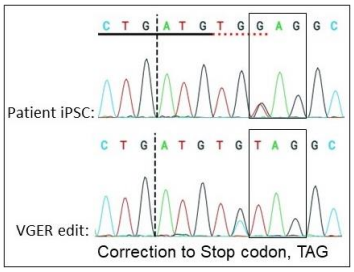
Vanderbilt Genome Editing Resource

VGER

# Winter 2021 Newsletter

**Gene editing in human iPSCs**: In partnership with a VUMC investigator, we developed protocols for genome editing iPSCs using the feeder-free mTeSR1 culture system and commercially-sourced, high quality genome-editing reagents. We made knockout and point mutation-corrected iPSC clones at high efficiencies without positive or negative selection (see figure, Synthego ICE CRISPR Analysis Tool). If you need a genome-edited iPSC line using either WTC-11 iPSCs or your own patient-derived line, please contact us.




**Intergenic DNA deletions**: Do you want to determine the role of a distal or proximal regulatory element? Generating a precise CRISPR-mediated intergenic deletion in mice is an excellent way to begin exploring the function of a gene regulatory region in a relevant, complex model. Intergenic DNA deletions can also be used to study the effects of human genome wide-associated single nucleotide polymorphism (GWAS) mutations in human iPSCs and in mice if the target locus is highly conserved.

**Rederiving mouse lines using off-site cryopreserved sperm and embryos:** Not all cryopreserved sperm and embryos are of similar quality. If you are planning a mouse rederivation, please contact us first. We have experience working with frozen gametes from different repositories and can offer valuable advice on which samples to obtain for the best chance for a successful rederivation. VGER uses state-of-the-art cryopreservation techniques and lines frozen with us are of exceptional quality.

**Mouse colony management:** Strategic use of our mouse cryopreservation and rederivation services can save animal space, research time, housing costs and protect your valuable research models from catastrophic loss due to things like pathogens, breeding failures, and genetic drift. If your research project involving a mutant mouse line is nearing completion, or if you want to preserve the line for future use, please contact us.

**Alternative strategies for tricky genome editing projects:** CRISPR-mediated double stranded DNA breaks resolve into frameshift mutations more frequently than the designed edit. When a gene or intergenic locus is critical for viability, it can be challenging to obtain live or fertile progeny. We can now reliably inject just one-cell of a two-cell embryo to improve survival rates and wild-type tissue contribution, as recently described (PMID:31253768).

As always, please contact Leesa Sampson at leesa.sampson@vanderbilt.edu or Jennifer Skelton at jennifer.skelton@vanderbilt.edu to discuss and initiate a project.

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