

CELLSHOT

Real Flow Transfection

EP Bufferless
Use your own culture media

JOIN OUR PLATFORM

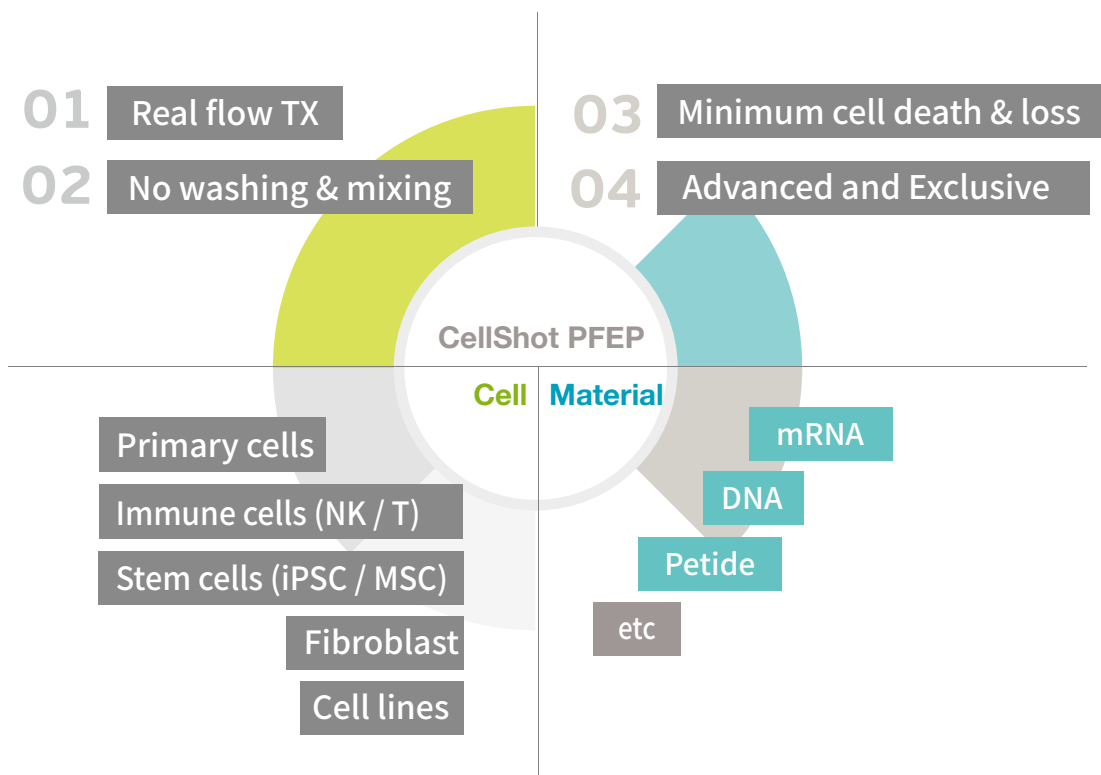
Conventional electroporation can be a labor-intensive process, requiring cells to be washed and mixed with transfection materials before the procedure.

CellShot Partitioned Flow Electroporation (PFEP) offers a more streamlined and efficient alternative. With CellShot, cells can be transfected directly in their own culture media, without the need for washing or mixing with additional materials.

The CellShot System handles all aspects of the transfection process, making it a convenient and effective solution for non-viral cell and gene therapy.



Introduction to CellShot® Technology

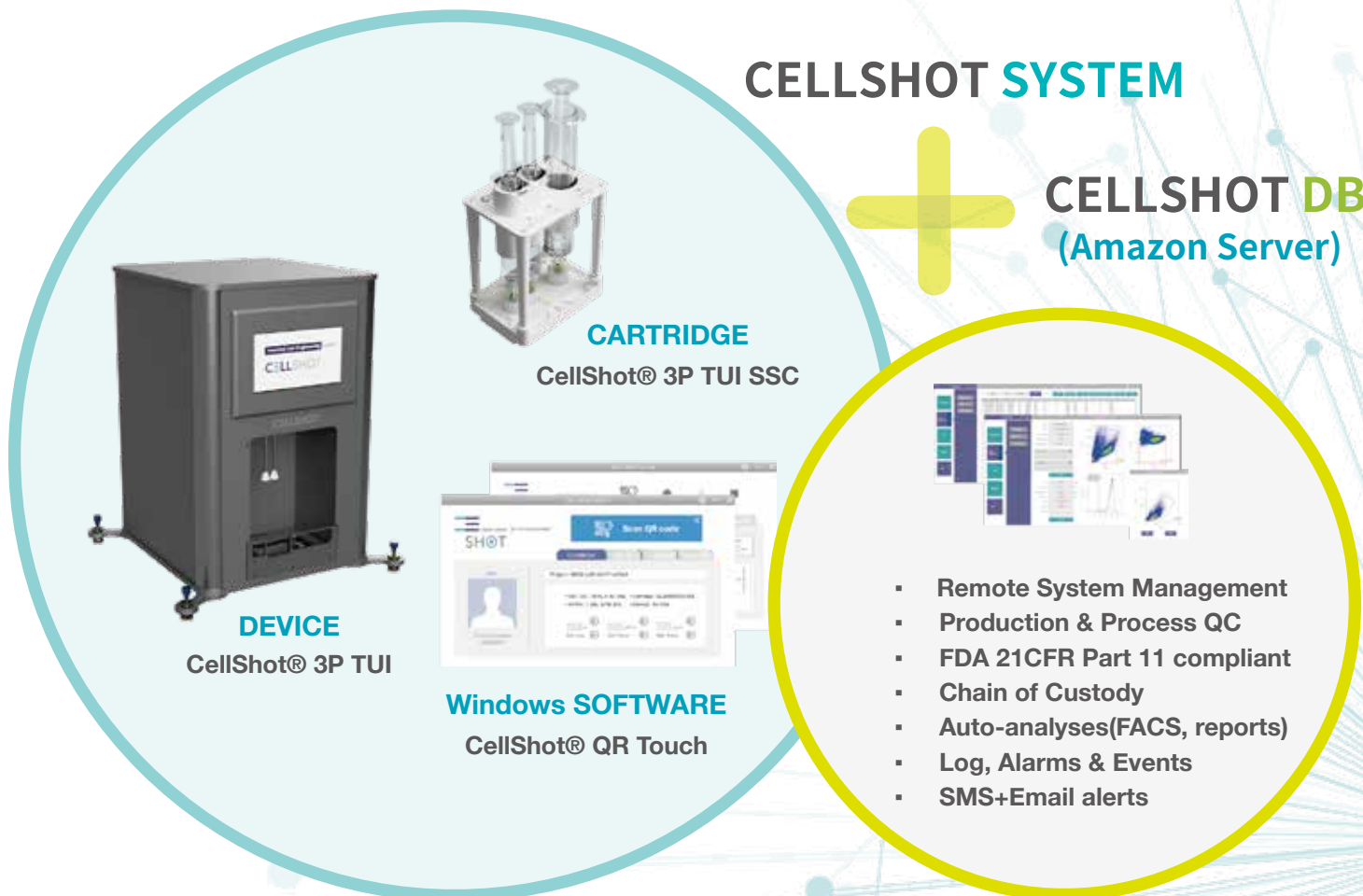


Electroporation(EP) has been widely used to transform bacteria, yeast, or plant protoplasts by introducing new coding DNA for applications to introduce foreign genes into tissue culture cells like mammalian cells. After COVID-19, mRNA applications have emerged in diverse cell therapeutics, and appropriate mRNA delivery protocols are needed, including electroporation. Because extremely fragile mRNA is challenging to deliver, appropriate EP buffers are necessary to minimize mRNA breakdown and cell damage. These EP buffers are rare, so manufacturers limit the application of EP buffers. In addition, primary cells are not recommended to be transfected in EP buffers, and the application time should be kept as short as possible.

CellShot Partitioned Flow Electroporation (PFEP) Technology removed the need for EP buffers. Hence cells in their culture media are directly plugged into the CellShot system separately from mRNA, bypassing washing or mixing steps. Removing the wash-mix process grants huge benefits by removing cell damage, cell loss, and the manual open process of centrifugation and mixing. In addition, higher transfection efficiencies can be achieved because healthier cells can take more transfection forces than damaged cells. The CellShot platform has made it possible to face difficulties no longer when transfecting primary cells. Please refer to the primary NK CAR production and GFP expression in hPBMCs in the Appendix.

The CellShot system provides the best solutions for your R&D and clinical trials in a cost-effective manner. To get a free demo of the innovative CellShot system, please get in touch with FEMTOBIOMED.

Introduction to CellShot® Platform



No washing!
No mixing!

No cell washing for EP buffer application!
Cells in any culture-media are sufficient for transfection.
Mixing of cell & material is unnecessary for transfection



Automated & Closed

After cells and materials are simply loaded separately, everything for transfection is automated in a closed way.



High Cell Viability
& Production Yield

Removed cell washing minimized cell death and loss. In addition, more materials can be transported in healthier cells, leading to much higher production yield!

CellShot® System

- ✓ Automated & closed system
- ✓ User login and QR operation
- ✓ User friendly touch GUI
- ✓ Automatic cartridge set-up
- ✓ cGMP Compliant
- ✓ CE-marked, ISO-certified
- ✓ FDA 21CFR Part 11 compliant



CellShot® 3P TUI

- ✓ Automated & closed operation
- ✓ QR & Touch input
- ✓ Windows based system
- ✓ Small scale cGMP & R&D cartridges
- ✓ Throughput: $10^6 \sim 10^8$ cells/min
- ✓ CAPA: $10^6 - 2 \times 10^8$ cells/cartridge

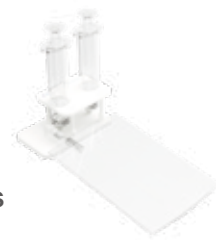


CARTRIDGE
CellShot® 3P TUI SSC



CellShot® 3P TAGA

- ✓ Automated & closed operation
- ✓ QR & Touch input
- ✓ Windows based system
- ✓ Large scale cGMP bag-type cartridges
- ✓ Throughput: $10^7 \sim 10^9$ cells/min
- ✓ CAPA: $10^8 - 5 \times 10^9$ cells/cartridge



CARTRIDGE
CellShot® 3P TAGA LSC

CELLSHOT SOFTWARE and DATABASE

For an automated transfection, we provide the CellShot Software QR Touch for Windows. QR input of user, cartridge and the TX project information removes unexpected errors. Remote management through CellShot DB powered by AWS provides accurate, convenient and qualified cell engineering.



CELLSHOT DATABASE

- ✓ Remote management of CellShot System
- ✓ Production management: cell, materials, consumables, and etc.
- ✓ Process management: transfection and related bio-works, cell-banking, temperature, humidity, purity, and etc.
- ✓ Data storage and automatic analyses of FACS data and reports
- ✓ FDA 21CFR Part 11 compliant

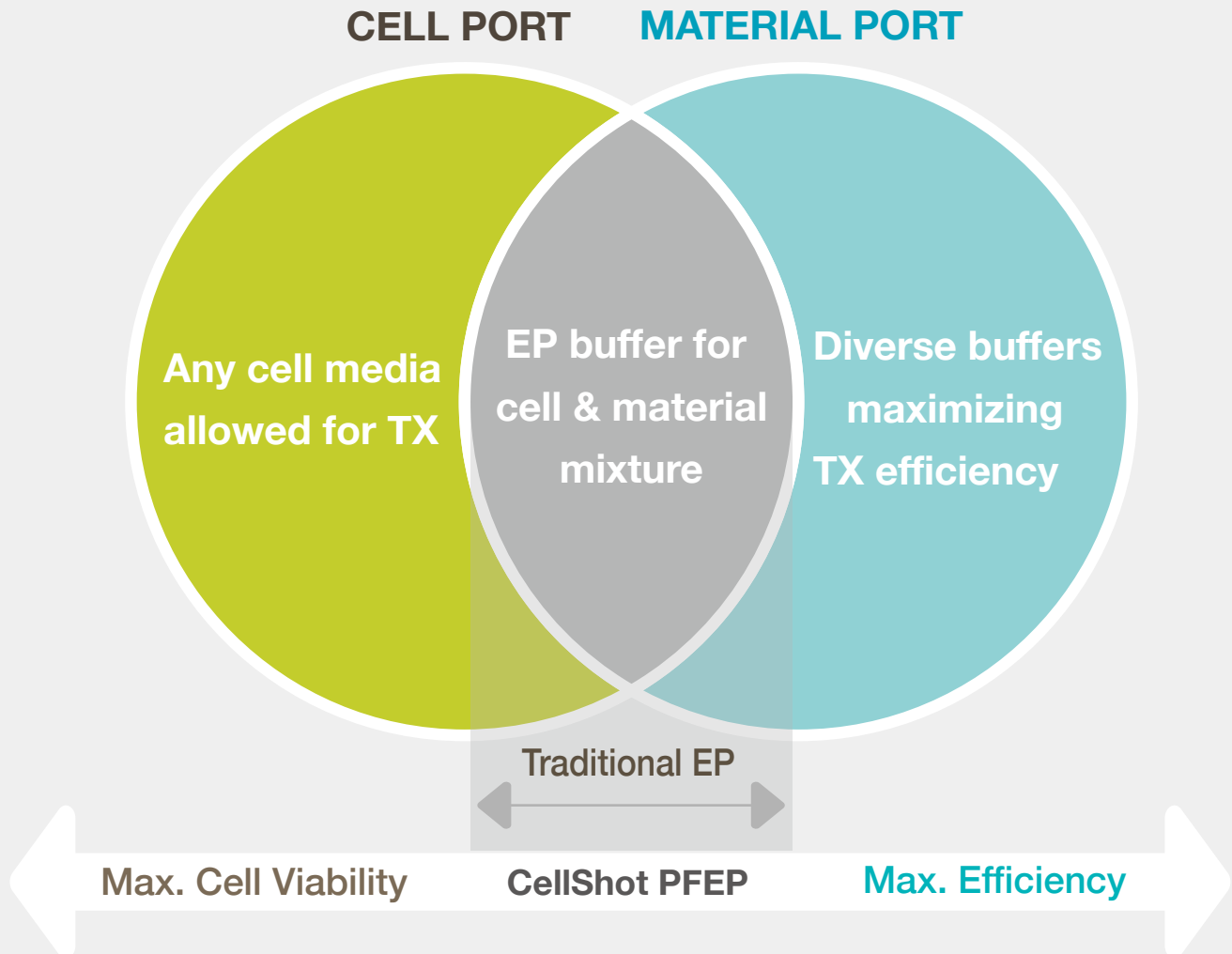


CELLSHOT SOFTWARE

- ✓ Automatic measurement of cell and material capacity
- ✓ QR input of user, cartridge, and TX project information removes uncertain input errors. FDA 21CFR Part 11 compliant
- ✓ Easy fine tuning of TX parameters with straightforward GUI
- ✓ Real time monitoring of TX procedures provides qualified operation.
- ✓ Connected data management with CellShot DB provides cGMP compatibilities.

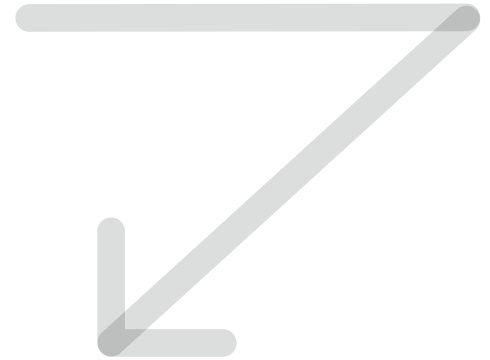
CellShot® Partitioned Flow Electroporation

CellShot PFEP is an exclusive flow EP technology that loads cells and materials separately. Cells can be loaded in any culture media, and materials can be loaded in any buffer. No cell washing is necessary, significantly improving cell viability without cell loss. Automated and closed CellShot provides a high production yield with reduced costs.

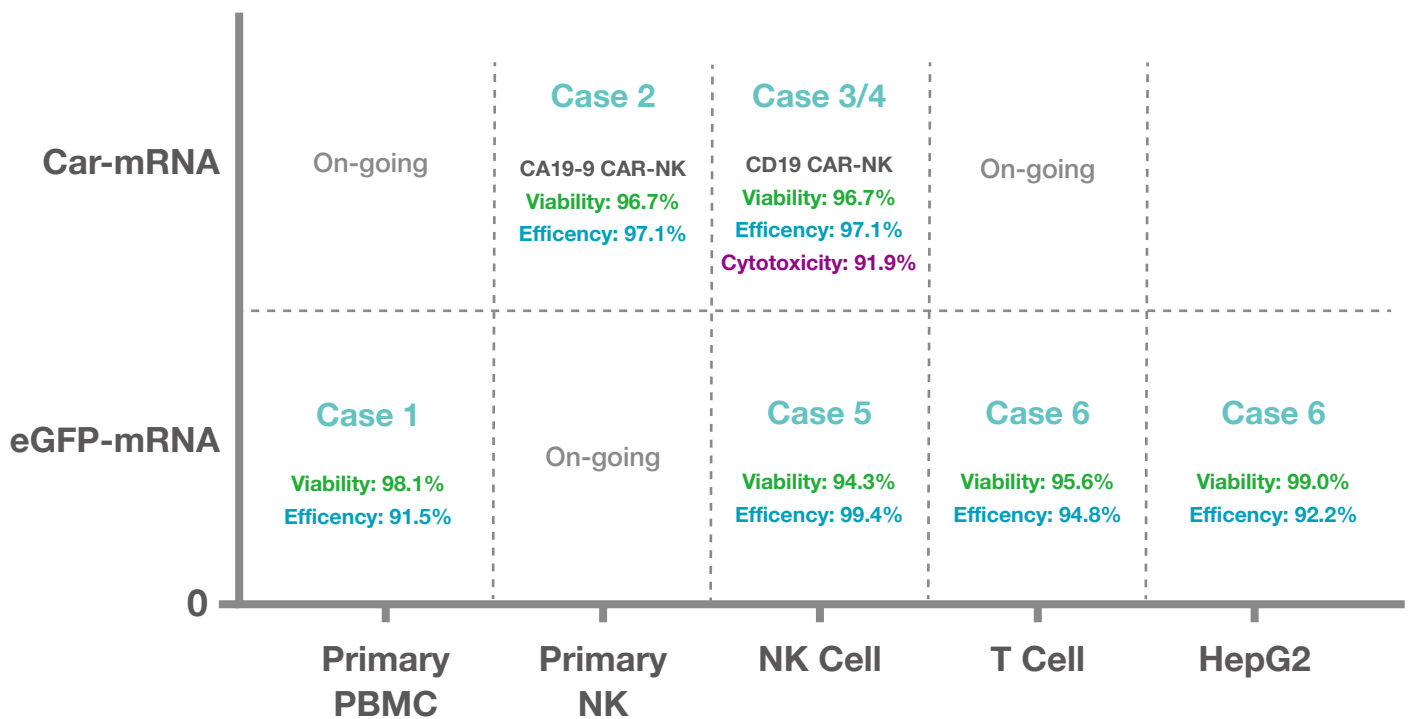


- ✓ No decrease in viability even for primary cells
- ✓ High TX efficiency of mRNAs from easy and safe handling
- ✓ High production yield from removing cell-washing
- ✓ Easy automation from an entirely closed process, suitable for cGMP

CELLSHOT Transfection Examples



CellShot® POC Domains



CELLSHOT Specifications

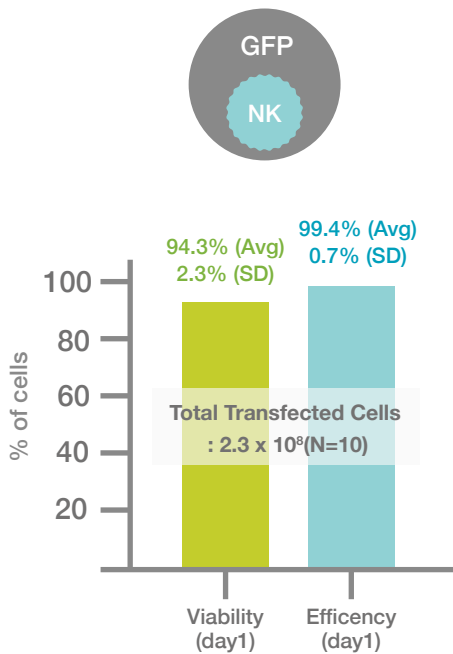
Software	Program Interface OS	CellShot (supplied) Touch screen Built-in PC Windows 10 (64 bit)
System Dimensions	Size (Width x Depth x Height) Weight	427 mm x 406 mm x 508 mm 20kg
Operating Conditions	Operating Temperature Storage Temperature Operating Humidity	10 - 35 °C 10 - 35 °C 93% Max
Power Source	Input Power Fuse Requirement	110~240 VAC, 50/60 Hz 10A Slow Blow, 250V
USB Function	USB Pors Available	1 x USB3.0
Electrical Characteristics	Pulse Voltage Range Pulse Width Range	0 - 2,000 V 10-100µs
Pump Characteristics	Modes of Operation Process Volume Performance	Flow 0.5 - 20 mL 0.1 - 2 mL / minute
PC Characteristics	OS Spec	Windows 10 (64 bit) RAM 4GB, eMMC 64GB
Touch Screen Characteristics	Screen Size Resolution Touch Type	7.0 inch 1024 x 600 (Up to 1920 x 1080) Capacitive Touch
QR Characteristics	Optical System Resolution	COMS ≥ 0.1 mm

Appendix 1.

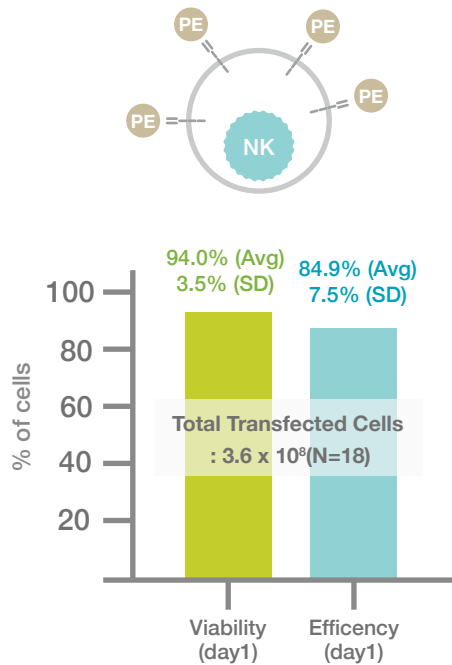
CAR-NK Production with mRNA TX

I. CD19-CAR-NK Development with mRNA transfection

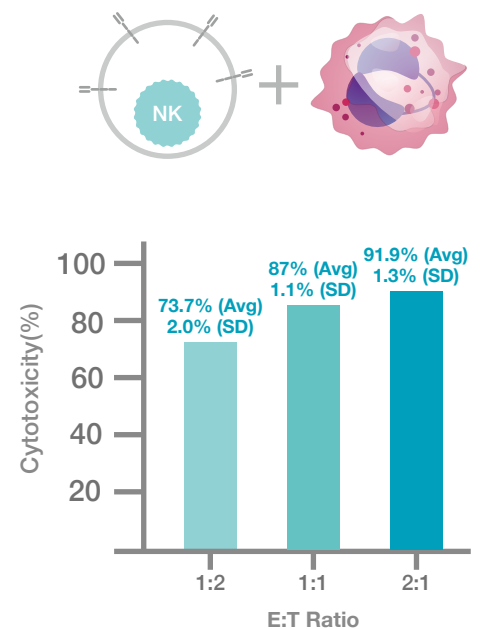
a) 99% GFP-expression in NK cells by CellShot TX



b) CD19-CAR evaluation with FMC63-PE antibody



c) Cytotoxicity evaluation with NALM6 cancer cells



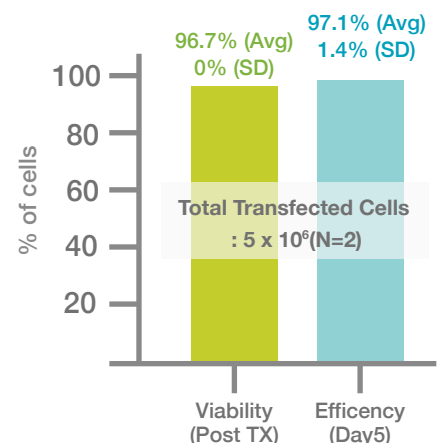
II. Primary NK-CA19-9 CAR Production by CellShot Platform

Autologous CAR-NK has been one of the most promising and challenging topics for cancer treatment in immune cell therapeutics.

Our exclusive technologies have proven that the production of primary CAR-NK cells from patients can be fast, easy, and affordable while still being highly efficient.

CellShot technologies believe that the dream of a one-day on-site cancer treatment using a patient's NK cells will soon become a reality.

Primary NK-CA19-9 CAR



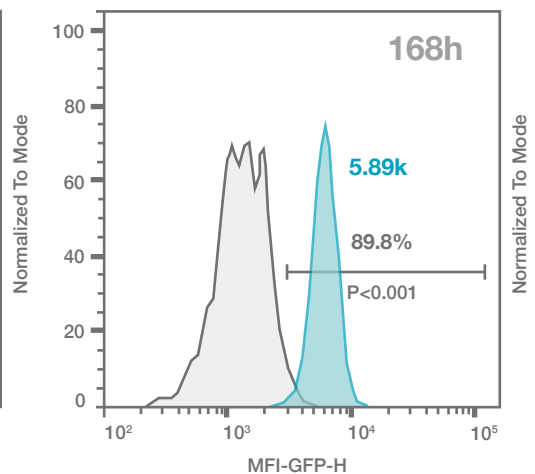
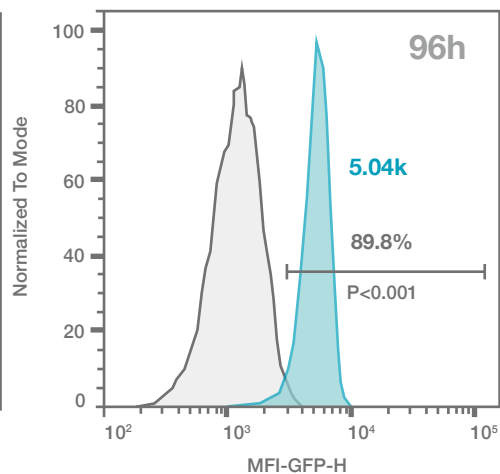
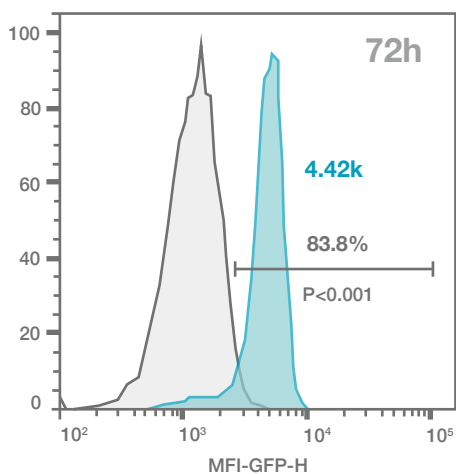
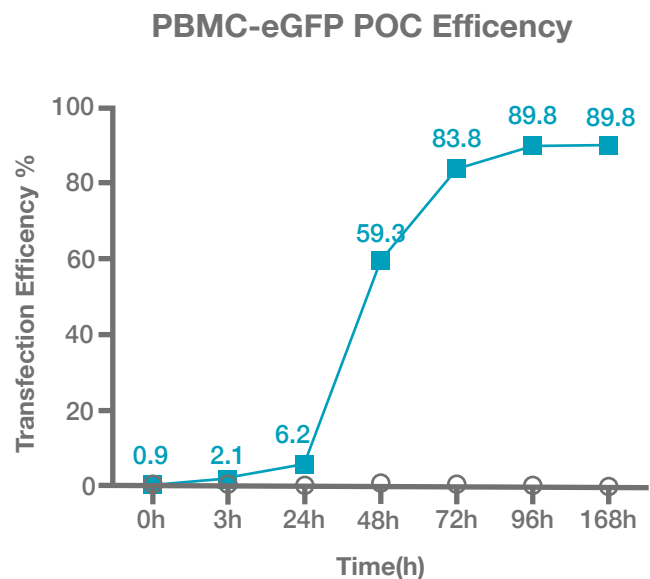
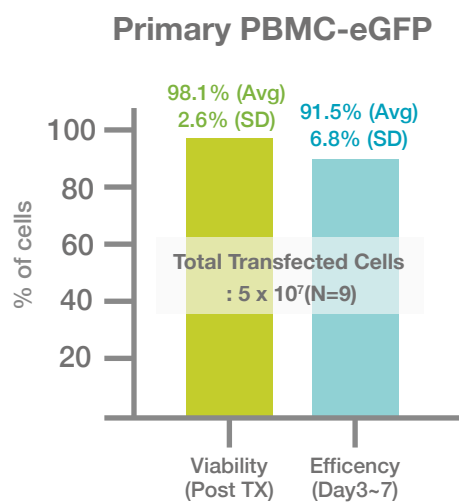
Appendix 2.

CellShot TX with Primary hPBMC (Lonza)

CellShot TX for primary hPBMC (Lonza) with mRNA-eGFP was performed.

More than 2×10^7 PBMCs were transfected, expressing green fluorescence up to 7 days after transfection. The averaged expression results show that after three days, more than 80% of the cells were GFP positive and had viability almost equal to that of the control cells.

Primary cells are generally more difficult to transfect than cell lines due to the significant viability decrease caused mainly by cell washing and EP buffer application in conventional electroporation. However, CellShot TX, not requiring cell washing and buffer exchange, can significantly improve the TX performance in terms of viability, efficiency, and yield.





(주)펨토바이오메드

Tell. (+82) 031. 622. 8501

Fax. (+81) 031. 622. 8509



letstalk@femtobiomed.com

■ **R&D / Main office**

17, Pangyo-ro 228beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea

■ **Manufacturing plant**

700, Pangyo-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, Republic of Korea

www.femtobiomed.com