

## **3D Bioprinting Strategies to Bioengineer Skeletal Muscle Constructs that Accelerate Muscle Function Restoration**

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To achieve rapid skeletal muscle function restoration, many attempts have been made to bioengineer functional muscle constructs by employing physical, biochemical, or biological cues. Currently, 3D bioprinting technologies combined with tissue engineering principles have been developed to offer the creation of biological tissue constructs that mimic the structural, anatomical, and functional features of native tissues or organs. Hence, these technologies have been applied to fabricate an implantable, bioengineered skeletal muscle tissues composed of human primary muscle cells. The bioprinted muscle constructs showed a highly organized multi-layered muscle bundle made by viable, densely packed, and aligned myofiber-like structures. More importantly, these constructs have been implanted in animal models and showed muscle regeneration with the vascularization and host nerve integrity, resulting in the restoration of muscle function. These 3D bioprinted skeletal muscle constructs present a possibility for therapeutic effects to treat the muscle defect injuries and have implications for future translation.