Methods of Genome Editing of Cells with Modified Donor Templates

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The Invention

UW-Madison researchers developed a novel method and plasmid construct for creating CAR T cells using CRISPR-Cas gene editing. They used a ribonucleic protein complex with guide RNAs and expressed Cas9 protein for targeting and cutting at the correct location in the T cell. In addition to this construct, they transfected the cells with a nanoplasmid designed to have the CAR sequence of interest as DNA donor material. This plasmid has a single engineered cut site that is recognized by the same guide RNA used to target the CAR location for editing in the T cell. When these constructs are transfected into the cells (the researchers use electroporation to get these materials into the cells), the nanoplasmid is cut in one place resulting in a linear dsDNA donor template. When the RNP cuts the T cell genome, the donor template provides the sequence for the cell to use homologous recombination to get the desired CAR sequence into the T cell genome.

Additional Information

For More Information About the Inventors

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Tech Fields

- Drug Discovery & Development : Drug production & design
- Research Tools : Genomics & proteomics

For current licensing status, please contact Andy DeTienne at adetienne@warf.org or 608-960-9857