

Low-cost and real-time color detector developments for glucose biosensor

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First Author	
Last Author	
Authors	Fatoni, A; Aziz, AN; Anggraeni, MD;
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Abstract	<p>One of the analytical methods widely developed is a biosensor, which has several advantages. We reported the development of a real-time colorimetric detector for glucose biosensor using low-cost electrical components of LDR, TCS230 and webcam. The detection was based on the color recognition from the devices resulted in RGB color intensity of the yellow color of hydrogen peroxide and titanium oxysulfate reaction. The comparison of three developed low-cost methods showed that the detector based on TCS230 had the best sensitivity. The real-time colorimetric glucose biosensor using TCS230 showed a good linearity, in the glucose detection of 0.1 to 2.5 mM with the regression equation of $y = 27.89x + 35.31$ ($R^2 = 0.993$). Furthermore, the calculated limit of detection of 0.14 mM and calculated limit of quantification of 0.58 mM. The glucose biosensor was also showed high selectivity to detect glucose in the blood sample with good agreement compare to commercial glucose biosensor.</p>
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Author	Ners MEKAR DWI ANGGRAENI, M.Kep, Ph.D