

DNA-Based Gold Nanoprobe Biosensor to Detect Pork Contaminant

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Abstract : Designing a sensitive, specific and easy to use method to detect pork contamination in the food industry remains a major challenge. In the current study, we developed a sensitive thiol-bond AuNP-Probe biosensor that will change color when detecting pork DNA in the Cytochrome B region. The interaction between the biosensors and DNA sample is measured by spectrophotometer at 540 nm. The biosensor is made by reducing gold with trisodium citrate to produce gold nanoparticle with 39.05 nm diameter. The AuNP-Probe biosensor (gold nanoprobe) achieved 16.04 ng DNA/ μ l limit of detection and 53.48 ng DNA/ μ l limit of quantification. The linearity (R^2) between color absorbance changes and DNA concentration is 0.9916. The biosensor has a good specificity as it does not cross-react with DNA of chicken and beef. To verify specificity towards the target sequence, PCR was tested to the target sequence and reacted to the PCR product with the biosensor. The PCR DNA isolate resulted in a 2.7 fold higher absorbance compared to pork-DNA isolate alone (without PCR). The sensitivity and specificity of the method show the promising application of the thiol-bond AuNP biosensor in pork-detection.

Keywords : biosensor, DNA probe, gold nanoparticle (AuNP), pork meat, qPCR

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