

ExTransfection[™]

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 μ L and 100 μ L
sample volumes available

Applicable with Various Cell Types

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

Superior Viability

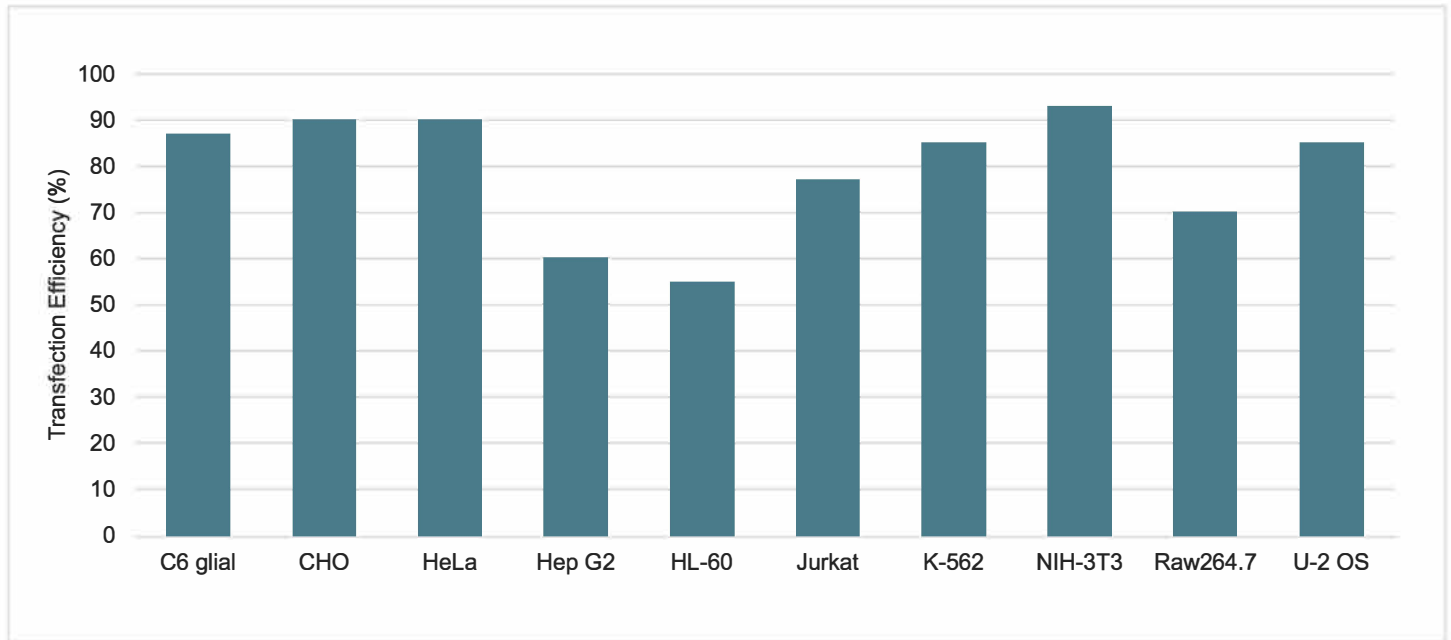
Provides higher
cell viability

MicroPoration Technology

Applications : Transfection efficiency

High Transfection Efficiency for Cell Lines

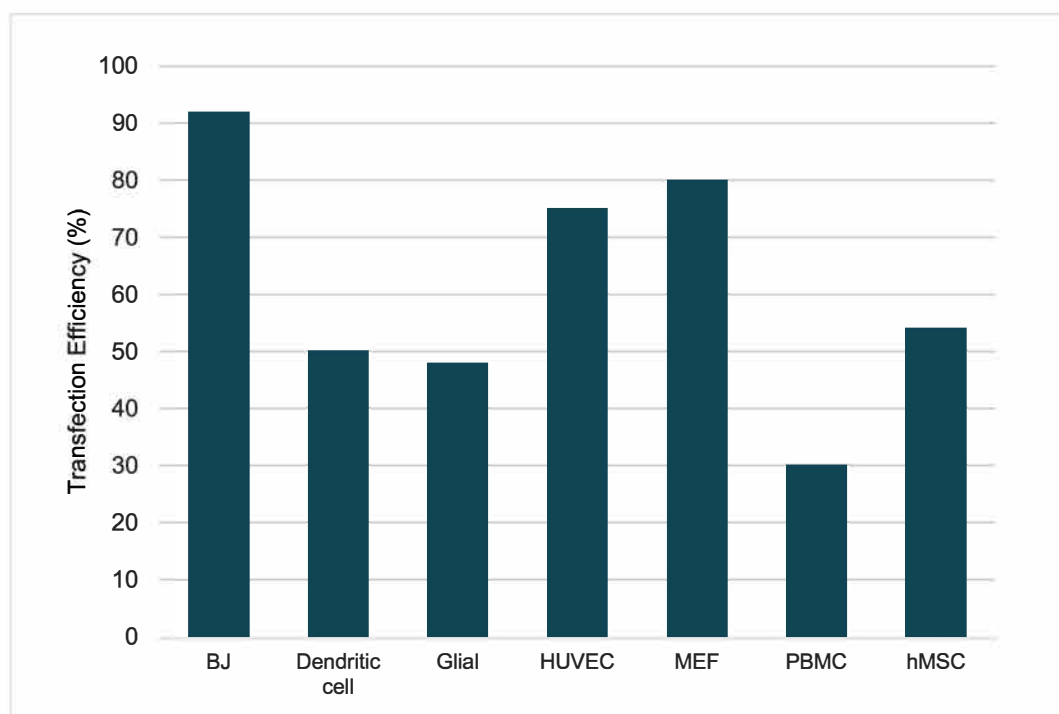
The transfection efficiency of microporation has always been reliable. Various cell lines have been extensively tested with GFP gene transfection, and their efficiencies were analyzed using fluorescence microscopy and flow cytometry.



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.

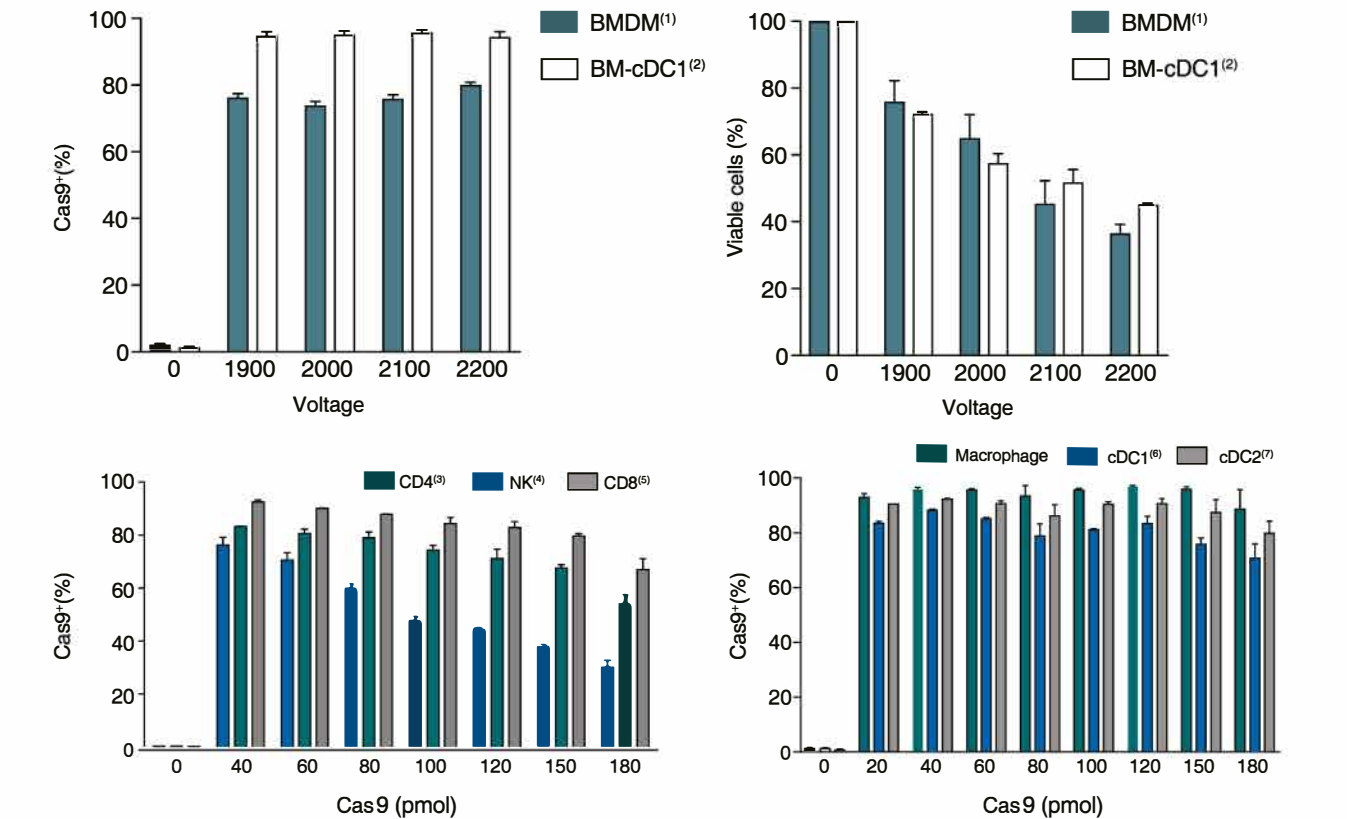
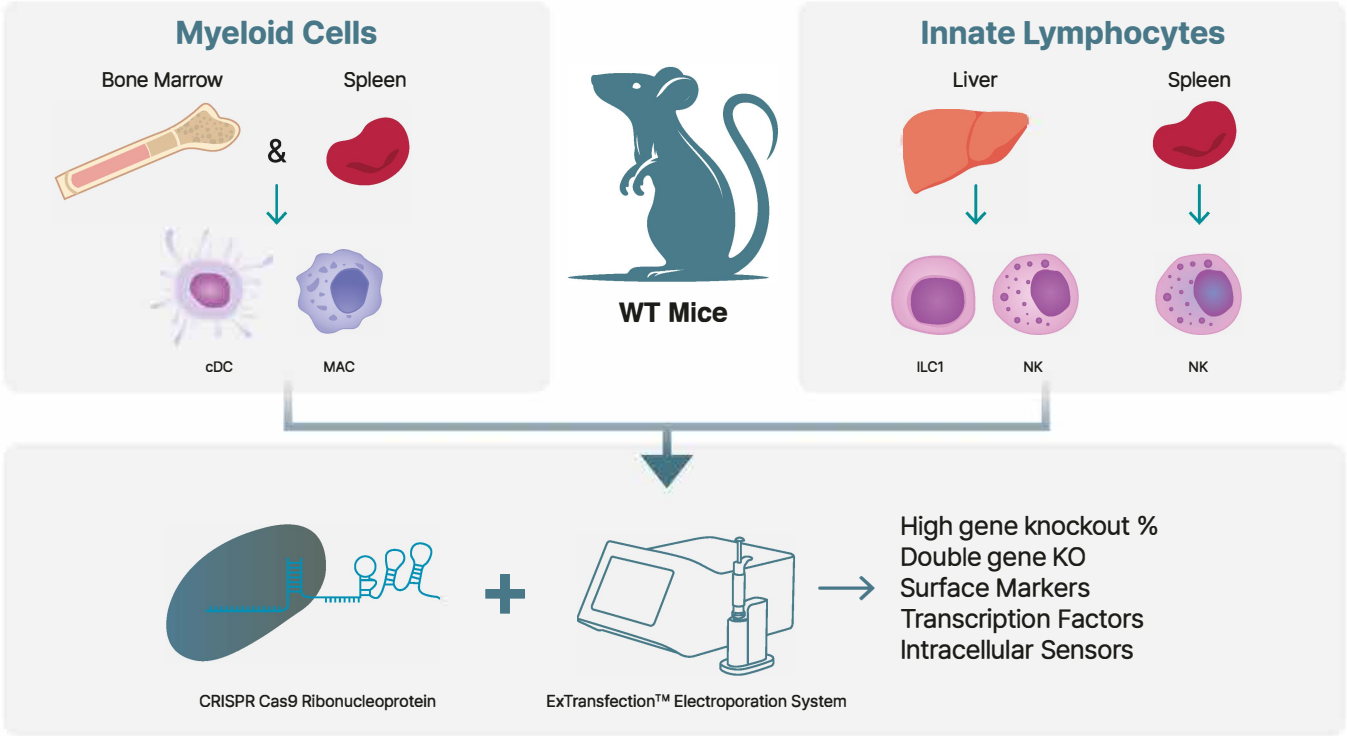
02

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

Reference:
Riggan L, Hildreth AD, Rolot M, et al. CRISPR-Cas9 Ribonucleoprotein-Mediated Genomic Editing in Mature Primary Innate Immune Cells. *Cell Rep.* (2020).

Reaction volume	10 µL or 100 µL
Cell concentrations	1×10^4 - 5×10^5 cells for 10 µL tip, 5×10^5 - 5×10^6 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



Ordering information

Cat. No	Product	Contents
ExTransfection™ Device and accessories		
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)
Consumables		
EXT1025K	ExTransfection™ 10 µL Kit (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 (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 (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 (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)

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