5. Experimental

All the reagents and solvents required for syntheses were purified by general laboratory techniques before use. Compounds were purified by passing them through silica gel H purifying column using mixture of ethyl acetate and n-hexane as eluent. Melting points were determined using a Veego make silicon oil bath-type melting point apparatus and are uncorrected. Purity of the compounds and completion of reactions were monitored by thin layer chromatography (TLC) on silica gel GF plates, visualizing with ultraviolet light or iodine vapors. The yields reported here are un-optimized. The IR spectra were recorded using KBr disc method on a Bruker FT-IR spectrophotometer. The H-NMR spectra were recorded in either CDCl₃ or DMSO-d₆. Microwave reactions were performed in CEM-Discovery, USA microwave reactor. Anhydrous sodium sulphate was used for drying of solutions. All proton magnetic resonance (PMR) values were considered on the basis of chemical shift (δ) values.

5.1. Synthesis of 4-chlorophenylacetic acid (3)

To a solution of 4-chloroacetophenone (1) (20 mL, 0.15 mol) in morpholine (18 mL, 0.2 mol) was added precipitated sulphur (8.0 g, 0.25 mol) and the reaction mixture was refluxed for 18 hr. To this hot solution, warm methanol (10 mL) was added and the mixture was refrigerated for 3 hr to obtain a yellow crystalline thiomorpholide (2). It was filtered and washed with cold methanol. The thiomorpholide (22 g) was taken in a 250 mL round-bottomed flask and aqueous sodium hydroxide (150 mL, 20%) was added to it. The reaction mixture was refluxed for 18 hr and poured onto crushed ice (1 kg). The resulting suspension was extracted thrice with small portions of chloroform (3 x 15 mL) and the organic layer was rejected. The aqueous layer was acidified with conc. HCl to get off-white colored precipitate of 4-chlorophenylacetic acid. Recrystallisation from methanol afforded the pure acid (3), (17.0 g, 76.5%), m.p. 90-92°C. Lit° 90-91°C.

Anal:

TLC : Rf 0.5 (CHCl₃ : MeOH) (9.5 : 0.5)
IR (KBr, cm⁻¹) : 3325, 1705, 1517, 1409, 1240 and 1170

5.2. Synthesis of 4-nitrophenylacetic acid (6)

Concentrated nitric acid (20 mL) and an equal volume of concentrated sulphuric acid were placed in a two-necked flask fitted with a thermometer and a dropping funnel. The mixture was
cooled to 10°C with stirring in ice-bath and benzyl cyanide (4) (15 mL, 0.126 mol) was run into it at such a rate (about 30 min) that the temperature remained at about 10°C and did not rise above 20°C. The solution was further stirred for 1 hr at room temperature and then poured onto crushed ice. A pasty mass that slowly separated contained 4-nitrobenzyl cyanide (5) and the oily 2-nitrobenzyl cyanide. Recrystallisation from methanol afforded white needles of compound (5), (10.15 g, 50%), m.p. 105-106°C (Lit\textsuperscript{137} 105-106°C)

A dilute solution of sulphuric acid was prepared by adding concentrated sulphuric acid (25 mL) cautiously to water (25 mL). Two thirds of the sulphuric acid was added into an RBF containing 4-nitrobenzyl cyanide (5) (7.45 g, 0.046 mol) and the nitrile adhering to the walls of the flask was washed down with the remaining quantity of sulphuric acid. The mixture was boiled under reflux for 15 min and then diluted with an equal volume of ice-cold water (50 mL). The resulting yellow solid mass was filtered, washed, decolorized and recrystallised from water to yield the acid (6), (8.0 g, 96%), m.p. 154-155°C (Lit\textsuperscript{137} 151-152°C)

Anal:

TLC : R\textsubscript{T} 0.5 (Benzene : Chloroform (1 : 1) + 2 drops of AcOH)

IR (KBr, cm\textsuperscript{-1}): 1705, 1523, 1336, 1252 and 709.

5.3. 2-(4-Chlorophenyl)-1-(4-fluorophenyl)ethanone (8a)

A mixture of 4-chlorophenylacetic acid (3) (10 g, 48.54 mmol) and thionyl chloride (4 mL, 33.61 mmol) was refluxed in a RBF for 1.5 hrs under anhydrous conditions. Excess of thionyl chloride was removed under vaccum. The resulting solution so obtained was added dropwise into a stirred solution of anhydrous aluminum chloride (7.5 g, 56.39 mmol) and fluorobenzene (5.2 mL, 54.104 mmol) in dry dichloromethane (DCM) (100 mL) at a temperature below 20°C over a period of 30 min under anhydrous conditions and the reaction mixture was stirred continuously for further 4 hr at room temperature. The reaction was monitored by TLC. The resulting reaction mixture was quenched in a mixture of ice-cold water (500 g) containing concentrated hydrochloric acid (75 mL). The resulting solution was extracted with chloroform (3x50 mL), the combined chloroform layer was washed with sodium bicarbonate solution (5%, 3x50 mL) followed by water (2x50 mL). The chloroform layer was dried and recovered. The crude product so obtained was crystallized from methanol to yield the title compound (8a), (5.4 g, 37%), m.p. 115-118°C (Lit\textsuperscript{138} 116-118°C)
5.4. 2-(4-Chlorophenyl)-1-(4-methylphenyl)ethanone (8b)

The title compound (8b) was synthesized as per the method described for compound (8a) by replacing fluorobenzene with toluene (5.5 mL, 59.78 mmol). The crude product so obtained was crystallized from methanol to afford the desired compound (8b), (8.1 g, 88.18%), m.p. 108-110°C. (Lit\textsuperscript{138} 106-108°C)

**Anal.**

TLC : R\textsubscript{f} 0.75 (n-Hexane: Ethyl acetate) (8:2)

IR (KBr cm\textsuperscript{-1}) : 3119, 1681, 1598, 1408, 1219 and 851

5.5. 2-(4-Chlorophenyl)-1-(4-methoxyphenyl)ethanone (8c)

The title compound (8c) was synthesized as per the method described for compound (8a) by replacing fluorobenzene with anisole (5.4 mL, 50.08 mmol). The crude product so obtained was crystallized from methanol to afford the desired compound (8c), (10.1 g, 83.82%), m.p. 128-130°C. (Lit\textsuperscript{138} 126-128°C)

**Anal.**

TLC : R\textsubscript{f} 0.73 (n-Hexane: Ethyl acetate) (8:2)

IR (KBr cm\textsuperscript{-1}) : 3112, 1676, 1601, 1414, 1220 and 845

5.6. 1-(4-Chlorophenyl)-2-(4-nitrophenyl)ethanone (8d)

A mixture of p-nitrophenylacetic acid (10 g, 64.50 mmol) and phosphorous trichloride (10 mL, 55.30 mmol) was refluxed in a round bottom flask (100 mL) for 1.5 hrs under anhydrous conditions. Excess of phosphorous trichloride was removed under vaccum. The resulting liquid so obtained was added drop-wise into a stirred solution of anhydrous aluminium chloride (7.55 g, 56.65 mmol) and chlorobenzene (6.1 mL, 55.45 mmol) in dry dichloromethane (DCM) (100 mL) at a temperature below 20°C over a period of 30 min under anhydrous conditions and stirred continuously for further 4 hr at room temperature. The reaction mixture was processed as described for compound (8a). The crude product so obtained was crystallized from methanol to afford the desired compound (8d), (12.2 g, 55 %), m.p. 105-107°C.
5.7. 1-(4-Fluorophenyl)-2-(4-nitropheno)ethanone (8e)

The title compound (8e) was synthesized as per the method described for compound (8d) by replacing chlorobenzene with fluorobenzene (5.4 mL, 57.708 mmol). The crude product so obtained was recrystallised from methanol to yield crystalline compound (8e), (5.7 g, 68.94%), m.p. 107-109°C.

Anal:
TLC : Rf 0.80 (n-Hexane: Ethyl acetate) (8: 2)
IR (KBr, cm⁻¹) : 1687, 1590, 1508, 1339, 1093 and 843.

5.8. 2-(4-Nitrophenyl)-1-(p-tolyl)ethanone (8f)

The title compound (8f) was synthesized as per the method described for compound (8d) by replacing chlorobenzene with toluene (5.2 mL, 50.52 mmol). The crude product thus obtained was crystallised from methanol to yield crystalline compound (8f), (5.8 g, 74.04%), m.p. 125-127°C.

Anal:
TLC : Rf 0.78 (n-Hexane: Ethyl acetate) (8: 2)
IR (KBr, cm⁻¹) : 1679, 1603, 1514, 1346, 1107 and 857.

5.9. 1-(4-Methoxyphenyl)-2-(4-nitropheno)ethanone (8g)

The title compound (8g) was synthesized as per the method described for compound (8d) by replacing chlorobenzene with anisole (5.5 mL, 50.92 mmol). The crude product was crystallised from methanol to yield crystalline compound (8g), (10.5 g, 84.94 %), m.p. 123-125°C.

Anal:
TLC : Rf 0.78 (n-Hexane: Ethyl acetate) (8: 2)
IR (KBr, cm⁻¹) : 1665, 1598, 1516, 1350, 1277, 1169, 1027 and 835.

5.10. 2-Bromo-2-(4-chlorophenyl)-1-(4-fluoropheno)ethanone (9a)

2-(4-Chlorophenyl)-1-(4-fluoropheno)ethanone (8a) (2.5 g, 10.08 mmol) was taken in a 100mL RBF and dissolved in sufficient quantity of glacial acetic acid (10 mL) by warming.
Bromine (5 mL) was added drop-wise into the stirred solution and the reaction was monitored by TLC until completion. The reaction mixture was poured into the ice cold water (200 mL) containing sodium metabisulphite to neutralize the excess bromine. The white precipitate so obtained was extracted with chloroform (3x20 mL) and the separated chloroform layer was dried. the solvent was distilled off and the resulting residue was crystallised in methanol to yield pure compound (9a), (2.5 g, 70%), m.p. 40-42°C.

**Anal:**

**TLC** : \( R_f 0.71 \) (n-Hexane: Ethyl acetate) (8: 2)

**IR** (KBr, cm\(^{-1}\)) : 3002, 1676, 1599, 1450, 1277, 1008 and 835.

**5.11. 2-Bromo-2-(4-chlorophenyl)-1-(4-methylphenyl)ethanone (9b)**

The title compound (9b) was synthesized as per the method described for compound (9a) taking compound 2-(4-chlorophenyl)-1-(4-methylphenyl)ethanone (8b) (2.5 g, 10.24 mmol) as the starting material. The product so obtained was crystallized from methanol to afford the desired compound (9b), (2.5 g, 71.72 %), m.p. 71-73°C.

**Anal:**

**TLC** : \( R_f 0.70 \) (n-Hexane: Ethyl acetate) (8: 2)

**IR** (KBr, cm\(^{-1}\)) : 3010, 1679, 1601, 1457, 1285, 1017 and 853.

**5.12. 2-Bromo-2-(4-chlorophenyl)-1-(4-methoxyphenyl)ethanone (9c)**

The title compound (9c) was synthesized as per the method described for compound (9a) taking compound 2-(4-chlorophenyl)-1-(4-methoxyphenyl)ethanone (8c) (2.5 g, 9.619 mmol) as the starting material. The product so obtained was crystallized from methanol to afford the desired compound (9c), (2.6 g, 95.38 %), m.p. 97-100°C.

**Anal:**

**TLC** : \( R_f 0.77 \) (n-Hexane: Ethyl acetate) (8: 2)

**IR** (KBr, cm\(^{-1}\)) : 3015, 1679, 1604, 1457, 1290, 1021 and 845.

**5.13. 2-Bromo-1-(4-chlorophenyl)-2-(4-nitrophenyl)ethanone (9d)**

The title compound (9d) was synthesized as per the method described for compound (9a) taking compound 1-(4-chlorophenyl)-2-(4-nitrophenyl)ethanone (8d) (2.5 g, 9.09 mmol) as the starting material. The product was crystallized from methanol to obtain the desired compound (9d), (2.6 g, 93.75%), m.p. 95-97°C.
5.14. 2-Bromo-1-(4-fluorophenyl)-2-(4-nitrophenyl)ethanone (9e)

The title compound (9e) was synthesized as per the method described for compound (9a) starting with 1-(4-fluorophenyl)-2-(4-nitrophenyl)ethanone (8e) (2.5 g, 9.65 mmol) as the starting material. The crude product so obtained was crystallised from methanol to obtain the desired compound (9e), (2.4 g, 70%), m.p. 40-42°C.

Anal:

TLC : Rf 0.71 (n-Hexane: Ethyl acetate) (8: 2)
IR (KBr, cm⁻¹) : 3121, 1679, 1587, 1456, 1280, 1043 and 840.

5.15. 2-Bromo-2-(4-nitrophenyl)-1-(p-tolyl)ethanone (9f)

The title compound (9f) was synthesized as per the method described for compound (9a) starting with compound 2-(4-nitrophenyl)-1-(p-tolyl)ethanone (8f) (2.5 g, 9.09 mmol). The crude product so obtained was crystallized from methanol to obtain the desired compound (9f), (2.6 g, 91 %), m.p. 110-112°C.

Anal:

TLC : Rf 0.82 (n-Hexane: Ethyl acetate) (8: 2)
IR (KBr, cm⁻¹) : 3111, 1678, 1598, 1452, 1278, 1021 and 835.

5.16. 2-Bromo-1-(4-methoxyphenyl)-2-(4-nitrophenyl)ethanone (9g)

The title compound (9g) was synthesized as per the method described for compound (9a) starting with compound 1-(4-methoxyphenyl)-2-(4-nitrophenyl)ethanone (8g) (2.5 g, 8.71 mmol). The crude product so obtained was crystallised from methanol to obtain the desired compound (9g), (2.6 g, 91 %), m.p. 93-94°C.

Anal:

TLC : Rf 0.81 (n-Hexane: Ethyl acetate) (8: 2)
IR (KBr, cm⁻¹) : 3112, 1675, 1597, 1456, 1279, 1021 and 840.
5.17. 5-(4-Chlorophenyl)-4-(4-fluorophenyl)thiazol-2-ylamine (10a)

2-Bromo-2-(4-chlorophenyl)-1-(4-fluorophenyl)ethanone (9a) (2.0 g, 6.104 mmol) was dissolved in sufficient quantity of methanol in a 100 mL round bottom flask. Thiourea (0.6 g, 7.32 mmol) and 3-4 drops of water were added into the reaction mixture and refluxed for 4-6 hrs. The reaction was monitored by TLC. After completion of the reaction, it was poured onto ice-cold water and the resulting solution was basified with ammonia. The product so precipitated was filtered, dried and crystallized in methanol to obtain the title compound (10a), (1.3 g, 54 %), m.p. 71-72°C.

Anal:

TLC : Rf 0.31 (n-Hexane: Ethyl acetate) (8: 2)
IR (KBr, cm⁻¹) : 3481, 3103, 1634, 1527, 1330, 1217, 1086 and 832
MS : m/z 303.98 (M⁺)

5.18. 5-(4-Chlorophenyl)-4-(4-methylphenyl)thiazol-2-ylamine (10b)

The title compound (10b) was synthesized as per the method described for compound (10a) taking 2-bromo-2-(4-chlorophenyl)-1-(4-methylphenyl)ethanone (9b) (2.0 g, 6.18 mmol) as the starting material. The crude product was crystallized from methanol to afford the desired compound (10b), (1.4 g, 69.56 %), m.p. 71-72°C.

Anal:

TLC : Rf 0.41 (n-Hexane: Ethyl acetate) (8: 2)
IR (KBr, cm⁻¹) : 3450, 1633, 1531, 1331, 1084 and 822
MS : m/z 299.98 (M⁺)

5.19. 5-(4-Chlorophenyl)-4-(4-methoxyphenyl)thiazol-2-ylamine (10c)

The title compound (10c) was synthesized as per the method described for compound (10a) taking 2-bromo-2-(4-chlorophenyl)-1-(4-methoxyphenyl)ethanone (9c) (2.0 g, 5.88 mmol) as the starting material. The crude product was crystallized from methanol to afford the desired compound (10c), (1.94 g, 86.95 %), m.p. 193-195°C.

Anal:

TLC : Rf 0.32 (n-Hexane: Ethyl acetate) (8: 2)
IR (KBr, cm⁻¹) : 3479, 3105, 1639, 1530, 1337, 1219, 1086 and 835
MS : m/z 316.02 (M⁺)
5.20. 4-(4-Chlorophenyl)-5-(4-nitrophenyl)thiazol-2-ylamine (10d)

The title compound (10d) was synthesized as per the method described for compound (10a) taking 2-bromo-1-(4-chlorophenyl)-2-(4-nitrophenyl)ethanone (9d) (2.0 g, 5.64 mmol) as the starting material. The crude product was crystallized from methanol to afford the desired compound (10d), (1.7 g, 89.93 %), m.p. 225-227°C.

Anal:

TLC : Rf 0.14 (n-Hexane: Ethyl acetate) (8: 2)
IR (KBr, cm⁻¹) : 3437, 3129, 1633, 1402 and 845

5.21. 4-(4-Fluorophenyl)-5-(4-nitrophenyl)thiazol-2-ylamine (10e)

The title compound (10e) was synthesized as per the method described for compound (10a) taking 2-bromo-1-(4-fluorophenyl)-2-(4-nitrophenyl)ethanone (9e) (2.0 g, 5.46 mmol) as the starting material. The crude product was crystallized from methanol to afford the desired compound (10e), (3.5 g, 90 %), m.p. 242-243°C.

Anal:

TLC : Rf 0.42 (n-Hexane: Ethyl acetate) (8: 2)
IR (KBr, cm⁻¹) : 3481, 3275, 1635, 1589, 1521 and 1339

5.22. 5-(4-Nitrophenyl)-4-(p-tolyl)thiazol-2-ylamine (10f)

The title compound (10f) was synthesized as per the method described for compound (10a) taking 2-bromo-2-(4-nitrophenyl)-1-(p-tolyl)ethanone (9f) (2.0 g, 5.98 mmol) as the starting material. The product was crystallized from methanol to afford the desired compound (10f), (1.33 g, 70.96%), m.p. 215-216°C.

Anal:

TLC : Rf 0.31 (n-Hexane: Ethyl acetate) (8: 2)
IR (KBr, cm⁻¹) : 3420, 3120, 1635, 1402 and 847

5.23. 4-(4-Methoxyphenyl)-5-(4-nitrophenyl)thiazol-2-ylamine (10g)

The title compound (10g) was synthesized as per the method described for compound (10a) taking 2-bromo-1-(4-methoxyphenyl)-2-(4-nitrophenyl)ethanone (9g) (2.0 g, 5.71 mmol) as
the starting material. The product was crystallized from methanol to afford the desired compound (10g), (1 g, 53.53%), m.p. 232-234°C.

**Anal:**

TLC : Rf 0.07 (n-Hexane: Ethyl acetate) (8: 2)

IR (KBr, cm⁻¹) : 3452, 3103, 1633, 1403 and 843

5.24. 1-(5-(4-Chlorophenyl)-4-(4-fluorophenylthiazol-2-yl)-3-(2,4-difluorophenyl)urea (11a)

5-(4-Chlorophenyl)-4-(4-fluorophenyl)thiazol-2-ylamine (10a) (0.25 g, 0.82 mmol) was dissolved in sufficient quantity of dry toluene (30 mL) in a 100 mL RBF. 2,4-Difluorophenyl isocyanate (0.25 mL, 1.60 mmol) was added to the reaction mixture and the reaction mixture was further stirred at room temperature and monitored by TLC. The solid precipitate so obtained was filtered, dried and collected as the product (11a), (0.13 g, 36%), m.p. 207-209°C.

**Anal:**

TLC : Rf 0.51 (n-Hexane: Ethyl acetate) (8: 2)

IR (KBr, cm⁻¹) : 3416, 3118, 1720, 1610, 1430 and 829

PMR : 10.43 (bs, 1H), 8.92 (bs, 1H), 8.08-8.15 (m, 1H), 7.37-7.42 (m, 2H), 7.18-7.28 (d, 4H), 6.87-6.98 (m, 3H) and 6.82-6.88 (m, 1H).

MS : m/z 303.98, 458.9 (M⁺)

5.25. 1-Butyl-3-(5-(4-chlorophenyl)-4-(4-fluorophenylthiazol-2-yl)urea (11b)

The title compound (11b) was synthesized as per the method described for compound (11a) taking 5-(4-chlorophenyl)-4-(4-fluorophenyl)thiazol-2-ylamine (10a) (0.25 g, 0.82 mmol) and n-butyl isocyanate (0.25 mL, 2.17 mmol) as the starting materials. The crude product so obtained was purified through column chromatography to afford the desired product (11b), (0.61 g, 45.86 %), m.p. 92-95°C.

**Anal:**

TLC : Rf 0.35 (n-Hexane: Ethyl acetate) (8: 2)

UV max (McOH) : 237 nm

IR (KBr, cm⁻¹) : 3490, 1691, 1561, 1402 and 826

PMR : 10.45 (bs, 1H), 8.95 (bs, 1H), 7.18-7.28 (d, 4H), 7.37-7.42 (m, 2H), 6.87-6.98 (m, 2H), 1.64-1.7 (m, 2H), 1.11-1.23 (m, 4H) and 0.91-0.95 (t, 3H).
MS : m/z 303.97, 403.15 (M⁺)

5.26. 1-(5-(4-Chlorophenyl)-4-(4-fluorophenylthiazol-2-yl)-3-(2,6-diethylphenyl)urea (11c)

The title compound (11c) was synthesized as per the method described for compound (11a) taking 5-(4-chlorophenyl)-4-(4-fluorophenyl)thiazol-2-ylamine (10a) (0.25 g, 0.82 mmol) and 2,6-diethylphenyl isocyanate (0.38 mL, 1.785 mmol) as the starting materials. The crude product so obtained was purified through column chromatography to afford the pure compound (11c), (0.125 g, 36.25%), m.p. 210-212°C.

Anal:

TLC . Rf 0.38 (n-Hexane: Ethyl acetate) (8: 2)

UVₘₐₓ(MeOH) : 237.4 nm

IR (KBr, cm⁻¹) : 3403, 1688, 1510, 1402 and 826

PMR : 7.11-7.5 (m, 11H), 5.5 (bs, 1H), 2.32-2.51 (q, 4H) and 1.21-1.31 (t, 6H)

MS : m/z 303.97 (M⁺)

5.27. 1-[5-(4-Chlorophenyl)-4-(4-fluorophenyl)thiazol-2-yl]-3-dodecylurea (11d)

The title compound (11d) was synthesized as per the method described for compound (11a) taking 5-(4-chlorophenyl)-4-(4-fluorophenyl)thiazol-2-ylamine (10a) (0.25 g, 0.82 mmol) and n-dodecyl isocyanate (0.3 mL, 1.77 mmol) as the starting materials. The crude product so obtained was crystallized from methanol to afford the desired compound (11d), (0.15 g, 36.25%), m.p. 136 138°C.

Anal:

TLC : Rf 0.64 (n-Hexane: Ethyl acetate) (8: 2)

UVₘₐₓ(MeOH) : 239 nm

IR (KBr, cm⁻¹) : 3344, 1688, 1637, 1504, 1327, 1156 and 821

PMR : 10.45 (bs, 1H), 7.2-7.3 (m, 2H), 7.11-7.21 (m, 6H), 4.5 (bs, 1H), 2.9-3.2 (q, 2H), 1.32-1.51(m, 20H), and 0.91-0.93 (t, 3H)

MS : m/z 303.97, 515.27 (M⁺)
5.28. 1-[5-(4-Chlorophenyl)-4-(p-tolyl)thiazol-2-yl]-3-phenylurea (11e)

The title compound (11e) was synthesized as per the method described for compound (11a) taking 5-(4-chlorophenyl)-4-(p-tolyl)thiazol-2-ylamine (10b) (0.25 g, 0.831 mmol) and phenyl isocyanate (0.25 mL, 2.1 mmol) as the starting materials. The product was crystallized from methanol to obtain pure compound (11e), (0.14 g, 41.72%), m.p. 228-229°C.

Anal:

TLC : Rf 0.6 (n-Hexane: Ethyl acetate) (8: 2)

UV\text{max} (MeOH) : 267 nm

IR (KBr, cm\textsuperscript{-1}) : 3403, 1688, 1609, 1449, 1275 and 820

PMR : 10.43 (bs, 1H), 8.92 (bs, 1H), 7.37-7.42 (d, 2H), 7.18-7.28 (m, 11H) and 2.02 (s, 3H)

5.29. 1-[5-(4-Chlorophenyl)-4-(p-tolyl)thiazol-2-yl]-3-(2,4-difluorophenyl)urea (11f)

The title compound (11f) was synthesized as per the method described for compound (11a) taking 5-(4-chlorophenyl)-4-(p-tolyl)thiazol-2-ylamine (10b) (0.25 g, 0.831 mmol) and 2,4-difluorophenyl isocyanate (0.25 mL, 1.603 mmol) as the starting materials. The product was crystallized from methanol to obtain pure compound (11f), (0.13 g, 33.5%), m.p. 223-226°C.

Anal:

TLC : Rf 0.8 (n-Hexane: Ethyl acetate) (8: 2)

UV\text{max} (MeOH) : 244 nm

IR (KBr, cm\textsuperscript{-1}) : 3209, 1689, 1610, 1506 and 733

PMR : 8.7 (bs, 1H), 8.2-8.3 (m, 1H), 7.0-7.21 (m, 8H), 6.81-6.92 (d, 2H) and 2.31 (s, 3H).

5.30. 1-Butyl-3-[5-(4-chlorophenyl)-4-(p-tolyl)thiazol-2-yl]urea (11g)

The title compound (11g) was synthesized as per the method described for compound (11a) taking 5-(4-chlorophenyl)-4-(p-tolyl)thiazol-2-ylamine (10b) (0.25 g, 0.831 mmol) and n-butyl isocyanate (0.13 mL, 0.099 mmol) as the starting materials. The crude product was crystallized from methanol to obtain the pure compound (11g), (0.1 g, 30.07%), m.p. 181-183°C.
Anal:

TLC : Rₓ 0.69 (n-Hexane: Ethyl acetate) (8: 2)

UVₓmax (MeOH) : 242 nm

IR (KBr, cm⁻¹) : 3410, 1698, 1534 and 822

PMR : 11.01 (bs, 1H), 7.11-7.41 (m, 8H), 2.92-2.98 (m, 2H), 2.52 (s, 3H),
1.62-1.64 (m, 2H) and 0.92-0.96 (t, 3H)

5.31. 1-[5-(4-Chlorophenyl)-4-(p-tolyl)thiazol-2-yl]-3-(2,6-dimethylphenyl)urea (11h)

The title compound (11h) was synthesized as per the method described for compound (11a) taking 5-(4-chlorophenyl)-4-(p-tolyl)thiazol-2-ylamine (10b) (0.25 g, 0.832 mmol) and 2,6-dimethylphenyl isocyanate (0.25 mL, 1.428 mmol) as the starting materials. The product so obtained was purified through column chromatography to obtain the pure compound (11h), (0.17 g, 42.76 %), m.p. 252-255°C.

Anal:

TLC : Rₓ 0.72 (n-Hexane: Ethyl acetate) (8: 2)

UVₓmax (MeOH) : 241 nm

IR (KBr, cm⁻¹) : 3409, 1690, 1592, 1430 and 852

PMR : 7.11-7.21 (m, 8H), 7.0-7.1 (m, 3H), 2.32-2.51 (q, 4H), 2.12
(s, 3H) and 0.91-0.93 (t, 6H).

5.32. 1-(5-(4-Chlorophenyl)-4-(4-methoxyphenyl)thiazol-2-yl)-3-phenylurea (11i)

The title compound (11i) was synthesized as per the method described for compound (11a) taking 5-(4-chlorophenyl)-4-(4-methoxyphenyl)thiazol-2-ylamine (10c) (0.25 g, 0.78 mmol) and phenyl isocyanate (0.25 mL, 2.52 mmol) as the starting materials. The work up of reaction mixture afforded the desired compound (11i), (0.18 g, 53.28%), m.p. 216-219°C.

Anal:

TLC : Rₓ 0.5 (n-Hexane: Ethyl acetate) (8: 2)

UVₓmax (MeOH) : 256 nm

IR (KBr, cm⁻¹) : 3377, 1692, 1510, 1301, 1248 and 825

PMR : 6.82-7.63 (m, 13H) and 3.62 (s, 3H)
MS: m/z 316.08, 436.34 (M+)

5.33. 1-[5-(4-Chlorophenyl)-4-(4-methoxyphenyl)thiazol-2-yl]-3-(2,4-difluorophenyl)urea (11j)

The title compound (11j) was synthesized as per the method described for compound (11a) taking 5-(4-chlorophenyl)-4-(4-methoxyphenyl)thiazol-2-ylamine (10c) (0.25 g, 0.789 mmol) and 2,4-difluorophenyl isocyanate (0.2 mL, 0.757 mmol) as the starting materials. The work up of reaction mixture afforded the desired compound (11j), (0.2 g, 55.4%), m.p. 222-225°C.

Anal:
TLC: \( R_f 0.58 \) (n-Hexane: Ethyl acetate) (8: 2)

UV\(_{\text{max}}\) (MeOH): 253 nm

IR (KBr, cm\(^{-1}\)) : 3403, 1695, 1530, 1293, 1251 and 818

PMR: 11.03 (bs, 1H), 9.14 (bs, 1H), 8.12-8.15 (m, 1H), 6.81-7.32 (m, 8H), 6.86 -7.12 (m, 1H) and 3.62(s, 3H)

MS: m/z 315.88, 470.68 (M\(^+\))

5.34. 1-Butyl-3-[5-(4-chlorophenyl)-4-(4-methoxyphenyl)thiazol-2-yl]urea (11k)

The title compound (11k) was synthesized as per the method described for compound (11a) taking 5-(4-chlorophenyl)-4-(4-methoxyphenyl)thiazol-2-ylamine (10c) (0.25 g, 0.789 mmol) and n-butyl isocyanate (0.2 mL, 0.757 mmol) as the starting materials. The work up of the reaction mixture afforded the desired compound (11k), (0.15 g, 54.96%), m.p. 203-206°C.

Anal:
TLC: \( R_f 0.58 \) (n-Hexane: Ethyl acetate) (8: 2)

UV\(_{\text{max}}\) (MeOH): 250.2 nm

IR (KBr, cm\(^{-1}\)) : 3404, 1532, 1293, 1249, 1692 and 831

MS: m/z 316.02, 414.97 (M\(^+\))

5.35. 1-[5-(4-Chlorophenyl)-4-(4-methoxyphenyl)thiazol-2-yl]-3-heptylurea (11l)

The title compound (11l) was synthesized as per the method described for compound (11a) taking 5-(4-chlorophenyl)-4-(4-methoxyphenyl)thiazol-2-ylamine (10c) (0.25 g, 0.789 mmol) and n-heptyl isocyanate (0.2 mL, 1.44 mmol) as the starting materials. The crude product
so obtained was purified through column chromatography to afford compound (11i), (0.14 g, 47.58%), m.p. 133-135 °C.

**Anal:**
- TLC: \( R_f \) 0.73 (n-Hexane: Ethyl acetate) (8: 2)
- \( \text{UV}_{\text{max}} \) (MeOH): 250 nm
- IR (KBr, cm\(^{-1}\)): 3420, 1693, 1514, 1294, 1250, 1027 and 828
- PMR: 11.0-11.5 (bs, 2H), 6.81-7.42 (m, 8H), 3.81(s, 3H), 1.41-2.61(m, 12H) and 0.91-0.95 (t, 3H).

5.36. 1-[4-(4-Chlorophenyl)-5-(4-nitrophenyl)thiazol-2-yl]-3-(2,4-difluorophenyl)urea (11m)

The title compound (11m) was synthesized as per the method described for compound (11a) taking 4-(4-chlorophenyl)-5-(4-nitrophenyl)thiazol-2-ylamine (10d) (1 g, 3.02 mmol) and 2,4-difluorophenyl isocyanate (0.32 mL, 2.064 mmol) as the starting materials. The solid product (11m) so obtained was filtered and dried and collected, (0.91 g, 89.94 %), m.p. 210-212 °C.

**Anal:**
- TLC: \( R_f \) 0.41 (n-Hexane: Ethyl acetate) (7: 3)
- IR (KBr, cm\(^{-1}\)): 3403, 1699, 1540, 1515, 1430 and 1339.

5.37. 1-[4-(4-Fluorophenyl)-5-(4-nitrophenyl)thiazol-2-yl]-3-(2,4-difluorophenyl)urea (11n)

The title compound (11n) was synthesized as per the method described for compound (11a) taking 4-(4-fluorophenyl)-5-(4-nitrophenyl)thiazol-2-ylamine (10e) (1 g, 3.174 mmol) and 2,4-difluorophenyl isocyanate (0.32 mL, 2.064 mmol) as the starting materials. The crude solid so obtained was filtered, dried and collected as the desired product (11n), (0.93 g, 87%), m.p. 275-278 °C.

**Anal:**
- TLC: \( R_f \) 0.57 (n-Hexane: Ethyl acetate) (5: 5)
- IR (KBr, cm\(^{-1}\)): 3408, 3118, 1691, 1430, 1547, 1515 and 1340
- PMR: 10.43 (bs, 1H), 8.92 (bs, 1H), 8.08-8.15 (m, 1H), 7.20-7.28 (d, 4H), 7.32-7.42 (m, 2H), 6.87-6.98 (m, 3H) and 6.82-6.88 (m, 1H)
5.38. 1-[4-(4-Methylphenyl)-5-(4-nitrophenyl)thiazol-2-yl]-3-(2,4-difluorophenyl)urea (11o)

The title compound (11o) was synthesized as per the method described for compound (11a) taking 5-(4-nitrophenyl)-4-(p-tolyl)thiazol-2-ylamine (10f) (1 g, 2.241 mmol) and 2,4-difluorophenyl isocyanate (0.32 mL, 2.161 mmol) as the starting materials (11o). The solid product was filtered, dried and collected (11o), (0.89 g, 89%), m.p. 222-225°C.

Anal:
TLC : Rf 0.6 (n-Hexane: Ethyl acetate) (5: 5)
IR (KBr, cm⁻¹) : 3411, 3109, 1691, 1574, 1504 and 1333
PMR : 8.7 (bs, 1H), 8.2- 8.3 (m, 1H), 7.42-7.61 (m, 2H), 7.0-7.21 (m, 4H), 7.2-7.41 (m, 4II) and 2.31 (s, 3II).

5.39. 1-[4-(4-Methoxyphenyl)-5-(4-nitrophenyl)thiazol-2-yl]-3-(2,4-difluorophenyl)urea (11p)

The title compound (11p) was synthesized as per the method described for compound (11a) taking 4-(4-methoxyphenyl)-5-(4-nitrophenyl)thiazol-2-ylamine (10g) (1 g, 3.05 mmol) and 2,4-difluorophenyl isocyanate (0.5 mL, 3.05 mmol) as the starting materials. The solid product was filtered, dried and collected (38), (1.4 g, 89.16%), m.p. 221-224°C.

Anal:
TLC : Rf 0.32 (n-Hexane: Ethyl acetate) (5: 5)
IR (KBr, cm⁻¹): 3409, 3115, 1702, 1613, 1575, 1507 and 1339

5.40. 1-Butyl-3-[4-(4-chlorophenyl)-5-(4-nitrophenyl)thiazol-2-yl]urea (11q)

The title compound (11q) was synthesized as per the method described for compound (11a) taking 4-(4-chlorophenyl)-5-(4-nitrophenyl)thiazol-2-ylamine (10d) (1 g, 3.05 mmol) and n-butyl isocyanate (0.3 mL, 3.05 mmol) as the starting materials (11q). The solid product was filtered and collected (11q), (1.2 g, 97.56%), m.p. 158-161°C.

Anal:
TLC : Rf 0.78 (n-Hexane: Ethyl acetate) (5: 5)
IR (KBr, cm⁻¹): 3403, 1699, 1591, 1430, 1540 and 1352

5.41. 1-Butyl-3-[4-(4-fluorophenyl)-5-(4-nitrophenyl)thiazol-2-yl]urea (11r)

The title compound (11r) was synthesized as per the method described for compound (11a) taking 4-(4-fluorophenyl)-5-(4-nitrophenyl)thiazol-2-ylamine (10e) (1 g, 0.317 mmol) and
$n$-butyl isocyanate (0.35 mL, 0.317 mmol) as the starting materials. The solid product (11r) so obtained was filtered and collected, (0.93 g, 89.9%), m.p. 156-159°C.

**Anal:**

TLC : $R_f$ 0.69 ($n$-Hexane: Ethyl acetate) (5: 5)

IR (KBr, cm$^{-1}$): 3410, 3179, 1670, 1592, 1546, 1515 and 1340

5.42. 1-[4-(4-Methylphenyl)-5-(4-nitrophenyl)thiazol-2-yl]-3-buty lurea (11s)

The title compound (11s) was synthesized as per the method described for compound (11a) taking 5-(4-nitrophenyl)-4-$(p$-tolyl)thiazol-2-ylamine (10f) (1g, 3.21mmol) and $n$-butyl isocyanate (0.35 mL, 3.21 mmol) as the starting materials (11a). The solid product (11s) was filtered and dried to yield compound, (0.82 g, 87.9 %), m.p. 198-201°C.

**Anal:**

TLC : $R_f$ 0.62 ($n$-Hexane: Ethyl acetate) (5: 5)

IR (KBr, cm$^{-1}$): 3411, 3156, 1693, 1591, 1553 and 1340.

5.43. 1-Butyl-3-[4-(4-methoxyphenyl)-5-(4-nitrophenyl)thiazol-2-yl]urea (11t)

The title compound (11t) was synthesized as per method described for compound (11a) taking 4-(4-methoxyphenyl)-5-(4-nitrophenyl)thiazol-2-ylamine (10g) (1 g, 3.054 mmol) and $n$-butyl isocyanate (0.3 mL, 3.054 mmol) as the starting materials. The solid product (11t) was filtered and dried to yield desired compound, (0.87 g, 85.87%), m.p. 207-210°C.

**Anal:**

TLC : $R_f$ 0.62 ($n$-Hexane: Ethyl acetate) (5: 5)

IR (KBr, cm$^{-1}$): 3421, 3144, 1700, 1639, 1430, 1514 and 1341.

5.44. 1-[5-(4-Aminophenyl)-4-(4-chlorophenyl)thiazol-2-yl]-3-(2,4-difluorophenyl)urea (12a)

1-[4-(4-Chlorophenyl)-5-(4-nitrophenyl)thiazol-2-yl]-3-(2,4-difluorophenyl)urea (11m) (0.5 g, 1.02 mmol) was dissolved in sufficient quantity of methanol (25 mL) and refluxed. Iron powder (2 g) and sodium chloride solution (50 %, 5 mL) were added into the refluxing solution portion wise. Completion of the reaction was confirmed by TLC. The reaction mixture was filtered out to collect the filtrate. The filtrate was concentrated in vacuo and poured into the water (50 mL). The precipitate so formed was filtered, dried and collected as the desired compound (12a), (0.4 g, 97.35%), m.p. 222-224°C.
**Experimental**

**Anal:**
- TLC: \( R_f \) 0.55 (n-Hexane: Ethyl acetate) (5:5)
- IR (KBr, cm\(^{-1}\)): 3413, 3403, 1699, 1611, 1569 and 1430

**5.45. 1-[5-(4-Aminophenyl)-4-(4-fluorophenyl)thiazol-2-yl]-3-(2,4-difluorophenyl)urea (12b)**

The title compound (12b) was synthesized as per the method described for compound (12a) taking 1-[4-(4-fluorophenyl)-5-(4-nitrophenyl)thiazol-2-yl]-3-(2,4-difluorophenyl)urea (11n) (0.5 g, 1.063 mmol) as the starting material. The precipitate so formed was filtered, dried and collected to obtain the desired compound (12b), (0.38 g, 90 %), **m.p.** 209-211 °C.

**Anal:**
- TLC: \( R_f \) 0.54 (n-Hexane: Ethyl acetate) (5:5)
- IR (KBr, cm\(^{-1}\)): 3416, 3312, 1685, 1611 and 1563.

**5.46. 1-[5-(4-Aminophenyl)-4-(p-tolyl)thiazol-2-yl]-3-(2,4-difluorophenyl)urea (12c)**

The title compound (12c) was synthesized as per the method described for compound (12a) taking 1-[4-(4-methylphenyl)-5-(4-nitrophenyl)thiazol-2-yl]-3-(2,4-difluorophenyl)urea (11o) (0.5 g, 1.07 mmol) as the starting material. The precipitate so formed was filtered, dried and collected to afford the desired compound (12c), (0.43 g, 91.34%), **m.p.** 223-226 °C.

**Anal:**
- TLC: \( R_f \) 0.49 (n-Hexane: Ethyl acetate) (5:5)
- IR (KBr, cm\(^{-1}\)): 3415, 3314, 1687, 1615 and 1561.

**5.47. 1-[5-(4-Aminophenyl)-4-(4-methoxyphenyl)thiazol-2-yl]-3-(2,4-difluorophenyl)urea (12d)**

The title compound (12d) was synthesized as per the method described for compound (12a) taking 1-[4-(4-methoxyphenyl)-5-(4-nitrophenyl)thiazol-2-yl]-3-(2,4-difluorophenyl)urea (11p) (500 mg, 1.036 mmol) as the starting material. The precipitate so formed was filtered, dried and collected to obtain the desired compound (12d), (0.44 g, 89.24%), **m.p.** 186-188 °C.

**Anal:**
- TLC: \( R_f \) 0.5 (n-Hexane: Ethyl acetate) (5:5)
- IR (KBr, cm\(^{-1}\)): 3143, 1703, 1685, 1611, 1549 and 1230.
5.48. 1-[5-(4-Aminophenyl)-4-(4-chlorophenyl)thiazol-2-yl]-3-butylurea (12e)

The title compound (12e) was synthesized as per the method described for compound (12a) taking 1-butyl-3-[4-(4-chlorophenyl)-5-(4-nitrophenyl)thiazol-2-yl]urea (11q) (0.5 g, 1.2 mmol) as the starting material. The precipitate so formed was filtered, dried and collected to afford the desired compound (12e), (0.48 g, 98.87%), m.p. 192-194°C.

Anal:
TLC : Rf 0.42 (n-Hexane: Ethyl acetate) (5: 5)
IR (KBr, cm⁻¹) : 3413, 3338, 1700, 1623, 1551 and 1430.

5.49. 1-[5-(4-Aminophenyl)-4-(4-fluorophenyl)thiazol-2-yl]-3-butylurea (12f)

The title compound (12f) was synthesized as per the method described for compound (12a) taking 1-butyl-3-[4-(4-fluorophenyl)-5-(4-nitrophenyl)thiazol-2-yl]urea (11r) (0.5 g, 1.20 mmol) as the starting material. The precipitate so formed was filtered, dried and collected (12f), (0.43 g, 87.8%), m.p. 160-162°C.

Anal:
TLC : Rf 0.28 (n-Hexane: Ethyl acetate) (5: 5)
IR (KBr, cm⁻¹) : 3415, 3318, 3217, 1687, 1615 and 1561

5.50. 1-[5-(4-Aminophenyl)-4-(p-tolyl)thiazol-2-yl]-3-butylurea (12g)

The title compound (12g) was synthesized as per the method described for compound (12a) taking 1-butyl-3-[5-(4-nitrophenyl)-4-(p-tolyl)thiazol-2-yl]urea (11s) (0.5 g, 1.22 mmol) as the starting material. The precipitate so formed was filtered, dried and collected to obtain the desired compound (12g), (0.36 g, 89%), m.p. 197-200°C.

Anal:
TLC : Rf 0.33 (n-Hexane: Ethyl acetate) (5: 5)
IR (KBr, cm⁻¹) : 3415, 3141, 1687, 1615 and 1561

5.51. 1-[5-(4-Aminophenyl)-4-(4-methoxyphenyl)thiazol-2-yl]-3-butylurea (12h)

The title compound (12h) was synthesized as per the method described for compound (12a) taking 1-butyl-3-[4-(4-methoxyphenyl)-5-(4-nitrophenyl)thiazol-2-yl]urea (11t) (0.5 g, 1.17 mmol) as the starting material. The precipitate so formed was filtered, dried and collected to obtain the desired compound (12h), (0.46 g, 89%), m.p. 174-176°C.
Anal:
TLC : Rf 0.31 (n-Hexane: Ethyl acetate) (7: 3)
IR (KBr, cm⁻¹): 3410, 3145, 1678, 1615, 1561, 1259 and 1024.

5.52. N-{4-[2-[(2,4-Difluorophenyl)carbamoyl]amino]-4-(4-chlorophenyl)-1,3-thiazol-5-yl]phenylacetamide (13a)

3-[5-(4-Aminophenyl)-4-(4-chlorophenyl)-1,3-thiazol-2-yl]-1-(2,4-difluorophenyl)urea (12a) (0.25 g, 1.02 mmol) was dissolved in THF (10 mL). Pyridine (2-3 drops) and acetic anhydride (0.12 mL, 1.02 mmol) were added drop wise into the stirred solution at 0-5°C. The reaction was monitored by TLC. The reaction mixture was poured into ice water (50 g) and the excess amount of pyridine was neutralized with HCl. The precipitate so obtained was filtered, dried and collected. The crude product so obtained was purified through column chromatography to afford the pure compound (13a), (0.2 g, 69.78 %), m.p. 240-242°C.

Anal:
TLC : Rf 0.32 (n-Hexane: Ethyl acetate) (5: 5)
IR (KBr, cm⁻¹): 3351, 3151, 1663, 1608, 1542 and 1562
PMR : 9.92 (bs, 1H), 9.33 (bs, 1H), 8.0-8.10 (m, 1H), 7.62-7.70 (d, 4H), 7.19-7.21 (d, 2H), 6.83-7.03 (m, 4H) and 3.12 (s, 3H)

5.53. 1-(2,4-Difluorophenyl)-3-[5-(4-methansulfonylphenyl)-4-(4-chlorophenyl)-1,3-thiazol-2-yl]urea (13b)

3-[5-(4-Aminophenyl)-4-(4-chlorophenyl)-1,3-thiazol-2-yl]-1-(2,4-difluorophenyl)urea (12a) (0.25 g, 1.02 mmol) was dissolved in dry pyridine (2 mL). Methanesulfonyl chloride (0.09 mL, 1.02 mmol) was added drop-wise into the stirred solution at 0-5°C. The reaction was further carried out as described for compound (13a) to obtain the desired compound (13b), (0.24 g, 59.98 %), m.p. 250-252°C.

Anal:
TLC : Rf 0.57 (n-Hexane: Ethyl acetate) (5: 5)
IR (KBr, cm⁻¹): 3251, 3118, 1697, 1612, 1547 and 1398
PMR : 10.3 (bs, 1H), 9.94 (bs, 1H), 8.00-8.10 (m, 1H), 7.58-7.68 (d, 4H), 7.19-7.21 (m, 2H), 6.83-7.03 (m, 4H) and 3.02 (s, 3H).
5.54. \(N\{4-[2-(Butylcarbamoyl)amidophenyl]-4-(4-chlorophenyl)-1,3-thiazol-5-yl\}acetamide (13c)

1-[5-(4-Aminophenyl)-4-(4-chlorophenyl)thiazol-2-yl]-3-buty lurea (12e) (0.25 g, 1.02 mmol) was dissolved in dry THF (10 mL). Pyridine (2-3 drops) and acetic anhydride (0.09 mL, 0.635 mmol) were added drop-wise into the stirred solution at 0-5°C. The reaction was further carried out as described for compound (13a), (0.19 g, 73.98 %), m.p. 208-210°C.

**Anal:**

**TLC** : \(R_f\) 0.14 (n-Hexane: Ethyl acetate) (5:5)

**IR (KBr, cm\(^{-1}\))** : 3252, 3182, 3115, 1685, 1599 and 1521

**PMR** : 10.30 (bs, 1H), 9.84 (bs, 1H), 6.40 (bs, 1H), 7.56-7.58 (d, 2H), 7.40-7.43 (d, 2H), 7.17-7.22 (m, 4H), 3.19-3.22 (q, 2H), 1.47-1.59 (m, 2H), 1.32-1.41 (m, 2H) and 0.92-0.95 (t, 3H).

5.55. 3-Butyl-1-[5-(4-methanesulfonylamidophenyl)-4-(4-chlorophenyl)-1,3-thiazol-2-yl]urea (13d)

1-[5-(4-Aminophenyl)-4-(4-chlorophenyl)thiazol-2-yl]-3-buty lurea (12e) (0.25 g, 1.02 mmol) was dissolved in dry pyridine (2 mL). Methanesulfonyl chloride (0.09 mL, 1.02 mmol) was added drop-wise into the stirred solution at 0-5°C. The reaction was further carried out as described for compound (13a), (0.21 g, 79.43%), m.p 188-191°C.

**Anal:**

**TLC** : \(R_f\) 0.29 (n-Hexane: Ethyl acetate) (5:5)

**IR (KBr, cm\(^{-1}\))** : 3348, 3142, 1665, 1608, 1564 and 1294

**PMR** : 10.30 (s, 1H), 9.77 (s, 1H), 6.39 (s, 1H), 7.4-7.42 (d, 2H), 7.24-7.42 (m, 6H), 3.19-3.29 (m, 2H), 2.99 (s, 3H), 1.47-1.54 (q, 2H), 1.34-1.41 (m, 2H), and 0.92-0.95 (t, 3H).

5.56. \(N\{4-[2-(((2,4-Difluorophenyl)carbamoyl)amino)-4-(4-fluorophenyl)-1,3-thiazol-5-yl(phenyl)acetamide (13e)

3-[5-(4-Aminophenyl)-4-(4-fluorophenyl)1,3-thiazol-2-yl]-1-(2,4-difluorophenyl)urea (12b) (0.25 g, 0.568 mmol) was dissolved in THF (10 mL). Pyridine (2-3 drops) and acetic anhydride (0.12 mL, 1.02 mmol) were added drop-wise in to the stirred solution at 0-5°C. The reaction was further carried out as described for compound (13a). The crude product so obtained was purified through column chromatography to obtain the pure product (13e), (0.16 g, 60 %), m.p 221-223°C.
5.57. N-{4-[2-(3-(2,4-Difluorophenyl)ureido)-4-(4-fluorophenyl)thiazol-5-yl]phenyl} methane-sulfonamide (13f)

3-(5-(4-Aminophenyl)-4-(4-fluorophenyl)-1,3-thiazol-2-yl)-1-(2,4-difluorophenyl)urea (12b) (0.25 g, 0.568 mmol) was dissolved in dry pyridine (2 mL). Methanesulfonyl chloride (0.09 mL, 1.02 mmol) was added drop-wise into the stirred solution at 0-5°C. The reaction was further carried out as described for compound (13a) to obtain the desired compound (13f), (0.19 g, 68%), m.p 150-152°C.

5.58. N-{4-[2-(Butylcarbamoylamino)-4-(4-fluorophenyl)-1,3-thiazol-5-yl]phenyl}acetamide (13g)

1-[5-(4-Aminophenyl)-4-(4-fluorophenyl)-1,3-thiazol-2-yl]-3-buty lurea (12f) (0.25 g, 0.65 mmol) was dissolved in THF (10 mL). Pyridine (2-3 drops) and acetic anhydride (0.09 mL, 0.65 mmol) was added drop-wise in to the stirred solution at 0-5°C. The reaction was further carried out as described for compound (13a). The crude product so obtained was purified through column chromatography to obtain the pure compound (13g), (0.16 g, 75.89 %), m.p 127-130°C.
5.59. 3-Butyl-1-[5-(4-methanesulfonamidophenyl)-4-(4-fluorophenyl)-1,3-thiazol-2-yl]urea (13b)

1-(5-(4-Aminophenyl)-4-(4-fluorophenyl)-1,3-thiazol-2-yl)-3-butylurea (12f) (0.25 g, 0.65 mmol) was dissolved in dry pyridine (2 mL). Methanesulfonyl chloride (0.09 mL, 1.02 mmol) was added drop-wise in to the stirred solution at 0-5°C. The reaction was further carried out as described for compound (13a) to afford the pure compound (13b), (0.16 g, 67.47 %), m.p. 175-178°C.

Anal:
TLC : Rf 0.30 (n-Hexane: Ethyl acetate) (5: 5)
IR (KBr, cm⁻¹): 3351, 3151, 1663, 1608, 1562 and 1298
PMR : 7.58-7.68 (m, 2H), 7.26-7.36 (m, 4H), 6.92-6.98 (m, 2H), 3.24-3.30 (m, 2H), 3.00 (s, 3H), 1.48-1.58 (m, 2H), 1.34-1.41(m, 2H) and 0.94-0.97 (t, 3H).

5.60. N-4-[(2,4-Difluorophenyl)carbamoyl]amino]-4-(4-methylphenyl)-1,3-thiazol-5-yl]phenylacetamide (13i)

3-[5-(4-Aminophenyl)-4-(4-methylphenyl)-1,3-thiazol-2-yl]-1-(2,4-difluorophenyl)urea (12c) (0.25 g, 0.57 mmol) was dissolved in THF (10 mL). Pyridine (2-3 drops) and acetic anhydride (0.09 mL, 0.6510 mmol) were added drop-wise into the stirred solution at 0-5°C. The reaction was further carried out as described for compound (13a). The crude product so obtained was purified through column chromatography to afford the pure compound (13i), (0.16 g, 65%), m.p. 255-258°C.

Anal:
TLC : Rf 0.29 (n-Hexane: Ethyl acetate) (3: 7)
IR (KBr, cm⁻¹): 3415, 3310, 3126, 1702, 1666, 1615 and 1554
PMR : 9.92 (bs, 1H), 8.7 (bs, 1H), 8.2-8.3 (m, 1H), 7.0-7.21 (m, 4H), 7.2-7.41 (d, 4H), 7.42-7.61 (d, 2H), 2.31 (s, 3H), and 2.25 (s, 3H).

5.61. 1-(2,4-Difluorophenyl)-3-[5-(4-methanesulfonamidophenyl)-4-(4-methylphenyl)-1,3-thiazol-2-yl]urea (13j)

3-[5-(4-Aminophenyl)-4-(4-methylphenyl)-1,3-thiazol-2-yl]-1-(2,4-difluorophenyl)urea (12c) (0.25 g, 0.57 mmol) was dissolved in dry pyridine (2 mL). Methanesulfonyl chloride (0.09 mL, 1.02 mmol) was added drop-wise into the stirred solution at 0-5°C. The reaction was further
carried out as described for compound (13a). The crude product was purified through column chromatography to obtain the pure compound (13j), (0.16 g, 70 %), m.p 190-192°C.

Anal:
TLC : Rf 0.51 (n-Hexane: Ethyl acetate) (3: 7)
IR (KBr, cm⁻¹): 3423, 3183, 1713, 1615, 1550 and 1299
PMR : 9.92 (s, 1H), 8.7 (bs, 1H), 8.2- 8.3 (m, 1H), 7.0-7.21 (m, 4H), 7.2-7.41 (d, 4H), 7.42-7.61 (d, 2H), 2.31 (s, 3H) and 2.64 (s, 3H).
MS : m/z 514.7 (M⁺)

5.62. 1-[5-(4-Acetamidophenyl)-4-(p-tolyl)thiazol-2-yl]-3-butylurea (13k)

1-[5-(4-Aminophenyl)-4-(p-tolyl)thiazol-2-yl]-3-butylurea (12g) (0.25 g, 0.65 mmol) was dissolved in THF (10 mL). Pyridine (2-3 drops) and acetic anhydride (0.09 mL, 0.657 mmol) were added drop-wise into the stirred solution at 0-5°C. The reaction was further carried out as described for compound (13a). The crude product so obtained was purified through column chromatography to afford the desired compound (13k), (0.23 g, 83.79%), m.p. 184-186°C.

Anal:
TLC : Rf 0.18 (n-Hexane: Ethyl acetate) (6: 4)
IR (KBr, cm⁻¹): 3425, 3134, 1688, 1609, 1573 and 1209.

5.63. 3-Butyl-1-[5-(4-methanesulfonamidophenyl)-4-(p-tolyl)-1,3-thiazol-2-yl]urea (13l)

1-[5-(4-Aminophenyl)-4-(p-tolyl)thiazol-2-yl]-3-butylurea (12g) (0.25 g, 0.65 mmol) was dissolved in dry pyridine (2 mL). Methanesulfonyl chloride (0.09 mL, 1.02 mmol) was added drop wise in to the stirred solution at 0-5°C. The reaction was further carried out as described for compound (13a). The crude product so obtained was purified through column chromatography to afford the desired compound (13l), (0.18 g, 65.13%), m.p 210-212°C.

Anal:
TLC : Rf 0.35 (n-Hexane: Ethyl acetate) (5: 5)
IR (KBr, cm⁻¹): 3342, 3133, 1664, 1560, 1436 and 1296
PMR : 10.15 (bs, 1H), 9.32 (bs, 1H), 8.63 (bs, 1H), 7.34-7.43 (m, 2H), 7.15-7.30 (m, 4H), 7.01-7.13 (m, 2H), 3.23 (q, 2H), 2.97 (s, 3H), 2.35 (s, 3H), 1.52-1.65 (m, 2H), 1.37-1.43 (m, 2H) and 0.87-0.93 (t, 3H).
5.64. 1-(2,4-Difluorophenyl)-3-[4-(4-methoxyphenyl)-5-(4-((propan-2-yl)amino)phenyl)1,3-thiazol-2-yl]urea (13m)

3-[5-(4-Aminophenyl)-4-(4-methoxyphenyl)-1,3-thiazol-2-yl]-1-(2,4-difluorophenyl)urea (12d) (0.5 g, 0.55 mmol) was taken in the RBF and dissolved in DMF (2 mL) under nitrogen. Anhydrous K₂CO₃ (1 g) and isopropyl bromide (0.67 mL, 0.55 mmol) were added into the stirred solution. The reaction mixture was stirred for another 24 h and completion of the reaction was monitored by TLC. The reaction mixture was quenched in ice water (200 mL) and extracted with chloroform (3x15 ml). The chloroform layer was separated and dried over sodium sulphate. The organic layer so obtained was distilled off and the mixture so obtained was purified through column chromatography (methanol: dichloromethane 1: 9) to obtain the pure desired compound (13m), (0.24 g, 75.65%), m.p. 150-152°C.

Anal:

<table>
<thead>
<tr>
<th>Method</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TLC</td>
<td>Rf 0.41 (n-Hexane: Ethyl acetate) (7: 3)</td>
</tr>
<tr>
<td>IR</td>
<td>3353, 3126, 1688, 1509, 1402 and 1322</td>
</tr>
<tr>
<td>PMR</td>
<td>10.63 (bs, 1H), 8.22 (bs, 1H), 8.2-8.3 (m, 1H), 7.0-7.21 (m, 4H), 7.2-7.41 (d, 4H), 7.42-7.61 (m, 2H), 3.9 (s, 3H), 3.81-3.93 (m, 1H) and 0.91-0.93 (d, 6H).</td>
</tr>
<tr>
<td>MS</td>
<td>m/z 494.7 (M⁺)</td>
</tr>
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</table>

5.65. 1-(2,4-Difluorophenyl)-3-[5-(4-dodecylaminophenyl)-4-(4-methoxyphenyl)-1,3-thiazol-2-yl]urea (13n)

3-(5-(4-Aminophenyl)-4-(4-methoxyphenyl)-1,3-thiazol-2-yl)-1-(2,4-difluorophenyl)urea (12d) (0.25 g, 0.55 mmol) was taken in the RBF and dissolved in DMF (2 mL) under nitrogen. Anhydrous K₂CO₃ (1 g) and n-dodecyl bromide (1.37 mL, 0.55 mmol) were added into the stirred solution. The reaction was further carried out as described for compound (13a). The crude compound was purified through column chromatography to obtain the pure compound (13n), (0.24 g, 70.47%), m.p 121-123°C.

Anal:

<table>
<thead>
<tr>
<th>Method</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TLC</td>
<td>Rf 0.53 (n-Hexane: Ethyl acetate) (7: 3)</td>
</tr>
<tr>
<td>IR</td>
<td>3415, 3310, 3126, 1702, 1666, 1615 and 1554</td>
</tr>
<tr>
<td>PMR</td>
<td>9.87 (bs, 1H), 8.13 (bs, 1H), 7.36-7.38 (d, 2H), 7.02-7.04 (d, 2H), 6.91-6.95 (m, 1H), 6.82-6.90 (t, 1H), 6.72-6.74 (d, 2H), 6.59 (d, 2H), 3.74(s, 3H), 2.95-3.02 (m, 3H), 2.07(s, 3H), 1.52-1.57 (m, 3H), 1.24-1.19 (m, 22H) and 0.79-0.81(t, 3H).</td>
</tr>
</tbody>
</table>
MS: m/z 536.9 (M⁺)

5.66. N-[4-[2-[(2,4-Difluorophenyl)carbamoyl]amino]-4-(4-methoxyphenyl)-1,3-thiazol-5-yl]phenyl]acetamide (13o)

3-[5-(4-Aminophenyl)-4-(4-methoxyphenyl)-1,3-thiazol-2-yl]-1-(2,4-difluorophenyl)urea (12d) (0.25 g, 0.55 mmol) was dissolved in THF (10 mL). Pyridine (2-3 drops) was added into the solution and acetic anhydride (0.09 mL, 0.657 mmol) was added drop wise into the stirred solution at 0-5°C. The reaction was further carried out as described for compound (13a). The crude product so obtained was purified through column chromatography to obtain the pure compound (13o), (0.18 g, 62.31%), m.p. 160-162°C.

Anal:
TLC: Rf 0.17 (n-Hexane: Ethyl acetate) (7: 3)
IR (KBr, cm⁻¹): 3406, 1675, 1610, 1615, 1548 and 1208
PMR:
3.73 (m, 2H), 7.15-7.46 (d, 2H), 4.12 (s, 3H), 6.74-6.83 (d, 2H), 3.31-7.36 (m, 2H)

5.67. 1-(2,4-Difluorophenyl)-3-[5-(4-methanesulfonylamidophenyl)-4-(4-methoxyphenyl)-1,3-thiazol-2-yl]urea (13p)

3-(5-(4-Aminophenyl)-4-(4-methoxyphenyl)-1,3-thiazol-2-yl]-1-(2,4-difluorophenyl)urea (12d) (0.25 g, 0.553 mmol) was dissolved in dry pyridine (2 mL). Methanesulfonyl chloride (0.09 mL, 1.02 mmol) was added drop wise into the stirred solution at 0-5°C. The reaction was further carried out as described for compound (13a). The crude compound was purified through column chromatography to obtain the pure compound (13p), (0.22 g, 69.78%), m.p. 176-178°C.

Anal:
TLC: Rf 0.33 (n-Hexane: Ethyl acetate) (7: 3)
IR (KBr, cm⁻¹): 3409, 3235, 1715, 1613, 1555 and 1790
MS: m/z 530 (M⁺)

5.68. 3-Butyl-1-[4-(4-methoxyphenyl)-5-[4-(propan-2-yl-amino)phenyl]-1,3-thiazol-2-yl]urea (13q)

1-(5-(4-Aminophenyl)-4-(4-methoxyphenyl)-1,3-thiazol-2-yl)-3-butylurea (12h) (0.25 g, 0.63 mmol) was dissolved in the DMF (2 mL). Anhydrous K₂CO₃ (1 g) and isopropyl bromide (0.67 mL, 0.552 mmol) were added into the stirred solution. The crude product so obtained was
purified through column chromatography to obtain the pure compound (13q), (0.18 g, 60%), m.p. 45-48°C.

Anal:
TLC : Rf 0.48 (n-Hexane: Ethyl acetate) (7: 3)
IR (KBr, cm⁻¹) : 3406, 2970, 1675, 1610, 1548 and 1230
MS : m/z 439.1 (M⁺)

5.69. 3-Butyl-1-{5-[4-(dodecylamino)phenyl]-4-(4-methoxyphenyl)-1,3-thiazol-2-yl]urea (13r)
1-(5-(4-Aminophenyl)-4-(4-methoxyphenyl)-1,3-thiazol-2-yl)-3-butylurea (12h) (0.25 g, 0.63 mmol) was taken in the RBF and dissolved in the DMF (2 mL). Anhydrous K₂CO₃ (1 g) and dodecyl bromide (0.14 mL, 0.631 mmol) were added into the stirred solution. The reaction was further carried out as described for compound (13m). The pure compound (13r) was purified through column chromatography, (0.18 g, 63%), m.p. 120-123°C.

Anal:
TLC : Rf 0.21 (n-Hexane: Ethyl acetate) (7: 3)
IR (KBr, cm⁻¹) : 3437, 3138, 1689, 1616, 1400 and 1294
MS : m/z 564.9 (M⁺)

5.70. N-{4-[2-(3-Butylureido)-4-(4-methoxyphenyl)thiazol-5-yl]phenyl}acetamide (13s)
1-(5-(4-Aminophenyl)-4-(4-methoxyphenyl)-1,3-thiazol-2-yl)-3-butylurea (12h) (0.25 g, 0.631 mmol) was dissolved in THF (10 mL). Pyridine (2-3 drops) and acetic anhydride (0.09 mL, 0.657 mmol) were added drop-wise into the stirred solution at 0-5°C. The reaction was further carried out as described for compound (13a). The desired compound (13s) was purified through column chromatography, (0.17 g, 69.47%), m.p. 159-161°C.

Anal:
TLC : Rf 0.17 (n-Hexane: Ethyl acetate) (7: 3)
IR (KBr, cm⁻¹) : 3405, 3247, 2953, 1668, 1529 and 837
PMR : 7.5 (bs, 1H), 7.37-7.39 (d, 2H), 7.25-7.27 (d, 2H), 7.09-7.11(d, 2H),
6.70-6.73 (d, 2H), 3.70 (s, 3H), 2.97-2.98 (t, 2H), 2.10 (s, 3H), 1.14-1.27 (m, 4H) and 0.81-0.93 (t, 3H).
MS : m/z 438.8 (M⁺)
5.71. 3-Butyl-1-[5-(4-methanesulfonylamidophenyl)-4-(4-methoxyphenyl)-1,3-thiazol-2-yl]urea (13t)

1-(5-(4-Aminophenyl)-4-(4-methoxyphenyl)-1,3-thiazol-2-yl)-3-buty lurea (12h) (0.25 g, 0.631 mmol) was dissolved in dry pyridine (2 mL). Methanesulfonyl chloride (0.09 mL, 1.02 mmol) was added drop wise into the stirred solution at 0-5°C. The reaction was further carried out as described for compound (13a). The crude product so obtained was purified through column chromatography to afford the pure compound (13t), (0.16 g, 62.13%), m.p. 172-174°C.

Anal:
TLC : Rf 0.33 (n-Hexane: Ethyl acetate) (7: 3)
IR (KBr, cm⁻¹) : 3431, 3254, 3173, 1710, 1674, 1563 and 1299
PMR : 8.8 (bs, 1H), 8.5 (bs, 1H), 8.2 (s, 1H), 7.14-7.23 (m, 8H), 3.73 (s, 3H), 3.23 (t, 2H), 2.99 (s, 3H), 1.46-1.48 (m, 2H), 1.28-1.34 (m, 2H) and 0.87-0.94 (t, 3H).

5.72. 4-(4-Chlorophenyl)-2-methyl-5-(4-nitrophenyl)thiazole (14i)

2-Bromo-1-(4-chlorophenyl)-2-(4-nitrophenyl)ethanone (9d) (0.5 g, 1.413 mmol) was dissolved in ethanol (30 mL) in a 100 mL RBF. Thioacetamide (0.113 g, 1.686 mmol) was added into this reaction mixture and the reaction mixture was refluxed for 4 hr. Completion of the reaction was monitored by TLC. The solvent was distilled off and the residue so obtained was poured into ice cold water (250 mL). The precipitate was filtered off, dried and collected to obtain the desired product (14i), (0.2 g, 42.82%), m.p. 147-149°C.

Anal:
TLC : 0.82 (n-Hexane: Ethyl acetate) (8: 2)
IR (KBr, cm⁻¹): 3242, 1633, 1528, 1335, 1220 and 835

5.73. 4-(4-Fluorophenyl)-2-methyl-5-(4-nitrophenyl)thiazole (14ii)

The title compound (14ii) was synthesized as per the method described for compound (14i) taking 2-bromo-1-(4-fluorophenyl)-2-(4-nitrophenyl)ethanone (9e) (0.5 g , 1.48 mmol) as the starting material. The crude product so obtained was purified through column chromatography to obtain the desired compound (14ii), (0.2 g, 44.2%), m.p. 47-49°C.

Anal:
TLC : 0.84 (n-Hexane: Ethyl acetate) (8: 2)
IR (KBr, cm⁻¹): 3142, 1638, 1530, 1332, 1225 and 825
5.74. 4-(4-Methylphenyl)-2-methyl-5-(4-nitrophenyl)thiazole (14iii)

The title compound (14iii) was synthesized as per the method described for compound (14i) taking 2-bromo-2-(4-nitrophenyl)-1-(p-tolyl)ethanone (9f) (0.5 g, 1.413 mmol) as the starting material. The crude product so obtained was purified through column chromatography to obtain pure compound (14iii), (0.2 g, 45.47%), m.p. 149-151°C.

Anal:
TLC : 0.78 (n-Hexane: Ethyl acetate) (8: 2)
IR (KBr, cm⁻¹): 3125, 1635, 1528, 1330, 1225 and 825

5.75. 4-(4-Methoxyphenyl)-2-methyl-5-(4-nitrophenyl)thiazole (14iv)

The title compound (14iv) was synthesized as per the method described for compound (14i) taking 2-bromo-1-(4-methoxyphenyl)-2-(4-nitrophenyl)ethanone (9g) (0.5 g, 1.413 mmol) as the starting material. The crude product so obtained was purified through column chromatography to obtain the desired compound (14iv), (0.2 g, 45.47%), m.p. 149-151°C.

Anal:
TLC : 0.78 (n-Hexane: Ethyl acetate) (8: 2)
IR (KBr, cm⁻¹): 3422, 1637, 1525, 1332 and 1256

5.76. 4-(4-Chlorophenyl)-2-methylthiazol-5-yl]aniline (15i)

4-(4-Chlorophenyl)-2-methyl-5-(4-nitrophenyl)thiazole (14i) (1 g, 3.025 mmol) was refluxed in methanol (50 mL). Iron powder (5 g) and sodium chloride solution (50 %, 10 mL) were added together portion-wise into the refluxed solution. Completion of the reaction was monitored by TLC. After completion of the reaction, the iron powder was filtered off from the reaction mixture and the filtrate was concentrated in-vacuo. The resultant solid so obtained was filtered off, dried and purified by column chromatography (neutral aluminum oxide as stationary phase and n-hexane and ethyl acetate, 7: 3 as mobile phase) to obtain pure desired compound (15i), (0.7, 77.78%), m.p. 102-104°C.

Anal:
TLC : 0.38 (n-Hexane: Ethyl acetate) (7: 3)
IR (KBr, cm⁻¹): 3413, 3338, 3029, 1497 and 1292
PMR : 6.5 -7.5 (m, 8H), 2.75 (s, 3H) and 4.1 (s, 2H)
5.77. 4-{4-(4-Fluorophenyl)-2-methylthiazol-5-yl}aniline (15ii)

The title compound (15ii) was synthesized as per the method described for compound (15i) taking 4-(4-fluorophenyl)-2-methyl-5-(4-nitrophenyl)thiazole (14ii) (1 g, 3.184 mmol) as the starting material. The crude product so obtained was purified through column chromatography to afford the pure desired compound (15ii), (0.7 g, 77.78%), m.p. 135-138°C.

**Anal:**
- TLC: 0.37 (n-Hexane: Ethyl acetate) (7: 3)
- IR (KBr, cm⁻¹): 3414, 3340, 1493 and 1294
- MS: m/z 284.01(M⁺)

5.78. 4-{4-(4-Methylphenyl)-2-methylthiazol-5-yl}aniline (15iii)

The title compound (15iii) was synthesized as per the method described for compound (15i) taking 4-(4-methylphenyl)-2-methyl-5-(4-nitrophenyl)thiazole (14iii) (1 g, 3.225 mmol) as the starting material. The crude product so obtained was purified through column chromatography to afford the pure product (15iii), (0.7 g, 77.78%), m.p. 151-153°C.

**Anal:**
- TLC: 0.36 (n-Hexane: Ethyl acetate) (7: 3)
- IR (KBr, cm⁻¹): 3408, 3352, 1509 and 1285
- NMR: 6.5 -7.5 (m, 8H), 2.75 (s, 3H), 2.46 (s, 3H) and 3.87 (s, 2H).

5.79. 4-{4-(4-Methoxyphenyl)-2-methylthiazol-5-yl}aniline (15iv)

The title compound (15iv) was synthesized as per the method described for compound (15i) taking 4-(4-methoxyphenyl)-2-methyl-5-(4-nitrophenyl)thiazole (14iv) (1 g, 3.067 mmol) as the starting material. The crude product so obtained was purified through column chromatography to afford the pure product (15iv), (0.7 g, 77.78%), m.p. 138-140°C.

**Anal:**
- TLC: 0.38 (n-Hexane: Ethyl acetate) (7: 3)
- IR (KBr, cm⁻¹): 3362, 3309, 3034, 1510 and 1288
- NMR: 6.5 -7.5 (m, 8H), 2.81 (s, 3H), 3.92 (s, 3H) and 3.75 (s, 2H)
5.80. 1-{4-[4-(4-Chlorophenyl)-2-methylthiazol-5-yl]phenyl}-3-phenylurea (16a)

Compound (15i) (0.2 g, 0.605 mmol) was dissolved in toluene (10mL) in a 50mL RBF. Phenyl isocyanate (0.086 g, 0.726 mmol) was added drop-wise into the stirring solution of amine (15i) at room temperature. The stirring was continued for 4 hours and completion of the reaction was monitored by TLC. A solid was separated out during the reaction and the resultant solid was filtered off followed by thorough washing by toluene to remove excess of isocyanate if present. The precipitate so obtained was dried and collected to afford the pure desired compound (16a), (0.15 g, 60%), m.p. 228-230°C.

Anal:
TLC : 0.34 (n-Hexane: Ethyl acetate) (7: 3)
IR (KBr, cm⁻¹) : 3318, 1649, 1592, 1552, 1316, 1231 and 837
NMR : 7.0-7.9 (m, 13H), 6.51 (s, 2H) and 2.61 (s, 3H).

5.81. 1-{4-[4-(4-Chlorophenyl)-2-methylthiazol-5-yl]phenyl}-3-(2,4-difluorophenyl)urea (16b)

Compound (15i) (0.5 g, 1.663 mmol) was dissolved in toluene (10 mL) in a 50 mL RBF. 2,4-Difluorophenyl isocyanate (0.5 mL) was added dropwise into the stirring solution of the amine (15i) at room temperature. The reaction was further carried out as described for compound (16a) to obtain the pure compound (16b), (0.3 g, 40%), m.p. 187-190°C.

Anal:
TLC : 0.32 (n-Hexane: Ethyl acetate) (7: 3)
UV_max (MeOH) : 256 nm
IR (KBr, cm⁻¹) : 3326, 1636, 1587, 1549 and 1228
PMR : 8.41 (bs, 1H), 8.91 (bs, 1H), 8.21-8.41 (m, 1H), 7.21-7.42 (m, 4H), 7.42-7.62 (m, 4H), 6.71-7.05 (m, 2H) and 2.81 (s, 3H).

5.82. 1-{4-[4-(4-Chlorophenyl)-2-methylthiazol-5-yl]phenyl}-3-(2,6-diethylphenyl)urea (16c)

Compound (15i) (0.2 g, 0.605 mmol) was dissolved in toluene (10 mL) in a 50 mL RBF. 2,6-Diethylphenyl isocyanate (0.13 mL, 0.726 mmol) was added drop wise into the stirring solution of amine (15i) at room temperature. The reaction was further carried out as described for compound (16a) to obtain the pure compound (16c), (0.1 g, 35%), m.p. 248-250°C.

Anal:
TLC : 0.35 (n-Hexane: Ethyl acetate) (7: 3)
UV$_{\text{max}}$ (MeOH) : 259 nm
IR (KBr, cm$^{-1}$) : 3285, 1637, 1588, 1548 and 1228
NMR : 7.01-7.51 (m, 8H), 7.62-7.81 (m, 2H), 7.82-7.91 (m, 1H), 2.72 (s, 3H), 2.61-2.67 (q, 4H) and 1.2-1.4 (t, 6H).

5.83. 1-Butyl-3-[4-{4-(4-chlorophenyl)-2-methylthiazol-5-yl}phenyl]urea (16d)

Compound (15i) (0.2 g, 0.605 mmol) was dissolved in toluene (10 mL) in a 50 mL RBF. n-Butyl isocyanate (0.1 mL, 0.78 mmol) was added drop wise into the stirring solution of the above amine (15i) at room temperature. The reaction was further carried out as described for compound (16a) to afford the pure compound (16d), (0.15 g, 62.5%) m.p. 140-142°C.

Analytical:
TLC : 0.35 (n-Hexane: Ethyl acetate) (7: 3)
UV$_{\text{max}}$ (MeOH) : 252 nm
IR (KBr, cm$^{-1}$) : 3326, 1636, 1585, 1560 and 1229
NMR : 8.4 (s, 1H), 7.2-7.7 (m, 8H), 5.9 (s, 1H), 3.2-3.5 (q, 2H), 2.7 (s, 3H), 1.2-1.4 (m, 4H) and 0.9-102 (t, 3H).

5.84. 1-Heptyl-3-[4-{4-(4-chlorophenyl)-2-methylthiazol-5-yl}phenyl]urea (16e)

Compound (15i) (0.2 g, 0.605 mmol) was dissolved in toluene (10 mL) in a 50 mL RBF. n-Heptyl isocyanate (0.12 mL, 0.723 mmol) was added drop wise into the stirring solution of the above mentioned amine (15i) at room temperature. The reaction was further carried out as described for compound (16a) to afford the pure compound (16e), (0.15 g, 55.97%) m.p. 168-170°C.

Analytical:
TLC : 0.36 (n-Hexane: Ethyl acetate) (7: 3)
UV$_{\text{max}}$ (MeOH) : 252 nm
IR (KBr, cm$^{-1}$) : 3321, 1633, 1586, 1555, 1235 and 833
NMR : 8.4 (s, 1H), 7.2-7.7 (m, 8H), 5.9 (s, 1H), 3.2-3.4 (q, 2H), 2.7 (s, 3H), 1.2-1.4 (m, 10H) and 0.9-1.02 (t, 3H).

5.85. 1-Dodecyl-3-[4-{4-(4-chlorophenyl)-2-methylthiazol-5-yl}phenyl]urea (16f)

Compound (15i) (0.2 g, 0.605 mmol) was dissolved in toluene (10 mL) in a 50 mL RBF. n-Dodecyl isocyanate (0.166 g, 0.784 mmol) was added drop-wise into the stirring solution of the
above amine (15i) at room temperature. The reaction was further carried out as described for compound (16a) to obtain the pure compound (16f), (0.12 g, 40%), m.p. 182-184°C.

**Anal:**

TLC : 0.4 (n-Hexane: Ethyl acetate) (7:3)

UV\textsubscript{max} (MeOH) : 252 nm

IR (KBr, cm\textsuperscript{-1}) : 3320, 1634, 1556, 1231 and 834

NMR : 7.2-7.7 (m, 8H), 6.4 (s, 1H), 4.5 (s, 1H), 3.2 (t, 2H), 2.7 (s, 3H), 1.2-1.4 (m, 20H) and 0.9 (t, 3H)

**5.86. 1-[4-(4-Fluorophenyl)-2-methylthiazol-5-yl|phenyl]-3-phenylurea (16g)**

Compound (15ii) (0.2 g, 0.605 mmol) was dissolved in toluene (10mL) in a 50mL RBF. Phenyl isocyanate (0.1 mL, 0.726 mmol) was added drop-wise into the stirring solution of amine (15ii) at room temperature. The reaction was further carried out as described for compound (16a) to obtain the pure compound (16g), (0.15 g, 60%), m.p. 202-204°C.

**Anal:**

TLC : 0.34 (n-Hexane: Ethyl acetate) (7:3)

UV\textsubscript{max} (MeOH) : 252 nm

IR (KBr, cm\textsuperscript{-1}) : 3299, 1641, 1594, 1552, 1229 and 837

NMR : 7.0-7.9 (m, 13H), 6.5 (s, 2H) and 2.6 (s, 3H)

**5.87. 1-[4-(4-Fluorophenyl)-2-methylthiazol-5-yl|phenyl]-3-(2,4-difluorophenyl)urea (16h)**

Compound (15ii) (0.2 g, 0.605 mmol) was dissolved in toluene (10 mL) in a 50 mL RBF. 2,4-Difluorophenyl isocyanate (0.134 mL, 0.865 mmol) was added drop wise into the stirring solution of the amine (15ii) at room temperature. The reaction was further carried out as described for compound (16a), (0.3 g, 40%), m.p. 216-218°C.

**Anal:**

TLC : 0.32 (n-Hexane: Ethyl acetate) (7:3)

UV\textsubscript{max} (MeOH) : 254 nm

IR (KBr, cm\textsuperscript{-1}) : 3291, 1640, 1556, 1505, 1226, 1096 and 842

NMR : 8.8 (s, 1H), 8.4 (s, 1H), 6.8-8.2 (m, 11H) and 2.8 (s, 3H).
5.88. 1-{4-[4-(4-Fluorophenyl)-2-methylthiazol-5-yl]phenyl}-3-(2,6-diethylphenyl)urea (16i)

Compound (15ii) (0.2 g, 0.605 mmol) was dissolved in toluene (10 mL) in a 50 mL RBF. 2,6-Diethylphenyl isocyanate (0.165 mL, 0.865 mmol) was added drop-wise into the stirring solution of amine (15ii) at room temperature. The reaction was further carried out as described for compound (16a), (0.1 g, 35 %), m.p. 252-254°C.

Anal:

TLC : 0.32 (n-Hexane: Ethyl acetate) (7: 3)
UV<sub>max</sub> (MeOH) : 253 nm
IR (KBr, cm<sup>-1</sup>) : 3294, 1641, 1554, 1403 and 1222
MS : m/z 459 (M<sup>+</sup>)

5.89. 1-Butyl-3-{4-[4-(4-fluorophenyl)-2-methylthiazol-5-yl]phenyl}urea (16j)

Compound (15ii) (0.2 g, 0.605 mmol) was dissolved in toluene (10 mL) in a 50 mL RBF. n-Butyl isocyanate (0.077 g, 0.786 mmol) was added drop-wise into the stirring solution of the amine (15ii) at room temperature. The reaction was further carried out as described for compound (16a), (0.15 g, 62.5%), m.p. 178-180°C.

Anal:

TLC : 0.35 (n-Hexane: Ethyl acetate) (7: 3)
UV<sub>max</sub> (MeOH) : 252 nm
IR (KBr, cm<sup>-1</sup>) : 3314, 3117, 1634, 1514, 1403 and 1224
NMR : 8.4 (s, 1H), 7.2-7.7 (m, 8H), 5.9 (s, 1H), 3.2-3.4 (q, 2H), 2.7 (s, 3H), 1.2-1.4 (m, 4H) and 0.9-1.02 (t, 3H).

5.90. 1-Heptyl-3-{4-[4-(4-fluorophenyl)-2-methylthiazol-5-yl]phenyl}urea (16k)

Compound (15ii) (0.2 g, 0.605 mmol) was dissolved in toluene (10 mL) in a 50 mL RBF. n-Heptyl isocyanate (0.102 g, 0.723 mmol) was added drop-wise into the stirring solution of the amine (15ii) at room temperature. The reaction was further carried out as described for compound (16a), (0.15 g, 55.97 %), m.p. 154-156°C.

Anal:

TLC : 0.36 (n-Hexane: Ethyl acetate) (7: 3)
UV<sub>max</sub> (MeOH) : 256 nm
IR (KBr, cm<sup>-1</sup>) : 3279, 1638, 1590, 1547, 1402 and 1225.
PMR : 8.4 (s, 1H), 7.2-7.7 (m, 8H), 5.9 (s, 1H), 3.2-3.4 (m, 2H), 2.7 (s, 3H), 1.2-1.4 (m, 10H) and 0.9-1.04 (t, 3H).
5.91. 1-Dodecyl-3-\{4-[4-(4-fluorophenyl)-2-methylthiazol-5-yl]phenyl\}urea (16l)

Compound (15ii) (0.2 g, 0.605 mmol) was dissolved in toluene (10 mL) in a 50 mL RBF. 
n-Dodecyl isocyanate (0.102 g, 0.723 mmol) was added drop wise into the stirring solution of amine (15ii) at room temperature. The reaction was further carried out as described for compound (16a), (0.12 g, 40%), m.p. 182-184°C.

Anal:
TLC : 0.4 (n-Hexane: Ethyl acetate) (7: 3)
UV\textsubscript{max} (MeOH) : 254 nm
IR (KBr, cm\textsuperscript{-1}) : 3320, 1634, 1556, 1403, 1222 and 836.
PMR : 8.01 (s, 1H), 7.2-7.7 (m, 8H), 5.5 (s, 1H), 3.2 (q, 2H), 2.7 (s, 3H), 1.2-1.4 (m, 20H) and 0.9-1.03 (t, 3H).

5.92. 1-[4-[4-(Methylphenyl)-2-methylthiazol-5-yl]phenyl]-3-phenylurea (16m)

Compound (15iii) (0.5 g, 1.785 mmol) was dissolved in toluene (10 mL) in a 50 mL RBF. Phenyl isocyanate (0.09 mL, 0.726 mmol) was added drop-wise into the stirring solution of the above solution of 15iii at room temperature. The reaction was further carried out as described for compound (16a), (0.3 g, 42%), m.p. 204-206°C.

Anal:
TLC : 0.32 (n-Hexane: Ethyl acetate) (7: 3)
UV\textsubscript{max} (MeOH) : 257 nm
IR (KBr, cm\textsuperscript{-1}) : 3310, 1647, 1594, 1548, 1234 and 822
PMR : 8.2-8.3 (s, 2H), 6.9-7.4 (m, 13H), 2.7 (s, 3H) and 2.30 (s, 3H)
MS : m/z 400.0 (M+1)

5.93. 1-[4-[4-(Methylphenyl)-2-methylthiazol-5-yl]phenyl]-3-(2,4-difluorophenyl)urea (16n)

Compound (15iii) (0.5 g, 1.785 mmol) was dissolved in toluene (10 mL) in a 50 mL RBF. Phenyl isocyanate (0.086 g, 0.726 mmol) was added drop-wise into the stirring solution of the amine (15iii) at room temperature. The reaction was further carried out as described for compound (16a) to obtain the desired compound (16n), (0.3 g, 40%), m.p. 212-214°C.

Anal:
TLC : 0.32 (n-Hexane: Ethyl acetate) (7: 3)
Experimental

$\text{UV}_{\text{max}}$ (MeOH) : 254 nm

IR (KBr, cm$^{-1}$) : 3322, 1634, 1586, 1554 and 833

NMR : 8.4 (bs, 1H), 8.8 (bs, 1H), 6.8-8.2 (m, 11H), 2.9 (s, 3H) and 2.52 (s, 3H).

MS : m/z 436.0 (M$^+$)

5.94. 1-{4-[4-(4-Methylphenyl)-2-methylthiazol-5-yl]phenyl}-3-(2,6-diethylphenyl)urea (16o)

Compound (15iii) (0.5 g, 1.785 mmol) was dissolved in toluene (10 mL) in a 50 mL RBF. 2,6-Diethylphenyl isocyanate (0.086 g, 0.726 mmol) was added drop-wise into the stirring solution of the amine (15iii) at room temperature. The reaction was further carried out as described for compound (16a) to obtain the desired compound (16o), (0.1 g, 35%), m.p. 240-242$^\circ$C.

**Anal:**

TLC : 0.35 ($n$-Hexane: Ethyl acetate) (7: 3)

UV$_{\text{max}}$ (MeOH) : 250 nm

IR (KBr, cm$^{-1}$) : 3309, 1647, 1596, 1550, 1245, 1027 and 835

NMR : 8.2 (bs, 1H), 8.7 (bs, 1H), 6.8-8.2 (m, 11H), 2.62 (s, 3H), 2.30 (s, 3H), 2.61-2.67 (q, 4H) and 1.2-1.4 (t, 6H)

5.95. 1-Butyl-3-{4-[4-(4-methyphenyl)-2-methylthiazol-5-yl]phenyl}urea (16p)

Compound (15iii) (0.5 g, 1.785 mmol) was dissolved in toluene (10 mL) in a 50 mL RBF. $n$-Butyl isocyanate (0.08 g, 0.786 mmol) was added drop wise into the stirring solution of the amine (15iii) at room temperature. The reaction was further carried out as described for compound (16a) to obtain the desired compound (16p), (0.15 g, 62%), m.p. 158-159$^\circ$C.

**Anal:**

TLC : 0.35 ($n$-Hexane: Ethyl acetate) (7: 3)

UV$_{\text{max}}$ (MeOH): 252 nm

IR (KBr, cm$^{-1}$) : 3318, 1639, 1596, 1313, 1273 and 829

NMR : 7.0-7.5 (d, 8H), 6.3(s, 1H), 4.9(s, 1H), 2.62(s, 3H), 3.2-3.4 (q, 2H), 2.30 (s, 3H), 1.2-1.4 (m, 4H) and 0.9-1.02 (t, 3H).

MS : m/z 380.1(M$^+$)
5.96. 1-Heptyl-3-{4-[4-(4-methylphenyl)-2-methylthiazol-5-yl]phenyl}urea (16q)

Compound (15iii) (0.2 g, 0.71 mmol) was dissolved in toluene (10 mL) in a 50 mL RBF. n-Heptyl isocyanate (0.102 g, 0.72 mmol) was added drop-wise into the stirring solution of above amine (15iii) at room temperature. The reaction was further carried out as described for compound (16a) to obtain the desired compound (16q), (0.15 g, 53.97%), m.p. 168-170°C.

Anal:

TLC : 0.35 (n-Hexane: ethyl acetate) (7:3)
UV\textsubscript{max} (MeOH) : 250 nm
IR (KBr, cm\textsuperscript{-1}) : 3321, 1633, 1596, 1565, 1313, 1240 and 829

5.97. 1-Dodecyl-3-{4-[4-(4-methylphenyl)-2-methylthiazol-5-yl]phenyl}urea (16r)

Compound (15iii) (0.2 g, 0.714 mmol) was dissolved in toluene (10 mL) in a 50 mL RBF. n-Dodecyl isocyanate (0.102 g, 0.723 mmol) was added drop wise into the stirring solution of amine (15iii) at room temperature. The reaction was further carried out as described for compound (16a). to obtain the desired compound (16r), (0.12 g, 40%), m.p. 115-117°C.

Anal:

TLC : 0.4 (n-hexane: ethyl acetate) (7:3)
UV\textsubscript{max} (MeOH) : 250 nm
IR (KBr, cm\textsuperscript{-1}) : 3318, 1637, 1568, 1315 and 1240
PMR : 7.2-7.7 (m, 8H), 8.25 (s, 1H), 5.5 (s, 1H), 2.9 (s, 3H), 0.9-1.01 (t, 3H), 1.2-1.4 (m, 20H), 3.2-3.4 (q, 2H) and 2.4 (s, 3H).

5.98. 1-{4-[4-(4-Methoxyphenyl)-2-methylthiazol-5-yl]phenyl}-3-phenylurea (16s)

Compound (15iv) (0.5 g, 1.68 mmol) was dissolved in toluene (10 mL) in a 50 mL RBF. Phenyl isocyanate (0.086 g, 0.72 mmol) was added drop-wise into the stirring solution of the amine (15iv) at room temperature. The reaction was further carried out as described for compound (16a), to obtain the desired compound (16s), (0.3 g, 42%), m.p. 180-182°C.

Anal:

TLC : 0.32 (n-hexane: ethyl acetate) (7:3)
UV\textsubscript{max} (MeOH) : 256 nm
IR (KBr, cm\textsuperscript{-1}) : 3321, 1633, 1596, 1550, 1221 and 835
NMR : 8.5 (s, 2H), 6.9-7.4 (m, 13H), 2.82 (s, 3H) and 3.82 (s, 3H).

5.99. 1-{4-[(4-Methoxyphenyl)-2-methylthiazol-5-yl]phenyl}-3-(2,4-difluorophenyl)urea (16t)

Compound (15iv) (0.5 g, 1.68 mmol) was dissolved in toluene (10 mL) in a 50mL RDF. 2,4-Difluorophenyl isocyanate (0.34 g, 2.163 mmol) was added drop-wise into the stirring solution of the amine (15iv) at room temperature. The reaction was further carried out as described for compound (16a) to obtain the desired product (16t), (0.3 g, 40%), m.p. 188-190°C.

Anal:
TLC : 0.34 (n-Hexane: Ethyl acetate) (7: 3)

UV\text{max} (MeOH) : 250 nm

IR (KBr, cm\(^{-1}\)) : 3309, 1647, 1596, 1550, 1292 and 835

NMR : 8.4 (s, 1H), 8.8 (s, 1H), 6.8-8.2 (m, 11H), 3.75 (s, 3H) and 2.92 (s, 3H).

5.100. 1-{4-[(4-Methoxyphenyl)-2-methylthiazol-5-yl]phenyl}-3-(2,6-diethylphenyl)urea (16u)

Compound (15iv) (0.5 g, 1.68 mmol) was dissolved in toluene (10mL) in a 50 mL RBF. 2,6-Diethylphenyl isocyanate (0.34 g, 2.163 mmol) was added drop-wise into the stirring solution of the amine (15iv) at room temperature. The reaction was further carried out as described for compound (16a) to obtain the desired product (16u), (0.3 g, 35%), m.p. 248-250°C.

Anal:
TLC : 0.35 (n-Hexane: Ethyl acetate) (7: 3)

UV\text{max} (MeOH) : 252 nm

IR (KBr, cm\(^{-1}\)) : 3322, 1634, 1554, 1251, 1028 and 828

NMR : 7.01-7.91 (m, 11H), 3.75 (s, 3H), 2.72 (s, 3H), 2.67-2.72 (q, 4H) and 1.2-1.4 (t, 6H).

5.101. 1-Butyl-3-{4-[(4-methoxyphenyl)-2-methylthiazol-5-yl]phenyl}urea (16v)

Compound (15iv) (0.5 g, 1.689 mmol) was dissolved in toluene (10 mL) in a 50 mL RBF. n-Butyl isocyanate (0.34 g, 2.163mmol) was added drop wise into the stirring solution of the amine (15iv) at room temperature. The reaction was further carried out as described for compound (16a) to afford the desired compound (16v), (0.15 g, 62%), m.p. 178-180°C.

Anal:
TLC : 0.37 (n-Hexane: Ethyl acetate) (7: 3)
UV$_{\text{max}}$ (MeOH) : 254 nm

IR (KBr, cm$^{-1}$) : 3321, 2927, 1633, 1596, 1222, 1179 and 829

NMR : 8.3(s, 1H), 6.8-7.5(d, 8H), 6.1(s, 1H), 3.75 (s, 3H), 3.2-3.4(q, 2H), 2.7 (s, 3H), 1.2-1.4 (m, 4H) and 0.9-1.02 (t, 3H).

5.102. 1-Heptyl-3-{4-[4-(4-methoxyphenyl)-2-methylthiazol-5-yl]phenyl}urea (16w)

Compound (15iv) (0.5 g, 1.689 mmol) was dissolved in toluene (10 mL) in a 50 mL RBF. n-Heptyl isocyanate (0.34 g, 2.163 mmol) was added drop wise into the stirring solution of the amine (15iv) at room temperature. The reaction was further carried out as described for compound (16a) to obtain the desired product (16w), (0.15 g, 53.97%), m.p. 168-170°C.

Anal:

TLC : 0.35 (n-Hexane: Ethyl acetate) (7: 3)

UV$_{\text{max}}$ (MeOH) : 251nm

IR (KBr, cm$^{-1}$) : 3309, 2927, 1647, 1550, 1220, 1116 and 822

NMR : 8.5 (s, 1H), 6.8-7.5 (d, 8H), 5.62 (s, 1H), 3.9 (s, 3H), 3.41-3.51 (q, 2H), 2.8 (s, 3H), 1.2-1.4 (m, 10H), and 0.9-1.01 (t, 5H).

5.103. 1-Dodecyl-3-{4-[4-(4-methoxyphenyl)-2-methylthiazol-5-yl]phenyl}urea (16x)

Compound (15iv) (0.5 g, 1.68 mmol) was dissolved in toluene (10 mL) in a 50 mL RBF. n-Dodecyl isocyanate (0.17 g, 0.784 mmol) was added drop wise into the stirring solution of the amine (15iv) at room temperature. The reaction was further carried out as described for compound (16a) to afford the desired compound (16x), (0.12 g, 40%), m.p. 108-110°C.

Anal:

TLC : 0.4 (n-Hexane: Ethyl acetate) (7: 3)

UV$_{\text{max}}$ (MeOH): 251nm

IR (KBr, cm$^{-1}$) : 3291, 1638, 1555, 1227, 1138 and 846

NMR : 6.8-7.4 (m, 8H), 6.8 (s, 1H), 5.1 (s, 1H), 3.2-3.4(q, 2H), 3.8 (s, 3H), 2.7 (s, 3H), 1.2-1.4 (m, 20H) and 0.9-1.01(t, 3H).

5.104. 1-(4-Chlorophenyl)-2-(4-nitrophenyl)ethanedione (17i)

A mixture of 1-(4-chlorophenyl)-2-(nitrophenyl)ethanone (8d) (5.0 g, 20.7 mmol), selenium dioxide (3.5 g, 31.5 mmol) and dimethylsulphoxide (DMSO) (25 mL) in a loosely stoppered conical flask (100 mL) was exposed to microwave irradiations for 30 sec intermittently. The hot reaction mixture was filtered to remove precipitated selenium metal and washed with hot
dioxane (15 mL) and the combined filtrate was poured into crushed ice (150 g) and the solid obtained was filtered, washed with water followed by chilled methanol to afford the desired compound (17i), (4 g, 75%), m.p. 196-197°C (Lit\textsuperscript{139}199-200°C).

**Anal:**
- TLC : 0.82 (n-Hexane: Ethyl acetate) (7: 3)
- \(\text{UV}_{\text{max}}\) (MeOH) : 268 nm
- IR(KBr, cm\(^{-1}\)) : 1670, 1659, 1528, 1349, 1099 and 847.

**5.105. 1-(4-Fluorophenyl)-2-(4-nitropheno)ethanedione (17ii)**

The title compound (17ii) was synthesized as described in method for compound (17a) starting with 1-(4-fluorophenyl)-2-(4-nitropheno)ethanone (8e) (5.0 g, 19.3 mmol) to yield compound (17ii), (4.5 g, 86%), m.p. 155-156°C. (Lit\textsuperscript{140}154-155°C)

**Anal:**
- TLC : 0.82 (n-Hexane: Ethyl acetate) (7: 3)
- \(\text{UV}_{\text{max}}\) (MeOH): 268 nm
- IR(KBr, cm\(^{-1}\)) : 1673, 1658, 1532, 1351, 1242, 1205 and 850.

**5.106. 1-(4-Methylphenyl)-2-(4-nitropheno)ethanedione (17iii)**

The title compound (17iii) was synthesized as described in method for compound (17i) starting with 1-(4-methylphenyl)-2-(4-nitropheno)ethanone (8f) (5.0 g, 19.3 mmol) to yield compound (17iii), (4 g, 76%), m.p. 180-181°C. (Lit\textsuperscript{140}178-179°C)

**Anal:**
- TLC : 0.67 (n-Hexane: Ethyl acetate) (7: 3)
- \(\text{UV}_{\text{max}}\) (MeOH) : 270 nm
- IR(KBr, cm\(^{-1}\)) : 1670, 1660, 1521, 1348, 1205 and 846.

**5.107. 1-(4-Methoxyphenyl)-2-(4-nitropheno)ethanedione (17iv)**

The title compound (17iv) was synthesized as described in method for compound (17i) starting with 1-(4-methoxyphenyl)-2-(4-nitropheno)ethanone (8g) (5.0 g, 18.3 mmol) to yield compound (17iv), (4.7 g, 89%), m.p. 150-152°C. (Lit\textsuperscript{140}148-150°C)

**Anal:**
- TLC : 0.60 (n-Hexane: Ethyl acetate) (7:3)
- \(\text{UV}_{\text{max}}\) (MeOH) : 275 nm
IR (KBr, cm\(^{-1}\)) : 1675, 1648, 1524, 1348, 1266 and 847.

5.108. 1-(4-Chlorophenyl)-2-(4-nitrophenyl)ethanedione dioxime (18i)

A mixture of 1-(4-chlorophenyl)-2-(4-nitrophenyl)ethanedione (17i) (2.0 g, 6.9 mmol), hydroxylamine hydrochloride (4 g, 57.14 mmol) and pyridine (10 mL) was refluxed in an oil bath for 7 hr. The reaction mixture was poured into crushed ice (150 g) containing conc HCl (10 mL). The product was filtered, washed with water and dried to yield compound (18i), (1.8 g, 80%), m.p. 208-210°C.

Anal:

TLC : 0.19 and 0.21 (5% methanol in CHCl\(_3\))

UV\(_{\text{max}}\) (MeOH): 255 nm

IR (KBr, cm\(^{-1}\)) : 3274, 1594, 1525, 1346, 1090, 985 and 732.

5.109. 1-(4-Fluorophenyl)-2-(4-nitrophenyl)ethanedione dioxime (18ii)

The title compound (18ii) was synthesized as per the method described for compound (18i) starting with 1-(4-fluorophenyl)-2-(4-nitrophenyl)ethanedione (17ii) (2.0 g, 7.32 mmol) to yield compound (18ii), (1.8 g, 81%), m.p. 193-195°C.

Anal:

TLC : 0.19 and 0.21 (5% methanol in CHCl\(_3\))

5.110. 1-(4-Methylphenyl)-2-(4-nitrophenyl)ethanedione dioxime (18iii)

The title compound (18iii) was synthesized as per the method described for compound (18i) starting with 1-(4-methylphenyl)-2-(4-nitrophenyl)ethanedione (17iii) (2.0 g, 7.43 mmol) to offer compound (18iii), (1.8 g, 81%), m.p. 191-193°C.

Anal:

TLC : 0.24 and 0.26 (5% methanol in CHCl\(_3\))

IR (KBr, cm\(^{-1}\)) : 3195, 1601, 1515, 1338, 1079 and 852.

5.111. 1-(4-Methoxyphenyl)-2-(4-nitrophenyl)ethanedione dioxime (18iv)

The title compound (18iv) was synthesized as per the method described for compound (18i) starting with 1-(4-methoxyphenyl)-2-(4-nitrophenyl)ethanedione (17iv) (2.0 g, 6.64 mmol) to offer compound (18iv), (1.8 g, 81%), m.p. 191-193°C.

Anal:

TLC : 0.19 and 0.21 (5% methanol in CHCl\(_3\))
IR (KBr, cm\(^{-1}\)): 3272, 1598, 1514, 1346, 1026 and 852.

5.112. 3-(4-Chlorophenyl)-4-(4-nitrophenyl)-1,2,5-oxadiazole (19i)

A mixture of finely powdered 1-(4-chlorophenyl)-2-(4-nitrophenyl)ethanedione dioxime (18i) (2.0 g, 8.34 mmol) and succinic anhydride (4 g) was fused in an oil bath at 180-185°C for 10 min. The reaction mixture was cooled, suspended in water (200 mL) and the acid was neutralized by addition of sodium bicarbonate. The resulting suspension was extracted with successive quantities of chloroform (3x25 mL). The combined organic extract was washed with water (3x50 mL), dried and chloroform was distilled off. The crude product was crystallized from methanol to yield the compound (19i), (0.82 g, 43%), m.p. 168-170°C.

Anal:
- TLC : 0.85 (Benzene)
- UV\(_{\text{max}}\) (MeOH): 257 nm
- IR (KBr, cm\(^{-1}\)) : 1601, 1515, 1350, 1087 and 830.

5.113. 3-(4-Fluorophenyl)-4-(4-nitrophenyl)-1,2,5-oxadiazole (19ii)

The title compound (19ii) was synthesized as described for compound (19i) taking 1-(4-fluorophenyl)-2-(4-nitrophenyl)ethanedione dioxime (18ii) (2.0 g, 6.60 mmol) as the starting material. The product was recrystallised from methanol to yield compound (19ii), (0.86 g, 45%), m.p. 137-138°C.

Anal:
- TLC : 0.76 (Benzene)
- UV\(_{\text{max}}\) (MeOH) : 266 nm
- IR (KBr, cm\(^{-1}\)) : 1608, 1519, 1448, 1350, 1097 and 842.

5.114. 3-(4-Methylphenyl)-4-(4-nitrophenyl)-1,2,5-oxadiazole (19iii)

The title compound (19iii) was synthesized as described for compound (19i) taking 1-(4-methylphenyl)-2-(4-nitrophenyl)ethanedione dioxime (18iii) (2.0 g, 6.68 mmol) as the starting material. The product was recrystallised from methanol to yield compound (19iii), (0.72 g, 38%), m.p. 113-114°C.

Anal:
- TLC : 0.78 (Benzene)
- UV\(_{\text{max}}\) (MeOH) : 257 nm
Experimental

IR (KBr, cm⁻¹) : 1602, 1517, 1448, 1346, 1109 and 852.

5.115. 3-(4-Methoxyphenyl)-4-(4-nitrophenyl)-1,2,5-oxadiazole (19iv)

The title compound (19iv) was synthesized as described for compound (19i) taking 1-(4-methoxyphenyl)-2-(4-nitrophenyl)ethanedione dioxime (18iv) (2.0 g, 6.68 mmol) as the starting material. The product was recrystallised from methanol to yield compound (19iv), (0.6 g, 32%), m.p. 125-126°C.

Anal:

TLC : 0.80 (Benzene)

UV max (MeOH) : 266 nm

IR (KBr, cm⁻¹) : 1610, 1519, 1436, 1350, 1174 and 835.

5.116. 3-(4-Aminophenyl)-4-(4-chlorophenyl)-1,2,5-oxadiazole (20i)

Sodium chloride (1.0 g) and iron powder (1.0 g) were added in parts to a refluxing solution of 3-(4-chlorophenyl)-4-(4-nitrophenyl)-1,2,5-oxadiazole (19i) (0.5 g, 1.87 mmol) in aqueous methanol (200 mL, 95%). Refluxing was continued further for 7 hr. The reaction mixture was filtered through filtering aid (high flow supercel) and the filtrate was concentrated in vacuo to remove methanol. The resulting aqueous solution was neutralized by adding sodium bicarbonate and extracted with chloroform (3x25 mL). The combine organic extract was dried and the solvent removed to obtain a residue which was crystallized from aqueous methanol to yield the compound (20i), (0.4 g, 90%), m.p. 98-100°C.

Anal:

TLC : 0.28 (Benzene)

UV max (MeOH) : 243 nm

IR (KBr, cm⁻¹) : 3482, 3382, 3230, 1624, 1446 and 835

PMR : 6.95-7.42 (m, 8H) and 3.75 (s, 2H)

5.117. 3-(4-Aminophenyl)-4-(4-fluorophenyl)-1,2,5-oxadiazole (20ii)

The title compound (20ii) was synthesized as per the method described for compound (20i) taking 3-(4-fluorophenyl)-4-(4-nitrophenyl)-1,2,5-oxadiazole (19ii) (0.5 g, 1.75 mmol) as the starting material. The product was crystallized from aqueous methanol to offer compound (20ii), (0.4 g, 89%), m.p. 107-108°C.
Anal:

TLC : 0.3 (Benzene)

UV_{max} (MeOH) : 262 nm

IR (KBr, cm^{-1}) : 3477, 3378, 3228, 1624, 1446 and 835.

PMR : 6.51-7.91 (m, 8H) and 4.0 (s, 2H)

5.118. 3-(4-Aminophenyl)-4-(4-methylphenyl)-1,2,5-oxadiazole (20iii)

The title compound (20iii) was synthesized as per the method described for compound (20i) taking 3-(4-methylphenyl)-4-(4-nitrophenyl)-1,2,5-oxadiazole (19iii) (0.5 g, 1.75 mmol) as the starting material. The product was crystallized from aqueous methanol to offer compound (20iii), (0.4 g, 89 %), m.p. 143-144 °C.

Anal:

TLC : 0.3 (Benzene)

UV_{max} (MeOH) : 258 nm

IR (KBr, cm^{-1}) : 3469, 3134, 3224, 1620, 1446 and 835.

PMR : 6.51-7.91 (m, 8H), 2.40 (s, 3H) and 3.9 (s, 2H)

5.119. 3-(4-Aminophenyl)-4-(4-methoxyphenyl)-1,2,5-oxadiazole (20iv)

The title compound (20iv) was synthesized as per the method described for compound (20i) taking 3-(4-methoxyphenyl)-4-(4-nitrophenyl)-1,2,5-oxadiazole (19iv) (0.5 g, 1.75 mmol) as the starting material. The product was crystallized from aqueous methanol to offer compound (20iv), (0.4 g, 89%), m.p. 95-96 °C.

Anal:

TLC : 0.3 (Benzene)

UV_{max} (MeOH) : 262

IR (KBr, cm^{-1}) : 3469, 3373, 3232, 1620, 1445, 1244 and 835.

PMR : 6.72-7.85 (m, 8H), 4.0 (s, 3H), and 4.53 (s, 2H)

5.120. 1-{4-[4-(4-Chlorophenyl)furazan-3-yl]phenyl}-3-(2,4-difluorophenyl)urea (21a)

3-(4-Aminophenyl)-4-(4-chlorophenyl)-1,2,5-oxadiazole (20i) (0.2 g, 0.46 mmol) was dissolved in toluene (25 mL). 2,4-Difluorophenyl isocyanate (1 mL) was added and the reaction mixture was stirred for 5 hr and the reaction was monitored by TLC. Solid precipitate so obtained
was filtered, washed with toluene to remove the excess isocyanate. The ppt was dried and collected to obtain the desired compound (21a), (0.15 g, 70%), m.p. 221-223°C.

**Anal:**

TLC : 0.3 (n-Hexane: Ethyl acetate) (7: 3)

UV<sub>max</sub> (MeOH) : 260 nm

IR (KBr, cm<sup>-1</sup>) : 3292, 3182, 1656, 1603, 1551, 1423 and 1142

PMR : 8.41(s, 1H), 8.81 (s, 1H), 8.21-8.41 (m, 1H), 7.21-7.42 (m, 4H), 7.42-7.62 (m, 4H) and 6.71-7.05 (m, 2H).

**5.121. 1-{4-[4-(4-Chlorophenyl)furazan-3-yl]phenyl}-3-(2,6-diethylphenyl)urea (21b)**

The title compound (21b) was synthesized as per the method described for compound (21a) taking 3-(4-aminophenyl)-4-(4-chlorophenyl)-1,2,5-oxadiazole (20i) (0.2 g, 0.46 mmol) and 2,6-diethylphenyl isocyanate (1 mL) as the starting materials. The crude product was purified through column chromatography to obtain pure compound (21b), (0.15g, 70%), m.p. 198-200°C.

**Anal:**

TLC : 0.32 (n-Hexane: Ethyl acetate) (7: 3)

UV<sub>max</sub> (MeOH) : 260 nm

IR (KBr, cm<sup>-1</sup>) : 3321, 1650, 1595, 1550, 1259 and 801

PMR : 7.01-7.51 (m, 8H), 7.62-7.81 (m, 2H), 7.82-7.91 (t, 1H), 2.61-2.67 (q, 4H) and 1.2-1.4 (t, 6H).

**5.122. 1-Butyl-3-{4-[4-(4-chlorophenyl)furazan-3-yl]phenyl}urea (21c)**

The title compound (21c) was synthesized as per the method described for compound (21a) taking 3-(4-aminophenyl)-4-(4-chlorophenyl)-1,2,5-oxadiazole (20i) (0.2 g, 0.46 mmol) and n-butyl isocyanate (1 mL) as the starting materials. The crude product was purified through column chromatography to obtain the pure desired product (21c), (0.15 g, 70 %), m.p. 184-186°C.

**Anal:**

TLC : 0.30 (n-Hexane: Ethyl acetate) (7: 3)

UV<sub>max</sub> (MeOH) : 260 nm

IR (KBr, cm<sup>-1</sup>) : 3299, 1638, 1571, 1498, 1296, 1092 and 898

PMR : 8.41 (s, 1H), 7.2-7.7 (m, 8H), 3.37 (s, 3H), 3.21-3.45 (m, 2H), 1.2-1.4 (m, 4H) and 0.9-1.01 (t, 3H).
5.123. 1-Heptyl-3-{4-[4-(4-chlorophenyl)furazan-3-yl]phenyl}urea (21d)

The title compound (21d) was synthesized as per the method described for compound (21a) taking 3-(4-aminophenyl)-4-(4-chlorophenyl)-1,2,5-oxadiazole (20i) (0.2 g, 0.46 mmol) and n-heptyl isocyanate (1 mL) as the starting materials. The crude product was purified through column chromatography to obtain the pure desired compound (21d), (0.1 g, 65 %), m.p. 160-162°C.

Anal:

TLC : 0.32 (n-Hexane: Ethyl acetate) (7: 3)  
UV$_{\text{max}}$ (MeOH) : 260 nm  
IR (KBr, cm$^{-1}$) : 3321, 1650, 1573, 1499, 1295 and 875  
PMR : 6.91 (bs, 1H), 7.51-8.1 (m, 8H), 5.2 (bs, 1H), 3.35-3.52 (m, 2H), 1.51-1.61(m, 10H) and 0.9-1.01 (t, 3H).

5.124. 1-{4-[4-(4-Chlorophenyl)furazan-3-yl]phenyl}-3-dodecylurea (21e)

The title compound (21e) was synthesized as per the method described for compound (21a) taking 3-(4-aminophenyl)-4-(4-chlorophenyl)-1,2,5-oxadiazole (20i) (0.2 g, 0.46 mmol) and n-dodecyl isocyanate (1 mL) as the starting materials. The crude product was purified through column chromatography to obtain the pure compound (21e), (0.1g, 65%), m.p. 110-112°C.

Anal:

TLC : 0.35 (n-Hexane: Ethyl acetate) (7: 3)  
UV$_{\text{max}}$ (MeOH) : 260 nm  
IR (KBr, cm$^{-1}$) : 3336, 1636, 1568, 1468, 1291 and 891  
PMR : 8.2 (bs, 1H), 7.2-7.4 (m, 8H), 6.1 (bs, 1H), 3.1-3.3 (q, 2H), 1.3-1.5 (m, 20H) and 0.9-1.01 (t, 3H).

5.125. 1-{4-[4-(4-Fluorophenyl)furazan-3-yl]phenyl}-3-(2,4-difluorophenyl)urea (21f)

The title compound (21f) was synthesized as per the method described for compound (21a) taking 3-(4-aminophenyl)-4-(4-fluorophenyl)-1,2,5-oxadiazole (20ii) (0.2 g, 0.46 mmol) and 2,4-difluorophenyl isocyanate (1 mL) as the starting material. The crude product was crystallized from aqueous methanol to obtain compound (21f), (0.1 g, 50 %), m.p. 212-214°C.

Anal:

TLC : 0.35 (n-Hexane: Ethyl acetate) (7: 3)  
UV$_{\text{max}}$ (MeOH) : 264 nm
5.126. 1-{4-[4-(4-Fluorophenyl)furazan-3-yl]phenyl}-3-(2,6-diethylphenyl)urea (21g)

The title compound (21g) was synthesized as per the method described for compound (21a) taking 3-(4-aminophenyl)-4-(4-fluorophenyl)-1,2,5-oxadiazole (20ii) (0.2 g, 0.46 mmol) and 2,6-diethylphenyl isocyanate (1 mL) as the starting material. The crude product was crystallized from aqueous methanol to obtain pure compound (21g), (0.1 g, 50 %), m.p. 210-212°C.

**Anal:**

TLC : 0.35 (n-Hexane: Ethyl acetate) (7: 3)

UV<sub>max</sub> (MeOH) : 264 nm

IR (KBr, cm<sup>-1</sup>) : 3286, 1639, 1401, 1310, 1225, 1096 and 810

PMR : 7.01-7.51 (m, 8H), 7.62-7.81 (m, 2H), 7.82-7.91 (m, 1H), 2.61-2.67 (q, 4H) and 1.2-1.4 (t, 6H).

5.127. 1-Butyl-3-{4-[4-(4-fluorophenyl)furazan-3-yl]phenyl}urea (21h)

The title compound (21h) was synthesized as per the method described for compound (21a) taking 3-(4-aminophenyl)-4-(4-fluorophenyl)-1,2,5-oxadiazole (20ii) (0.2 g, 0.46 mmol) and n-butyl isocyanate (1 mL) as the starting materials. The crude product was crystallized from aqueous methanol to obtain pure compound (21h), (0.1 g, 50 %) m.p. 150-152°C.

**Anal:**

TLC : 0.36 (n-Hexane: Ethyl acetate) (7: 3)

UV<sub>max</sub> (MeOH) : 264 nm

IR (KBr, cm<sup>-1</sup>) : 3300, 1637, 1577, 1509, 1451, 1236 and 839

PMR : 8.41 (bs, 1H), 5.91 (bs, 1H), 7.21-7.61 (m, 8H), 3.62-3.81 (q, 2H), 2.61-2.67 (m, 4H) and 1.2-1.4 (t, 3H).

5.128. 1-Heptyl-3-{4-[4-(4-fluorophenyl)furazan-3-yl]phenyl}urea (21i)

The title compound (21i) was synthesized as per the method described for compound (21a) taking 3-(4-aminophenyl)-4-(4-fluorophenyl)-1,2,5-oxadiazole (20ii) (0.2 g, 0.46 mmol) and n-heptyl isocyanate (1 mL) as the starting materials. The crude product was crystallized from aqueous methanol to obtain compound (21i), (0.1 g, 50%), m.p. 136-138°C.
**Experimental**

**Anal:**

TLC : 0.35 (n-Hexane: Ethyl acetate) (7: 3)

UV$_{\text{max}}$ (MeOH) : 260 nm

IR (KBr, cm$^{-1}$) : 3298, 1637, 1553, 1453, 1235 and 841

PMR : 8.41 (bs, 1H), 7.2-7.7 (m, 8H), 5.91 (bs, 1H), 3.37-3.45 (m, 2H), 1.37-1.45 (m, 10H) and 0.9-1.01 (t, 3H).

**5.129. 1-4-[4-(4-Fluorophenyl)furazan-3-yl]phenyl-3-dodecylurea (21j)**

The title compound (21j) was synthesized as per the method described for compound (21a) taking 3-(4-aminophenyl)-4-(4-fluorophenyl)-1,2,5-oxadiazole (20ii) (0.2 g, 0.46 mmol) and $n$-dodecyl isocyanate (1 mL) as the starting materials. The crude product was crystallized from aqueous methanol to obtain pure compound (21j), (0.1 g, 50%), m.p. 82-85°C.

**Anal:**

TLC : 0.34 (n-Hexane: Ethyl acetate) (7: 3)

UV$_{\text{max}}$ (MeOH) : 260 nm

IR (KBr, cm$^{-1}$) : 3336, 1636, 1401, 1096 and 810

PMR : 8.5 (bs, 1H), 7.8 (bs, 1H), 7.2-7.4 (m, 8H), 1.3-3.5 (m, 22H) and 0.9-1.02 (t, 3H).

**5.130. 1-(2,4-Difluorophenyl)-3-[4-(p-tolyl)-1,2,5-oxadiazol-3-yl]phenylurea (21k)**

The title compound (21k) was synthesized as per the method described for compound (21a) taking 3-(4-aminophenyl)-4-(4-methylphenyl)-1,2,5-oxadiazole (20iii) (0.2 g, 0.46 mmol) and 2,4-difluorophenyl isocyanate (1 mL) as the starting materials. The crude product was crystallized from aqueous methanol to obtain pure compound (21k), (0.1 g, 50%), m.p. 198-200°C.

**Anal:**

TLC : 0.35 (n-Hexane: Ethyl acetate) (7: 3)

UV$_{\text{max}}$ (MeOH) : 265 nm

IR (KBr, cm$^{-1}$) : 3446, 1650, 1400, 1262, 1021 and 805

PMR : 9.3 (bs, 1H), 8.4 (bs, 1H), 6.8-8.2 (m, 11H) and 2.3 (s, 3H).
5.131. 1-(2,6-Diethylphenyl)-3-[4-(p-tolyl)-1,2,5-oxadiazol-3-yl]phenylurea (21l)

The title compound (21l) was synthesized as per the method described for compound (21a) taking 3-(4-aminophenyl)-4-(4-methylphenyl)-1,2,5-oxadiazole (20iii) (0.2 g, 0.46 mmol) and 2,6-diethylphenyl isocyanate (1 mL) as the starting materials. The crude product was crystallized from aqueous methanol to obtain pure compound (21l), (0.1 g, 50%), m.p. 205-207°C.

Anal:

TLC : 0.32 (n-Hexane: Ethyl acetate) (7: 3)

UV$_{\text{max}}$ (MeOH) : 262 nm

IR (KBr, cm$^{-1}$) : 3286, 1639, 1400, 1262, 1021 and 805

PMR : 7.01-7.51 (m, 8H), 7.62-7.81 (m, 2H), 7.82-7.91 (m, 1H), 2.61-2.67 (q, 4H), 2.37 (s, 3H) and 1.2-1.4 (t, 6H).

5.132. 1-Butyl-3-[4-(p-tolyl)-1,2,5-oxadiazol-3-yl]phenylurea (21m)

The title compound (21m) was synthesized as per the method described for compound (21a) taking 3-(4-aminophenyl)-4-(4-methylphenyl)-1,2,5-oxadiazole (20iii) (0.2 g, 0.46 mmol) and n-butyl isocyanate (1 mL) as the starting materials. The crude product was crystallized from aqueous methanol to obtain pure compound (21m), (0.1 g, 50%), m.p. 165-168°C.

Anal:

TLC : 0.34 (n-Hexane: Ethyl acetate) (7: 3)

UV$_{\text{max}}$ (MeOH) : 265 nm

IR (KBr, cm$^{-1}$) : 3301, 1654, 1453, 1401, 1229, 1025 and 804.

PMR : 8.41 (s, 1H), 7.2-7.7 (m, 8H), 5.91 (s, 1H), 3.37-3.40 (m, 2H), 2.37 (s, 3H), 1.2-1.4 (m, 4H) and 0.9-1.06 (t, 3H).

5.133. 1-Heptyl-3-[4-(p-tolyl)-1,2,5-oxadiazol-3-yl]phenylurea (21n)

The title compound (21n) was synthesized as per the method described for compound (21a) taking 3-(4-aminophenyl)-4-(4-methylphenyl)-1,2,5-oxadiazole (20iii) (0.2 g, 0.46 mmol) and n-heptyl isocyanate (1 mL) as the starting materials. The crude product was crystallized from aqueous methanol to obtain pure compound (21n), (0.1 g, 50%), m.p. 142-145°C.

Anal:

TLC : 0.32 (n-Hexane: Ethyl acetate) (7: 3)
UV\textsubscript{max} (MeOH) : 263 nm
IR (KBr, cm\textsuperscript{-1}) : 3321, 1650, 1511, 1401, 1255 and 810
PMR : 7.52-8.12 (m, 8H), 6.92 (bs, 1H), 5.21 (bs, 1H), 3.32 (m, 2H), 1.52-1.81 (m, 10H), 2.37 (s, 3H) and 0.91-1.02 (t, 3H)

5.134. 1-Dodecyl-3-[4-(p-tolyl)-1,2,5-oxadiazol-3-yl]phenylurea (21o)

The title compound (21o) was synthesized as per the method described for compound (21a) taking 3-(4-aminophenyl)-4-(4-methylphenyl)-1,2,5-oxadiazole (20iii) (0.2 g, 0.46 mmol) and \textit{n}-dodecyl isocyanate (1 mL) as the starting material. The crude product was purified through column chromatography to obtain compound (21o), (0.12 g, 62%), \textbf{m.p.} 162-165°C.

Anal:

TLC : 0.34 (\textit{n}-Hexane: Ethyl acetate) (7: 3)

UV\textsubscript{max} (MeOH) : 265 nm
IR (KBr, cm\textsuperscript{-1}) : 3336, 1636, 1524, 1290, 1024 and 814.
PMR : 8.5 (s, 1H), 7.2-7.4, (m, 8H), 7.8 (s, 1H), 2.3(s, 3H), 1.3-3.5 (m, 22H) and 0.9-1.05 (t, 3H).

5.135. 1-(2,4-Difluorophenyl)-3-[4-(4-methoxyphenyl)-1,2,5-oxadiazol-3-yl]phenylurea (21p)

The title compound (21p) was synthesized as per the method described for compound (21a) taking 3-(4-aminophenyl)-4-(4-methoxyphenyl)-1,2,5-oxadiazole (20iv) (0.2 g, 0.46 mmol) and 2,4-difluorophenyl isocyanate (1 mL) as the starting materials. The crude product was crystallized from aqueous methanol to obtain compound (21p), (0.13 g, 66 %), \textbf{m.p.} 210-212°C.

Anal:

TLC : 0.35 (\textit{n}-Hexane: Ethyl acetate) (7: 3)

UV\textsubscript{max} (MeOH) : 262 nm
IR (KBr, cm\textsuperscript{-1}) : 3401, 3124, 1654, 1504, 1220, 1027 and 836.
PMR : 8.4 (s, 1H), 9.3 (s, 1H), 6.8-8.2 (m, 11H) and 4.0 (s, 3H)

5.136. 1-(2,6-Diethylphenyl)-3-[4-(4-methoxyphenyl)-1,2,5-oxadiazol-3-yl]phenylurea (21q)

The title compound (21q) was synthesized as per the method described for compound (21a) taking 3-(4-aminophenyl)-4-(4-methoxyphenyl)-1,2,5-oxadiazole (20iv) (0.2 g, 0.46 mmol)
and 2,4-diethylphenyl isocyanate (1 mL) as the starting materials. The crude product was crystallized from aqueous methanol to obtain pure compound (21q), (0.09 g, 45 %), m.p. 240-242°C.

**Anal:**
- TLC : 0.38 (n-Hexane: Ethyl acetate) (7: 3)
- UV\textsubscript{max} (MeOH) : 264 nm
- IR (KBr, cm\textsuperscript{-1}) : 3298, 3129, 1637, 1410, 1220, 1024 and 854
- PMR :
  - 7.01-7.51 (m, 8H), 7.62-7.81 (d, 2H), 7.82-7.91 (m, 1H), 2.61-2.67 (q, 4H), 4.0 (s, 3H) and 1.2-1.4 (t, 6H)

### 5.137. 1-Butyl-3-[4-(4-methoxyphenyl)-1,2,5-oxadiazol-3-yl]phenylurea (21r)

The title compound (21r) was synthesized as per the method described for compound (21a) taking 3-(4-aminophenyl)-4-(4-methoxyphenyl)-1,2,5-oxadiazole (20iv) (0.2 g, 0.46 mmol) and n-butyl isocyanate (1 mL) as the starting materials. The crude product was crystallized from aqueous methanol to obtain pure compound (21r), (0.12 g, 61 %), m.p. 150-152°C.

**Anal:**
- TLC : 0.32 (n-Hexane: Ethyl acetate) (7: 3)
- UV\textsubscript{max} (MeOH) : 264 nm
- IR (KBr, cm\textsuperscript{-1}) : 3321, 1650, 1450, 1222 and 1025
- PMR :
  - 8.45 (s, 1H), 7.2-7.7 (m, 8H), 5.9 (s, 1H), 3.37-3.40 (m, 2H), 4.05 (s, 3H), 1.2-1.4 (m, 4H) and 0.9-1.05 (t, 3H)

### 5.138. 1-Heptyl-3-[4-(4-methoxyphenyl)-1,2,5-oxadiazol-3-yl]phenylurea (21s)

The title compound (21s) was synthesized as per the method described for compound (21a) taking 3-(4-aminophenyl)-4-(4-methoxyphenyl)-1,2,5-oxadiazole (20iv) (0.2 g, 0.46 mmol) and n-heptyl isocyanate (1 mL) as the starting materials. The crude product was crystallized from aqueous methanol to obtain pure compound (21s), (0.11 g, 49 %) m.p. 135-138°C.

**Anal:**
- TLC : 0.36 (n-Hexane: Ethyl acetate) (7: 3)
- UV\textsubscript{max} (MeOH) : 261 nm
- IR (KBr, cm\textsuperscript{-1}) : 3446, 1650, 1545, 1409, 1225 and 1025
- PMR :
  - 7.5-8.1 (m, 8H), 6.91 (bs, 1H), 5.2 (bs, 1H), 3.3-3.5 (m, 2H), 3.8 (s, 3H), 1.5-1.8 (m, 10H) and 0.9-1.02 (t, 3H)
5.139. 1-Dodecyl-3-[4-(4-methoxyphenyl)-1,2,5-oxadiazol-3-yl]phenylurea (21t)

The title compound (21t) was synthesized as per the method described for compound (21a) taking 3-(4-aminophenyl)-4-(4-methoxyphenyl)-1,2,5-oxadiazole (20iv) (0.2 g, 0.46 mmol) and *n*-dodecyl isocyanate (1 mL) as the starting materials. The crude product was crystallized from aqueous methanol to obtain compound (21s), (0.1 g, 50%), m.p. 121-123°C.

Anal:

- TLC : 0.34 (*n*-Hexane: Ethyl acetate) (7: 3)
- \( \text{UV}_{\text{max}} \) (MeOH) : 262 nm
- IR (KBr, cm\(^{-1}\)) : 3336, 1636, 1547, 1410 and 1220
- PMR : 8.5 (bs, 1H), 7.8 (bs, 1H), 7.2-7.4 (m, 8H), 4.0 (s, 3H), 1.3-3.5 (m, 22H) and 0.9-1.08 (t, 3H).

5.140. Biological studies

Screening of the synthesized compounds was performed as per the method of Largis et al\(^{141}\), \(^{142}\) with some modifications. The assay mixture consisted of potassium phosphate buffer (0.1 M), BSA (5 mg/ml), microsomal protein from rat liver (200 µg) and cholesterol solubilized in 45% w/v hydroxypropyl β-cyclodextrin (2 mM) and the reaction volume was made upto 850 µl with the help of potassium phosphate buffer (0.1 M). Vehicle or test/standard compounds were added having a final volume not exceeding 10 µl and incubated at room temperature for 15 mins to allow binding with the ACAT enzymes. The reaction was initiated by the addition of oleoyl CoA (200 µM, sigma). The reaction was allowed to proceed for 10 minutes at 37°C and was terminated by the addition of of chloroform: methanol mixture (6 mls, 2:1 v/v). This mixture was shaken in a separating funnel and phases were allowed to segregate. The organic phase was collected and evaporated to dryness. The residue was resuspended in of chloroform: methanol (500 µl, 2:1 v/v) and 25 µl of this solution was spotted on the aluminium backed silica gel 60F\(_{254}\) TLC plates (Merck) for separation of cholesteryl oleate and its quantification. Each sample was applied to the TLC plates at least in triplicate. Before sample application, chromatography plates were pre-washed using methanol as a mobile phase and dried for 10 minutes at 120°C to activate the plates. Samples were applied to the plate as 6 mm wide bands, 10 mm apart by means of Linomat V sample applicator (Camag, Switzerland) fitted with a 100 µl Hamilton syringe. A constant rate of application of 150 nI/s was used. After sample application, the plates were dried in a current of dry air and developed in a linear ascending manner using *n*-hexane-diethyl ether-glacial acetic
acid (90:10:1, v/v/v) as mobile phase. Mobile phase (18 ml) was used for development of each plate. Development was performed in a 10×10 twin-trough chamber (Camag, Switzerland) which was previously saturated with mobile phase for 30 minutes. All the steps were performed at 25±2°C and ambient relative humidity. The solvent front position was fixed at 80 mm from the point of application.

After running the mobile phase the plates were dried and dipped in a solution of anisaldehyde-sulphuric acid reagent. The plates were dried and heated at 120°C for 8 minutes. This led to the development of purple colored bands on the plates. Densitometric scanning was performed with Scanner III (Camag, Switzerland) in absorbance mode at 546 nm. The slit dimension was set at 0.6mm × 0.45mm and scanning speed was kept at 20 mm/s. Calculations were performed with the help of WinCats software (version 1.4.4, Camag). Percentage inhibition values were obtained by comparing the AUC of cholesteryl oleate in test compound lanes to that of vehicle lane.