



# Personalized 3D Bioprinted Implants for Faster Regeneration of Cartilage and Tendons

**Innovative hydrogel biomaterials enable patient-specific, cell-enriched implants for orthopedic soft tissue repair.**

Our advanced hydrogel biomaterials, combined with 3D bioprinting, allow the creation of personalized implants for cartilage and tendon injuries. This approach supports faster, more effective regeneration and better mimics the natural properties of healthy tissue.

Cartilage, tendon, and ligament injuries are common in sports and aging, often leading to long-term disability and high healthcare costs. Traditional treatments can be lengthy and may not fully restore the natural function of soft tissues. Our solution combines specially developed hydrogel biomaterials with 3D bioprinting to produce patient-specific implants that closely replicate the biochemical and mechanical properties of native tissue.

The hydrogel material can be precisely hardened with light, allowing us to adjust its strength and print multi-layered, customized

structures. Its biocompatibility and porous matrix enable the integration of living cells and growth factors, supporting cell growth and tissue regeneration. By incorporating nano-encapsulated regenerative factors, we further enhance the healing process.

This technology offers a less invasive, more efficient treatment for orthopedic soft tissue injuries, reducing complications and improving patient outcomes. Our approach is designed to help athletes and patients return to activity faster, with implants that are tailored to their individual needs.

**Fraunhofer Institute for  
Interfacial Engineering and  
Biotechnology IGB**

Dr. Achim Weber  
Tel. +49 711 970-4022  
[achim.weber@igb.fraunhofer.de](mailto:achim.weber@igb.fraunhofer.de)  
[www.igb.fraunhofer.de](http://www.igb.fraunhofer.de)

[exhibit overview](#)