Parents

Genetically Engineered Babies: Good Or Bad Idea?

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Would you want the option of harnessing the power of genetics to alter the DNA of your unborn child? Would you want this to prevent disease? Select physical characteristics? Or "design" your baby by changing the genetic code?

Such was the topic of an Intelligence Squared debate held in New York City on February 13. Two experts argued that genetic engineering should be banned; two experts argued that it should be supported. The audience – of which I was a part – had a chance to vote both before, and after, the arguments were made. Prior to the debate, I was in favor of supporting genetic engineering – with many caveats. After listening to both sides present their point of view, I pondered three points to help me come to a final decision:

Is genetic engineering feasible?

The science of genetics is fast paced. Although we don't have much in the way of actual examples, it is worth assuming that it would be feasible at some point in the future. That said, my position is that it will only be worth considering for diseases or traits that are shaped by a single gene. There are certainly many diseases for which this is the case, such as cystic fibrosis and Huntington Disease. I certainly think there may come a time when it would be possible to try to intervene biologically to correct the mutations that underlie these conditions. However, bear in mind that most diseases and traits are believed to be due to the effects of many genes (polygenic) as well as environmental influences (multifactorial). Even height, which we think of as being "genetic", is due to the combined effects of many genes as well as environment, and hence is multifactorial. Eye color is not as straightforward in terms of genetics as you might think. So … I think we can have the conversation about those more rare diseases and traits that are due to the "necessary and sufficient" effects of a single gene which can be identified along with the gene product. Having the debate about polygenic and multifactorial traits (more on this below) seems to be morphing into science fiction rather than science (unless science proves that wrong).

Why should we pursue it?

The primary reason would be to eradicate disease, especially disorders that are known to cause premature death. Certainly think about the life of a kid with cystic fibrosis – who wouldn't want to spare a child that? Huntington Disease is an interesting example because it reveals that genes don't just express themselves at birth – they can have a deleterious effect in adulthood. If we

could alter that gene and prevent Huntington Disease, shouldn't we do that? Some cases of breast cancer involve the primary (though not fully deterministic) effects of a single gene – again, if we could alter that mutation, wouldn't we do that?

Why shouldn't we pursue it?

Many feel that there are ethical considerations. For example, some do not like the idea of changing DNA – in essence, the thought is that it should be left alone. However, in terms of disease treatment, it's worth noting that we do have examples of changing what a mutation does, and in the process keeping people healthy. A great example is a type of lymphoma caused by the "Philadelphia Chromosome" (so named because the mutation was discovered by scientists at the University of Pennsylvania). While the discovery was made in 1960, it took about 40 years to discover a genetically tailored drug that keeps the disease in check and allows people with this mutation to lead healthy lives. Although this isn't genetic engineering in the strict sense, the principle is the same – alter the effects of DNA to change the likelihood of disease.

Less clarity surrounds the use of genetic engineering to try to give parents the opportunity to control a variety of traits in their child to be – their appearance, personality, intelligence. As discussed by Melanie Abrahams, the pregnancy editor at Parents.com, the issue is would you want to create a Super Baby if you were given the choice? Again, my two cents to throw into this part of the debate is that it's hard for me to imagine genetic engineering for polygenic, multifactorial traits – which includes appearance, personality, and intelligence. But then again, we don't really know, do we?

Where do I land on this issue?

Bottom line, I support the idea of genetic engineering for well-defined diseases that are known to cause suffering and death. I don't see any difference between designing a drug that is tailored to counter the biological effects of a mutation, and in principle directly altering the mutation. I don't like the idea of applying genetic engineering principles to anything other than disease. Even "black or white" questions have their gray area.