

## Bush's policy stopped US gaining stem-cell lead

SIR — Your News story “Korea launches network to share cloning information” (*Nature* **437**, 1077; 2005) reports the establishment of the World Stem Cell Hub, under the direction of Professor Woo Suk Hwang. Hwang's research team have developed a highly efficient recipe for producing human embryos through somatic-cell nuclear transfer (SCNT) and then extracting their stem cells (W. S. Hwang *et al.* *Science* **303**, 1669–1674; 2004).

The announcement of the hub signals South Korea's intention to become the world's leading centre for stem-cell and therapeutic-cloning research. It also reflects how far the United States has fallen behind its competitors in this pivotal area and how much the lack of federal leadership has handicapped US efforts.

In 2000, Advanced Cell Technology (ACT) — of which one of us is vice-president for medical and scientific development — initiated a significant human therapeutic-cloning programme. ACT's ethics advisory board assisted researchers by providing ethical guidelines and supervision for a pioneering egg-donor research programme. In 2001, ACT scientists reported the creation of the first early (4-6-cell stage) cloned human embryos (J. B. Cibelli *et al.* *J. Regen. Med.* **2**, 25–31; 2001). As early as 2002 and 2003, the team of researchers at ACT had very promising results — including what we believe were stem-cell-stage competent embryos — that seemed to be on a par with those of the South Korean team, subject to some changes in the experimental conditions.

Why did the South Koreans win this race despite our early lead?

In our view, President George W. Bush's restrictive policy on funding stem-cell research was a major factor. SCNT research is expensive — a full research programme costs hundreds of thousands of dollars each year. At that time, ACT was a privately financed company, and from the summer of 2001 on, it was operating in an extremely hostile funding environment, with no hope of federal support. There is no reason to believe that ACT was a special case. Indeed, the stem-cell area as a whole has continued to encounter difficulties in garnering sufficient financial support.

Bush also repeatedly spoke out in support of legislation in Congress that would ban all therapeutic-cloning research. Investors may be willing to accept market and research risks, but they are very reluctant to fund work that might be criminalized, and venture-capital funding dried up. By mid-2003, it had become a challenge for ACT to maintain staffing levels and meet payrolls.

*In vitro* fertilization clinics, too, were

unwilling to get involved. There was concern among clinic staff that they would receive adverse media publicity for participating in stem-cell research and that the physical security of staff and patients would be put at risk.

No one likes to lose a race. Apart from the egos involved here, however, the stakes for this research are important. Although the South Korean team deserve every credit for their accomplishments, the current absence of a strong US competitor in this research narrows the range of directions likely to be explored.

Robert Lanza\*, Ronald M. Green†

\*Advanced Cell Technology, 381 Plantation Street, Worcester, Massachusetts 01605, USA and Institute of Regenerative Medicine, Wake Forest University School of Medicine, Winston-Salem, North Carolina 27157, USA  
†Ethics Institute, Dartmouth College, Hanover, New Hampshire 03755-3500, USA