

# Synthesis of Functional Isoxazole and Isothiazole Derivatives from [(5-Arylisoxazol-3-yl)methoxy]arylmethanols

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**Abstract**—A procedure has been developed for the synthesis of functional isoxazole and isothiazole derivatives by reduction of (5-aryl-1,2-oxazol-3-yl)methoxybenzaldehydes to (5-aryl-1,2-oxazol-3-yl)methoxyarylmethanols and subsequent acylation of the latter with isoxazole- and isothiazolecarbonyl chlorides.

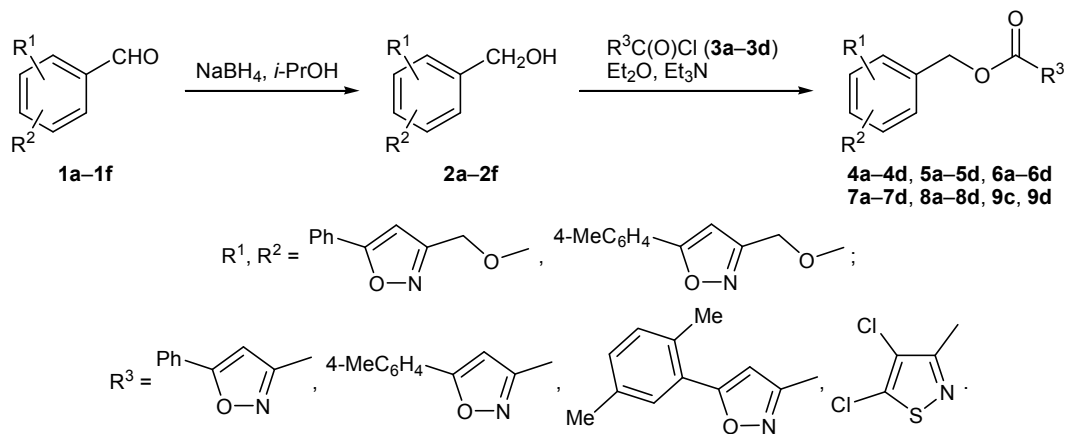
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Biological activity of substituted isoxazoles and isothiazoles is largely determined by functional environment of the corresponding heterocycles and their variable combinations [1–3]. Purposeful development of synthetic approaches to required exocyclic functionalities of isoxazoles and isothiazoles and preparation of their derivatives containing fragments of natural compounds, which may be promising for biological screening and use as ligands for metal complex catalysts, seem to be reasonable and important [4–6].

Herein, we describe a procedure for the synthesis of variable functional isoxazole and isothiazole deriva-

tives **4–9** by reduction of [(5-aryl-1,2-oxazol-3-yl)methoxy]benzaldehydes **1a–1f** [7] with sodium tetrahydridoborate in anhydrous isopropyl alcohol at 20–23°C to the corresponding [(5-aryl-1,2-oxazol-3-yl)methoxy]arylmethanols **2a–2f**, followed by acylation with 1,2-oxazole- and 1,2-thiazole-3-carboxylic acid chlorides **3a–3d** in anhydrous diethyl ether in the presence of triethylamine at 20–23°C (Scheme 1). Compounds **2a–2f**, **4a–4d**, **5a–5d**, **6a–6d**, **7a–7d**, **8a–8d**, **9c**, and **9d** were identified on the basis of their elemental compositions and IR, <sup>1</sup>H and <sup>13</sup>C NMR, and mass spectra.

**Scheme 1.**



**1a**, **2a**, **4a–4d**,  $R^1 = H$ ,  $R^2 = 2-[(5\text{-phenyl-1,2-oxazol-3-yl)methoxy}]$ ; **1b**, **2b**, **5a–5d**,  $R^1 = H$ ,  $R^2 = 2-[(5\text{-}(4\text{-methylphenyl)-1,2-oxazol-3-yl)methoxy}]$ ; **1c**, **2c**, **6a–6d**,  $R^1 = H$ ,  $R^2 = 4-[(5\text{-}(4\text{-methylphenyl)-1,2-oxazol-3-yl)methoxy}]$ ; **1d**, **2d**, **7a–7d**,  $R^1 = 4\text{-MeO}$ ,  $R^2 = 2-[(5\text{-}(4\text{-methylphenyl)-1,2-oxazol-3-yl)methoxy}]$ ; **1e**, **2e**, **8a–8d**,  $R^1 = 3\text{-MeO}$ ,  $R^2 = 4-[(5\text{-}(4\text{-methylphenyl)-1,2-oxazol-3-yl)methoxy}]$ ; **1f**, **2f**, **9c**, **9d**,  $R^1 = 3\text{-EtO}$ ,  $R^2 = 4-[(5\text{-}(4\text{-methylphenyl)-1,2-oxazol-3-yl)methoxy}]$ ; **3–9**,  $R^3 = 5\text{-phenyl-1,2-oxazol-3-yl}$  (**a**),  $5\text{-}(4\text{-methylphenyl)-1,2-oxazol-3-yl}$  (**b**),  $5\text{-}(2,5\text{-dimethylphenyl)-1,2-oxazol-3-yl}$  (**c**),  $4,5\text{-dichloro-1,2-thiazol-3-yl}$  (**d**).

Alcohols **2a–2f** and esters **4–9** are structural analogs of compounds exhibiting antitumor activity and enhancing the cytotoxic effect of such antitumor agents as cisplatin and carboplatin [2, 8]. They are now under medical and biological testing at the Institute of Physiology, National Academy of Sciences of Belarus. Some of the synthesized isoxazole derivatives attract interest as ligands for the preparation of palladium complexes and polymer modifiers with the aim of developing cross-coupling catalysts [1].

## EXPERIMENTAL

The IR spectra were recorded in KBr on a Nicolet Protégé-460 spectrometer. The  $^1\text{H}$  and  $^{13}\text{C}$  NMR spectra were measured on a Bruker Avance-500 spectrometer using  $\text{CDCl}_3$  as solvent and reference ( $\text{CHCl}_3$ ,  $\delta$  7.26 ppm;  $\text{CDCl}_3$ ,  $\delta_{\text{C}}$  77.2 ppm). The mass spectra were obtained on an Agilent 5975 inert MSD/6890N Network GC System (electron impact, 70 eV; HP-5MS capillary column, 30 m  $\times$  0.25 mm, film thickness 0.25  $\mu\text{m}$ ; injector temperature 250°C).

Initial [(5-aryl-1,2-oxazol-3-yl)methoxy]benzaldehydes **1a–1f** were synthesized by the Williamson reaction [7], and isoxazole- and isothiazolecarbonyl chlorides **3a–3d** were prepared as described in [9–11].

**[(5-Aryl-1,2-oxazol-3-yl)methoxy]arylmethanols 2a–2f (general procedure).** Aldehyde **1a–1f**, 10 mmol, was dissolved in 50 mL of anhydrous isopropyl alcohol, 10 mmol of  $\text{NaBH}_4$  was added, and the mixture was stirred for 24 h at 20–23°C. The mixture was then poured into 150 mL of 5% aqueous sodium carbonate and stirred for 3 h, and the precipitate was filtered off, washed with 500 mL of cold water, and dried under reduced pressure. Alcohols **2a–2f** were purified by low-temperature crystallization from methylene chloride–hexane.

**2-[(5-Phenyl-1,2-oxazol-3-yl)methoxy]phenylmethanol (2a).** Yield 83%, mp 79–80°C. IR spectrum,  $\nu$ ,  $\text{cm}^{-1}$ : 3311, 3150, 3138, 3064, 3042, 2919, 2860, 1602, 1592, 1574, 1493, 1468, 1449, 1426, 1368, 1288, 1240, 1181, 1161, 1119, 1060, 1050, 996, 947, 918, 873, 844, 801, 764, 754, 687.  $^1\text{H}$  NMR spectrum,  $\delta$ , ppm: 2.59 br.s (1H, OH), 4.75 s (2H,  $\text{CH}_2\text{OH}$ ), 5.24 s (2H,  $\text{CH}_2$ ), 6.61 s (1H, 4'-H), 6.80–7.20 m (2H,  $\text{H}_{\text{arom}}$ ), 7.28 d.d (1H,  $\text{H}_{\text{arom}}$ ,  $J = 7.9, 1.7$  Hz), 7.34 d.d (1H,  $\text{H}_{\text{arom}}$ ,  $J = 7.9, 1.7$  Hz), 7.43–7.63 m (3H,  $\text{H}_{\text{arom}}$ ), 7.76–7.79 m (2H,  $\text{H}_{\text{arom}}$ ).  $^{13}\text{C}$  NMR spectrum,  $\delta_{\text{C}}$ , ppm: 61.70 ( $\text{CH}_2$ ), 62.14 ( $\text{CH}_2$ ), 98.63 ( $\text{C}^4$ ), 111.72 ( $\text{CH}_{\text{arom}}$ ), 121.82 ( $\text{CH}_{\text{arom}}$ ), 126.02 (2C,  $\text{CH}_{\text{arom}}$ ), 129.15 (3C,  $\text{CH}_{\text{arom}}$ ), 129.17 ( $\text{CH}_{\text{arom}}$ ), 130.57 ( $\text{CH}_{\text{arom}}$ ), 127.20,

129.82, 155.97, 161.37, 170.85. Found, %: C 72.74; H 5.48; N 4.66.  $m/z$  281 [ $M$ ] $^+$ .  $\text{C}_{17}\text{H}_{15}\text{NO}_3$ . Calculated, %: C 72.58; H 5.37; N 4.98.  $M$  281.31.

**2-[[5-(4-Methylphenyl)-1,2-oxazol-3-yl]methoxy]phenylmethanol (2b).** Yield 87%, mp 86–87°C. IR spectrum,  $\nu$ ,  $\text{cm}^{-1}$ : 3450, 3128, 3079, 3059, 3034, 3010, 2921, 2856, 1616, 1594, 1568, 1517, 1495, 1469, 1452, 1434, 1369, 1290, 1238, 1188, 1160, 1117, 1056, 1021, 976, 948, 919, 821, 750, 503.  $^1\text{H}$  NMR spectrum,  $\delta$ , ppm: 2.40 s (3H, Me), 2.58 t (1H, OH,  $J = 6.5$  Hz), 4.75 d (2H,  $\text{CH}_2\text{OH}$ ,  $J = 6.5$  Hz), 5.23 s (2H,  $\text{CH}_2$ ), 6.56 s (1H, 4'-H), 6.94–7.04 m (2H,  $\text{H}_{\text{arom}}$ ), 7.25 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8$  Hz), 7.28 d.d (1H,  $\text{H}_{\text{arom}}$ ,  $J = 7.9, 1.8$  Hz), 7.35 d.d (1H,  $\text{H}_{\text{arom}}$ ,  $J = 7.9, 1.8$  Hz), 7.66 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8$  Hz).  $^{13}\text{C}$  NMR spectrum,  $\delta_{\text{C}}$ , ppm: 21.63 (Me), 61.74 ( $\text{CH}_2$ ), 62.18 ( $\text{CH}_2$ ), 98.01 ( $\text{C}^4$ ), 111.72 ( $\text{CH}_{\text{arom}}$ ), 121.79 ( $\text{CH}_{\text{arom}}$ ), 125.96 (2C,  $\text{CH}_{\text{arom}}$ ), 129.14 ( $\text{CH}_{\text{arom}}$ ), 129.16 ( $\text{CH}_{\text{arom}}$ ), 129.83 (2C,  $\text{CH}_{\text{arom}}$  and  $\text{C}_{\text{quat}}$ ), 124.52, 140.91, 156.01, 161.30, 171.04. Found, %: C 73.48; H 5.96; N 4.31.  $m/z$  276 [ $M - \text{H}_2\text{O} - \text{H}$ ] $^+$ .  $\text{C}_{18}\text{H}_{17}\text{NO}_3$ . Calculated, %: C 73.20; H 5.80; N 4.74.  $M$  295.34.

**4-[[5-(4-Methylphenyl)-1,2-oxazol-3-yl]methoxy]phenylmethanol (2c).** Yield 89%, mp 137–138°C. IR spectrum,  $\nu$ ,  $\text{cm}^{-1}$ : 3252, 3133, 3067, 3037, 2950, 2921, 2870, 2856, 1612, 1586, 1572, 1510, 1466, 1452, 1367, 1300, 1244, 1226, 1211, 1175, 1113, 1050, 1009, 860, 829, 803, 783, 505.  $^1\text{H}$  NMR spectrum,  $\delta$ , ppm: 1.79 t (1H, OH,  $J = 5.2$  Hz), 2.40 s (3H, Me), 4.62 d (2H,  $\text{CH}_2\text{OH}$ ,  $J = 5.2$  Hz), 5.17 s (2H,  $\text{CH}_2$ ), 6.59 s (1H, 4'-H), 6.99 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8.5$  Hz), 7.26 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8$  Hz), 7.31 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8.5$  Hz), 7.66 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8$  Hz).  $^{13}\text{C}$  NMR spectrum,  $\delta_{\text{C}}$ , ppm: 21.66 (Me), 62.04 ( $\text{CH}_2$ ), 65.06 ( $\text{CH}_2$ ), 98.35 ( $\text{C}^4$ ), 115.00 (2C,  $\text{CH}_{\text{arom}}$ ), 125.97 (2C,  $\text{CH}_{\text{arom}}$ ), 128.88 (2C,  $\text{CH}_{\text{arom}}$ ), 129.84 (2C,  $\text{CH}_{\text{arom}}$ ), 124.66, 134.25, 140.84, 157.80, 161.51, 170.91. Found, %: C 73.45; H 5.93; N 4.44.  $m/z$  276 [ $M - \text{H}_2\text{O} - \text{H}$ ] $^+$ .  $\text{C}_{18}\text{H}_{17}\text{NO}_3$ . Calculated, %: C 73.20; H 5.80; N 4.74.  $M$  295.34.

**(4-Methoxy-3-[[5-(4-methylphenyl)-1,2-oxazol-3-yl]methoxy]phenyl)methanol (2d).** Yield 81%, mp 85–86°C. IR spectrum,  $\nu$ ,  $\text{cm}^{-1}$ : 3398, 3138, 3058, 3033, 2921, 2853, 1618, 1594, 1570, 1519, 1465, 1445, 1425, 1377, 1322, 1261, 1243, 1183, 1162, 1136, 1030, 1020, 947, 815, 800, 504.  $^1\text{H}$  NMR spectrum,  $\delta$ , ppm: 2.10 br.s (1H, OH), 2.39 s (3H, Me), 3.87 s (3H, OMe), 4.59 s (2H,  $\text{CH}_2$ ), 5.23 s (2H,  $\text{CH}_2$ ), 6.63 s (1H, 4'-H), 6.87 d (1H,  $\text{H}_{\text{arom}}$ ,  $J = 8.2$  Hz), 6.95 d.d (1H,  $\text{H}_{\text{arom}}$ ,  $J = 8.2, 1.6$  Hz), 7.04 d (1H,  $\text{H}_{\text{arom}}$ ,  $J = 1.6$  Hz), 7.24 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8$  Hz), 7.64 d (2H,  $\text{H}_{\text{arom}}$ ,  $J =$

8 Hz).  $^{13}\text{C}$  NMR spectrum,  $\delta_{\text{C}}$ , ppm: 21.63 (Me), 56.17 (OMe), 63.08 ( $\text{CH}_2$ ), 65.07 ( $\text{CH}_2$ ), 98.53 ( $\text{C}^{4'}$ ), 111.99 ( $\text{CH}_{\text{arom}}$ ), 113.57 ( $\text{CH}_{\text{arom}}$ ), 120.98 ( $\text{CH}_{\text{arom}}$ ), 125.94 (2C,  $\text{CH}_{\text{arom}}$ ), 129.79 (2C,  $\text{CH}_{\text{arom}}$ ), 124.70, 133.96, 140.74, 147.63, 149.30, 161.54, 170.80. Found, %: C 70.42; H 5.97; N 4.15.  $m/z$  325 [ $M$ ] $^+$ .  $\text{C}_{19}\text{H}_{19}\text{NO}_4$ . Calculated, %: C 70.14; H 5.89; N 4.31.  $M$  325.36.

**(3-Methoxy-4-{[5-(4-methylphenyl)-1,2-oxazol-3-yl]methoxy}phenyl)methanol (2e).** Yield 82%, mp 103–104°C. IR spectrum,  $\nu$ ,  $\text{cm}^{-1}$ : 3396, 3137, 3077, 3034, 2959, 2921, 2888, 2837, 1612, 1595, 1570, 1522, 1468, 1438, 1419, 1372, 1333, 1298, 1264, 1236, 1167, 1141, 1114, 1038, 1010, 948, 916, 850, 820, 790, 639, 502.  $^1\text{H}$  NMR spectrum,  $\delta$ , ppm: 2.03 br.s (1H, OH), 2.38 s (3H, Me), 3.88 s (3H, OMe), 4.60 s (2H,  $\text{CH}_2$ ), 5.23 s (2H,  $\text{CH}_2$ ), 6.62 s (1H, 4'-H), 6.83 d.d (1H,  $\text{H}_{\text{arom}}$ ,  $J = 8.2, 1.9$  Hz), 6.95 d (1H,  $\text{H}_{\text{arom}}$ ,  $J = 1.9$  Hz), 6.96 d (1H,  $\text{H}_{\text{arom}}$ ,  $J = 8.2$  Hz), 7.24 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8$  Hz), 7.64 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8$  Hz).  $^{13}\text{C}$  NMR spectrum,  $\delta_{\text{C}}$ , ppm: 21.60 (Me), 56.05 (OMe), 63.23 ( $\text{CH}_2$ ), 65.22 ( $\text{CH}_2$ ), 98.48 ( $\text{C}^{4'}$ ), 111.17 ( $\text{CH}_{\text{arom}}$ ), 114.52 ( $\text{CH}_{\text{arom}}$ ), 119.47 ( $\text{CH}_{\text{arom}}$ ), 125.94 (2C,  $\text{CH}_{\text{arom}}$ ), 129.79 (2C,  $\text{CH}_{\text{arom}}$ ), 124.70, 135.32, 140.74, 147.04, 149.97, 161.64, 170.82. Found, %: C 70.37; H 5.99; N 4.10.  $m/z$  306 [ $M - \text{H}_2\text{O} - \text{H}$ ] $^+$ .  $\text{C}_{19}\text{H}_{19}\text{NO}_4$ . Calculated, %: C 70.14; H 5.89; N 4.31.  $M$  325.36.

**(3-Ethoxy-4-{[5-(4-methylphenyl)-1,2-oxazol-3-yl]methoxy}phenyl)methanol (2f).** Yield 80%, mp 62–63°C. IR spectrum,  $\nu$ ,  $\text{cm}^{-1}$ : 3355, 3148, 3054, 3021, 2975, 2923, 2870, 1619, 1600, 1568, 1517, 1457, 1430, 1400, 1372, 1263, 1236, 1223, 1168, 1138, 1112, 1038, 1018, 949, 907, 873, 841, 821, 804, 502.  $^1\text{H}$  NMR spectrum,  $\delta$ , ppm: 1.46 t (3H,  $\text{OCH}_2\text{Me}$ ,  $J = 7$  Hz), 1.97 br.s (1H, OH), 2.39 s (3H, Me), 4.11 q (2H,  $\text{OCH}_2\text{Me}$ ,  $J = 7$  Hz), 4.59 s (2H,  $\text{CH}_2$ ), 5.22 s (2H,  $\text{CH}_2$ ), 6.63 s (1H, 4'-H), 6.82 d.d (1H,  $\text{H}_{\text{arom}}$ ,  $J = 8.3, 1.9$  Hz), 6.95 d (1H,  $\text{H}_{\text{arom}}$ ,  $J = 1.9$  Hz), 6.96 d (1H,  $\text{H}_{\text{arom}}$ ,  $J = 8.3$  Hz), 7.25 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8$  Hz), 7.65 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8$  Hz).  $^{13}\text{C}$  NMR spectrum,  $\delta_{\text{C}}$ , ppm: 15.04 ( $\text{OCH}_2\text{Me}$ ), 21.62 (Me), 63.59 ( $\text{CH}_2$ ), 64.57 ( $\text{CH}_2$ ), 65.24 ( $\text{CH}_2$ ), 98.51 ( $\text{C}^{4'}$ ), 112.66 ( $\text{CH}_{\text{arom}}$ ), 115.52 ( $\text{CH}_{\text{arom}}$ ), 119.51 ( $\text{CH}_{\text{arom}}$ ), 125.92 (2C,  $\text{CH}_{\text{arom}}$ ), 129.79 (2C,  $\text{CH}_{\text{arom}}$ ), 124.74, 135.54, 140.71, 147.32, 149.51, 161.87, 170.67. Found, %: C 71.15; H 6.39; N 3.88.  $m/z$  339 [ $M$ ] $^+$ .  $\text{C}_{20}\text{H}_{21}\text{NO}_4$ . Calculated, %: C 70.78; H 6.24; N 4.13.  $M$  339.39.

**Esters 4–9 (general procedure).** Alcohol **2a–2f**, 10 mmol, was dissolved in 50 mL of anhydrous diethyl ether, 11 mmol of acid chloride **3a–3d** and 11 mmol of anhydrous triethylamine were added, and the mixture

was stirred for 8 h at 23°C. The precipitate was filtered off, washed with 5–10 mL of cold (5–10°C) diethyl ether, 200–300 mL of cold water (15–20°C), 150–200 mL of 5% aqueous  $\text{NaHCO}_3$ , and 200–300 mL of warm water (45–50°C), dried under reduced pressure, and purified by low-temperature crystallization from methylene chloride–hexane.

**2-[(5-Phenyl-1,2-oxazol-3-yl)methoxy]benzyl 5-phenyl-1,2-oxazole-3-carboxylate (4a).** Yield 83%, mp 153–154°C. IR spectrum,  $\nu$ ,  $\text{cm}^{-1}$ : 3423, 3146, 3133, 3063, 3033, 2924, 2858, 1728 (C=O), 1607, 1591, 1574, 1497, 1471, 1445, 1364, 1291, 1253, 1147, 1123, 1048, 1020, 1001, 947, 924, 817, 764, 689, 677.  $^1\text{H}$  NMR spectrum,  $\delta$ , ppm: 5.29 s (2H,  $\text{CH}_2$ ), 5.55 s (2H,  $\text{CH}_2$ ), 6.80 s and 6.92 s (4'-H, 4''-H), 7.00–7.07 m (2H,  $\text{H}_{\text{arom}}$ ), 7.35 d.d (1H,  $\text{H}_{\text{arom}}$ ,  $J = 7.9, 1.7$  Hz), 7.37–7.42 m (3H,  $\text{H}_{\text{arom}}$ ), 7.45–7.51 m (4H,  $\text{H}_{\text{arom}}$ ), 7.74–7.80 m (4H,  $\text{H}_{\text{arom}}$ ).  $^{13}\text{C}$  NMR spectrum,  $\delta_{\text{C}}$ , ppm: 62.05 ( $\text{CH}_2$ ), 63.74 ( $\text{CH}_2$ ), 99.17 and 100.21 ( $\text{C}^{4'}$ ,  $\text{C}^{4''}$ ), 111.95 ( $\text{CH}_{\text{arom}}$ ), 121.58 ( $\text{CH}_{\text{arom}}$ ), 126.07 (4C,  $\text{CH}_{\text{arom}}$ ), 129.07 (2C,  $\text{CH}_{\text{arom}}$ ), 129.33 (2C,  $\text{CH}_{\text{arom}}$ ), 130.40 ( $\text{CH}_{\text{arom}}$ ), 130.60 ( $\text{CH}_{\text{arom}}$ ), 131.01 ( $\text{CH}_{\text{arom}}$ ), 131.09 ( $\text{CH}_{\text{arom}}$ ), 123.74, 126.75, 127.38, 156.49, 157.09, 160.12, 161.57, 170.77, 171.91. Found, %: C 71.89; H 4.57; N 5.86.  $m/z$  452 [ $M$ ] $^+$ .  $\text{C}_{27}\text{H}_{20}\text{N}_2\text{O}_5$ . Calculated, %: C 71.67; H 4.46; N 6.19.  $M$  452.47.

**2-[(5-Phenyl-1,2-oxazol-3-yl)methoxy]benzyl 5-(4-methylphenyl)-1,2-oxazole-3-carboxylate (4b).** Yield 86%, mp 130–131°C. IR spectrum,  $\nu$ ,  $\text{cm}^{-1}$ : 3435, 3133, 3067, 3042, 2920, 2854, 1726 (C=O), 1605, 1593, 1573, 1505, 1469, 1447, 378, 1367, 1292, 1254, 1241, 1139, 1124, 1050, 1001, 947, 920, 820, 804, 764, 754, 694, 500.  $^1\text{H}$  NMR spectrum,  $\delta$ , ppm: 2.41 s (3H, Me), 5.28 s (2H,  $\text{CH}_2$ ), 5.54 s (2H,  $\text{CH}_2$ ), 6.80 s and 6.86 s (1H each, 4'-H, 4''-H), 6.98–7.06 m (2H,  $\text{H}_{\text{arom}}$ ), 7.28 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8$  Hz), 7.35 d.d (1H,  $\text{H}_{\text{arom}}$ ,  $J = 7.9, 1.4$  Hz), 7.36–7.43 m (3H,  $\text{H}_{\text{arom}}$ ), 7.47 d.d (1H,  $\text{H}_{\text{arom}}$ ,  $J = 7.4, 1.2$  Hz), 7.66 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8$  Hz), 7.74–7.81 m (2H,  $\text{H}_{\text{arom}}$ ).  $^{13}\text{C}$  NMR spectrum,  $\delta_{\text{C}}$ , ppm: 21.67 (Me), 62.01 ( $\text{CH}_2$ ), 63.65 ( $\text{CH}_2$ ), 99.16 and 99.59 ( $\text{C}^{4'}$ ,  $\text{C}^{4''}$ ), 111.91 ( $\text{CH}_{\text{arom}}$ ), 121.53 ( $\text{CH}_{\text{arom}}$ ), 125.98 (2C,  $\text{CH}_{\text{arom}}$ ), 126.04 (2C,  $\text{CH}_{\text{arom}}$ ), 129.04 (2C,  $\text{CH}_{\text{arom}}$ ), 129.96 (2C,  $\text{CH}_{\text{arom}}$ ), 130.35 ( $\text{CH}_{\text{arom}}$ ), 130.54 ( $\text{CH}_{\text{arom}}$ ), 131.04 ( $\text{CH}_{\text{arom}}$ ), 123.74, 124.03, 127.35, 141.41, 156.45, 157.00, 160.16, 161.55, 170.72, 172.08. Found, %: C 72.30; H 4.91; N 5.74.  $m/z$  466 [ $M$ ] $^+$ .  $\text{C}_{28}\text{H}_{22}\text{N}_2\text{O}_5$ . Calculated, %: C 72.09; H 4.75; N 6.01.  $M$  466.49.

**2-[(5-Phenyl-1,2-oxazol-3-yl)methoxy]benzyl 5-(2,5-dimethylphenyl)-1,2-oxazole-3-carboxylate**

**(4c).** Yield 88%, mp 127–129°C. IR spectrum,  $\nu$ ,  $\text{cm}^{-1}$ : 3165, 3067, 3046, 2955, 2922, 2855, 1733 (C=O), 1607, 1592, 1571, 1502, 1469, 1450, 1390, 1366, 1293, 1241, 1180, 1151, 1124, 1049, 1018, 1002, 951, 930, 910, 812, 769, 751, 692.  $^1\text{H}$  NMR spectrum,  $\delta$ , ppm: 2.37 s (3H, Me), 2.43 s (3H, Me), 5.30 s (2H,  $\text{CH}_2$ ), 5.56 s (2H,  $\text{CH}_2$ ), 6.82 s and 6.83 s (1H each, 4'-H, 4''-H), 7.00–7.07 m (2H,  $\text{H}_{\text{arom}}$ ), 7.19 s (2H,  $\text{H}_{\text{arom}}$ ), 7.35 d.d (1H,  $\text{H}_{\text{arom}}$ ,  $J = 7.9, 1.5$  Hz), 7.37–7.42 m (3H,  $\text{H}_{\text{arom}}$ ), 7.48 d.d (1H,  $\text{H}_{\text{arom}}$ ,  $J = 8.4, 1.2$  Hz), 7.53 s (1H,  $\text{H}_{\text{arom}}$ ), 7.78–8.01 m (2H,  $\text{H}_{\text{arom}}$ ).  $^{13}\text{C}$  NMR spectrum,  $\delta_{\text{C}}$ , ppm: 20.98 (Me), 21.06 (Me), 61.96 ( $\text{CH}_2$ ), 63.70 ( $\text{CH}_2$ ), 99.20 and 103.08 ( $\text{C}^4$ ,  $\text{C}^{4''}$ ), 111.91 ( $\text{CH}_{\text{arom}}$ ), 121.54 ( $\text{CH}_{\text{arom}}$ ), 126.04 (2C,  $\text{CH}_{\text{arom}}$ ), 129.03 (3C,  $\text{CH}_{\text{arom}}$ ), 130.38 ( $\text{CH}_{\text{arom}}$ ), 130.56 ( $\text{CH}_{\text{arom}}$ ), 131.07 ( $\text{CH}_{\text{arom}}$ ), 131.58 (2C,  $\text{CH}_{\text{arom}}$ ), 123.70, 125.95, 133.39, 136.11, 156.44, 156.67, 160.28, 161.59, 162.40, 170.73, 172.11. Found, %: C 72.84; H 5.13; N 5.56.  $m/z$  480  $[M]^+$ .  $\text{C}_{29}\text{H}_{24}\text{N}_2\text{O}_5$ . Calculated, %: C 72.49; H 5.03; N 5.83.  $M$  480.52.

**2-[(5-Phenyl-1,2-oxazol-3-yl)methoxy]benzyl 4,5-dichloro-1,2-thiazole-3-carboxylate (4d).** Yield 88%, mp 114–115°C. IR spectrum,  $\nu$ ,  $\text{cm}^{-1}$ : 3131, 3054, 3033, 3013, 2924, 2854, 1725 (C=O), 1606, 1592, 1573, 1494, 1453, 1408, 1363, 1354, 1256, 1241, 1211, 1162, 1123, 1080, 1041, 1018, 966, 914, 847, 763, 750, 684.  $^1\text{H}$  NMR spectrum,  $\delta$ , ppm: 5.26 s (2H,  $\text{CH}_2$ ), 5.54 s (2H,  $\text{CH}_2$ ), 6.73 s (4'-H), 6.99–7.04 m (2H,  $\text{H}_{\text{arom}}$ ), 7.33 d.d (1H,  $\text{H}_{\text{arom}}$ ,  $J = 7.9, 1.4$  Hz), 7.42–7.49 m (4H,  $\text{H}_{\text{arom}}$ ), 7.73–7.79 m (2H,  $\text{H}_{\text{arom}}$ ).  $^{13}\text{C}$  NMR spectrum,  $\delta_{\text{C}}$ , ppm: 62.09 ( $\text{CH}_2$ ), 63.60 ( $\text{CH}_2$ ), 99.02 ( $\text{C}^4$ ), 111.94 ( $\text{CH}_{\text{arom}}$ ), 121.60 ( $\text{CH}_{\text{arom}}$ ), 125.96 (2C,  $\text{CH}_{\text{arom}}$ ), 129.05 (2C,  $\text{CH}_{\text{arom}}$ ), 130.40 ( $\text{CH}_{\text{arom}}$ ), 130.44 ( $\text{CH}_{\text{arom}}$ ), 130.88 ( $\text{CH}_{\text{arom}}$ ), 123.65, 126.00, 127.29, 150.62, 154.40, 156.28, 159.10, 161.48, 170.59. Found, %: C 54.89; H 3.38; Cl 15.07; N 5.66; S 6.60.  $m/z$  460  $[M]^+$ .  $\text{C}_{21}\text{H}_{14}\text{Cl}_2\text{N}_2\text{O}_4\text{S}$ . Calculated, %: C 54.68; H 3.06; Cl 15.37; N 6.07; S 6.95.  $M$  461.31.

**2-[[5-(4-Methylphenyl)-1,2-oxazol-3-yl]methoxy]benzyl 5-phenyl-1,2-oxazole-3-carboxylate (5a).** Yield 84%, mp 133–135°C. IR spectrum,  $\nu$ ,  $\text{cm}^{-1}$ : 3134, 3067, 3038, 2960, 2920, 2875, 2852, 1729, 1605, 1590, 1573, 1497, 1475, 1444, 1362, 1291, 1252, 1145, 1122, 1047, 1019, 1000, 948, 926, 845, 810, 771, 762, 690.  $^1\text{H}$  NMR spectrum,  $\delta$ , ppm: 2.35 s (3H, Me), 5.27 s (2H,  $\text{CH}_2$ ), 5.55 s (2H,  $\text{CH}_2$ ), 6.71 s and 6.91 s (1H each, 4'-H, 4''-H), 7.02 t (1H,  $\text{H}_{\text{arom}}$ ,  $J = 7.5$  Hz), 7.04 d (1H,  $\text{H}_{\text{arom}}$ ,  $J = 8.4$  Hz), 7.18 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8$  Hz), 7.35 d.d (1H,  $\text{H}_{\text{arom}}$ ,  $J = 7.8, 1.3$  Hz), 7.42–7.52 m (4H,  $\text{H}_{\text{arom}}$ ), 7.64 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8$  Hz),

7.72–7.82 m (2H,  $\text{H}_{\text{arom}}$ ).  $^{13}\text{C}$  NMR spectrum,  $\delta_{\text{C}}$ , ppm: 21.61 (Me), 62.11 ( $\text{CH}_2$ ), 63.70 ( $\text{CH}_2$ ), 98.52 and 100.20 ( $\text{C}^4$ ,  $\text{C}^{4''}$ ), 111.99 ( $\text{CH}_{\text{arom}}$ ), 121.55 ( $\text{CH}_{\text{arom}}$ ), 125.98 (2C,  $\text{CH}_{\text{arom}}$ ), 126.08 (2C,  $\text{CH}_{\text{arom}}$ ), 129.29 (2C,  $\text{CH}_{\text{arom}}$ ), 129.75 (2C,  $\text{CH}_{\text{arom}}$ ), 130.55 ( $\text{CH}_{\text{arom}}$ ), 130.96 ( $\text{CH}_{\text{arom}}$ ), 131.02 ( $\text{CH}_{\text{arom}}$ ), 123.78, 124.70, 126.79, 140.65, 156.52, 157.08, 160.09, 161.46, 170.95, 171.88. Found, %: C 72.38; H 4.87; N 5.81.  $m/z$  466  $[M]^+$ .  $\text{C}_{28}\text{H}_{22}\text{N}_2\text{O}_5$ . Calculated, %: C 72.09; H 4.75; N 6.01.  $M$  466.49.

**2-[[5-(4-Methylphenyl)-1,2-oxazol-3-yl]methoxy]benzyl 5-(4-methylphenyl)-1,2-oxazole-3-carboxylate (5b).** Yield 88%, mp 136–138°C. IR spectrum,  $\nu$ ,  $\text{cm}^{-1}$ : 3146, 3133, 3038, 2948, 2920, 2854, 1723, 1617, 1607, 1594, 1498, 1467, 1448, 1412, 1368, 1289, 1257, 1230, 1200, 1186, 1135, 1040, 1005, 973, 948, 911, 808, 772, 755, 737, 497.  $^1\text{H}$  NMR spectrum,  $\delta$ , ppm: 2.34 s (3H, Me), 2.40 s (3H, Me), 5.26 s (2H,  $\text{CH}_2$ ), 5.54 s (2H,  $\text{CH}_2$ ), 6.72 s and 6.85 s (1H each, 4'-H, 4''-H), 7.02 t (1H,  $\text{H}_{\text{arom}}$ ,  $J = 7.5$  Hz), 7.04 d (1H,  $\text{H}_{\text{arom}}$ ,  $J = 8.2$  Hz), 7.17 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8$  Hz), 7.27 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8$  Hz), 7.34 d.d (1H,  $\text{H}_{\text{arom}}$ ,  $J = 7.9, 1.6$  Hz), 7.47 d.d (1H,  $\text{H}_{\text{arom}}$ ,  $J = 7.4, 1.4$  Hz), 7.58 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8$  Hz), 7.58 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8$  Hz).  $^{13}\text{C}$  NMR spectrum,  $\delta_{\text{C}}$ , ppm: 21.54 (Me), 21.60 (Me), 62.01 ( $\text{CH}_2$ ), 63.57 ( $\text{CH}_2$ ), 98.48 and 99.54 ( $\text{C}^4$ ,  $\text{C}^{4''}$ ), 111.89 ( $\text{CH}_{\text{arom}}$ ), 121.47 ( $\text{CH}_{\text{arom}}$ ), 125.91 (2C,  $\text{CH}_{\text{arom}}$ ), 125.94 (2C,  $\text{CH}_{\text{arom}}$ ), 129.68 (2C,  $\text{CH}_{\text{arom}}$ ), 129.89 (2C,  $\text{CH}_{\text{arom}}$ ), 130.45 ( $\text{CH}_{\text{arom}}$ ), 130.92 ( $\text{CH}_{\text{arom}}$ ), 123.74, 124.02, 124.62, 140.55, 141.32, 156.43, 156.95, 160.09, 161.40, 170.86, 172.00. Found, %: C 72.80; H 5.24; N 5.41.  $m/z$  480  $[M]^+$ .  $\text{C}_{29}\text{H}_{24}\text{N}_2\text{O}_5$ . Calculated, %: C 72.49; H 5.03; N 5.83.  $M$  480.52.

**2-[[5-(4-Methylphenyl)-1,2-oxazol-3-yl]methoxy]benzyl 5-(2,5-dimethylphenyl)-1,2-oxazole-3-carboxylate (5c).** Yield 89%, mp 121–122°C. IR spectrum,  $\nu$ ,  $\text{cm}^{-1}$ : 3128, 3067, 3048, 3012, 2955, 2922, 2854, 1730, 1606, 1595, 1561, 1518, 1504, 1473, 1445, 1376, 1365, 1294, 1255, 1187, 1147, 1127, 1060, 1005, 923, 827, 810, 791, 758, 501.  $^1\text{H}$  NMR spectrum,  $\delta$ , ppm: 2.33 s (3H, Me), 2.35 s (3H, Me), 2.41 s (3H, Me), 5.25 s (2H,  $\text{CH}_2$ ), 5.55 s (2H,  $\text{CH}_2$ ), 6.74 s and 6.80 s (1H each, 4'-H, 4''-H), 7.01 t (1H,  $\text{H}_{\text{arom}}$ ,  $J = 7.5$  Hz), 7.03 d (1H,  $\text{H}_{\text{arom}}$ ,  $J = 8.3$  Hz), 7.12–7.22 m (4H,  $\text{H}_{\text{arom}}$ ), 7.34 d.d (1H,  $\text{H}_{\text{arom}}$ ,  $J = 7.9, 1.7$  Hz), 7.47 d.d (1H,  $\text{H}_{\text{arom}}$ ,  $J = 7.4, 1.5$  Hz), 7.64 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8.2$  Hz).  $^{13}\text{C}$  NMR spectrum,  $\delta_{\text{C}}$ , ppm: 20.85 (Me), 20.93 (Me), 21.45 (Me), 61.90 ( $\text{CH}_2$ ), 63.54 ( $\text{CH}_2$ ), 98.44 and 102.94 ( $\text{C}^4$ ,  $\text{C}^{4''}$ ), 111.80 ( $\text{CH}_{\text{arom}}$ ), 121.37 ( $\text{CH}_{\text{arom}}$ ), 125.80 (2C,  $\text{CH}_{\text{arom}}$ ), 128.87 ( $\text{CH}_{\text{arom}}$ ), 129.59

(2C, CH<sub>arom</sub>), 130.40 (CH<sub>arom</sub>), 130.90 (CH<sub>arom</sub>), 131.40 (CH<sub>arom</sub>), 131.47 (CH<sub>arom</sub>), 123.63, 124.54, 125.85, 133.26, 135.96, 140.46, 156.37, 156.59, 160.11, 161.33, 170.74, 171.90. Found, %: C 73.05; H 5.51; N 5.50. *m/z* 494 [M]<sup>+</sup>. C<sub>30</sub>H<sub>26</sub>N<sub>2</sub>O<sub>5</sub>. Calculated, %: C 72.86; H 5.30; N 5.66. *M* 494.55.

**2-{{5-(4-Methylphenyl)-1,2-oxazol-3-yl}methoxy}benzyl 4,5-dichloro-1,2-thiazole-3-carboxylate (5d).** Yield 85%, mp 121–123°C. IR spectrum,  $\nu$ , cm<sup>-1</sup>: 3130, 3067, 3032, 3009, 2924, 2869, 1728, 1618, 1594, 1567, 1513, 1497, 1459, 1450, 1407, 1355, 1322, 1255, 1205, 1164, 1122, 1082, 1043, 1019, 966, 949, 915, 846, 815, 751, 728, 636, 503. <sup>1</sup>H NMR spectrum,  $\delta$ , ppm: 2.39 s (3H, Me), 5.25 s (2H, CH<sub>2</sub>), 5.55 s (2H, CH<sub>2</sub>), 6.67 s (1H, 4'-H), 7.01 t (1H, H<sub>arom</sub>, *J* = 7.5 Hz), 7.02 d (1H, H<sub>arom</sub>, *J* = 8.4 Hz), 7.25 d (2H, H<sub>arom</sub>, *J* = 8 Hz), 7.33 d.d (1H, H<sub>arom</sub>, *J* = 7.9, 1.6 Hz), 7.48 d.d (1H, H<sub>arom</sub>, *J* = 7.4, 1.4 Hz), 7.65 d (2H, H<sub>arom</sub>, *J* = 8 Hz). <sup>13</sup>C NMR spectrum,  $\delta_C$ , ppm: 21.62 (Me), 62.20 (CH<sub>2</sub>), 63.64 (CH<sub>2</sub>), 98.42 (C<sup>4'</sup>), 112.01 (CH<sub>arom</sub>), 121.60 (CH<sub>arom</sub>), 125.95 (2C, CH<sub>arom</sub>), 129.76 (2C, CH<sub>arom</sub>), 130.45 (CH<sub>arom</sub>), 130.87 (CH<sub>arom</sub>), 123.72, 124.67, 125.85, 140.72, 150.62, 154.48, 156.36, 159.14, 161.45, 170.83. Found, %: C 55.84; H 3.45; Cl 14.66; N 5.60; S 6.61. *m/z* 474 [M]<sup>+</sup>. C<sub>22</sub>H<sub>16</sub>Cl<sub>2</sub>N<sub>2</sub>O<sub>4</sub>S. Calculated, %: C 55.59; H 3.39; Cl 14.92; N 5.89; S 6.75. *M* 475.34.

**4-{{5-(4-Methylphenyl)-1,2-oxazol-3-yl}methoxy}benzyl 5-phenyl-1,2-oxazole-3-carboxylate (6a).** Yield 88%, mp 134–135°C. IR spectrum,  $\nu$ , cm<sup>-1</sup>: 3149, 3128, 3053, 3038, 2971, 2920, 2857, 1729, 1614, 1588, 1572, 1515, 1471, 1444, 1381, 1298, 1241, 1184, 1137, 1063, 1051, 1007, 982, 948, 828, 802, 766, 687, 507. <sup>1</sup>H NMR spectrum,  $\delta$ , ppm: 2.38 s (3H, Me), 5.19 s (2H, CH<sub>2</sub>), 5.37 s (2H, CH<sub>2</sub>), 6.58 s and 6.89 s (1H each, 4'-H, 4''-H), 7.03 d (2H, H<sub>arom</sub>, *J* = 8.7 Hz), 7.24 d (2H, H<sub>arom</sub>, *J* = 8.1 Hz), 7.43 d (2H, H<sub>arom</sub>, *J* = 8.7 Hz), 7.44–7.53 m (3H, H<sub>arom</sub>), 7.65 d (2H, H<sub>arom</sub>, *J* = 8.1 Hz), 7.72–7.82 m (2H, H<sub>arom</sub>). <sup>13</sup>C NMR spectrum  $\delta_C$ , ppm: 21.57 (Me), 61.99 (CH<sub>2</sub>), 67.49 (CH<sub>2</sub>), 98.28 and 100.07 (C<sup>4'</sup>, C<sup>4''</sup>), 115.04 (2C, CH<sub>arom</sub>), 125.91 (2C, CH<sub>arom</sub>), 126.01 (2C, CH<sub>arom</sub>), 129.22 (2C, CH<sub>arom</sub>), 129.77 (2C, CH<sub>arom</sub>), 130.74 (2C, CH<sub>arom</sub>), 130.90 (CH<sub>arom</sub>), 124.60, 126.69, 128.12, 140.76, 156.90, 158.53, 159.98, 161.27, 170.89, 171.83. Found, %: C 72.31; H 4.82; N 5.94. *m/z* 466 [M]<sup>+</sup>. C<sub>28</sub>H<sub>22</sub>N<sub>2</sub>O<sub>5</sub>. Calculated, %: C 72.09; H 4.75; N 6.01. *M* 466.49.

**4-{{5-(4-Methylphenyl)-1,2-oxazol-3-yl}methoxy}benzyl 5-(4-methylphenyl)-1,2-oxazole-3-car-**

**boxylate (6b).** Yield 87%, mp 143–144°C. IR spectrum,  $\nu$ , cm<sup>-1</sup>: 3141, 3121, 3047, 2966, 2920, 2858, 1728, 1613, 1599, 1589, 1511, 1461, 1448, 1431, 1412, 1369, 1302, 1266, 1244, 1175, 1135, 1113, 1063, 1008, 981, 949, 840, 820, 775, 501. <sup>1</sup>H NMR spectrum,  $\delta$ , ppm: 2.39 s (3H, Me), 2.40 s (3H, Me), 5.20 s (2H, CH<sub>2</sub>), 5.37 s (2H, CH<sub>2</sub>), 6.58 s and 6.84 s (1H each, 4'-H, 4''-H), 7.02 d (2H, H<sub>arom</sub>, *J* = 8.7 Hz), 7.25 d (2H, H<sub>arom</sub>, *J* = 8.2 Hz), 7.27 d (2H, H<sub>arom</sub>, *J* = 8.7 Hz), 7.43 d (2H, H<sub>arom</sub>, *J* = 8.2 Hz), 7.66 d (2H, H<sub>arom</sub>, *J* = 8.2 Hz), 7.67 d (2H, H<sub>arom</sub>, *J* = 8.2 Hz). <sup>13</sup>C NMR spectrum,  $\delta_C$ , ppm: 21.63 (Me), 21.66 (Me), 62.07 (CH<sub>2</sub>), 67.50 (CH<sub>2</sub>), 98.32 and 99.53 (C<sup>4'</sup>, C<sup>4''</sup>), 115.10 (2C, CH<sub>arom</sub>), 125.98 (2C, CH<sub>arom</sub>), 126.02 (2C, CH<sub>arom</sub>), 129.83 (2C, CH<sub>arom</sub>), 129.96 (2C, CH<sub>arom</sub>), 130.78 (2C, CH<sub>arom</sub>), 124.10, 124.68, 128.23, 140.82, 141.39, 156.90, 158.58, 160.13, 161.35, 170.97, 172.12. Found, %: C 72.66; H 5.19; N 5.48. *m/z* 480 [M]<sup>+</sup>. C<sub>29</sub>H<sub>24</sub>N<sub>2</sub>O<sub>5</sub>. Calculated, %: C 72.49; H 5.03; N 5.83. *M* 480.52.

**4-{{5-(4-Methylphenyl)-1,2-oxazol-3-yl}methoxy}benzyl 5-(2,5-dimethylphenyl)-1,2-oxazole-3-carboxylate (6c).** Yield 90%, mp 121–122°C. IR spectrum,  $\nu$ , cm<sup>-1</sup>: 3127, 3115, 3085, 3038, 2963, 2922, 2867, 1731, 1613, 1587, 1570, 1518, 1468, 1453, 1374, 1360, 1304, 1263, 1249, 1184, 1144, 1116, 1060, 1010, 981, 949, 832, 820, 808, 790, 777, 505. <sup>1</sup>H NMR spectrum,  $\delta$ , ppm: 2.37 s (3H, Me), 2.39 s (3H, Me), 2.45 s (3H, Me), 5.21 s (2H, CH<sub>2</sub>), 5.38 s (2H, CH<sub>2</sub>), 6.59 s and 6.81 s (1H each, 4'-H, 4''-H), 7.03 d (2H, H<sub>arom</sub>, *J* = 8.6 Hz), 7.18 s (2H, H<sub>arom</sub>), 7.26 d (2H, H<sub>arom</sub>, *J* = 8 Hz), 7.44 d (2H, H<sub>arom</sub>, *J* = 8.6 Hz), 7.53 s (1H, H<sub>arom</sub>), 7.67 d (2H, H<sub>arom</sub>, *J* = 8 Hz). <sup>13</sup>C NMR spectrum,  $\delta_C$ , ppm: 21.00 (Me), 21.06 (Me), 21.65 (Me), 62.02 (CH<sub>2</sub>), 67.58 (CH<sub>2</sub>), 98.36 and 103.05 (C<sup>4'</sup>, C<sup>4''</sup>), 115.10 (2C, CH<sub>arom</sub>), 126.01 (2C, CH<sub>arom</sub>), 129.12 (CH<sub>arom</sub>), 129.85 (2C, CH<sub>arom</sub>), 130.87 (2C, CH<sub>arom</sub>), 131.58 (2C, CH<sub>arom</sub>), 124.59, 125.89, 128.22, 133.44, 136.16, 140.93, 156.82, 158.56, 160.24, 161.39, 171.02, 172.19. Found, %: C 72.99; H 5.43; N 5.41. *m/z* 494 [M]<sup>+</sup>. C<sub>30</sub>H<sub>26</sub>N<sub>2</sub>O<sub>5</sub>. Calculated, %: C 72.86; H 5.30; N 5.66. *M* 494.55.

**4-{{5-(4-Methylphenyl)-1,2-oxazol-3-yl}methoxy}benzyl 4,5-dichloro-1,2-thiazole-3-carboxylate (6d).** Yield 84%, mp 149–150°C. IR spectrum,  $\nu$ , cm<sup>-1</sup>: 3125, 3066, 3038, 2951, 2921, 2876, 1724, 1615, 1599, 1589, 1570, 1513, 1476, 1461, 1445, 1404, 1364, 1348, 1299, 1226, 1177, 1088, 1053, 1024, 994, 964, 857, 813, 801, 725, 509. <sup>1</sup>H NMR spectrum,  $\delta$ , ppm: 2.39 s (3H, Me), 5.19 s (2H, CH<sub>2</sub>), 5.36 s (2H, CH<sub>2</sub>), 6.57 s (1H, 4'-H), 7.01 d (2H, H<sub>arom</sub>, *J* = 8.6 Hz),

7.25 d (2H,  $H_{\text{arom}}$ ,  $J = 8.1$  Hz), 7.43 d (2H,  $H_{\text{arom}}$ ,  $J = 8.6$  Hz), 7.66 d (2H,  $H_{\text{arom}}$ ,  $J = 8.1$  Hz).  $^{13}\text{C}$  NMR spectrum,  $\delta_{\text{C}}$ , ppm: 21.64 (Me), 62.06 ( $\text{CH}_2$ ), 67.80 ( $\text{CH}_2$ ), 98.31 ( $\text{C}^4$ ), 115.12 (2C,  $\text{CH}_{\text{arom}}$ ), 125.98 (2C,  $\text{CH}_{\text{arom}}$ ), 129.83 (2C,  $\text{CH}_{\text{arom}}$ ), 130.84 (2C,  $\text{CH}_{\text{arom}}$ ), 124.67, 125.79, 128.08, 140.83, 150.72, 154.39, 158.60, 159.13, 161.33, 170.96. Found, %: C 55.86; H 3.31; Cl 14.60; N 5.62; S 6.48.  $m/z$  474 [ $M$ ] $^+$ .  $\text{C}_{22}\text{H}_{16}\text{Cl}_2\text{N}_2\text{O}_4\text{S}$ . Calculated, %: C 55.59; H 3.39; Cl 14.92; N 5.89; S 6.74.  $M$  475.34.

**4-Methoxy-3-[[5-(4-methylphenyl)-1,2-oxazol-3-yl]methoxy]benzyl 5-phenyl-1,2-oxazole-3-carboxylate (7a).** Yield 83%, mp 163–164°C. IR spectrum,  $\nu$ ,  $\text{cm}^{-1}$ : 3133, 3063, 2958, 2922, 2854, 1737 (C=O), 1611, 1592, 1571, 1523, 1467, 1446, 1370, 1268, 1235, 1164, 1137, 1017, 949, 850, 819, 764, 687, 503.  $^1\text{H}$  NMR spectrum,  $\delta$ , ppm: 2.36 s (3H, Me), 3.90 s (3H, OMe), 5.29 s (2H,  $\text{CH}_2$ ), 5.35 s (2H,  $\text{CH}_2$ ), 6.63 s (1H, 4'-H or 4''-H), 6.91 d (2H,  $H_{\text{arom}}$ ,  $J = 8.2$  Hz), 6.92 s (1H, 4''-H or 4'-H), 7.09 d.d (1H,  $H_{\text{arom}}$ ,  $J = 8.2$ , 1.8 Hz), 7.18 d (1H,  $H_{\text{arom}}$ ,  $J = 1.8$  Hz), 7.21 d (2H,  $H_{\text{arom}}$ ,  $J = 8$  Hz), 7.42–7.52 m (3H,  $H_{\text{arom}}$ ), 7.62 d (2H,  $H_{\text{arom}}$ ,  $J = 8$  Hz), 7.75–7.84 m (2H,  $H_{\text{arom}}$ ).  $^{13}\text{C}$  NMR spectrum,  $\delta_{\text{C}}$ , ppm: 21.62 (Me), 56.18 (OMe), 62.17 ( $\text{CH}_2$ ), 67.69 ( $\text{CH}_2$ ), 98.52 and 100.16 ( $\text{C}^4$ ,  $\text{C}^{4''}$ ), 111.92 ( $\text{CH}_{\text{arom}}$ ), 115.24 ( $\text{CH}_{\text{arom}}$ ), 123.21 ( $\text{CH}_{\text{arom}}$ ), 125.95 (2C,  $\text{CH}_{\text{arom}}$ ), 126.11 (2C,  $\text{CH}_{\text{arom}}$ ), 129.28 (2C,  $\text{CH}_{\text{arom}}$ ), 129.78 (2C,  $\text{CH}_{\text{arom}}$ ), 130.93 ( $\text{CH}_{\text{arom}}$ ), 124.70, 126.80, 127.65, 140.70, 147.60, 150.24, 156.91, 159.99, 161.39, 170.88, 171.89. Found, %: C 70.38; H 4.97; N 5.34.  $m/z$  496 [ $M$ ] $^+$ .  $\text{C}_{29}\text{H}_{24}\text{N}_2\text{O}_6$ . Calculated, %: C 70.15; H 4.87; N 5.64.  $M$  496.52.

**4-Methoxy-3-[[5-(4-methylphenyl)-1,2-oxazol-3-yl]methoxy]benzyl 5-(4-methylphenyl)-1,2-oxazole-3-carboxylate (7b).** Yield 84%, mp 160–161°C. IR spectrum,  $\nu$ ,  $\text{cm}^{-1}$ : 3129, 3058, 3013, 2920, 2854, 1721 (C=O), 1612, 1593, 1570, 1523, 1466, 1446, 1432, 1377, 1367, 1295, 1271, 1243, 1165, 1144, 1054, 1039, 1018, 949, 914, 847, 819, 772, 504.  $^1\text{H}$  NMR spectrum,  $\delta$ , ppm: 2.36 s (3H, Me), 2.41 s (3H, Me), 3.90 s (3H, OMe), 5.28 s (2H,  $\text{CH}_2$ ), 5.34 s (2H,  $\text{CH}_2$ ), 6.63 s and 6.86 s (1H each, 4'-H, 4''-H), 6.91 d (2H,  $H_{\text{arom}}$ ,  $J = 8.2$  Hz), 7.09 d.d (1H,  $H_{\text{arom}}$ ,  $J = 8.2$ , 1.8 Hz), 7.17 d (1H,  $H_{\text{arom}}$ ,  $J = 1.8$  Hz), 7.21 d (2H,  $H_{\text{arom}}$ ,  $J = 8$  Hz), 7.27 d (2H,  $H_{\text{arom}}$ ,  $J = 8$  Hz), 7.63 d (2H,  $H_{\text{arom}}$ ,  $J = 8$  Hz), 7.68 d (2H,  $H_{\text{arom}}$ ,  $J = 8$  Hz).  $^{13}\text{C}$  NMR spectrum,  $\delta_{\text{C}}$ , ppm: 21.62 (Me), 21.68 (Me), 56.17 (OMe), 63.17 ( $\text{CH}_2$ ), 67.64 ( $\text{CH}_2$ ), 98.52 and 99.56 ( $\text{C}^4$ ,  $\text{C}^{4''}$ ), 111.91 ( $\text{CH}_{\text{arom}}$ ), 115.25 ( $\text{CH}_{\text{arom}}$ ), 123.22 ( $\text{CH}_{\text{arom}}$ ), 125.95 (2C,  $\text{CH}_{\text{arom}}$ ), 126.04 (2C,  $\text{CH}_{\text{arom}}$ ), 129.77 (2C,  $\text{CH}_{\text{arom}}$ ), 129.94 (2C,  $\text{CH}_{\text{arom}}$ ),

124.11, 124.71, 127.68, 140.69, 141.35, 147.59, 150.23, 156.85, 160.07, 161.38, 170.86, 172.09. Found, %: C 70.74; H 5.26; N 5.32.  $m/z$  510 [ $M$ ] $^+$ .  $\text{C}_{30}\text{H}_{26}\text{N}_2\text{O}_6$ . Calculated, %: C 70.58; H 5.13; N 5.49.  $M$  510.55.

**4-Methoxy-3-[[5-(4-methylphenyl)-1,2-oxazol-3-yl]methoxy]benzyl 5-(2,5-dimethylphenyl)-1,2-oxazole-3-carboxylate (7c).** Yield 88%, mp 133–135°C. IR spectrum,  $\nu$ ,  $\text{cm}^{-1}$ : 3126, 3062, 3025, 2960, 2922, 2850, 1732 (C=O), 1614, 1597, 1560, 1524, 1469, 1445, 1429, 1367, 1271, 1253, 1241, 1184, 1148, 1052, 1023, 1013, 1003, 949, 871, 814, 799, 781, 521, 502.  $^1\text{H}$  NMR spectrum,  $\delta$ , ppm: 2.35 s (3H, Me), 2.36 s (3H, Me), 2.44 s (3H, Me), 3.89 s (3H, OMe), 5.28 s (2H,  $\text{CH}_2$ ), 5.35 s (2H,  $\text{CH}_2$ ), 6.31 s and 6.80 s (1H each, 4'-H, 4''-H), 6.91 d (2H,  $H_{\text{arom}}$ ,  $J = 8.2$  Hz), 7.11 d.d (1H,  $H_{\text{arom}}$ ,  $J = 8.2$ , 1.6 Hz), 7.18 s (3H,  $H_{\text{arom}}$ ), 7.20 d (2H,  $H_{\text{arom}}$ ,  $J = 8$  Hz), 7.53 s (1H,  $H_{\text{arom}}$ ), 7.62 d (2H,  $H_{\text{arom}}$ ,  $J = 8$  Hz).  $^{13}\text{C}$  NMR spectrum,  $\delta_{\text{C}}$ , ppm: 20.97 (Me), 21.05 (Me), 21.57 (Me), 56.13 (OMe), 63.16 ( $\text{CH}_2$ ), 67.64 ( $\text{CH}_2$ ), 98.48 and 103.01 ( $\text{C}^4$ ,  $\text{C}^{4''}$ ), 111.89 ( $\text{CH}_{\text{arom}}$ ), 115.31 ( $\text{CH}_{\text{arom}}$ ), 123.28 ( $\text{CH}_{\text{arom}}$ ), 125.89 (2C,  $\text{CH}_{\text{arom}}$ ), 129.07 ( $\text{CH}_{\text{arom}}$ ), 129.73 (2C,  $\text{CH}_{\text{arom}}$ ), 131.48 ( $\text{CH}_{\text{arom}}$ ), 131.53 ( $\text{CH}_{\text{arom}}$ ), 124.66, 126.03, 127.66, 133.39, 136.08, 140.64, 147.58, 150.23, 156.53, 160.14, 161.33, 170.81, 172.06. Found, %: C 71.18; H 5.44; N 5.10.  $m/z$  524 [ $M$ ] $^+$ .  $\text{C}_{31}\text{H}_{28}\text{N}_2\text{O}_6$ . Calculated, %: C 70.98; H 5.38; N 5.34.  $M$  524.57.

**4-Methoxy-3-[[5-(4-methylphenyl)-1,2-oxazol-3-yl]methoxy]benzyl 4,5-dichloro-1,2-thiazole-3-carboxylate (7d).** Yield 85%, mp 137–138°C. IR spectrum,  $\nu$ ,  $\text{cm}^{-1}$ : 3142, 3128, 3067, 3005, 2967, 2934, 2890, 2858, 1732 (C=O), 1615, 1598, 1567, 1519, 1471, 1460, 1434, 1407, 1371, 1353, 1272, 1257, 1241, 1203, 11163, 1141, 1081, 1052, 1023, 966, 856, 812, 520, 503.  $^1\text{H}$  NMR spectrum,  $\delta$ , ppm: 2.38 s (3H, Me), 3.89 s (3H, OMe), 5.26 s (2H,  $\text{CH}_2$ ), 5.33 s (2H,  $\text{CH}_2$ ), 6.61 s (1H, 4'-H), 6.90 d (2H,  $H_{\text{arom}}$ ,  $J = 8.2$  Hz), 7.09 d.d (1H,  $H_{\text{arom}}$ ,  $J = 8.2$ , 1.8 Hz), 7.15 d (1H,  $H_{\text{arom}}$ ,  $J = 1.8$  Hz), 7.24 d (2H,  $H_{\text{arom}}$ ,  $J = 8$  Hz), 7.64 d (2H,  $H_{\text{arom}}$ ,  $J = 8$  Hz).  $^{13}\text{C}$  NMR spectrum,  $\delta_{\text{C}}$ , ppm: 21.63 (Me), 56.15 (OMe), 63.23 ( $\text{CH}_2$ ), 67.94 ( $\text{CH}_2$ ), 98.46 ( $\text{C}^4$ ), 111.92 ( $\text{CH}_{\text{arom}}$ ), 115.28 ( $\text{CH}_{\text{arom}}$ ), 123.30 ( $\text{CH}_{\text{arom}}$ ), 125.94 (2C,  $\text{CH}_{\text{arom}}$ ), 129.78 (2C,  $\text{CH}_{\text{arom}}$ ), 124.71, 125.84, 127.53, 140.71, 147.63, 150.26, 150.68, 154.28, 159.06, 161.37, 170.80. Found, %: C 54.93; H 3.67; Cl 13.84; N 5.18; S 6.11.  $m/z$  504 [ $M$ ] $^+$ .  $\text{C}_{23}\text{H}_{18}\text{Cl}_2\text{N}_2\text{O}_5\text{S}$ . Calculated, %: C 54.66; H 3.59; Cl 14.03; N 5.54; S 6.34.  $M$  505.37.

**3-Methoxy-4-{{5-(4-methylphenyl)-1,2-oxazol-3-yl}methoxy}benzyl 5-phenyl-1,2-oxazole-3-carboxylate (8a).** Yield 82%, mp 135–136°C. IR spectrum,  $\nu$ ,  $\text{cm}^{-1}$ : 3148, 3133, 3068, 3033, 2962, 2923, 2852, 1731, 1611, 1596, 1572, 1519, 1468, 1449, 1441, 1422, 1367, 1329, 1273, 1252, 1234, 1166, 1142, 1035, 1016, 993, 949, 819, 806, 763, 686, 676, 499.  $^1\text{H}$  NMR spectrum,  $\delta$ , ppm: 2.34 s (3H, Me), 3.90 s (3H, OMe), 5.24 s (2H,  $\text{CH}_2$ ), 5.34 s (2H,  $\text{CH}_2$ ), 6.60 s and 6.88 s (1H each, 4'-H, 4''-H), 7.00 s (2H,  $\text{H}_{\text{arom}}$ ), 7.04 s (1H,  $\text{H}_{\text{arom}}$ ), 7.20 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8$  Hz), 7.37–7.47 m (3H,  $\text{H}_{\text{arom}}$ ), 7.62 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8$  Hz), 7.68–7.78 m (2H,  $\text{H}_{\text{arom}}$ ).  $^{13}\text{C}$  NMR spectrum,  $\delta_{\text{C}}$ , ppm: 21.47 (Me), 56.00 (OMe), 62.92 ( $\text{CH}_2$ ), 67.68 ( $\text{CH}_2$ ), 98.33 and 99.99 ( $\text{C}^{4'}$ ,  $\text{C}^{4''}$ ), 112.74 ( $\text{CH}_{\text{arom}}$ ), 114.03 ( $\text{CH}_{\text{arom}}$ ), 121.78 ( $\text{CH}_{\text{arom}}$ ), 125.78 (2C,  $\text{CH}_{\text{arom}}$ ), 125.89 (2C,  $\text{CH}_{\text{arom}}$ ), 129.13 (2C,  $\text{CH}_{\text{arom}}$ ), 129.65 (2C,  $\text{CH}_{\text{arom}}$ ), 130.83 ( $\text{CH}_{\text{arom}}$ ), 124.51, 126.53, 128.80, 140.59, 147.84, 149.70, 156.77, 159.87, 161.30, 170.71, 171.74. Found, %: C 70.36; H 4.96; N 5.30.  $m/z$  496  $[\text{M}]^+$ .  $\text{C}_{29}\text{H}_{24}\text{N}_2\text{O}_6$ . Calculated, %: C 70.15; H 4.87; N 5.64.  $M$  496.52.

**3-Methoxy-4-{{5-(4-methylphenyl)-1,2-oxazol-3-yl}methoxy}benzyl 5-(4-methylphenyl)-1,2-oxazole-3-carboxylate (8b).** Yield 84%, mp 164–165°C. IR spectrum,  $\nu$ ,  $\text{cm}^{-1}$ : 3130, 3062, 3029, 2962, 2923, 2852, 1729, 1614, 1595, 1567, 1522, 1474, 1445, 1424, 1381, 1357, 1330, 1273, 1253, 1236, 1172, 1148, 1138, 1118, 1060, 1034, 1016, 984, 948, 851, 818, 780, 499.  $^1\text{H}$  NMR spectrum,  $\delta$ , ppm: 2.37 s (3H, Me), 2.38 s (3H, Me), 3.91 s (3H, OMe), 5.26 s (2H,  $\text{CH}_2$ ), 5.35 s (2H,  $\text{CH}_2$ ), 6.61 s and 6.84 s (1H each, 4'-H, 4''-H), 7.01 s (2H,  $\text{H}_{\text{arom}}$ ), 7.04 s (1H,  $\text{H}_{\text{arom}}$ ), 7.23 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8$  Hz), 7.25 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8$  Hz), 7.64 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8$  Hz), 7.65 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8$  Hz).  $^{13}\text{C}$  NMR spectrum,  $\delta_{\text{C}}$ , ppm: 21.56 (Me), 21.60 (Me), 56.10 (OMe), 63.03 ( $\text{CH}_2$ ), 67.72 ( $\text{CH}_2$ ), 98.39 and 99.47 ( $\text{C}^{4'}$ ,  $\text{C}^{4''}$ ), 112.80 ( $\text{CH}_{\text{arom}}$ ), 114.12 ( $\text{CH}_{\text{arom}}$ ), 121.86 ( $\text{CH}_{\text{arom}}$ ), 125.88 (2C,  $\text{CH}_{\text{arom}}$ ), 125.93 (2C,  $\text{CH}_{\text{arom}}$ ), 129.73 (2C,  $\text{CH}_{\text{arom}}$ ), 129.89 (2C,  $\text{CH}_{\text{arom}}$ ), 123.95, 124.61, 128.91, 140.68, 141.34, 147.89, 149.78, 156.79, 160.05, 161.41, 170.82, 172.05. Found, %: C 70.72; H 5.21; N 5.36.  $m/z$  510  $[\text{M}]^+$ .  $\text{C}_{30}\text{H}_{26}\text{N}_2\text{O}_6$ . Calculated, %: C 70.58; H 5.13; N 5.49.  $M$  510.55.

**3-Methoxy-4-{{5-(4-methylphenyl)-1,2-oxazol-3-yl}methoxy}benzyl 5-(2,5-dimethylphenyl)-1,2-oxazole-3-carboxylate (8c).** Yield 86%, mp 140–141°C. IR spectrum,  $\nu$ ,  $\text{cm}^{-1}$ : 3143, 3125, 3059, 3023, 2963, 2925, 2851, 1733, 1608, 1596, 1559, 1523, 1473, 1453, 1437, 1379, 1331, 1273, 1255, 1237, 1186,

1145, 1033, 1016, 986, 822, 811, 778, 501.  $^1\text{H}$  NMR spectrum,  $\delta$ , ppm: 2.37 s (3H, Me), 2.39 s (3H, Me), 2.45 s (3H, Me), 3.92 s (3H, OMe), 5.27 s (2H,  $\text{CH}_2$ ), 5.37 s (2H,  $\text{CH}_2$ ), 6.62 s and 6.80 s (1H each, 4'-H, 4''-H), 7.02 s (2H,  $\text{H}_{\text{arom}}$ ), 7.05 s (1H,  $\text{H}_{\text{arom}}$ ), 7.18 s (2H,  $\text{H}_{\text{arom}}$ ), 7.25 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8$  Hz), 7.53 s (1H,  $\text{H}_{\text{arom}}$ ), 7.65 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8$  Hz).  $^{13}\text{C}$  NMR spectrum,  $\delta_{\text{C}}$ , ppm: 21.01 (Me), 21.08 (Me), 21.65 (Me), 56.19 (OMe), 63.13 ( $\text{CH}_2$ ), 67.82 ( $\text{CH}_2$ ), 98.45 and 103.06 ( $\text{C}^{4'}$ ,  $\text{C}^{4''}$ ), 112.92 ( $\text{CH}_{\text{arom}}$ ), 114.20 ( $\text{CH}_{\text{arom}}$ ), 121.99 ( $\text{CH}_{\text{arom}}$ ), 125.98 (2C,  $\text{CH}_{\text{arom}}$ ), 129.11 ( $\text{CH}_{\text{arom}}$ ), 129.81 (2C,  $\text{CH}_{\text{arom}}$ ), 131.57 ( $\text{CH}_{\text{arom}}$ ), 131.59 ( $\text{CH}_{\text{arom}}$ ), 124.70, 126.02, 128.98, 133.42, 136.16, 140.77, 147.98, 149.85, 156.59, 160.25, 161.49, 170.93, 172.17. Found, %: C 71.10; H 5.43; N 5.18.  $m/z$  524  $[\text{M}]^+$ .  $\text{C}_{31}\text{H}_{28}\text{N}_2\text{O}_6$ . Calculated, %: C 70.98; H 5.38; N 5.34.  $M$  524.57.

**3-Methoxy-4-{{5-(4-methylphenyl)-1,2-oxazol-3-yl}methoxy}benzyl 4,5-dichloro-1,2-thiazole-3-carboxylate (8d).** Yield 86%, mp 119–120°C. IR spectrum,  $\nu$ ,  $\text{cm}^{-1}$ : 3144, 3056, 2957, 2920, 2852, 1731, 1615, 1595, 1572, 1521, 1473, 1450, 1402, 1352, 1331, 1271, 1233, 1201, 1195, 1169, 1145, 1079, 1054, 1036, 1020, 975, 934, 908, 851, 821, 806, 792, 639, 507.  $^1\text{H}$  NMR spectrum,  $\delta$ , ppm: 2.35 s (3H, Me), 3.88 s (3H, OMe), 5.23 s (2H,  $\text{CH}_2$ ), 5.33 s (2H,  $\text{CH}_2$ ), 6.59 s (1H, 4'-H), 6.99 s (2H,  $\text{H}_{\text{arom}}$ ), 7.02 s (1H,  $\text{H}_{\text{arom}}$ ), 7.20 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8$  Hz), 7.61 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8$  Hz).  $^{13}\text{C}$  NMR spectrum,  $\delta_{\text{C}}$ , ppm: 21.50 (Me), 56.01 (OMe), 62.93 ( $\text{CH}_2$ ), 67.90 ( $\text{CH}_2$ ), 98.32 ( $\text{C}^{4'}$ ), 112.68 ( $\text{CH}_{\text{arom}}$ ), 114.06 ( $\text{CH}_{\text{arom}}$ ), 121.76 ( $\text{CH}_{\text{arom}}$ ), 125.79 (2C,  $\text{CH}_{\text{arom}}$ ), 129.65 (2C,  $\text{CH}_{\text{arom}}$ ), 124.52, 125.70, 128.70, 140.59, 147.82, 149.69, 150.61, 154.13, 158.92, 161.30, 170.71. Found, %: C 54.85; H 3.64; Cl 13.80; N 5.27; S 6.03.  $m/z$  504  $[\text{M}]^+$ .  $\text{C}_{23}\text{H}_{18}\text{Cl}_2\text{N}_2\text{O}_5\text{S}$ . Calculated, %: C 54.66; H 3.59; Cl 14.03; N 5.54; S 6.34.  $M$  505.37.

**3-Ethoxy-4-{{5-(4-methylphenyl)-1,2-oxazol-3-yl}methoxy}benzyl 5-(2,4-dimethylphenyl)-1,2-oxazole-3-carboxylate (9c).** Yield 81%, mp 131–132°C. IR spectrum,  $\nu$ ,  $\text{cm}^{-1}$ : 3152, 3138, 3063, 3033, 2974, 2928, 2877, 1729 ( $\text{C}=\text{O}$ ), 1617, 1592, 1560, 1520, 1465, 1449, 1429, 1398, 1379, 1363, 1333, 1290, 1255, 1243, 1229, 1183, 1152, 1136, 1113, 1057, 1039, 1014, 963, 943, 843, 815, 803, 780, 504.  $^1\text{H}$  NMR spectrum,  $\delta$ , ppm: 1.48 t (3H,  $\text{OCH}_2\text{Me}$ ,  $J = 7$  Hz), 2.36 s (3H, Me), 2.38 s (3H, Me), 2.44 s (3H, Me), 4.14 q (2H,  $\text{OCH}_2\text{Me}$ ,  $J = 7$  Hz), 5.26 s (2H,  $\text{CH}_2$ ), 5.36 s (2H,  $\text{CH}_2$ ), 6.63 s and 6.80 s (1H each, 4'-H, 4''-H), 7.01 s (2H,  $\text{H}_{\text{arom}}$ ), 7.06 s (1H,  $\text{H}_{\text{arom}}$ ), 7.18 s (2H,  $\text{H}_{\text{arom}}$ ), 7.24 d (2H,  $\text{H}_{\text{arom}}$ ,  $J = 8$  Hz), 7.53 s (1H,

H<sub>arom</sub>), 7.65 d (2H, H<sub>arom</sub>,  $J = 8$  Hz). <sup>13</sup>C NMR spectrum,  $\delta_C$ , ppm: 14.99 (OCH<sub>2</sub>Me), 20.97 (Me), 21.04 (Me), 21.60 (Me), 63.44 (CH<sub>2</sub>), 64.70 (CH<sub>2</sub>), 67.78 (CH<sub>2</sub>), 98.45 and 103.01 (C<sup>4'</sup>, C<sup>4''</sup>), 114.44 (CH<sub>arom</sub>), 115.22 (CH<sub>arom</sub>), 121.91 (CH<sub>arom</sub>), 125.91 (2C, CH<sub>arom</sub>), 129.05 (CH<sub>arom</sub>), 129.77 (2C, CH<sub>arom</sub>), 131.52 (CH<sub>arom</sub>), 131.54 (CH<sub>arom</sub>), 124.71, 125.98, 129.17, 133.36, 136.11, 140.69, 148.26, 149.39, 156.56, 160.19, 161.69, 170.72, 172.10. Found, %: C 71.69; H 5.80; N 5.01.  $m/z$  538 [M]<sup>+</sup>. C<sub>32</sub>H<sub>30</sub>N<sub>2</sub>O<sub>6</sub>. Calculated, %: C 71.36; H 5.61; N 5.20.  $M$  538.60.

**3-Ethoxy-4-[[5-(4-methylphenyl)-1,2-oxazol-3-yl]methoxy]benzyl 4,5-dichloro-1,2-thiazole-3-carboxylate (9d).** Yield 80%, mp 126–127°C. IR spectrum,  $\nu$ , cm<sup>-1</sup>: 3146, 3080, 3077, 2962, 2924, 2872, 2855, 1731 (C=O), 1617, 1604, 1593, 1523, 1476, 1448, 1434, 1407, 1371, 1352, 1298, 1271, 1253, 1241, 1207, 1171, 1140, 1112, 1079, 1041, 964, 877, 814, 801, 650, 503. <sup>1</sup>H NMR spectrum,  $\delta$ , ppm: 1.46 t (3H, OCH<sub>2</sub>Me,  $J = 7$  Hz), 2.38 s (3H, Me), 4.12 q (2H, OCH<sub>2</sub>Me,  $J = 7$  Hz), 5.25 s (2H, CH<sub>2</sub>), 5.34 s (2H, CH<sub>2</sub>), 6.61 s (1H, 4'-H), 6.99 s (2H, H<sub>arom</sub>), 7.04 s (1H, H<sub>arom</sub>), 7.24 d (2H, H<sub>arom</sub>,  $J = 8$  Hz), 7.64 d (2H, H<sub>arom</sub>,  $J = 8$  Hz). <sup>13</sup>C NMR spectrum,  $\delta_C$ , ppm: 14.98 (OCH<sub>2</sub>Me), 21.61 (Me), 63.43 (CH<sub>2</sub>), 64.66 (CH<sub>2</sub>), 68.04 (CH<sub>2</sub>), 98.44 (C<sup>4'</sup>), 114.35 (CH<sub>arom</sub>), 115.23 (CH<sub>arom</sub>), 121.87 (CH<sub>arom</sub>), 125.91 (2C, CH<sub>arom</sub>), 129.77 (2C, CH<sub>arom</sub>), 124.70, 125.81, 129.00, 140.69, 148.25, 149.37, 150.73, 154.30, 159.07, 161.68, 170.71. Found, %: C 55.79; H 3.96; Cl 13.28; N 5.17; S 5.86.  $m/z$  518 [M]<sup>+</sup>. C<sub>24</sub>H<sub>20</sub>Cl<sub>2</sub>N<sub>2</sub>O<sub>5</sub>S. Calculated, %: C 55.50; H 3.88; Cl 13.65; N 5.39; S 6.17.  $M$  519.39.

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