



Huachenbio -- Your Professional Choice!

- ⊕ Engineered Flexible Porous Gelatin (Pharmaceutical Grade)
- ⊕ Irradiated, Closed-Process, Ready-to-Use
- ⊕ Spherical, Uniform in Size, Fragment-Free
- ⊕ Gentle 20-Minute Dissociation with Specialized Formulation
- ⊕ Achieves 10B Cells in 10L and 50B Cells in 50L Bioreactors With Lower Carrier Consumption
- ⊕ Higher Seeding Density · Higher Yield per Carrier
- ⊕ Smaller Cell Size than Comparable Products
- ⊕ Larger Surface Area for Higher Fold Expansion
- ⊕ Direct Seeding with DMSO-Preserved Cells



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WeChat ID for Inquiries

3D StarPore® Max

第二代Max微载体

3D StarPore gelatin dissolvable porous microcarrier for cell culture

Product Description

3D StarPore® Max Microcarriers

3D StarPore® Max Microcarriers are independently developed and manufactured by Huachen Bio specifically for high-yield suspension culture of various animal cells—including mesenchymal stem cells, 293 cells, Vero cells, and more—with culture volumes ranging from a few milliliters to several hundred liters.

Featuring excellent surface properties and a density slightly greater than water, these microcarriers are designed with a flexible porous structure made of gelatin, with particle sizes ranging from 200-350 µm. Each product specification is supplied with a defined weight, pre-sterilized and ready for immediate use.



Advantages of Microcarrier Culture

Increased Productivity: The microcarrier system offers an extremely high surface area-to-volume ratio, enabling high cell yields without the need for large-volume equipment or labor-intensive methods. Compared to other monolayer culture systems, microcarrier culture requires significantly less space to produce equivalent quantities of cells or cell-derived products.

Protection from Physical and Chemical Stress: Macroporous microcarriers shield cells from shear stress caused by impeller agitation, particularly during large-scale culture. This protective effect also allows for oxygenation using pure oxygen micro-bubbles.

Reduced Medium Consumption: Lower medium requirements translate into significant cost savings in cell culture processes.

Reduced Labor Requirements: By enabling high-density culture in smaller volumes, microcarrier systems reduce the need for large culture vessels. Cell harvesting is simplified: after stopping agitation, microcarriers with attached cells settle by gravity, allowing easy removal of the supernatant.

Lower Contamination Risk: Microcarrier culture minimizes the number of handling steps, substantially reducing the risk of contamination.

Product Features

3D Biomimetic Porosity

The porous structure provides a biomimetic environment for three-dimensional cell growth, while offering ample space for cell expansion.

High Porosity (>90%)

High Accessible Surface Area with >90% Porosity. The optimized surface characteristics promote efficient cell adhesion and spreading.

20-Minute Complete Digestion

Gentle yet complete digestion in 20 minutes with our specialized dissociation solution.

High Seeding Density · High Yield

Supports high-density seeding, enabling higher cell yield per unit of carrier, while achieving smaller cell diameter compared to competing products.

Direct Seeding with DMSO

Supports Direct Seeding with DMSO - Containing Cells Post-Thaw - No Seed Preparation Required.

Shear-Protective Structure

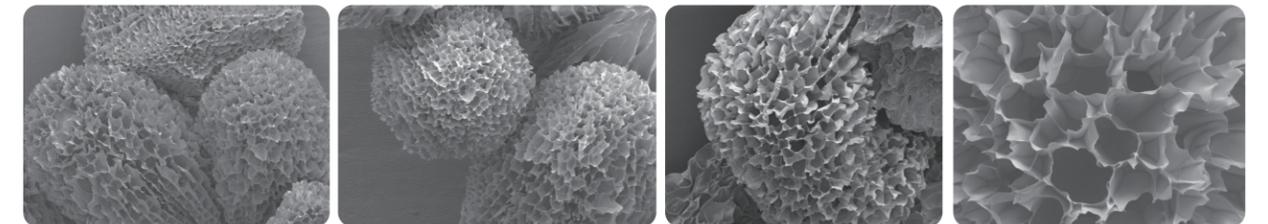
High Shear Tolerance with Porous Protection. The porous structure shields cells from shear stress while maintaining structural integrity under high-agitation conditions.

GMP-Compliant Excipients

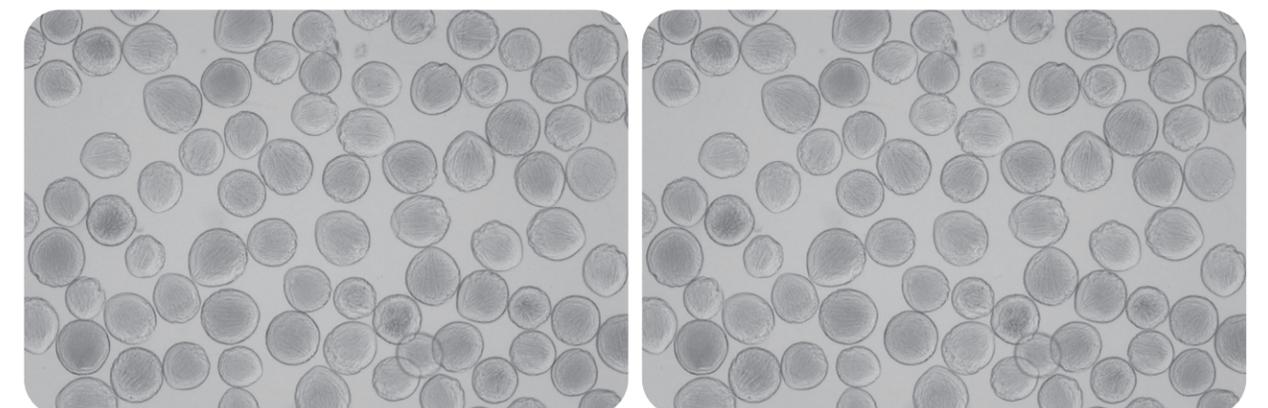
All raw materials are derived from pharmaceutical-grade excipients and manufactured under GMP conditions.



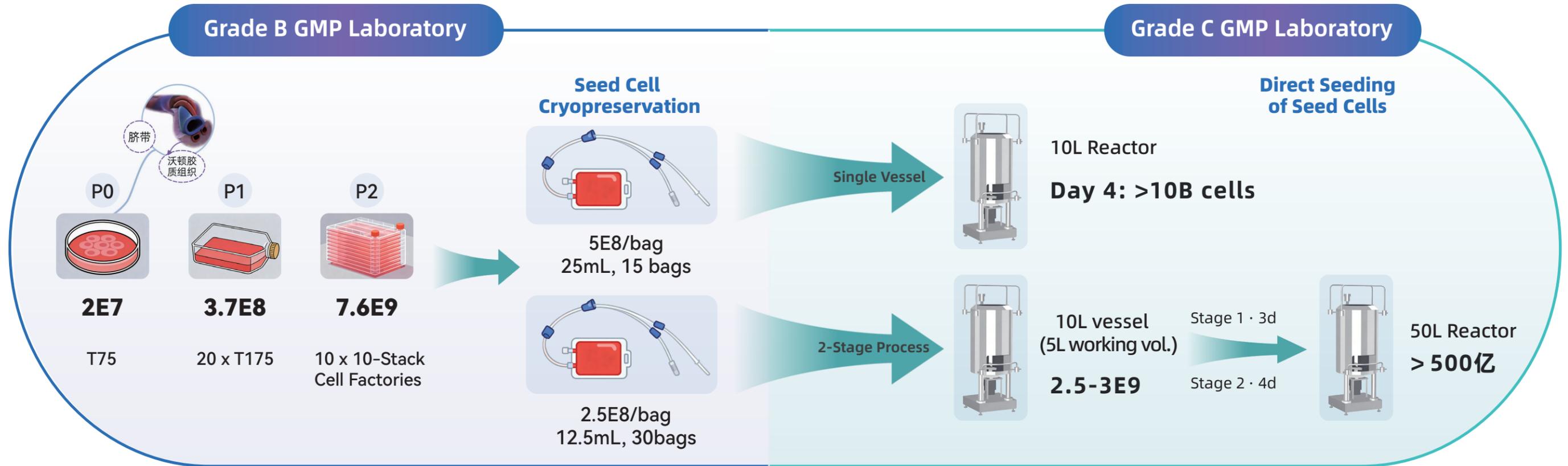
SEM Image of Max Microcarriers



Morphology of Hydrated Microcarriers

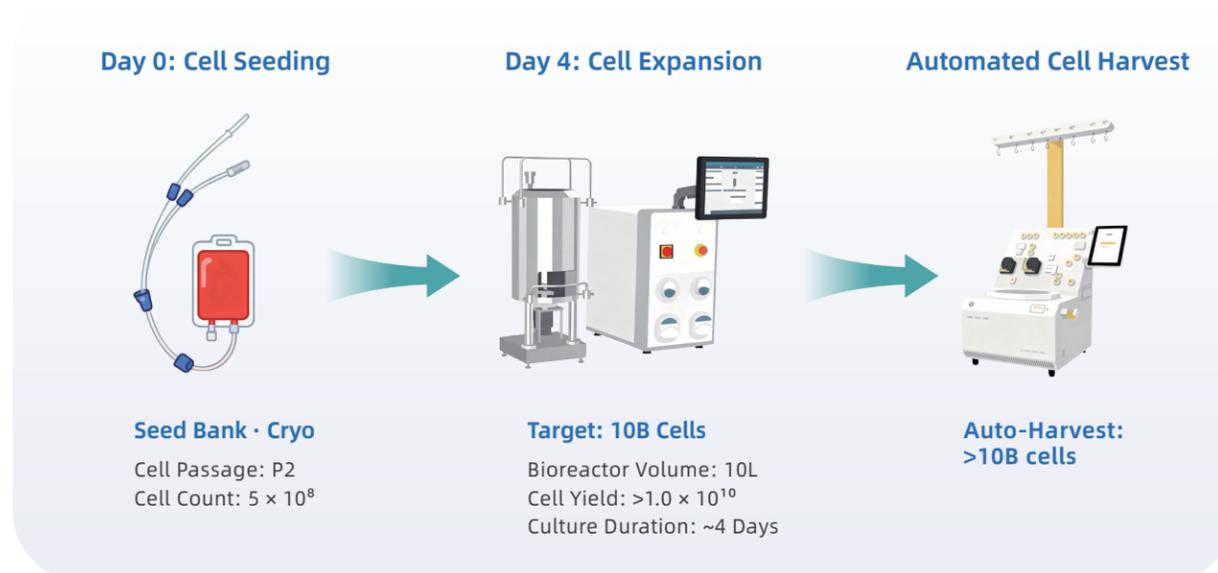


Huachen 3D Large-Scale Culture Solutions



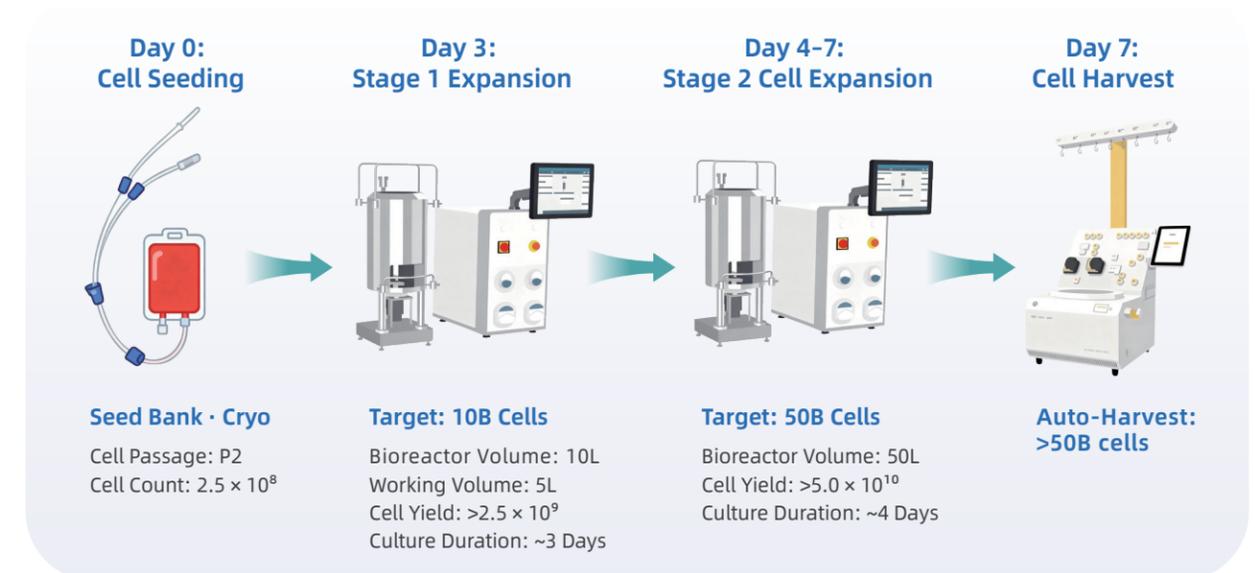
Single-Stage Process

10L Single-Use Bioreactor Solution 10 Billion Cells · Ideal for IND-Enabling Studies



Two-Stage Process

50L Single-Use Bioreactor Solution 50 Billion Cells · Designed for Commercial Manufacturing



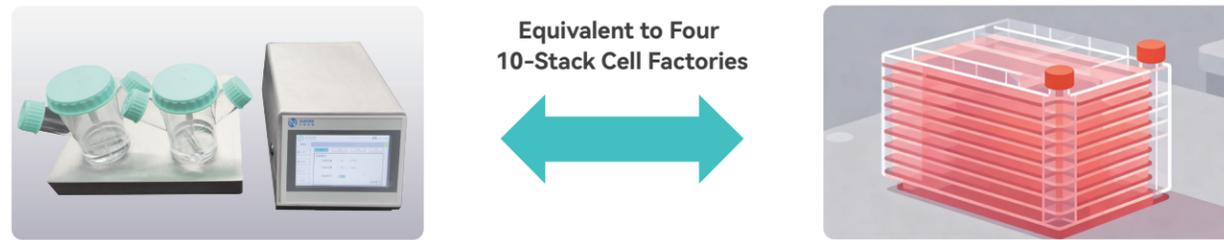
3D StarPore®Max Large Health Spinner Flask System

500mL Spinner Flask, One StarSpan™ Mini Bioreactor

4 Flask Positions, with a Maximum System Volume of 2L at a Time

One 500mL spinner flask can hold a 400mL culture system, with an inoculation density of 2g/L (total 0.8g) and 4×10^7 cells inoculated. After 20-fold expansion, 8×10^8 cells can be harvested from a single flask in 4 days, which is equivalent to one 10-layer cell factory. One mini bioreactor can harvest 3.2×10^9 cells at a time, equivalent to four 10-layer cell factories.

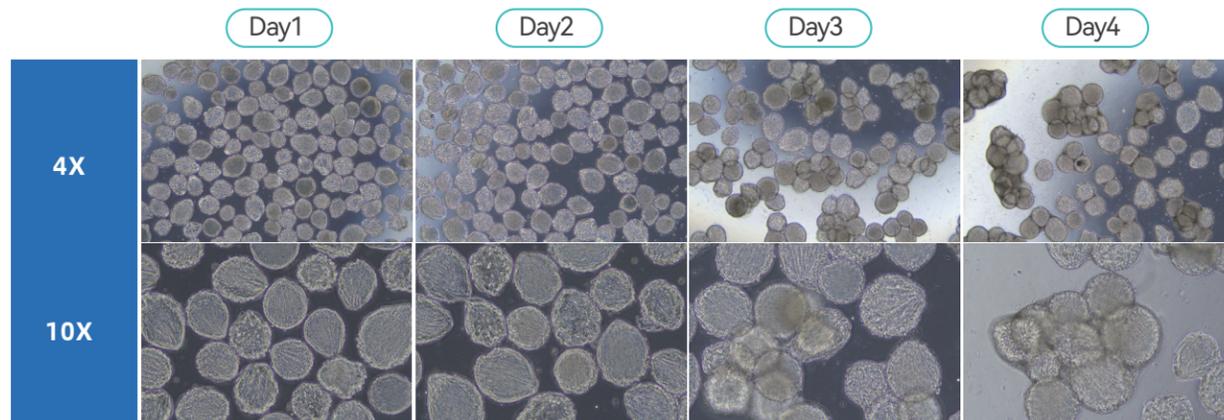
Reduce incubator occupancy rate, labor input, and cell processing workload.



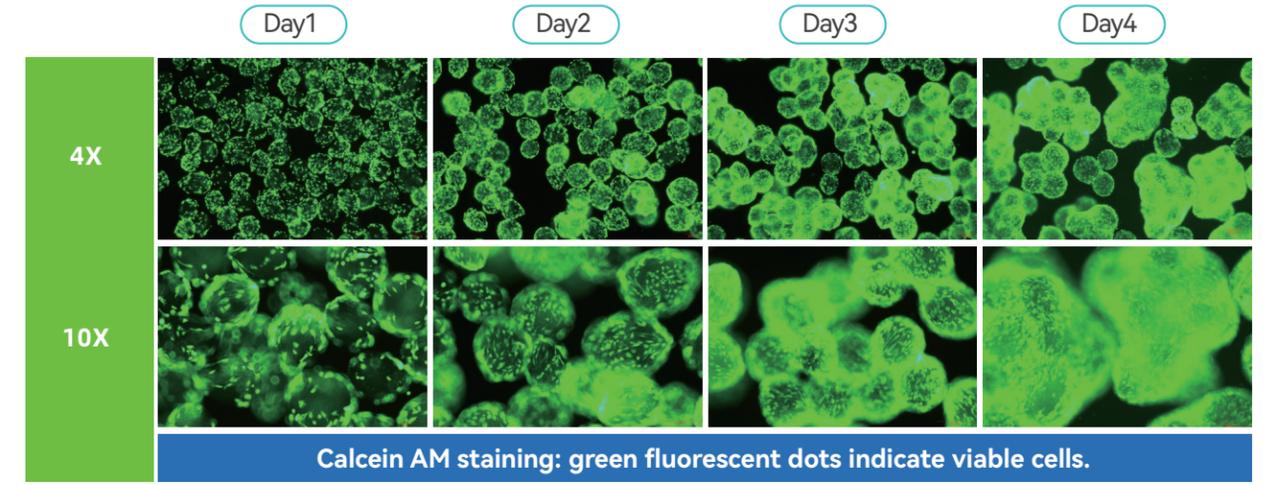
10L Bioreactor Cell Harvest Parameters

Time	Vessel	Procedure	Cell Count	Viability	Expansion Fold
D-3 UC06P2	Thaw / Tube	Thaw / Count	4.74E7	97.15%	/
D0 UC06P3	Cell Factory	Dissoc / Passage	6.00E8	97.82%	1x
D1	10L Bioreactor	Sample, Lyse & Count	10.585E8	98.30%	1.76x
D2	10L Bioreactor	Sample, Lyse & Count	26.125E8	98.45%	4.35x
D3	10L Bioreactor	Sample, Lyse & Count	99.83E8	98.16%	16.64x
D4	10L Bioreactor	Wash / Lyse / Count	121.76E8	97.64%	20.30x

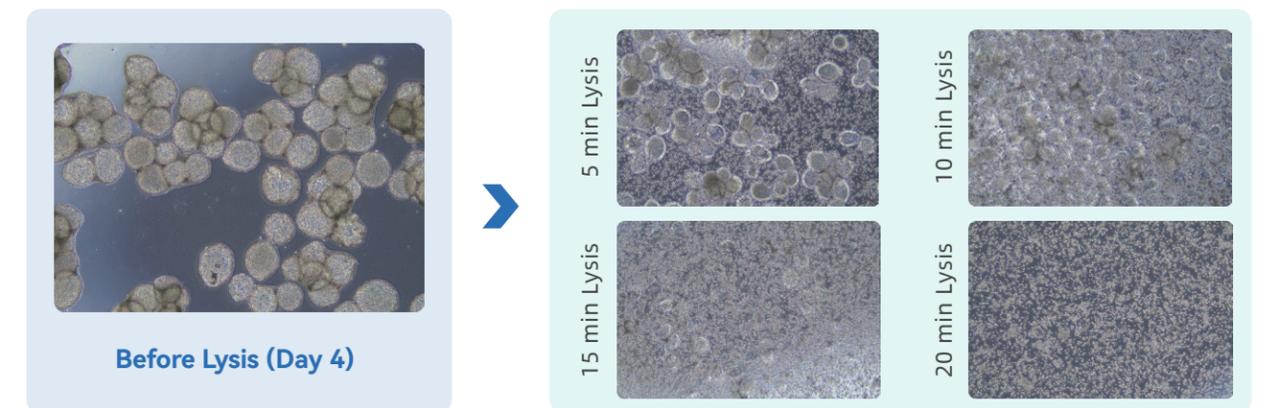
MSCs on 3D StarPore Microcarriers – Brightfield



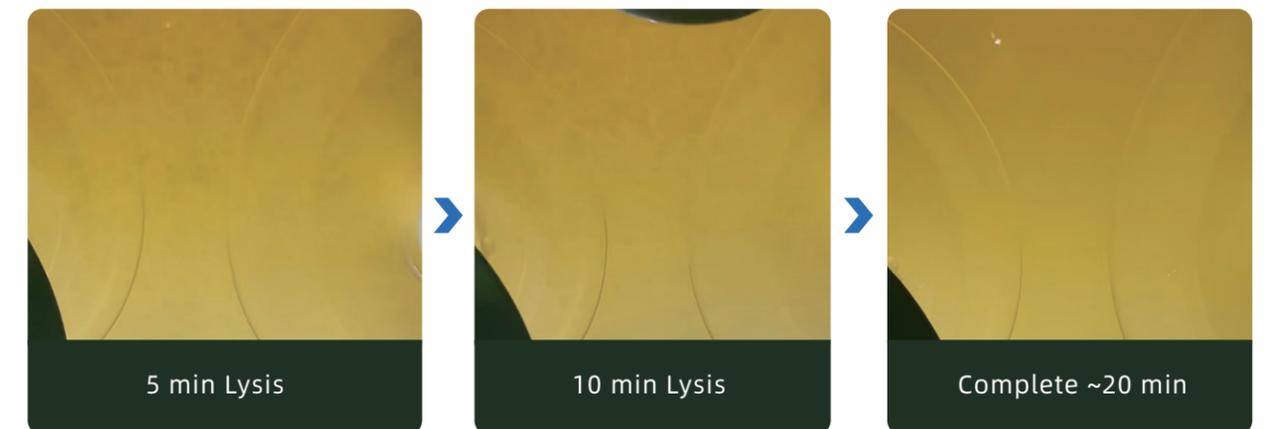
MSCs on 3D StarPore Microcarriers – Fluorescence



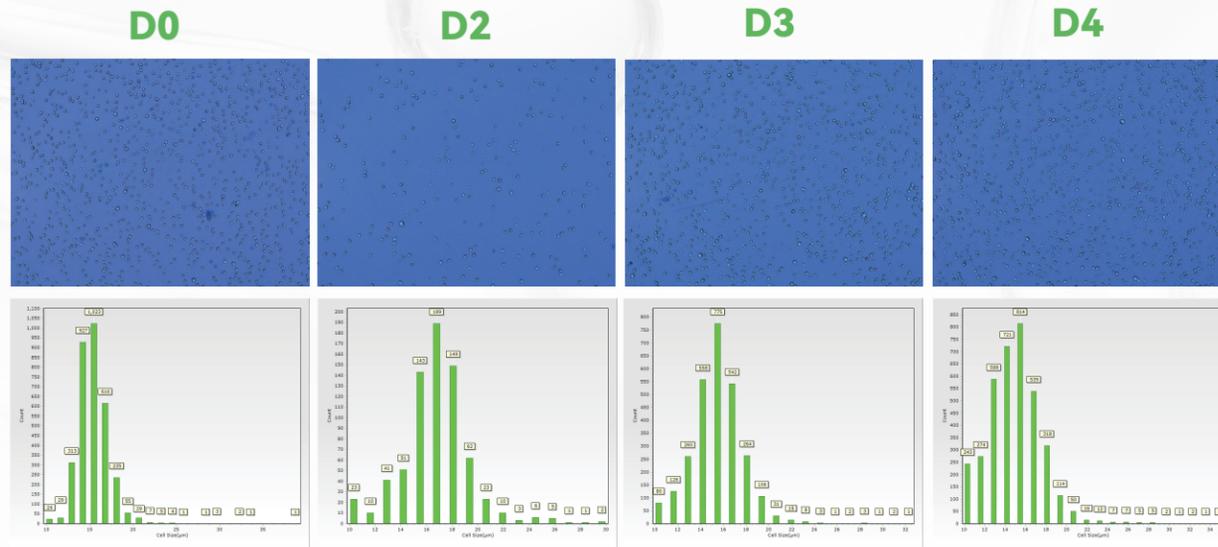
20-Minute Complete Microcarrier Digestion



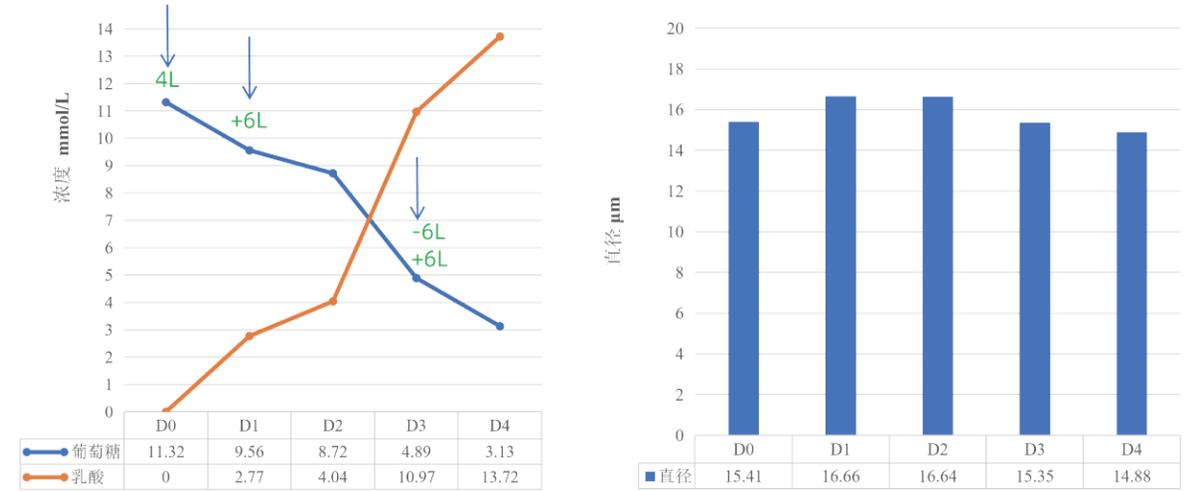
Day 4 Microcarrier Lysis & Harvest



Cell Counter Results



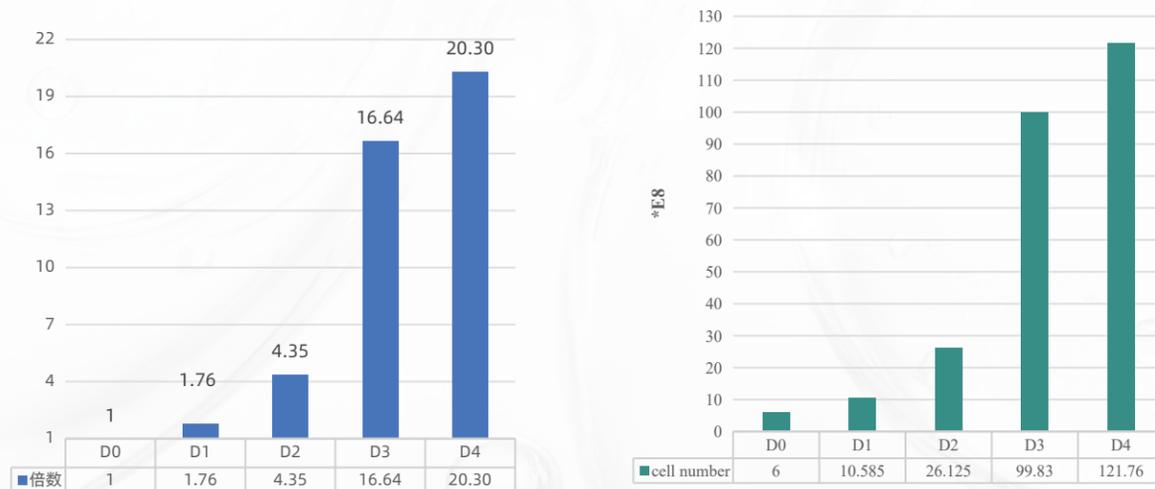
Metabolic Profile & Cell Size During Expansion



MSC Metabolism (10L)

Cell Diameter (10L)

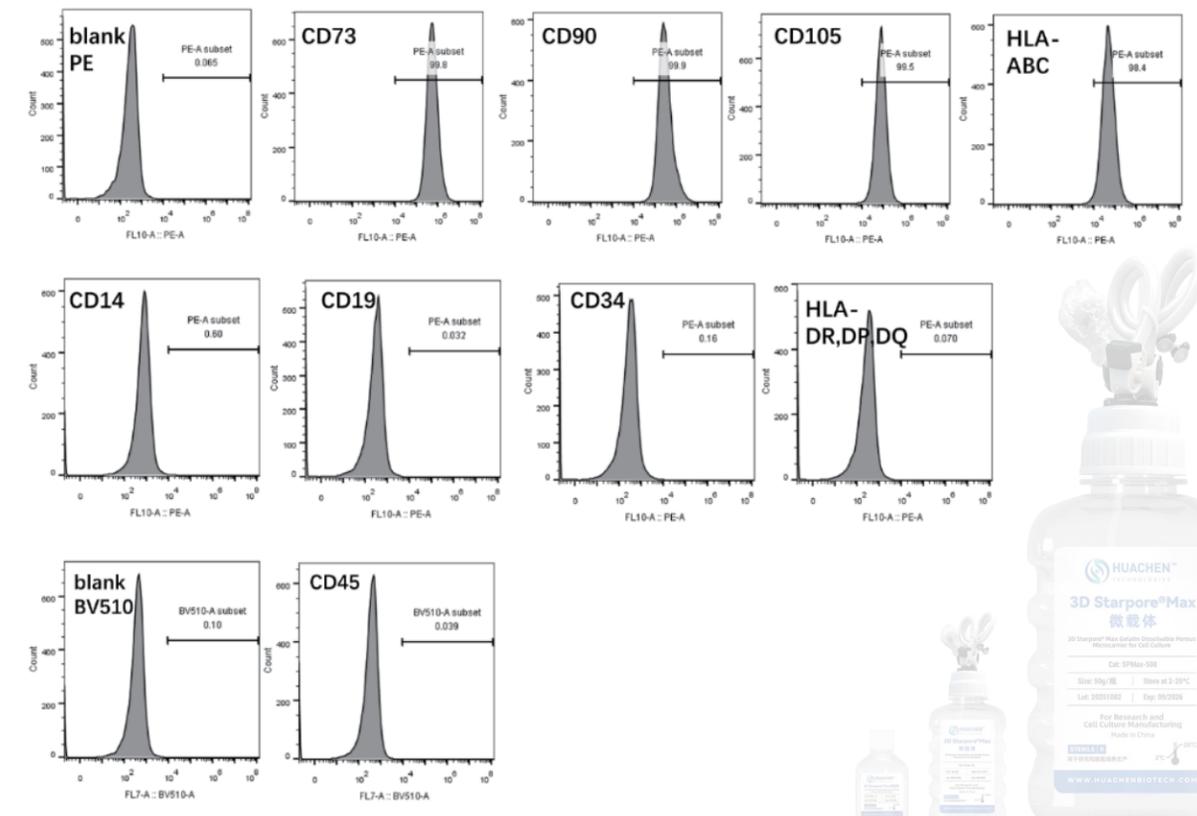
10L Bioreactor: Fold Expansion and Total Cell Yield



10L Fold Expansion

10L Cell Count

Quality Control Flow Cytometry Analysis of Stem Cell Surface Markers



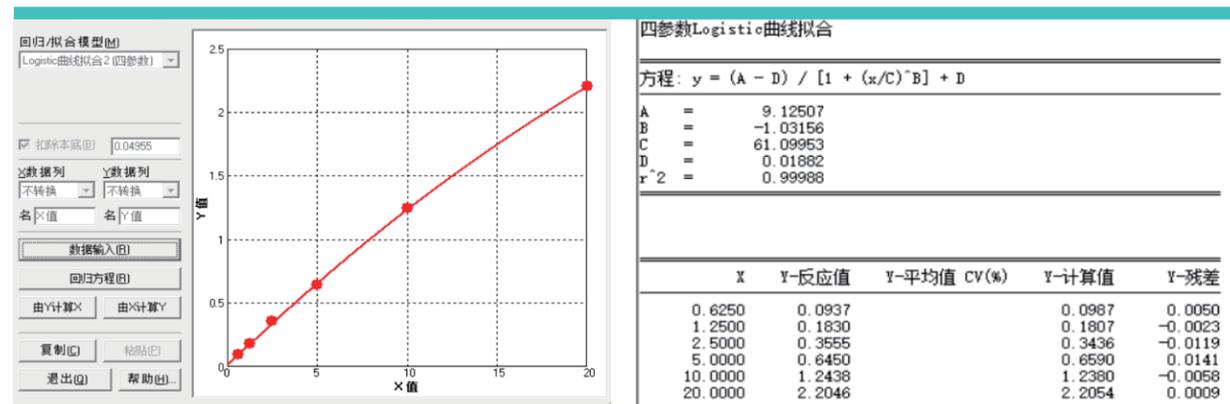
Quality Control

Biochemical Analysis of Microcarrier Dissociation at Day 4

Residual microcarriers were detected in the supernatant after the first and second PBS washes. Following the second wash, residuals met acceptance criteria, with two centrifugation cycles sufficient to reduce microcarrier carryover to below the detection limit.



Microcarrier residue in the first wash supernatant: 152.7 µg/mL.
The absorbance reading for the second wash supernatant was negative, below the blank value.
This confirms that the washing procedure meets the required specifications.

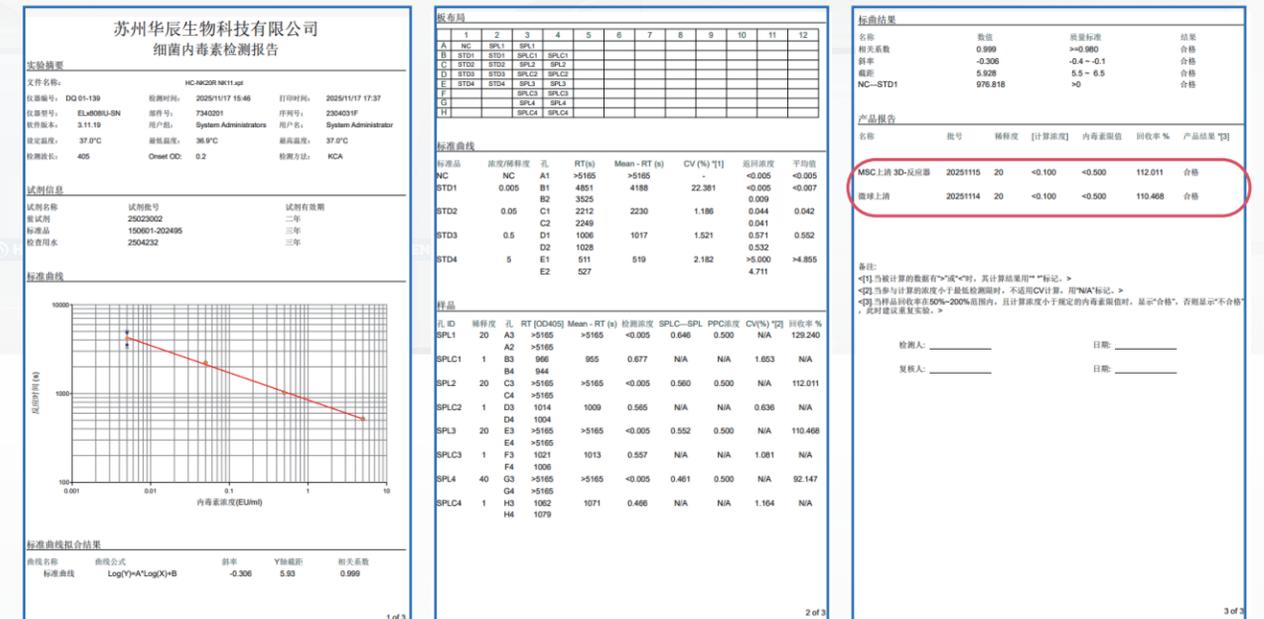


样本 (ng/ml)	OD值 (450nm-630nm)	浓度 (ng/ml)
20	2.2541	
10	1.29335	
5	0.6945	
2.5	0.40505	
1.25	0.2325	
0.625	0.14325	
0	0.04955	
first上清	0.65605	4.574
second上清	0.071	未检出
冻存制剂	0.0455	未检出

ELISA Detection of Enzyme Residues in Final Formulation
Enzyme residues were measured in the supernatant lysis buffer after the first and second PBS washes of Day 4 cells. Following the second wash, residues in the final formulation met all acceptance criteria.

Endotoxin Testing in Cell Culture Supernatant

Endotoxin testing of Day 3 and Day 4 cell culture supernatants, filtered through a 0.22 µm membrane, showed results <0.1 EU/mL in all samples.



Results & Conclusions

Test Results

Cell Culture (2D Planar): Ten-layer Cell Factory culture showed normal growth, with a viability of 97.82%. Cell count met the requirements for bioreactor inoculation.

Cell Harvest (3D 10L Bioreactor): After 3 days of culture, cell count reached 9.983 billion, with a 16.64-fold expansion and 98.16% viability. After 4 days of culture, cells were washed with PBS, followed by microcarrier dissociation using lysis solution. A total of 12.18 billion cells were harvested, achieving a 20.3-fold expansion and 97.64% viability. The average cell diameter was 14.88 µm, meeting all acceptance criteria for harvest.

Cell Quality Control: Day 4 harvested cells were washed and cryopreserved. Residue testing for microcarriers and lysis solution in both the second wash and final cryopreservation formulation passed all specifications.

Cell Quality Control (Endotoxin): Endotoxin level in the Day 4 culture supernatant was <0.25 EU/mL, demonstrating an ultra-low endotoxin level throughout the entire culture system.

Conclusion

Cell Culture: Cell expansion fold (>20-fold by Day 4), cell count, and viability all met required specifications.

Cell Harvest: Cell viability (>95%) complied with acceptance criteria.

Cell Quality Control: Endotoxin levels and residue testing met all required specifications.