ELECTROCHEMICAL OPTICAL WAVEGUIDE LIGHTMODE SPECTROSCOPY (EC-OWLS) FOR ESCHERICHIA COLI DETECTION

Abstract
Escherichia Coli is a Gram-negative non-sporing rod and a representative microorganism in the enteric bacteria. It is also considered as index microorganism in the food industry.

Electrochemical Optical Waveguide Lightmode Spectroscopy (EC-OWLS) combines evanescent-field optical sensing with electrochemical control of surface adsorption processes. A layer of indium tin oxide (ITO) serves as a conductive electrode for electrochemical sensing and together with the other glass-type layers of the sensor functioned as a high refractive index waveguide for optical sensing.

Measuring setup

Sample preparation
E. coli strain (NCAIM B.00200, http://www.uni-corvinus.hu:8089/NCAIM/frameset.jsp) was grown in BHI broth shaking on 37°C for 18 hours.

Calculated mass of immobilized cells as the function of polarizing potential

The effect of polarization potential on the adsorption of the E. coli cells onto the sensor surface was investigated. Sample of 10⁸ CFU/ml bacteria suspended in buffer solution was injected into the flow-through cuvette. The polarization potential was changed between 0-1200 mV.

References: