

Gold-Nanoprobos for specific targets enrichment

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Noble metal nanoparticles functionalized with ssDNA oligonucleotides have wide scope application for nucleic acid detection and characterization^[1,2]. Their extensive use has relied on the optical properties of Au-nanoparticles that convey increased sensitivity upon molecular recognition of a specific target. Here, we present a simple approach to allow the enrichment of a nucleic acid mixture for a specific sequence/target of interest. We take advantage of the ease of functionalization provided by the Au-nanoparticles' surface via a thiol bond – capture nanoprobe. Upon centrifugation, the capture-nanoprobos can be retrieved allowing isolation of the target; iteration of the process provides for a considerable enrichment that is of utmost relevance in gene expression assays. Recovery of the target sequence might be completed by heat or alkaline denaturation followed by centrifugation and removal of the AuNPs (Figure 1). Here, we demonstrate the potential of use of this approach, as well as quantification of target recovery from complex mixtures via a fluorescence based technique.

References

- [1] M.M. Cheng, G. Cuda, Y.L. Bunimovich, M. Gaspari, J.R. Heath, H.D. Hill, C.A. Mirkin, A.J. Nijdam, R. Terracciano, T. Thundat, M. Ferrari, *Current Opinion in Chemical Biology*, **10** (2006) 11-19.
[2] Baptista P., Pereira E., Eaton P., Doria G., Miranda A., Gomes I., Quaresma P. and Franco R., *Analytical Bioanalytical Chemistry*, **391** (2008) 943-950.

Figures

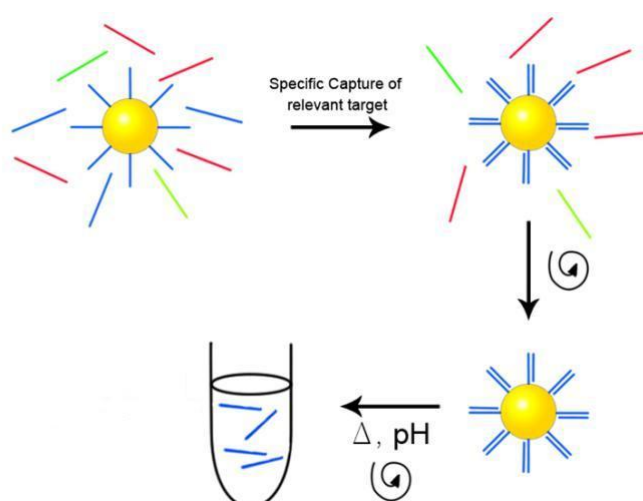


Figure 1: Illustration of target capture and recovery using specifically functionalized gold nanoparticles.