



Antleron

Engineering life

Antleron MSC Expansion: Scaling Excellence in Cell Therapy

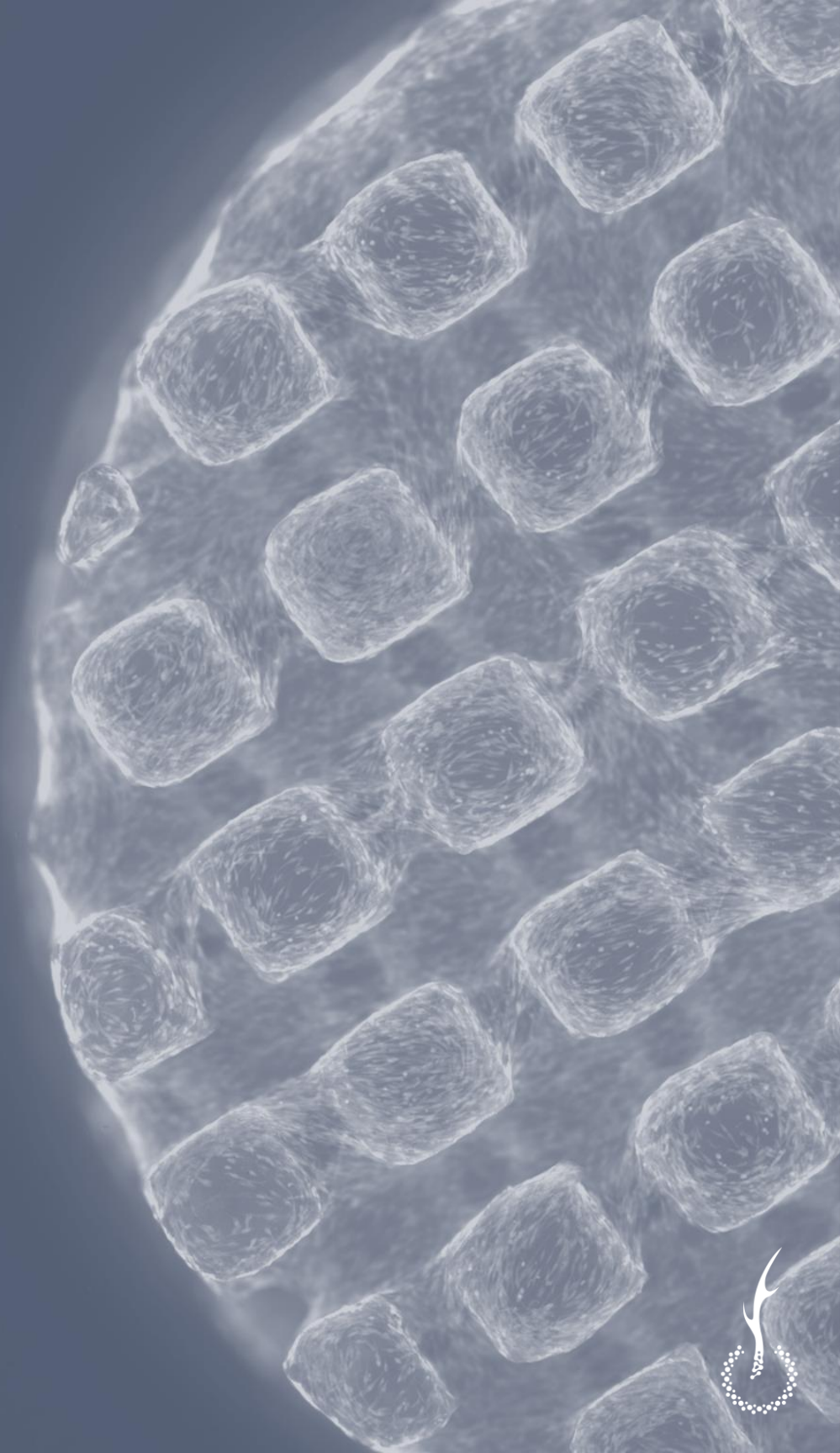
Discover how Antleron's pioneering approach to mesenchymal stromal cell expansion is transforming the landscape of regenerative medicine. Our integrated solutions address the critical challenges in MSC manufacturing, enabling biotech innovators to accelerate their path from promising research to clinical-grade cell therapies with confidence and precision.

Scaling MSCs is hard - Antleron makes it controllable, reproducible and clinically relevant

Mesenchymal stromal cells (MSCs) hold enormous promise for regenerative medicine, immunomodulation, and cell therapy. But translating that promise into scalable, clinical-grade manufacturing remains a major hurdle for biotech innovators.

Our mission at Antleron is to bridge this gap by providing tailored solutions that optimize MSC expansion processes or MSC-based biologicals production, whilst maintaining critical quality attributes throughout scale-up operations.

MSCs hold great therapeutic promise across a wide range of indications, but without a carefully designed and controlled expansion process, they are prone to losing their identity, functional potency, and ultimately, their clinical benefit.



The Challenge: MSC Expansion Is More Complex Than It Seems

MSC cultures are sensitive systems — and small decisions in early R&D often have massive consequences at scale.



Donor variability and inconsistent tissue sourcing

Significant heterogeneity between donors and tissue sources creates unpredictable growth patterns and therapeutic profiles, complicating standardization efforts.



Senescence and loss of identity during expansion

Extended cultivation leads to cellular aging, reduced proliferation capacity, and diminished therapeutic potency, limiting viable population doublings.



Phenotypic drift, reducing therapeutic potency

MSCs can lose their defining characteristics and functional properties during expansion, undermining the very mechanisms behind their therapeutic effects.



Scale-up bottlenecks for adherent cells

Traditional 2D platforms do not benefit from economies of scale, creating manufacturing bottlenecks and increasing costs.



Lack of digital control and batch comparability

Limited real-time monitoring capabilities make it difficult to ensure consistent quality across batches and predict outcomes.



Regulatory uncertainty around critical quality attributes (CQAs)

Evolving regulatory frameworks and unclear CQA definitions such as potency, functional assays or source-specific attributes create compliance challenges for novel cell therapy products.

Even promising therapies are delayed — or derailed — due to insufficient control over these variables.



The Antleron Solution: Engineering MSC Success from Lab to Clinic

At Antleron, we specialize in making MSC expansion **scalable, reproducible**, and **GMP-ready**. Our smart bioprocess CellGuide® approach combines biological expertise, smart engineering, and digital control.



Fixed-bed bioreactors

Engineered for optimal 3D growth of adherent MSCs, our bioreactor systems maximize surface area while maintaining critical microenvironmental conditions for cell identity preservation.



Process digitization

Our digital tools embedded into our Nexus platform monitor CQAs such as cell yield or identity in real time, enabling data-driven decisions and establishing digital twins of your manufacturing process.



Custom CRO services

We offer comprehensive process optimization, miniaturization, and robust tech transfer services tailored to your specific MSC source and therapeutic application.

Expertise in tissue-specific MSCs

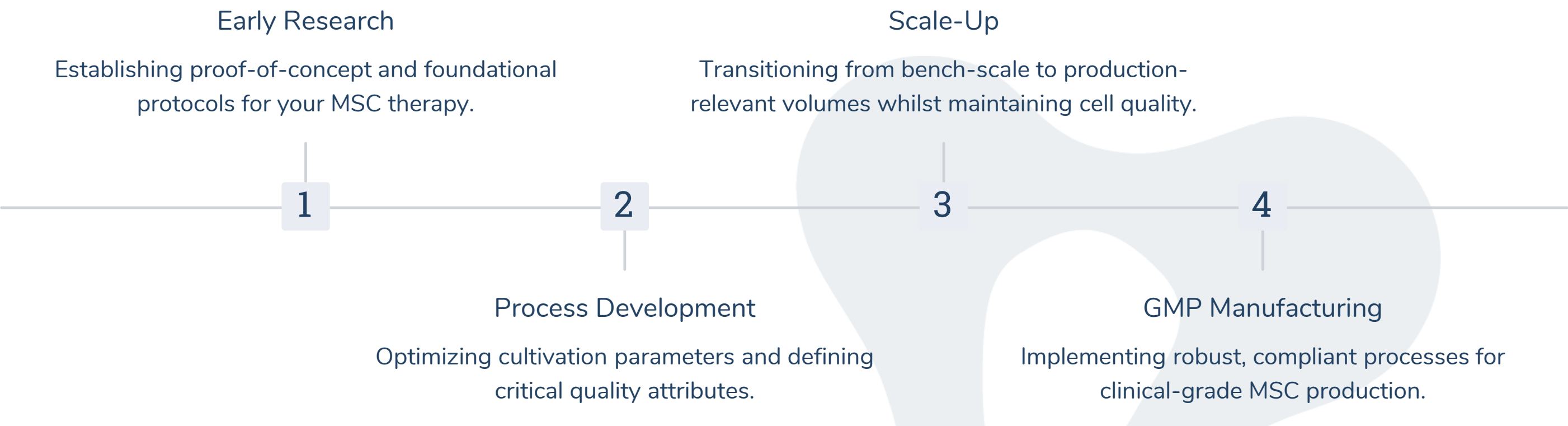
Our team brings deep knowledge of various MSC sources, including bone marrow, adipose, and neonatal tissues, with protocols optimized for each type's unique characteristics.

Proven track record

We've successfully partnered with biotech companies advancing MSC-based Advanced Therapy Medicinal Products (ATMPs) through critical development stages and regulatory milestones.



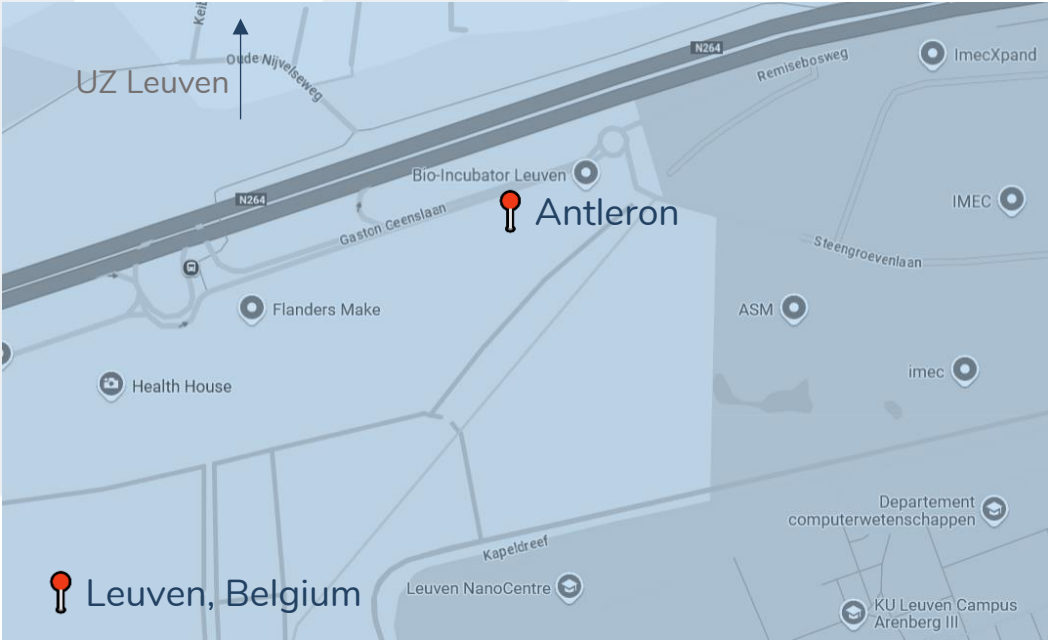
Where Are You in Your MSC Journey?



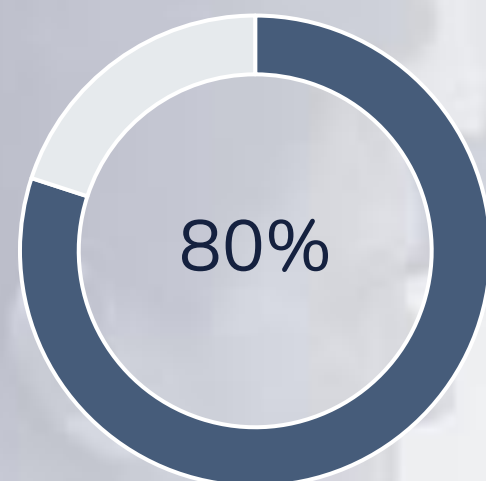
Whether you're scaling from research to GMP or troubleshooting a stalled manufacturing process, Antleron can help you **design, optimize, and derisk** your MSC strategy.

Let's start with a conversation. Contact us for a free consultation or to schedule a discovery workshop.

**Request
Consultation**

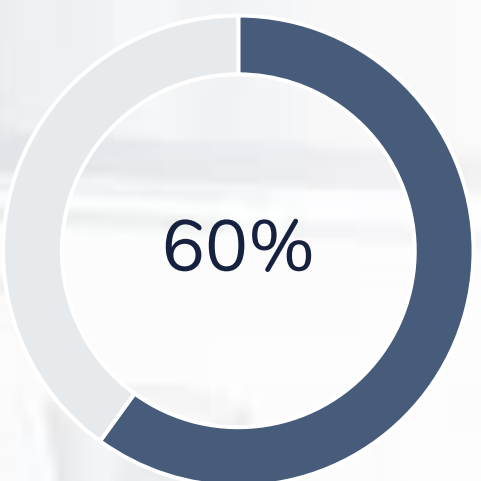


Why Partner with Antleron for Your MSC Development



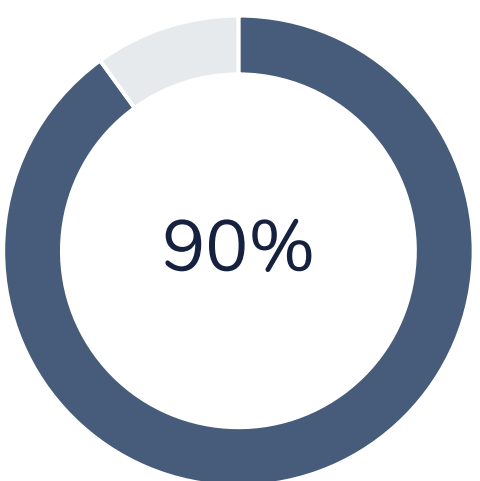
Time Savings

Reduce development timelines by leveraging our established protocols and expertise.



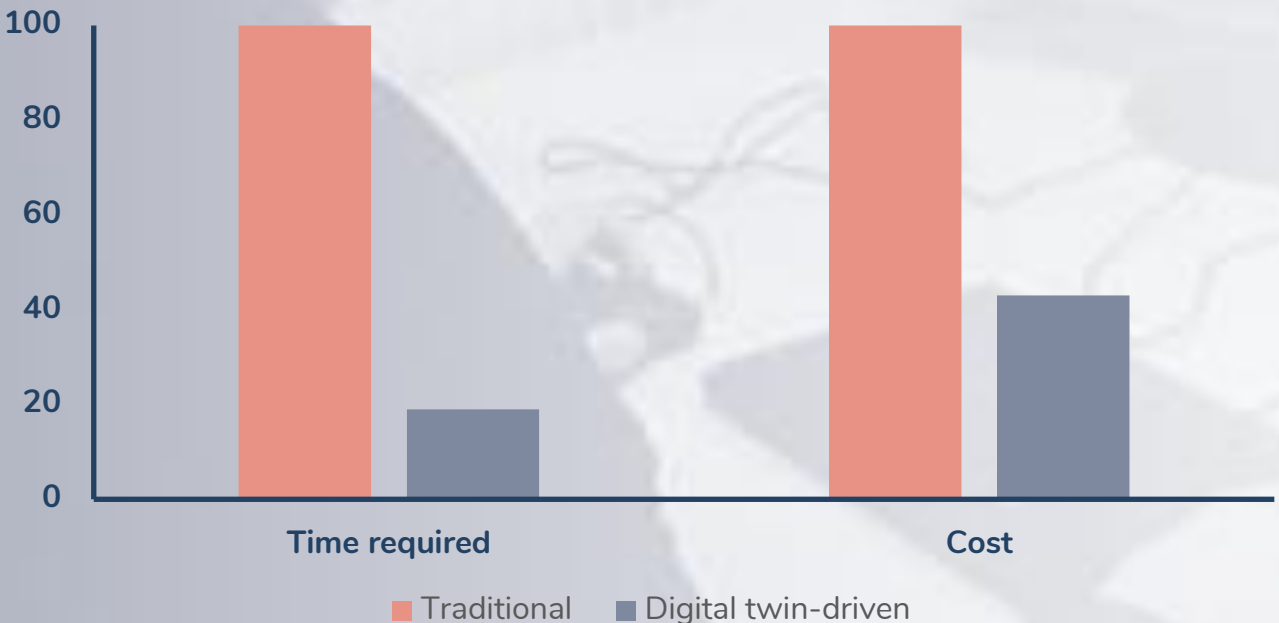
Cost Reduction

Lower overall development costs through optimized processes and reduced material waste.



Success Rate

Our clients achieve significantly higher success rates in transitioning from 2D to 3D, and, to the next stage of development.



The Antleron Advantage

Our integrated approach delivers measurable improvements across all critical aspects of MSC manufacturing. By combining biological expertise with engineering innovation and digital monitoring, we create robust processes that meet both scientific and regulatory requirements.

Partner with us to transform your promising research into clinically-ready cell therapy products.



Proven impact in MSC Bioprocessing

Increased **10x**
MSC-based product
yield for customer

>500k MSCs/cm²
in our custom fixed-
beds

Over **30x** expansion
fold in 9 days of
culture

Scalable seed
trains for MSC-based
bioprocesses

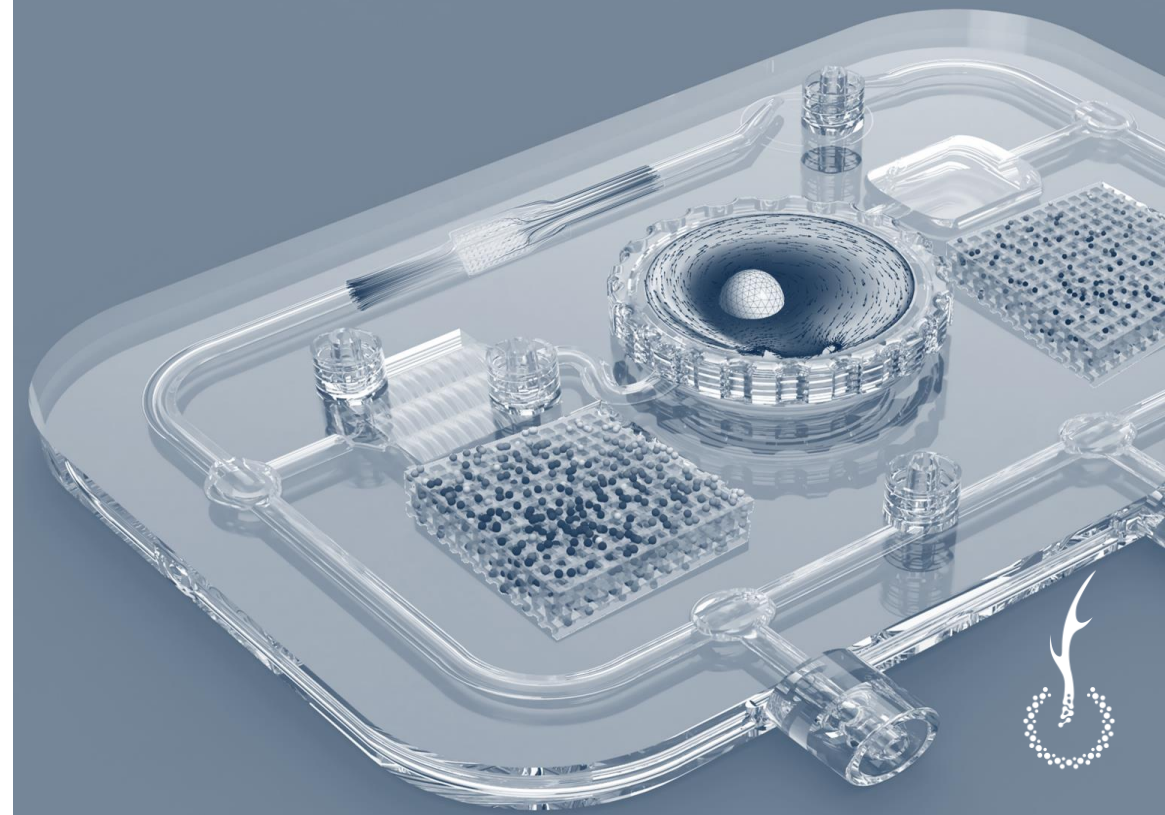
88M MSCs
produced in high-
throughput, R&D
scale bioreactors

>95% cell viability
after harvest

Cell growth



Time



The Discovery Workshop: Your MSC Roadmap



Our 60 minutes discovery workshop creates a structured pathway to transform your MSC challenges into actionable solutions.

[Schedule your
Workshop](#)

[Learn More](#)





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Enable living therapies

Turn cells into personalized therapies, tissues and organs

