

Gene editing human embryos



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Recently, genome editing of human embryos was reported. Since biotechnology had already enabled researchers to conduct genome editing of embryos from other animals, the ability to do so in humans was long awaited but with anticipated bioethical concerns. As biotechnology improves, so too will our ability to selectively manipulate the embryo to produce a human being of our liking. Current genome editing methods are viewed as too risky to be done in human embryos, since they would almost certainly lead to undesired mutations. However, ambitious scientists have sought to push the boundaries of these limitations. The obvious concern that emerges from modifying the human embryo with gene editing technology is designer babies, where parents can literally select for traits in their offspring before birth. Beyond the societal implications, there are also personal ones, as the baby itself cannot be consulted on how it wants to be designed.

The paper that reported this genome editing used fertilized eggs from fertility clinics that could not be used for impregnation. Therefore, these experiments avoid the possibility of human embryos reaching birth. Importantly, a number of off-target mutations were observed in the paper, demonstrating that from a safety perspective genome editing of human embryos in its current state is ethically untenable. Nevertheless, with continued advancements in gene editing and developmental biology, including that of iPS cells, the ability to manipulate viable human embryos with high precision is inevitable. In anticipation of these experiments, the International Society for Stem Cell Research (ISSCR) has condemned these efforts, arguing it is far too early to be using human embryos. However, as demonstrated by the already reported efforts, the ISSCR cannot prohibit these experiments. Instead, countries must set the rules.

Coincidentally, it was a discovery made by Prof. Atsuo Nakata and fellow Japanese researchers in 1987 that lay the foundation for genome editing. Thus, with its history in the field, it would be nice to see Japan take a lead role in setting the framework.