

## Supplementary information

### Graphene-Nanoplatelets-Sericin Surface-Modified Gum Alloy for Improved Biological Response

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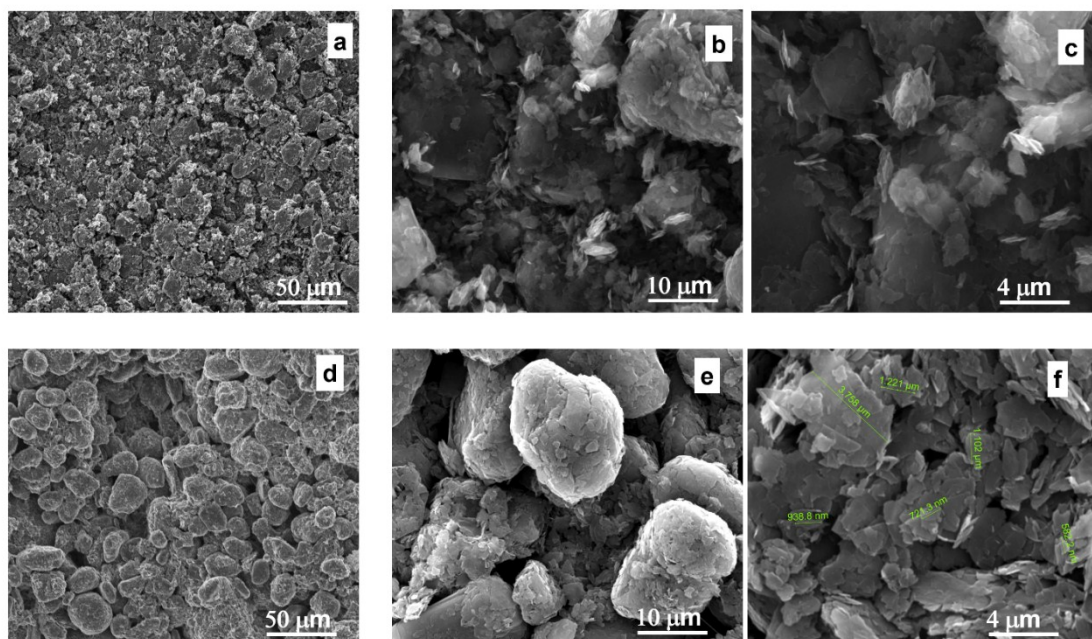
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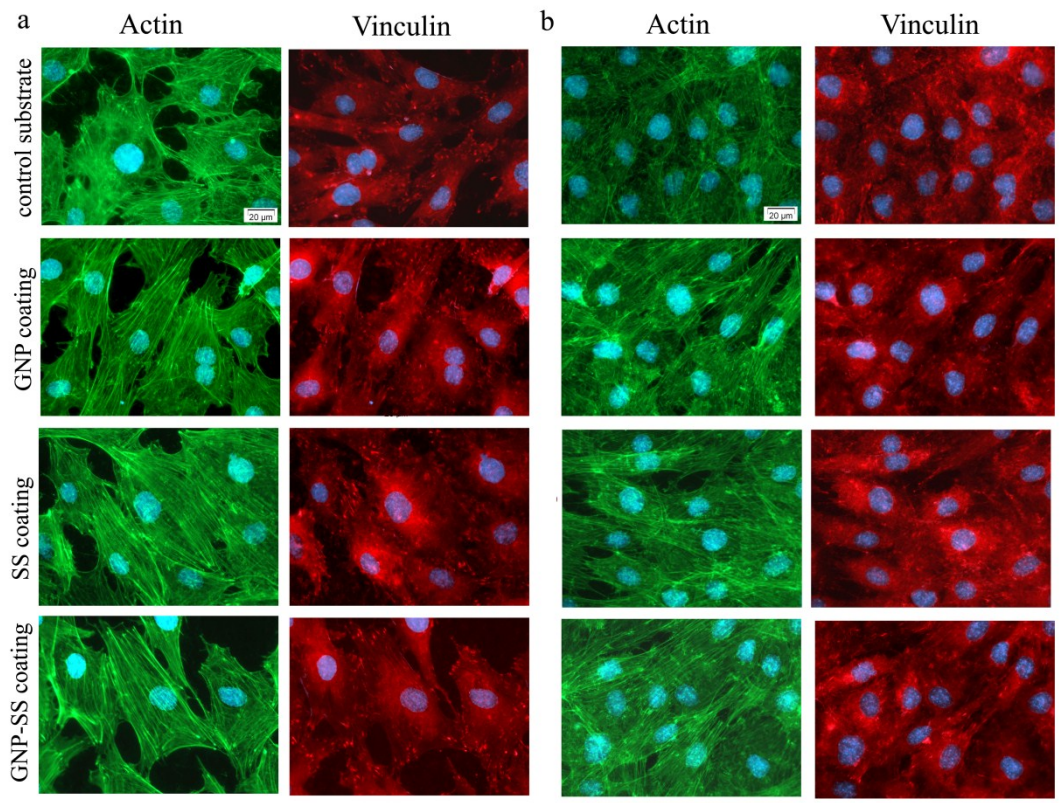
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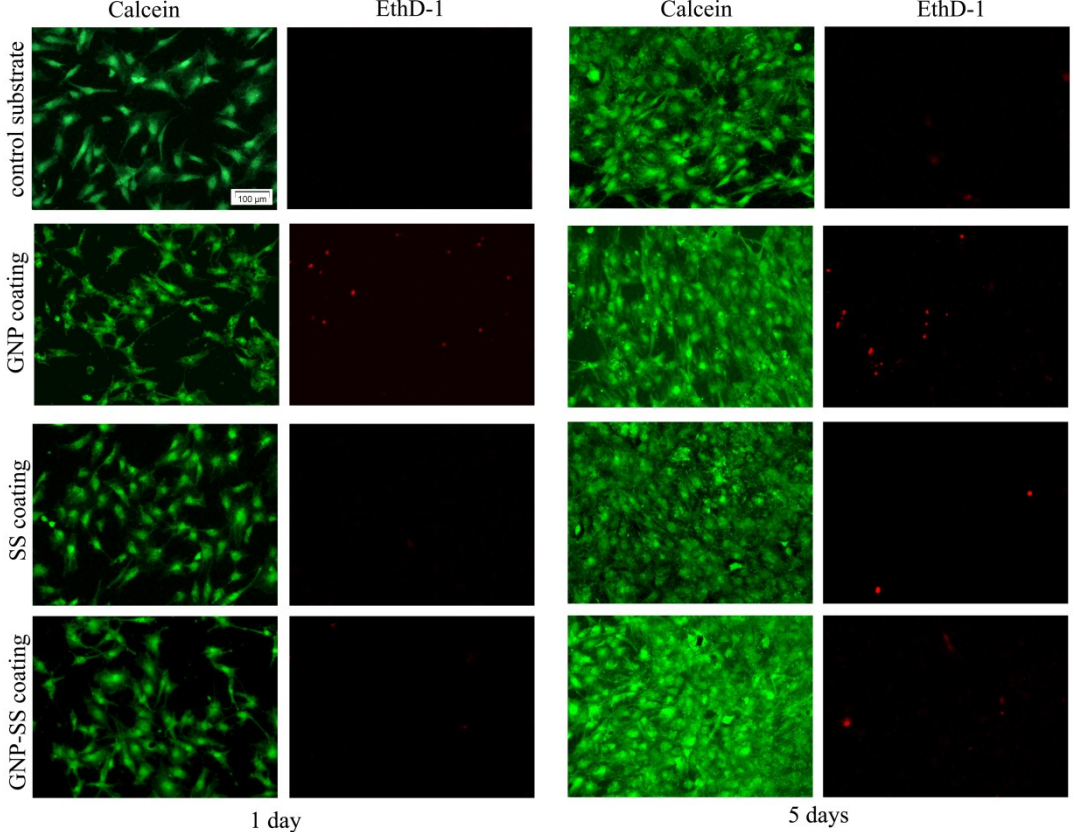
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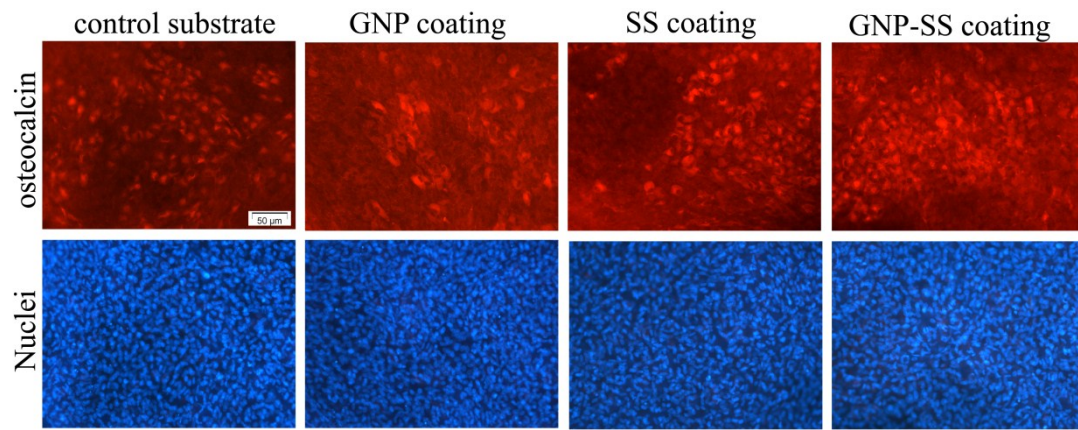
**Fig. S1** SEM images of powder at different magnification (a-c) and of the drop casted solution of GNP after the sonication process (d-f). It can be observed higher density of nanoplatelets present onto the powder sample, while for the sonicated one, due to water and drying process, the smaller nanoplatelets are found between the aggregates. However, the sonication helps in detaching nanoplatelets from the aggregates, which is helpful in MAPLE process, where smaller particles are easier to be transported onto the substrates than bigger ones and helps as well to obtain more homogenous coatings.



**Fig. S2** Fluorescent images of MC3T3-E1 pre-osteoblasts grown on uncoated and GNP-, SS- and GNP-SS- coated Gum alloy for 1 day (a) and 5 days (b) respectively. Green fluorescence: actin cytoskeleton; Red fluorescence: vinculin signals. Scale bar: 20  $\mu\text{m}$ .



**Fig. S3** Fluorescent cell staining with LIVE/DEAD Cell Viability/Cytotoxicity Assay Kit after 1 day and 5 days of culture (live cells fluorescence green and dead cells fluorescence red). Scale bar: 100  $\mu\text{m}$ .



**Fig. S4** Fluorescent immunolabeling of osteocalcin protein expression and cell nuclei stained with DAPI in MC3T3-E1 pre-osteoblasts grown for 3 weeks on control substrate and GNP-, SS- and GNP-SS- coated Gum alloy. Red fluorescence: osteocalcin; Blue fluorescence: nuclei. Scale bar: 50 μm