



Sustained release of TGF- β 1 from biodegradable microparticles prepared by a new green process in CO₂ medium

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Auteur	Swed, Amin [1], Cordonnier, Thomas [2], Dénarnaud, Alison [3], Boyer, Cécile [4], Guicheux, Jérôme [5], Weiss, Pierre [6], Boury, Frank [7]
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Résumé en anglais	<p>The aim of this work was to encapsulate transforming growth factor b1 (TGF-b1) into PLGA microparticles for regenerative medicine applications. TGF-b1 was firstly precipitated to ensure its stability during subsequent encapsulation within microparticles. A novel emulsification/extraction process in CO₂ medium under mild conditions of pressure and temperature was used to encapsulate the protein. Interestingly, non-volatile injectable solvents, isosorbide dimethyl ether (DMI) and glycofurol (GF), were employed to precipitate the protein and to dissolve the polymer. Good encapsulation efficiency was obtained with preserved bioactivity of the protein. The microparticles were characterized in terms of size and zeta potential. In addition, the morphology and surface properties were determined using scanning electron microscopy (SEM) and atomic force microscopy (AFM) respectively. In vitro release study of the protein from microparticles was presented to assess the capacity of these systems to control the protein release. Moreover, cytotoxicity study was performed and showed an excellent cytocompatibility of the obtained microparticles. Thus, we described an effective and original process for TGF-b1 encapsulation into PLGA microparticles. The obtained polymeric carriers could be used in many biomedical applications and were more specifically developed for cartilage regeneration.</p>
URL de la notice	http://okina.univ-angers.fr/publications/ua13833 [14]

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