

CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats) is a powerful tool for gene editing that allows scientists to make precise alterations to DNA.

**Challenges and Considerations**

**Ethical Concerns:** The potential to edit human embryos raises significant ethical questions about genetic modification and designer babies.

**Provide a donor DNA template for homology-directed repair (HDR),** enabling precise edits like gene corrections or the introduction of new genes.

**Applications of CRISPR in Gene Therapy**

**Genetic Disorders:** CRISPR holds potential for treating genetic disorders like sickle cell anemia, cystic fibrosis, and muscular dystrophy by correcting mutations at the DNA level.

**Infectious Diseases:** CRISPR can be used to target and edit the genomes of viruses (like HIV) in infected cells, potentially leading to new antiviral therapies.

**Agricultural Biotechnology:** Beyond human health, CRISPR is used in agriculture to create crops with desirable traits, such as disease resistance or enhanced nutritional profiles.

**Regulatory Hurdles:** The use of CRISPR in clinical settings faces regulatory challenges and requires extensive safety evaluations.