Fuctionalization of porous silicon surface with prolinker™A in the interferometric biochip to sense β-galactosidase

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Abstract

When a recombinant *E.coli* ACV1003(*recA::lacZ*) is exposed to a DNA- damaging compound, β-galactosidase is released by a SOS regulon system. This mechanism can be used to detect easily endocrine disruptors such as a bisphenol A[1,2]. Heavily doped p-type porous silicon was fabricated by etching to produce a Fabry-Perot fringe pattern, which caused the change in the refractive index of the medium including β-galactosidase. Surface of porous silicon has been modified and funtionalized with Prolinker ™ A and (3-aminopropyl) trimethoxy silane, using SAM(self-assembled monolayer) to display considerable stability against detachment of the β-galactosidase molecules, and then environmental endocrine disruptor can be easily determined by the changes in the refractive index of the medium upon enzyme-ligand binding[3,4,5]. The change in the effective optical thickness versus β-galactosidase showed a sigmoidal increase up to the concentration of 200 unit β-galactosidase ml^{-1} [6].

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