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

Supporting Information

An integrated multi-molecular sensor for simultaneous BRAFV600E protein and DNA single point mutation detection in circulating tumour cells

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Table S1. Oligonucleotide sequences used in experiments. *Underlined and bold represent RPA primer sequences on ligation probes.

Oligos	5'-Sequence-3'
BRAF^{V600E} Fwd Ligation Probe	-PO-AGACATCGATCTG**GACGAGGGAAAGAGTTGTACCTAAAT**
BRAF^{V600E} Rev Ligation Probe	**TGTATAGGAATCCCACTGAATTTTTC**CCATCGAGATTTC
BRAF^{V600E} RPA Fwd Primer	SH-C3-ATTTAGGTACAACTCTTTCCCTCGTC
BRAF^{V600E} RPA Rev Primer	TGTATAGGAATCCCACTGAATTTTTC
BRAF^{V600E} PCR Fwd Primer	ATAGGTGATTTTGGTCTAGCTACAGA
BRAF^{V600E} PCR Rev Primer	AGTAACTCAGCAGCATCTCAGG

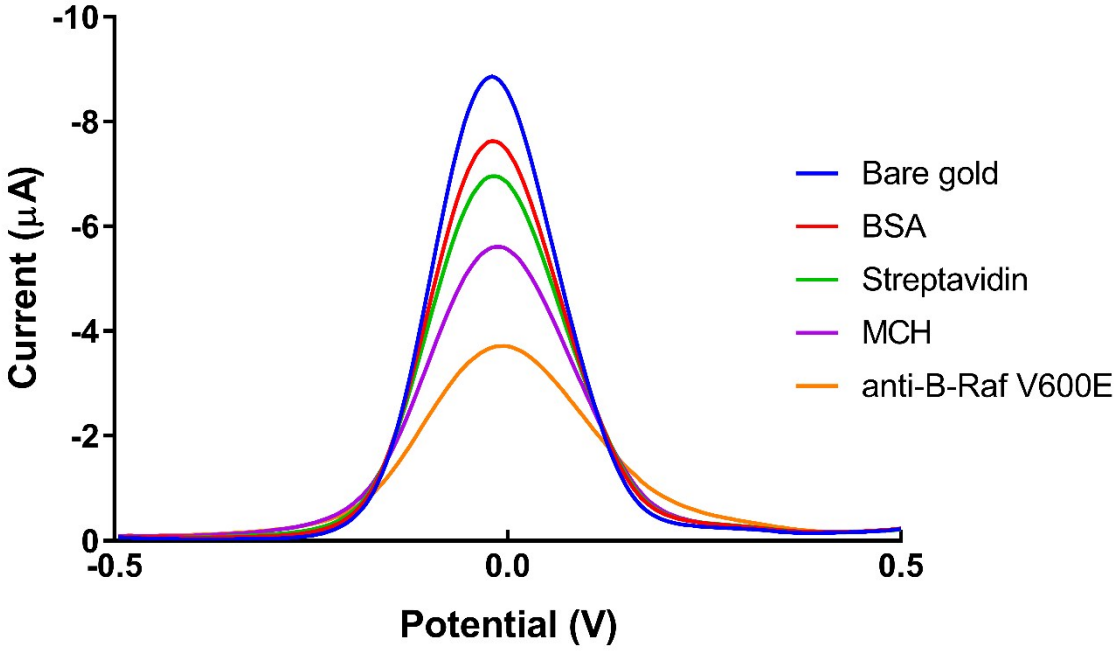

Fig. S1. Electrode surface functionalization for *BRAF*^{V600E} protein detection. Each overlaid differential pulse voltammetric signal represented a stepwise molecular functionalization to prepare the eventual protein sensing surface.

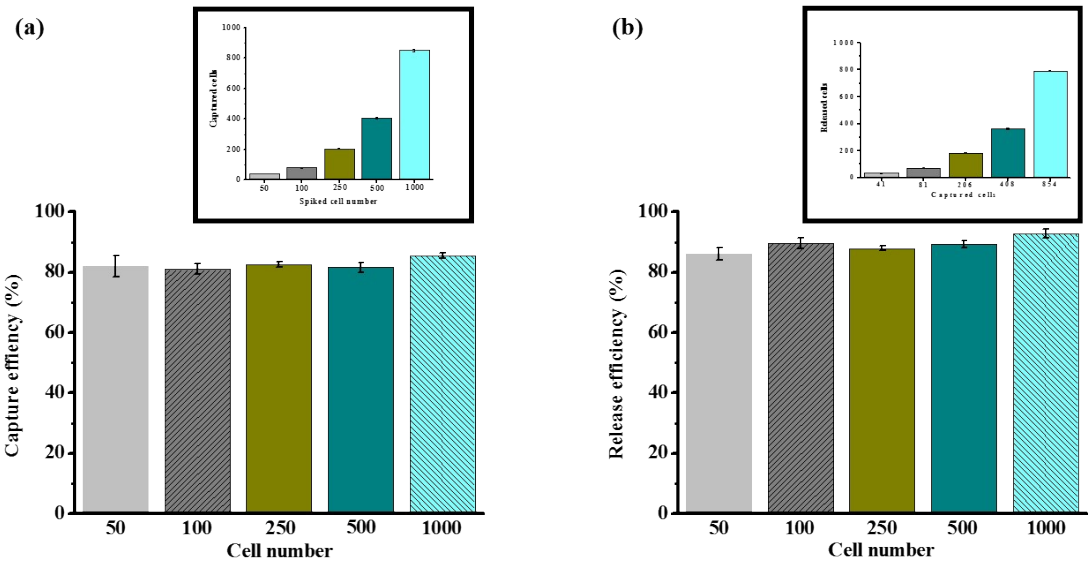

Fig. S2. (a) Capture and (b) release efficiencies of different SK-MEL-28 cell counts in 1 mM PBS. (insets) Corresponding actual number of captured and released cells.

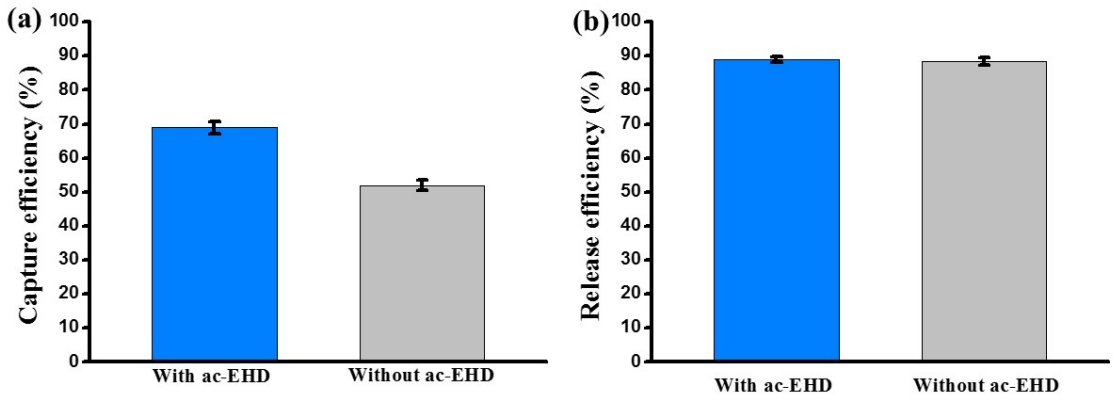

Fig. S3. (a) Capture efficiencies of 100 SK-MEL-28 cells spiked in 10x diluted blood in 1 mM PBS under ac-EHD (left bar, blue) and hydrodynamic fluid flow conditions (right bar, grey), n=3. (b) DC induced cell release performance for cuaptured cells under ac-EHD (right, blue bar) and under hydrodynamic fluid flow (right, grey bar) conditons. Error bars represent the standard error of three repeats (n=3).