Electronic Supplementary Material (ESI) for Lab on a Chip.

Electronic Supplementary Information

A centrifugal direct recombinase polymerase amplification (direct-RPA) microdevice for multiplex and real-time identification of food poisoning bacteria

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Table S1. Primer and probe sequences for the multiplex and real-time RPA

	Type	**Gene locus**	**Nucleotide sequence 5' to 3'**
Escherichia coli O157:H7	Forward primer	fliC gene	GTTAACTTTACCATTTGCAAAGGTATATGTAC
	Reverse primer	fliC gene	GAAATATACTTATAACGCATCGACCAATGATT
	Probe	fliC gene	CCTTCAGAGTAGCGCCAAGATCTGTCG-T(FAM)-TG-dSpacer-AG-T(BHQ-1)-GCCTGTCGCTAC
Salmonella enterica	Forward primer	InvA gene	CGTCTACGTAGTCAGTTCTTTATTGATTAT
	Reverse primer	InvA gene	CATCAAATCAAAATAGACCGTAAATTGTTC
	Probe	InvA gene	GCGATGGCGAGGGCCTGGACGATAACAGCA-T(FAM)-CG-dSpacer-AT-T(BHQ-1)-GTTGATTAATGAGAT
Vibrio parahaemolyticus	Forward primer	MutS gene	ATTGGTGAAATTAAAGATCAAGGCTTATTTAC
	Reverse primer	MutS gene	AACTTCACTAAGTATGGATGAGTTAAGGAT
	Probe	MutS gene	ATTGAACGTATCTTAGCGCGTCTTGCTC-T(FAM)-A-dSpacer-G-T(BHQ-1)-TCTGCTCGTCCAC

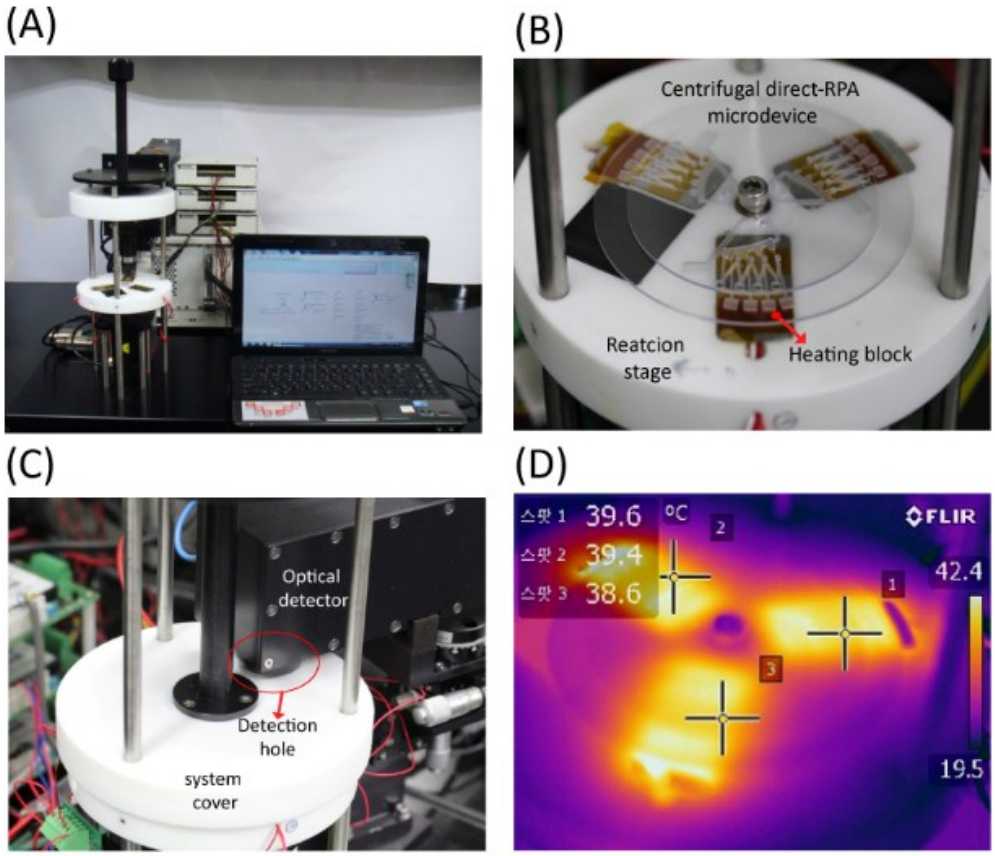

Fig. S1 Digital image of (A) a custom-made portable genetic analyzer with a miniaturized optical detector, (B) a reaction stage including heating blocks and a rotation axis, and (C) the reaction stage sealed by a system cover, which was equipped with an optical detector for fluorescence signal monitoring. (D) An infrared thermal image of the heaters during the direct-RPA reaction.

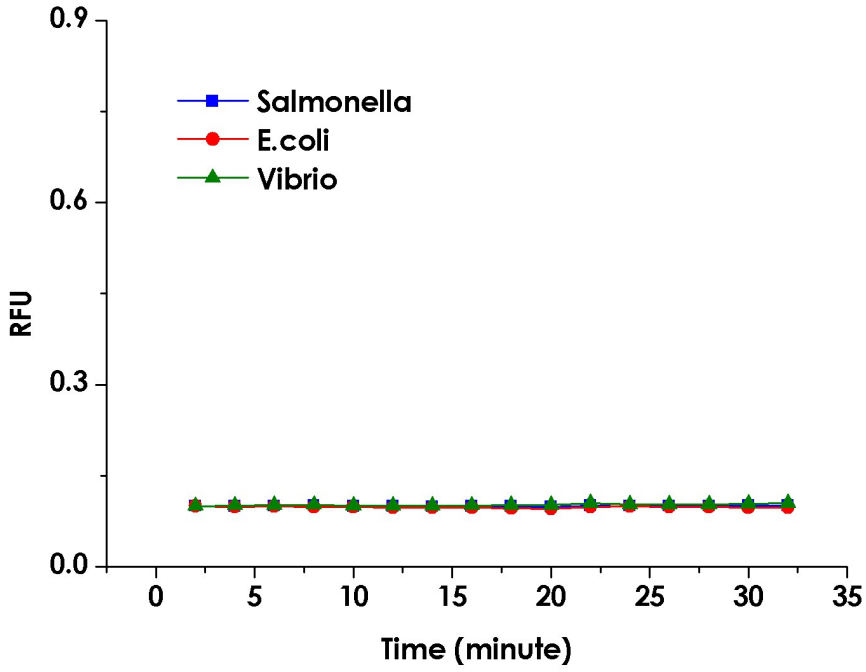

Fig. S2 A negative control tests with a fresh milk sample without addition of bacterial cells.

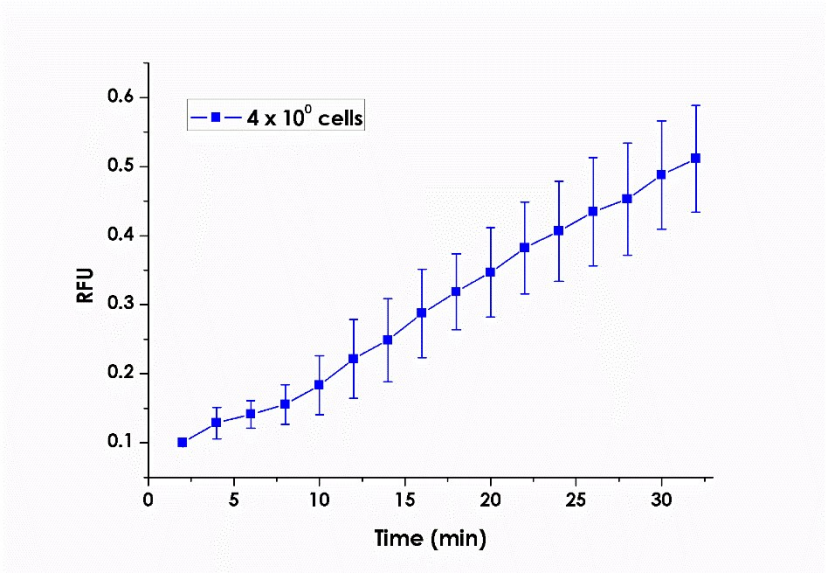

Fig. S3 The amplification profiles using 4 bacteria cells (S. enterica). The experiments were repeated ten times for proving the data reliability. (RFU: relative fluorescence unit, NC: negative control).

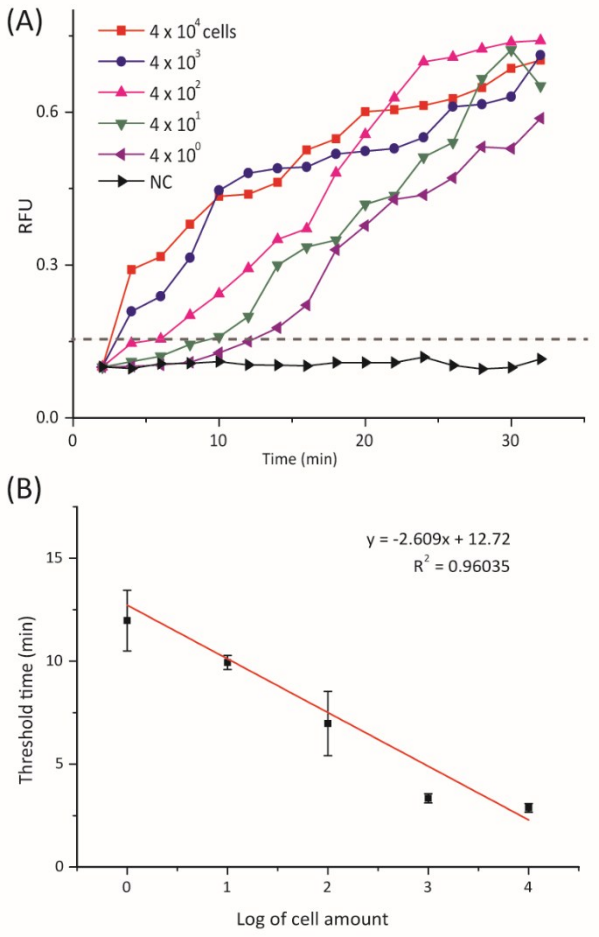

Fig. S4 A detection sensitivity test of the on-chip direct-RPA for analyzing *E. coli* O157:H7. (A) Real-time direct-RPA profiles depending on the number of cells. (B) A standard curve by plotting the threshold time versus the logarithm of cell number (RFU: relative fluorescence unit, NC: negative control).

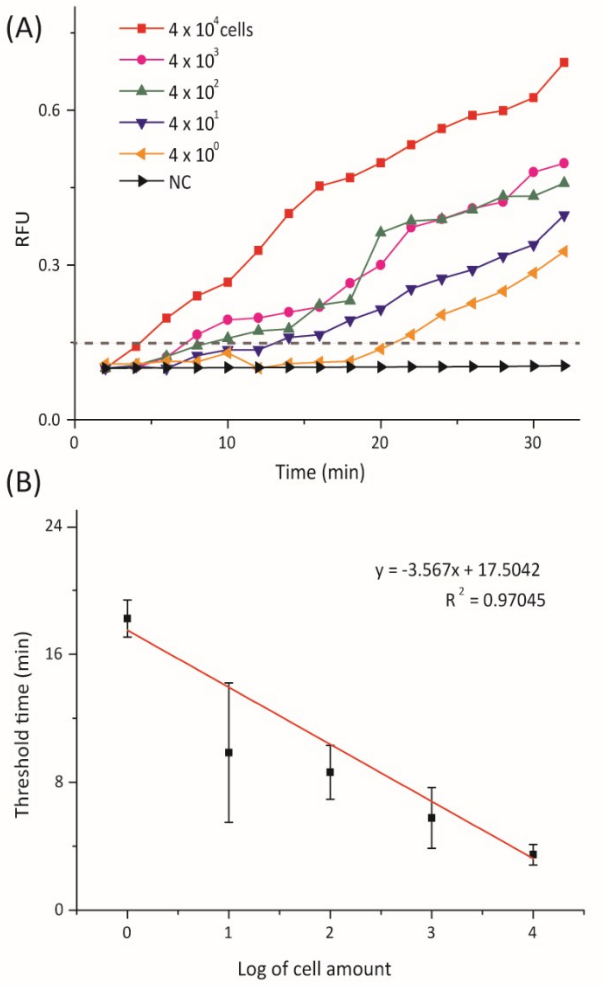

Fig. S5 A detection sensitivity test of the on-chip direct-RPA for analyzing *V. parahaemolyticus*. (A) Real-time direct-RPA profiles depending on the number of cells. (B) A standard curve by plotting the threshold time versus the logarithm of cell number (RFU: relative fluorescence unit, NC: negative control).