

무세포 단백질 합성을 이용한 면역 분석 신호의 증폭(Harnessing cell-free protein synthesis as a signal amplification module for immunoassays)

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While signal generation of conventional ELISA methods relies on antibody-conjugated enzymes, the finite number of antibody-conjugated enzymes limits the sensitivity of ELISA. In this study, we probed the possibility of using cell-free protein synthesis as a signal amplification module for immunoassays, by conjugating a detection antibody for ELISA with a DNA that encodes a reporter enzyme. This allowed the generation of a large number of reporter enzymes per antibody-target binding, and led to markedly improved sensitivity of target detection. Given the outstanding sensitivity that can be obtained with only minimal modifications to the procedure of standard ELISA, we believe that this method will open up new possibilities for widespread application of expression immunoassays to ultrasensitive detection and diagnostics.