

## OFFICIAL ABSTRACT and CERTIFICATION

Fabrication of Biomaterials for Bone Repair and Regeneration

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Bone defects, both congenital and acquired, are serious and costly impairments. Beyond a critical size, bone defects (e.g., fractures) are not likely to heal without further medical intervention. An effective treatment technique is to implant a biodegradable scaffold at the injured site to promote bone regeneration by attracting cells to the area and fostering their growth. Via additive manufacturing, scaffolds can be fabricated to the specific needs of patients. In this study, scaffolds were fabricated from various polymeric biomaterials with different infill geometries and percentages. The mechanical properties of the scaffolds were characterized using compression testing to determine the characteristic yield stress and compressive Young's modulus for each configuration. The results were compared with reported yield stresses and moduli of different trabecular bone tissues at multiple anatomical locations in order to determine which of the fabricated scaffold examples best fit the application.

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