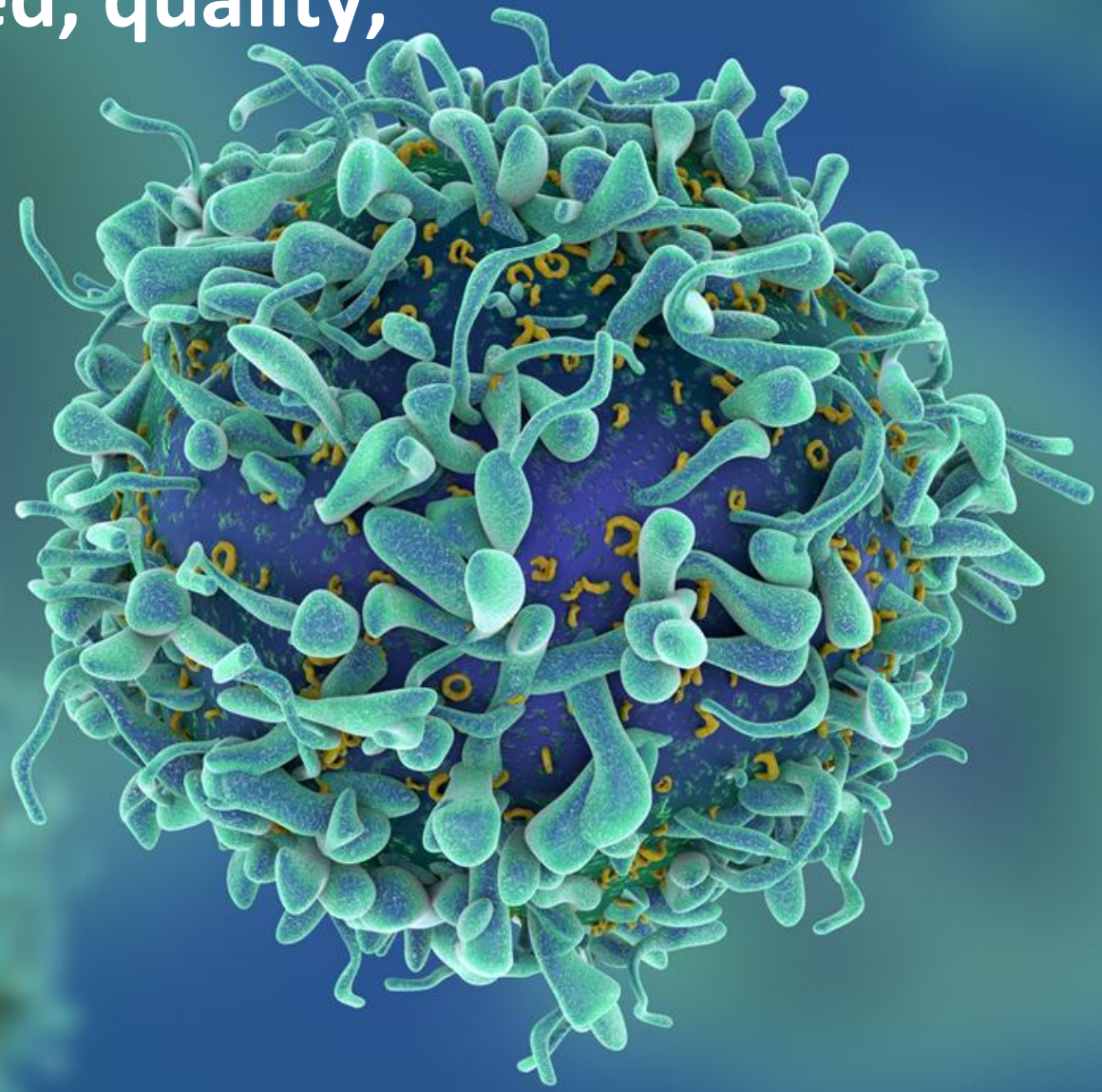
The key to accessibility and ROI: Microbubbles unlock speed, quality, and cost efficiency in CGT manufacturing



Simple, fast manufacturing tools for cell therapy

Bill Lloyd, PhD
Vice President of Research & Devp
bill@akadeum.com

Cell Therapy is Curing Many Diseases

But…

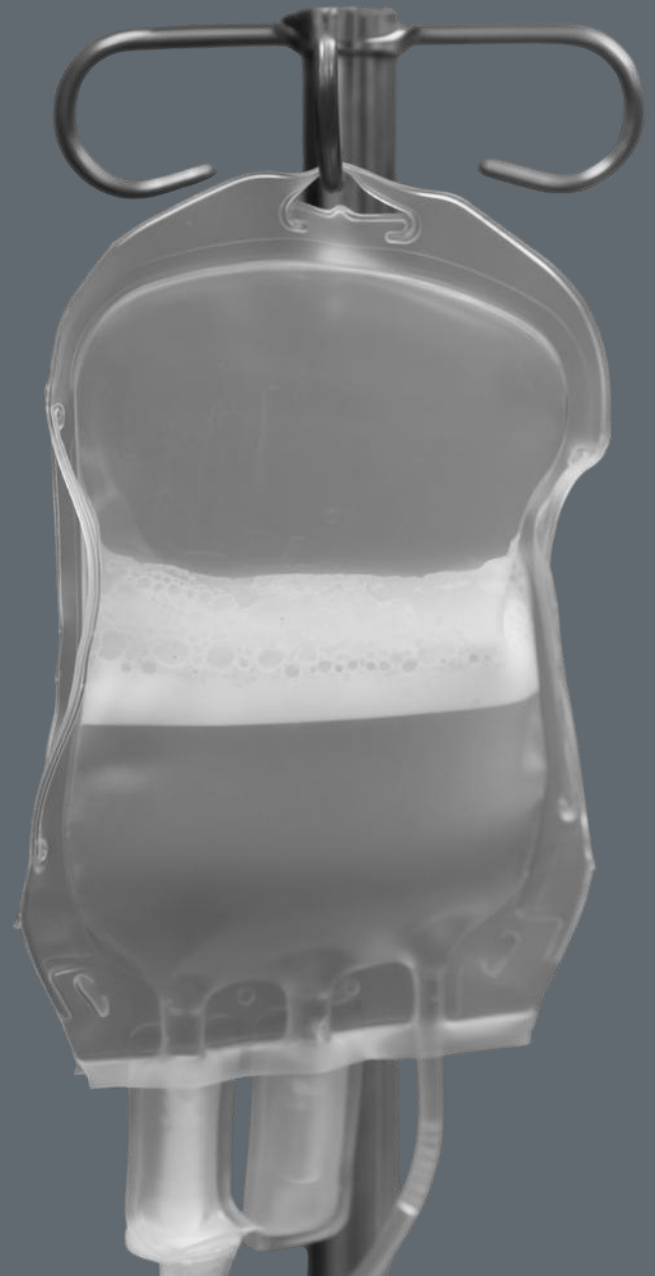
Most patients do not have access to approved therapies because of how they are made

Too Slow | **Too Costly** | **Too Unscalable**

4-6 Weeks $500k+/dose 1-10k doses/yr

The Future of Cell Separation is Microbubbles

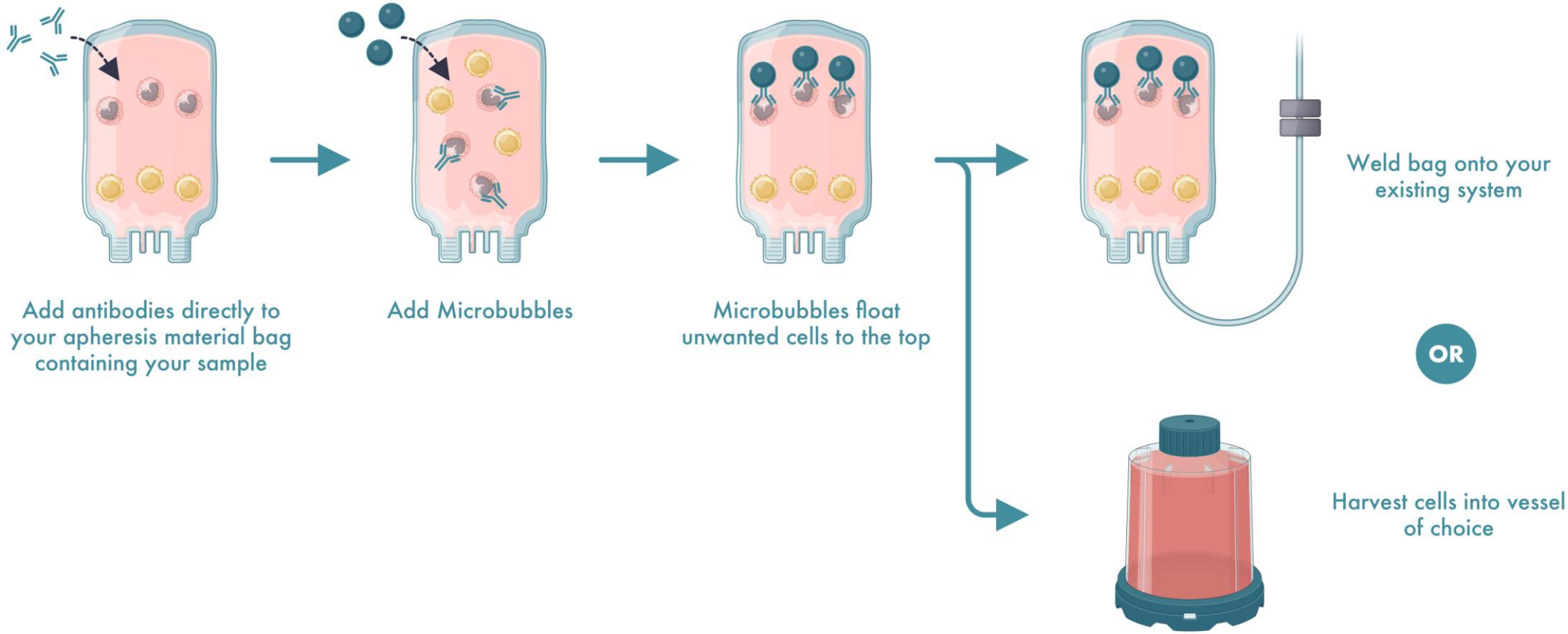
- Healthier cells with increased recovery improves cell engineering
- Improved engineering leads to greater potency, persistence
- Integrates into existing equipment, workflows
- Less than 1 hour cell separation in-bag
- cGMP Manufacturing
- Complies with standards for ancillary materials in cell therapy



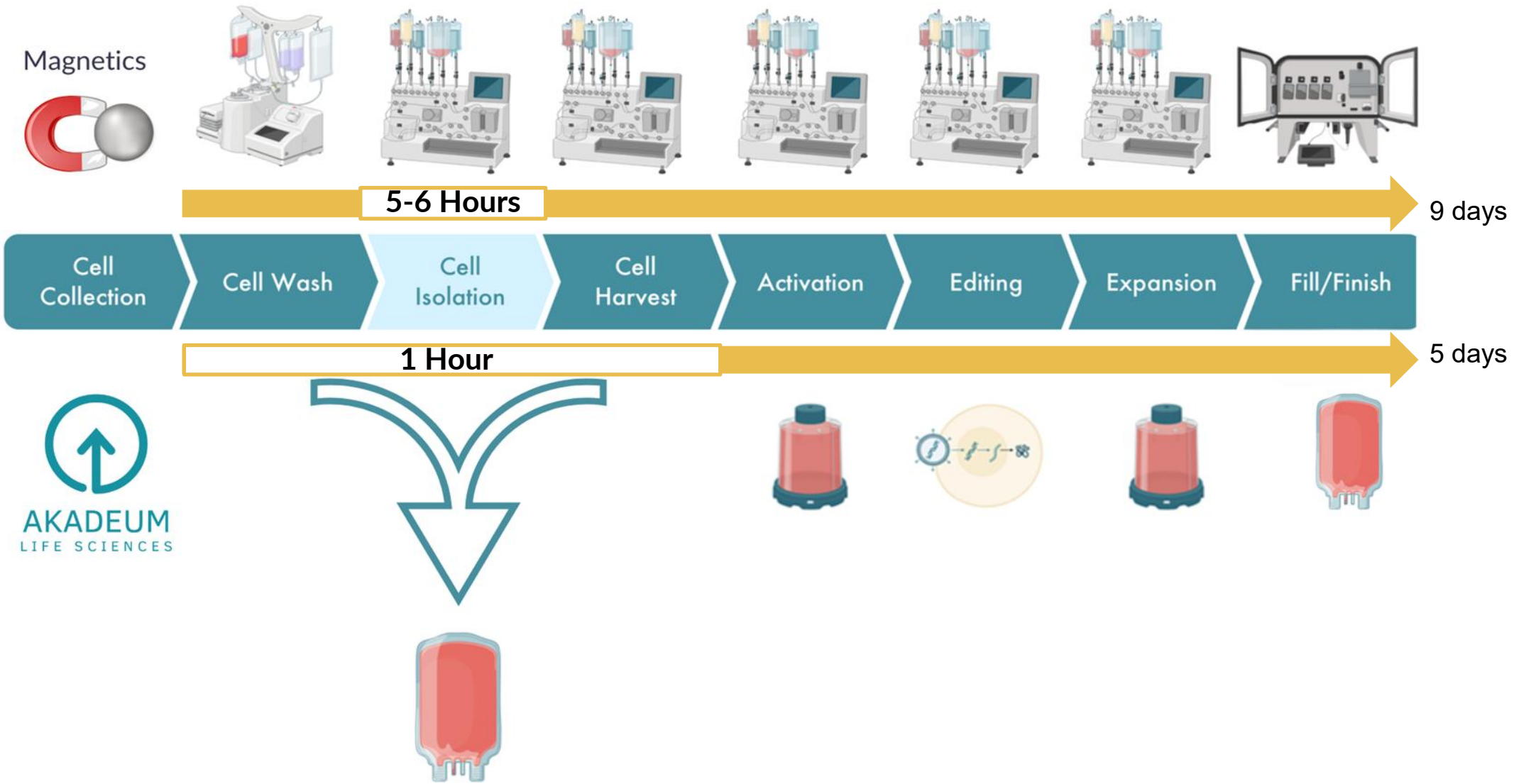
Fast, Simple, Flexible Workflow in Closed System

Any volume. **Isolated Cells.**

1 Hour

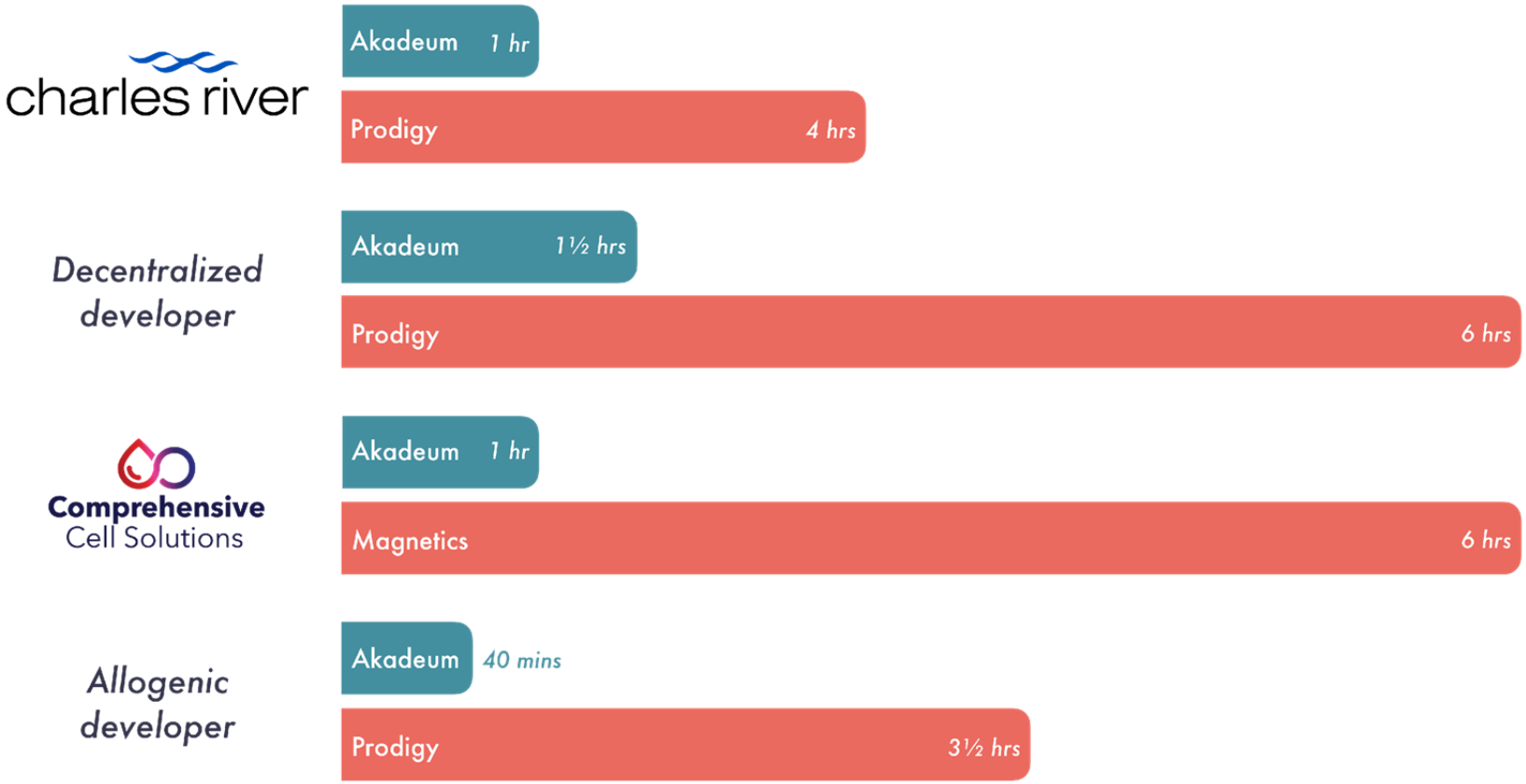


Microbubbles: Faster, Simpler, Cheaper Workflow



Fastest Cell Separation Method = Better Quality Cells

Enable additional manufacturing starts in a day *and* faster turn around



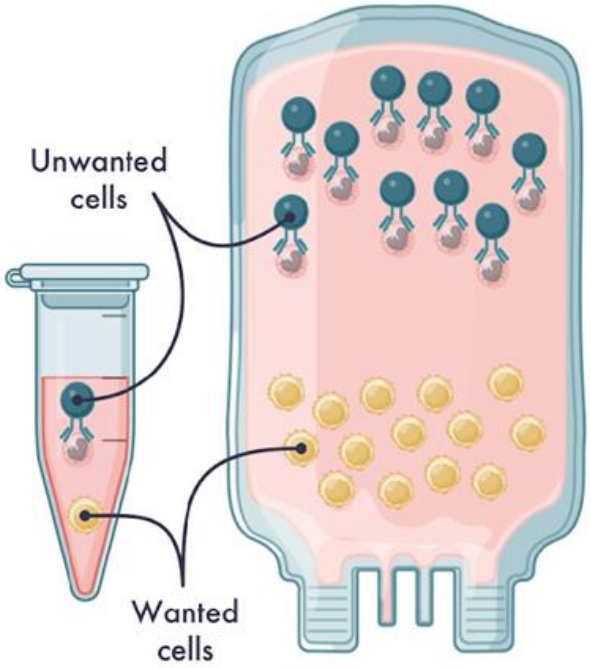
Decreasing time = reduces costs = increased access

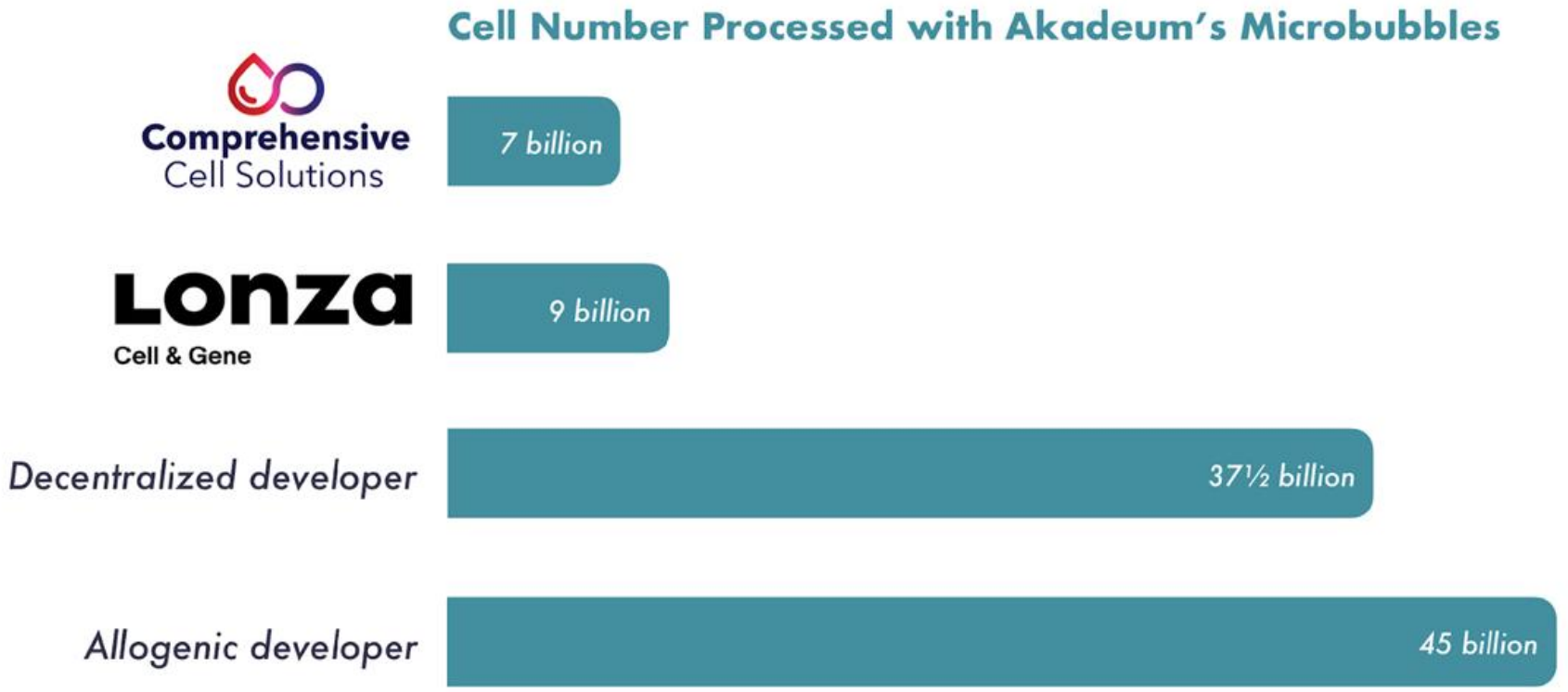
Akadeum Scales to Commercial Manufacturing

Scale Out
to any number of samples

+

Scale Up
to any volume (no known upper limit)





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Negative Separation Significantly Improves Cell Therapy

*"Patients treated with positively selected product actually had much higher rates of toxicities…**modulates the potency and the toxicity of the CAR T Cells.**"*

Poor Cell Separation Methods Lead to Poor Therapeutics: Akadeum Eliminates These Issues

Lower Quality Cells	Keep your full cell population **Healthier Cells**
Lower Potency	Reduced impurities = Improved engineering = **Faster Expansion, More Potent Cells**
Scale Challenges	Any volume, any starting material = **More Patients Dosed**
Manufacturing Failures	Improved potency **Reduces Batch Risk**
Increased Costs	40% overall reduction costs 75% equipment savings
Time Consuming and Complex	<1hr isolation- up to 37% time savings Simplicity – up to 35% labor savings

Akadeum Platform: Flexible to Your Workflow

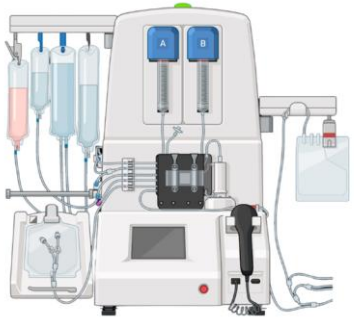
Universal compatibility - Smaller Footprint

A closed-system solution scalable process up to 50 billion cells at once in less than 1 hour

Manual + WilsonWolf G-Rex® BioReactor

Fast Expansion

Fresenius Kabi Cue®

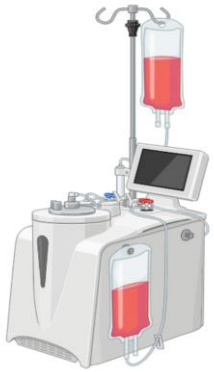


Increased Potency

Thermo Fisher Rotea™

High Purity

Cytiva Sepax™



High Viability

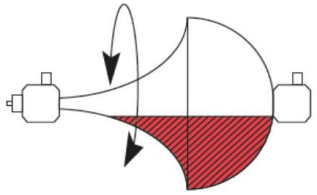
MaxCyte ExPERT GTx®

More total engineered cells

Lonza Cocoon™

Reduced Impurities

Limula LimGROW



All-In-One Manufacturing

Collaborative application notes with additional high-performance data available for each system
Protocols also available

Created with BioRender.com

Already De-Risked for Clinical Adoption

Ready for Clinical Use

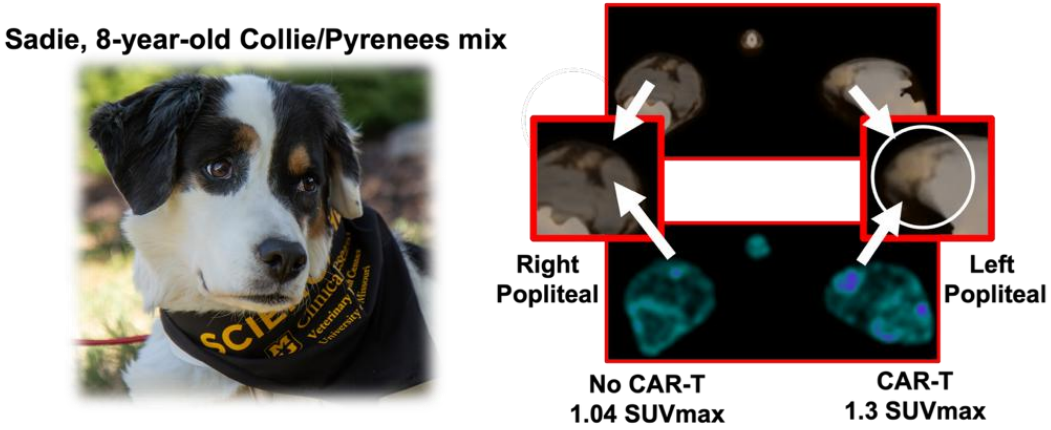
- *Drug Master File*
- *21 CFR 820 GMP Compliant*
- *ISO / USP Compliant*
- *Successful GMP audit per US and EU standards*
- *100s of Commercial Lots*

AMT Designation (Mid 2026)

GMP T Cell Separation Kit

Canine Cancer Remission

treated with human T cells



DARK HORSE CONSULTING

Akadeum Filed A Drug Master File with the U.S. FDA

DMF Contents Reflect FDA's CMC Guidance and Adherence to Ancillary Material Standards

Inclusive of:

- ✓ Facilities and equipment
- ✓ Adventitious agents (viruses) safety evaluations
- ✓ Biocompatibility
- ✓ Extractables and toxicological report
- ✓ Manufacturing (including supplier management and processes, formulations, production processes)
- ✓ Detailed product composition
- ✓ Control of drug substance (such as specifications, analytical procedures, validation and verification)
- ✓ Reference standards
- ✓ Container closure systems
- ✓ Stability

Letter of Authorization Upon Request (Requires IND number)

DHC
DARK HORSE CONSULTING

FDA

Customer Traction and Testimonials

"Akadeum's innovative isolation technology ***unlocks unparalleled reproducibility in T cell engineering*** *… We are excited to continue partnering with Akadeum as we develop the next generation of gene-edited cellular therapies for pets first, and their people next."* – Dr. Wes Wierson, LEAH Labs CEO

"Akadeum's cell isolation technology directly supports [Kure's] mission by ***simplifying a traditionally complex step in manufacturing, enabling speed, consistency, and scalability without sacrificing cell quality***" – Dr. David Wald, Kure Cells CEO

"We're constantly evaluating new technologies … ***Akadeum represent the kind of solutions we look for to overcome challenges in cell therapy manufacturing and move the field forward.***" – Michael Paglia, CTO, ElevateBio

"Together with Akadeum, our Flex Platform is working to provide an innovative ***manufacturing solution that is scalable and ensures efficiency and quicker therapeutic delivery to patients***" – Ahmad Hussin, Charles River Vice President, CDMO

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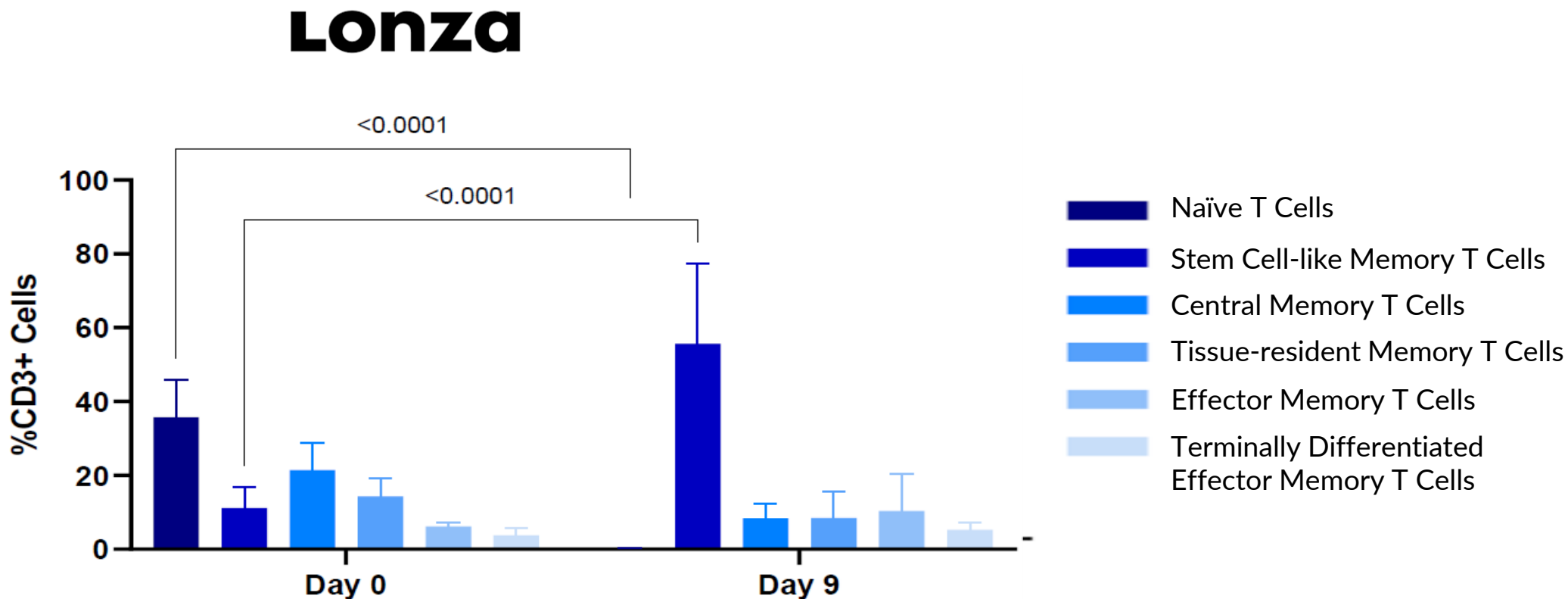
Preserving Memory Phenotype for Potency



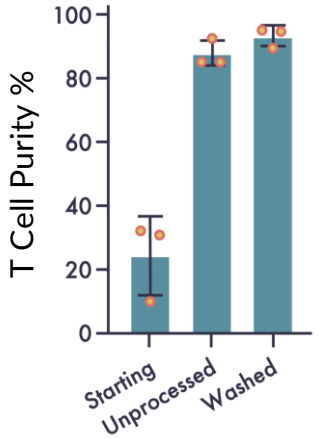
Rapid activity against tumors, followed by persistence, with manageable toxicity

Any Starting Material, Same GMP Reagents!

Fresh Apheresis

Skip Cell Washing Equipment

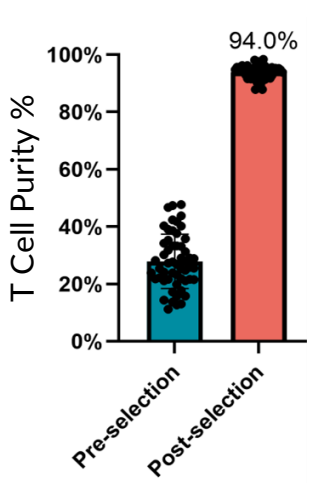
1. Add reagents directly into apheresis material bag
2. Mix
3. Isolate

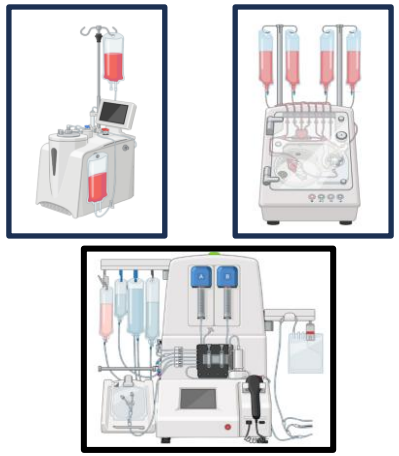


Cell Washed

Robust Performance Across Platforms

- 55 donors
- In-bag processing
- Cell washing equipment: Rotea™, Sepax™, Cue®

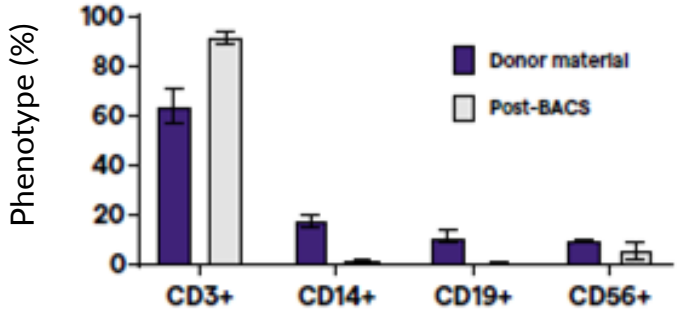




Cryopreserved *and* No Cell Wash

Simplify your Workflow

- No need to wash out DMSO when cell separation process is <1hr
- Repeatable, High performance at customer sites



Capex savings: Use Your Current Equipment

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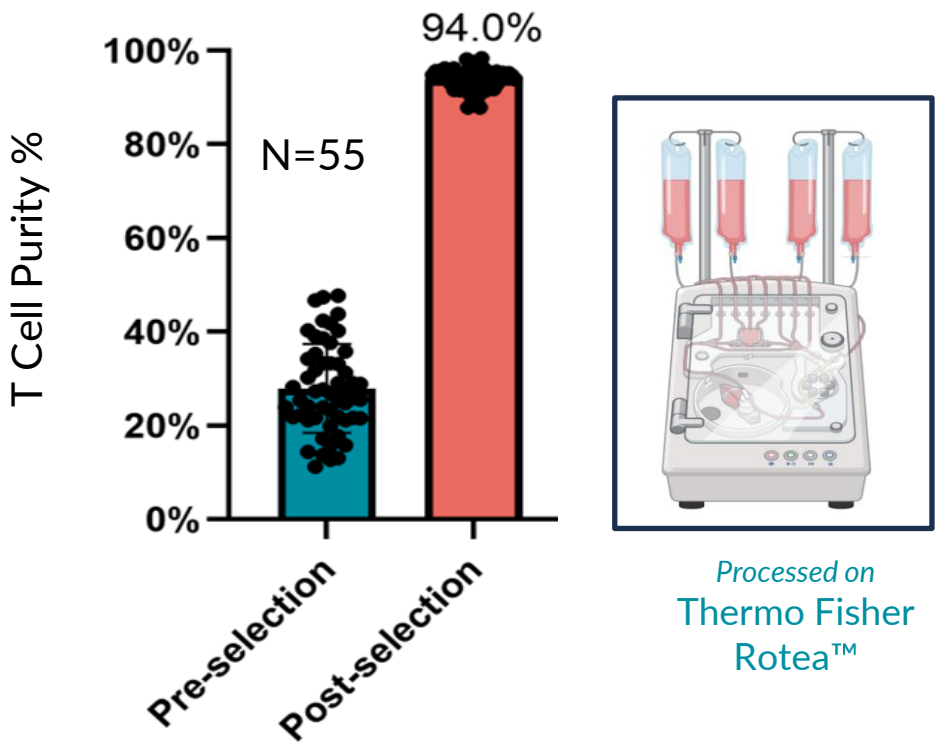
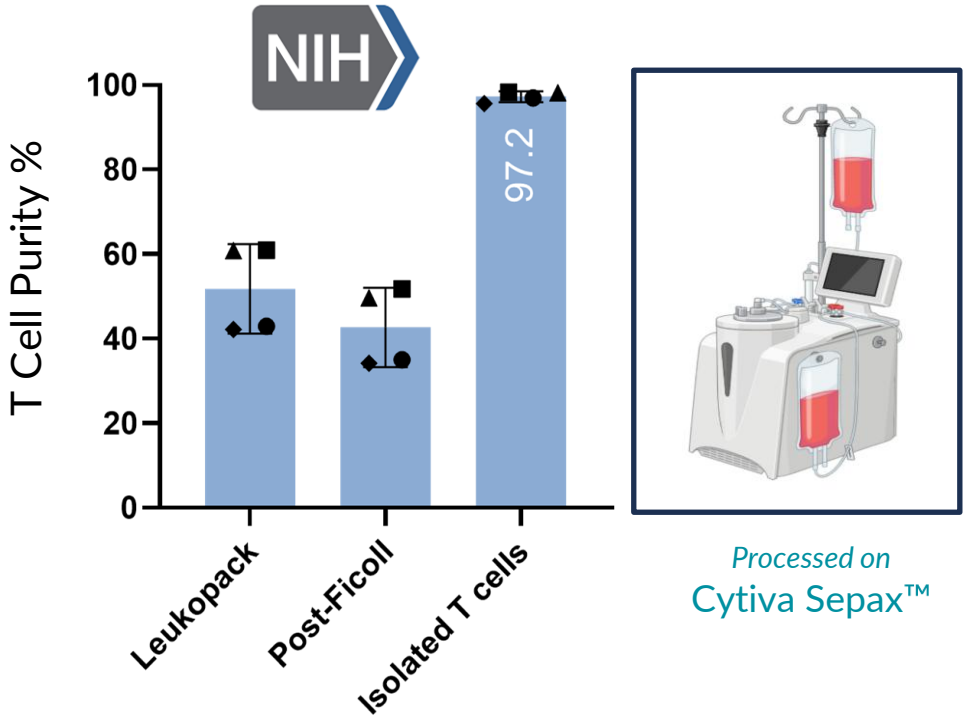
Platelet-Wash and Isolate Cells on the Same Instrument

Cell wash + isolation on cell washing equipment



Processed on
Thermo Fisher Rotea™



Processed on
Cytiva Sepax™

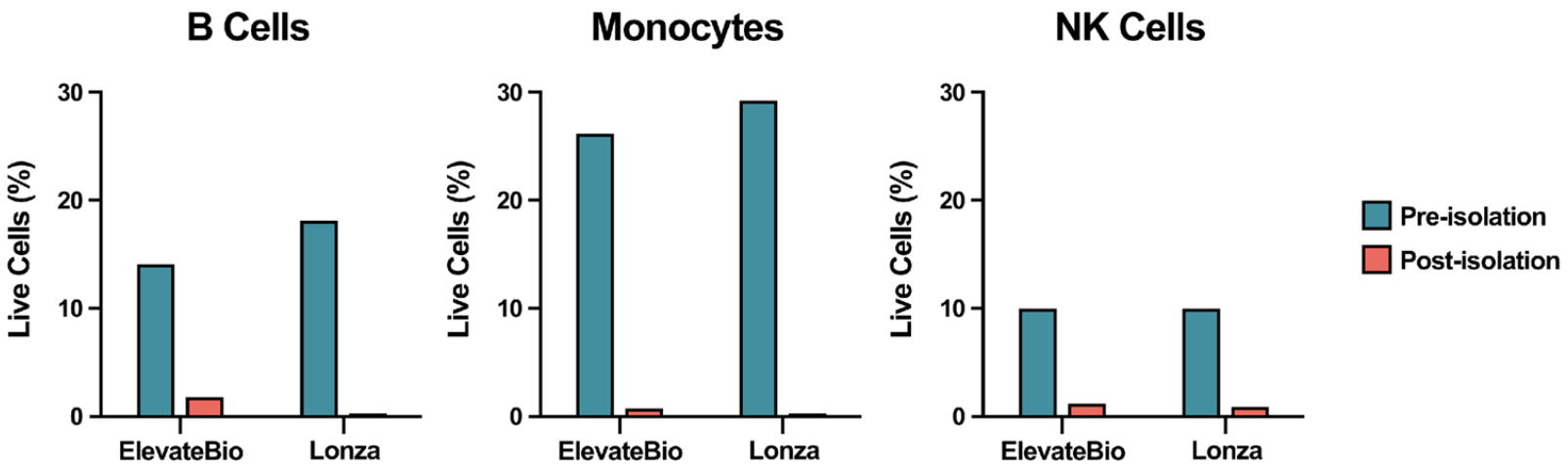
Automated Cell Separation without Additional CapEx Costs

Reduced Impurities Enable Better Engineered T Cells

Why It Matters:

B Cells: reduce competition for growth factors and get better therapy efficacy
Monocytes: reduce cytokine release syndrome and more efficient gene editing
NK Cells: reduce cytotoxicity

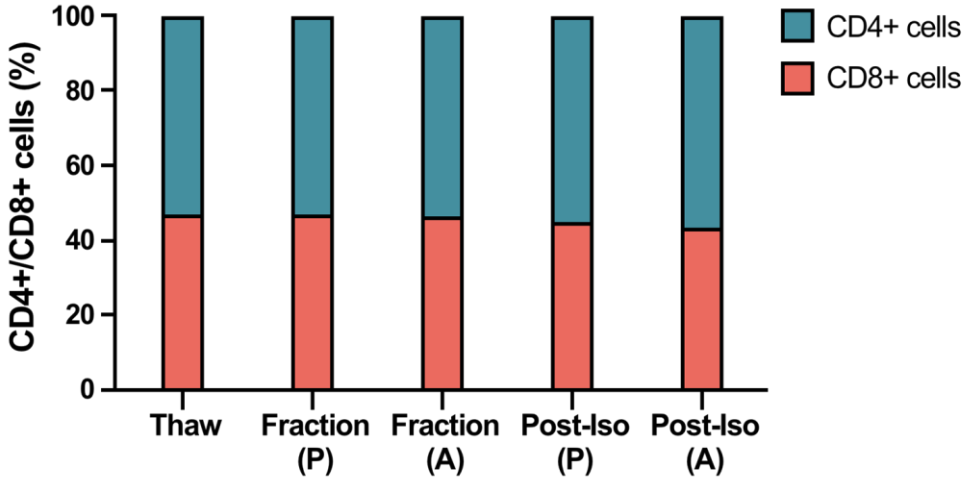
Negative selection targets and removes unwanted cells



More predictable, potent, safer therapy

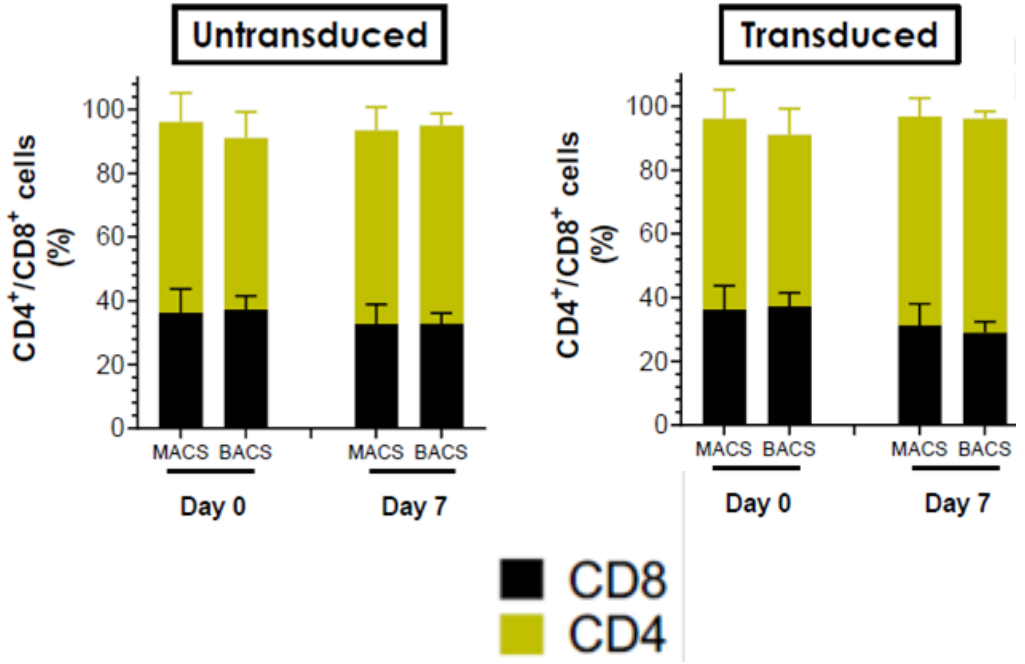
CD4/CD8 Ratios Maintained

Allogeneic Developer



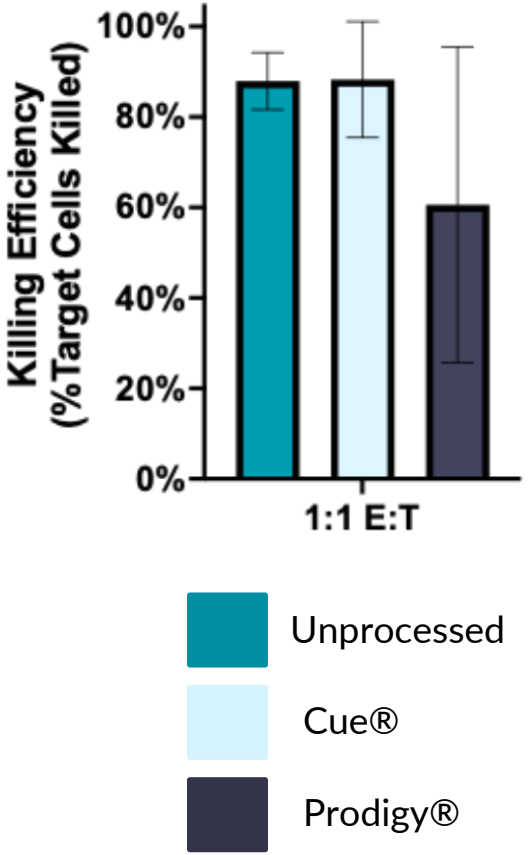
P = Prodigy
A = Akadeum

elevatebio

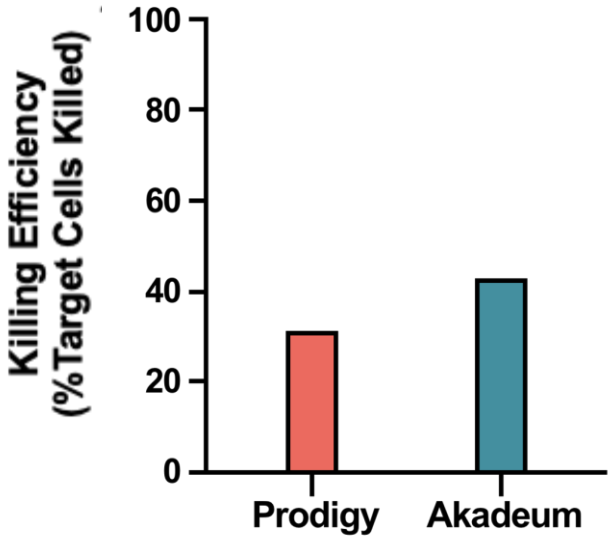


High Quality + Highly Potent Cells = Better Therapies

charles river



Large Biotech



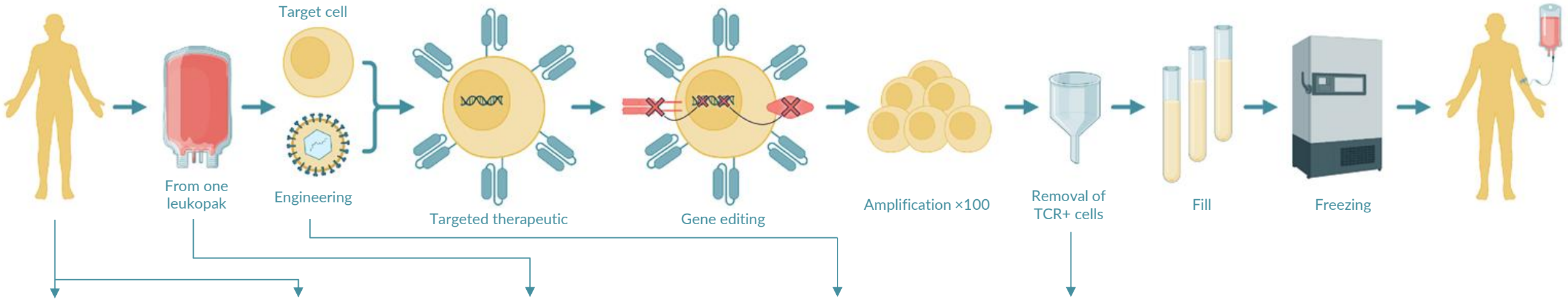
More Potent Cells:

✓ Lower Failure Risk

✓ Lower Adverse Event Risk

✓ Enable More Doses

Collaborating on custom workflows



Any Starting Material:
Healthy
Mobilized
Patient
Fresh / unprocessed
Washed
Cryopreserved
PBMC
Buffy coat
Whole blood
Cord blood
iPSC

Cell Type Capability:
T (CD3, CD4, CD8)
B
NK
Monocytes
RBC depletion
Dead Cell
HSCs (CD34+)
Treg
TIL
iNKT

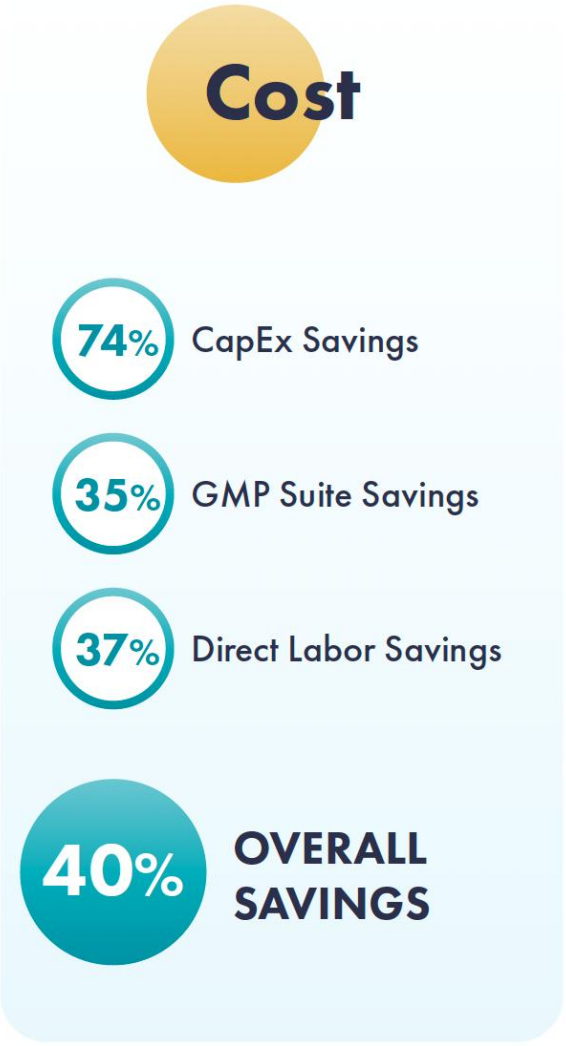
Processing capacity:
Quarter leukopak
Half leukopak
Full leukopak
Cryopreserved aliquots
Scale: up to 40 billion tested

Tested with:
AAV
Lentiviral
Electroporation

Depletion Capability:
Unedited CD3+
TCRαβ
Dead Cell
Scale: up to 100 billion

Reduce Per Dose Cost by 40%+

- <1 hour Cell Separation
- 34% More Starts per line
- Reduced Batch Failure
- Save 35% Overall Process Time
- Cut Production Line Needs by 2/3
- Reduce FTE Need by 36%



Comparator: approved autologous therapeutic workflow that uses Miltenyi

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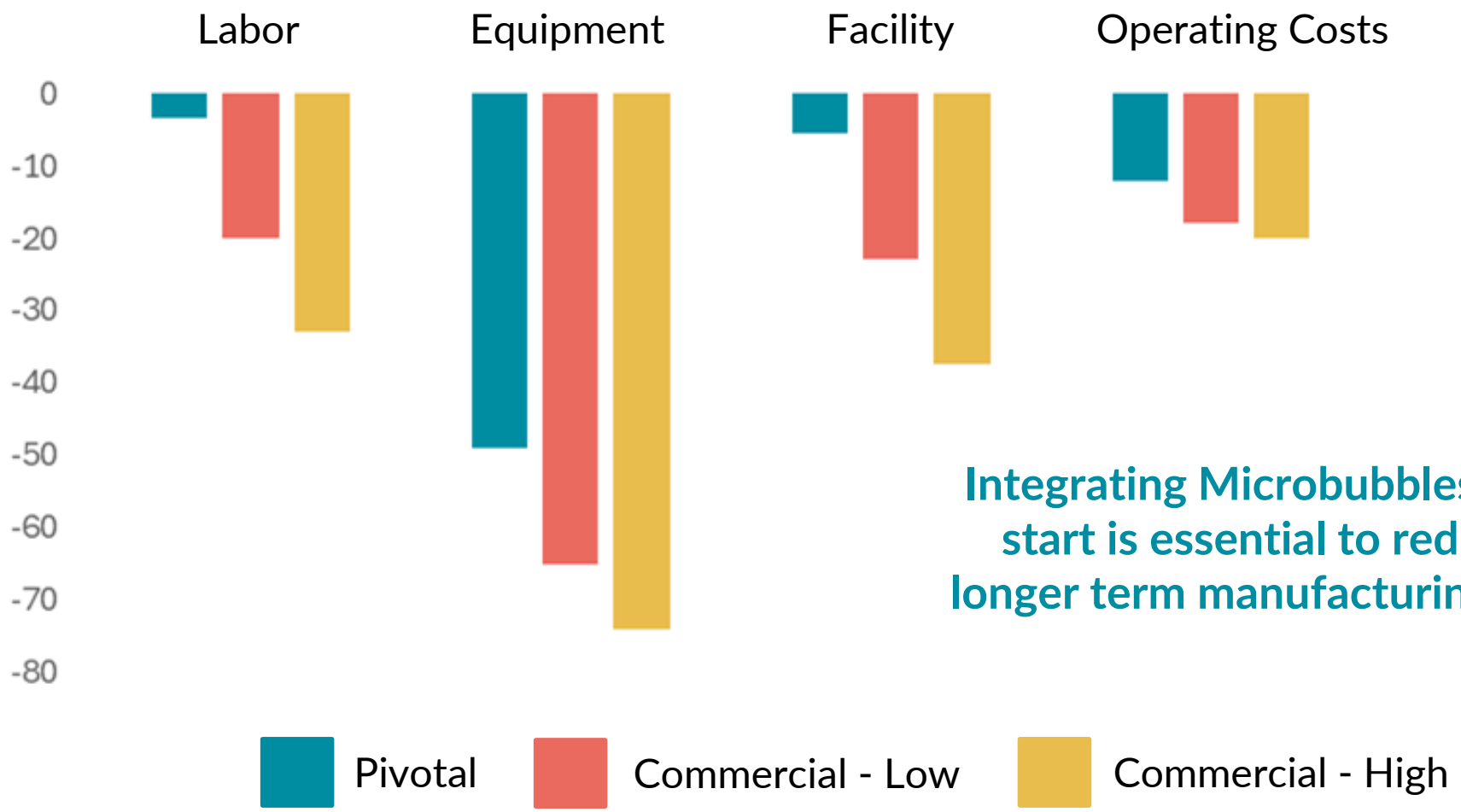
ROI of Microbubbles from Pivotal to Commercial Stage

Cost Reduction Percentage Compared to Approved, Magnetics-based Cell Therapy Manufacturing Workflow



Integrating Microbubbles at the start is essential to reducing longer term manufacturing costs.

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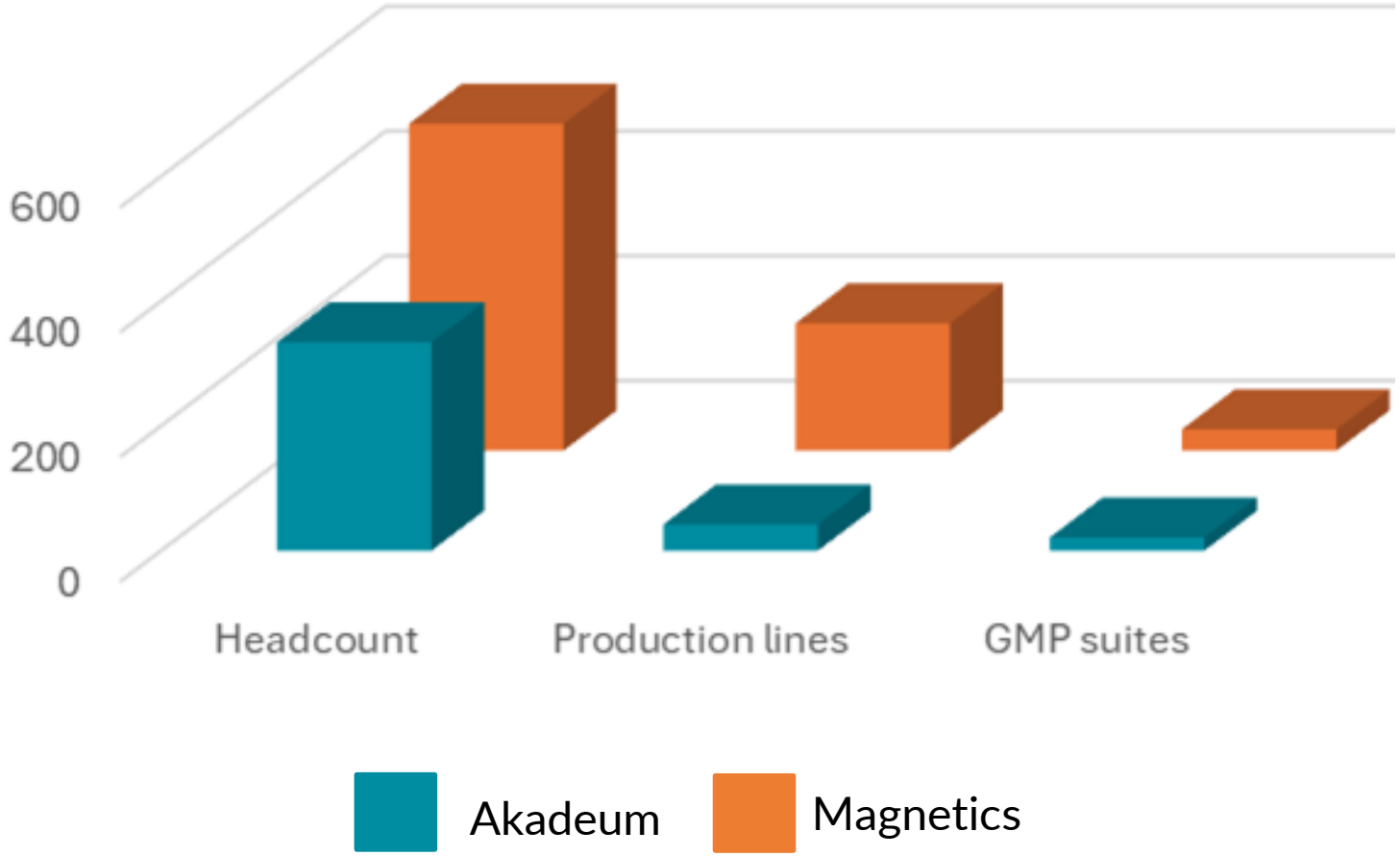
Accelerate Timelines: More Doses, Smaller Footprint

Increase throughput while overcoming space and hiring challenges when scaling your cell therapy workflow – more doses, smaller footprint



34% More Starts

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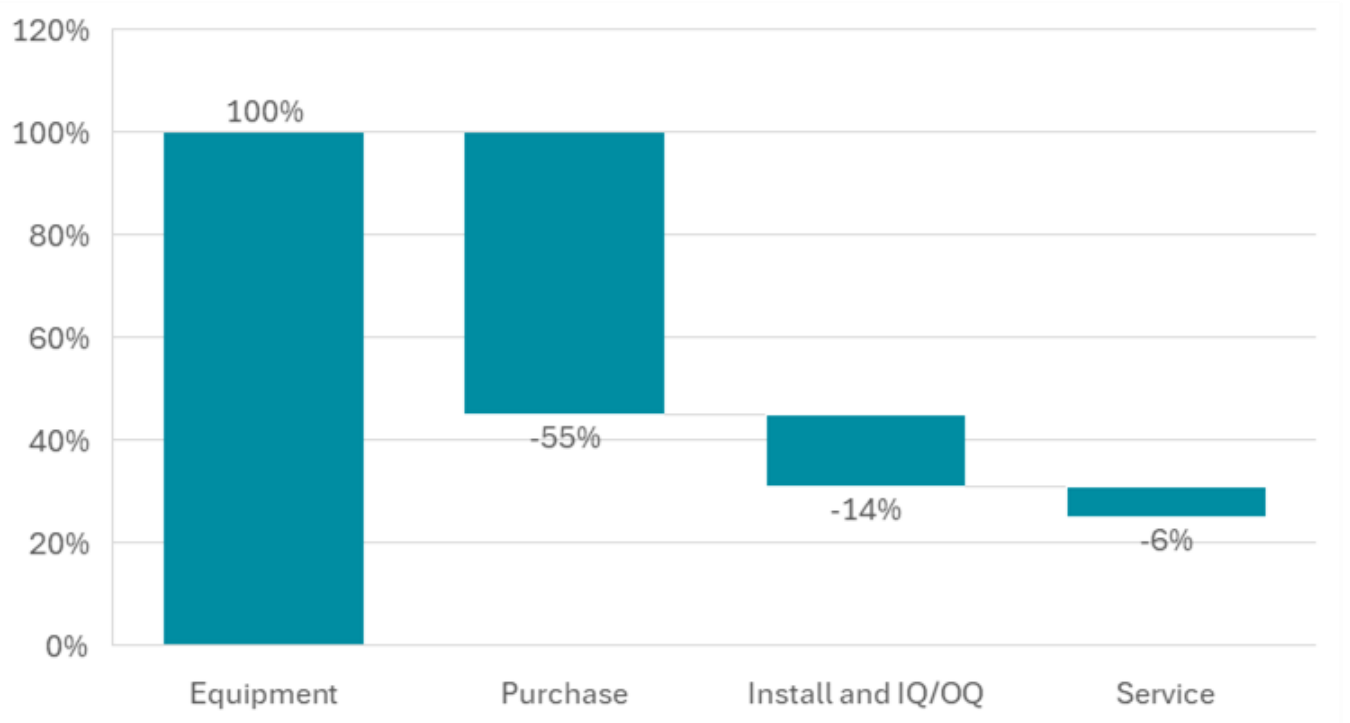
74% Reduction in Equipment Costs

Reduce the risk of a batch failure and enable more cost-effective manufacturing



The Future of Cell Separation is Here.

Separation without limits – built for mass-market cell therapy.

- >40% COGS reduction potential (workflow-dependent)
- Unlocks 100k+ doses/year manufacturing reality
- <1 hour separation; can reduce manufacturing by days
- Closed-system scalable; drop-in consumable economics
- 3 clinical workflow lock-ins (2025); first in-human expected 2026

Product Demo
Schedule an evaluation to see firsthand results

Partner
Private label or co-development

Data
App notes and protocols at akadeum.com

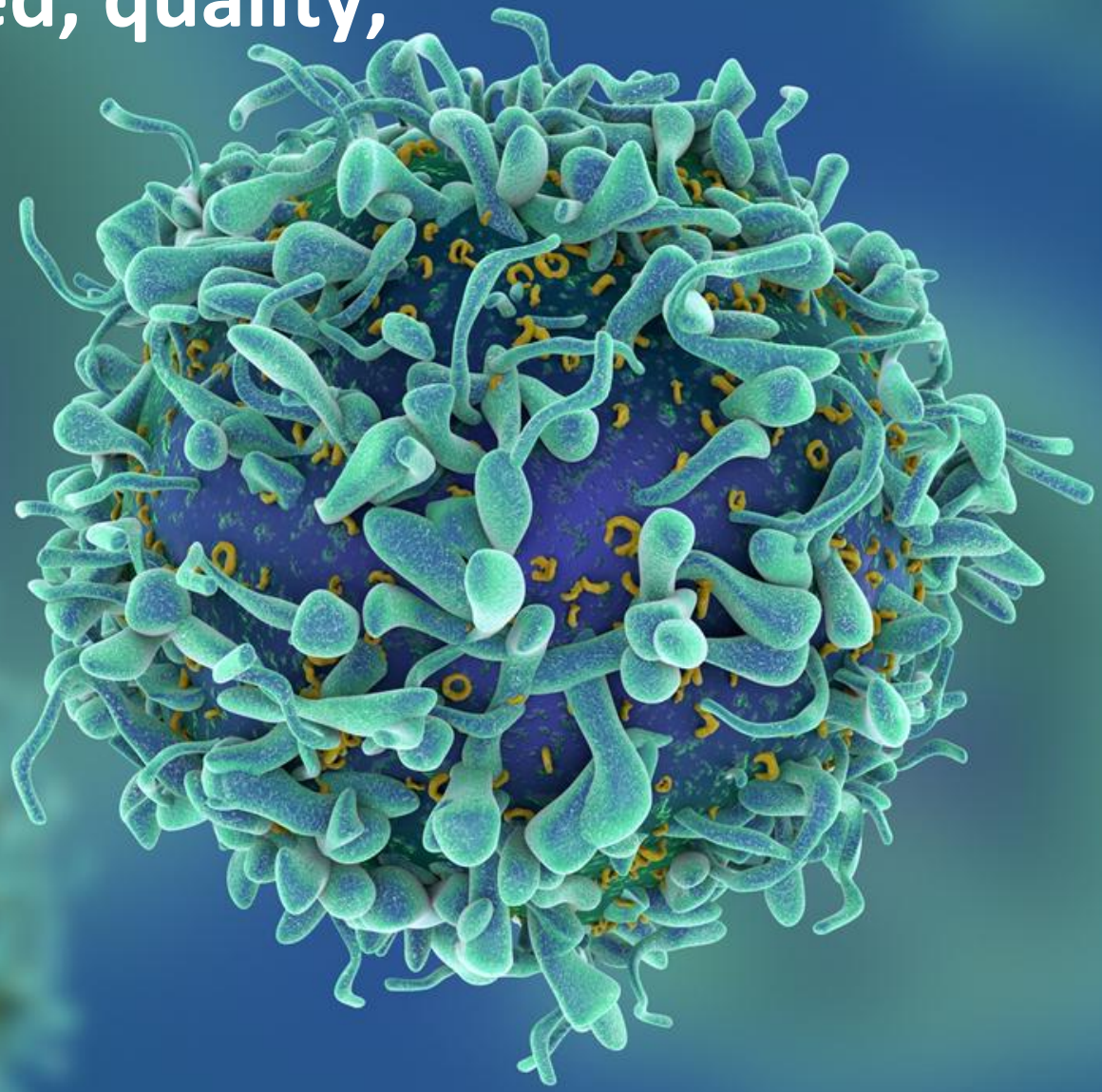
Select Investors

MCN Michigan Capital Network

ARBORETUM VENTURES

NYBCVENTURES

The key to accessibility and ROI: Microbubbles unlock speed, quality, and cost efficiency in CGT manufacturing



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