Gold Nanoring Sensing Membrane Application for Hydrogen Peroxide Detection as Myocardial Marker Study

Saputra, Gardin Muhammad (School: Boyolangu 1st State Senior High School, Tulungagung)

Hydrogen peroxide (H2O2) is highly noted as a cytotoxic compound. Typically, its level is increased in cardiovascular disease patients, such as in myocardial infarction cases. In 2013, as reported by American Heart Association (AHA), about 31.5% of worldwide death was caused by cardiovascular disease. Therefore, the emergence of a rapid detection system for H2O2 in human body could provide an important pathway toward the elimination of myocardial impair-caused mortality. In this research, we performed an initial H2O2 screening platform using Au nanoring electrode. The nanoring structure facilitated larger electro active surface area simply fabricated through nanosphere lithography (NSL) technique. The target of this research includes the creation of highly order metallic interspacing on a low cost and simple sensor fabrication. The sensor performance was tested using potentiostat and field effect transistor (FET) systems. It is highly noticed that the proposed Au nanoring electrode had performed considerably high sensitivity and excellent limitation of detection (LoD) in a quite large dynamic range of H2O2 detection which concomitantly reflect the successful low cost fabrication of a sensor. Future study is targeting the better sensing parameters in H2O2 screening in more complex bio samples.

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