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Implantable Wireless Sensor Using Glucose Sensitive Ferrogel

A novel implantable glucose monitor utilizes a passive glucose-sensitive ferrogel for continuous, wirelessly detected blood sugar monitoring without requiring an internal power source.

Type 1 diabetes afflicts approximately one million people living in the United States and 10 to 20 million people worldwide. Caused by the body's inability to produce its own insulin to regulate blood glucose levels, type 1 diabetes can cause a wide variety of complications and requires careful monitoring of glucose levels and insulin injections. The most common way to monitor blood glucose levels is with a finger stick, which measures glucose at a point in time, potentially missing important fluctuations, such as sudden hypoglycemic episodes. The most effective way to measure glucose levels is to monitor it continuously in a way that it could be recorded and tracked. To accomplish this, various monitor designs have been proposed, including several designs for implantable sensors, but most require an internal power supply or make use of potentially dangerous enzymes.

Researchers at Purdue University have developed a new design for an implantable glucose monitor that requires no internal power and has a fast reaction time to changes in glucose levels. This device uses a glucose sensitive ferrogel, which grows and shrinks based on the level of glucose present. This device is expected to have an area no larger than one cubic centimeter and once implanted into the body's soft-tissue, the ferrogel's change in size can be detected wirelessly, providing a continuous measurement of glucose levels.

Advantages:

-Device requires no internal power supply

-Fast reaction time to changes in glucose levels

-Provides continuous measurement of glucose levels

Potential Applications:

Technology ID

66011

Category

Materials Science & Nanotechnology/Biomedical & Bioinspired Materials

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-Medical/Healthcare

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