Electronic Supplementary Information

Detection and identification of dengue virus serotype altering quantum dots and AuNP regulated localized surface plasmon resonance

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Table S1. Total genome of four DENV serotypes and their selected region for designing the synthetic analytes:

Dengue 1

AGTTGTTAGTCTACGTGGACCGACAAGAACAGTTTCGAATCGGAAGCTTGCTTAACG
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Dengue 2

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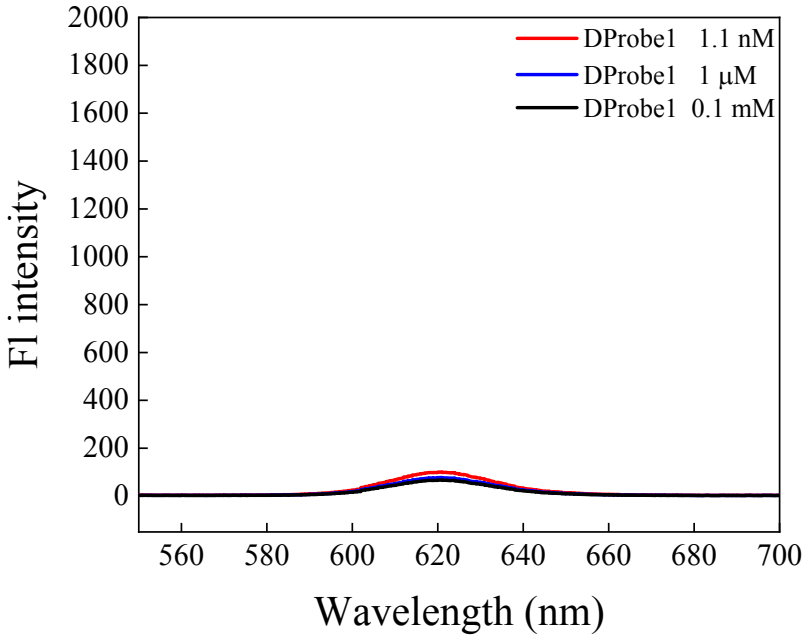

Fig S1. Initial fluorescence of DENV probe 1 in different concentration of 0.1 mM (as prepared), 1 μM and 1.1 nm (used amount).

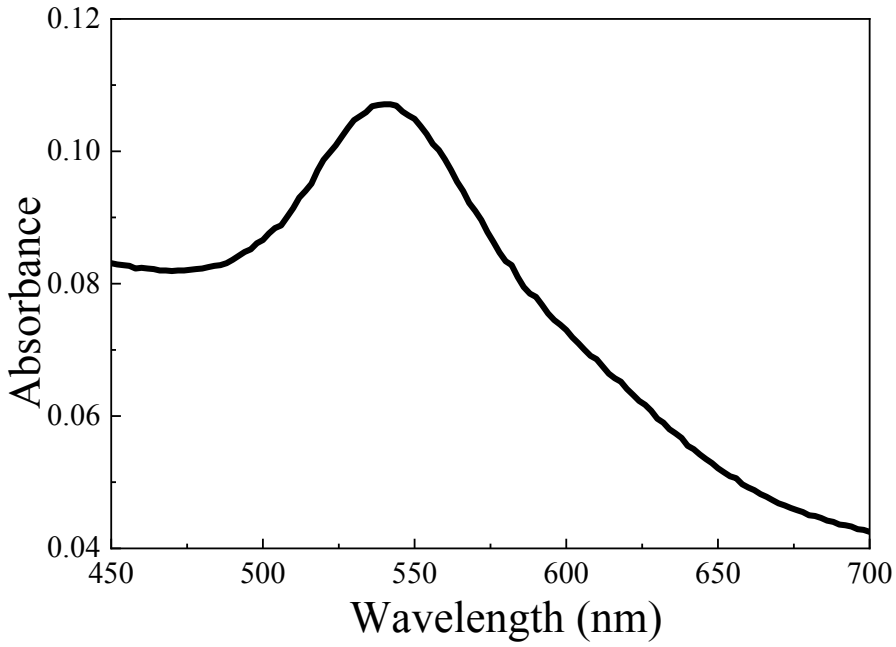

Fig. S2. UV-Vis spectrum of CdSeTeS QDs showing peak absorbance at 540 nm.

Measurement of quantum yield (QY) of CdSeTeS:

The quantum yield (QY) of QDs was measured and calculated by the comparative fluorescence method using fluorescein as a standard fluorophore (Φ = 0.79). Five different concentrations of fluorescein and CdSeTeS QD solutions were prepared using deionized water. Then, the absorbance as well as the corresponding fluorescence curve of each solution was recorded and calculated. Figure S1 shows the linear relationship between fluorescence curve areas and corresponding optical density from absorbance. The quantum yields of CdSeTeS QDs was calculated from the following equation:

$$QY = Q_R\,[m/m_R][n^2/n_R^2]$$

where m is the slope of the line obtained from two calibration lines, n is the refractive index of solvent and subscript R refers to the reference fluorophore of known QY.

$$QY_{CdSeTeS} = 0.79 \times 6.4/15.3 = 0.33$$

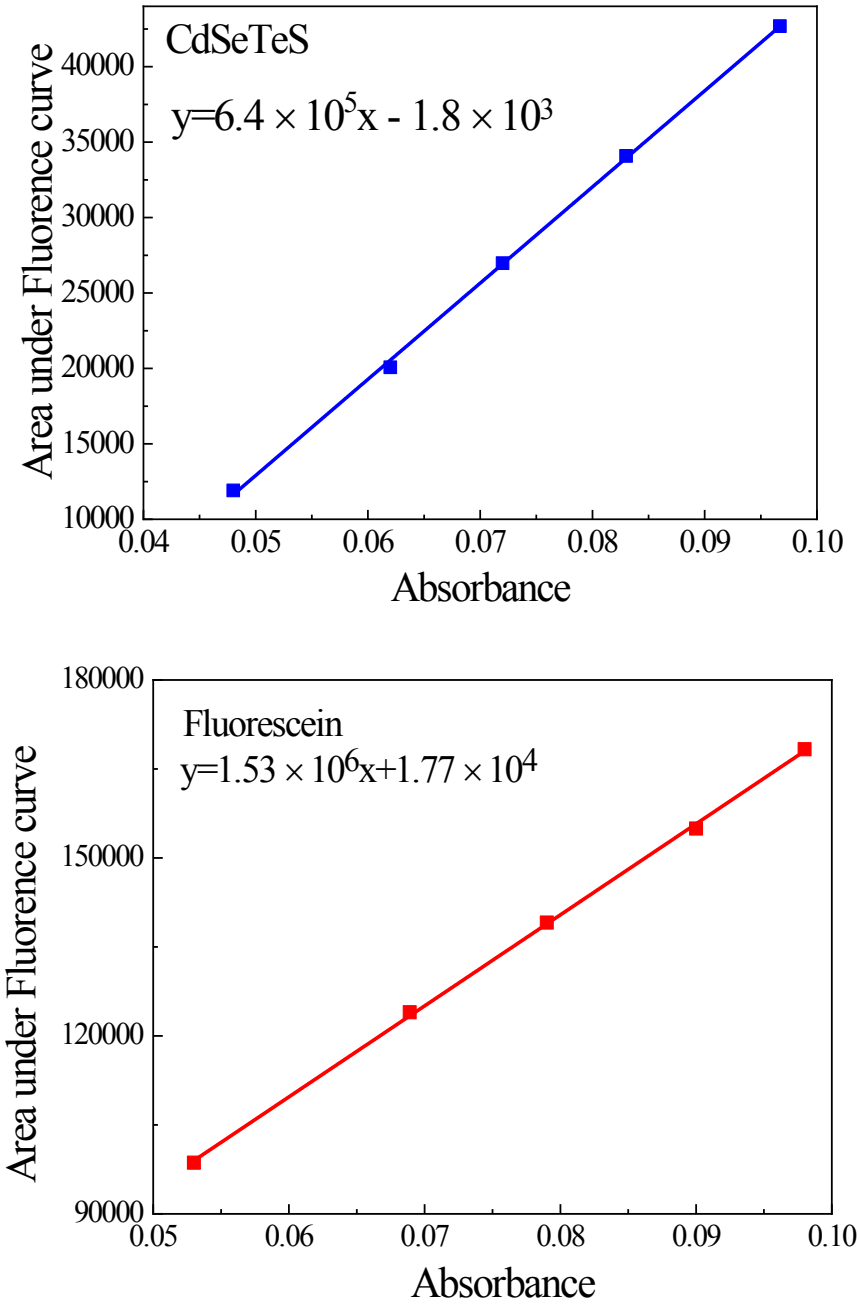

Fig. S3. The linear relationship between fluorescence curve areas and corresponding optical density from absorbance. (a) CdSeTeS QDs and (b) fluorescein.

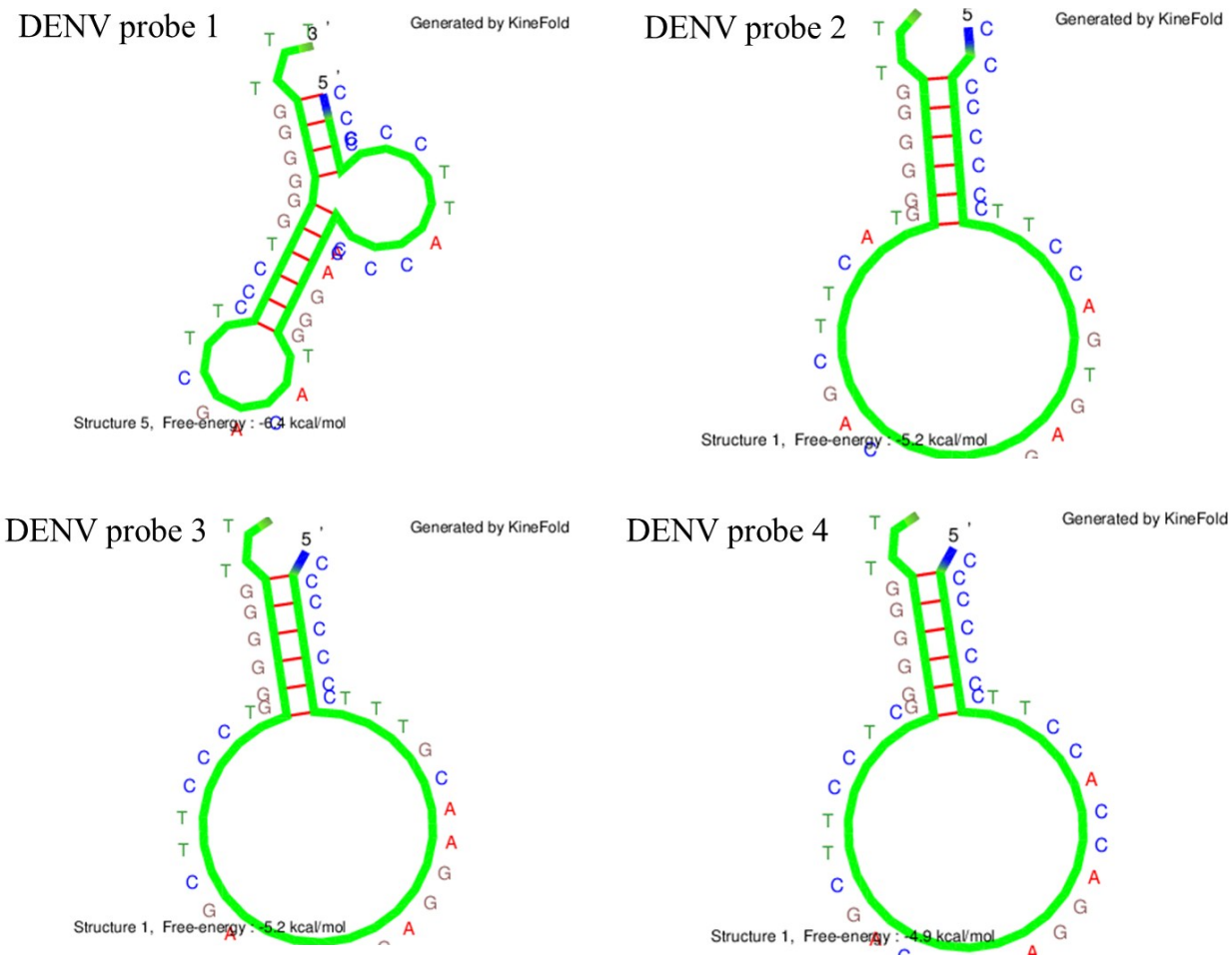

Fig S4. The possible secondary structures of all four bare hairpin DNAs.

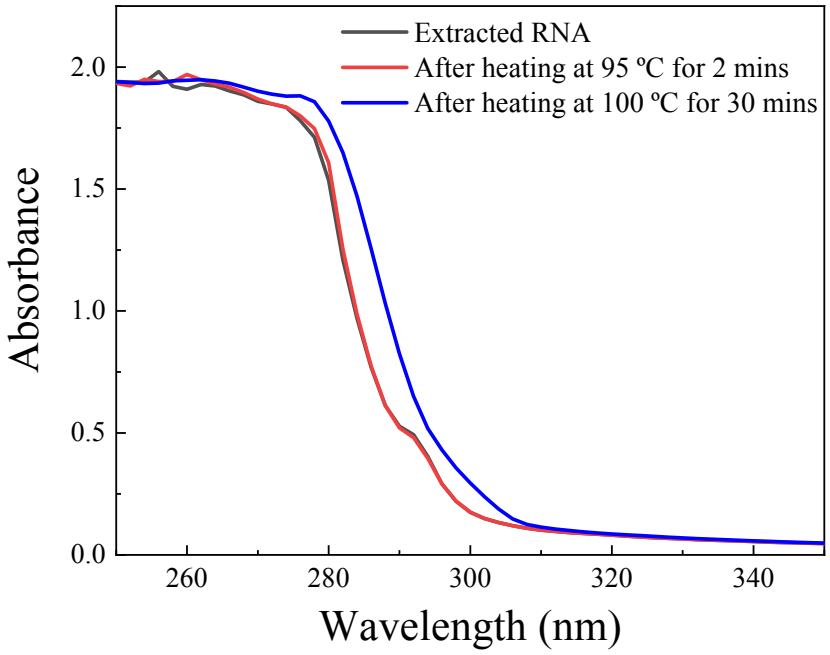

Fig. S5. UV-Visible curve of RNAs indicates the stability at 95 °C.

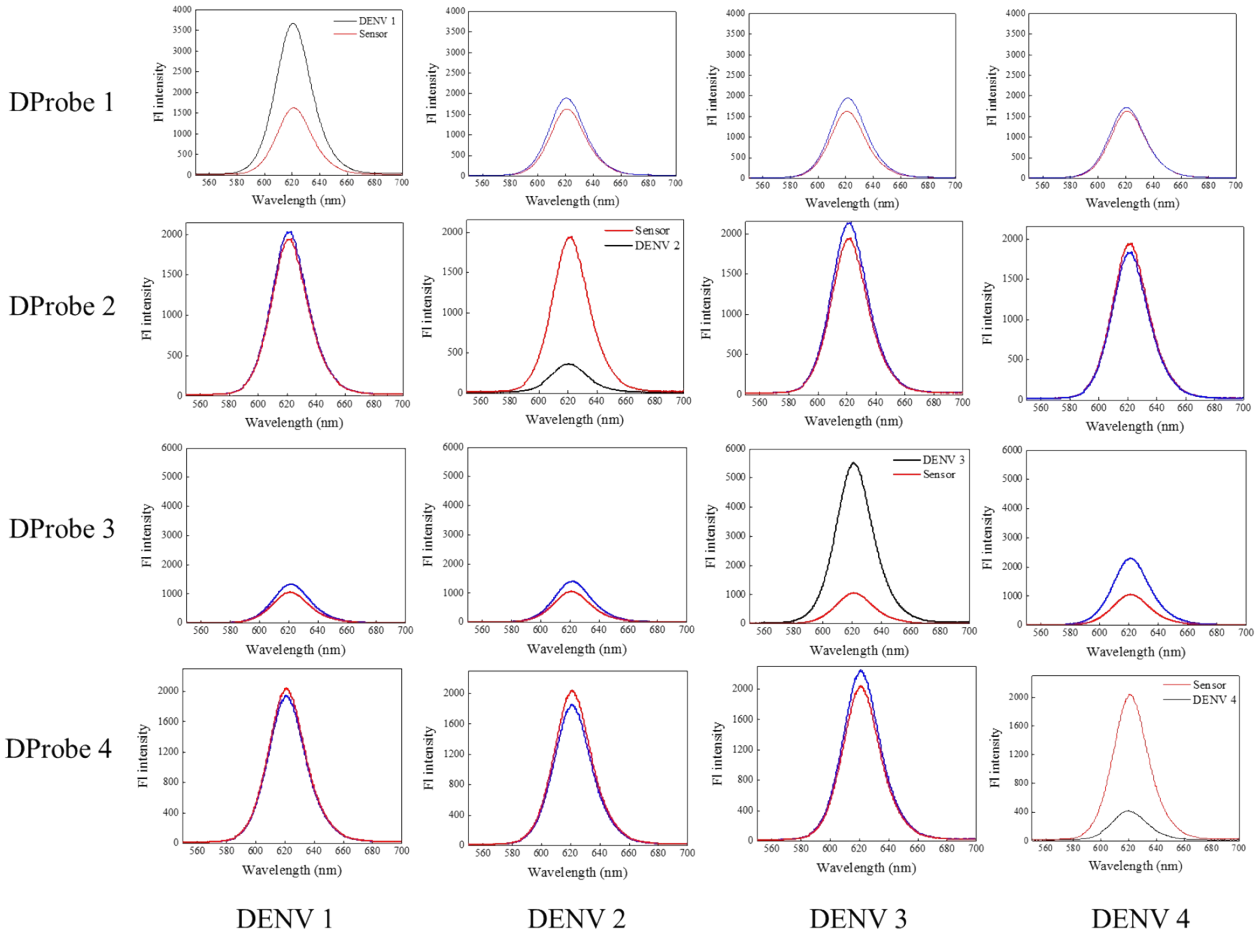

Fig. S6. Fluorescence curves of four different DProbes after separately interacts with four different Dengue serotype RNAs.

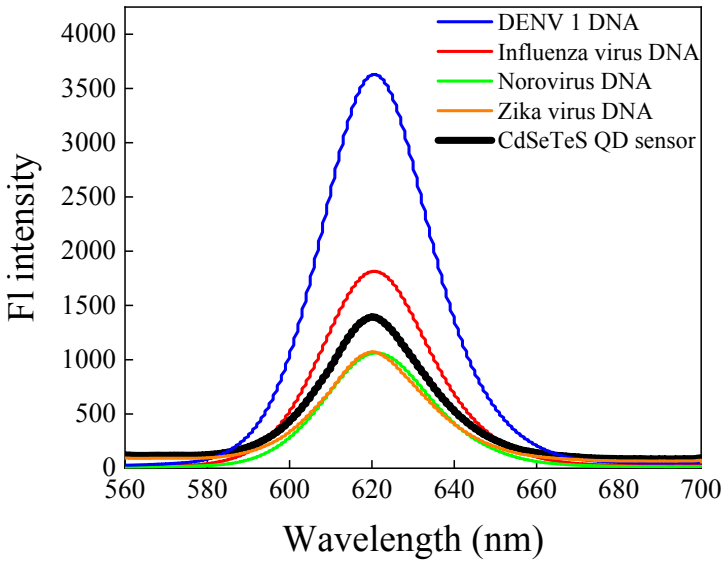

Fig. S7. Selectivity test of CdSeTeS QDs with DENV 1 nanoprobes toward 10^{-9} M DENV 1 DNA along with Influenza virus, Zika virus and Norovirus DNAs.