

# ***ExTransfection<sup>TM</sup>***

**Electroporation system**

**Making Next-Level Technology Accessible**



## Introducing Microporation Technology

NanoEntek developed microporation technology to overcome the limitations of traditional electroporation methods using cuvettes. We are proud to introduce the **ExTransfection™**, an innovative pipette-type electroporation system that dramatically improves transfection efficiency.

The core of microporation technology lies in its use of a **capillary-type electric chamber**, replacing the conventional cuvette. This breakthrough maximizes the gap size between electrodes while minimizing the electrode surface area, significantly **enhancing both transfection efficiency and cell viability**. The increased electrode gap ensures a more uniform electric field within the capillary, further improving transfection performance.



Microporation technology overcomes the challenges of conventional electroporation by:

Reducing  
electrode surface area

Minimizing  
heat generation

Minimizing  
pH changes

Minimizing  
metal ion formation



\*Conventional cuvette

## Advantages of the ExTransfection™ Electroporation System

The ExTransfection™ is a cutting-edge, benchtop electroporation device featuring a single electroporation chamber within its pipette tip. With precise electrical pulses, it efficiently delivers nucleic acids, proteins, and siRNA into all mammalian cell types while maintaining high cell viability.

### High-Efficiency Transfection

Conveys intensive & even electricity  
into cells without unexpected loss

### Consistent Results

Delivers reproducible outcomes  
under the same conditions

### Wide Range of Sample Sizes

10  $\mu$ L and 100  $\mu$ L  
sample volumes available

### Applicable with Various Cell Types

Compatible to all cell types,  
covering mammalian, primary,  
stem and blood cells

### Superior Viability

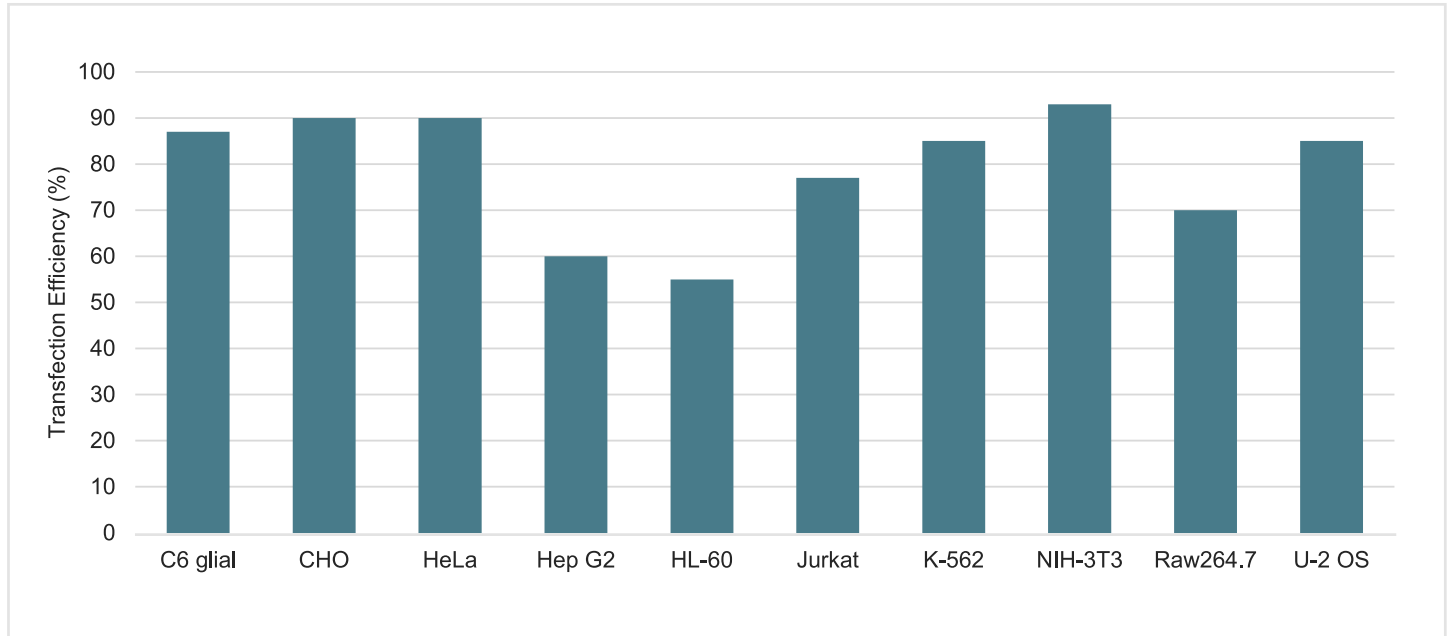
Provides higher  
cell viability

## MicroPoration Technology

# Applications : Transfection efficiency

## High Transfection Efficiency for Cell Lines

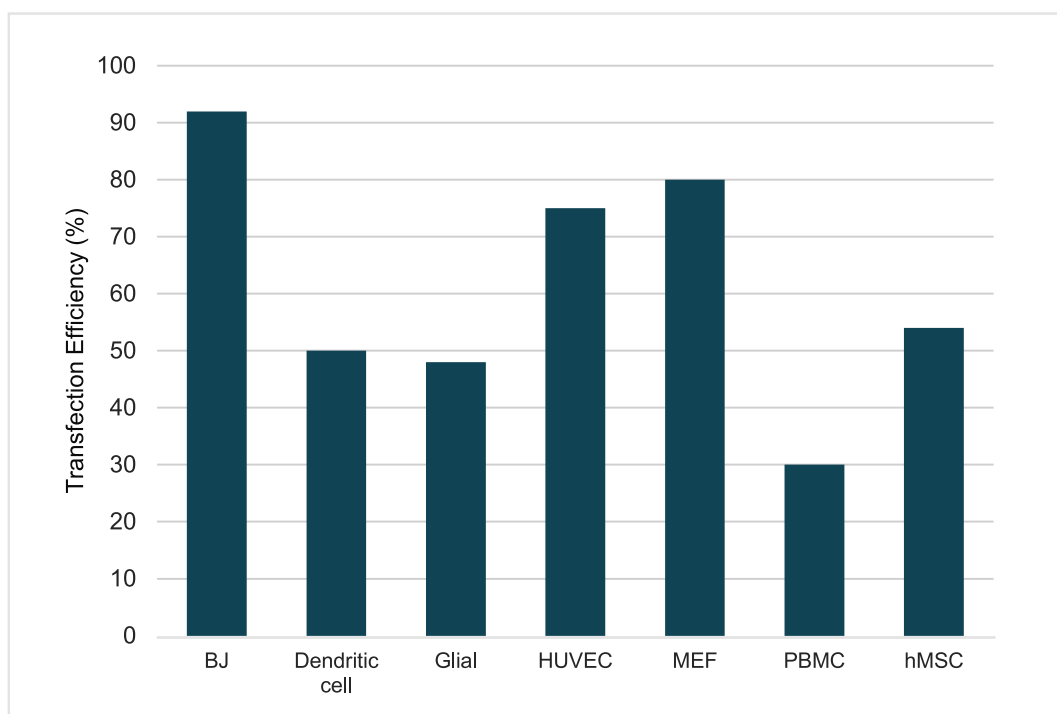
The transfection efficiency of microporation has always been reliable. Various cell lines have been extensively tested with GFP gene transfection, and their efficiencies were analyzed using fluorescence microscopy and flow cytometry.



## High Transfection Efficiency for Primary Cells

Primary cells are widely recognized as the ideal material for animal cell research due to their physiological similarity to live animals. However, the transfection of genetic material into primary cells has long been a significant challenge.

The ExTransfection™ consistently delivers successful transfection results across various primary cells.



# Applications : CRISPR/Cas9

## ExTransfection™: Empowering Your CRISPR/Cas9 Research

The ExTransfection™ Electroporation System delivers cutting-edge performance and reliability for genome editing applications, including CRISPR/Cas9 workflows. With unparalleled efficiency and precision, the ExTransfection™ simplifies complex gene editing protocols, enabling researchers to achieve exceptional results across a wide range of cell types.

## Key Advantages for CRISPR/Cas9 Applications

### 1. Exceptional Transfection Efficiency

Achieve up to **90% transfection efficiency** across diverse cell types, including primary, stem, and hard-to-transfect cells.

### 2. Seamless Workflow

Intuitive **three-step protocol with single buffer** simplifies electroporation for CRISPR ribonucleoproteins (RNPs), plasmids, and other nucleic acids.

### 3. Precision and Customization

Optimize electroporation parameters freely or utilize **pre-programmed protocols** tailored for CRISPR workflows.

(1) Jurkat cell: 1,600V, 10ms, 3 pulses (IDT Alt-R CRISPR-Cas9 system, ThermoFisher TrueCut Cas9 Protein V2, STEMCELL CRISPR-Cas9 complex system)

(2) HEK293 cell: 1,200V, 10ms, 3 pulses (GenScript Cas9 system)

### 4. Scalability and Enhanced Sample Integrity

Handle wide variety of cell samples ranging from 10,000 to 10 million cells per reaction. Minimized sample loss during transfer with biologically compatible pipette tips.

## Proven Results in CRISPR Research

Researchers worldwide trust the ExTransfection™ for its consistency and reliability in demanding CRISPR workflows. The ExTransfection™ has been successfully employed in CRISPR/Cas9 experiments to:

01

Achieve **high-efficiency gene knockout** in primary T cells and stem cells.

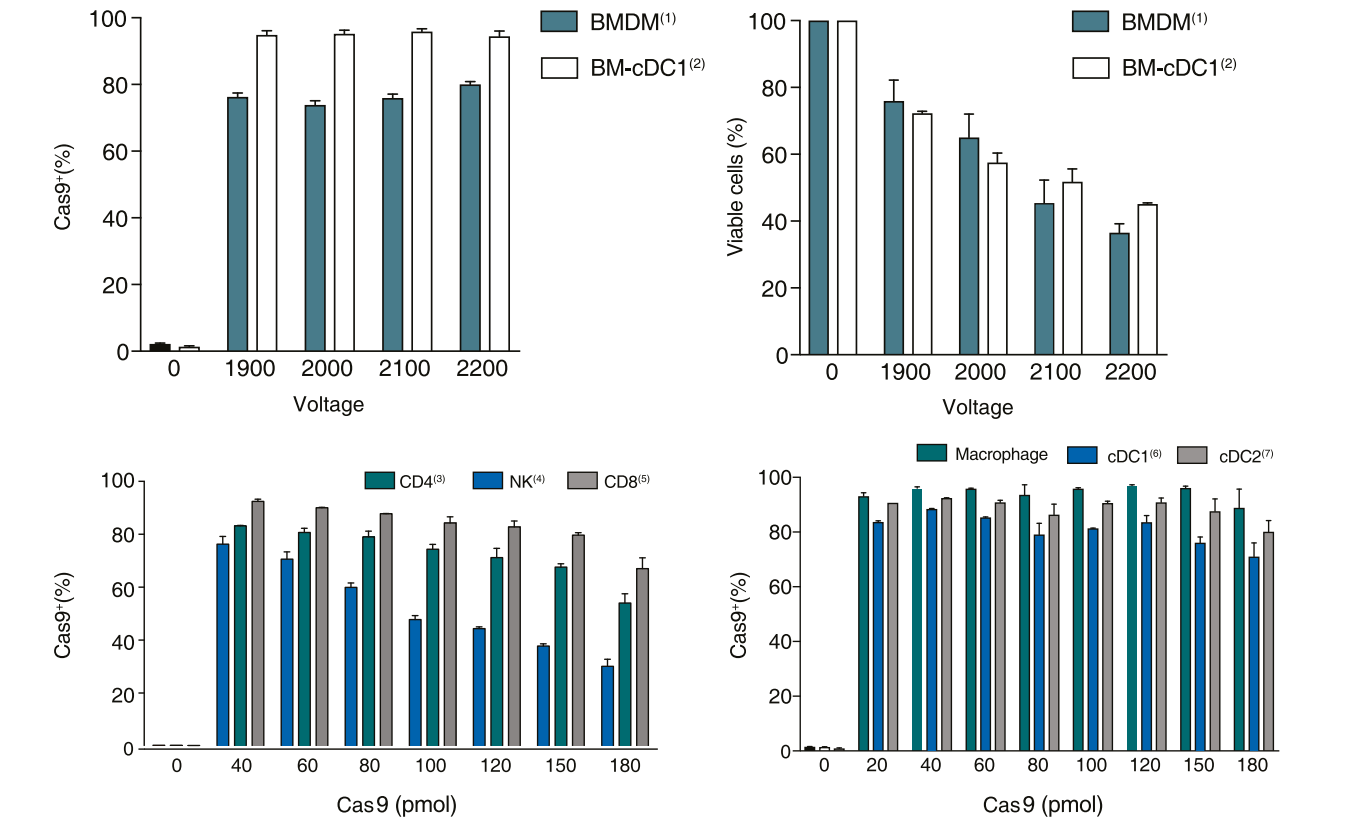
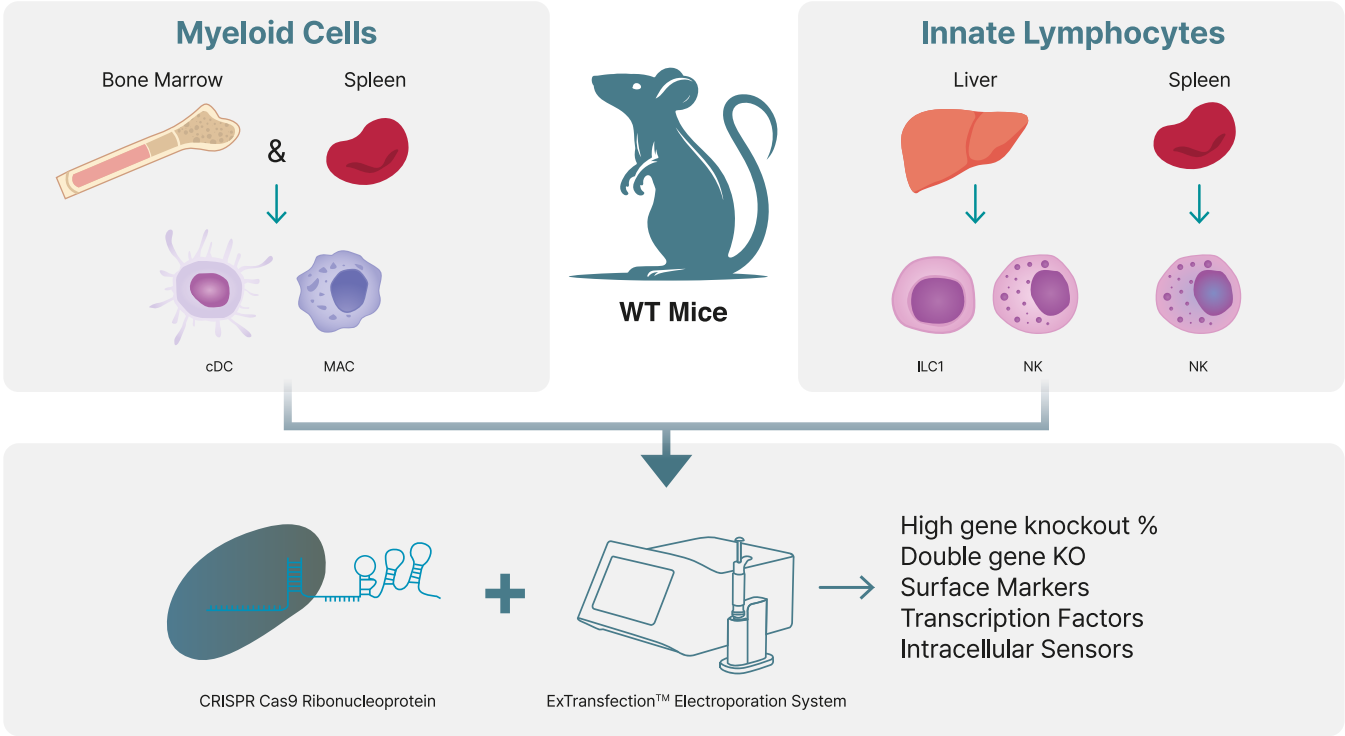
02

Facilitate precise **gene insertions and corrections** with minimal off-target effects.

03

Support large-scale screens for functional genomics.

The ExTransfection™ is a highly efficient tool for gene editing, achieving a high gene knockout percentage and enabling important analyses such as double gene knockout, surface markers, transcription factors, and intracellular sensors. Through this, it allows for precise analysis of gene functions in immune cells, making a significant contribution to immunological research and therapeutic development.



The ExTransfection™ makes it effortless to optimize Cas9 delivery efficiency in immune cells. It shows high performance and flexibility in the precise adjustment of Cas9 protein delivery based on various electrical conditions, cell types, and Cas9 concentrations.

(1) BMDM: Bone Marrow-Derived Macrophage, (2) BM-cDC1: Bone Marrow-Derived Conventional Dendritic Cell 1, (3) CD4: Helper T Cell, (4) NK: Natural Killer Cell, (5) CD8: Cytotoxic T Cell, (6) cDC1: Conventional Dendritic Cell Type 1, (7) cDC2: Conventional Dendritic Cell Type 2

|                     |                                                                                                                               |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Reaction volume     | 10 µL or 100 µL                                                                                                               |
| Cell concentrations | 1 × 10 <sup>4</sup> - 5 × 10 <sup>5</sup> cells for 10 µL tip, 5 × 10 <sup>5</sup> - 5 × 10 <sup>6</sup> cells for 100 µL tip |
| Pulse voltage       | 500 - 2,500 V                                                                                                                 |
| Pulse width         | 1 - 100 ms                                                                                                                    |
| Number of pulses    | 1 - 10                                                                                                                        |
| User interface      | 8 inch touch screen                                                                                                           |
| Electrical rating   | 100 - 240 VAC, 4.0 A, 50/60 Hz                                                                                                |
| Electrical input    | 24 VDC, 7.5 A, 180 W                                                                                                          |
| Device weight       | 6 Kg                                                                                                                          |
| Device dimensions   | 251.6 (W) x 383.4 (D) x 185.1 (H) mm                                                                                          |



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## Ordering information

| Cat. No                                       | Product                                          | Contents                               |
|-----------------------------------------------|--------------------------------------------------|----------------------------------------|
| <b>ExTransfection™ Device and accessories</b> |                                                  |                                        |
| EXT1000                                       | ExTransfection™, Electroporation System          | Main device, Pipette, Pipette Station  |
| EXT1000P                                      | ExTransfection™ Pipette                          | ExTransfection™ Pipette (1 ea)         |
| EXT1000PS                                     | ExTransfection™ Pipette Station                  | ExTransfection™ Pipette Station (1 ea) |
| <b>Consumables</b>                            |                                                  |                                        |
| EXT1025K                                      | ExTransfection™ 10 µL Kit<br>(25 × 2 reactions)  | Resuspension buffer R (1 ml)           |
|                                               |                                                  | Resuspension buffer T (1 ml)           |
|                                               |                                                  | Electrolytic buffer E (75 ml)          |
|                                               |                                                  | Disposable tip (10 µl, 25 tips)        |
|                                               |                                                  | ExTransfection™ tube (5 ea)            |
| EXT10025K                                     | ExTransfection™ 100 µL Kit<br>(25 × 2 reactions) | Resuspension buffer R (10 ml)          |
|                                               |                                                  | Resuspension buffer T (10 ml)          |
|                                               |                                                  | Electrolytic buffer E2 (75 ml)         |
|                                               |                                                  | Disposable tip (100 µl, 25 tips)       |
|                                               |                                                  | ExTransfection™ tube (5 ea)            |
| EXT1096K                                      | ExTransfection™ 10 µL Kit<br>(96 × 2 reactions)  | Resuspension buffer R (1 ml, 3 ea)     |
|                                               |                                                  | Resuspension buffer T (1 ml, 3 ea)     |
|                                               |                                                  | Electrolytic buffer E (150 ml, 2 ea)   |
|                                               |                                                  | Disposable tip (10 µl, 96 tips)        |
|                                               |                                                  | ExTransfection™ tube (20 ea)           |
| EXT10096K                                     | ExTransfection™ 100 µL Kit<br>(96 × 2 reactions) | Resuspension buffer R (30 ml)          |
|                                               |                                                  | Resuspension buffer T (30 ml)          |
|                                               |                                                  | Electrolytic buffer E2 (150 ml × 2 ea) |
|                                               |                                                  | Disposable tip (100 µl, 96 tips)       |
|                                               |                                                  | ExTransfection™ tube (20 ea)           |
| EXT50T                                        | ExTransfection™ Tube                             | ExTransfection™ tube (5 ea, 10 packs)  |



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\*Available Worldwide (except in the USA)  
FOR RESEARCH USE ONLY. Not for use in diagnostic procedures.

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