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

DNA sequence information：

DNA Symbol	Sequence	Modified
ssDNA1	TTTTTTTTTTACCCCAACCTTCCCACTCCCTTTA ATTTTTT TTATTTT	$5'-NH_2-(CH_2)_6$
ssDNA2	TTTTTTTTTTTGTTAGTGAGTTTAGTTGGCATGT GTAGATTATTTTAT	$5'-NH_2-(CH_2)_6$
Template1	GGGAGTGGGAAGGTTGGGGTAAAACGGCTAA GGAGGAGACCCTGAACAGCCACCGAACTATC CTCCTAACACGACTAAAAATAAAAAAAATTAA A	$5'-PO_4$
273CGTcaptu (capture probe)	TTTTTTACAGGCACAAACAC	$5'-NH_2-(CH_2)_6$
273CATcaptu (capture probe)	TTTTTTACAGGCACAAACAT	$5'-NH_2-(CH_2)_6$
273CTTcaptu (capture probe)	TTTTTTACAGGCACAAACAA	$5'-NH_2-(CH_2)_6$
273CCTcaptu (capture probe)	TTTTTTACAGGCACAAACAG	$5'-NH_2-(CH_2)_6$
Reporter probe	GCACCTCAAAGCTTTTTTTTTTTATCATCAATCTG AGCAATTACGA	$5'-PO_4$
273wtCGT	AGCTTTGAGGTGCGTGTTTGTGCCTGT	
273muCAT	AGCTTTGAGGTGCATGTTTGTGCCTGT	
273muCTT	AGCTTTGAGGTGCTTGTTTGTGCCTGT	
273muCCT	AGCTTTGAGGTGCCTGTTTGTGCCTGT	
Template2	GATTGATGATTTTTTTTTTTTTTTTTTTTTTTTTT TTTCGTAATTGCTCA	$5'-PO_4$

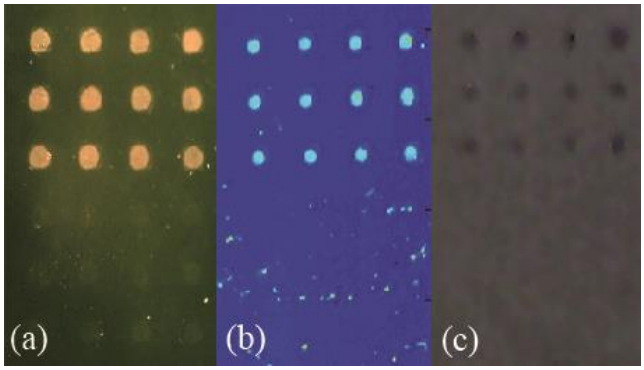

Fig. S1 Photos of the RCA-amplified chip. (a) Comparative results of fluorescence microscopy. (b) Comparative results of hyperspectral interference microscopy. The RCA product is 5.4 nanometres thick and 112 micrometres in diameter according to the interference spectral while the probes without RCA product cannot be detected. (c) Chip after vapor condensation.

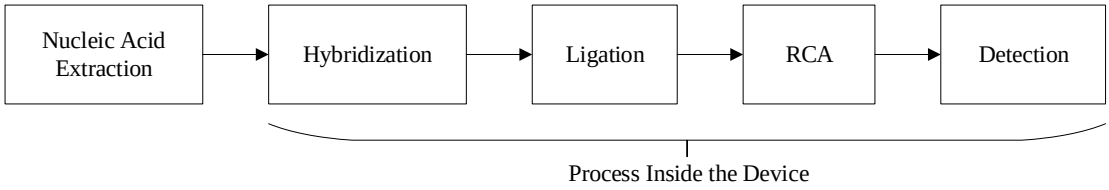

Fig. S2 The whole workflow of gene point mutation detection. The amplification and the detection process are in the device while hybridization and ligation process can also be carried out both in the device.

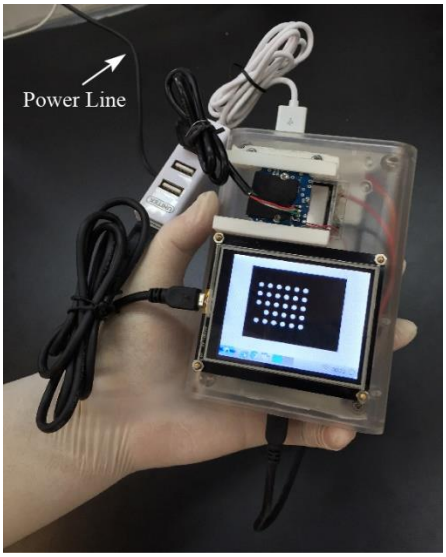

Fig. S3 Actual picture of the whole device including the USB hub and the all wires.