Electronic Supplementary Material (ESI) for Analyst

Supplementary data

Ultrasensitive detection of mRNA extracted from cancerous cells achieved by DNA rotaxane-based cross rolling circle amplification

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Table S1. Oligonucleotides used in the expriments[a]

No.	Description	Sequences(5′-3′)
1-1	cDNA specific for *ACTB*	CGGATCGGCAAAGGCGAGGCTCTGTGCTCGCGGGGCGGACGCGGTCTCGGCGGT
1-2	cDNA specific for *TERT*	CGTCCCAGGGCACGCACACCAGGCACTGGGCCACCAGCGCGCGGAAAGCCGCCG
1-3	cDNA specific for *MYC*	CTGCTATGGGCAAAGTTTCGTGGATGCGGCAAGGGTTGCGGACCGCTGGCTGGG
1-4	cDNA specific for *ERBB2*	TGCAGGAAGGACAGGCTGGCATTGGTGGGCAGGTAGGTGAGTTCCAGGTTTCCC
2	biotinylated primer-I	biotin-AGCACAGAGCCTCGCC
3	linear DNA rod-I	CAGGGATTTTTATCCCTGCGCGTCCGCCCCGCGAGCACAGAGCCTCGCCTTTGCCGATCCGGAACTAATTTTTTAGTTCTTT
4	circle template-I	TGTGCTCGCGTTTCTCCTCATCTTTGACTTCCCCTTCCCAACCCGCCCTACCCCTCCTCATCTTTGACTTCCCCTTTTTGGCGAGGCTC
5	release-DNA-I	AAGGGGAAGTCAAAGATGAGGAGTTT
6	biotinylated primer-II	biotin-CATCTTTGACTTCC
7	linear DNA rod-II	CAGGGATTTTTATCCCTGCTCCTCATCTTTGACTTCCCCTTGAACTAATTTTTTAGTTCTTT
8	circle template-II	AAAGATGTTCCGCGAGCACAGAGCCTCGCCTTTGCCCCCAACCCGCCCTACCCCCGCGAGCACAGAGCCTCGCCTTTGCCTTGGAAGTC
9	release-DNA-II	GGCAAAGGCGAGGCTCTGTGCTCGCGGTTT
10	DNA primer	ATCATCCATGGTGAGCTGGCGGCGG

[a]Font colors correspond to the line colors in the schemes.

Nondenaturing PAGE Results of RT-PCR. PCR products of standard cDNA samples and RT-PCR products of *ACTB* extracted from MCF-7 cells were detected by nondenaturing PAGE (15%) (Fig. S1), whose data were analyzed by VisionWorks®LS Image Acquisition and Analysis software (Ultra-Violet Products Ltd., cambridge, UK). The calibration curve is shown in Fig. S2.

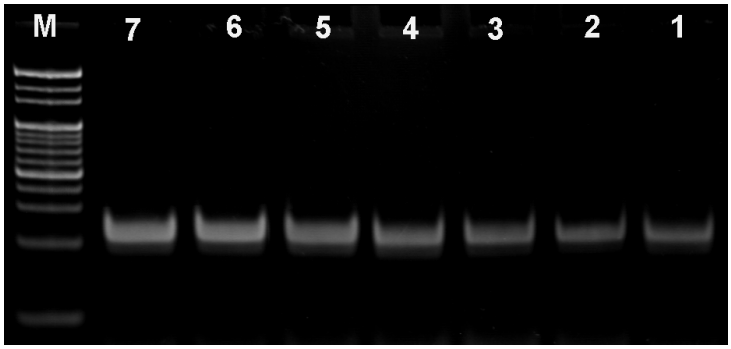

Fig. S1. The sensitivity of PCR for detection of cDNA that is specific for *ACTB*. M: Marker; lanes 1~7: differently diluted cDNA template (10^2, 10^3, 10^4, 10^5, 10^6, 10^7, 10^8, 10^9, 10^{10}, 10^{11} copies per reaction).

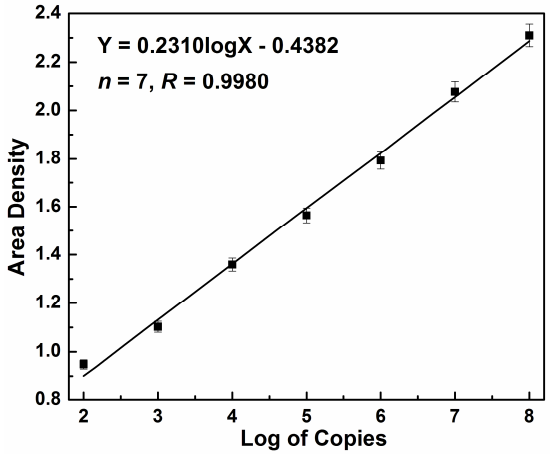

Fig. S2. Standard curve of the PCR products of cDNA. Synthetic cDNA input ranges from 10^2 copies per reaction to 10^8 copies per reaction in PCR.

Table S2. Comparison of the Proposed C-RCA-Based Method with the RT-PCR Method for the Detection of *ACTB* in MCF-7 Cells

No[a]	The proposed C-RCA method (copies per cell)	RSD (%)	RT-PCR method (copies per cell)	RSD (%)
1	117	3.1	138	1.8
2	100	2.3	129	1.6
3	128	3.5	144	1.2

[a] Each sample is analyzed in triplicate, and the results are the average values.