OMICS Group Conferences
Accelerating Scientific Discovery

International Conference and Exhibition on
Biosensors & Bioelectronics

May 14-16, 2012   Embassy Suites Las Vegas, USA

Real-time monitoring of bacterial growth using label free biosensors. A new tool for fast bacterial diagnosis

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The standard diagnostic protocol for bacterial diagnosis in the medical and agronomic fields remains microbial culture, which takes days to identify the pathogen. However, these time lags are not compatible for instance, with the analysis of some infectious disease. There is a strong need to develop new tools to identify pathogenic bacteria in a shorter time. To achieve this goal, Surface Plasmon Resonance imaging (SPRi) technology has been successfully used for the specific detection of growing bacterial populations using proteins and/or antibodies targeting these bacteria. This strategy of simultaneous bacterial growth monitoring and specific detection, using the SPR imaging, enabled the detection of less than 50 cfu inoculation within few hours. First *Streptococcus pneumoniae* R6 was used as a model, and then *Escherichia coli* K12 provided the proof that this method can be applied to other strains. Our quantitative results are consistent with the expected doubling time of bacteria reported in the literature.

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