

Genome editing reveals key gene for human embryo growth

PARIS - British scientists have used genome "editing" technology to reveal the role of a key gene in the early development of human embryos, a potential boost for fertility treatment.



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They used genome "scissors" called CRISPR-Cas9 to snip out a gene called OCT4 from fertilised eggs.

OCT4 is thought to be a major player in embryo formation.

"After the egg is fertilised, it divides until at about seven days it forms a ball of around 200 cells called the 'blastocyst'," authors of the study explained in a press release.

"The study found that human embryos need OCT4 to correctly form a blastocyst."

This was the first use of genome editing to study gene function in human embryos, which could help scientists to better understand early development, said the Francis Crick Institute, whose researchers took part in the study.

"This proof of principle lays out a framework for future investigations that could transform our understanding of human biology," said the study published in the science journal *Nature*.

The work boosts the quest for therapeutic use of stem cells and in IVF (in-vitro fertilisation) treatments," it said.

On a technical level, the study confirmed CRISPR-Cas9 editing as a "powerful method" for probing the role of individual genes in human development.

The technique -- repeatedly mooted as a worthy candidate for a Nobel -- allows scientists to remove and replace a faulty sequence on a strand of DNA with pinpoint precision.

The method can theoretically be used to eliminate disease-bearing mutations in embryos, or to engineer more nutritious and resilient plants and healthier livestock.

It is controversial because, say critics, it evokes a future in which humans can order "designer" babies with specific features, perhaps even intelligence.

"One way to find out what a gene does in the developing embryo is to see what happens when it isn't working. Now we have demonstrated an efficient way of doing this," said Kathy Niakan, one of the Francis Crick Institute authors.

"If we knew the key genes that embryos need to develop successfully, we could improve IVF treatments and understand some causes of pregnancy failure. It may take many years to achieve such an understanding, our study is just the first step."

The embryos used in the study were donated by couples who had undergone IVF treatment for infertility.

Other experts welcomed the study findings.

"This landmark study confirms CRISPR's status as a transformative tool for research," said Andrew Chisholm of the Wellcome research trust.

"This work underscores why such studies are key to understanding our own biology."

In August, scientists in the United States said they had repaired a disease-causing mutation in the DNA of early-stage human embryos using CRISPR-Cas9 -- although other teams have expressed doubts about their conclusions.

Source: *AFP*

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