Supplementary Information

Gradient coatings of strontium hydroxyapatite/ zinc β-tricalcium phosphate as a tool to modulate osteoblast/osteoclast response

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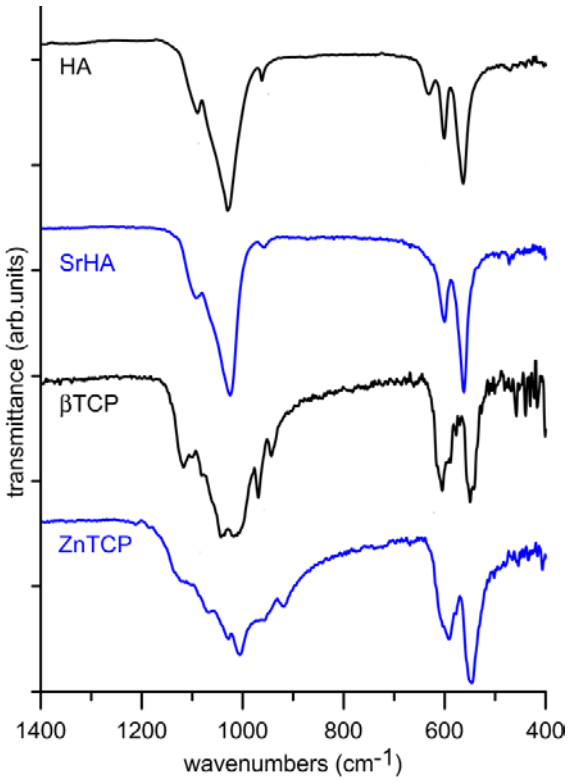

Figure S1. FT-IR of SrHA and ZnTCP, compared with those of HA and β-TCP.

Table S1. Main infrared absorption bands present in the spectra reported in Figure S1.

HA	SrHA	βTCP	ZnTCP	assignment
1089 1030 962	1093 1025 958	1116 1039 1014 970 943	1123 1028 1006 961 920	ν_3, ν_1 PO_4^{3-} stretching
630				OH^- libration
601 563	600 562	606 548	594 548	ν_4 PO_4^{3-} bending

Table S2. Calcium, strontium and zinc content in coatings prepared through C-MAPLE technique. EDS measurements were performed on as-prepared samples and on samples after incubation in cell medium for 7 days (in the absence of cells). The values are reported as atom%.

		A	B	C	D	E
As-prepared	Sr Ca Zn	18.1 81.9 ---	13.2 80.9 5.9	10.1 81.7 8.2	7.0 81.1 11.9	--- 85.0 15.0
After 7-days incubation	Sr Ca Zn	16.4 83.6 ---	12.3 82.5 5.2	8.1 83.8 8.1	6.9 83.7 9.4	--- 88.9 11.1

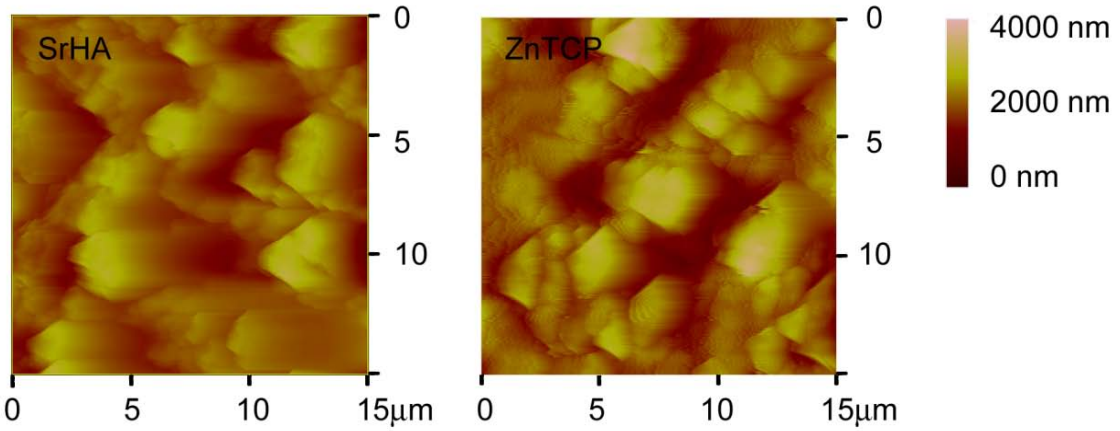

Figure S2. AFM images of the surfaces of A (SrHA) and E (ZnTCP) thin films.

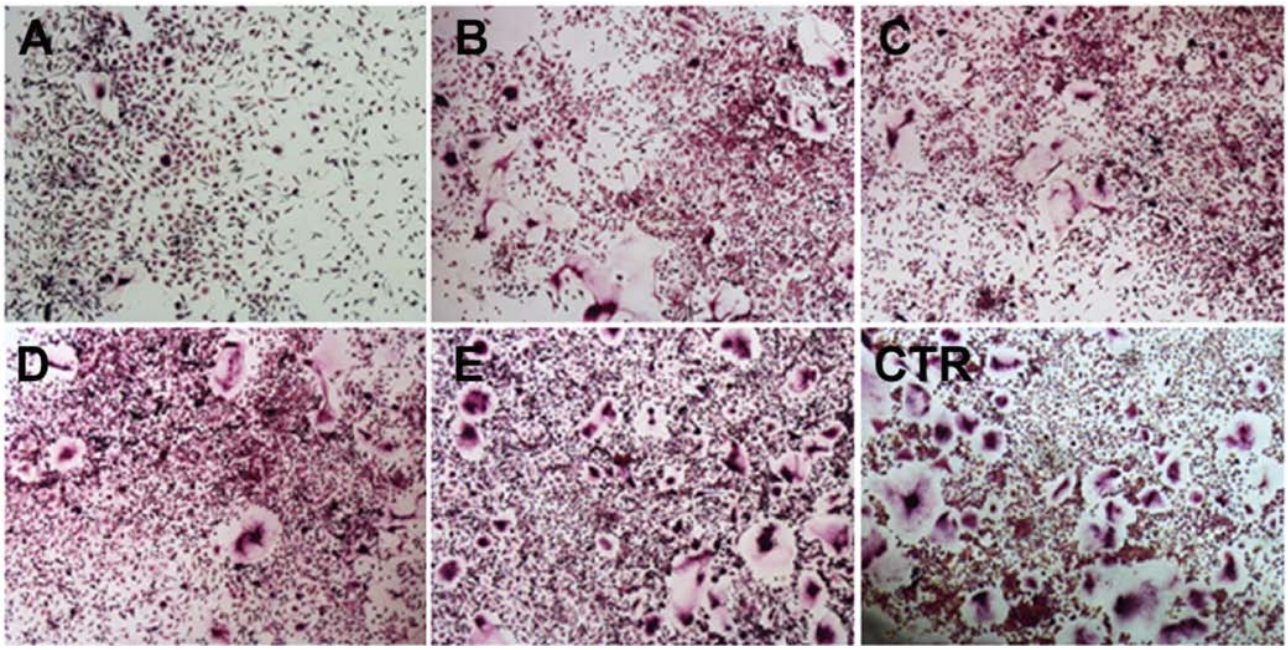

Figure S3. TRAP staining of OC co-cultured with OB and in presence of the different samples, and CTR. Monocytes differentiated in OC are recognizable as large multinucleated cells. (optical microscope, 4x magnification).

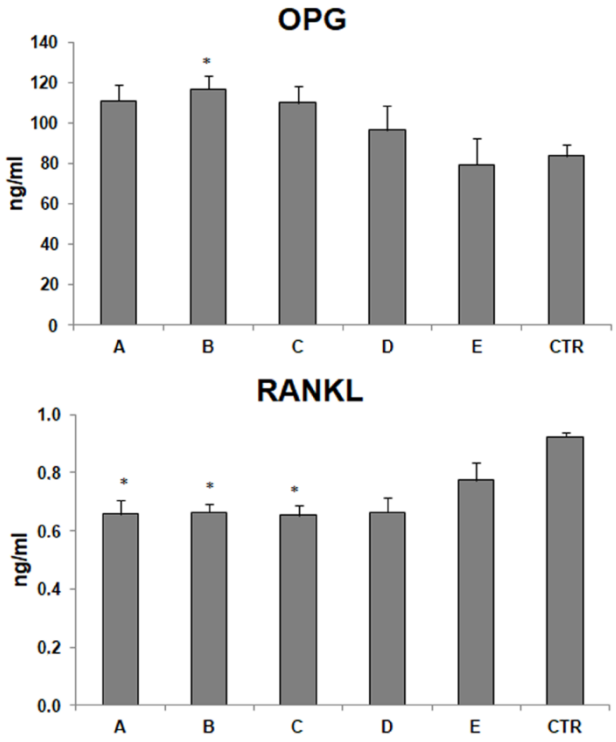

Figure S4. Osteoprotegerin and RANKL production were measured in cell supernatant after 1 week of OB-OC co-culture on material samples and CTR and their ratio was calculated (c). Statistical analysis is reported in the figure (*p<0.05, **p<0.005, ***p<0.0005).

OPG: * B vs CTR;

RANKL: * A, B, C vs CTR.

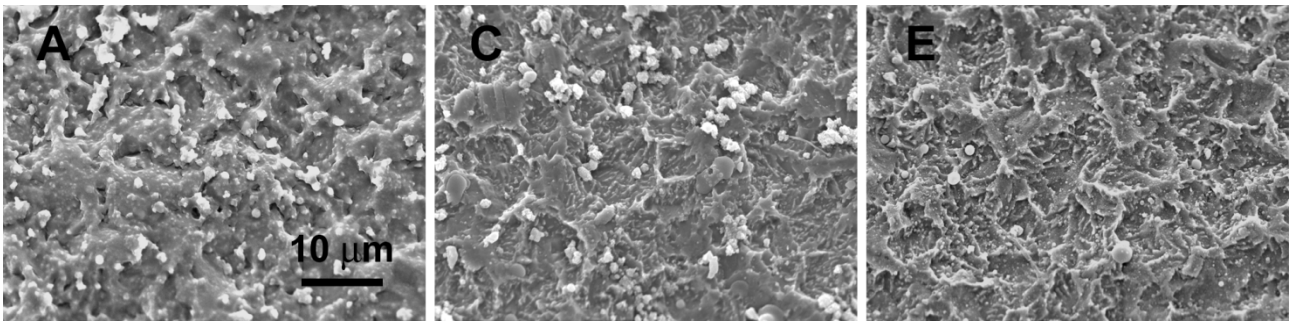

Figure S5. SEM images of A, C and E thin films after incubation in cell medium for 7 days (in the absence of cells).