



## Rare earth compounds as smart materials to biological application

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### Abstract

Materials containing rare earth metals are receiving increasing attention due to its wide range of potential applications, including bioanalytical, images, dye-sensitized solar cells, nanobiotechnology, catalyses among others. The distinguished spectroscopic properties of lanthanides (intense emission bands, high color purity, long lifetime and high quantum efficiency) make them strong candidates for use as markers or bio-selective detectors. Besides the interest in developing nanoparticles ( NP ) associated with biological materials continues growing rapidly . This interest is mainly motivated by the desire to simultaneously exploit the properties of both the NP and biological components in new hybrid operating devices or materials that can be applied in strategic areas. In this work, we design various materials, synthesized and characterized in several laboratories that are part of the group fluoroimunoensaio inct - INAMI and NanoBio network and that have potential to use as biological markers .An attention to materials that emit in the regions of Vis and IR as the compound of Eu and Nd compounds, RE<sup>3+</sup> compounds covered with silica and functionalized, RE<sup>3+</sup> complexes dispersed in polymeric matrix and have sharp, etc. luminescence will be discussed. Also it will show these nanoparticles in - action , signaling biological materials at very low concentrations , on the order of nanomolar . The principal studies are connected to the diagnostic field and has been studied mainly *Leishmania* , PSA , LDL, sickle cell disease, estradiol and Chagas disease.

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