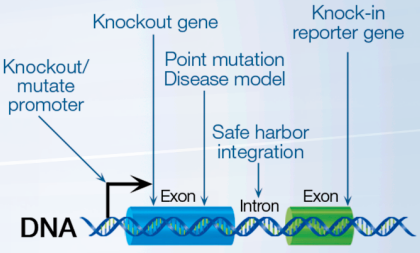
hera BioLabs

Research Model Creation & Services

Hera BioLabs offers all-inclusive *in vivo* services from model creation to data delivery. Streamline your pre-clinical model research by combining transformative gene editing technology with contract research services under one roof.



Research Model Creation

Colony Management

- Rat and Mouse
- Maintenance & Breeding

Screening Services

- Pharmacology & Toxicology
- Xenografts Efficacy
- Phenotyping

Gene Editing Technology and Model Creation

Using site specific nuclease NextGEN™ CRISPR and *piggyBac*™ technology, Hera BioLabs has the ability to make the custom genomic modifications your new model requires from knockout and knock-in models to BAC transgenics, and humanization. Model creation typically takes 5-7 months from vector creation to confirmed germline transmission.

Colony Management

Our all-inclusive service can reduce timelines by proceeding directly into breeding. Newly established engineered lines can be bred to cohorts of the exact age, sex, and genotype required for your studies. Our brand-new vivarium facilities are equipped with an all IVC Innovive system, featuring disposable/recyclable caging, are 100% HEPA filtered, have 24-hour security monitoring and are staffed by our ACLAM and AALAS certified veterinary team so that we can best support your preclinical *in-vivo* research.

Screening Services

Our contract research services include transgene expression profiling (gene expression via RT-PCR and protein detection when possible). Additional services such as detailed validation of the transgenic model including phenotyping, toxicity and efficacy studies are also available.

PiggyBac™ transposons for transgenesis

The piggyBac transposon technology is becoming popular for gene editing applications including BAC transgenics. The transposon delivers the transgene into the genomic DNA through a 'cut' and 'paste' mechanism illustrated in Figure 1. Due to the large cargo capacity, up to 250 kb, and stability the piggyBac transposon is ideal for transgenic rodent model creation.

BAC transgenic rodent models are created to express human genes and using a BAC allows for the transgenic expression of the full human gene (not just the cDNA), including the human promoter and local regulatory elements.

Jung et al[1] recently published in *Scientific Reports* on the creation of BAC transgenic rats that faithfully expressed human SIRPA evaluating piggyBac transposon, CRISPR/Cas9 and TALEN mediated approaches. The piggyBac approach was found to be more efficient than classical BAC transgenesis (embryonic injection of BACs). The insertion of predictable end sequences also provided the added benefit of being able to readily identify the insertion sites using a simple PCR approach. Neither CRISPR nor TALEN proved to be effective methods for the large targeted insertions associated with creation BAC-based transgenics.

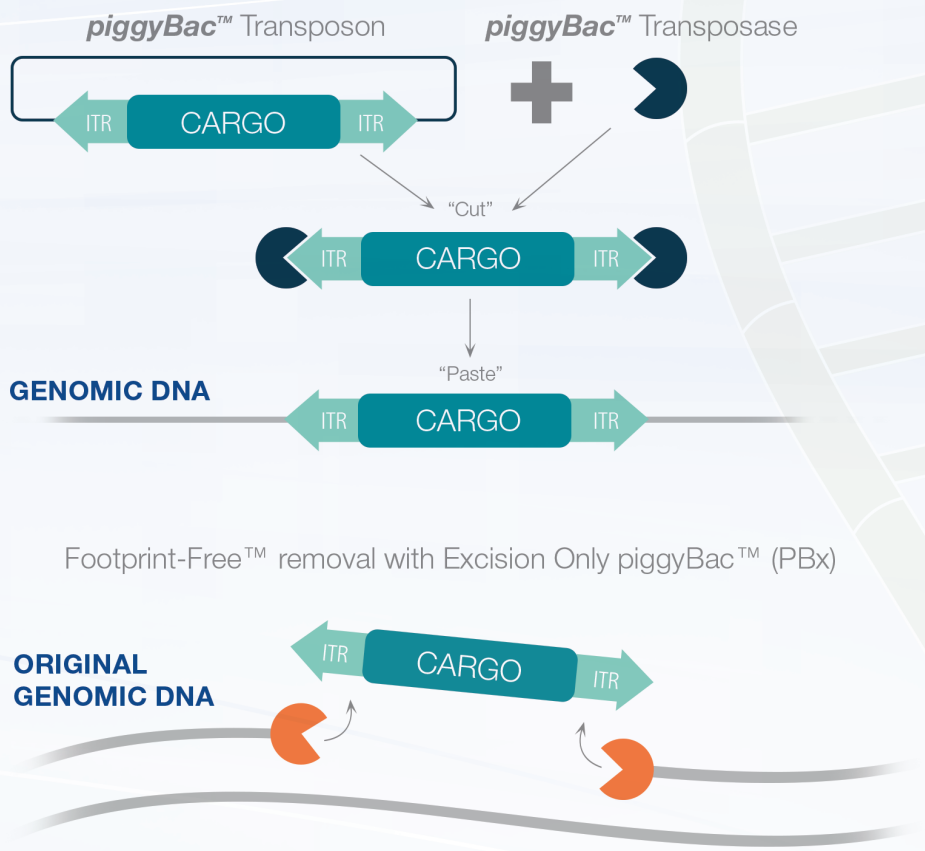


Figure 1. piggyBac transposon mechanism

1. Jung, C. J. *et al.* Comparative Analysis of *piggyBac*, CRISPR/Cas9 and TALEN Mediated BAC Transgenesis in the Zygote for the Generation of Humanized *SIRPA* Rats. Sci. Rep. 6, 31455;doi: 10.1038/srep31455 (2016).