Continuous, Quantitative, Selective, Non-Enzymatic Glucose Monitoring Using Conductimetric Analysis

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Technology description

Researchers at the University of California, Santa Barbara have developed a novel molecule that enables continuous glucose monitoring using conductimetric measurements. This new recognition molecule binds glucose with affinity and selectivity, and changes charge after binding with glucose in physiological conditions. Both the glucose binding and the change in charge alter the conductivity of the solution. Thus, the conductivity of the solution is characterized by its glucose level. Conductimetric methods can be used to generate continuous and quantitative measurements of glucose in physiological conditions, offering long-term stability at a low cost and a high potential for miniaturization. Furthermore, this molecule can be applied to other methods based on glucose induced charge changes.

A new molecule that enables glucose monitoring using measurements of solution conductivity.

Background

The human body contains an elaborate system to monitor and distribute glucose.Blood glucose level dysregulation, especially in diabetics, has significant consequences for the heart, kidney, retina, neural system and other organs. Continuous glucose monitoring (CGM) systems can guide treatments, give patients feedback on their diet, and integrate with artificial pancreas systems to prevent many of the side effects of metabolic dysfunction. To do so, they require stable, quantitative, real-time measurement of in-body glucose levels. Most CGMs are dependent on electrochemical or other sensing methods where their instability leads to frequent calibration.

Application area

Real-time Glucose Measurement, in-vivo Glucose Measurement

Advantages

Stable, quantitative glucose measurements
Long-term stability
Low cost of materials
Potential to miniaturize
Energy efficient sensor

Extension ability

Institution

University of California, Santa Barbara

Inventors

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