Platelet Matrix: 3D Cell Culture System

Product Description

Stem cell expansion in standardized and animal-free conditions represents a major challenge for the production of cell therapy products. To date, many cell culture laboratories still use Foetal Bovine Serum (FBS), as a cell culture supplement. Replacing bovine serum with human Platelet Lysate (hPL) allows for expansion of stem cells without the risk of xenogeneic immune reactions or the potential for transmission of bovine pathogens.

Biomaterials have an impact on proliferation and differentiation of cell preparations. Stem cells are routinely cultured on conventional tissue culture plastic (TCP). In these dishes, plastic adherent cell growth is restricted to two dimensions and it occurs preferentially at the rim of colonies due to contact inhibition. Furthermore, adherent cells need to be loosened from the substrate for passaging – usually by enzymatic treatment with peptidases such as trypsin.

- Platelet Matrix is a lyophilized cell culture supplement derived from human Platelet Rich Plasma (PRP) which is subjected to a freeze-thaw process to induce growth factors release.
- Platelet Matrix is an innovative two-phase cell culture system for more standardized cell expansion protocol.
- Platelet Matrix provides a suitable 3D-matrix for cell culture that consists of the same components as the over-layered culture medium.
- Platelet Matrix offers a uniform distribution of growth factors throughout the cell culture system.
- Cells can grow in several layers at the interface layer which minimizes contact inhibition with any artificial biomaterials.
- The viscous consistency of Platelet Matrix enables non-enzymatic Passaging with a convenient harvesting and reseeding procedure.

Recommended for

- Human Mesenchymal Stromal Cells from Bone Marrow (hMSC-BM)
- Human Mesenchymal Stromal Cells from Umbilical Cord (hMSC-UC)
- Human Mesenchymal Stromal Cells from Adipose Tissue (hMSC-AT)
- Human Dermal Fibroblasts (HDF)

Donor Qualification and Testing

Platelet Matrix is manufactured from platelet units obtained from healthy blood donors who have been tested and found negative for HBsAg, HIV I/II antibody, CMV, HCV-, HBC-Antibody, HIV-, HCV-, HBV-, HAV-, PVB19-NAT, Treponema pallidum and Syphilis.

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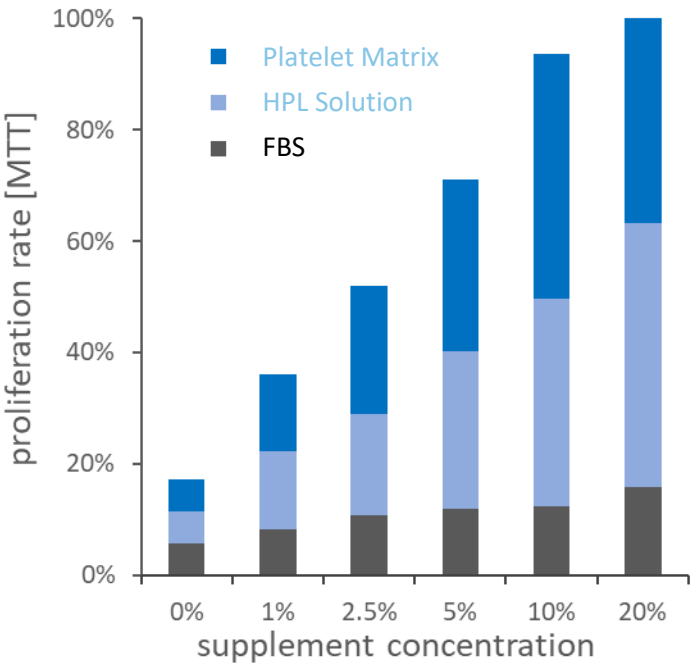
Performance

Proliferation rate: Proliferation increased in a concentration-dependent manner with Platelet Matrix and FBS as determined by MTT assay after 7 days, but was significantly higher with Platelet Matrix.



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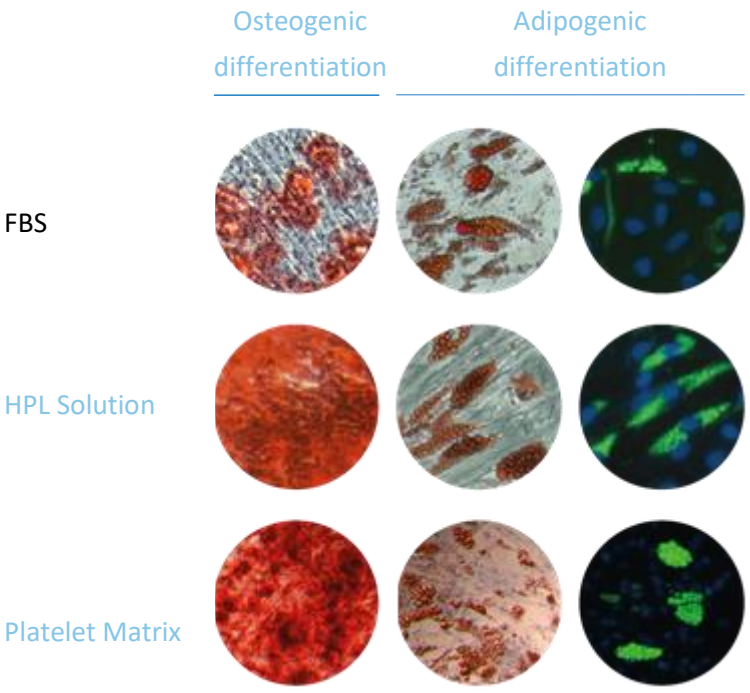
Differentiation potential: Osteogenic and adipogenic differentiation potential of human bone marrow-derived MSC in FBS, HPL Solution and Platelet Matrix. Isolation of Mesenchymal Stromal Cells from Adipose Tissue with 10% Platelet Matrix or 10% FBS resulted in MSC of similar cellular morphology. Osteogenic and adipogenic differentiation of MSC was higher with Platelet Matrix than FBS.



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Product Information

Product Code	Product Description	Pack Size
Platelet Matrix - Platelet Accelerator needed to induce gelation		
PLM-001G	Platelet Matrix - 3D Cell Culture System - Research Grade	1 mL
PLM-001F	Platelet Matrix - 3D Cell Culture System - Research Grade	5 mL
PLM-002K	Platelet Accelerator (10 mg/mL)	0.25 mL

To induce the gelation process, it is recommended to add 50 µg/mL of Platelet ACCELERATOR to the complete 3D cell culture mixture after 2 minutes incubation at 37°C.

Preparation of complete 3D cell culture matrix and Troubleshooting

- Reconstitute one vial of Platelet Matrix in 1 mL TC grade water. Once the lyophilized Platelet Matrix pellet is fully dissolved, you should notice a yellowish, slightly cloudy liquid.
- Prepare the complete 3D cell culture matrix by adding reconstituted Platelet Matrix to your chosen basal medium (e.g. Dulbecco's Modified Eagles Medium-Low Glucose; DMEM-LG) with 2 mM L-glutamine and 100 U/mL penicillin/streptomycin as final concentration and mix gently. Platelet Matrix shows optimal gelatinization at 10% (v/v). You can mix by pipetting up and down several times (but avoid excessive foam formation). and mix gently by rotation of the flask
- Transfer the complete 3D cell culture matrix to a cell culture vessel and place it in the incubator at 37°C without shaking.
- Allow gelatinization to take place by incubation of the complete 3D cell culture matrix for 60 minutes (37°C). Do not disturb the gelation process during that time. If the gelation process is disturbed by strong shaking/movements the gel will NOT form.
- After 60 minutes check if a proper gel has formed. The entire volume should have turned into a very soft but stable gel. The gel should look like a liquid (smooth surface) but is solid enough to keep its shape when you hold the plate upside-down. If the gel has a slightly wrinkled surface, wait a few more minutes.
- Once the gel has formed, cells can be re-suspended with HPL Solution culture medium (cat. no. PLS-100.01) and seeded on the surface layer of the 3D cell culture matrix. Incubate cells at 5% CO_2 and 37°C.
- For cell passaging, cells can be harvested together with the gel by pipetting and then plated onto cell culture flasks with freshly prepared Platelet Matrix gel.
- Exchange the HPL Solution culture medium (cat. no. PLS-100.01) after 48 hours for the first time and then twice per week thereafter.
- It is recommended to use TPP® Tissue Culture Flask with peel-off Foil in order to provide easy access.

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Sterility

Platelet Matrix is aseptically processed. Microbial cultures tested negative. Quality control testing is carried out in a certified test laboratory.

Shelf life

Platelet Matrix products are stable until the expiry date stated on the label.

Storage & Handling

Platelet Matrix is most stable when stored frozen at -20°C until used.

It is not recommended to aliquot and re-freeze samples of unused Platelet Matrix.

Shipping

Product ships frozen on dry ice.

Precaution

All Human derived products have been thoroughly tested to strict guidelines. However, while all of the human donors that go into producing each batch of human serum have been tested and have been found negative for several virus antibodies and antigens, there is no known test method can offer complete assurance that human derived blood products are not capable of transmitting an infectious disease. It is therefore important that human platelet lysate be considered potentially infectious and handled accordingly.

Disclaimer

For research use only. Not for therapeutic or diagnostic use.

Support

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Life Science Production is ISIA Traceability Certified
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