

Electronic Supplementary Information for
Fluorescence Ratiometric Zinc Sensors Based on Controlled
Energy Transfer

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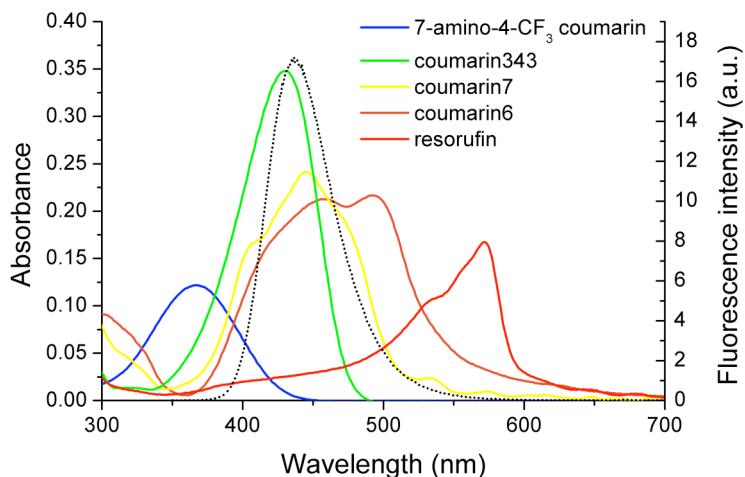


Figure S1. UV-visible absorption spectra of the energy acceptors (resorufin, coumarin6, coumarin7, 7-amino-4-(trifluoromethyl)coumarin, and coumarin343) and fluorescence spectrum (dotted line; $\lambda_{\text{ex}} = 336$ nm) of the zinc-bound CM1. 10 μM solutions in pH 7.0 buffer (25 mM PIPES) were used for measurements at 25 °C.

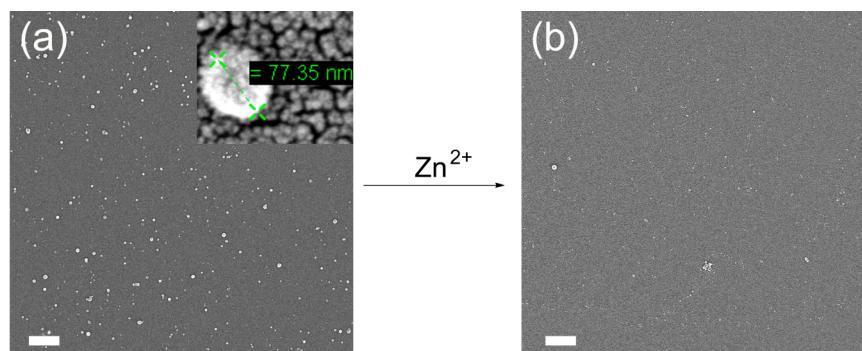


Figure S2. FE-SEM images of HN1 nanoparticles in the absence (a) and presence (b) of ZnCl_2 (1 equiv). 3 μL of a 10 mM HN1 stock solution (DMSO) was injected to 3 mL of milli-Q water in the presence or absence of ZnCl_2 , and the solution was thoroughly mixed. An aliquot of the solution was placed onto a precleaned SiO_2 wafer and left under an ambient condition for slow evaporation of water. The HN1 nanoparticles on the wafer were further dried under reduced pressure before measurements. Thin Pt layer was deposited onto the sample through a standard sputtering procedure. Images were acquired by employing a Carl Zeiss, AURIGA field-emission scanning electron microscope at 30 kV. The imaging experiment was performed in duplicate with a fresh sample. Scale bar = 1 μm .

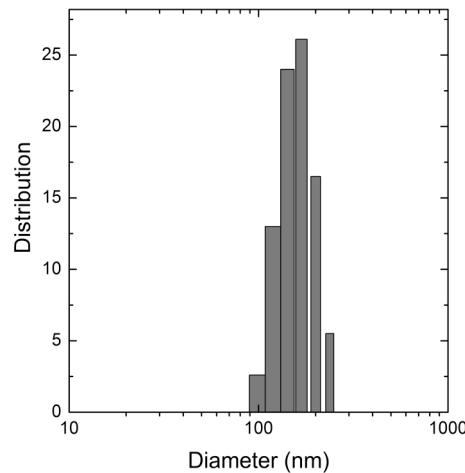


Figure S3. Dynamic light scattering (DLS) measurements of HN1 nanoparticles in the absence of zinc ions. Average diameter = 162 ± 34 nm. DLS data for HN1 nanoparticles in the presence of zinc ions were acquired but showed lack of particles in the range 10–1000 nm. HN1 solutions prepared by the identical method for FE-SEM experiments were used. 1 mL of the solution was taken for measurements. Dynamic light scattering experiments were performed on a DLS-7000 instrument (Otsuka Electronics) using an argon ion laser operating with vertically polarized light at $\lambda = 488$ nm. Analysis of particle diameters was performed with software provided by the manufacturer. Measurements were performed in triplicate with fresh samples.

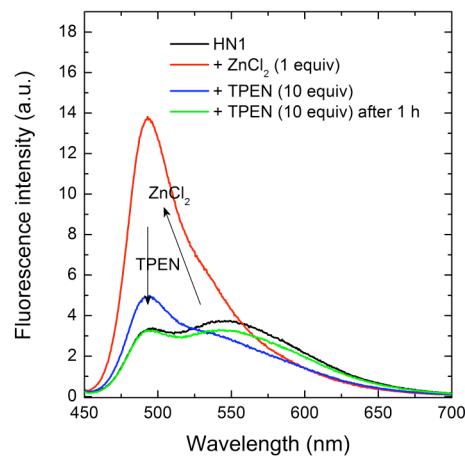


Figure S4. Reversible fluorescent zinc response of HN1. 10 μ M solution in pH 7.0 buffer (25 mM PIPES) containing 17 vol % DMSO was excited at 443 nm.

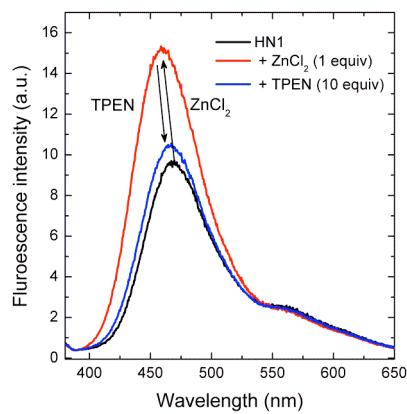


Figure S5. Reversible fluorescent zinc response of HN2. 10 μ M solution in pH 7.0 buffer (25 mM PIPES) containing 33 vol % CH₃CN was excited at 443 nm.

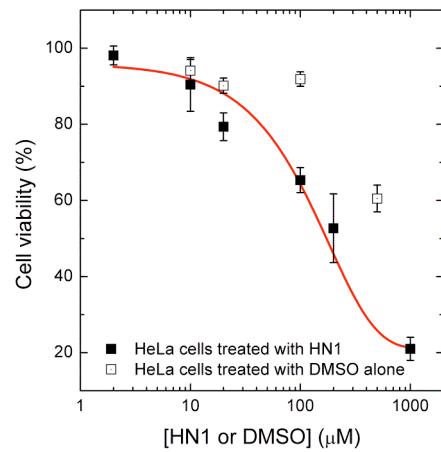


Figure S6. MTT assays for HeLa cells (24 h, 37 °C) treated with HN1. IC₅₀ = 178 μ M.

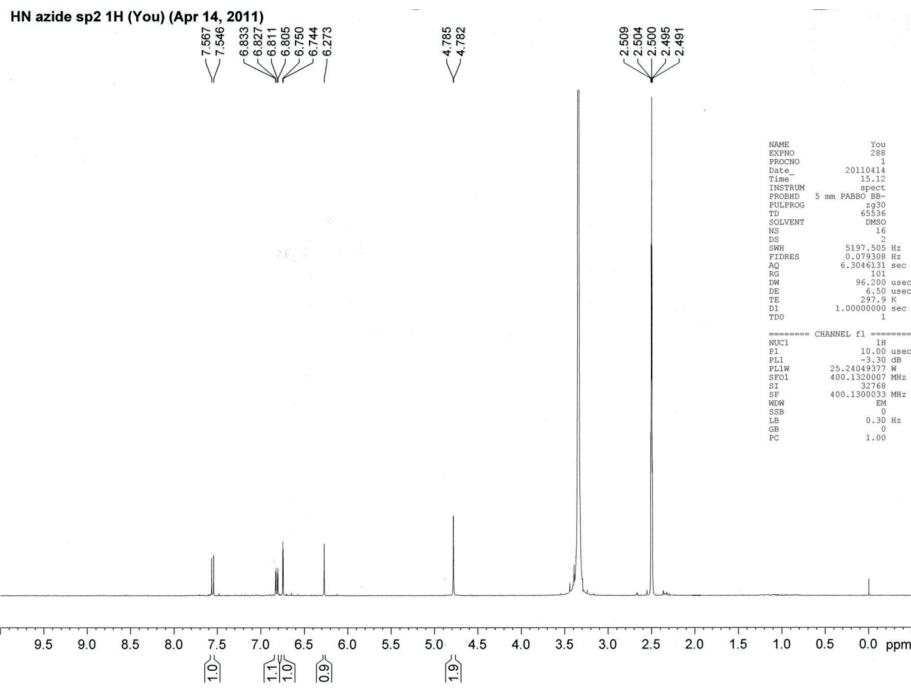


Figure S7. ^1H NMR spectrum of **3** (d_6 -DMSO, 400 MHz)

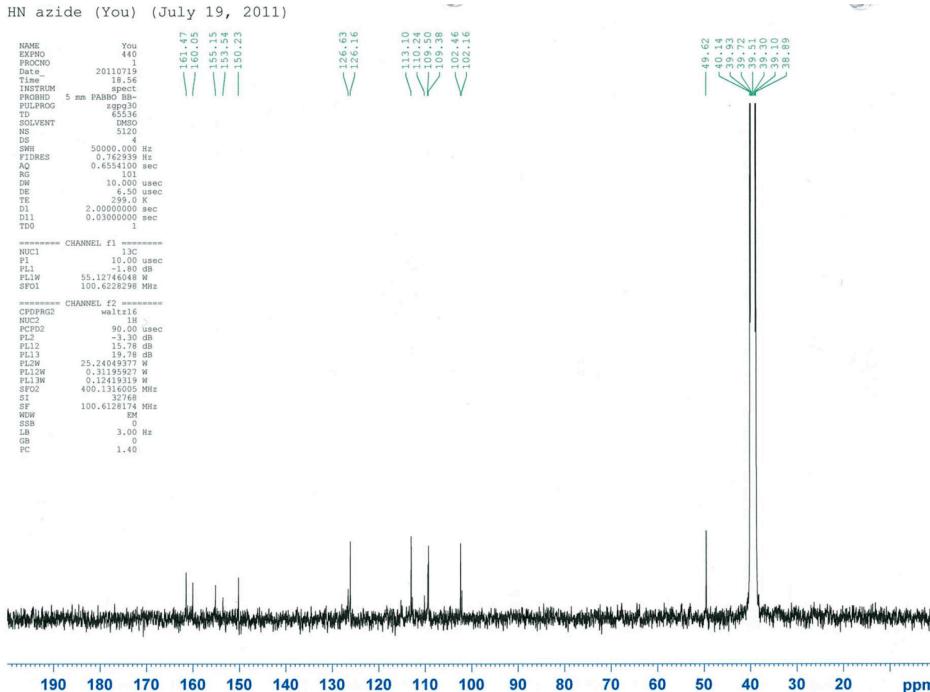


Figure S8. ^{13}C NMR spectrum of **3** (d_6 -DMSO, 100 MHz)

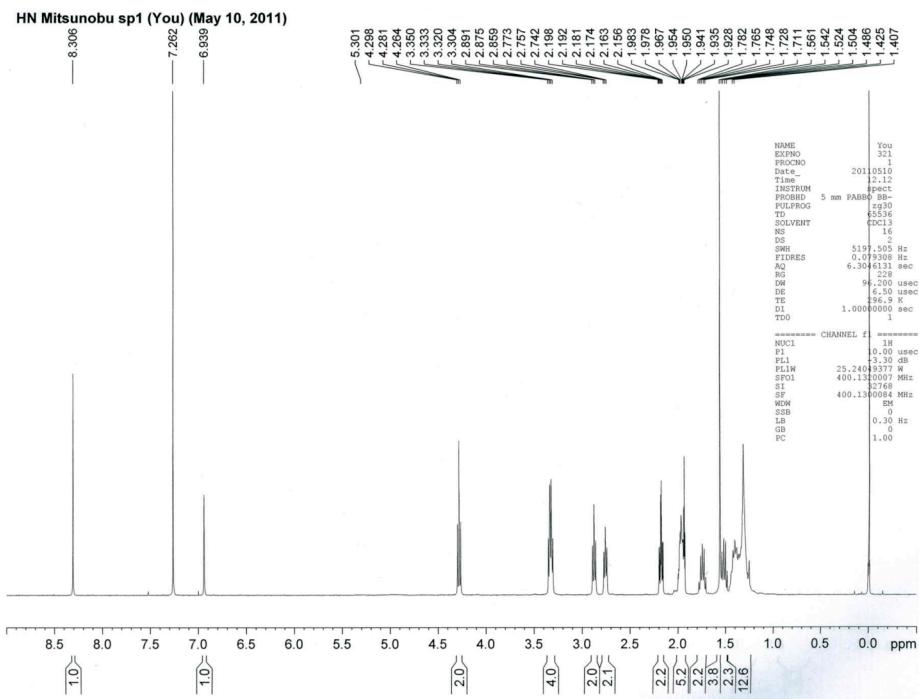


Figure S9. ^1H NMR spectrum of **4** (CDCl_3 , 400 MHz)

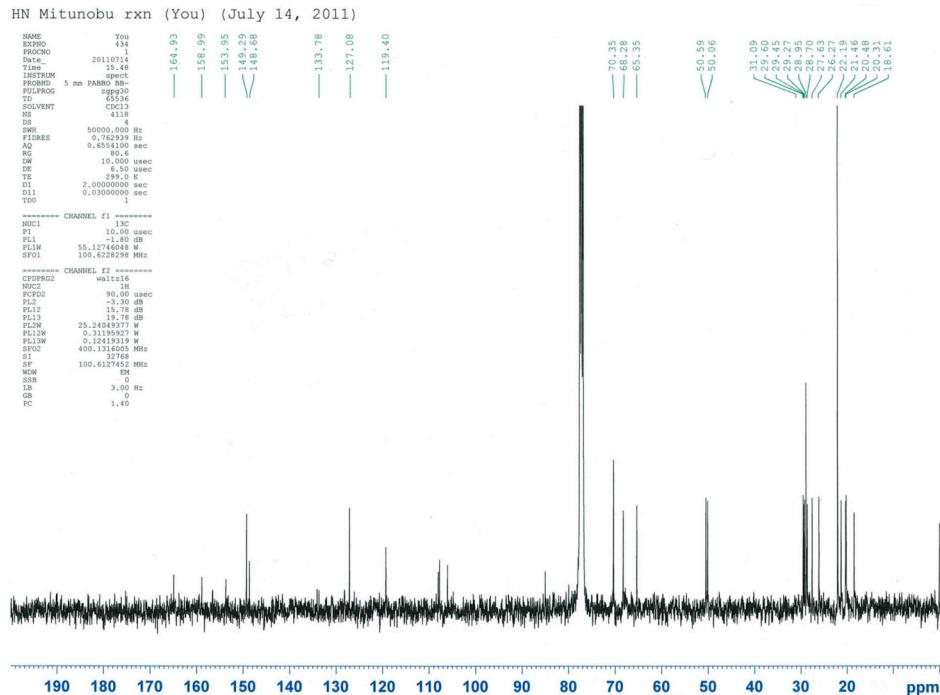


Figure S10. ^{13}C NMR spectrum of **4** (CDCl_3 , 100 MHz)

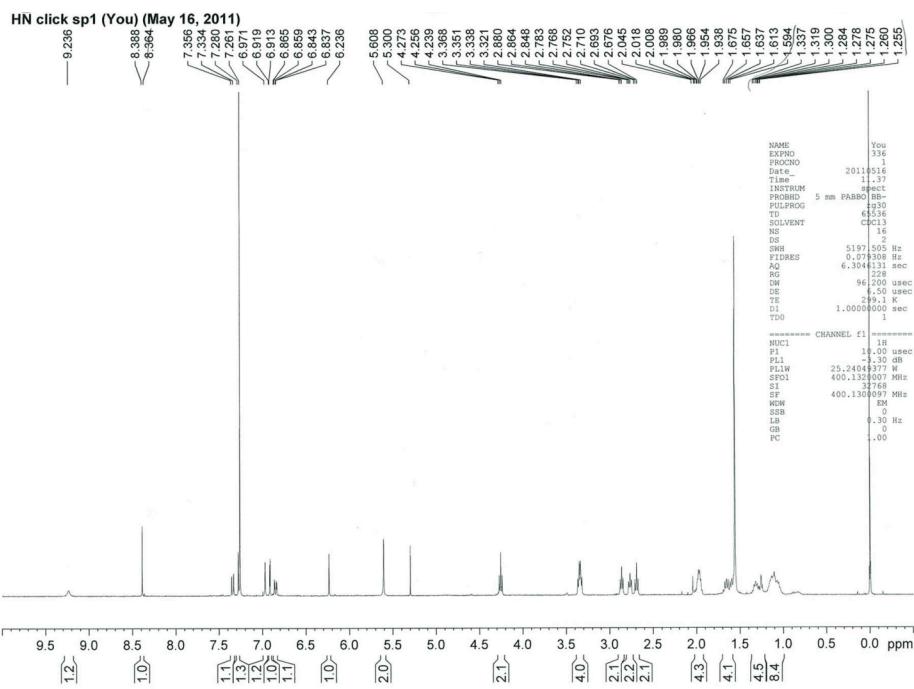
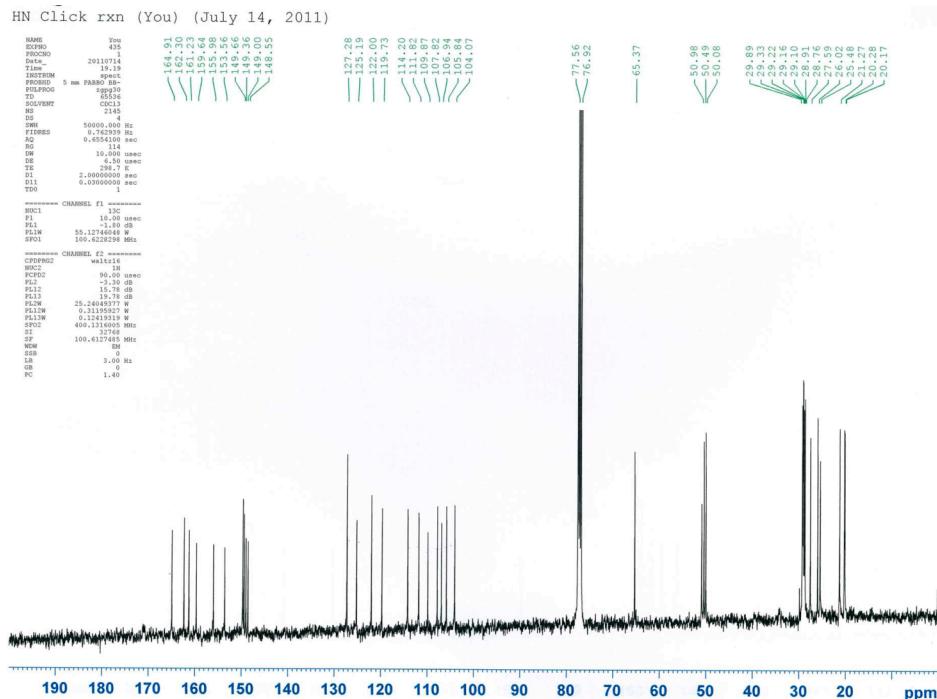


Figure S11. ^1H NMR spectrum of **5** (CDCl_3 , 400 MHz)



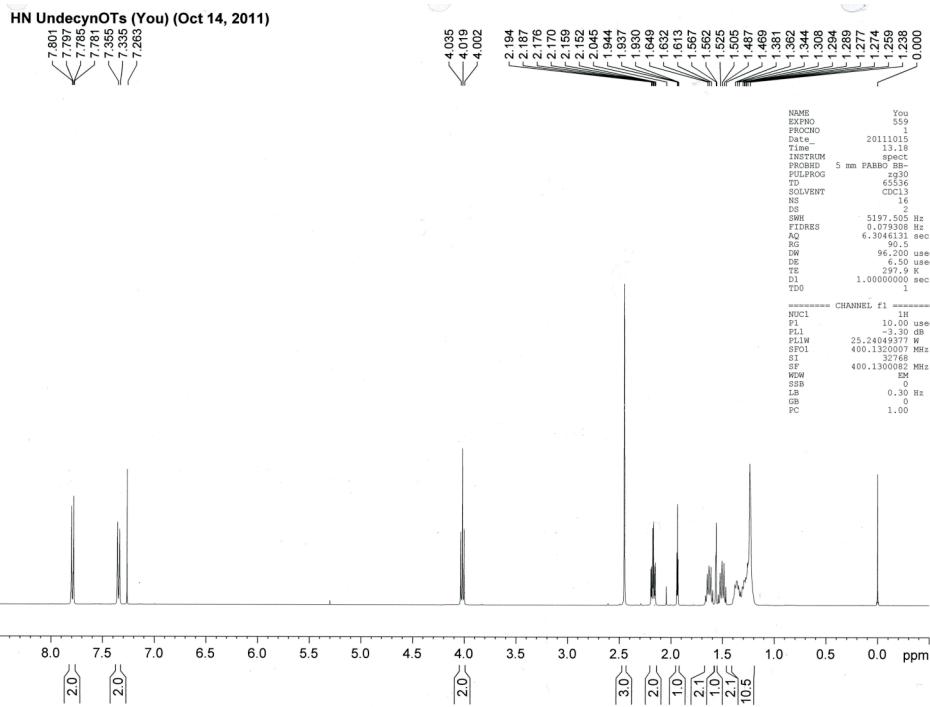


Figure S13. ^1H NMR spectrum of **6** (CDCl_3 , 400 MHz)

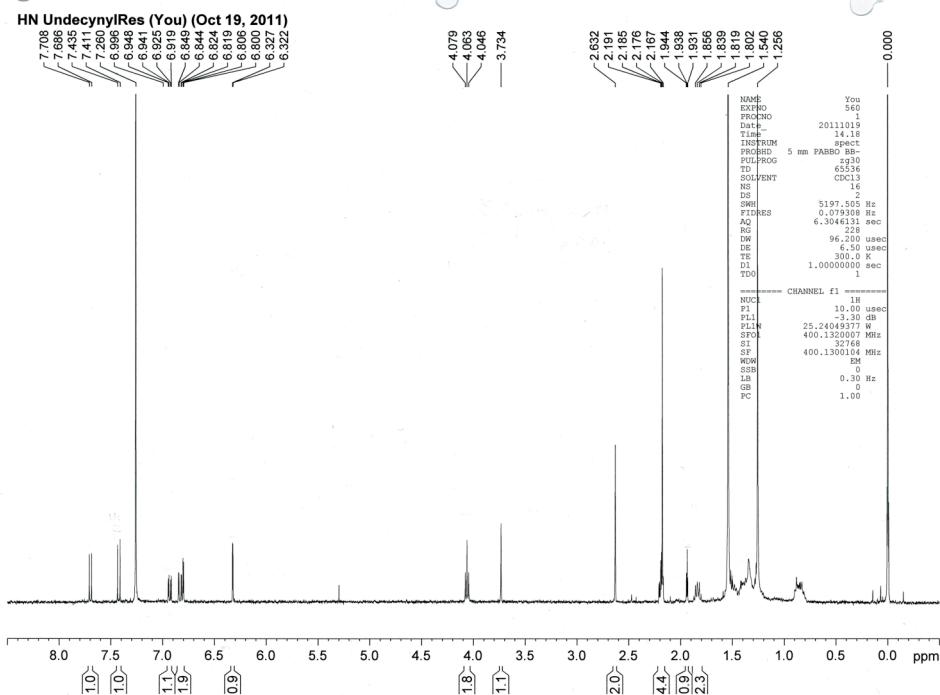


Figure S14. ^1H NMR spectrum of **7** (CDCl_3 , 400 MHz)

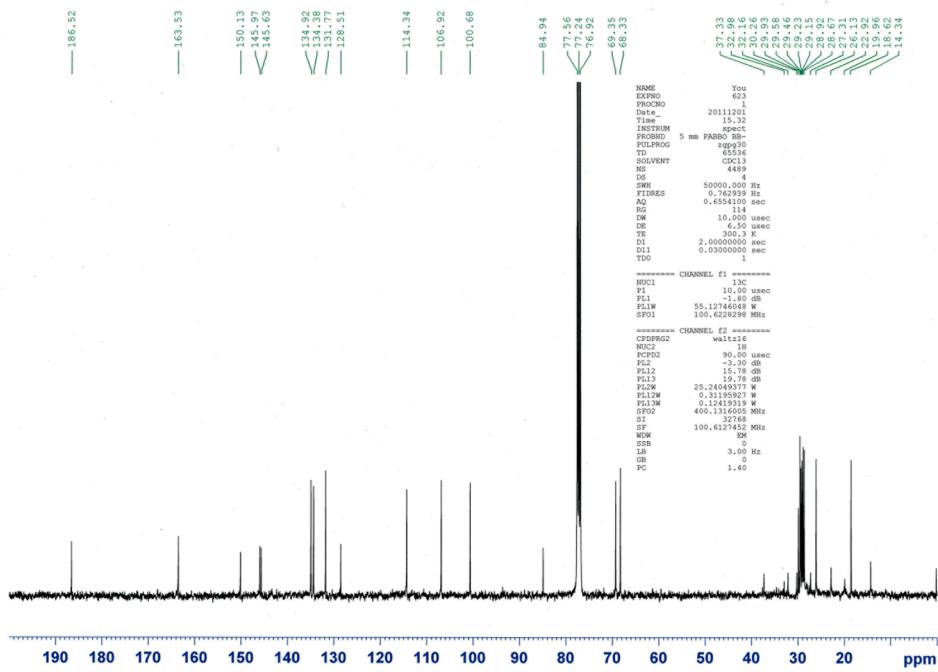


Figure S15. ^{13}C NMR spectrum of **7** (CDCl_3 , 100 MHz)

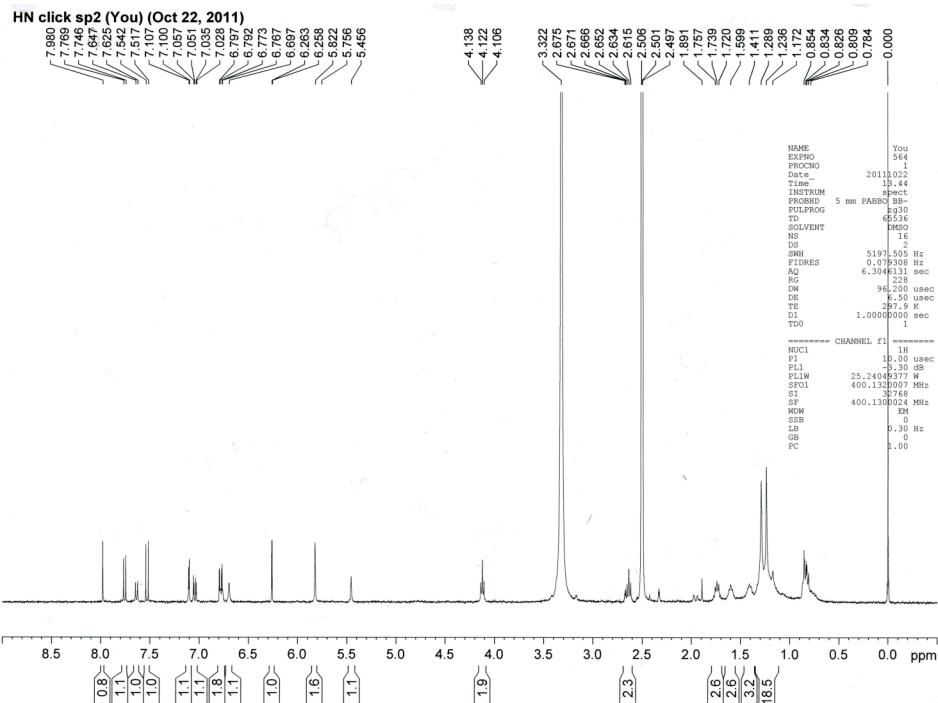


Figure S16. ^1H NMR spectrum of **8** (CDCl_3 , 400 MHz)

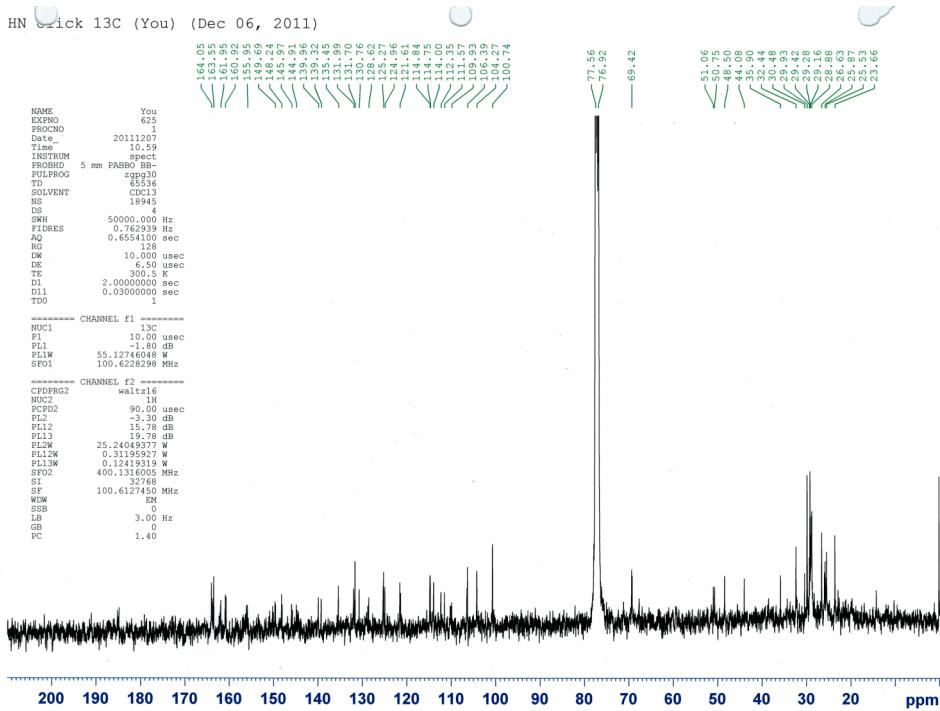


Figure S17. ^{13}C NMR spectrum of **8** (CDCl_3 , 100 MHz)

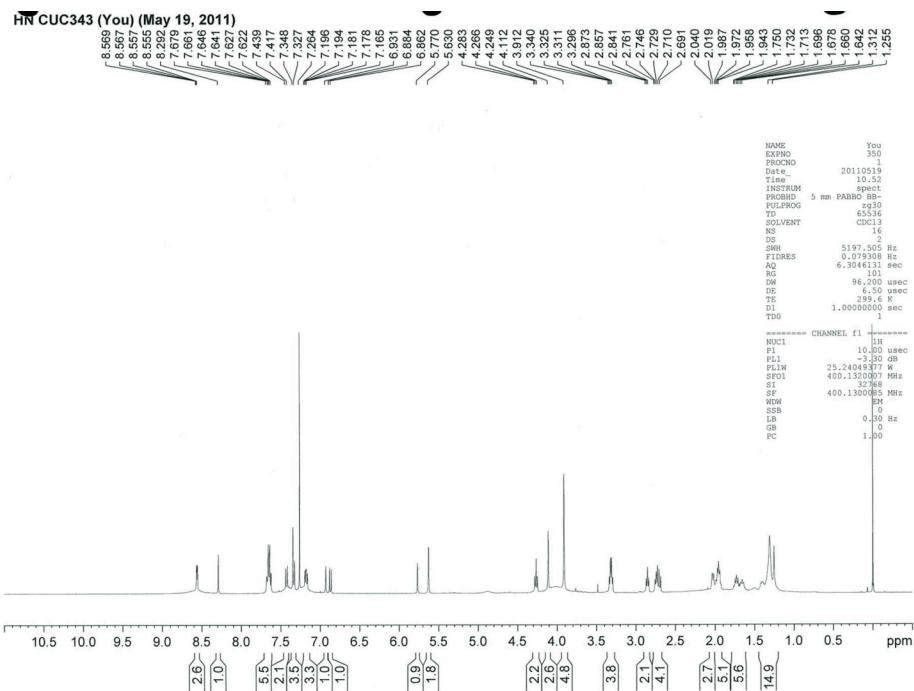


Figure S18. ^1H NMR spectrum of **HN1** (CDCl_3 , 400 MHz)

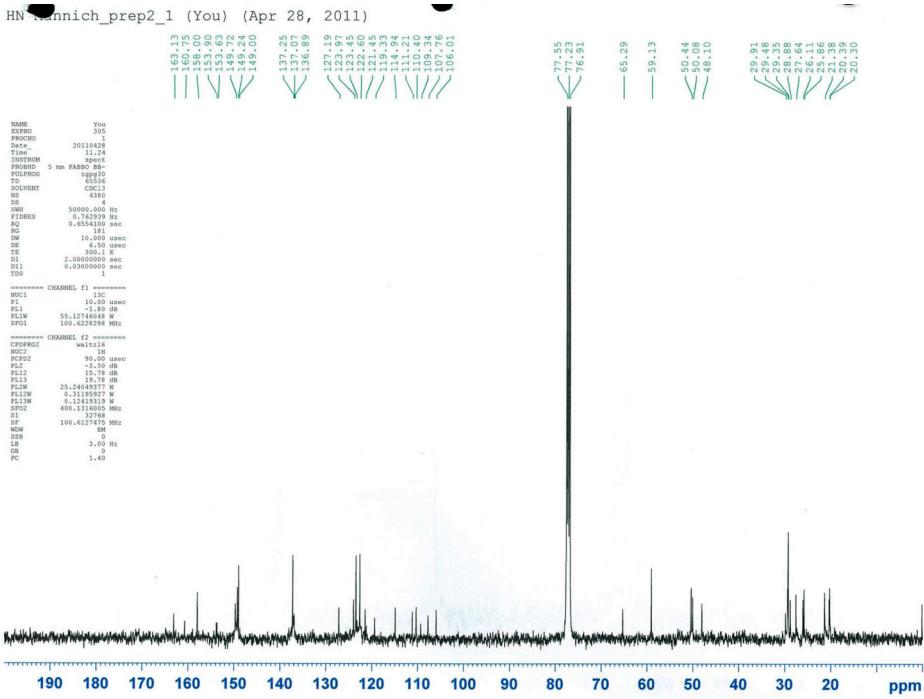


Figure S19. ^{13}C NMR spectrum of **HN1** (CDCl_3 , 100 MHz)

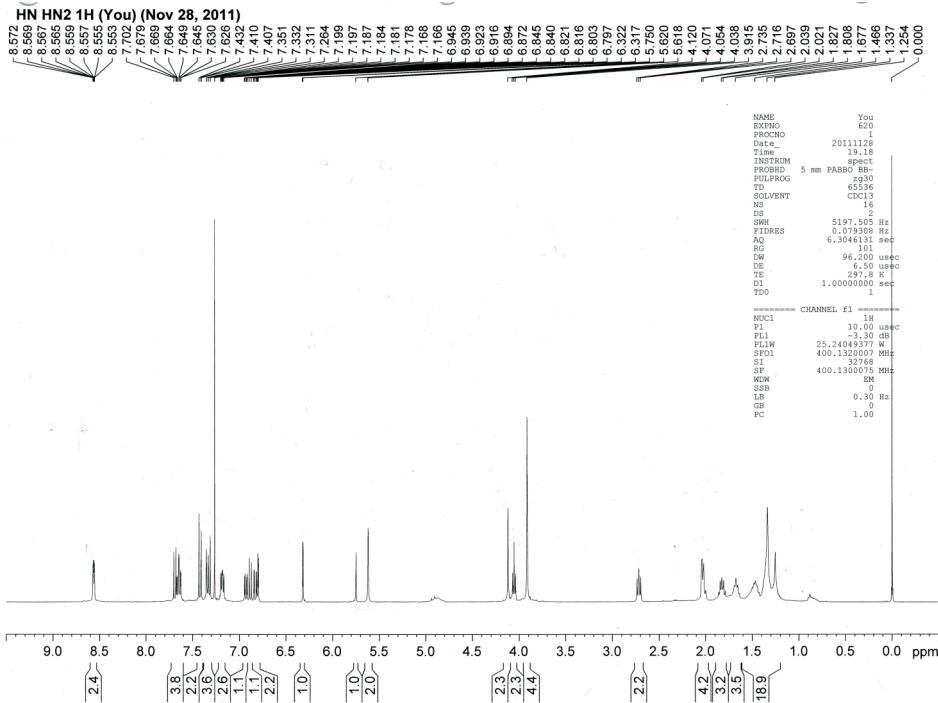


Figure S20. ^1H NMR spectrum of **HN2** (CDCl_3 , 400 MHz)

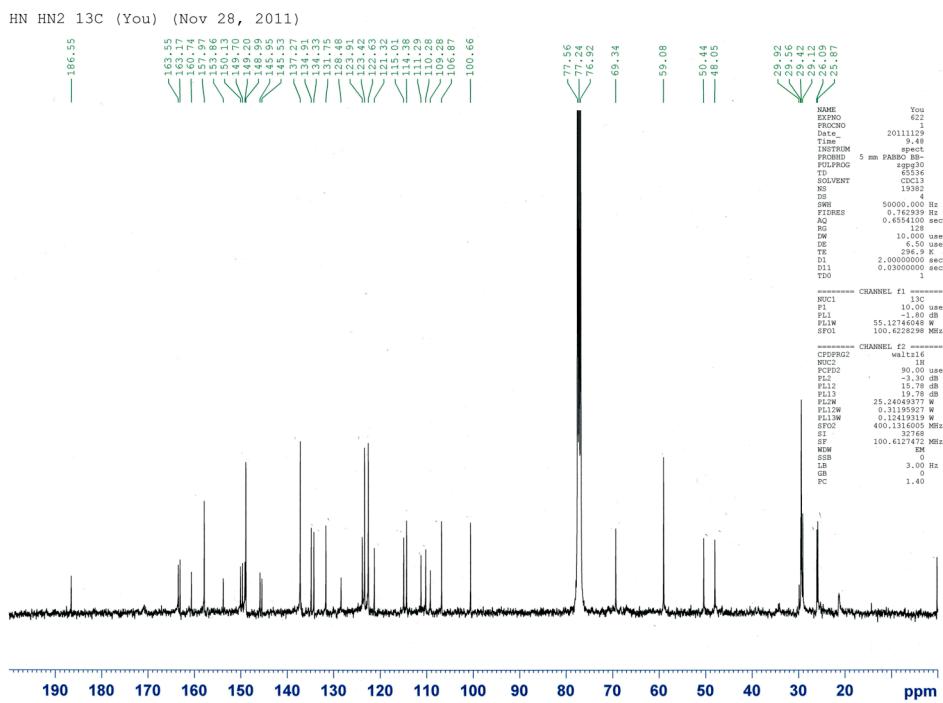


Figure S21. ^{13}C NMR spectrum of HN2 (CDCl_3 , 100 MHz)