Supporting Information

Ligands substituent effect on the cytotoxicity activity of two new copper(II) complexesbearing 8-hydroxyquinoline derivatives: Validated by MTT assay and apoptosis in MCF-7 cancer cell line (human breast cancer)

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Synthesis of organic ligands

Synthesis of 2-(quinolin-8-yloxy)(methyl)benzonitrile (qmbn)

8-hydroxyquinoline (2g, 13.7mmol) and dry K_2CO_3 (5g, 36.17mmol) were mixed in a round-bottom flask under an inert atmosphere, and acetonitrile (60 mL) added to the above mixture. The mixture was allowed to stirring for 60 minutes at 90 $^{\circ}$C. The mixture was treated with 2-(bromomethyl) benzonitrile (2.69g, 13.7mmol), and the resulting solution refluxed for 24h. After completion of this period, the solution was allowed to cool to room temperature and the mixture was poured slowly in ice water (100 mL) with constant stirring to give a white muddy solid precipitate that was collected by filtration and dry under vacuum. Yield: 3.3gm (70%). Melting Point 120 ^{0}c. IR (cm^{-1}): 3398(s), 2948(m), 2922(m), 2835(w), 2224(w), 1619(w), 1564(w), 1503(m), 1468(m), 1379(m), 1319(m), 1262(m), 1177(w),1105(m), 1027(s), 983(w), 952(w), 893(w), 856(w), 820(m), 794(m), 753(m), 713(w), 668(w), 547(w), 418(w). Elemental analysis (%): Calcd. For $C_{17}H_{12}N_2O$: C, 78.44; H, 4.65; N, 10.76%; Found: C, 78.54; H, 4.56; N, 10.64%.

Synthesis of 2-((quinolin-8-yloxy)methyl)benzoic acid (Hqmba)

The obtained solid compound (**qmbn**) (2g, 7.68 mmol) was hydrolyzed by 6N NaOH solution (100 mL) under reflux for 24h. After completing this process, the resulting solution was allowed to cool 5 ^{0}C and acidified with the 6N HCl solution to obtained light pale yellow

solid. This compound was collected by filtration and dried in air. The melting point is 201^0c. Yield: 1.71g (85%) IR(cm^{-1}): 3382(m), 3191(w), 3058(w), 2921(m), 2856(m), 1654(s), 1620(w), 1596(w), 1572(w), 1502(s), 1470(w), 1404(w), 1371(s), 1312(s), 1265(s), 1185(m), 1115(s), 1066(m), 1015(w), 827(s), 801(s), 772(s), 742(s), 724(m), 654(m), 622(w), 576(w), 505(w), 458(w). Elemental analysis (%): Calcd. For $C_{17}H_{13}NO_3$: C, 73.11; H, 4.69%; N, 5.02 Found: C, 73.98; H, 4.77; N, 5.10%.

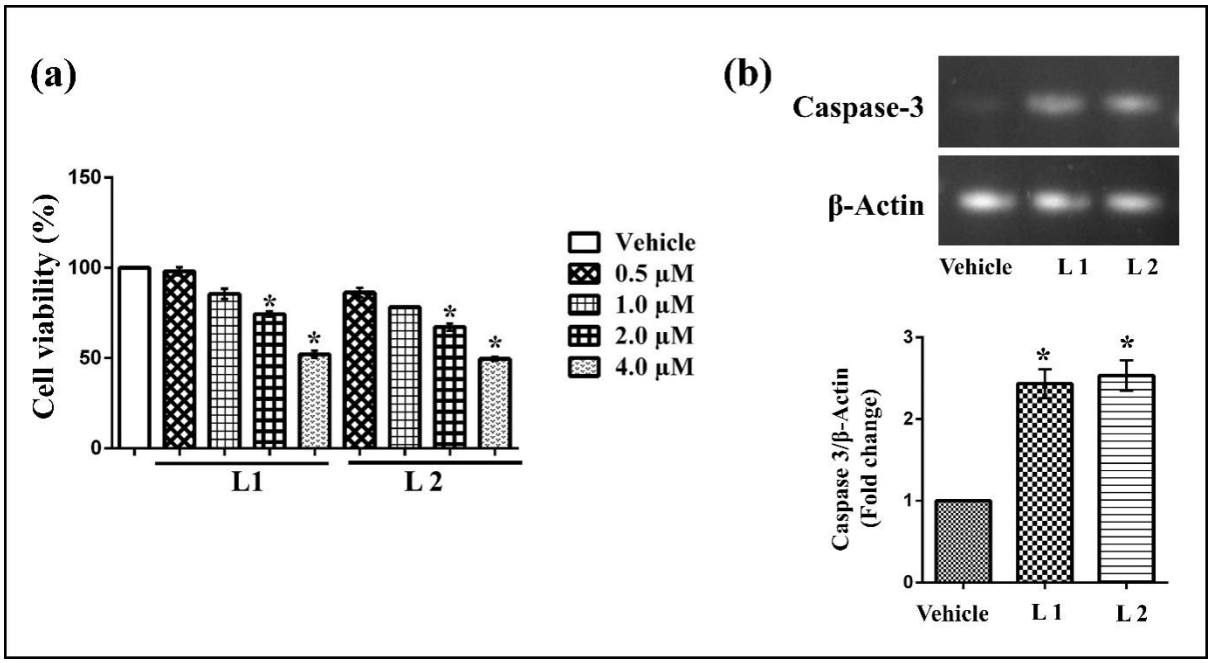

Fig. S1. Effect of ligands **L1** and **L2** on the MCF-7 cells. (a) Cells were treated with varying concentration of ligands and the cell survivability was evaluated by performing MTT assay. (b) Representative PCR images indicating the transcriptional pattern of β-actin, capase-3 in response to ligands L1 and L2 treated cells. The bar graph below represents the fold change in the expression pattern of gene in treatment with IC_{50} concentration of ligands as compared to vehicle treated control cells condition. Results are the mean±SEM of three independent experiments. * indicates $p< 0.05$ as compared to the vehicle treated control group.

Table S1. Crystal data and structure refinement for complexes **1 (CCDC:** 2040551) and **2 (**2040552).

Parameters	**1**	**2**
Empirical formula	$C_{43}H_{35}CuN_5O_{10}$	$C_{43}H_{36}CuN_4O_{12}$
Formula weight	845.33	864.33
Temperature/K	100(2)	100(2)
Crystal system	triclinic	triclinic
Space group	P-1	P-1
a/Å	11.1425(10)	11.6573(7)
b/Å	12.3552(11)	12.7849(8)

c/Å	15.2616(14)	15.4024(9)
α/°	91.131(3)	66.799(2)
β/°	104.168(3)	71.044(2)
γ/°	112.006(3)	65.341(2)
Volume/Å^3	1874.1(3)	1881.8(2)
Z	2	2
ρ_{calc}g/cm^3	1.4979	1.5253
μ/mm^{-1}	0.653	0.655
F(000)	875.1	895.2
Crystal size/mm^3	0.37 × 0.23 × 0.18	0.39 × 0.31 × 0.19
Radiation	Mo Kα (λ = 0.71073)	Mo Kα (λ = 0.71073)
2Θ range for data collection/°	5.94 to 50.1	4.4 to 50
Index ranges	-14 ≤ h ≤ 14, -16 ≤ k ≤ 16, -20 ≤ l ≤ 20	-15 ≤ h ≤ 15, -17 ≤ k ≤ 17, -20 ≤ l ≤ 20
Reflections collected	29492	31042
Independent reflections	6630 [R_{int} = 0.0802, R_{sigma} = 0.1065]	6608 [R_{int} = 0.0310, R_{sigma} = 0.0326]
Data/restraints/parameters	6630/0/533	6608/0/549
Goodness-of-fit on F^2	1.138	1.062
Final R indexes [I>=2σ (I)]	R_1 = 0.0601, wR_2 = 0.1562	R_1 = 0.0368, wR_2 = 0.0985
Final R indexes [all data]	R_1 = 0.1006, wR_2 = 0.1936	R_1 = 0.0406, wR_2 = 0.1024
Largest diff. peak/hole / e Å^{-3}	0.98/-0.98	0.65/-0.69