

# Biosensor Technology

SOURCE: DR. TAN LING LING

Biosensor is an analytical device developed by incorporating biological molecule, e.g. tissues, microorganisms, organelles, cell receptors, enzymes, antibodies and nucleic acids into a biocompatible immobilisation matrix. Association of the biologically derived material with a physicochemical transducer, which may be optical, electrochemical, thermometric, piezoelectric or magnetic would ultimately form a reagentless system for specific determination of a desired analyte. Biosensor which uses enzyme, cell, bacteria and tissue for reaction with analyte and producing a new molecule is known as catalytic biosensor.

Affinity biosensor on the other hand, entails simple binding of biological molecules such as antibody and deoxyribonucleic acid (DNA) with substrate.

Biosensor is usually produced for use in applications such as environmental monitoring, biomedical sensing and industrial process control. The principle of its detection is based on a biochemical recognition phase coupled with a transduction element to provide an optical or electrical signal parameter for a given compound.

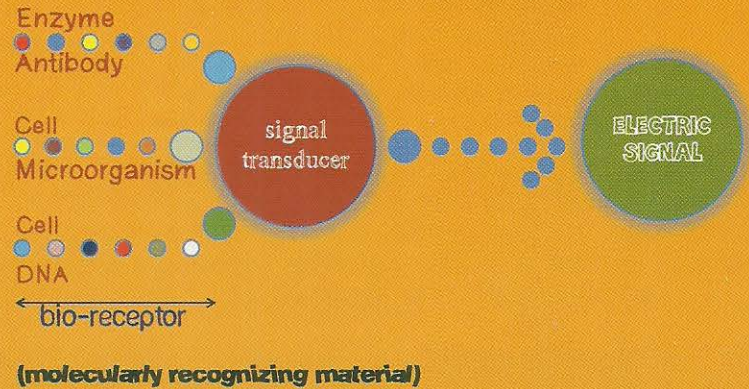


Figure 1: Principle of biosensor

Figure 1 shows the principle of biosensor. The procedures of biosensing involve placing the biosensor in a liquid sample and measuring either an electrical or optical signal, which is related to the concentration of analyte. The importance of biosensors has increased during the past decade due to high selectivity of the biological recognition elements and the sensitivity of signal transduction. This has triggered the development of various types of optical and electrochemical biosensors for rapid, accurate and specific measurement of target analyte on-site.