µCollaFibR[™] Additive for **Bioinks and Hydrogels**

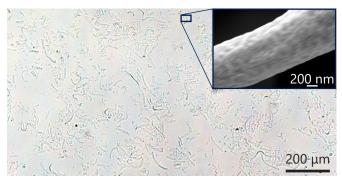
Hydrogel additive for increased durability and biological relevance

3D Bioprinting is the future of personalized tissue engineering. However, bioprinted constructs require improved mechanical durability and biological relevance to have clinical utility.

3D BioFibR's patented dry-spinning technology produces µCollaFibR™; 50 µm collagen fibers that increase the shape fidelity and biological relevance of bioprinted constructs. With excellent chemical stability and 1-2 μ m diameters, µCollaFibR[™] is universally compatible with bioprinting materials and modalities.

µCollaFibR[™] Additive:

- Produced using GMP type I collagen, and resembles natural collagen fiber structures
- Can be resuspended in any aqueous environment, including acidic environments ($pH \ge 2$)
- Increases mechanical strength and modulus of hydrogels in extension and compression
- Improves shape retention/durability for at least 28 days in bioprinted cellular constructs
- Acts as a physiologically relevant site for cell attachment within the constructs
- Improves shape fidelity without compromising bioink viscosity/printability
- Aligns with printhead flow, avoiding clogging



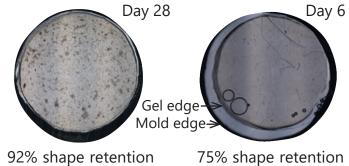
µCollaFibR[™] dispersed at 7.5 mg/mL in PBS

Shape Retention

5% gelMA constructs with HEK293 kidney cells

µCollaFibR[™] - 1.25 mg/mL

without fibers



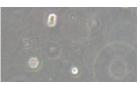
Cell Functionality

3% alginate constructs with fibroblasts (MEFs)

μCollaFibR[™] - 2.5 mg/mL

without fibers





BioFibR

µCollaFibR[™] drives cell attachment and function

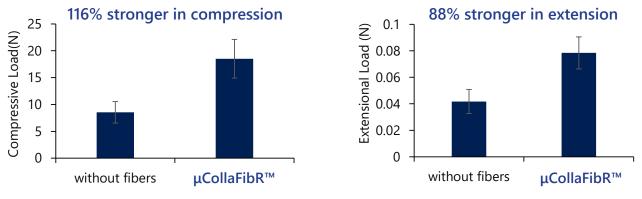
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µCollaFibR[™] for Bioinks and Hydrogels

Mechanical Performance

Compression: 5%_{wt} GelMA with 1.25 mg/mL µCollaFibR™ Extension: 7.5%_{wt} GelMA with 2.5 mg/mL µCollaFibR™



Error bars show standard error of the mean

Product Specifications	
Collagen	Bovine Type I
Length	44 ± 13 μm
Diameter	1 – 2 µm
**Stability in Solution	\geq 3 months at pH 2 – 7.4
Temperature Stability	≤ 60 °C
Hydrated Young's Modulus	50 ± 16 kPa
	4 °C short term -20 °C long term
Degrading Enzyme	Collagenase I/IV

**Stability testing is ongoing for longer time points



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