Jesuit scientist encourages Church to jump into gene pool conversation

Canadians haven’t quite made up their minds about designer babies, but at least one Catholic scientist thinks the Church should be part of the conversation about editing human genes.

An Angus Reid Institute poll in March found that Canadians are overwhelmingly in favour of using gene-editing technology to cure life-threatening genetic disease (73 per cent said embryonic gene editing would be acceptable for this purpose), but they were adamantly opposed to altering embryo genetics to produce a better looking child with preferred eye or hair colour (81 per cent opposed this use of gene-editing technology).

Overall, there are slightly more Canadians worried about the risks involved in made-to-order human genetics than there are Canadians attracted to the potential positive benefits. Forty per cent told pollsters the risks outweigh the potential benefits, versus 32 per cent who said potential benefits outweigh the risk.

That 28 per cent were uncertain how to answer the question reflects the fact Angus Reid found only one in four Canadians had never even heard of gene editing, versus nine per cent who claimed to be “very familiar” with the new technology.

Rev. Rob Allore

“It’s always complicated to ask people an opinion on something that they don’t

really understand," said Jesuit Rev Rob Allore. "It's not a simple yes-or-no set of questions."

Allore's main job these days is pastor of St. Mark's Parish in Vancouver and chaplain at the University of British Columbia. But before entering the Jesuits in 1990 he did his PhD in microbiology. Throughout his Jesuit formation and beyond Allore pursued genetic research with a number of laboratories. He is still affiliated with a lab at the University of British Columbia and follows the science with avid interest.

It's a good thing that Angus Reid is asking Canadians about gene editing in the wake of last November's revelation that rogue Chinese scientist He (pronounced "hay") Jiankui had used CRISPR technology to alter the basic genetic code of twins to eliminate their susceptibility to the AIDS-causing HIV virus. CRISPR stands for "clusters of regularly interspaced short palindromic repeats."

It's a technique that allows an operator at a computer keyboard to snip out a gene sequence and immediately replace it with a different sequence.

When performed on an embryo, human egg or sperm, a CRISPR gene edit has the potential to alter every cell in the body and this change will be passed onto future generations.

Allore believes people's basic moral instinct tells them this powerful technology should be approached with caution and deep forethought, rather than a rush to make a baby who has "Bobby Orr's skating capacity with some other guy's knees."

"People's innate understanding is that diversity is a powerful, wonderful thing. And even maybe a gut understanding of biology tells them that if we try to manipulate things too much we're going to get in trouble," Allore said. "Who gets to make the decisions about what's a good use of this stuff?"

Following violations of scientific protocol and ethics – He was fired from Southern University of Science and Technology in Shenzhen, China, and placed under house arrest by Chinese authorities after he claimed to have altered human genes at a scientific conference Nov. 28 last year – a World Health Organization advisory group of researchers recommended a global registry of all studies into human genome editing. The panel of scientists also opposed any clinical application of gene-editing research that alters genes, human eggs, sperm or embryos.

"We are trying to look at the broader picture and a framework for responsible stewardship," the panel's co-chair Margaret Hamburg told the American scientific publication *Nature* in March.

Final recommendations on gene-editing research protocols are expected from the WHO next year.

A new paper published June 3 in *Nature Medicine* illustrates just how tricky it can be to mess with a human's genetic code. It turns out changing that one gene which opens the door to HIV could also shorten a person's life.

The Chinese twins had their CCR5 gene altered so that it wouldn't display a particular protein which acts as a doorway to the virus which causes AIDS. A small part of the population in northern Europe has a similar mutation that occurs naturally. He tried to reproduce this mutation, but failed.

Since He's alteration of the CCR5 gene is slightly different than the naturally occurring mutation, nobody can say what will happen to the HIV-immune twins. But that's the point. He altered the genetics of otherwise healthy human embryos to produce one, narrow result – a result they will pass onto their children and grandchildren. But he can't predict other knock-on effects.

Allore finds it interesting that scientists are talking about "stewardship" as a more responsible approach to genetic research. This is just the opening the Church needs to engage in a dialogue with researchers about the broader social and ethical implications of altering human genes, he said.

"The Church can make known her position and then come to the table and make a contribution," he said. "To me, the experience in interfaith dialogue is exactly the model we need to bring to the table here."

The ethical questions aren't the exclusive territory of scientists. We need a broad, democratic conversation, said Allore.

"In order to participate adequately in democracy today, a certain technological capacity to understand where things are going in society is in a sense a prerequisite. If it's not a prerequisite, it's at least really helpful," he said.

The most recent Church teaching on the subject of genetic research predates the advances of cheap, quick, CRISPR technology. In 2008 the Congregation for the Doctrine of the Faith issued the instruction *Dignitas Personae (The Dignity of a Person): On Certain Bioethical Questions*. It affirmed the dignity of every person at every stage of development from conception to a natural death.

"This fundamental principle expresses a great yes to human life and must be at the centre of ethical reflection on biomedical research," the document said.

"The Church has universities and hospitals and medical schools and that sort of thing. So the Church is part of the production of medical technology, of modern medical technology, and the delivery of that medicine from genetic counselling to palliative care," said Allore. "We enter as medical experts, but we enter from a sociological perspective too."

Don't assume the Church will be dismissed as an outside meddler, he said.