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Application of a potential fluorescence resonance energy transfer (FRET) method sensing combining CdTe quantum dots and Au nanoparticles for the determination of relevant analytes

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A high sensitivity in the analysis of biological components and drugs is essential to plainly determine the behavior and their different actions in the human body. For this reason, it is been developed a potential and sensitive detection method based on the fluorescence resonance energy transfer (FRET) system between mercaptopropionic acid (MPA)-capped CdTe quantum dots (QDs) and cysteamine (CS)-capped Au nanoparticles. Acting as energy donors, CdTe QDs and Au nanoparticles as energy acceptors in our system produced the modulation in FRET efficiency between QDs and AuNPs in the presence of target analytes like captopril, L- cysteine, glutathione, etc, which inhibits the interaction of the QD-AuNP assembly. Depending on the target analyte, the interaction could be either with MPA-capped CdTe QDs or CS-capped Au nanoparticles, enabling the measurement of the magnitude of this interaction and how it affects the FRET system. As a result, rapid, simple and novel methods of analysis based on fluorescence resonance energy transfer (FRET) in combination with quantum dots (QDs) and their unique properties are being designed, providing new and improved sensors for the determination of relevant analytes.

Biography

Julia Jiménez-López is pursuing her PhD since 2014 at University of Jaén (Spain). She has published seven papers in reputed journals. João L. M. Santos is developing his career as researcher and full professor at University of Porto. P. Ortega-Barrales and A. Ruiz-Medina, both full professors at University of Jaén, have published more than 70 and 90 papers cited in the JCR, respectively, and more than 20 book or book chapters. Moreover, they hold different positions in university management.

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