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Review Article

Bioengineering of bone tissues using bioreactors for modulation of mechano-sensitivity in bone

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ABSTRACT

Since the last decade, significant developments have been made in the area of bone tissue engineering associated with the emergence of novel biomaterials as well as techniques of scaffold fabrication. Despite all these developments, the translation from research findings to clinical applications is still very limited. Manufacturing the designed tissue constructs in a scalable manner remains the most challenging aspect. This bottleneck could be overcome by using bioreactors for the manufacture of these tissue constructs. In this review, a current scenario of bone injuries/defects and the cause of the translational gap between laboratory research and clinical use has been emphasized. Furthermore, various bioreactors being used in the area of bone tissue regeneration in recent studies have been highlighted

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attributes of bioreactors has been accounted, viz. dynamic, versatile, automated, reproducible and commercialization aspects. Additionally, the illustration of computational approaches that should be combined with bone tissue engineering experiments using bioreactors to simulate and optimize cellular growth in bone tissue constructs has also been done extensively.

Q KEYWORDS: [Biofabrication](#) [bioreactors](#) [mechanotransduction](#) [scaffolds](#) [bone tissue engineering](#)

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