Electronic Supplementary Material (ESI) for Analytical Methods.

Fluorescent Ratiometric Cu^{2+} Probe Based on FRET by Naphthalimide-Appended Rhodamine Derivative

Chunwei Yu,[a] Yingying Wen,[a] Xi Qin*[,b] and Jun Zhang*[,a]

[a] *Laboratory of Environmental Monitoring, School of Tropical and Laboratory Medicine, Hainan Medical University, Haikou, 571101, China*

[b] *Department of Clinical Laboratory, Affiliated Hospital of Hainan Medical University, Haikou 570102, China*

*Corresponding author. Tel.: +86 898 66973190; Fax: +86 898 66989173.

**Corresponding author. E-mail address: qinxi99@21cn.com (X. Qin), jun_zh1979@163.com (J. Zhang)

Contents

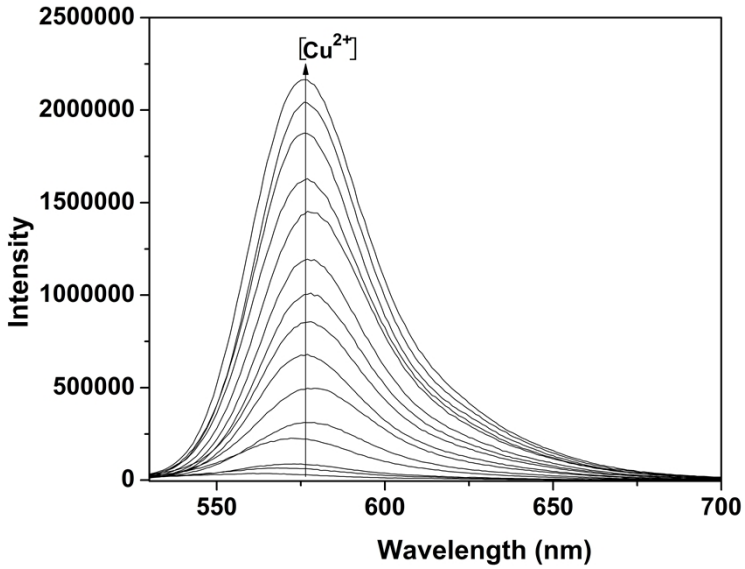

Fig. S1. Fluorescence titration spectra of **L** (2 μM) in ethanol/water solution (1:9 ,v/v, 50 mM HEPES, pH 7.4) upon gradual addition of Cu^{2+} (0-20 μM). Ex=520 nm.

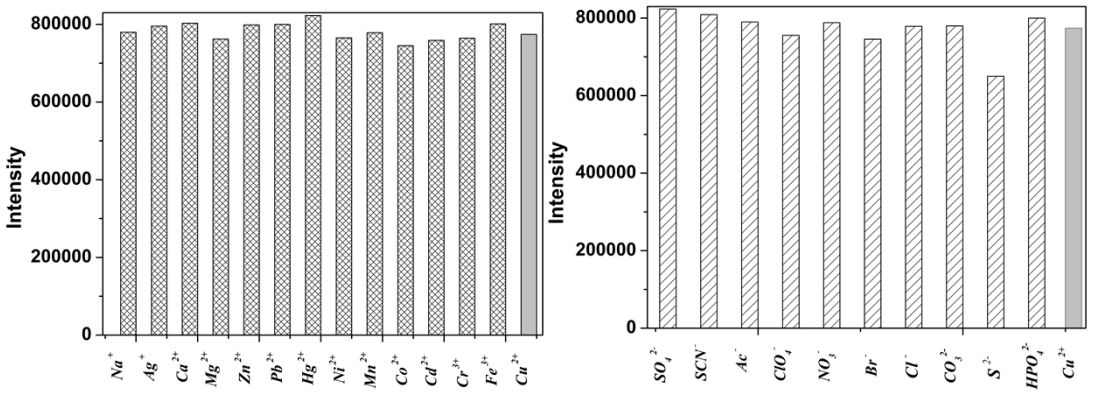

Fig. S2. Fluorescence spectra response of **L** (2 μM) to Cu^{2+} (10 μM) containing various metal ions and anions (50 μM) in ethanol-water solution (1:9, v:v. 50 mM HEPES, pH 7.4).

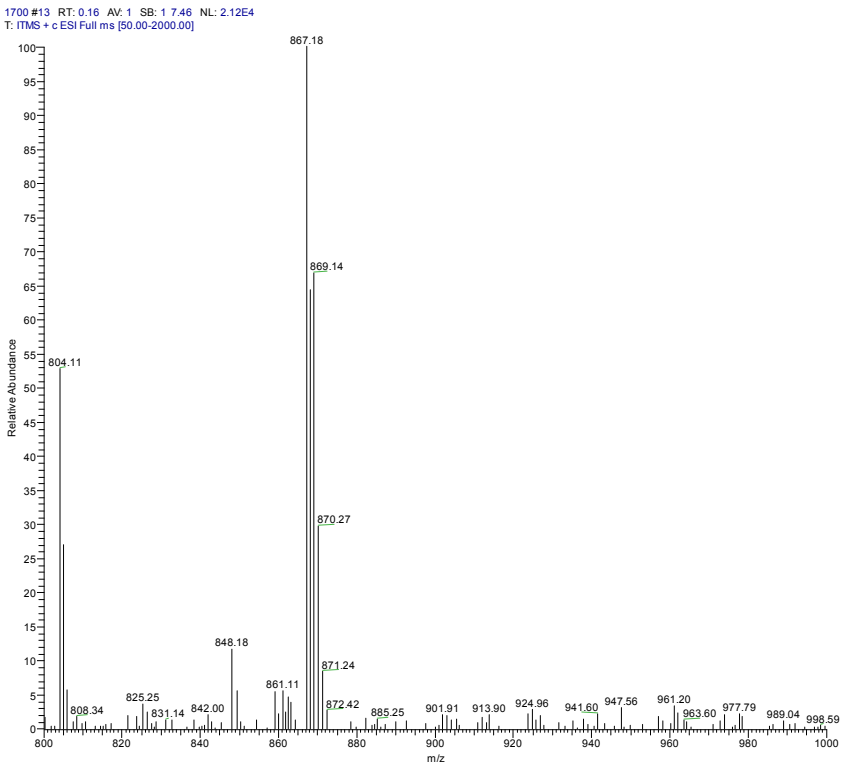

Fig. S3. Partial ESI-MS (ES+) mass spectrum of **L** in the presence of 1.0 equiv. of Cu^{2+} in ethanol.

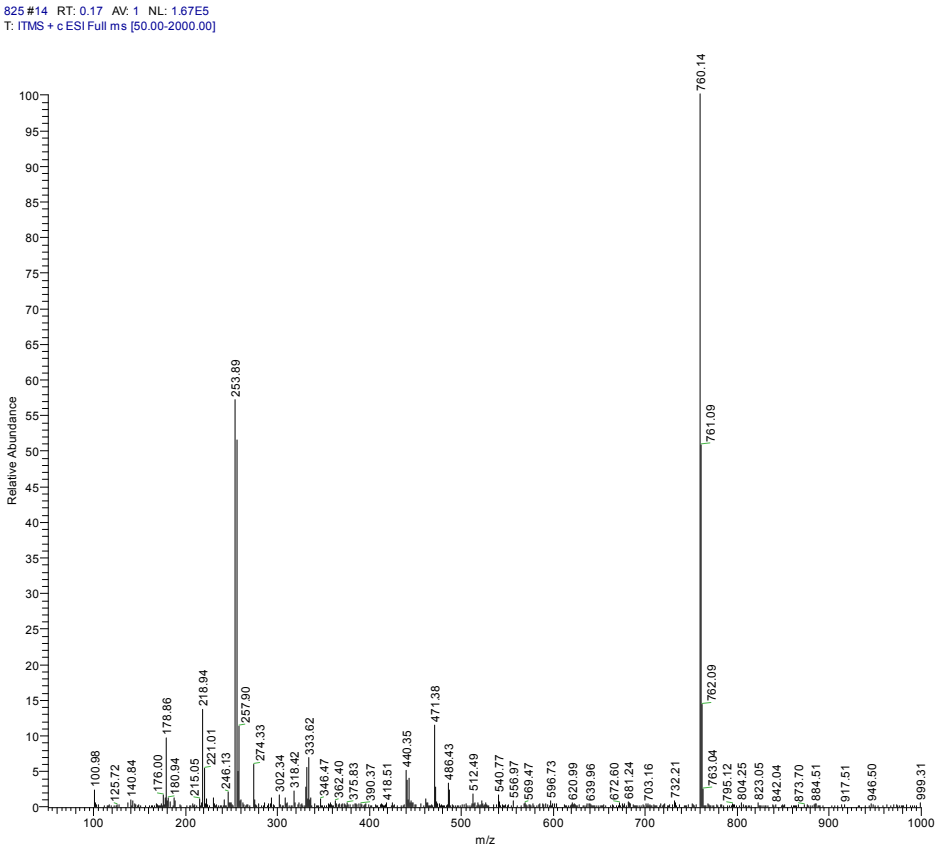

Fig. S4. ESI-MS mass spectrum of **L**.

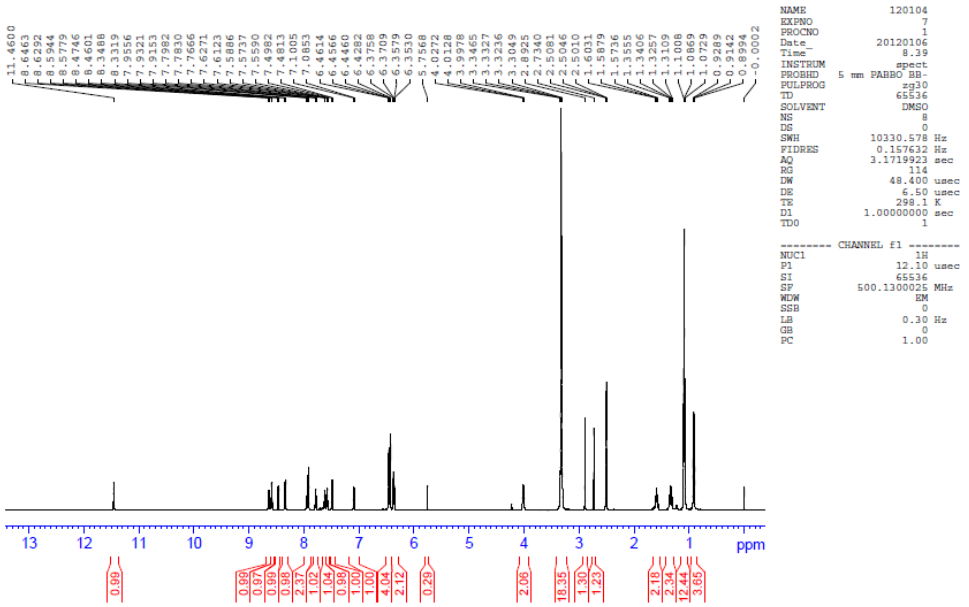

Fig. S5.[1]H NMR spectrum of **L**.

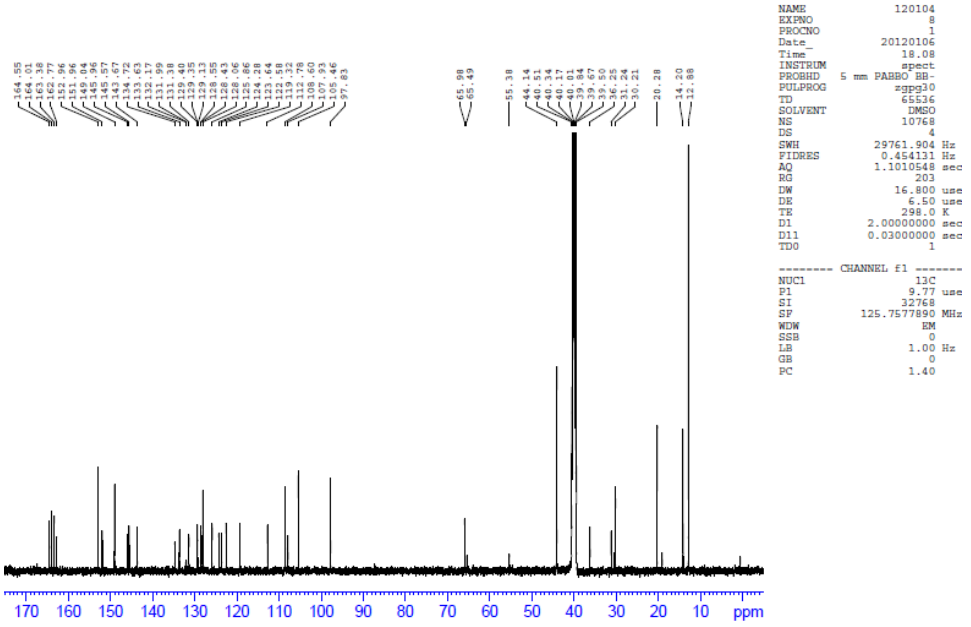

Fig. S6.[13]C NMR spectrum of **L**.

Table **S1**

Energy donor/acceptor	Testing media	Applications	Reproducibility	Linear range (nM)	LOD (nM)	Ref.
Naphthalene/Pyrene unit	CH_3CN	NA[a]	NA	NA	NA	[1]
Coumarin/Fluorescein	H_2O/DMSO solution (9:1, v/v)	NA	NA	NA	NA	[2]
Dansyl/Rhodamine	H_2O/CH_3CN (1:9, v/v, pH 7.0, Tris -HCl buffer)	NA	NA	NA	NA	[3]
Naphthalimide/dansyl	Acetonitrile containing neutral micelles TX-100 (2 mM)	NA	Reversible	NA	NA	[4]
Coumarin/Rhodamine	H_2O/CH_3CN solution (4:1, v/v, pH 7.0, HEPES buffer)	HeLa cells	NA	0.08-30 μM	NA	[5]
Coumarin/4-amino-7-sulfamoyl benzoxadiazole	H_2O/CH_3CN solution (9:1, v/v pH 7.4, Tris–HCl buffer)	MCF-7 cells	Reversible	NA	3 mM	[6]
Indole/Rhodamine	H_2O/CH_3CN solution (4:1, v/v, pH 7.3, HEPES buffer)	HeLa cells	NA	NA	3.6 ppb	[7]
Coumarin/Rhodamine	H_2O/CH_3CN solution (4:1, v/v, pH 7.0, HEPES buffer)	MCF-7 cells	NA	NA	NA	[8]
Dansyl/Rhodamine	H_2O/CH_3CN solution (1:1, v/v, pH 7.4, HEPES buffer)	HeLa cells	NA	10 to 50 mM	0.12 mM	[9]
Naphthalimide/Rhodamine	H_2O/Ethanol solution (1:9, v/v, pH 7.4, HEPES buffer)	RAW cells	Reversible	0.5–1.5 μM	0.25 μM	This work

[a] NA: Not Available.

References

[1] H. J. Kim, S. Y. Park, S. Yoon and J. S. Kim, *Tetrahedron*, 2008, **64**, 1294.

[2] S. Y. Lee, H. J. Kim, J. S. Wu, K. No and J. S. Lim, *Tetrahedron Lett.*, 2008, **49**, 6141.

[3] M. H. Lee, H. J. Kim, S. Yoon, N. Park and J. S. Kim, *Org. Lett.*, 2008, **10**, 213.

[4] V. S. Jisha, A. J. Thomas, and D. J. Ramaiah, *J. Org. Chem.*, 2009, **74**, 6667.

[5] L. Yuan, W. Y. Lin, B. Chen and Y. N. Xie, *Org. Lett.*, 2012, **14**, 432.

[6] Y. C. Chen, C. C. Zhu, J. J. Cen, J. Li, W. J. He, Y. Jiao and Z. J. Guo, *Chem. Commun.,* 2013, **49**, 7632.

[7] C. Kar, M. D. Adhikari, A. Ramesh and G. Das, *Inorg. Chem.*, 2013, **52**, 743.

[8] X. Y. Guan, W. Y. Lin and W. M. Huang, *Org. Biomol. Chem.*, 2014, **12**, 3944.

[9] Z. J. Hu, J. W. Hu, Y. Cui, G. N. Wang, X. J. Zhang, K. Uvdalb and H. W. Gao, *J. Mater. Chem. B*, 2014, **2**, 4467.