ABSTRACT

A biosensor is a compact analytical device incorporating a biological or biologically-derived sensing element either integrated within or intimately associated with a physicochemical transducer. The usual aim of a biosensor is to produce either discrete or continuous digital electronic signals which are proportional to a single analyte or a related group of analytes.

Over the past 20 years, the field of biosensor research have had a significant impact in both laboratory research and the commercial sector. Over that period, biosensors have revolutionized the care and management of diabetes and have had important impacts in several other areas such as: clinical diagnosis and biomedicine, microbiological and pharmaceutical analysis, food and drink production, pollution control and monitoring, industrial and toxic gases, garden and veterinary analysis.

Biosensors are based on catalytic or affinity reactions (chemical reactions facilitating specific binding).

The construction of biosensors is first related to the immobilization techniques for the enzymes, cell, or other biologically active substances and second to the transducer that will be used (electrochemical, optical, magnetic etc).

The validation criteria for electrochemical biosensors must take into account both construction and performance of the sensors,
including high accuracy and precision, reliability and simplicity in operation, rapidity and low cost, portability and the possibility of miniaturization. For bioanalysis, electrochemical sensors have maximum reliability and can be successfully employed. To be able to utilize the electrochemical sensors for in vivo measurements, they must be biocompatible, solid, inert, and non-toxic.

Biosensors are very promising analytical tools as early warning systems. Several recognition prototypes are currently being tested but are still very primitive.