Welcome students.

In this session I will becovering up the topic biosensors

and this module covers up definition principle and working

Of a biosensor.

The outline of this module covers the concept of a

biosensor. The various components of a biosensor, and

working of a biosensor.

The learning outcomes  explain the term biosensor.

This particular module describes the principle and working of a

biosensor and differentiates between the various components

of a biosensor.

Coming to the term biosensor.

Biosensor is basically an analytical device used for

detection of an analyte, and it combines a biological component

with a physical chemical detector to produce a signal

which is displayed on the

display unit. The term is a combination of two words, bio

and sensor. Bio stands for the biological system, whereas

sensor is the device used to analyze the analyte.

Basically, biosensors are analytical devices used to

detect the presence or concentration of a biological

analyte in biosensors for biological material, such as an enzyme antibody or whole cell or nucleic acid is used to interact with the analyte.

Now, this interaction between the biological material.

And the analyte produces a physical or chemical change which is detected by the transducer, and this physical chemical signal is now converted to an electrical signal. This signal is interpreted and converted to analyte concentration, which is present in the sample, which is then displayed on the screen of the display unit.

Biosensor basically consists of three main components. The bio component, which produces a physical chemical signal.

The transducer which converts the physical chemical signal to an electric signal, and an amplifier which amplifies the signal.

Biosensors were first invented by the scientist Leyland Clark.

Therefore he is also termed as the father of biosensors. He invented the oxygen electrode in19, nineteen, 62 or pivotal device that allows real time monitoring of patients blood oxygen levels, which has made surgery safer and more successful for millions of people around the world.

Coming to the components of biosensor, the main component of the biosensor is the analyte,that is, the material which is used for analysis.

For example, to make it simpler glucose biosensor, glucose is the analyte. The biological component could be the enzyme in a glucose biosensor. The Biological component is an enzyme glucose oxidase.

If the analyte is an antigen.

Then it could be the biological component. Could be an antibody or whole cells nucleic acid and this material. Now the biological component is used to interact with the analyte.

The biological component is basically coated on the surface of the transducer.

Now this next component transducer is the main component.

Which converts the physical chemical signal which is produced by the analyte and the biological component together into a. Electrical signal.

So this physical chemical signals is converted to an electrical signal. Thetransducer is an element that converts one form of energy into another. So in a biosensor, the

role of a transducer is to convert the bio recognition

event into a measurable signal.Now this process of energy

conversion is known as

signalization. The next component is the amplifier.

Which amplifies the electrical signal which is

produced by the transducer.

The next component is the processor which processes

this electric signal and the last component is the display

unit where the analyte concentration is displayed on

the display unit.

Now this is a schematic diagram of a biosensor in the 1st Lane

you can see the analyte in clay.In case of a glucose biosensor,

the analyte would be glucose.

The analyte also could be other compounds like antigens. If the

biorecognition element is an antibody. In case of glucose,

the bio recognition would be an enzyme that is

glucose oxidase. In a BOD

biosensor. The biological component is a microorganism.

Now the analyte is sewage and in the 1stlane in the bio recognition

element. They combine together and produce a

physical chemical signal.

Which is produced on the transducer and the transducer

now changes the signal into an

electric signal. Which is amplified by the next component

called amplifier and then this signal is seen on the display

unit. That is the last unit which is seen as it could be

seen as a reading, or it could be seen as a graph.

Based on the bio element, the biosensor detector

can be categorized into several categories, namely catalytic. If

enzymes, Organism tissues are involved, affinity if it is an

antibody antigen reaction, hybrid receptors in case of DNA.

Now the basic reaction is where the analyte, which could be

substrate or antigen, combines with the biological component,

which is an enzyme or an antibody to produce a signal.

The transducer is coated with this biological component and it

produces a physical change.

This physical change occurs when the analyte reacts with the

biological component. This is then changed to an electric

signal by an amplifier.

The amplified electric signal is now processed.

To give the analyte

concentration. Now in case of a glucose biosensor, this would be

displayed as a reading on the sensor telling you the amount of

glucose which is present in the blood of that particular human.

So the amplified electric signal is processed to analyze.

Concentration, which is then displayed on the display

unit of a biosensor.

Coming to.

Certain examples of biosensors.The most commonly seen biosensor

is the glucose biosensor, which all of you have

mostly seen OK and it is used to monitor the blood glucose.

Another very frequently used biosensor is the pregnancy

kit biosensor, which

tells you whether a woman is pregnant or not.

These are the references.

Thank you.