Electronic supplementary information (ESI)

for

Naked-eye and electrochemical detection of isothermally amplified HOTAIR long non-coding RNA †

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Experimental

Determination of surface area of electrodes

The effective areas of SPGE was determined by the measurement of the peak current obtained as a function of scan rate under cyclic voltammetric conditions for the one-electron reduction of $[Fe(CN)_6]^{3-}$ [2.0 mM $K_3Fe(CN)_6$ in 10 mM PBS (0.5 M KCl)] using the Randles- Sevcik equation (Eqn. S1), as shown before.[1]

$$i_p = (2.69 \times 10^5)\ n^{3/2} A D^{1/2} C \nu^{1/2} \ldots \quad \ldots \quad \ldots \quad \ldots \quad \text{(Eqn. S1)}$$

Atomic Force Microscopy (AFM) Measurements

A Cypher scanning atomic force microscope (Asylum Research, Santa Barbara, CA) was used to image the samples (Fig S1). The cantilevers used were from Etalon series (TipsNano, Tallinn, Estonia) with a nominal Resonant frequency of 140 kHz. All the measurements were performed in tapping mode method at room temperature.

RT-qPCR

The cDNA conversion was performed in a 20 µL reaction using miScript Reverse Transcription kit (Qiagen, Germany) according to the manufacturer's instructions and the converted product was stored at - 20ºC until further use. To verify the expression of HOTAIR, RT-qPCR was performed in a total reaction volume of 50 µL containing 25 µL of 2XSensiMix SYBR No-ROX master mix (Bioline, UK), 1.0 µL each of 10 µM primer, 3.0 µL of cDNA at 5.0 ng/µL and 19 µL of nuclease-free water. Thermal cycling was initiated with a first denaturation step at 95 °C for 10 min followed by 40 cycles of 95 °C for 15 s (denaturation), 55°C for 15 s (annealing), and 72 °C for 15 s (extension). All samples were run in triplicate and no template control was also included in the PCR assays.

Table S1. Patient sample information

Sample id	Sample category	Diagnosis
P1	Cancer	Mucinous borderline tumour, endocervical type, left ovary only
P2	Cancer	High-grade papillary serous carcinoma
P3	Cancer	Papillary Serous Carcinoma
P4	Benign	Benign Mucinous Cystadenoma
P5	Benign	Benign Haemorrhagic Cyst Left Ovary-Normal Right Ovary

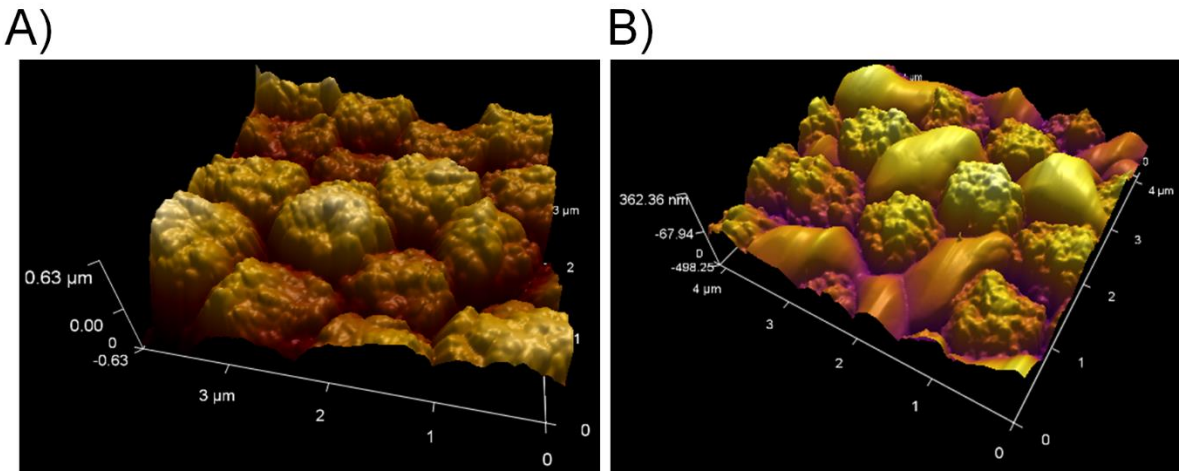

Fig. S1. Corresponding AFM 3D images of *A)* conjugates without RT-RPA amplified biotinylated target (dynabads only), and *B)* biotinylated target amplicons/SA-HRP/SA-dynabeads complex.

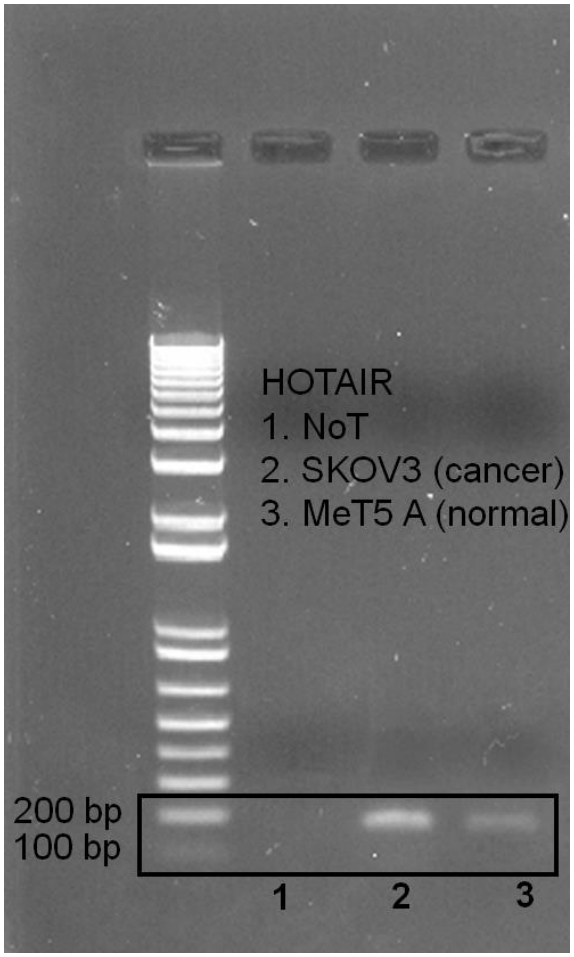

Fig. S2. Corresponding gel electrophoresis images after RT-RPA for NoT, and RNA amplicons derived from SKOV3 and Met-5A cell lines.

Notes and References

1. M. J. A. Shiddiky, A. A. Torriero, J. M. Reyna-Gonzalez and A. M. Bond, *Anal. Chem.*, 2010, **82**, 1680-1691.