Focus on healthcare products and services

Radiometer Turku Oy operates in the healthcare area by supporting caregivers in making diagnostic decisions and thereby improving the quality of global healthcare. The more critical the setting, the greater the requirement, and therefore the company strives to provide solutions that are reliable, fast and easy to understand and use. Building on the value of continuous improvement and an ambition to meet customer needs, Radiometer's vision is to improve global healthcare with reliable, fast and easy patient diagnoses, www.radiometer.com

RADIOMETER

Industrial need

The company develops and manufactures immunoassay test kits, specifically it produces immunoassay designs that consist of antibodies coated onto the polystyrene surface of microtiter wells. The intention with the experiment was to investigate how the antibodies are oriented and packed onto the surface. These measurements could provide the company with the information on the morphological characteristics of the coated surface.

How did it go?

The company realized the need in testing the materials and was actively searching for analytical research services. In its search for scientific support the company was driven by the need to get more specific information of the surfaces in order to develop new products. By participating at the Materials research event organized by Turku Science Park, the company received the information about the ongoing call for proposals driven by the Baltic TRAM initiative.
The University of Turku acting as Industrial Research Center (IReC) in collaboration with the company identified Atomic Force Microscopy to be the most suitable research method, which was additionally approved by the international evaluation committee.

Figure 1. The image of microtitration wells.

Experiment

The objective with the experiment was to find out the morphology of antibody coated polystyrene surface of microtiter wells. The technique, specifically Atomic Force Microscopy (AFM), was applied by using Bruker Innova Atomic Force Microscope, and applying the measurement method of contact mode imaging. As regards the materials used, the proteins on polystyrene surface were tested. Total amount of 6 samples were studied. Three different sample types were studied with AFM method: one was clean polystyrene surface of the microtiter well, second was polystyrene surface containing streptavidin proteins, third surface was polystyrene surface containing both streptavidin and biotinylated antibody proteins. Size of the individual streptavidin protein is about 5 nm and size of a biotinylated antibody is approximately 10–15 nm.

Findings?

The experiment provided the measurements of Atomic Force Microscopy (AFM) images of protein coated polystyrene surfaces and studied immunoassay designs containing antibodies coated onto the polystyrene surface of microtiter wells. The experiment was valuable both for material science by proving the AFM method as the most suitable to study the morphology of this kind of surfaces, and had useful industrial application by providing the company with the new information about the studied samples and for the quality control.

Contact

Taina Laiho
Materials Research Laboratory
Department of Physics and Astronomy
University of Turku
FI-20014 TURKU
E-mail: taina.laiho@utu.fi