Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B.

Supporting Information

Multicolour fluorescent carbon nanoparticle probes for live cell imaging cum dual palladium and mercury sensor

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Quantum yield calculations:

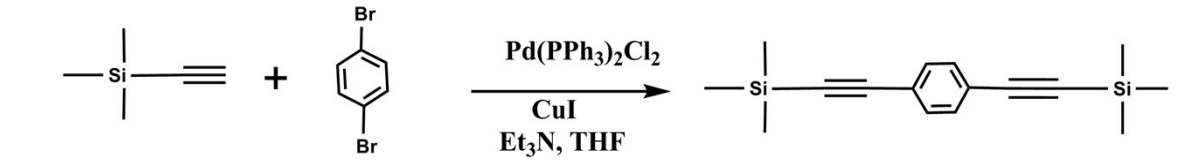
The quantum yield of **CNP** was calculated using quinine sulphate as a reference (QY= 54%). The fluorescence and absorbance values were compared. Quinine sulfate was dissolved in 0.1M H_2SO_4 (refractive index (***η***):1.33) , and the **CNP** were dissolved in deionized water (***η***: 1.33). Quantum yield was calculated using following formulae

$$\Phi=\Phi_r\,(S/S_r)\,(A_r/A)\,(\eta^2/\eta_r^2)$$

Here Φ is the quantum yield, S is the measured integrated emission intensity band area, η is the refractive index, and A is the optical density. The subscript *r* represents the reference fluorophore of known quantum yield.

Model sonogashira reaction

The sonogashira reaction was carried out as per scheme 2.[1] Impure reaction product was used for leftover Pd detection.



ethynyltrimethylsilane **1,4-dibromobenzene** **1,4-bis((trimethylsilyl)ethynyl)benzene**

Scheme 2

Table S1: TCSPC data of CNP, CNP-Pd^{2+}, CNP-Hg^{2+}.

	Avg. life time (ns)	χ^2	τ1 (ns)	τ2 (ns)	τ3 (ns)	α1	α2	α3
CNP	7.95	1.032	4.58	9.17	18.3	0.24	0.51	0.25
CNP-Pd^{2+}	7.94	1.057	3.05	13.2	14.1	0.19	0.55	0.26
CNP-Hg^{2+}	2.53	1.47	3.5	7.08	0.16	0.27	0.18	0.55

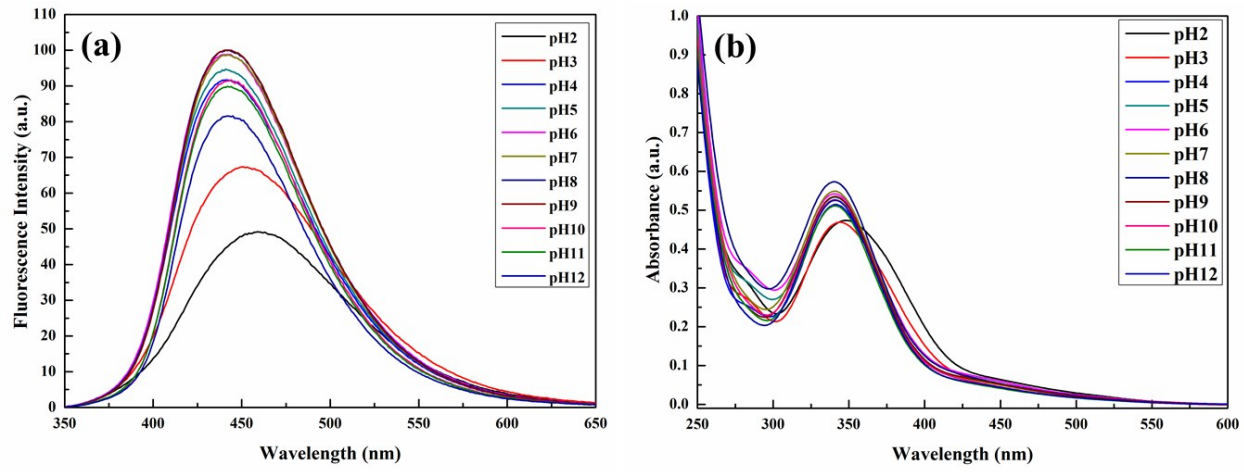


Fig. S1 (a) Emission spectra and **(b)** Absorption spectra of **CNP** at different pH.

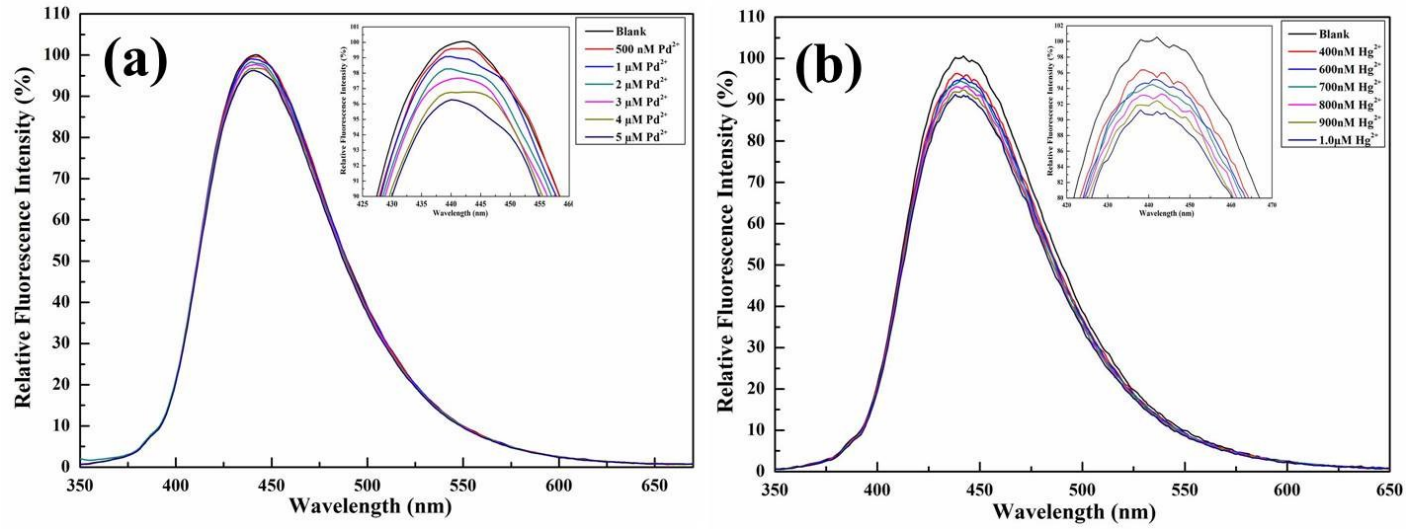


Fig. S2 Fluorescence quenching of **CNP** in presence of Noble metal Pd and Hg. (a-b) In presence of Pd^{2+} (500nM-5μM). (c-d) In presence of Hg^{2+} (400nM-1.0μM)

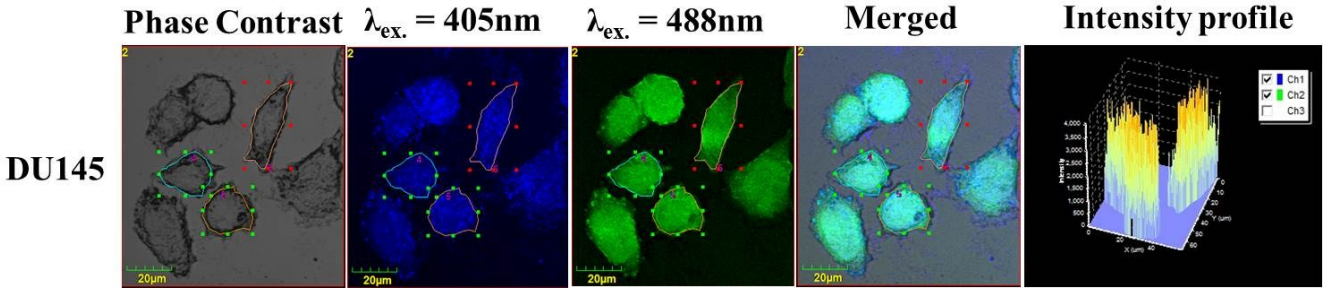


Fig. S3 The confocal microscopy images of DU145 cells treated with **CNP** showing intracellular localization of **CNP.**

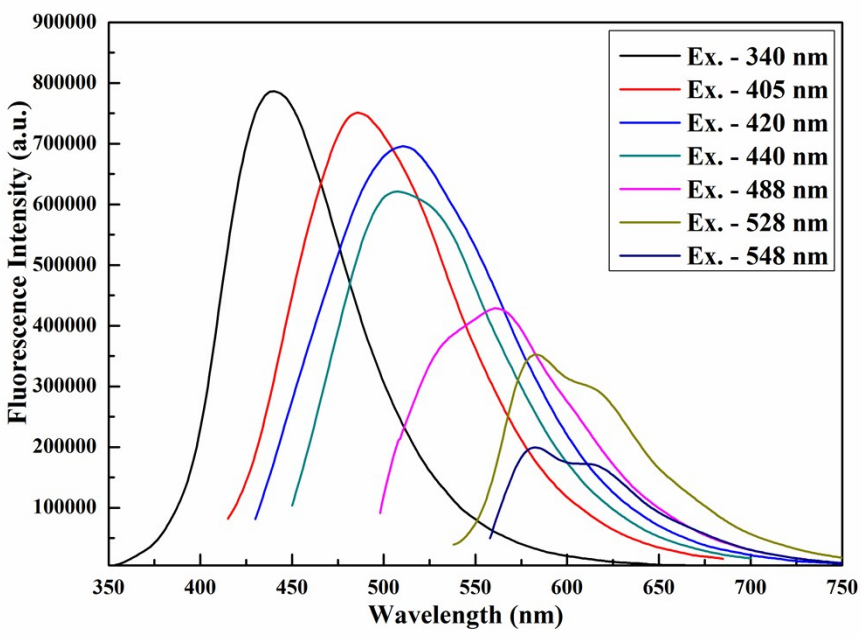


Fig. S4 Excitation tuned emission spectra of **CNP**.

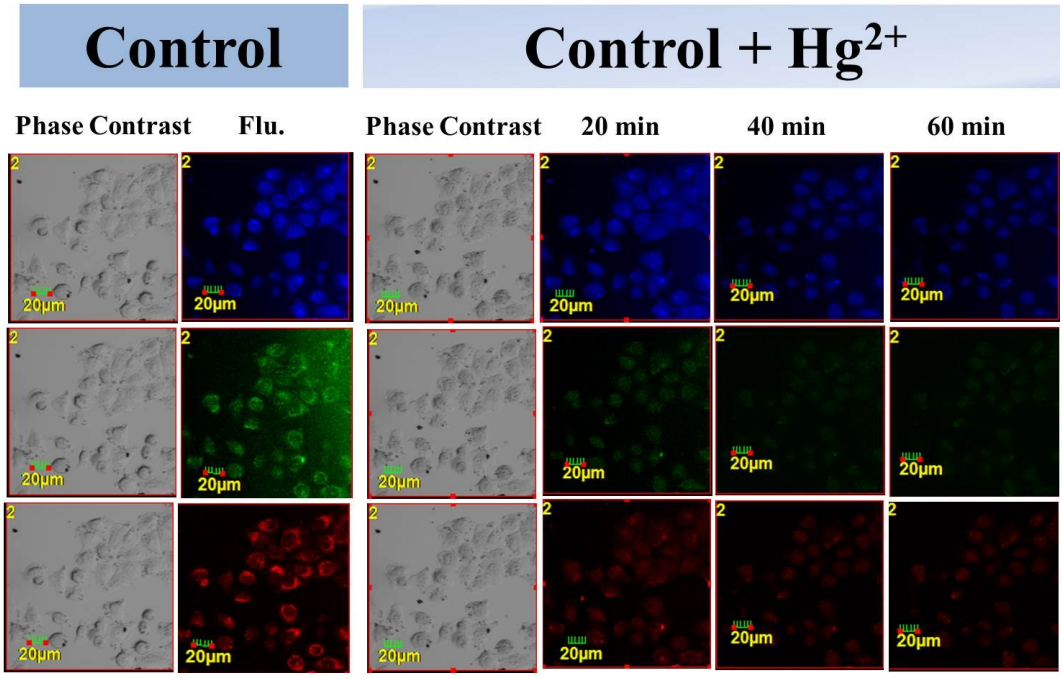


Fig. S5 The confocal microscopy images of A375 cells treated with **CNP** (*control*), followed by further incubation with **Hg^{2+}**at different time interval.

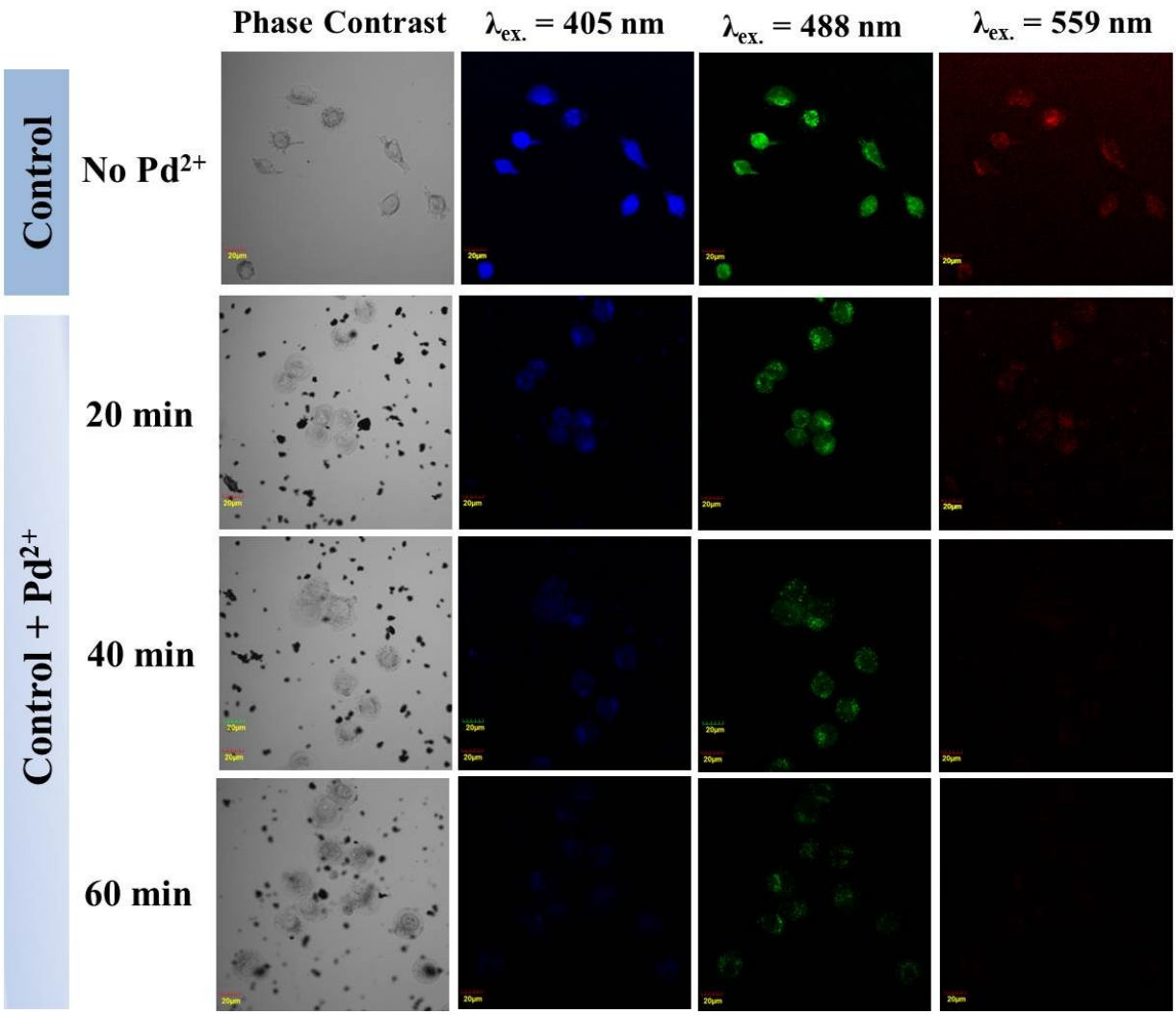
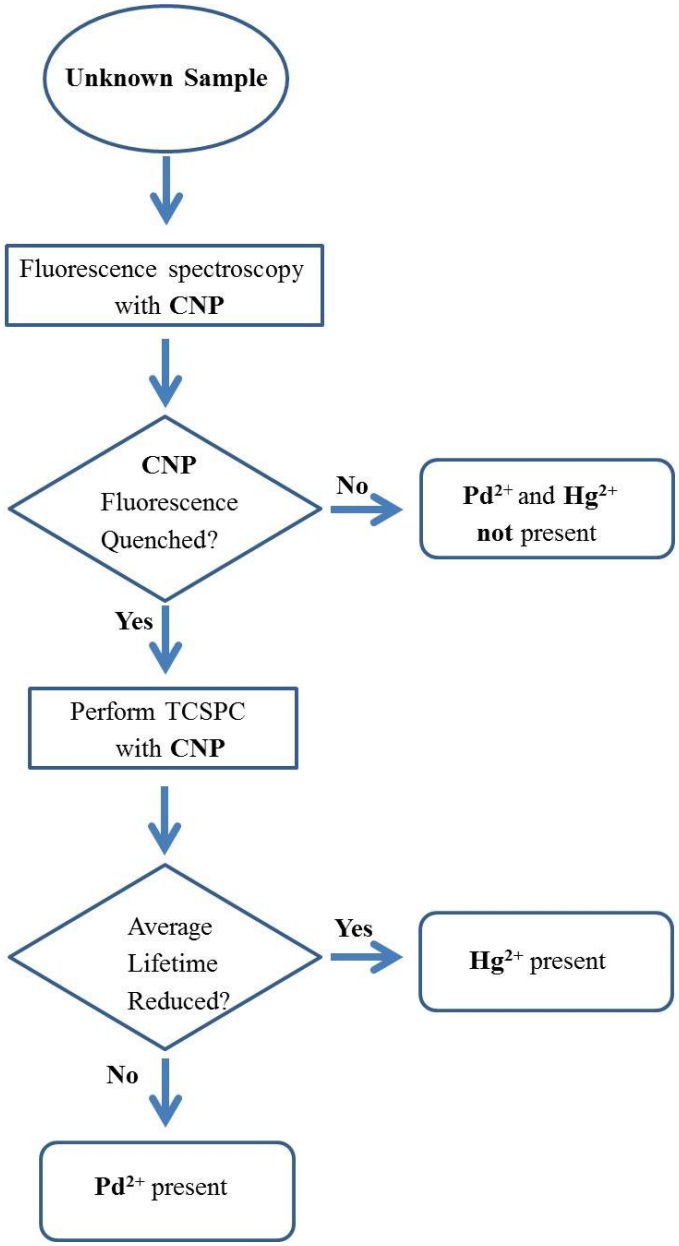


Fig. S6 The confocal microscopy images of DU145 cells treated with **CNP** (*control*), followed by further incubation with **Pd^{2+}** at different time interval, showing different areas of cell suspension.



Flow chart S1: Schematic representation showing method to identify Pd^{2+} and Hg^{2+} individually.

DU CNP 50.avi

SV 1: Two channel confocal (50 scans) of **CNP** treated DU145 cells.

References

1 K. Sonogashira, Y. Tohda and N. Hagihara, *Tetrahedron Lett.*, 1975, **16**, 4467–4470.