

Accepted Manuscript

Peptides for bone tissue engineering

Rick Visser, Gustavo A. Rico-Llanos, Hertta Pulkkinen, Jose Becerra

PII: S0168-3659(16)30733-7
DOI: doi: [10.1016/j.jconrel.2016.10.024](https://doi.org/10.1016/j.jconrel.2016.10.024)
Reference: COREL 8515

To appear in: *Journal of Controlled Release*

Received date: 12 September 2016
Revised date: 21 October 2016
Accepted date: 23 October 2016



Please cite this article as: Rick Visser, Gustavo A. Rico-Llanos, Hertta Pulkkinen, Jose Becerra, Peptides for bone tissue engineering, *Journal of Controlled Release* (2016), doi: [10.1016/j.jconrel.2016.10.024](https://doi.org/10.1016/j.jconrel.2016.10.024)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Peptides for Bone Tissue Engineering

Rick Visser^{a, b, c, *}, Gustavo A. Rico-Llanos^{b, c, a}, Hertta Pulkkinen^{d, c}, Jose Becerra^{b, a, c}

a. Networking Research Center on Bioengineering, Biomaterials and Nanomedicine, (CIBER-BBN), Malaga, Spain

b. Department of Cell Biology, Genetics and Physiology, University of Malaga. IBIMA. Spain

c. BIONAND, Andalusian Center for Nanomedicine and Biotechnology. Junta de Andalucía and University of Malaga. Spain

d. Institute of Biomedicine, University of Eastern Finland, Kuopio, Finland.

* Corresponding author: Rick Visser. Andalusian Center for Nanomedicine and Biotechnology (BIONAND). C/ Severo Ochoa, 35. E-29590 Malaga. Spain. E-mail: visser@uma.es

Abstract

Molecular signals in the form of growth factors are the main modulators of cell behavior. However, the use of growth factors in tissue engineering has several drawbacks, including their costs, difficult production, immunogenicity and short half-life. Furthermore, many of them are pleiotropic and, since a single growth factor can have different active domains, their effect is not always fully controllable. A very interesting alternative that has recently emerged is the use of biomimetic peptides. Sequences derived from the active domains of soluble or extracellular matrix proteins can be used to functionalize the biomaterials used as scaffolds for new tissue growth to either direct the attachment of cells or to be released as soluble ligands. Since these short peptides can be easily designed and cost-effectively synthesized *in vitro*, their use opened up a world of new opportunities to obtain cheaper and more effective implants for regenerative medicine strategies. In this extensive review we will go through many of the most important peptides with potential interest for bone tissue engineering, not limiting to those that only mediate cell adhesion or induce the osteogenic differentiation of progenitor cells, but also focusing on those that direct angiogenesis because of its close relation with bone formation.

Keywords: Biomimetic peptides; Surface functionalization; Delivery; Osteogenesis; Tissue Engineering

Download English Version:

<https://daneshyari.com/en/article/5434066>

Download Persian Version:

<https://daneshyari.com/article/5434066>

[Daneshyari.com](https://daneshyari.com)