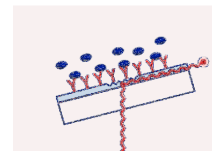


LABEL-FREE IMMUNOSENSOR FOR HSP70 DETECTION

using OPTICAL WAVEGUIDE LIGHTMODE SPECTROSCOPY (OWLS) detection

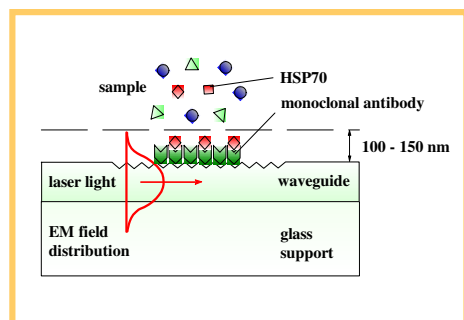


Abstract

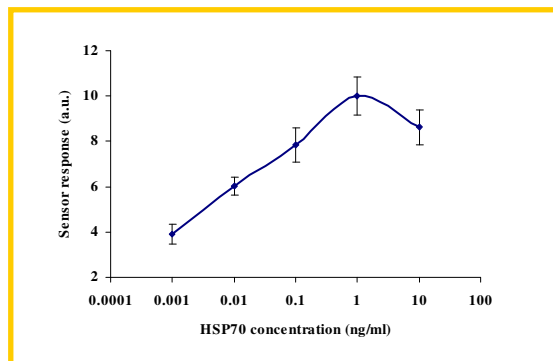
OWLS immunosensor offers a real time label-free detection of heat shock protein, HSP70 (molecular weight of 70 kDa). For biosensing monoclonal antibodies raised against HSP70 protein under investigation were used. To form regenerable sensor surface, the waveguide sensor surface was modified with amino group and sensitized by immobilizing antibody/antigen molecules covalently to the surface.

Application of OWLS sensors

as immunosensor for the detection of the heat-shock protein HSP70



Calibration curve for HSP-70 sensor

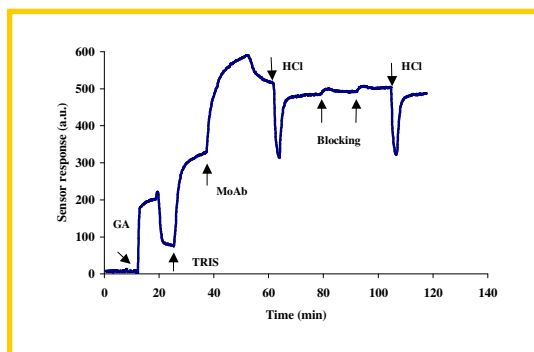


Surface Chemistry

- Amino functionalisation of waveguide surface by (γ -aminopropyl)triethoxysilane
- Immobilisation of biomolecules on the amino surface of the OWLS sensors by glutaraldehyde.

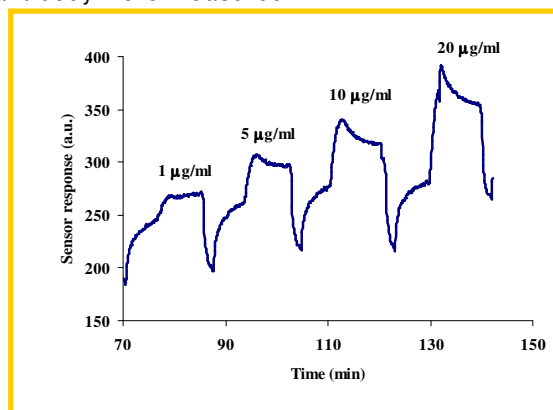
Sensitization of the sensor surface

with monoclonal anti-HSP70 IgG



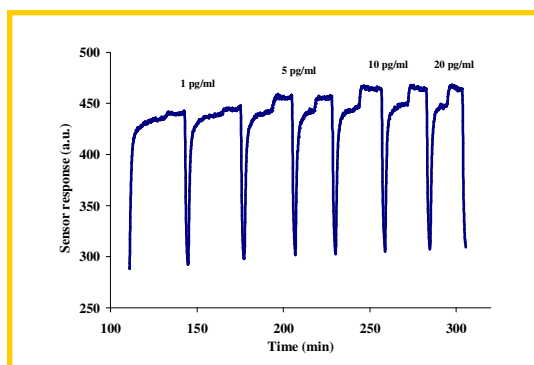
Measurement of anti-HSP70 antibody

HSP70 molecules are covalently attached to the surface and different dilutions of anti-HSP70 antibody were measured.



Regeneration cycles of the measurement

Antibodies are covalently attached to the surface and lifetime of sensors were examined and optimized.



Conclusion

The OWLS Sensor is a very sensitive and cost-effective tool for HSP70 and anti-HSP70 antibody detection.

The lowest detectable amount of HSP70 is 1 pg/ml.

References

1. Vörös, J. J. Ramsden, G. Csucs, I. Szendrő, S.M. De Paul, M. Textor, N. D. Spencer "Optical Grating Coupler Biosensors" *Biomaterials* 23 (2002) 3699-3710
2. Levkovets I., Adányi N., Trummer N., Váradi M., Szendrő I., Starodub N.F., Székács A., "Development of optical (OWLS) immunosensors for macromolecules and small analytes", *BIOKÉMIA XXVIII/1*, 2004
3. www.owls-sensors.com