

Science and Technology

The relationship between bio impedance of blood and effects of glucose in blood had been discussed for decades. The method of measuring blood glucose is to capture the characteristics of the impedance of glucose concentrations in blood by using electrical impedance spectroscopy (EIS). The electrical impedance of blood is determined by extracellular medium, cell interior, and cell membrane [1].

The intracellular fluid (ICF) and extracellular fluid (ECF) which is composed of the interstitial fluid and plasma are acting like resistors in an electrical circuits. With existence of lipid layer [2], the cellular membrane is acting like capacitor in an electrical circuits.

Our scientists model body tissues as electrical circuits. The fluctuation of blood glucose concentration will change the ionic balance in the plasma and increase or decrease the resistance of extracellular medium [3]. Therefore, the glucose variation could be monitored by electrical impedance spectroscopy.

Working Mechanism

Users need to have their 4 fingers contact the sensing electrodes. Two of the sensing electrodes emit the stimulating signal that is substantially a square wave with a specific frequency. The other two receiving the feedback signal will conduct pre-processing and filtering procedures to convert the analog to digital signal. eTouch had collected three different diabetes types (Normal, Prediabetes, Type 2 diabetes) to cluster and develop specific patented algorithm to simulate blood glucose. ETM-G01E is a revolutionary product combining electronic engineering and biomedical engineering. It is a true non-invasive blood glucose meter without the use of fingersticks or test strips.

References

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