16s ribosomal RNA detection of food-borne pathogenic microorganisms using surface plasmon resonance biosensor

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Surface plasmon resonance (SPR) is a label-free technique now widely used to monitor affinity interactions between molecules of biological interest by measuring changes in refractive indices[1,2]. In this study, we optimized the binding efficiency of 16s rRNA extracted from food-borne pathogenic microorganisms using SPR system. Several biotin labeled oligonucleotide probes were designed to be complementary to the 16s rRNA gene sequences of *Escherichia coli* and *Listeria monocytogenes*and named as uni1, uni2, uni3, uni4, uni5, uni6, lis1, lis2, lis3, lis4, and lis5. Each probe was used for detecting the intact or fragmented[3] *E.coli* and *L.monocytogenes* rRNA by the SPR biosensor. The quantification of *E.coli* rRNA was also performed in this experiment. Both the intact and fragmented *E. coli*rRNA detection using uni3 probe showed the high binding efficiency. The detection limit of fragmented *E.coli* rRNA was 0.4 μg/ml. In case of *L. monocytogenes*, the intact *L.monocytogenes* rRNA detection using uni4 probe and the fragmented *L.monocytogenes* rRNA detection using lis3 probe showed the high binding efficiency. We demonstrated that the applicability of the SPR biosensor for detecting 16s rRNA of food-borne pathogenic microorganisms.

References

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