

SUPPLEMENTARY MATERIAL

***N*-isopentyl-1,10-phenanthroline-2-amine (5, X = CH).**

The 2-chloro-1,10-phenanthroline (**1**, 1 g, 4.7 mmol) was dissolved in isoamylamine (15 mL) in a round bottom flask which was equipped with a reflux condenser, purged with nitrogen and refluxed at 110°C for 15.5 h. On cooling to room temperature, light yellow crystals formed in a light brown solution. The excess amine was removed via vacuum distillation and ice water (15 mL) was added to the residue. This residue was then basified to a pH of 13 with aqueous KOH and the product collected by filtration to produce a light yellow colored off-white solid (1.24 g, 4.59 mmol, 97.6% crude). This compound crystallized easily from toluene; mp 165.5-166.5°.

¹H NMR (CDCl₃) δ 9.07 (dd, J = 1.8, 4.3 Hz, 1H), 8.12 (dd, J = 1.7, 8.1 Hz, 1H); 7.97 (d, J = 8.8 Hz, 1H), 7.59 (d, J = 8.7 Hz, 1H), 7.50 (dd, J = 4.3, 8.1 Hz, 1H), 7.42 (d, J = 8.6 Hz, 1H), 6.84 (d, J = 8.8 Hz, 1H), 5.44 (br s, 1H), 3.40 (m, 2H), 1.79 (m, 1H), 1.58, m, 2H), 0.99 (d, J = 6.5 Hz, 6 H). ¹³C NMR (CDCl₃) δ 158.2, 149.2, 146.0, 145.0, 138.0, 135.8, 129.3, 126.5, 122.2, 120.8, 108.4, 40.8, 38.5, 25.7, 22.5. Anal. Calcd. For C₁₇H₁₉N₃: C, 76.95; H, 7.22; N, 15.84. Found: C, 76.85; H, 7.00; N, 15.64.

***N*-isopentyl-*N*-(1,10-phenanthroline-2-yl)-1,10-phenanthroline-2-amine (7, X = CH).**

The NaH (30 mg, 57 – 63% dispersion) was added to an oven dried, nitrogen purged two-neck flask, with one neck equipped with a reflux condenser and the other with a septum. The monoamine **5** (X = CH) (135 mg, 0.5 mmol) was dissolved in DMF (2 mL) and added via syringe to the flask. A color shift from clear to dark orange was observed and this mixture was allowed to stir for five minutes until gas evolution was no longer noticed. The 2-chloro-1,10-phenanthroline (**1**, 110 mg, 0.5 mmol) was dissolved in DMF (2 mL) and added to the flask via syringe and the mixture allowed to stir for 15 min. The mixture was then heated to 100°C, held at this temperature for 4 h and allowed to cool to room temperature. Ice water (20 mL) was added via syringe to quench any excess NaH. A light off-white precipitate formed in a milky light yellow suspension. The product was collected by filtration, washed with ice water to afford an orange yellow solid, which was air dried (155 mg). The solid was then crystallized from acetonitrile, producing a light yellow solid. A portion of this solid in acetonitrile was then treated with silica gel to afford an off white, slightly yellow solid; mp 170-171°C.

¹H NMR (CDCl₃) δ 9.14 (dd, J = 4.3, 1.6 Hz, 2H) 8.18 (dd, J = 8.1, 1.6 Hz, 2H), 8.06 (d, J = 8.7 Hz, 2H), 7.71 (d, J = 8.7 Hz, 2H), 7.69 (dd, J = 8.1 Hz, 4.3 Hz, 2H), 4.96 (t, J = 7.6 Hz, 2H), 1.93 (m, 2H), 1.84 (m, 1H), 1.06 (d, J = 6.6 Hz, 6H). ¹³C NMR (CDCl₃) δ 156.6, 149.8, 145.7, 145.6, 137.2, 135.7; 129.1, 124.6, 123.7, 122.4, 116.6, 48.0, 37.5, 26.3, 22.8. Anal. Calcd. For C₂₉H₂₅N₅: C, 78.53; H, 5.68; N, 15.79. Found: C, 78.43; C, 5.58; N, 15.58.

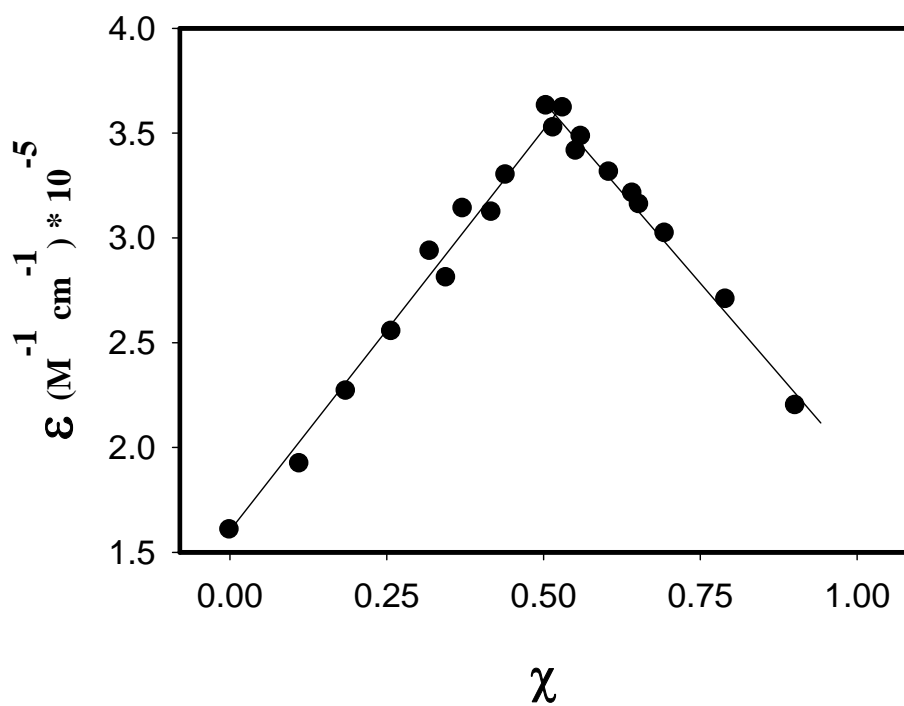


Fig. S1: Job plot for **6**-Ni(II) (total concentration 0.3 mM) complex formation monitored in 10 mM Tris, 50 mM KCl, pH 7.5. Absorbance was measured at 271 nm.

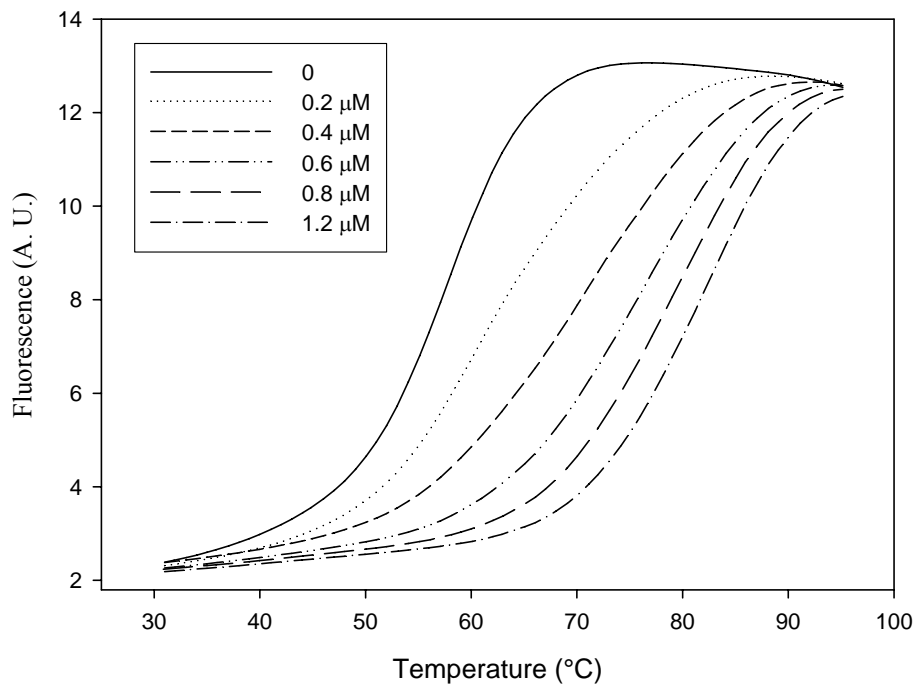


Fig. S2: Melting profile of fluorescence-labelled HTS upon addition of **6**-Ni(II) (0-1.2 μM).



Fig. S3: Effect of increasing concentrations of **3-Cu(II)** (0-20 μM) on the cleavage of G-quadruplex folded Tel22 (1 μM strand concentration) in 10 mM TRIS, 50 mM KCl at pH 8.0. M refers to Maxam and Gilbert purine ladder