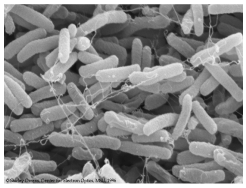
LABEL-FREE IMMUNOSENSOR FOR ESCHERICHIA COLI DETECTION

using OPTICAL WAVEGUIDE LIGHTMODE SPECTROSCOPY (OWLS) detection

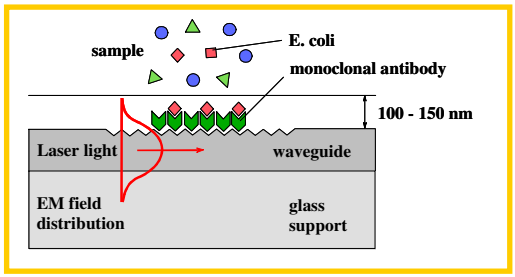


Abstract

Escherichia Coli is a Gram-negative non-spore forming rod and a representative microorganism in the enteric bacteria. It is also considered as index microorganism in the food industry. OWLS immunosensor offers a real time label-free detection of E.Coli bacteria For biosensing monoclonal antibodies raised against E.Coli bacteria. 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 E.Coli

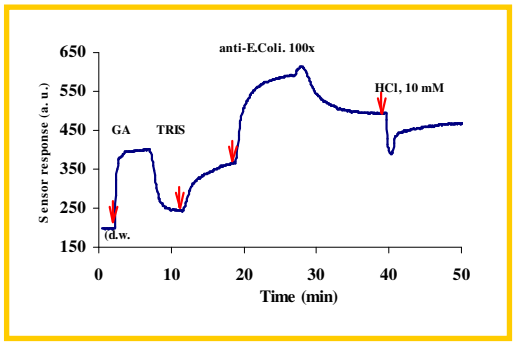


Surface Chemistry

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

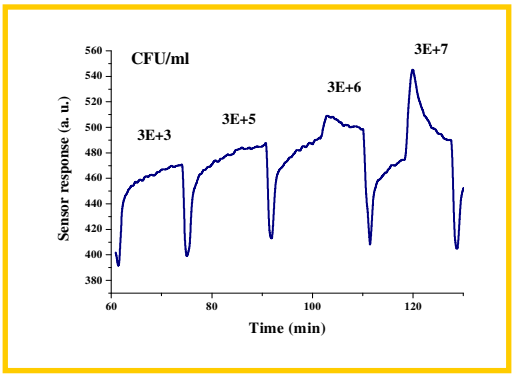
Sensitization of the sensor surface

with monochlonal anti-E.Coli



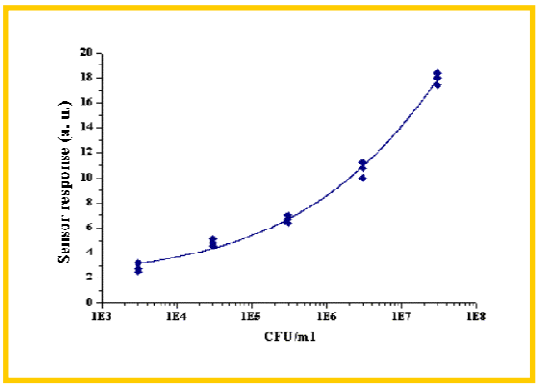
Regeneration cycles of the measurement

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



Calibration curve for E.Coli sensor

Concentration dependent response of E.Coli by OWLS



Conclusion

The OWLS Sensor is a rapid and cost-effective tool for Escherichia Coli detection.

With the presented immunosensor the lowest detectable amount of E. Coli is $3x10^3$ CFU/ml.

References

1. Vörös, J. J. Ramsden, G. Csucs, I. Szendrõ, S.M. De Paul, M. Textor, N. D. Spencer "Optical Grating Coupler Biosensors" Biomaterials 23 (2002) 3699-3710
2. Adányi N. Váradi M., Kim N., Szendrő I. "Development of new immunosensors for determination of contaminants in food" Current Applied Physics (in press)
3. www.owls-sensors.com

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