

## The Rise and Fall of Embryonic Stem Cell Research in Korea

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**Abstract:** The recent Hwang Woo-Suk scandal in stem cell research ranks among one of the biggest considering its scope and impact. In 2004, Hwang surprised the world by establishing a stem cell line from a cloned blastocyst. Another breakthrough in the following year consisted in making the patient-specific embryonic stem cells which made him rise to international stardom.

It is not true that there was no ethical backlash to Hwang's research. The Catholic Church, NGOs and bioethicists were outspoken critics of Hwang from the outset.

The Korean government should bear the main responsibility for the Hwang scandal. Distortion and exaggeration in the reports of the irresponsible media aggravated the situation.

Scientism and crude nationalism are also to be blamed. Asia has a deep-rooted tradition of scientism which has lasted for more than a century. In the nineteenth century Asia was overrun by Western imperialism. Asian countries had to make desperate attempts to survive the challenge. After the liberation in 1945, "nation building with science and technology" has been the national motto of Korea. Scientism continues to be paramount in Korea

*Keywords: Alliance of Science and Technology, Embryonic Cloning, Ethics Solidarity, Nationalism, Research Ethics, Scientism, Stem Cell.*

In the history of science, frauds and fakes are not rare. However, the recent Hwang Woo-Suk scandal in stem cell research is one of the biggest considering its scope and impact. The collapse of research ethics in Korean biotechnology has dealt a fatal blow not only to Korea, but also raised many issues of debate for the whole world. The Hwang scandal is too complex to be analyzed intensively in a short paper. This paper tries to highlight some major issues of stem cell research in Korea.

The birth of Dolly in 1997 aroused great concern among the Koreans. That year more than ten academic meetings were held to discuss the meaning and impact of animal cloning. Hwang Woo-Suk,

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a veterinarian appeared suddenly at the centre of reproductive technology.<sup>1</sup> Scientists by and large were excited, while humanists and social scientists were somewhat sceptical. If animals could be cloned, it was probable that human cloning would be realized eventually. Many people talked about the necessity of a National Commission on Bioethics. As ‘cowboy cloners’<sup>2</sup> did sensitive researches with embryos, the pressure to regulate them was mounting. In 2000, the Ministry of Science and Technology (MOST) created the Bioethics Advisory Commission (KBAC) to make policy recommendations on human cloning and stem cell research. While China and Japan were framing guidelines on stem cell research, Korea went forward with legislation.<sup>3</sup> The primary task for KBAC was to draft the Bioethics Law. KBAC consisted of 20 members: 10 scientists (biotechnology and medicine) and 10 non-scientists (philosophy, social sciences, NGOs and religion). It existed for only one year.

KBAC could complete the framework of the ‘Basic Law on Bioethics’ after meeting 13 times for 7 months. The recommendations of KBAC to MOST were for instance: i) to prohibit both reproductive and therapeutic cloning, and ii) to allow temporarily stem cell research on the surplus frozen embryos created through *in vitro* fertilization (IVF). It was an unexpected result of the dramatic compromise between scientists and non-scientists. Neither conservatives nor liberals were satisfied with the compromise. The recommendations should have been respected as promised at the beginning, but MOST obviously did not like them. As a result MOST failed to submit its own version of the bioethics law to the National Assembly.

After one year, the Ministry of Health and Welfare (MHW) took over the bioethics issue, which MOST had been responsible for. Unlike MOST, the MHW took a position similar to the recommendations by KBAC. MHW in cooperation with Kim Hong Shin, a member of the National Assembly, submitted a bill entitled ‘Bioethics and Biosafety Law.’ Later, Lee Sang Hee, another member of the National Assembly and former Minister of Science and Technology submitted a different bill entitled ‘Prohibiting Human Cloning and Stem Cell Research Law.’ This bill strongly supported embryonic stem cell research.

The preparation of the bill on the government side dragged on for more than three years. At the end of 2003, the adjusted bill was passed by the National Assembly. The result was that the final bill became very much like Lee's proposed bill. This meant the victory of the growth-oriented MOST. The degraded bill caused a furious reaction from civil movement groups. The important points in the 'Bioethics and Biosafety Act' were twofold. First, human embryonic cloning was permitted in case it was approved by the Stem Cell Research Committee. Second, and more serious was that the bill could be interpreted to allow research where a genetic mix between humans and animals takes place.<sup>4</sup> The 'Bioethics and Biosafety Act' was to come into force from 2005 after one year of deferment. It is believed that the Act was made meticulously to protect Hwang Woo-Suk. If the Korean government had taken the recommendations of the Bioethics Advisory Commission, the Hwang scandal could not have happened.

In 2004, Hwang surprised the world by establishing a stem cell line from a cloned blastocyst. Another breakthrough in the following year consisted in making the patient-specific embryonic stem cells which made him rise to international stardom. It was also the fruit of the deliberate operation of the Korean government to make him a national hero. But for the massive support of major media in Korea, it would have been impossible for him to be a god-like figure among the people. After the 2004 paper of Hwang et al. was published in *Science*, a further recognition was waiting for him. He was made a 'Supreme Scientist' with special guards provided by the government. No Nobel Prize winner has ever had such honours as Hwang enjoyed. The Korean Air gave him two first class tickets for ten years. In October 2005, Hwang was at the peak of his career when he opened the World Stem Cell Hub with President Roh Moo-Hyun and Ian Wilmut. Then, he fell abruptly.

In Korea though the main concern was with human cloning; it moved to embryonic cloning subsequently. Numerous papers on cloning appeared in philosophy journals; most of them against human cloning, but there were some favourable responses to it. The Korean National Commission for UNESCO organized a consensus conference on cloning, which reached a conclusion not only against reproductive cloning but also against embryonic cloning. The Korean media, however, failed to turn the discussions into public debate; as their objective was merely to

target for Hwang Woo-Suk. There have been no debates on cloning in the true sense of the word. In the case of Korea, the socio-political context was much more important than the perspective from philosophy or religion in the problem of stem cell research. One-third of South Koreans are Christians. However, the idea that life belongs to the realm of God does not matter very much to them. In other words, religious affiliation has little to do with bioethics in Korea.<sup>5</sup>

Contrary to the common belief outside of Korea, it is not true that there was no ethical backlash to Hwang's research. The Catholic Church, NGOs and bioethicists were outspoken critics of Hwang from the outset. Right after the 2004 paper came out, the Korean Bioethics Association (KBA) formed the 'Ad Hoc Committee on the Research Ethics of Therapeutic Embryonic Cloning.' KBA sent a letter to the editor of *Science* concerning the problem of the Ethics Committee.<sup>6</sup> The letter was published with Hwang's response more than half a year later. At the General Meeting in May, KBA adopted a statement challenging Hwang to have an open discussion on the ethical problems of his research: IRB, authorship and acquisition of eggs.<sup>7</sup> The problem of authorship was raised by Lee Pil Ryul, Professor at Korea National Open University and the Centre for Democracy in Science and Technology, an NGO; and, the egg problem by David Cyranoski, *Nature's* correspondent in Tokyo, respectively.<sup>8</sup> The request was ignored by Hwang, though he admitted that he had some ethical problems on other occasions. The indifference to ethics on the part of the government and media also helped Hwang's arrogance.

Gerald Schatten's sudden severance of the relation with Hwang was a turning point for the decline of Hwang. It brought out the charges of oocyte donation irregularities by *Nature* anew. It was not until the 'PD Notebook' of MBC (Munhwa Broadcasting Corporation) television raised questions about the research that Hwang confessed his wrongdoing in obtaining the eggs. All the ethical suspicions regarding his paper turned out to be true. The verification efforts of young scientists through BRIC (Biological Research Information Centre) and the prompt investigation by Seoul National University further concluded that both the papers by Hwang were nothing but fakes. It was shocking news even to the critics of Hwang. The two papers by Hwang published in *Science* were retracted. Hwang was fired from Seoul National University

after a long deliberation. The Korean Society for Molecular and Cell Biology expelled him and the Ministry of Health and Welfare removed his license to conduct embryonic stem cell research. The Ministry of Science and Technology stripped him of the title 'Supreme Scientist.' Intensive investigations by prosecutors followed and the trial is going on. Investigations by the National Assembly agreed to by major parties have not yet been carried out. Hwang still holds some important honorary posts including the membership of the Korean Academy of Science and Technology (KAST) and the Board of the Korean Federation of Science and Technology Societies (KOFST). There is no doubt that Korean society is too magnanimous to him. The case is yet to be concluded in the midst of continuing resistance offered by the fanatic supporters of Hwang.

The Korean government should bear the main responsibility for the Hwang scandal. Its growth-first policy in developing biotechnology left no room for any kind of regulations or criticisms. All Asian countries are keenly interested in developing biotechnology; Korea, however, dashed ahead recklessly and the result was a debacle. President Roh Moo-Hyun with his entourage gave huge support to Hwang, while all the political circle leaders except the Democratic Labour Party praised Hwang as a hope for the nation. But no one has apologized for the awful misjudgement. Distortion and exaggeration in the reports of the irresponsible media aggravated the situation. There was no place for ethics in the hostile landscape dominated by the government and media.

Scientism and crude nationalism are also to be blamed. Asia has a deep-rooted tradition of scientism which lasted for more than a century. In the nineteenth century Asia was overrun by Western imperialism. Asian countries had to make desperate attempts to survive the challenge. In Japan it was believed that the only way for survival was to catch up with Western science and technology. Of Tokyo University graduates in the 1890s 85 per cent were science and engineering majors. Japan became the first country in Asia which succeeded in modernization. There were similar aspirations for science and technology in both China and Korea, though in these two countries there was more resistance by traditionalists. It was hard for China to attain modernization even after the revolution of 1911. Korea lost the last chance and became a victim of Japanese imperialism in 1910. In Korea under colonial rule,

there was a belief that independence could be achieved through science and technology. The nationwide science movement in the 1930s is a good example. After liberation in 1945, 'nation building with science and technology' has been the national motto of Korea.<sup>9</sup>

Korea emerged as an economic giant from a poverty-stricken country in the 1960s. During a period of 45 years the national income per capita rose from \$200 to \$17,000. But the amazing success in industrialization was possible only at the expense of the environment, tradition, and ethics. Science and technology was the handmaiden of the economy. It was only 10 years ago that the Korean government began to consider science and technology as culture also. Nevertheless, scientism continues to be paramount in Korea. Both the government and opposition are growth-oriented and they are supported by the major mass media groups. The government has been extraordinarily interested in developing biotechnology. In 1983 it framed the world's first the Law for the Promotion of Biotechnology in the world. Even the National Human Rights Commission of Korea, which had opposed the dispatch of Korean troops to Iraq, remained silent concerning the misconduct of Hwang. The situation in Korea until November 2005 was something like the United States right after September 11.

Korea had good reasons to be nationalistic. There had been ceaseless invasions from its neighbours. It is still said to be an ant surrounded by four elephants. It suffered from Japanese colonial rule for 35 years. After 1945, it was continuously humiliated by the four big powers surrounding the peninsula. Korea is now the twelfth economic power in the world. It is not as friendly with the United States as it used to be. In a climate of the growing nationalism of Japan and China the majority of Koreans are still nationalists or patriots. Hwang exploited the nationalist feeling of people shrewdly. He kept paraphrasing Pasteur's famous words: "There is no national border in science, but a scientist has a fatherland." When he came home after reading his paper, he said proudly: "I have fixed our national flag in the heart of the United States." Some politicians and journalists joined him in instigating patriotism.

It is held that the Hwang scandal was a confrontation between the 'Alliance of Science and Technology'<sup>10</sup> and the 'Solidarity of Ethics.'

The former consisted of scientists, government, business and media which were united with vested interests and ideologies. The latter was composed of NGOs, religious groups and bioethicists. A formal alliance never existed, but the de facto alliance was extremely powerful. An alliance on such a scale is unprecedented in Korean history. There were formal solidarities for several campaigns in different forms, but they were heterogeneous, loose and hence weak. Only the Catholic Church and some conservative Protestants among religious groups were critical of Hwang. Feminist and environmental NGOs did not cooperate actively with the Centre for Democracy in Science and Technology, which alone fought against the 'Alliance' consistently. "South Korea's handful of bioethicists had no leverage".<sup>11</sup> The defeat of the 'Solidarity' by the 'Alliance' was too natural, since these two were incomparable.

After Hwang was dishonoured, the main issue now becomes research ethics. The government is hurriedly drafting a guideline for research ethics. Of course, research integrity is important, but due to an over-emphasis on this, other ethical problems of stem cell research are blurred. There have been many conferences dealing with various problems of the Hwang scandal in a broader context. There was a session on 'What does the Korean Stem Cell Scandal Imply to STS?' at the EASST 2006 in Lausanne. Four sessions are being organized in the upcoming 4S conference in Vancouver. It is a real challenge to history and the philosophy of science and STS. There are also campaigns for making a 'Code of Conduct for Scientists and Engineers'<sup>12</sup> and for strengthening bioethics education. However, it is to be regretted that neither the government nor media is interested in them.

One of the early issues of Hwang's research was to do with eggs. Many Westerners find it difficult to understand the indifference of the Koreans to the problem of eggs. How could Hwang get over two thousand eggs so easily? They tend to consider that it is due to cultural difference, but it is not that simple. Korea was tremendously influenced by Confucianism, which is profoundly ethical. Confucianism was the guiding principle of the last dynasty in Korea for 500 years. According to the Confucian ethics, all parts of the body are important, since they are from the parents. The negligence of ethics is quite a new phenomenon resulting from the civil war and industrialization. In the 1950s, the Korean government launched a successful campaign for birth

control. Thus, abortion became a common practice in Korea, though it was against criminal law. It seems that the negligence of life has something to do with the 'paradise for abortion.' It was disgusting to see thousands of Korean women including some members of the National Assembly volunteer to donate eggs to Hwang. Hwang's misconduct in acquiring eggs is no less serious than his fraud in research. It is vital for the Koreans to restore the respect for life. Extensive discussions on this problem are necessary.

Korea is suffering from its failure to liquidate the past properly. The Japanese colonial rule, the Korean War, two military dictatorships, the Kwangju massacre have never been concluded. They are still a cause of quite a few problems. This is why the Hwang scandal should be finalized neatly; if the Koreans fail to do so, there is no guarantee that there will not be a second Hwang. There are many lessons we should learn from the Hwang scandal. According to two Austrian political scientists, the imprudent fraud of Hwang is a result of political irresponsibility.<sup>13</sup> "Korea should provide the system of science with clear structure of political-administrative responsibility, transparent decision processes and the room and chance for scientific criticism." Cho, a Korean-American bioethicist, concludes: "The lesson to be learned is that we need to do a better job of holding research institutions accountable for setting up systems and mentorship that will produce integrity in its scientists."<sup>14</sup> But the most important lesson is that we came to rethink what science really is and where science should go.

### Endnotes

- <sup>1</sup> Kim G.B. (2006).
- <sup>2</sup> Rose, Hilary (2004).
- <sup>3</sup> Lee & Yamazaki (2003); Wang (2003).
- <sup>4</sup> Cf. Han *et al.* (2003); Pak U. J. (2005), Ch. 8.
- <sup>5</sup> Cf. Song (1999).
- <sup>6</sup> Song (2004)
- <sup>7</sup> Koo (2005).
- <sup>8</sup> Lee P. R. (2006); Cyranoski (2006b).
- <sup>9</sup> Song (2006a).
- <sup>10</sup> Chang (2005), Kim J. Y. (2006).
- <sup>11</sup> Editorial, *Nature* (2005).
- <sup>12</sup> Song (2006c).
- <sup>13</sup> Gottweis & Triendl (2006).
- <sup>14</sup> Cho *et al.* (2006).

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