

Stem Cell Research in China:

An Intertwinement of International Finances, Ambition, and Bioethics

Report >
China

Stem cell research promises remedies to widespread diseases ranging from diabetes to paralysis. 'Stem cell' is a term used to refer to a range of cells that have the ability to divide into specialized body cells, such as blood cells or new tissue. By studying the processes in which stem cells grow and differentiate, biologists study the causes of many diseases, and hope to use them for therapeutic uses in the repair of damaged tissue and organs for a wide range of currently incurable disorders.

By Margaret Sleeboom

At present, stem cells from embryos (or 'totipotent' stem cells) appear to have the greatest potential to be developed into the widest range of tissues. These embryonic stem cells have been the focus of bioethical discussion in Asia and Western countries, mainly because the use of their embryonic source is controversial. In the future, however, adult stem cells ('pluripotent' stem cells) taken from bone marrow, the umbilical cord, and placentas may be equally useful. Pei Xuetao, director of Stem Cell Research at Beijing's Military Medical College, at the Conference on Stem Cell Research in Beijing (23–27 May 2002, Xiaotangshan) claimed that 128.4 million persons can be helped by stem cell research annually, thereby referring to sufferers from Alzheimer's, cancer, and Parkinson's. He argued that pluripotent stem cells (i.e. specialized, adult stem cells) can be made to function as totipotent embryonic stem cells by using a 'cocktail stem cell strategy'.¹ Nevertheless, for now, scientists insist on the need to create embryos for research.

The idea of creating embryos for scientific experiments has appalled people of various walks of life, and governments have taken measures against the practice.

Thus, President Bush in 2001 decided to supply public money for stem cell research, but limited it to research on materials from 60 stem lines already in use by laboratories. According to conservatives, drawing cells from embryos equates to murder. Bush justified his decision by arguing that the decision of life and death had already been made in case of the existing embryo stem cell lines. On the one hand, strong supporters of stem cell research, such as Nancy Reagan, tried to get Bush to use public money to finance it, reportedly because her sympathies lie with Alzheimer patients such as her husband. On the other hand, Pope John Paul II urged President Bush to put a ban on embryo use altogether, comparing it to a 'cannibalization of embryos'. Generally, Christian parties regard embryos not as just a lump of cells but as an emerging individual and scientific or economic interests cannot legitimize embryo use.

'[w]ho ever destroys life in order to save life, faces life at a greater distance'

In China the situation is not very different. But what arguments are used for and against it in Chinese debates on embryonic stem cell research (ESR)? At the Conference on Stem Cell Research in May 2002, a German scholar of Asian Studies, Ole Doering (Hamburg University), caused commotion when he spoke about the bioethical and legal dimensions of stem cell research in Germany. He had probably aimed to sensitize his mostly Chinese audience to bioethical issues linked to ESR in general. Quoting a famous Tang physician, Sun Simiao, by the phrase '[w]ho ever destroys life in order to save life, faces life at a greater distance', he related that heated debates on ESR in Germany include discussions on the abuse of human values and Nazi experiments on human subjects. In April 2002 it was decided that German law would allow the importation of stem cells from

Israel (which derive from surplus embryos, after IVF), to be implemented on 1 June 2002. Many opponents have expressed discomfort with the idea that descendants of the Nazi Germany now are using stem cells that belong to descendants of Jewish victims in Israel. Several motions were submitted against it, but fears that Germany would fall behind in the technology competition prompted the acceptance of the new law in parliament.

During question time, a German American, Michael Andreeff (University of Texas, Anderson Cancer Centre) questioned the relevance of German law for the Chinese situation. He wondered what the Chinese have to do with German scruples about their Nazi past and accused Doering of preaching to the Chinese. The audience stood up and applauded Andreeff, making it the first time a question was applauded during the conference. The scientists in the audience were not interested in the ethical dimension of their research, especially when suspecting imperialist condescension. Naturally, researchers that have invested much energy and family fortune into their careers are not likely to jeopardize their future by including bioethical considerations into their research practice. Competition is fierce, and wages are low compared to that of scientists abroad, which is why another speaker, Helmut Kaiser (Research and Developments on the Stem Cells Industries), who was enthused about China's cheap intellectual labour, excellent equipment, and positive government support.

Discussing the human value of the embryo at Zhongli (Taiwan)

According to *China Daily*, 28 February 2001 stem cell research has become a hot item among scientists in China. Li Lingsong, director of the Stem Cell Research Centre established in January 2001, is one of a handful of Chinese pioneers of ESR. Shortly after a US breakthrough, a Chinese team led by Xu Ling claimed in a paper published in the *Zhongshan Medical School Journal* that they too had succeeded in isolating and growing human embryonic stem cells. A few other medical institutes across the country also initiated research in this field, either independently or in collaboration with foreign counterparts. In October 2000, Li's centre established a library of human adult stem cells with which to research the developing processes both from embryonic to adult stem cells and from adult stem cells to specialized cells. He hopes to attract big money, but fears that the priority of companies will be that of making quick money and not science.

At present, embryonic stem cell lines have been developed from two sources: from the inner cell mass of human embryos at the blastocyst stage at which a hollow sphere of cells forms when a fertilized egg begins to divide and specialize; and from foetal tissue obtained from terminated pregnancies. But how and for what 'good' reasons do we experiment on life? At the Conference on Bioethical Issues in Stem Cell Research at Zhongli University (24–28 June 2002, Taiwan), one physician remarked that technology forces us to define the time of brain-death so we can perform organ transplantation; now, he maintained, technology forces us to determine the time of becoming a person, 'ensoulment', in order to conduct ESR. Daniel Fu-Chang Tsai, a physician at the National Taiwan University and an advocate of Confucian humaneness, takes a pragmatic approach. He believes that the use of the embryo in ESR depends on the moral status of the embryo. Approximately two-thirds of the fertilized ovals are lost, he argues, and we do not save or mourn their miscarriage. Furthermore, there is not much objection against IVF, the morning-after pill, or abortion before the fourteenth week of pregnancy.

Regulation versus the freedom of ESR

It seems that before we become persons, we do not have human rights. But Derrick Kit-sing Au, chief of service of the Department of Rehabilitation at Kowloon Hospital (Hong Kong) believes that this form of 'personal' incapacity actually requires extra protection, not less, especially as no one can speak for embryos. He asks why the human potential of the embryo is valued less compared to the potential of ESR. Fur-

thermore, Chen Yingling from the National Zhongzheng University (Taiwan) wants to protect the blastocyst's (120 cells) potential human rights against arbitrary abortion, arguing that 'there are various kinds of freedom: freedom of research, freedom of reproduction, freedom from illness, and freedom of medical practice and application'. Chen believes that one could argue that the embryo has legal interests: it is a member of *homo sapiens*; its DNA is identical; it has human rights after its division has become advanced; and, it is a potential human (as genetic unity) as it is a fluent process of development.

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Chen Yingling also emphasized that the bioethical debate is heavily influenced by the difference in national regulations for ESR. For instance, Britain takes a liberal attitude, as Tony Blair turned it into a free haven for stem cell research. Similarly, Alex Capron (University of Southern California) fears that if the withdrawal of federal funding for stem cell research continues, private companies will acquire a monopoly on the research. Therefore, most research gets patented or is kept secret. Furthermore, basic research loses out, as it is usually funded by federal money. Finally, the Chinese research environment allows ESR in China to thrive. Li's group has found a way to introduce genetic material into a stem cell, which could cause it to grow into a full organ that would then be transplanted into a human body. So far Li has successfully caused human stem cells to produce a glandular structure that secretes chemicals useful in treating diabetes and Parkinson's disease. Chinese scientists have successfully transplanted healthy (embryonic) nerve stem cells into a patient's brain to replace the deteriorated ones (Xinhua-net, Zhengzhou, 31 August). They have cloned pulsating heart cells from human embryo stem cells (Reuters, 3 September 2001), and succeeded in curing a mouse of lower paralysis four months after implanting nerve stem cells from a human embryo (Xinhua-net, Harbin, 5 December 2001).²

Bioethical debate in the PRC

It is clear that a better understanding of our bioethical priorities is needed. In Mainland China a beginning has been made by the National Bioethical Committees and by research centres at various institutions of higher education such as the Chinese Academy of Medical Sciences (CAMS) and the Centre for Applied Ethics located in the Chinese Academy of Social Sciences. Ethical issues in stem cell research seem to involve arguments both for and against its continuation. Obvious arguments for continuation include its promise of relief from a large range of diseases, and an extension of the human lifespan. Furthermore, it will be able to facilitate transplantation or even replace transplantation of organs by stem cell replacement. Another argument 'for' is the fact that it makes the use of animal stem cell research largely unnecessary. Others, however, such as Yang Huanming, director of the Beijing Genomics Institute, recommend the use of animals to grow human body parts as bioethical to humans. Arguments that oppose ESR object to the creation of embryos especially for stem cell research. In case of the use of aborted embryos and spare embryos (left over after IVF treatment), there are worries about the observation of informed consent proceedings. Apart from medical safety issues, there are also objections to the use of financial resources for expensive medical technologies, while many diseases could be prevented and cured with simple investment in water, vaccines, and condoms. More abstract issues, but certainly not less important, concern the question of the value of embryonic life: what it means to people and how it is experienced in different cultural and economic environments. ◀

Dr Margaret Sleeboom is a research fellow at the IIAS and is currently setting up the research programme 'Genomics in Asia'. m.sleeboom.let.leidenuniv.nl

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- 1 However, in the long run the use of adult stem cells will probably coexist with that of embryonic stem cells for several reasons. The occurrence of teratomas (tumours of heterogeneous tissues) in case of the use of embryonic stem cells is high; and the occurrence of immune problems in case of the manipulation of bone marrow cells of the person in question is lower.
- 2 For more information on the scientific work and achievements of Chinese researchers in the life sciences, see www.Eastday.com.cn.