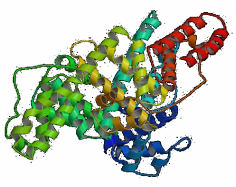
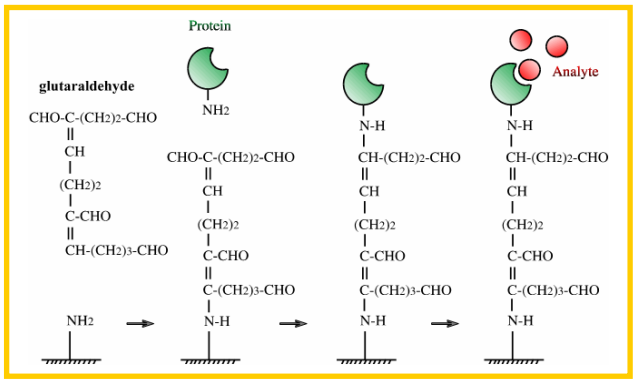
TEST MEASUREMENT OF LABEL-FREE IMMUNOSENSOR USING BSA - ANTI BSA MODEL MOLECULE PAIR

Using OPTICAL WAVEGUIDE LIGHTMODE SPECTROSCOPY (OWLS) detection

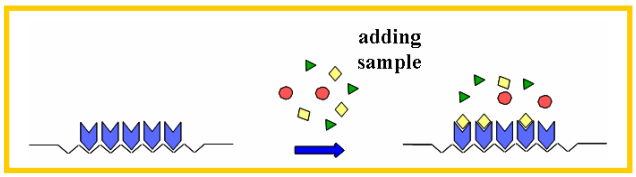


In the case of glass type metal oxide surfaces such as SiO_2-TiO_2, mainly hydroxyl groups are present, which offer relatively few possibilities for covalent immobilization of biomolecules. To widen the circle of covalent coupling methods, the surface of the waveguide has to be modified by silanization using reactive silane reagents for introducing functional groups of all sorts (e.g. aliphatic amine, sulfhydryl, aromatic amine and epoxy) onto the surface of inorganic materials. Amino groups are formed by γ-aminopropyltriethoxysilane (APTS).

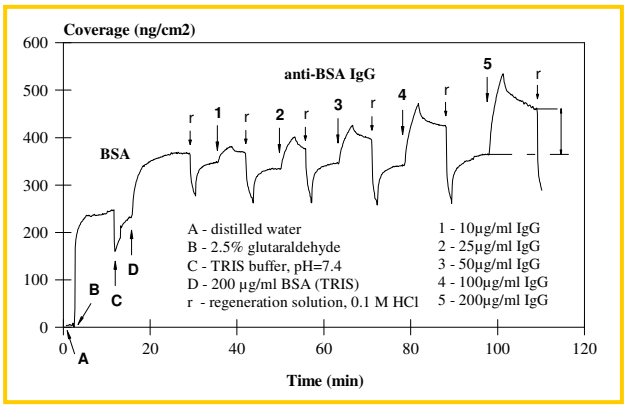


Evaluation of layers formed

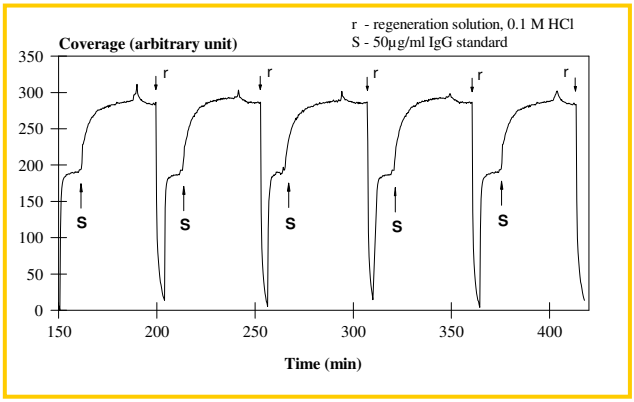
To test the layers formed, immobilization experiments were undertaken on the modified surfaces using the bovine serum albumin (BSA) - anti-BSA antibody model molecule pair.



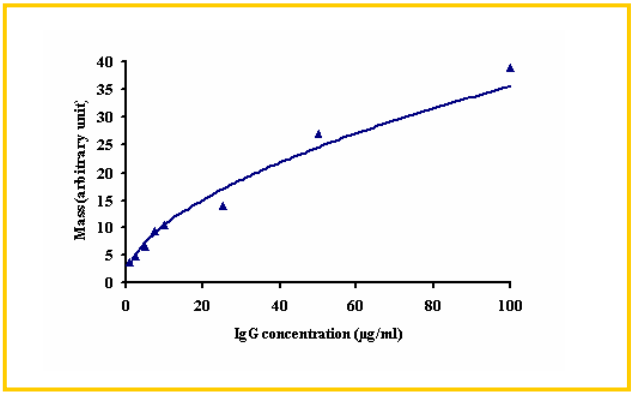
The activation of the amino silanized sensors was performed by injecting **glutaraldehyde** (2.5% in distilled water). Than the surface was washed with distilled water and tris buffer (42 mM, pH 7.4) for a few minutes and BSA (10 □g/ml) in TRIS buffer was immobilized on the surface. It was followed by washing with buffer and injecting 0.1 M HCl to remove molecules bound slightly to the surface. After this step the chip was ready to measure IgG molecules. Measurements were carried out by injecting the IgG standard solutions. Antibodies bound to the antigen were washed off with 0.1M HCl after each cycle. The system proved to be stable, responses did not decrease significantly during the measurement.



Experiment performed on amino surface



Sensor responses obtained for 50µg/ml anti-BSA antibody standards



Calibration curve for anti-BSA antibody standards

References

1. Vörös, J. J. Ramsden, G. Csucs, I. Szendrõ, S.M. De Paul, M. Textor, N. D. Spencer (2002): Optical Grating Coupler Biosensors. Biomaterials 23 3699-3710

2. www.owls-sensors.com

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