Product Data Sheet

hPLMA Easy - Ready-to-use Photopolymerizable Hydrogel

hPLMA* Easy is a xeno-free, animal serum-free, and bioactive hydrogel platform derived from human platelet lysates. Designed to closely mimic the native extracellular environment, it provides a physiologically relevant and supportive matrix for in vitro cell culture, tissue engineering, and regenerative medicine applications.

This ready-to-use formulation consists of a 15% (w/v) solution of methacrylated human platelet lysates (hPLMA – Ref: PL01) in PBS, containing 0.5% (w/v) LAP (Ref: PH01) (lithium phenyl-2,4,6-trimethylbenzoylphosphinate) as a photoinitiator. It enables straightforward and reproducible hydrogel preparation, eliminating the need for reconstitution or additional mixing steps, and helping reduce variability across experiments.

Upon exposure to light within the appropriate wavelength range for LAP activation (typically 365–405 nm), hPLMA Easy undergoes rapid polymerization to form a stable hydrogel.

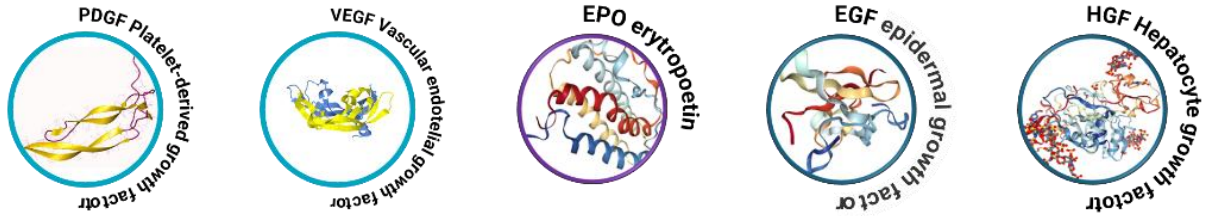
With its bioactive composition and customizable physical properties, hPLMA Easy offers a versatile and convenient solution for a wide range of advanced 3D cell culture applications, facilitating more predictive and translationally relevant in vitro models.

*Technology Licensed by University of Aveiro

Expires 6 months after MFG

hPLMA Easy is composed of several proteins, including growth factors and cytokines. These bioactive proteins are known to be key components involved in cell adhesion and proliferation processes and are major regulators of angiogenesis.

Identified Growth factors [1]



Human Platelet Source and Donor Screening

hPLMA is manufactured from platelet units obtained from screened healthy donors designated for therapeutic transfusion. Each donor undergoes testing, and non-reactivity is confirmed for HBsAg, anti-HBc, anti-HIV-1/2, anti-HCV, anti-HTLV-1/2, anti-T. cruzi, HIV-1, HCV, HBV, WNV nucleic acid testing, and syphilis micro hemagglutination assay.

hPLMA Easy - validation in cell culture

CELL VIABILITY AND PROLIFERATION:

hPLMA Easy hydrogels provide a supportive three-dimensional environment for encapsulated stem cells, maintaining their viability and enabling proliferation for at least 7 days (Fig. 1). This demonstrates that the material does not act as a restrictive barrier, but rather as a permissive matrix that sustains both cell maintenance and expansion over time. The hydrogels also exhibit mechanical properties with a Young's modulus of approximately 15 kPa, aligning with the range of soft tissue-like mechanics. For more information, please see [hPLMA Product Data Sheet – Ref: PL01.]

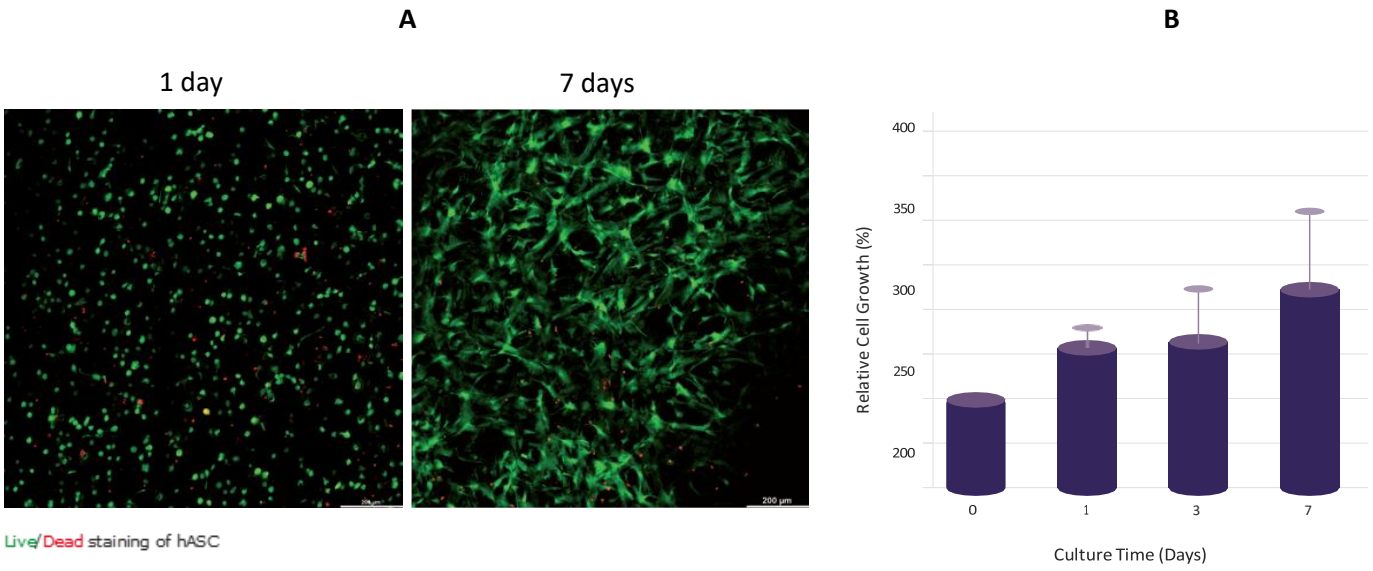


Fig.1) (A) Live/Dead assay staining. Representative images of Live/Dead staining for hASCs cultured encapsulated in PLMA Easy at 1, and 7 days of cell culture. Scale **bar**: 200 µm. (B) hASCs relative cell growth in hPLMA Easy hydrogels assessed through the CCK-8 assay.

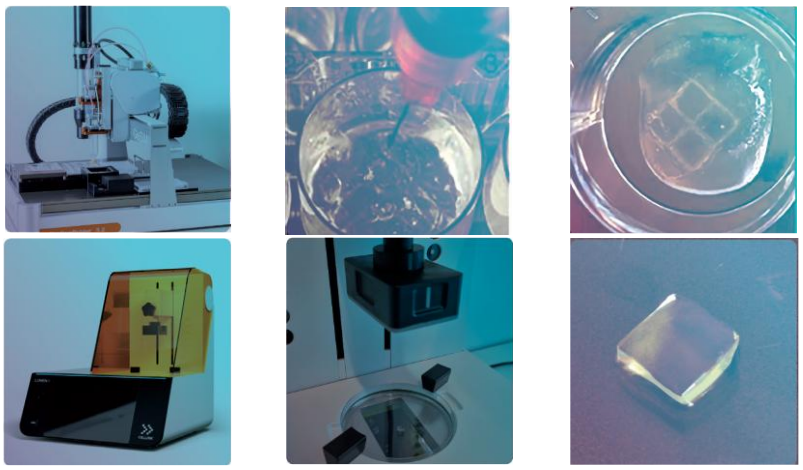
hPLMA Easy as a Bioink

3D BIOPRINTING BY EXTRUSION AND DLP

hPLMA Easy can be used as an ink for bioprinting in different printing techniques, such as extrusion or DLP. It can also be added to new ink formulations as a complement for a human touch.

hPLMA Easy for extrusion 3D printing with a supporting bath (FRESH)[2]

hPLMA Easy for DLP 3D printing



DOI: 10.1002/smtd.202400857

STORAGE STABILITY

Stability of the ready-to-use formulation has been thoroughly validated. The product remains stable for up to 6 months when stored at 4°C. Encapsulated cells exhibit comparable viability and behaviour in hydrogels prepared from freshly made product and from product stored for 6 months, confirming its consistent performance over time.

References:

1. Santos, S. C., Custódio, C. A., Mano, J. F., *Human Protein-Based Porous Scaffolds as Platforms for Xeno-Free 3D Cell Culture*. Adv. Healthcare Mater. 2022, 2102383. https://doi.org/10.1002/adhm.202102383.
2. Caiado Decarli M., Ferreira H.P., Sobreiro-Almeida R., Teixeira F.C., Correia T.R., Babilotte J., Olijve J., Custódio C.A., Gonçalves I.C., Mota C., Mano J.F., Moroni L. *Embedding Bioprinting of Low Viscous, Photopolymerizable Blood-Based Bioinks in a Crystal Self-Healing Transparent Supporting Bath*. Small Methods. 2025 Jan;9(1):e2400857. https://doi: 10.1002/smtd.202400857.

Contact us

For additional information, please contact us:

support@metatissue.com

Metatissue

PCI · Creative Science Park Aveiro Region

Via do Conhecimento, Edifício Central

3830-352 Ílhavo, Portugal

https://www.metatissue.com/