# SUPPORTING INFORMATION

# GLUCOPYRANOSYL-1,4-DIHYDROPYRIDINE AS A NEW FLUORESCENT CHEMOSENSOR FOR SELECTIVE DETECTION OF 2,4,6-TRINITROPHENOL

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**S16.** (A) Change in fluorescence spectra of Glc-DHP (1 μM) with the addition of DNP at pH 3. (B) Stern-Volmer plot in response to DNP at pH 3.

**S17.** (A) Change in fluorescence spectra of Glc-DHP (1 μM) with the addition of TNP at pH 3. (B) Stern-Volmer plot in response to TNP at pH 3.

**S18.** (A) Change in fluorescence spectra of Glc-DHP (1 μM) with the addition of 4NP at pH 5. (B) Stern-Volmer plot in response to 4NP at pH 5.

**S19.** (A) Change in fluorescence spectra of Glc-DHP (1 μM) with the addition of DNP at pH 5. (B) Stern-Volmer plot in response to DNP at pH 5.

**S20.** (A) Change in fluorescence spectra of Glc-DHP (1 μM) with the addition of TNP at pH 5. (B) Stern-Volmer plot in response to TNP at pH 5.

**S21.** (A) Change in fluorescence spectrum of Glc-DHP (1 μM) with the addition of 4NP at pH 8. (B) Stern-Volmer plot in response to 4NP at pH 8.

**S22.** (A) Change in fluorescence spectra of Glc-DHP (1 μM) with the addition of DNP at pH 8. (B) Stern-Volmer plot in response to DNP at pH 8.

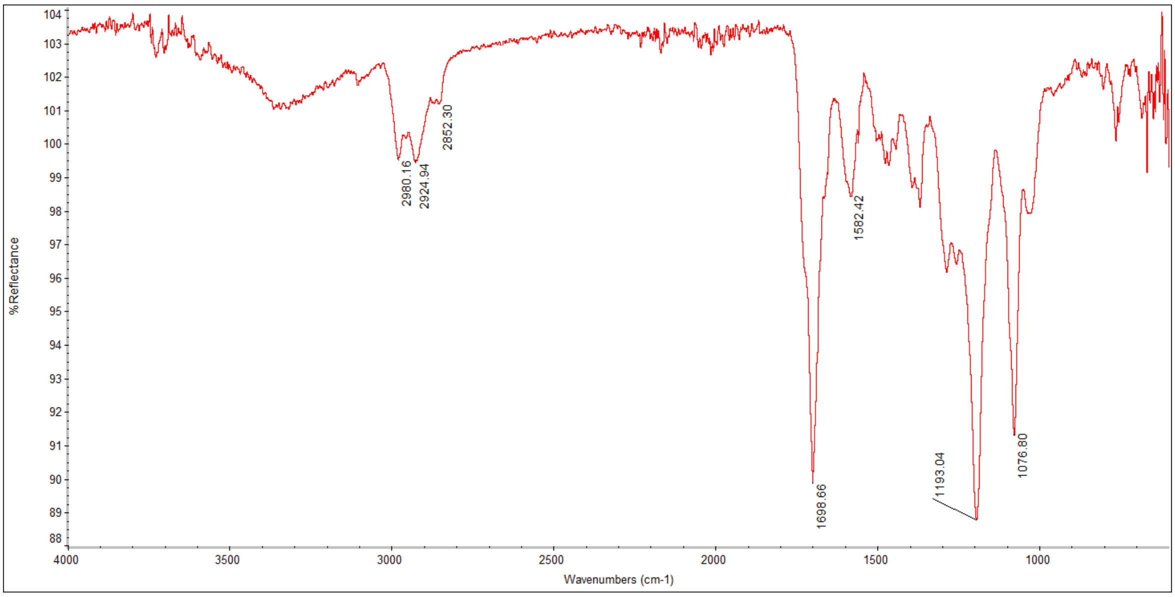
**S23.** (A) Change in fluorescence spectra of Glc-DHP (1 μM) with the addition of TNP at pH 8. (B) Stern-Volmer plot in response to TNP at pH 8.

**S24.** Stern-Volmer plot in response to various NPs at pH 3.

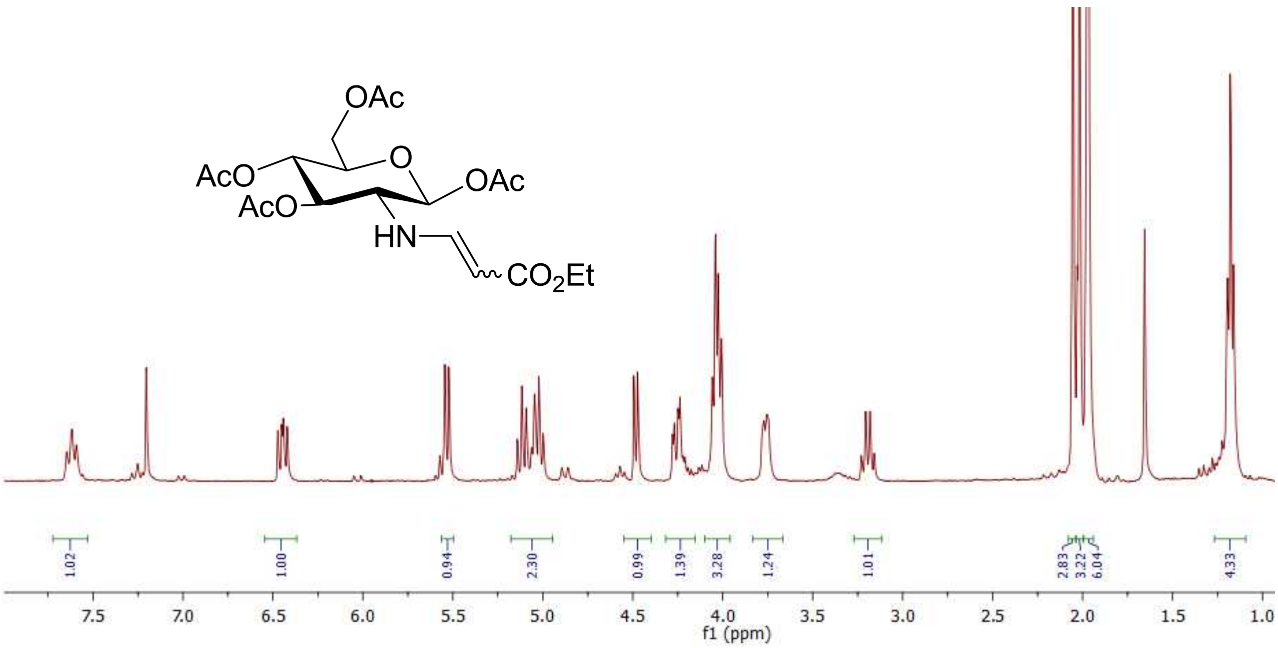
**S25.** Stern-Volmer plot in response to various NPs at pH 5.

**S26.** Stern-Volmer plot in response to various NPs at pH 8.

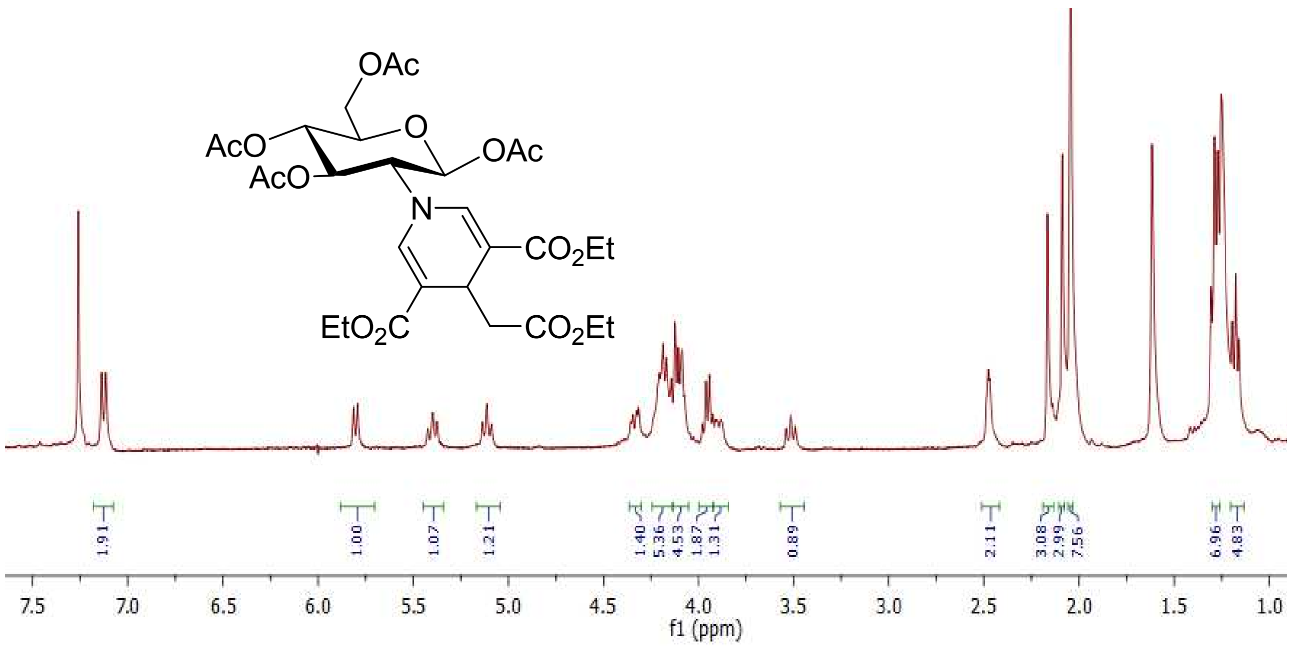
**S27.** Stern-Volmer plot in response to various NPs at pH 3, 5, 8.



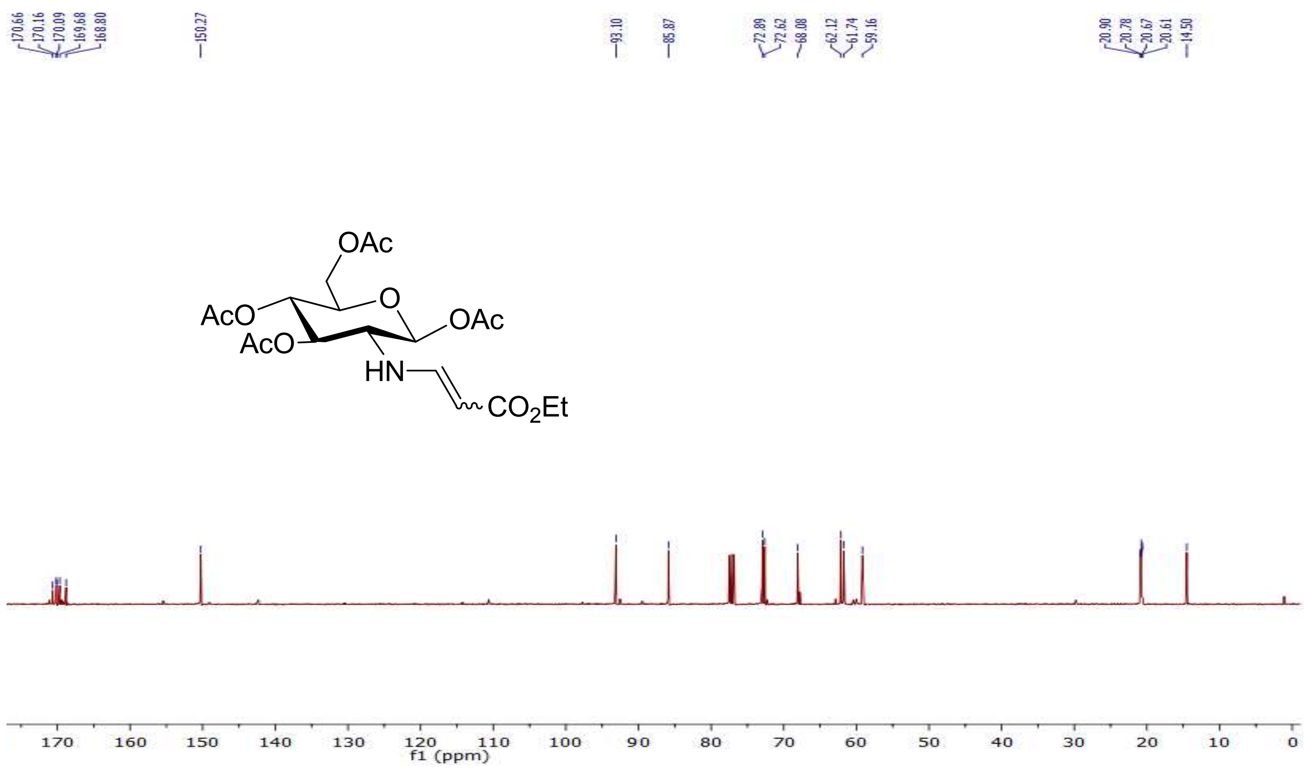

**S1.** The IR of glucopyranosyl-1,4-dihydropiridine (Glc-DHP).



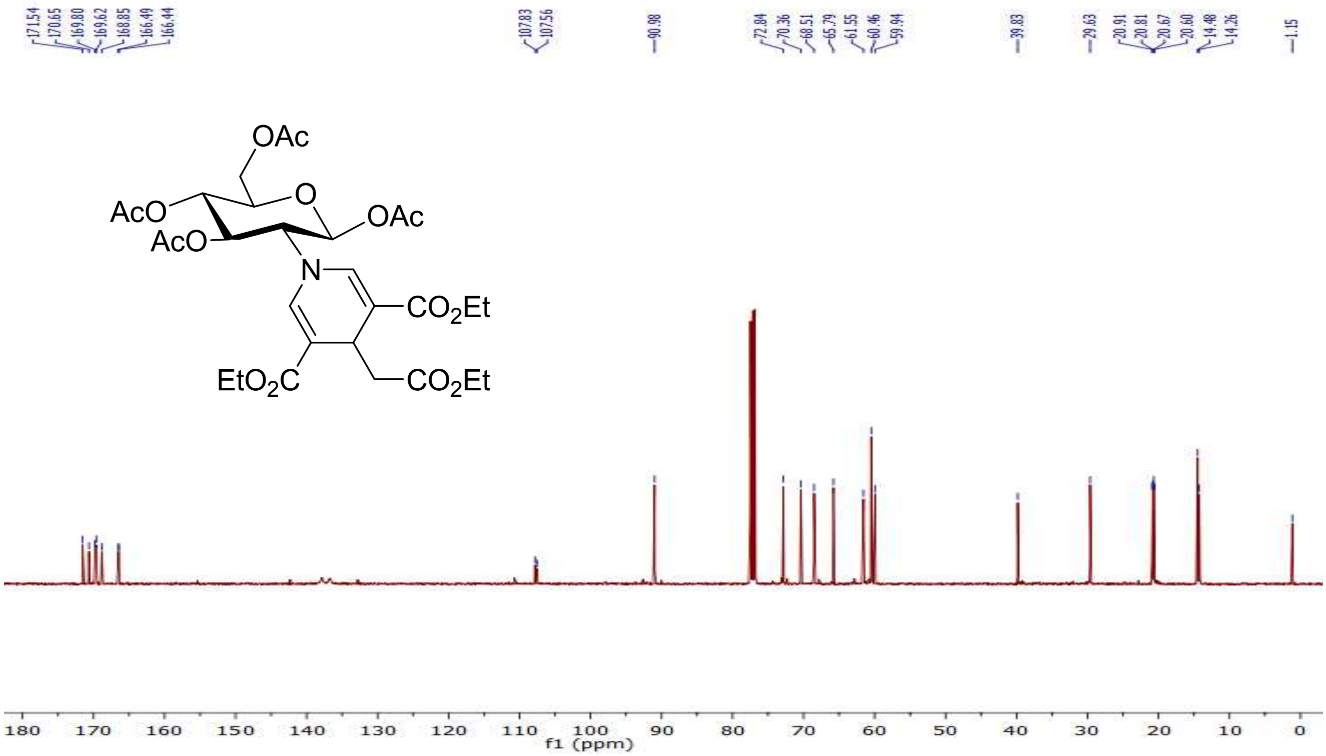

**S2.** The $^1$H NMR of ethyl β-amino acrylate **2** in $CDCl_3$.



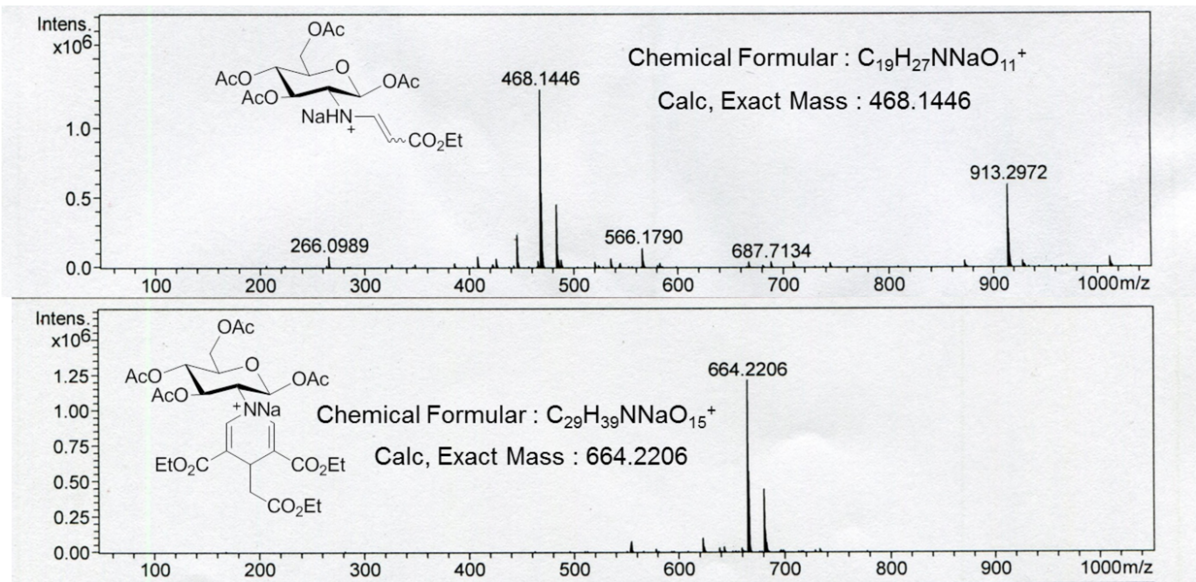

**S3.** The [1]H NMR of glucopyranosyl-1,4-dihydropiridine (Glc-DHP) in $CDCl_3$.



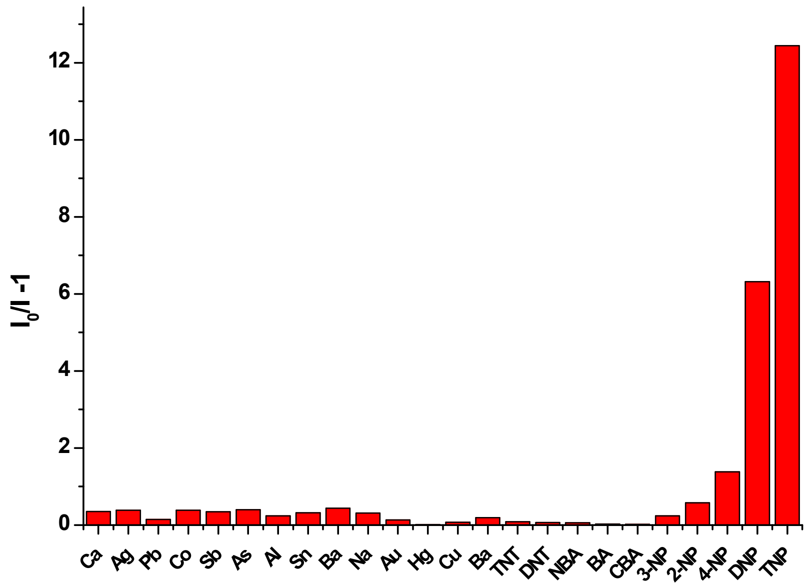

**S4.** The [13]C NMR ethyl β-amino acrylate **2** in $CDCl_3$.



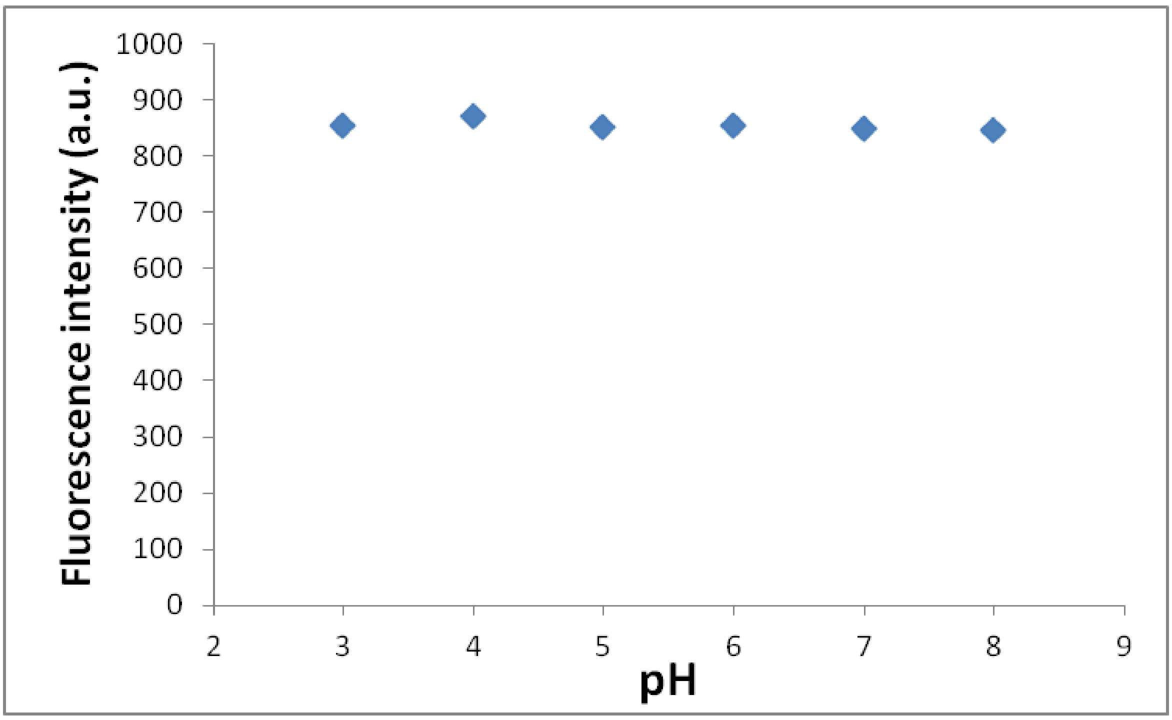
**S5.** The $^{13}C$ NMR of glucopyranosyl-1,4-dihydropiridine (Glc-DHP) in $CDCl_3$.



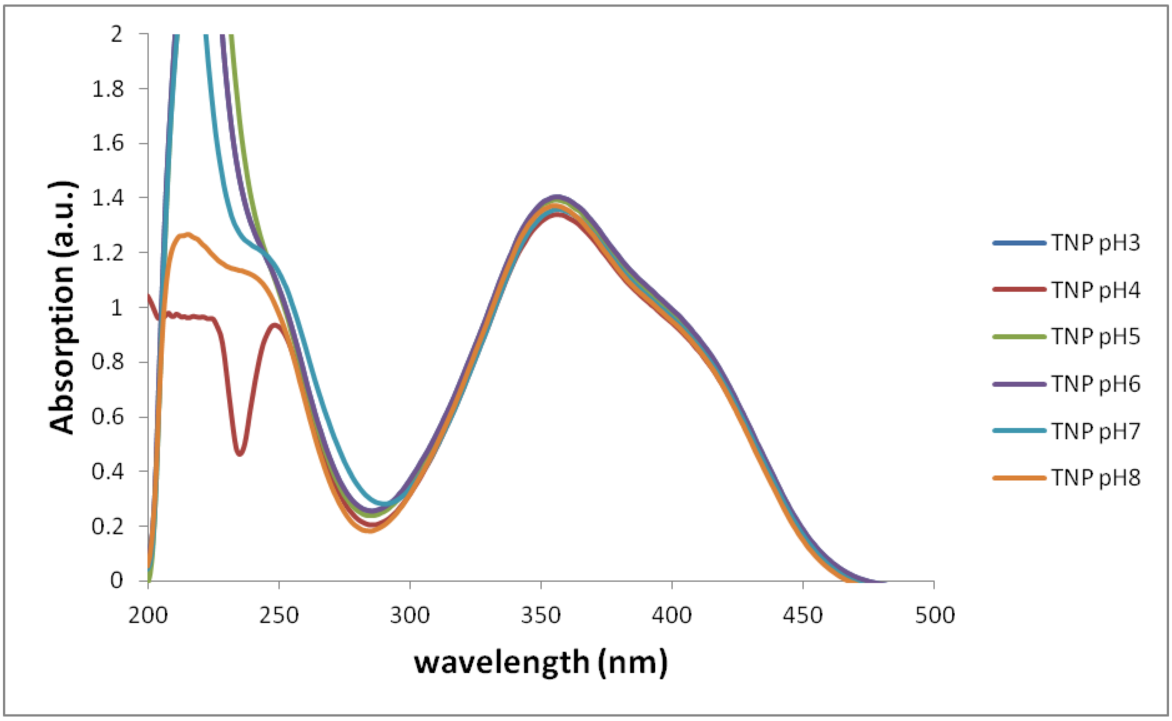

**S6.** The HRMS of ethyl β-amino acrylate **2** and glucopyranosyl-1,4-dihydropiridine (Glc-DHP).



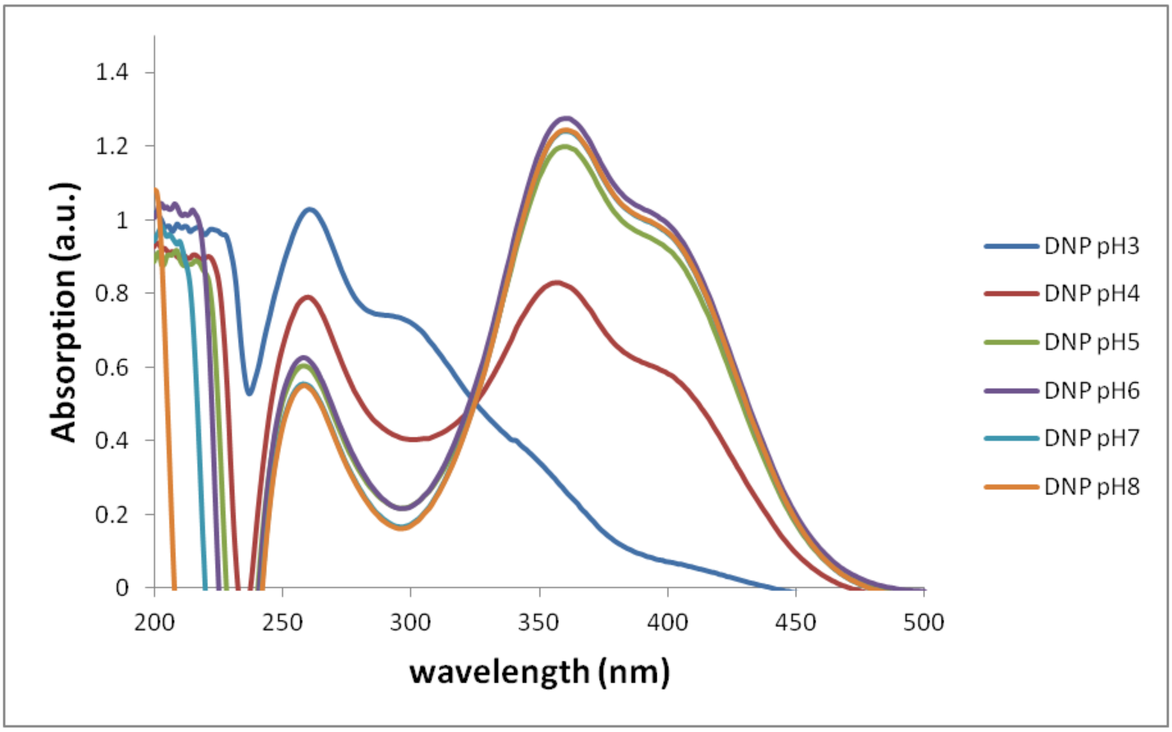

**S7.** Fluorescence quenching effects of 14 metal ions ($Ca^{2+}$, $Ag^{+}$, $Pb^{2+}$, $Co^{2+}$, $Sb^{5+}$, $As^{3+}$, $Al^{3+}$, $Sn^{2+}$, $Ba^{2+}$, $Na^{+}$, $Au^{+}$, $Hg^{2+}$, $Cu^{2+}$, $Ba^{+}$) and 10 electron deficient aromatic compounds (TNT, DNT, NBA, BA, CBA, 3-NP, 2-NP, 4-NP, DNP, TNP) (100μM) on the fluorophores (1 μM) in aqueous solution.



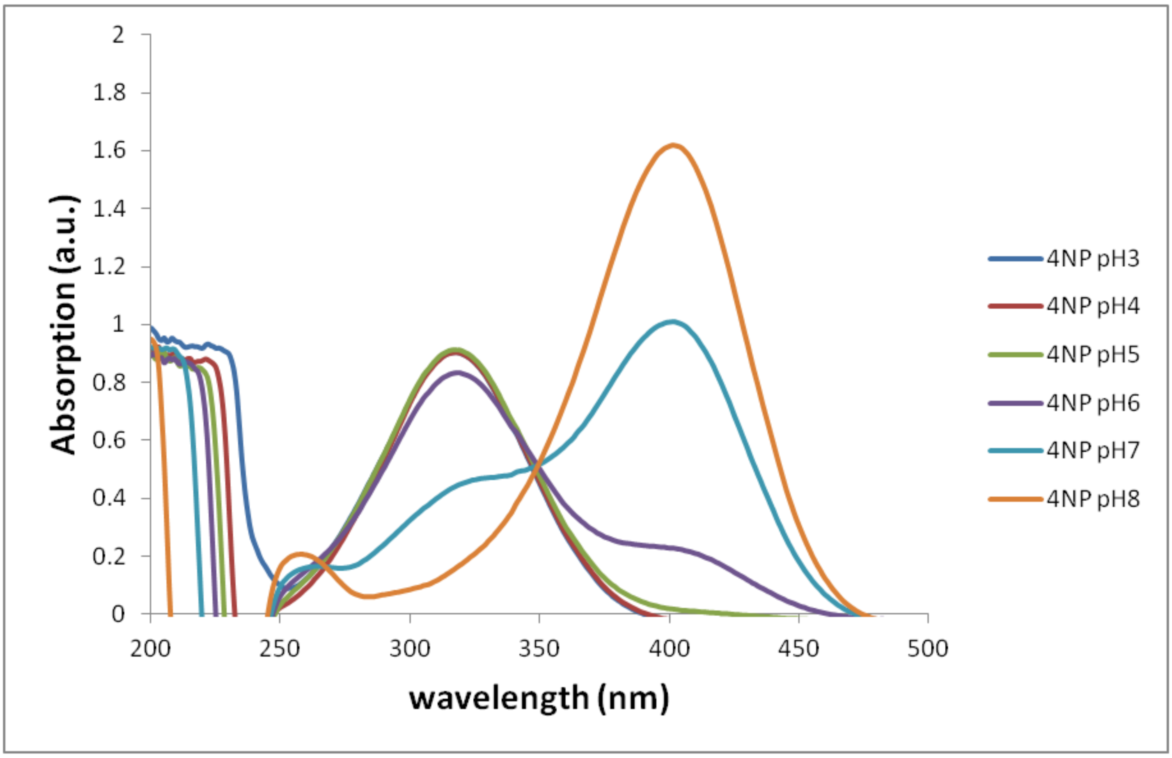

**S8.** Fluorescence intensity of Glc-DHP 1 μM at $\lambda_{max}$ = 450 nm in various pHs.



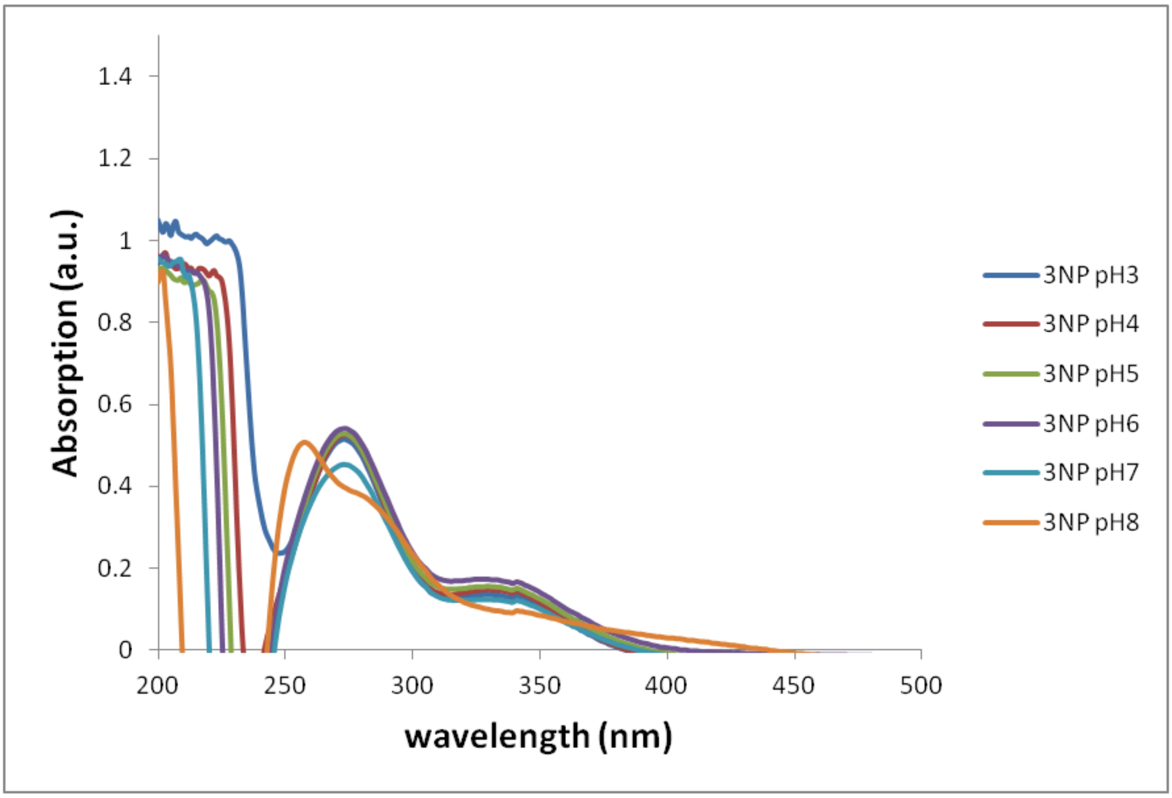

**S9.** Absorption spectra of TNP in various pHs.



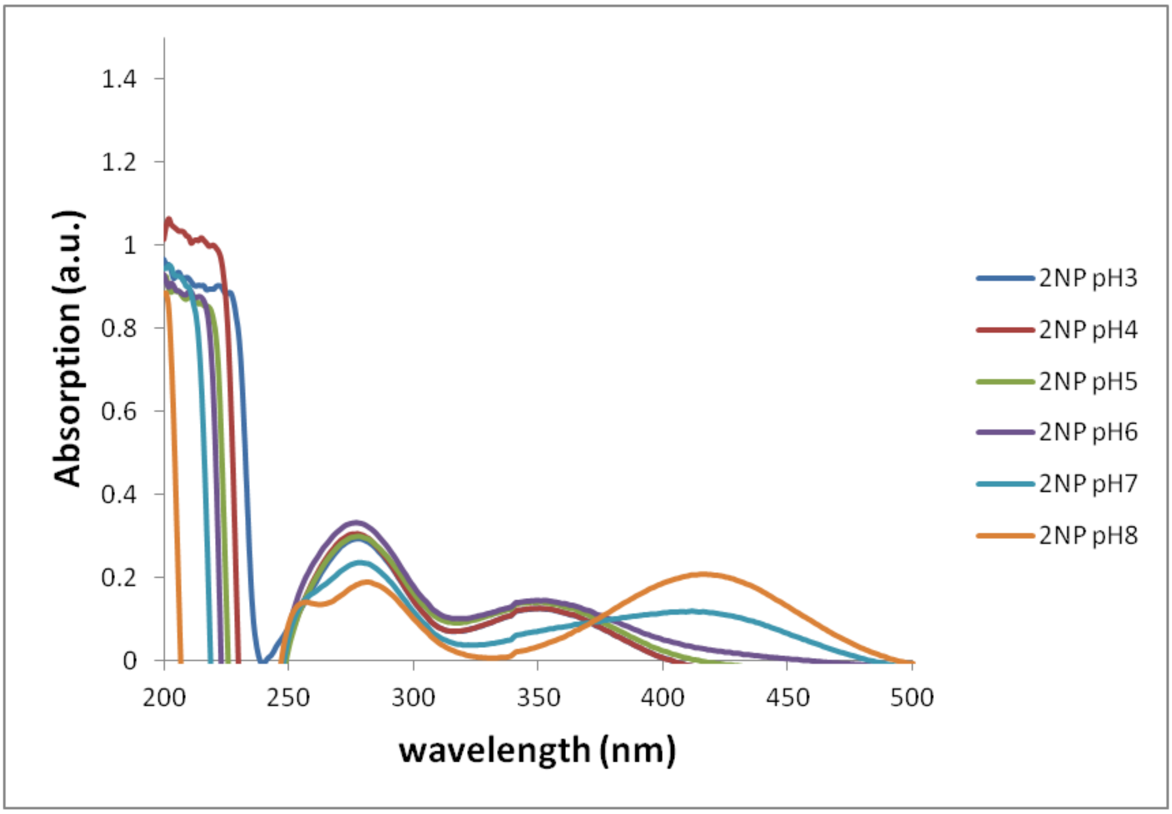

**S10.** Absorption spectra of DNP in various pHs.




**S11.** Absorption spectra of 4NP in various pHs.




**S12.** Absorption spectra of 3NP in various pHs.




**S13.** Absorption spectra of 2NP in various pHs.

**S14.** Calculation of the critical distance ($R_0$) between fluorescent donor (Glc-DHP) and acceptor (TNP) when the efficiency of transfer = 50%

According to the Förster theory, the efficiency of FRET between donor and acceptor also depends on the distance between the fluorescent donor and the acceptor, which is lower than 8 nm. The critical distance ($R_0$) between fluorescent donor (Glc-DHP) and acceptor (TNP) when the efficiency of transfer = 50% was estimated by the calculation using the following equation (eq. [5]).

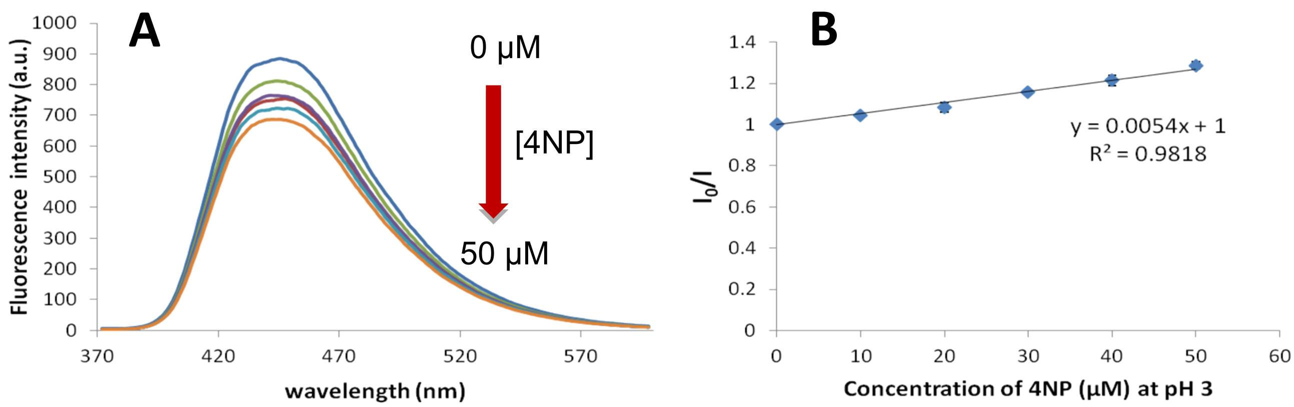
$$R_0^6 = 8.79 \times 10^{-25} K^2 N^{-4} \Phi J \tag{5}$$

In eq. [5], $K^2$ is the orientation related to the dipole geometry of the donor and the acceptor and $K^2$ = 2/3 for random orientation as in fluid solution; $N$ is the average refracted index of medium in the wavelength range where spectral overlap is significant; Φ is the fluorescence quantum yield of the donor; $J$ is the effect of the spectral overlap between the emission spectrum of the donor and the absorption spectrum of the acceptor, which could be calculated by the eq. [6]:

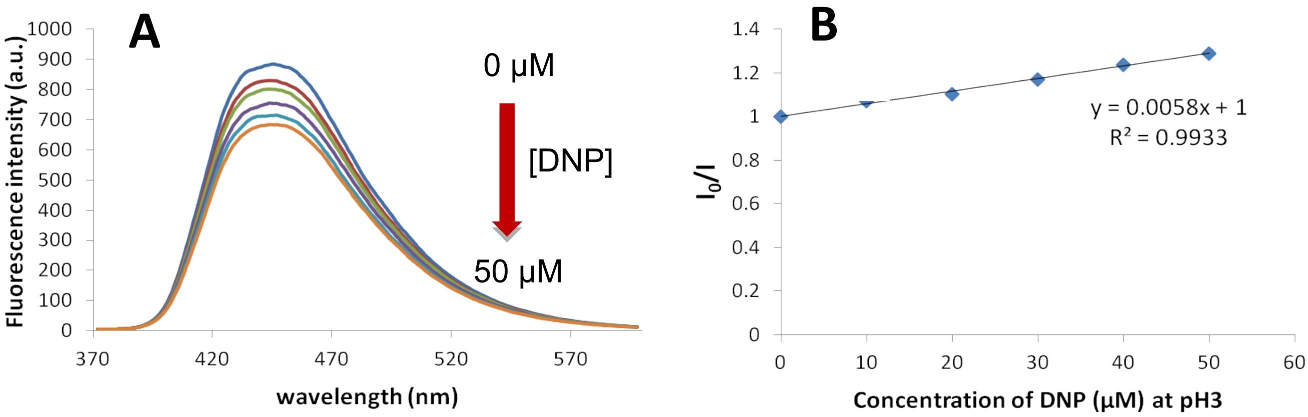
$$J = \frac{\int_0^\infty F(\lambda)\varepsilon(\lambda)\lambda^4 d\lambda}{\int_0^\infty F(\lambda) d\lambda} \qquad [6]$$

where $F(\lambda)$ is the corrected fluorescence intensity of the donor in the wavelength range, from $\lambda$ to $\lambda + \Delta\lambda$; $\varepsilon(\lambda)$ is the extinction coefficient of the acceptor at $\lambda$.

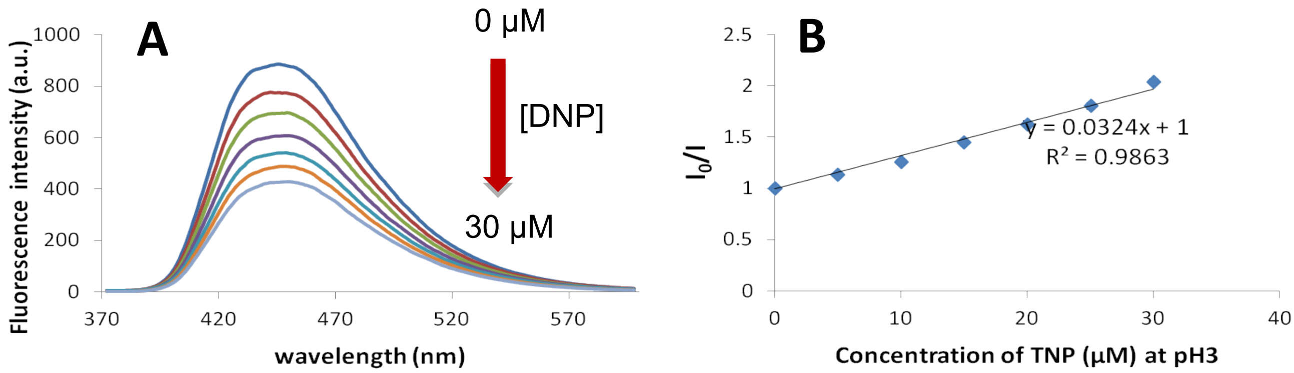
In the present case, $N = 1.33$, $\Phi = 0.29$ for Glc-DHP, according to eqs. [5]–[6], $J = 1.3264\times10^{-15}$ cm$^3$ Lmol$^{-1}$ and $R_0 = 2.039$ nm could be determined. The critical average distance between a donor fluorophore and acceptor when the efficiency of transfer = 50% are 2-8 nm, which indicate that the energy transfer from Glc-DHP to TNP occurs with high probability.



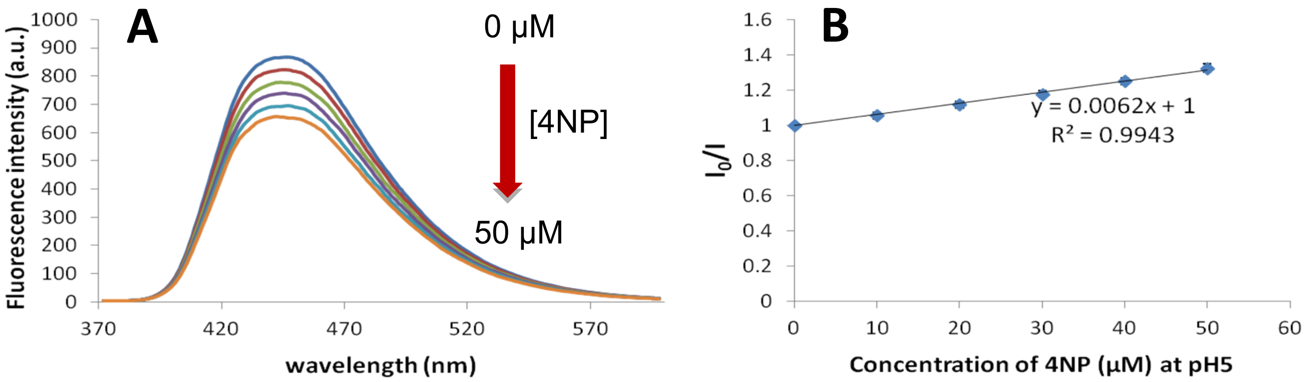

**S15.** (A) Change in fluorescence spectra of Glc-DHP (1 µM) with the addition of 4NP at pH 3. (B) Stern-Volmer plot in response to 4NP at pH 3.



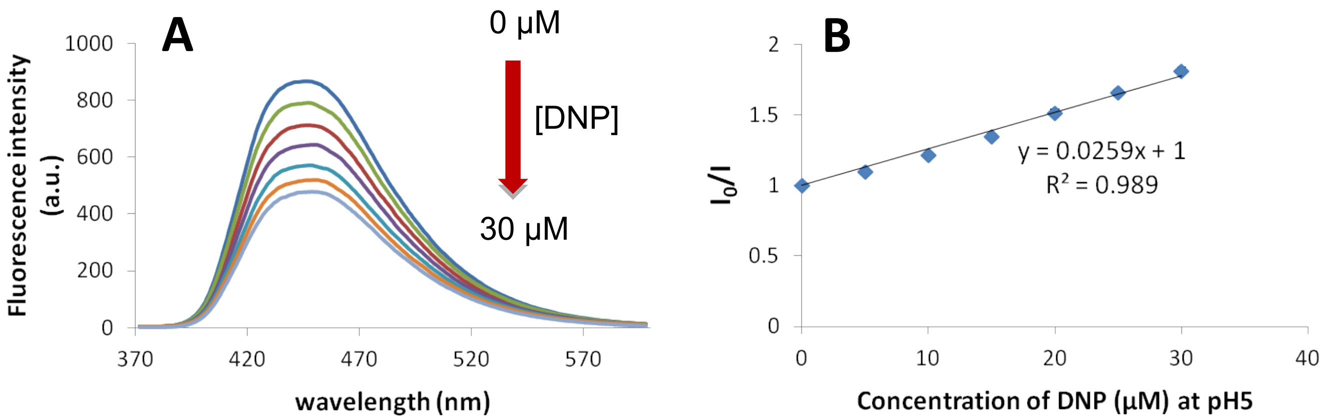

**S16.** (A) Change in fluorescence spectra of Glc-DHP (1 µM) with the addition of DNP at pH 3. (B) Stern-Volmer plot in response to DNP at pH 3.



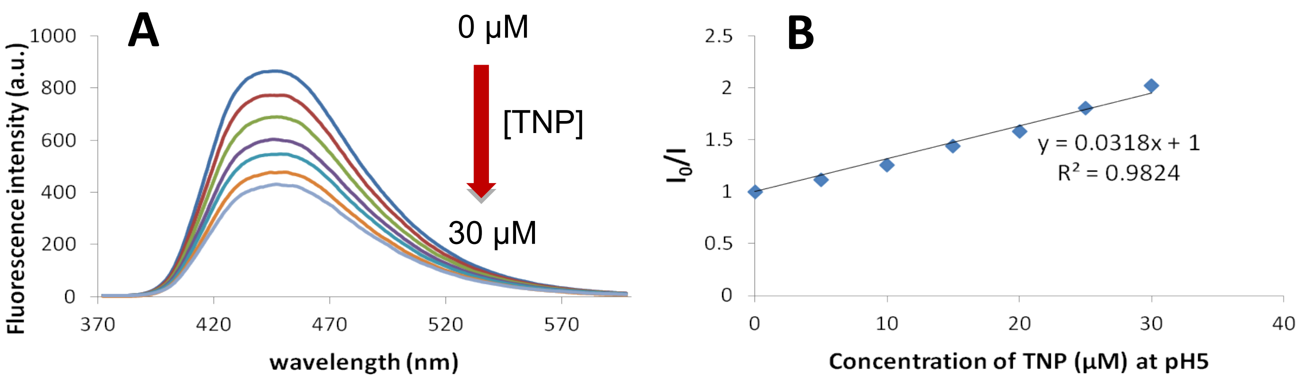

**S17.** (A) Change in fluorescence spectra of Glc-DHP (1 μM) with the addition of TNP at pH 3. (B) Stern-Volmer plot in response to TNP at pH 3.



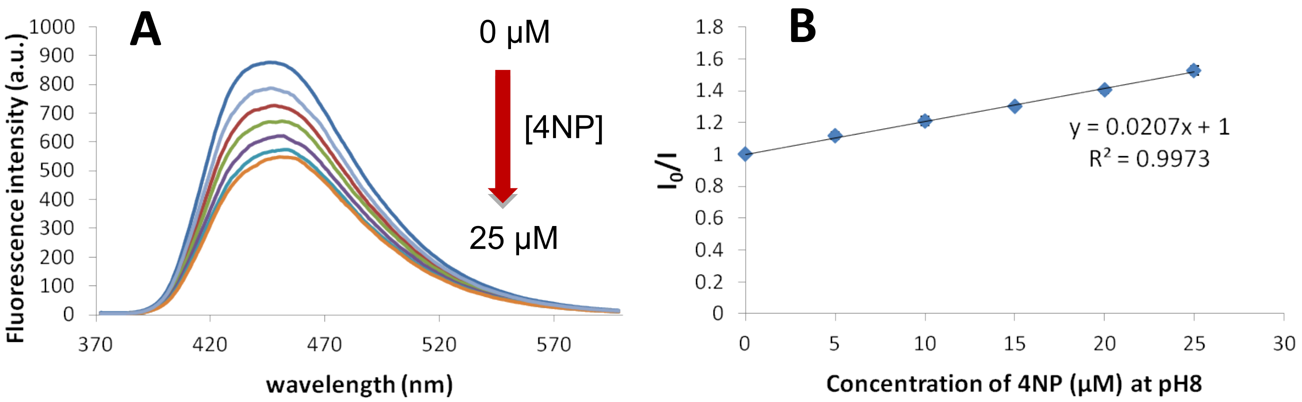

**S18.** (A) Change in fluorescence spectra of Glc-DHP (1 μM) with the addition of 4NP at pH 5. (B) Stern-Volmer plot in response to 4NP at pH 5.



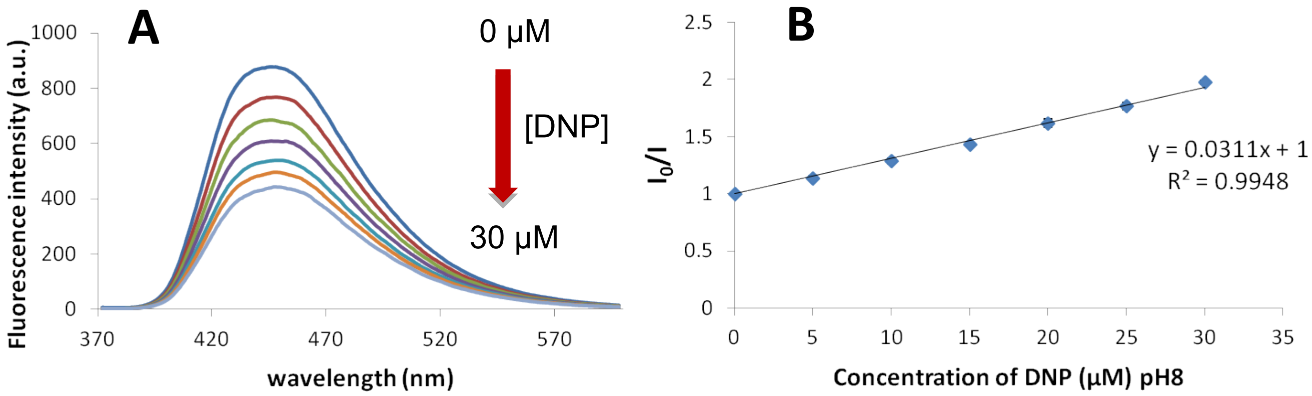
**S19.** (A) Change in fluorescence spectra of Glc-DHP (1 μM) with the addition of DNP at pH 5. (B) Stern-Volmer plot in response to DNP at pH 5.



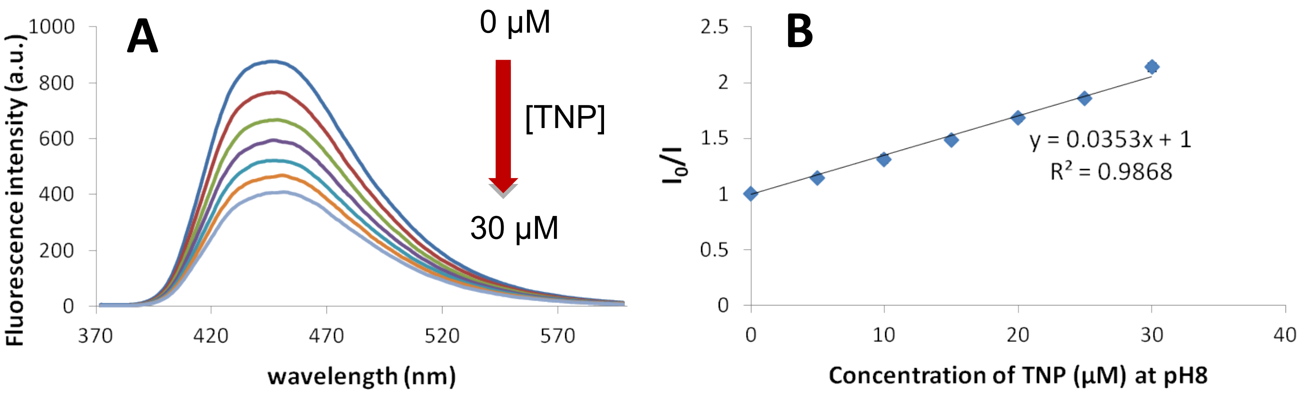

**S20.** (A) Change in fluorescence spectra of Glc-DHP (1 μM) with the addition of TNP at pH 5. (B) Stern-Volmer plot in response to TNP at pH 5.



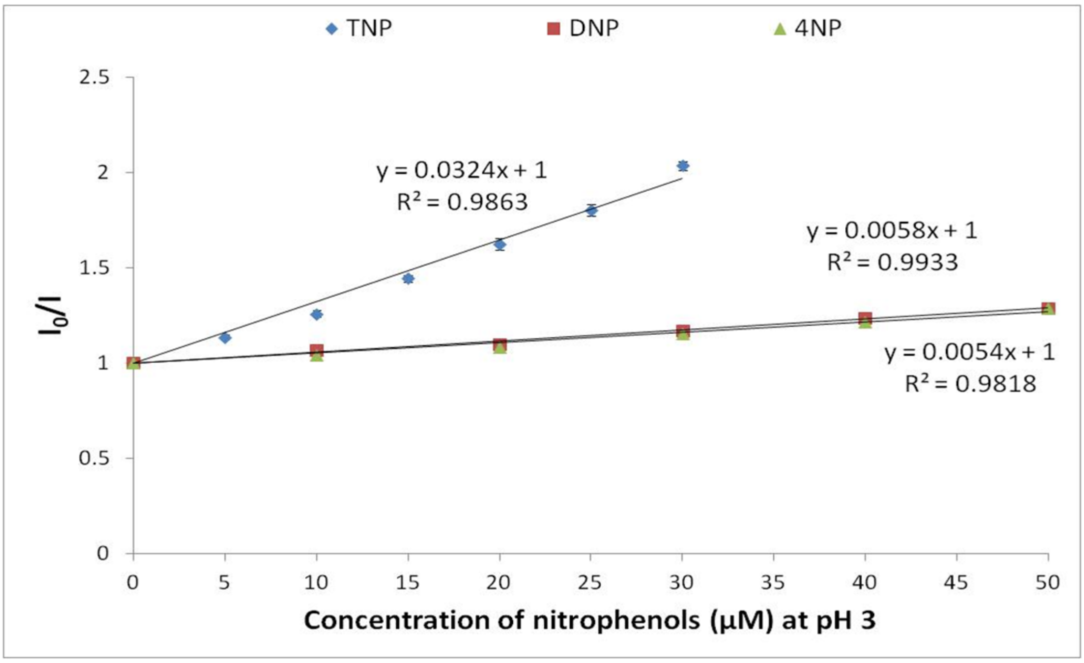

**S21.** (A) Change in fluorescence spectra of Glc-DHP (1 μM) with the addition of 4NP at pH 8. (B) Stern-Volmer plot in response to 4NP at pH 8.



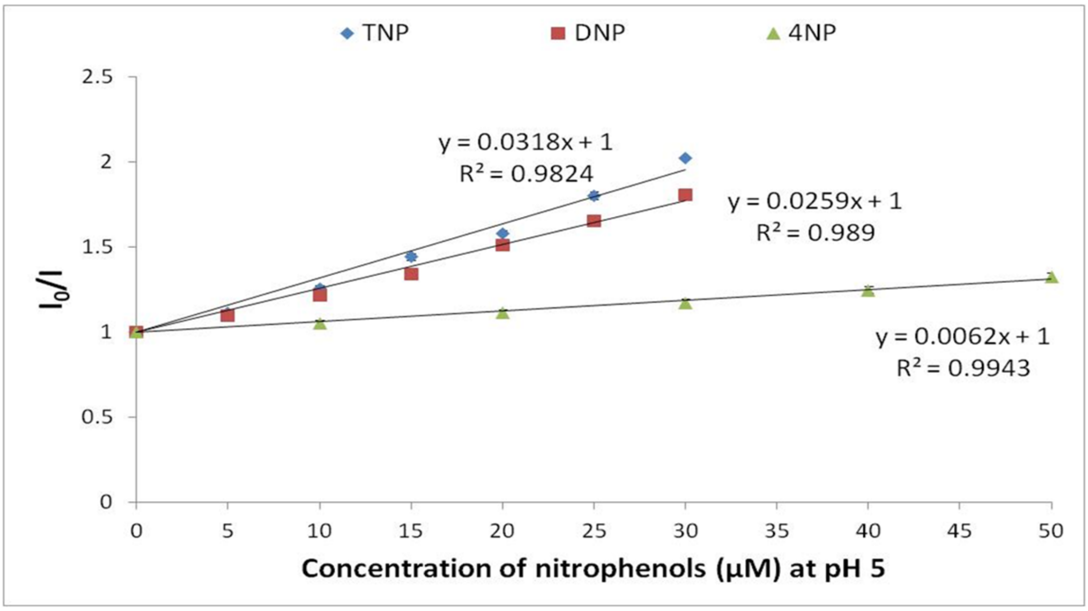
**S22.** (A) Change in fluorescence spectra of Glc-DHP (1 μM) with the addition of DNP at pH 8. (B) Stern-Volmer plot in response to DNP at pH 8.



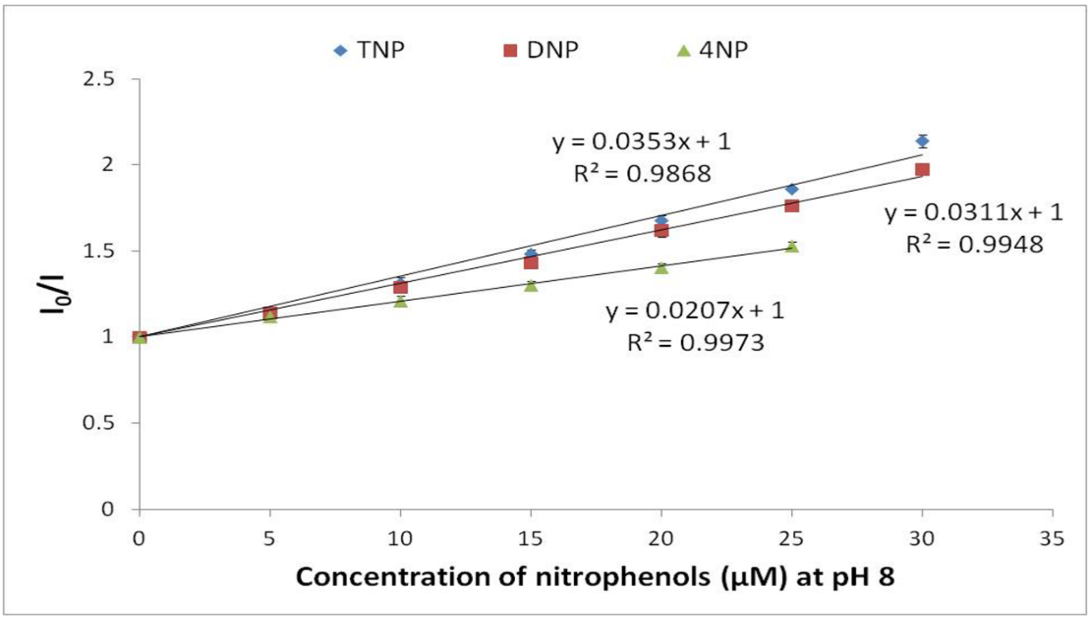

**S23.** (A) Change in fluorescence spectra of Glc-DHP (1 μM) with the addition of TNP at pH 8. (B) Stern-Volmer plot in response to TNP at pH 8.



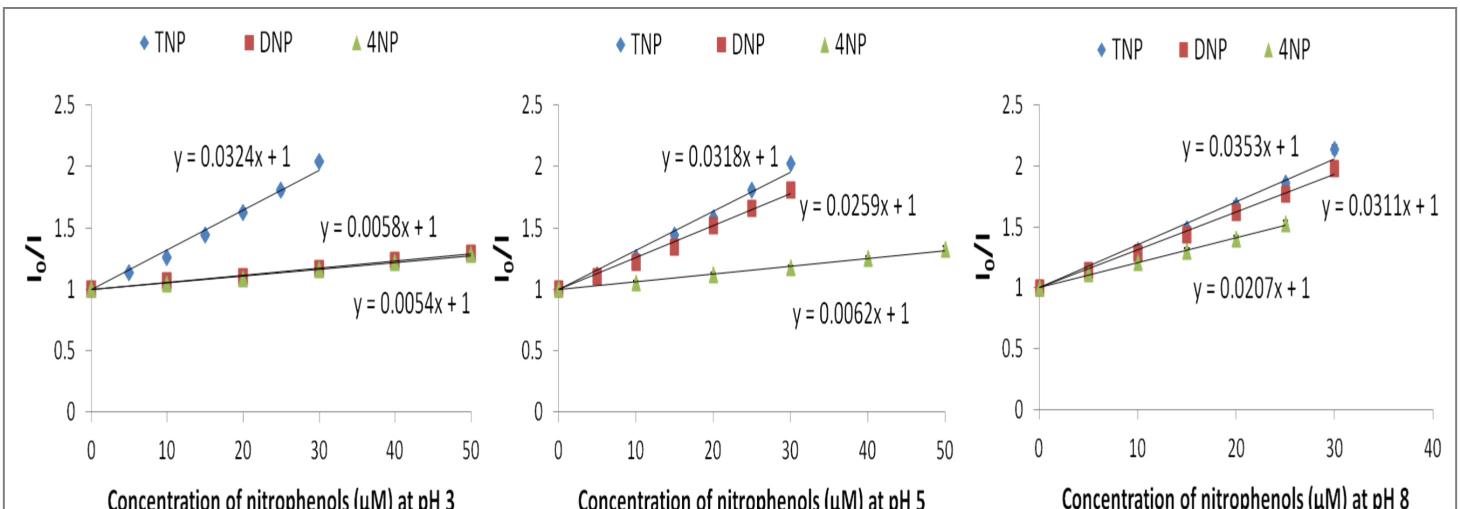

**S24.** Stern-Volmer plot in response to various NPs at pH 3.




**S25.** Stern-Volmer plot in response to various NPs at pH 5.




**S26.** Stern-Volmer plot in response to various NPs at pH 8.



**S27.** Stern-Volmer plot in response to various NPs at pH 3, 5, 8.