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Visual Detection of Escherichia coli (E. coli) through Formation of Beads Aggregation in Capillary Tube by Rolling Circle Amplification

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Abstract : Food contaminated by bacteria (E.coli), causes food poisoning, which occurs to many patients worldwide annually. We have introduced an application of rolling circle amplification (RCA) as a versatile biosensor and developed a diagnostic platform composed of capillary tube and microbeads for rapid and easy detection of Escherichia coli (E. coli). When specific mRNA of E.coli is extracted from cell lysis, rolling circle amplification (RCA) of DNA template can be achieved and can be visualized by beads aggregation in capillary tube. In contrast, if there is no bacterial pathogen in sample, no beads aggregation can be seen. This assay is possible to detect visually target gene without specific equipment. It is likely to the development of a genetic kit for point of care testing (POCT) that can detect target gene using microbeads.

Keywords : rolling circle amplification (RCA), Escherichia coli (E. coli), point of care testing (POCT), beads aggregation, capillary tube
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