

Gold Nanoparticles Labeled Electrochemical Immunoassay of Human Chorionic Gonadotropin Hormone Detection using Open Circuit Potential

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Open circuit potential (OCP) has drawn much attention for investigating various electrochemical processes because of its simplicity and miniaturized ability. In this work, the detection of pregnancy marker, human chorionic gonadotropin hormone (hCG), was developed by direct electrical detection of gold nanoparticles (AuNPs) using OCP measurement. After preparation of sandwich-type immunosystem, the preoxidation and reduction processes were applied, followed by electrical detection using OCP as shown in Fig.1. For the optimization of preoxidation and reduction processes, the applied potential and time period were studied. As the results, it was found that the preoxidation potential of 1.2 V for 60 s and reduction potential of -0.3 V for 30 s provided the highest potential change. Using the optimal condition, detection limit was improved to be 0.016 ng/mL which is several times lower than those obtained from previous researches [1-2]. This developed system could be applied to a simplified and miniaturized diagnostic system.

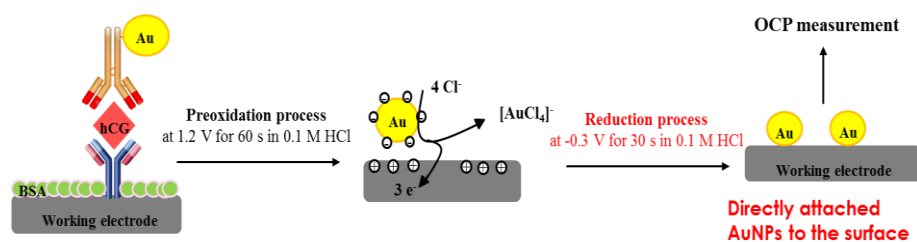


Fig. 1. Electrochemical detection of sandwich-type immunoassay

References

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