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Biosensors: A device to detect diseases

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ABSTRACT

Nowadays, due to technology development, people are getting modernised. But as they get modernised, they also develop new diseases. The more we get modernised, the more we are diseased. Hence nowadays it has become difficult for doctors to distinguish the disease caused by bacteria and the disease caused by the virus. For example, if a person is having the symptoms of TB and coughs up blood and another person has the symptoms of cancer and coughs up blood.so in both the cases the diseases are different but the symptom is same. Is this case the doctor will probably ask the patients to take a blood test or a chest x-ray. This process may take a day or two for the reports to come by which cancer may reach its last stage (though the cancer is already noticed only at the last stage). Thus though the technology in medicine has developed to the 8th generation level, still we haven't achieved a halt in delayed diagnosis. According to WHO, in 1968, we had a situation of human beings going almost extinct due to the outbreak of deadly disease "swine flu". This flu is actually caused by the type A influenza virus in pigs which gets transmitted to human beings through direct contact. So doctors took time to find whether it is a bacterial disease or a viral one. But due to early precaution and prevention, we survived to overcome this flu. Also now certain diseases like smallpox have been eradicated from India due to repeated vaccination of all newborn babies. This stage has been achieved only due to precautions.

Keywords— *Biosensor, Pathogen, Vaccination, Diagnosis, Signalling, Mordernisation*

1. INTRODUCTION

A biosensor is a device made up of one of the strongest and lightest alloys in the world – alloy of magnesium and titanium. A biosensor measures 7 cm in length and 4cm in breadth. It has a signalling processor inside it which catches chemical signals. It also has a microchip on the outside. It has a DNA chamber beside the signalling processor and finally the detector on the outside. The detector turns blue or red depending upon the pathogen (blue for bacteria and red for virus).

2. AIMS OF BIOSENSOR

- To detect the organism causing pathogen (bacteria/ virus/ protozoa).
- Hence to reduce the delay in diagnosing the disease.

3. FLEXIBILITY OF USING A BIOSENSOR

A biosensor can be used anywhere at any time. It is handy. It can be used in hospitals, at home or ay vaccination centres.

4. WORKING OF A BIOSENSOR

A typical biosensor has the following components:

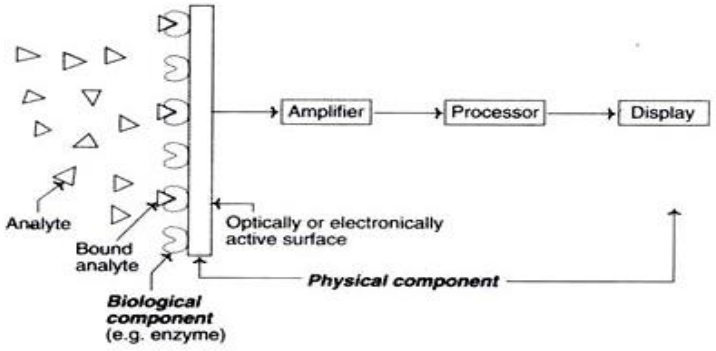

Fig. 1: A diagrammatic representation of a biosensor

This diagram is only a sample and not the actual sensor. This diagram shows only the basic parts of a biosensor.

4.1 How does a biosensor work??

Chemically speaking, a biosensor is a device which captures chemical energy and detects the enzyme properties. Similarly, biologically speaking, a biosensor is something that captures the various chemical enzymes from virus or bacteria and connect them with the DNA signals and detects the pathogen.

Simply speaking,

1. When this biosensor is placed on any place in the infected human body where there are veins (generally on the wrist region), then those bacteria and virus present in the body of the person projects chemical signals (as we know that pathogens communicate with each other through chemical signals).
2. Thus these chemical signals are captured by the microchip in the biosensor and identifies the type of pathogen. It can identify the type of pathogen because the DNA chamber can distinguish between the bacteria and virus. (Blue for bacteria and red for virus). This colour variation is just to distinguish between bacteria and virus and has nothing to do with the characteristic features of the pathogen.

Note: If the biosensor is not placed on the appropriate region in the body, then the chip cannot detect the presence of pathogen and will show an error. Thus it is important to place the biosensor in the correct place. (That is in the wrist region where veins are visible).

4.2 How to know if your body is affected by a disease??

First of all, when your body is affected by a disease, your body undergoes certain changes like the hormonal change, temperature change, changes in weight, changes in appetite, changes in brain activities, mood swings, etc. though, any of us may face one of these above mentioned situation in our everyday life, it is easy to find the problem with your body. For example, when you are depressed for a week since you failed in your exams, it doesn't mean that you are in illness. It is just the normal mood swing which we face in everyday life. So, here are some tips on how to find whether you are facing an illness or not:

- Unusual temperature increase or decrease in the body which lasts for more than 49 hours.
- Unexpected hair loss probably after trying a new product like new shampoo or conditioner.
- Tendering stiffness in your joins especially in knees and elbows.
- Loss of nails in your legs.
- Sudden increase in sugar level in your body. (This can be found through a blood test).
- Severe tiredness especially in the night.
- Overwhelming night sweat.
- Irregular periods for more than 5 months for women.
- Loss of appetite.
- Staying in depression such that it causes inability to sleep.
- Frequent fatigue.
- Softening of gums or reddening of gums.
- A rash that doesn't go away even after a medical consultation.
- Pre whitening of hair.
- A blood clot that doesn't go away after medical consultation.
- Blood in urine or in faeces.
- Paling of eyes.
- An unusual swelling behind the ears or hip region.
- A lump on your head after an injury that doesn't go away.
- Over sweating (losing 470ml per 2 hours) or less sweating (losing only 120 ml per 2 hours).
- A pain only in one eye.
- Vomiting immediately after waking up.
- Frequent tingling sensation all over the body especially in night time.
- Formation of violet spots here and thereafter have a small burn like cooking burn.
- Inability to sleep.
- Tendency to rest all the time.
- Loss of 2 or more teeth at the same time.
- Corneal damage.
- Frequent urination or urge to urination.
- Whole body itches.
- Tendon damage.

5. CONCLUSION

Thus a biosensor can help in the prevention of delay diagnosis as the causative agent is tracked. Now the remaining thing left is only treatment: "**Prevention is better than cure but pre-cure is better than prevention!!"**

The tips given above may probably help you get a medical consultation to stay away from dreadful diseases. Note that a symptom may be a cause of a major disease or it can be even a harmless allergy.

