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Merck’s CRISPRi whole-genome libraries can unravel Gene pathways

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Offers distinct advantages over existing loss-of-function strategies and adds to a comprehensive suite of fully customizable lentivirus screening tools

Merck, a leading science and technology company, has launched its CRISPR inhibition (CRISPRi) whole-genome libraries and pools to complement its industry-leading suite of genome-editing products and technologies. CRISPRi is a useful tool for screening an entire genome, smaller gene family or individual targets. The CRISPRi libraries are fully customizable, providing the same flexibility as the entire family of Merck screening products.

Instead of imprecise DNA repair to knock out a gene, CRISPRi modulates gene expression, allowing for robust loss-of-function studies, even in essential genes, with fewer off-target effects. CRISPRi provides unique insights into the underlying biology often missed when only using gene knockout or overexpression studies. Using CRISPRi as a discovery tool, researchers can make scientific breakthroughs in identifying new disease pathways or drug targets.

The whole CRISPRi libraries and pools were created by the University of California, San Francisco, USA, and further enhanced by the Life Science business of Merck, resulting in superior algorithm design and improved scaffolding that has been proven to increase gene knockdown, even in difficult-to-repress targets. The CRISPRi offerings feature:

- Pooled libraries containing the top five guide RNAs (gRNA) and a subpool of five additional gRNAs per gene for a total of 10 gRNAs targeting every gene; this offers increased sensitivity as most other competing technologies only offer three to five gRNAs.
- Defined subpanels targeting gene groups including the druggable genome, cancer and apoptosis, membrane proteins, stress and protrostatis genes and others.
- A KRAB-dCas9 helper construct containing a propriety expression-stabilizing UCOE element.
- CRISPRi vectors engineered to include a blue fluorescent protein and puromycin selection marker for easier downstream analysis.
- 10x Genomics-compatibility for downstream single cell analysis.

Merck’s comprehensive gene modulation offering also includes CRISPR activation (CRISPRa) whole-genome libraries and pools, often used in conjunction with CRISPRi.

The Life Science business provides a full suite of screening tools for genome-editing applications including CRISPR knock out, RNAi knock down and open reading frame gain-of-function studies. Genome-editing and gene modulation technologies

complement each other and used together, they can fully elucidate gene pathways and identify drug targets. Merck is a global leader in developing innovative CRISPR tools, products and services.