CDMO partnerships vs in-house manufacturing in advanced therapies

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Advanced Therapies Week
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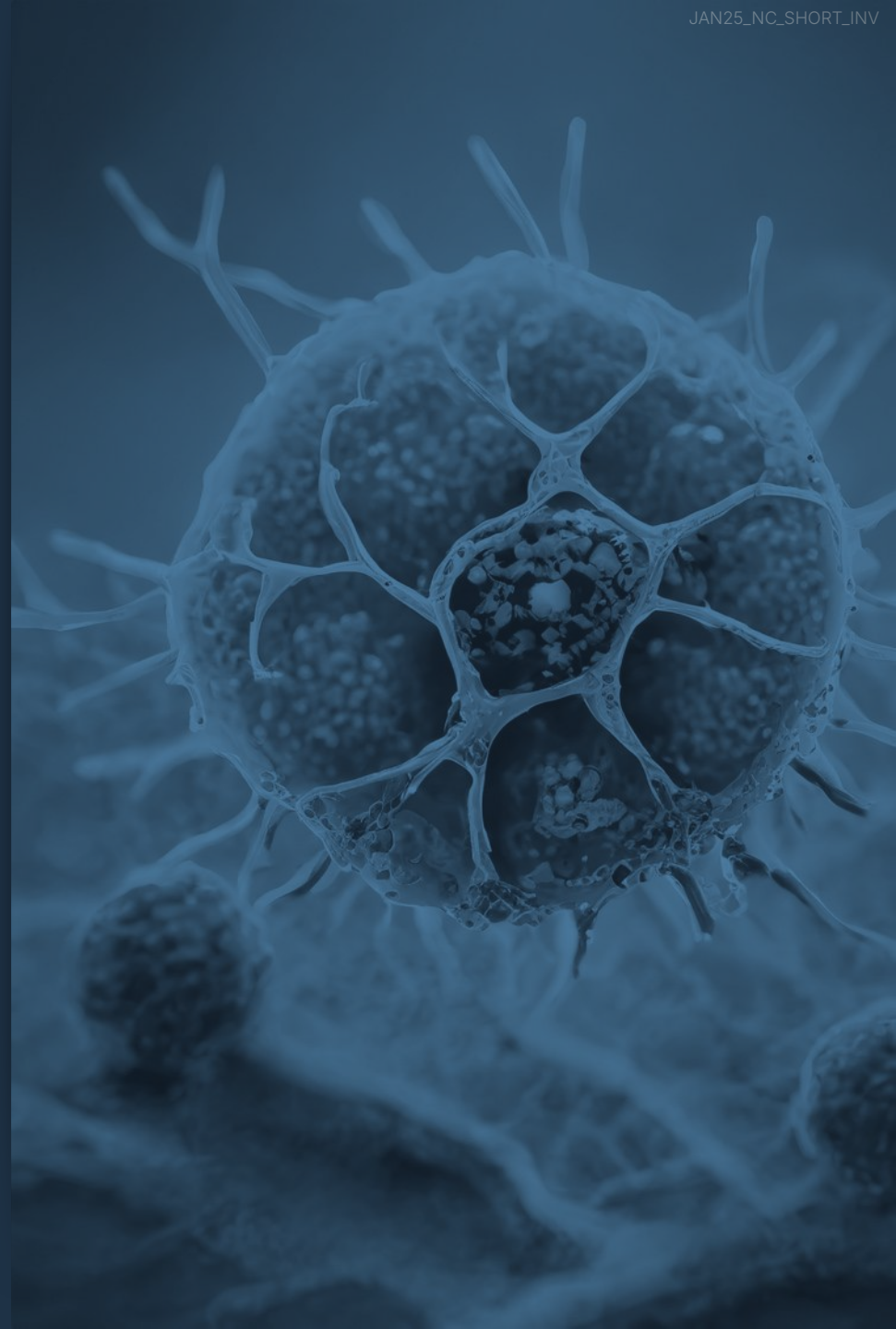


About Tr1X

- **Clinical-Stage first in class allogeneic Tr1 Treg / CAR-Treg cell therapies** - unlike FOXP3 Treg and CAR-T cells, inhibit autoreactive T and B cells and inflammation with homing and immune reset capabilities without requiring standard lymphodepletion

- **Lead clinical-stage program:** TRX103: Ph1 Tr1 allogeneic Tr1 Treg, 2026 data readouts in HSCT/ GVHD prevention, refractory Crohn's disease and Noninfectious Uveitis

- **Second IND-stage program**: TRX319: allogeneic CD19 CAR-Tr1 Treg in Progressive MS, 2026 data readouts

- **Reproducible clinical grade manufacturing** process yields tens of billions of highly pure allogeneic cells per run at commercial COGS

- **Capital efficiency –** Series A + non dilutive grant funding yields clinical PoC in two indications, recent Series B will fund Phase 2a readouts

Value Proposition

Multiple products targeting large unmet need indications. Potential for safer, more durable efficacy/cure, lymphodepletion free-administration at low COGs.

>50M people

in G7 suffer from autoimmune and inflammatory diseases

>$80Bn Markets

for both T and B-cell mediated I&I diseases

$125M+

Raised to date from leading investors

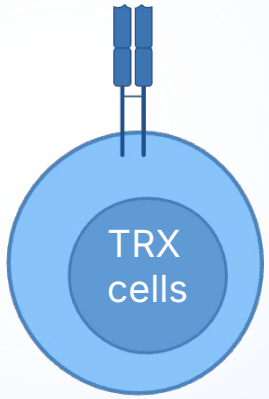
THE COLUMN GROUP · NEVA SGR · ALEXANDRIA Venture Investments

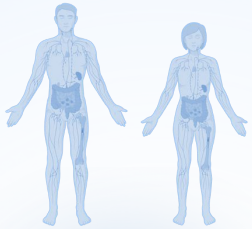
2026

Multiple Clinical Readouts; near-term catalysts

Our Therapies Are Designed To Cure I&I Diseases At Scale

Tr1X's Cells, Based On Tr1 Treg Biology, Safely Target Multiple Pathways for Immune Reset

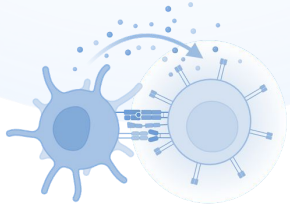




Migrate to sites of inflammation & draining lymph nodes, while evading immune clearance

Rapidly dampen inflammation
(IL1-β, TNF-α, IL-6)

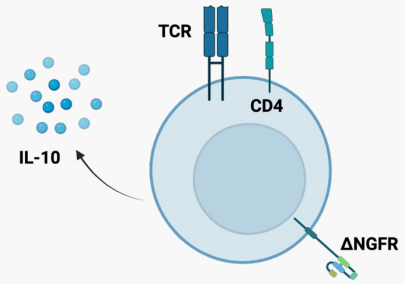
Reduce proliferation of pathogenic T cells
(CD4⁺ & CD8⁺)



Induce long term tolerance and immune reset
(production of de-novo Tregs via positive feedback loop)

Two Differentiated Allogeneic Tr1 Treg & Tr1 CAR-Treg Products Specifically Engineered to Address T & B-cell Driven Autoimmune Diseases

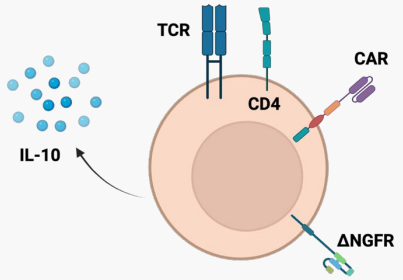
TRX103 Allo Tr1 Treg: T-cell-mediated I&I



Differentiation

- High IL-10 secretion/immune tolerance
- Lymphodepletion free/light conditioning
- No Ag-specificity requirement, chemokine homing
- Outpatient dosing

TRX319 Allo Tr1 CAR Treg: B + T-cell-mediated I&I



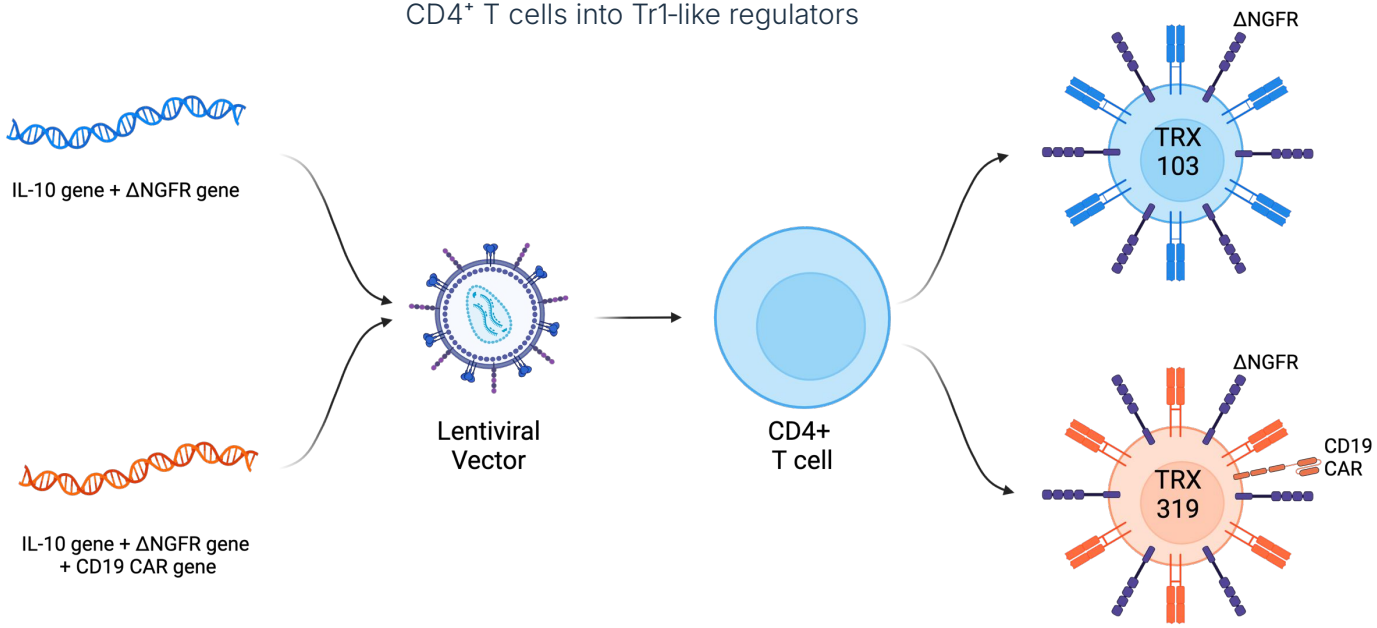
Differentiation

- B-cell depletion AND T-cell suppression
- Lymphodepletion free/light conditioning
- Reduced risk of CRS and ICANS
- Allogeneic, scalable

Tr1X's Proprietary First-in-Kind Allogeneic Engineered "TRX" Cells
Reproduce Biology & Function of Natural Tr1 Treg Cells with Improved Manufacturability

TRX Cell Characteristics	
✔ "Off the shelf"	• Generated from CD4⁺ cells isolated from healthy donors
✔ Tr1 Treg properties	• Shielded / low immunogenicity • Anti-inflammatory • Suppress CD4 and CD8 T cells • Induce new Tr1 and FOXP3 Tregs
✔ Highly pure & detectable	• Non-signaling ΔNGFR enables >95% Tr1 cell product purity
✔ Modular (specificity)	• Option to add in antigen targeting via CAR for B cell depletion
✔ Low COGS	• Billions of cells per run, estimated $10-40k per dose COGS

LVV platform + Tr1X's manufacturing process reprograms third party donor CD4⁺ T cells into Tr1-like regulators



TRX cells overcome multiple limitations through manufacturing of highly pure, stable tolerance-inducing products: current clinical grade runs produce 8-12B cells, commercial-scale COGS per dose.

Tr1X Pipeline: Multiple Assets for High Value I&I Indications

Strategy: Land and Expand in Refractory Subpopulations of Large Indications Before Moving Upstream

Product	Indication	Research	Lead Selection	IND Enabling	Phase 1/2a
TRX103 allo, polyclonal, off the shelf, Ag-specificity not required	Refractory Crohn's Disease *(Go to market indication)*	DOSE ESCALATION UNDERWAY, OUTPATIENT DOSING			
	HSCT/GvHD (*PK-PD & Safety POC*)	DOSE ESCALATION COMPLETION Q4 2025			
	Autoimmune Uveitis *(IIT)*	Q1 2026 START			
TRX319 allo, off the shelf, Ag (CAR)-specific	Progressive Multiple Sclerosis	Q1 2026 START			
	Additional T & B cell mediated indications (ANCA, Graves, ITP etc.)				

Hematopoietic Stem Cell Transplant (HSCT)
Graft-versus-Host Disease (GvHD)
ANCA-Associated Vasculitis (ANCA)
Neuromyelitis Optica (NMO)

CDMO Partnership

Leveraging CDMO capabilities to expedite and advance drug development

Pros/Cons Comparison – CDMO vs In-House Manufacturing

In-House Manufacturing

Pros

- Full control: you set priorities, timelines, and quality culture.
- Better long-term economics: lower COGS once capex is deployed and utilized.
- Strategic capability: internal GMP becomes a differentiating core competency.
- Faster innovation: PD, MSAT, and GMP under one roof accelerates improvements.

Cons

- High capex & time: 18–36 months and significant capital to build/qualify.
- Organizational load: need to build and manage a large ops/QC/QA/engineering team.
- Utilization risk: underuse or overloading of a fixed-capacity asset.
- Concentrated risk: any internal failure or finding can halt all supply.

CDMO

Pros

- Faster path to clinic: existing GMP suites, QC, and QMS reduce build time.
- Lower upfront capex: pay per batch/FTE instead of building a facility.
- Access to expertise: established templates, analytics, and regulatory experience.
- Flexible capacity: easier to ramp up/down with volatile or early-stage demand.

Cons

- Less control: you compete with other clients for slots and resources.
- Higher long-term cost: CDMO margins make COGS higher for successful products.
- Slower change agility: every process/analytics change goes through their governance.
- Tech transfer risk: moving in (and later out) can cause variability and delays.
- Dependence on partner: their quality issues, supply chain, or inspections affect you.

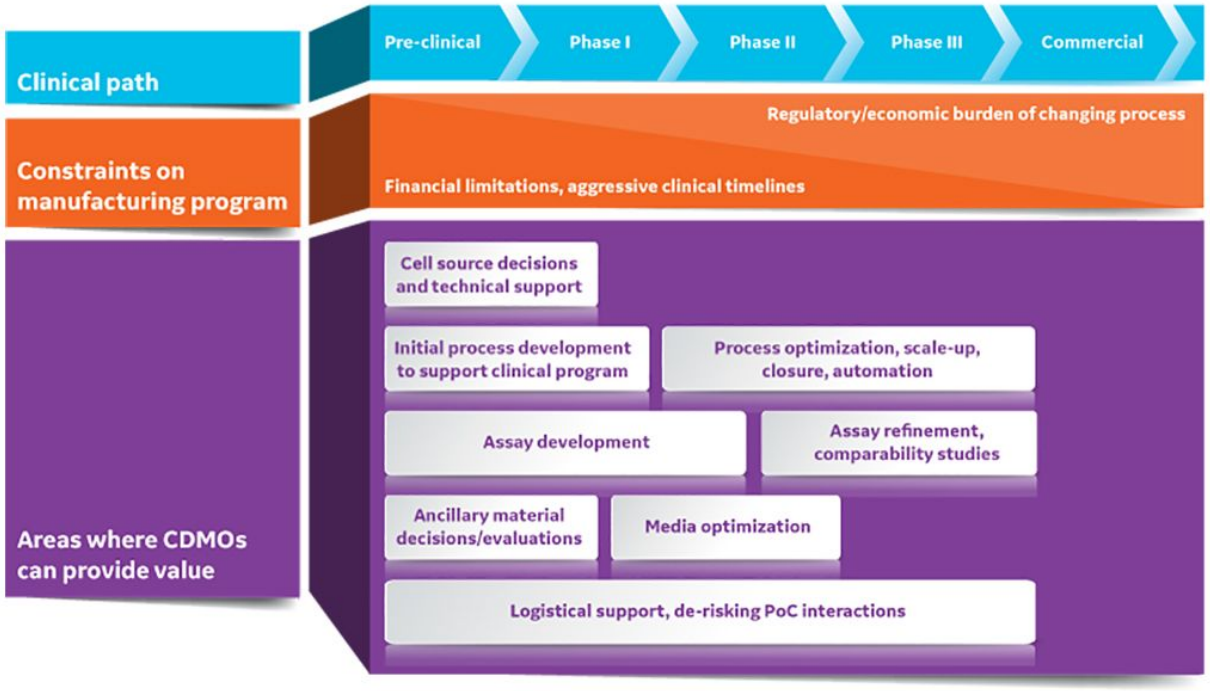
Improving the Security and Robustness of the Manufacturing Process

Selecting a CDMO for development and manufacturing

Key Considerations:

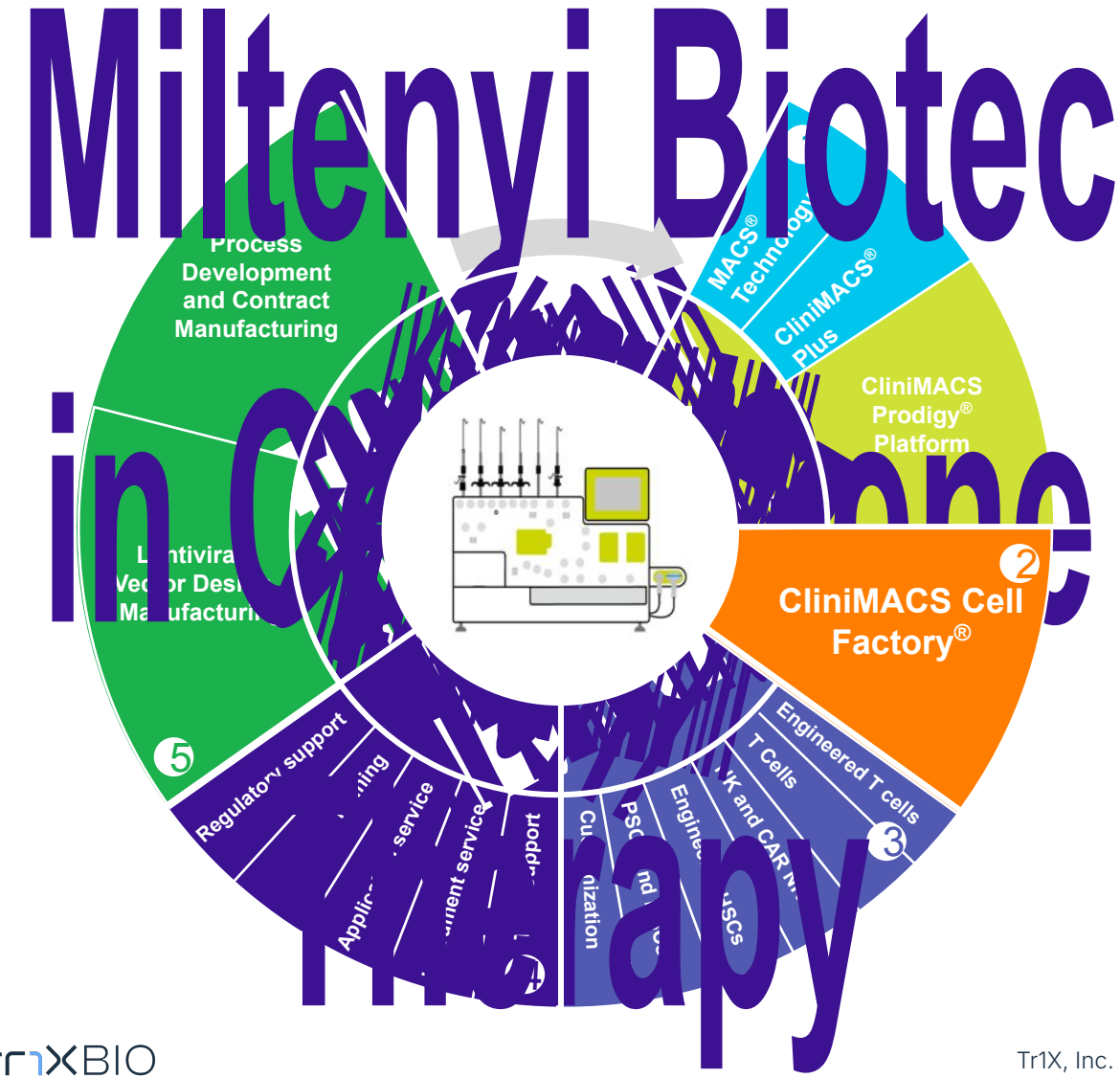
1. Technical expertise
2. Regulatory and compliance history
3. Size, speed, location, and cost

- Process and analytical capabilities
- Technology transfer approach and experience
- Communication methodologies and willingness to be open and collaborative
- Ability to support late-phase trials and commercialization



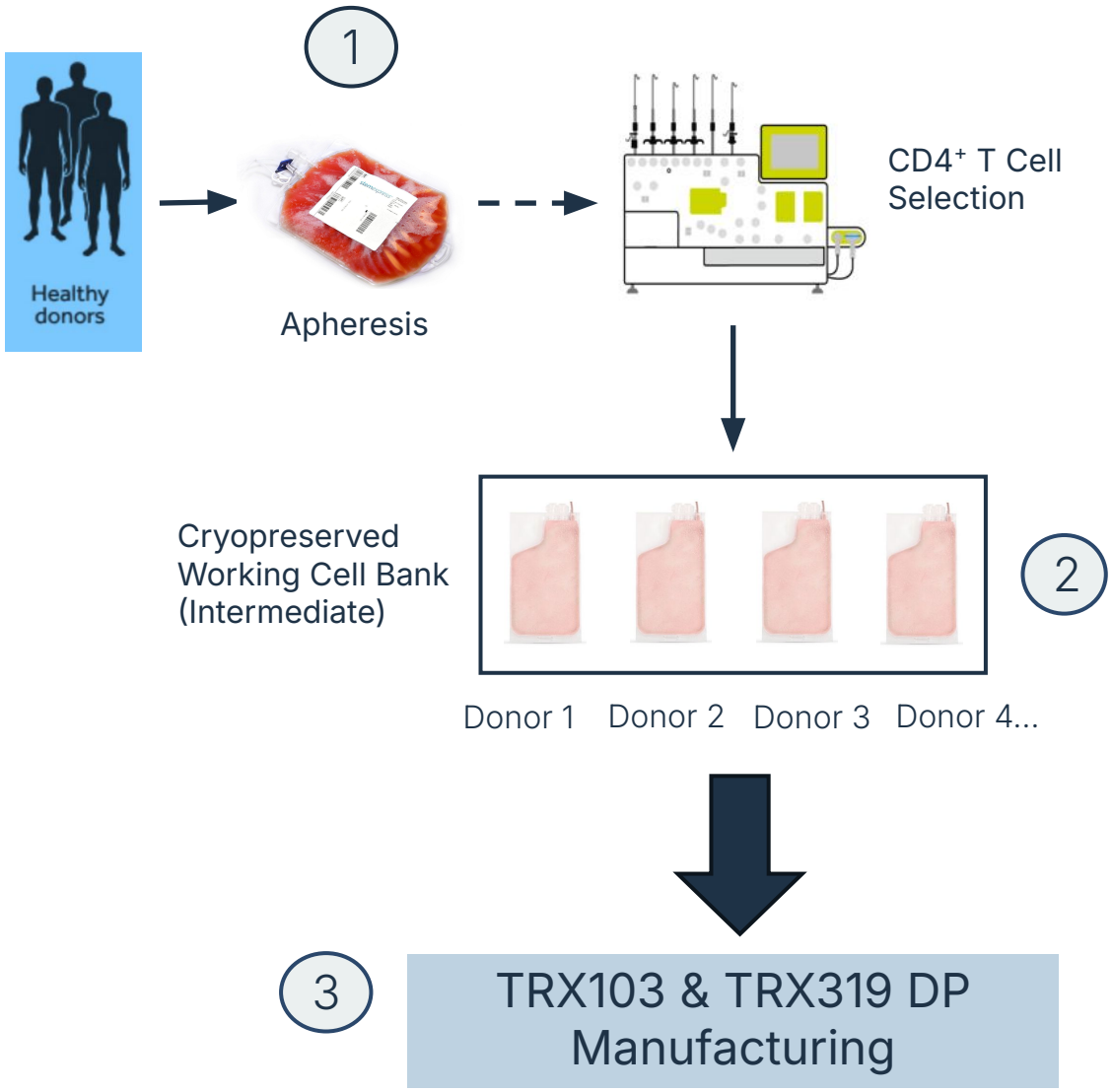
https://www.cytivalifesciences.com/en/us/solutions/emerging-biotech/knowledge-center/cell-and-gene-therapy-cdmo-role?srsltid=AfmBOor-TCSabkLPQVLSpEtbHKCl0IDtijDYsChvgMSGPBVPhVpo2_yU

Partnering with Miltenyi Biotec for Scalable, GMP Compliant Production of Allogeneic Cell Therapies – TRX103/TRX319



Industry Leading Cell Sourcing Strategy

Designed to support both TRX103 and TRX319



Approach (Step-by-step):

1. Whole apheresis from healthy donors is procured and processed through the Miltenyi Prodigy to isolate $CD4^+$ T cells from the wider blood cell population
2. These cells are collected and cryopreserved down to create a working, stable intermediate cell bank
3. Tr1X continuously generates and maintains a robust inventory of CD4 intermediate product available for DP manufacturing

Advantages:

- Capability to test and hand select the best donors with which to initiate DP productions
- Enables the identification of characteristics of top performing donors to further prioritize starting material for GMP manufacturing runs (Donor Screening)

Tech Transfer to Clinic in Record Breaking Time

Kickoff

- Initiate Tech Transfer Process
- Define Tech Transfer Team

Knowledge Transfer

- Gap and Risk Assessment
- Develop Transfer Plan and Method Transfer Master Plan
- Draft GMP Documentation (Process and Assays)

Transfer Execution

- Train Operations
- Perform Additional PD and Training Runs
- Complete Eng Runs
- Perform Analytical Dry Runs and start Qualification

Qualification/ Validation

- Perform Method Qualification
- Perform Process Qualification
- Perform Comparability Studies (as Needed)
- Complete APS

Transfer Closeout

- Finalize Tech Transfer and GMP Documentation
- Generate Tech Transfer Closeout Report
- Establish Clinical Readiness

Clinical Manufacturing

- Perform Routine Clinical Manufacturing
- Conduct Continuous Improvement
- Implement Process Improvements through Change Management

TRX103: ~14 months to complete all activities vs. standard industry benchmark of 18-30 months

TRX319: <12 months to complete all activities vs. standard industry benchmark of 18-30 months

Overcoming Manufacturing Challenges: Strategies for Continuous Improvement

Challenges	Solutions
Aggressive timelines	Strong, collaborative partnership to maintain adaptiveness/flexibility and share responsibility to accommodate accelerated timeline demands
Sublot product segregation and parallel processing	Involved MSAT from early on in development lifecycle to efficiently and effectively translate the PD process to a GMP compatible state
Final Product Pooling (from multiple donors)	Implemented best practices and introduced adequate in process controls to ensure process consistently performed as expected
Extended Processing Times (e.g. DMSO contact time)	Streamlined batch record and operator workstreams to improve efficiencies and reduce downtime
Extended in-process assay TaT	Instituted robust communication plan all parties (including QC) agreed and aligned on to acquire and transmit in process results in a rapid fashion

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