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 K₃Fe(CN)₆ in 10 mM PBS (0.5 M KCl)] using the Randles-Sevcik equation (Eqn. S1), as shown before.¹

\[ i_p = (2.69 \times 10^5) n^{3/2} A D^{1/2} C^{1/2} \]  \hspace{1cm} \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 -20°C 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 ºC for 10 min followed by 40 cycles of 95 ºC for 15 s (denaturation), 55ºC for 15 s (annealing), and 72 ºC for 15 s (extension). All samples were run in triplicate and no template control was also included in the PCR assays.
<table>
<thead>
<tr>
<th>Sample id</th>
<th>Sample category</th>
<th>Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>Cancer</td>
<td>Mucinous borderline tumour, endocervical type, left ovary only</td>
</tr>
<tr>
<td>P2</td>
<td>Cancer</td>
<td>High-grade papillary serous carcinoma</td>
</tr>
<tr>
<td>P3</td>
<td>Cancer</td>
<td>Papillary Serous Carcinoma</td>
</tr>
<tr>
<td>P4</td>
<td>Benign</td>
<td>Benign Mucinous Cystadenoma</td>
</tr>
<tr>
<td>P5</td>
<td>Benign</td>
<td>Benign Haemorrhagic Cyst Left Ovary-Normal Right Ovary</td>
</tr>
</tbody>
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**Fig. S1.** Corresponding AFM 3D images of *A*) conjugates without RT-RPA amplified biotinylated target (dynabeads 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**