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Dual-color bioconjugated upconversion fluorescent probes for simultaneous sensing two food borne pathogenic bacteria**Huanhuan Li, Quansheng Chen, Qin Ouyang and Zhiming Guo**
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Rare earth-doped Up-Conversion Nano Particles (UCNPs) possess peculiar frequency up-converting capabilities and high detection sensitivity qualities which present them as a potent alternative biosensor requisite for the detection of pathogenic bacteria. This paper reports a novel dual-color UCNP-based bacterium-sensing biosensor for *Escherichia coli* and *Staphylococcus aureus* detection simultaneously using UCNP as a fluorescence marker conjugated with antibodies as the specific molecular recognition unit. Dual-color UCNPs were fabricated via varying doped rare-earth ions to acquire the well-separated emission peaks. Dual-color UCNPs conjugated with antibody of *E. coli* and *S. aureus* for use as fluorescent probes. When *E. coli* and *S. aureus* were added into the reaction system, the fluorescent probes will capture the target bacteria through the specific binding of antibody, and then the fluorescence intensities decreased ($\Delta I = I_0 - I$) were observed to increase linearly with the concentration of the *E. coli* (664 nm) and *S. aureus* (806 nm) from 47 to 47×10^6 cfu mL⁻¹ ($y = 199.45x - 207.95$, $R^2 = 0.98$) and 64 to 64×10^6 cfu mL⁻¹ ($y = 281.94x - 116.19$, $R^2 = 0.9657$), respectively, resulting in the relatively low limit of 13 cfu mL⁻¹ and 15 cfu mL⁻¹ for *E. coli* and *S. aureus*, respectively. Furthermore, this UCNP-based bacterium-sensing biosensor could be successfully applied to detect *E. coli* and *S. aureus* in adulterated meat and milk samples simultaneously.

Biography

Huanhuan Li has completed her Master's degree from Jiangsu University and pursued her PhD from Jiangsu University School of Food and Biological Engineering. She has published 8 SCI papers in the reputed journals.

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