



GEL-MA INX<sup>®</sup> X100  
based on X-pure

First GMP-like GEL-MA bioink



X-Pure-based GEL-MA INX<sup>®</sup> X100 is the world's first GMP-like gelatin methacryloyl bioink. By leveraging Rousselot's renowned X-Pure<sup>®</sup> GEL-MA line and BIO INX' extensive 25 years of in-house expertise in GEL-MA synthesis and applications. This revolutionary ink sets a new benchmark in bioink technology.

Designed for translational research, X-Pure-based GEL-MA INX<sup>®</sup> X100 facilitates seamless transition to

GMP-grade production, while maintaining the accessibility of research-grade pricing. Its advanced formulation positions this deposition-based bioink as a frontrunner for clinical applications across cutting-edge biomedical realms.

This premium biomaterial excels in 3D bioprinting, regenerative medicine, and tissue engineering, exhibiting minimal impurity levels, low endotoxin content, and unparalleled batch-to-batch consistency. With customizable mechanical properties, it offers unparalleled versatility to meet diverse application needs.

Due to the GMP-like production of the base material, it has the potential to shorten the development timeline from bench to bedside in pharmaceuticals, medical devices, and advanced therapy medicinal products (ATMP).

With X-Pure-based GEL-MA INX<sup>®</sup>, the benefits of GEL-MA are combined with a high degree of reproducibility and ease of use, by offering the material in a convenient ready-to-print cartridge with defined printing parameters, thereby adhering to BIO INX' "plug & print" principle. Revolutionize your research with X-Pure-based GEL-MA INX<sup>®</sup> X100, setting new standards in bioink innovation.

## BIOLOGICAL APPLICATIONS

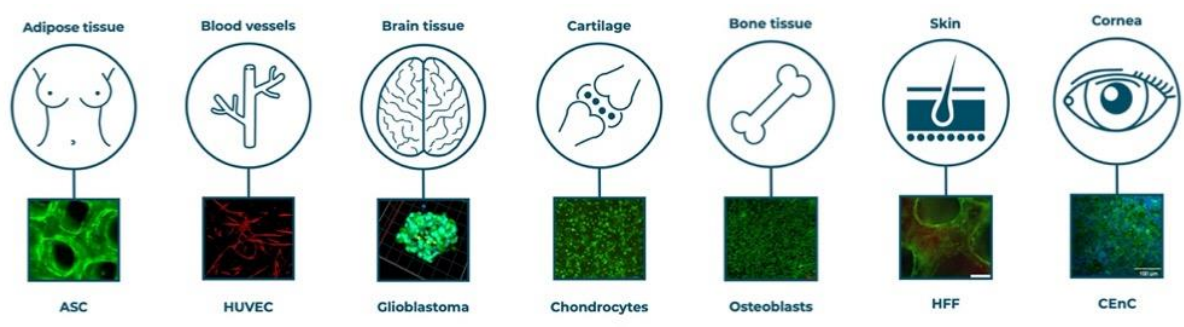
Being derived from porcine gelatin, X-Pure-based GEL-MA INX<sup>®</sup> was designed to mimic the complex structure of the natural extracellular matrix and to facilitate dynamic cellular engagement. Supported by extensive scientific investigation, this bioink showcases exceptional compatibility across a diverse range of tissue types, including vascular-, adipose tissue-derived-, brain-, cartilage-, bone-, connective-, skin-, and ocular tissue. For more



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information on the biological applications of X-Pure-based GEL-MA INX<sup>®</sup> and the parameters used to generate these 3D cellular structures, contact us: [info@bioinx.com](mailto:info@bioinx.com)



### BENEFITS OF X-PURE-BASED GEL-MA INX<sup>®</sup>

- ✓ Biocompatibility      Supports cell adhesion and proliferation
- ✓ Biodegradability      Enables cellular remodeling of the printed matrix
- ✓ Easy Handling      Delivered in a ready-to-use cartridge
- ✓ Photo-curable      Efficient photo-crosslinking at both 365 and 405 nm
- ✓ GMP-like      Produced using GMP-like raw materials
- ✓ Low-endotoxin levels      Based on Rousselot's low-endotoxin X-Pure GEL-MA

Table 1: Typical benefits of X-Pure-based GEL-MA INX<sup>®</sup> over conventional bioinks

	Conventional Alginate-based bioink	Conventional GEL-MA-based bioink	GEL-MA INX <sup>®</sup> X100 <small>based on  pure</small>
Temperature-controlled gelation	✗	✓	✓
Cell-interactivity	✗	✓	✓
Biodegradability	✗	✓	✓
Biocompatibility	✓	✓	✓
Shear-thinning	✓	✗	✗
Low-endotoxin level	✗	✗	✓
GMP-like production	✗	✗	✓



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## PROPERTIES & PROCESSING

X-Pure-based GEL-MA INX<sup>®</sup> is a transparent gel at room temperature, which turns into a liquid after heating above 30 °C. Some physical properties are listed in Table 2.

X-Pure-based GEL-MA INX<sup>®</sup> is a photo-crosslinkable material, as shown in Figure 1. After crosslinking, a non-soluble polymer network is obtained which makes the material physiologically stable, while still being biodegradable thanks to the presence of sequences which can be cleaved enzymatically by matrix metalloproteases such as collagenase. After photo-crosslinking, a storage modulus in the range of 5 to 15 kPa is obtained. Consequently, the material exhibits sufficient mechanical integrity to maintain shape retention while being soft enough to stimulate cellular proliferation, making it suitable for a whole range of soft tissue applications (see Figure 2). Additionally, the use of blue light to UV-A for crosslinking ensures mild processing conditions, resulting in high cell viability after encapsulation.

Table 2: Physical properties of X-Pure-based GEL-MA INX<sup>®</sup>

Physical Properties	X-Pure-based GEL-MA INX <sup>®</sup>
pH	6.5 – 8.5
Viscosity (high shear) (Pa.s)	< 10
Total degree of functionalization	50 – 70 %
Storage modulus after photo-crosslinking (kPa)	5 - 15

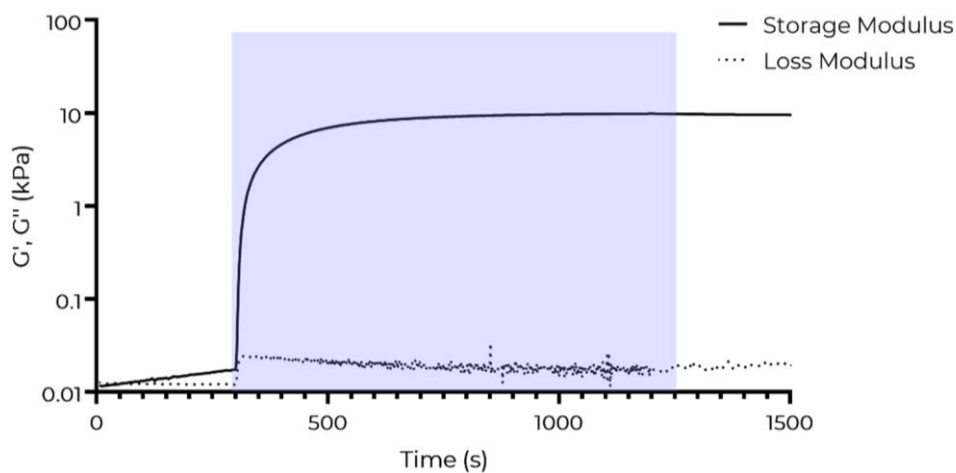


Figure 1: Storage and loss moduli of GEL-MA INX<sup>®</sup> recorded via a rheometer during UV irradiation



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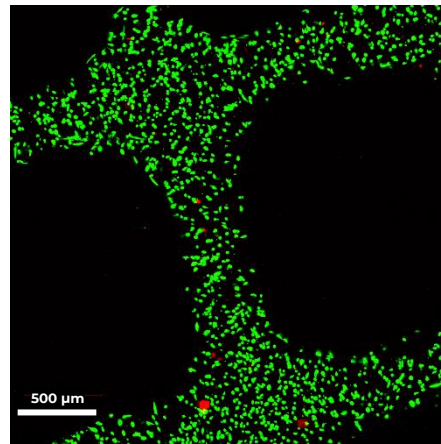
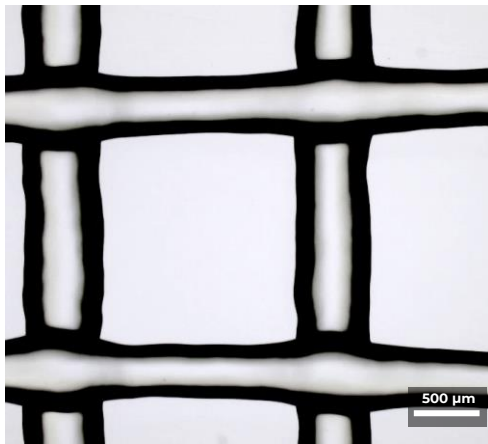


Figure 2: Extrusion-printed X-Pure-based GEL-MA INX<sup>®</sup> X100 scaffold (Left). 3D bioprinted Human Foreskin Fibroblasts (HFF) encapsulated in X-Pure-based GEL-MA INX<sup>®</sup> X100 (Right).

## 3D PRINTER COMPATIBILITY

GEL-MA INX<sup>®</sup> X100 based on X-Pure has been used repeatedly and successfully with the following printers:

- ✓ Regemat3D
- ✓ FelixBio
- ✓ Cellink BIOX
- ✓ Brinter One

For optimal processing, a heated nozzle insulator and a cooled printbed are recommended.

If you would like to discuss your printer's compatibility with our bioinks, please contact us at [info@bioinx.com](mailto:info@bioinx.com)