NANOPARTICLES PRESENTING THE PHENOMENON OF LUMINESCENT PERSISTENCE MAKE THE DIFFERENCE IN BIOLOGICAL APPLICATIONS.

Reference	Presenter	Authors (Institution)	Abstract
01-158	Hermi Felinto de Brito	Brito, H.F. (Universidade de São Paulo); Felinto, M.C. (Instituto de Pesquisas Energéticas e Nucleares); Francisco, L.H. (IPEN); SAULA, M.S.(USP); MERIZIO, L.G. (USP);	The persistent luminescent materials are an important class of light-induced energy storage materials, which have undertaken a long development process. Recently, there has been increasing interest in employing long persistence luminescent nanoparticles (LPLNPs) for in vivo imaging. Because the long afterglow of these nanoparticles can last for several hours after they are excited in vitro, real-time in vivo imaging can be achieved after injection without requiring any external illumination source. Thus, the SNR can be significantly improved by removing the background noise originating from in situ excitations. Moreover, the afterglow luminescence of near-infrared (NIR)-emitting long-persistence luminescent nanoparticles (NLPLNPs) (the afterglow wavelength varies from 650 nm to 900 nm) falls within the tissue transparency window, where light attenuation is largely due to scattering rather than absorption, which is advantageous for long-term in vivo imaging with deep penetration and a high SNR1-3. In this work, we will be discussed the synthesis of these LPLNPs, the characterization and the luminescent properties especially the persistent luminescence intensity and lifetime that are the two important parameters to evaluate the persistent luminescent properties of materials. It was expected the materials to have a very high luminescence intensity and long persistent lifetime. The development of rare-earth doped core-shell SrAl2O4:Eu2+/3+, Dy3+ nanoparticles prepared via hydrothermal synthesis and p-st-annealed on carbon monoxide, in reducing atmosphere, or materials like Li1,6M1,6Sn2,8O8:R3+ (M2+: Mg, Zn and Cd; R3+: Cr, Nd, Yb), etc prepared by microwave-assisted solid-state reaction, ceramics method and co-precipitation reaction generate materials with efficient persistent luminescence and will be discussed in terms of electronic structure and syntheses methodology. Moreover, standard luminescence spectroscopy results of pure characteristic green Eu2+ emission assigned to the 4f65d1?4f7(8S7/2) interconfigurational transition under near-ultraviolet excitation. Some of these materials have special behavior and present persistent luminescence in the near-infrared, NIR, which is very important in terms of biological application point-of-view.

References: [1] E. Bonturim, et. al.; J. Alloys Compd., 732, 705-715 (2018). [2] Y. Li, et. al.; Chem Soc Rev., 45, 2090-2136 (2016). [3] J. Xu, S. Tanabe., J. Luminesc., 205, 581-620, (2018). Acknowledgments: This research was supported by the funding agenciesFAPESP, CNPq and CAPES.

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