

Overview of a Novel Sensor for Continuous Glucose Monitoring

Günther Schmelzeisen-Redeker, Ph.D., Arnulf Staib, Ph.D., Monika Strasser, M.Sc.,
Ulrich Müller, Ph.D., and Michael Schoemaker, Ph.D.

Abstract

The core element of a continuous glucose monitoring (CGM) system is the glucose sensor, which should enable reliable CGM readings in the interstitial fluid in subcutaneous tissue for a period of several days. The aim of this article is to describe the layout and constituents of a novel glucose sensor and the rationale behind the measures that were used to optimize its performance. In order to achieve a stable glucose sensor signal, special attention was paid to the sensor materials and architecture, i.e., biocompatible coating of the sensor, limitation of glucose flux into the working electrode, low oxidation potential by use of manganese dioxide, and a tissue-averaging sensor design. A series of *in vitro* and *in vivo* evaluations showed that the sensor enables stable and accurate glucose sensing in the subcutaneous tissue for up to 7 days. Parallel measurements with four sensors in a single patient showed a close agreement between these sensors. In summary, this high-performance needle-type glucose sensor is well suited for CGM in patients with diabetes.

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Author Affiliation: Roche Diagnostics, Mannheim, Germany

Abbreviations: (BG) blood glucose, (CGM) continuous glucose monitoring, (ISF) interstitial fluid

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Corresponding Author: Günther Schmelzeisen-Redeker, Ph.D., Roche Diagnostics GmbH, Sandhofer Straße 116, 68305 Mannheim, Germany; email address guenther.schmelzeisen-redeker@roche.com