

Concerns with gene editing

What is the issue?

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- Gene editing with CRISPR can eradicate diseases, and it may also lead to mutations with dangerous result.

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What are the significance of CRISPR?

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- CRISPR are naturally occurring repetitive sequences of genetic code, which are part of the immune system.

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- Techniques based on CRISPR CAS-9 gene editing are to be done with extraordinary precision.

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- When an alien bacteria or virus invades the body, CRISPR is “programmed” to recognise the alien material.

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- It then uses CAS-9, an enzyme produced by the CRISPR system to bond with the alien DNA and excise it.

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- Apart from being used as a gene-editing tool, CRISPR CAS-9 can also function as a diagnostic tool.

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- It can recognise target DNA very quickly and identify viruses such as Zika and dengue very efficiently.

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What are the wide arenas of this technique?

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- **Nerve disorder** - Scientists have removed the muscular dystrophy gene and a nervous disorder of brain cells in mice using CRISPR.
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- **Organ transplant** - Experiments with pigs suggest that CRISPR could help grow organs for human transplants in cloned pigs.
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- **Dengue & Zika** - It may even be possible to breed the Aedes aegypti mosquito (female is the carrier of zika and dengue) into extinction by encoding a “male only” instruction.
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- **Non-communicable disease** - Diabetes, cancer, Parkinson’s, exposure to heart disease are known to be caused by specific genes, the diseases could be eradicated if those genes could be safely removed.
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What are the concerns need to be addressed?

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- The dangers of research involving humans is high.
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- Most nations have laws to prevent such research from being conducted in an irresponsible fashion.
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- As edited DNA repairs itself, it can result in unforeseen mutations with dangerous consequences.
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- The methods of the experiments didn’t work 100 per cent, further research is obviously required.
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- The ethical debate will also need to be updated to take this study into account.
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Source: Business Standard

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