Supplementary Material

Development of Cyanine 813@imidazole-based Doped Supported Devices for Divalent Metal Ions Detection

Joana Galhano [1], Gonçalo A. Marcelo [1], Hugo M. Santos [1,2], José Luis Capelo-Martínez [1,2], Carlos Lodeiro [1,2] and Elisabete Oliveira [1,2,*]

[1]BIOSCOPE Research Group, LAQV-REQUIMTE, Chemistry Department, NOVA School of Science and Technology, FCT-NOVA, Universidade NOVA de Lisboa, 2829-516 Caparica, Portugal; j.galhano@campus.fct.unl.pt (J. G.); goncalo.marcelo9@gmail.com (G. A. M.); hmsantos@fct.unl.pt (H. M. S.); jlcm@fct.unl.pt (J.C.); cle@fct.unl.pt (C. L.); ej.oliveira@fct.unl.pt (E. O)
[2]PROTEOMASS Scientific Society, Rua dos Inventores, Madam Parque, Caparica Campus, Portugal;
*Correspondence: ej.oliveira@fct.unl.pt

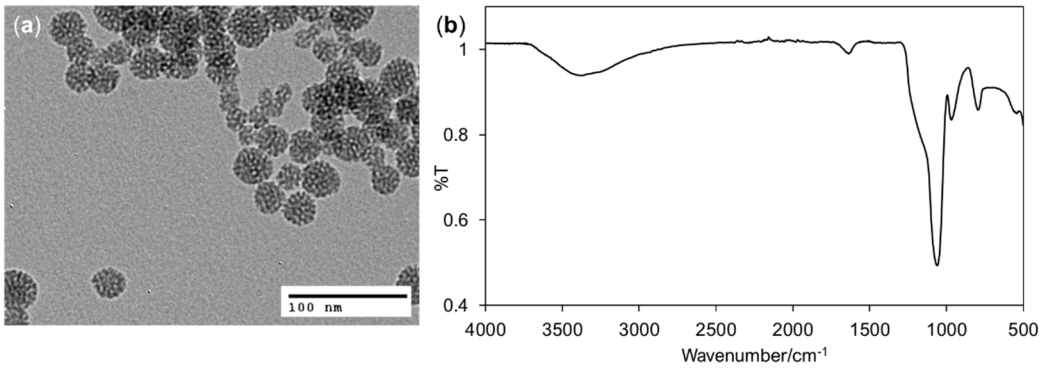

Figure S1. Mesoporous silica nanoparticle Characterization. (A) – TEM image of MNs, (B) – FT-IR spectra of MNs.

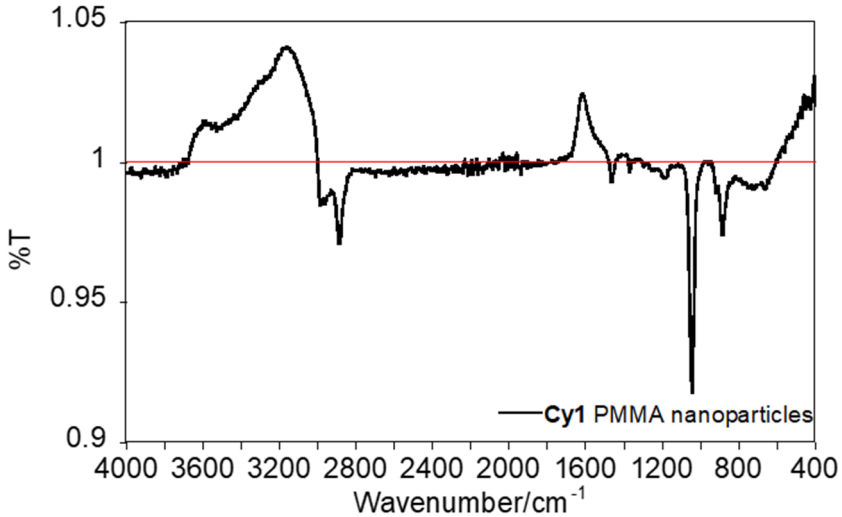

Figure S2. FTIR spectra, after water subtraction, of the aqueous suspension of **Cy1**-doped PMMA nanoparticles, acquired with 500 μM CTAB.

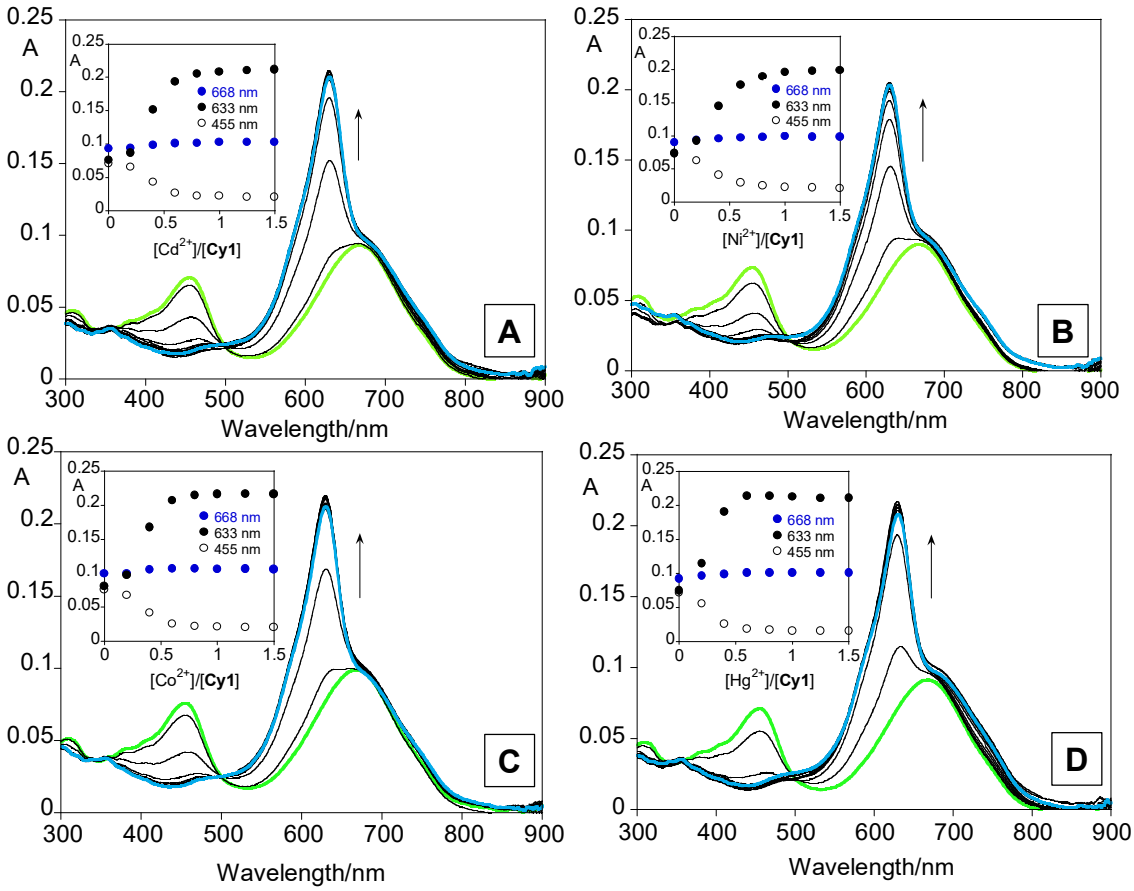

Figure S3. Spectrophotometric titrations of dye **Cy1** with the addition of Cd^{2+} (A), Ni^{2+} (B), Co^{2+} (C) and Hg^{2+} (D) in acetonitrile. The inset (A to D) represents the absorption at 455 nm, 633 nm and 668 nm, as function of [Cd^{2+}]/[**Cy1**], [Ni^{2+}]/[**Cy1**], [Co^{2+}]/[**Cy1**] and [Hg^{2+}]/[**Cy1**], respectively. ([**Cy1**] = 5.8 ×10^{-6} M, λ_{exc}= 668 nm, T = 295 K).

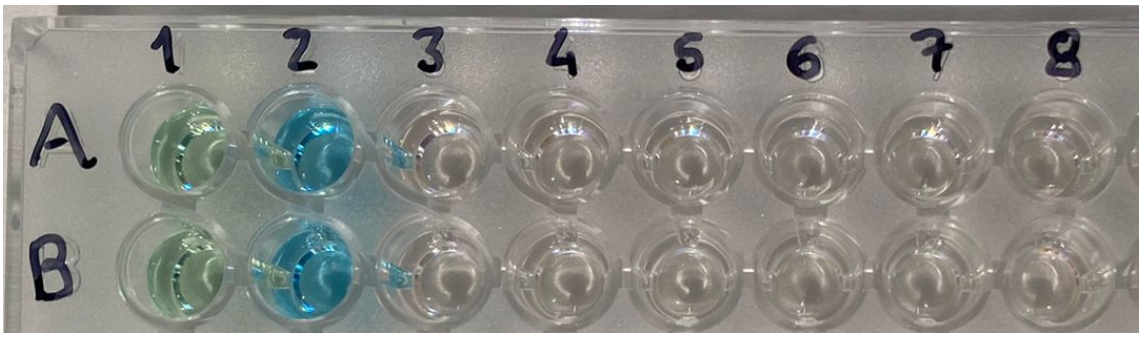

Figure S4. Naked-eye assessment of the colourimetric selectivity of **Cy1** (1×10^{-5}M) for Cu^{2+} metal ions (0.5 equivalents) upon the addition of other metal ions (1 equivalent) in acetonitrile. 1 – **Cy1**, 2 – **Cy1** + M^{n+} (Zn^{2+}, Cd^{2+}, Co^{2+}, Ni^{2+} and Hg^{2+}), 3 – **Cy1** + Cu^{2+}, 4 - **Cy1** + Cu^{2+} + Zn^{2+}, 5 - **Cy1** + Cu^{2+} + Cd^{2+}, 6 - **Cy1** + Cu^{2+} + Co^{2+}, 7 - **Cy1** + Cu^{2+} + Ni^{2+}, 8 - **Cy1** + Cu^{2+} + Hg^{2+}. A and B are duplicates.

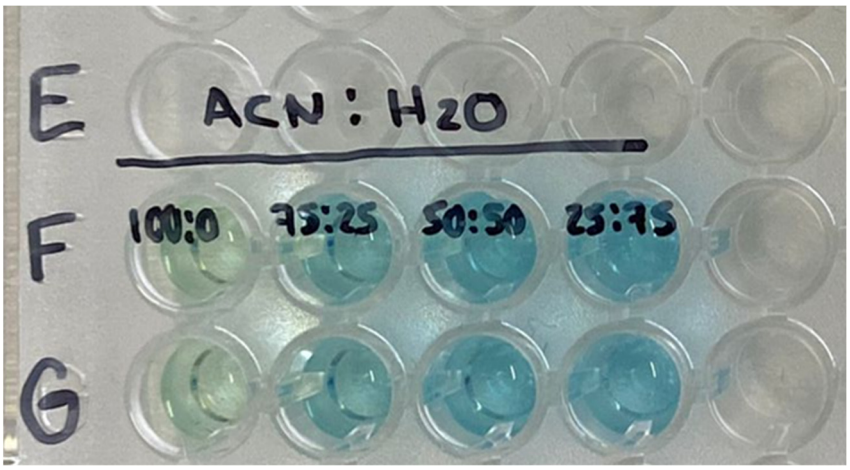

Figure S5. Naked-eye assessment of **Cy1** (1×10^{-5} M) in different ratios of acetonitrile (ACN) and water (H_2O). F and G are duplicates.

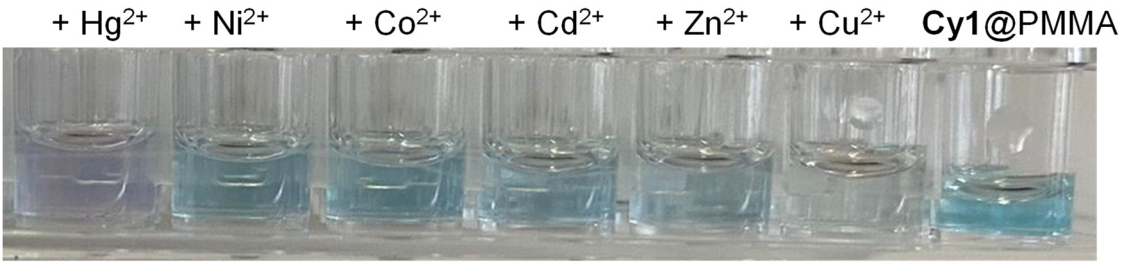

Figure S6. Naked-eye image of **Cy1**@PMMA nanoparticles upon the addition of 20 equivalents of the metal ions in water.

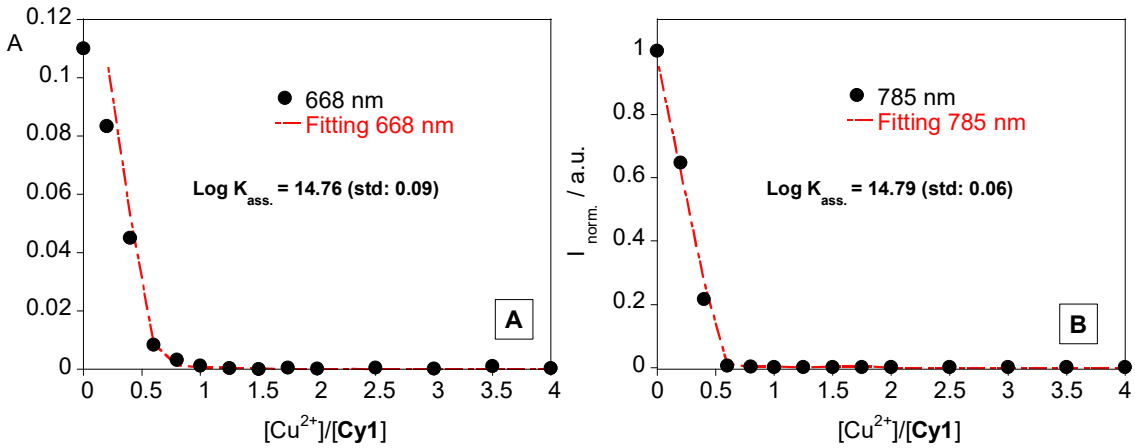

Figure S7 - Absorption (A) at 668 nm and emission (B) at 785 nm in acetonitrile, with the fitting determined by HypSpec Program, as function of $[Cu^{2+}]/[\mathbf{Cy1}]$ (A, B). [**Cy1**] = 5.8 ×10^{-6} M, λ_{exc}=668 nm, T = 295 K).