

# **A Ruthenium(II) Complex as Potential luminescent Switch-on Probe on G-quadruplex DNA**

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## 1. The synthetic route of 1 and 2

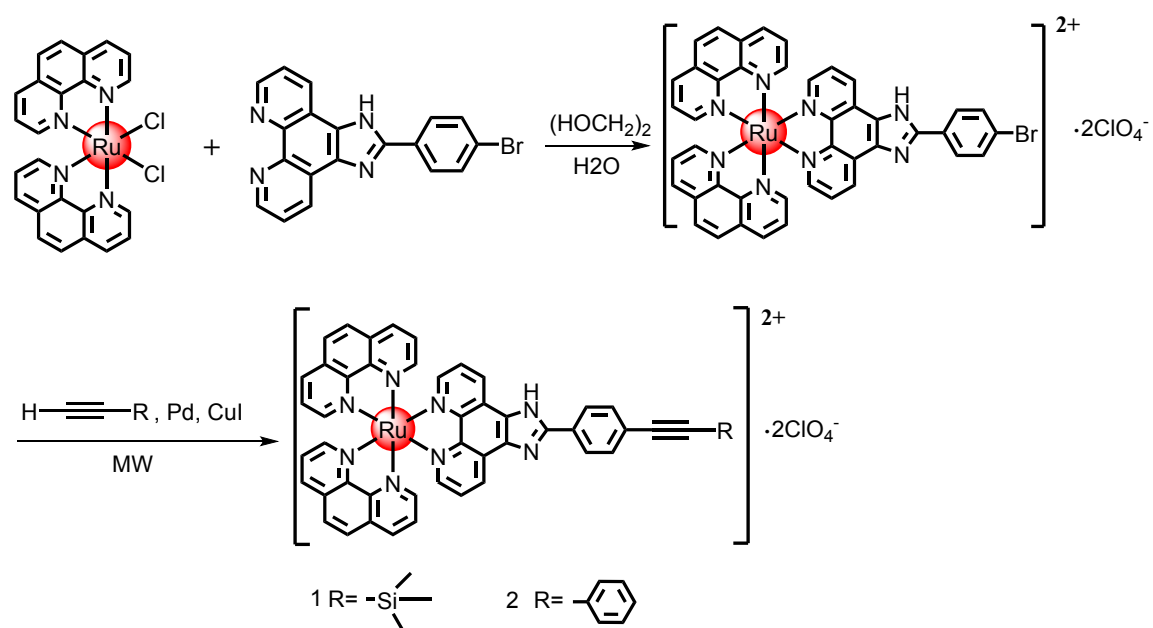
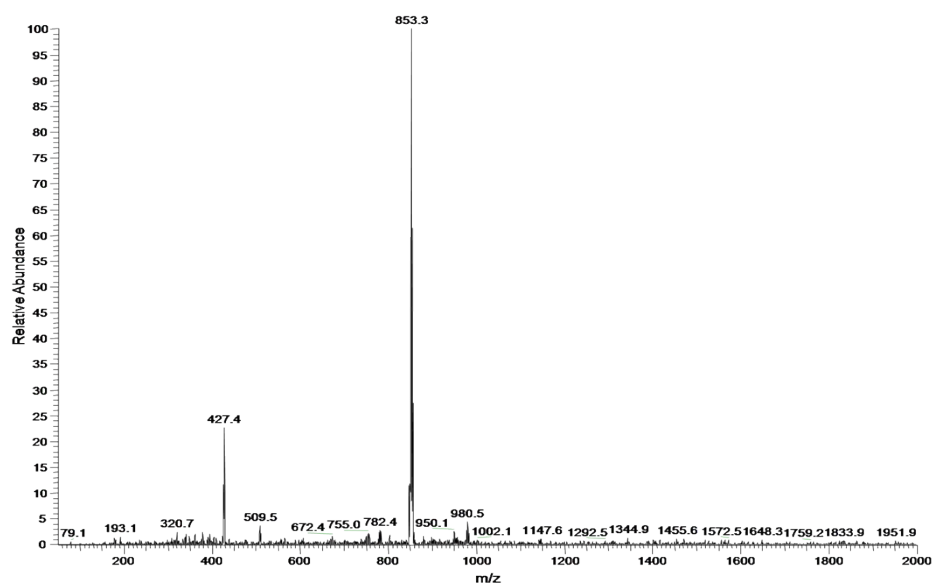
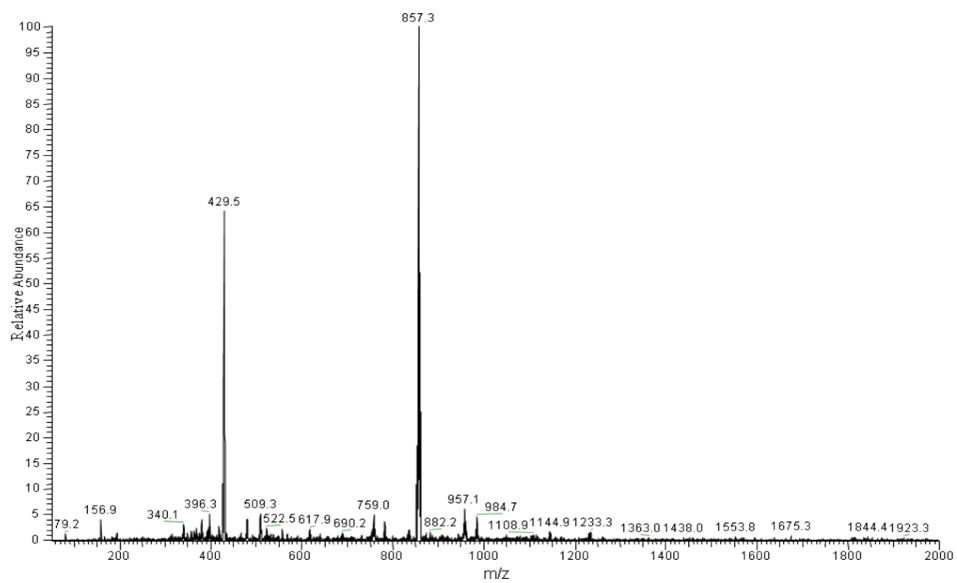


Fig. S1 Microwave-assisted synthesis route of 1 and 2.

## 2. The ESI-MS spectra of 1 and 2



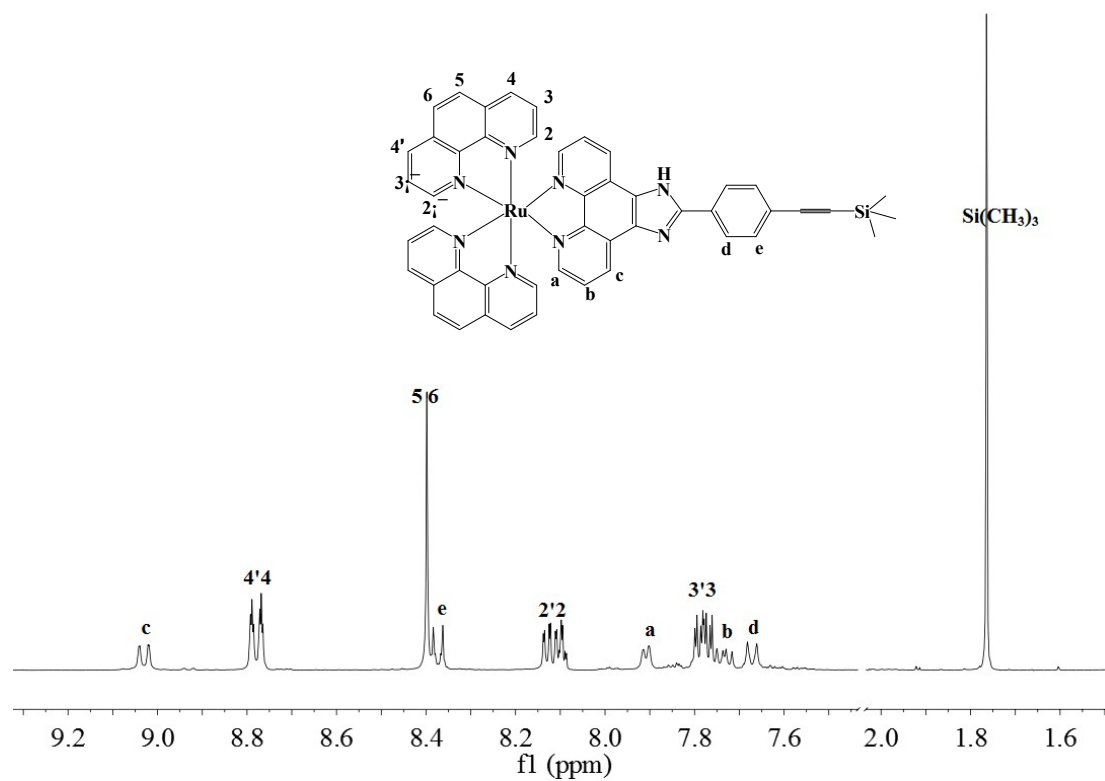
A



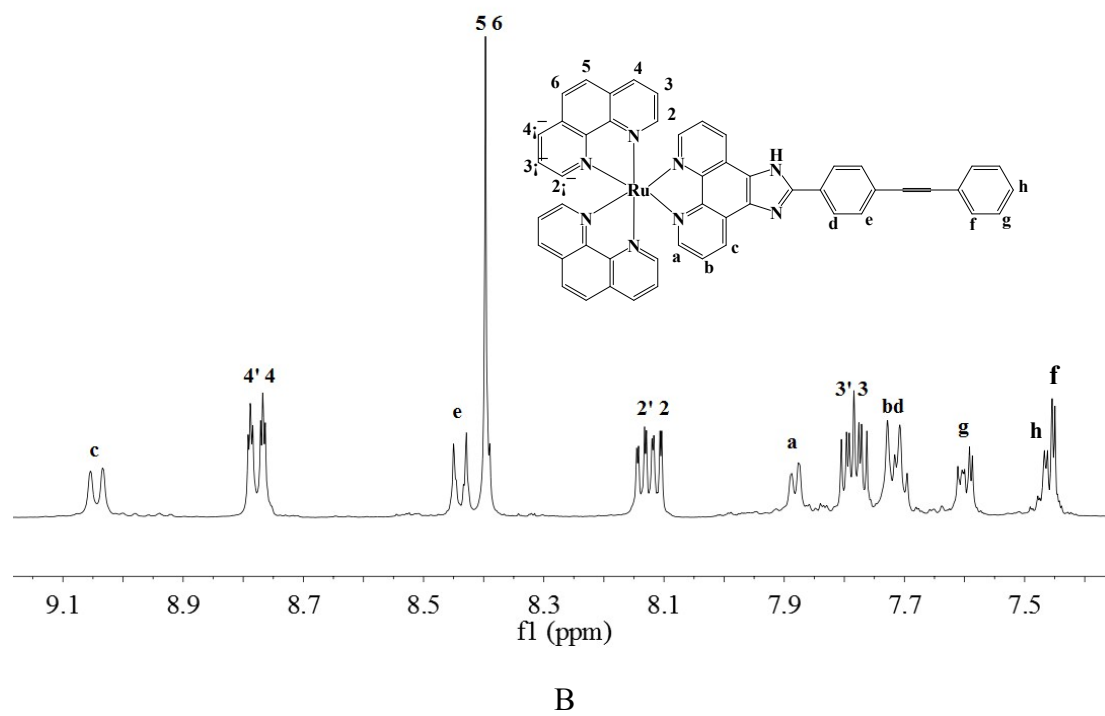
B

Fig. S2 The ESI-MS spectra of 1 (A) and 2 (B)

3. The  $^1\text{H}$  NMR spectra of 1 and 2

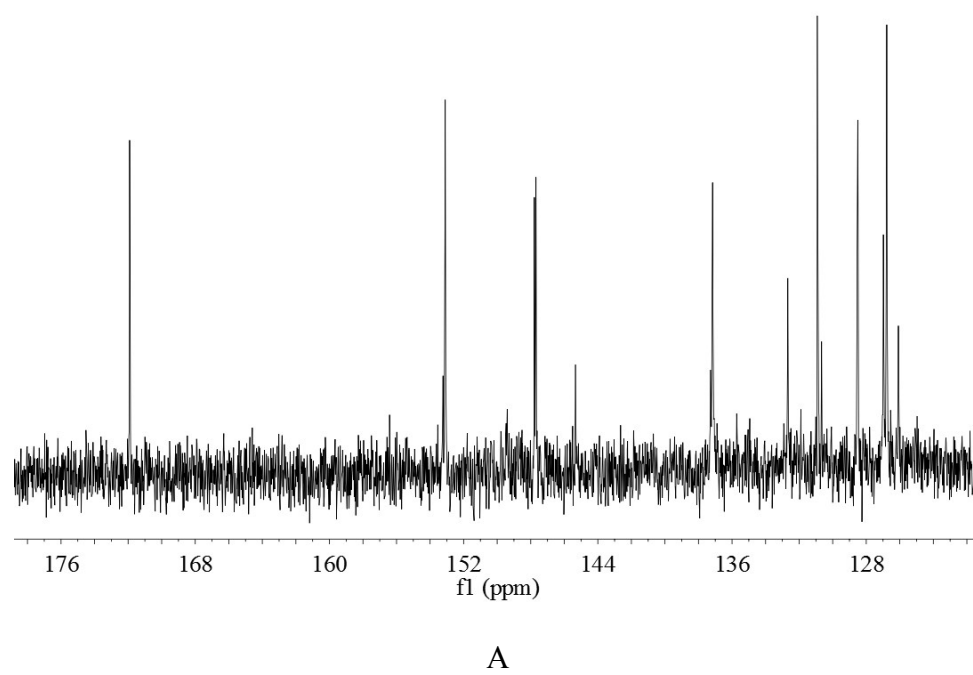


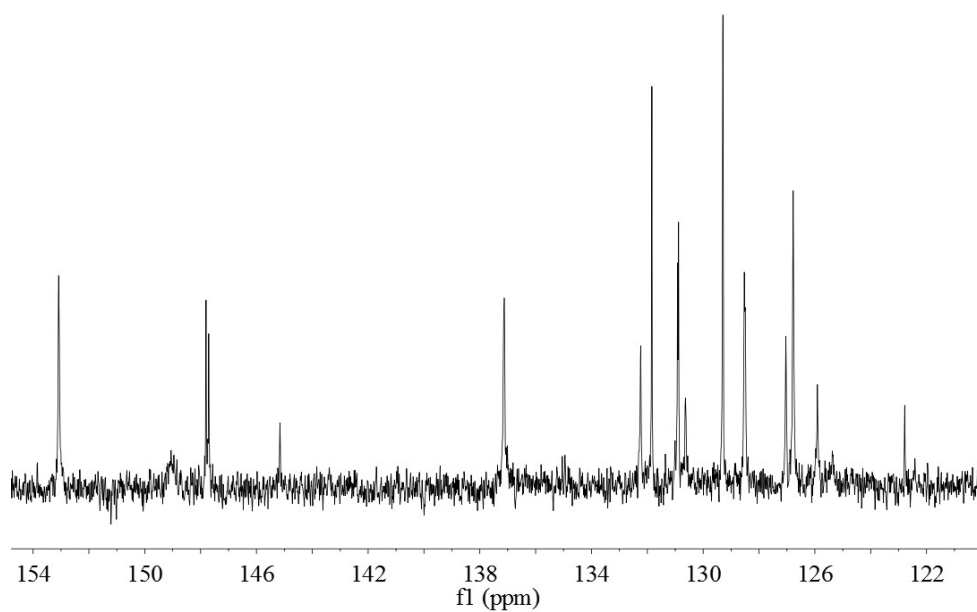
A



**Fig. S3** The  $^1\text{H}$  NMR spectra of **1** (A) and **2** (B)

4. The  $^{13}\text{C}$  NMR spectra of **1** and **2**

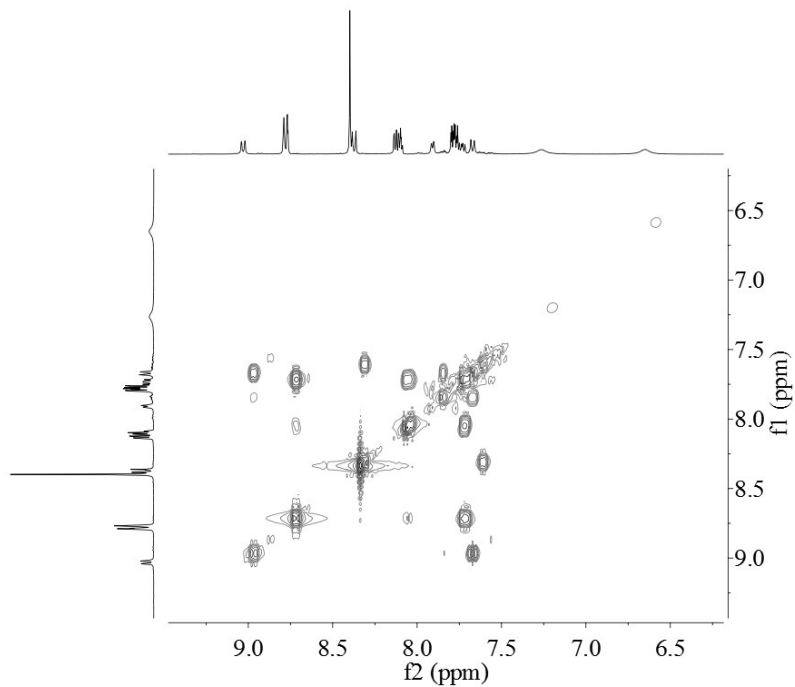




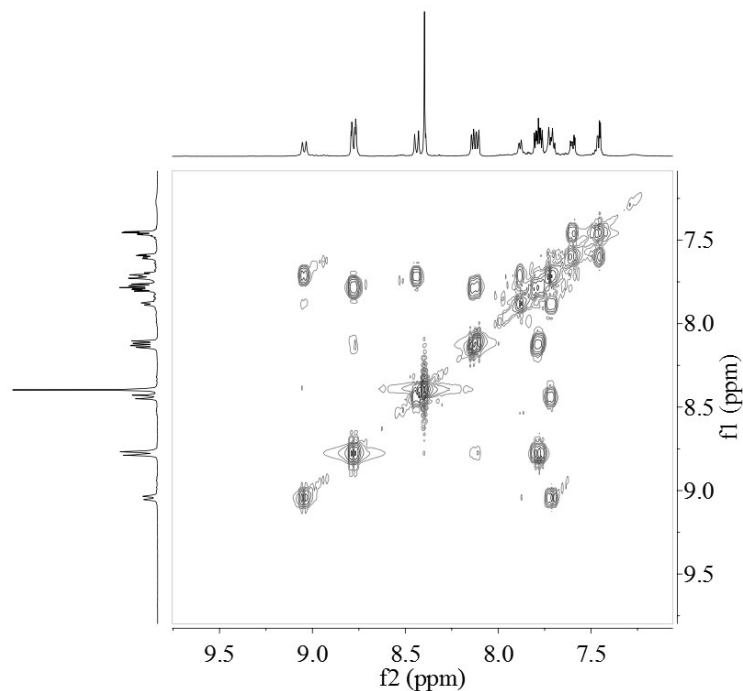
B

**Fig. S4** The  $^{13}\text{C}$  NMR spectra of **1** (A) and **2** (B)

*5. The  $^1\text{H}$ - $^1\text{H}$  COSY spectra of **1** and **2***



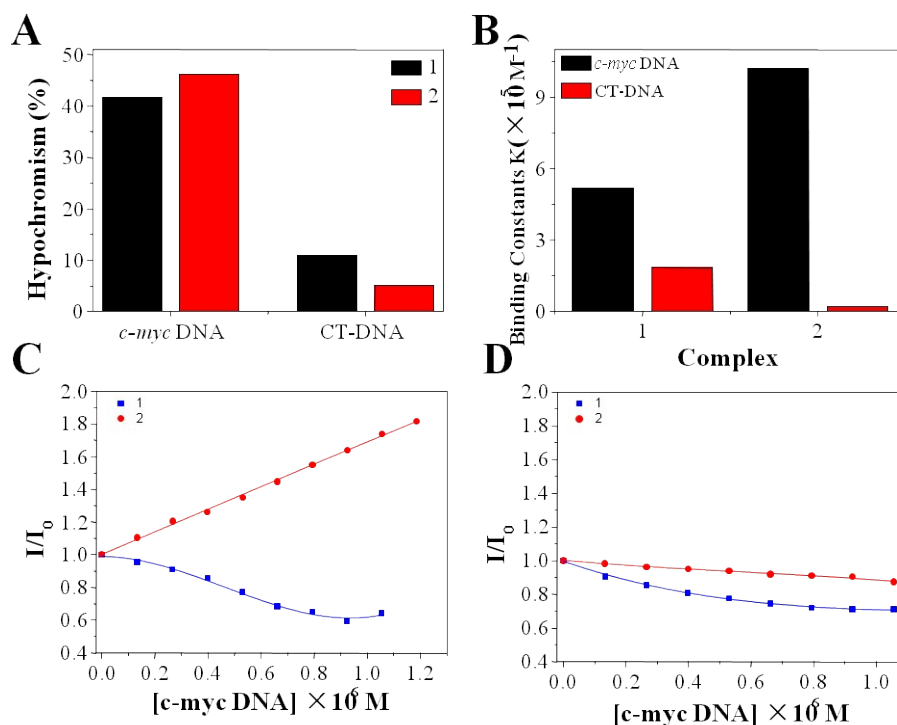
A



B

**Fig. S5** The  $^1\text{H}$ - $^1\text{H}$  COSY spectra of **1** (A) and **2** (B)

6. Selectivity recognition of *c-myc* G-quadruplex DNA rather than CT-DNA

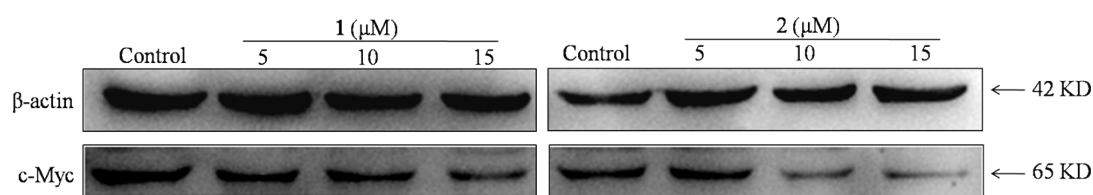


**Fig. S6** Both Ru(II) complexes **1** and **2** selectively bind to G-quadruplex DNA rather than to double-strand CT-DNA. (A) The hypochromic effect of **1** and **2** changed between *c-myc* and CT-DNA; (B) the DNA-binding constant of **1** and **2** interacted with *c-myc* and CT-DNA by electronic

spectra; (C) the fluorescence intensity of **1** and **2** changed with the increase in *c-myc* (C) and CT-DNA (D).

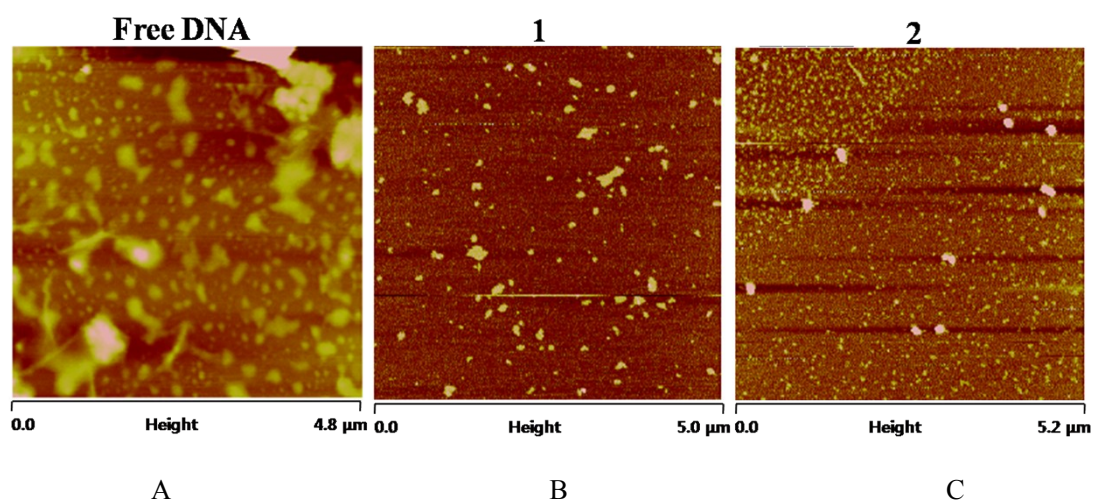
### 7. The expression of *c-Myc* regulated by **1** and **2**

Western blot analysis was used to investigate the *c-Myc* expression in **1** and **2** treated MDA-MB-231 cells. As shown in Fig. S7, the treatment of cells with complex **1** and **2** at the different concentrations notably down-regulated *c-Myc* expression in a dose-dependent manner. The results suggest that Ru(II) complexes may decrease *c-Myc* expression through the stabilization of the *c-Myc* oncogene G4-DNA in the promoter region, especially for **2**, exhibited greater inhibition of *c-Myc* expression than **1**, which was agreement with the above spectroscopic analysis. These results indicated that this class of Ru(II) complex can bind to *c-myc* G-quadruplex DNA and block its expression.



**Fig. S7** The ruthenium(II) complexes **1** and **2** (0, 5, 10 and 20  $\mu$ M) blocked the expression of *c-myc* in MDA-MB-231 cells.

### 8. The AFM of free *c-myc* G4 DNA and ruthenium(II) complexes alone



**Fig. S8** (A) The AFM image of *c-myc* DNA (100  $\mu$ M) in the absence of Ru(II) complexes. (B) The AFM image of **1** (100  $\mu$ M). (C) The AFM image of **2** (100  $\mu$ M).