Real-Time detection of telomerase activity in cancer cells using a label-free electrochemical impedimetric biosensing microchip

Landscape Study

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Purpose of this Document

 $\mathbf{T}_{ ext{he purpose of this document is to serve as a sample}$

Introduction

The following patent landscape shows recent development trends within the technical art of Real time electrochemical biosensors. OPITT created this study from an analysis of US patents, US published patent applications, and foreign patents relevant to Real time electrochemical biosensors. To expand upon this analysis, OPITT. supplemented its research with information from other publicly available sources, to include peer-reviewed journal articles and product descriptions. The report provides an overview of the current market and technology prognosis for the Real time electrochemical biosensors.



Figure 1. Biosensors technology

Literature Review- Keywords



Impedance spectroscopy AND biosensor

Figure 3. Number of publications on impedance spectroscopy and biosensors since 1997, corresponding to bibliographic searches using the keyword combination "impedance spectroscopy AND biosensor" Science Direct.



Real Time label free Electrochemical & Telomerase biosensor

Figure 2. Number of publications on Real time label free Electrochemical & telomerase biosensor in Science direct

Patent Search

Market Search



Figure 4. Total Biosensors Market: Percent Revenues (World), 2016

The point of care testing segment was the most revenue generating segment in 2013. The development of biosensor has initiated a revolution in the rapidly evolving point of care testing market. Point of care biosensor systems provide **real time** health monitoring and thus, have the potential to improve patient care. They also lead to reduction in patient waiting time and an increase in patient satisfaction.



Figure 5. Maket Revenues



Figure 6. Global Market, by technology, 2013.



Figure 5. Totka Biosensors Market : Percent Revenues by Enduser (World)

Technology Insights

Electrochemical biosensors were the largest technology segment of the biosensors market in 2013. Easy miniaturization, robustness and excellent detection limits are some advantages associated with these biosensors. Furthermore, these devices find extensive use in research initiatives involving accurate analysis of the contents of a biological sample. Optical biosensors are expected to witness a healthy growth during the forecast period. These devices have revolutionized the environmental monitoring and early warning field by enhancing the ability to quantify and characterize environmental pollutants, and this is expected to drive segment growth during the forecast period.

Market by Application:

The biosensors market is mainly categorized into applications, such as the point-ofcare, home diagnostics, research labs, biodefense, environmental monitoring, and food industries.

Biosensors Market Segmentation

Biosensors Market by Application

Medical diagnostics

- Food toxicity detection
- Industrial process control
- Environmental
- Agricultural testing

Biosensors Market by End-users

- Point of care testing
- Home healthcare diagnostics
- Research laboratories
- Food industry
- Security and bio-defense

Biosensors Market by Technology

- Electrochemical biosensor
- Piezoelectric biosensors
- Optical biosensors
- Thermal biosensor

Geographical Segmentation

Biosensors Market by Region

- North America
 - The U.S.
- Europe
 - o Germany
 - France
 - o Italy
 - The U.K.
- Asia-Pacific

- o India
- o China
- Japan
- Rest of the World (ROW)

Competitive Insights

- Key players of the biosensors market include:
- F. Hoffmann-La Roche Ltd.,
- Abbott Point of Care Inc.,
- LifeSensors, Inc.,
- Nova Biomedical Corporation,
- AgaMatrix, Inc.
- Siemens Healthcare.

The market is technology driven and therefore, manufacturers engage constantly in R&D aimed at the development of technologically advanced biosensors.

Opportunity Areas

Technological Challenges

In spite of product and technology innovations and improvements, the growth of the biosensors market is still restricted to certain vertical markets. Most biosensors are patented and their market penetration is limited by the resources of the patenting company.

- Sensitivity, the most important performance element in a biosensor. Sensitivity in a biosensor refers to real-time detection and measurement of the reaction of the target analyte, and conversion of this measurement into a usable signal.
- Readout times that vary greatly from one biosensor to another. In some biosensors, readout times are very long, in certain cases >20 s.
- The life span of a biomolecule is limited.
- In certain cases, biosensors require a special pre-treatment prior to each use.
- A number of existing sensors lack long-term stability.
- Miniaturization in sensors poses technical challenges.
- Some biosensors are too expensive for commercial production.
- Some biosensors are not sufficiently rugged for their intended applications.

Search and Analysis Procedure

Conclusion