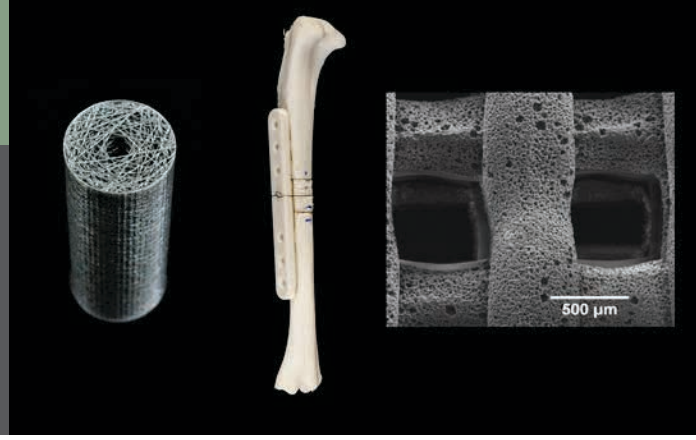
Customised 3D-Printed Bone Graft



Problem Statement: Currently, autograft is the gold standard for bone grafting, which is, however, most painful and costly and has a high morbidity period. Moreover, autograft deteriorates the patient's financial and social life. Also, there is no patient-specific, biodegradable, ready-to-use synthetic bone graft in the market. A biodegradable, faster bone generation and cost-effective bone graft method are needed. The customised 3D-printed bone graft developed by the IIT Bombay team addresses these shortcomings by providing an affordable, patient-specific, ready-to-use device, thus impacting a large section of the society, including the economically weaker sections.

Uniqueness of the Solution: The 3D printed bone graft has a novel gradient 3D mesh mimicking human bone. In addition, the graft is custom-made, biodegradable, and favours faster bone generation.

Current Status of Technology: The team has completed the market survey; they have identified the available technologies and their limitations prior to development. The implant design and scaffold fabrication procedure is ready and has been successfully executed with lab-grade materials. The materials and composition have been finalised based on competitor analysis and patent landscaping.

Societal Impact: In India, of the patients who suffer from bone loss or defects annually, approximately 15% of patients avail the bone graft services available in the market. These are the patients who need bone grafts for their treatment. Further, only 20% of these make it to treatment for bone grafts and substitutes. In addition to this, 5% of the total patients need bone grafts for cosmetic purposes. Thus, a total of nearly 6-7 lakh patients annually will be directly benefited from the proposed innovation. Furthermore, this product provides an affordable patient-specific ready-to-use device, thus impacting a large section of the society, including the bottom of the pyramid is possible.

Patent(s): Filed

Relevant Industries: Bonegraft and Implant industries

Faculty: Prof. Jayesh Bellare, Chemical Engineering.