

# Protein-Templated Copper Nanoclusters: Versatile Platform for Label-Free Detection of Albumin <sup>†</sup>

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**Abstract:** The outstanding properties of metal nanoclusters, stabilized with different scaffolds i.e., proteins, nucleic acids, polymers and dendrimers, enabled their applications in a wide range of fields [1]. The recent advances in the fabrication and synthesis of nanoclusters have revolutionized the design of biosensors leading to significant improvement in the selective and sensitive determination of several targets. In particular, in recent years, copper nanoclusters (CuNCs) have attracted more attention mainly for the unique fluorescent properties as well as large Stokes shifts, low toxicity, and high biocompatibility [2]. The high photoluminescent features of CuNCs provide the high sensitive target detection even in complex biological matrices. For these reasons, in this work, we exploited the specific template-targeted CuNCs growth for the sensitive and accurate determination of human serum albumin (HSA) in urine and human serum. HSA is the most abundant protein in plasma acting as a carrier for many key biological molecules such as hormones, fatty acids and steroids and it provides to the maintenance of the oncotic blood pressure. The concentration of HSA in body fluids greatly influences the state of health of the patients. Taking into account these considerations, quantitative detection of human serum albumin plays a key role in early diagnosis of serious pathological conditions like as albuminuria and albuminemia. Here, we present a CuNCs-based assay in which copper nanoclusters were used as fluorescent signal indicators to detect serum albumin in complex biological matrix.

**Keywords:** copper nanoclusters, HSA, CuNCs-based assay, fluorescence

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## References

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