Supplementary Material

A WS_2 nanosheet based sensing platform for highly sensitive detection of T4 polynucleotide kinase and its inhibitors

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Fig. S1. Values of the ζ potential for WS_2 nanosheets.

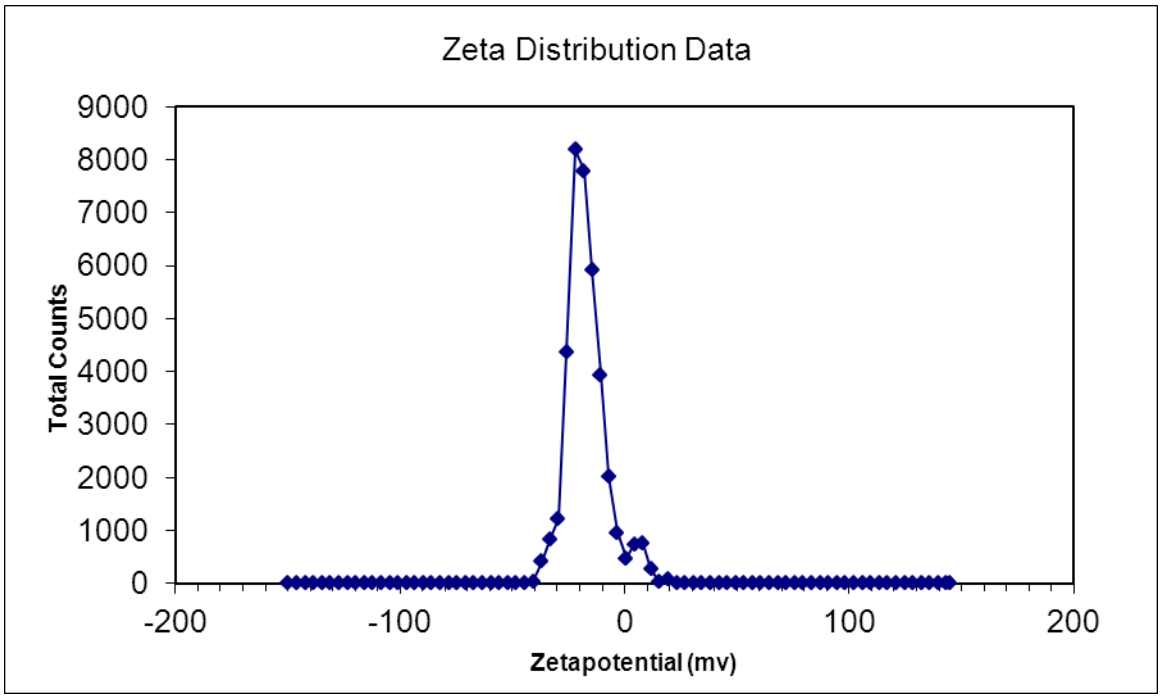

Fig. S2. Fluorescence intensities of (a) 100 nM P1 and (b) 100 nM FAM labeled

dsDNA via time in the presence of 20 μL of WS_2 nanosheets. The assays were all carried out in the Tris-HCl buffer. (P1 100 nM, FAM labeled dsDNA 100 nM, λ exonuclease 10U, WS_2 5 μg mL^{-1})

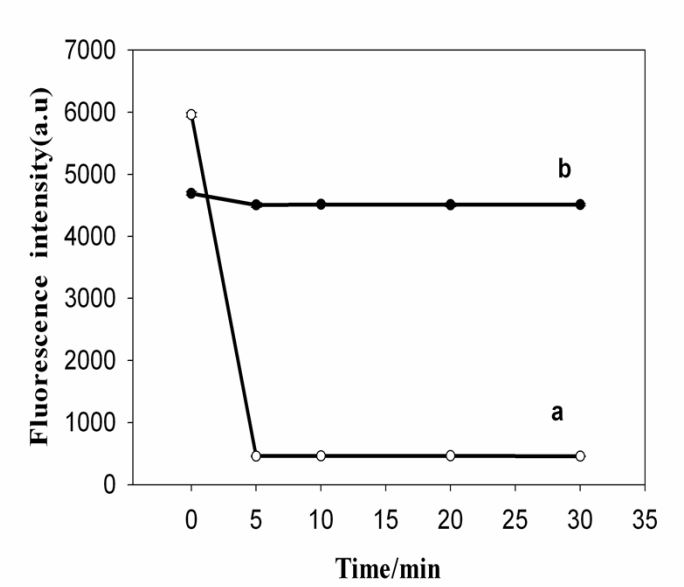

Fig. S3. Fluorescence intensity histogram of P1 + WS_2 (black histogram) and FAM

labeled dsDNA + WS_2 (gray histogram) in the presence of 0, 1, 2, 4, 5, and 6 μg mL^{-1} WS_2 nanosheets (P1 100 nM, FAM labeled dsDNA 100 nM).

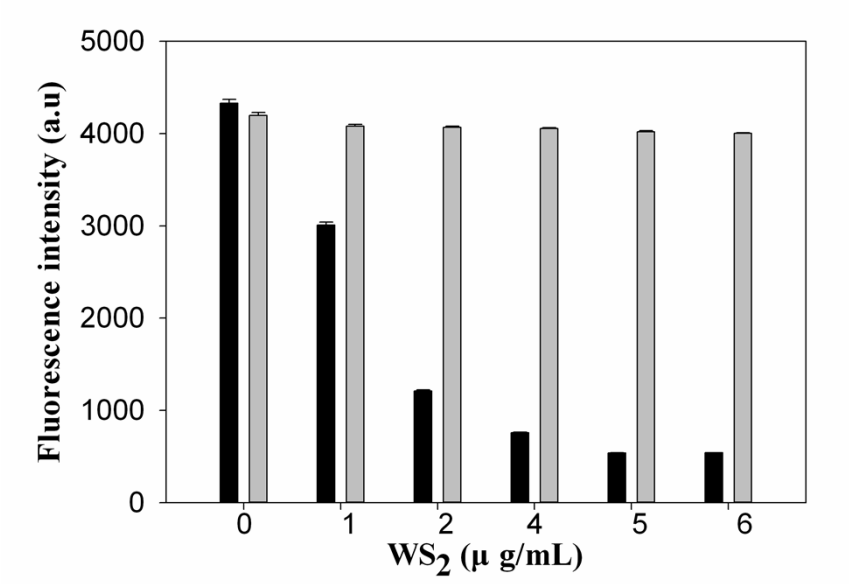

Fig. S4. (A) Optimization of the reaction time. The concentrations of ATP and λ

exonuclease were 0.5 mM and 10 units, respectively. (B) Optimization of λ exonuclease concentration. The concentration of ATP was 0.5 mM. (C) Optimization of ATP concentration. The concentration of λ exonuclease was 10 units. (FAM labeled dsDNA 100 nM, T4 PNK 10 U mL^{-1}, WS_2 5 μg mL^{-1}).

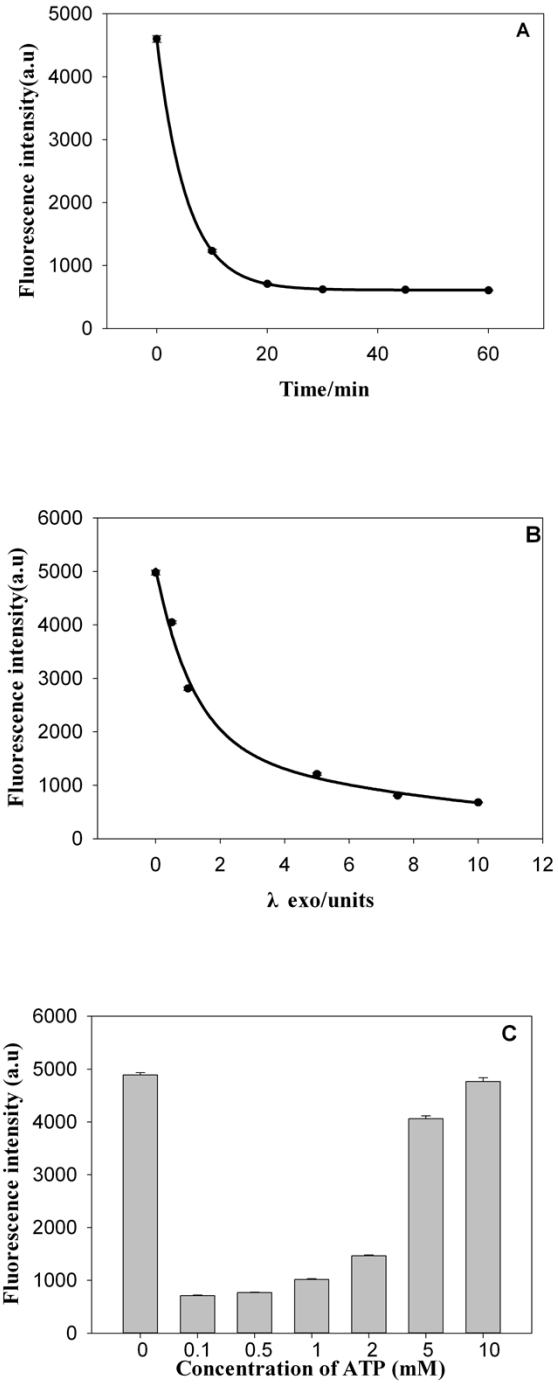

Fig. S5. Fluorescence spectra of P1 without (a) and with (d) incubation with 20 μL

WS_2 nanosheets. Fluorescence spectra of FAM labeled dsDNA after incubation without (b) and with (c) 20 μL WS_2 nanosheets. The assays were all carried out in the reaction buffer containing 1% (v/v) cell extracts. (P1 100 nM, FAM labeled dsDNA 100 nM, WS_2 5 μg mL^{-1}).

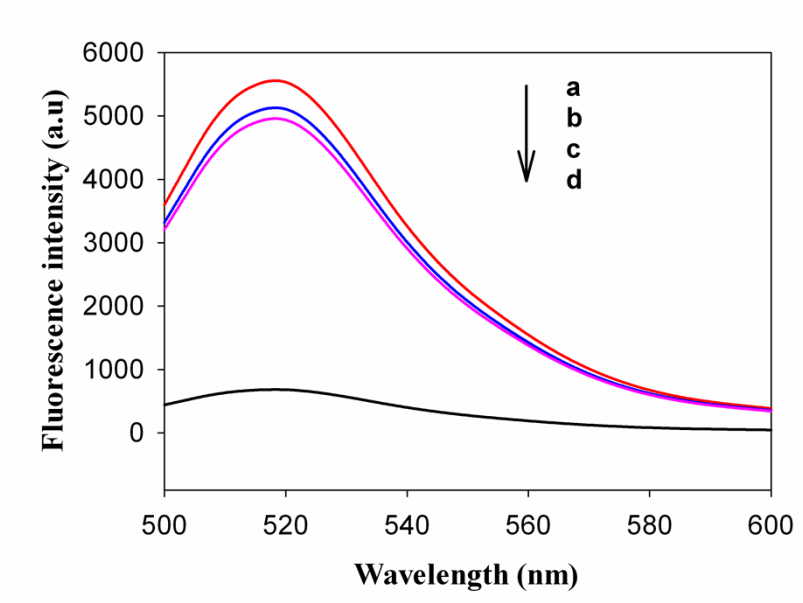

Fig. S6. The selectivity of the WS_2 nanosheets-based strategy for T4 PNK assay. The

concentrations of all enzymes were 10U mL^{-1}. Error bars were estimated from three replicate measurements. (FAM labeled dsDNA 100 nM, ATP 0.5 mM, λ exonuclease 10U, WS_2 5 μg mL^{-1}).