## **CellPore™ Transfection System**

Gentle Intracellular Delivery for T Cell Engineering Applications



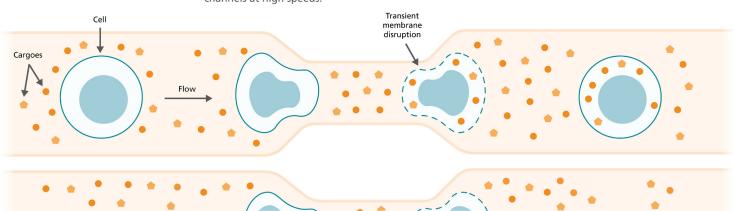
Open up new possibilities for T cell engineering by using direct cytosolic delivery with the CellPore™ Transfection System. Consisting of a benchtop instrument and a specialized reagent kit, which includes single-use delivery cartridges, CellPore™ uses gentle microfluidic technology to deliver mRNA and ribonucleoprotein (RNP) for gene editing into human unactivated T cells. The modified cells may then be used for further downstream analyses and applications.

## How Does CellPore™ Work?

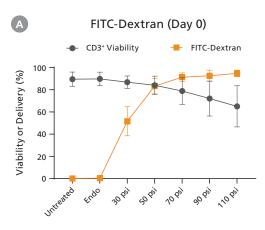
The CellPore™ Transfection System uses microfluidic technology to deliver target mRNAs and RNPs directly to the cytosol of human unactivated T cells. Using pressure, the cells are squeezed at high speeds through parallel microfluidic channels embedded in a single-use delivery cartridge (included in the CellPore™ Transfection Kit 300). This creates transient cell membrane pores that allow the target cargoes to enter the cytosol before the membrane reseals.

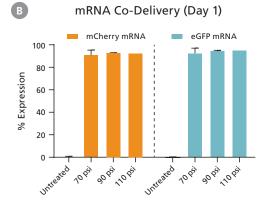


- 1 Cells and target cargoes are resuspended in delivery medium and added to the disposable cartridge.
- Cartridge is loaded into the CellPore™ instrument and the cells are gently squeezed through parallel microfluidic channels at high speeds.
- 3 Transient disruptions to the cell membrane allow target cargoes to enter the cytosol.
- 4 The cell membrane reseals and cargoes remain inside the cell.









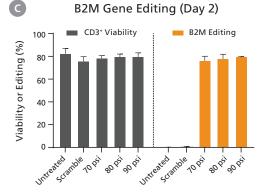


Figure 1. Identification of Optimal CellPore™ Delivery Parameters to Human Unactivated Pan T Cells

(A) CellPore<sup>TM</sup> FITC-Dextran or (B) mCherry and eGFP mRNA were delivered to 2 x 10<sup>6</sup> unactivated T cells via a pressure sweep, and optimal delivery/expression was measured at 70 - 90 psi. Cas9 RNPs targeting (C) the  $\beta$ -2-microglobulin (B2M) gene measured optimal gene editing efficiency at the 90 psi condition. All conditions were assessed by flow cytometry. Endocytosis (Endo) control represents natural uptake of CellPore<sup>TM</sup> FITC-Dextran in undelivered samples. Scramble control represents delivery of non-targeting gRNA Cas9 RNP complexes. Data are shown as mean  $\pm$  SD (n = 2 - 5).

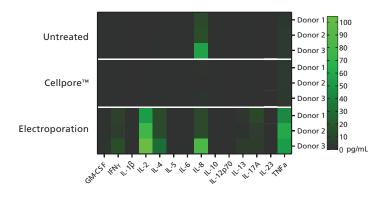


Figure 2. Unactivated Pan T Cells Manipulated by the CellPore™ Transfection System Retain Their Phenotype

Following 24 hours post-delivery of ribonucleoproteins targeting the B2M gene, increased levels of several pro-inflammatory cytokines were measured in the supernatant of electroporated T cell samples. In contrast, samples manipulated by the CellPore<sup>TM</sup> Transfection System retained baseline secretion levels. Untreated control refers to unmanipulated T cell samples. Data are shown as mean  $\pm$  SD (n = 3).

## Why Use CellPore™ for Cell Engineering?

- Engineer human unactivated T cells while avoiding unwanted electroporation-induced broad gene dysregulation and functional changes
- Deliver target mRNA and RNPs into human unactivated
  T cell cytosol while retaining the resting human T cell
  phenotype
- Easily adjust instrument parameters to find your optimal delivery conditions faster



## **Product Information**

Additional data on CellPore™ www.stemcell.com/product-cellpore

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