

Supporting Information

Construction of highly efficient DNA nanotube sensor with peroxide-like activity

Ying Zhang ^{[a], [b]}, Lingqi Wu ^{[a], [b]}, Xin Su^{*, [b]}, Hao Liang ^{*, [a], [b]}

^[a] State Key Laboratory of Chemical Resource Engineering, Beijing University of Chemical
Technology, Beijing 100029, P.R. China

^[b] College of Life Science and Technology, Beijing University of Chemical Technology, Beijing
100029, P.R. China

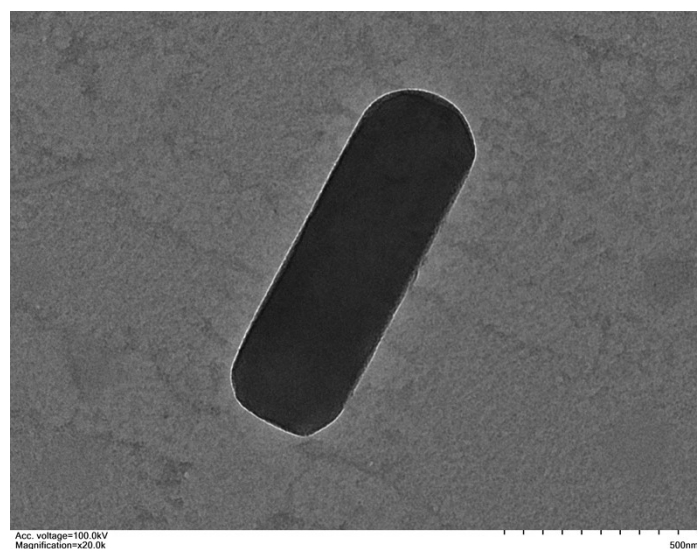


Fig. S1 TEM of DNA nanotubes

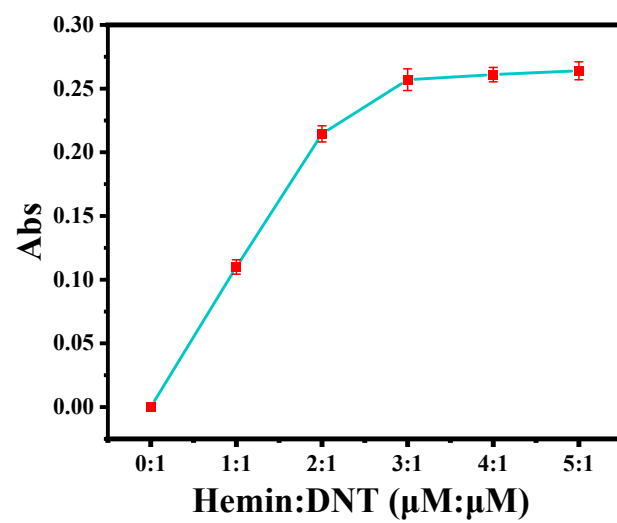


Fig. S2 Hemin-DNT binding curve.

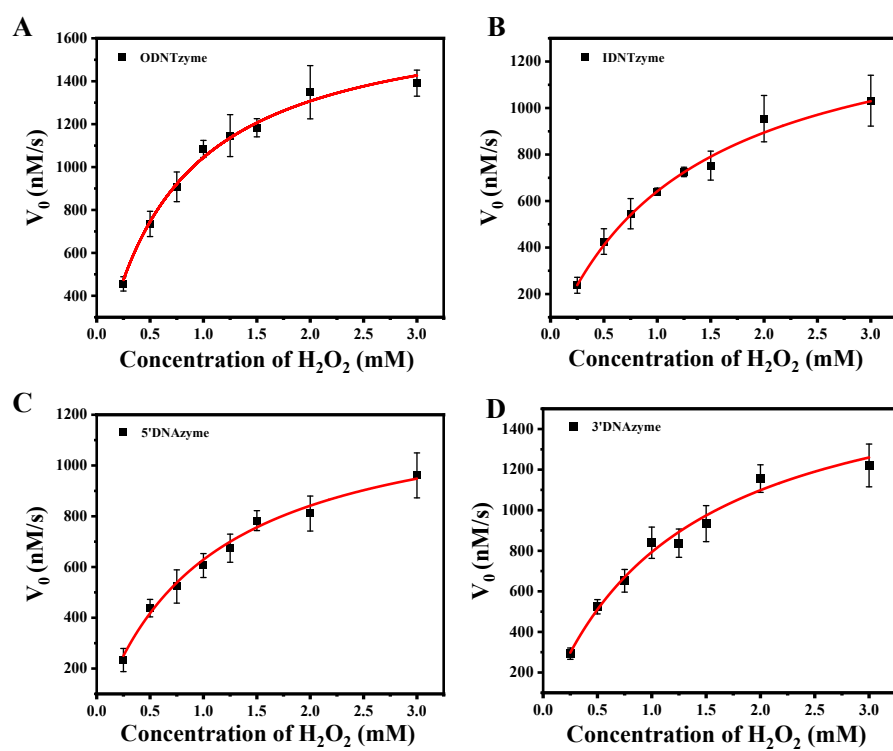


Fig. S3 Michaelis-Menten analysis: ODNTzyme (A), IDNTzyme (B), 5'DNAzyme (C), 3'DNAzyme (D).

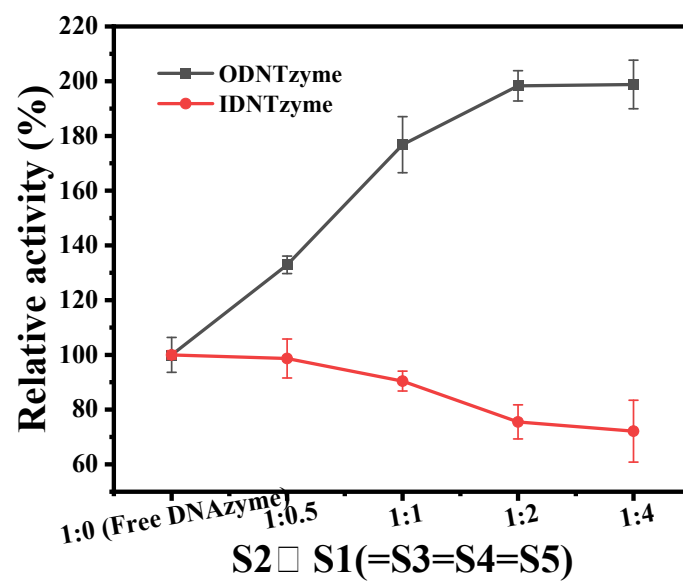


Fig. S4 Changes of the activities of ODNTzyme and IDNTzyme when the percentage of S2 whose concentration was kept constant decreased.

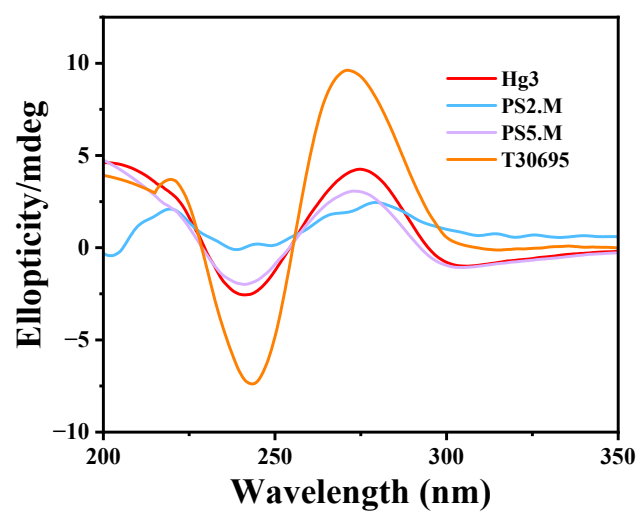


Fig. S5 The CD spectroscopy of different G-quadruplex topological structures.

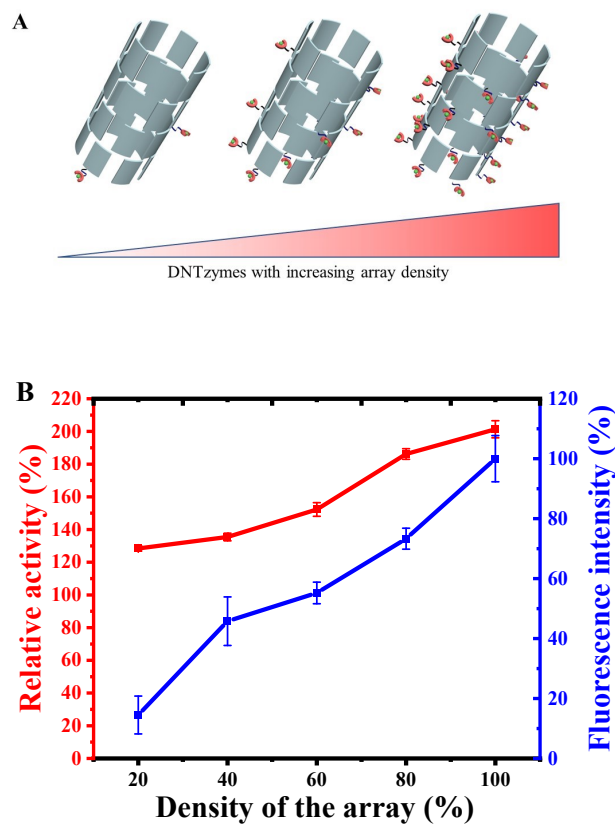


Fig. S6 (A) Schematic diagram of DNTzyme with different array density. (B) Fluorescence intensity and activity of DNTzyme with different array density.

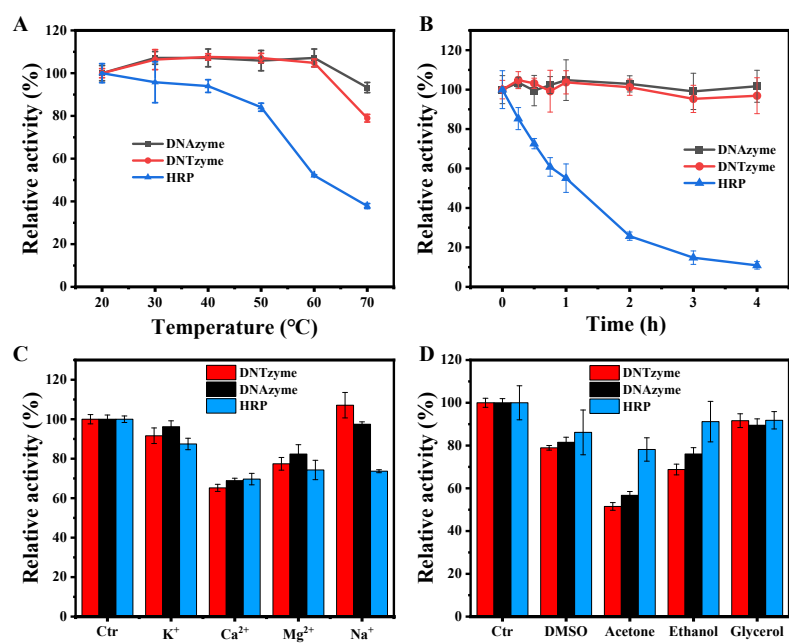


Fig. S7 The temperature stability: (A) Different temperature treatment for 1 h. (B) Treatment at 60°C for different duration. (C) The metal ions and (D) organic reagents stability of DNTzyme, DNAzyme and HRP.

Table S1 Buffer A component

Component name	Final concentration
Tris	40 mM
EDTA	2 mM
Glacial acetic acid	20 mM
MgCl ₂	12.5 mM

Table S2 DNA sequence

ssDNA 名称	ssDNA 序列 (5'-3')
S1	AGTGGACAGCCGTTCTGGAGCGTTGGACGAAACT
NG4-S2	TGTAATATCGTGCCCGAGCACCCTGAGAGGTA
S3	CCAGAACGGCTGTGGCTAAACAGTAACCGAAGCACCAACGCT
FAM-S3	5'FAM- TCCAGAACGGCTGTGGCTAAACAGTAACCGAAGCACCAACGCT
S4	GGGCACGAAGTTTCGTGGTCATCGTACCTCTC
S5	CGATGACCTGCTTCGGTACTGTTAGCCTGCTC
G4-S2	GTGGGTAGGGCGGGTTGGTAAGCTATTTTGTAATATCGTGCCCGAG CACCCTGAGAGGTA
G4-A	GGGTGGGCGGGATGGGTTT
G4-B	GGGTGGGCGGGATGGGTTT
G4-C	TTGGGTGGGTGGGTGGGTC
G4-D	GGGTGGGTGGGTGGG
G4-E	CCCGGGTGGGGAGGGTGGGCCC
G4-F	TTGGGTGGGTGGGTGGGTC
G4-G	TTGGGTGGGTGGGTGGGTC
3'S2-G	TGTAATATCGTGCCCGAGCACCCTGAGAGGTAGTCTGATAAGCTA TTTTTGGGTGGGTGGGTGGGTC
5'S2-A	GGGTGGGCGGGATGGGTTTCTATTTTGTAATATCGTGCCCGAGCA CACCCTGAGAGGTA
5'S2-B	GGGTGGGCGGGATGGGTTTGTCTGATAAGCTATTTTGTAATATCGT GCCCGAGCACCCTGAGAGGTA
5'S2-C	TTGGGTGGGTGGGTGGGTCCTATTTTGTAATATCGTGCCCGAGCAC CACTGAGAGGTA
5'S2-D	GGGTGGGTGGGTGGGATAAGCTATTTTGTAATATCGTGCCCGAGCA CACCCTGAGAGGTA
5'S2-E	CCCGGGTGGGGAGGGTGGGCCCTGTAATATCGTGCCCGAGCACCAC TGAGAGGTA
5'S2-F	TTGGGTGGGTGGGTGGGTCTGTAATATCGTGCCCGAGCACCCTGA GAGGTA
5'S2-G	TTGGGTGGGTGGGTGGGTCGTCTGATAAGCTATTTTGTAATATCGTG CCCGAGCACCCTGAGAGGTA
SP-A(O)	TTGGGTGGGTGGGTGGGTCTGTAATATCGTGCCCGAGCACCCTGA GAGGTA
SP-B(O)	TTGGGTGGGTGGGTGGGTCTTTTGTAATATCGTGCCCGAGCACCAC TGAGAGGTA
SP-C(O)	TTGGGTGGGTGGGTGGGTCCTATTTTGTAATATCGTGCCCGAGCAC CACTGAGAGGTA
SP-D(O)	TTGGGTGGGTGGGTGGGTCGTCTGATAAGCTATTTTGTAATATCGTG CCCGAGCACCCTGAGAGGTA
SP-D(I)	TGTAATATCGTGCCCGAGCACCCTGAGAGGTATTGGGTGGGTGGG TGGGTC

ssDNA 名称	ssDNA 序列 (5'-3')
SP-D(I)	TGTAATATCGTGCCCGAGCACCAGTGAAGGATTTTTGGGTGGGT GGGTGGGTC
SP-D(I)	TGTAATATCGTGCCCGAGCACCAGTGAAGGATATTTTTGGGTG GGTGGGTGGGTC
SP-D(I)	TGTAATATCGTGCCCGAGCACCAGTGAAGGATAGTCTGATAAGCTA TTTTTGGGTGGGTGGGTGGGTC
PS2.M	GTGGGTAGGGCGGGTTGG
PS5.M	GTGGGTCATTGTGGGTGGGTGTGG
T30695	GGGTGGGTGGGTGGGT
Hg3	GGGTTTGGGTTTGGGTTTGGG
PS2.M-S2	GTGGGTAGGGCGGGTTGGTAAGCTATTTTGTAATATCGTGCCCGAG CACCAGTGAAGGTA
PS5.M-S2	GTGGGTCATTGTGGGTGGGTGTGGTAAGCTATTTTGTAATATCGTGC CCGAGCACCAGTGAAGGTA
T30695-S2	GGGTGGGTGGGTGGGTAAAGCTATTTTGTAATATCGTGCCCGAGCA CACCAGTGAAGGTA
Hg3-S2	GGGTTTGGGTTTGGGTTTGGGTAAGCTATTTTGTAATATCGTGCCCG AGCACCAGTGAAGGTA