Supporting Information

Nano-particle Catalyzed Reaction (NPCR) : ZnO-NP catalyzed Ugi-reaction in aqueous medium

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General: All the reagents and solvents were purchased from Sigma-Aldrich or Merck chemical Co. Column chromatography was performed using Spectrochem silica gel (100-200). Organic solvents were concentrated under reduced pressure on Ika rotary evaporator. The progress of reaction was checked by thin-layer chromatography. The plates were visualized first with UV illumination followed by iodine. $^1$H and $^{13}$C NMR spectra were obtained using either a Bruker DRX-200 or AV-300 spectrometer. Chemical shifts are reported in ppm from tetramethylsilane with the solvent resonance as the internal standard and $^1$H NMR Spectra are reported in the order: multiplicity, coupling constant (J value) in hertz (Hz) and no of protons; signals were characterized as s (singlet), d (doublet), t (triplet), m (multiplet). $^{13}$C NMR spectra were recorded at 50 or 75 MHz. Mass spectra were obtained using JEOL SX-102 (ESI) instrument. Elemental analysis was performed using a Perkin-Elmer Autosystem XL Analyzer.

General experiment procedure for the synthesis of compound (5)

Aldehyde (1 mmol), aniline (2 mmol), isocyanide (1 mmol) and ZnO <50 nm (15 mol %) were placed into a flask. Water (3 mL) was added to the mixture and stirred for 5 min at room temperature. Progress of reaction was monitored by TLC, after completion of the reaction, the reaction mixture was diluted with water and extracted with ethyl acetate, dried over sodium sulphate and evaporated under vacuum to give crude product, which was purified by silica gel (100-200 mesh) column chromatography to afford the corresponding product.
General procedure for the synthesis of compound (6)
In a 50-mL round-bottom flask, iodine (0.2 mmol), 2-arylamino-2-phenylacetimidamide (1 mmol), and surfactant (sodium dodecyl sulfate, 10 mol %) were added in H₂O (5 mL) and stirred for 6h at 80°C and reaction was monitored by TLC. The aqueous part was diluted and extracted with ethyl acetate, the organic layer was washed with brine and dried over anhydrous Na₂SO₄. Evaporation of solvent gave a crude product which was purified by column chromatography (silica gel, ethyl acetate:hexane).

General procedure for the synthesis of α-Amino Acid (7)
In a 50-mL round-bottom flask, 2-arylamino-2-phenylacetimidamide (1 mmol) was added in 1:3 ratio of H₂O: EtOH with 20 mol% NaOH and stirred for 3h at 70°C. After completion of reaction as evidenced by TLC, solvent was removed in vacuum. The aqueous part was diluted and extracted with ethyl acetate, the organic layer was washed with brine and dried over anhydrous Na₂SO₄. Evaporation of solvent gave a crude product which was purified by column chromatography (silica gel, ethyl acetate:hexane).

ZnO-NPs purchase from Sigma-Aldrich
Catalog No. 677450. <50 nm particle size.

Table 2. Recovery and Reuse of ZnO-Nanoparticle for the Synthesis of 5a.

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Characterization data for synthesized compounds:

**N-Tert-butyl-N',2-diphenyl-2-(phenylamino)acetimidamide (5a)**

Solid, ESI MS \( (m/z) = 358 \) (M+H), IR (KBr) \( v_{\text{max}} \) : 3289, 3027, 2966, 2906, 1634, 1611, 1591, 1485, 1310, 1253, 1185, 1166, 1070, 745 cm\(^{-1}\). \(^1\)H NMR (300 MHz; CDCl\(_3\)) \( \delta_H \) : 1.48 (s, 9H), 4.22 (s, 1H, NH), 4.92 (s, 1H, CH), 6.16 (s, 1H, NH), 6.51 (d, \( J = 5.7 \) Hz, 2H), 6.66 (t, \( J = 1.0 \) Hz, 1H), 6.96 (d, \( J = 5.1 \) Hz, 2H), 7.08-7.13 (m, 5H), 7.29 (t, \( J = 4.2 \) Hz, 1H), 7.40 (q, \( J = 1.3 \) Hz, 4H). \(^{13}\)C NMR (50 MHz; CDCl\(_3\)) \( \delta_C \) : 29.6, 52.1, 56.5, 112.1, 119.0, 120.0, 123.4, 127.4, 128.8, 129.8, 139.9, 146.0, 148.9, 158.8. Analysis calculated for : C\(_{24}\)H\(_{27}\)N\(_3\), C 80.63, H 7.61, N 11.75, Found : C 80.58, H 7.53, N 11.82.

**2-(4-Chlorophenyl)-N-cyclohexyl-N'-(4-methoxyphenyl)-2-((4-methoxyphenyl)amino)acetimidamide (5b)**

Solid, ESI MS \( (m/z) = 478 \) (M+H), IR (KBr) \( v_{\text{max}} \) : 3319, 3030, 2860, 2730, 2140, 1650, 747 cm\(^{-1}\). \(^1\)H NMR (300 MHz; CDCl\(_3\)) \( \delta_H \) : 1.27-1.59 (m, 8H), 1.60 (br, s, 2H), 1.91 (br, s, 1H), 3.80 (s, 3H, OCH\(_3\)), 3.95 (s, 3H, OCH\(_3\)), 4.67 (s, 1H, NH), 5.32 (s, 1H, CH), 6.11 (s, 1H, NH), 6.44 (d, \( J = 8.5 \) Hz, 2H), 6.94 (d, \( J = 8.6 \) Hz, 2H), 7.04 (d, \( J = 6.4 \) Hz, 4H), 7.28-7.30 (m, 4H). \(^{13}\)C NMR (50 MHz; CDCl\(_3\)) \( \delta_C \) : 25.4, 26.5, 33.9, 53.9, 55.3, 56.6, 113.9, 114.4, 114.9, 122.9, 128.2, 128.5, 132.6, 136.4, 141.3, 141.5, 141.7, 154.3, 154.5, 158.2. Analysis calculated for : C\(_{28}\)H\(_{32}\)ClN\(_3\)O\(_2\), C 70.35, H 6.75, N 8.79 Found : C 70.23, H 6.87, N 8.66.

**N'-(4-Chlorophenyl)-2-(4-chlorophenylamino)-N-cyclohexyl-2-(4-methoxyphenyl)acetimidamide (5c)**

Solid, ESI MS \( (m/z) = 482 \) (M+H), IR (KBr) \( v_{\text{max}} \) : 3384, 2967, 2901, 1641, 1491, 1482, 1284, 746 cm\(^{-1}\). \(^1\)H NMR (300 MHz; CDCl\(_3\)) \( \delta_H \) : 1.10-1.37 (m, 4H), 1.49 (t, \( J = 4.7 \) Hz, 2H), 1.67 (t, \( J = 14.5 \) Hz, 4H), 2.01 (t, \( J = 13.5 \) Hz, 1H), 3.74 (s, 3H, OCH\(_3\)), 4.33 (s, 1H, NH), 4.61 (s, 1H, CH), 5.85 (s, 1H, NH), 6.11 (s, 1H), 6.75 (d, \( J = 8.4 \) Hz, 4H), 7.08 (s, 1H), 7.18 (d, \( J = 8.6 \) Hz, 4H), 7.28 (d, \( J = 3.5 \) Hz, 2H). \(^{13}\)C NMR (75 MHz; CDCl\(_3\)) \( \delta_C \) : 24.6, 24.7, 25.3, 29.6, 32.7, 32.9, 48.4, 55.3, 58.8, 113.1, 114.7, 120.4, 122.9, 127.7, 128.3, 128.8, 130.1, 141.4, 159.8. Analysis calculated for : C\(_{27}\)H\(_{29}\)Cl\(_2\)N\(_3\)O, C 67.22, H 6.06, N 8.71 Found : C 67.13, H 5.96, N 8.83.

**N-Tert-butyl-N'-(3-chlorophenyl)-2-(3-chlorophenylamino)-2-(3-methoxyphenyl)acetimidamide (5d)**

Solid, ESI MS \( (m/z) = 456 \) (M+H), IR (KBr) \( v_{\text{max}} \) : 3373, 2966, 1719, 1669, 1633, 1588, 1492, 1373, 1212, 1127, 1033, 749 cm\(^{-1}\). \(^1\)H NMR (300 MHz; CDCl\(_3\)) \( \delta_H \) : 1.46 (s, 9H), 3.74 (s, 3H, OCH\(_3\)), 4.76 (s, 1H, NH), 5.31 (s, 1H, CH), 5.89 (s, 1H, NH), 6.40 (d, \( J = 8.3 \) Hz, 2H), 6.58 (d, \( J = 7.3 \) Hz, 2H), 6.84 (d, \( J = 5.7 \) Hz, 2H), 7.12-7.18 (m, 4H), 7.19 (d, \( J = 8.4 \) Hz, 2H).
Hz, 2H). $^{13}$C NMR (75 MHz, CDCl$_3$) $\delta_C$: 29.6, 51.9, 55.2, 58.1, 111.1, 112.5, 114.6, 115.3, 118.8, 119.4, 119.6, 121.4, 123.9, 129.1, 130.2, 130.9, 133.4, 134.2, 141.1, 148.1, 149.2, 157.2, 160.1. Analysis calculated for: C$_{25}$H$_{27}$Cl$_2$N$_3$O, C 65.79, H 5.96, N 9.21 Found: C 65.88, H 6.08, N 9.12.

N-Tert-butyl-N’-(3-methoxyphenyl)-2-(3-methoxyphenylamino)-2-phenylacetimidamide (5e)

Solid, ESI MS ($m/z$) = 418 (M+H), IR (KBr) $\nu_{\text{max}}$: 3375, 2976, 1720, 1668, 1589, 1482, 1383, 1128, 1071, 746 cm$^{-1}$. $^1$H NMR (300 MHz; CDCl$_3$) $\delta_H$: 1.51 (s, 9H), 3.75 (s, 3H, OCH$_3$), 3.79 (s, 3H, OCH$_3$), 4.34 (s, 1H, NH), 4.70 (s, 1H, CH), 6.01 (s, 1H, NH), 6.20 (d, $J = 1.2$ Hz, 1H), 6.55 (t, $J = 1.3$ Hz, 1H), 6.74-6.87 (m, 4H), 6.95 (t, $J = 4.9$ Hz, 1H), 7.10 (d, $J = 5.9$ Hz, 3H), 7.13 (d, $J = 2.6$ Hz, 3H). $^{13}$C NMR (50 MHz; CDCl$_3$) $\delta_C$: 29.6, 51.9, 55.1, 55.4, 57.9, 100.7, 104.9, 105.8, 106.0, 106.0, 106.3, 106.9, 116.3, 127.4, 127.5, 128.9, 129.6, 130.1, 140.1, 147.9, 149.6, 157.3, 159.9. Analysis calculated for: C$_{26}$H$_{31}$N$_3$O$_2$, C 74.79, H 7.48, N 10.06 Found: C 74.68, H 7.57, N 9.93.

2-(4-Chlorophenyl)-N’-(4-fluorophenyl)-2-(4-fluorophenylamino)-N-(tosylmethyl)acetimidamide (5f)

Solid, ESI MS ($m/z$) = 540 (M+H), IR (KBr) $\nu_{\text{max}}$: 3469, 2989, 1730, 1678, 1589, 1482, 1383, 1128, 1089, 751 cm$^{-1}$. $^1$H NMR (300 MHz: CDCl$_3$) $\delta_H$: 2.42 (s, 3H, CH$_3$), 4.36 (s, 1H, NH), 4.46 (s, 2H), 4.93 (s, 1H, CH), 6.35 (s, 1H, NH), 6.50 (t, $J = 6.0$ Hz, 2H), 6.75 (d, $J = 6.1$ Hz, 2H), 7.01-7.09 (m, 4H), 7.17-7.20 (m, 6H), 7.80 (d, $J = 6.4$ Hz, 2H). $^{13}$C NMR (75 MHz; CDCl$_3$) $\delta_C$: 21.0, 46.2, 57.8, 114.8, 114.8, 115.6, 115.8, 116.0, 116.2, 123.6, 123.6, 128.2, 128.3, 128.4, 130.1, 132.6, 133.1, 136.5, 143.1, 143.3, 143.4, 143.5, 143.7, 156.9, 159.8. Analysis calculated for: C$_{28}$H$_{24}$ClF$_2$N$_3$O$_2$S, C 62.28, H 4.48, N 7.78 Found: C 62.18, H 4.32, N 7.89.

N-Tert-butyl-2-(4-chlorophenyl)-N’-(3-methoxyphenyl)-2-(3-methoxyphenylamino)acetimidamide (5g)

Solid, ESI MS ($m/z$) = 452 (M+H), IR (KBr) $\nu_{\text{max}}$: 3359, 2965, 2828, 1616, 1590, 1495, 1291, 1214, 1170, 1099, 748 cm$^{-1}$. $^1$H NMR (300 MHz; CDCl$_3$) $\delta_H$: 1.51 (s, 9H), 3.67 (s, 3H, OCH$_3$), 3.80 (s, 3H, OCH$_3$), 4.39 (s, 1H, NH), 4.50 (s, 1H, CH), 5.99 (s, 1H, NH), 6.29 (d, $J = 8.6$ Hz, 1H), 6.47 (d, $J = 7.9$ Hz, 1H), 6.64 (s, 1H), 6.74 (d, $J = 7.6$ Hz, 1H), 6.82-6.88 (m, 2H), 7.20 (dd, $J = 7.2$, 16.0, Hz, 4H), 7.31 (t, $J = 5.3$ Hz, 2H). $^{13}$C NMR (50 MHz; CDCl$_3$) $\delta_C$: 29.6, 52.9, 55.1, 55.4, 58.1, 100.7, 104.9, 105.8, 106.0, 106.0, 106.3, 106.9, 116.3, 127.8,
128.1, 128.2, 128.4, 129.6, 130.0, 132.8, 137.4, 147.3, 149.9, 157.5, 158.9. Analysis calculated for: C_{26}H_{30}ClN_{3}O_{2}, C 69.09, H 6.69, N 9.30, Found: C 69.18, H 6.78, N 9.18.

2-(4-Bromophenyl)-N-tert-butyl-N’-(3-methoxyphenyl)-2-(3-methoxyphenylamino)acetimidamide (5h)

Solid, ESI MS (m/z) = 496 (M+H), IR (KBr) ν<sub>max</sub>: 3380, 3362, 2958, 1637, 1595, 1508, 1481, 1329, 749 cm<sup>-1</sup>. <sup>1</sup>H NMR (300 MHz; CDCl<sub>3</sub>) δ<sub>H</sub>: 1.49 (s, 9H), 3.67 (s, 3H, OCH<sub>3</sub>), 3.84 (s, 3H, OCH<sub>3</sub>), 4.31 (s, 1H, NH), 4.48 (s, 1H, CH), 6.04 (s, 1H, NH), 6.27 (d, J = 5.0 Hz, 1H), 6.47 (d, J = 6.9 Hz, 1H), 6.64 (s, 1H), 6.74 (d, J = 6.0 Hz, 1H), 6.81-6.88 (m, 2H), 7.21 (d, J = 6.5 Hz, 2H), 7.33 (t, J = 6.5 Hz, 2H), 7.51 (d, J = 6.7 Hz, 2H). <sup>13</sup>C NMR (50 MHz; CDCl<sub>3</sub>) δ<sub>C</sub>: 29.8, 52.9, 55.2, 55.5, 57.9, 101.7, 105.9, 105.8, 106.0, 106.0, 106.3, 106.9, 116.3, 122.7, 128.4, 129.6, 130.0, 131.5, 138.2, 147.3, 150.1, 159.9. Analysis calculated for: C_{26}H_{30}BrN_{3}O_{2}, C 62.90, H 6.09, N 8.46, Found: C 62.98, H 5.99, N 8.34.

N-tert-butyl-2-(4-chlorophenyl)-N’-(4-methoxyphenyl)-2-(4-methoxyphenylamino)acetimidamide (5i)

Solid, ESI MS (m/z) = 452 (M+H), IR (KBr) ν<sub>max</sub>: 3319, 3050, 2870, 2760, 2150, 1630, 752 cm<sup>-1</sup>. <sup>1</sup>H NMR (300 MHz; CDCl<sub>3</sub>) δ<sub>H</sub>: 1.51 (s, 9H), 3.75 (s, 3H, OCH<sub>3</sub>), 3.80 (s, 3H, OCH<sub>3</sub>), 4.38 (s, 1H, NH), 4.70 (s, 1H, CH), 6.03 (s, 1H, NH), 6.20 (d, J = 3.2 Hz, 1H), 6.71 (t, J = 1.3 Hz, 1H), 6.74-6.87 (m, 4H), 6.98-7.23 (m, 4H), 7.26 (t, J = 2.6 Hz, 2H). <sup>13</sup>C NMR (75 MHz; CDCl<sub>3</sub>) δ<sub>C</sub>: 29.8, 52.1, 55.3, 56.1, 113.8, 113.9, 114.1, 122.7, 127.7, 128.1, 128.1, 128.4, 132.6, 137.4, 139.1, 142.9, 154.7, 155.1, 158.6. Analysis calculated for: C_{26}H_{30}ClN_{3}O_{2}, C 69.09, H 6.69, N 9.30, Found: C 68.97, H 6.76, N 9.21.

N-Cyclohexyl-2-(4-fluorophenyl)-N’-(4-methoxyphenyl)-2-(4-methoxyphenylamino)acetimidamide (5j)

Solid, ESI MS (m/z) = 462 (M+H), IR (KBr) ν<sub>max</sub>: 3356, 2935, 2852, 2760, 2150, 1630, 752 cm<sup>-1</sup>. <sup>1</sup>H NMR (300 MHz; CDCl<sub>3</sub>) δ<sub>H</sub>: 1.11-1.14 (m, 5H), 1.15 (t, J = 5.6 Hz, 2H), 1.17 (t, J = 11.9 Hz, 3H), 2.12 (t, J = 5.4 Hz, 1H), 3.72 (s, 3H, OCH<sub>3</sub>), 3.79 (s, 3H, OCH<sub>3</sub>), 4.25 (s, 1H, NH), 4.71 (s, 1H, CH), 6.10 (br, s, 1H, NH), 6.34 (br, s, 1H), 6.74 (t, J = 6.3 Hz, 1H), 6.72-6.94 (m, 4H), 6.97 (d, J = 6.8 Hz, 4H), 7.29 (d, J = 5.4 Hz, 2H). <sup>13</sup>C NMR (75 MHz; CDCl<sub>3</sub>) δ<sub>C</sub>: 25.2, 26.8, 33.8, 53.9, 55.3, 56.8, 113.9, 114.1, 114.7, 114.9, 122.9, 128.2, 128.3, 134.1, 141.3, 141.5, 141.7, 154.7, 158.2. Analysis calculated for: C_{28}H_{32}FN_{3}O_{2}, C 72.86, H 6.99, N 9.10, Found: C 72.76, H 7.09, N 9.21.
N-Cyclohexyl-N’-(2,4-dimethylphenyl)-2-(2,4-dimethylphenylamino)-2-phenylacetimidamide (5k)
Solid, ESI MS (m/z) = 440 (M+H), IR (KBr) νmax : 3355, 2934, 2855, 2870,1640, 1600, 14292, 1256, 1091, 1013, 754 cm⁻¹.¹H NMR (300 MHz; CDCl₃) δH : 1.28-1.60 (m, 6H), 1.68 (t, J = 6.3 Hz, 5H), 2.16 (s, 6H, CH₃), 2.30 (s, 6H, CH₃), 4.08 (br, s, 1H, NH), 4.33 (br, s, 1H, CH), 5.32 (br, s, 1H, NH), 6.25 (d, J = 7.5 Hz, 1H), 6.51 (d, J = 7.2 Hz, 1H), 6.68 (s, 1H), 6.74 (d, J = 7.7 Hz, 1H), 6.84 (d, J = 9.2 Hz, 2H), 7.01 (s, 1H), 7.45 (d, J = 8.5 Hz, 2H), 7.81 (d, J = 8.4 Hz, 2H).
¹³C NMR (50 MHz; CDCl₃) δC : 17.7, 18.1, 20.5, 20.9, 25.4, 26.5, 33.3, 53.8, 56.3, 112.8, 119.6, 122.6, 125.3, 127.1, 127.4, 127.6, 127.7, 128.9, 130.3, 131.8, 132.1, 133.2, 140.6, 142.2, 142.5, 154.5, 156.3, 159.6. Analysis calculated for : C₃₀H₃₇N₃, C 81.96, H 8.48, N 9.56, Found : C 82.04, H 8.41, N 9.49.

N’-(4-Chlorophenyl)-2-(4-chlorophenylamino)-N-cyclohexyl-2-(pyridin-4-yl)acetimidamide (5l)
Solid, ESI MS (m/z) = 453 (M+H), IR (KBr) νmax : 3356, 2939, 2850, 2875,1645, 1430, 1255, 1093, 1013, 756 cm⁻¹.¹H NMR (300 MHz; CDCl₃) δH : 1.22-1.55 (m, 5H), 1.67 (d, J = 13.9 Hz, 3H), 1.72 (br, s, 2H), 2.12 (t, J = 5.4 Hz, 1H), 4.36 (s, 1H, NH), 4.55 (s, 1H, CH), 6.24 (s, 1H, NH), 6.48 (d, J = 6.1 Hz, 2H), 6.79 (d, J = 6.1 Hz, 2H), 7.08 (d, J = 6.1 Hz, 2H), 7.23-7.28 (m, 4H), 8.50 (d, J = 4.5 Hz, 2H).¹³C NMR (75 MHz; CDCl₃) δC : 25.4, 26.4, 32.8, 53.9, 55.9, 114.0, 122.6, 123.6, 125.0, 129.3, 129.4, 130.4, 144.8, 146.5, 146.6, 149.9, 159.9. Analysis calculated for : C₂₅H₂₆Cl₂N₄, C 66.23, H 5.78, N 12.36, Found : C 66.31, H 5.67, N 12.45.

N-Tert-butyl-N’-phenyl-2-(phenylamino)-2-(pyridin-4-yl)acetimidamide (5m)
Solid, ESI MS (m/z) = 359 (M+H), IR (KBr) νmax : 3360, 2940, 2853, 2870,1648, 1435, 1260, 1093, 1019, 752 cm⁻¹.¹H NMR (300 MHz; CDCl₃) δH : 1.51, (s, 9H), 4.28 (s, 1H, NH), 4.69 (s, 1H, CH), 6.10 (s, 1H, NH), 6.51 (d, J = 5.7 Hz, 2H), 6.68 (t, J = 5.6 Hz, 1H), 6.94 (d, J = 1.0 Hz, 2H), 7.08-7.12 (m, 3H), 7.28 (d, J = 4.4 Hz, 2H), 7.41 (t, J = 5.6 Hz, 2H), 8.50 (d, J = 4.5 Hz, 2H).¹³C NMR (75 MHz; CDCl₃) δC : 29.6, 52.0, 56.3, 112.1, 118.9, 120.0, 123.4, 128.8, 128.9, 146.0, 146.8, 148.3, 149.8, 158.8. Analysis calculated for : C₂₃H₂₆N₄, C 77.06, H 7.31, N 15.63, Found : C 76.98, H 7.38, N 15.58.
N,2-Bis(4-chlorophenyl)-2-(4-chlorophenylamino)-N-(2-morpholinoethyl)acetimidamide (5n)
Solid, ESI MS (m/z) = 517 (M+H), IR (KBr) v_max : 3359, 2947, 2855, 2868,1640, 1433, 1261, 1019, 754 cm⁻¹. ¹H NMR (300 MHz; DMSO-d₆) δ_H : 2.19 (t, J = 5.1 Hz, 2H), 2.29 (s, 4H), 3.51 (t, J = 4.3 Hz, 2H), 3.70 (s, 4H), 4.45 (s, 1H, NH), 5.10 (s, 1H, CH), 5.94 (s, 1H, NH), 6.51 (d, J = 5.7 Hz, 2H), 6.66 (t, J = 4.6 Hz, 2H), 6.91 (d, J = 5.0 Hz, 2H), 7.08 (d, J = 5.2 Hz, 2H), 7.29 (t, J = 3.9 Hz, 1H), 7.40 (t, J = 1.3 Hz, 3H).

N-Tert-butyl-2-phenyl-2-(phenylamino)acetamide (6a)
Oily, ESI MS (m/z) = 283 (M+H), IR (KBr) v_max : 3382, 1641, 1531, 1473, 749 cm⁻¹. ¹H NMR (300 MHz; CDCl₃) δ_H : 1.49 (s, 9H), 4.49 (s, 1H, NH), 4.95 (s, 1H, CH), 6.06 (s, 1H, NH), 6.57 (d, J = 5.7 Hz, 2H), 6.66 (t, J = 5.5 Hz, 1H), 6.98 (d, J = 3.7 Hz, 2H), 7.14 (t, J = 5.8 Hz, 2H), 7.28 (m, 3H).

N-Cyclohexyl-2-(2,4-dimethylphenylamino)-2-phenylacetamide (6k)
Solid, ESI MS (m/z) = 337 (M+H), IR (KBr) v_max : 3374, 1633, 1531, 1475, 749 cm⁻¹. ¹H NMR (300 MHz; CDCl₃) δ_H : 1.18-1.49 (m, 6H), 1.58 (d, J = 16.8 Hz, 4H), 2.28 (s, 6H, CH₃), 3.59-3.79 (m, 1H), 4.07 (s, 1H, NH), 4.53 (s, 1H, CH), 6.03 (s, 1H, NH), 6.35 (d, J = 3.4 Hz, 1H), 6.76 (s, 1H), 6.84 (d, J = 6.09 Hz, 1H), 7.01 (d, J = 4.71 Hz, 2H), 7.32 (t, J = 5.52 Hz, 3H).

N-Tert-butyl-2-(4-chlorophenyl)-2-(4-methoxyphenylamino)acetamide (6i)
Solid, ESI MS (m/z) = 347 (M+H), IR (KBr) v_max : 3383, 1639, 1535, 1478, 751 cm⁻¹. ¹H NMR (300 MHz; CDCl₃) δ_H : 1.49 (s, 9H), 3.69 (s, 3H, OCH₃), 3.69 (s, 3H, CH₃), 4.45 (s, 1H, NH), 4.91 (s, 1H, CH), 6.03 (s, 1H, NH), 6.74 (dd, J = 6.6, 6.6 Hz, 4H), 7.06 (dd, J = 6.4, 6.3 Hz, 4H).

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2-(4-Chlorophenyl)-N-cyclohexyl-2-(4-methoxyphenylamino)acetamide (6b)
Solid, ESI MS (m/z) = 373 (M+H), IR (KBr) νmax: 3381, 1635, 1528, 1469, 756 cm⁻¹. ¹H NMR (300 MHz; CDCl₃) δH: 1.13-1.28 (m, 5H), 1.45 (t, J = 4.31 Hz, 3H), 1.65 (t, J = 10.6 Hz, 2H), 3.39-3.61 (m, 1H), 3.67 (s, 3H, OCH₃), 4.14 (s, 1H, NH), 4.43 (s, 1H, CH), 6.03 (s, 1H, NH), 6.76 (q, J = 6.6 Hz, 4H), 7.06 (d, J = 6.2 Hz, 2H), 7.16 (d, J = 6.3 Hz, 2H). ¹³C NMR (75 MHz; CDCl₃) δC: 25.2, 26.3, 32.8, 49.6, 55.3, 61.6, 114.1, 115.1, 128.6, 129.0, 133.1, 135.8, 140.9, 153.8, 169.5. Analysis calculated for: C₂₁H₂₅ClN₂O₂, C 67.77, H 6.52, N 7.40.

2-(4-Bromophenyl)-N-tert-butyl-2-(3-methoxyphenylamino)acetamide (6h)
Solid, ESI MS (m/z) = 391 (M+H), IR (KBr) νmax: 3389, 1638, 1533, 1479, 747 cm⁻¹.¹H NMR (300 MHz; CDCl₃) δH: 1.49 (s, 9H), 3.67 (s, 3H, OCH₃), 4.33 (s, 1H, NH), 4.48 (s, 1H, CH), 6.28 (d, J = 5.1 Hz, 1H), 6.45 (d, J = 4.6 Hz, 1H), 6.87 (d, J = 5.8 Hz, 3H), 7.44 (d, J = 6.3 Hz, 2H). ¹³C NMR (75 MHz; CDCl₃) δC: 28.9, 49.4, 55.3, 63.1, 111.1, 114.3, 116.3, 122.4, 128.6, 129.6, 132.1, 138.2, 147.7, 141.8, 159.8, 169.5. Analysis calculated for: C₁₀H₂₅BrN₂O₂, C 58.32, H 5.92, N 7.16, Found: C 58.42, H 5.81, N 7.27.

2-Phenyl-2-(phenylamino)acetic acid (7a)
Solid, ESI MS (m/z) = 228 (M+H). IR (KBr) νmax: 3400, 3331, 1671, 749 cm⁻¹.¹H NMR (300 MHz DMSO-d₆) δH: 4.33 (s, 1H, NH), 4.92 (s, 1H, CH), 6.29 (d, J = 5.7 Hz, 2H), 6.69 (t, J = 1.0 Hz, 1H), 7.14 (t, J = 5.7 Hz, 2H), 7.30-7.35 (m, 5H), 8.31 (s, 1H). ¹³C NMR (75 MHz, DMSO-d₆) δC: 60.3, 114.2, 119.4, 127.19, 127.7, 128.1, 128.3, 128.9, 129.3, 137.5, 145.8, 169.4. Analysis calculated for: C₁₄H₁₃NO₂, C 73.99, H 5.77, N 6.16, Found: C 74.09, H 5.62, N 6.25.

2-(2,4-Dimethylphenyl)-2-phenylacetic acid (7k)
Solid, ESI MS (m/z) = 256 (M+H), ¹H NMR (300 MHz, DMSO-d₆) δH: 2.25 (s, 6H, CH₃), 4.30 (s, 1H, NH), 4.90 (s, 1H, CH), 6.04 (d, J = 6.0 Hz, 1H), 6.76 (s, 1H), 6.84 (d, J = 6.0 Hz, 1H), 7.30-7.35 (m, 5H), 8.29 (s, 1H). ¹³C NMR (50 MHz, DMSO-d₆) δC: 18.2, 20.5, 60.7, 113.8, 121.7, 127.9, 128.1, 128.8, 129.0, 130.8, 132.7, 137.94, 143.8, 169.7. Analysis calculated for: C₁₆H₁₇NO₂, C 75.27, H 6.71, N 5.49, Found: C 75.37, H 6.62, N 5.58.

2-(4-Chlorophenyl)-2-(4-methoxyphenyl)acetic acid (7b)
Solid, ESI MS (m/z) = 292 (M+H), IR (KBr) νmax: 3419, 3292, 1678, 748 cm⁻¹. ¹H NMR (300 MHz, DMSO-d₆) δH: 3.67 (s, 3H, OCH₃), 4.48 (s, 1H, NH), 4.83 (s, 1H, CH), 6.51 (d, J = 6.5 Hz, 2H), 6.80 (d, J = 6.5 Hz, 2H), 7.26 (d, J = 6.4 Hz, 2H), 7.42 (d, J = 6.4 Hz, 2H), 8.30 (s, 1H). ¹³C NMR (50 MHz, DMSO-d₆) δC: 55.3, 59.6, 115.3, 116.1, 128.5, 128.8, 129.2,
130.3, 133.6, 135.7, 141.4, 154.8, 170.3. Analysis calculated for: C$_{15}$H$_{14}$ClNO$_3$, C 61.76, H 4.84, N 4.80, Found: C 61.85, H 4.73, N 4.93.
Fig. 2 (5b)
Fig. 3 (5c)
Fig. 4 (5d)
Fig. 5 (5e)
Fig. 6 (5f)
Fig. 7 (5g)
Fig. 8 (5h)
Fig. 9 (5i)
Fig. 11 (5k)
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Fig. 12(5l)
Fig 15 (6a)
Fig. 17 (6i)
Fig. 19 (6h)
Fig. 20 (7a)
Fig. 21 (7k)
Fig. 23 (7b)