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Could the cure for all diseases be banned?

By Anjana Ahuja

As the human fertilisation and embryology authority considers granting Britain's first licence for therapeutic cloning, fears of a U.N. ban on all cloning research are growing

JOHN WAGNER, a tall, thin, bespectacled doctor with a broad smile, is sipping water on the east balcony of Grand Central Station in New York. In a few months he could be sipping champagne. Together with the Geron Corporation, his clinic at Minnesota University will soon begin inserting stem cells into the severed spines of a handful of paralysed patients. Those stem cells will be plucked from days-old clones of the patients themselves.

It will make him the first person in the world to put human embryonic stem cells inside human patients. If the results are anything like those in rats, Wagner's patients will be able to walk across the room to thank him personally. Yet not everyone likes Wagner's business. "I was giving a talk the other day and someone stood up and called me a murderer," he says, with a resigned smile.

The demonisation of Wagner, and hundreds of other scientists and doctors like him, may soon be complete. In November the United Nations is likely to hold a vote on whether to ban all human cloning. If passed, the ban would prohibit not just the kind of cloning that makes babies (called reproductive cloning), a Brave New World against which all but a few maverick scientists and cult members are united. It will also proscribe therapeutic cloning, which is the creation and use of embryos a few days old in order to harvest a special, versatile kind of cell — embryonic stem cells — that could be used in treatments for virtually every disease known to mankind.

Earlier this month the top researchers and clinicians in the world — Ian Wilmut, the man who cloned the first mammal (Dolly), and Shin Yong Moon and Woo Suk Hwang, the Korean duo who first cloned a human embryo — and patient groups flew to the United Nations headquarters in New York in a last-ditch attempt to head off such a ban. The former Superman actor Christopher Reeve, paralysed in a horseriding accident, also sent a televised address to what he called "the collective moral voice of the world", saying that "not to encourage the ethical pursuit of (embryonic stem-cell) research may result in needless human suffering".

What makes the conference so urgent is that the United Nations has already come within a whisker of an outright ban. Last year Costa Rica proposed a motion — seconded by America — to forbid all cloning immediately. Iran countered with a last-minute proposal to defer the vote temporarily, to allow more considered deliberation. Iran's motion won

the day by a single vote, a skin-of-the-teeth result that Wagner calls “shocking”.

A UN treaty against cloning will not technically trump domestic laws, such as those in Britain (therapeutic cloning and stem-cell research are legal under licence on embryos under 14 days old, but reproductive cloning is illegal). However, most experts feel that it would smother the field in an atmosphere of hostility, spelling a slow death for one of medicine’s most promising weapons in the war against sickness. A UN decision might also set a precedent for other lawmaking bodies such as the European Parliament, possibly leading to legislation that conflicts with that of member states.

“A ban would definitely set the field back, no doubt about it,” says Ross Frommer, an expert on health policy at Columbia University, as we admire the newly cleaned station from the balcony. “If the UN resolution is adopted, nations would still be able to carry out the research as they saw fit. However, there would be this *tremendous* policy statement that embryonic stem-cell research and therapeutic cloning should be stopped. Governments would stop funding it. Individuals would stop funding it. Who wants to be in contravention of the UN?”

Bernard Siegel, a silver-haired, fast-talking attorney and head of the non-profit organisation Genetics Policy Institute, which has organised the conference, says that humanity cannot afford for the United Nations to make the wrong decision. The GPI, like most leading scientists, supports a ban on reproductive cloning but opposes one on therapeutic cloning.

“A ban would have been horrible,” says Siegel, shaking his head. “It would have been a disaster for anyone with a child suffering from diabetes or who has a parent with Alzheimer’s. This research has the greatest hope of providing treatments and cures, of being able to repair damaged organs. How can we allow it not to advance? All I want is for people like Sabrina to be able to walk again.” I turn around — he is pointing over my shoulder towards a pretty, dark-haired young woman in a wheelchair, who is chatting animatedly to a television reporter.

A car accident 14 years ago left 26-year-old Sabrina Cohen a quadriplegic; she now works as public relations director for the Genetics Policy Institute. She is proud of living alone but needs round-the-clock assistance. “The thing that keeps me going is the hope that I’ll be able to get out of this wheelchair one day,” Cohen says, matter-of-factly. “A ban on therapeutic cloning would be catastrophic. Now is the time for people to wake up and start fighting, not just for those suffering now but for people who, like me, will become the next statistic.”

It is medicine’s misfortune that both reproductive and therapeutic cloning share the same first step. The recipe for genetically “Xeroxing” a person — Madonna, say — starts with a process called somatic cell nuclear transfer (SCNT). Take one unfertilised human egg and suck out the contents. Next, take a skin cell (or any other cell) from Madonna and remove its DNA. Then insert the DNA in the egg, and add a small burst of electricity to make them fuse into an embryo.

The embryo produced in this way will be genetically identical to the person who donated the skin cell, ie, Madonna. Dolly was the first living, breathing mammalian product of this DNA copying technique — her DNA came from a donated mammary cell, and her naming in honour of the well-endowed country singer Dolly Parton seemed a deliberate, if pointless, act of levity to counter the fact that her birth really did change the world.

As an embryo develops into a foetus and then a baby, its cells specialise, unfurling into heart muscle, liver cells, neurones. But catch those embryonic stem cells (ESC) early, in the first five or so days of life, and they become a chameleon-like panacea for every ill. When placed in the pancreas of diabetic animals, ESC turn into pancreatic cells, generating life-saving insulin. Put them in the heart and they become heart cells capable of pumping blood. And, most dramatically, put them in the severed spinal cords of paralysed rats and the rodents regain the ability to walk.

Still, an embryo, whether created by sex, fertility treatment or cloning, represents the first stage in the long, complex and magical process that has so far created every human being on Earth. That has convinced many, including George W. Bush, that all cloning poses uncomfortable ethical dilemmas. Human reproductive cloning — carrying a cloned embryo to term — threatens the sanctity of the individual. There is a widespread consensus that using cloning to make babies is inherently wrong as well as medically unsafe. The vast majority of cloned animals abort. The dissected corpses of those who survive are a stomach-churning deterrent to others — they have mutant organs, contorted limbs and suffer from “large offspring syndrome”. The idea of a grotesquely deformed human baby means that producing the first human clone remains the least sought-after first in medicine.

But therapeutic cloning has split the international community. Stem cells derived from embryonic clones of a patient are genetically identical to the patient and will therefore not be rejected. If Madonna’s liver begins to pack up, the stem cells culled from her embryonic copy could be placed in her ailing liver and would take up the hepatic baton. But to extract the cells, the Madonna embryo would be sacrificed.

To scientists, the potential ends — cures for diseases — justify the means. Moreover, there are already 400,000 unused embryos sitting in freezers in American fertility clinics. Instead of throwing them away, they say, why not see if they can be used to cure disease?

For staunch pro-life advocates, however, there is something unthinkable about embryos, symbolic of the beginning of life, being churned out and carved up to sustain those at the end of theirs. The organisation Americans to Ban Cloning, for example, declares that all human cloning should be banned because “(it) would create a class of human beings who exist not as ends in themselves, but as the means to achieve the ends of others”.

There is also the “slippery slope” argument — that if scientists are given the go-ahead to produce cloned embryos for therapy, one of those embryos will inevitably find its way into a woman’s womb. As a result, the numbers for and against a total cloning ban have been so close to call that it has come down to who is in the UN chamber on voting day.

Last year, Siegel says, 100 out of 191 countries were ready to prohibit all cloning. It was only the absence of several pro-ban delegates that led to it being temporarily derailed.

Dolly's creator, Ian Wilmut, can't see how the UN can confuse two different practices, and doesn't accept the slippery-slope argument. "I prefer the stance that it is logically and legally quite easy to frame things to say that to produce an embryo to produce cells is acceptable, but to transfer that embryo to a uterus is not. I would be shocked if any British clinician put a cloned embryo into a patient. That wouldn't happen."

The debate is complicated even further by another avenue of research — adult stem-cell research. Some studies suggest that certain types of cell, such as bone marrow cells, found in adult patients have a chameleon-like potential to turn into useful tissue. However, by virtue of the fact that they come from an adult, they have already lost some of their pliability. To say otherwise, Wagner insists, is simply untrue: "I can state unequivocally that they *don't* obviate the need for embryonic stem cells. Adult stem cells cannot do everything; embryonic stem cells are still the gold standard."

Wilmut, who says that cell therapy has the potential to transform medicine, is at peace with the idea of cloning embryos for judicious medical use. Cloned embryos are most useful within the first week of life, when specialisation has not yet begun. At this stage, the embryo — technically called a blastocyst — is a bundle of fewer than 100 cells. It is emphatically not, Wilmut insists, the same as a baby: "I have a grandson who is two months old. To think of a blastocyst as equivalent to a foetus or my newborn grandson is just absurd. The key aspect of development is the ability to be aware, to think and to feel, and so on. A blastocyst does not have those attributes, and that's why I would draw the line there.

"I personally wouldn't like to work with foetal cells. Depending on their stage, there could possibly be consciousness. Don't ask me where the line is because I don't know, but I do know that six or seven days, when most blastocysts are taken, is well before the line."

Wagner makes the same point: "Some people believe that we are destroying babies when in fact we are talking about between 8 and 50 cells. I think that the public overall is in favour of embryonic stem-cell research, but we hear mostly from the pro-life contingent. We must make it clear that if you believe in this, you need to stand up for it. You must make your voice heard because you may lose the opportunity of using this potentially life-saving therapy."

People's voices are beginning to be heard. Hollywood has made stem-cell research its cause célèbre, with Christopher Reeve and Michael J. Fox, who suffers from Parkinson's disease, its figureheads. Only weeks before her husband's death from Alzheimer's disease, Nancy Reagan used one such glittering occasion to berate George W. Bush for his conservative approach to stem-cell research.

Even anti-abortionists are among signatories to a letter to the American President urging

him to relax federal legislation governing stem- cell research. Says Frommer: “Among the 206 members of Congress who signed it were more than 30 pro-life members who understand that this is not an abortion issue. Part of being pro-life is trying to do what you can for the living.”

Are you in favour of embryonic stem-cell research?

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