SperiMesen™ CD

Human MSC Expansion Medium

Chemically Defined, Ready-to-Use, Exosome-Depleted Formula

Product Technical Brochure | SPERIKON Life Sciences

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Product Overview

SperiMesen™ CD Human MSC Expansion Medium is a chemically defined (CD), ready-to-use, serum-free medium specifically designed for the establishment and efficient expansion of human mesenchymal stem cells (MSCs) from multiple sources. This advanced formulation completely eliminates xenogeneic animal components, human serum, and blood-derived supplements such as platelet lysate (hPL) or AB plasma.

The medium optimally maintains MSC biological characteristics and multi-lineage differentiation potential. Notably, SperiMesen™ CD is a true exosome-depleted medium, providing an exceptionally clean platform with minimal endogenous exosome background for high-quality exosome collection and downstream therapeutic applications.

Chemically Defined	**Xeno-Free**	**Exosome-Depleted**
100% CD formulation	No animal components	Clean background
Ready-to-Use	**2-8°C Storage**	**Clinical Grade**
No additives needed	No freeze-thaw	ISO 13485/cGMP

Key Features & Advantages

- **Truly Chemically Defined:**Every component is fully identified and quantified — no undefined or animal-derived ingredients.
- **Xeno-Free & Serum-Free:**Completely free of xenogeneic animal components, human serum, platelet lysate, and AB plasma.
- **Ready-to-Use Convenience:**No additives, supplements, or reconstitution required. Store at 2-8°C — no freeze-thaw cycles.
- **Exosome-Depleted Formula:**Minimal endogenous exosome background for clean exosome harvest and therapeutic-grade quality.
- **Stemness Preservation:**Maintains high expression of CD73/CD90/CD105 (≥ 95%) with CD34/CD45 negativity (≤ 2%).
- **Trilineage Differentiation:**Complete retention of adipogenic, osteogenic, and chondrogenic differentiation potential.
- **3D Bioreactor Compatible:**Supports fixed-bed bioreactor culture for up to 18 days with sustained high cell viability (≥ 90%).

- **Clinical-Grade Pathway:**Manufactured under ISO 13485 and cGMP quality systems. Supports clinical regulatory filing.
- **Phenol Red-Free Option:**Available with or without phenol red indicator to suit your assay requirements.

Product Specifications

Cat. No.	Product Name	Size	Storage
SP04005	SperiMesen™ CD Human MSC Expansion Medium (with Phenol Red)	500 mL	2-8°C
SP04006	SperiMesen™ CD Human MSC Expansion Medium (w/o Phenol Red)	500 mL	2-8°C

Storage Conditions: 2-8°C, protected from light. Shelf life: 12 months unopened; use within 1 month after opening for optimal performance.

Performance Validation

SperiMesen™ CD has undergone comprehensive multi-dimensional validation to ensure consistent performance across critical quality attributes for MSC culture and exosome production.

Cell Morphology & Proliferation

MSCs (Passage 2, seeded at 8,000 cells/cm²) cultured in SperiMesen™ CD exhibit typical spindle-shaped fibroblast-like morphology at 48h and 72h. The expansion rate closely matches the 5% PL positive control and significantly outperforms leading imported competitor media. The growth curve demonstrates robust and consistent proliferation over 4 days.

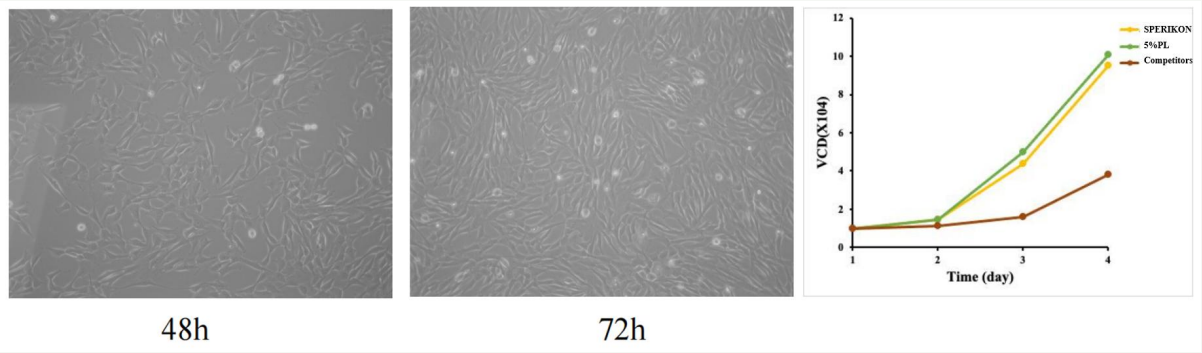
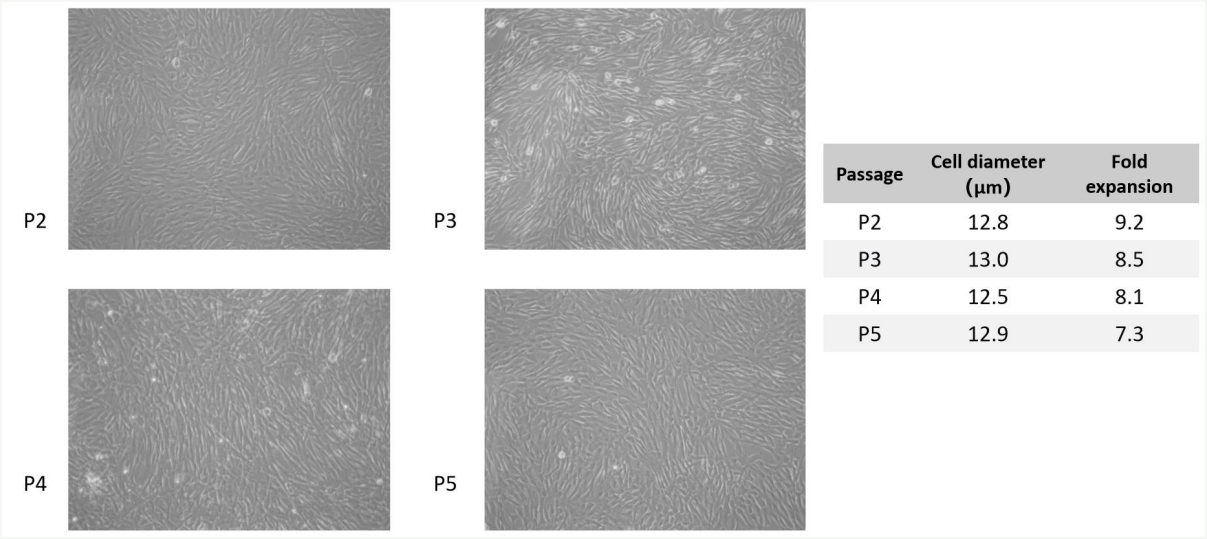


Figure 1: MSC morphology at 48h and 72h (left), and proliferation curve over 4 days (right). SperiMesen™ CD (green) matches 5% PL performance (yellow) and exceeds competitor (red).

Continuous Passage Stability

Continuous passaging from P2 to P5 demonstrates stable cell morphology with uniform size distribution. Cell diameter remained consistent at 12.5-13.0 µm across all passages, with expansion fold maintaining at 7.3-9.2, indicating highly consistent proliferative performance throughout long-term subculture.



Passage	Cell diameter (µm)	Fold expansion
P2	12.8	9.2
P3	13.0	8.5
P4	12.5	8.1
P5	12.9	7.3

Figure 2: MSC morphology and cell diameter analysis across P2-P5 in SperiMesen™ CD.

Stem Cell Marker Analysis

Flow cytometry analysis confirms that MSCs cultured in SperiMesen™ CD maintain high expression of positive markers CD44 (≥ 99%), CD73 (≥ 99%), and CD90 (≥ 98%), while negative markers CD34 (≤ 0.1%), CD45 (≤ 0.1%), and CD19 (≤ 0.1%) remain below the threshold. Results are comparable to or better than both 5% PL and optimized PL media controls.

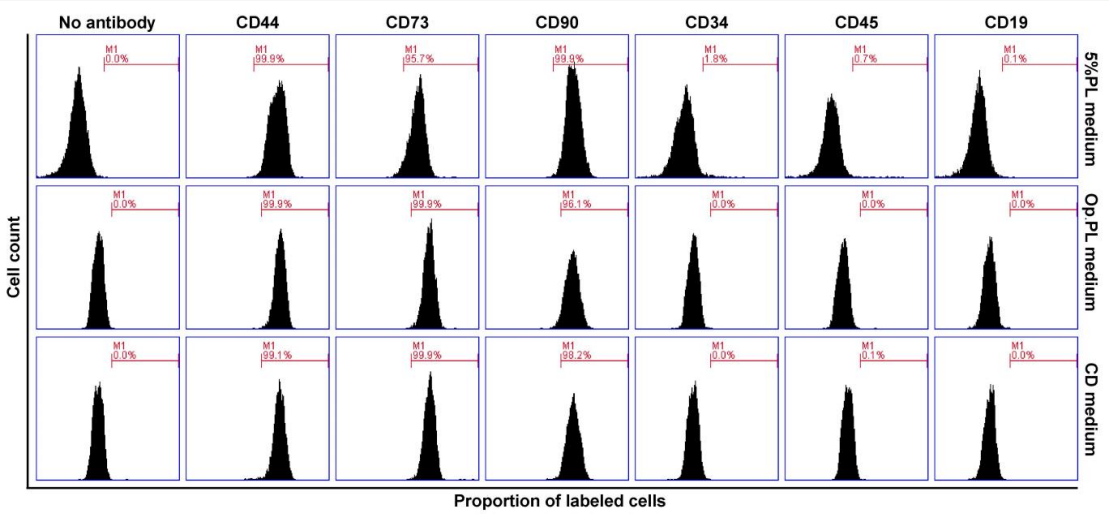


Figure 3: Flow cytometry analysis of MSC surface markers. All three media conditions (5% PL, Op.PL, and SperiMesen™ CD) demonstrate consistent positive and negative marker profiles.

Trilineage Differentiation Potential

SperiMesen™ CD preserves the full trilineage differentiation capacity of MSCs. EdU proliferation assays show robust cell division (left panel). Beta-galactosidase senescence staining confirms minimal cellular aging even at Passage 10 (center). Oil Red O (adipogenic), Alcian Blue (chondrogenic), and Alizarin Red (osteogenic) staining all demonstrate successful differentiation across all three media conditions (right panel).

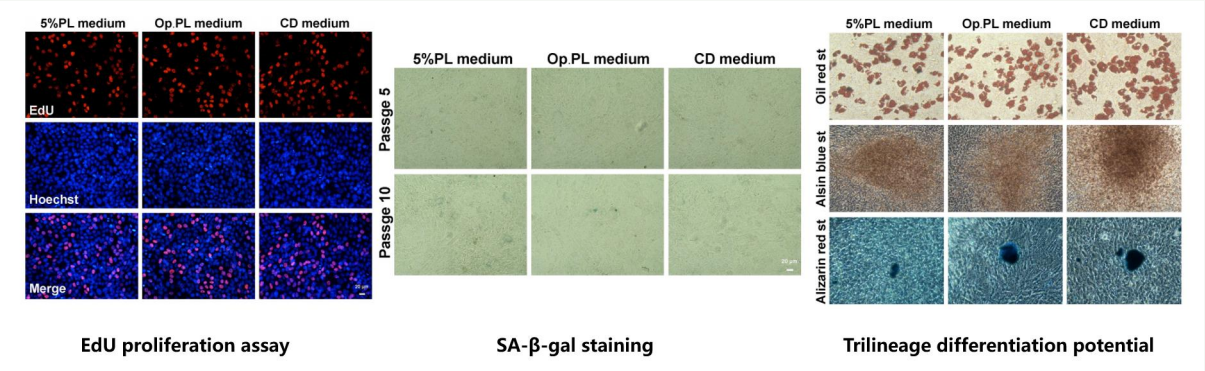


Figure 4: EdU proliferation assay (left), senescence staining (center), and trilineage differentiation staining (right) for 5% PL, Op.PL, and SperiMesen™ CD media.

Karyotype Analysis

Karyotype analysis performed on MSCs cultured in SperiMesen™ CD confirms normal diploid chromosome structure with no chromosomal abnormalities, deletions, or translocations. The stable genetic profile ensures the safety of expanded MSCs for therapeutic applications.

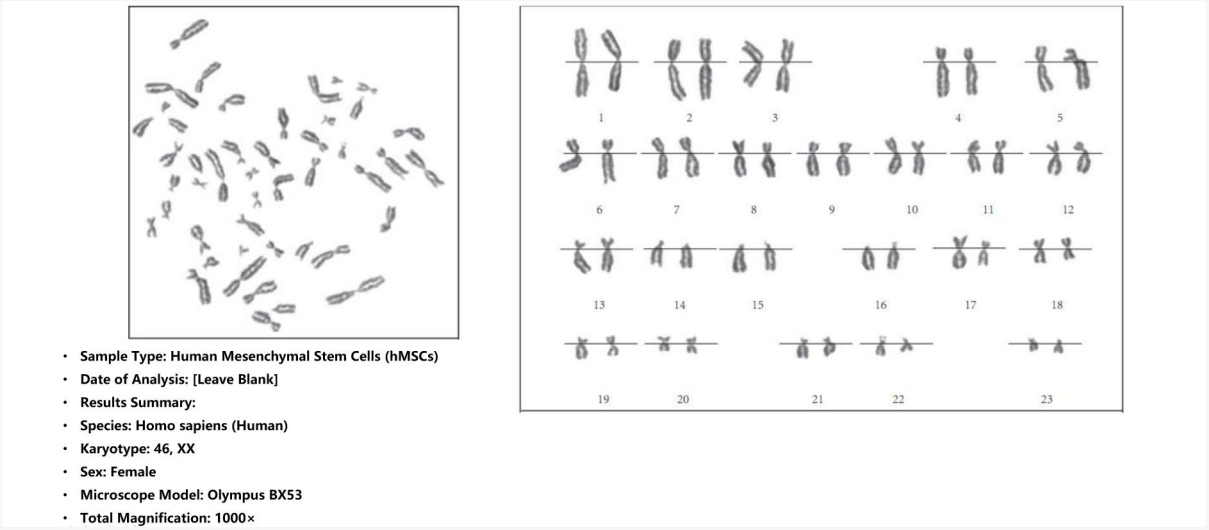


Figure 5: Representative karyotype of MSCs after culture in SperiMesen™ CD, showing normal chromosome complement.

Exosome Production & Characterization

SperiMesen™ CD's exosome-depleted formulation enables clean exosome harvest from MSC-conditioned medium. TEM imaging reveals typical cup-shaped bilayer membrane vesicles. NTA analysis confirms uniform particle size distribution with peak diameters consistent across all conditions. Western blot analysis shows strong positive expression of exosome markers CD9, CD63, CD81, and TSG101, with minimal β-Actin background, confirming high exosome purity.

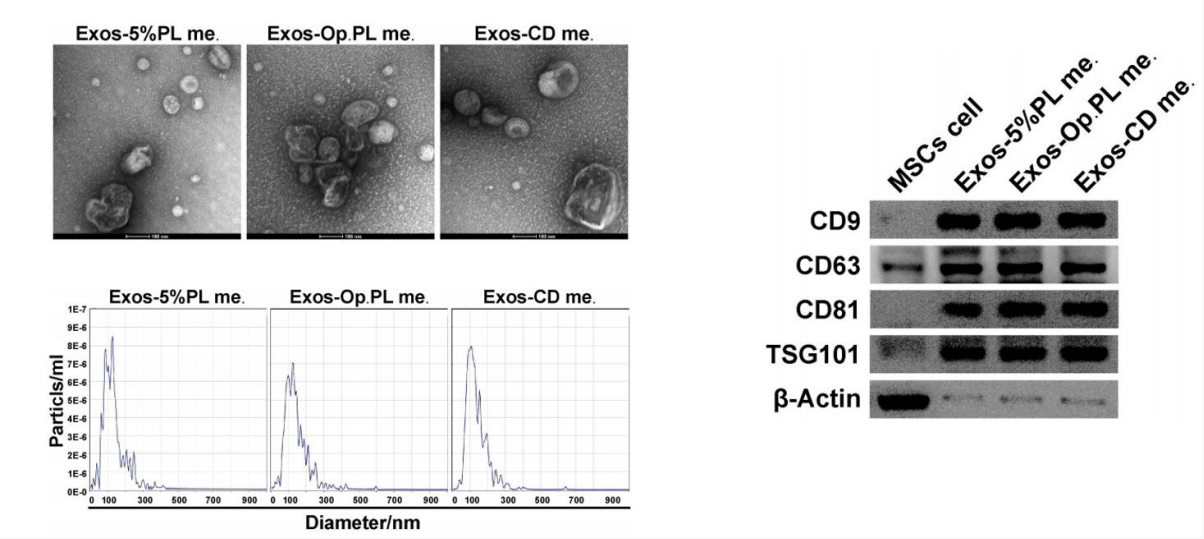


Figure 6: Exosome characterization: TEM morphology (top left), NTA size distribution (bottom left), and Western blot marker analysis (right) for exosomes harvested from MSCs cultured in SperiMesen™ CD.

Exosome Functional Assays

Exosomes derived from SperiMesen™ CD-cultured MSCs demonstrate potent biological activity. Fluorescence imaging shows efficient cellular uptake by keratinocytes, fibroblasts, AECII cells, and macrophages (top). Tube formation assays using HUVECs confirm strong pro-angiogenic activity comparable to 5% PL-derived exosomes (bottom). These results validate the therapeutic potential of exosomes produced using SperiMesen™ CD.

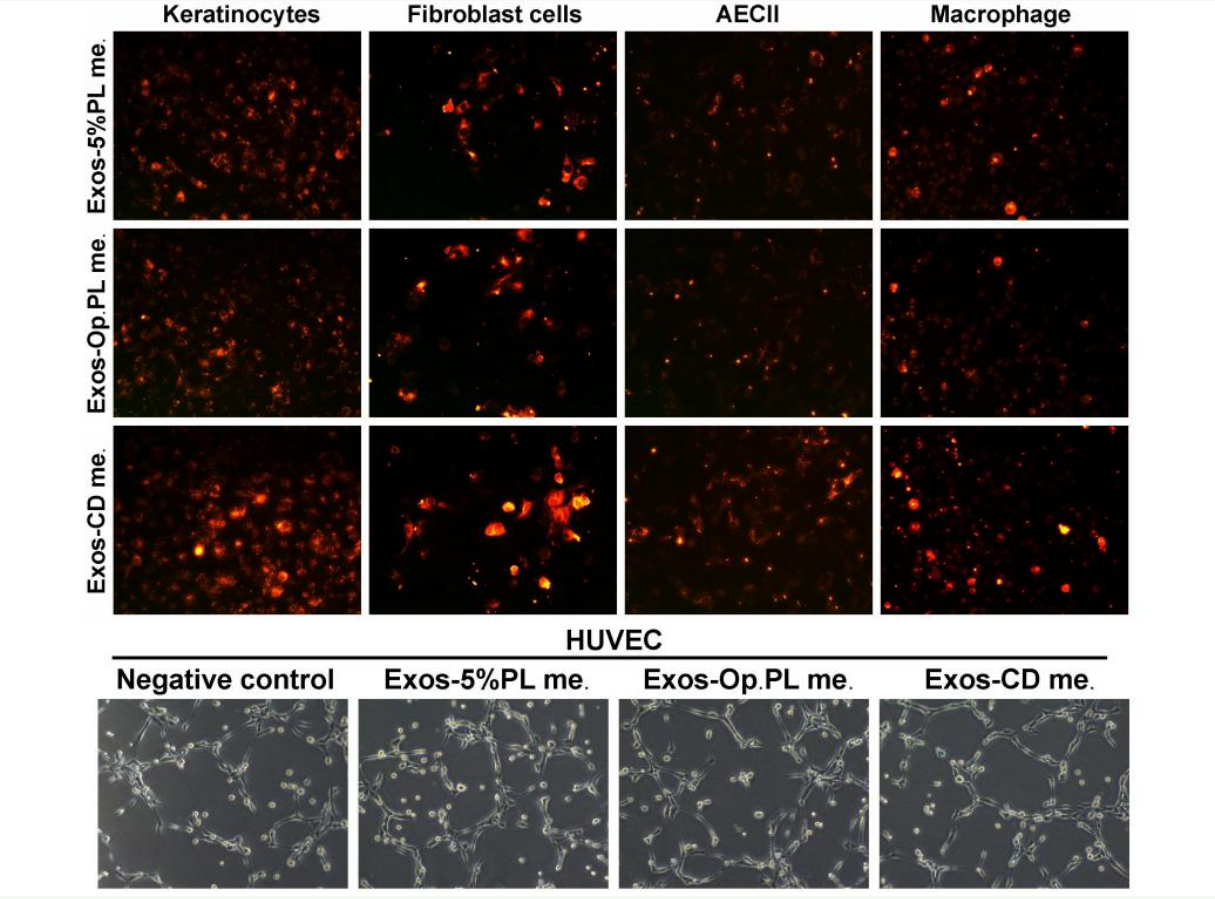


Figure 7: Exosome functional validation: cellular uptake by multiple cell types (top) and HUVEC tube formation assay (bottom).

Quality & Regulatory Compliance

SperiMesen™ CD is manufactured under stringent quality management systems to meet the demands of both research and clinical applications:

•ISO 9001 Quality Management System certified

•ISO 13485 Medical Device Quality Management System certified

•Manufactured in GMP-grade cleanroom facilities

•Comprehensive Certificate of Analysis (CoA) provided per lot

•Detailed Xeno-Free Statement available

•Safety compliance data and regulatory documentation provided

•Full traceability from raw materials to finished product

•Custom manufacturing and formulation services available

For clinical-grade applications, SPERIKON can provide equivalent media manufactured under cGMP with complete regulatory documentation packages to facilitate seamless translation from laboratory research to clinical manufacturing.

Ordering Information

Cat. No.	Product	Size
SP04005	SperiMesen™ CD Human MSC Expansion Medium (with Phenol Red)	100 / 500 mL
SP04006	SperiMesen™ CD Human MSC Expansion Medium (w/o Phenol Red)	100 / 500 mL

Related Products:

Cat. No.	Related Products	Size
SP00104	PBS, pH 7.4, Basic (1x)	500 mL
SP00213	Recombinant Trypsin-EDTA Solution	100 mL

For bulk orders, custom formulations, OEM partnerships, or technical consultation, please contact our sales team.

Technical Support: support@sperikon.com

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