Design and Optimization of Cholesterol Biosensor

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Abstract

Cholesterol is an essential lipid for human body. The desired total plasma cholesterol for an individual is less than 5.2 mM (200 mg/dL) and it poses a potential health threat when the level is greater than 6.2 mM (240 mg/dL) [1]. Excessive plasma cholesterol causes poor cardiovascular conditions. The experimental fabrication of nano structured biosensor with advanced materials is more expensive and time consuming. Though, there are few reports on the COMSOL Multiphysics® sensor modeling, there is no report on the PZT based piezoelectric cantilever for cholesterol detection. In this work, design and simulations of pizeoelectric micro-cantilever made up of Lead Zirconate Titanates (PZTs) by using COMSOL Multiphysics® simulation software were carried out to ease the real fabrication process.

Reference

[1] A. Boisen, et al. "Cantilever-like micromechanical sensors." Reports on Progress in Physics 74.3 (2011): 036101.