

B-MO'S
**TIP OF THE
MONTH**

SEP 2016

BMOGEN'S ENHANCED SLEEPING BEAUTY VECTORS

Simplified In Vitro and In Vivo Gene Delivery



B-MoGen's Enhanced Sleeping Beauty Vectors Simplified In Vitro and In Vivo Gene Delivery

Sleeping Beauty (SB) was the first cut and paste transposon ever shown to function in vertebrates, including human cells, and has revolutionized gene delivery technology and mutagenesis.⁶

Sleeping Beauty is a two-part system: The SB transposase enzyme mediates a cut and paste reaction of donor DNA flanked by SB-specific inverted repeats/direct repeats (IR/DRs) into chromosomal DNA.¹¹ The SB system allows for highly efficient transfer of desired genetic material into host cell genomes of vertebrate species and is by far the best studied and well utilized transposon for basic and applied research.

There are several uses of *Sleeping Beauty*. SB has been used for transgene delivery to the mouse brain and other organs to model cancer,^{1,8,10} to enhance gene transfer to cultured cell lines,³ and to create chimeric antigen receptor (CAR) T-cells for human cancer therapy.⁷ SB transposon mobilization and integration has additionally been used in cultured cell lines, and transgenic mice and zebrafish for forward genetic screens to discover novel cancer genes.² In its simplest application, SB can be used to deliver genes to a variety of cell types including adherent and suspension cultured cell lines, primary cells, and cells in situ in laboratory animals (including mice).^{5,9}

SB transposons integrate in a random distribution at TA sites without a preference to integrate in or near endogenous genes, making them less likely to cause off-target effects when compared to other transposons and viral gene delivery methods.⁴

B-MoGen offers a variety of SBT™ transposon donor vectors designed for maximal activity, and SB transposase expression vectors for combined use to stably integrate transgenes into the genome of your desired cells.

Sample protocols for SBT™ MCS cloning, co-transfection of SBT™ and SB transposase vectors, and selection of SBT™ integrated cells are available.

B-MoGen Multiple Cloning Site (MCS) ready SBT™ vectors are ideal for easily creating custom transgene transposon vectors. The MCS in B-MoGen vectors allow researchers to choose from 30 unique restriction enzyme sites for insertion of donor DNA, validation of donor DNA insertion, and excision of donor DNA. The SBT™ vector and the SB transposase expression vector are generally co-transfected in order to effectively integrate the SBT™ vector transposon into the host cell genome. The specific co-transfection method to be used is the user's choice. B-MoGen technical staff members are available to discuss the details of your project and help develop specific protocols.

FIGURE 1A.

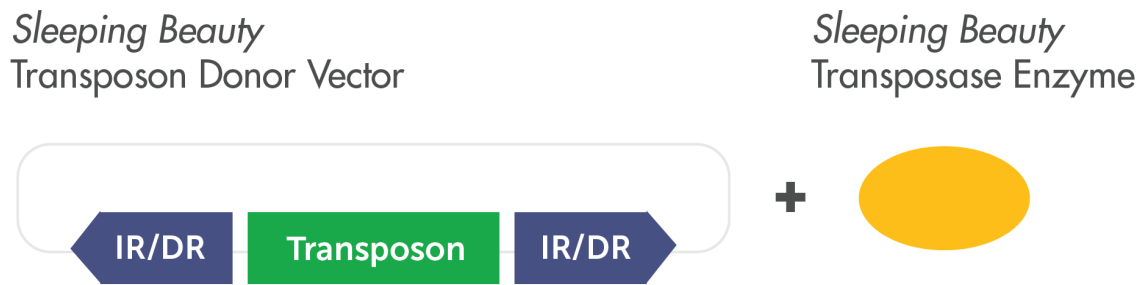


FIGURE 1B.

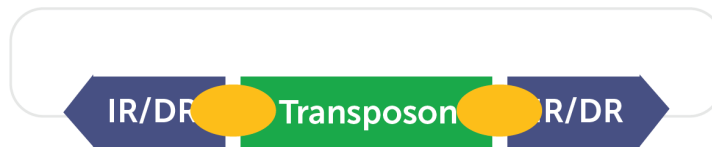


FIGURE 1C.



FIGURE 1D.



FIGURE 1. SLEEPING BEAUTY TRANSPOSON SYSTEM.

- A depiction of Sleeping Beauty transposon plasmid and Sleeping Beauty transposase enzyme active in cellular nuclei.
- Transposase enzyme binds to Sleeping Beauty-specific IR/DR sites.
- Transposase enzyme excises transposon sequence from transposon vector.
- Transposase enzyme stably integrates transposon sequence at TA site in host cell genome.

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