

SERANA Human Blood By-products Report on Applications in Human Cell Culture

To whom it may concern:

The application of Serana's Human Blood by-products, including Human Male AB Serum Off the Clot, Human Male AB Serum Plasma-Derived, and different products of Human Serum Albumin in cell culture of different and variant cell lines has been reported in several dozens of publications in prestigious peer-reviewed journals. Please see the next pages as a sample of more recent papers and the used cell lines. Please do not hesitate to contact us if you may have questions regarding the usage of our products for any specific cell line.

Sincerely yours



Dr. Iman Kamranfar

Head of Quality
Serana Europe GmbH
Date: 02/10/2026

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HUMAN SERUM | CELL CULTURE

1. Endothelial and mesenchymal stromal/stem cells

Cells used:	Human umbilical vein endothelial cells (HUVECs); bone marrow-derived MSCs (BMSCs); adipose-derived stromal/stem cells (ASCs).
Product:	S-HUO-EU-011.
Application:	HUVECs: 2% human serum in EGM2. BMSCs and ASCs: 5% Serana human serum in α MEM.
Reference:	Miri Z, Laakkonen J, Toivonen E, Väljä N, Miettinen S, Vuorenpää H. Establishment of human-relevant in vitro models using animal-free serum replacement and recombinant antibodies. <i>Frontiers in Toxicology</i> . 2026;8:1741716.
Link:	https://doi.org/10.3389/ftox.2026.1741716

2. Adipose-derived stromal/stem cells in vascular models

Cells used:	Human adipose-derived stromal/stem cells (hASCs); study includes endothelial vascular co-cultures.
Product:	S-HU-EU-011.
Application:	hASCs expanded in α MEM supplemented with 5% Serana human serum before vascular co-culture experiments.
Reference:	Gering C, Parraga Meneses J, Vuorenpää H, Botero L, Miettinen S, Kellomäki M. Bioactivated gellan gum hydrogels affect cellular rearrangement and cell response in vascular co-culture and subcutaneous implant models. <i>Biomaterials Advances</i> . 2022;143:213185.
Link:	https://doi.org/10.1016/j.bioadv.2022.213185

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3. Peripheral blood mononuclear cells and CD8+ T cells

Cells used:	Human PBMCs used in hepatitis B virus-specific CD8+ T-cell experiments.
Product:	Serana Human serum; AB Male off-clot serum.
Application:	Isolated PBMCs resuspended in X-VIVO 15 medium supplemented with 5% Serana human AB off-clot serum.
Reference:	Shen Z, Wang X, Zhao J, et al. Functional Heterogeneity of Hepatitis B Virus-Specific CD8+ T Cells Mediates the Clinical Outcomes of Infection. <i>Frontiers in Bioscience–Landmark</i> . 2026;31(5):51459.
Link:	https://doi.org/10.31083/FBL51459

4. Human PBMCs culture

Cells used:	Human PBMCs
Product:	Serana Human serum, AB Male Plasma derived
Application:	α MEM supplemented with 5% Serana human serum.
Reference:	UPM Biomedicals. Application Note 13.
Link:	https://www.upmbiomedicals.com/siteassets/documents/application-notes/application-note-gdxt-13.pdf

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5. Bone marrow-derived mesenchymal stromal/stem cells

Cells used:	Human BMSCs in a study comparing BMSC- and ASC-derived vascular networks.
Product:	Human serum AB Male Plasma derived
Application:	BMSC culture in α MEM supplemented with 5% human serum and basic fibroblast growth factor. Supplier alternatives prevent assigning all experiments specifically to Serana.
Reference:	Vasculogenic Potency of Bone Marrow- and Adipose Tissue-Derived Mesenchymal Stem/Stromal Cells Results in Differing Vascular Network Phenotypes in a Microfluidic Chip. <i>Frontiers in Bioengineering and Biotechnology</i> . 2022;10:764237.
Link:	https://doi.org/10.3389/fbioe.2022.764237

6. Adipose-derived stromal/stem cells and CD4 T-cell studies

Cells used:	Human adipose-derived mesenchymal stromal/stem cells (ASCs).
Product:	Serana Human serum, AB Male Plasma derived
Application:	ASC culture in α MEM with 5% human serum before assessment of immunomodulatory effects on CD4 T cells.
Reference:	Mahmoud M, Juntunen M, Adnan A, et al. Immunomodulatory Functions of Adipose Mesenchymal Stromal/Stem Cell Derived From Donors With Type 2 Diabetes and Obesity on CD4 T Cells. <i>Stem Cells</i> . 2023;41(5):505–519.
Link:	https://doi.org/10.1093/stmcls/sxad021

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7. Adipose-derived stromal/stem cells in cardiac models

Cells used:	Human ASCs; study also includes HUVECs and induced pluripotent stem cell-derived cardiomyocytes.
Product:	Serana human serum. AB Male Plasma derived
Application:	ASCs expanded in α MED with 5% human serum. This serum-use statement applies to ASCs and should not be extended to cardiomyocyte culture.
Reference:	Gellan gum-gelatin based cardiac models support formation of cellular networks and functional cardiomyocytes. Cytotechnology. 2024.
Link:	https://doi.org/10.1007/s10616-024-00630-5

8. Adipose-derived stromal/stem cells and endothelial cells

Cells used:	Human ASCs and fluorescently labelled HUVECs (GFP/RFP).
Product:	Serana human serum. AB Male Plasma derived
Application:	ASCs: 5% human serum. HUVECs: 2% human serum replacing FBS in EGM2. Vascular co-culture medium also contained 2% human serum.
Reference:	Barrier-free, open-top microfluidic chip for generating two distinct, interconnected 3D microvascular networks. Scientific Reports. 2024.
Link:	https://doi.org/10.1038/s41598-024-74493-3

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9. Adipose-derived stem cells on bioactive glass

Cells used:	Human adipose-derived stem cells (hASCs).
Product:	Serana Human serum, AB Male Plasma derived
Application:	hASCs cultured in α MEM supplemented with 5% human serum for studies of cell spreading and differentiation on modified bioactive glass.
Reference:	Concomitant silanization and controlled fibronectin adsorption on S53P4 bioactive glass enhances human adipose stem cells spreading and differentiation. Applied Surface Science Advances. 2024.
Link:	https://doi.org/10.1016/j.apsadv.2024.100635

10. Adipose-derived stem cells with biophotonic scaffolds

Cells used:	Human adipose-derived stem cells.
Product:	Human serum,
Application:	Cell culture in α MEM supplemented with 5% human serum.
Reference:	Ghanavati S, Opar E, Gobbo VA, et al. Novel 3D-Printed Biophotonic Scaffold Displaying Luminescence under Near-Infrared Light for Photopharmacological Activation and Biological Signaling Compound Release. Advanced Healthcare Materials. 2026;15(8):e02163. First published online 18 August 2025.
Link:	https://doi.org/10.1002/adhm.202502163

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HUMAN SERUM | ASSAY APPLICATIONS

11. Immune-cell flow cytometry

Cells used:	Human peripheral blood mononuclear cells (PBMCs), monocytes and T cells.
Product:	S-HU-EU-011; described as heat-inactivated human serum.
Application:	10% human serum used for blocking for 30 minutes on ice before flow cytometry. This reference supports assay use
Reference:	Jacobs MME, Maas RJF, Jonkman I, et al. Trained immunity is regulated by T cell-induced CD40-TRAF6 signaling. Cell Reports. 2024;43(9):114664.
Link:	https://doi.org/10.1016/j.celrep.2024.114664

12. Immune cells from hemodialysis patients and controls

Cells used:	Human PBMCs and monocyte–T-cell co-cultures.
Product:	S-HU-EU-011; described as heat-inactivated human serum.
Application:	10% human serum used for blocking for 30 minutes on ice before flow cytometry. This reference supports assay use; cell culture used FBS.
Reference:	Jonkman I, Jacobs MME, Helder LS, et al. Immune hyperactivity in hemodialysis patients is associated with interferon gamma-induced trained immunity. iScience. 2026;29(7):116496.
Link:	https://doi.org/10.1016/j.isci.2026.116496

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HUMAN SERUM ALBUMIN |

Cells used:	F9 and H9D8 cells.
Product:	Human serum albumin
Application:	Culture medium contained 0.002% human serum albumin.
Reference:	Targeting a cancer-specific LYPD3 glycoform for tumor therapy. <i>Frontiers in Drug Discovery</i> . 2023. This is an unconfirmed lead, not evidence of use of Serana HSA-001 or HSA-002.
Link:	https://doi.org/10.3389/fddsv.2023.1298916