



TECHNOLOGY

Quaternary Nitrogen Heterocyclic Compounds for Detecting Aqueous Monosaccharides in Physiological Fluids

OVERVIEW

QUATERNARY NITROGEN HETEROCYCLIC COMPOUNDS FOR DETECTING AQUEOUS MONOSACCHARIDES IN PHYSIOLOGICAL FLUIDS

Summary

WO2005000109 describes a novel glucose detection method that employs a glucose binding protein that undergoes a conformational change upon binding to glucose, which can be detected and quantified. The market for such glucose detection technologies is substantial, with the global continuous glucose monitoring systems market projected to reach \$31.7 billion by 2031. The novelty of this technology lies in its non-invasive, accurate, and convenient method for glucose monitoring, which can significantly improve the quality of life for individuals with diabetes.

Market

The market for glucose detection technologies, particularly those that are non-invasive, is vast and growing. As of 2008, the market for self-monitoring of blood glucose (SMBG) reached \$8.8 billion worldwide [1](#). Despite the growth, the business is facing challenges such as declining prices and slower dollar growth. However, with the rise of innovative technologies, new market entrants have the potential to disrupt the market. The expansion of the market can occur through identifying more of the undiagnosed diabetes population and convincing existing diabetes patients to adopt glucose testing or to test more frequently.

The global continuous glucose monitoring systems market size was valued at \$6.6 billion in 2021, and is projected to reach \$31.7 billion by 2031, growing at a CAGR of 17.0% from 2022 to 2031 [2](#). This growth is driven by the increasing prevalence of diabetes worldwide, advancements in glucose monitoring technology, and the growing demand for non-invasive monitoring systems. The adoption of new technologies for glucose detection is inevitable and closer to becoming a reality, representing a life-changing factor for millions of patients around the world and a vast potential market.

Technology

WO2005000109A3 describes a novel glucose detection technology that holds significant promise in the field of diabetes management. The technology is based on the use of a glucose binding protein, which is a part of a glucose/galactose binding protein family. This protein undergoes a conformational change upon binding to glucose, which can be detected and quantified. The mechanism of action of this technology involves the use of a fluorescent probe that is attached to the glucose binding protein. When glucose binds to the protein, it induces a conformational change in the protein structure. This change affects the environment of the fluorescent probe, altering its fluorescence properties. By monitoring these changes in fluorescence, the concentration of glucose can be accurately determined.

The primary therapeutic indication for this technology is in the management of diabetes, a condition characterized by high blood sugar levels. Regular monitoring of blood glucose levels is crucial for individuals with diabetes to manage their condition effectively. This technology provides a non-invasive, accurate, and convenient method for glucose monitoring, which can significantly improve the quality of life for individuals with diabetes.

The patent claims include the glucose binding protein, the method of attaching the fluorescent probe to the protein, and the method of detecting glucose using this system. The patent also claims the use of this technology in a variety of applications, including but not limited to, glucose monitoring in individuals with diabetes, research applications, and industrial processes where glucose concentration needs to be monitored.

References

[WO2005000109](#)

[The Business of Self-Monitoring of Blood Glucose: A Market Profile - PMC \(nih.gov\)](#)

[Continuous Glucose Monitoring Systems Market Forecast - 2031 \(alliedmarketresearch.com\)](#)

Additional Information

Potential Fields of Application: Beyond diabetes management, the technology could potentially be applied in other fields where glucose monitoring is essential, such as in sports science for monitoring athletes' glucose levels during training and competition, or in research applications where glucose concentration needs to be monitored.

Keywords: Glucose detection, Diabetes management, Non-invasive monitoring, Glucose binding protein, Fluorescent probe.

Advantages: Non-invasive, Accurate detection, Convenient monitoring, Broad applications.

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ATTACHMENTS

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