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# A Novel Nanosensor Composed of Aptamer Bio-dots and Gold Nanoparticles for Determination of Thrombin with Multiple Signals

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## Abstract

Thrombin is a crucial multifunctional enzyme involved in many physiological and pathological processes. Its detection is of great importance. In this work, a novel bio-dots nanosensor for detection of thrombin with colorimetric, fluorometric and light-scattering signals is developed. This nanosensor is composed of thrombin-binding aptamer bio-dots (TBA-dots) and gold nanoparticles (AuNPs), where TBA-dots serve as fluorometric reporter and AuNPs function as multiple roles as colorimetric reporter, light scattering reporter and fluorescence quencher. TBA-dots retain inherent structures of aptamer to specifically interact with thrombin and simultaneously induce the aggregation of AuNPs. The mechanism of the sensing system is based on distance-dependent aggregation of

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