

Simple Colorimetric Glucose Biosensor using Chitosan Cryogel Supporting Material

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First Author	
Last Author	
Authors	Fatoni, A; Anggraeni, MD; Dwiasi, DW;
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Abstract	<p>Large surface area of porous structure cryogel showed an excellent matrix for enzyme immobilization, especially in the biosensor development. A chitosan cryogel beads was prepare by cross-linking chitosan with sodium tripolyphosphate at subzero temperature. This chitosan cryogel beads was then used to immobilize glucose oxidase for glucose biosensor fabrication. The biosensor was simple design and operation, using a micropipette tip to hold the immobilized enzyme, where the reaction can be performed by suck-hold-release the analyte using micropipette. The detection was based on the reaction between hydrogen peroxide, enzymatic product, with titanium (IV) oxysulfate to produce color change, which finally recorded using commercial scanner. The digital image obtained was then analyze using freeware of ImageJ to get the relationship between color change and the analyte concentration. The result showed a linear response in the glucose detection of 1.0 to 5.0 and 10 mM, with a regression of $y = 11.33x + 46.02$ and R^2 of 0.983. The great enzyme immobilization was showed in the fabricated biosensor with 12 times uninterrupted analysis without reducing significant responses.</p>
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Author	Ners MEKAR DWI ANGGRAENI, M.Kep, Ph.D