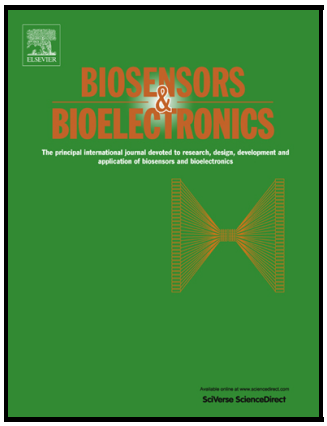

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Guozhen Liu, Yin Zhang, Wenqi Guo

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Covalent Functionalization of Gold Nanoparticles as Electronic Bridges and Signal Amplifiers Towards an Electrochemical Immunosensor for Botulinum Neurotoxin Type A

Guozhen Liu*, Yin Zhang, Wenqi Guo

Key Laboratory of Pesticide and Chemical Biology of Ministry of Education, College of Chemistry, Central China Normal University, Wuhan 430079, P. R. China

*To whom correspondence should be addressed. Email: gzliu@mail.ccnu.edu.cn. Tel: +86-27-6786 7535

Abstract

This work introduced an efficient approach for modification of AuNPs with multicomponents by diazonium salt couplings. The multifunctionalized AuNPs with protruding functional groups that allow simple bioconjugation to large amounts of biomolecules have been successfully used as electronic bridges and signal amplifiers for an electrochemical immunosensor towards the detection of BoNT/A. The one-step anchoring AuNPs strategy has greatly increased the efficiency for attachment of biomolecules and subsequently increased the sensitivity. Sensitivity was further amplified by preparation of bioconjugates particles containing horseradish peroxidase (HRP) labels along with detection antibodies (Ab_L) attached to AuNPs. The immunosensor can be used for the detection of BoNT/A over the range of 4-35 pg