A Novel Reflectance-basedAptasensor using Gold nanoparticles for the Detection of Oxytetracycline

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Colorimetric aptasensors using gold nanoparticles (AuNPs) for target chemicals have recently drawn much attention because of its simple and easy protocol with naked eyes (1, 2). All the previously reported aptasensors using AuNPs were based on the absorbance mechanism. However, in this study, we present a novel reflectance-based colorimetric aptasensor for the detection of oxytetracycline, since the reflectance-based configuration can generate more stable and sensitive signal even at the high AuNP concentrations. In this reflectance configuration, the signal ratio at two wavelengths (650 and 520 nm) was used to determine the aggregation of AuNPs. In order to demonstrate the performance of this reflectance-based aptasensor, oxytetracycline (OTC), one of the most common antibacterial agents, was successfully used as a model chemical. The limit of detection in this reflectance-based configuration was 1nM in buffer solution and tap water. It must also be noted that this reflectance-based sensors can be more readily integrated with microfluidic components and be developed into a portable sensor system. We envision developing a miniaturized biosensor system for the detection of toxic chemicals and biomarkers such as detection of excess antibiotics in food samples.