Online Ethics Center
FOR ENGINEERING AND SCIENCE

Readings

Description

Part of unit 6 of the Course on Genomics, Ethics, and Society, this section provides a number of readings on the ethics of gene therapies and human enhancement.

Body

Week 1

Everyone should read both readings this week. The Gould reading may be a bit technical for non-scientists, but have a go at getting the gist of what's being said.

The first paper here gives a wide-ranging and helpful overview of the current state of genomic medicine (at least as it was in 2013). It explains challenges and opportunities presented by genomic medicine and outlines some of the key ethical issues involved, including those concerning gene patenting and privacy (which we'll consider in Unit 7). The paper also provides some signposts as to how we might reasonably expect genomic medicine to change over the next few years.

1. McCarthy, J. J., McLeod, H. L., & Ginsburg, G. S. (2013). Genomic medicine: A decade of successes, challenges, and opportunities. *Science Translational Medicine, 5*, 1-17.

Questions for reflection: What do the authors here identify as the main challenges to getting research in genomic medicine into clinical practice? What do you think are the best ways of trying to deal with these challenges?

The second reading here considers the potential for different kinds of “gene doping” in sport. The paper gives an overview of how gene therapy works (developing some of material we outlined in the Background to this unit) and giving examples of the success of certain gene therapies. It then considers the potential for different kinds of gene doping and the health risks the practice is likely to pose.

2. Gould, D. (2012). Gene doping: gene delivery for olympic victory. *British Journal of Clinical Pharmacology, 76*, 292-298.

Questions for reflection: Gene doping may pose a risk to the health of athletes. But people are free to take many risks with their health (eg to consume poor diets, to smoke and to drink alcohol). Is there something different about gene doping? Are there other important issues to consider here?

Week 2

This week, everyone should read the papers by **Garcia and Sandler** and **Sandel**. Graduate students should also read **Liao.**

The first reading here, by Garcia and Sandler, considers the ways in which human enhancements may be relevant to justice issues: whether they are likely to increase injustice or promote justice. Garcia and Sandler argue that while many of these technologies are likely to be justice impairing, they are not intrinsically unjust, and that even if some technologies are likely to promote injustice in practice, this is not an all-things-considered reason for not pursing them.

1. Garcia, T., & Sandler, R. (2008). Enhancing justice? *Nanoethics, 2*, 277-287.

Questions for reflection: Do you agree with Garcia and Sandler ? How likely do you think it is that the development of various genomic technologies will enhance, rather than reduce, existing injustices?

Michael Sandel is a well-known contributor to debates about human genetic enhancement as well as for his work as an advocate of communitarianism in political philosophy. Sandel's piece here, from *the Atlantic* has been influential because of its strongly-worded advocacy of an intrinsic objection to genetic engineering of human beings (rather than an objection based on problematic consequences, such as

promoting injustices).

2. Sandel, M. J. (2004). The case against perfection: What's wrong with designer children, bionic athletes, and genetic engineering. *The Atlantic Monthly, 293*, 51-62.

Question for Reflection: Sandel argues that it's wrong for us to genetically re-engineer our natures. Do you agree? Do you think he's right to suggest that genetic engineering fails to appreciate the ways in which human talents and achievements are gifts?

Liao's paper gives an overview of many of the central issues raised by selecting children, and critically examines arguments like Sandel's. The paper draws a number of useful distinctions early on, including that between modification and selection. Liao then considers some of the most prominent arguments both for and against selection, modification, and the creation of human/animal chimera.

3. Liao, S. M. (2008). Selecting children: The ethics of reproductive genetic engineering. *Philosophy Compass, 3*, 973-991.

Question for Reflection: Which of the arguments Liao presents did you find most persuasive, and why?

Recommended Readings

- Agar, N. (2014). Radical human enhancement, and what's wrong with it. In J. Basl and R. Sandler (Eds.), Designer biology (pp. 87-104). UK: Lexington Books.
- Basl, J. (2010). State neutrality and the ethics of human enhancement technologies. *AJOB Neuroscience, 1*, 41-48.
- Hayden, E. C. (2013). Regulators weigh benefits of 'three parent' fertilization. *Nature, 502*, 284-285.
- Lea, D. H. (May 5, 2009). The Genetic Information Nondiscrimination Act (GINA): What it means for your patients and families. OJIN: The Online Journal of Issues in Nursing, 14.
- Samuels, D. C., Wonnapinij, P., & Chinnery, P. F. (2013). Preventing the transmission of pathogenic mitochondrial DNA mutations. *Human Reproduction, 28*, 554-559.

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