Polymeric foams with functional nanocomposite cells

Paola Calcagnile, a Despina Fragouli, a,b Elisa Mele, a Roberta Ruffilli, c and Athanassia Athanassiou b

a Center for Biomolecular Nanotechnologies (CBN) @UNILE, Istituto Italiano di Tecnologia (IIT) Via Barsanti, 73010 Arnesano (LE), Lecce, Italy.
b Smart Materials Group – Nanophysics, Istituto Italiano di Tecnologia, Via Morego 30, 16163 Genova, Italy.
c Nanochemistry, Istituto Italiano di Tecnologia, Via Morego 30, 16163 Genova, Italy.
despina.fragouli@iit.it
Figure S1. Schematic description of the T-junction fluidics set-up used for the fabrication of sub-millimetric calcium alginate beads.
Table S1. Values of flow rate for oil and sodium alginate solution utilized in the T-junction fluidics set-up, and the diameters of the alginate beads obtained.
Figure S2. Optical images of calcium alginate beads obtained using the fluidics set-up and (a) 3%, (b) 5% and (c) 7%wt sodium alginate solution. A progressive reduction in the length of the tips can be observed.
Figure S3. Photo of calcium alginate beads loaded with HAuCl₄ gold precursor. Ions Au⁺⁺ are reduced from the alginate matrix to Au⁰, creating gold nanoparticles into the calcium alginate beads. Purple colour is characteristic for gold nanoparticles.
Figure S4. (a) Photo of calcium alginate beads with diameter of around 1.56 mm. (b) Photo of calcium alginate beads of same dimensions as (a), containing a high amount of gold precursor.
**Figure S5.** Photo of a PDMS foam obtained using gold precursor loaded calcium alginate beads as templates. It exhibits the typical purple colour due to the formation of gold nanoparticles at the inner surface of the pores, in contact with the beads.
Figure S6. Three dimensional reconstruction of a PDMS foam, using gold precursor loaded calcium alginate beads as templates, as obtained by confocal microscopy. The blue region corresponds to the formation of gold nanoparticles at the inner surface of the pores.