MEDELLAPRO®
For Innovative Bioscience



Collagen-Based Materials for Bioinks in Advanced 3D Bioprinting

Versatile, Cell-Compatible Precursors for Research and Innovation

MEDELLAPRO® Ultra Pure

- Ultimate purity for highly sensitive applications
- Endotoxin levels below or equal 10 EU/g

MEDELLAPRO® GelMA

- Photo-crosslinkable for high-resolution bioprinting
- Adjustable stiffness
- Optical clarity

GELITA
Improving Quality of Life

Engineering Bioinks

for Functional Tissue Models

3D bioprinting combines biomaterials with living cells to build three-dimensional models of tissues and organs. Reliable results depend on bioinks that hold enough water to sustain a hydrogel network, yet remain porous enough to allow nutrient diffusion and cell migration throughout the printed structure.

Gelatin and its hydrolysate are biomaterials that closely resemble and therefore mimic the extracellular matrix (ECM) that surrounds and supports cells in the body. The amino acid sequence which is very close to human collagen gives them high cell affinity and strong adhesion properties, while their biocompatible, biodegradable protein matrix can be enzymatically metabolized. These properties make collagen-based materials an established building block for scaffolds, tissue engineering, organ-on-a-chip (OoC) systems and cell cultivation.

Designed to Replicate the Extracellular Matrix

Collagen-based bioinks mimic the ECM more effectively than synthetic alternatives, giving cells a familiar environment that supports adhesion, proliferation and differentiation. Their high water-binding capacity makes them a suitable hydrogel base, while their structure can be adapted to the mechanical and biological requirements of the target tissue. Being of natural origin, gelatin and collagen peptides are well tolerated in biological systems and compatible with a broad range of cell types – all useful properties when a single material needs to support several applications.



Designed for Established 3D Bioprinting Platforms

Material behavior and printing hardware need to be compatible from the outset. Collagen-based bioinks can be formulated to work across the three printing technologies most widely used in bioprinting research.

Drop-on-Demand (DoD):

– ***Low viscosity for precise droplet formation, suited to cell patterning and high-resolution constructs.***

Extrusion:

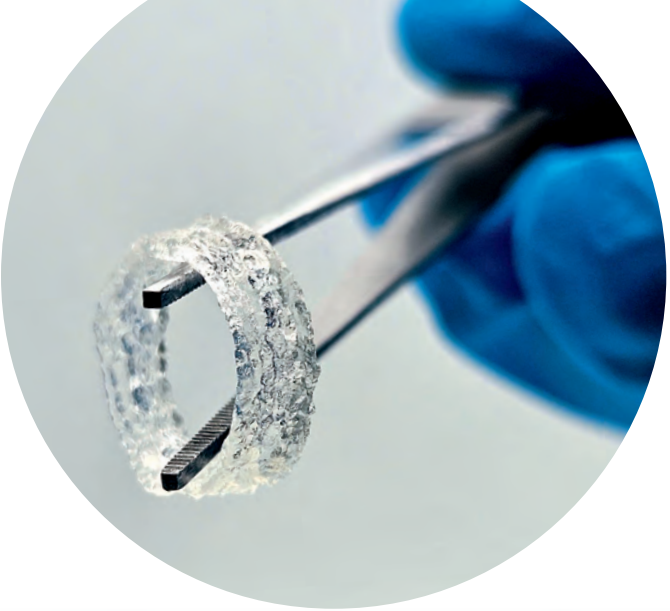
– ***Broad viscosity window, continuous filament deposition.***

Stereolithography:

– ***Requires a photo-crosslinkable system, suited to high-resolution, complex geometries.***

From Printed Structure to Functional Scaffold

Bioink composition affects printability, the mechanical properties of the printed structure and, ultimately, the viability of the cells it carries. Once printed, a scaffold needs to support nutrient diffusion, provide structural support and enable cellular signaling – functions closely tied to its mechanical properties which, in turn, influence how cells behave and develop.



VALUE OF COLLAGEN-BASED BIOINKS

Tissue engineering scaffolds: *supporting cell adhesion, proliferation and differentiation in constructs that mimic native tissue structure*

Organ-on-a-chip (OoC) systems: *providing a biocompatible matrix for microphysiological models*

Cell culture substrates: *promoting attachment and growth of adherent cell types in vitro*

Drug screening models: *enabling tissue-like environments for testing compound efficacy and toxicity*

Regenerative medicine research: *supporting the study of tissue regeneration pathways*

Manufactured for Reproducible Research

Consistent, well-documented raw materials are a pre-requisite for reproducible research results. GELITA's ECE (Endotoxin Controlled Excipients) portfolio is produced under endotoxin-controlled conditions, with Drug Master Files and pharmacopeia compliance (US/EU/JP) available for selected grades. Traceability is supported through ISO 22442 documentation, including Virus Inhibition Studies. Batch-to-batch consistency and defined specifications ensure uniformity across experiments, and research-grade materials are available for early-stage development work.

Get in Touch

Discuss your bioink formulation requirements with experts from the GELITA Pharma Institute (GPI). Whether you need support selecting the right material for your printing system, adapting scaffold parameters to a specific application or navigating regulatory documentation, GPI's team can help. Request samples or start the conversation here:

pharma.institute@gelita.com



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Two Complementary Platforms

for Bioink Development



MEDELLAPRO® is GELITA's established range of endotoxin-controlled gelatins for advanced biomedical applications, spanning parenteral solutions, wound care, cell culture and 3D bioprinting.

Within the ECE (Endotoxin Controlled Excipients) portfolio, MEDELLAPRO® offers two options for bioprinting: MEDELLAPRO® Ultra Pure (UP) gelatin, where endotoxin control and purity are the priority, and MEDELLAPRO® GelMA, where photo-crosslinking is required.

MEDELLAPRO® Ultra Pure (Ultra Low Endotoxin Levels in Gelatin)

Ultra Pure gelatin is available with endotoxin levels below or equal to 10 EU/g. Its high purity and optical clarity make it suitable for sensitive applications such as cell-based assays, where direct microscopic observation of cells is required, and the absence of endotoxins must be ensured.

MEDELLAPRO® GelMA (Gelatin Methacrylate)

A photo-crosslinkable gelatin derivative produced by modifying part of the gelatin's amine groups with methacrylate groups. In combination with a photoinitiator, it crosslinks under light exposure, forming a controlled network and stabilizing the 3D bioprinted structures. Its optical clarity even supports light penetration during crosslinking and allows real-time observation of cells within the printed construct.

Designed for Convenient Handling

MEDELLAPRO® GelMA is supplied as uniform, freeze-dried cubes that can be picked individually and transferred without dust formation.

Unlike loose powders or irregular fragments, the cube format supports convenient handling, minimizes material loss during transfer and enables reproducible preparation. The cubes can also be cut into smaller portions when required.

Engineering Mechanical and Biological Properties

Scaffold performance depends on how a material's structural parameters are controlled during formulation and printing. Crosslinking density and concentration are central levers: a denser, more crosslinked network typically has smaller pores and degrades more slowly, while a more open structure supports faster nutrient exchange and degradation.

Together with stiffness, these parameters determine how closely a scaffold can model a specific tissue type and support the intended cell differentiation pathway.

GELITA's MEDELLAPRO® Ultra Pure gelatin and MEDELLAPRO® GelMA give formulators precise control over these levers. With Ultra Pure gelatin, viscosity and concentration can be adapted to the application, from low-viscosity formulations for fine droplet formation to more concentrated systems built for structural stability. With GelMA, stiffness and crosslinking density can be adjusted via the degree of substitution, concentration and co-polymers, supporting a range of target moduli.

What GELITA adds beyond base chemistry is controlled production, batch-to-batch consistency and access to GPI's formulation expertise when adapting these parameters to a specific application.





About GELITA

GELITA is an innovation leader for gelatin and collagen peptides, providing customers around the world with products of the highest standards, comprehensive technical expertise and sophisticated solutions.



The GELITA Pharma Institute (GPI) is the ultimate knowledge hub and the site of our collective pharmaceutical know-how. Dedicated to the pursuit of future-proof solutions that help our customers to excel and grow, it is here that we foster growth and innovation through passion, products and global expertise. Thanks to our team of in-house specialists and longstanding expertise in gelatin science, we can assist with product formulation, market insights, regulatory guidance and more, along with solutions to technical and production challenges.

GELITA PHARMA INSTITUTE

PORTFOLIO OVERVIEW

Product Name	Endotoxin level [EU/g]	Animal Base	Bloom [g]	Viscosity* [mPas]
MEDELLAPRO® UP 10 P 270 RG	≤ 10	PS	240 – 300	3,0 – 5,6

Product Name	Endotoxin level [EU/g]	Animal Base	DoM [%]	Free MA [ppm]	MW [kDa]
MEDELLAPRO® GelMA 1000 P 160 RG	≤ 1000	PS	≥ 90	≤ 100	130 – 150

**concentration=6,67%, T=60°C*

***MA:** Methacrylate, **PS:** Porcine Skin, **UP:** Ultra Pure, **RG:** Research Grade, **DoM:** Degree of Modification, **MW:** Average Molecular Weight*

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