

A long way to go...

Federal policy on human embryonic stem cell research must become bolder to truly support progress in the field.

In the beginning of 2009, President Obama's decision to overturn a ban on federal funding for embryonic stem cell research was received with great enthusiasm by the scientific community. Although research in the field was never banned in the United States—only restricted from using federal funds—President Obama's decision made a strong statement. By defining the 'official' position of the government, it bore the promise not only of an accelerated rate of scientific discovery but also of a greater effort to educate the public about the biology and potential of stem cells. At the time, it was seen as a move to remove ideology from government decision-making on science policy.

One month after the presidential order, the US National Institutes of Health (NIH) published draft guidelines for human embryonic stem cell research and allowed a period of open discussion during which patient advocacy groups, scientists, religious organizations and even members of Congress sent feedback to the NIH. The final guidelines were published and became effective 7 July 2009. For scientists working in the field, the new set of rules are disappointingly conservative. Although they were extended to include funding for research on new embryonic stem cell lines generated from excess fertilized eggs resulting from *in vitro* fertilization and donated with informed consent, they will not allow funding of research on material generated especially for research purposes.

In the interim discussions, scientists and high-profile patient advocates lobbied for a more liberal attitude. Despite the pressure from supporters of stem cell research, public spending reflects the public's state of mind, and the NIH guidelines were drawn to reflect the type of public support that emerged from debates on the topic in Congress and elsewhere. Indeed, for the past half a decade, polls have showed that about 60% of Americans were in favor of fewer restrictions to stem cell research, a percentage that stayed relatively constant throughout the years. In the summer of 2008, a poll conducted by *Time* magazine showed that 73% were in favor of using discarded eggs for stem cell research. However, no mutual consensus has emerged on the use of other sources of human pluripotent stem cells, such as parthenogenesis and somatic cell nuclear transfer, so they were excluded from the governmental funding program. As a result, a substantial fraction of the human embryonic stem cell research still must rely on state legislative initiatives and state and private funding.

In 2007, New York State followed California in becoming one of the pioneers of stem cell research in the United States by providing \$600 million for an 11-year program to finance basic, applied and translational research that advances scientific discoveries in the field of stem cell biology. The commitment was reinforced in June 2009, when

the Empire State Stem Cell Board, the committee that oversees the administration of funds, voted to "allow funding of research on stem cell lines derived using oocytes donated solely for research purposes and to compensate the donor for the expense, burden and discomfort associated with the donation process." The board concluded that there is no principled reason why there should be an ethical difference between being compensated for oocyte donation for reproductive purposes and being similarly compensated for research purposes. As with clinical trials, a reasonable financial compensation should be acceptable for human research subjects. Still, many were unnerved by this move and voiced concern that it could lead to the exploitation of poor women and that it virtually represents trafficking of human parts and raised the ethical question of whether human cells should even be up for sale.

Some of the concerns are probably justified, and the board move might be a bold one, but it reflects a commitment that federal guidelines lack. That is not completely surprising, given that the New York initiative is backed by high-profile patient advocates, people with a strong motivation in pursuing rapid advances in this promising field. At the same time, the federal policies are hampered by the need to reflect the mind and moral beliefs of a public still separated by a huge divide of opinion. According to polls, a very large fraction (20%) of Americans still oppose any form of human embryonic research, whereas 30% consider the use of human eggs morally wrong.

These days, the main controversy remains the source of human embryonic stem cells. However, one should not be so naive as to think that the ethical debates will end here. This may be the dawn of a new era, brimming with its own remarkable possibilities and profound dilemmas. Stem cell technology, which aims to replace failing or damaged body tissue, has huge potential for growth and could become a real industry in itself. For the past 8 years, lack of funding and government support has driven scientists out of the United States to more hospitable shores; Biopolis has been one of the top destinations, because of Singapore's governmental commitment to transform the tiny state into a biotechnology hub. The lukewarm waters of today's stem cells policies in the United States may not lure many researchers back.

If the United States wishes to maintain a leading role in this field, then the official federal position should be more open to the exploration of various alternatives and possibilities. To support this, scientists and politicians must promote stem cell education and engage in an open dialog with the public to explain the practical implications, discuss the moral issues and convey the potential benefits of stem cell research.