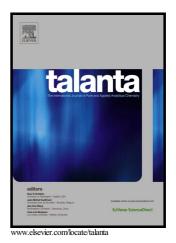
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ACCEPTED MANUSCRIPT

An "off-on" phosphorescent aptasensor switch for detection of ATP

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Abstract:

An "off-on" phosphorescent aptasensor based on the 3-mercaptopropionic acid (MPA) capped Mn-doped ZnS quantum dots (MPA-Mn:ZnS QDs)/aptamer hybrid system was developed to detect adenosine triphosphate (ATP) in biological fluids. The phosphorescence of MPA-Mn:ZnS QDs was obviously quenched when ATP aptamer was added due to the aggregation induced effect. ATP aptamer, adsorbing on the surface of the phosphorescent MPA-Mn:ZnS QDs, has a high affinity for ATP. And then, with the addition of ATP, phosphorescence was gradually recovered because of the stronger special binding interaction between ATP and ATP aptamer than that between QDs and ATP aptamer. In this case, a high sensitivity and selectivity of phosphorescent aptasensor for the detection of ATP have constructed with a low detection limit of 0.9 nM and a wide linear range from 2 nM to 9 μ M. What's more, the phosphorescent aptasensor does not require complex pretreatments and can effectively eliminate the interference from auto fluorescence and scattering light.

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