

X-Porator M1

Flow Electroporation System



Designed for cell therapy process development and manufacture
GMP compliant, continuous flow large-volume electroporation system



The Etta X-Porator M1 Electroporation system provide an entire nonviral electroporation delivery solution. Rely on the superior performance of the patented continuous flow electroporation technology, the system enables effective and large-scale delivery of DNA, RNA and Protein up to 10^{10} cells in a 100mL run to genetically engineer immune cells and stem cells. This nonviral deliver system offers reliably high transfection performance in volumes of 3-100mL with exceptional cell viability and recovery, simplifies cell therapy process workflow and advances the next-generation cell therapies from concept to clinical trials and manufacture.

Key Features

Designed for cell therapy

Focus on the next-generation cell therapies, advance nonviral cell therapies from concept to clinical trials and manufacture

Continuous flow electroporation technology

Up to 10^{10} cells in a 100mL run in less than 30 minutes

Flexible, adjustable electroporation parameters

Full control over electroporation parameters for optimal performance about different cell types and biomolecules

GMP compliant system

Closed, integrated design, better sealing feature, resistant to disinfection and sterilization

Barcode Reader- minimize manual information entry to improve overall traceability

Provide IQ, OQ and PQ support

Closed, GMP compliant consumables

USP Class VI medical grade materials

PVC tube, suitable for sterile tubing welder

Provide luer connector and robert clamp

100mL liquid bottle, better recovery rate

Disposable sterile package

Passed 6 biosafety third-party verifications

Compliant enhanced software

21 CFR Part 11 enabled software

FDA Master file supported

Provide additional regulatory compliant functionality and intuitive ease of use



Applications

- Nonviral cell therapy products development and manufacture: CAR-T, TCR-T, CAR-NK, UCAR-T, DC-based vaccines
- Primary cells and cell lines gene editing: CRISPR/Cas9, Transposon
- Stem cells: iPSCs gene editing



Scale up translation



Step 1: X-Porator H1 small-volume optimization

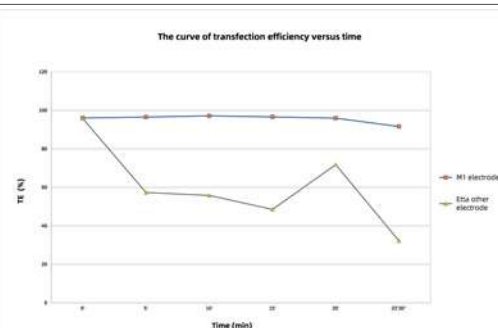
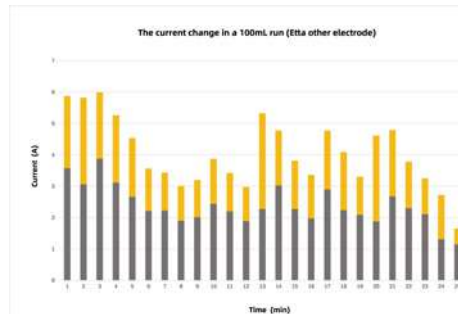
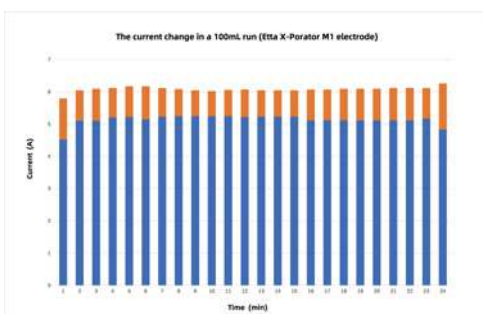
1. Enable transfection in volume of 100-300 μ L, up to 3.0×10^7 cells
2. Titanium platinum alloy cuvette, reusable
3. Lower voltage electroporation, adjustable parameters
4. Wireless remote control, keep cells in hood all the process
5. Optimized electroporation voltage, width, interval, and the number of pulses by small-volume test

Step 2: X-Porator M1 scale up test

1. Enable transfection in volume of 3-100mL, up to 10^{10} cells
2. Proprietary patented continuous flow technology
3. GMP compliant, closed 100mL consumables
4. Compliant enhanced software
5. Better consistency of scale up electroporation results:
based on H1 optimized parameters, test width gradient to
get the large-scale electroporation parameters

► Performance Verification

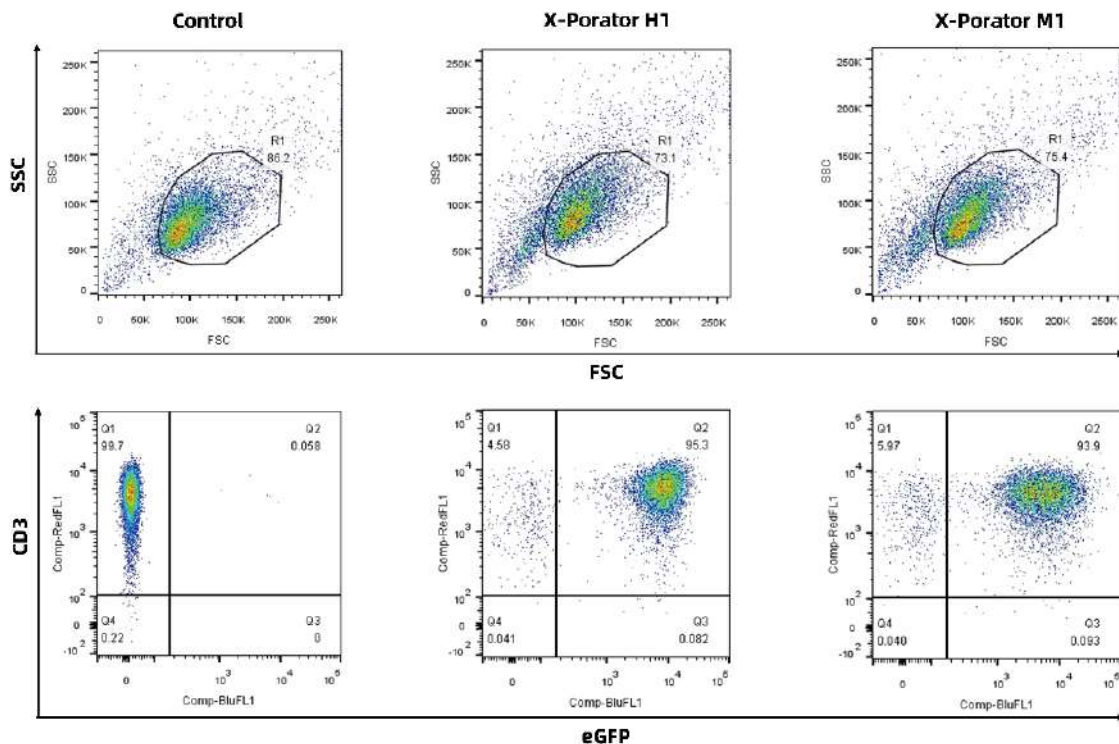
Verify the system physical performance by using fluorescein: the current signal is highly consistent and sensitive.



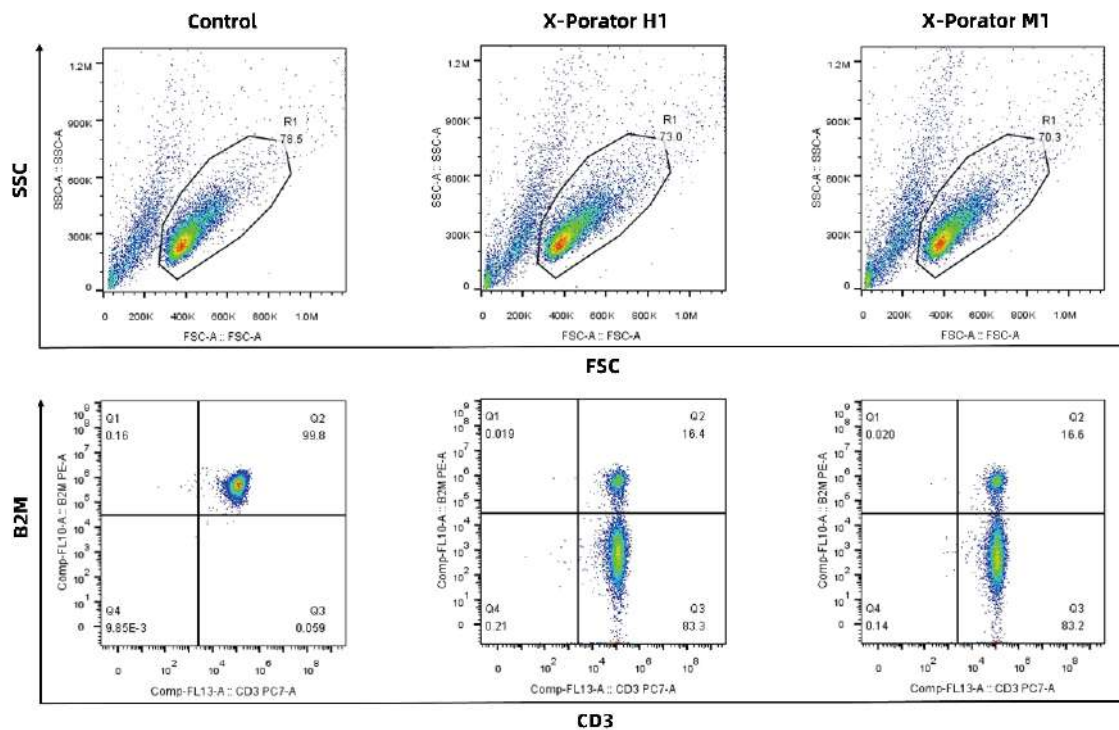
X-Porator M1 electrode advantages

1. Compared to other electrode, the electrode of X-Porator M1 system output more steady current.
2. The transfection efficiency is highly consistent with the steadiness of current during electroporation. Etta X-Porator M1 system has more stable transfection efficiency.

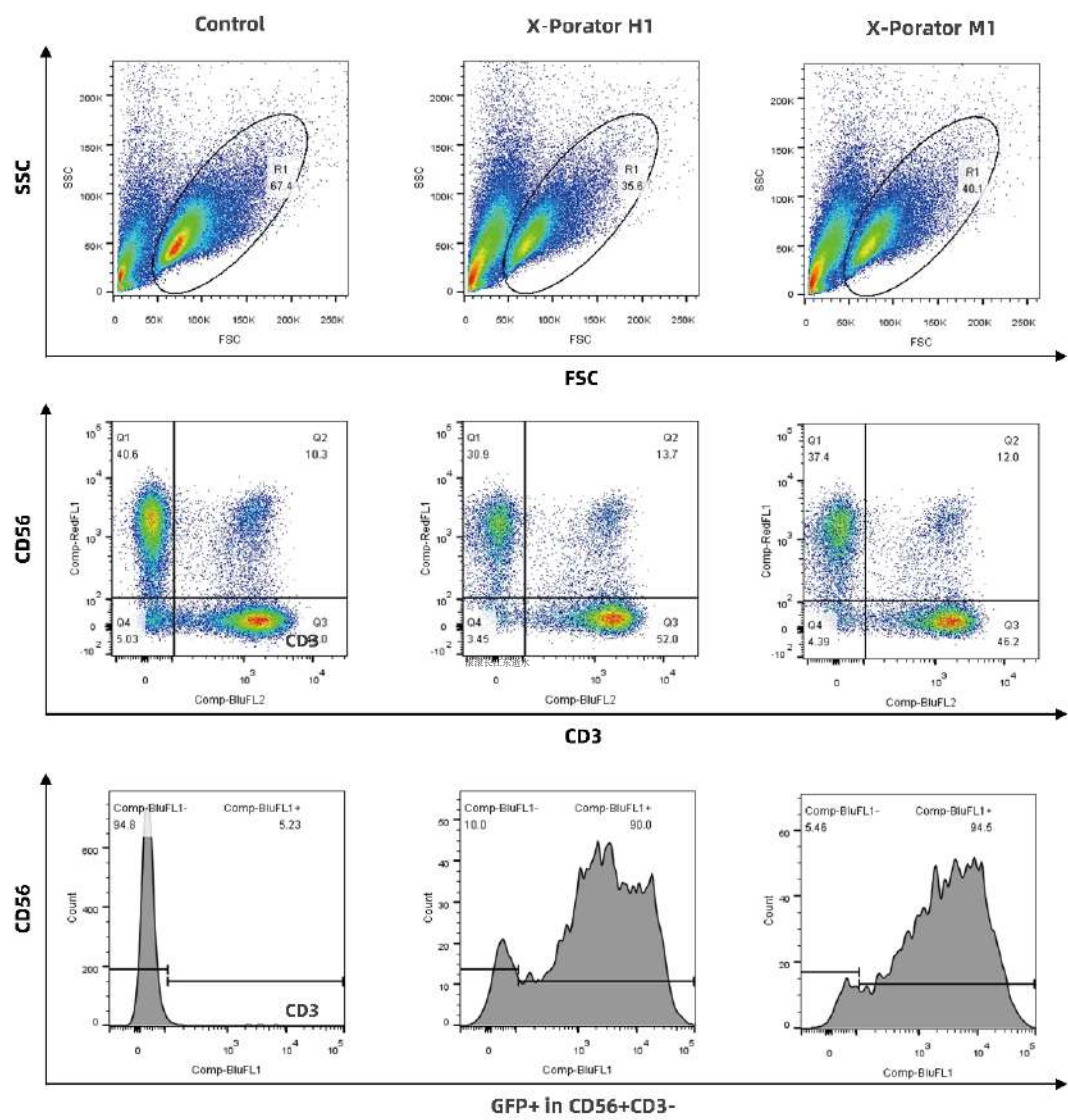
1. Electroporation activated T cells with IVT-eGFP mRNA, the GFP positive rate of Etta H1 and M1 system is 95.3% and 93.9% respectively.



2. Electroporation activated T cells with RNP to knock out B2M, the knock out percentage of Etta H1 and M1 system is 83.3% and 83.2% respectively.



3. Electroporation activated NK cells with IVT-eGFP mRNA, the GFP positive rate of Etta H1 and M1 system is 90.0% and 94.5% respectively.



4. Verified electroporation protocols for various cell types

Cell Type	Protocol	Efficiency(eGFP)	Viability	User verified
T	200V/220V*****	>90%	>80%	Y
PBMC	300V/330V*****	>90%	>70%	Y
TIL	200V*****	>90%	>80%	Y
NK	150V/130V*****	>95%	>60%	Y
DC	180V/200V*****	>80%	>70%	Y
MSC	120V/150V*****	>90%	>70%	Y
HSC	150V/180V*****	>75%	>50%	Y



▼ Item	▼ Specification
Model	EBXP-M1
Cell Types	Immune cells, Stem cells
Process Volumes	3-100mL
Cell Number per Treatment	6.0×10^7 - 1.0×10^{10}
Consumable	Closed, GMP compliant sterile consumables
Mode of Operation	Continuous flow
Flow Rate	1-20mL/min
Waveform	Square wave
Pulse Voltage	60-600V
Number of Pulses	1-99
Input Voltage	110-240 VAC
Operation Software	Enhanced Software, Support 21 CFR Part 11 compliance, Include three-tier client rights management
Dimensions	W 530mm×D 470mm×H 560mm
Weight	35kg

▶ About Etta Biotech

Etta Biotech

Etta Biotech is a professional electroporator manufacturer located in Suzhou, China. It was funded by 12 experts in multiple fields, including 6 PhD, 2 national experts and 4 top university professors. Etta Biotech possesses intellectual property in electroporation technology consisting of 28 invention patents, 26 utility model patents and 3 PCT, 4 of which are US and EP patents.

Etta Biotech is the leading manufacturer of high efficiency electroporator in China, and dedicates to the development of electroporation technology to provide effective cell transfection solutions. The flow electroporator X-Porator F1 that Etta Biotech launched in Oct. 2018, enables electroporation of up to 1×10^{10} cells in one treatment to support both cell immunotherapy development and large-scale transient expression of therapeutic proteins. In the 2nd half of 2022, Etta Biotech launched another flow electroporator X-Porator M1, specifically for cell immunotherapeutic applications as its contribution to driving the next-generation cell immunotherapies from concept to clinical trials and treatment.

Suzhou Etta Biotech Co., Ltd.

-  **Tel:** +86-(0)512-62991988
-  **E-mail:** info@ettabiotech.com
-  **Website:** www.ettabiotech.com
-  **Add:** 2#501, 200 Xingpu Rd., Suzhou Industrial Park, Suzhou, 215126, China