

# TcBuster™ Non-viral Genetic Engineering

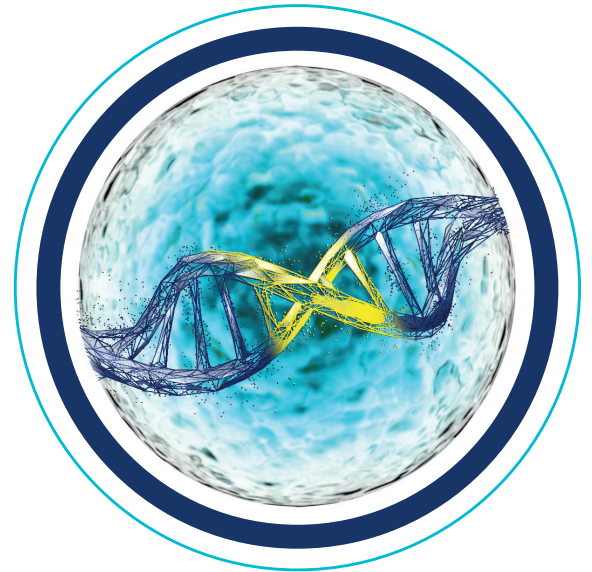
## for Cell and Gene Therapy Manufacturing

Efficient and scalable gene editing for cell therapy manufacturing is now at your fingertips. TcBuster non-viral genetic engineering technology and services solve the supply chain and timeline bottlenecks facing viral vector-based editing, while maintaining high efficiency insertion and a low-risk profile.

TcBuster is a commercially available non-viral, transposon-based gene transfer system. Proven to insert CAR and TCR constructs reliably and cost-effectively into T cells and NK cells, TcBuster is the future of genetically engineered autologous and allogeneic cell therapies.

### CAR and TCR Gene Transfer without the Viral Baggage

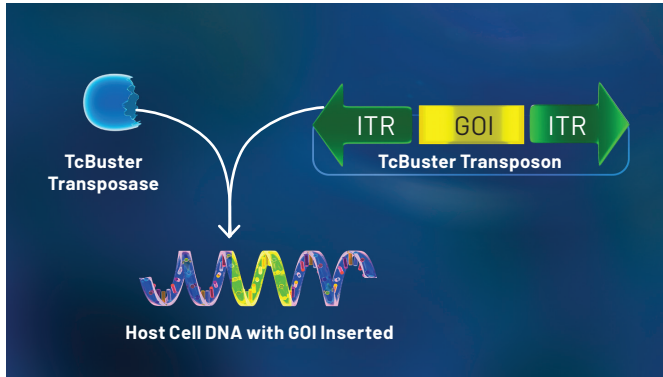
TcBuster addresses the cost, scalability, supply chain, and integration challenges of retroviral and lentiviral vectors, as demonstrated in the table below. Manufacturing of TcBuster plasmids is inherently faster and less variable than retro and lentiviral production.



	TcBuster	Lentivirus
<b>Cost</b>	\$	\$\$\$
<b>Manufacturing Timeline</b>	8-14 weeks	11-20 weeks
<b>Lot Consistency</b>	Repeatable	Lot-to-lot variability
<b>Manufacturing Capacity</b>	Robust and scalable	Susceptible to supply shortage
<b>Cargo Size</b>	>11 kb	< 9kb
<b>Gene Transfer Capacity</b>	Multiple genes	One gene
<b>Mediates Stable Gene Transfer</b>	Yes	Yes
<b>Delivery Method</b>	Electroporation	Transduction
<b>Integration Risk Profile</b>	Low Random; No site preference	Medium Random; Preferences for exons, transcriptional start sites
<b>Immunogenicity</b>	No	Yes
<b>Clinical Use</b>	Yes	Yes

## How TcBuster Works

TcBuster integrates your gene of interest (GOI) into host cell DNA using the highly efficient Red Flour Beetle transposase and specifically-designed transposons. Transposon systems have the safest insertion profile of any commercial gene delivery, with limited off-target effects and stable, reliable gene expression.



## Scalable to Support Therapeutic Manufacturing

TcBuster gene edited cells are compatible with cell expansion in closed-system G-Rex bioreactors. Optimized transposition and expansion protocols will support research and therapeutic scales.

Small Scale  
G-Rex6M



40% transposition  
25-fold expansion  
Yield:  $2.5 \times 10^8$

Mid Scale  
G-Rex100M



51.3% transposition  
50-fold expansion  
Yield:  $4 \times 10^9$

Large Scale  
G-Rex500M



40.9% transposition  
38-fold expansion  
Yield:  $15 \times 10^9$

**Transposition and Expansion Rates of TcBuster-edited Cells in G-Rex Bioreactors.** Increasing numbers of cells ( $1 \times 10^7$ ,  $8 \times 10^7$ , and  $40 \times 10^7$ ) were electroporated to introduce TcBuster, then seeded into small, mid-, and large-scale G-Rex bioreactors, respectively, for expansion. TcBuster successfully transposed cells with >30% efficiency and resulted in 25-, 50-, and 38-fold expansion in the G-Rex.

[scaleready.com](http://scaleready.com)

Contact us: [info@scaleready.com](mailto:info@scaleready.com)

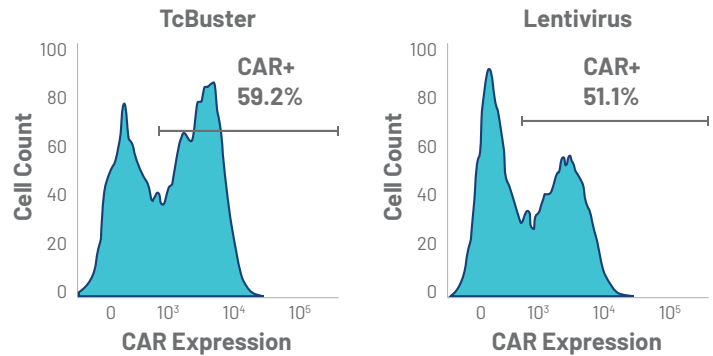
ScaleReady is a Joint Venture formed by Bio-Techne, Fresenius Kabi, and Wilson Wolf. Combining selected offerings from the three partners, the ScaleReady manufacturing platform combines tools and technologies for cell culture, cell activation and expansion, gene editing, and cell processing.

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## Highly Efficient Integration

Optimized protocols can result in TcBuster transposition yielding similar or higher efficiencies compared to lentivirus transduction.



**Comparable Efficiency Compared to Lentivirus.** CAR expression was evaluated by flow cytometry, showing similar rates of efficiency between TcBuster transposition (59.2%) versus lentivirus (51.1%).

## TcBuster Service Options

From proof-of-concept studies and process optimization to cGMP cell line manufacturing or technology licensing, we have you covered. We've partnered with Bio-Techne's process development team to make sure TcBuster integrates seamlessly into your clinical manufacturing process.

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