

Sensory Elements and Devices Operational Diagnostic Blood Glucose

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Problem research and creation of sensor elements, processing schemes and homeland device for operative diagnostics of blood glucose levels is relevant because of the significant increase the number of diabetic patients. For daily, non-stop and continuous monitoring of blood glucose levels the most promising are issued portable type non-invasive blood glucose meters, because, without mechanical interference with the patient's body to assess the level of glucose. This method, despite the worst accuracy, has several advantages compared to invasive methods.

We considered the physical principles of detection, in particular, the optical spectra absorption of blood glucose are shown (Fig. 1), the schematic diagrams optical sensors are shown(Fig. 2).

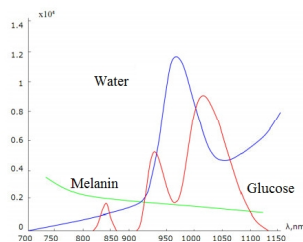


Fig. 1. The optical absorption spectrum of blood glucose.

This data can be used as a basis for the development of optical sensors and data processing schemes for non-invasive portable blood glucose meters of optical type.

A conceptual block diagram of the blood glucose meter was proposed (Fig. 3). Experimental device pattern is demonstrated (Fig. 4), which confirms the possibility of further work towards building element base non-invasive blood glucose meters.

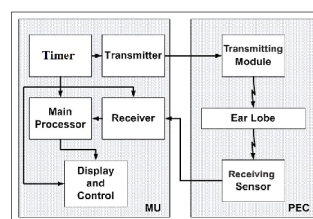


Fig. 3. The conceptual block diagram of non-invasive glucose meter (MU- main unit, PEC - personal ear clip).

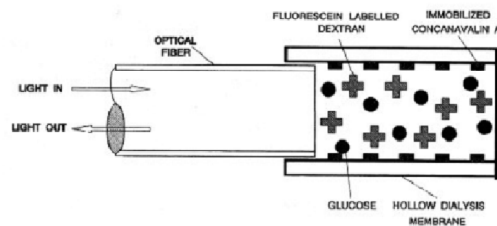


Fig. 2. Schematic diagram of the optical sensor to measure glucose. [1]



Fig 4. The experimental device

1. Mendelson, Y. Optical Sensors, in *The Biomedical Engineering Handbook*, Bronzino, J.D., Ed. Boca Raton, FL: CRC, p. 764–778, 1995.