Editorial

iMedPub Journals
www.imedpub.com

Cellular & Molecular Medicine: Open Access

2021
Vol. 7 No. 5: 21

Novel Tool for Genome Editing: CRISPR

Harriet Wood*

Editorial Office, Cellular and Molecular Medicine: Open access, UK

Received: October 06, 2021, **Accepted:** October 11, 2021, **Published:** October 14, 2021

***Corresponding author:** Harriet Wood

cellularmedicine@imedpub.org

Cellular and Molecular Medicine: Open access, UK

Citation: Wood H (2021) Novel Tool for Genome Editing: CRISPR. Cell Mol Med. Vol. 7 No. 5: 21.

Editorial Note

Genome editing (also known as gene editing) refers to a set of technologies that allow scientists to alter an organism's DNA. These technologies allow for the addition, removal, or modification of genetic material at specific points in the genome. There have been several ways to genome editing developed. CRISPR-Cas9, which stands for clustered regularly interspaced short palindromic repeats and CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats) associated protein is a recent one. Because it is faster, cheaper, more accurate, more efficient than other genome editing technologies, the CRISPR-Cas9 system has sparked a lot of interest in the scientific community.

CRISPR-Cas9 is a genome-editing mechanism that evolved naturally in bacteria. CRISPR arrays are DNA segments created by bacteria that catch fragments of DNA from invading viruses. Bacteria can "remember" viruses thanks to CRISPR arrays (or closely related ones). If the viruses resurface, the bacteria synthesize RNA segments from the CRISPR arrays to assault the viruses' DNA. The bacteria then employ Cas9 or a similar enzyme to rip the virus's DNA apart, rendering it inoperable. In the lab, the CRISPR-Cas9 system operates similarly. A little piece of RNA with a short "guide" sequence that connects (binds) to a specific target sequence of DNA in a genome is created by researchers. CRISPR-Cas9 is a genome-editing mechanism that evolved naturally in bacteria. CRISPR arrays are DNA segments created by bacteria that catch fragments of DNA from invading viruses. Bacteria can "remember" viruses thanks to CRISPR arrays (or closely related ones). If the viruses resurface, the bacteria synthesize RNA segments from the CRISPR arrays to assault the viruses' DNA. The bacteria then employ Cas9 or a similar enzyme to rip the virus's DNA apart, rendering it inoperable. In the lab, the CRISPR-Cas9 system operates similarly. A little piece of RNA with a short "guide" sequence that connects (binds) to a specific target sequence of DNA in a genome is created by researchers.

The RNA interacts to the Cas9 enzyme as well. The modified RNA recognizes the DNA sequence, just like bacteria, and the Cas9 enzyme cuts the DNA at the desired spot. Although Cas9 is the most commonly employed enzyme, other enzymes (such as Cpf1) can also be used. Researchers employ the cell's own DNA repair mechanism to add or delete fragments of genetic material, or to make modifications to the DNA by replacing an existing segment with a tailored DNA sequence, after the DNA has been cut. In the prevention and treatment of human diseases, genome editing is of tremendous interest. The majority of genome editing research is now conducted utilizing cells and animal models to better understand illnesses. Scientists are still trying to figure out if this method is safe and successful in humans. It's being studied for a number of ailments, including single-gene disorders including cystic fibrosis, hemophilia, and sickle cell anemia. It also has the potential to treat and prevent more complex ailments like cancer, heart disease, mental illness, and HIV infection. When genome editing, such as CRISPR-Cas9, is utilized to change human genomes, ethical considerations arise. The majority of genome editing's effects are restricted to somatic cells, which are cells other than egg and sperm cells.

These modifications only affect specific tissues and are not passed down from generation to generation. Changes to genes in egg or sperm cells (germline cells) or the genes of an embryo, on the other hand, may be handed down to future generations. The use of germline cell and embryo genome editing to improve normal human qualities raises a number of ethical questions, including whether it is appropriate to utilize this technology to improve normal human traits (such as height or intelligence). Germline cell and embryo genome editing are now forbidden in many countries due to ethical and safety concerns.

© Copyright iMedPub | **This article is available in:** https://www.imedpub.com/journal-cognitive-neuropsychology/