

## Miniature Surface Plasmon Resonance (SPR)-based Immunosensor Equipped with All-in-one Multi-microchannel Chip for Detecting Small Molecules

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A miniature SPR analyzer equipped with a multi-microchannel flow-module has been investigated for its operational stability, sensitivity and high reusability. The sensor module integrating the prism, SPR sensor chip and multichannel flow system together is a separate entity, and it eliminates the necessity of matching oil in SPR measurements and allows simple storage of the sensor chip in a cool-storage device. For evaluation of the present novel SPR sensor, determination of 2,4-D, one of the small molecular endocrine disruptors, concentration levels has been used. A simple physical adsorption of 2,4-D-BSA conjugate and indirect competitive assay have been applied for sensor surface fabrication and detection of 2,4-D, respectively. Low-detection-limit of this sensor system is determined to 0.1 ppb by simultaneous analysis of multi-2,4-D samples with the response time of 4 min. Sensitivity enhancement, selectivity, stability and sample matrix effect of real river-water sample have been also evaluated to demonstrate the potential applicability of the miniature SPR analyzer for field-portable real-time detection of 2,4-D.