

Turning misfortune into blessing

Public confidence in hESC after Hwang

Following the 2005 Hwang scandal, the South Korean government promised a hugely disappointed public *jeonhwawibok* – turning the misfortune into a blessing. Four years on, Seyoung Hwang reports the ways in which scientists, policy and bioethics experts anticipate the prospect of research governance and human embryonic stem cell research (hESC), and explores the place of public confidence in the current regulatory discourse.

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THE SUDDEN FALL OF WOO-SUK HWANG, the pioneer of human embryonic stem cell research in Korea, threw the nation into turmoil. His misconduct, including the fabrication of stem cell research data and ethical violations in oocyte (immature egg cell) donation, left the public confronted (and disappointed) by the truth that the therapeutic cloning attempt had failed. In May 2006, just half a year after the scandal, the government launched the *National Plan for Stem Cell Research (2006–2015)* which identified stem cell research as one of the new biotechnologies that will enhance Korea's status as a world-leading bio-economy. Premised upon an ambitious vision to become, within a decade, one of the world's top three countries in the field of stem cell research, the core strategies included, (1) the consolidation of an effective, comprehensive system in government; (2) procurement of original technology; (3) the establishment of advanced industrial infrastructures; and (4) the establishment of bioethics and research integrity.

Somatic nuclear transfer and oocyte donation

Somatic cell nuclear transfer (SCNT) is a type of cloning that involves replacing the nucleus of an unfertilised egg cell with material from the nucleus of a somatic cell (a skin, heart, or nerve cell, for example). Popularly known as 'therapeutic cloning', SCNT is deemed a revolutionary approach to the generation of patient-specific embryonic stem cells that will open up a new paradigm of regenerative medicine. It was precisely this reason why Hwang's 2005 *Science* paper, in which he fraudulently claimed the success of stem cell derivation, was hailed as an international breakthrough. Since the method involves the destruction of human oocytes, policy regarding SCNT varies among countries depending on their cultural traditions and religious influence: for example Britain, Belgium and Japan permit SCNT whereas others, such as Germany and the US, do not.

The history of bioethical legislation in Korea dates back to the mid-90s when the birth of the cloned sheep Dolly caused an international sensation regarding the human cloning issue. Initiated by the pressing need to prohibit human cloning, Korea's Bioethics and Biosafety Act (enacted in 2005, amended in 2008) is the first comprehensive legal framework for bioethical issues. The dual goals declared in Article 1 – one being promotion of biotechnology, and the other protection of human dignity – suggest that the bioethical legislation is clearly motivated for research advancement. The two *Science* papers on human embryonic stem cell research (published in 2004 and 2005), that made Woo-Suk Hwang a national hero, were the result of a legislative vacuum and the absence of criticism. Consequently, the 2005 version of the Bioethics and Biosafety Act stipulates the provision for SCNT as follows:

"...no one shall conduct SCNT other than for research aimed at curing rare or currently incurable diseases, as decided by the President after review by the National Bioethics Committee". (Bioethics and Biosafety Act 2005, Article 22)

Also important is the inclusion of interim measures; that is, a clause that allows qualified SCNT researchers to continue the same research with the approval of the Ministry of Health and Welfare (MoHW). In fact, only Hwang's team could meet the criteria at that time in Korea. The 2008 amendment to the Act abolished this clause. Bioethics campaigners claim that this political manoeuvring tarnished the consensus-building and democratic values crucial to the public acceptability of such sensitive research.

The conflict over SCNT resurfaced when the National Bioethics Committee resumed the preparation of Presidential Decrees for the scope of human embryonic stem cell research in 2009. The revelation that Hwang's research failed to create a single stem cell line, despite using more than 2000 oocytes, came as a blow to SCNT supporters. However, the dominance of the pro-SCNT National Bioethics Committee, whose 20 members include seven government ministers, tipped the balance in the favour of SCNT supporters.

While the law on SCNT remains permissive, it now includes a new provision on oocyte donation that forbids the use of 'fresh' oocytes, as seen in Hwang's research. Instead, only remaining oocytes extracted for in-vitro fertilisation (IVF) treatments can be used for stem cell research after obtaining new consent from donors. Some scientists and SCNT supporters criticise the law as 'going too far', arguing that a successful cloning depends on the freshness of oocytes (*Medical Today*, 12 June 2009). But critics point out that the grey area between donation for pregnancy and donation for research still exists, and could be abused in obtaining oocytes for stem cell research (Harmon & Kim 2008; Ku 2009). A more radical view, held mostly by Christian bioethics campaigners, argues that the very idea of oocyte donation is unethical, and therefore must be outlawed (CBCK 2008).

After three years' suspension, the Cha Medical Center was the first SCNT research group to which the new regulations applied, requiring them to obtain approval for their research proposal from the National Bioethics Committee in April 2009. Approval was granted on condition that the notion of 'treating diseases' was omitted from the research proposal in order to avoid raising people's expectations too high; also that the use of human eggs was minimised; and that their Institutional Review Board (IRB) was reorganised to ensure high-quality ethical review.

Prospects for hESC research

Since the Hwang scandal, scientists' views on the prospects of SCNT have become both more realistic and more cautious. Now, with the development of an alternative approach – induced pluripotent stem cells (iPS) that do not require the destruction of oocytes – the feasibility of SCNT is under scrutiny. Some scientists are outspoken in their criticism of SCNT, arguing that there is a hidden agenda more about public support and financing than science. Many scientists point out that even if the derivation of stem cells is successful, and even if Korea wins the 'race' in that respect, the competitiveness of the country's stem cell science should not be overestimated. In fact, only a few research teams in Korea have the expertise to conduct hESC research despite the government's generous support. The realisation that the road to therapeutic application depends on scientific infrastructure, not just on a single breakthrough, is noted in policy statements too.

Despite lessons learnt from the Hwang scandal, the communication between policy makers, experts and the public remains poor. A media poll conducted for SBS TV in 19 July 2008 shows that more than 80% of the public expressed support for Hwang's human embryo research. In 2008, a license application by the Suam Biotech Research Foundation, currently headed by Hwang, was rejected by the government. The reasons given included the fact that Hwang's trial was ongoing and the gravity of the ethical misconduct involved. This raises the question whether the public support is simply an expression of sympathy for their disgraced hero, Woo-Suk Hwang; or is it evidence that the public still believes in the feasibility of the therapeutic application of human embryonic stem cells? Perhaps public interest in bioethical issues and the realisation of the world's first patient-specific human embryonic stem cells has never been greater?

Ethical review

One consequence of the Hwang affair is that more media attention is paid to the workings of the Institutional Review Boards (IRBs), where bioethical regulations have a direct effect. Although not unique to human embryo research, the slack governance of IRBs has become a clear target for policy action after the scandal. To reduce the gaps in IRB performance, the new provision in 2008 – the Bioethics and Biosafety Act – stipulates the Ministry of Health, Welfare and Family Affairs', (formerly MoHW) responsibility for the supervision and evaluation of IRBs. A nationwide survey conducted by the Korean Association of IRBs in April 2002 shows that IRBs review only 30% of academic research (Kim et al. 2003). This shows that the absence of IRB review on Hwang's research was not exceptional. Bioethics experts point out that even the IRB of Cha Medical Center, now under increased public scrutiny, is still not up to standard.

Evidence of improvement is noted among some leading hospital IRBs. By the end of 2008, nine IRBs in Korea gained recognition from the Strategic Initiative for Developing Capacity in Ethical Review (SIDCER) for quality ethical review. The SIDCER recognition programme is an international collaborative initiative, facilitated by the World Health Organization (WHO). The Forum for Ethical Review Committees in the Asian and Western Pacific Region (FERCAP) was set up as its regional forum in 2000 and, since then, it has seen a notable increase in SIDCER membership in countries such as Thailand, China, Taiwan and South Korea. The fact that securing international collaboration for research and clinical trials requires the meeting of global standards clearly influences this. But given the current policy direction and relatively regularised operation of medical institutions, experts regard IRB performance as a matter of policy coordination, which is why it can yield positive outcomes relatively quickly. The combined effect of international pressure and policy action is an increasing endorsement of a sound oversight system in Korea.

Although the occurrence of major changes remains to be seen, the evasion of ethical guidelines has increasingly become a risky business. But taking place concurrently is the alienation of the wider public from bioethical discussion, as the SCNT issue shows. The post-Hwang era dictates that new bioethical issues will be dealt with within the small circle of policy makers and bioethics experts, a new profession borne out of the last decade's legislative process and also, ironically, the Hwang scandal. What is lacking is attention to public concerns, and their participation in the much needed debate.

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References

- Catholic Bishops' Conference of Korea (CBCK) (2008). Press release, 19 May.
- Harmon, Shawn H. E. and Kim, Na-Kyung (2008). A tale of two standards: drift and inertia in modern Korean medical law'. *SCRIPTed*, 5(2), 267–293.
- Kim, Ock-Joo, Park, Byung-Joo, Sohn, Dong-Ryul, Lee, Seung-Mi, and Shin, Sang-Goo (2003). Current status of the institutional review boards in Korea: constitution, operation, and policy for protection of human research participants. *Journal of Korean Medical Sciences*, 18: 3–10.
- Ku, In-Hoe (2009). Problems with the Korean law on donation and research on eggs'. The 5th conference of the Catholic Institute of Bioethics: Ethical Problems of Oocyte Donation and Research, 6 May, Catholic Institute of Bioethics and the Catholic University of Korea, 85–99.
- Min, Seung-Gi (2009). Controversy over egg donation for research. *Medical Today*, 12 June.
- URL: <http://www.mdtoday.co.kr/mdtoday/index.html?no=86667> (accessed 26 October 2009).
- Ministry of Science and Technology, Ministry of Commerce, Industry, and Energy, and the Ministry of Health and Welfare (2006). *Bio-Vision 2016: The 2nd Framework Plan for Biotechnology Promotion*. Seoul.



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