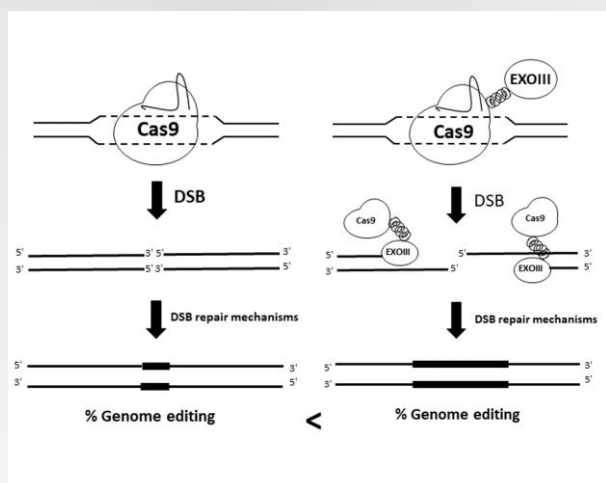


# COILED-COIL MEDIATED TETHERING OF CRISPR/CAS AND EXONUCLEASES FOR ENHANCED GENOME EDITING



The global gene editing market is growing with more than 15% CAGR and what propels it are multiple applications; from drug discovery processes and high-value personalized medicines to microorganisms and plant genetic engineering. Another market driver are increasingly accessible gene editing tools. CRISPR/Cas is an important one, holding about 50% of the market due to its multiplexing ability and a relatively easy design. It consists out of an endonuclease, called Cas9, and an engineered chimeric guide RNA that matches DNA sequence of interest. The technology has significant potential of use and any advancement is highly desired.

## TYPE OF COOPERATION

R&D cooperation and technology licensing opportunity

## INTELLECTUAL PROPERTY

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## MORE INFORMATION ABOUT THE INVENTION



## Technology

The invention is CRISPR/Cas9 tethered with exonucleases, such as EXOIII or others. Tethering is achieved in a cell and uses heterodimeric peptide pairs, linked to Cas9 and exonuclease, which form a coiled-coil due to hydrophobic and electrostatic interactions. Tethering can also be induced with different heterodimerization systems that are regulated via small molecules or light source with appropriate wavelength. Cas9 tethered to exonuclease brings the latter one into proximity of double stranded breaks (DSB). This allows additional DNA resection leading to different 5' overhangs that pose greater mismatches in template and non-template DNA strand resulting in higher indel mutations. The initial research was focused on the oncology field, the technology was tested *in vivo* in cell lines, using five different exonucleases.

## Main advantages

- Simple tethering of various exonucleases with Cas9 and its variants via coiled-coils
- Improved DNA resection and higher percentage or degree of genome modification
- No additional increase in off-target effects, no cytotoxicity

## Key words

CRISPR/Cas, Gene editing, Exonuclease, Coiled-coil



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