

# Optimizing Lentivirus Production

## Using scale-X™ Fixed Bed Bioreactors

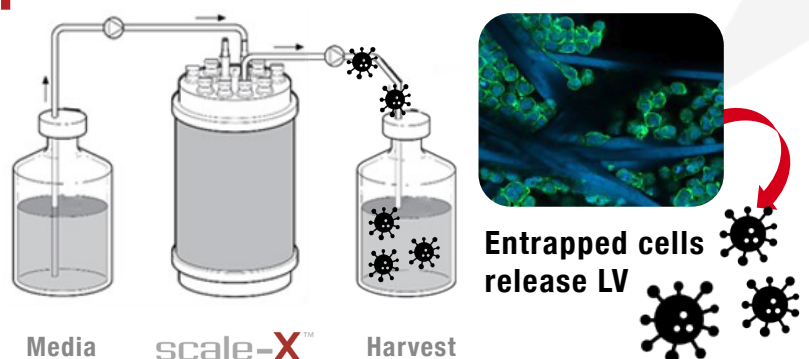
Lentiviral vectors (LVs) are a cornerstone of gene therapy, powering *ex vivo* treatments like CAR T and showing growing potential for *in vivo* delivery. However, their production is notoriously complex – challenged by shear-sensitive biology, high costs, and inconsistent yields. To scale these life-changing therapies, manufacturers need efficient scalable solutions.

### LV production challenges

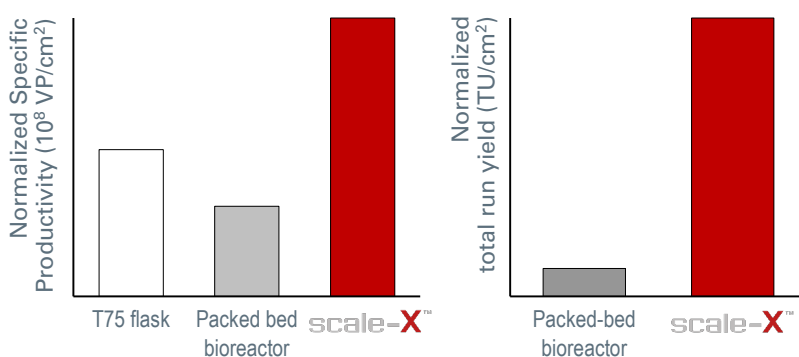
- ▶ LV production demands vary up to  $10^6$  fold between *ex vivo* and *in vivo* applications.
- ▶ Shear stress in stirred-tank reactors damages product and reduces yield.
- ▶ Lentiviral vectors require strict biosafety and QC.
- ▶ Transient transfection is sensitive to shear and can lead to cell toxicity.

### Enter perfusion by design

- ▶ Homogenous, low-shear environment
- ▶ Linear scalability from 0.5 m<sup>2</sup> to 600 m<sup>2</sup> using the scale-X platform
- ▶ Continuous collection improves yields and product stability
- ▶ Cleaner harvest = fewer impurities and lower downstream processing burden

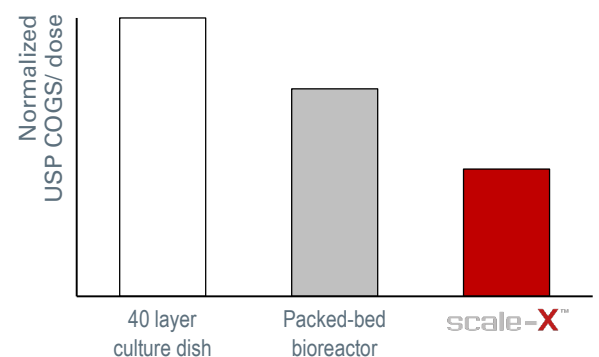


#### ✓ Increased productivity



**Higher specific viral productivities** achieved due to cell protection within the structured fixed-bed, which reduces shear stress and supports high cell viability.

#### ✓ Lower costs



**Lower cost of goods per dose** enabled by increased productivity and lower operating footprint, lowering labor, facility and material costs.

## scale-X™ Portfolio

The scale-X portfolio offers linear scalability from 0.5m<sup>2</sup> to 600m<sup>2</sup> covering R&D through mid- and large-scale production

