

Egal Igeh  
The case against Genetic Editing

CRISPR –Cas9 is a genome editing tool generating much debate and controversy in the scientific world due to its wide range of potential applications. Developed from the adaptive immune system of bacteria, [1] it essentially works by guide RNA, which locates specific parts of the DNA, binding with Cas9 that cuts strands of DNA. With the developments in genetics, scientists have been using gene targeting to introduce changes in specific places which results in modified organisms. [2]

Science now is moving faster than our moral understanding and as a result society is unable to articulate its worries. Genetic editing offers both the promise of being able to treat diseases and the possibility of causing disease. In this essay I will present the most common arguments against the introduction of genetic editing in human embryos and how, in my opinion, it will do more harm than good in the long term. We need to first distinguish between health and enhancement.

There is no question, with regards to somatic genetic editing, that treating a diseased individual is of overall benefit. Somatic cell modifications are non-inheritable, affecting only the treated individual [3]. But the slippery slope argument can be applied as to where the line would be drawn; what we have now defined as acceptable, for example to remove cystic fibrosis which is a devastating disease nearly all people would want to remove, may lead to morally unacceptable consequences. Once you accept one particular position then it will be extremely difficult, or indeed impossible, not to accept more and more extreme positions. You can either place barriers, governed by laws and policies, or shift your moral framework to accommodate the new reality.

Genetic editing of the germ line, which applies to embryos, sperms and eggs, will affect future generations. The offspring that the parents wish to enhance will also have its right to autonomy violated, possibly leading to that child moving into a particular career, so they are not truly free in their decisions and are instead governed by their genetics. This is a concept known as genetic determination. Fundamentally, it renders our humanity void, threatening our capacity to not only act freely but also to succeed by our own efforts, and consider ourselves responsible for our achievements. Parents want what is best for their children and this is understandable, however parents who are making the decision may be influenced by other parents, the media and further society to have designer babies.

The enhancement of the mind for non – medical purposes such as memory or cognitive function could serve as tools to aid in manipulation and over time create two different classes of humans; over time becoming subspecies and may lead to discrimination and violence etc. The poor will continue to be disadvantaged; creating an even bigger gap in wealth and health. If the goal of society is equality of opportunity, genetic engineering threatens to undermine this principle.

Traditionally and culturally in many countries, boys are preferred. This will cause a disproportionate sex ratio and demographic shift leading to increased sex discrimination and social dysfunction, for example a societal expectation to get married as soon as possible, already seen as a result of one child policies in China [4]. The American Congress of Obstetricians and Gynaecologists (ACOG) advocates prohibiting sex selection because of its potential to lead to sex discrimination against women in society [5]. Currently in the UK choosing sex is only allowed for medical reasons such as being at risk of passing on a sex linked disease that affects children of a particular sex. [6]

In sports, genetic enhancements from birth would be seen as cheating and much harder to detect by sports bodies compared to drug use. Some may argue certain athletes already have genetic advantages like those of Caribbean descent [7]. However, sports is a display of natural talent and hardships, spectacles such as the Olympics are all about overcoming these hardships and striving to

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perfect yourself with training. Widespread genetic engineering carries the possibility of rendering sports a contest of technology, rather than natural ability and determination.

Genetic editing requires the genome sequenced and data obtained. Health companies may use this data to predict life expectancy and discriminate by setting high premiums, moreover this may be used as a premise to discriminate in the workplace and make those with pre-dispositions to genetic conditions less employable. The US senate prohibited genetic discrimination in health insurance [8]. However, this may be difficult to control once genetic sequencing becomes common.

In terms of politics the question remains; how do you make policy for people who disagree with genetic editing? Laws are governed partially by moral stance and this requires a lot of debate with the public in order to make informed decisions on issues that will affect them. There is a daunting prospect that imposed genetic enhancement may also occur. Those currently in mental institutions are imprisoned against their will until they are considered cured of their mental illness. In a similar way and justified by similar arguments, this may lead to those who have a proven predisposition for a mental illness being forced to undergo editing to remove the possibility of disease.

In addition to this, where would the line be drawn for an abnormality; would it be a certain IQ threshold, physical features etc and will society govern this and be prepared for it? This already been seen in the way society has responded to screening for Down syndrome babies. In a documentary by the BBC in 2016 called A World without Down's Syndrome, the prospect of a world without Down's syndrome is explored with the arrival of a new NHS test that is able to identify babies with the condition with a high degree of accuracy. In the documentary, the mother of a child with Down's syndrome looks at views and opinions from parents, experts, educators and scientists. The suggestion of the documentary is that a negative perception exists surrounding Down's syndrome, generated by the public, the media and even medical institutions. In the UK there is a 90% abortion rate for positive results, it is legal to terminate under law and there are only 40,000 Down syndrome people in the UK. [9] In Iceland there is now a 100% termination rate for Down's syndrome. However, people are challenging this negative perception of Down's syndrome, for example with the introduction of Down's syndrome actors in the media, such as Spanish actor Pablo Pineda, also the first European with Down syndrome to complete a university degree [10]. This is important in showing the public that despite their genetic condition they are able to live normal lives, provided they are given this opportunity. A similar challenge of genetic engineering and the resultant discrimination which could occur is important.

The future is now, the technology developed from the scientific developments is available; science has no inherent morality and it is up to us to decide whether or not it should be used. But that doesn't mean that the technology available should always be used. The atomic bombings of Hiroshima and Nagasaki during WW2 which killed at least 129,000 people is regarded as one of the most worst crimes against humanity and the aftermath of the use of that technology prompted society to cease use [11].

In conclusion to this, the recent introduction of CRISPR-Casp9 has generated much debate and controversy about its use in human embryos. Somatic gene editing is promising, as it can help sufferers of disease, while having no effect on future generations and is consented to by that individual. Nonetheless, there is a possibility of germline editing of human embryos taking place, affecting future generations by creating modified humans.

Ethical questions surrounding the use of this new genetic editing tool need to be considered now and requires interdisciplinary work with academics from all backgrounds as well as the public as it is

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an issue that will affect everyone. Increased awareness is needed on all fronts as the need for an informed decision is crucial and this can first be done by addressing the unease of the public by forming bridges and modes of communication between them and the scientists involved in the research.

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