Biological behaviour of UCNPs loaded aerogel scaffolds

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Aerogels are the lightest solids on Earth with outstanding physical properties like highly porous, high specific surface areas and low densities [1]. Furthermore, aerogels exhibit tunable mechanical properties, composition and porous structure making them attractive for biomedical applications. Nevertheless, the difficulty to track and monitor them and their degradation products in a non-invasive way after their implantation through an *in vivo* imaging method is still a challenge. In this context, upconversion nanoparticles (UCNPs), also known as “new generation fluorophores”, present unique luminescent properties, deep near infrared light penetration into biological tissues, excellent detection sensitivity and low toxicity [2]. Specifically, rare earth based UCNPs are excellent fluorescent bioimaging labels able to convert infrared light into visible light [3]. For this reason, UCNPs have been employed for *in vitro* and *in vivo* bioimaging and biodetection applications without significant toxicity. In this work, UCNPs were synthesized by a co-precipitation method from rare earth elements followed by a silica coating step. Then, aerogel scaffolds were manufactured and loaded with UCNPs and the success of this incorporation was assessed by microscopy techniques. Finally, UCNPs loaded aerogels were evaluated regarding their *in vitro* biological behavior by cytocompatibility, adhesion and migration tests.

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