Electronic supplementary information

A Michael addition reaction-based fluorescent probe for malononitrile detection and its applications in aqueous solution, living cells and zebrafish

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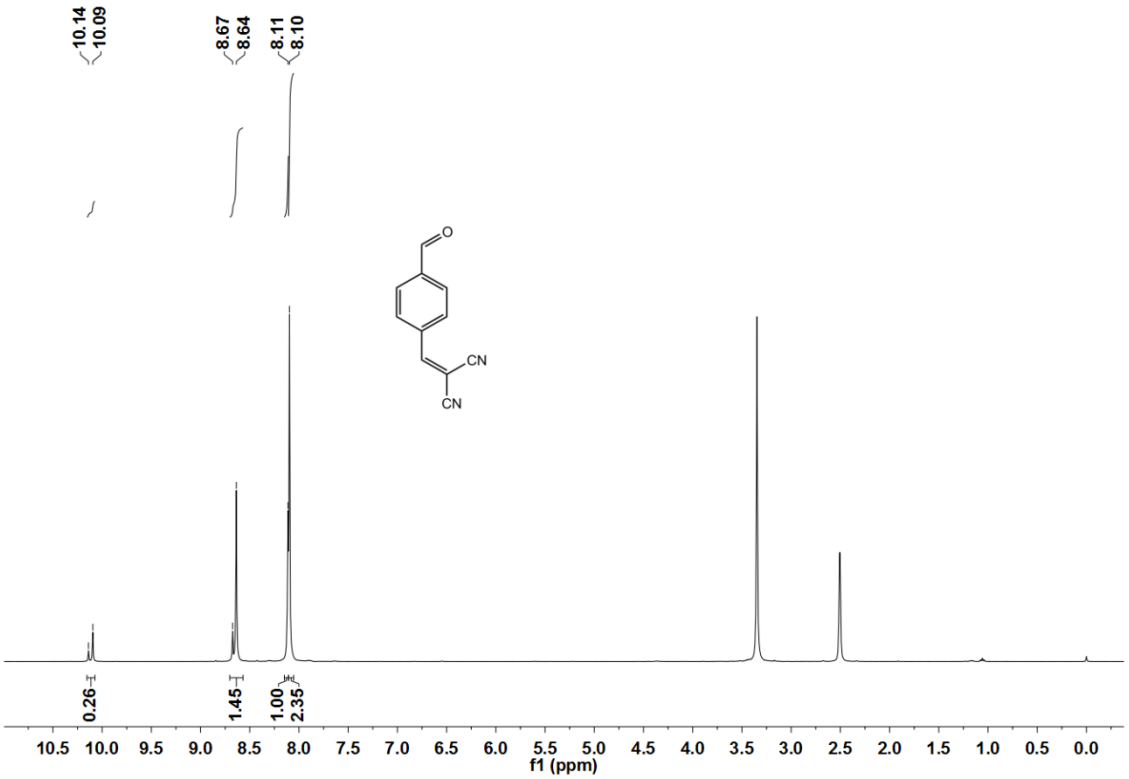

Fig. S1. ^{1}H NMR spectra of intermediate **1**.

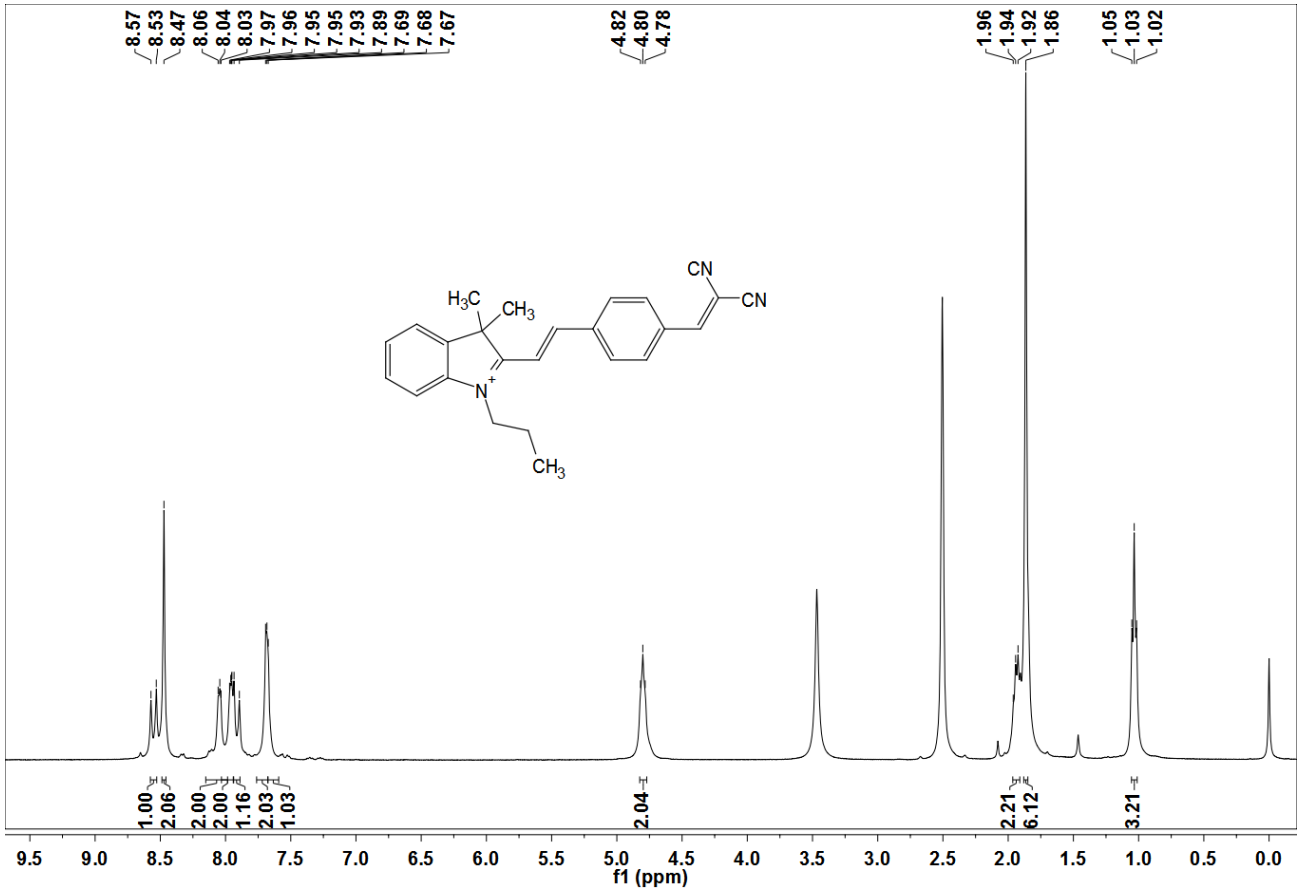

Fig. S2. ^{1}H NMR spectra of probe **Hcy-DCV**.

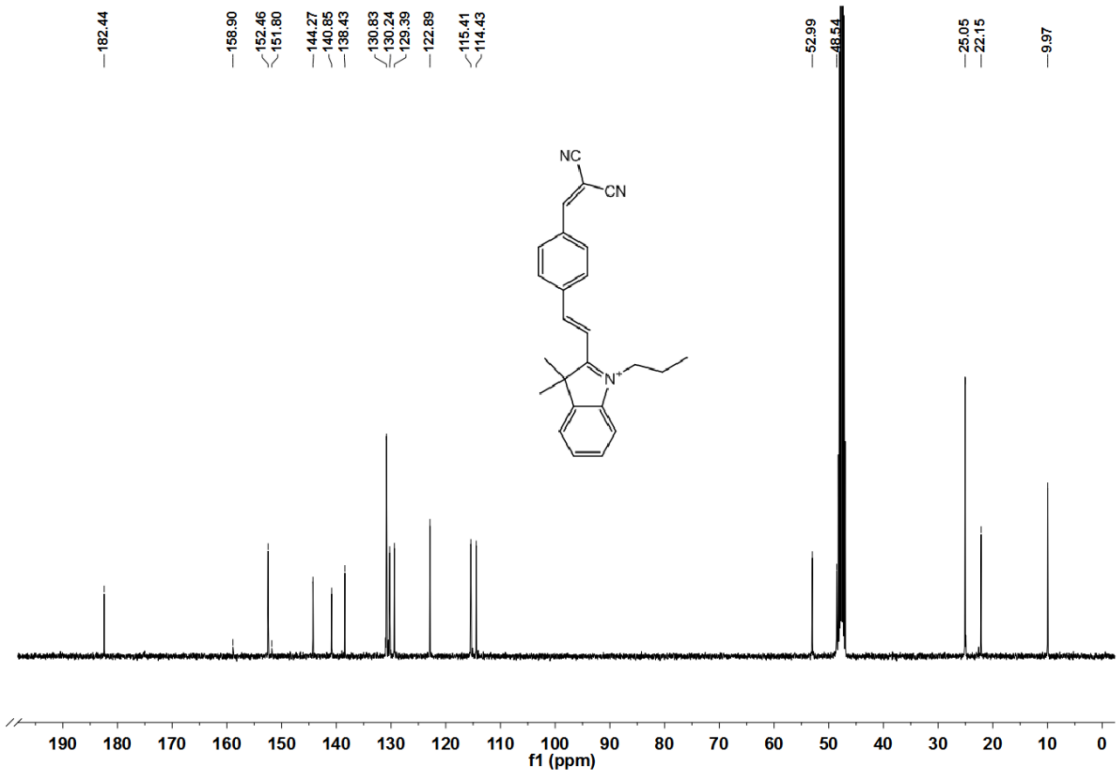

Fig. S3. ^{13}C NMR spectra of probe **Hcy-DCV**.

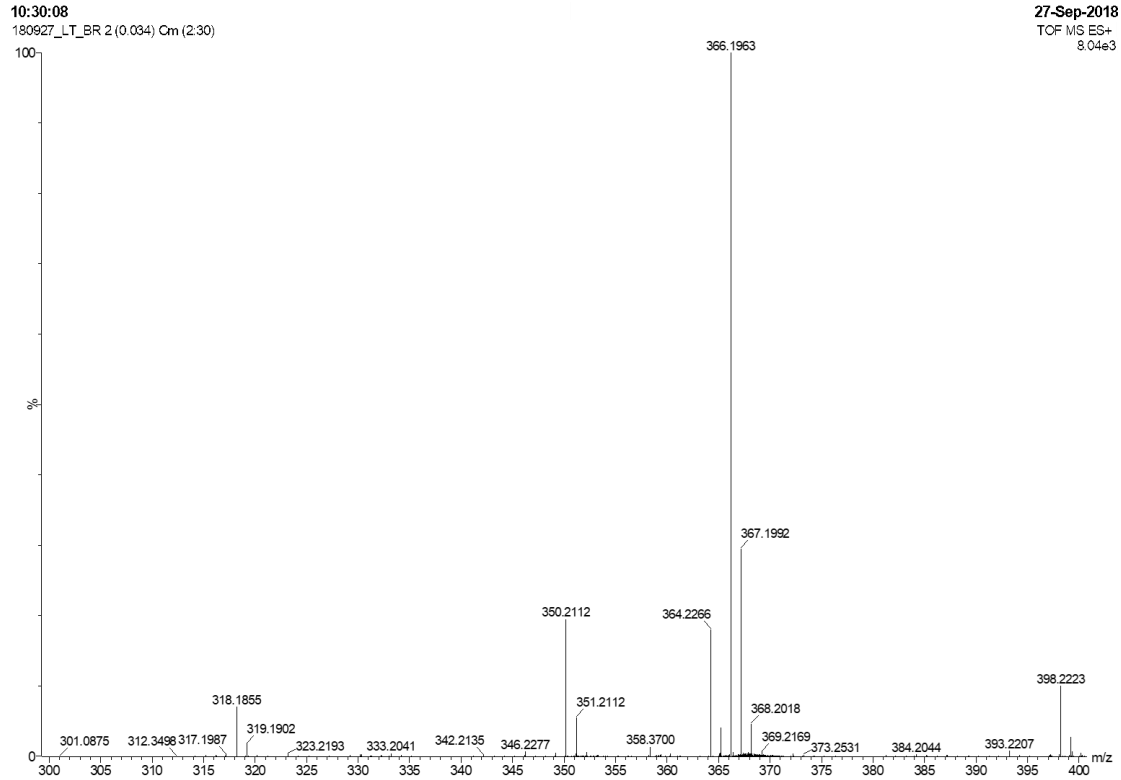

Fig. S4. HR-MS of probe **Hcy-DCV**.

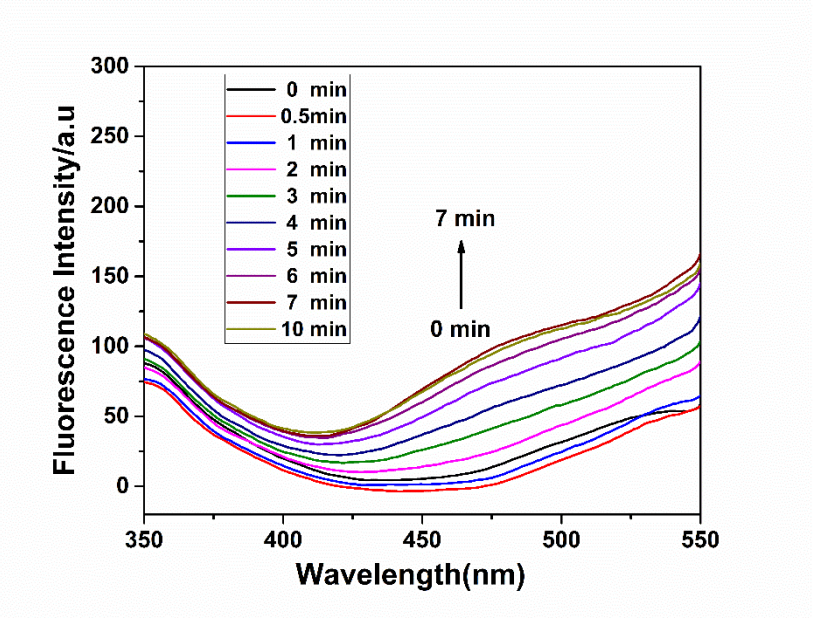

Fig. S5. Time-dependent fluorescence spectral changes of probe **Hcy-DCV** (10 μM) upon the addition of malononitrile (100 μM) in PBS buffer (pH=7.4, 10 mM) at 25°C (λ_{ex} = 300 nm, λ_{em} = 460 nm).

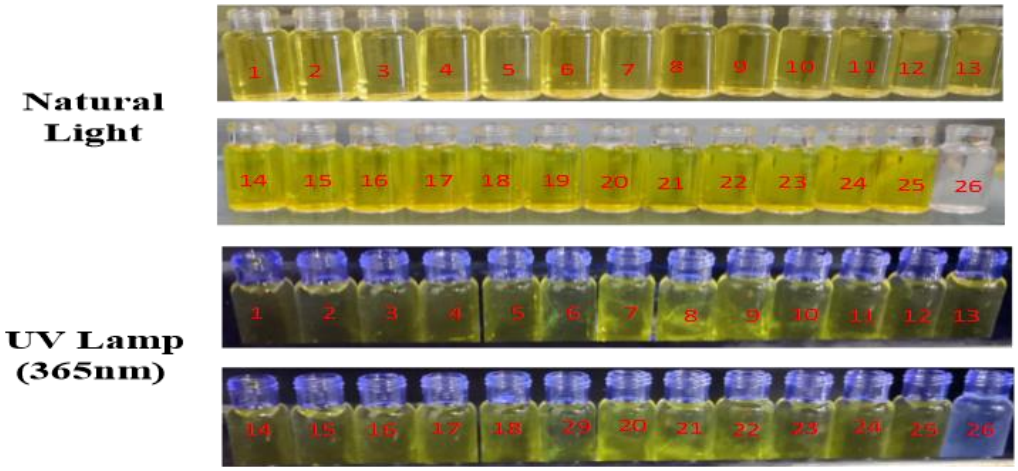

Fig. S6. Color changes of **Hcy-DCV** solutions (10 μM) upon the addition of different interfering analysts and malononitrile (200 μM) under natural light and UV radiation. (1, K^+; 2, Cu^{2+}; 3, Mg^{2+}; 4, Ca^{2+}; 5, Fe^{3+}; 6, Cl^-; 7, NO_2^-; 8, SO_4^{2-}; 9, CO_3^{2-}; 10, L-Phe; 11, L-Ile; 12, L-Lys; 13, L-Pro; 14, L-Arg; 15, Acetoacetate; 16, Acetylacetone; 17, Dimethyl sulfone; 18, Dimethyl sulfoxide; 19, Malonic acid; 20, Diethyl malonate; 21, Nitromethane; 22, Methyl cyanoacetate; 23, Acetonitrile; 24, *p* - Nitrophenylacetonitrile; 25, Hydrazine; 26, $CNCH_2CN$).

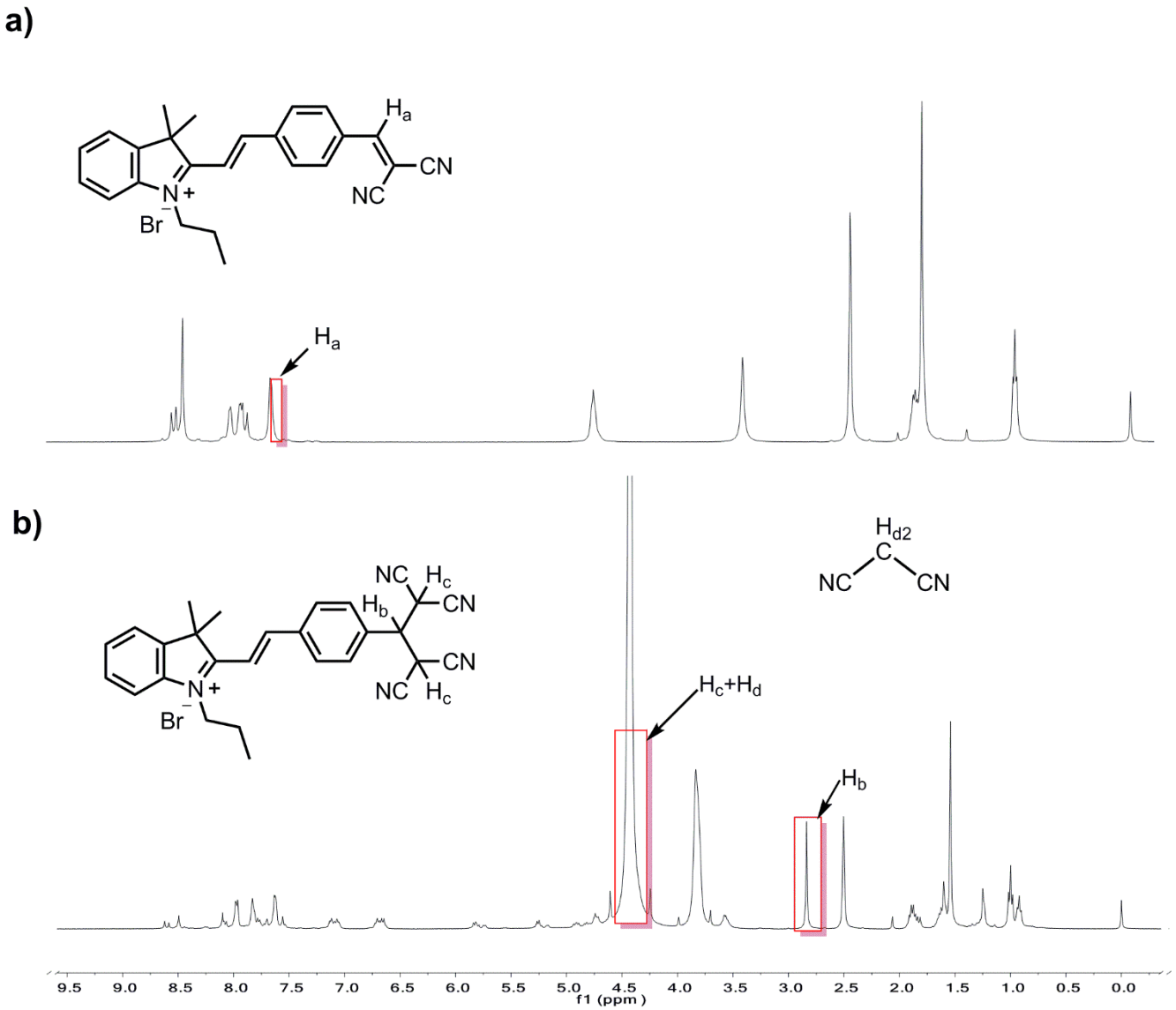

Fig. S7. Partial ^{1}H NMR spectra of probe **Hcy-DCV** in the absence (a) and presence (b) of malononitrile in DMSO-d_6 (400 MHz).

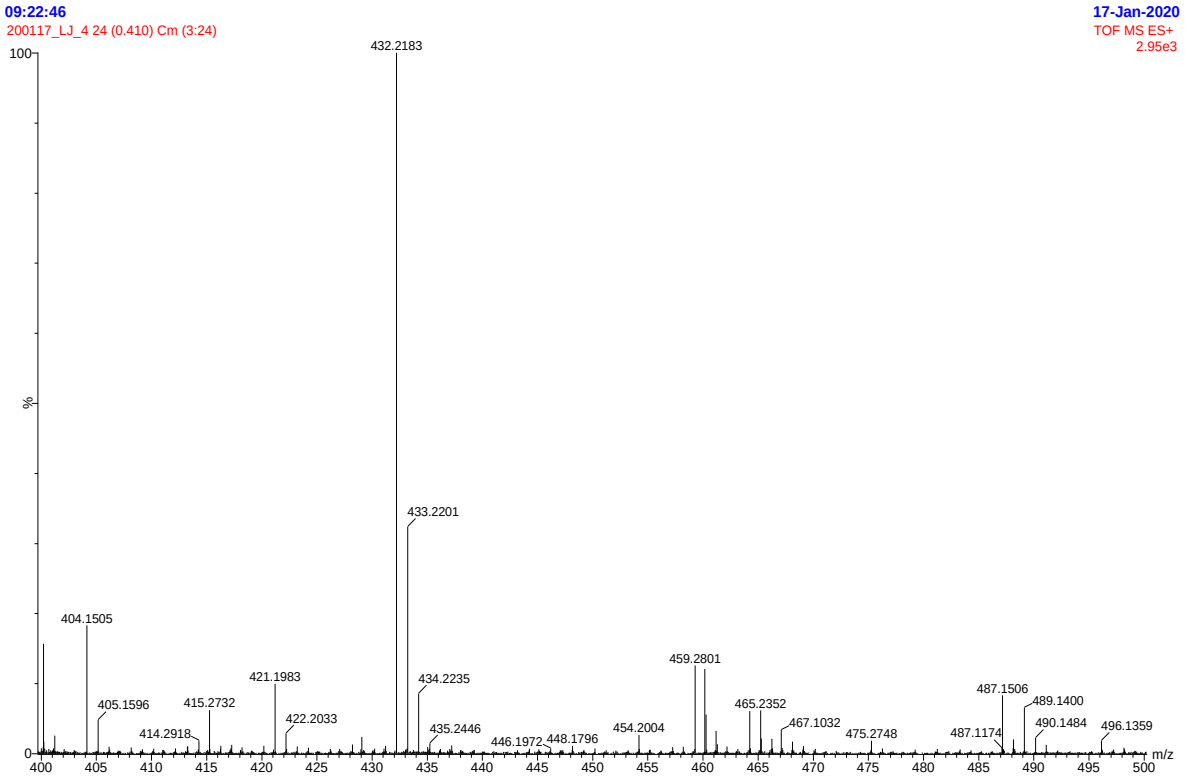

Fig. S8. HR-MS of the reaction product of probe **Hcy-DCV** and malononitrile.

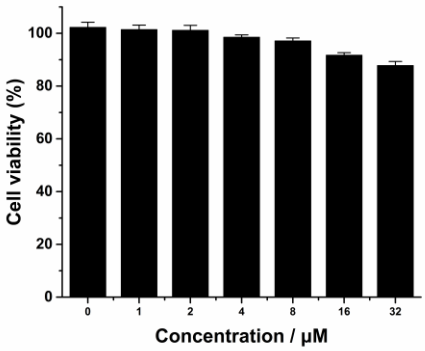

Fig. S9. Cell viability of H1975 cells after the treatment by different concentrations of **Hcy-DCV** (0-32 μM).