited genetic diversity and utility.

The institute will not try to create stem cell lines immediately; it will initially explore the machinery that tumor cells share with stem cells. "I believe nuclear transfer for human stem cells is five years away, minimum," Weissman says. In fact, the first American university to transfer the nuclei of human cells may be U.C.S.F., which is building a $10-million graduate training program in stem cell research.

Although Weissman tells students that the potential for scientific advances must sometimes outweigh individual moral, ethical or religious beliefs, he doesn't brush aside social responsibility. At critical junctures he consults with Stanford's bioethicists--most recently, before trying to grow human neurons in mice. He hopes to study learning, memory and diseases such as schizophrenia but wants to stop short of creating a mouse with human characteristics in its brain.

Weissman thinks that reasoned debate will never be enough to settle the stem cell dispute. The general public doesn't have a desire to delve into the issue, he argues, and the Bush administration has religious reasons to remain unconvinced. Words such as "cloning" and "embryo" bolster a hidden quest to redefine human life as beginning at the moment of nuclear transfer or of fertilization, according to Weissman. This is a position that neither a scientist nor a religious person can argue, he says: "You'd have to have an assay for a human soul."

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