

Concerns with Gene editing

Click [here](#) to know more about CRISPR

\n\n

What is the issue?

\n\n

Ethical concerns have been raised over the clinical application of gene editing technique in recent times.

\n\n

What is CRISPR?

\n\n

\n

- It is a gene editing technique which stands for Clustered Regularly Interspaced Short Palindromic Repeats.

\n

- It harnesses the natural defence mechanisms of bacteria to alter an organism's genetic code.

\n

- The bacteria are likened to a pair of molecular scissors that can cut the two DNA strands at a specific location and modify gene function.

\n

- 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.

\n

\n\n

What are the practical applications?

\n\n

\n

- CRISPR was used successfully to repair a heart-damaging gene in human embryos.

\n

- It marked a step towards preventing inherited diseases from being passed on to the next generation.
\n
- It can be useful in learning how genes cause disease or influence development and what therapies might help.
\n
- It was also found that gene editing in the brain can help decrease the repetitive behaviours, which is a symptom of autism spectrum disorders.
\n
- The approach can also be used to treat other neurological diseases such as epilepsy and the brain cancer glioblastoma.
\n
- Scientists in the UK have used genome editing to study DNA function in human embryos that could help better understand the biology of our early development.
\n
- The findings could improve IVF treatments and understand some causes of pregnancy failure in the future if key genes responsible for successful development of embryos are identified.
\n
- Researchers also are using gene editing to hatch malaria-resistant mosquitoes, grow strains of algae that produce bio-fuels, improve crop growth, even make mushrooms that don't brown as quickly.
\n

\n\n

What are the concerns?

\n\n

- Safety is a key question because gene editing has the possibility of accidentally cutting DNA that is similar to the real target.
\n
- A study published in the journal Nature Medicine, found that therapeutic application of the genome-editing tool may increase the risk of cancer.
\n
- It could be potentially used to edit out undesirable traits in human beings in the name of improving genetic quality of a human population, as Eugenics.
\n
- It could also be used by governments to create a 'superior' race and by the private sector in the name of creating a perfect child for the parents.
\n
- Altering genes in sperm, eggs or embryos through "germ line" engineering leads to concerns regarding creation of designer babies with enhanced traits.

\n

- This leads to the argument that gene editing be reserved for serious diseases with no good alternatives and performed under rigorous oversight.

\n

\n\n

Source: The Hindu

\n

