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Photochimie et Photophysique Supramoléculaires et Macromoléculaires

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«Luminescent Silica Nanoparticles: Extending the Frontiers of Brightness»

Silica nanoparticles are versatile platforms with many intrinsic features, including a low toxicity. Proper design and derivatization yield particularly stable, very bright nanosystems displaying multiple functions, which can be used for either photoluminescence (PL) or electrochemiluminescence (ECL) sensing, labelling or imaging applications. [1,2] For these reasons silica nanoparticles already offer unique opportunities, and further improvement and optimization can substantially increase their applications in fields of high impact, such as medical diagnostics and therapy, environmental and food analysis, and security. In particular, our group has recently designed silica-core/PEG-shell multi-component nanoparticles (NPs), tailored for optimization of processes such as directional energy transfer, which provide those systems with extremely valuable functions: high light-harvesting capability, signal-to-noise maximization, multiplex output, and signal amplification, [1-4] also for in vivo imaging (figure 1).

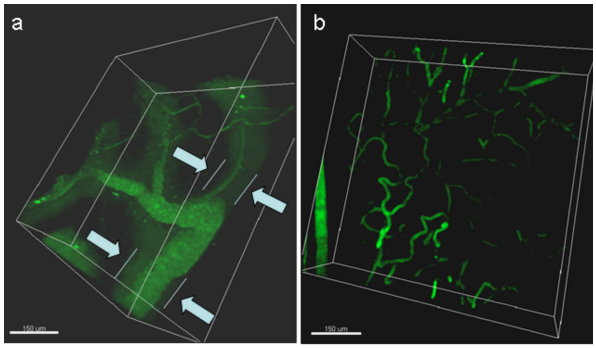

Figure 1: In vivo microscopic images of silica-core/PEG-shell multi-component nanoparticles in tumor (panel a) and in ear (panel b). [4]

Références :

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[2]Bonacchi, S.; Genovese, D.; Juris, R.; Montalti, M.; Prodi, L.; Rampazzo, E.; Sgarzi, M.; Zaccheroni, N., *Top. Curr. Chem.* **2011**, *300*, 93-138.

[3]Rampazzo, E.; Bonacchi, S.; Genovese, D.; Juris, R.; Sgarzi, M.; Montalti, M.; Prodi, L.; Zaccheroni, N.; Tomaselli, G.; Gentile, S.; Satriano, C.; Rizzarelli, E., *Chem. Eur. J.*, **2011**, *17*, 13429-13432.

[4] Rampazzo, E.; Boschi, F.; Bonacchi, S.; Juris, R.; Montalti, M.; Zaccheroni, N.; Prodi, L.; Calderan, L.; Rossi, B.; Becchi, L. S.; Sbarbati, A., *Nanoscale*, **2012**, *4*, 824-830.

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