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## All Pros And Cons Of Genetic Engineering

There are many misconceptions and oppositions on embryo alterations. There is a belief about it is unnatural and playing God. But it is important to recognise that this criticism relies on the belief that nature is good. If we used this belief, we would never use antibiotics or medicines as the diseases and illnesses received are all natural. Therefore, making this argument completely redundant.

Many critics use the argument that embryo modifications are entirely unethical but what is really unethical is depriving those who are suffering from these potential treatments. Embryo modifications could eradicate suffering and to not investigate into it and not use the technology is completely unethical as people are dying and genetic engineering can provide them with lifesaving treatment. To not consider the greater good within this technology and how it can be utilised is absolutely corrupt.

It is also important to remember that these are embryos that are being tested on they are not babies; they are just embryos. Additionally, to combat the argument that it is unethical to study and use embryos for research purposes the Chinese scientist who we touched on earlier made sure to use embryos that were not viable and would not carry to full term. The investigations into genetic engineering would make sure the CRISPR technology is 100% safe and tested before it would actually move to humans therefore should not be criticised for being unethical. People make the assumption that it would be used on humans straight away, but it would take many trials before it would be used, and they would ensure that it was safe to practise before using on viable embryos. There are many risks however they will be handled before it can be proceeded to be used as a treatment.

A reason why people are against genetic engineering is because they argue that experimenting on embryos is unethical due to a number of reasons, the main being embryos are unable to give consent and has no choice over the modifications that are enforced upon them. Because the embryo is not actively giving consent, they believe that the decision cannot be made to modify them. They state that scientists do not know whether the embryo would have wanted them (modifications) so therefore is not consensual. It takes away the basic of human rights as it doesn't get a choice over its body or what it is about to become. Thus, genetic engineering should not be carried out and should be banned from being practised by the whole world.

Another reason why many disagree with genetic engineering is because they believe that it is not right and that it is a life and people should not be able to use them for research purpose. Many religious people question the use of embryonic research. It can be argued that embryos are a life and by using them for research is highly unethical and does not take in account how they are destroying life in the investigations to better the technology. Individuals are not in favour of the idea of a genetic engineering future and believe it is immoral to be tampering with life. If research is showing us the failure of this technology time and time again how can we in good conscious allow for that many embryos to be destroyed that could potentially have been a life. It is completely unethical and immoral. It is unacceptable to be treating an embryo as if it is not human as that is what it is, and the destruction of these human embryos are diabolical. Genetic engineering should not be allowed testing.

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By creating a door to a form of gene editing we are opening it to all forms. By allowing human gene editing for any cause, would eventually lead to breaks from regulatory restrictions. Some people would abuse this type of technology using it for enhancement functions and the development of a market-based eugenics that would intensify already occurring discrimination, disparity and conflict. Saying yes to gene editing research and these modifications opens doors to all kinds of modifications how far are we willing to go? What is too far? Yes, there are scientists who only want the best for people and are sincere in their aim of ending suffering however there will also be scientists who just go too far, pushing boundaries and creating problems. Not only that but what people demand from genetic engineering would also go too far, people would begin to insist on 'designer babies.' Places in the world like China, have a preference for boys so that they have 'heirs' if genetic engineering was possible, they would have the choice to ensure that the sex of the baby is what they desire. This is just too far as well as not right and would not be fair, this creates problems then in society where there are too many men to women ratio. Furthermore, people could use the technology for not its intended purpose but in a harmful way.

The technology could create more problems than what it can solve. CRISPR in the wrong hands can be used as a weapon and further create and spread inequality. It is important to remember who would be the ones that would be able to afford this kind of technology, this technology would not be accessible to all, only to a select few who would be able to afford this, this would give people further advantages in life and make the line between rich and poor even more prominent. Genetic engineering sets restrictions on genetic diversity. Using genetic engineering would be like cloning it would have a negative effect on genetic diversity. Diversity is essential to life. We know that not everyone would be able to afford gene therapy, only wealthy people would have access to it, which could mean that the traits such as the qualities that are inclined to make individuals make less money would ultimately perish. The use of genetic engineering would make individuals appear similar and the existence of diversity would soon die out. There would be no genetic diversity between people. We do not need to and mustn't take the risk of these consequences.

A reason why genetic engineering should not be carried out is because it can cause genetic defects. Researchers and scientists do not have a full understanding about everything in the human body and therefore do not know the implications they can be causing by their slight changes. There is a great chance that eradicating one disease could lead to something even more dangerous. If embryos are being implanted that have been genetic engineered, then there is high risk of implications for instance miscarriages or stillborn. All situations that are harmful and should be avoided. Scientists cannot guarantee that the adjustments they make will result in their exact aim as the human body is extremely complicated therefore anything could do wrong. Is it worth the risk? It is not worth risking mother and child. Genetic engineering risks too much and is too unpredictable and so should not be carried out.

I decided to investigate into this debate and conduct some research. Initially to research into my topic I chose to create a questionnaire where the participants were anonymous therefore, I could get the most honest answers. Questionnaires also meant that I could hand as many out as I'd like. This meant I would have a bigger sample therefore having more data to compare making my research reliable. However, when it came to be completed and handed in the questionnaire, people had difficulties in understanding such a complex research topic in a questionnaire resulting in many questions unanswered and some giving up halfway. I concluded after that I had to switch up my research collection data method and ended up on conducting

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interviews. Interviews meant I could in depth explain the questions to the participants and actually listen and understand their point of view. I used a structured interview this allowed me to gain reliable information. Even though my sample size was not huge the data I gained was insightful and helpful. It was also valid. The answers were also very thorough, this made it easier to draw conclusions.

After analysing my research data, I found that men on average were more accepting of embryo modifications and genetic engineering. On the contrary, women happened to be more critical and subject to other ideas on improving diseases. I think this had to be due to women having to be the ones who would have to go through with the implanting of the embryo and the idea is slightly terrifying. The research may go one of two ways, additionally to women embryos are more precious as they age and therefore causing them to be less likely to want to risk one on them with this technology. For women they felt like their eggs were too valuable to be wasting on research. There are many risks for women when it comes to genetic engineering. The participants main concerns when questioned about genome editing were that the issues would outweigh anything positive about it and that it was totally reckless. They also believed that it would be unfair as not everyone would be able to afford it, and this would lead to inequalities. My research also showed to me that people who were higher up at work were more likely to agree to the idea whereas people who did not have as high status at work were more likely to disagree with the modifications.

The main consensus from the participants were that the idea of embryo editing was a total no go and should not be messed with as its unnatural and we should let the body handle what it is given. One interview stood out to me it was by a participant who will not be named for private and confidential implications. This participant stated that they believe the economic issues would be their main issues as it would create disparities. They felt that there would be great conflict due to who would be able to afford this technology and thought that it was not fair. This participant also stated that they would be opposed to having children if this was the future and would have an issue with this if it were to become mainstream.

Another participant pointed out that this was out right playing God and would be disappointed in the society we became if we let this happen. When questioned whether any of them use antibiotics or had any treatment the ones who did found it interesting that I would compare it to embryonic engineering. After presenting them with evidence of what genetic engineering could do and asked if not using this knowledge was acceptable, they had a shift in thought and started to think about both sides. Some of them believed that withholding from investigating into this type of research was ridiculous if it could save lives then it should be done. They also argued that it was disrespectful to not go ahead when they can improve lives of those suffering as well as help with crops, ensuring a resourceful future. Even after they were presented with evidence from both sides, it was conclusive that they believed it is still unethical and should not be followed through.

The ones who agreed with embryo modifications said that they would not personally follow through with it but wouldn't be opposed to others carrying the procedure out. They stated your body your choice if you want to you can, but I wouldn't as I am a religious person and wouldn't want to mess with what has been given. They stated that it is more than taking antibiotics to get rid of something temporary this is changing someone's whole DNA their whole genetic code would be altered in effect creating a robot of some sort. They argued that these genetic engineered people would all be similar and there would be no diversity present within them.

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There would also be significant differences between regular people and genetic engineered people. As the technology advances people would be able to just write off certain diseases and won't have to inherit them, majority of the participants saw this as a bad thing as they believed that this would rid the idea of natural selection and ruin human nature. When it comes to the debate on whether genetic engineering should be the future or not the argument is very divided and will continue to be divided. The results on my research show me that people are very strong in their beliefs when it comes to genetic engineering. They are either very for it or strongly against it. I concluded though through my research that majority of people do not believe genetic engineering should be the future and that they believe we are very far off from being a society that will accepting these modifications.

To sum up everything that has been stated, unquestionably research into embryo editing needs to be done to narrow down the risks before anything can proceed. However, when there is so much suffering in the world by diseases such as cystic fibrosis and it can be reduced or eradicated due to this technology it is a decision that is time sensitive and should not be made light. The rejections of these advancement in medicine costs humans their lives everyday so we shouldn't dismiss it so easily if it could be potentially prevented. As the saying goes justice delayed is justice denied as is treatment delayed is treatment denied.

If we fail to investigate into such promising research possibilities for the reason of misdirected fears on the subject of risk, then people who potentially could be helped by these developments will suffer as a consequence of our failure to take action. In order for us to approach this topic ethically we must assess the outcome of us not taking action as well as taking action. With regards to this research the expense of not practising genetic engineering will be harmful, when there is potential for new treatments we must go ahead. It would also be incredibly unethical to not consider what the implications are of not acting on this potentially lifesaving treatment as this genome editing research is very significant and will produce new treatments. Should research not be conducted than we would not be able to carry out the thorough scientific assessment of consequences and doubts that is needed to progress in the direction of safe treatments. Essentially if we do not carry out research due to it being risky, it will always remain risky. Prohibiting research is not the solution.

The use of this technology we can conclude, is very essential. It is already being used to modify crops and is showing significant improvement in producing viable produce. If it is creating evidence that it is helpful, then we should trust the science and begin as soon as we can. Stephen Hawking declared "With genetic engineering, we will be able to increase the complexity of our DNA and improve the human race. But it will be a slow process, because one will have to wait about 18 years to see the effect of changes to the genetic code."

This statement proves to me that we are capable of improving lives and we should conduct research as soon as we can in order to reap the benefits of it. It will take a long time to make adjustments and continuing this debate is wasting time for potential treatments. We shall never know the benefits unless we start to test the technology and develop treatments.

In conclusion it is incredibly privileged of us to have such technology and argue whether we should pursue it when people are suffering and will die while we are discussing whether we should go ahead or not. To me to sit on this research prospect is absolutely unjust and immoral. Everything considered, I do believe that genetic engineering does have a future and is highly probable. Because of the fact that this technology could save lives it should go ahead as the

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advantages outweigh the disadvantages. We shall never know if we should continue to use this technology or develop something different if we are unable to use it and find out if it is good or not.

I hope in the future genetic engineering can be used for good and to help people who are suffering from diseases and allow for individuals to have children stress free. Genetic engineering should be used but in moderation. There should be restrictions and regulations to ensure that people are not conducting any dangerous or potentially harmful research. I can see how genetic engineering can perhaps go awry and wreak havoc, but I can also acknowledge that people who are suffering from life threatening disease could have had this all prevented if only we acted on this research. I am deeply saddened by the suffering and if genetic engineering can help even the platform from those who are at a disadvantage I say go ahead.

In summary is genetic engineering the future cannot be answered by a simple yes or no. It is very complex, and many considerations need to be taken in order to reduce risk. For now, genetic engineering continues to be banned in majority of countries. However, the International Bioethics Committee stated that genetic engineering can be carried out but only for preventative or diagnostic purposes and shouldn't be used for creating unnecessary modifications. Certain genetic engineering research is being carried out and more and more people are becoming open to the idea to it so perhaps a genetic future is in tow. Years ago, talk about genetic engineering was far from ever being discussed but now it is being explored. Despite how long it took the progress and acceptance to this research is growing day by day. At the end of the day we can establish that genetic engineering will ensue whether people agree with it or not as science is always progressing and looking for ways to improve lives, and this can do just that.