

# Accepted Manuscript

Functional calcium phosphate composites in nanomedicine

Francesca Ridi, Ilaria Meazzini, Benedetta Castroflorio, Massimo Bonini,  
Debora Berti, Piero Baglioni

PII: S0001-8686(16)30091-4  
DOI: doi: [10.1016/j.cis.2016.03.006](https://doi.org/10.1016/j.cis.2016.03.006)  
Reference: CIS 1635

To appear in: *Advances in Colloid and Interface Science*

Received date: 21 September 2015  
Revised date: 29 March 2016  
Accepted date: 31 March 2016



Please cite this article as: Ridi Francesca, Meazzini Ilaria, Castroflorio Benedetta, Bonini Massimo, Berti Debora, Baglioni Piero, Functional calcium phosphate composites in nanomedicine, *Advances in Colloid and Interface Science* (2016), doi: [10.1016/j.cis.2016.03.006](https://doi.org/10.1016/j.cis.2016.03.006)

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.

**Functional calcium phosphate composites in nanomedicine**

Francesca Ridi, Ilaria Meazzini<sup>†</sup>, Benedetta Castorflorio<sup>‡</sup>, Massimo Bonini, Debora Berti, Piero Baglioni\*

*Department of Chemistry “Ugo” Schiff and CSGI, University of Florence, 50019 Florence, Italy*

Present addresses:

<sup>†</sup> *School of Chemistry, The University of Dublin, Trinity College, Dublin 2, Ireland*

<sup>‡</sup> *Laboratory for Molecular Surfaces and Nanotechnology (LAMSUN), CSGI and Dept. of Chemical Sciences, University of Catania, Italy*

\* Corresponding author:

*Piero Baglioni*

*Department of Chemistry “Ugo” Schiff and CSGI*

*University of Florence,*

*Via della Lastruccia 3 - Sesto Fiorentino*

*50019 Florence, Italy*

*Phone: +39 055 4573033*

*Email: [piero.baglioni@unifi.it](mailto:piero.baglioni@unifi.it)*

**Abstract**

Calcium Phosphate (CaP) materials have many peculiar and intriguing properties. In Nature CaP is found in nanostructured form embedded in a soft proteic matrix as the main mineral component of bones and teeth. The extraordinary stoichiometric flexibility, the different stabilities exhibited by its different forms as a function of pH and the highly dynamic nature of its surface ions, render CaP one of the most versatile materials for Nanomedicine. This review summarizes some of the guidelines so far emerged for the synthesis of CaP composites in aqueous media, that endow the material with tailored crystallinity, morphology, size, and functional properties. First, we introduce very briefly the areas of application of CaP within the Nanomedicine field. Then, through some selected examples we review some synthetic routes where the presence of functional units (emphasizing the role of small templating molecules like surfactants, or oligomers and polymers) assist the synthesis and at the same time impart the functionality or the responsiveness desired for the end-application of the material. Finally, we illustrate two examples from our laboratory, where CaP is decorated by biologically active polymers or prepared within a thermo- and magneto-responsive hydrogel, respectively.

**Keywords.** Calcium phosphate; hydroxyapatite; nanoparticles; functional nanocomposites; nanomedicine; transfection.

Download English Version:

<https://daneshyari.com/en/article/4981382>

Download Persian Version:

<https://daneshyari.com/article/4981382>

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