

Supporting information

2-Aminopurine-based quencher-free DNA tweezer with well-tunable fluorescence property by surrounding bases

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Table S1 DNA sequences used in the experiment

	Strands	Sequences
	F	CGCATAGACCGTGATTGTTACCAGCGTTAGTTCAGACAGTAGG ACTCCTGCTACGA
	\bar{F}	TCGTAGCAGGAGTCCTACTGTCTGAACTAACGCTGGTAACAAT CACGGTCTATGCG
Tw-1	A	TGCCTTGTAAGAGCGACCATA <u>A</u> CAACCTGGAATGCTTCGGAT
	B	GTCGCTCTTACAAGGCACTGGTAACAATCACGGTCTATGCG
	C	GGAGTCCTACTGTCTGAACTAACGATCCGAAGCATTCCAGG
Tw-2	A	TGCCTTGTAAGAGCGACCATA <u>A</u> CAACCTGGAATGCTTCGGAT
	B	GGTCGCTCTTACAAGGCACTGGTAACAATCACGGTCTATGCG
	C	GGAGTCCTACTGTCTGAACTAACGATCCGAAGCATTCCAGGT
Tw-3	A	TGCCTTGTAAGAGCGACCATA <u>A</u> CAACCTGGAATGCTTCGGAT
	B	TGGTCGCTCTTACAAGGCACTGGTAACAATCACGGTCTATGCG
	C	GGAGTCCTACTGTCTGAACTAACGATCCGAAGCATTCCAGGTT
Tw-4	A	TGCCTTGTAAGAGCGACCATA <u>A</u> CAACCTGGAATGCTTCGGAT
	B	ATGGTCGCTCTTACAAGGCACTGGTAACAATCACGGTCTATGC G
	C	GGAGTCCTACTGTCTGAACTAACGATCCGAAGCATTCCAGGTT G
Tw-5	A	TGCCTTGTAAGAGCGACC <u>AA</u> AAACCTGGAATGCTTCGGAT
	B	TTGGTCGCTCTTACAAGGCACTGGTAACAATCACGGTCTATGC G
	C	GGAGTCCTACTGTCTGAACTAACGATCCGAAGCATTCCAGGTT T
Tw-6	A	TGCCTTGTAAGAGCGACCATA <u>A</u> TAAACCTGGAATGCTTCGGAT
	B	ATGGTCGCTCTTACAAGGCACTGGTAACAATCACGGTCTATGC G
	C	GGAGTCCTACTGTCTGAACTAACGATCCGAAGCATTCCAGGTT A
Tw-7	A	TGCCTTGTAAGAGCGACCAC <u>A</u> CAACCTGGAATGCTTCGGAT
	B	GTGGTCGCTCTTACAAGGCACTGGTAACAATCACGGTCTATGC G
	C	GGAGTCCTACTGTCTGAACTAACGATCCGAAGCATTCCAGGTT

		G
Tw-8	A	TGCCTTGTAAGAGCGACCAG <u>A</u> GAAACCTGGAATGCTTCGGAT
	B	CTGGTCGCTCTTACAAGGCACTGGTAACAATCACGGTCTATGC G
	C	GGAGTCCTACTGTCTGAACTAACGATCCGAAGCATTCCAGGTT C
Tw-9	A	TGCCTTGTAAGAGCGACCAA <u>A</u> CAACCTGGAATGCTTCGGAT
	B	TTGGTCGCTCTTACAAGGCACTGGTAACAATCACGGTCTATGC G
	C	GGAGTCCTACTGTCTGAACTAACGATCCGAAGCATTCCAGGTT G
Tw-10	A	TGCCTTGTAAGAGCGACCACA <u>A</u> AAACCTGGAATGCTTCGGAT
	B	GTGGTCGCTCTTACAAGGCACTGGTAACAATCACGGTCTATGC G
	C	GGAGTCCTACTGTCTGAACTAACGATCCGAAGCATTCCAGGTT T
Tw-11	A	TGCCTTGTAAGAGCGACCAA <u>A</u> GAAACCTGGAATGCTTCGGAT
	B	TTGGTCGCTCTTACAAGGCACTGGTAACAATCACGGTCTATGC G
	C	GGAGTCCTACTGTCTGAACTAACGATCCGAAGCATTCCAGGTT C
Tw-12	A	TGCCTTGTAAGAGCGACCAG <u>A</u> AAACCTGGAATGCTTCGGAT
	B	CTGGTCGCTCTTACAAGGCACTGGTAACAATCACGGTCTATGC G
	C	GGAGTCCTACTGTCTGAACTAACGATCCGAAGCATTCCAGGTT T
Tw-13	A	TGCCTTGTAAGAGCGACCAA <u>A</u> TAACCTGGAATGCTTCGGAT
	B	TTGGTCGCTCTTACAAGGCACTGGTAACAATCACGGTCTATGC G
	C	GGAGTCCTACTGTCTGAACTAACGATCCGAAGCATTCCAGGTT A
Tw-14	A	TGCCTTGTAAGAGCGACCAT <u>A</u> AAACCTGGAATGCTTCGGAT
	B	ATGGTCGCTCTTACAAGGCACTGGTAACAATCACGGTCTATGC G
	C	GGAGTCCTACTGTCTGAACTAACGATCCGAAGCATTCCAGGTT

		T
Tw-15	A	TGCCTTGTAAGAGCGACCAA <u>A</u> CAACCTGGAATGCTTCGGAT
	B	ATGGTCGCTCTTACAAGGCACTGGTAACAATCACGGTCTATGC G
	C	GGAGTCCTACTGTCTGAACTAACGATCCGAAGCATTCCAGGTT G
Tw-16	A	TGCCTTGTAAGAGCGACCAA <u>A</u> CAACCTGGAATGCTTCGGAT
	B	CTGGTCGCTCTTACAAGGCACTGGTAACAATCACGGTCTATGC G
	C	GGAGTCCTACTGTCTGAACTAACGATCCGAAGCATTCCAGGTT G
Tw-17	A	TGCCTTGTAAGAGCGACCAA <u>A</u> CAACCTGGAATGCTTCGGAT
	B	GTGGTCGCTCTTACAAGGCACTGGTAACAATCACGGTCTATGC G
	C	GGAGTCCTACTGTCTGAACTAACGATCCGAAGCATTCCAGGTT G
Tw-18	A	TGCCTTGTAAGAGCGACCAA <u>A</u> CAACCTGGAATGCTTCGGAT
	B	TTGGTCGCTCTTACAAGGCACTGGTAACAATCACGGTCTATGC G
	C	GGAGTCCTACTGTCTGAACTAACGATCCGAAGCATTCCAGGTT A
Tw-19	A	TGCCTTGTAAGAGCGACCAA <u>A</u> CAACCTGGAATGCTTCGGAT
	B	TTGGTCGCTCTTACAAGGCACTGGTAACAATCACGGTCTATGC G
	C	GGAGTCCTACTGTCTGAACTAACGATCCGAAGCATTCCAGGTT C
Tw-20	A	TGCCTTGTAAGAGCGACCAA <u>A</u> CAACCTGGAATGCTTCGGAT
	B	TTGGTCGCTCTTACAAGGCACTGGTAACAATCACGGTCTATGC G
	C	GGAGTCCTACTGTCTGAACTAACGATCCGAAGCATTCCAGGTT T

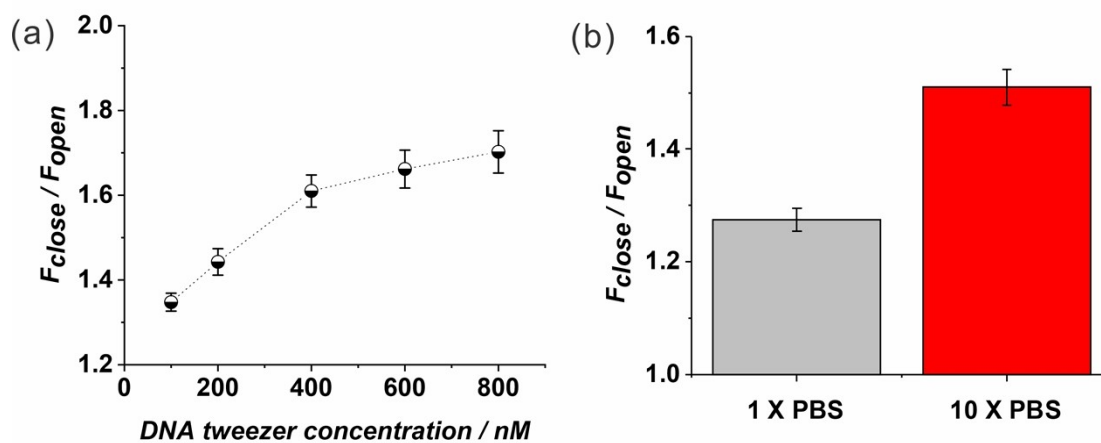


Fig. S1 (a) Effects of DNA tweezer concentration on the fluorescence intensity of the 2-AP based DNA tweezer nanomachine. (b) Fluorescence intensity ratio of the closed and open DNA tweezer (400 nM) by fuel strand input (400 nM) at a low or high saline PBS buffer. Herein, Tw-2 (detailed sequences are listed in Table S1) was used for this analysis. Errors were obtained from three repeated experiments.

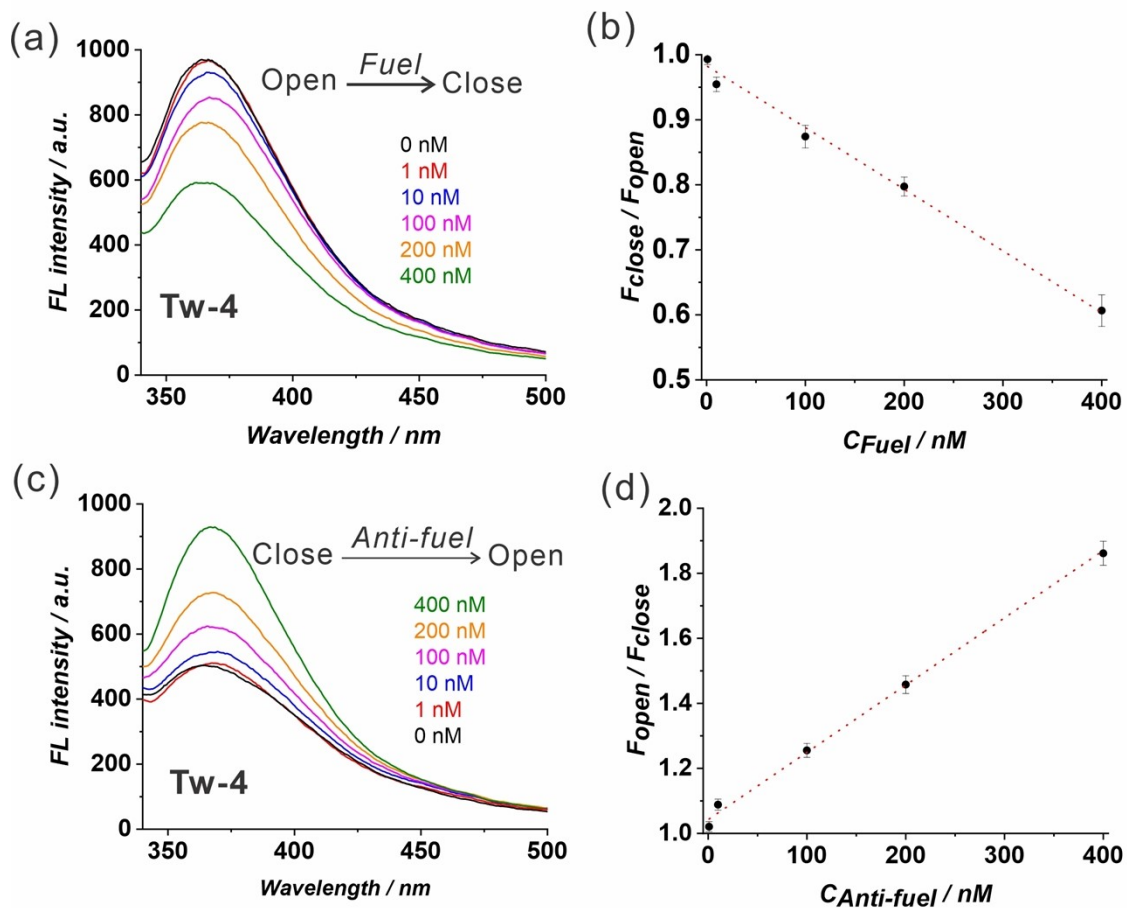


Fig. S2 Detailed fluorescence spectrum (a) and decrease in fluorescence intensity (b) with fuel concentrations when the structure of the tweezer (Tw-4) changes from open to closed upon the addition of fuel strand. Detailed fluorescence spectrum (c) and increase in fluorescence intensity (d) with anti-fuel concentrations when the structure of the tweezer (Tw-4) changes from closed to open upon the addition of anti-fuel strand.

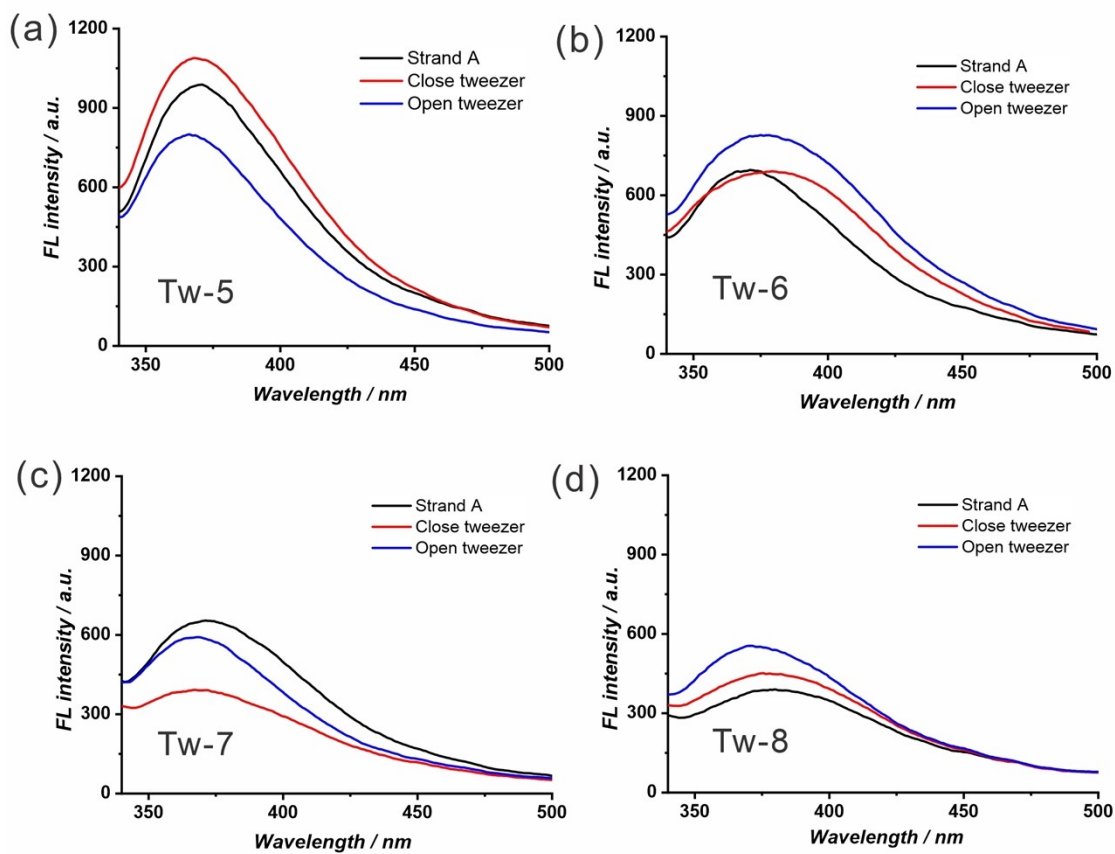


Fig. S3 Fluorescence spectra of the four DNA tweezers: (a) Tw-5; (b) Tw-6; (c) Tw-7; and (d) Tw-8 with a concentration of 400 nM.

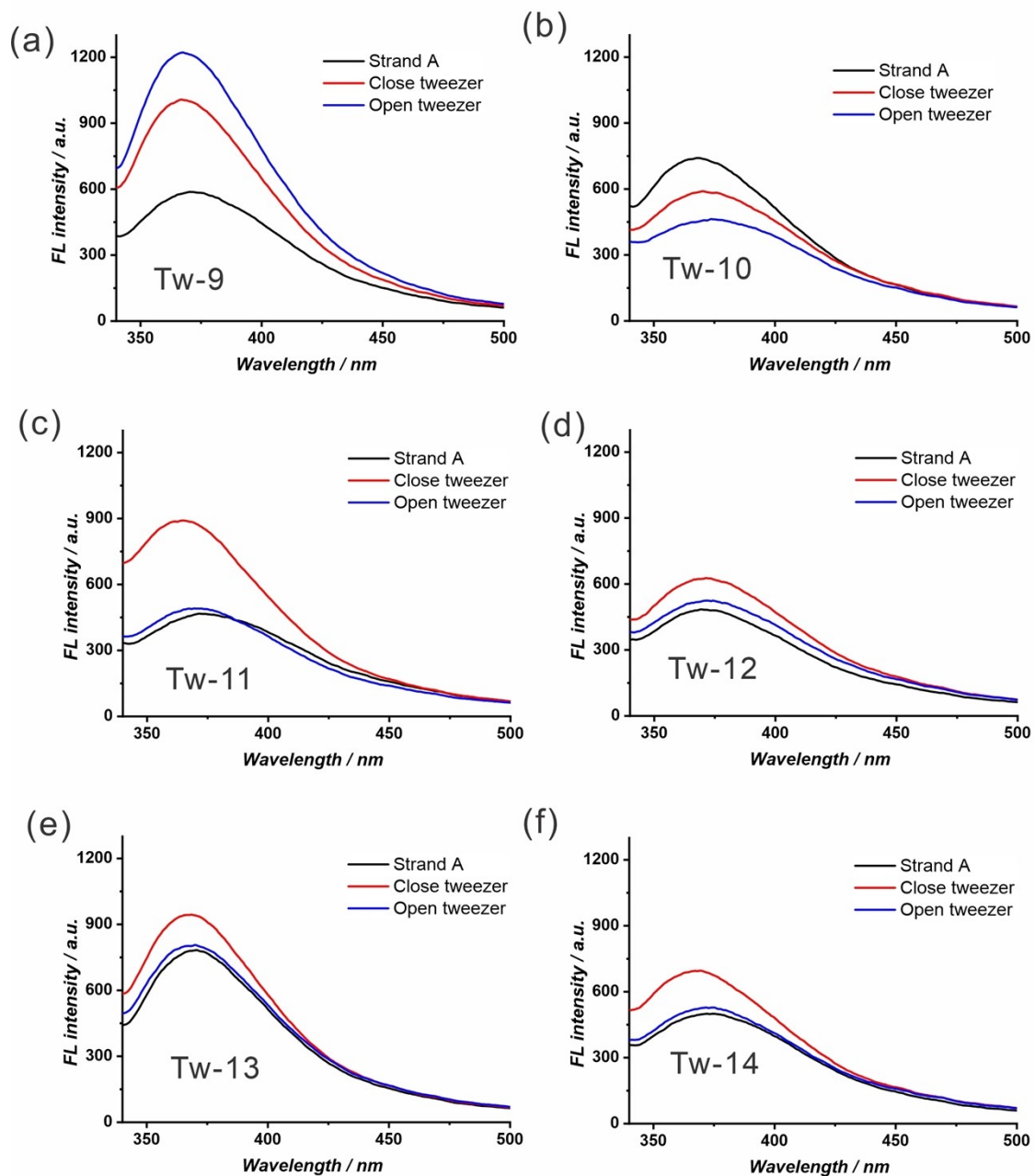


Fig. S4 Fluorescence spectra of the six DNA tweezers: (a) Tw-9; (b) Tw-10; (c) Tw-11; (d) Tw-12; (e) Tw-13; (f) Tw-14 at a concentration of 400 nM.

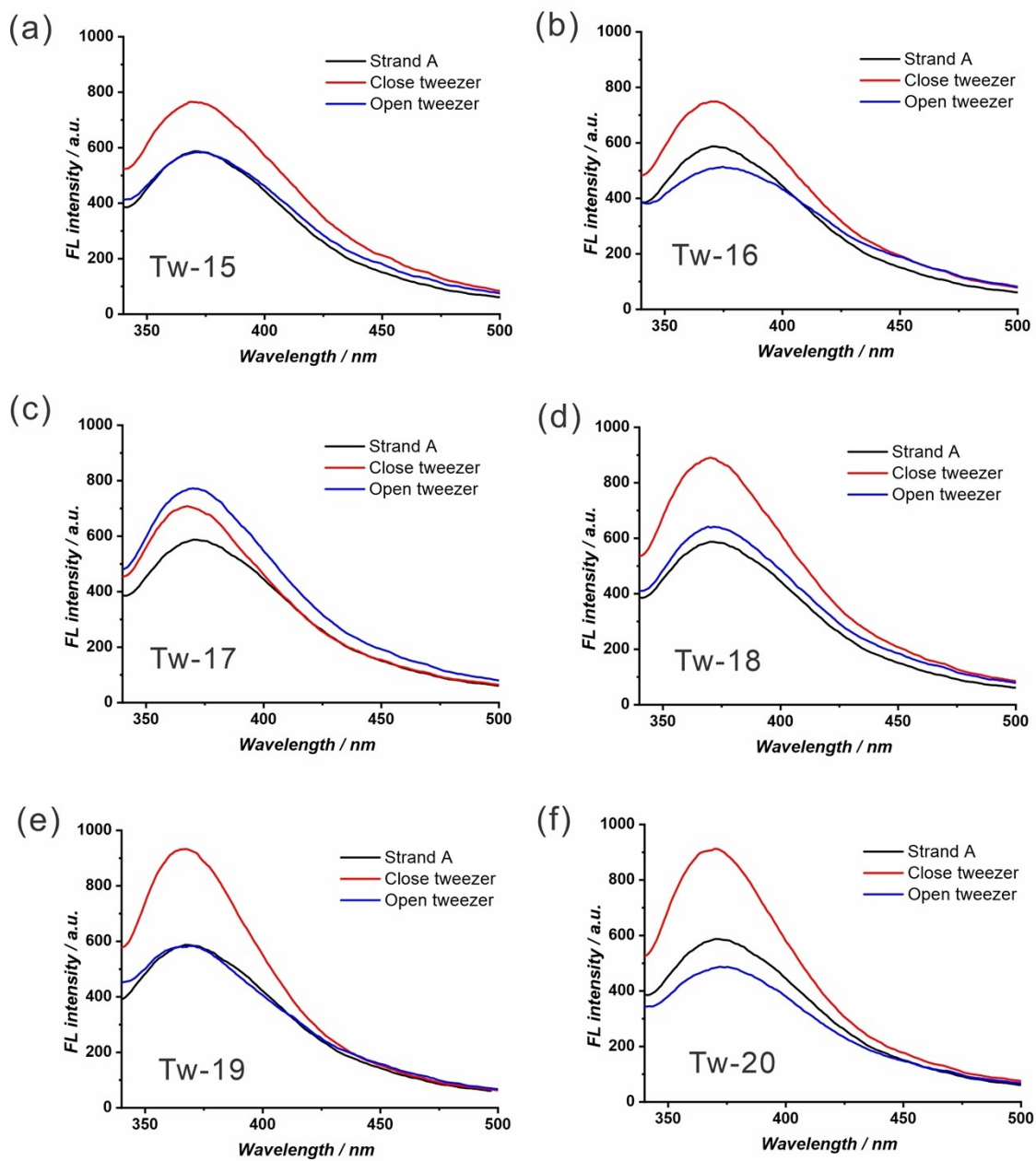


Fig. S5 Fluorescence spectra of (a) Tw-15; (b) Tw-16; (c) Tw-17; (d) Tw-18; (e) Tw-19; (f) Tw-20 at a concentration of 400 nM.