Applied StemCell

PRODUCT DATA SHEET

TARGATT™ HEK293 Knock-in Kit (H11)

Catalog No. AST-1305 RUO • Rev. 1 | August 2026

Product Overview

The TARGATT™ HEK293 Knock-in Kit (H11) is designed for fast, site-specific knock-in in HEK293 cells using a simple, plasmid-based workflow. The master cell line supplied with the kit carries an attP integrase recognition landing pad engineered into the human H11 safe harbor locus.

Any gene of interest can be cloned into the supplied attB cloning plasmid — under control of the CMV promoter or a promoter of your choice — and co-transfected with the TARGATT™ Integrase expression plasmid. Expression of the integrase mediates stable integration of the transgene into the master cell line without disruption of internal genes.

This general-purpose configuration is the appropriate choice for single-transgene knock-in and uniform, stable expression of a protein or multi-protein construct.

Key Features & Benefits

Feature	Benefit
Site-specific integration at the H11 safe harbor locus	No position effects, no silencing, no disruption of endogenous genes
Irreversible attP × attB integrase reaction	Permanent, stable integration — not reversible like conventional recombinase systems
Single-copy insertion	Predictable genotype; eliminates the instability of multi-copy random integration
Integration efficiency >40% without enrichment; approximately 90% with enrichment	Substantially less screening to reach a usable line
Large cargo capacity — up to 50 kb in a single reaction, more with nested reactions	Integration of full-length proteins and multi-gene constructs beyond the reach of CRISPR, transposons, and lentivirus
Uniform, stable expression clone to clone	Pool-based workflows replace clonal purification, removing weeks from development timelines
Promoter of choice supported in the donor plasmid	Tune expression level to the application
Kit format precedes licensing	Evaluate the technology before committing; academic researchers may purchase without a license

Product Specifications

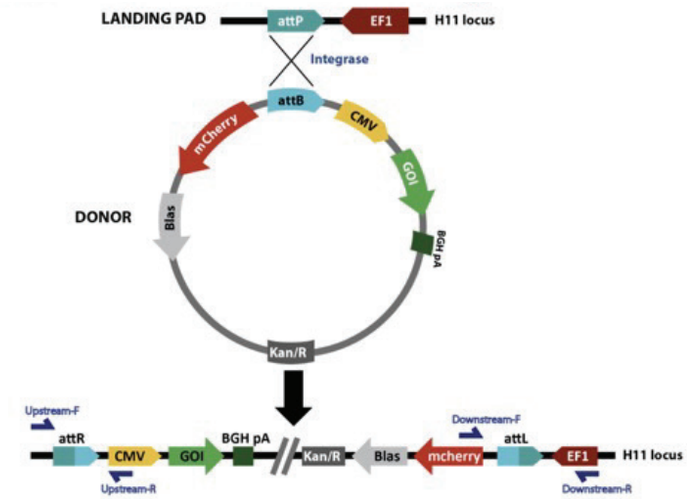
Host cell line	HEK293
Integration site	H11 safe harbor locus
Integration mechanism	Serine integrase; attP × attB; unidirectional and irreversible
Copy number	Single copy
Maximum insert size	Up to 50 kb in a single reaction; larger via nested reactions
Integration efficiency	>40% without enrichment (based on mCherry control plasmid); ~90% with enrichment
Screening format	None required — general purpose. Blasticidin enrichment supported
Optimal harvest window	Highest integration efficiencies observed ~72 hours post-transfection
Quality control	Certificate of Analysis with detailed QC information for the cell line and kit components provided with each shipment
Shipping conditions	Dry ice
Storage conditions	Master cell line: liquid nitrogen immediately upon receipt (vapour phase, not -70°C). Plasmids: -20°C in single-use aliquots; do not freeze-thaw repeatedly
Stability	At least 6 months from date of receipt when stored as directed
Product grade	Research use only — not for human or animal diagnostic or therapeutic use

Applications

- Single- and multi-gene protein expression
- Stable reporter and isogenic cell line generation
- Viral vector producer cell line development
- Target and pathway studies in a human cell background

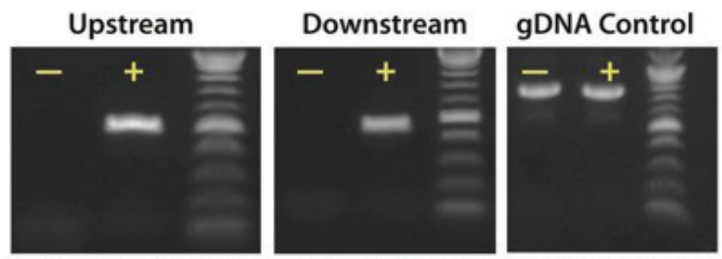
Supporting Data

Schematic representation of TARGATT™ knock-in strategy



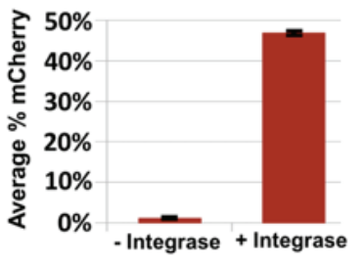
Figures 1. Schematic representation of TARGATT™ site-specific transgene integration mediated by integrase. The TARGATT™-HEK Master Cell Line was engineered with the attP landing pad at the hH11 safe harbor locus. The TARGATT™ plasmid containing the integrase recognition site, attB, is used to clone the transgene. The integrase catalyzes an irreversible reaction between the attP site in the genome and the attB site in the donor vector, resulting in integration of the gene of interest at the selected H11 locus. Cells containing the gene of interest can be enriched using the selection marker (grey box).

Confirmation of site-specific CMV-MCS plasmid integration



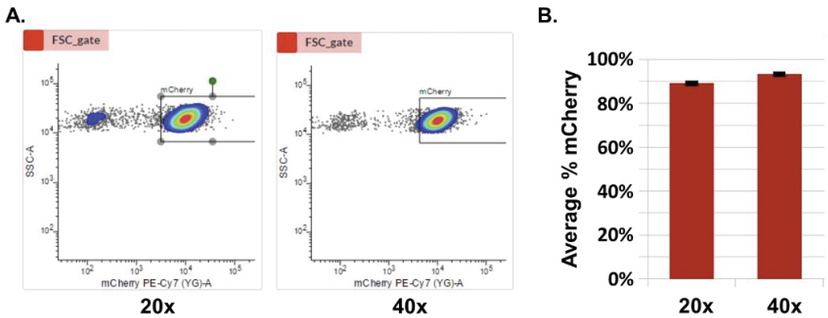
Figures 2. PCR gel electrophoresis confirming knock-in of the TARGATT™ 24 CMV-MCS-attB plasmid mediated by the TARGATT™ Integrase plasmid after transfection into the TARGATT™ HEK293 Master Cell Line. Two primer sets were used to confirm knock-in: upstream (512 bp) and downstream (464 bp). Human control primers (777 bp) were used to check the integrity of the cells and genomic DNA. The negative control (–) represents cells transfected with the TARGATT™ 24 CMV-MCS-attB plasmid and a mutant TARGATT™ Integrase plasmid deficient for integration. DNA ladder: NEB 1 kb Plus.

mCherry expression 72 hours post-transfection



Figures 3. mCherry integration into the TARGATT™ HEK293 master cell line mediated by the integrase, 72 hours post-transfection. Cells were transfected with the mCherry positive control plasmid and either the provided TARGATT™ integrase plasmid (+Integrase) or a mutant TARGATT™ integrase plasmid deficient for integration (–Integrase). The mCherry plasmid has no promoter and requires the ubiquitous EF1 promoter in the landing pad after integration to express the reporter gene. Integration efficiency of mCherry knock-in into the landing pad was >40% without selection. Data represent the mean ± SE of two representative experiments performed in triplicate.

mCherry expression after Blasticidin enrichment



Figures 4. Blasticidin enrichment of TARGATT™ HEK293 cells with a knocked-in mCherry-blasticidin plasmid. Cell pools (20× and 40× split ratio) were enriched in selection medium for 3 weeks without cell sorting. (A) Flow-cytometric analysis of mCherry expression after enrichment. (B) Summary of enrichment results for two representative experiments performed in triplicate (N=3); data shown are mean ± SE. Enrichment of mCherry was approximately 90% after blasticidin selection.

References

- Chi X, Zheng Q, Jiang R, Chen-Tsai RY, Kong LJ. A system for site-specific integration of transgenes in mammalian cells. PLOS ONE. 2019;14(7):e0219842.
- Zhu F, Gamboa M, Farruggio AP, et al. DICE, an efficient system for iterative genomic editing in human pluripotent stem cells. Nucleic Acids Research. 2014;42(5):e34.

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Licensing

TARGATT™ kits are designed to enable evaluation of the technology prior to purchasing a commercial license. Academic researchers may purchase TARGATT™ technology without licensing. Contact Applied StemCell to discuss commercial licensing terms.

Related Services

If you prefer to outsource, Applied StemCell offers custom genome engineering, iPSC gene editing and differentiation, cGMP cell banking and manufacturing, and process, analytical, quality, and regulatory support. Contact us for a custom service project quote..

Kit Components

Catalog No.	Component	Format	Quanity
AST-1305-1	TARGATT™ HEK293 Master Cell Line	Cells	1×10^6 cells
AST-3064	TARGATT™ 24 CMV-MCS-attB Cloning Plasmid	Plasmid	5 µg
AST-3065	TARGATT™ 25 mCherry-attB (No Promoter) Positive Control Plasmid	Plasmid	15 µg
AST-3201	TARGATT™ CMV-Integrase Plasmid	Plasmid	15 µg

Ordering Information

Catalog No.	AST-1305
Description	TARGATT™ HEK293 Knock-in Kit (H11) — General purpose
Format	kit
Pack Size	1 kit

Related Products

- AST-1306 – TARGATT™ HEK293 Knock-in Kit (H11) for Library Screening (Drug Selection); Drug selection
- AST-1308 – TARGATT™ HEK293 High-Efficiency Sub-Line (HESL) Knock-in Kit (H11) for Library Screening (FACS); FACS
- Contact Applied StemCell for compatible media and related cell models.

Contact & Ordering

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