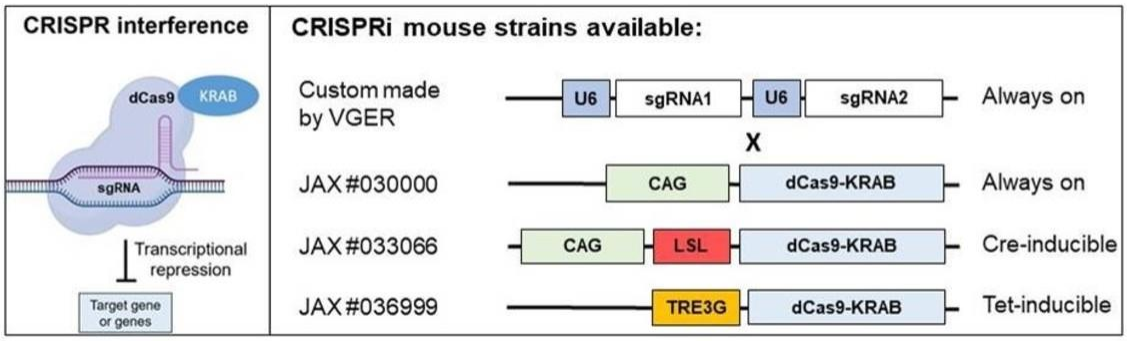
Vanderbilt Genome Editing Resource

SUMMER 2023 NEWSLETTER

Welcome Kasia! We are pleased to introduce Kasia Jopek. Kasia was previously employed at the Technical University of Munich in Germany where she developed new mouse models using CRISPR gene editing. She joins VGER as a Research Specialist. Her expertise and abilities will help us meet the growing demand for our services.

Get ready for CRISPR-READI. We have begun using recombinant adeno-associated viruses and electroporation to deliver DNA sequences greater than 500 bp into mouse embryos. This method, known as "**CRISPR-READI**" enables the efficient production of gene modifications up to 3.7 kb in size. The greater efficiency and size limit will facilitate the insertion of exogenous sequences, such as those for a fluorescent reporter, into various genomic loci.

CRISPRi mouse models. CRISPR interference (CRISPRi) is an effective technology for transcriptional gene repression, non-coding RNA regulation, and enhancer blocking. Compared to Cre/loxP, CRISPRi simultaneously repress multiple genes and some strategies are even reversible. We have been collaborating with several investigators to produce mice expressing one or more small guide RNAs using piggyBac transgenesis. These new transgenic lines are then bred to various dCas9-KRAB expressing mice to repress genes in either a global, conditional, or tissue-restricted manner (see Figure below). We've obtained good to outstanding gene repression all five models tested and are happy to discuss whether this technology is right for you.



Cryopreservation and sharing of mice. The NIH requires a sharing plan that details how mouse models will be made available to others after publication. Depositing your mutant mice into the Vanderbilt **Vanderbilt Cryopreserved Mouse Repository** will help you comply with this policy. Besides obtaining an official allele name prior to publication, use of the VCMR assures that your line is safely and reliably cryopreserved. VGER also manages all Material Transfer Agreements and shipping arrangements, saving you time and effort.

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Core Development Award. Finally, we are pleased to announce that VGER received a Core Development Grant to implement a technology called **inducible mosaic animal for perturbation (iMAP).** This method enables small scale in vivo CRISPR, CRISPRi or CRISPRa screens in mice. We will provide more information in future newsletters.
As always, please contact Leesa Sampson at **leesa.sampson@vanderbilt.edu** or Jennifer Skelton at **jennifer.skelton@vanderbilt.edu** to discuss or initiate a project.

Leesa Sampson
Jennifer Skelton
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Historical summary

Years in existence	30
Investigators served	340
Unique lines produced (since 1993)	>3500
CRISPR-edited lines (since 2013)	155
Lines cryopreserved	930
Lines shared in VCMR	52

Vanderbilt Center for Stem Cell Biology