

December 19, 2017

Singapore's IP Office to Grant MilliporeSigma's Patent Application for CRISPR Technology

- **Patent covers successful integration of an external DNA sequence into the chromosome of eukaryotic cells using CRISPR**
- **Fourth patent allowance for MilliporeSigma's CRISPR technology; similar patents from Australian, Canadian and European Patent Offices already received**
- **MilliporeSigma to license its CRISPR-related patents to interested parties**

Burlington, Massachusetts, December 19, 2017 – MilliporeSigma, a leader in genome editing, today announced that the Intellectual Property Office of Singapore has issued a “Notice of Eligibility for Grant” for MilliporeSigma’s patent application covering the company’s CRISPR technology used in a genomic-integration method for eukaryotic cells.

“Singapore’s notice of patent allowance for MilliporeSigma’s CRISPR integration technology is yet another reinforcement of our intellectual property,” said Udit Batra, CEO, MilliporeSigma. “We look forward to receiving additional grants for similar patent applications in several other countries as we collaborate with the global scientific community to find new treatments for diseases.”

MilliporeSigma is now licensing these foundational integration patent allowances for applications including basic science research, agricultural biotech and therapeutic use.

This forthcoming, fundamental patent in Singapore, entitled “CRISPR-BASED GENOME MODIFICATION AND REGULATION,” covers chromosomal integration, or



News Release

cutting of the chromosomal sequence of eukaryotic cells (such as mammalian and plant cells) and insertion of an external or donor DNA sequence into those cells using CRISPR. Scientists can replace a disease-associated mutation with a beneficial or functional sequence, a method important for creating disease models and gene therapy. Additionally, the method can be used to insert transgenes that label endogenous proteins for visual tracking within cells.

CRISPR genome-editing technology, which allows the precise modification of chromosomes in living cells, is advancing treatment options for some of the toughest medical conditions faced today. CRISPR applications are far-ranging — from identifying genes associated with cancer and rare diseases to reversing mutations that cause blindness.

Once issued, the Singapore patent will extend the protection of MilliporeSigma's CRISPR integration technology into Singapore, further strengthening the company's patent portfolio. MilliporeSigma also has patent filings for its insertion CRISPR method in the U.S., Brazil, China, India, Israel, Japan and South Korea. In June 2017, MilliporeSigma was awarded its first CRISPR patent by the Australian patent office. That award was followed by related patent awards by European and Canadian Patent Offices.

With a 12-year history in the genome-editing field, MilliporeSigma 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. MilliporeSigma was also the first company to manufacture arrayed CRISPR libraries covering the entire human genome, accelerating cures for diseases by allowing scientists to explore more questions about root causes.

MilliporeSigma recognizes the potential benefits of conducting properly defined research with genome editing because of the breakthrough therapeutic potential. Therefore, MilliporeSigma supports research with genome editing under careful consideration of ethical and legal standards. MilliporeSigma's parent company has established a Bioethics Advisory Panel to provide guidance for research in which its businesses are involved, including research on or using genome editing.

News Release

All Merck KGaA, Darmstadt, Germany news releases are distributed by email at the same time they become available on the EMD Group website. In case you are a resident of the U.S. or Canada please go to www.emdgroup.com/subscribe to register again for your online subscription of this service as our newly introduced geo-targeting requires new links in the email. You may later change your selection or discontinue this service.

About the Life Science Business of Merck KGaA, Darmstadt, Germany

The Life Science business of Merck KGaA, Darmstadt, Germany, which operates as MilliporeSigma in the U.S. and Canada, has 20,000 employees and 60 manufacturing sites worldwide, with a portfolio of more than 300,000 products enabling scientific discovery. Udit Batra is the global chief executive officer of MilliporeSigma.

Merck KGaA, Darmstadt, Germany completed its \$17 billion acquisition of Sigma-Aldrich in November 2015, creating a leader in the \$125 billion global life science industry.

Merck KGaA, Darmstadt, Germany is a leading company for innovative and top-quality high-tech products in healthcare, life science and performance materials. The company has five businesses – Biopharmaceuticals, Consumer Health, Allergopharma, Life Science and Performance Materials – and generated sales of €15 billion in 2016. Around 50,000 employees work in 66 countries to improve the quality of life for patients, to foster the success of customers and to help meet global challenges.

Merck KGaA, Darmstadt, Germany is the world's oldest pharmaceutical and chemical company – since 1668, the company has stood for innovation, business success and responsible entrepreneurship. Holding an approximately 70 percent interest, the founding family remains the majority owner of the company to this day. The company holds the global rights to the name and the trademark "Merck" internationally except for the United States and Canada, where the company operates as EMD Serono, MilliporeSigma and EMD Performance Materials.