

XplaceH | Serum replacement, human cell line-derived

Characteristics

XplaceH is a supplement for serum-free cell culture processes. It contains proteins produced by continuously growing hepatocyte-derived cell lines in a concentrated and purified form.

The supplement is available in two variations:

- As a frozen liquid (10 mg/ml) with 100 ml (1000 mg) or in various sizes on demand.
- As a lyophilised solid (10 mg or 50 mg), which provides improved shipping and storage behaviour and is reconstituted in sterile water

It is used to replace foetal calf serum as well as human serum or platelet lysate from standard media for cell cultivation containing additional trace elements and specialized growth factors. XplaceH contains human proteins such as:

- **Transportproteins:** Transferrin, serum albumin (low amount), transthyretin, apolipoprotein B-100 and ferritin.
- **Adhesion factors:** Fibronectin, vitronectin, various laminins such as 511, 411 and 211
- **Protease inhibitors:** alpha-1-antitrypsin, alpha-2-macroglobulin, plasminogen activator inhibitor
- low amount in **growth factors**, but notable amounts of VEGF-A, IGF-2, TGF- β 1

XplaceH is sterile and ready-to-use upon reconstitution or thawing, respectively. Since XplaceH is produced in a controlled, chemically defined process as well as dialysed, small molecules such as hormones, metabolites and media components are not present

Application note

Serum replacement

As serum replacement within the medium, XplaceH can be applied to cell cultures directly at a concentration of 5 - 100 mg/L final concentration. The optimal concentration depends on the cell line, culture medium and culture device used. Please note that XplaceH contains purified proteins only and other factors need to be added. Some cell lines require additional growth factors such as bFGF, EGF or PDGF for optimal growth. In addition, trace elements such as selenium and hormones are needed for sustainable growth. XplaceH is compatible with platelet lysates and can be applied at a range of 0.1 - 1 %, but the addition of foetal calf serum (FCS) is not recommended and may cause adverse effects in growth. The concentration of FCS should not exceed 0.1 %.

Coating agent

For coating, XplaceH is recommended to be applied 2-10 $\mu\text{l}/\text{cm}^2$ as diluted buffered solution or diluted in sterile water. After 30-60 minutes at 37 °C, the diluted Xplace is removed. The vessel can be washed once with PBS 1x to remove residual amounts of soluble XplaceH but is not necessary.

iPSC cultivation

For iPSC cultivation, XplaceH is applied as coating reagent as described above or as a supplement to surrogate the addition of transferrin, TGF- β 1 and adhesion factors in a standard E8 medium. By proceeding with latter approach, the addition of bFGF and insulin is needed to complement the medium. Here, XplaceH acts like a knockout serum. As a coating agent, the addition of transferrin and TGF- β 1 is eventually necessary.

MSC cultivation

For MSC cultivation in general, it is recommended to apply 10-50 mg/L XplaceH to the medium. If human platelet lysate is used, the amount of platelet lysate can be reduced from 1-2 % to 0.1-0.5%. On microcarriers we recommend the usage of 25-50 mg/L to ensure a proper adherence. Precoating of microcarriers with XplaceH and calcium (2 mM) may improve the subsequent bead-to-bead transfer.

Notes | Troubleshooting

Additional Supplements	Please note, XplaceH is a dialysed and purified protein supplement with low growth factor content and absence of trace elements, hormones or vitamins. Depending on your cell line, additional factors are required. Contact us for further help and questions.
Adherence	Depending on cell types and the cell line used there is no pre-coating of vessels needed. These preferences have to be further tested by the customer. Some cell types forms spheroids or low-level clustered cell suspensions, which are capable to grow similar or better than on adherent mode. As an alternative, add additional CaCl_2 (sterile; up to 4 mM).
Poor adaptation performance	If no cell growth is observed for several days, contact us first for further support or add known growth factors for your specific cell type in higher or even lower concentrations. In addition, keep the batch-to-batch variations of the growth factors in mind and test different batches/suppliers.

Available products

Art. No.	Components
108101-1000MG	XplaceH Serum replacement, human cell line-derived liquid formulation for 10 L – 200 L
108102-10MG	XplaceH Serum replacement, human cell line-derived lyophilised formulation for 100 ml – 2 L
108102-50MG	XplaceH Serum replacement, human cell line-derived lyophilised formulation for 500 ml – 10 L