Electronic Supplementary Material (ESI) for Analyst.

Supporting Information

A Highly Selective Naphthalimide Based Ratiometric Fluorescence Probe for Recognition of Tyrosinase and Cellular Imaging

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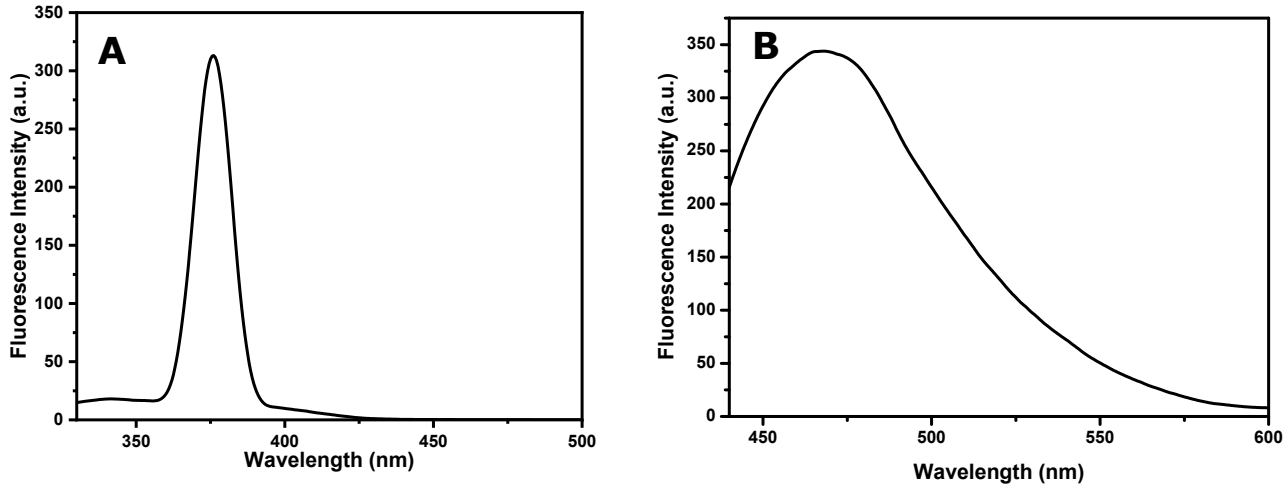

Fig. S1: (**A**) Fluorescence excitation spectra of probeL3. (**B**) Fluorescence emission spectra of probe L3 in 10% ACN in PBS (λ_{ex}= 425 nm, λ_{em}= 467 nm).

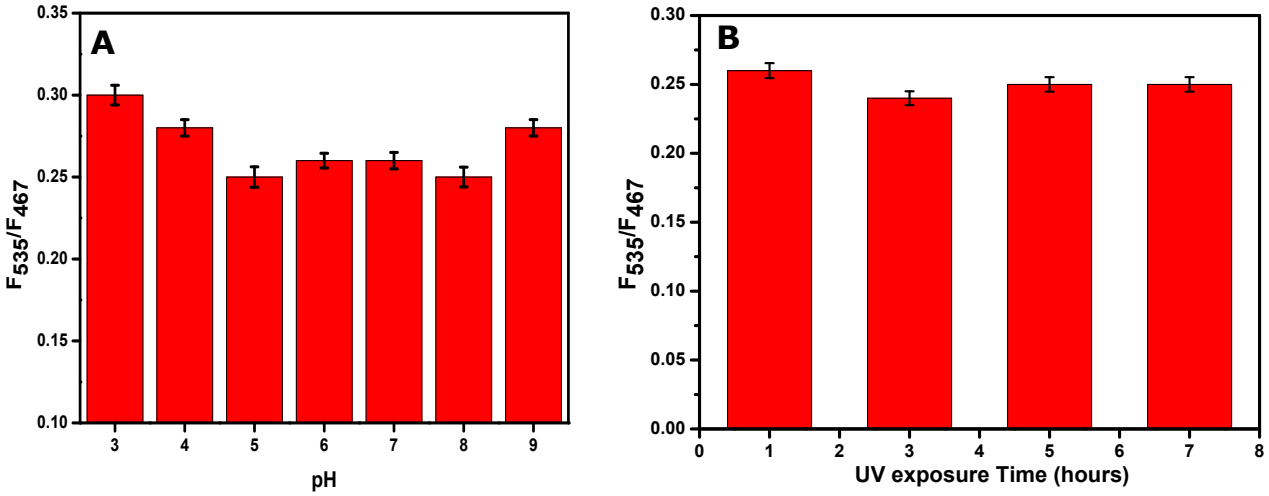

Fig. S2: (**A**) Fluorescence response (F_{535}/F_{467}) of the probe at different pH. (**B**) Fluorescence stability study of the probe L3 on exposure to UV light at a different time interval.

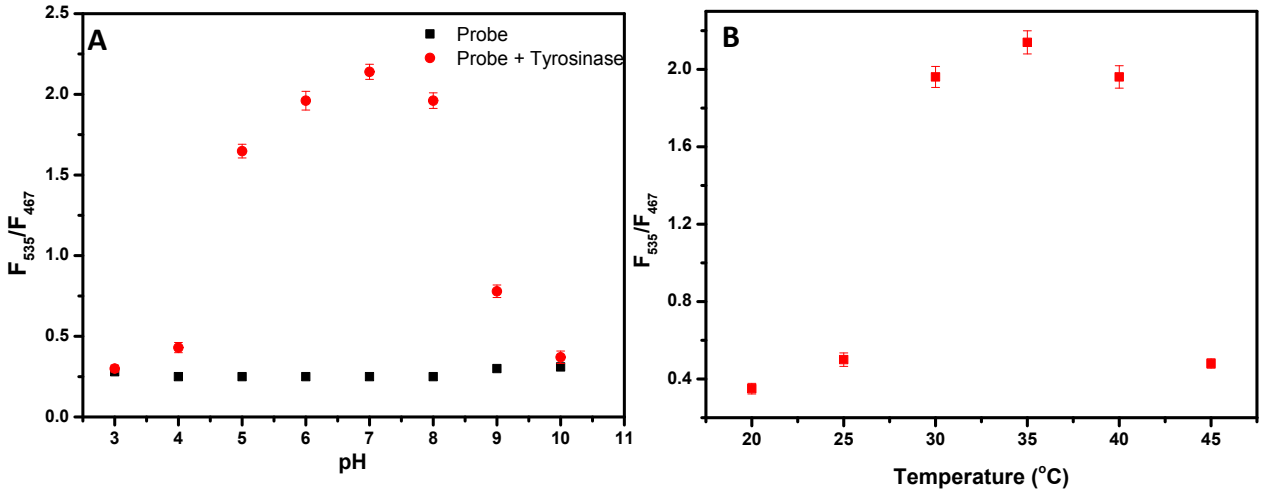

Fig. S3: (**A**) Fluorescence response of probe in the presence of tyrosinase (150 U mL^{-1}) at different pH. (**B**) Effect of temperature on fluorescence response of probe in the presence of tyrosinase (150 U mL^{-1}).

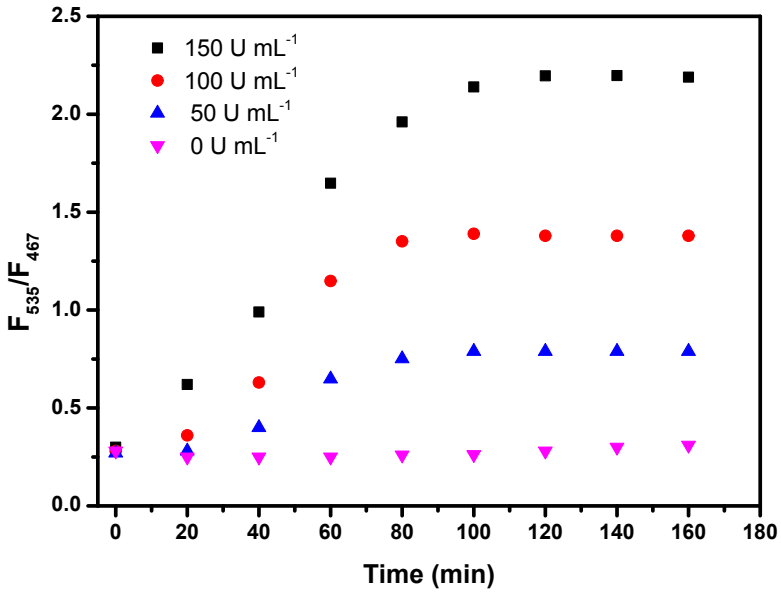

Fig. S4: Fluorescence emission plot of probe L3 (10 µM) *vs.* reaction time (0-160 min.) at different concentration of tyrosinase (0- 150 U mL^{-1}). Experiments were performed at 37 °C in PBS (10% ACN pH 7.4) with λ_{ex} = 425 nm.

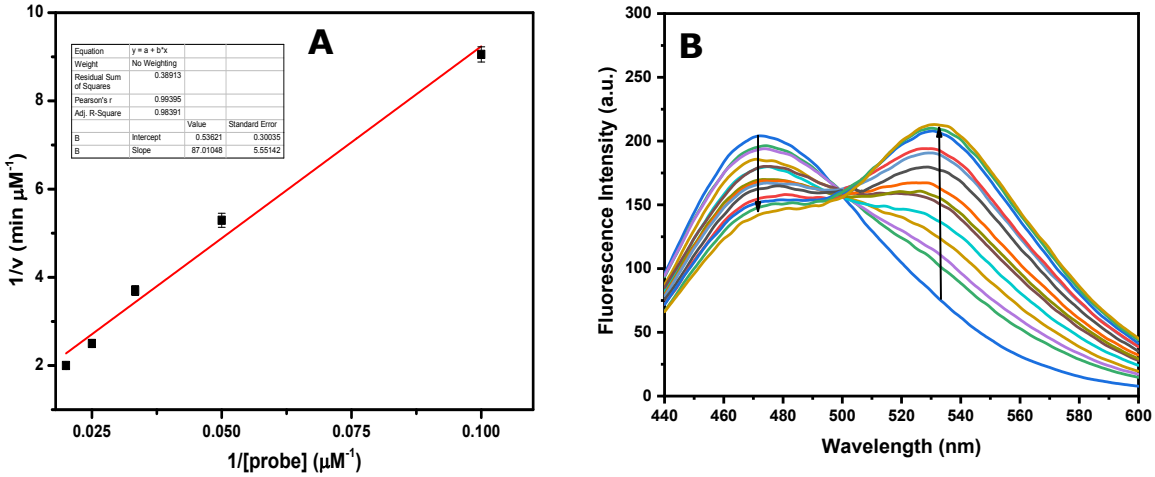

Fig. S5: (**A**) Kinetic parameter study for the calculation of K_m. (**B**) Fluorescence emission spectra of Probe L3 in response to tyrosinase in 1:99 (v/v) DMSO/PBS.

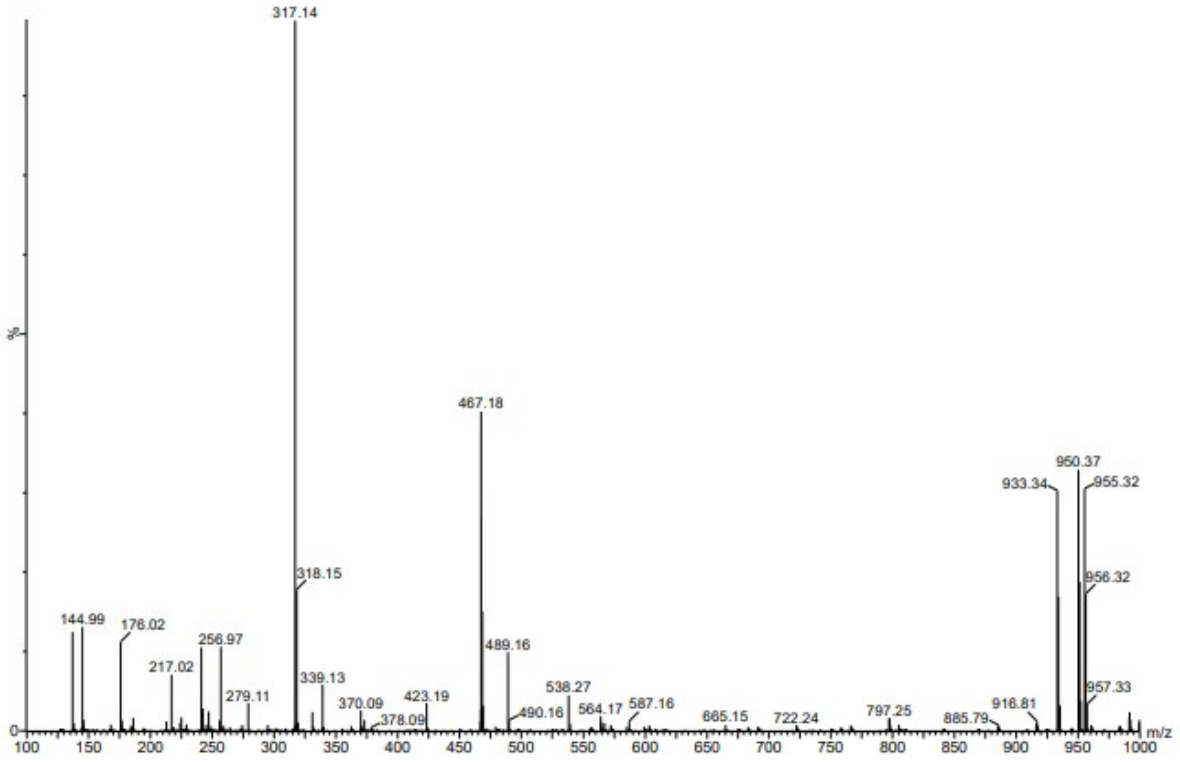

Fig. S6: Mass spectra of L3 solution in the presence of tyrosinase. Peak correspondence to m/z at 317.14 indicate the breakage of carbamate linkage and release of free 4-aminonaphthalimide derivative (L2).

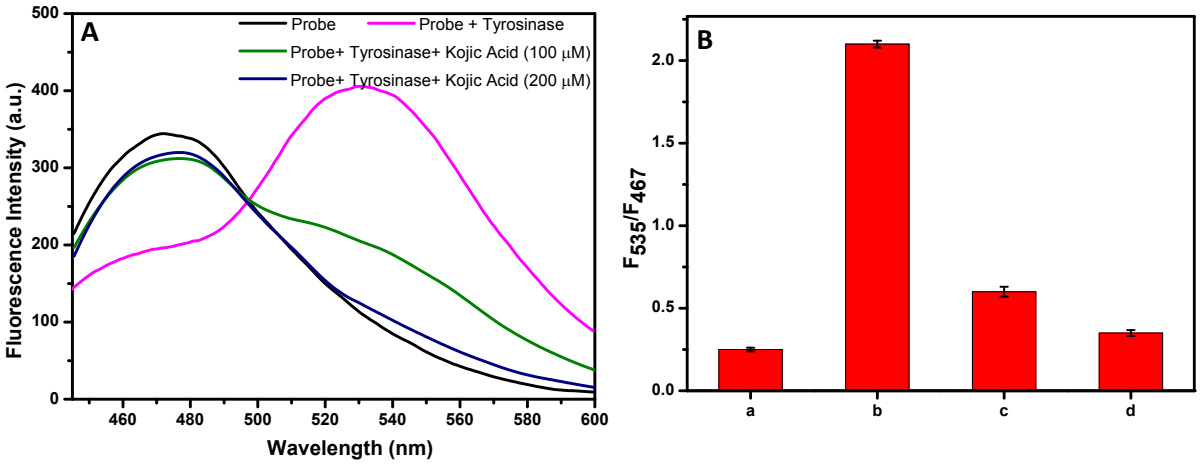

Fig. S7: (**A**) Fluorescence emission profile of probe at different reaction conditions. (**B**) Fluorescence intensity ratio of probe at F_{535}/F_{467}. (a) Probe (b) Probe + Tyrosinase (c)Probe + Tyrosinase + Kojic acid (100 μM) (d) Probe + Tyrosinase + Kojic acid (200 μM)

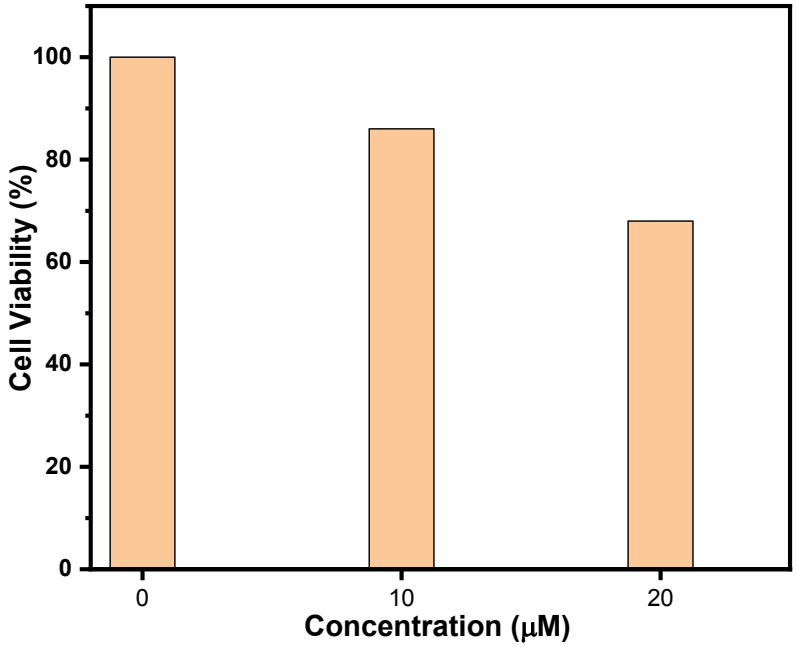

Fig. S8: Cytotoxicity Assay of Probe L3.

Table. S1: Fluorescence sensor for the detection of Tyrosinase with a different detection limit

Method	Limit of Detection	Reference
Nanoclusters of gold	6 U L^{-1}	1
RF-QDs-DA	10 U L^{-1}	2
Cyanine	0.01 U mL^{-1}	3
Pdots@Tyr-OMe	1.1 U L^{-1}	2
Dopa-CQDs	17 U L^{-1}	2
CDs-Tyr	10.2 U mL^{-1}	4
Resofuran	0.04 U mL^{-1}	5
Naph-L3	0.2 U mL^{-1}	This work

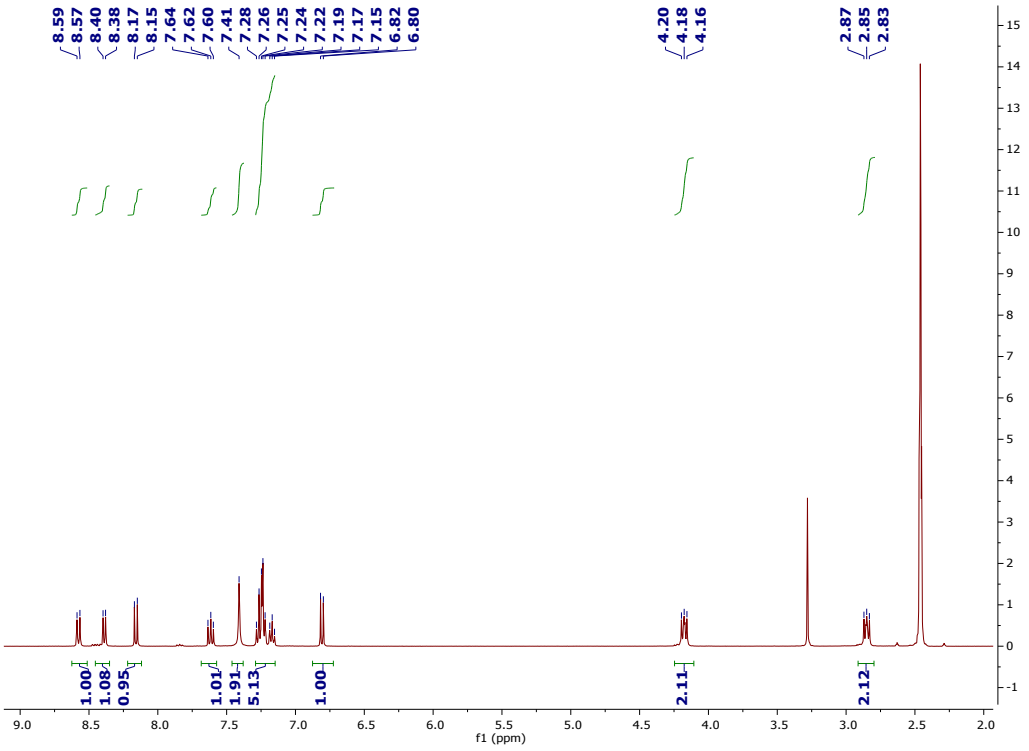

Fig. S9: [1]HNMR of L2

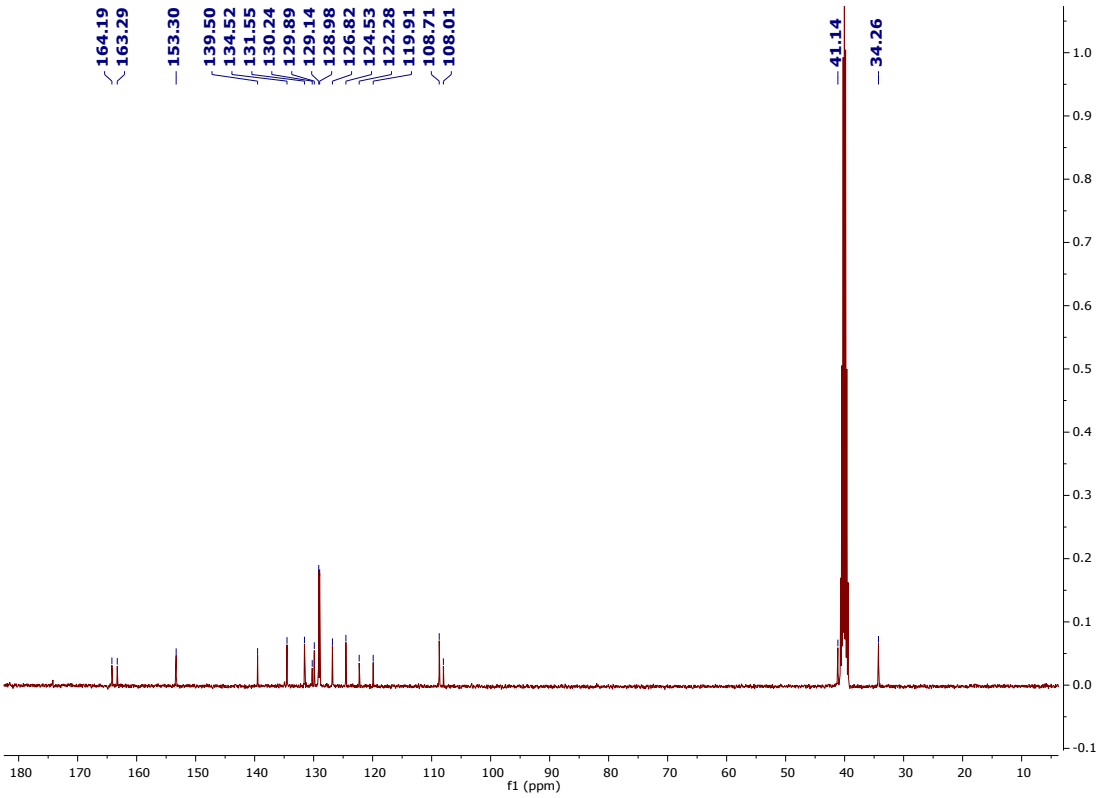

Fig. S10: ^{13}CNMR of L2

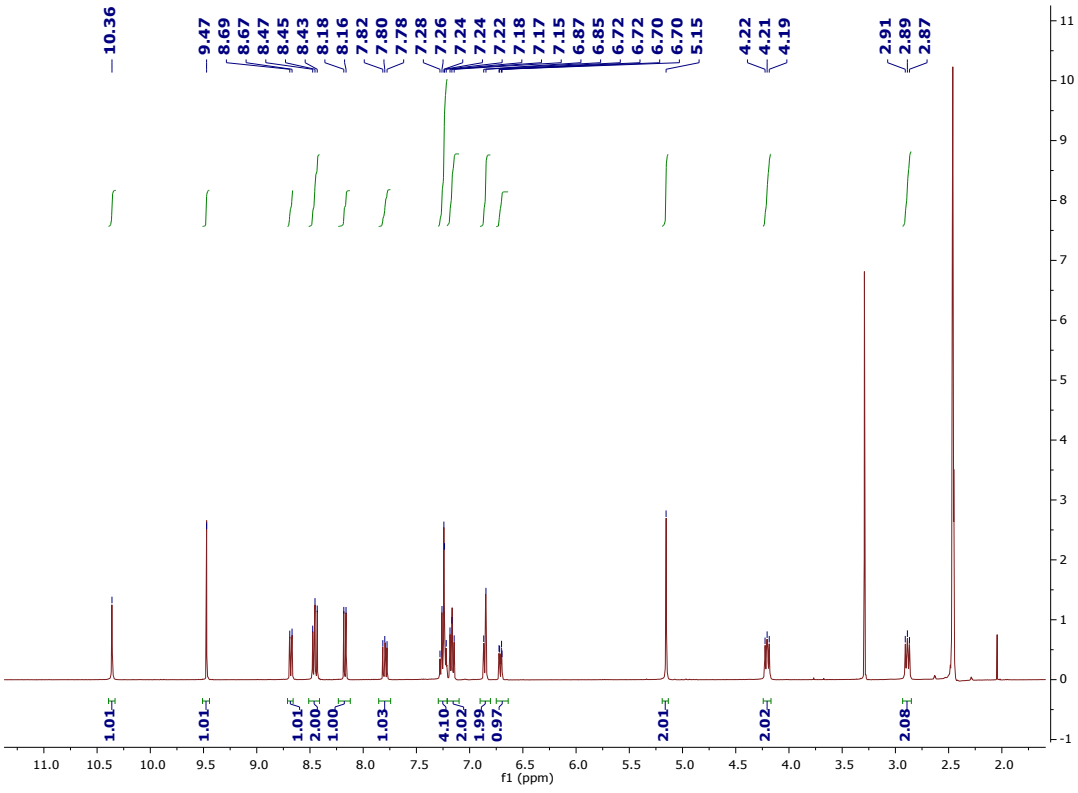

Fig. S11: ^{1}HNMR of Probe L3

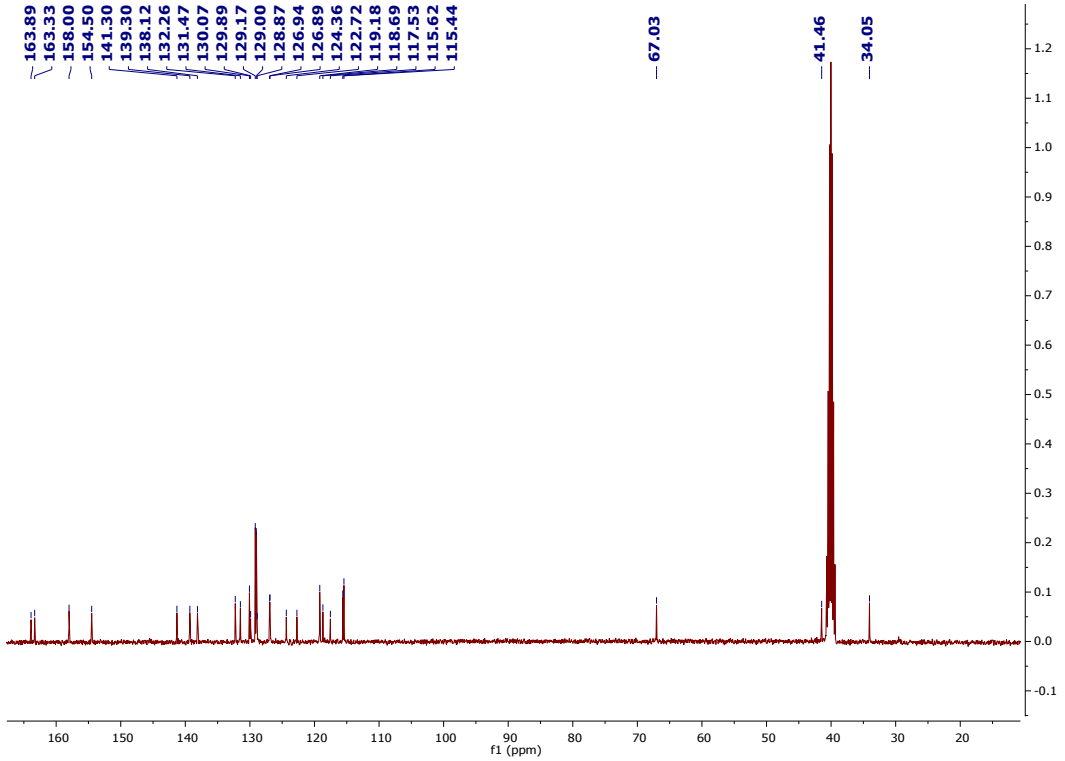

Fig. S12: ^{13}CNMR of Probe L 3

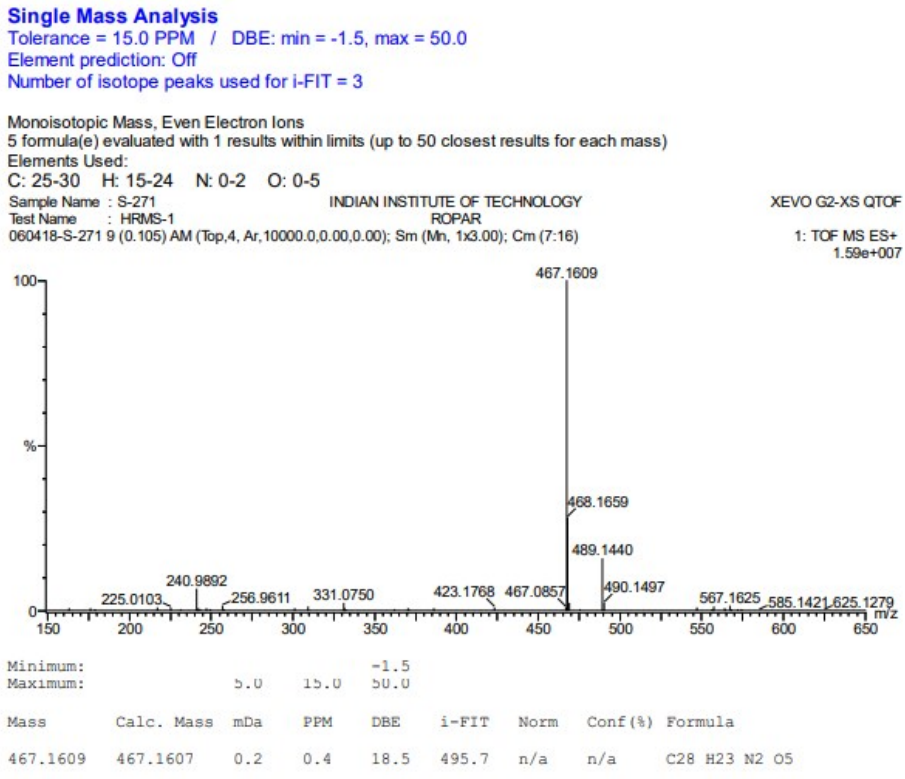

Fig. S13: HRMS of Probe L3

References:

1. Y. Teng, X. Jia, J. Li and E. Wang, *Anal. Chem.*, 2015, **87**, 4897-4902.
2. J. Sun, H. Mei, S. Wang and F. Gao, *Anal. Chem.*, 2016, **88**, 7372-7377.
3. X. Li, W. Shi, S. Chen, J. Jia, H. Ma and O. S. Wolfbeis, *Chem. Comm.*, 2010, **46**, 2560-2562.
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