

Supporting Information

A covalently conjugated branched DNA aptamer cluster-based nanoplatfom for efficiently targeted drug delivery†

Runze Li,†^a Xiaohui Wu,†^{b,c} Jing Li,†^a Xuehe Lu,^b Robert Chunhua Zhao,*^{a,d}
Jianbing Liu*^{b,c} and Baoquan Ding*^{b,c}

^aInstitute of Basic Medical Sciences Chinese Academy of Medical Sciences, School of Basic Medicine Peking Union Medical College, Beijing 100730, China.

^bCAS Key Laboratory of Nanosystem and Hierarchical Fabrication, National Center for Nanoscience and Technology, Beijing 100190, China.

^cUniversity of Chinese Academy of Sciences, Beijing 100049, China.

^dSchool of Life Sciences, Shanghai University, Shanghai 200444, China.

†These authors contributed equally to this work.

Corresponding: zhaochunhua@ibms.pumc.edu.cn, liujb@nanoctr.cn, dingbq@nanoctr.cn.

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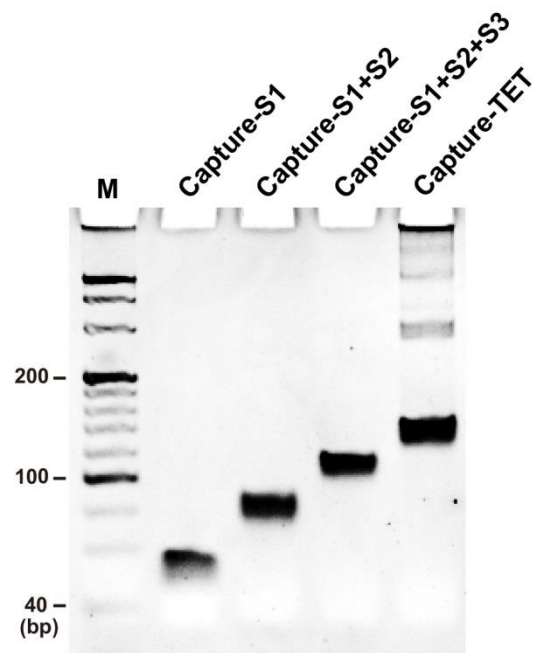


Fig. S1 6% native PAGE analysis of step-by-step construction of capture strand-modified tetrahedron (Capture-TET).

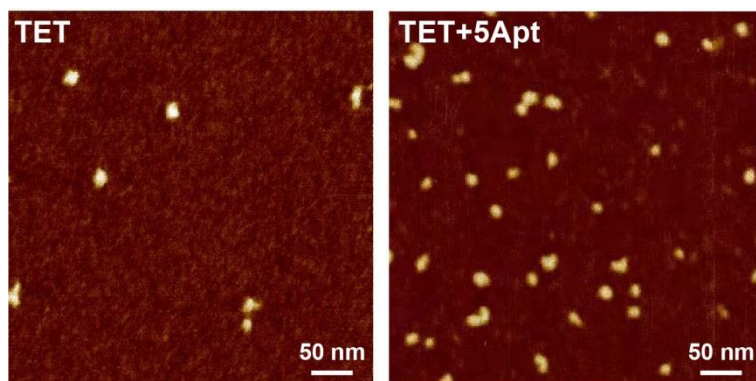


Fig. S2 AFM images of TET and TET+5Apt, scale bars: 50 nm.

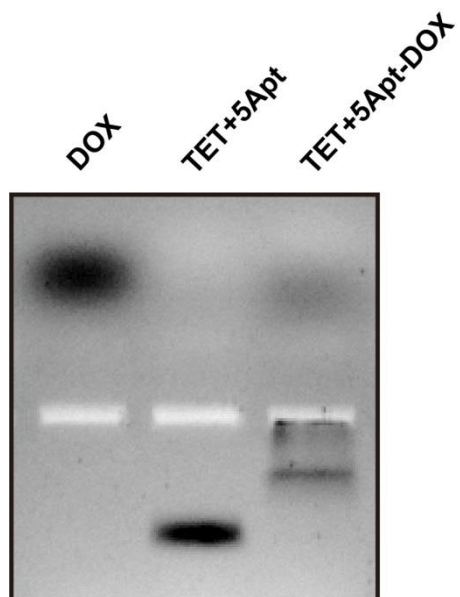


Fig. S3 0.7% agarose gel electrophoresis analysis of DOX, TET+5Apt, and TET+5Apt-DOX.

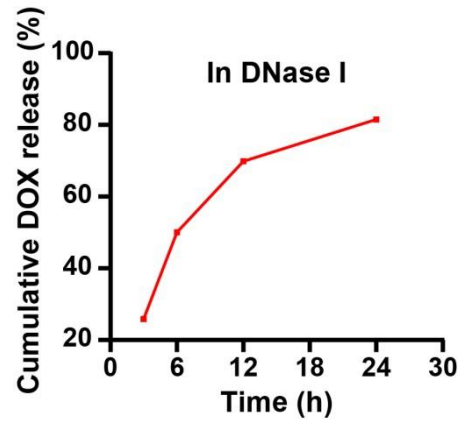


Fig. S4 Cumulative DOX release efficiency of TET+5Apt-DOX in DNase I.

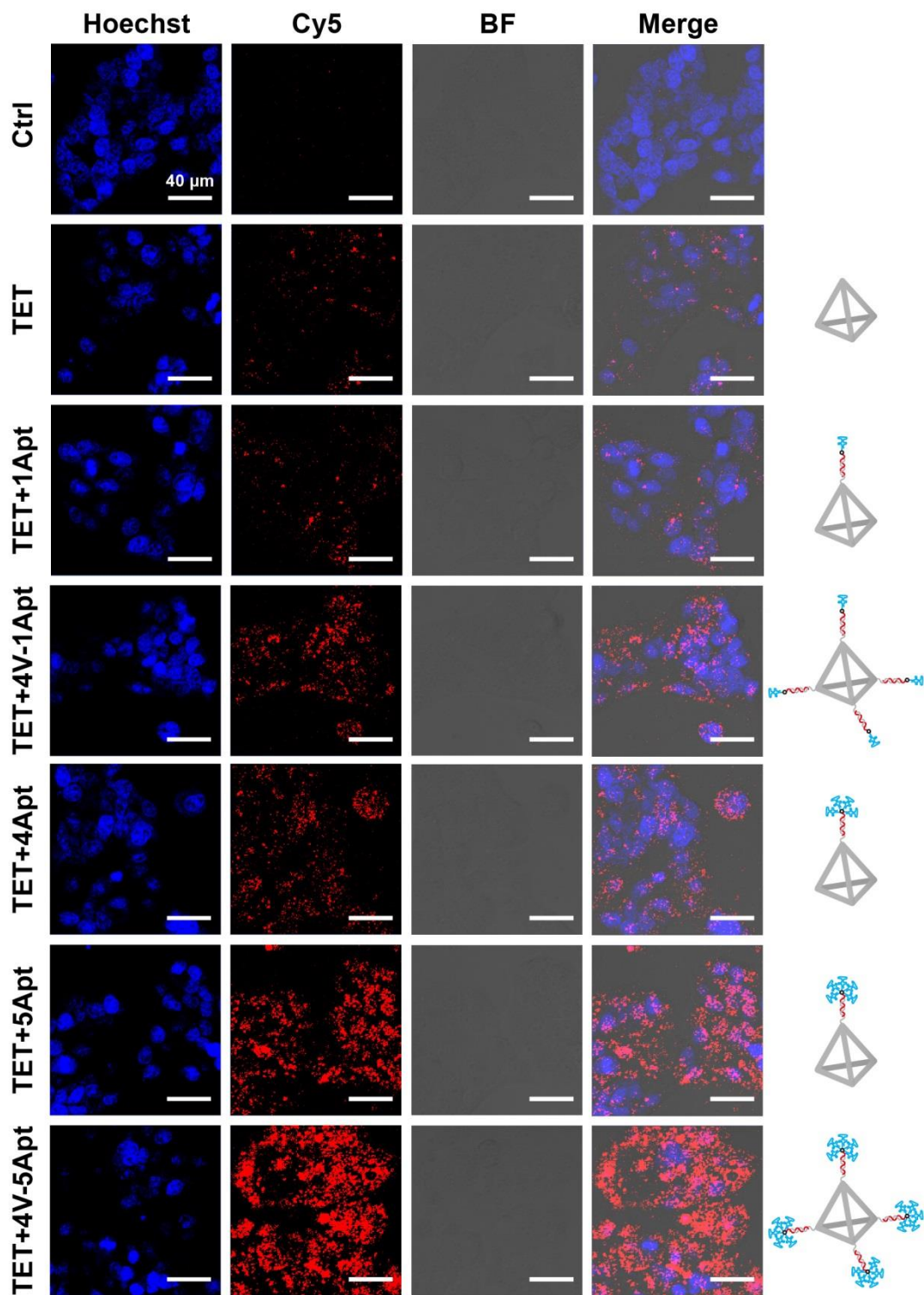


Fig. S5 Confocal images of MCF-7 cells treated with TET, TET with one aptamer at one vertex (TET+1Apt), TET with one aptamer at each vertex (TET+4V-1Apt), TET with four aptamers at one vertex (TET+4Apt), TET with five aptamers at one vertex (TET+5Apt), or TET with five aptamers at each vertex (TET+4V-5Apt) for 8 h (nuclei were labeled with Hoechst, blue; TETs were labeled with Cy5, red; scale bars: 40 μ m).

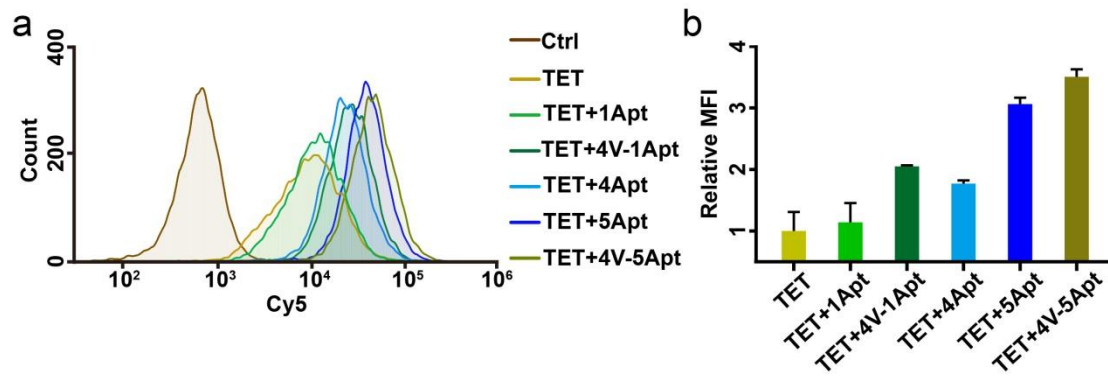


Fig. S6 (a) Flow cytometry analysis of MCF-7 cells treated with TET, TET with one aptamer at one vertex (TET+1Apt), TET with one aptamer at each vertex (TET+4V-1Apt), TET with four aptamers at one vertex (TET+4Apt), TET with five aptamers at one vertex (TET+5Apt), or TET with five aptamers at each vertex (TET+4V-5Apt) for 8 h. (b) Quantification of the relative mean fluorescence intensity (MFI). The error bars represent the SD values of three independent experiments.

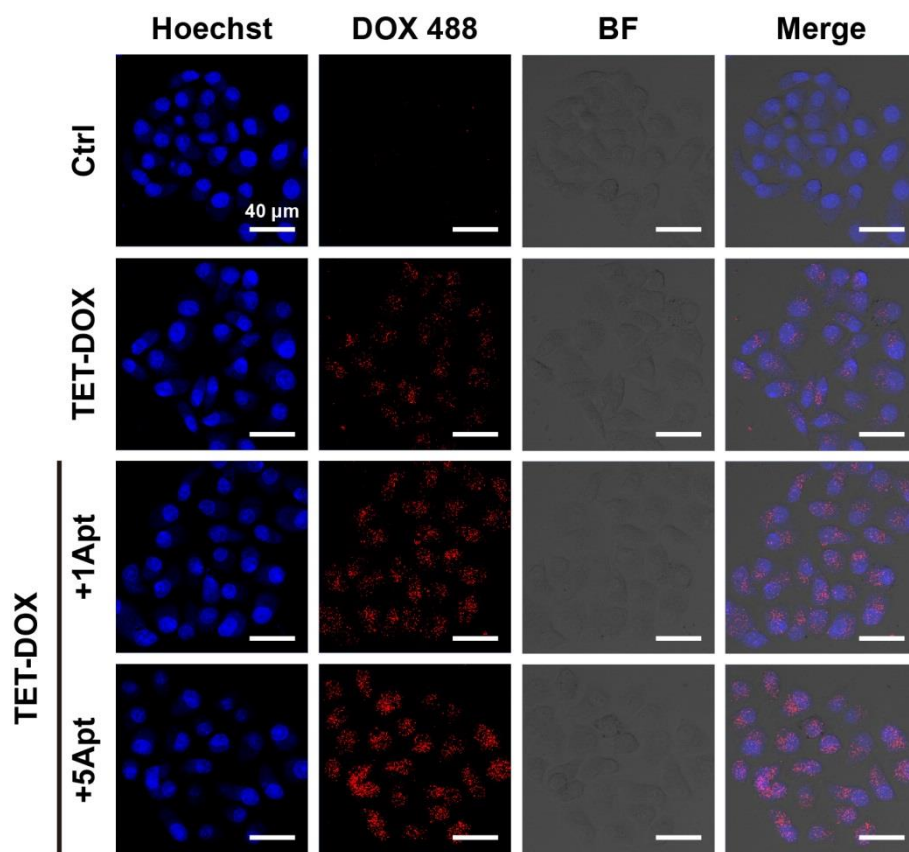


Fig. S7 Confocal images of MCF-7 cells treated with DOX-loaded TET (TET-DOX), DOX-loaded TET with one aptamer at one vertex (TET+1Apt-DOX), or DOX-loaded TET with five aptamers at one vertex (TET+5Apt-DOX) for 8 h, scale bars: 40 μm .

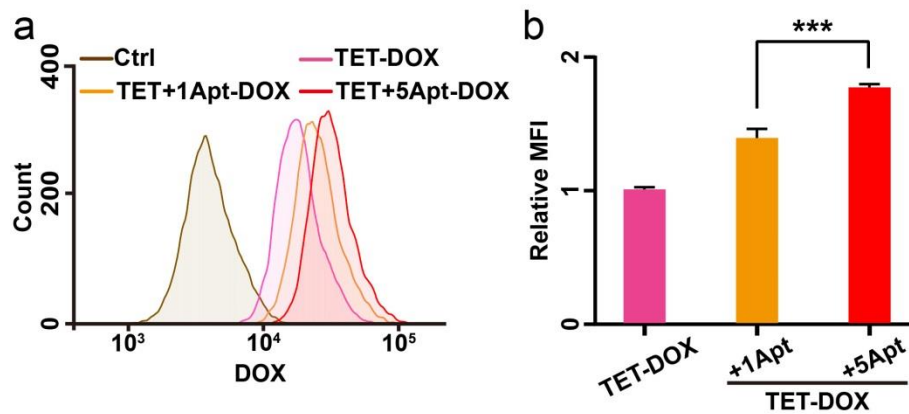


Fig. S8 (a) Flow cytometry analysis of MCF-7 cells treated with DOX-loaded TET (TET-DOX), DOX-loaded TET with one aptamer at one vertex (TET+1Apt-DOX), or DOX-loaded TET with five aptamers at one vertex (TET+5Apt-DOX) for 8 h (b) Quantification of the relative mean fluorescence intensity (MFI). The error bars represent the SD values of three independent experiments. (t test: *** $P < 0.001$).

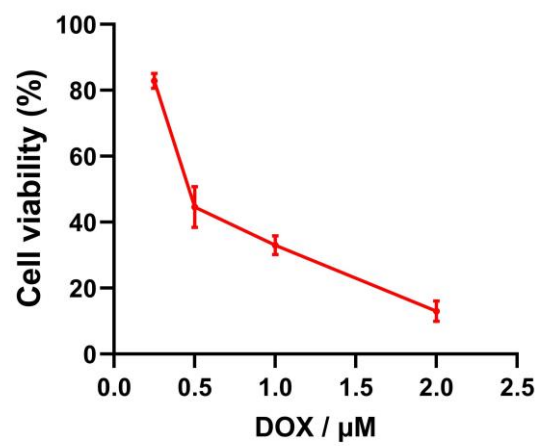


Fig. S9 Cell viability of MCF-7 cells treated by different concentrations of DOX. The error bars represent the SD values of three independent experiments.

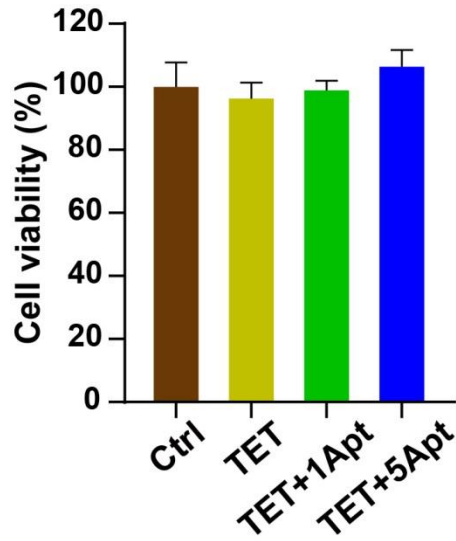


Fig. S10 Cell viability of MCF-7 cells with the indicated treatments of TET, TET+1Apt, or TET+5Apt, respectively. The error bars represent the SD values of three independent experiments.

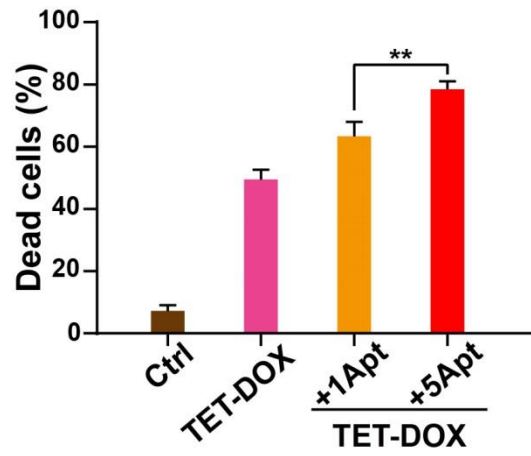


Fig. S11 Statistic analysis of the percentage of dead cells by Image J analysis. The error bars represent the SD values of three independent experiments. (t test: $**P < 0.01$).

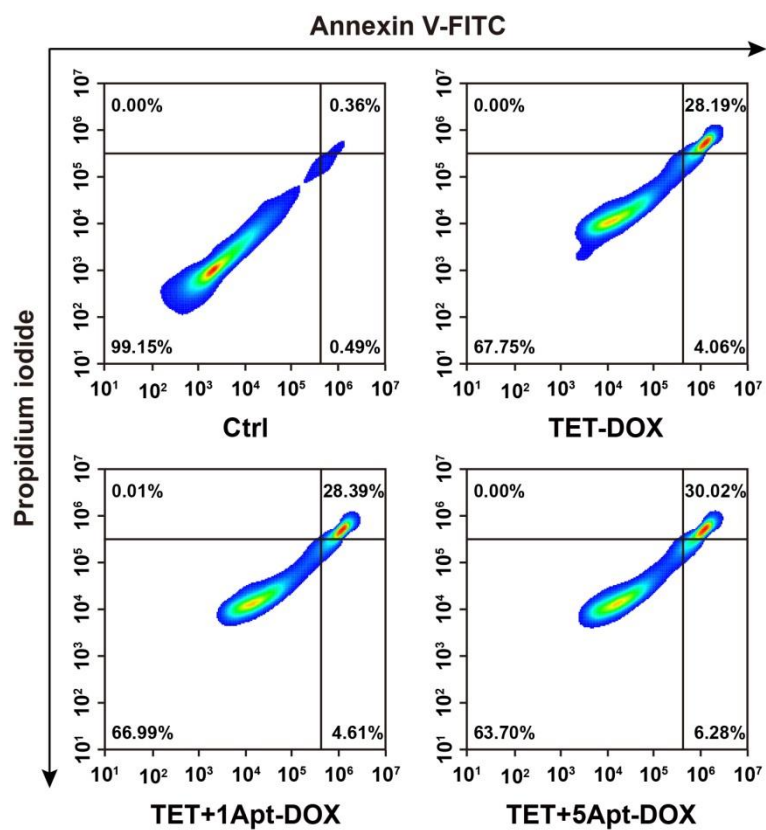
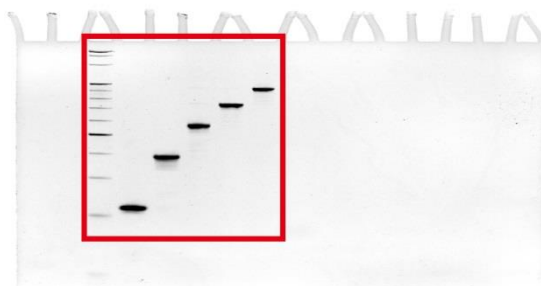
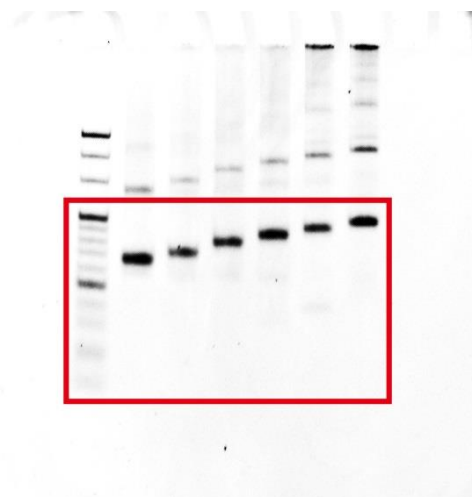


Fig. S12 Cell apoptosis analysis of L929 cells treated with DOX-loaded TET (TET-DOX), DOX-loaded TET with one aptamer at one vertex (TET+1Apt-DOX), or DOX-loaded TET with five aptamers at one vertex (TET+5Apt-DOX). (DOX: 2.0 μ M).

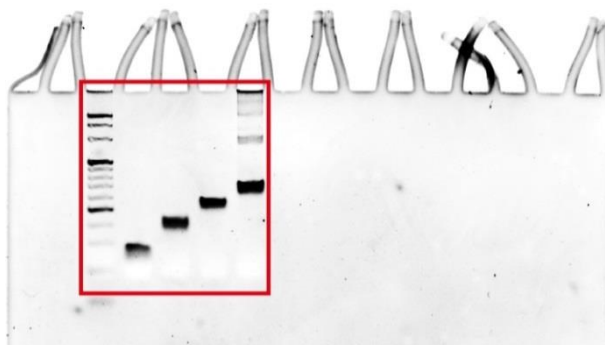
Unprocessed gels



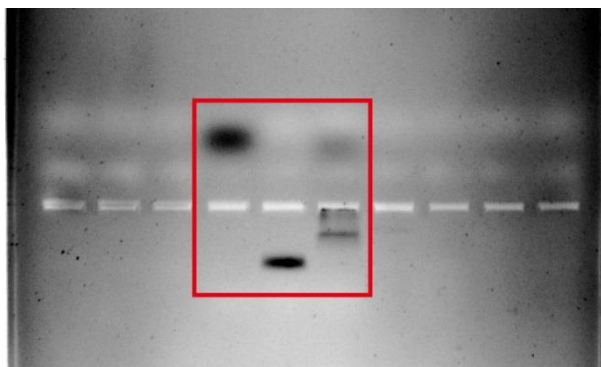
Raw gel for Fig. 2(b)



Raw gel for Fig. 3(a)



Raw gel for Fig. S1



Raw gel for Fig. S3

Additional tables

Table S1 DNA sequences of the aptamer and linker

Name	Sequence (5'-3')
Aptamer	GCAGTTGATCCTTTGGATAACCCTGGTTTTT-NH ₂
Linker	NH ₂ -CTCTCTCTCTCTCTCCTCTC

Table S2 DNA sequences for assembly of DNA tetrahedron

Name	Sequence (5'-3')
S1	TATCACCAGGCAGTTGACAGTGTAGCAAGCTGTAATAGATGC GAGGGTCCAATAC
S2	TCAACTGCCTGGTGATAAAACGACACTACGTGGGAATCTACT ATGGCGGCTCTTC
S3	TTCAGACTTAGGAATGTGCTTCCCACGTAGTGTCGTTTGTATT GGACCCTCGCAT
S4	ACATTCCTAAGTCTGAAACATTACAGCTTGCTACACGAGAAG AGCCGCCATAGTA
Capture-S1	TATCACCAGGCAGTTGACAGTGTAGCAAGCTGTAATAGATGCG AGGGTCCAATACTTTTTGAGAGGAGAGAGAGAGAGAG
Capture-S2	TCAACTGCCTGGTGATAAAACGACACTACGTGGGAATCTACT ATGGCGGCTCTTCTTTTTGAGAGGAGAGAGAGAGAGAGAG
Capture-S3	TTCAGACTTAGGAATGTGCTTCCCACGTAGTGTCGTTTGTATT GGACCCTCGCATTTTTGAGAGGAGAGAGAGAGAGAGAG
Capture-S4	ACATTCCTAAGTCTGAAACATTACAGCTTGCTACACGAGAAG AGCCGCCATAGTATTTTTGAGAGGAGAGAGAGAGAGAGAG
Cy5-S3	Cy5-TTCAGACTTAGGAATGTGCTTCCCACGTAGTGTCGTTTGT ATTGGACCCTCGCAT
Cy5-Capture-S3	Cy5-TTCAGACTTAGGAATGTGCTTCCCACGTAGTGTCGTTTGT ATTGGACCCTCGCATTTTTGAGAGGAGAGAGAGAGAGAGAG