Layer by Layer Self-assembly Thin Films on Microcantilever for Biosensing

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A layer-by-layer coating method was developed for the modification of microcantilever surface. The microcantilever, with gold surface on one side, was coated with 2-mercaptoethanesulfic acid (MES) first, providing a stable substrate for further chemical coating. Poly(diallydimethylammonium chloride) (PDDA) and poly(sulfonate styrene) (PSS) were used for layer-by-layer modification of the microncantilever surface. After alternate dipping the cantilever into a PDDA and PSS solution, contact angle data show the formation of PDDA/PSS films. Enzymes, Glucose Oxidase (GOX) and Organophosphorus Hydrolas (OPH) were then coated as top layers on those cantilevers respectively. Results demonstrate that GOX-immobilized cantilever has corresponding deflection when it was exposure to glucose solution at concentration of 10^{-3}M and has good selectivity to glucose over mannose, fructose and galacose. Same way, OPH-based cantilevers show deflection to parathion solution.