

Rapid Colorimetric Detection of Sexually Transmitted Diseases Using Ligase Detection Reaction and Gold Nanoparticles

정원영, Agnishwar Girigoswami, 정철희, 문효영, 박현규*
한국과학기술원
(hgpark@kaist.ac.kr*)

Sexually transmitted diseases (STDs) are the most important and recently increasing type of diseases caused by genitourinary infections. *Chlamydiae trachomatis*, *Neisseria Gonorrhoea* and *Ureaplasma urealyticum* are the most common pathogens found in the STD patients. However, various approaches to detect the pathogens have been suffered from a variety of limitations, including requirement of specific instruments and much time for the detection. In this study, we developed a novel method to detect STD pathogens in a colorimetric way in a short time by utilizing the aggregation of DNA-modified gold nanoparticles in a non-cross-linking configuration. The sample DNAs were treated with ligation detection reaction (LDR) followed by the application of the DNA-modified gold nanoparticles. The sample from non-infected patients induced aggregation of gold nanoparticles, while the sample from the STD infected patients induced no aggregation due to the LDR products. We could detect the multiple infections simultaneously by applying the multiple tubes for the gold assay. This study would offer a simple and rapid method for the point-of-care detection of the STD pathogens.