

## The Study of an Interferometric Biosensor Chip for Biomonitoring DNA Damaging Chemicals

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In E.coli, DNA damage coordinately induces a set of genes, resulting in several physiological changes, termed the SOS response. Recombinant E. coli GW1040 (dinD::lacZ) releasing  $\beta$ -galactosidase by a SOS regulon system have been used to effectively monitor endocrine disruptors. Low enzyme activity of less than 10 units/ml can be rapidly determined, not by conventional time-consuming enzyme assay, but by an alternative interferometric biosensor.

Heavily boron-doped porous silicon for application as an interferometer was fabricated by etching in order to form a Fabry-Perot fringe pattern, which caused effectively the change in the refractive index of the medium including  $\beta$ -galactosidase. In order to enhance the immobilization of the porous silicon surface and to reduce of nonspecific binding, a calyx crown derivative (prolinker®-A) and anti- $\beta$ -galactosidase was applied.

ELISA method was used to verify the sensitivity of interferometric biosensor in the antigen-antibody reaction.