

Tissue engineering detection

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Detection

When talking about detection in tissue engineering, there is often one term occurring: Biosensors. Biosensors are detectors, which are provided with biologic components for identification of determining substances. These biologic components could be for example antibodies, enzymes, organelles and microorganism.

Process of detection:

1. A sample is taken out of environmental (water, air, soil) or biological (blood, urine, saliva) substances.
2. A detector is added as a bioreceptor (nucleic acid, cells, antibody, enzyme)
3. Transducer: electrical interface (nanowire array, nanoparticles, electrode)
4. Output: Signal amplifier, Signal processor, display

There are different types of biosensors:

- 1) Electrochemical biosensor-> for detection of hybridized DNA, glucose concentration, etc.
- 2) Optical biosensors-> detect microscopic changes, when cells bind to receptors
- 3) Acoustic, thermometric, magnetic and piezoelectric biosensor.

A good example for detection with biosensors is the glucose measurement in case of diabetes diagnosis.

1. A blood sample is taken (biological)
2. As detector is used: inactive apoenzymes, binding proteins and receptors
3. In this case the blood glucose meter acts as the transducer (electrical interface)
4. The signal (glucose level) is to be found on the display

As a conclusion the detection with blood glucose meter is an easy and fast way to find out if a disease like diabetes is current or not.

Sources:

Article: Recent Advances in Application of Biosensors in Tissue Engineering- Various authors

<http://de.wikipedia.org/wiki/Biosensor>

http://en.wikipedia.org/wiki/Blood_glucose_monitoring