

# Tissue Engineering and Regenerative Medicine

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## Application of selected scaffolds for bone tissue engineering: a systematic review

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### Purpose:

The current systematic review investigated the results of application of some of the most commonly used scaffolds in conjugation with stem cells and growth factors in animal and clinical studies.

### Methods

A comprehensive electronic search was conducted according to the PRISMA guidelines in NCBI PMC and PubMed from January 1970 to December 2015 limited to English language publications with available full texts. In vivo studies in relation to “bone healing,” “bone regeneration,” and at least one of the following items were investigated: allograft,  $\beta$ -tricalcium phosphate, deproteinized bovine bone mineral, hydroxyapatite/tricalcium phosphate, nanohydroxyapatite, and composite scaffolds.

### Results

A total of 1252 articles were reviewed, and 46 articles completely fulfilled the inclusion criteria of this study. The highest bone regeneration has been achieved when combination of all three elements, given scaffolds, mesenchymal stem cells, and growth factors, were used. Among studies being reported in this review, bone marrow mesenchymal stem cells are the most studied mesenchymal stem cells,  $\beta$ -tricalcium phosphate is the most frequently used scaffold, and platelet-rich plasma is the most commonly used growth factor.

### Conclusion

The current review aimed to inform reconstructive surgeons of how combinations of various mesenchymal stem cells, scaffolds, and growth factors enhance bone regeneration. The highest bone regeneration has been achieved when combination of all three elements, given scaffolds, mesenchymal stem cells, and growth factors, were used.

### Biography

Mohammad Taghi Baghani has completed his DDS at the age of 25 years from Shahid beheshti university of medical sciences and MSc in Prosthodontics from Shahed University Dental school. He is an Assistant Professor in Shahid Beheshti university of medical sciences. He has published more than 18 papers in reputed journals and has been serving as an editorial board member of repute.

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