Supporting Information

DNA Adsorption on Nanoscale Zeolitic Imidazolate Framework-8 Enabling Rational Design of DNA-based Nanoprobe for Gene Detection and Regulation in Living Cells

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Table S1  Oligonucleotide sequences and modifications used in this work

| DNA names         | Sequences and modifications (from 5’ to 3’)                              |
|-------------------|------------------------------------------------------------------------|
| DMB sensor        | 6-FAM-TCTGGCTCCCAGCTCGGAGCCGGTCGAATCCAGCTCCTTGCCAGA-BHQ-1              |
| Target DNA        | CAAGGAGCTGGAAGGCTGGGAGCCAGA                                             |
| (Survivin)        |                                                                        |
| Mis 1             | CAAGAAGCTGGAAGGCTGGGAGCCAGA                                             |
| Mis 3             | CAAGAAGCTGGAAGGCTAGGCGCCAGA                                             |
| DMB-FAM           | 6-FAM-TCTGGCTCCCAGCTCGGAGCCGGTCGAATCCAGCTCCTTGCCAGA                   |
| DMB-Sub-FAM       | 6-FAM-CAGGAAGCTGGA/ra/GGCTGGGAGCCAGA                                   |
| A15-FAM           | 6-FAM-AAAAAAAAAAAAAAAAAAAA                                               |
| A15               | AAAAAAAAAAAAAAAAAAAAA                                                 |
| T15-FAM           | 6-FAM-TTTTTTTTTTTTTTTTTTT                                               |
| T15               | TTTTTTTTTTTTTTTTTTT                                                   |
| C15-FAM           | 6-FAM-CCCCCCCCCCCCCCCC                                                  |
| C15               | CCCCCCCCCCCCCC                                                        |
| G15-FAM           | 6-FAM-GGGGGGGGGGGGGGGGGGGGGGGGGGGG                                   |
| G15               | GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG                                  |
| Survivin forward  | ATGGGTTGCCCCCCGACGTGT                                                |
| primer            |                                                                        |
| Survivin reverse  | AGAGGCCTCAGTTGATCCATG                                                 |
| primer            |                                                                        |
| GAPDH forward     | GAACGGGAAAGTCCTCACTG                                                   |
| primer            |                                                                        |
| GAPDH reverse     | GCCTGCTTCACCACCTTCT                                                   |
| primer            |                                                                        |

**Fig. S1** The fluorescence photograph showing adsorption of free FAM fluorophore without fluorescence quench as indicated by the strong fluorescence in precipitant. The ZIF-8 and FAM solution were also presented as controls.
Fig. S2 The fluorescence photograph showing FAM-labeled homo-DNAs mixed with or without ZIF-8.

Fig. S3 The secondary structures of (A) DMB and (B) DMB+cDNA.

Fig. S4 (A) The image of ZIF-8 NPs dissolving in neutral (pH 7.4) and acid conditions (pH 5.5) for 24 h. (B) Gel image indicating the cleavage activity of DMB triggered by ZIF-8 NPs (the supernatant of the ZIF-8 after pretreatment of acidic pH), CON ( no Zn^{2+}), and Zn^{2+}. 