

Breakthrough stirs US embryo debate...

[PARIS] One of the scientists behind last week's announcement of the culturing and differentiation of human embryonic stem cells says he is applying to the US National Institutes of Health (NIH) for funds to challenge the ban on federal funding for such research.

John Gearhart of the Johns Hopkins University School of Medicine in Baltimore, Maryland, will seek funding to study the differentiation of embryonic stem cells into blood and neuronal cells. The move will test whether the therapeutic promise of last week's breakthrough will weaken ideological and political resistance to human embryo research in the United States.

Many argue that the expanded scientific and therapeutic applications of human embryo research that will be opened up by the breakthrough will lead to a shift in public perception of the utility of such research, and pressure to relax the funding ban.

In an interview with *Nature*, Harold Varmus, the director of the NIH, said that embryonic stem cell research "is of sufficient magnitude and importance that the federal government should be playing an active role in supporting it".

The potential clinical applications opened up by the successful culturing of human embryonic stem cells — reported independently last week by Gearhart's team and by James Thomson's group at the University of Wisconsin — are broad. One



Gearhart: plans test case to challenge ban.

immediate application of the progenitor cells — which have the capacity to grow indefinitely and differentiate into all human cell types — would be to screen drugs on fully characterized human cell lines.

But ultimately, large quantities of disease-free cells might be produced for transplants, such as pancreatic beta cells for the treatment of diabetes, neuronal implants for Parkinson's disease, or cells for brain, nerve, and heart grafts (see *Nature* 391, 325; 1998).

The potential impact on fundamental developmental and cellular biology, including the generation of 'knock-out' cell lines, have also been unanimously acclaimed. "We are witnessing a coming of age of cell technology," says Ron McKay, head of the Laboratory of Molecular Biology at the US National Institute of Neurological Disorders and Stroke. "For me this is the future of molecular biology."

"It is probably the biggest development since recombinant DNA," says Jeremy Rifkin, president of the Washington-based Foundation on Economic Trends. He adds that the science is "highly valuable", although he is sceptical of the uses to which it will be put.

Previously, embryo research has been perceived as largely a means for improving *in vitro* fertilization procedures. But the prospect that it may underpin a broad generic technology for therapies in almost every disease area is likely to reignite the embryo research debate.

"Congressmen will not be able to tell sick and dying people that you can't do this or that because of moral reservations, say about surplus embryos," argues Arthur Kaplan, director of the Penn Center for Bioethics at the University of Pennsylvania.

At present, embryo research is banned from federal funding, where it could be openly regulated, but it is allowed to proceed largely unregulated within the private sector.

Varmus believes there will be a debate about the ban in Congress and in the public arena, and points out that congressional hearings are in the offing. Several researchers argue that the setback for Republicans in this month's congressional elections may embolden those who favour funding for embryo research. NIH lawyers are poring over the federal funding ban to determine whether cultures of embryonic stem cells might be interpreted as falling outside its scope.

In an editorial last weekend, *The New York Times* described the breakthrough as "not only a stunning achievement, but a rebuke to Congress for banning federal funding of this exciting research".

But in a statement to *Nature*, Congressman Jay Dickey (Republican, Arkansas), maintained his position that "the ban serves a very good purpose in our society because it honors the sanctity of life".

"There are no instances in which I feel the ban on federally funded research on human embryos should be lifted," says Dickey. "The language of this ban prevents taxpayer funding for bizarre experiments, such as cloning. Eventually, I could see the embryonic stem cell technology going in this direction."

But Gearhart is one of many researchers who complain about what they describe as an exclusive political and dogmatic emphasis on the morality of embryo research, and on its potential abuses. They say this is to the detriment of considered ethical discussion of the various forms of embryo research, the need to ensure that these are regulated appropriately, and the conditions required to exploit them fully for the public good.

In a bid to stir public debate, Gearhart says he intends to bring a test case to NIH. "The government has to move... to resolve this issue for everybody," he says.

Rifkin has launched a petition to Congress calling for a moratorium on all commercial exploitation of embryonic stem cells until the long term social and ethical consequences have been considered. **Declan Butler**

Company seeks strict controls on access

[PARIS] Excitement among biomedical researchers over the breakthrough in the culturing of human embryonic stem cells is giving way to concerns about the possible constraints that will be imposed on access to the technology.

The techniques developed by James Thomson's group at the University of Wisconsin have been patented by the Wisconsin Alumni Research Foundation, and licensed by Geron, a Californian biotechnology company. The company has licensed similar technology from the Johns Hopkins University School of Medicine, where John Gearhart's group works (see above).

Tom Okurma, Geron's

vice-president of research, says the company "intends to collaborate as widely as possible", but that cells would only be made available "under a very restrictive material transfer agreement". "We plan to selectively transfer the cells to folks that we know, that are in the field, and have a track record of appropriate ethical applications."

The agreement would not only protect the company's commercial interests, but also set ethical restrictions on the research that could be done — with a ban on human cloning, creation of chimaeras and modification of the germline, for example.

"The two big questions on my mind are, whether these cells are going to be widely available, and whether

people with NIH grants will be able to work on them," says Brigid Hogan, a cell biologist at Vanderbilt University School of Medicine in Nashville.

Arthur Kaplan, director of the Center for Bioethics at the University of Pennsylvania, says it is a "disaster" to have such fundamental technologies "privatized", arguing that this risks impeding publication and holding back development of the technology.

Jeremy Rifkin, president of the Foundation on Economic Trends, says he intends to challenge the Wisconsin patents at the US patent office. "There is no patent in history that is comparable in terms of the extraordinary monopoly conferred by this one," he complains. **D.B.**