HEALTH & SCIENCE

New gene technology an ethical minefield

A new technology that could wipe out diseases, but also create designer babies is here and it's time to have a conversation about the future, says leading science and philosophy experts. They spoke to Sasha Borissenko.

by **Sasha Borissenko** 16/10/2018

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A researcher performs a CRISPR/Cas9 process at the Max-Delbrueck-Centre for Molecular Medicine. Photo: Getty Images

Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR) technology is the new kid on the block.

It's used to alter DNA sequences and modify genes. Changes can be made to DNA without the need to introduce genes from a different species. It can effectively correct genetic defects and disorders, treat and prevent the spread of diseases, and improve crops.

And compared to other forms of technology, it's increasingly cheap and available, Massey molecular bioscience senior lecturer Heather Hendrickson tells *Newsroom*.

"There's been a constant expansion of the gene editing in the last five years. We're just scratching the service. And CRISPR has the capacity to change essentially anything. I could change the skin

cells on the top of my hand, which wouldn't change my offspring, but if I were to change sperm or eggs, those changes would manifest in my offspring, and any offspring thereafter."

But if you can effectively change anything and everything in theory, where do you draw the line?

You certainly get into eugenics territory, she says. Where most people wouldn't have a problem changing eyes to correct blindness, changing the genes for future generations would bring ethical questions to the fore, she says.

"If we edit the germ line of any species it will have massive implications as to what happens in the future. The individuals who you are affecting do not have the opportunity to consent."

Then there's the issue of equity. "What kind of future are we looking at if we have people who are wealthy, who are able to make super babies, whereas there are people who can't afford those opportunities."

The technology has the means to target the obesity gene, change height, and even skin colour, for example.

> "There's a very important distinction that's to be made whether the technology will be used to cure people, or to enhance them."

The problem is there's no single international body responsible for monitoring what is and what isn't acceptable, she says.

"When I think about it, discussion with the public is key, and it's important we have these discussions as soon as possible. Most scientists would agree we want consensus from the public.

"I think there are probably a lot of interventions that I would be comfortable with – preventing disease and preventing suffering would be wonderful. And as a planet we're facing a huge number of problems which we've caused. How are we going to handle climate change or antibiotic resistance?

"If we come to a place where we can all agree as to where and how the technology can be applied, it may help in lot of situations we've put ourselves in."

Auckland University philosophy professor Tim Dare says that, like big data, CRISPR is an example of where our technology ability is outpacing our ethical understanding of the issues.

"The way we make ethical judgments generally is by inching our way forward from current understanding and experiences. Or, when we face an ethical challenge we use analogy, or compare from what we already know. In this space, our existing knowledge isn't very reliable."

Governance on a national and international level is lacking he says, but the precautionary principle is widely accepted in scientific and ethics circles. It dictates that we ought to give a great deal of weight to potential risks, even if they're not considered substantial.

The chances of regulations keeping a cap on things really depends on the accessibility of the technology. "If we are talking about big publicly-funded labs, then regulation would be easy, but if it can be done privately, there's the potential for great profits so the chance of regulation isn't very high."

"There's a very important distinction that's to be made whether the technology will be used to cure people, or to enhance them," he says.

"Enhancement is an ethical minefield, as what constitutes a better person? Tolerance and prejudice comes into it. You could imagine the great cost of illuminating a variation. We are all comfortable pursuing some current idea of perfection. If we could do it, would it be desirable to do so?"

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