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Merck gets Canadian CRISPR Nickase Patent

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Patent covers paired Cas9 nickase technology to advance gene therapy and research, reduce off-target effects

Merck, a leading science and technology company and leader in genome editing has announced that the Canadian Patent Office has allowed Merck's patent application directed to the use of paired CRISPR nickases in eukaryotic cells. The patent provides an important and more specific solution for scientists who need accurate methods when developing treatments for difficult-to-treat diseases that ultimately reach the patient.

Merck's CRISPR patent in Canada covers foundational genome-editing technology that improves CRISPR’s ability to fix diseased genes while not affecting healthy ones

"This patent allowance marks another advancement in safety for CRISPR-enabled therapeutics, as it covers technology that improves CRISPR's ability to fix diseased genes while not affecting healthy ones," said Udit Batra, member of the Merck Executive Board and CEO, Life Science. "Merck has been at the forefront of genome-editing innovation for 15 years and this allowance further expands our foundational CRISPR cutting and integration intellectual property to help scientists advance gene therapy research."

CRISPR technology is a core competency for Merck. The company supports research with genome editing under careful consideration of ethical and legal standards. Merck has established an independent, external Bioethics Advisory Panel to provide guidance for research in which its businesses are involved, including research on or using genome editing, and has defined a clear operational position taking into account scientific and societal issues to inform promising therapeutic approaches for use in research and applications.

This Canadian patent marks Merck's second in Canada and the 13th worldwide. Similar patents were granted in Australia and Europe in late 2018. This latest patent covers paired nickases, which drive specificity through a highly flexible and efficient approach to reduce off-target effects.

Paired nickases are two CRISPR nickases targeted to a common gene target that work together by nicking or cleaving opposite strands of a chromosomal sequence to create a double-stranded break. This process can include an exogenous or

donor sequence for insertion in the same manner as Merck's CRISPR integration technology. The requirement of two CRISPR binding events greatly reduces the chances of off-target cutting at other locations in the genome.

Merck's CRISPR integration patent portfolio includes granted patents in Australia, Canada, China, Europe, Israel, Singapore and South Korea. These CRISPR patents are for chromosomal integration or cutting of the sequence of eukaryotic cells and insertion of a DNA sequence, to make a desired genomic change.

Merck is licensing its entire patent portfolio for all fields of use.

Merck was the first company to offer custom biomolecules for genome editing globally (TargeTron™ RNA-guided group II introns and CompoZr™ zinc finger nucleases), driving adoption of these techniques by researchers all over the world. Merck was also the first to manufacture arrayed CRISPR libraries covering the entire human genome, accelerating disease cures by allowing scientists to explore more questions about root causes.

In addition to basic genome-editing research, Merck supports development of gene- and cell-based therapeutics and manufactures viral vectors. The Life Science business of Merck has a dedicated genome-editing group aimed at advancing research in novel modalities — from genome editing to gene medicine manufacturing — further solidifying the company's commitment to the field.