



**Transposagen**  
Better Models. Better Results.™

PiggyBac™ applications in

# FOOTPRINT-FREE™ GENE EDITING

"A completely excisable selection system... significantly improved the efficiency of this [cystic fibrosis mutation] correction"

– Firth et al, 2015<sup>1</sup>

## WHY USE FOOTPRINT-FREE™ GENE EDITING?

Positive & negative selection

Scarless selection cassette removal

Nuclease compatible: ZFN, TALEN, CRISPR, etc

Works in difficult cell lines (ES, iPSCs)

Reduced screening time

Edit as little as a single basepair

Shorter timeline & fully customizable

## GENE EDITING IS NO EASY TASK

New gene editing technologies are opening new doors for innovation in genetic research and therapeutics. However, the latest site-specific nucleases (i.e. CRISPR, TALENs) can still sometimes produce low frequency results, especially in difficult cell lines such as stem cells. As a result, scientists must rely on selection methods to obtain their desired gene edits. Unfortunately, traditional selection methods, such as Cre-loxP, leave behind disruptive genetic remnants of the selection marker. This issue of residual selection debris is hindering progress for the many beneficial applications of gene editing technologies, which increasingly demand precision and high efficiency.

## GENE EDITING LIMITATIONS

- Time-consuming screening
- Low frequency events
- Residual selection debris
- Difficult cell lines
- Limited selection capabilities

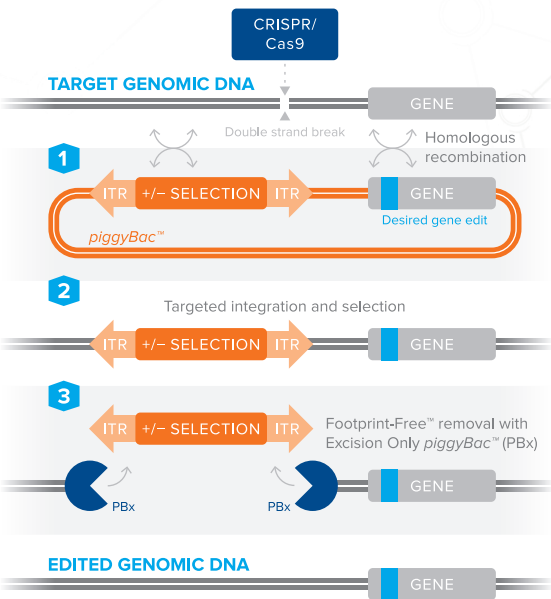
## FOOTPRINT-FREE™ GENE EDITING IS ON THE RISE

Footprint-Free™ gene editing, a completely removable selection system, makes gene editing possible in difficult cell lines and is gaining acceptance amongst researchers for optimization of gene editing procedures. In recent studies, Footprint-Free™ gene editing has been successfully used in combination with CRISPR-Cas9 and TALENs to facilitate gene corrections in human iPSC cells for disease-causing mutations for cystic fibrosis,  $\beta$ -thalassemia, and HIV.<sup>1-3</sup>

Increases efficiency with positive & negative selection



**Transposagen**



## HOW IT WORKS

Footprint-Free<sup>™</sup> gene editing is in a class of its own—a unique gene editing system that gives you the ability for both positive and negative selection. Since *piggyBac*<sup>™</sup> transposase is not mutagenic, this system is ideal for making clean edits—even in the most difficult cell lines such as ES or iPSCs.

- 1** Homologous recombination is stimulated at the target site using site-specific nucleases such as CRISPR or TALENs.
- 2** The *piggyBac*<sup>™</sup> plasmid, with selection cassette and desired gene edits, is integrated into the genomic DNA.
- 3** After selection, Excision Only *piggyBac*<sup>™</sup> (PBx) precisely removes the selection cassette, leaving pristine edited genomic DNA with no scarring.

Choose from our library of selection options or customize for your needs

Select for rare editing events without leaving a mess behind



### Be More Productive: Save Time & Effort

Increase your efficiency and reduce your workload with positive/negative selection capabilities.



### Fast-Track Your Research Project Timelines

Stay innovative and get study results sooner with the CRISPR + *piggyBac*<sup>™</sup> combination.



### Unlock Potential: Edit Difficult Cell Lines

Efficiently edit difficult cell lines such as human embryonic and induced pluripotent stem cells.

## BRING FOOTPRINT-FREE<sup>™</sup> GENE EDITING TO YOUR LAB

### DIY Development

Order off-the-shelf (OTS) reagents or let us build custom reagents specific for your project. We are dedicated to delivering the highest quality products for efficient, cost-effective gene editing solutions.

### Customized Cell Engineering

Let us take on the heavy lifting when it comes to cell line engineering. Using our suite of technologies, including *piggyBac*<sup>™</sup>, we can engineer all types of gene edits—knock-outs, knock-ins, transgenic edits, and more. Working closely with our scientists, our lab becomes an extension of yours.

### Licensing

Partner with us and use the *piggyBac*<sup>™</sup> system to provide your company with a superior platform for R&D and commercial use. Contact us to learn more about our licensing and partnership opportunities.

### Better Models. Better Results.<sup>™</sup>

Transposagen is a worldwide leader in genome engineering technologies and services with applications in therapeutics, research & drug discovery, bioproduction, and agriculture.

Our products and services include Footprint-Free<sup>™</sup> Gene Editing, NextGEN<sup>™</sup> CRISPR, XTN<sup>™</sup> TALENs, custom cell lines, and engineered animal models. Our unique genome engineering capabilities allow for the creation of nearly any genetic modification in any genome.