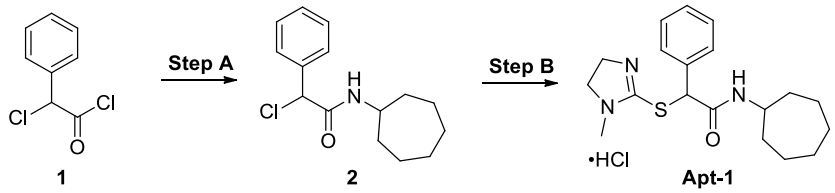
Synthesis of Apt-1

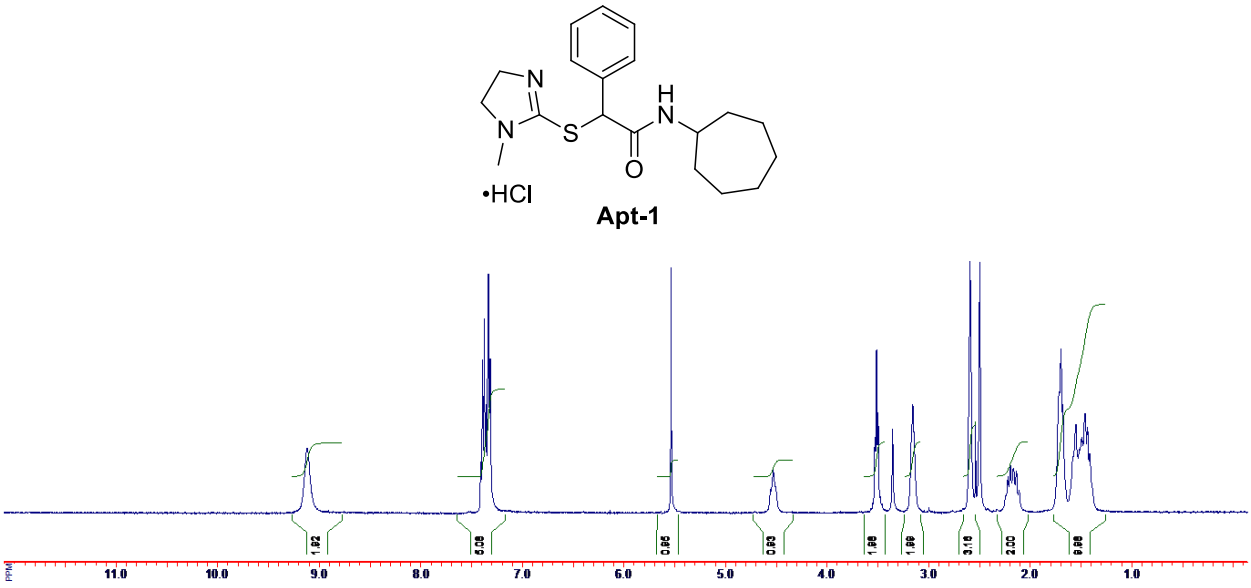


1 2 Apt-1

Step A: Cycloheptylamine (11.3 g, 0.1 mol) and triethylamine (12 g, 0.12 mol, 1.2 eq) were dissolved in acetonitrile (300 mL) and cooled to -20 ^{o}C. A solution of **1** (19 g, 0.1 mol) in acetonitrile (30 mL) was added dropwise and then the reaction mixture was allowed to warm to room temperature and stir for 16 hours. The mixture was evaporated, 0.01M HCl aqueous solution (300 mL) was added and the obtained precipitate was filtered. The material was recrystallized from isopropanol-hexane to give **2** (20 g). Yield: 75%.

Step B: Compound **2** (10 g, 0.037 mol) and 1-methyl-4,5-dihydro-1H-imidazole-2-thiol (**3**, 4.3 g, 0.037 mol) were dissolved into DMA (200 mL) and the reaction mixture was stirred for 16 hours at 90-100 ^{o}C. The mixture was allowed to cool to room temperature, diluted with Et_2O (150 mL) and stirred for another hour. The obtained precipitate was filtered to give crude product, which was purified by column chromatography on silica gel to give **Apt-1** (6 g). Yield: 47%. The material was further purified by liquid chromatography to give **Apt-1** hydrochloride salt. ^{1}H NMR: (DMSO-d_6, 400 MHz): 9.10 (bs, 1H), 7.40 – 7.20 (m, 5H), 5.55 (s, 1H), 4.60 - 4.45 (m, 1H), 3.55 – 3.50 (m, 2H), 3.30 – 3.20 (m, 2H), 2.60 (s, 3H), 2.25 – 2.05 (m, 2H), 1.80 – 1.35 (m, 10H). LRMS: m/z = 346.2.

^{1}H NMR of Apt-1



LRMS of Apt-1

Mol Wt of Apt-1: 381.96

Exact Mass of Apt-1: 345.23