

Author's Accepted Manuscript

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PII: S0039-9140(16)30364-2
DOI: <http://dx.doi.org/10.1016/j.talanta.2016.05.038>
Reference: TAL16588

To appear in: *Talanta*

Received date: 17 March 2016
Revised date: 12 May 2016
Accepted date: 13 May 2016

Cite this article as: Hongchang Li, Yuqing Cheng, Yong Liu and Bo Chen, Fabrication of folic acid-sensitive gold nanoclusters for turn-on fluorescent imaging of overexpression of folate receptor in tumor cells, *Talanta*, <http://dx.doi.org/10.1016/j.talanta.2016.05.038>

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Fabrication of folic acid-sensitive gold nanoclusters for turn-on fluorescent imaging of overexpression of folate receptor in tumor cells

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Abstract:

Based on the fluorescence quenching of folic acid-sensitive bovine serum albumin-directed gold nanoclusters (BSA-AuNCs) via folic acid-induced the change of environment around BSA-AuNCs, we have constructed a turn on fluorescence imaging of folate receptor overexpressed tumor cells. In this paper, the primary fluorescence intensity of BSA-AuNCs was quenched via self-assembly of folic acid onto BSA-AuNCs to produce negligible fluorescence background, the linear range of the method was 0.1-100 ug/mL with the limit of detection (LOD) of 30 ng/mL (S/N = 3); In the presence of overexpression of folate receptor on the surface of tumor cells, the primary fluorescence intensity of BSA-AuNCs turned on by folic acid desorbing from BSA-AuNCs, the linear range of method was 0.12-2 ug/mL with the LOD of 20 ng/mL (S/N = 3). Additionally, due to specific and high affinity of folic acid and folate receptor, the probe had high selectivity for folate receptor, other interferences hardly changed the fluorescence intensity of the probe. Moreover, the text for cytotoxicity implied that the probe had no toxicity for tumor cells. Consequently, using the fluorescence probe,

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