RECOMMENDED READING

Publications using guide RNA with MS2 RNA aptamers for CRISPR modulation

These publications demonstrate the application of MS2 guide RNAs for a wide array of CRISPR-dCas9 based genome modulation techniques.

Highlighted

Horizon Discovery scientists have developed chemically modified synthetic guide RNA, including an MS2 containing tracrRNA (CRISPRmod MS2 tracrRNA , Cat# U-102005-XX) compatible with the CRISPRa SAM system, for high throughput, arrayed screening applications as well as individual gain of function hit validation.

Strezoska, Z., *et al.* CRISPR-mediated transcriptional activation with synthetic guide RNA. *Journal of Biotechnology.* **319**:25-35 (2020)

2021

1. Malik, R., & Svoboda, P. CRISPR-Induced Expression of N-Terminally Truncated Dicer in Mouse Cells. *Genes.* **12**(4), 540. https://doi.org/10.3390/genes12040540
   Application: CRISPRa using gRNA with MS2 domains and enhanced dimerization MS2 variants to activate Dicer expression in mouse embryonic stem cells.

2020

1. Khosravi, S., *et al.* Application of Aptamers Improves CRISPR-Based Live Imaging of Plant Telomeres. *Frontiers in Plant Science.* **11**:1254. doi: 10.3389/fpls.2020.01254.
   Application: Improved live cell imaging using gRNA with MS2 domains and CRISPR-based targeting of fluorescent protein to DNA.
2. Krawczyk, K., Scheller, L., Kim, H. & Fussenegger, M. Rewiring of endogenous signaling pathways to genomic targets for therapeutic cell reprogramming. *Nature Commununications.* **11**(608). doi.org/10.1038/s41467-020-14397-8
   Application: CRISPRa using gRNA with MS2 domains, dCas9 and transactivators fused to MS2 coat protein to rewire endogenous signal responses from natural receptors.
3. Moghadam, F., *et al.* Synthetic immunomodulation with a CRISPR super-repressor in vivo. *Nature Cell Biology.* **22**, 1143–1154.
   Application: CRISPRi using gRNA with MS2 domains, Cas9, and a MS2 coat protein fused to HP1a-KRAB dual repressor to reprogram immune homeostasis *in vivo*.
4. Raffeiner, P., *et al.* An MXD1-derived repressor peptide identifies noncoding mediators of MYC-driven cell proliferation. *Proceedings of the National Academy of Sciences of the United States of America.* **117**(12): 6571-6579.
   Application: CRISPRi using gRNA with MS2 domains, dCas9, and a MS2 coat protein fused to KRAB or SID repressors to identify MYC-regulated lncRNAs.and Coclooxygenase-2. *Journal of Immunology* **183**(12), 8119–27 (2009). [RAW264.7 macrophages]

2019

1. Cunningham-Bryant, D., Sun, J., Fernandez, B., & Zalatan, J.G. CRISPR-Cas-Mediated Chemical Control of Transcriptional Dynamics in Yeast. *Chembiochem.* Jun 14; **20**(12): 1519–1523.
   Application: Inducible CRISPRa using gRNA with MS2 domains to recruit a complex containing MS2 coat protein fused to inducible activators and dCas9.
2. Taghbalout, A., *et al.* Enhanced CRISPR-based DNA demethylation by Casilio-ME-mediated RNA-guided coupling of methylcytosine oxidation and DNA repair pathways. *Nature Communications.* **10**(4296). doi.org/10.1038/s41467-019-12339-7
   Application: Activation of methylation-silenced genes using gRNA with MS2 domains, dCas9, and a MS2 coat protein fused to a DNA demethylation domain.
3. Tran, N.T., *et al.* Enhancement of Precise Gene Editing by the Association of Cas9 with Homologous Recombination Factors. *Frontiers in Genetics.* **10**(365). doi:10.3389/fgene.2019.00365
   Application: DNA knock-in is enhanced using a gRNA with MS2 domains along with Cas9 and MS2 coat protein fused to enhancers of homology directed repair (HDR).

2019

1. Kunii, A., *et al.* Three-Component Repurposed Technology for Enhanced Expression: Highly Accumulable Transcriptional Activators via Branched Tag Arrays. *CRISPR J.* Oct 1; **1**(5): 337–347.
   Application: CRISPRa using gRNA with MS2 domains to target and accumulate a branched system of transcriptional activators with dCas9 for enhanced gene transcription.
2. Nakade, S., *et al.* Biased genome editing using the local accumulation of DSB repair molecules system. *Nature Communications.* **9**(3270). doi: 10.1038/s41467-018-05773-6
   Application: DNA knock-in is enhanced using a gRNA with MS2 domains along with Cas9 and MS2 coat protein fused to an enhancer of homology directed repair (HDR)

2016

1. Fu, Y., *et al.* CRISPR-dCas9 and sgRNA scaffolds enable dual-colour live imaging of satellite sequences and repeat-enriched individual loci. *Nature Communications.* **7**(11707). https://doi.org/10.1038/ncomms11707
   Application: Live cell imaging using gRNA with MS2 domains and CRISPR-based targeting of fluorescent protein to DNA to study cellular processes such as DNA replication and transcription.
2. Xu, X,. *et al.* A CRISPR-based approach for targeted DNA demethylation. *Cell Discovery.* **2**(16009). doi:10.1038/celldisc.2016.9
   Application: Activation of methylation-silenced genes using gRNA with MS2 domains, dCas9, and a MS2 coat protein fused to a DNA demethylation domain.

2015

1. Konermann, S., *et al.* Genome-scale transcriptional activation by an engineered CRISPR-Cas9 complex. *Nature*, **517**(7536), 583–588.
   Application: CRISPRa using gRNA with MS2 domains and the development of a CRISPR-based SAM system for transcriptional activation.

For more information

To find the contact information in your country for your technology of interest, please visit us at **horizondiscovery.com/contact-us**

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