

Mesoporous magnetic nanorods for theranostics

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Abstract

The presented work involves developing mesoporous silica nanorods as a platform for production of multimodal agents for diagnostic and therapeutic purposes. The main aim is to demonstrate that such materials can exhibit improved properties compared to the current state of the art, mainly focused on spherical particles.

In this work mesoporous silica nanorods (Figure) have been synthesized and characterized in terms of size, shape, pore size and surface area. In a second step, silica was functionalized by inserting iron oxide nanoparticles into the pores by an in-situ method.

The magnetic properties of the silica nanorods have been investigated and their performance as MRI contrast agents has been studied.

Future work will focus on in vitro and in vivo performance tests as well as on using the nanoplatforms for ultrasound (US) imaging and computerized tomography (CT) imaging.

References

Figures

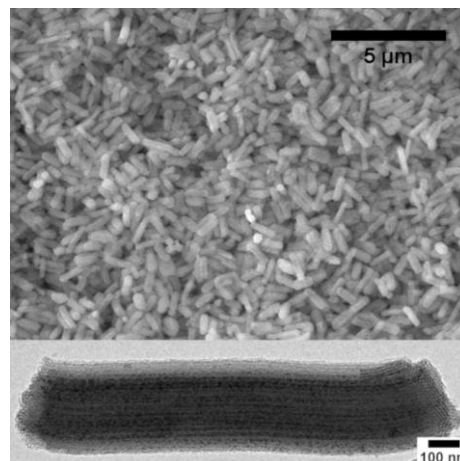


Figure 1. (Top) Scanning electron microscopy (SEM) image of mesoporous silica nanorods synthesized using a templated sol-gel method. (Bottom) Transmission electron microscopy (TEM) image of a silica rod filled with iron oxide nanoparticles.

