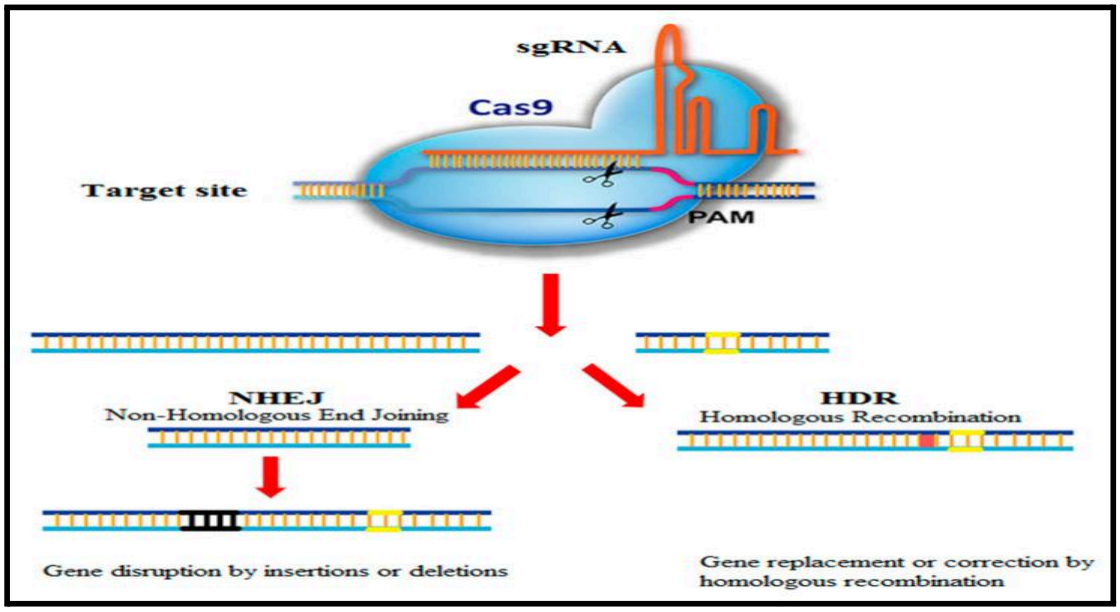
Editing humanity : Will CRISPR help in creating tailored babies

In 2018, a Chinese scientist created genome editing of twin embryo. Will it pave the way for creation of designer babies?

Embryo genome editing is one of the best methods to permanently get rid of genetic diseases. DNA is an instruction manual where we can tailor our genes to our interests and knock down the genes that cause mutations.

Gene editing is the process where genes can be edited by adding or deleting the nucleotide base pair, which helps in functioning or mutation of gene.



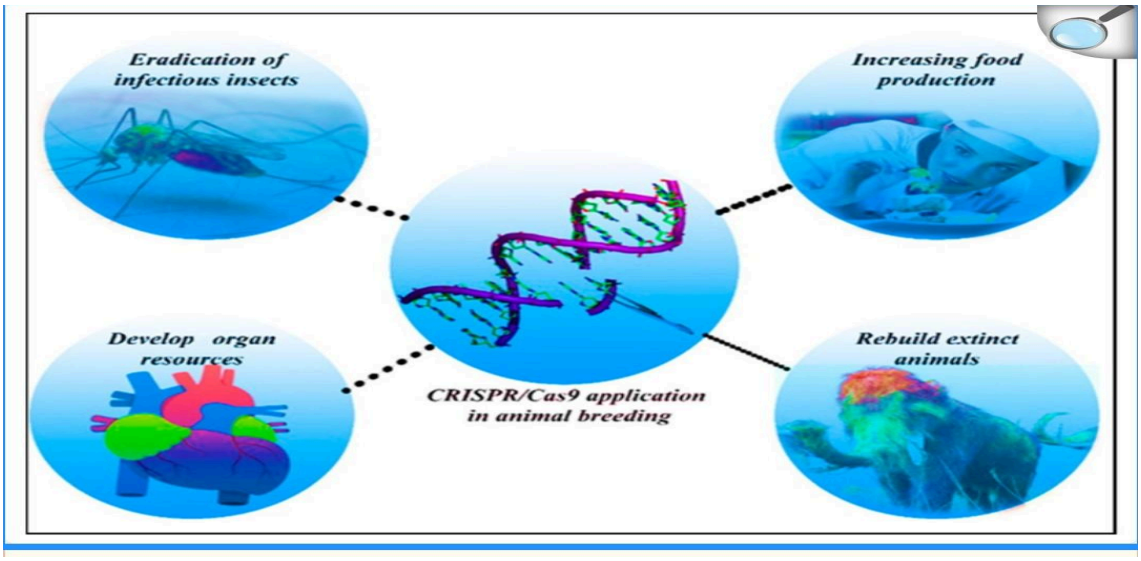
What is CRISPR CAS9 ?

CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats) is a revolutionized technique where we fight disease, create new genes, first identified in E. coli bacteria. CRISPR genes associate with Cas9 protein and act as scissors to cut

desired DNA. It is used by bacteria to identify viral gene and kill foreign genome. This method is used by researchers to combat genetic disorders to identify and knock down the gene that is causing mutation.

Uses and Advantages of CRISPR

- Improves crop value and food quality through enhancing their nutritional status by enhancing micronutrient content of plants.
- Used to modify targeted genes in herbal plants , survey the synthesis of efficacious compounds, select characteristics for increased yield.
- Plays a key role in improvement of livestock to meet the growing demand of animal-derived food products, especially milk and meat.
- Modification of pigs by CRISPR for Xenotransplantation (transplanting of living organs, tissues, or living cells from one species to another) research.
- Treatment of genetic disorders like sickle cell anemia, muscular dystrophy, and cystic fibrosis.

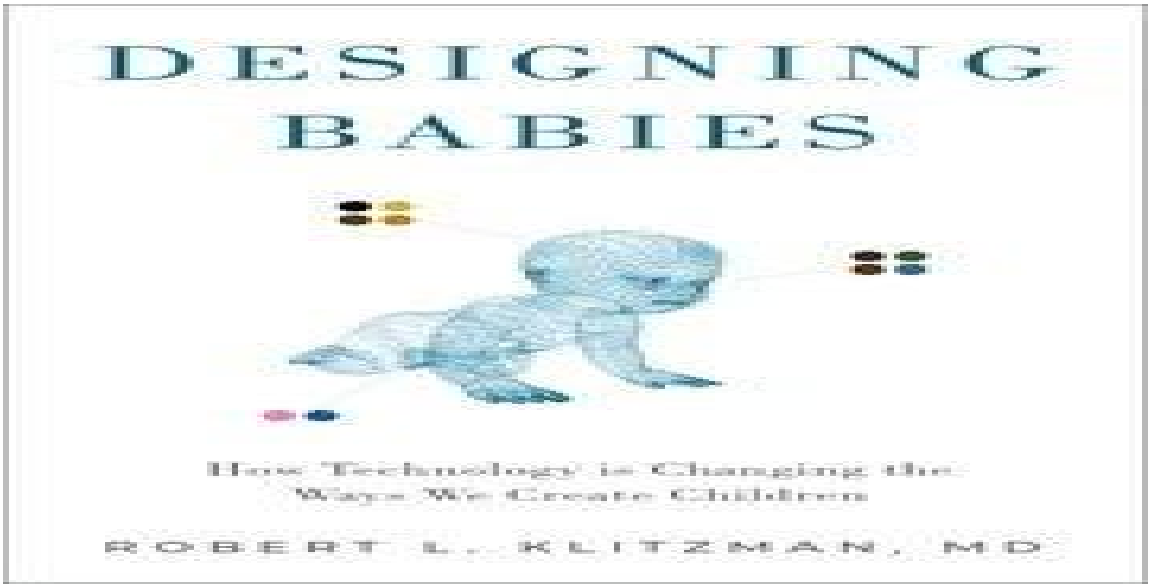


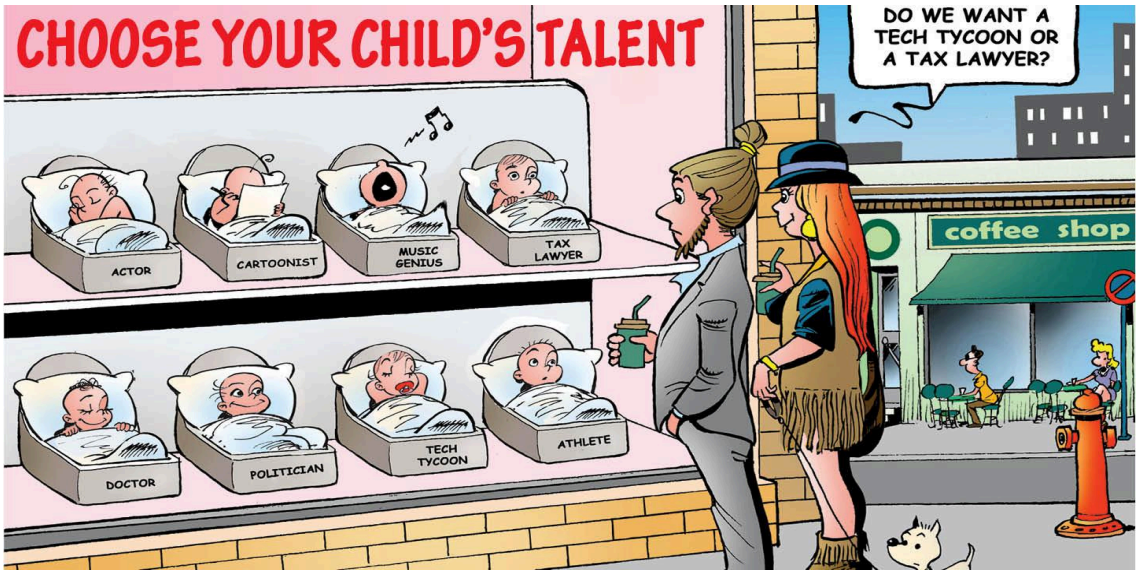
Why CRISPR used in germline editing?

The ease and efficacy of CRISPR-Cas9 gene editing in animal models paved the way to human germline gene editing by which permanent changes can be introduced to embryo. Distinct genes can be knocked out to examine their function during embryonic development.

Even though with only a limited number of reports, it has become clear that CRISPR-Cas9 in its conventional setup, it is not able to provide a safe and efficient way to edit the germline precisely.

What would you think if human have the power to create an individual according to his own will? Or as a parent, what is your view if you are given the menu to choose the baby of your desire like highest IQ, muscle strength with fair-skinned handsome boy?

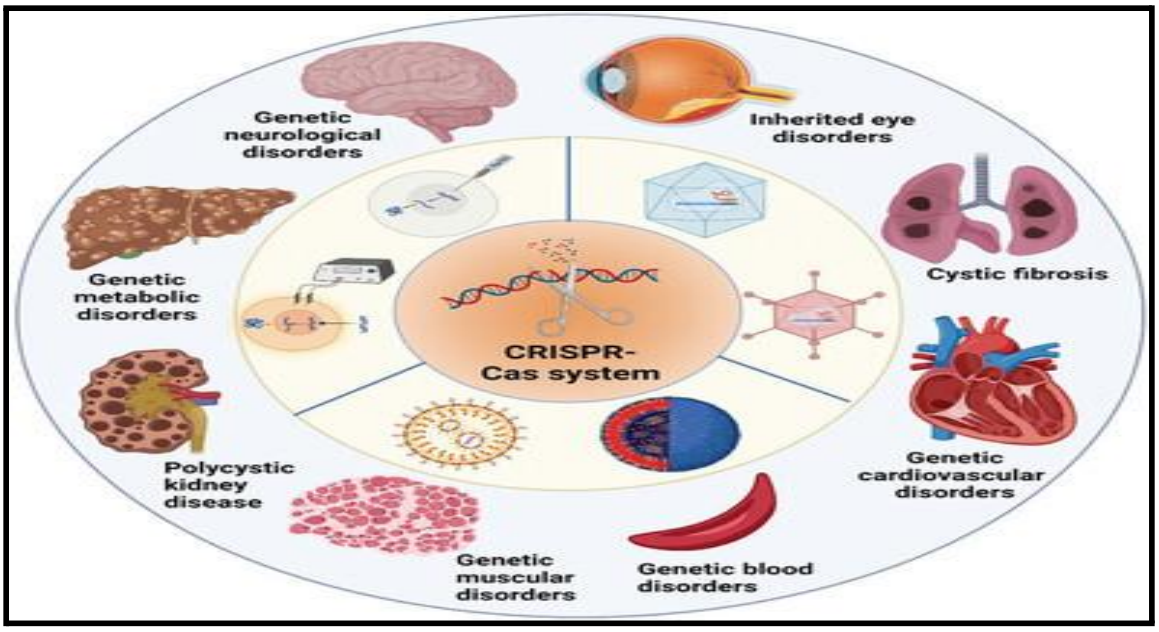


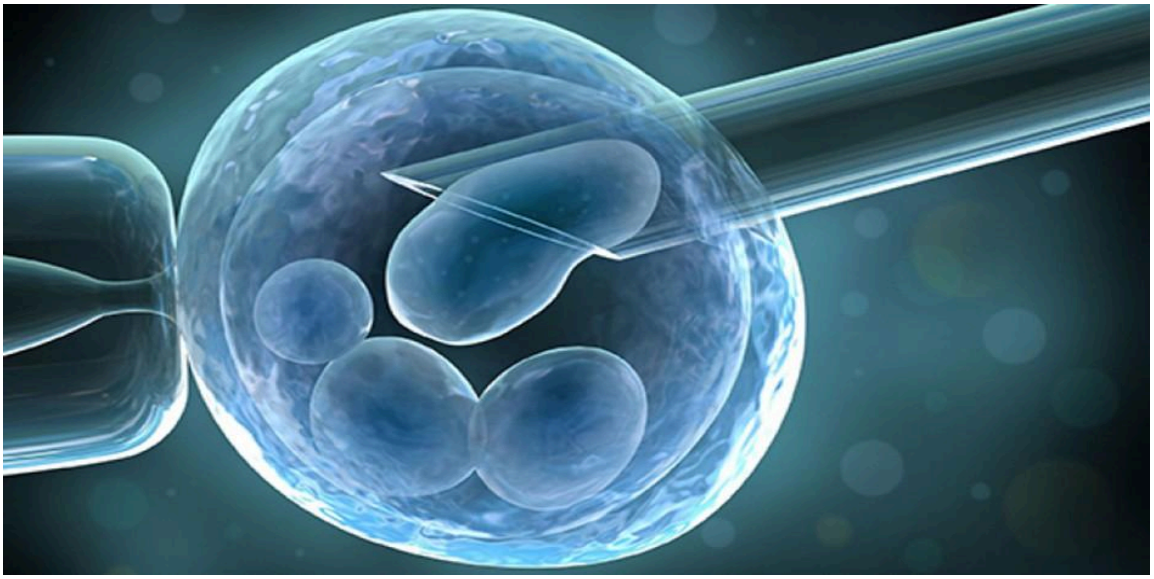


Causes and effects of germline editing

- Germline editing is altering genome in the embryo level, this may affect every cell.
- It also includes targeting the wrong gene, off- target impacts, in which editing may fix one problem but cause another.
- For those living in poverty, this is another way for the privileged to vault ahead.
- We are manipulating the environment in so many ways and exposing to lot of chemicals that cause unknown changes in our genome. How are we going to treat all of that?

Some consequences are difficult to predict that may also arise after 20 to 30 years or during the lifespan of changing environment. What are your views on these?!





Conclusion

Germline editing has immense potential to revolutionize the future in science and medicine. The creation of knockout embryos has helped researchers to increase the knowledge on early embryonic development. More debates relating to the use of germline genome editing, to correct specific germline mutation due to ethical

constraints and prematurity of techniques.The committee which is responsible for this issue should propagate treatment in treating of genetic diseases which are inheritable and stop creating designer babies. No individual scientists have specific warrant to redesign human embryo or design new bacteria or virus. Altering human genome cannot be made without discussing to affected population and potential regulation should be made in context of reducing sperm and egg count.

Reference

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Dated on- 30th March 2025

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