Gene overexpression

Generate a mouse model in which an exogenous gene is introduced and overexpressed. An overexpression model can be used to investigate gene functions, promoter functions, or model the pathogenesis of human disease. Depending on the method to introduce foreign DNA, a random transgenes or targeted conditional overexpression model can be created.

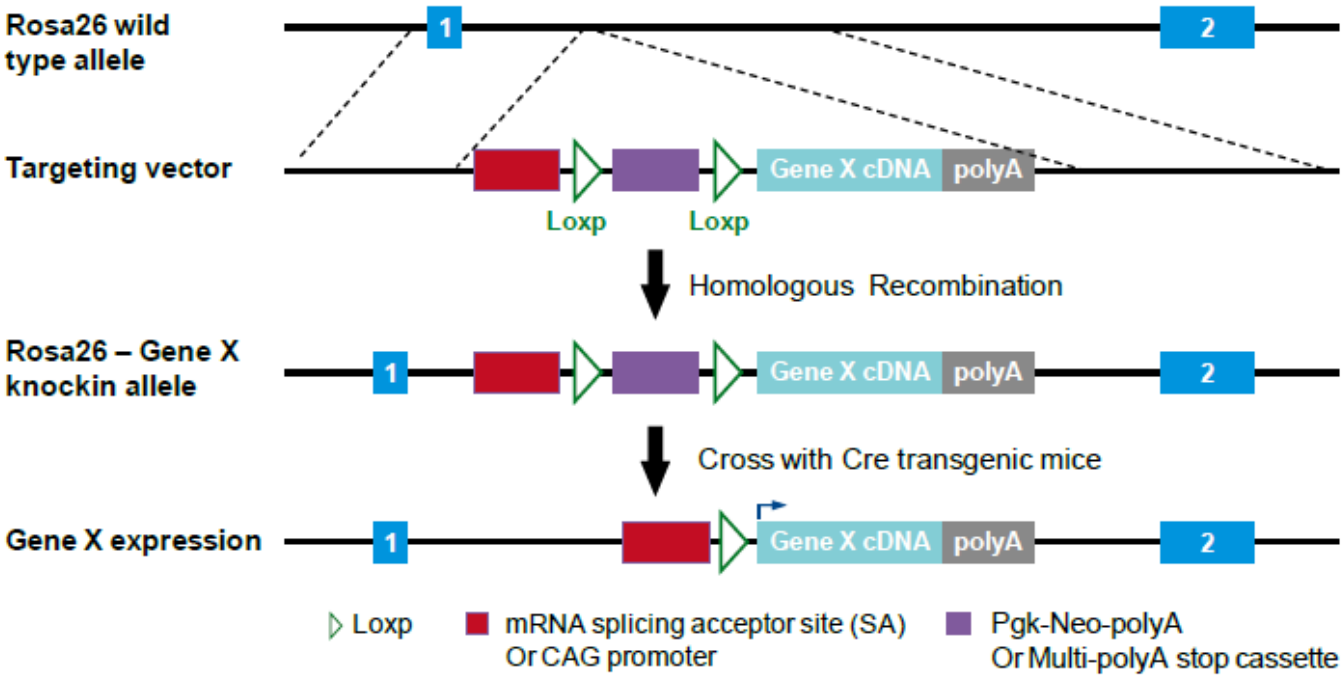
Targeted conditional overexpression

Rosa26 is one of the most well-characterized and frequently used genomic locus for site-specific integration. It is a non-coding gene located on mouse chromosome 6 that has been shown to be expressed in most tissues and cell types. Besides, this locus has no observable effects upon the host phenotypes. Therefore, Rosa26 is a well-known "safe harbor" site widely used for exogenous gene expression.

Cre-LoxP system can be used to modulate exogenous gene expression. Simply speaking, a Rosa26-(SA/pCAG)-loxp-Stop-loxp-cDNA-pA recombinant vector can be constructed and inserted into the Rosa26 locus, leading to the generation of an engineered strain bearing the desired gene. Such animals can be hybridized with a variety of Cre recombinase-expressing mice (available in SMOC) to obtain the desired mouse models in which the exogenous gene is expressed in a spatial-dependent manner.

- Avoid multiple copies, multi-site insertion, unstable expression, the need to establish animal strains, and other problems that you may encounter with transgenic models created via random integration
- Achieves stable and controllable expression of exogenous genes to help avoid unpredictable and abnormal phenotypes that may result from systemic gene overexpression
- Allows for site-specific integration of large fragments (20-30kb)
- In addition to the Rosa26 site, several other sites are available to meet different research purposes

- Can be used for overexpression experiments
- Can be used for gene function rescue experiments
- Can be used to model disease-related mutations



Random Transgenes

Transgenic mouse models can be obtained more efficiently using the piggyBac transposon system. Clone the target fragment into the piggyBac transposon plasmid. Inject the plasmid into the fertilized egg together with the piggyBac transposase. Transposase will integrate the target fragment into the 5'-TTAA-3' site on the genome to obtain transgenic mice.

Since the piggyBac transposon can specifically recognize the 5’-TTAA-3’ site in the genome with the help of a transposase, it can precisely cleave and insert the gene without leaving any mark. In addition, in the process of random insertion into the genome, the gene is more likely to be inserted into a transcription-active position, thus greatly increasing the likelihood of active expression of exogenous gene.

- A quick and efficient way to obtain the Founder mice of the transgenic model

- Rapid detection of target gene expression in Founder mice using a luciferase reporter gene in conjunction with an in vivo imaging system