

Engineered nanostructures within sol-gel bioactive glass for enhanced bioactivity and modulated drug delivery

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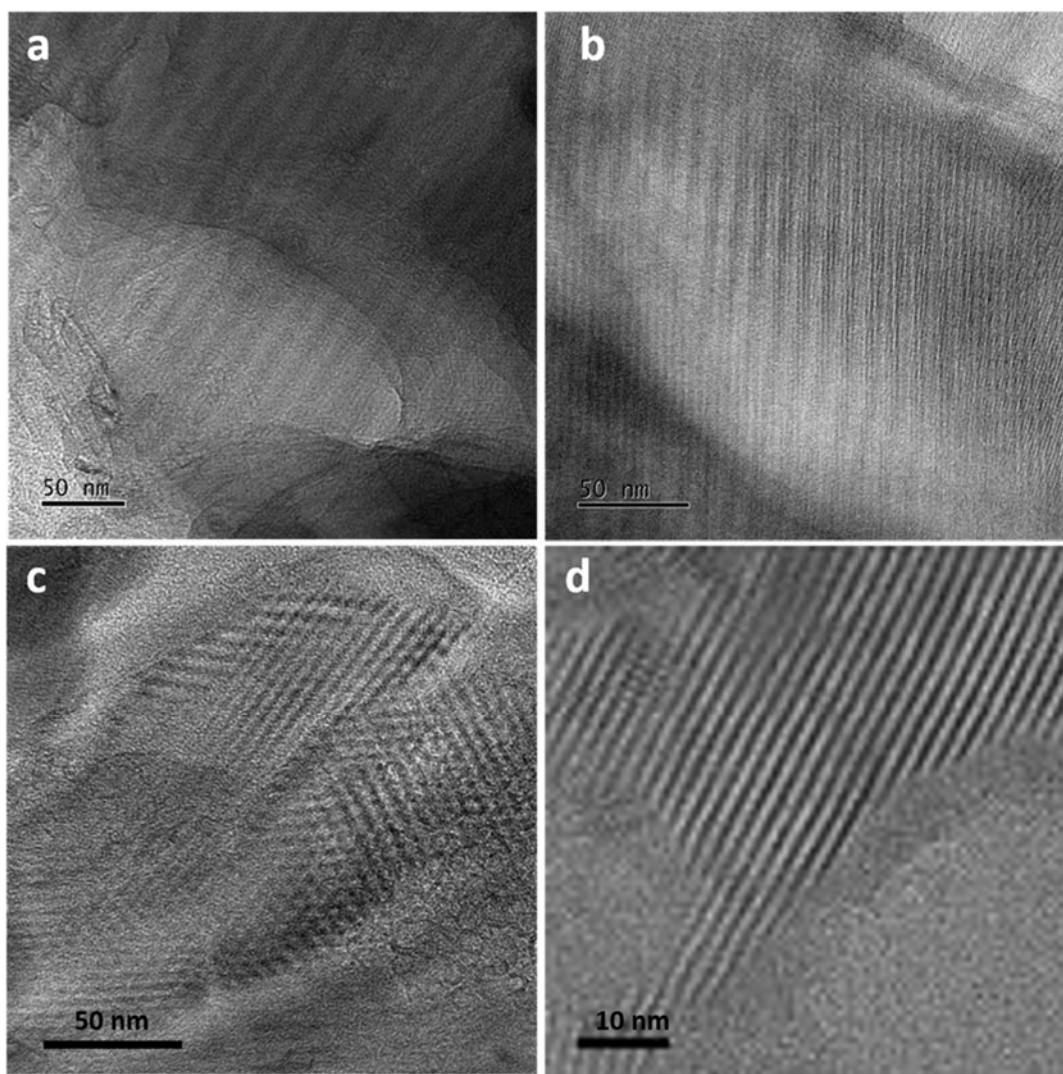


Fig. S1. TEM photomicrograph of nMBG@P1 showing the differently scaled mesopores.

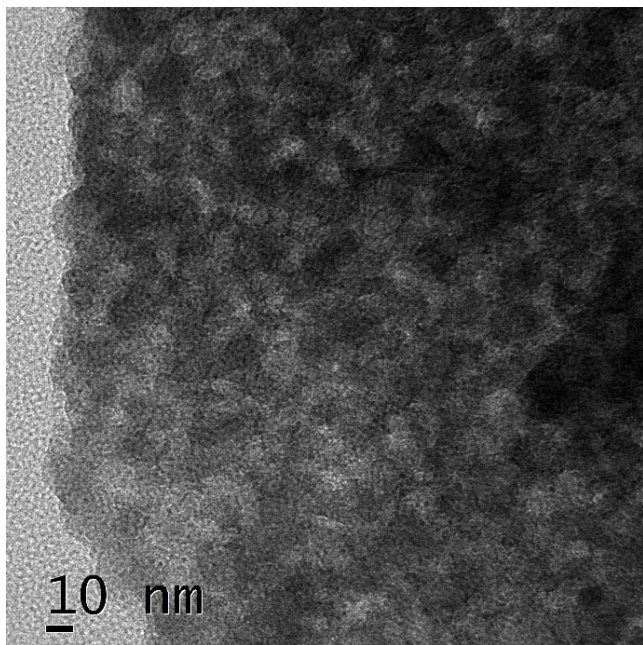


Fig. S2. TEM photomicrograph of BG showing the worm-like disordered phase.

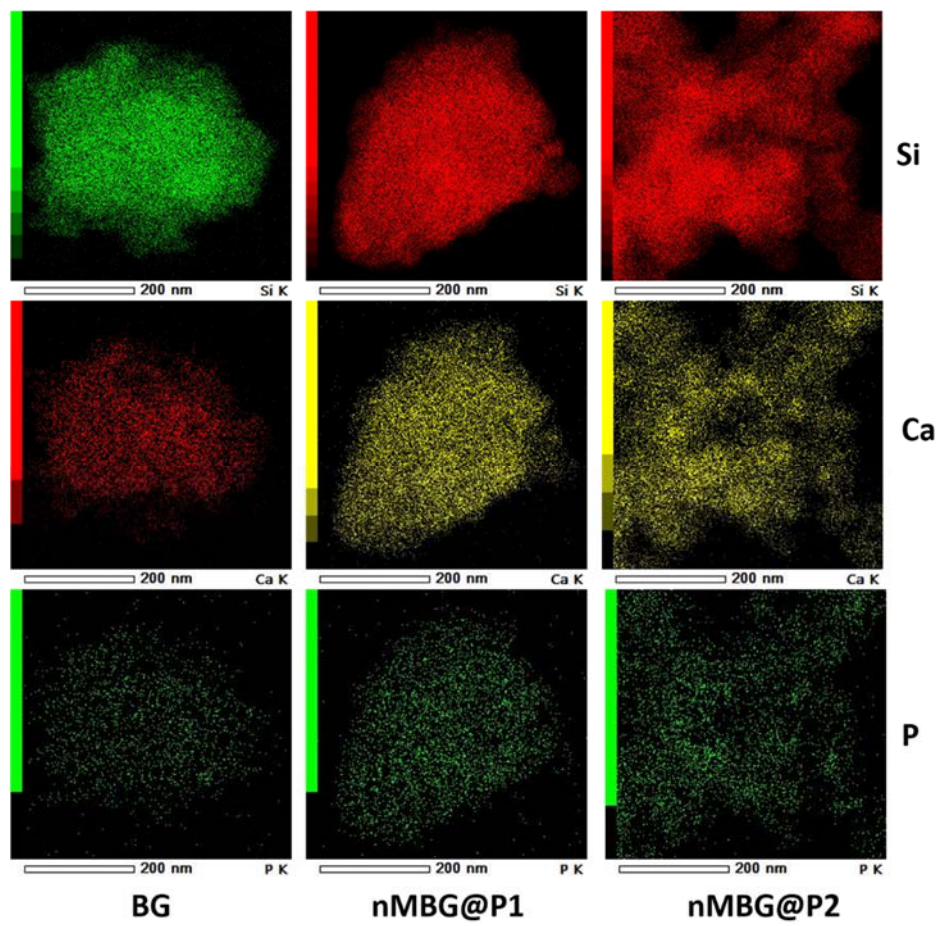


Fig. S3. STEM elemental mapping images of bioactive glass samples

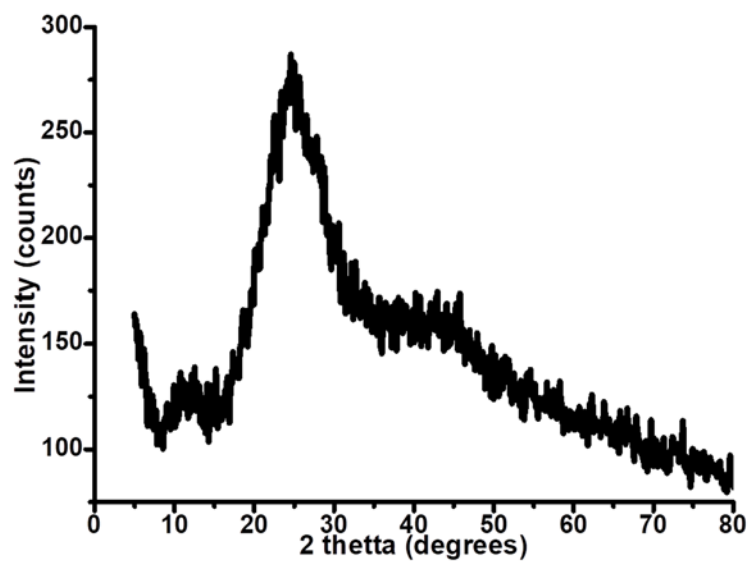


Fig. S4. XRD pattern of as-synthesized nMBG@P1 sample

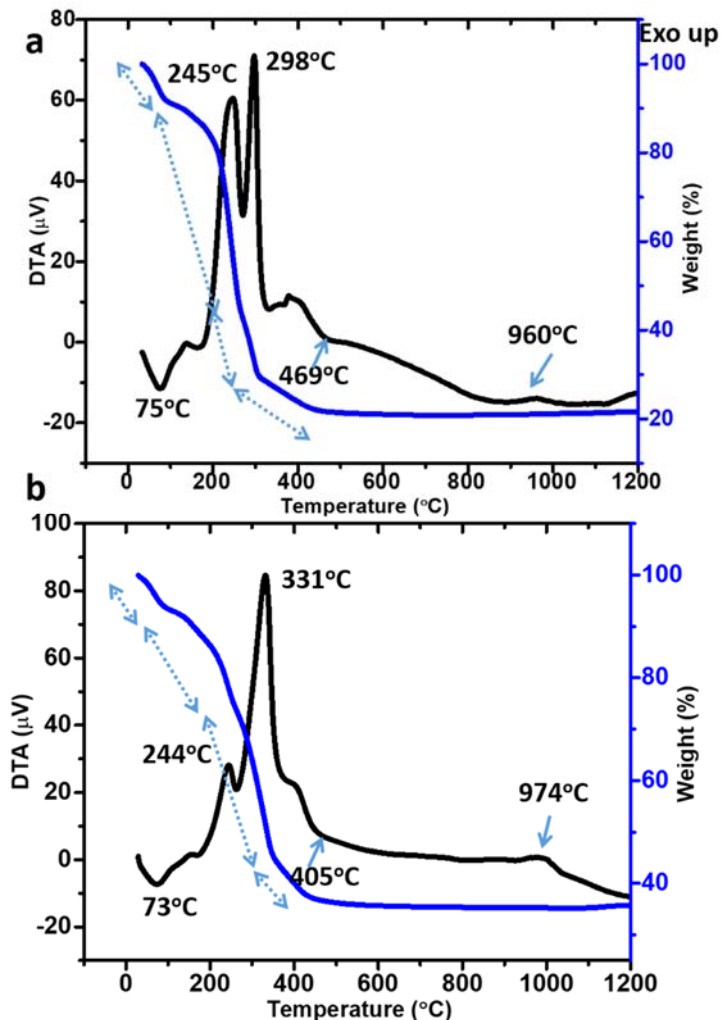


Fig. S5. TGA-DTA traces of as-synthesized (a) nMBG@P2 and (b) nMBG@P1 sample

TGA-DTA analysis- Simultaneous TGA-DTA was performed using Perkin Elmer (Pyris Diamond TG-DTA) in air atmosphere from room temperature to 1200°C with a heating rate of 10°/min. The TGA thermogram of nMBG@P2 raw sample (Fig. S4a) shows a first mass loss which initiated at room temperature corresponds to the loss of physisorbed water and alcohol which remained in the pores as the condensation byproducts that were not removed during drying. In the DTA curve this initial mass loss (9% weight loss) is reflected by a sharp endothermic peak at 75°C. The second weight loss onset at 100°C till 269°C is attributed to the removal of template which is reflected by a sharp exothermic peak at 245°C. The third mass loss occurred owing to the desorption of chemically adsorbed water as the silanol group condenses. This is correlated with an exothermic peak at 298°C in the DTA trace. The fourth mass drop corresponding to a broad endothermic peak at 469°C is attributed for the removal of residual nitrates. The TGA thermogram indicated the complete elimination of by-products (water, ethanol and nitrates) below 700 °C. Therefore, the thermal events detected in the DTA trace above 700 °C can be strictly attributed to the structural changes. The small exothermic peak at 960°C

corresponds to the glass crystallization (T_g). Hence the calcination temperature was selected to be 700°C so that the amorphous nature of the silicate phase is preserved.

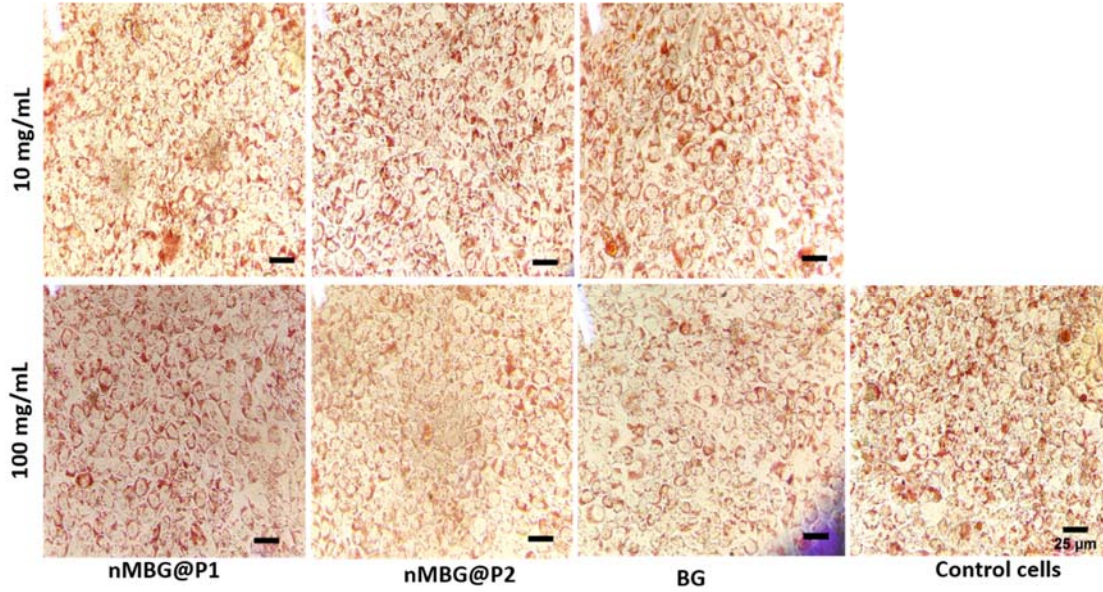


Fig. S6. Neutral red staining of HOS cells treated with a concentration of 100 µg of sample for 24 h and were compared with the control cells. Scale bar represents 25 µm

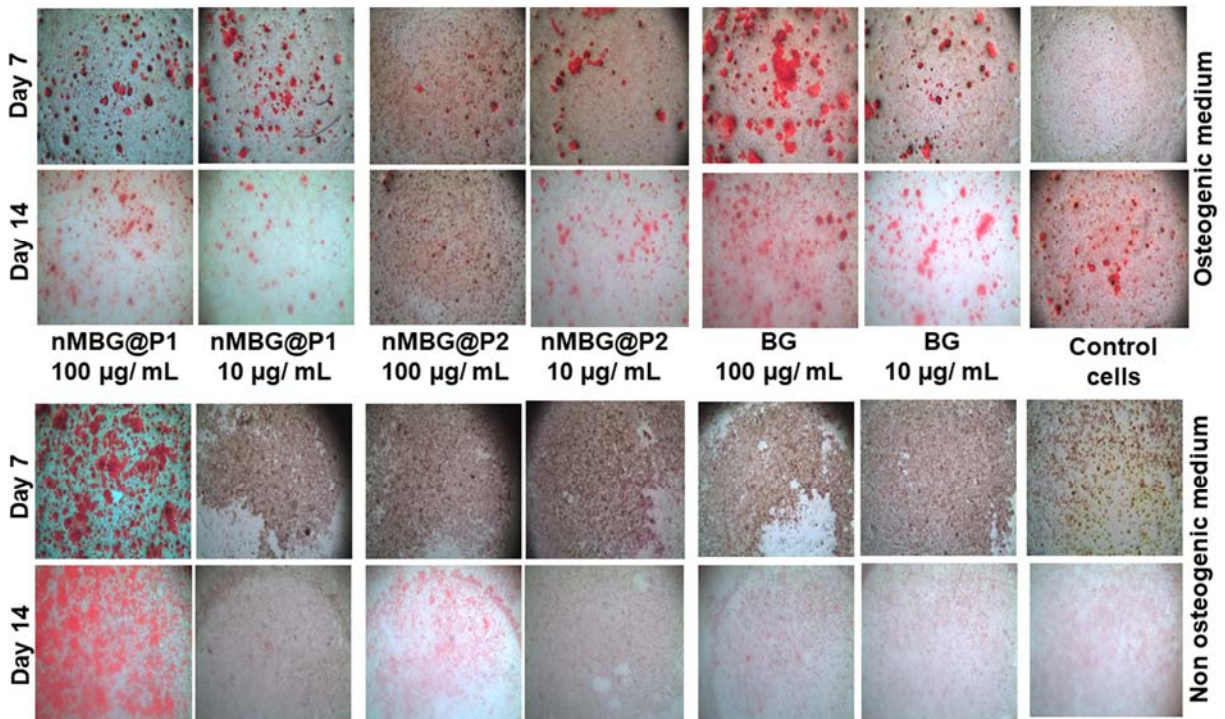


Fig. S7. Alizarin red staining of bioactive glass samples at day 7 and 14 (magnification 4x)