

Supplementary Information

Antibacterial activity of adamantyl substituted cyclohexane diamine derivatives against methicillin resistant *Staphylococcus aureus* and *Mycobacterium tuberculosis*

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Experimental section

Chemicals and instrumentation

All the chemicals used in the synthesis were purchased from Sigma-Aldrich and were used as such. The solvents used were of analytical grade and were used as supplied unless otherwise stated. The melting point of the compounds, were determined on EZ-Melt automated melting point apparatus, Stanford Research Systems and are uncorrected. IR (film/KBr) spectra were recorded using Perkin-Elmer FT-IR spectrophotometer and the values are expressed as ν_{\max} cm^{-1} . ¹H and ¹³C NMR spectra were recorded on a Jeol ECX spectrospin instrument at 400 and 100 MHz, respectively in CDCl₃ or DMSO-*d*₆ solutions, with TMS as an internal reference. Mass data were recorded in Jeol-Accu TOF JMS-T100LC mass spectrometer. Silica gel (60-120 mesh) was used for column chromatography.

Synthesis of tert-butyl-2-(adamantylamino)cyclohexyl carbamate (6)

To a stirred solution of **4** (2 g, 9.3 mol) in dry MeOH (30 mL), 2-adamantanone (1.4 g, 9.3 mol) was added and the reaction mixture was stirred at room temperature for 4 h (Scheme 1). After completion of the reaction the solvent was removed and product was extracted with CHCl₃ (3 x 20 ml). The combined organic layer was dried over sodium sulphate and solvent was removed under pressure to get compounds **5** as white solid. The Schiff's base (**5**) obtained was dissolved in dry MeOH (20 mL) and NaBH₄ (3.0 equiv) was added to this. Progress of the reaction was monitored by TLC. After 3 h the solvent was removed and product was extracted with CHCl₃ (3 x 20 mL). The reduced product was purified by column chromatography using 5% EtOAc/Hexane as eluent to obtain compounds **6**. Yield 65%; ¹H NMR (CDCl₃, 400 MHz) δ : 1.38-1.39 (m, 3H), 1.43 (s, 9H), 1.47-1.48 (m, 2H), 1.50 (brs, 2H), 1.54-1.56 (m, 1H), 1.64 (br,

1H), 1.70 (brs, 5H), 1.76 (brs, 2H), 1.80-1.83 (m, 3H), 1.87-1.88 (m, 1H), 1.98-2.08 (m, 3H), 2.72 (brs, 1H), 2.75-2.76 (m, 1H), 3.53 (br, 1H), 5.27 (br, 1H).

Synthesis of N'-adamantylcyclohexane-1,2-diamine (7)

An aqueous solution of H₃PO₄ (35%, 4 mL) was added to a solution of the compound **6** (1 g) in CH₂Cl₂ (20 mL) and reaction was stirred for 4 h (Scheme 1). After completion of the reaction water (20 mL) was added and, the aqueous layer was washed with CH₂Cl₂ (3 x 15 mL). The aqueous layer was neutralized with NaOH solution and extracted with CH₂Cl₂ (3 x 15 mL). The combined basic organic layer was washed with brine solution (20 mL), dried over Na₂SO₄ and evaporated under reduced pressure to yield the corresponding amine **7** in good yield. Yield 90%; IR (film, cm⁻¹): 2905, 2850, 1458, 1116, 913, 744; ¹H NMR (CDCl₃, 400 MHz) δ: 1.32-1.38 (m, 2H), 1.47 (brs, 1H), 1.50-1.51 (m, 2H), 1.55 (brs, 1H), 1.60 (s, 8H), 1.70 (s, 3H), 1.77 (brs, 3H), 1.86-1.82 (m, 2H), 1.84 (brs, 1H), 1.95-2.03 (m, 2H), 2.61-2.65 (m, 1H), 2.75 (brs, 1H), 2.88-2.90 (m, 1H).

Synthesis of N-(benzyl)-N'-(2-adamantyl)-cyclohexane-1,2-diaminium dichloride (8a) and related compounds (8b-8u)

To a stirred solution of **7** (200 mg, 0.8 mmol) in dry MeOH (10 mL) benzaldehyde (85.4 mg, 0.8 mmol) was added and the reaction mixture was stirred at room temperature. After 4 h NaBH₄ (3.0 equiv) was added and progress of the reaction was monitored by TLC (Scheme 1). After 3 h the solvent was removed and product was extracted with CHCl₃ (3 x 15 mL). The reduced product was purified by column chromatography using CHCl₃-MeOH as eluent. To the viscous liquid HCl gas was passed to obtain compound **8a** as white solid.

N-(Benzyl)-N'-(2-adamantyl)-cyclohexane-1,2-diaminium dichloride (8a)

Yield 88% (white solid); mp 212-214 °C; IR (KBr, cm⁻¹): 2918, 2852, 2786, 2650, 1592, 1458, 1329, 1211, 1083, 1041, 991; ¹H NMR (400 MHz, DMSO-*d*₆) δ: 1.42 (brs, 2H), 1.49 (brs, 1H), 1.52 (brs, 1H), 1.59-1.62 (m, 1H), 1.67 (brs, 3H), 1.80 (brs, 7H), 1.87-1.90 (m, 1H), 1.97-2.02 (m, 2H), 2.15 (brs, 1H), 2.26 (brs, 1H), 2.30-2.33 (m, 2H), 3.25 (brs, 1H), 3.69 (brs, 1H), 3.95 (brs, 1H), 4.28 (brs, 1H, CH₂Ph), 4.39 (brs, 1H, CH₂Ph), 7.43-7.44 (m, 3H, ArH), 7.71-7.72 (m, 2H, ArH), 9.11 (brs, 2H, NH₂⁺), 9.44 (brs, 1H, NH₂⁺), 9.69 (brs, 1H, NH₂⁺); ¹³C NMR (100 MHz, DMSO-*d*₆) δ: 22.11, 22.93, 23.98, 26.16, 26.37, 27.63, 28.82, 29.68, 36.10, 36.20, 36.67,

48.91, 55.05, 55.25, 60.42, 128.58, 129.13, 130.84, 131.27; ESI-MS (m/z): 338.2 [M+H - 2HCl]⁺; Anal. calcd. for C₂₃H₃₆Cl₂N₂: C, 67.14; H, 8.82; N, 6.81; Found: C, 67.19; H, 8.78; N, 6.83.

***N*-(2-Methyl-benzyl)-*N'*-(2-adamantyl)-cyclohexane-1,2-diaminium dichloride (8b)**

Yield 91 % (white solid); mp 218-220 °C; IR (KBr, cm⁻¹): 2916, 2855, 2744, 1578, 1459, 1437, 1245, 1223, 1103, 1040, 995; ¹H NMR (400 MHz, DMSO-*d*₆) δ: 1.44 (brs, 2H), 1.49 (brs, 1H), 1.52 (brs, 1H), 1.67 (brs, 4H), 1.80 (brs, 5H), 1.87-1.89 (m, 2H), 1.96 (brs, 2H), 2.20 (brs, 2H), 2.27 (brs, 1H), 2.31-2.37 (m, 2H), 2.43 (s, 3H), 3.32 (brs, 1H), 3.76 (brs, 1H), 4.08 (brs, 1H), 4.33 (brs, 2H, CH₂Ph), 7.22-7.26 (m, 2H, ArH), 7.29-7.32 (m, 1H, ArH), 7.71 (d, *J* = 7.3 Hz, 1H, ArH), 9.18 (brs, 2H, NH₂⁺), 9.35 (brs, 1H, NH₂⁺), 9.51 (brs, 1H, NH₂⁺); ¹³C NMR (100 MHz, DMSO-*d*₆) δ: 18.97, 19.39, 21.87, 22.97, 23.83, 26.19, 26.41, 27.59, 28.94, 29.67, 29.75, 36.14, 36.23, 36.72, 46.78, 55.15, 56.29, 60.53, 125.96, 129.20, 129.84, 130.45, 131.69, 138.03; ESI-MS (m/z): 352.2 [M+H - 2HCl]⁺; Anal. calcd. for C₂₄H₃₈Cl₂N₂: C, 67.75; H, 9.00; N, 6.58; Found: C, 67.81; H, 9.05; N, 6.62

***N*-(3-Methyl-benzyl)-*N'*-(2-adamantyl)-cyclohexane-1,2-diaminium dichloride (8c)**

Yield 82% (white solid); mp 200-202 °C; IR (KBr, cm⁻¹): 2924, 2854, 2345, 1583, 1458, 1214, 1103, 1041, 993, 791; ¹H NMR (400 MHz, DMSO-*d*₆) δ: 1.40-1.42 (m, 2H), 1.48 (brs, 1H), 1.51 (brs, 1H), 1.59-1.61 (m, 1H), 1.66 (brs, 3H), 1.79 (brs, 7H), 1.87-1.89 (m, 1H), 2.04 (brs, 2H), 2.14 (brs, 1H), 2.24 (brs, 1H), 2.31 (s, 4H), 2.33 (brs, 1H), 3.20 (brs, 1H), 3.68 (brs, 1H), 3.94 (brs, 1H), 4.23 (brs, 1H, CH₂Ph), 4.33 (brs, 1H, CH₂Ph), 7.23 (d, *J* = 7.3 Hz, 1H, ArH), 7.30-7.33 (m, 1H, ArH), 7.51 (d, *J* = 7.3 Hz, 1H, ArH), 7.54 (s, 1H, ArH), 9.14 (brs, 2H, NH₂⁺), 9.41 (brs, 1H, NH₂⁺), 9.65 (brs, 1H, NH₂⁺); ESI-MS (m/z): 352.2 [M+H - 2HCl]⁺; Anal. calcd. for C₂₄H₃₈Cl₂N₂: C, 67.75; H, 9.00; N, 6.58; Found: C, 67.68; H, 9.04; N, 6.52.

***N*-(4-Methyl-benzyl)-*N'*-(2-adamantyl)-cyclohexane-1,2-diaminium dichloride (8d)**

Yield 86% (white solid); mp 224-226 °C; IR (KBr, cm⁻¹): 2915, 2857, 2811, 2740, 1571, 1460, 1430, 1221, 1041, 989; ¹H NMR (400 MHz, DMSO-*d*₆) δ: 1.39-1.41 (m, 2H), 1.47 (s, 1H), 1.51 (s, 1H), 1.55 (brs, 1H), 1.60 (brs, 1H), 1.63 (brs, 1H), 1.66 (brs, 2H), 1.79 (brs, 7H), 1.83-1.89 (m, 1H), 2.02 (brs, 2H), 2.10 (brs, 1H), 2.22 (brs, 1H), 2.26 (brs, 1H), 2.30 (s, 3H), 3.15 (brs, 1H), 3.66 (brs, 1H), 3.85 (brs, 1H), 4.20 (brs, 1H, CH₂Ph), 4.33 (brs, 1H, CH₂Ph), 7.24 (d, *J* = 8

Hz, 2H, ArH), 7.58 (d, $J = 8$ Hz, 2H, ArH), 9.02 (brs, 1H, NH_2^+), 9.11 (brs, 1H, NH_2^+), 9.37 (brs, 1H, NH_2^+), 9.67 (brs, 1H, NH_2^+); ESI-MS (m/z): 352.2 [$M+H - 2HCl$] $^+$; Anal. calcd. for $C_{24}H_{38}Cl_2N_2$: C, 67.75; H, 9.00; N, 6.58; Found: C, 67.72; H, 9.02; N, 6.55

N-(4-Ethyl-benzyl)-N'-(2-adamantyl)-cyclohexane-1,2-diaminium dichloride (8e)

Yield 80% (white solid); mp 252-254 °C; IR (KBr, cm^{-1}): 2913, 2855, 2746, 2423, 2375, 1560, 1458, 1416, 1356, 1252, 1103, 1040; 1H NMR (400 MHz, DMSO- d_6) δ : 1.15 (t, $J = 8$ Hz, 3H), 1.40-1.42 (m, 2H), 1.46 (s, 1H), 1.49 (s, 1H), 1.59-1.62 (m, 1H), 1.65 (brs, 2H), 1.72 (brs, 1H), 1.75-1.78 (m, 6H), 1.86 (br, 2H), 2.05 (brs, 1H), 2.09 (brs, 2H), 2.24 (brs, 1H), 2.27-2.32 (m, 2H), 2.60 (q, $J = 8$ Hz, 2H), 3.09 (brs, 1H), 3.66 (brs, 1H), 3.84 (brs, 1H), 4.20-4.23 (m, 1H, CH_2Ph), 4.33-4.37 (m, 1H, CH_2Ph), 7.27 (d, $J = 8$ Hz, 2H, ArH), 7.61 (d, $J = 8$ Hz, 2H, ArH), 9.08 (brs, 1H, NH_2^+), 9.16 (brs, 1H, NH_2^+), 9.39 (brs, 1H, NH_2^+), 9.69 (brs, 1H, NH_2^+); ^{13}C NMR (100 MHz, DMSO- d_6) δ : 15.52, 18.50, 22.28, 23.00, 23.88, 26.13, 26.39, 27.80, 27.93, 28.39, 29.60, 36.10, 36.66, 48.47, 54.15, 55.07, 60.07, 128.06, 128.36, 130.99, 144.98; ESI-MS (m/z): 367.37 [$M+H - 2HCl$] $^+$; Anal. calcd. for $C_{25}H_{40}Cl_2N_2$: C, 68.32; H, 9.17; N, 6.37; Found: C, 68.28; H, 9.12; N, 6.34.

N-(4-n-Propyl-benzyl)-N'-(2-adamantyl)-cyclohexane-1,2-diaminium dichloride (8f)

Yield 85% (white solid); mp 180-182°C; IR (KBr, cm^{-1}): 2921, 2862, 1740, 1577, 1459, 1240, 1102, 1040, 984, 844; 1H NMR (400 MHz, DMSO- d_6) δ : 0.88 (t, $J = 7.3$ Hz, 3H), 1.40 (brs, 2H), 1.48-1.51 (m, 3H), 1.53-1.61 (m, 2H), 1.65 (brs, 3H), 1.72-1.79 (m, 7H), 1.84-1.87 (m, 1H), 2.01-2.10 (m, 3H), 2.24 (brs, 3H), 2.55 (t, $J = 7.3$ Hz, 2H), 3.13 (brs, 1H), 3.66 (brs, 1H), 3.84 (brs, 1H), 4.19-4.22 (m, 1H, CH_2Ph), 4.33 (brs, 1H, CH_2Ph), 7.26 (d, $J = 8$ Hz, 2H, ArH), 7.60 (d, $J = 8$ Hz, 2H, ArH), 9.00 (brs, 1H, NH_2^+), 9.10 (brs, 1H, NH_2^+), 9.36 (brs, 1H, NH_2^+), 9.63 (brs, 1H, NH_2^+); ^{13}C NMR (100 MHz, DMSO- d_6) δ : 13.65, 18.48, 22.28, 22.96, 24.00, 26.14, 26.39, 27.54, 28.50, 29.61, 36.07, 36.13, 36.66, 36.93, 48.53, 54.35, 55.13, 60.16, 128.42, 128.58, 130.86, 143.35; ESI-MS (m/z): 380.3 [$M+H - 2HCl$] $^+$; Anal. calcd. for $C_{26}H_{42}Cl_2N_2$: C, 68.85; H, 9.33; N, 6.18; Found: C, 68.92; H, 9.31; N, 6.12.

N-(4-iso-Propyl-benzyl)-N'-(2-adamantyl)-cyclohexane-1,2-diaminium dichloride (8g)

Yield 82% (white solid); mp 238-240 °C; IR (KBr, cm^{-1}): 2917, 2709, 2372, 1583, 1459, 1224, 1102, 1055, 1042, 1011, 993, 942, 826; 1H NMR (400 MHz, DMSO- d_6) δ : 1.18 (d, $J = 6.6$ Hz,

6H), 1.42-1.49 (m, 5H), 1.57-1.65 (m, 3H), 1.70-1.78 (m, 8H), 2.08 (brs, 3H), 2.25-2.34 (m, 3H), 2.90 (septet, $J = 7$ Hz, 1H), 3.07 (brs, 1H), 3.66 (brs, 1H), 3.82 (brs, 1H), 4.23 (brs, 1H, CH_2Ph), 4.33 (brs, 1H, CH_2Ph), 7.31 (d, $J = 7.3$ Hz, 2H, ArH), 7.62 (d, $J = 7.3$ Hz, 2H, ArH), 9.10-9.16 (m, 2H, NH_2^+), 9.40 (brs, 1H, NH_2^+), 9.68 (brs, 1H, NH_2^+); ^{13}C NMR (100 MHz, DMSO- d_6) δ : 18.45, 22.34, 23.01, 23.70, 23.72, 23.81, 26.12, 26.37, 27.85, 28.24, 29.57, 33.26, 36.06, 36.64, 48.38, 53.95, 55.0, 59.97, 126.61, 128.49, 131.03, 149.55; ESI-MS (m/z): 380.3 [$M+H - 2HCl$] $^+$; Anal. calcd. for $C_{26}H_{42}Cl_2N_2$: C, 68.85; H, 9.33; N, 6.18; Found: C, 68.92; H, 9.31; N, 6.12.

N-(4-n-Butyl-benzyl)-N'-(2-adamantyl)-cyclohexane-1,2-diaminium dichloride (8h)

Yield 90% (white solid); mp 246-248 °C; IR (KBr, cm^{-1}): 2920, 2856, 2785, 1578, 1515, 1460, 1425, 1406, 1328, 1215, 1117, 1102, 1040, 988, 932, 825; 1H NMR (400 MHz, DMSO- d_6) δ : 0.77 (t, $J = 7.3$ Hz, 3H), 1.11-1.23 (m, 3H), 1.31 (brs, 2H), 1.36-1.45 (m, 5H), 1.62-1.68 (m, 8H), 1.93-2.00 (m, 3H), 2.14-2.20 (m, 3H), 2.38 (s, 2H), 2.47 (t, $J = 8$ Hz, 2H), 3.04 (brs, 1H), 3.56 (brs, 1H), 3.77 (brs, 1H), 4.12 (brs, 1H, CH_2Ph), 4.23 (brs, 1H, CH_2Ph), 7.14 (d, $J = 8$ Hz, 2H, ArH), 7.50 (d, $J = 8$ Hz, 2H, ArH), 9.00-9.06 (m, 2H, NH_2^+), 9.28 (brs, 1H, NH_2^+), 9.56 (brs, 1H, NH_2^+); ^{13}C NMR (100 MHz, DMSO- d_6) δ : 13.78, 18.49, 21.75, 22.29, 23.01, 23.92, 26.15, 26.42, 27.80, 28.49, 29.63, 33.06, 34.56, 36.09, 36.14, 36.68, 48.52, 54.31, 55.12, 60.15, 128.38, 128.57, 130.89, 143.58; ESI-MS (m/z): 394.3 [$M+H - 2HCl$] $^+$; Anal. calcd. for $C_{27}H_{44}Cl_2N_2$: C, 69.36; H, 9.49; N, 5.99; Found: C, 69.42; H, 9.42; N, 5.94.

N-(4-tert-Butyl-benzyl)-N'-(2-adamantyl)-cyclohexane-1,2-diaminium dichloride (8i)

Yield 85% (white solid); mp 254-256 °C; IR (KBr, cm^{-1}): 2921, 2866, 1741, 1578, 1460, 1364, 1268, 1241, 1104, 1075, 1041, 990, 832, 788; 1H NMR (400 MHz, DMSO- d_6) δ : 1.26 (s, 9H), 1.37-1.51 (m, 5H), 1.55-1.59 (m, 2H), 1.70-1.78 (m, 9H), 2.05 (brs, 2H), 2.16-2.22 (m, 4H), 3.04 (brs, 1H), 3.70 (brs, 2H), 4.20 (brs, 1H, CH_2Ph), 4.32 (brs, 1H, CH_2Ph), 7.47 (d, $J = 8$ Hz, 2H, ArH), 7.61 (d, $J = 8$ Hz, 2H, ArH), 8.79 (brs, 1H, NH_2^+), 9.04 (brs, 1H, NH_2^+), 9.35 (brs, 1H, NH_2^+), 9.61 (brs, 1H, NH_2^+); ^{13}C NMR (100 MHz, DMSO- d_6) δ : 18.40, 22.33, 23.07, 23.71, 26.09, 26.35, 27.90, 28.12, 29.54, 30.97, 34.42, 36.03, 36.61, 48.18, 53.76, 54.92, 59.86, 125.53, 128.11, 130.74, 151.79; ESI-MS (m/z): 394.3 [$M+H - 2HCl$] $^+$; Anal. calcd. for $C_{27}H_{44}Cl_2N_2$: C, 69.36; H, 9.49; N, 5.99; Found: C, 69.39; H, 9.46; N, 5.97.

N-(2-Chloro-benzyl)-N'-(2-adamantyl)-cyclohexane-1,2-diaminium dichloride (8j)

Yield 70% (white solid); mp 204-206 °C; IR (KBr, cm^{-1}): 2910, 2856, 2679, 1577, 1458, 1250, 1102, 1055, 1043, 993; ^1H NMR (400 MHz, $\text{DMSO-}d_6$) δ : 1.43 (brs, 2H), 1.50 (s, 1H), 1.53 (s, 1H), 1.58-1.62 (m, 1H), 1.68 (s, 3H), 1.72 (brs, 1H), 1.81 (s, 6H), 1.89 (brs, 1H), 1.97 (brs, 1H), 2.15-2.20 (m, 2H), 2.26-2.31 (m, 3H), 3.38 (brs, 1H), 3.73 (brs, 1H), 4.07 (brs, 1H), 4.43 (brs, 2H, CH_2Ph), 7.42-7.44 (m, 2H, ArH), 7.54-7.56 (m, 1H, ArH), 7.71-7.72 (m, 1H, ArH), 9.12 (brs, 1H, NH_2^+), 9.24 (brs, 1H, NH_2^+), 9.44 (brs, 1H, NH_2^+), 9.82 (brs, 1H, NH_2^+); ESI-MS (m/z): 372.2 [$\text{M}+\text{H}-2\text{HCl}$] $^+$, 374.2 [$\text{M}+2-2\text{HCl}$] $^+$; Anal. calcd. for $\text{C}_{23}\text{H}_{35}\text{Cl}_3\text{N}_2$: C, 61.95; H, 7.91; N, 6.28; Found: C, 61.94; H, 7.88; N, 6.21.

***N*-(3-Chloro-benzyl)-*N'*-(2-adamantyl)-cyclohexane-1,2-diaminium dichloride (8k)**

Yield 80% (white solid); mp 216-218 °C; IR (KBr, cm^{-1}): 2917, 2855, 2743, 2418, 2372, 1570, 1474, 1458, 1357, 1217, 1077, 1038, 992; ^1H NMR (400 MHz, $\text{DMSO-}d_6$) δ : 1.41 (brs, 2H), 1.50 (s, 1H), 1.54 (s, 1H), 1.67 (brs, 5H), 1.81 (brs, 7H), 1.89 (brs, 1H), 1.96 (brs, 1H), 2.10 (brs, 1H), 2.15 (brs, 1H), 2.26 (brs, 3H), 3.68 (brs, 1H), 4.02 (brs, 1H), 4.28 (brs, 1H, CH_2Ph), 4.39 (brs, 1H, CH_2Ph), 7.38-7.42 (m, 1H, ArH), 7.62 (d, $J = 7.3$ Hz, 1H, ArH), 7.72 (s, 1H, ArH), 7.99 (s, 1H, ArH), 9.04 (brs, 2H, NH_2^+), 9.43 (brs, 1H, NH_2^+), 9.57 (brs, 1H, NH_2^+); ^{13}C NMR (100 MHz, $\text{DMSO-}d_6$) δ : 22.22, 22.89, 23.98, 26.19, 26.40, 27.60, 29.12, 29.69, 29.76, 36.14, 36.25, 36.69, 48.29, 55.41, 55.84, 121.60, 130.02, 130.63, 131.96, 133.51, 133.99; ESI-MS (m/z): 372.2 [$\text{M}+\text{H}-2\text{HCl}$] $^+$, 374.4 [$\text{M}+2-2\text{HCl}$] $^+$; Anal. calcd. for $\text{C}_{23}\text{H}_{35}\text{Cl}_3\text{N}_2$: C, 61.95; H, 7.91; N, 6.28; Found: C, 61.99; H, 7.92; N, 6.24.

***N*-(4-Chloro-benzyl)-*N'*-(2-adamantyl)-cyclohexane-1,2-diaminium dichloride (8l)**

Yield 88% (white solid); mp 242-244 °C; IR (KBr, cm^{-1}): 2920, 2856, 2707, 2562, 2417, 1577, 1491, 1459, 1420, 1262, 1091, 1043, 1017, 976, 939, 845, 809; ^1H NMR (400 MHz, $\text{DMSO-}d_6$) δ : 1.40-1.41 (m, 2H), 1.49-1.52 (m, 2H), 1.66 (brs, 4H), 1.80-1.88 (m, 9H), 2.03-2.06 (m, 1H), 2.15 (brs, 1H), 2.25-2.31 (m, 3H), 3.28 (brs, 1H), 3.68 (brs, 1H), 3.98-4.01 (m, 1H), 4.28 (brs, 1H, CH_2Ph), 4.38 (brs, 1H, CH_2Ph), 7.51 (d, $J = 8$ Hz, 2H, ArH), 7.75 (d, $J = 8$ Hz, 2H, ArH), 9.09 (brs, 2H, NH_2^+), 9.46 (brs, 1H, NH_2^+), 9.64 (brs, 1H, NH_2^+); ^{13}C NMR (100 MHz, $\text{DMSO-}d_6$) δ : 18.60, 22.17, 22.89, 23.99, 26.18, 26.42, 27.59, 29.03, 29.67, 29.73, 36.11, 36.25, 36.69, 48.22, 55.34, 55.48, 60.58, 128.50, 130.33, 132.88, 133.96; ESI-MS (m/z): 372.2 [$\text{M}+\text{H}-2\text{HCl}$] $^+$, 374.1 [$\text{M}+2-2\text{HCl}$] $^+$; Anal. calcd. for $\text{C}_{23}\text{H}_{35}\text{Cl}_3\text{N}_2$: C, 61.95; H, 7.91; N, 6.28; Found: C, 61.91; H, 7.89; N, 6.24.

***N*-(2-Bromo-benzyl)-*N'*-(2-adamantyl)-cyclohexane-1,2-diaminium dichloride (8m)**

Yield 70% (white solid); mp 148-150 °C; IR (KBr, cm⁻¹): 2920, 2854, 2746, 1572, 1438, 1251, 1204, 1041, 993, 935, 864; ¹H NMR (400 MHz, DMSO-*d*₆) δ: 1.44 (brs, 2H), 1.51 (brs, 1H), 1.54 (brs, 1H), 1.58-1.61 (m, 1H), 1.68 (brs, 3H), 1.72 (brs, 2H), 1.81 (brs, 4H), 1.87-1.89 (m, 2H), 1.97 (brs, 2H), 2.15 (brs, 1H), 2.20 (brs, 1H), 2.28-2.31 (m, 2H), 3.39 (brs, 1H), 3.74 (brs, 1H), 4.09 (brs, 1H), 4.43 (brs, 2H, CH₂Ph), 7.36-7.38 (m, 1H, ArH), 7.42-7.48 (m, 1H, ArH), 7.71 (d, *J* = 8 Hz, 1H, ArH), 7.97 (s, 1H, ArH), 9.05-9.13 (m, 1H, NH₂⁺), 9.28 (brs, 1H, NH₂⁺), 9.43 (brs, 1H, NH₂⁺), 9.81 (brs, 1H, NH₂⁺); ¹³C NMR (100 MHz, DMSO-*d*₆) δ: 18.69, 22.11, 22.90, 26.18, 26.40, 27.67, 28.84, 28.97, 29.68, 29.73, 36.15, 36.24, 36.69, 49.23, 55.26, 60.42, 124.76, 127.99, 128.62, 132.76, 132.95; ESI-MS (*m/z*): 416.1 [M+H - 2HCl]⁺, 418.2 [M+2 - 2HCl]⁺; Anal. calcd. for C₂₃H₃₅BrCl₂N₂: C, 56.34; H, 7.19; N, 5.71; Found: C, 56.42; H, 7.13; N, 5.75.

***N*-(3-Bromo-benzyl)-*N'*-(2-adamantyl)-cyclohexane-1,2-diaminium dichloride (8n)**

Yield 78% (white solid); mp 230-232 °C; IR (KBr, cm⁻¹): 2918, 2856, 2743, 2561, 1577, 1458, 1356, 1218, 1085, 989; ¹H NMR (400 MHz, DMSO-*d*₆) δ: 1.40 (brs, 2H), 1.50 (brs, 1H), 1.53 (brs, 1H), 1.67 (brs, 5H), 1.80 (s, 7H), 1.87-1.90 (m, 1H), 1.96 (brs, 1H), 2.06 (brs, 1H), 2.16 (s, 1H), 2.26-2.31 (m, 3H), 3.68 (brs, 1H), 4.01 (brs, 1H), 4.30 (brs, 1H, CH₂Ph), 4.40 (brs, 1H, CH₂Ph), 7.44-7.47 (m, 2H, ArH), 7.68 (s, 1H, ArH), 7.86 (s, 1H, ArH), 9.08 (brs, 2H, NH₂⁺), 9.46 (brs, 1H, NH₂⁺), 9.61 (brs, 1H, NH₂⁺); ¹³C NMR (100 MHz, DMSO-*d*₆) δ: 22.22, 22.97, 24.02, 26.22, 26.43, 27.68, 29.17, 29.73, 29.80, 36.16, 36.28, 36.71, 48.38, 55.45, 55.84, 129.08, 129.61, 130.42, 130.65, 133.06; ESI-MS (*m/z*): 416.1 [M+H - 2HCl]⁺, 418.1 [M+2 - 2HCl]⁺; Anal. calcd. for C₂₃H₃₅BrCl₂N₂: C, 56.34; H, 7.19; N, 5.71; Found: C, 56.45; H, 7.16; N, 5.68.

***N*-(4-Bromo-benzyl)-*N'*-(2-adamantyl)-cyclohexane-1,2-diaminium dichloride (8o)**

Yield: 82% (white solid); mp 224-226 °C; IR (KBr, cm⁻¹): 2917, 2855, 2706, 2562, 1585, 1459, 1262, 1072, 1013, 988; ¹H NMR (400 MHz, DMSO-*d*₆) δ: 1.22 (s, 2H), 1.41 (brs, 2H), 1.50-1.53 (m, 2H), 1.67 (brs, 3H), 1.81 (brs, 7H), 1.97-2.08 (m, 2H), 2.15 (brs, 1H), 2.25-2.31 (m, 3H), 3.27 (brs, 1H), 3.69 (brs, 1H), 3.96 (brs, 1H), 4.27 (brs, 1H, CH₂Ph), 4.38 (brs, 1H, CH₂Ph), 7.43 (m, 1H, ArH), 7.66 (m, 3H, ArH), 9.07 (brs, 2H, NH₂⁺), 9.46 (brs, 1H, NH₂⁺), 9.66 (brs, 1H, NH₂⁺); ESI-MS (*m/z*): 416.1 [M+H - 2HCl]⁺, 418.1 [M+2 - 2HCl]⁺; Anal. calcd. for C₂₃H₃₅BrCl₂N₂: C, 56.34; H, 7.19; N, 5.71; Found: C, 56.44; H, 7.15; N, 5.69.

***N*-(2-Fluoro-benzyl)-*N'*-(2-adamantyl)-cyclohexane-1,2-diaminium dichloride (8p)**

Yield 75% (white solid); mp 186-188 °C; IR (KBr, cm⁻¹): 2916, 2860, 2741, 2705, 1588, 1497, 1458, 1238, 1186, 1103, 1040, 986, 937, 860; ¹H NMR (400 MHz, DMSO-*d*₆) δ: 1.42 (brs, 2H), 1.48 (brs, 1H), 1.52 (brs, 1H), 1.67 (brs, 4H), 1.78-1.86 (m, 7H), 2.10 (brs, 1H), 2.21 (brs, 1H), 2.28 (brs, 1H), 2.33-2.39 (m, 2H), 3.34 (brs, 1H), 3.48 (brs, 2H), 3.74 (brs, 1H), 4.07 (brs, 1H), 4.35-4.38 (m, 2H, CH₂Ph), 7.25-7.31 (m, 2H, ArH), 7.46-7.51 (m, 1H, ArH), 7.89-7.93 (m, 1H, ArH), 9.13 (brs, 1H, NH₂⁺), 9.31 (brs, 1H, NH₂⁺), 9.56 (brs, 1H, NH₂⁺), 9.86 (brs, 1H, NH₂⁺); ¹³C NMR (100 MHz, DMSO-*d*₆) δ: 21.97, 22.99, 23.91, 26.20, 26.42, 27.66, 28.93, 29.67, 29.75, 36.17, 36.26, 36.73, 42.26, 55.18, 56.08, 115.62, 124.57, 131.59, 133.10, 159.57, 162.04; ESI-MS (*m/z*): 356.2 [M+H - 2HCl]⁺; Anal. calcd. for C₂₃H₃₅Cl₂FN₂: C, 64.33; H, 8.21; N, 6.52; Found: C, 64.41; H, 8.20; N, 6.48.

***N*-(4-Fluoro-benzyl)-*N'*-(2-adamantyl)-cyclohexane-1,2-diaminium dichloride (8q)**

Yield 78% (white solid); mp 230-232 °C; IR (KBr, cm⁻¹): 2920, 2858, 2756, 2565, 1586, 1514, 1458, 1223, 1164, 1102, 1041, 987, 833; ¹H NMR (400 MHz, DMSO-*d*₆) δ: 1.40 (brs, 2H), 1.50 (s, 1H), 1.53 (s, 1H), 1.67 (brs, 4H), 1.81 (brs, 7H), 1.89 (brs, 1H), 1.96 (brs, 1H), 2.03-2.05 (m, 1H), 2.16 (brs, 1H), 2.26-2.31 (m, 3H), 3.31 (brs, 1H), 3.68 (brs, 1H), 4.00 (brs, 1H), 4.28 (brs, 1H, CH₂Ph), 4.39 (brs, 1H, CH₂Ph), 7.26-7.31 (m, 2H, ArH), 7.72-7.78 (m, 2H, ArH), 9.07 (brs, 2H, NH₂⁺), 9.41 (brs, 1H, NH₂⁺), 9.60 (brs, 1H, NH₂⁺); ESI-MS (*m/z*): 356.2 [M+H - 2HCl]⁺; Anal. calcd. for C₂₃H₃₅Cl₂FN₂: C, 64.33; H, 8.21; N, 6.52; Found: C, 64.31; H, 8.24; N, 6.48.

***N*-(2-Trifluoromethyl-benzyl)-*N'*-(2-adamantyl)-cyclohexane-1,2-diaminium dichloride (8r)**

Yield 85% (white solid); mp 234-236 °C; IR (KBr, cm⁻¹): 2922, 2860, 2751, 2711, 2367, 2345, 1586, 1460, 1438, 1315, 1173, 1120, 1111, 1061, 1039, 987, 776; ¹H NMR (400 MHz, DMSO-*d*₆) δ: 1.43 (brs, 2H), 1.52-1.55 (m, 2H), 1.68 (brs, 3H), 1.82 (brs, 10H), 1.94 (brs, 2H), 2.08 (brs, 1H), 2.24-2.31 (m, 3H), 3.77 (brs, 1H), 4.14 (brs, 1H), 4.40 (brs, 1H, CH₂Ph), 4.54 (brs, 1H, CH₂Ph), 7.63 (s, 1H, ArH), 7.71-7.79 (m, 2H, ArH), 8.12 (s, 1H, ArH), 8.95 (brs, 1H, NH₂⁺), 9.34 (brs, 1H, NH₂⁺), 9.53 (brs, 1H, NH₂⁺), 9.80 (brs, 1H, NH₂⁺); ¹³C NMR (100 MHz, DMSO-*d*₆) δ: 21.89, 22.94, 26.21, 26.42, 27.60, 29.71, 29.79, 36.15, 36.29, 36.70, 45.98, 55.32, 126.02, 129.57, 131.83, 132.67, 132.98; ESI-MS (*m/z*): 406.2 [M+H - 2HCl]⁺; Anal. calcd. for C₂₄H₃₅Cl₂F₃N₂: C, 60.12; H, 7.36; N, 5.84; Found: C, 60.10; H, 7.32; N, 5.79.

***N*-(4-Trifluoromethyl-benzyl)-*N'*-(2-adamantyl)-cyclohexane-1,2-diaminium dichloride (8s)**

Yield 86% (white solid); mp 212-214 °C; IR (KBr, cm⁻¹): 2923, 2860, 2750, 2659, 2370, 2345, 1581, 1459, 1329, 1159, 1129, 1068, 1041, 1020, 991, 847, 833; ¹H NMR (400 MHz, DMSO-*d*₆) δ: 1.41-1.43 (m, 2H), 1.49 (brs, 1H), 1.52 (brs, 1H), 1.67 (brs, 4H), 1.80 (brs, 7H), 1.90-1.94 (m, 1H), 2.07-2.09 (m, 1H), 2.18 (brs, 1H), 2.29 (brs, 1H), 2.38 (brs, 2H), 3.33 (brs, 1H), 3.50 (brs, 1H), 3.74 (brs, 1H), 4.10 (brs, 1H), 4.43 (brs, 1H, CH₂Ph), 4.50 (brs, 1H, CH₂Ph), 7.81 (d, *J* = 8 Hz, 2H, ArH), 7.98 (d, *J* = 8 Hz, 2H, ArH), 9.19 (brs, 1H, NH₂⁺), 9.30 (brs, 1H, NH₂⁺), 9.66 (brs, 1H, NH₂⁺), 9.78 (brs, 1H, NH₂⁺); ¹³C NMR (100 MHz, DMSO-*d*₆) δ: 18.69, 22.12, 22.90, 23.92, 26.18, 26.39, 27.58, 29.05, 29.67, 29.73, 36.10, 36.23, 36.68, 48.40, 55.35, 55.91, 122.72, 125.25, 131.72, 136.08; ESI-MS (*m/z*): 406.2 [M+H - 2HCl]⁺; Anal. calcd. for C₂₄H₃₅Cl₂F₃N₂: C, 60.12; H, 7.36; N, 5.84; Found: C, 60.22; H, 7.39; N, 5.82.

***N*-(2,6-Dimethyl-benzyl)-*N'*-(2-adamantyl)-cyclohexane-1,2-diaminium dichloride (8t)**

Yield 74 % (white solid); mp 236-238 °C; IR (KBr, cm⁻¹): 2910, 2854, 2729, 1589, 1465, 1105, 1040, 990, 930; ¹H NMR (400 MHz, DMSO-*d*₆) δ: 1.46 (br, 2H), 1.52 (brs, 1H), 1.55 (brs, 1H), 1.68 (brs, 2H), 1.77-1.83 (m, 7H), 1.92 (brs, 4H), 2.28 (brs, 3H), 2.33 (brs, 1H), 2.37 (brs, 1H), 2.47 (s, 3H), 2.48 (s, 3H), 3.47 (brs, 1H), 3.73 (brs, 1H), 4.29-4.34 (m, 2H), 4.47 (brs, 1H, CH₂Ph), 7.10 (d, *J* = 7.3 Hz, 2H, ArH), 7.18-7.22 (m, 1H, ArH), 8.94 (brs, 1H, NH₂⁺), 9.16 (brs, 2H, NH₂⁺), 9.52 (brs, 1H, NH₂⁺); ¹³C NMR (100 MHz, DMSO-*d*₆) δ: 20.22, 22.26, 24.20, 26.20, 26.44, 27.42, 29.21, 29.74, 29.85, 36.16, 36.30, 36.70, 45.15, 55.39, 57.48, 60.48, 128.36, 129.35, 139.50; ESI-MS (*m/z*): 366.3 [M+H - 2HCl]⁺; Anal. calcd. for C₂₅H₄₀Cl₂N₂: C, 68.32; H, 9.17; N, 6.37; Found: C, 68.38; H, 9.22; N, 6.39.

***N*-(3,4-Dimethyl-benzyl)-*N'*-(2-adamantyl)-cyclohexane-1,2-diaminium dichloride (8u)**

Yield 78% (white solid); mp 222-224 °C; IR (KBr, cm⁻¹): 2919, 2767, 2672, 2435, 2345, 1587, 1457, 991, 821; ¹H NMR (400 MHz, DMSO-*d*₆) δ: 1.41 (brs, 2H), 1.47-1.51 (m, 3H), 1.56 (brs, 1H), 1.65 (brs, 2H), 1.73-1.78 (m, 8H), 2.01 (brs, 1H), 2.08 (brs, 2H), 2.21 (s, 9H), 3.04 (brs, 1H), 3.64 (brs, 1H), 3.77 (brs, 1H), 4.16 (brs, 1H, CH₂Ph), 4.29 (brs, 1H, CH₂Ph), 7.20 (d, *J* = 7.3 Hz, 1H, ArH), 7.40 (d, *J* = 7.3 Hz, 1H, ArH), 7.46 (s, 1H, ArH), 8.88 (brs, 1H, NH₂⁺), 9.08 (brs, 1H, NH₂⁺), 9.33 (brs, 1H, NH₂⁺), 9.57 (brs, 1H, NH₂⁺); ¹³C NMR (100 MHz, DMSO-*d*₆) δ: 19.11, 19.38, 22.27, 23.05, 23.90, 26.12, 26.39, 27.81, 28.37, 29.60, 35.99, 36.07, 36.64, 48.49, 54.04, 55.08, 60.09, 128.36, 129.73, 131.93, 136.93, 137.46; ESI-MS (*m/z*): 366.3 [M+H -

2HCl]⁺; Anal. calcd. for C₂₅H₄₀Cl₂N₂: C, 68.32; H, 9.17; N, 6.37; Found: C, 68.38; H, 9.12; N, 6.31.

(1r,3r,5r,7r)-N-((3-((Benzylamino)methyl)cyclohexyl)methyl)adamantan-2-amine dihydrochloride (14a)

Yield 72%; mp 261-264 °C; IR (film, cm⁻¹): 2922, 2853, 2799, 1591, 1459, 1215, 1083, 993, 751; ¹H NMR (400 MHz, CDCl₃): δ 0.68-0.71 (m, 1H), 0.85-0.87 (m, 1H), 1.35-1.41 (m, 1H), 1.61 (brs, 1H), 1.64 (brs, 1H), 1.74-1.77 (m, 6H), 1.91-1.95 (m, 5H), 2.16 (brs, 1H), 2.36-2.42 (m, 4H), 2.48-2.52 (m, 3H), 2.60-2.66 (m, 2H), 2.75-2.84 (m, 2H), 3.19-3.26 (m, 1H), 4.19 (brs, 2H), 7.37 (s, 3H, ArH), 7.65-7.66 (m, 2H, ArH), 8.39 (brs, 1H, NH₂⁺), 9.11 (brs, 1H, NH₂⁺), 9.51 (brs, 1H, NH₂⁺), 9.94 (brs, 1H, NH₂⁺); ESI-MS (*m/z*): 367.34 [M+H - 2HCl]⁺; Anal. calcd. for C₂₅H₄₀Cl₂N₂: C, 68.32; H, 9.17; N, 6.37; Found: C, 68.38; H, 9.10; N, 6.41.

(1r,3r,5r,7r)-N-((3-((2-Methylbenzyl)amino)methyl)cyclohexyl)methyl)adamantan-2-amine dihydrochloride (14b)

Yield 50%; mp 219-221 °C; IR (film, cm⁻¹): 2922, 2853, 1589, 1461, 1083, 1046, 751; ¹H NMR (400 MHz, CDCl₃): δ 0.71-0.80 (m, 1H), 0.84-0.93 (m, 1H), 1.34-1.43 (m, 2H), 1.60-1.63 (m, 2H), 1.74-1.78 (m, 6H), 1.90-1.93 (m, 5H), 2.04 (brs, 1H), 2.15 (s, 1H), 2.36-2.40 (m, 3H), 2.43 (s, 3H), 2.63-2.72 (m, 2H), 2.82-2.87 (m, 4H), 3.27 (brs, 1H), 4.18-4.26 (m, 2H), 7.18-7.21 (m, 1H, ArH), 7.23-7.26 (m, 2H, ArH), 7.72-7.74 (m, 1H, ArH), 8.48 (brs, 1H, NH₂⁺), 8.97 (brs, 1H, NH₂⁺), 9.48 (brs, 1H, NH₂⁺), 9.70 (brs, 1H, NH₂⁺); ESI-MS (*m/z*): 381.37 [M+H - 2HCl]⁺; Anal. calcd. for C₂₆H₄₂Cl₂N₂: C, 68.85; H, 9.33; N, 6.18; Found: C, 68.90; H, 9.22; N, 6.20.

(1r,3r,5r,7r)-N-((3-((3-Methylbenzyl)amino)methyl)cyclohexyl)methyl)adamantan-2-amine dihydrochloride (14c)

Yield 55%; mp 260-262 °C; IR (film, cm⁻¹): 2921, 2854, 1592, 1460, 1084, 752; ¹H NMR (400 MHz, CDCl₃): δ 0.65-0.73 (m, 1H), 0.85-0.91 (m, 1H), 1.35-1.42 (m, 1H), 1.61 (brs, 1H), 1.64 (brs, 1H), 1.74-1.78 (m, 6H), 1.91-1.96 (m, 6H), 2.15 (brs, 1H), 2.35 (s, 4H), 2.42-2.44 (m, 2H), 2.49 (s, 1H), 2.58 (brs, 1H), 2.63-2.66 (m, 1H), 2.69-2.72 (m, 2H), 2.84 (brs, 2H), 3.26 (brs, 1H), 4.15 (brs, 2H), 7.17 (d, *J* = 7.32 Hz, 1H, ArH), 7.25-7.29 (m, 1H, ArH), 7.41 (s, 1H, ArH), 7.46 (d, *J* = 8.05 Hz, 1H, ArH), 8.47 (brs, 1H, NH₂⁺), 9.14 (brs, 1H, NH₂⁺), 9.51 (brs, 1H, NH₂⁺), 9.90

(brs, 1H, NH_2^+); ESI-MS (m/z): 381.37 [$M+H - 2HCl$] $^+$; Anal. calcd. for $C_{26}H_{42}Cl_2N_2$: C, 68.85; H, 9.33; N, 6.18; Found: C, 68.80; H, 9.28; N, 6.12.

(1r,3r,5r,7r)-N-((3-(((4-Methylbenzyl)amino)methyl)cyclohexyl)methyl)adamantan-2-amine dihydrochloride (14d)

Yield 62%; mp 274-276 °C; IR (film, cm^{-1}): 2920, 2851, 1592, 1460, 1081, 810, 752; 1H NMR (400 MHz, $CDCl_3$): δ 0.68-0.71 (m, 1H), 0.86-0.88 (m, 2H), 1.25 (s, 2H), 1.34-1.40 (m, 1H), 1.60-1.63 (m, 3H), 1.74-1.77 (m, 6H), 1.90 (brs, 5H), 2.32 (s, 3H), 2.36-2.43 (m, 2H), 2.56-2.64 (m, 2H), 2.73-2.87 (m, 2H), 2.99 (s, 2H), 3.26 (brs, 1H), 4.13 (brs, 2H), 7.17 (d, $J = 7.32$ Hz, 2H, ArH), 7.51 (d, $J = 7.32$ Hz, 2H, ArH), 8.40 (brs, 1H, NH_2^+), 9.08 (brs, 1H, NH_2^+), 9.42 (brs, 1H, NH_2^+), 9.81 (brs, 1H, NH_2^+); ESI-MS (m/z): 381.37 [$M+H - 2HCl$] $^+$; Anal. calcd. for $C_{26}H_{42}Cl_2N_2$: C, 68.85; H, 9.33; N, 6.18; Found: C, 68.83; H, 9.26; N, 6.27.

(1r,3r,5r,7r)-N-((3-(((4-Ethylbenzyl)amino)methyl)cyclohexyl)methyl)adamantan-2-amine dihydrochloride (14e)

Yield 60%; mp 271-272 °C; IR (film, cm^{-1}): 2921, 2853, 1589, 1460, 1084, 826, 754; 1H NMR (400 MHz, $CDCl_3$): δ 0.71-0.74 (m, 1H), 0.87 (brs, 2H), 1.21 (t, $J = 7.32$ Hz, 3H), 1.35-1.41 (m, 1H), 1.60-1.63 (m, 2H), 1.73 (brs, 6H), 1.90 (brs, 5H), 2.01-2.02 (m, 1H), 2.14 (brs, 1H), 2.36-2.46 (m, 3H), 2.59-2.65 (m, 4H), 2.73 (brs, 1H), 2.82-2.86 (m, 2H), 3.25 (brs, 2H), 4.15 (brs, 2H), 7.20 (d, $J = 7.32$ Hz, 2H, ArH), 7.54 (d, $J = 7.32$ Hz, 2H, ArH), 8.45 (brs, 1H, NH_2^+), 9.05 (brs, 1H, NH_2^+), 9.47 (brs, 1H, NH_2^+), 9.77 (brs, 1H, NH_2^+); ESI-MS (m/z): 395.37 [$M+H - 2HCl$] $^+$; Anal. calcd. For $C_{27}H_{44}Cl_2N_2$: C, 69.36; H, 9.49; N, 5.99; Found: C, 69.28; H, 9.55; N, 6.12.

(1r,3r,5r,7r)-N-((3-(((4-Propylbenzyl)amino)methyl)cyclohexyl)methyl)adamantan-2-amine dihydrochloride (14f)

Yield 50%; mp 241-244 °C; IR (film, cm^{-1}): 2922, 2852, 1593, 1460, 1084, 754; 1H NMR (400 MHz, $CDCl_3$): δ 0.71-0.73 (m, 1H), 0.87 (brs, 1H), 0.92 (t, $J = 7.32$ Hz, 3H), 1.36-1.42 (m, 1H), 1.58-1.64 (m, 5H), 1.74-1.77 (m, 6H), 1.90-1.94 (m, 5H), 2.15 (brs, 1H), 2.36-2.40 (m, 3H), 2.45 (brs, 1H), 2.56 (t, $J = 7.32$ Hz, 2H), 2.69 (s, 3H), 2.82-2.88 (m, 2H), 2.99 (brs, 1H), 3.21-3.27 (m, 1H), 4.14 (brs, 2H), 7.18 (d, $J = 7.32$ Hz, 2H, ArH), 7.52 (d, $J = 7.32$ Hz, 2H, ArH), 8.36 (brs, 1H, NH_2^+), 8.84 (brs, 1H, NH_2^+), 9.41 (brs, 1H, NH_2^+), 9.73 (brs, 1H, NH_2^+); ESI-MS

(*m/z*): 409.40 [M+H - 2HCl]⁺. Anal. calcd. for C₂₈H₄₆Cl₂N₂: C, 82.29; H, 10.85; N, 6.85; Found: C, 82.18; H, 10.80; N, 6.88.

(1r,3r,5r,7r)-N-((3-(((4-iso-Propylbenzyl)amino)methyl)cyclohexyl)methyl)adamantan-2-amine dihydrochloride (14g)

Yield 55%; mp 246-249 °C; IR (film, cm⁻¹): 2925, 2856, 1613, 1460, 1175, 1084, 829, 753; ¹H NMR (400 MHz, CDCl₃): δ 0.72-0.75 (m, 1H), 0.86-0.89 (m, 1H), 1.21 (d, *J* = 6.59 Hz, 6H), 1.36-1.42 (m, 1H), 1.61-1.64 (m, 2H), 1.74-1.77 (m, 6H), 1.86-1.94 (m, 5H), 2.01 (brs, 1H), 2.15 (brs, 1H), 2.38-2.41 (m, 3H), 2.46 (brs, 1H), 2.63-2.65 (m, 2H), 2.74 (brs, 1H), 2.85-2.88 (m, 2H), 2.90-2.92 (m, 2H), 3.21-3.28 (m, 1H), 4.15 (brs, 2H), 7.23 (d, *J* = 8.05 Hz, 2H, ArH), 7.54 (d, *J* = 8.05 Hz, 2H, ArH), 8.43 (brs, 1H, NH₂⁺), 9.03 (brs, 1H, NH₂⁺), 9.46 (brs, 1H, NH₂⁺), 9.77 (brs, 1H, NH₂⁺); ESI-MS (*m/z*): 409.37 [M+H - 2HCl]⁺; Anal. calcd. for C₂₈H₄₆Cl₂N₂: C, 82.29; H, 10.85; N, 6.85; Found: C, 82.34; H, 10.80; N, 6.79.

(1r,3r,5r,7r)-N-((3-(((4-Butylbenzyl)amino)methyl)cyclohexyl)methyl)adamantan-2-amine dihydrochloride (14h)

Yield 50%; mp 253-255 °C; IR (film, cm⁻¹): 2923, 2856, 1595, 1459, 1103, 828, 751; ¹H NMR (400 MHz, CDCl₃): δ 0.70-0.73 (m, 1H), 0.85-0.87 (m, 1H), 0.91 (t, *J* = 7.32 Hz, 3H), 1.29-1.38 (m, 3H), 1.52-1.58 (m, 2H), 1.60-1.64 (m, 2H), 1.74-1.77 (m, 5H), 1.90-1.95 (m, 5H), 2.00 (brs, 1H), 2.15 (brs, 1H), 2.36-2.40 (m, 3H), 2.47 (brs, 1H), 2.58 (t, *J* = 8.05 Hz, 2H), 2.63-2.66 (m, 2H), 2.73 (brs, 1H), 2.86 (brs, 4H), 3.27 (brs, 1H), 4.14 (brs, 2H), 7.17 (d, *J* = 7.32 Hz, 2H, ArH), 7.52 (d, *J* = 7.32 Hz, 2H, ArH), 8.43 (brs, 1H, NH₂⁺), 9.05 (brs, 1H, NH₂⁺), 9.45 (brs, 1H, NH₂⁺), 9.78 (brs, 1H, NH₂⁺); ¹³C NMR (100 MHz, CDCl₃): δ 13.80, 22.22, 24.59, 26.41, 26.84, 28.70, 28.99, 29.93, 30.15, 30.40, 33.25, 33.52, 34.09, 35.21, 36.84, 37.03, 50.90, 51.50, 51.65, 63.83, 127.27, 128.88, 130.43, 143.98. Anal. calcd. for C₂₉H₄₈Cl₂N₂: C, 70.28; H, 9.76; N, 5.65; Found: C, 70.36; H, 9.68; N, 5.63.

(1r,3r,5r,7r)-N-((3-(((4-(tert-Butyl)benzyl)amino)methyl)cyclohexyl)methyl)adamantan-2-amine dihydrochloride (14i)

Yield 60%; mp 288-291 °C; IR (film, cm⁻¹): 2923, 2855, 1591, 1460, 1103, 1083, 831, 753; ¹H NMR (400 MHz, CDCl₃): δ 0.70-0.79 (m, 1H), 0.87-0.90 (m, 2H), 1.22-1.24 (m, 1H), 1.28 (s, 9H), 1.37-1.39 (m, 1H), 1.60-1.64 (m, 2H), 1.73-1.77 (m, 5H), 1.90-1.94 (m, 4H), 2.02 (brs, 1H),

2.16 (brs, 1H), 2.36-2.46 (m, 3H), 2.46 (brs, 1H), 2.62 (brs, 2H), 2.86 (brs, 2H), 3.09 (brs, 2H), 3.21-3.28 (m, 1H), 4.15 (brs, 2H), 7.39 (d, $J = 8.05$ Hz, 2H, ArH), 7.55 (d, $J = 8.05$ Hz, 2H, ArH), 8.46 (brs, 1H, NH_2^+), 9.04 (brs, 1H, NH_2^+), 9.49 (brs, 1H, NH_2^+), 9.78 (brs, 1H, NH_2^+); ESI-MS (m/z): 423.42 (M+H - 2HCl)⁺; Anal. calcd. for C₂₉H₄₈Cl₂N₂: C, 70.28; H, 9.76; N, 5.65; Found: C, 70.32; H, 9.70; N, 5.70.

(1r,3r,5r,7r)-N-((3-(((2-Chlorobenzyl)amino)methyl)cyclohexyl)methyl)adamantan-2-amine dihydrochloride (14j)

Yield 65%; mp 252-255 °C; IR (film, cm⁻¹): 2921, 2853, 1593, 1460, 1216, 1083, 1056, 755; ¹H NMR (400 MHz, CDCl₃): δ 0.74-0.77 (m, 1H), 0.89-0.91 (m, 2H), 1.38-1.41 (m, 2H), 1.61-1.65 (m, 3H), 1.74-1.79 (m, 6H), 1.91-1.95 (m, 5H), 2.16 (brs, 1H), 2.38-2.45 (m, 3H), 2.72 (brs, 2H), 2.83 (brs, 2H), 2.90 (brs, 1H), 3.21-3.28 (m, 1H), 4.36-4.42 (m, 2H), 7.30-7.38 (m, 2H, ArH), 7.41 (d, $J = 7.32$ Hz, 1H, ArH), 8.04 (d, $J = 7.32$ Hz, 1H, ArH) 8.43 (brs, 1H, NH_2^+), 8.99 (brs, 1H, NH_2^+), 9.65 (brs, 1H, NH_2^+), 9.94 (brs, 1H, NH_2^+); Anal. calcd. for C₂₅H₃₉Cl₃N₂: C, 63.35; H, 8.29; N, 5.91; Found: C, 63.40; H, 8.20; N, 5.86.

(1r,3r,5r,7r)-N-((3-(((3-Chlorobenzyl)amino)methyl)cyclohexyl)methyl)adamantan-2-amine dihydrochloride (14k)

Yield 65%; mp 259-262 °C; IR (film, cm⁻¹): 2921, 2853, 1592, 1460, 1214, 1083, 753; ¹H NMR (400 MHz, CDCl₃): δ 0.68-0.77 (m, 1H), 0.84-0.92 (m, 1H), 1.32-1.42 (m, 1H), 1.61 (brs, 1H), 1.64 (brs, 1H), 1.74-1.78 (m, 6H), 1.87-1.94 (m, 5H), 2.04 (brs, 1H), 2.16 (brs, 1H), 2.35 (brs, 1H), 2.41 (brs, 2H), 2.45 (brs, 3H), 2.64-2.67 (m, 2H), 2.80-2.84 (m, 2H), 3.19-3.27 (m, 1H), 4.17-4.22 (m, 2H), 7.34-7.35 (m, 2H, ArH), 7.66 (brs, 2H, ArH), 8.35 (brs, 1H, NH_2^+), 9.08 (brs, 1H, NH_2^+), 9.65 (brs, 1H, NH_2^+), 10.04 (brs, 1H, NH_2^+); ESI-MS (m/z): 401.32 [M+H - 2HCl]⁺, 403.35 [M+2 - 2HCl]⁺; Anal. calcd. for C₂₅H₃₉Cl₃N₂: C, 63.35; H, 8.29; N, 5.91; Found: C, 63.30; H, 8.26; N, 6.12.

(1r,3r,5r,7r)-N-((3-(((4-Chlorobenzyl)amino)methyl)cyclohexyl)methyl)adamantan-2-amine dihydrochloride (14l)

Yield 75%; mp 273-276 °C; IR (film, cm⁻¹): 2920, 2852, 1600, 1458, 1085, 754; ¹H NMR (400 MHz, CDCl₃): δ 0.64-0.73 (m, 1H), 0.82-0.91 (m, 1H), 1.33-1.39 (m, 2H), 1.60-1.63 (m, 3H), 1.74 (brs, 5H), 1.92 (brs, 5H), 2.14 (brs, 1H), 2.33 (s, 3H), 2.39 (brs, 2H), 2.44 (brs, 1H), 2.61-2.69 (m, 2H), 2.77 (brs, 1H), 2.86 (brs, 1H), 3.17-3.25 (m, 1H), 4.13-4.17 (m, 2H), 7.35 (d, $J =$

8.05 Hz, 2H, ArH), 7.65 (d, $J = 8.05$ Hz, 2H, ArH), 8.28 (brs, 1H, NH_2^+), 8.84 (brs, 1H, NH_2^+), 9.57 (brs, 1H, NH_2^+), 9.99 (brs, 1H, NH_2^+); ^{13}C NMR (100 MHz, $CDCl_3$): δ 24.55, 26.40, 26.81, 28.69, 28.99, 29.88, 30.11, 30.31, 33.45, 33.98, 35.33, 36.81, 36.98, 50.50, 51.60, 51.99, 63.84, 128.74, 128.87, 129.0, 132.17, 132.56, 135.23; ESI-MS (m/z): 401.31 $[M+H - 2HCl]^+$, 403.31 $[M+2 - 2HCl]^+$; Anal. calcd. for $C_{25}H_{39}Cl_3N_2$: C, 63.35; H, 8.29; N, 5.91; Found: C, 63.39; H, 8.19; N, 5.84.

(1r,3r,5r,7r)-N-((3-(((2-Bromobenzyl)amino)methyl)cyclohexyl)methyl)adamantan-2-amine dihydrochloride (14m)

Yield 60%; mp 232-235 °C; IR (film, cm^{-1}): 2921, 2853, 1593, 1460, 1084, 1029, 754; 1H NMR (400 MHz, $CDCl_3$): δ 0.71-0.74 (m, 1H), 0.88-0.91 (m, 2H), 1.37-1.42 (m, 2H), 1.61-1.64 (m, 3H), 1.74-1.80 (m, 6H), 1.91 (brs, 5H), 2.16 (brs, 1H), 2.41-2.50 (m, 3H), 2.70 (brs, 2H), 2.83-2.89 (m, 2H), 3.0 (brs, 1H), 3.20-3.27 (m, 1H), 4.38-4.52 (m, 2H), 7.21-7.25 (m, 1H, ArH), 7.39-7.40 (m, 1H, ArH), 7.57-7.59 (m, 1H, ArH), 8.07 (s, 1H, ArH), 8.40 (brs, 1H, NH_2^+), 9.07 (brs, 1H, NH_2^+), 9.66 (brs, 1H, NH_2^+), 10.0 (brs, 1H, NH_2^+); Anal. calcd. for $C_{25}H_{39}BrCl_2N_2$: C, 57.92; H, 7.58; N, 5.40; Found: C, 57.88; H, 7.60; N, 5.45.

(1r,3r,5r,7r)-N-((3-(((3-Bromobenzyl)amino)methyl)cyclohexyl)methyl)adamantan-2-amine dihydrochloride (14n)

Yield 68%; mp 238-242 °C; IR (film, cm^{-1}): 2921, 2853, 1591, 1460, 1083, 753; 1H NMR (400 MHz, $CDCl_3$): δ 0.71-0.73 (m, 1H), 0.87-0.90 (m, 1H), 1.32-1.39 (m, 1H), 1.61 (brs, 1H), 1.65 (brs, 1H), 1.74-1.78 (m, 6H), 1.91-1.94 (m, 5H), 2.04 (brs, 1H), 2.15 (brs, 1H), 2.27 (s, 3H), 2.35 (brs, 1H), 2.41 (brs, 1H), 2.45 (brs, 1H), 2.64 (brs, 2H), 2.81 (brs, 2H), 3.19-3.26 (m, 1H), 4.18 (brs, 2H), 7.29 (d, $J = 8.05$ Hz, 1H, ArH), 7.50 (d, $J = 7.32$ Hz, 1H, ArH), 7.72-7.73 (m, 1H, ArH), 7.81 (s, 1H, ArH), 8.34 (brs, 1H, NH_2^+), 8.86 (brs, 1H, NH_2^+), 9.64 (brs, 1H, NH_2^+), 10.06 (brs, 1H, NH_2^+); Anal. calcd. for $C_{25}H_{39}BrCl_2N_2$: C, 57.92; H, 7.58; N, 5.40; Found: C, 57.98; H, 7.61; N, 5.44.

(1r,3r,5r,7r)-N-((3-(((4-Bromobenzyl)amino)methyl)cyclohexyl)methyl)adamantan-2-amine dihydrochloride (14o)

Yield 78%; mp 273-276 °C; IR (film, cm^{-1}): 2923, 2854, 2793, 1593, 1460, 1215, 1072, 1013, 754; 1H NMR (400 MHz, $CDCl_3$): δ 0.65-0.74 (m, 1H), 0.82-0.91 (m, 1H), 1.29-1.38 (m, 1H),

1.57-1.63 (m, 3H), 1.74 (brs, 6H), 1.92 (brs, 5H), 2.13 (brs, 1H), 2.34-2.38 (m, 3H), 2.43 (brs, 1H), 2.63 (brs, 2H), 2.65 (s, 2H), 2.78 (brs, 2H), 3.17-3.25 (m, 1H), 4.08-4.14 (m, 2H), 7.50 (d, $J = 8.05$ Hz, 2H, ArH), 7.59 (d, $J = 8.05$ Hz, 2H, ArH), 8.29 (brs, 1H, NH_2^+), 9.08 (brs, 1H, NH_2^+), 9.57 (brs, 1H, NH_2^+), 9.97 (brs, 1H, NH_2^+); ESI-MS (m/z): 445.26 [M+H - 2HCl]⁺, 447.27 [M+2 - 2HCl]⁺; Anal. calcd. for C₂₅H₃₉BrCl₂N₂: C, 57.92; H, 7.58; N, 5.40; Found: C, 58.00; H, 7.62; N, 5.35.

(1r,3r,5r,7r)-N-((3-(((2-Fluorobenzyl)amino)methyl)cyclohexyl)methyl)adamantan-2-amine dihydrochloride (14p)

Yield 45%; mp 236-238 °C; IR (film, cm⁻¹): 2921, 2854, 1588, 1496, 1460, 1236, 1103, 1084, 755; ¹H NMR (400 MHz, CDCl₃): δ 0.71-0.80 (m, 1H), 0.85-0.94 (m, 1H), 1.37-1.44 (m, 1H), 1.61-1.64 (m, 2H), 1.74-1.78 (m, 6H), 1.86-1.95 (m, 5H), 2.04 (brs, 1H), 2.16 (brs, 1H), 2.36-2.44 (m, 3H), 2.63-2.68 (m, 2H), 2.77-2.81 (m, 1H), 2.84-2.86 (m, 1H), 3.03-3.29 (m, 2H), 3.21-3.27 (m, 1H), 4.26-4.34 (m, 2H), 7.07-7.12 (m, 1H, ArH), 7.21-7.24 (m, 1H, ArH), 7.35-7.40 (m, 1H, ArH), 7.92-7.94 (m, 1H, ArH), 8.48 (brs, 1H, NH_2^+), 8.98 (brs, 1H, NH_2^+), 9.96 (brs, 2H, NH_2^+); ESI-MS (m/z): 385.33 [M+H - 2HCl]⁺; Anal. calcd. for C₂₅H₃₉Cl₂FN₂: C, 65.63; H, 8.59; N, 6.12; Found: C, 65.69; H, 8.64; N, 6.05.

(1r,3r,5r,7r)-N-((3-(((4-Fluorobenzyl)amino)methyl)cyclohexyl)methyl)adamantan-2-amine dihydrochloride (14q)

Yield 60%; mp 276-278 °C; IR (film, cm⁻¹): 2922, 2855, 2798, 1603, 1513, 1460, 1226, 1162, 1102, 834, 754; ¹H NMR (400 MHz, CDCl₃): δ 0.65-0.74 (m, 1H), 0.82-0.91 (m, 1H), 1.31-1.37 (m, 1H), 1.60-1.64 (m, 2H), 1.74 (brs, 5H), 1.91 (brs, 5H), 2.01-2.04 (m, 1H), 2.15 (brs, 1H), 2.35-2.40 (m, 3H), 2.46 (brs, 1H), 2.58-2.61 (m, 1H), 2.66 (s, 3H), 2.77-2.79 (m, 2H), 2.87 (brs, 1H), 3.18-3.25 (m, 1H), 4.11-4.18 (m, 2H), 7.05-7.09 (m, 2H, ArH), 7.67-7.70 (m, 2H, ArH), 8.33 (brs, 1H, NH_2^+), 8.86 (brs, 1H, NH_2^+), 9.55 (brs, 1H, NH_2^+), 9.94 (brs, 1H, NH_2^+); ¹³C NMR (100 MHz, CDCl₃): δ 24.59, 26.45, 26.84, 28.74, 29.05, 29.94, 30.16, 30.36, 33.54, 34.05, 35.41, 36.85, 37.02, 50.49, 51.73, 51.85, 63.98, 115.74, 115.95, 126.12, 132.70, 132.78, 161.84, 164.31; ESI-MS (m/z): 385.33 [M+H - 2HCl]⁺; Anal. calcd. for C₂₅H₃₉Cl₂FN₂: C, 65.63; H, 8.59; N, 6.12; Found: C, 65.68; H, 8.61; N, 6.06.

(1r,3r,5r,7r)-N-((3-(((3-Fluorobenzyl)amino)methyl)cyclohexyl)methyl)adamantan-2-amine dihydrochloride (14r)

Yield 50%; mp 274-276 °C; IR (film, cm⁻¹): 2922, 2854, 1590, 1459, 1257, 1084, 752; ¹H NMR (400 MHz, CDCl₃): δ 0.69-0.78 (m, 1H), 0.87-0.93 (m, 1H), 1.32-1.42 (m, 2H), 1.61-1.64 (m, 3H), 1.74-1.77 (m, 6H), 1.86-1.90 (m, 5H), 2.02 (brs, 1H), 2.15 (brs, 1H), 2.35-2.44 (m, 4H), 2.60-2.66 (m, 2H), 2.75-2.84 (m, 2H), 3.20-3.28 (m, 1H), 4.18-4.26 (m, 2H), 7.04-7.08 (m, 1H, ArH), 7.34-7.40 (m, 1H, ArH), 7.44-7.51 (m, 2H, ArH), 8.41 (brs, 1H, NH₂⁺), 8.93 (brs, 1H, NH₂⁺), 9.06 (brs, 1H, NH₂⁺), 9.65 (brs, 1H, NH₂⁺); Anal. calcd. for C₂₅H₃₉Cl₂FN₂: C, 65.63; H, 8.59; N, 6.12; Found: C, 65.57; H, 8.63; N, 6.17.

(1r,3r,5r,7r)-N-((3-(((4-Methoxybenzyl)amino)methyl)cyclohexyl)methyl)adamantan-2-amine dihydrochloride (14s)

Yield 58%; mp 245-247 °C; IR (film, cm⁻¹): 2922, 2853, 1612, 1516, 1461, 1252, 1181, 1032, 753; ¹H NMR (400 MHz, CDCl₃): δ 0.68-0.71 (m, 1H), 0.85-0.87 (m, 1H), 1.35-1.38 (m, 1H), 1.60 (brs, 1H), 1.64 (brs, 1H), 1.74-1.77 (m, 6H), 1.90-1.95 (m, 5H), 2.15 (brs, 1H), 2.35-2.40 (m, 3H), 2.47 (brs, 1H), 2.58 (brs, 1H), 2.67 (s, 4H), 2.81-2.85 (m, 2H), 3.19-3.26 (m, 1H), 3.78 (s, 3H), 4.12 (brs, 2H), 6.89 (d, *J* = 7.32 Hz, 2H, ArH), 7.57 (d, *J* = 8.05 Hz, 2H, ArH), 8.39 (brs, 1H, NH₂⁺), 8.88 (brs, 1H, NH₂⁺), 9.39 (brs, 1H, NH₂⁺), 9.79 (brs, 1H, NH₂⁺); ESI-MS (*m/z*): 397.37 [M+H - 2HCl]⁺; Anal. calcd. for C₂₆H₄₂Cl₂N₂O: C, 66.51; H, 9.02; N, 5.97; Found: C, 66.47; H, 9.12; N, 5.90.

(1r,3r,5r,7r)-N-((3-(((3-Nitrobenzyl)amino)methyl)cyclohexyl)methyl)adamantan-2-amine dihydrochloride (14t)

Yield 70%; mp 265-268 °C; IR (film, cm⁻¹): 2922, 2854, 1530, 1460, 1352, 1084, 754; ¹H NMR (400 MHz, CDCl₃): δ 0.74 (brs, 1H), 0.88-0.90 (m, 1H), 1.34-1.37 (m, 1H), 1.60-1.63 (m, 2H), 1.73-1.78 (m, 6H), 1.92 (brs, 4H), 2.06 (brs, 1H), 2.17 (brs, 1H), 2.34-2.38 (m, 2H), 2.41 (brs, 1H), 2.52 (brs, 3H), 2.62-2.80 (m, 3H), 2.89 (brs, 2H), 3.18-3.28 (m, 1H), 4.35 (brs, 2H), 7.62 (d, *J* = 7.32 Hz, 1H, ArH), 8.23 (d, *J* = 7.32 Hz, 2H, ArH), 8.56-8.58 (m, 1H, ArH), 8.79 (brs, 1H, NH₂⁺), 9.02 (brs, 1H, NH₂⁺), 9.78 (brs, 1H, NH₂⁺), 10.18 (brs, 1H, NH₂⁺); ESI-MS (*m/z*): 412.31 [M+H - 2HCl]⁺; Anal. calcd. for C₂₅H₃₉Cl₂N₃O₂: C, 61.97; H, 8.11; N, 8.67; Found: C, 61.92; H, 8.17; N, 8.59.

(1r,3r,5r,7r)-N-((3-(((4-Nitrobenzyl)amino)methyl)cyclohexyl)methyl)adamantan-2-amine dihydrochloride (14u)

Yield 65%; mp 256-259 °C; IR (film, cm⁻¹): 2922, 2853, 1607, 1523, 1460, 1347, 1084, 855, 749; ¹H NMR (400 MHz, CDCl₃): δ 0.65-0.74 (m, 1H), 0.82-0.91 (m, 1H), 1.28-1.34 (m, 1H), 1.47-1.56 (m, 1H), 1.60-1.63 (m, 2H), 1.74-1.82 (m, 6H), 1.92 (brs, 5H), 2.07 (brs, 1H), 2.18 (brs, 1H), 2.34 (brs, 2H), 2.39 (brs, 3H), 2.67-2.76 (m, 2H), 2.81-2.89 (m, 2H), 3.16-3.26 (m, 1H), 4.32-4.38 (m, 2H), 7.97 (d, *J* = 8.79 Hz, 2H, Ar*H*), 8.23 (d, *J* = 8.05 Hz, 2H, Ar*H*), 8.82 (brs, 1H, NH₂⁺), 9.14 (brs, 1H, NH₂⁺), 9.85 (brs, 1H, NH₂⁺), 10.25 (brs, 1H, NH₂⁺); ESI-MS (*m/z*): 412.34 [M+H - 2HCl]⁺; Anal. calcd. for C₂₅H₃₉Cl₂N₃O₂: C, 61.97; H, 8.11; N, 8.67; Found: C, 61.91; H, 8.18; N, 8.62.