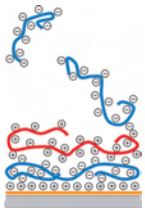
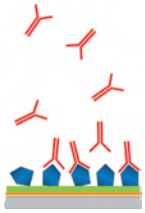
A CLOSER LOOK AT THE SURFACE OF BIOMATERIALS

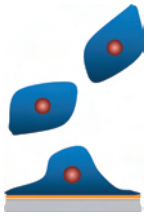
Interactions at the interface between a biomaterial and its physiological environment in the body are critical for the performance of medical devices. Q-Sense instruments are based on the unique and powerful QCM-D technology. QCM-D is a surface sensitive technique that enables evaluation of the surface properties of bulk materials and coatings, including the physiological response of proteins and cells to the surface. A QCM-D analysis can for example answer questions about how much protein is adsorbed, to what extent cells attach to different materials, the extent of surface induced immune responses and how the surface of a material can be modified to optimize its function. The real-time analysis that Q-Sense instruments provide is a cost efficient tool in the optimization of biomaterial properties, potentially reducing the need for animal studies.



Polyelectrolyte mulitlayer build-up and functionalisation.



Protein-protein interactions and specificity of binding.



Measure cell adhesion to different surfaces.

QCM-D application examples from literature:

1. Evaluation of material properties of surface coatings
- Build up of polyelectrolyte multilayers
- Swelling of hydrogels
- Viscoelastic properties of polymers, hydrogels and multilayer coatings
- Calcification of polyelectrolyte multilayers

2. Evaluation of interactions between a surface and its physiological environment
- Hemocompatibility of polymers evaluated by fibrinogen adsorption
- Immune response evaluated by complement factor 3c adsorption
- Cell attachment on functionalized surfaces
- Protein resistance of contact lenses

THE PRODUCT SOLUTION

Q-Sense QCM-D instruments are useful tools in biomaterial research ranging from fundamental explorative research to product development such as orthopedic and dental implants to cardiovascular devices and contact lenses.

• Measure the mass
of molecular layers adsorbing or desorbing from a surface in real-time.

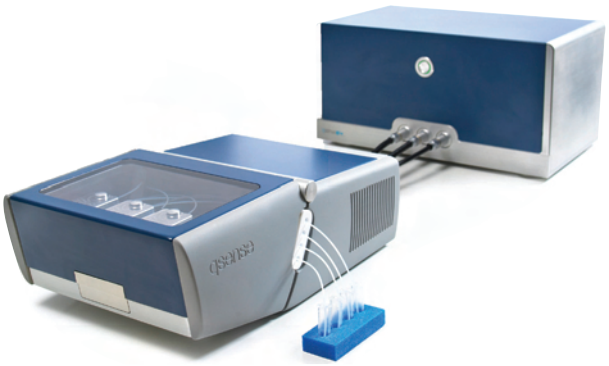
• Structural changes
are measured simultaneously to provide information on the softness and conformational changes of adsorbed layers.

• Real time analysis
of adsorption, reaction and structural changes

• Flexible choice of surfaces
of molecular layers adsorbing or desorbing from the surface in real-time.

• Surface modification
of the sensors in situ or ex situ allows for numerous possibilities to functionalize the surface.

• Speed and efficiency
chamber specifically designed for flow measurements in a temperature-controlled environment.
Four channel system for higher throughput.



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