

Scientist claims first gene-edited babies

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Analysis

A Chinese researcher has been denounced as “insane” after claiming that he created the world’s first genetically engineered babies.

He Jiankui said he had altered the DNA of twin girls called Lula and Nana to prevent them from contracting HIV. The girls were born prematurely a few weeks ago and were “as healthy as any other babies”, he said.

Such gene editing is banned in most countries as the technology is still experimental and DNA changes can be passed down through generations. Most mainstream scientists consider it to be dangerous and unethical.

“I understand my work will be controversial,” Mr He said in a video released last night. “But I believe families need this technology and I’m willing to take the criticism for them.” The development was “beautiful and wholesome for society”, he added.

Mr He claimed to have used a pioneering technique, known as Crispr/Cas9, to alter the girls’ genetic material to try to give them immunity from HIV.

It had long been feared that a rogue scientist would try to use the Crispr technology on a human embryo, and China was widely seen as the most likely location. Last night Mr He was condemned by scientists for a “monstrous” experiment. There is no independent confirmation of his claim and he has not published his work in a peer-reviewed journal.

Lord Winston, emeritus professor of fertility studies at Imperial College London, said: “If this is a false report, it is scientific misconduct and deeply irresponsible. If true, it is still scientific misconduct.”

Kathy Niakan, of the Francis Crick

Jennifer Doudna, co-creator of the gene-editing tool used to modify these babies, feels a lot of affinity with Robert Oppenheimer, father of the atomic bomb and a predecessor at the University of California, Berkeley (Tom Whipple writes).

After Oppenheimer witnessed the Trinity tests, he recalled the Hindu scripture: “I am become death, destroyer of worlds.” He spent his

career warning of the dangers.

That is how Professor Doudna feels. This is the nuclear bomb of gene editing, a tool that changes not just your DNA but potentially your offspring’s too. It gives humans the power to control the evolution of humanity itself.

The world, largely, has not been listening. Yesterday, perhaps, that changed. There is a lot that is strange about this announcement. Why did

the scientist choose to change a gene affecting HIV risk, something which can be achieved more effectively by other means? Tweaking a gene that affects, say, breast cancer risk would seem more obvious. Why is the data not published in a journal?

Even if this announcement is not all it seems, the point is that it could be, and it raises questions that we should all start considering. Is it ethical to change human

genetic code to save lives? Is it ethical not to? What about if you use gene-editing techniques to enhance rather than save humans? You might think you know the answer: curing is good, enhancing bad. Such easy distinctions blur very quickly though.

We have only one scientist’s word that this Pandora’s box has been opened, but if it hasn’t been it will be soon. It is time to consider the implications.

“serious violation of academic ethics and standards”.

The Nuffield Council on Bioethics, which tracks ethical issues in biotechnology, said that it was deeply concerned: “The possibilities raised by heritable genome editing could have significant implications for individuals and for all of society.”

A council report in July concluded that the use of genetic editing, seen as a potential therapy for conditions such as sickle cell disease, could be morally permissible sometimes. “These circumstances do not exist at present anywhere,” it said yesterday.

A group of 122 Chinese scientists warned that Mr He had opened a Pandora’s box and called his experiment “insane”. They added: “It’s a huge blow to the reputation and the research by all Chinese researchers in biological medicine.” The Shenzhen Harmonicare Women’s and Children’s Hospital, whose medical ethics commission allegedly approved Mr He’s project, claimed that it had no knowledge of the experiment.

Mr He, who is in his 30s, studied in the United States before returning to China to open a lab at the university and to set up two genetics companies. The scientist said that he would provide insurance coverage for the children conceived through the project and medical follow-up at least until they were 18. “I feel a strong responsibility that it’s not just to make a first, but also make it an example,” he said. “Society will decide what to do next”

Mr He made his claim on the eve of a landmark international summit on genome editing. A number of leading scientists have suggested that he is guilty of a cynical attempt to seize headlines before the event.

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Institute in London, said: “This would be a highly irresponsible, unethical and dangerous use of genome-editing technology.

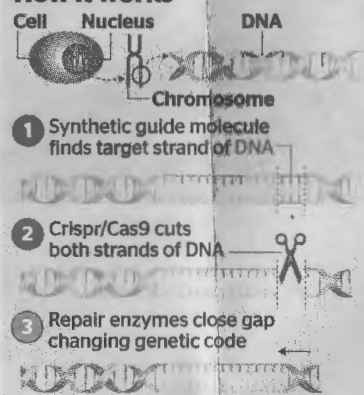
“In the UK it is rightly illegal to establish a pregnancy from a genome-edited embryo. Given the significant doubts about safety, including the potential for unintended harmful side-effects, it is far too premature to attempt this.”

Mr He said that he had genetically altered embryos for seven couples during IVF treatment, with one pregnancy resulting so far. He claims that 11 altered embryos were used in six implant attempts before the twin pregnancy was achieved.

The couples were recruited through a Beijing-based Aids advocacy group. The fathers were HIV positive but the mothers were not.

Crispr/Cas9 is a gene-editing tool that allows scientists to slice DNA at any position in the genome, to create

How it works



mutations and switch off specific genes. It has been used to study which genes are behind conditions such as cancer and there are hopes that it could be used therapeutically to correct harmful

mutations in the human genome. Mr He used the Crispr/Cas9 technology to disable a gene called CCR5, which allows HIV, the virus that causes Aids, to enter a cell.

Researchers have warned of unpredictable changes when cells attempt to repair the break caused by the Cas9 “scissors”, however, at the point they rejoin the two cut ends of the DNA.

“No gene was changed except one that allows HIV infection,” Mr He said, arguing in the video, released on YouTube, that he had not set out to create a designer baby. He said that gene editing for purposes such as augmenting intelligence should be banned.

Last night it was reported that since February Mr He had been suspended without pay from his post at the Southern University of Science and Technology in Shenzhen. The university said it had been unaware of the research project, adding that the work was a

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