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DUAL-CRISPR FOR GENOME EDITING AND DIAGNOSIS

A new improvement of CRISPR systems is described. This innovative technology allows Cas9 and Cas13 proteins to be more versatile by dissociating the crRNA into two RNA molecules with different functions.

This allows to design robust and cheaper platforms for multiplexing genome editing and diagnosis.

Technology for Licensing

Keywords:

Dual type V CRISPR, Dual Type VI CRISPR, genome editing, diagnosis; dcrRNA, dtracrRNA, Cas9, Cas12a, Cas13.

Description:

CRISPR based technologies for diagnosis or genome editing require RNA molecules to guide Cas proteins to their target DNA or RNA molecule. Regarding to multiplexing using this technology there are two disadvantages:
a) Genome edition and diagnosis are expensive procedures.
b) When it is used for diagnosis, it can be deleterious for genome editing.

This invention solves these objections by separating both activities of single crRNA into two different RNA molecules. These activities are 1) binding to the Cas protein and 2) binding to the RNA or DNA molecule.

In this way, this new platform cheapens genome editing and diagnosis when multiplexing CRISPR based assays are used, reduce collateral activity and improve versatility in diagnosis applications.

This invention has great potential in the same fields as known CRISPR technologies such as genome editing, biotechnology, industry and diagnosis applications.

Advantages and Benefits

- Reduces the cost of multiplexing analysis: this is achieved by designing a common dtracrRNA and changing only a 25 – 35 nucleotide dcrRNA.
- Makes therapeutic applications of these technologies safer by reducing the collateral activity in the absence and/or presence of the targeted sequence.
- Improved versatility: with that platform it is possible to use the same dcrRNA to target different type V/VI Cas proteins.

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Contact:
Oficina de Transferencia de Resultados de Investigación (OTRI) - Universidad de Granada

patentes@ugr.es www.otri.ugr.es