

Fig. S1: Spectrum obtained by TRES global analysis for the short-lived component in solutions of (a)  $\text{H}_2\text{Nep}$  (17  $\mu\text{M}$ , pH = 7.0,  $\lambda_{\text{exc}}$  = 341 nm) and (b)  $\text{H}_2\text{Hmp}$  (9.4  $\mu\text{M}$ , pH = 6.0,  $\lambda_{\text{exc}}$  = 341 nm). Insets: comparison between the spectra obtained by TRES global analysis for the longer-lived component in solutions of (a)  $\text{H}_2\text{Nep}$  or (b)  $\text{H}_2\text{Hmp}$  (black solid lines) and the unique species detected in TRES global analysis of (a) Nep or (b) Hmp solutions (red dashed lines).

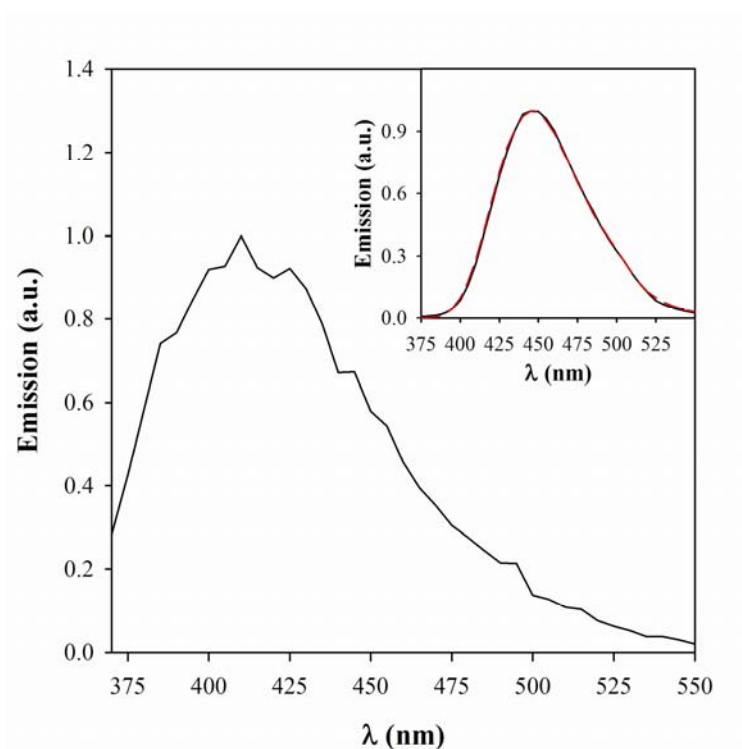


Fig. S2: Spectrum obtained by TRES global analysis for the short-lived component in solutions of H<sub>2</sub>Mep (24  $\mu$ M, pH = 6.0,  $\lambda_{exc}$  = 341 nm). Inset: comparison between the spectra obtained by TRES global analysis for the longer-lived component in solutions of H<sub>2</sub>Mep (black solid line) and the unique species detected in TRES global analysis of Mep solutions (red dashed line).<sup>23</sup>