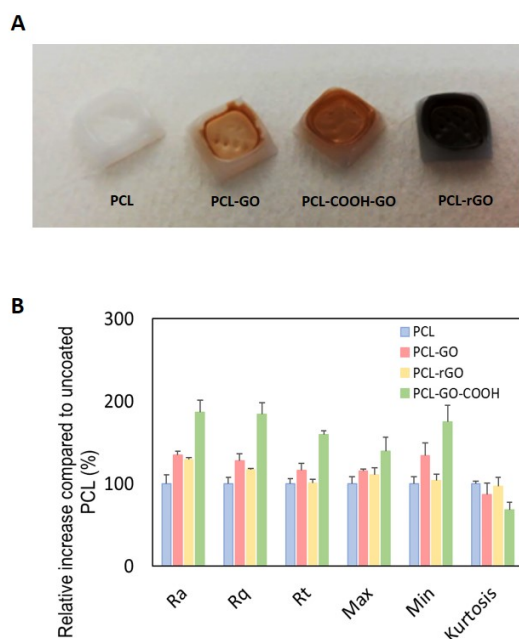


## Supplementary Materials

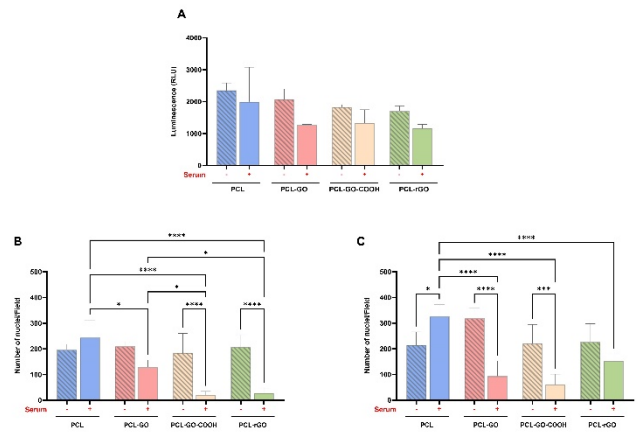


**Fig. S1. A)** Macroscopic images of PCL, PCL-GO, PCL-GO-COOH and PCL-rGO scaffolds. **B) Analysis of AFM imaging of samples.** Different coatings have been imaged with AFM and analyzed with Gwyddion software to retrieve main surface features: Ra is the Roughness average, i.e. the average absolute deviation of the roughness irregularities from the mean line; Rq is the RMS height of the surface roughness, the Rt is the height difference between the highest (Max) and lowest peak (Min) in the image and the Kurtosis is the “sharpness” of the surface topography.

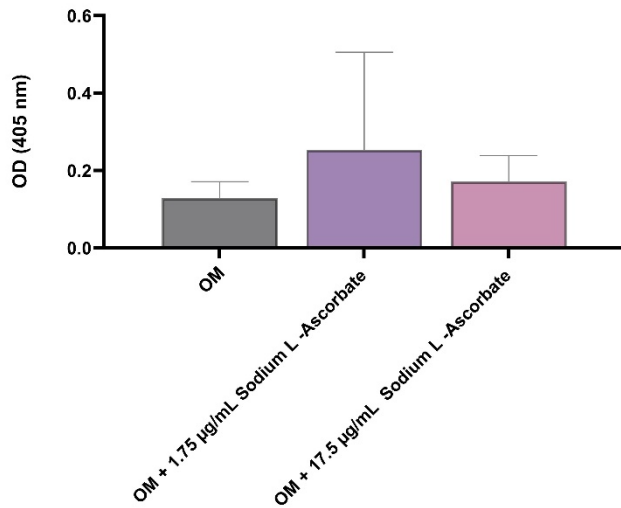
**Table S1.** Position and full-width at half-maximum (FWHM) of peaks resulting from curve-fitting of C 1s XPS region for the three samples. <sup>a</sup>The corresponding normalized areas to the sum of C<sub>sp<sup>2</sup></sub> and C<sub>gr</sub> components are also reported.

GO	Position (eV)	FWHM (eV)	Normalized area
sp <sup>2</sup>	284,8	1,6	-
hydroxyl	286,4	1,0	0,26
epoxy	287	1,1	0,75
carbonyl	288,1	1,3	0,19
carboxyl	289,2	1,6	0,07
<b>GO-COOH</b>			
sp <sup>2</sup>	284,8	1,3	-
hydrox	286,6	1,0	0,25
epoxy	287,1	1,3	0,28
carbonyl/carboxylate	288,2	1,2	0,30
carboxyl	289,3	1,3	0,06
methylene	285,4	1,5	0,11
<b>rGO</b>			

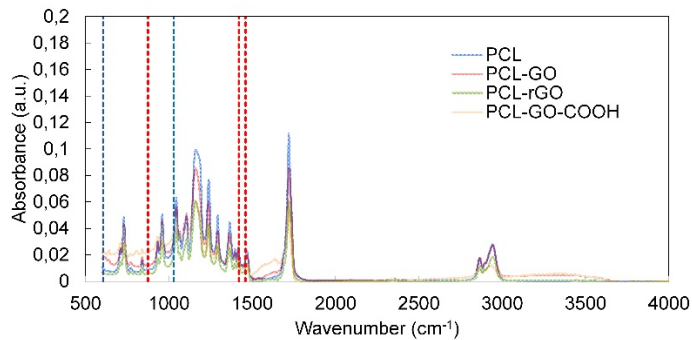
sp <sup>2</sup>	284,8	1,8	-
hydroxyl	286,3	1,6	0,22
epoxy	286,9	1,6	0,05
carbonyl/carboxylate	287,9	1,6	0,07
carboxyl	289,2	1,8	0,08
C <sub>gr</sub>	284,3	0,8	-



**Figure S2. Viability assay.** A) The graph displays the viability of hBM-MSC grown on the surface of uncoated (PCL) and GO-coated scaffolds pretreated (+) or not (-) with human serum. B-C) The graphs show the number of nuclei per field of hBM-MSC cultured for 24 (B) and 72 hours (C) on PCL, PCL -GO, PCL -GO-COOH and PCL-rGO.



**Figure S3: Photometric quantification of ARS staining.** The graph shows the quantification of bone matrix deposits of hBM-MSC treated with osteogenic medium (OM) supplemented with different concentrations of (+)-Sodium L-ascorbate, as absorbance of extracted ARS. The results are reported in the graphs bar as mean  $\pm$  SD.



**Figure S4. Analysis of the inorganic CL component in untreated samples.** The graph displays the PCL-GO coated samples FTIR Spectra without SBF incubation.