



Editing our genes

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Highlights

- American biochemist Jennifer Doudna, one of the pioneers of the gene editing tool Crispr-Cas9, woke up in a cold sweat after she dreamt of Adolf Hitler.
- Crispr, an acronym for **Clustered Regularly Interspaced Short Palindromic Repeats**, harnesses the natural defence mechanisms of bacteria to alter an organism's genetic code.
- It's likened to a pair of molecular scissors, a cut-and-paste technology, that can snip the two DNA strands at a specific location and modify gene function.
- The cutting is done by enzymes like Cas9, guided by pre-designed RNA sequences, which ensure that the targeted section of the genome is edited out.
- The elegance of this editing tool has transformed medical research and gives rise to the question: can a faulty gene be deleted or corrected at the embryonic stage?
- Last month, researchers in China used a variation of Crispr.
- Instead of snipping strands, they swapped DNA letters to correct Marfan Syndrome, an inherited disorder that affects connective tissue.
- Two of the embryos, however, exhibited unintended changes. All were destroyed after the experiment.
- In 2017, American biologist Shoukhrat Mitalipov used Crispr to repair a genetic mutation that could cause a deadly heart condition.
- It was done on embryos in such a way that the faulty gene would not be passed down the family tree.
- The findings are the focus of an ongoing debate, with several scientists sceptical of whether the gene was corrected.
- Bioethicists expressed concern over the clinical application of such research.
- These are still early days in a new frontier of genome engineering.
- Researchers are only beginning to understand the power — and fallout — of gene editing.
- Studies have shown that edited cells can lack a cancer suppressing protein.
- We will perhaps one day have the potential to use the very same mechanisms to edit out undesirable traits in human beings, raising the spectre of eugenics.
- Bioethicists fear abuse of gene editing, not just by misguided governments hoping to create a 'superior' race, but also by the private sector preying on a parent's desire to create a perfect child.
- For now, it remains a distant prospect, but silencing science or hijacking the debate is not the answer.
- The burden of this knowledge cannot be borne by science alone.