

In vitro and in vivo response of zinc-containing mesoporous bioactive glasses in a sheep animal model

Supporting information

S.1. Thermogravimetical analysis.

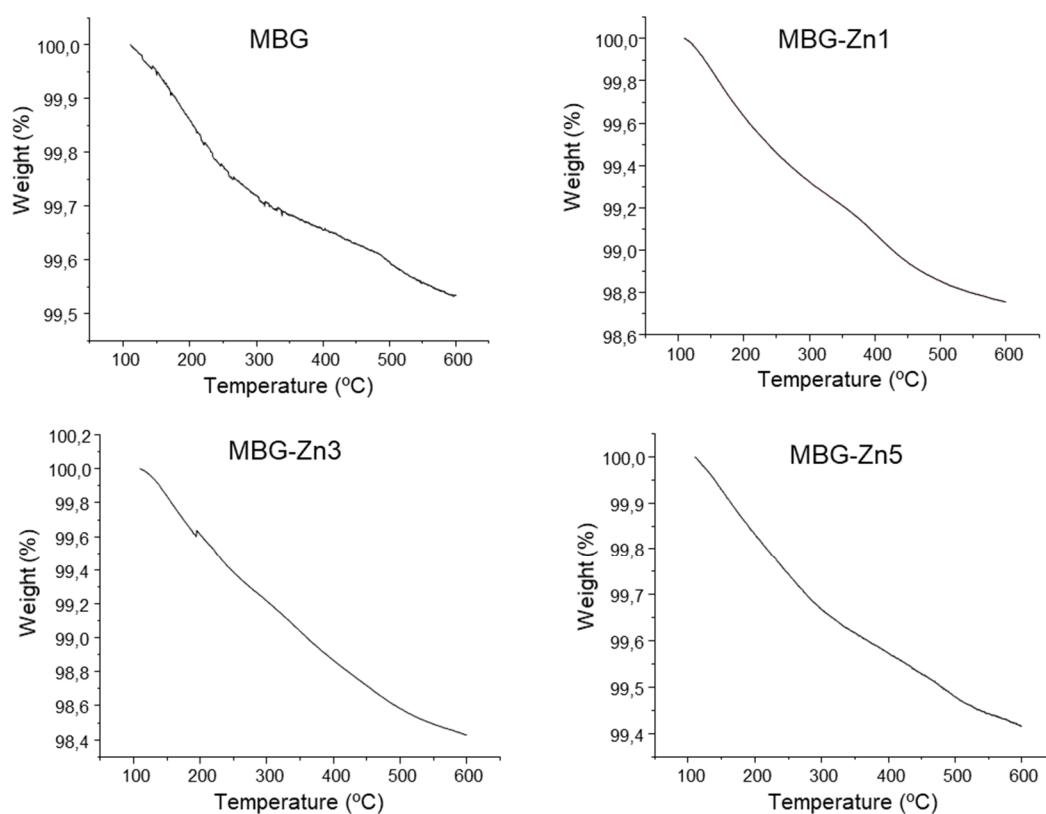


Figure S1. Thermogravimetical analysis of the different materials synthesized. The weight losses observed range between 0.4 and 1.5 % and would correspond to the condensation of silanol groups.

S.2. Implantation procedure

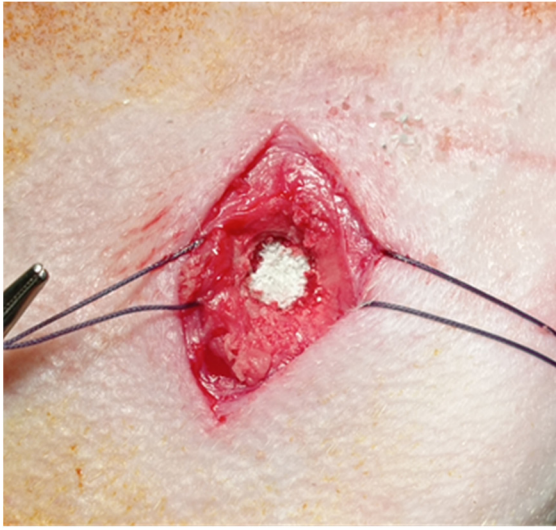


Figure S2. Image of the bone defect filled with MBG-Zn5 granules.

S.3. Computed tomography (CT) images

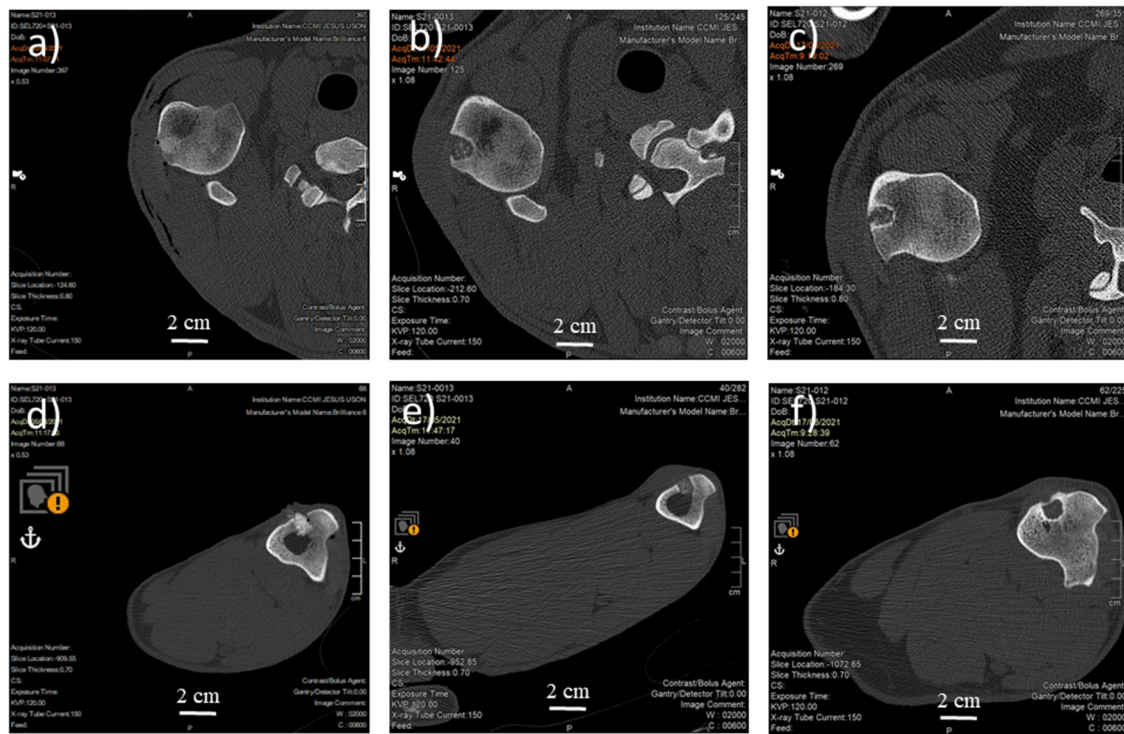


Figure S3. CT images for a) MBG post implantation, b) MBG after 6 weeks, c) MBG after 12 weeks, d) MBG-Zn5 post implantation, e) MBG-Zn5 after 6 weeks and f) MBG-Zn5 after 6 weeks.

S.4. Cells morphology studies

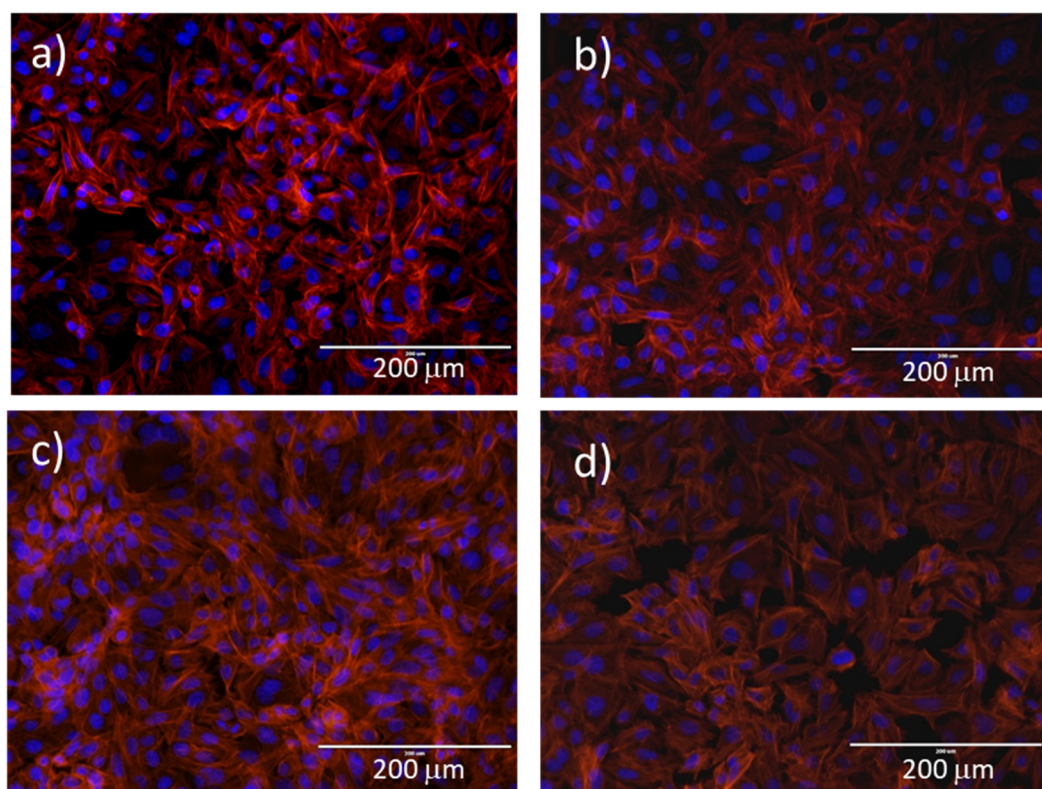


Figure S4. Optical images of MB3T3-E1 pre-osteoblast cells obtained after 1 week of culture in the presence of a) MBG; b) MBG-Zn1; c) MBG-Zn3 and d) MBG-Zn5

S.5. Apatite-forming ability of MBG in α -MEM culture media

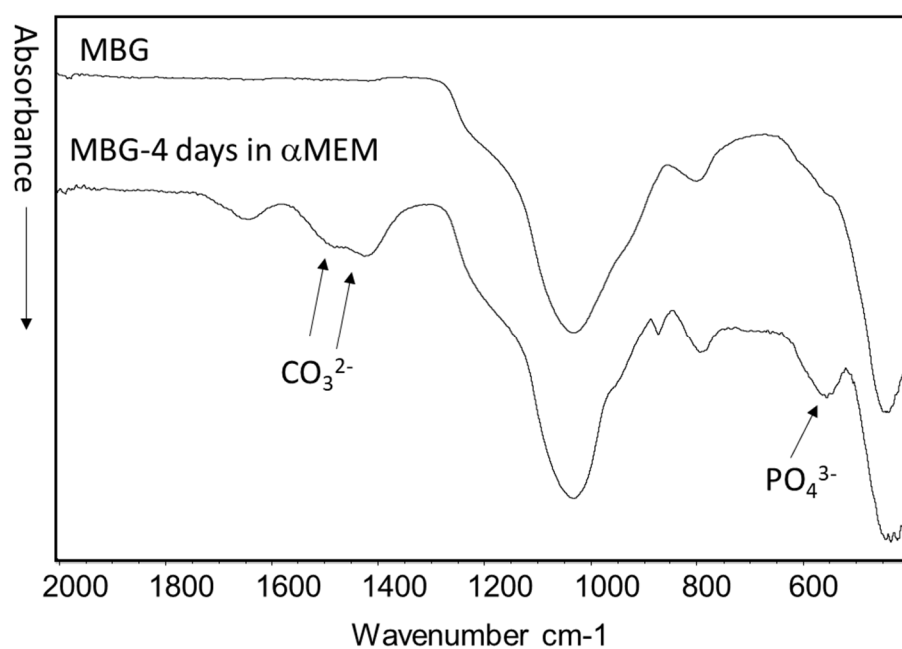


Figure S5. FT-IR spectrum of MBG sample before and after being soaked in α -MEM for 4 days. The presence of absorption bands at 560, 1419 and 1455 cm^{-1} evidence the formation of a new carbonated calcium phosphate phase similarly to the one observed when soaked in SBF

Table S1. Guide for quantitative histological analysis

Scoring for the extent of inflammatory component	
Description	Score
Absent	0
Mild. Mild or moderate focal infiltrate, or mild multifocal infiltrate	1
Moderate. Marked focal, moderate or marked multifocal, or mild diffuse infiltrate grade	2
Marked. Marked diffuse infiltrate	3
Scoring for the extent of blood vessels formation	
Description	Score
Absent	0
Mild: 0-5 vessels /20X microscope field	1
Moderate: 5-10 vessels /20X microscope field	2
Marked >10 vessels / 20X microscope field	3
Scoring for the extent of osteoblasts presence	
Description	Score
0 % of the new formed trabeculae contain osteoblasts	0
1-25 % of the new formed trabeculae contain osteoblasts	1
26-50 % of the new formed trabeculae contain osteoblasts	2
51-75% of the pores contain osteoblasts	3
76-100 % of the pores contain osteoblasts	4

Scoring for the extent of osteoclasts presence	
Description	Score
Absent	0
Mild: 1 – 5 osteoclasts /20X microscope field	1
Moderate: 5 - 10 osteoclasts /20X microscope field	2
Marked: More than 10 osteoclasts/ 20X microscope field	3