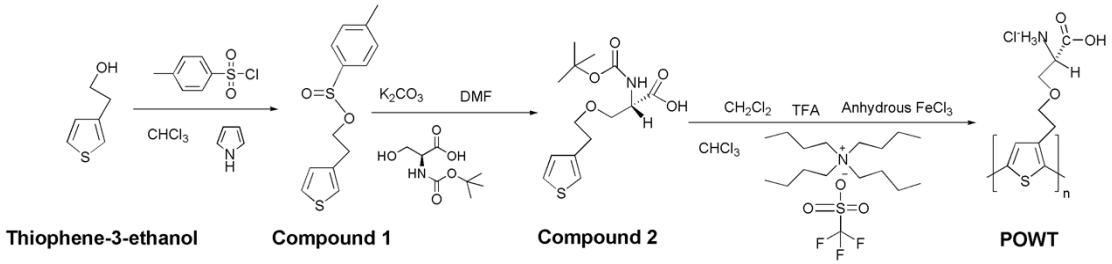
Supporting Information

1. General information

All the reagents used in synthesis are analytical pure and were used as received. Solvents were dried and distilled before being used for synthesis. Irradiation at 365 nm was carried out using a hand-held UV lamp (the power density is ca. 2.0 W/m^2).

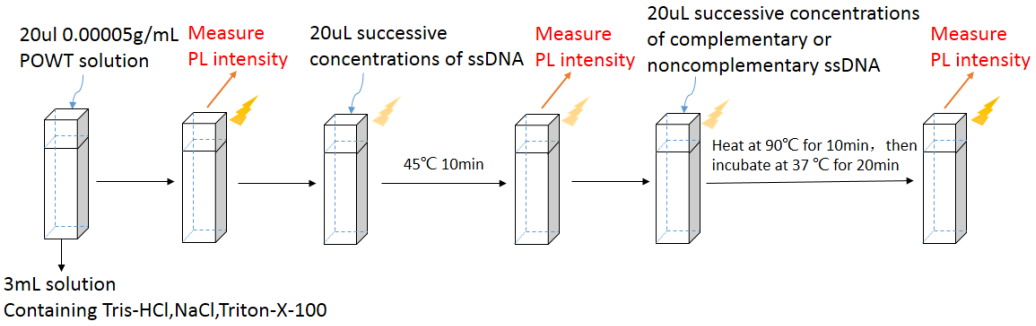
2. Synthetic Route of POWT

Compound 1, Compound 2 and POWT were prepared according to the literature methods. And the procedure was shown in Scheme S1. The procedure demonstrated the main solvents and reagents.



Scheme S1. The Synthetic Route of POWT.

3.The fluorescence measurement procedures



Scheme S2. The fluorescence measurement procedures

4. The oligonucleotides used in this study.

ssDNA	*Sequences*	*Length (bp)*	*T_M (℃)*	*Pairs of mismatched bases*
BRCA1-1	5'-GAGCATACATAGGGTTTCTCTTGGTTTCTTTGATTATAATTCATAC	*47*	*64.8*	-
BRCA1-2	5'-GTATGAATTATAATCAAAGAAACCAAGAGAAACCCTATGTATGCTC	47	64.8	0
BRCA1-3	5'-GTATGAATTATAATCAAAGAAACCAAGAGAAACCCTATGTATGCTG	47	64.8	1
BRCA1-4	5'-GTATGAATTATAATCAAAGAAACCAAGAGAAACCCTATGTATGCAG	47	64.8	2
BRCA1-5	5'-GTATGAATTATAATCAAAGAAACCAAGAGAAACCCTATGTATGCTT	47	64.8	3

	5'- GTATGAATTATAATCAAAGAAACCAAGAGAAACCCTATGTATGGAG			
TB4-1	5'-ATGTCTGACAAACCGGACATGGCTGAAATCGAAAAATTCG	40	67.2	-
TB4-2	5'-CGAATTTTTCGATTTCAGCCATGTCCGGTTTGTCAGACAT	40	67.2	0
TB4-3	5'-CGAATTTTTCGATTTCAGCCATGTCCGGTTTGTCAGACAA	40	67.2	1
TB4-4	5'-CGAATTTTTCGATTTCAGCCATGTCCGGTTTGTCAGACCA	40	67.2	2
TB4-5	5'-CGAATTTTTCGATTTCAGCCATGTCCGGTTTGTCAGAACA	40	67.2	3

Table S1. The oligonucleotides used in this study. *BRCA1-1* and *BRCA1-2*, *TB4-1* and *TB4-2* sequences are completely complementary ssDNA respectively. Others are oligonucleotide sequences with 1~3 mismatched bases.

5. PL intensity of Triton-X-100 dissolved in Milli-Q water

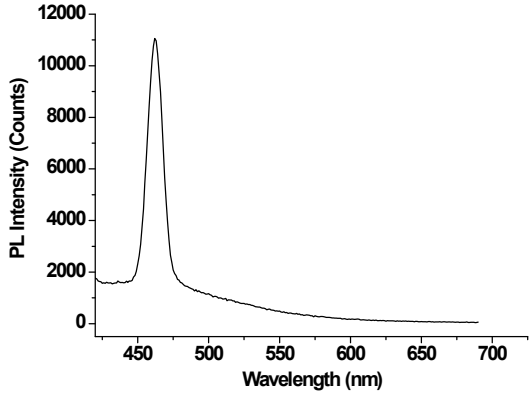


Figure S1. PL intensity of Triton-X-100 dissolved in Milli-Q water. [Triton-X-100]=0.0003M. Excitation wavelength was at 400nm. The maximum peak at 462nm is the Rayleigh Scattering of Milli-Q water.