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Development of a glucose sensor system with real time calibration

(Article)

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Abstract

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This research discussed on developing a glucose sensor with real time calibration. In general cases, the blood sugar level is checked through puncturing the fingertip to get the blood sample on a test strip. Moreover, this method is not convenient for the patients because it requires changing of the strips for taking the blood samples every time and its price is also higher. This may expose the patients to infections while taking the blood samples. A non-invasive method is developed in this work to improve the old method. A near infrared (NIR) sensor is used to detect the scattering and absorption of light through glucose concentration. The simulation and construction of glucose sensor circuit are implemented through testing different solutions of glucose concentration (50-300 mg/dL) using microcontroller and Matlab software. The data of blood tests from 6 patients are compared and analyzed with the constructed glucose sensor. Results show that, the glucose sensor can detect the glucose concentrations (hyperglycemia, normal and hypoglycemia level) through finger and display it on Liquid Crystal Display (LCD). This sensor is able to provide an alert if glucose level reach higher than normal range. So the diabetes disease can be monitored in real time without difficulties of the patients in addition this method is competitive, affordable and convenient for the patients. © BEIESP.

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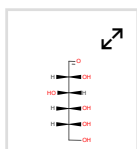
Author keywords

(Diabetes disease) (Near infrared (NIR) sensor) (Non-invasive method)

Funding details

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☐ 1 Coster, S., Gulliford, M.C., Seed, P.T., Powrie, J.K., Swaminathan, R.

Monitoring blood glucose control in diabetes mellitus: A systematic review

(2000) Health Technology Assessment, 4 (12), pp. i-iv+1-84. Cited 102 times.

☐ 2 Ferrante do Amaral, C.E., Wolf, B.

Current development in non-invasive glucose monitoring

(2008) Medical Engineering and Physics, 30 (5), pp. 541-549. Cited 153 times.
doi: 10.1016/j.medengphy.2007.06.003

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☐ 3 Maruo, K., Tsurugi, M., Chin, J., Ota, T., Arimoto, H., Yamada, Y., Tamura, M., (...), Ozaki, Y.

Noninvasive blood glucose assay using a newly developed near-infrared system

(2003) IEEE Journal on Selected Topics in Quantum Electronics, 9 (2), pp. 322-330. Cited 103 times.
doi: 10.1109/JSTQE.2003.811283

View at Publisher

☐ 4 Amir, O., Weinstein, D., Zilberman, S., Less, M., Perl-Treves, D., Primack, H., Weinstein, A., (...), Karasik, A.

Continuous noninvasive glucose monitoring technology based on "occlusion spectroscopy"

(2007) Journal of Diabetes Science and Technology, 1 (4), pp. 463-469. Cited 51 times.
http://dst.sagepub.com/content/by/year
doi: 10.1177/193229680700100403

View at Publisher

☐ 5 Shaw, J.E., Sicree, R.A., Zimmet, P.Z.

Global estimates of the prevalence of diabetes for 2010 and 2030

(2010) Diabetes Research and Clinical Practice, 87 (1), pp. 4-14. Cited 3777 times.
doi: 10.1016/j.diabres.2009.10.007

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