

Coassemble Dopamine and GHK Tripeptide into Fluorescent Nanoparticles for pH Sensing

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Abstract

Fluorescent nanostructures have been widely applied to biomedical researches and clinical diagnosis such as biolabeling/imaging/sensing and have even acted as therapy reagents. Peptide-based fluorescent nanostructures attract recent interest from biomedical researchers. Inspired by the natural existence of GHK-Cu complex with a growth factor-like effect in human blood, here we have developed a novel approach for designing nanosensors through the co-assembling of two kinds of biomolecules. By making best use of both π - π stacking between carbon rings and the easy-oxidation property of an important transmitter molecule, dopamine (DA), we successfully built up a supersensitive and robust fluorescent pH nanosensor by co-assembling oxidized DA (DAox) with a tripeptide GHK. The GHK-DAox nanostructures have a quantum yield of 20.82%, which might be the brightest one among all the current co-assembling structures merely through unmodified biomolecules. We envision this approach could open a new avenue for not only hybrid nanostructure construction, but also may inspire the bioengineering of in vivo luminescent probes.