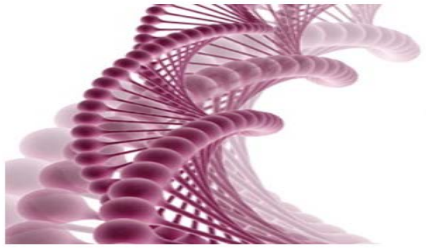

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Identifying Basic Principles for Moving Forward

Beyond local interest toward universal responsibility

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Main Argument

- At present, in order to develop human gene editing technology further and apply it to clinical practice, we need to go beyond local interest toward universal responsibility.

- For this, scientists, researchers, oversight and policy people, research funding agencies, governments, patients and civil society are all important, but scientists are particularly important.

Historical experience of Korea

- Here, I would like to share a historical experience of Korea, Hwang Woo-Suk Scandal since 2004.

- Hwang claimed that he had established human cloned embryonic stem cells lines in *Science in* 2004 and 2005,

- Korean government and people supported WS Hwang with strong nationalism and patriotism, for the sake of **national interest**, despite its ethical problems such as use of human eggs and embryo, human cloning, etc.

Criticism from international community

- After the revelation of the research misconduct in a global scale, the international community diagnosed that it was not just a moral failure of an individual but a system failure of Korean society.

- pointing out that Korea had not established a good research governance system, lack of research ethics education, lack of human subject research oversight, etc.

Korean Government

- The government and the National Assembly revised the Bioethics and Safety Law
  - The bioethics law apply to all human subject and biomaterial research
  - Central and local governments duty to support bioethics activities
  - Support, Evaluation, and accreditation of all IRBs by Ministry of Health
  - Training IRB members abroad for eight years with government funding, training for researchers and IRB members across the country
- The Ministry of Science and Technology created research ethics guidelines that includes handling of research misconduct.

Funding Agencies

- The Korean Research Foundation provided model research ethics governance for universities, adopted those from advanced countries
- Provided funding for promoting research ethics activities and education to universities and academic societies and journals
- Required various academic societies and journals make research ethics guidelines
- Mandated IRB reviews of protocols and research ethics education for researchers

Academia

- Various consorted efforts to enhance ethics in research by Association of IRBs, scientific societies, journal editors, university integrity officers, etc.
- Universities and research institutes mandate research ethics education for graduate students and researchers at
- Each university established IRB and research ethics committee including Integrity Officer
- Established a research governance system based upon IRB and HRPP in universities and hospitals.

Korean Society

- In the society as a whole, the sensitivity and awareness to research ethics rose
- Violations of research ethics became one of the main reasons for disqualification when scholars began to enter public domain, such as when appointed as a minister, or president of university
- Tremendous change in research ethics governance and culture in Korean society for 10 years since the Hwang Scandal.
- Some scholars call this ***ethical modernization in Korean society***

From relativism toward universalism

- An important change is that Korean society has shifted from having relativistic values in research ethics to universal ones.
- When Hwang's research used a large number of female oocytes including Hwang’s subordinate researchers became an international issue, some argued that Korea's culture and values are different from Western values.
- The so-called Korean values turned out to be misused as a rational to exploit vulnerable women and researchers, and the revised bioethics law to include a principle to accord to international standards and international cooperation.

Beyond local interest to universal responsibility

- To retrospect, the Korean research system and culture before Hwang Scandal were like houses built on sand.

- In a nutshell, Hwang Woo Suk 's experience made Korean society change beyond local interest toward universal responsibility.

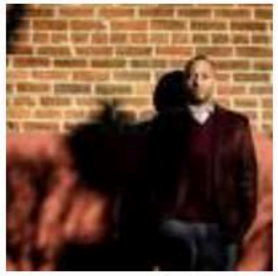
Bio capitalism and conflict of interest

- Now that we have heard about the birth of gene-edited twins and the possibility of applying gene editing technology to clinical research in the last two days, we need to go beyond local interest to universal responsibility.

- Local interest can be private interests of scientists, of universities or research institutions, or even interests of a nation.

- To this end, the issues of conflict of interest need to be addressed.
- At present, no one is free from the very strong influence of bio capitalism. Research fidelity, safety of research subjects, public trusts in science become at stake because of conflict of interest arising from local interest.

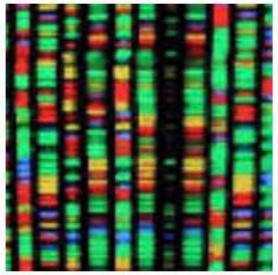
Gene editing and Conflict of Interest



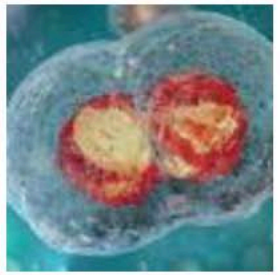
CRISPR could end sickle cell disease, but signing up black patients ...
STAT - Feb 21, 2018
CRISPR could end sickle cell disease, but signing up black patients for .... as recently as 1995, therefore being rife with **conflicts of interest**.

Crispr Therapeutics AG (NASDAQ:CRSP): Could it Benefit from the ...
FDA Headlines - 6 hours ago
Crispr Therapeutics AG (NASDAQ:CRSP): Could it Benefit from the Slippery Slope of ... To avoid a **conflict** of **interest**, our writers work independently and without ... Your technology was likely to bring up some **ethical** issues.

Claims of gene-edited babies trigger major controversy
RACGP - 1 hour ago
Claims by a Chinese scientist to have created the first **CRISPR** **of interest** of researchers who had a **financial** stake in the ...



Gene Editing Controversy Reminds Us Just How Much Money ...
Gizmodo - Jul 6, 2017
"We've talked about **conflicts of interest** for many years in science and for many reasons much of that focus has been on **financial** conflicts.



Genome editing of human embryos broadens **ethics** discussions
The Conversation CA - Oct 1, 2017
The use of **CRISPR** (pronounced "crisper") to modify human embryos ... This raises the spectre of institutional **conflict** of **interest** because OHSU ...

Current Gene Therapy, 2017, *17*, 309-319

RESEARCH ARTICLE

BENTHAM SCIENCE

First-in-human Phase 1 CRISPR Gene Editing Cancer Trials: Are We Ready?

Françoise Baylis* and Marcus McLeod

Novel Tech Ethics, Faculty of Medicine, Dalhousie University, P.O. Box 15000, 1379 Seymour Street Halifax, NS, Canada

4.2. Financial Conflicts of Interest

Biomedical research conducted in academic institutions is now commonly intertwined with pharmaceutical and biotechnology industries as part of an innovation ecosystem [49]. In this way, academic institutions and investigators have embraced a new kind of entrepreneurship in which financial conflicts of interest may arise [50]. In an effort to manage such conflicts of interest, academic institutions and professional organizations have developed policies governing academic-industrial collaborations. For example, the 2000 "Policy of The American Society of Gene Therapy Financial Conflict of Interest in Clinical Research" stipulates that,

4.4. Summary of Concerns Regarding Credibility

Optimism bias, potential financial conflicts, competing interests between investigators, institutions and pharmaceutical companies, as well as a publication bias, raise serious concerns regarding the credibility of the pre-clinical study that provided an evidentiary basis for the move to the first-in-human Phase 1 gene editing cancer trial.

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Commentary

Lessons learned from the gene therapy trial for ornithine transcarbamylase deficiency

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ABSTRACT

It has been 9 years since Mr. Jesse Gelsinger died from complications of vector administration in a liver gene therapy trial of research subjects with a deficiency of ornithine transcarbamylase (OTCD). This study was performed at the Institute for Human Gene Therapy of the University of Pennsylvania (Penn) which I directed. His tragic death provoked a series of events that had implications beyond those directly involved in the clinical trial.

The events surrounding the death of this research subject have been the topic of much coverage and commentary in the popular press. The goal of this article is to share with you my reflections on the OTCD gene therapy trial and lessons that I have learned which may be of value to others engaged in various aspects of translational medicine.

aspects of translational medicine.

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Lesson Learned

Commentary

Lessons learned from the gene therapy trial for ornithine transcarbamylase deficiency

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Lesson #3: It is very difficult to manage real or perceived financial conflicts of interest in clinical trials. One of the most troubling allegations that surfaced following the OTCD gene therapy trial was that decisions were influenced by the potential for personal financial gain, especially as it related to my affiliation with a gene therapy biotechnology company called Genovo, Inc. These allegations emerged at a time when more global concerns had been rising regarding financial conflicts of interest in other clinical trials conducted in the United States. Evaluation of this issue often attempts to differentiate real conflicts of interest due to possible financial gain from situations where there is no potential for financial gain but that there is the perception that this may occur (i.e., perception

Bias Blindspot and Conflict of Interest

- The problem of conflict of interest is difficult to judge for oneself because human being has a "bias blindspot."
- One cannot perceive that a bias occurs because of one's own interests.

In the Bible, Jesus said this well.

Why can you see so well the mote in your brother's eye while cannot see the beam in your own eye?

- "*And why beholdest thou the mote that is in thy brother's eye, but considerest not the beam that is in thine own eye?*" (Matthew 7: 3)

Let us be vulnerable to open scrutiny

- If there is a problem of local interstate that may erode universal responsibilities, whether it be researchers, research institutes or national units, you should make others or other actors judge of your own rather than by you.

- To do this, you should be able to do self-doubt, be overseen and scrutinized, open to criticism by others or independent beings, with the idea that you may go wrong due to local interest.

Conclusion

Now, we are laying the foundation of the new norms for international and professional communities around Human Genome Editing.

So far, Conflict of Interest has been largely neglected and overlooked in process of making such norms.

Constant self-reflection and self-doubt on Conflict of Interest by informed individuals and institutions, will be the foundation of enhancing transparency, due care, responsible science, and fairness for the technology.

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