Poster

Optimized fluorescent nanoparticles used for direct detection of GST fusion proteins.

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The current development of life sciences is strongly linked to the availability of new experimental tools that enable the manipulation of biomolecules and the study of the biological process at the molecular level. We have optimized a synthetic process to obtain glutathione capped fluorescent CdS nanoparticles. Brightly fluorescents and biocompatible CdS quantum dots of different sizes can be obtained through our method based on four different heating steps. The optical behavior of the QDs has been evaluated studying both absorbance and fluorescence of the solutions containing the nanoparticles. For all samples the excitonic absorption onset clearly shows a blue shift in comparison to that of bulk CdS at 512nm, due to the quantum confinement effect. As the nanocrystal average size increases, the emission fluorescent band shows a red shift, from 440nm to 540nm. Both the study of the fluorescent efficiency as well as the fluorescent dynamic evolution provide information about the surface structure reconstruction of the quantum dot. We find a critical size at which, the quantum confinement effect as well as the surface/volume ratio give place to the highest fluorescent quantum yield and the largest fluorescent life time. We also show that optimized nanoparticles bound to Glutathione can directly bind Glutathion S-Transferase (GST) blotted onto PVDF membranes and thus are suitable for direct detection of GST fusion proteins.