

A Label-Free Immunosensor Chip Based on Polydiacetylene Vesicle Arrays for Bacteria Detection

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The conjugated polydiacetylene (PDA) vesicles have been proved as convenient chemical and biological sensors due to their unique chromatic properties. The diacetylene lipids, undergo polymerization via 1,4-addition reaction upon UV light to form an ene-yne alternating polymer chains, producing liposome-like vesicles in aqueous solution. The polymerized vesicles have a bichromic property from blue to red upon external perturbations. Here we developed antibody-affixed PDA sensors on a solid substrate as an array form. An antibody for detecting *E. coli* was covalently linked to the PDA vesicles. Although antibody-antigen binding plays a key role in many medical diagnoses through various techniques, the attempts to develop biosensors using antibody affixed PDA vesicles have been scarce. In this work, we demonstrate antibody-affixed PDA vesicles on the solid substrates as a robust chip-type biosensor which can detect bacteria, complicated biological analytes, without any labeling procedure.