**Design, Synthesis, In silico Docking Prediction of Novel Triazolyl Tetrazole Derivatives: Evaluation of Anticancer and SIRT1 inhibition Activity**

**Supporting Information (SI)**

**Spectroscopic data**

**(*S*)-9-(4-(((1-(4-hydroxyphenyl)-1H-tetrazol-5-yl)thio)methyl)-1H-1,2,3-triazol-1-yl)-6,7,8,9-tetrahydro-5H-****cyclohepta[*b*]pyridin-5-one** (**8b**)

1H NMR (400 MHz, CDCl3, *δ*, ppm): 9.64 (brs, 1H, OH), 7.82 (d, 1H, *J* = 8.9 Hz, Ar-H), 7.70 (t, 1H, *J* = 9.3 Hz, Ar-H), 7.37 (d, 1H, *J* = 8.9 Hz, Ar-H), 7.29 (s, 1H, triazole H), 7.09 (d, 2H, *J* = 8.8 Hz, Ar-H), 6.83 (d, 2H, *J* = 8.8 Hz, Ar-H), 4.60 (s, 2H, CH2), 4.37 (m, 1H, CH), 3.09 (m, 1H, CH), 2.83 (m, 1H, CH), 2.55 (t, 1H, *J =* 9.9 Hz, CH), 2.12 (m, 1H, CH), 1.76 (t, 2H, *J =* 10.2 Hz, CH). 13C NMR (100 MHz, CDCl3, *δ*, ppm): 193.51, 169.60, 158.55, 153.94, 146.12, 136.32, 132.66, 131.56, 130.68, 130.64, 128.17, 127.25, 126.99, 125.47, 124.51, 68.47, 41.65, 37.36, 34.12, 24.55. IR (KBr, cm-1) *υ*: 3392.95 (‒OH), 2977.88, 2928.32 (‒CH), 1736.33 (C=O), 1592.25 (C=C), 1438.18 (C=N), 1208.51 (CSC). HRMS (*m/z*): 435.2419 [M + H]+. Elemental analysis for C20H18N8O2S: calcd, C, 55.13; H, 4.03; N, 25.55; S, 7.16; found, C, 55.34; H, 4.23; N, 25.88; S, 7.29.

**(*S*)-9-(4-(((1-(4-methoxyphenyl)-1H-tetrazol-5-yl)thio)methyl)-1H-1,2,3-triazol-1-yl)-6,7,8,9-tetrahydro-5H-cyclohepta[*b*]pyridin-5-one** (**8c**)

1H NMR (400 MHz, CDCl3, *δ*, ppm): 8.10 (d, 1H, *J* = 8.9 Hz, Ar-H), 7.91 (t, 1H, *J* = 9.3 Hz, Ar-H), 7.31 (d, 1H, *J* = 8.9 Hz, Ar-H), 7.22 (s, 1H, triazole H), 7.12 (d, 2H, *J* = 8.8 Hz, Ar-H), 6.87 (d, 2H, *J* = 8.8 Hz, Ar-H), 5.14 (s, 2H, CH2), 4.77 (t, 1H, *J =* 9.9 Hz, CH), 3.73 (s, 3H, OCH3), 3.12 (m, 1H, CH), 2.67 (m, 1H, CH), 2.38 (m, 1H, CH), 2.13 (t, 1H, *J =* 9.9 Hz, CH), 1.70 (m, 1H, CH). 13C NMR (100 MHz, CDCl3, *δ*, ppm): 191.14, 167.08, 160.56, 156.15, 150.28, 145.99, 136.52, 132.26, 130.60, 129.75, 128.60, 127.29, 127.21, 127.07, 126.57, 124.43, 67.08, 58.41, 39.77, 32.58, 29.66, 24.72. IR (KBr, cm-1) *υ*: 3137.08 (=CH), 2964.89, 2841.93 (‒CH), 1735.30 (C=O), 1575.24, 1509.93 (C=C), 1466.50 (C=N), 1391.39 (N=N), 1268.61 (CSC), 1163.23 (COC). HRMS (*m/z*): 449.2276 [M + H]+. Elemental analysis for C21H20N8O2S: calcd, C, 56.02; H, 4.04; N, 24.55; S, 7.33; found, C, 56.24; H, 4.49; N, 24.98; S, 7.14.

**(*S*)-9-(4-(((1-(p-tolyl)-1H-tetrazol-5-yl)thio)methyl)-1H-1,2,3-triazol-1-yl)-6,7,8,9-tetrahydro-5H-cyclohepta[*b*]pyridin-5-one** (**8d)**

1H NMR (400 MHz, CDCl3, *δ*, ppm): 8.47 (d, 1H, *J* = 8.9 Hz, Ar-H), 7.87 (t, 1H, *J* = 9.3 Hz, Ar-H), 7.75 (s, 1H, triazole H), 7.70 (d, 1H, *J* = 8.9 Hz, Ar-H), 7.60 (d, 2H, *J* = 8.8 Hz, Ar-H), 7.37 (d, 2H, *J* = 8.8 Hz, Ar-H), 5.12 (s, 2H, CH2), 4.82 (t, 1H, *J =* 9.9 Hz, CH), 2.71 (s, 3H, CH3), 2.51 (t, 1H, *J =* 9.9 Hz, CH), 2.19 (m, 1H, CH), 1.76 (m, 1H, CH), 1.70 (m, 1H, CH), 1.45 (t, 2H, *J =* 9.8 Hz, CH). 13C NMR (100 MHz, CDCl3, *δ*, ppm): 191.24, 168.31, 155.48, 145.80, 140.59, 136.23, 130.58, 130.21, 129.18, 127.32, 127.02, 124.73, 124.45, 122.37, 68.31, 41.67, 34.92, 32.59, 26.12, 24.70. IR (KBr, cm-1) *υ*: 3197.10 (=CH), 2966.39, 2879.33 (‒CH), 1755.15 (C=O), 1590.91, 1505.18 (C=C), 1449.50 (C=N), 1376.72 (N=N), 1269.35 (CSC). HRMS (*m/z*): 433.2254 [M + H]+. Elemental analysis for C21H20N8OS: calcd, C, 58.32; H, 4.66; N, 25.91; S, 7.41; found C, 58.55; H, 4.98; N, 26.05; S, 7.22.

**(*S*)-9-(4-(((1-(4-chlorophenyl)-1H-tetrazol-5-yl)thio)methyl)-1H-1,2,3-triazol-1-yl)-6,7,8,9-tetrahydro-5H-cyclohepta[*b*]pyridin-5-one** (**8e**)

1H NMR (400 MHz, CDCl3, *δ*, ppm): 8.49 (d, 1H, *J* = 8.9 Hz, Ar-H), 8.01 (s, 1H, triazole H), 7.86 (d, 2H, *J* = 8.8 Hz, Ar-H), 7.71 (d, 1H, *J* = 8.9 Hz, Ar-H), 7.59 (t, 1H, *J* = 9.8 Hz, Ar-H), 7.20 (d, 2H, *J* = 8.8 Hz, Ar-H), 5.06 (s, 2H, CH2), 4.75 (t, 1H, *J =* 9.9 Hz, CH), 3.51 (m, 1H, CH), 3.23 (t, 1H, *J =* 9.9 Hz, CH), 2.57 (m, 1H, CH), 2.02 (t, 1H, *J =* 9.9 Hz, CH), 1.60 (m, 2H, CH). 13C NMR (100 MHz, CDCl3, *δ*, ppm): 192.68, 167.13, 152.26, 145.62, 137.39, 133.27, 132.03, 132.19, 131.80, 129.33, 128.77, 128.11, 127.07, 126.03. IR (KBr, cm-1) *υ*: 3181.26 (=CH), 2961.34, 2896.62 (‒CH), 1762.08 (C=O), 1586.94, 1505.17 (C=C), 1474.16 (C=N), 1363.92 (N=N), 1269.05 (CSC), 866.44 (CCl). HRMS (*m/z*): 453.1910 [M + H]+. Elemental analysis for C20H17ClN8OS: calcd, C, 53.04; H, 3.78; Cl, 7.83; N, 24.74; S, 7.08; found C, 52.78; H, 3.33; Cl, 7.46; N, 24.30; S, 6.88.

**(*S*)-9-(4-(((1-(2,4-dichlorophenyl)-1H-tetrazol-5-yl)thio)methyl)-1H-1,2,3-triazol-1-yl)-6,7,8,9-tetrahydro-5H-cyclohepta[*b*]pyridin-5-one** (**8f)**

1H NMR (400 MHz, CDCl3, *δ*, ppm): 8.23 (d, 1H, *J* = 8.9 Hz, Ar-H), 7.86 (d, 1H, *J* = 8.9 Hz, Ar-H), 7.72 (s, 1H, triazole H), 7.57 (t, 2H, *J* = 9.8 Hz, Ar-H), 7.35 (s, 1H, Ar-H), 6.90 (d, 1H, *J* = 8.9 Hz, Ar-H), 5.09 (s, 2H, CH2), 4.70 (t, 1H, *J =* 9.9 Hz, CH), 3.10 (m, 1H, CH), 2.81 (t, 1H, *J =* 9.9 Hz, CH), 2.18 (m, 1H, CH), 1.90 (m, 1H, CH), 1.52 (t, 1H, *J =* 9.9 Hz, CH), 1.25 (t, 1H, *J =* 9.9 Hz, CH). 13C NMR (100 MHz, CDCl3, *δ*, ppm): 191.40, 167.29, 157.22, 148.70, 145.08, 136.55, 133.64, 131.67, 130.27, 130.12, 129.07, 129.46, 128.78, 127.55, 125.08, 124.80, 67.50, 40.82, 36.12, 32.67, 24.65. IR (KBr, cm-1) *υ*: 3185.75 (=CH), 2970.78, 2875.99 (‒CH), 1744.40 (C=O), 1576.02, 1501.66 (C=C), 1465.45 (C=N), 1368.42 (N=N), 1266.15 (CSC), 884.56 (CCl). HRMS (*m/z*): 488.1435 [M + H]+. Elemental analysis for C20H16Cl2N8OS: calcd, C, 49.03; H, 3.21; Cl, 14.10; N, 22.37; S, 6.03; found C, 49.29; H, 3.33; Cl, 14.54; N, 22.97; S, 5.68.

**(*S*)-9-(4-(((1-(2,4-difluorophenyl)-1H-tetrazol-5-yl)thio)methyl)-1H-1,2,3-triazol-1-yl)-6,7,8,9-tetrahydro-5H-cyclohepta[*b*]pyridin-5-one** (**8g)**

1H NMR (400 MHz, CDCl3, *δ*, ppm): 8.48 (d, 1H, *J* = 8.9 Hz, Ar-H), 8.20 (s, 1H, triazole H), 7.90 (t, 2H, *J* = 9.8 Hz, Ar-H), 7.78 (d, 1H, *J* = 8.9 Hz, Ar-H), 7.58 (t, 1H, *J* = 9.9 Hz, Ar-H), 7.36 (d, 1H, *J* = 8.9 Hz, Ar-H), 5.01 (s, 2H, CH2), 4.62 (t, 1H, *J =* 9.9 Hz, CH), 3.36 (m, 1H, CH), 3.08 (t, 1H, *J =* 9.9 Hz, CH), 2.54 (m, 1H, CH), 1.61 (t, 1H, *J =* 9.9 Hz, CH), 1.26 (m, 2H, CH). 13C NMR (100 MHz, CDCl3, *δ*, ppm): 191.47, 170.78, 167.97, 165.98, 155.16, 145.77, 136.74, 133.87, 130.43, 129.90, 128.96, 127.92, 127.20, 127.07, 126.42, 125.93, 124.22, 122.64, 67.90, 40.30, 37.05, 32.67, 25.98. IR (KBr, cm-1) *υ*: 3195.10 (=CH), 2972.96, 2842.93 (‒CH), 1738.63 (C=O), 1594.28, 1502.33 (C=C), 1458.56 (C=N), 1366.59 (N=N), 1264.42 (CSC), 1023.42 (CF). HRMS (*m/z*): 454.2289 [M + H]+. Elemental analysis for C20H16F2N8OS: calcd, C, 52.55; H, 3.12; F, 8.07; N, 24.21; S, 7.09; found C, 52.86; H, 3.55; F, 8.36; N, 24.65; S, 6.78.

**(*S*)-9-(4-(((1-(2-fluorophenyl)-1H-tetrazol-5-yl)thio)methyl)-1H-1,2,3-triazol-1-yl)-6,7,8,9-tetrahydro-5H-cyclohepta[*b*]pyridin-5-one** (**8h)**

1H NMR (400 MHz, CDCl3, *δ*, ppm): 8.08 (d, 1H, *J* = 8.9 Hz, Ar-H), 7.70 (d, 1H, *J* = 8.9 Hz, Ar-H), 7.60 (s, 1H, triazole H), 7.40 (t, 2H, *J* = 9.8 Hz, Ar-H), 7.29 (d, 1H, *J* = 8.9 Hz, Ar-H), 7.04 (t, 1H, *J* = 9.9 Hz, Ar-H), 6.84 (d, 1H, *J* = 8.9 Hz, Ar-H), 5.20 (s, 2H, CH2), 4.83 (t, 1H, *J =* 9.9 Hz, CH), 3.35 (m, 1H, CH), 3.20 (t, 1H, *J =* 9.9 Hz, CH), 2.60 (m, 1H, CH), 2.34 (m, 1H, CH), 1.99 (t, 1H, *J =* 9.9 Hz, CH), 1.75 (m, 1H, CH). 13C NMR (100 MHz, CDCl3, *δ*, ppm): 192.36, 167.42, 158.91, 144.13, 140.23, 135.48, 134.14, 133.52, 133.39, 129.82, 129.70, 128.02, 127.24, 127.05, 124.88, 123.42, 67.56, 40.55, 36.98, 33.19, 24.81. IR (KBr, cm-1) *υ*: 3131.85 (=CH), 2961.27, 2831.13 (‒CH), 1734.32 (C=O), 1575.07, 1511.99 (C=C), 1435.52 (C=N), 1365.96 (N=N), 1226.04 (CSC), 1010.02 (CF). HRMS (*m/z*): 437.2214 [M + H]+. Elemental analysis for C20H17FN8OS: calcd, C, 55.76; H, 3.73; F, 4.30; N, 25.10; S, 7.01; found C, 55.04; H, 3.93; F, 4.34; N, 25.62; S, 7.26.

**(*S*)-9-(4-(((1-(2-nitrophenyl)-1H-tetrazol-5-yl)thio)methyl)-1H-1,2,3-triazol-1-yl)-6,7,8,9-tetrahydro-5H-cyclohepta[*b*]pyridin-5-one** (**8i)**

1H NMR (400 MHz, CDCl3, *δ*, ppm): 8.23 (d, 1H, *J* = 8.9 Hz, Ar-H), 7.97 (d, 1H, *J* = 8.9 Hz, Ar-H), 7.78 (s, 1H, triazole H), 7.49 (t, 2H, *J* = 9.8 Hz, Ar-H), 7.30 (d, 1H, *J* = 8.9 Hz, Ar-H), 7.07 (t, 1H, *J* = 9.9 Hz, Ar-H), 6.99 (d, 1H, *J* = 8.9 Hz, Ar-H), 5.19 (s, 2H, CH2), 4.80 (t, 1H, *J =* 9.9 Hz, CH), 3.30 (m, 1H, CH), 3.16 (t, 1H, *J =* 9.9 Hz, CH), 2.75 (m, 1H, CH), 2.38 (m, 1H, CH), 2.05 (t, 1H, *J =* 9.9 Hz, CH), 1.88 (m, 1H, CH). 13C NMR (100 MHz, CDCl3, *δ*, ppm): 189.25, 168.17, 156.09, 144.21, 139.20, 135.45, 134.62, 133.35, 129.75, 129.12, 128.31, 127.25, 126.47, 124.36, 123.40, 68.55, 41.50, 35.72, 32.20, 23.70. IR (KBr, cm-1) *υ*: 3071.12 (=CH), 2970.80, 2943.96 (‒CH), 1738.98 (C=O), 1575.62, 1508.03 (C=C), 1450.04 (C=N), 1383.71 (N=N), 1272.30 (CSC). HRMS (*m/z*): 464.1472 [M + H]+. Elemental analysis for C20H17N9O3S: calcd, C, 51.87; H, 3.23; N, 26.33; S, 6.10; found C, 51.65; H, 3.71; N, 27.15; S, 6.47.

**(S)-9-(4-(((1-(pyridin-3-yl)-1H-tetrazol-5-yl)thio)methyl)-1H-1,2,3-triazol-1-yl)-6,7,8,9-tetrahydro-5H-cyclohepta[*b*]pyridin-5-one** (**8j**)

1H NMR (400 MHz, DMSO-d6, *δ*, ppm): 8.66 (d, 1H, *J* = 8.9 Hz, Ar-H), 8.25 (d, 1H, *J* = 8.9 Hz, Ar-H), 8.01 (s, 1H, triazole H), 7.80 (d, 1H, *J* = 8.9 Hz, Ar-H), 7.27 (t, 1H, *J* = 9.8 Hz, Ar-H), 7.16 (s, 1H, Ar-H), 7.05 (t, 1H, *J* = 9.9 Hz, Ar-H), 6.97 (d, 1H, *J* = 8.9 Hz, Ar-H), 5.17 (s, 2H, CH2), 4.82 (t, 1H, *J =* 9.9 Hz, CH), 3.30 (m, 1H, CH), 3.18 (t, 1H, *J =* 9.9 Hz, CH), 2.64 (m, 1H, CH), 2.35 (m, 1H, CH), 2.04 (t, 1H, *J =* 9.9 Hz, CH), 1.88 (m, 1H, CH). 13C NMR (100 MHz, DMSO-d6, *δ*, ppm): 188.75, 167.86, 158.67, 150.29, 147.88, 135.64, 131.66, 131.07, 130.85, 130.25, 128.94, 128.28, 126.47, 125.52, 65.87, 48.13, 31.83, 26.49, 24.42. IR (KBr, cm-1) *υ*: 3137.36 (=CH), 3007.23, 2963.05 (‒CH), 1733.05 (C=O), 1596.32, 1512.05 (C=C), 1467.23 (C=N), 1364.31 (N=N), 1265.39 (CSC). HRMS (*m/z*): 420.2578 [M + H]+. Elemental analysis for C19H17N9OS: calcd, C, 54.40; H, 4.09; N, 30.05; S, 7.64; found C, 54.26; H, 4.36; N, 30.18; S, 7.01.

**(S)-9-(4-(((1-(pyridin-4-yl)-1H-tetrazol-5-yl)thio)methyl)-1H-1,2,3-triazol-1-yl)-6,7,8,9-tetrahydro-5H-cyclohepta[*b*]pyridin-5-one** (**8k)**

1H NMR (400 MHz, DMSO-d6, *δ*, ppm): 7.87 (d, 1H, *J* = 8.9 Hz, Ar-H), 7.61 (d, 2H, *J* = 8.8 Hz, Ar-H), 7.39 (t, 2H, *J* = 9.8 Hz, Ar-H), 7.29 (d, 1H, *J* = 8.9 Hz, Ar-H), 7.20 (s, 1H, triazole H), 7.08 (d, 2H, *J* = 8.8 Hz, Ar-H), 5.25 (s, 2H, CH2), 4.90 (m, 1H, CH), 3.59 (m, 1H, CH), 2.70 (t, 1H, *J =* 9.9 Hz, CH), 2.50 (m, 1H, CH), 2.05 (t, 1H, *J =* 9.9 Hz, CH), 1.58 (m, 2H, CH). 13C NMR (100 MHz, DMSO-d6, *δ*, ppm): 188.94, 168.84, 157.86, 148.28, 145.52, 141.94, 135.65, 134.28, 130.29, 129.46, 129.10, 127.72, 126.55, 125.29, 68.83, 48.04, 38.50, 25.90, 24.32. IR (KBr, cm-1) *υ*: 3106.16 (=CH), 2942.57, 2873.51 (‒CH), 1695.85 (C=O), 1589.97, 1503.43 (C=C), 1447.69 (C=N), 1364.02 (N=N), 1258.46 (CSC). HRMS (*m/z*): 420.1952 [M + H]+. Elemental analysis for C19H17N9OS: calcd, C, 54.41; H, 4.10; N, 30.07; S, 7.63; found C, 54.55; H, 4.78; N, 30.66; S, 7.23. Spectral copies of 1H NMR, 13C NMR, IR and mass spectrums are included in supporting information (**Figure S1-S43**).

**Biological evaluation**

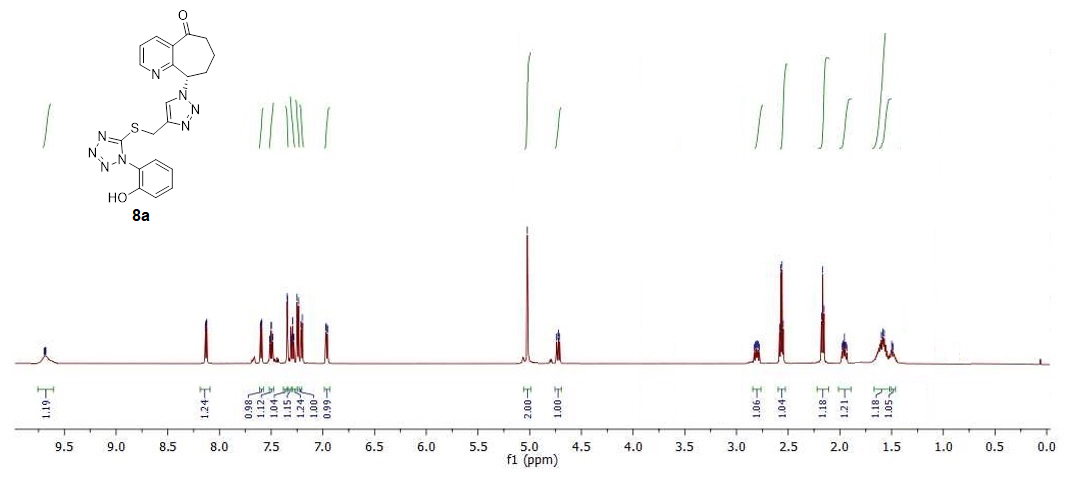
**Anticancer activity***:* 20,000 human cancer cells were plated in a 96-well plate and incubated for 24 h at 37 °C in an incubator with 5% CO2. Subsequently, the culture medium was replaced with one devoid of foetal bovine serum (FBS), test compounds were introduced, and the incubation period was carried out once more. Following a 24 h incubation period, the wells serum-free medium was disposed of, and 100 μL of the reagent, the MTT reagent was pipetted. After that, the plate was further incubated for 4 h at 37 °C. For the purpose of calculating cell viability, absorbance at 570 and 630 nm was measured using a microplate reader.

**hSIRT1 enzymatic assay:** For this investigation, a full-length SIRT1 clone was employed. In BL21 X (DE3) PLysS cells, SIRT1 expression was achieved via induction at an A600 of 0.6 and a final IPTG concentration of 1 mM for 16–20 h at 15 °C. As stated in the presented procedure (see infra), SIRT1 was purified by utilizing an anion exchange chromatography system after a Ni+2-NTA chelating column. Generally, each liter culture yielded 3-5 mg of approximately 70% pure SIRT1. Following the manufacturer's instructions, the MTT test was conducted after the SIRT1 activity assay utilizing recombinant pure SIRT1 and p53K382 fluorophore labelled substrate using a BioMol fluorimetric activity assay kit from Biomol Inc., Pune, India.

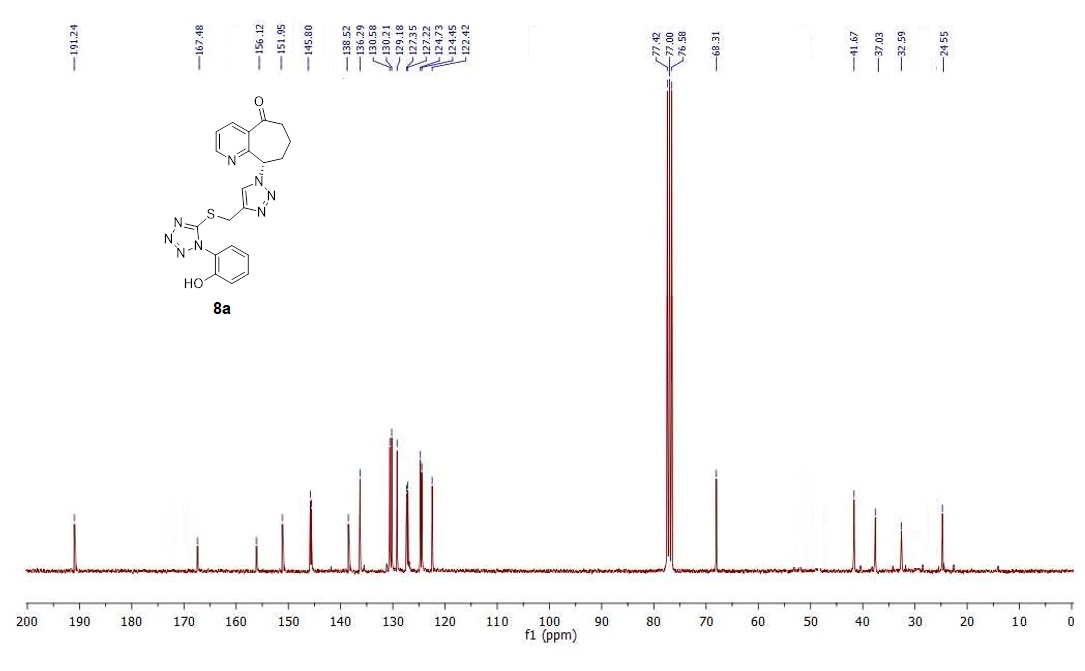
**Docking studies**

Using ACD Chemsketch, the majority of active synthetic compounds were created and saved in a. mol file. Next, using OPENBABEL software and the Autodock 4.2 program, all of the sketched molecules were translated to PDB format (Bioinformatics Division, PGRRCDE, Hyderabad, India). For this program, the Protein Data Bank provided the X-ray crystal structure of the SIRT1 catalytic domain bound to NAD and an EX527 counterpart (PDB: 4I5I). The traditional method was used to attach a rigid protein with a flexible ligand that had known torsion angles. Protein was given hydrogen bonding, and distinct ligand preparation was also carried out. Constructed using a 0.691 Å grid spacing, the grid box had dimensions of 60 x 60 x 60, and the coordinates were noted in x, y, and z. Subsequently, the Autodock Tools 4.2 program was used to insert hydrogen atoms; water, ligands, and other structures were eliminated and saved in pdb format; PyRx was then employed to decrease energy. The minimized compounds were converted to pdb format and then combined with Autodock Tool 4.2 to make them compatible with Autodock protein structures. The two-dimensional structures of the compounds were drawn using Chem Bio Draw Ultra 13.0, and the energy map was calculated using a function of the dielectric constant that varied with distance.

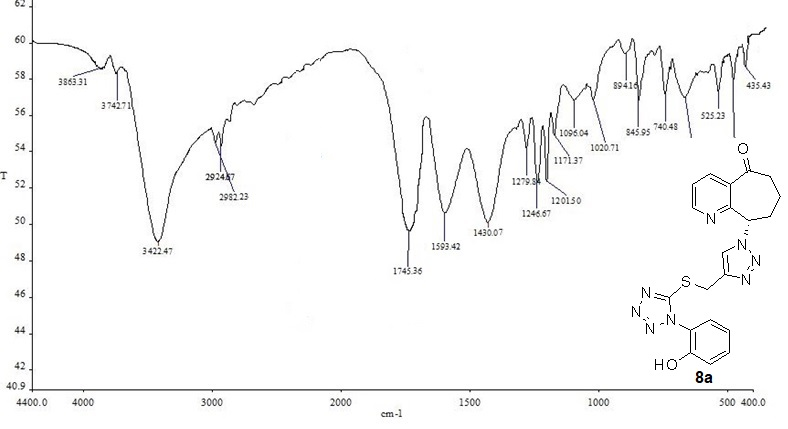
**Supporting Spectral Information (1H-NMR and 13C-NMR, IR and Mass reports) [Figure S1-S43]**

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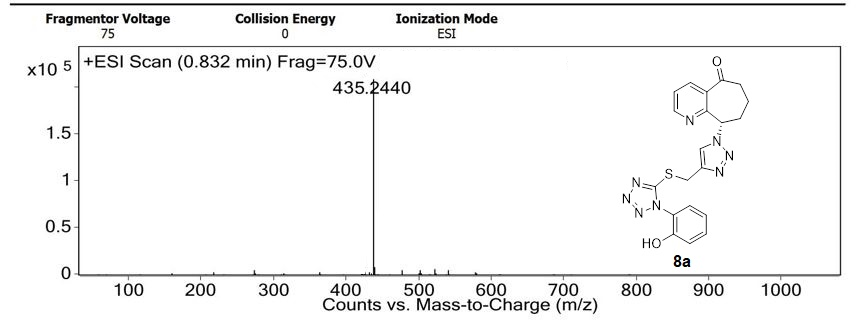
**Figure S1**: 1H NMR spectra of 8a

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**Figure S2**: 13C NMR spectra of 8a



**Figure S3**: IR spectra of 8a



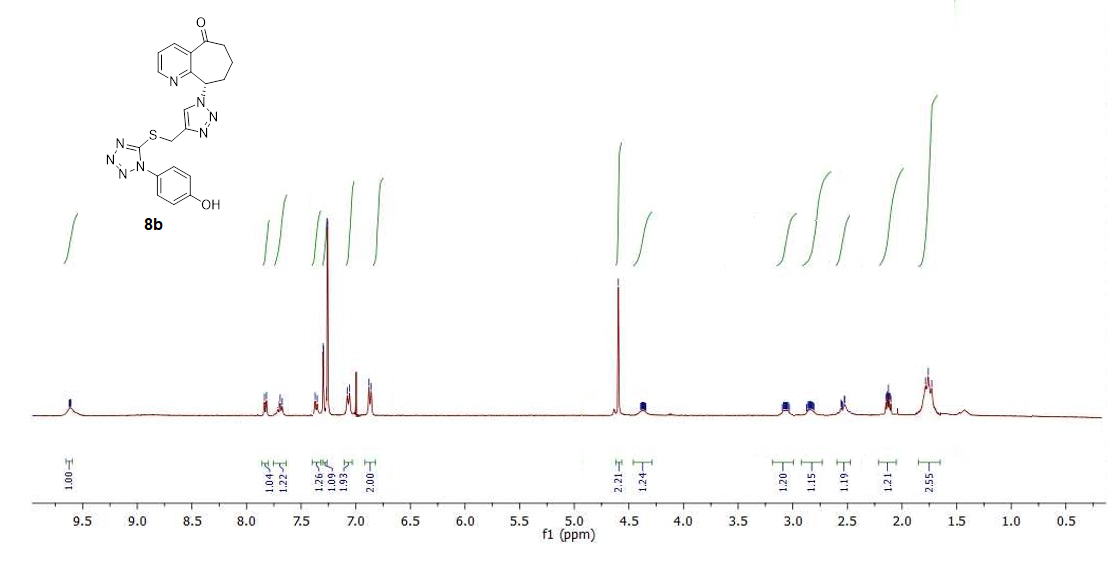
**Figure S4**: Mass spectra of 8a

A picture containing chart

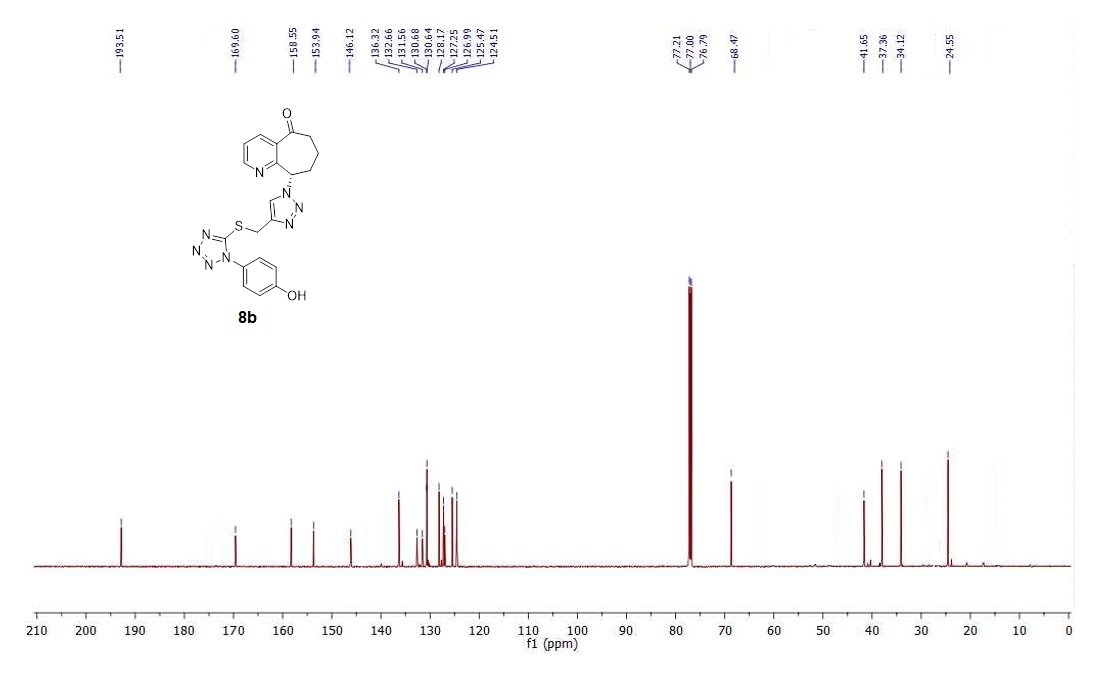
Description automatically generated

**(S)-8a**

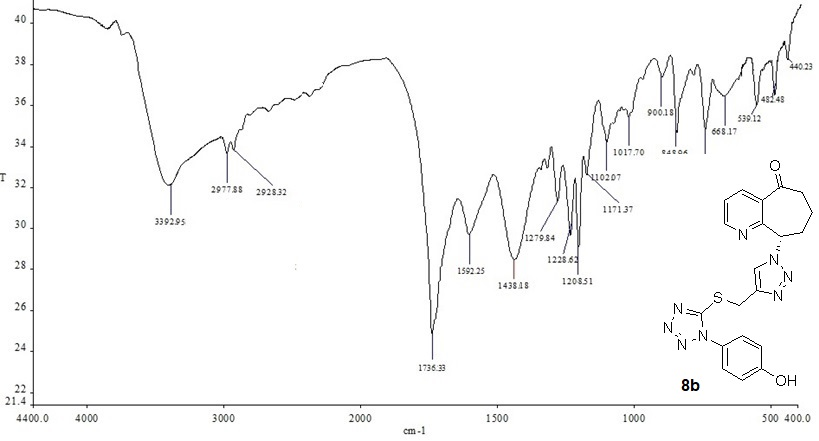
Figure S5: HPLC chromatogram of (S)-8a.



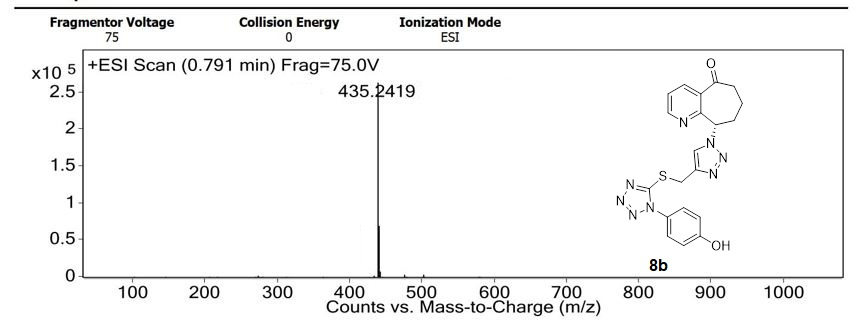
**Figure S6**: 1H NMR spectra of 8b



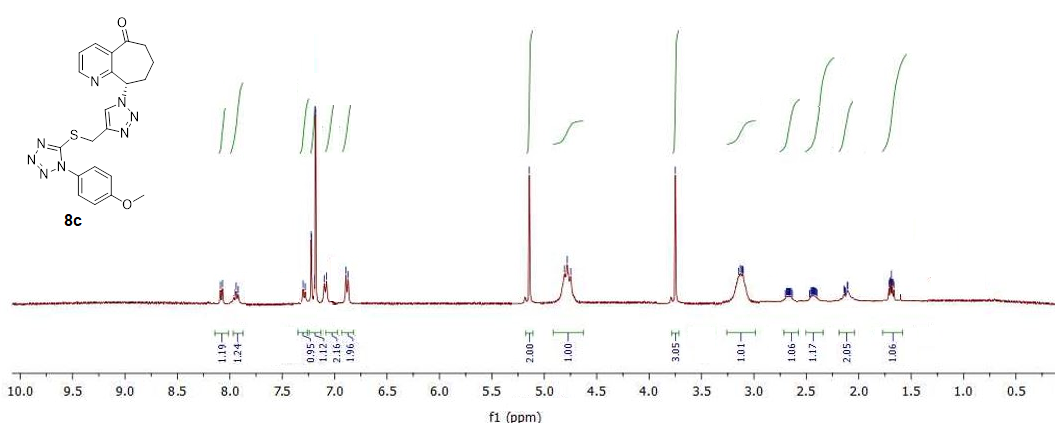
**Figure S7**: 13C NMR spectra of 8b



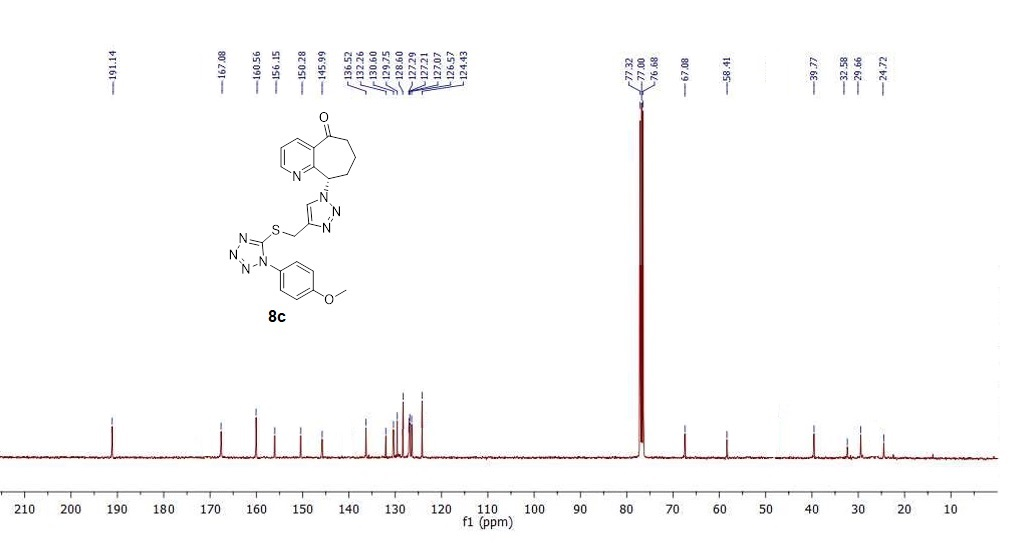
**Figure S8**: IR spectra of 8b



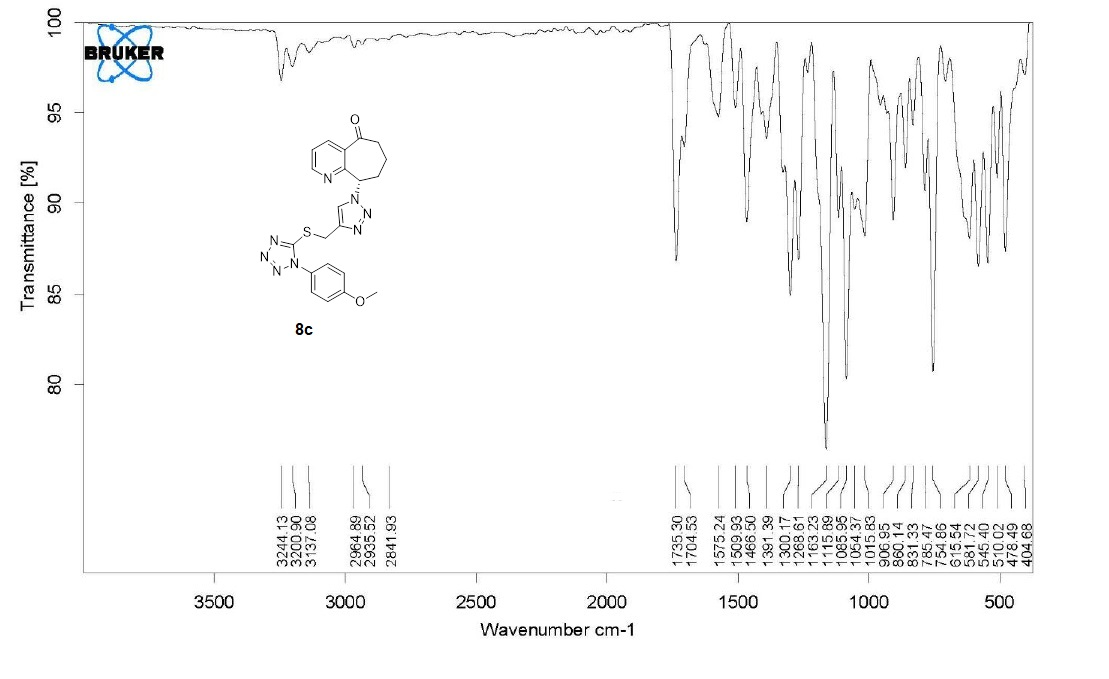
**Figure S9**: Mass spectra of 8b



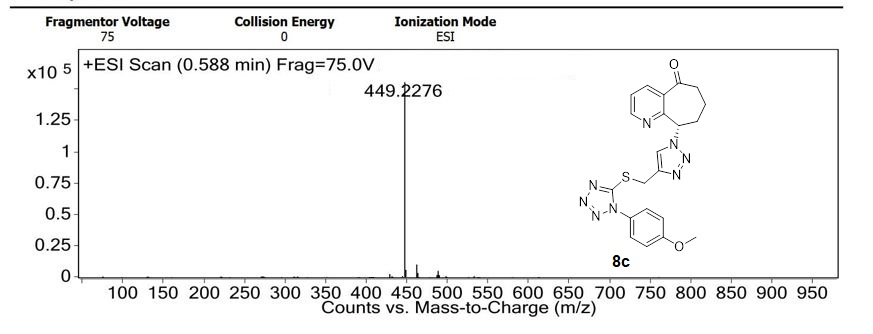
**Figure S10**: 1H NMR spectra of 8c

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**Figure S11**: 13C NMR spectra of 8c



**Figure S12**: IR spectra of 8c



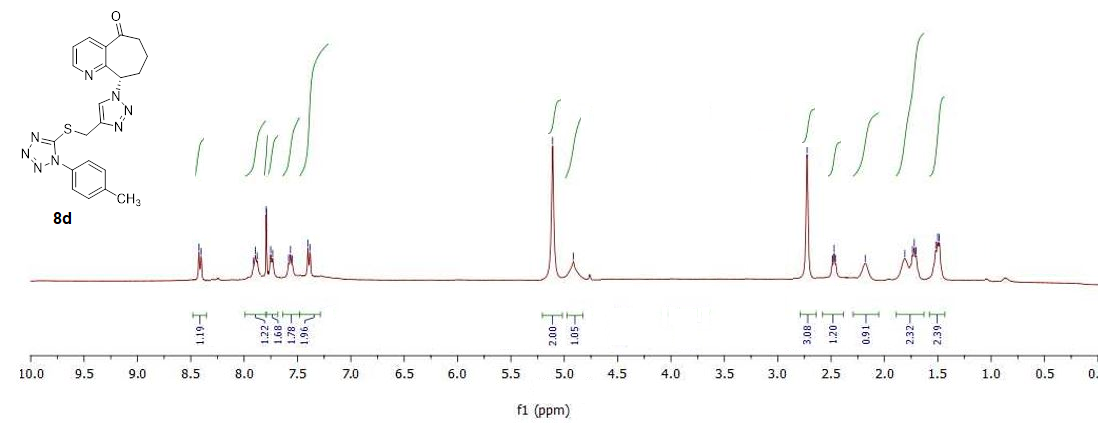
**Figure S13**: Mass spectra of 8c

A picture containing graphical user interface

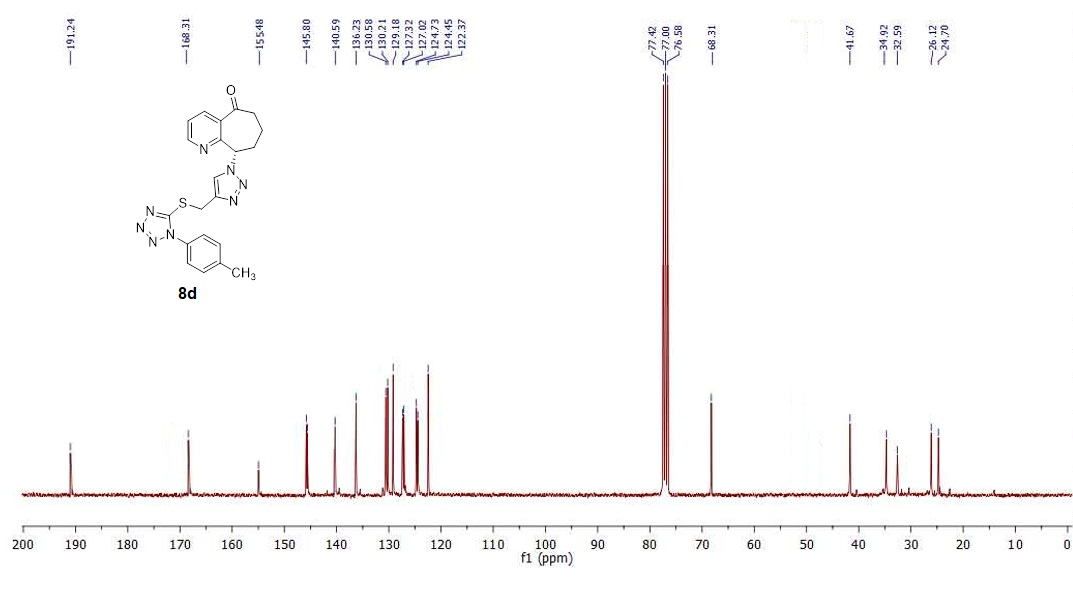
Description automatically generated

**(S)-8c**

Figure S14: HPLC chromatogram of (*S*)-8c.



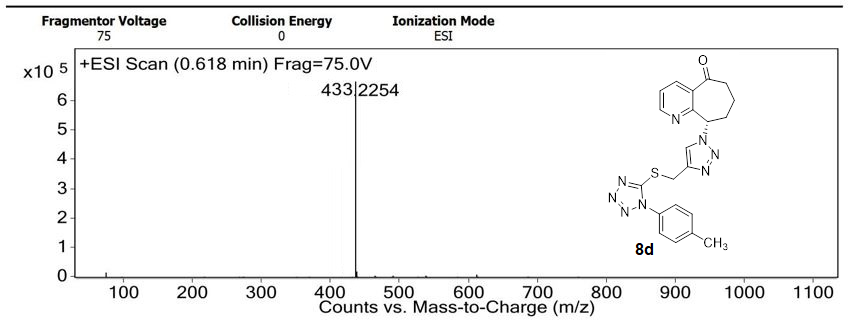
**Figure S15**: 1H NMR spectra of 8d



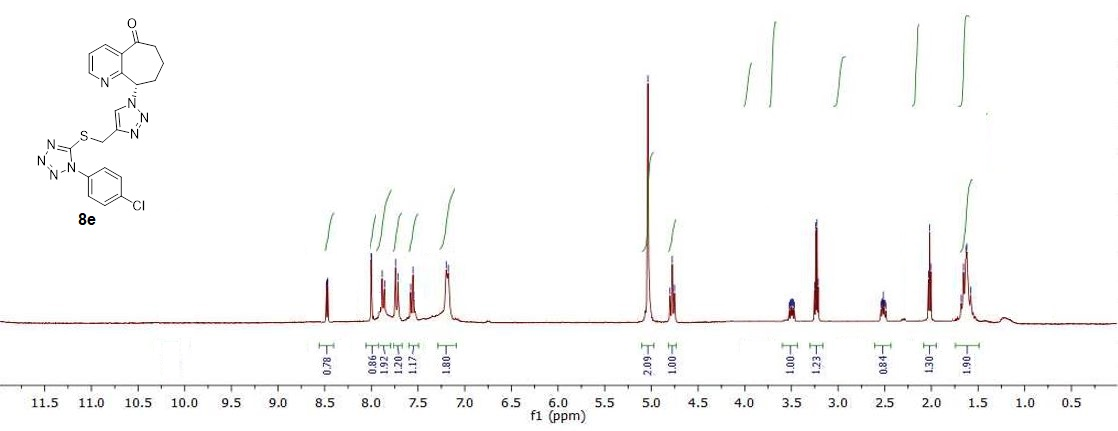
**Figure S16**: 13C NMR spectra of 8d



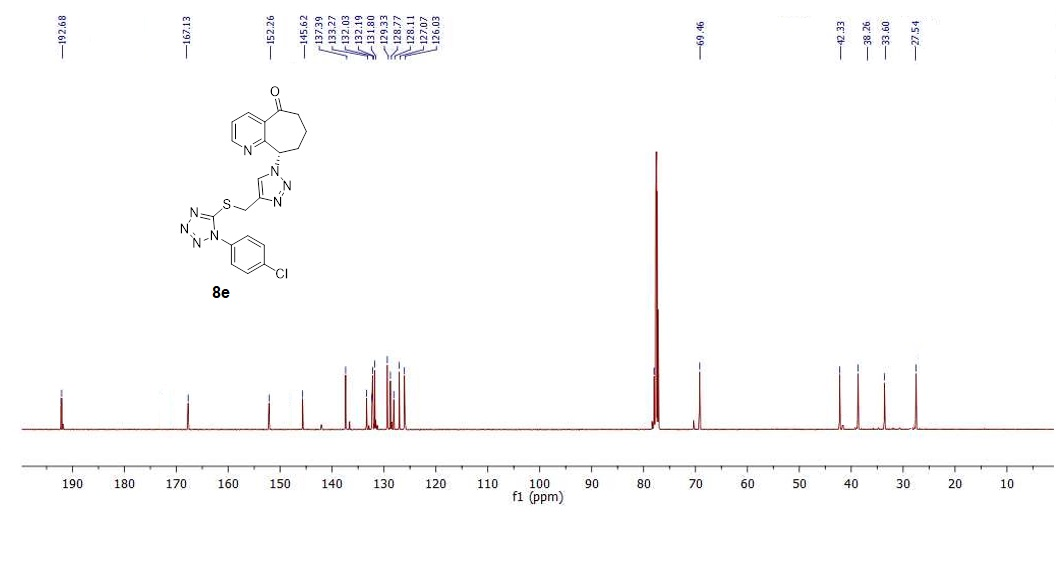
**Figure S17**: IR spectra of 8d



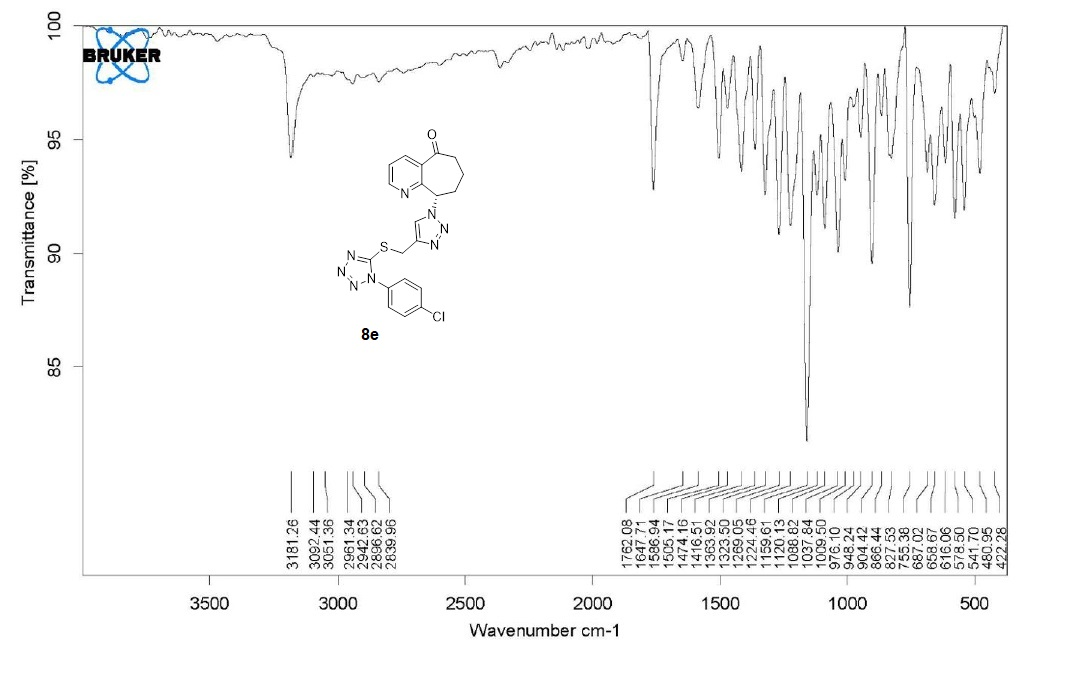
**Figure S18**: Mass spectra of 8d



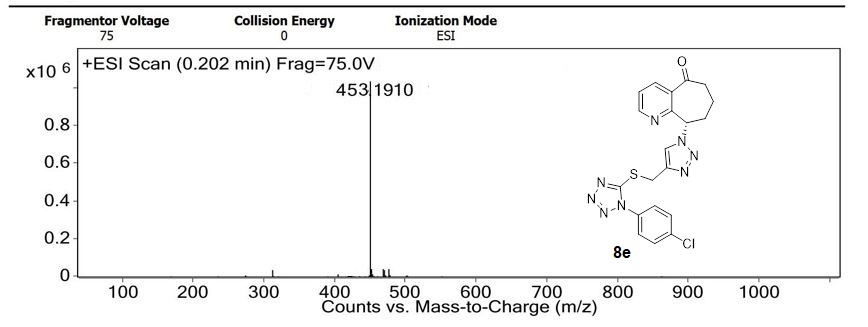
**Figure S19**: 1H NMR spectra of 8e



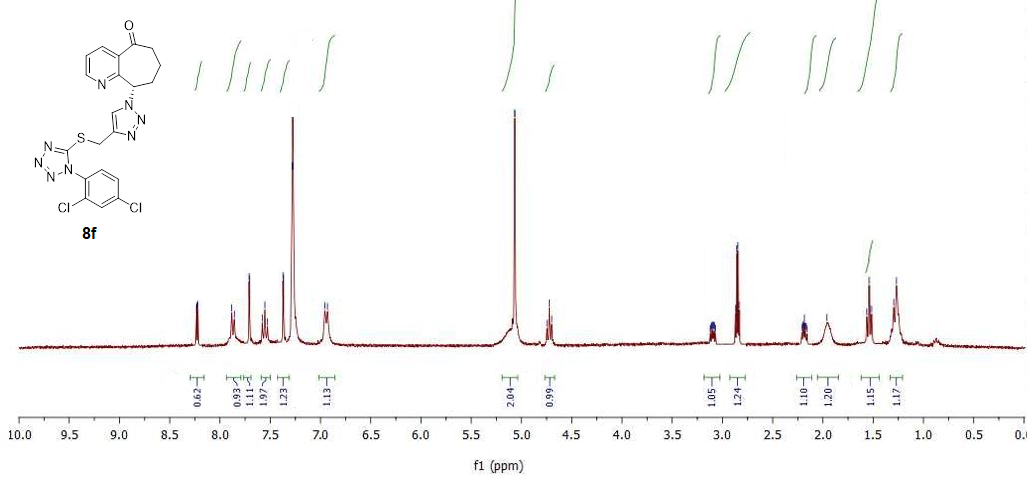
**Figure S20**: 13C NMR spectra of **8e**



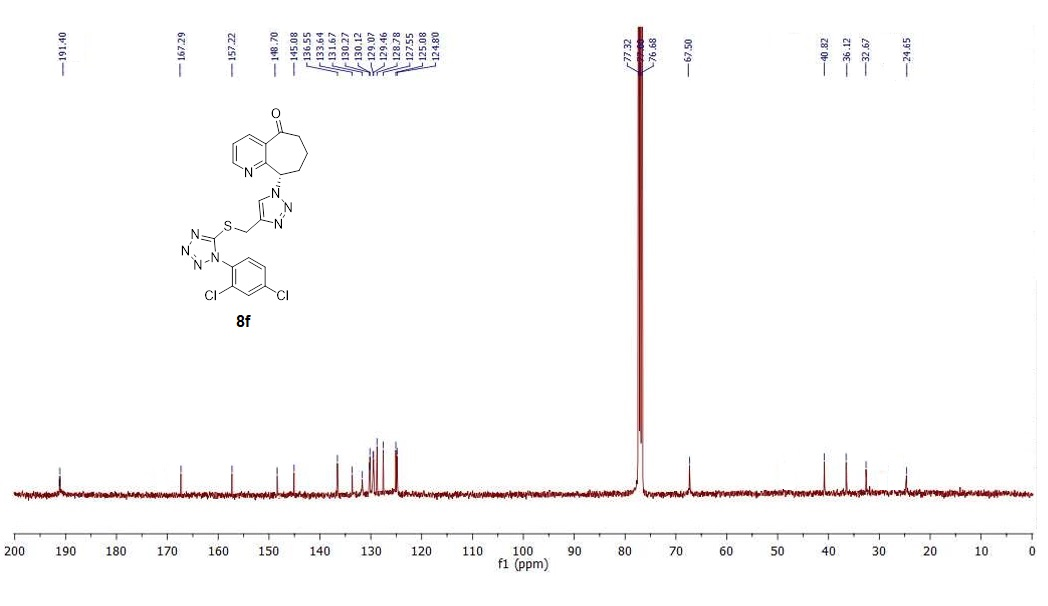
**Figure S21**: IR spectra of 8e



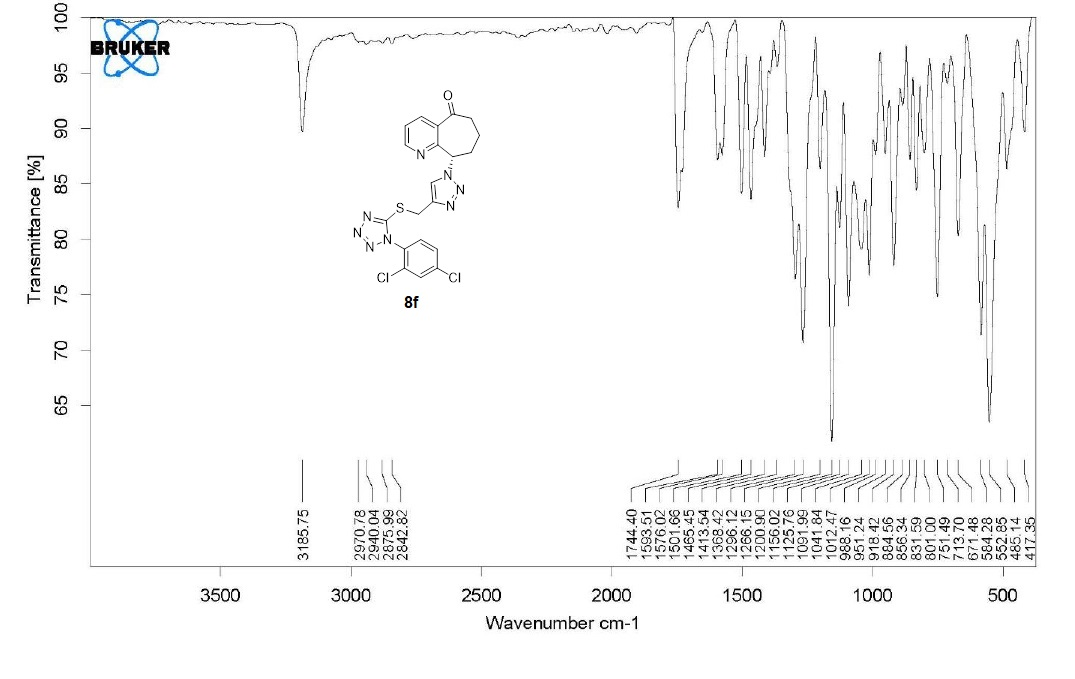
**Figure S22**: Mass spectra of 8e



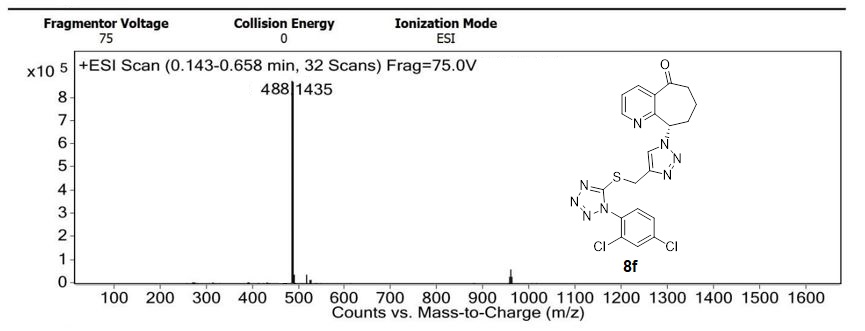
**Figure S23**: 1H NMR spectra of 8f



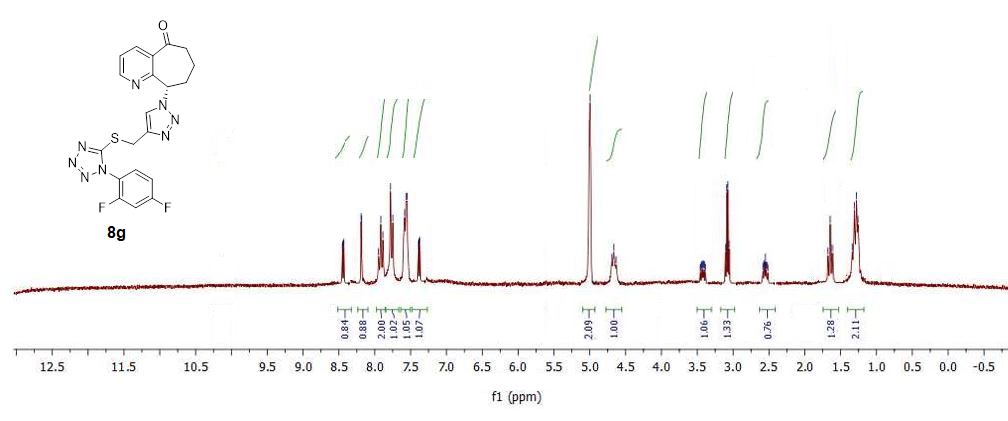
**Figure S24**: 13C NMR spectra of 8f



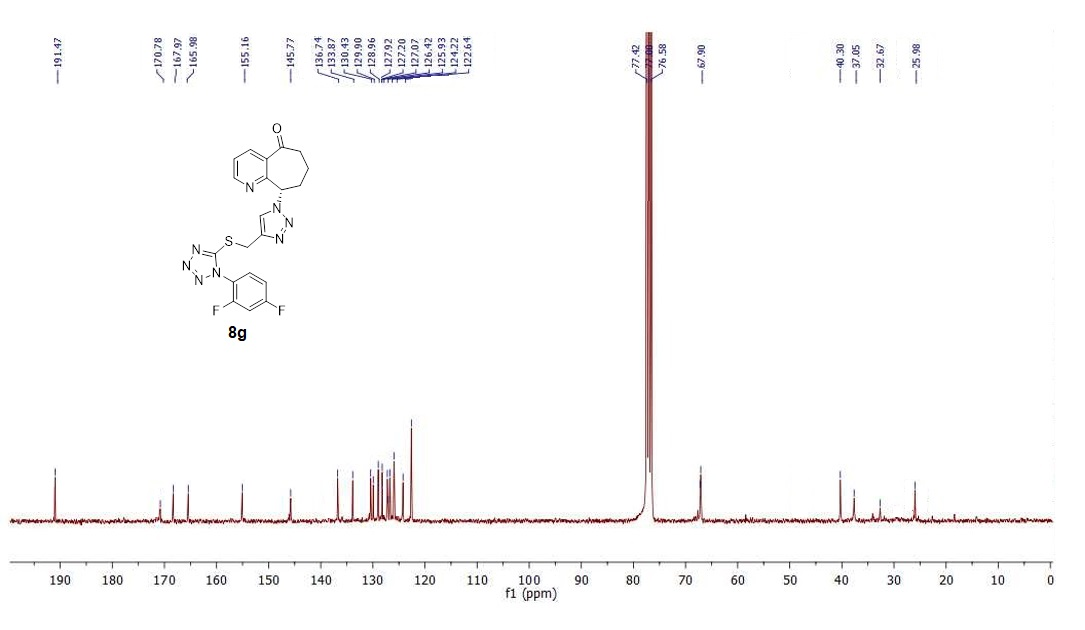
**Figure S25**: IR spectra of 8f



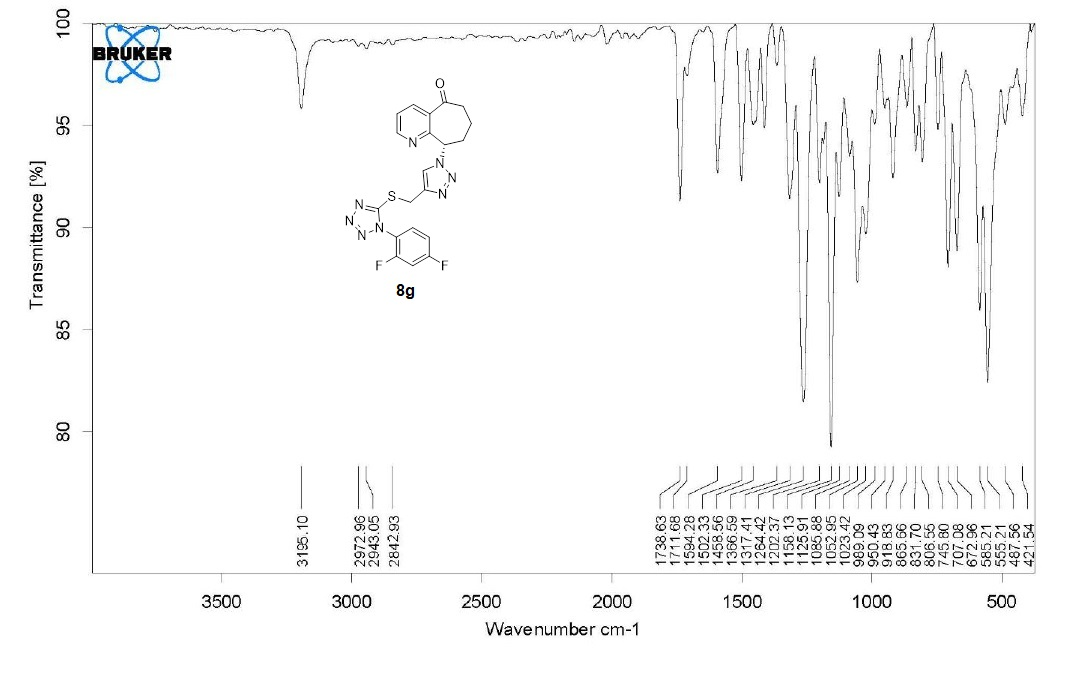
**Figure S26**: Mass spectra of 8f



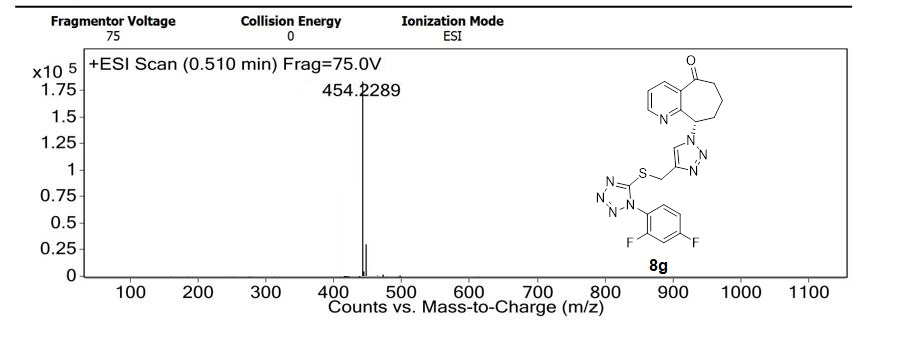
**Figure S27**: 1H NMR spectra of 8g



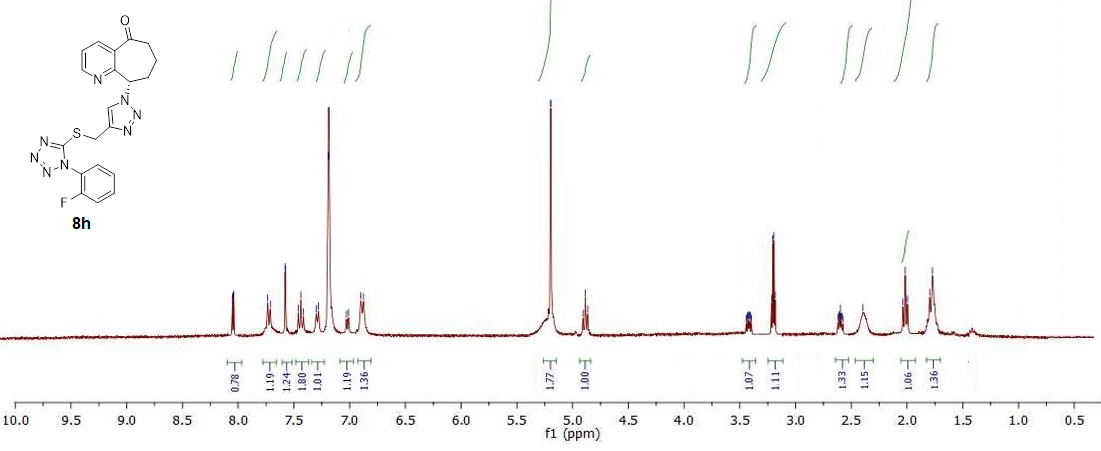
**Figure S28**: 13C NMR spectra of 8g



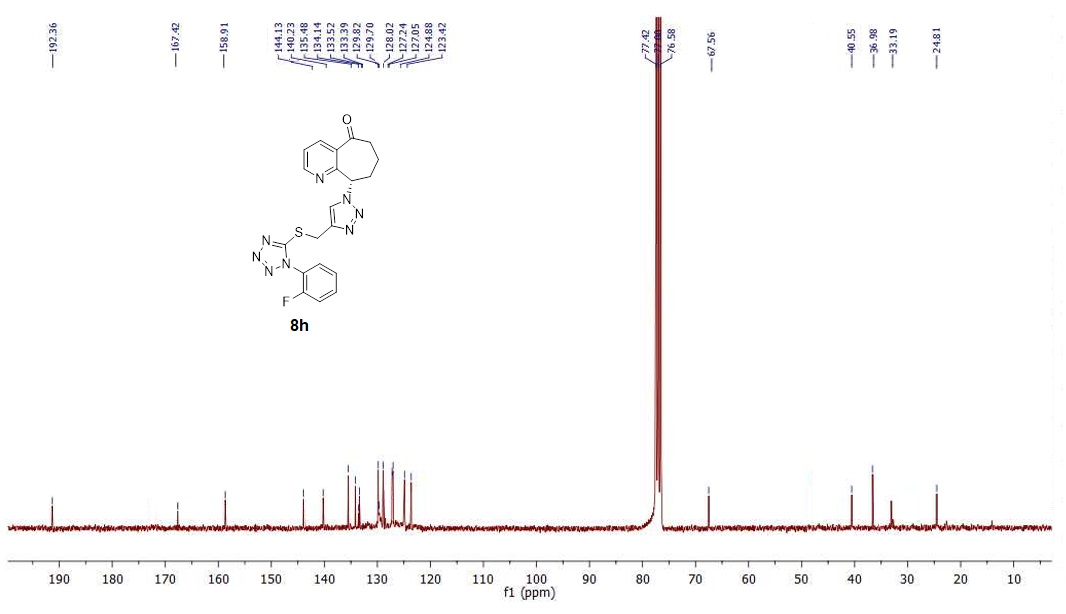
**Figure S29**: IR spectra of 8g



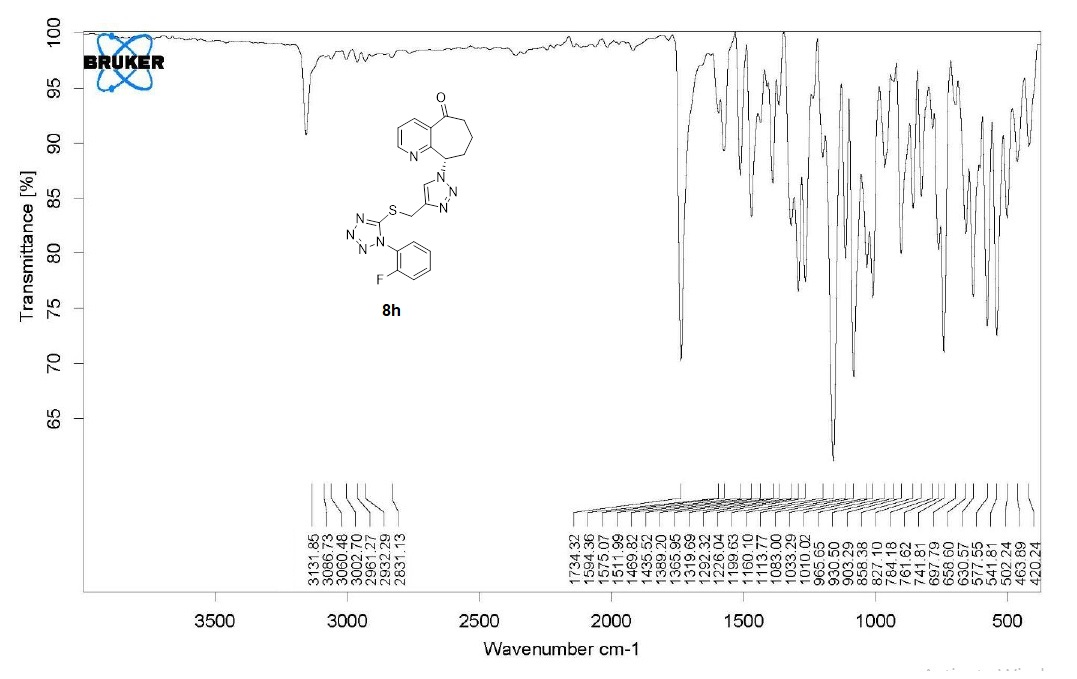
**Figure S30**: Mass spectra of 8g



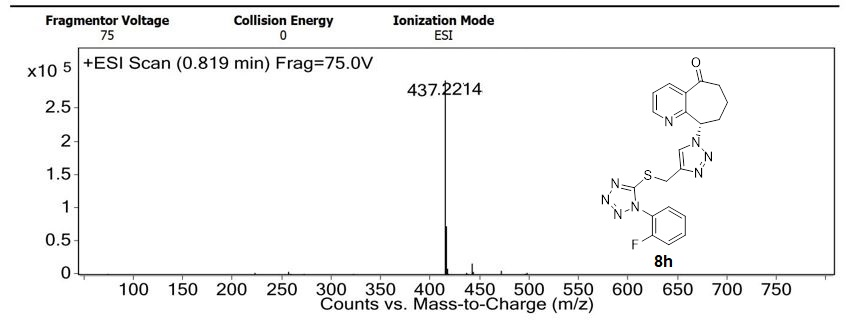
**Figure S31**: 1H NMR spectra of 8h



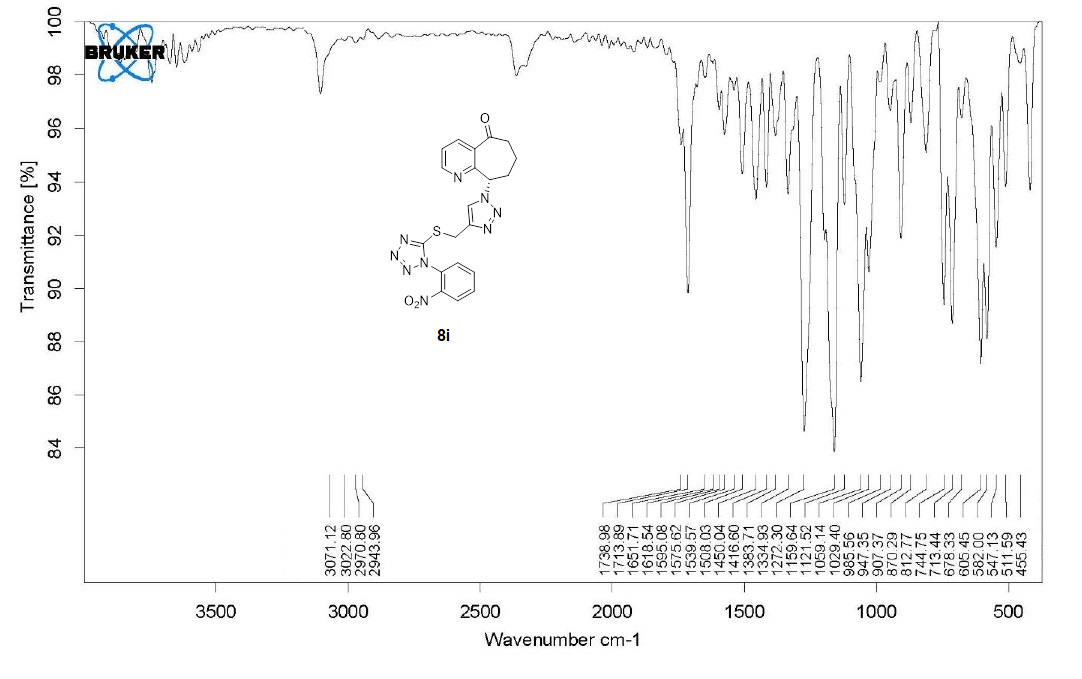
**Figure S32**: 13C NMR spectra of 8h



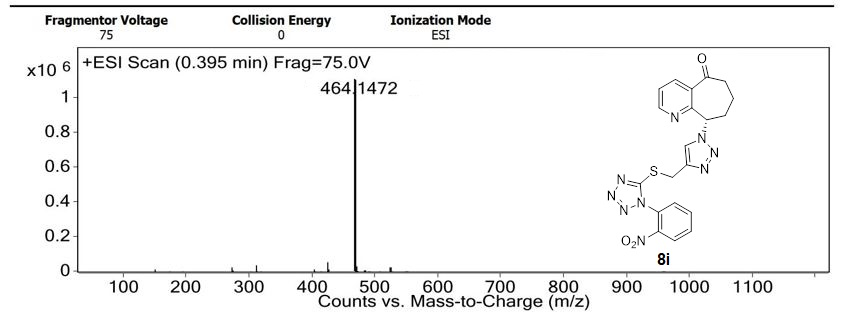
**Figure S33**: IR spectra of 8h



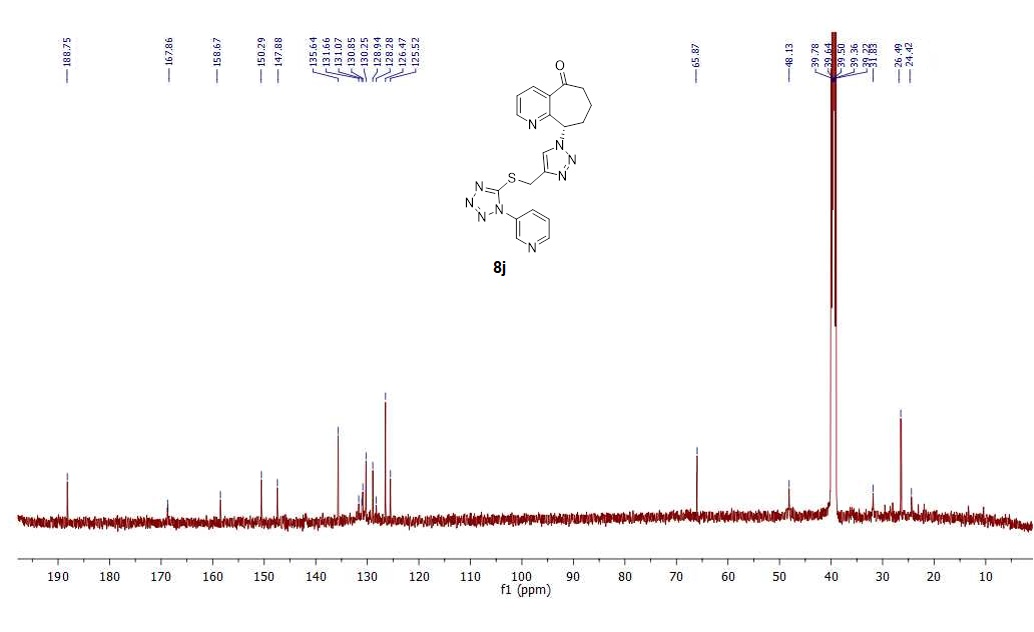
**Figure S34**: Mass spectra of 8h



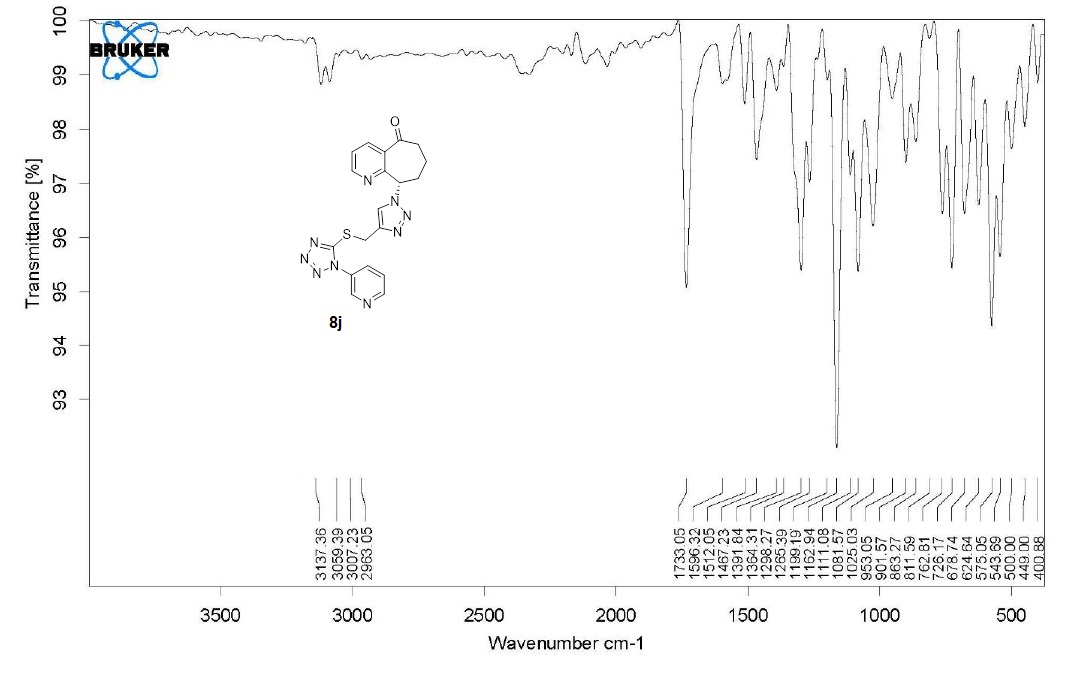
**Figure S35**: IR spectra of 8i



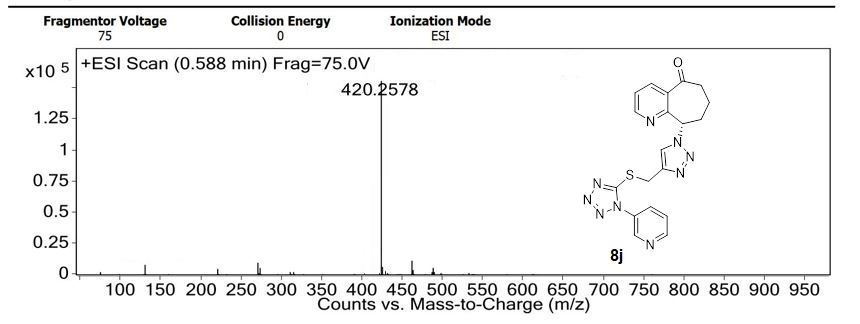
**Figure S36**: Mass spectra of 8i



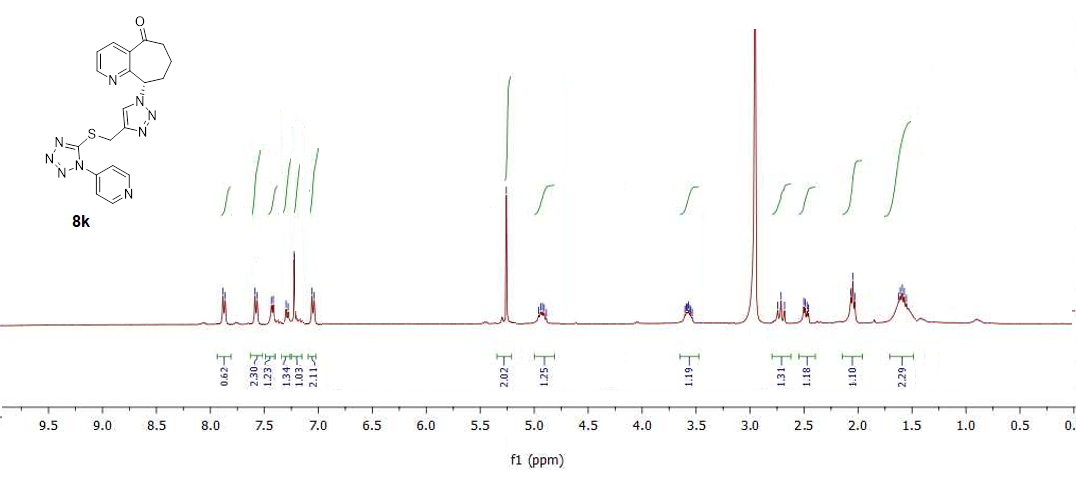
**Figure S37**: 13C NMR spectra of 8j



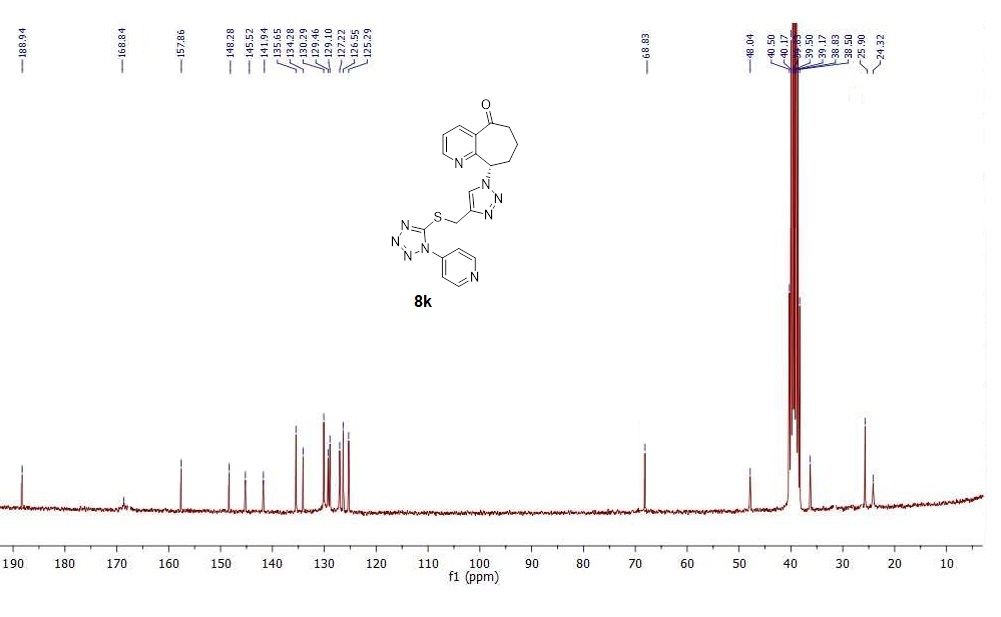
**Figure S38**: IR spectra of 8j



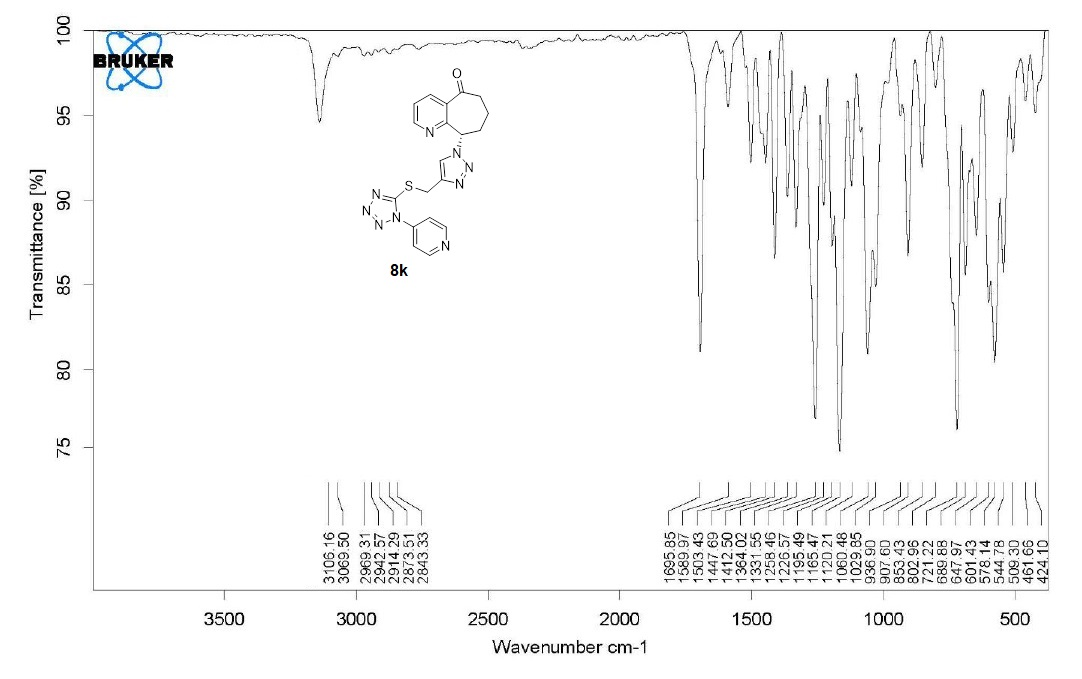
**Figure S39**: Mass spectra of 8j



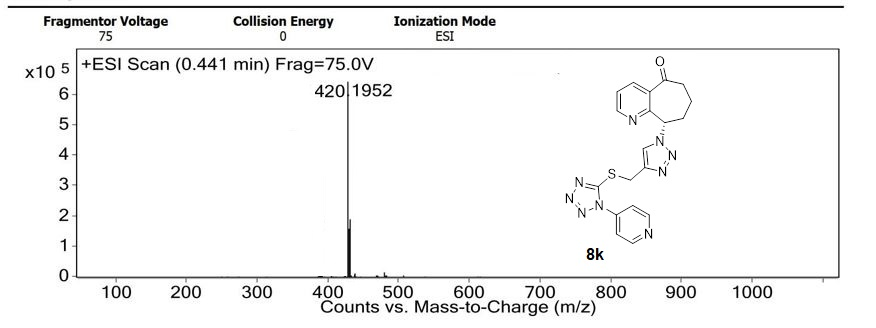
**Figure S40**: 1H NMR spectra of 8k



**Figure S41**: 13C NMR spectra of 8k



**Figure S42**: IR spectra of 8k



**Figure S43**: Mass spectra of 8k