

Encoded Nanospheres for the Fast Ratiometric Detection of Cystic Fibrosis

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Abstract : We present herein two colour encoded silica nanospheres (2nanoSi) for the fluorescence quantitative ratiometric determination of trypsin in humans. The system proved to be a faster (minutes) method, with two times higher sensitivity than the state-of-the-art biomarkers based sensors for cystic fibrosis (CF), allowing the quantification of trypsin concentrations in a wide range (0-350 mg/L). Furthermore, as trypsin is directly related to the development of cystic fibrosis, different human genotypes, i.e. healthy homozygotic (> 80 mg/L), CF homozygotic (< 50 mg/L), and heterozygotic (> 50 mg/L), respectively, can be determined using our 2nanoSi nanospheres.

Keywords : cystic fibrosis, trypsin, quantum dots, biomarker, homozygote, heterozygote

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