MaxCyte®

MaxCyte® GT™

FLOW TRANSFECTION SYSTEM

Simple, Safe, Scalable.
Enhances Product Potency. Enables Clinical Delivery.

ANY CELL. ANY MOLECULE. ANY SCALE.™

MaxCyte® GT™

FLOW TRANSFECTION SYSTEM

Now Available to Academic & Clinical Investigators

- CE marked platform for automated, robust, rapid, scalable, cGMP-compliant closed processing for Cell Therapy Development.
- Obtain high viability and recovery of cells with augmented biological activity for development of more effective cellular therapeutics.
- Accelerate pre-clinical development and product evaluations in clinical trials by cross-referencing MaxCyte's FDA Master File.

MaxCyte GT Advantages

Simple: Ease and flexibility of use.

High Yield: >90% viability & recovery.

High Efficiency: >90% loading & transfection efficiency.

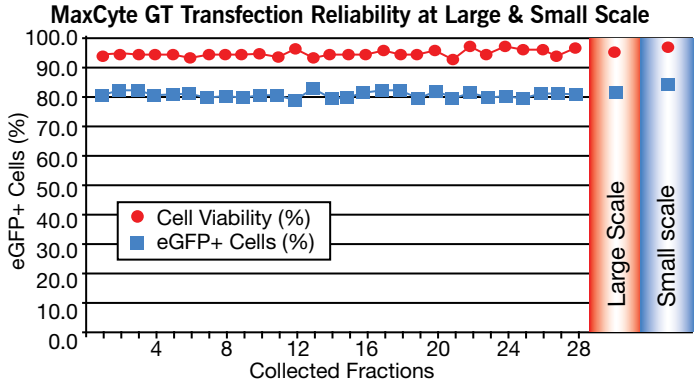
Safe: Chemically defined media (no added "biologicals").

Rugged: Reproducible processing.

Scalable: ~5 x 10^5 (~sec) to 2 x 10^{11} cells (30 min).

Quality: cGMP compliant, sterile closed system.

Regulatory: Master File on record with FDA, CE marked.

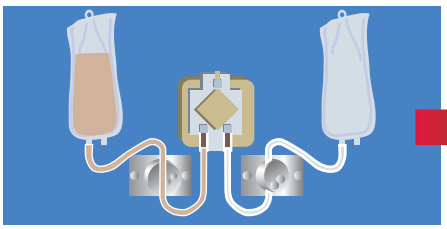


MaxCyte technology was used to transfect K562 cells with pCMV-eGFP, illustrating its utility for loading suspension cells in large volumes (6 x 10^9 cells in 100 mL). Processed cells were collected every 3 to 4 mL. Cells from each fraction of the entire pool were analyzed by FACS at 48 hours post-transfection for their viability● (PI exclusion) or efficiency■ (GFP+), which were compared to samples from standard static (400 µl) transfection.

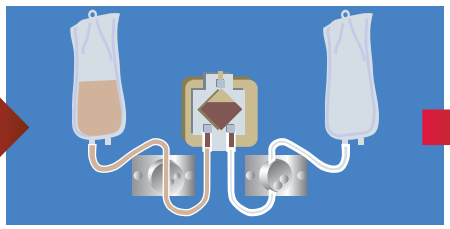
How the MaxCyte GT Flow Transfection System Works

To modify cells for *ex vivo* cell therapy, the MaxCyte GT uses simple, automated, computer controlled protocols to transfect up to 1 x 10^{10} cells within 15-20 minutes.

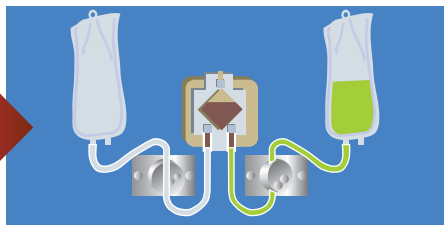
The system is pre-configured with protocols optimized for specific cell type and application(1). Manufacturing uses sterile, single-use, closed-system processing assemblies(2).



1. To begin, cells harvested from a patient or donor and the molecules to be transfected are suspended in up to 100 ml of MaxCyte electroporation buffer and transferred to the cell bag in the single-use disposable processing assembly on the instrument.



2. An operator simply selects the desired electroporation protocol, clicks the start button, and cells from the loading bag will flow gently into the GT electroporation chamber, where precisely optimized electrical pulses load the molecules into the cells.

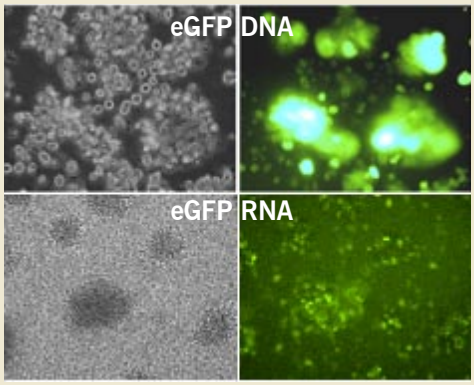


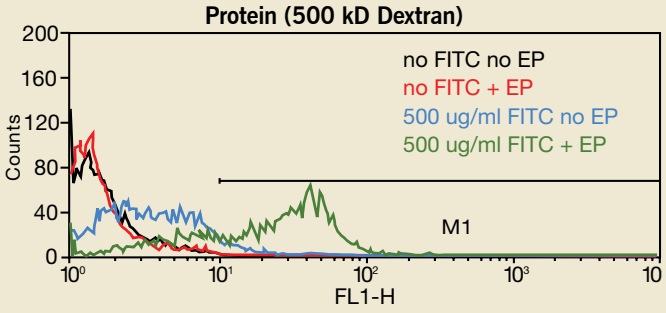
3. Loaded cells emerging from the chamber flow into a collection bag. Transfection is now complete, and the cells, undamaged and unstressed, are ready for final processing for cell therapy or cryopreservation.

Example Cell Therapy Applications

MaxCyte GT Flow Transfection System facilitates loading of multiple molecules (DNA, mRNA, siRNA, proteins, small molecules) into autologous or allogenic immune, stem/progenitor or somatic cells to enable transient engineering of product potency. The system provides a safe, robust, scalable close process for rapid, automated, regulatory Master File supported clinical manufacture and delivery of "enhanced" cellular therapeutics.

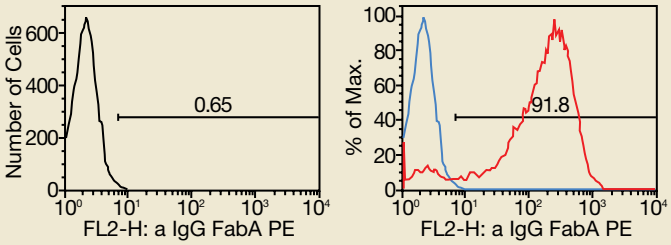
1: Tumor Antigens Loaded into Dendritic Cells

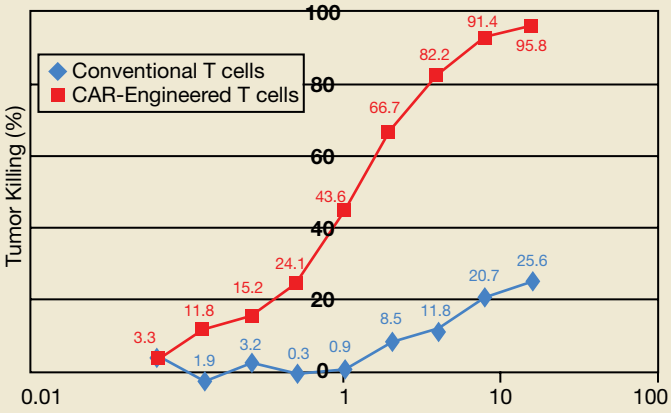




Electroporation by itself does not lead to any appreciable loss in dendritic cell viability, phenotype or T cell activation function[3,4]. MaxCyte GT loading with DNA, mRNA or protein (including tumor lysate) antigens results in increased antigen uptake compared to co-incubation control. The amount of antigen loading can be controlled to deliver optimal concentration of processed antigen-peptide complex presentation in functionally mature DC resulting in enhanced T cell activation and anti-tumor efficacy[5].

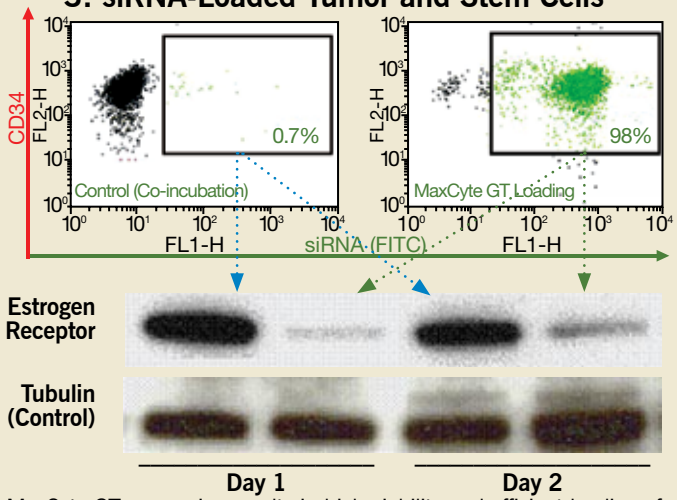
2: mRNA-Engineered T Cells





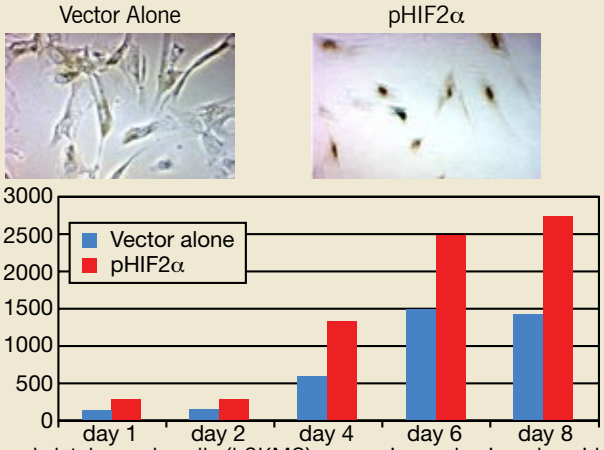
T cells can be effectively loaded with DNA or mRNA encoding chimeric antigen receptor (CAR)[6] or other molecules[7,8]. High viability and efficiency of CAR molecules is observed over multiple days following mRNA loading. CAR-engineered T cells exhibit enhanced anti-tumor activity and redirect cytolytic response toward tumor cells expressing antigens encoded by the CAR molecule.

3: siRNA-Loaded Tumor and Stem Cells



MaxCyte GT processing results in high viability and efficient loading of siRNA into cells. Loading of siRNA results in effective gene product knock down. Level & Duration of gene product knock down can be engineered to set-point. Biological effect of siRNA delivery is specific (on-target), robust, and scalable. Non-specific off-target effects (observed with other chemical transfection approaches) are not detected.

4: Engineered Primary Somatic Cells



Human skeletal muscle cells (hSKMC) are engineered using plasmid DNA to transiently over-express HIF-2α, an early transcription initiation factor in angiogenesis pathway. Loaded cells exhibit high viability and robust expression of HIF-2α protein. Engineered cells exhibit enhanced levels of secretion of Vascular Endothelial Growth Factor (VEGF), an essential bio-trophic factor responsible for enhancing angiogeneic activity of hSKMC for cardiac regenerative therapies.

Buy or Lease the MaxCyte GT Flow Transfection System

The MaxCyte GT Flow Transfection System is available to academic and clinical investigators for pre-clinical research and non-commercial clinical trial use.

References

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Find out how the MaxCyte GT Flow Transfection System can accelerate your cell therapy program by contacting MaxCyte at:

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2009.04