Supporting Information -I

Organocatalytic Enone-Azide [3+2]-Cycloaddition: Synthesis of Functionally Rich C/N-Double Vinyl 1,2,3-Triazoles

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CONTENTS

<table>
<thead>
<tr>
<th>CONTENTS</th>
<th>Page No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. General methods</td>
<td>S1-2</td>
</tr>
<tr>
<td>2. Materials</td>
<td>S2</td>
</tr>
<tr>
<td>3. General experimental procedures</td>
<td>S2-3</td>
</tr>
<tr>
<td>4. Crystal structure for 4aj [Figure S1]</td>
<td>S3</td>
</tr>
<tr>
<td>5. Crystal structure for 6ac [Figure S2]</td>
<td>S3</td>
</tr>
<tr>
<td>6. Crystal structure for 9ap [Figure S3]</td>
<td>S3</td>
</tr>
<tr>
<td>7. Table-S1</td>
<td>S4</td>
</tr>
<tr>
<td>8. Spectral data</td>
<td>S4-26</td>
</tr>
<tr>
<td>9. References</td>
<td>S26</td>
</tr>
</tbody>
</table>

General Methods: The $^1$H NMR and $^{13}$C NMR spectra were recorded at 400 MHz and 100 MHz respectively. The chemical shifts are reported in ppm downfield to TMS ($\delta = 0$) for $^1$H NMR and relative to the central CDCl$_3$ resonance ($\delta = 77.0$) for $^{13}$C NMR. In the $^{13}$C NMR spectra, the nature of the carbons (C, CH, CH$_2$ or CH$_3$) was determined by recording the DEPT-135 experiment, and is given in parentheses. The coupling constants $J$ are given in Hz. Column chromatography was performed using Acme’s silica gel (particle size 0.063-0.200 mm). High-resolution mass spectra were recorded on micromass ESI-TOF MS. GCMS mass spectrometry was performed on Shimadzu GCMS-QP2010 mass spectrometer. IR spectra were recorded on JASCO FT/IR-5300 and Thermo Nicolet FT/IR-5700. Elemental analyses were recorded on a Thermo Finnigan Flash EA 1112 analyzer. Mass spectra were recorded on either VG7070H mass spectrometer using EI technique or Shimadzu-LCMS-2010 A mass
spectrometer. The X-ray diffraction measurements were carried out at 298 K on an automated Enraf-Nonious MACH 3 diffractometer using graphite monochromated, Mo-Kα (λ = 0.71073 Å) radiation with CAD4 software or the X-ray intensity data were measured at 298 K on a Bruker SMART APEX CCD area detector system equipped with a graphite monochromator and a Mo-Kα fine-focus sealed tube (λ = 0.71073 Å). For thin-layer chromatography (TLC), silica gel plates Merck 60 F254 were used and compounds were visualized by irradiation with UV light and/or by treatment with a solution of p-anisaldehyde (23 mL), conc. H2SO4 (35mL), acetic acid (10 mL), and ethanol (900 mL) followed by heating.

Materials: All solvents and commercially available chemicals were used as received. Starting materials 1a-g,1 and 82 were synthesized based on the previous literature methods.

General Experimental Procedures:

Procedure A: General procedure for the DBU-catalyzed domino [3+2]-cycloaddition reactions in DMSO: In an ordinary glass vial equipped with a magnetic stirring bar, to 0.10 mmol of DBU (3e) in DMSO (1.0 mL), was added 0.75 mmol of azides (2 or 5) and 0.5 mmol of corresponding enones (1 or 8) and the reaction mixture was stirred at 25 °C for 0.5-6.0 h. The crude reaction mixture was worked up with aqueous NH₄Cl solution and the aqueous layer was extracted with dichloromethane (2 x 20 mL). The combined organic layers were dried (Na₂SO₄), filtered and concentrated. Pure click products were obtained by column chromatography (silica gel, mixture of hexane/ethyl acetate).

Procedure B: General procedure for the DDQ oxidation of 4aa: In a 10 mL round bottom flask equipped with a magnetic stirring bar, to 0.5 mmol of compound 4aa was added 5.0 mL of dry toluene as a solvent and then DDQ (2 equiv., 1.0 mmol) was added. The reaction mixture were refluxed for 48 h, the crude product was purified by column chromatography on silica gel (hexane/EtOAc) to afford the oxidized product 11.

Procedure C: General procedure for the hydrogenation of 11: In a 10 mL round bottomed flask, a solution of 0.5 mmol of 11 in dry methanol (5 mL) was taken followed by addition of Pd/C (10 mol%). The reaction mixture was purged with nitrogen gas followed by hydrogen gas. The reaction mixture was allowed to stir at 25 °C under the pressure of a hydrogen gas
filled balloon for 3 h. The crude reaction mixture was filtered through a pad of celite and the filtrate was concentrated under reduced pressure. The concentrate was subjected to column chromatography (silica gel, mixture of hexane/ethyl acetate) to obtain the pure compound 12 respectively.

**Figure S1.** Crystal structure of ethyl 4-methyl-1-(3-(4-nitrophenoxyl)prop-1-en-2-yl)-6,7-dihydro-1H-benz[o][1,2,3]triazole-5-carboxylate (4a).

**Figure S2.** Crystal structure of ethyl 1-(4-methoxyphenyl)-4-methyl-6,7-dihydro-1H-benzo[o][1,2,3]triazole-5-carboxylate (6ac).

**Figure S3.** Crystal structure of (E)-ethyl 3-(1-(4-chlorophenyl)-5-methyl-1H-1,2,3-triazol-4-yl)acrylate (9ap).
Ethyl 4-methyl-1-(1-phenylvinyl)-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (4aa): Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a white solid; Yield: 90% (139.5 mg); Mp.: 86-88 °C; IR (Neat): ν$_{\text{max}}$ 2979, 2923, 1689, 1603, 1477, 1371, 1274, 1200, 1108, 905, 812, 774, 702, 613 and 524 cm$^{-1}$; $^1$H NMR (400 MHz, CDCl$_3$) δ 7.41-7.35 (3H, m), 7.25-7.22 (2H, m), 5.78 (1H, d, $J$ = 1.2 Hz, olefinic-H), 5.64 (1H, d, $J$ = 0.8 Hz, olefinic-H), 4.24 (2H, q, $J$ = 7.2 Hz, OCH$_2$CH$_3$), 2.72 (2H, qt, $J$ = 8.8, 1.6 Hz), 2.62 (3H, t, $J$ = 1.6 Hz, olefinic-CH$_3$), 2.46 (2H, t, $J$ = 9.2 Hz), 1.32 (3H, t, $J$ = 7.2 Hz, OCH$_2$CH$_3$); $^{13}$C NMR (CDCl$_3$, DEPT-135) δ 167.7 (C, O-C=O), 145.4 (C), 141.8 (C), 138.2 (C), 134.5 (C), 134.2 (C), 129.7 (CH), 128.7 (2 x CH), 126.1 (2 x CH), 120.8 (C),
112.3 (CH₃), 60.2 (CH₂, OCH₂CH₃), 25.0 (CH₂), 19.2 (CH₂), 15.1 (CH₃), 14.2 (CH₃, OCH₂CH₃); HRMS (ESI-TOF) m/z 310.1556 (M + H⁺), calcd for C₁₈H₁₉N₃O₂H 310.1556.

**Ethyl 1-(1-(4-chlorophenyl)vinyl)-4-methyl-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (4ab):** Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a light yellow solid; Yield: 84% (144.5 mg); Mp.: 92-94 °C; IR (Neat): νmax 2982, 2925, 1696, 1603, 1562, 1484, 1443, 1278, 1200, 1097, 1055, 839, 782 and 735 cm⁻¹; ¹H NMR (400 MHz, CDCl₃) δ 7.36 (2H, td, J = 8.4, 2.4 Hz), 7.18 (2H, td, J = 8.8, 2.0 Hz), 5.78 (1H, J = 8.0 Hz, olefinic-H), 5.64 (1H, br s, olefinic-H), 4.25 (2H, q, J = 7.2 Hz, OCH₂CH₃), 2.74 (2H, qt, J = 8.8, 1.6 Hz), 2.62 (3H, t, J = 1.6 Hz, olefinic-CH₃), 2.49 (2H, t, J = 8.4 Hz), 1.33 (3H, t, J = 7.2 Hz, OCH₂CH₃); ¹³C NMR (CDCl₃, DEPT-135) δ 167.9 (C, O-C=O), 145.7 (C), 141.0 (C), 138.3 (C), 136.0 (C), 134.5 (C), 132.8 (C), 129.2 (2 x CH), 127.6 (2 x CH), 121.0 (C), 112.8 (CH₂), 60.4 (CH₂, OCH₂CH₃), 25.2 (CH₂), 19.4 (CH₂), 15.2 (CH₃), 14.3 (CH₃, OCH₂CH₃); HRMS (ESI-TOF) m/z 344.1166 (M + H⁺), calcd for C₁₈H₁₈ClN₃O₂H 344.1166.

**Ethyl 1-(1-(4-fluorophenyl)vinyl)-4-methyl-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (4ac):** Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a light yellow solid; Yield: 85% (139.50 mg); Mp.: 103-105 °C; IR (Neat): νmax 2977, 2920, 2843, 1696, 1603, 1510, 1371, 1205, 1164, 1050, 839, 782, 725 and 673 cm⁻¹; ¹H NMR (500 MHz, CDCl₃) δ 7.24 (2H, tt, J = 8.5, 2.0 Hz), 7.08 (2H, tt, J = 8.5, 2.0 Hz), 5.74 (1H, d, J = 0.5 Hz, olefinic-H), 5.61 (1H, br s, olefinic-H), 4.26 (2H, q, J = 7.0 Hz, OCH₂CH₃), 2.74 (2H, qt, J = 8.5, 1.5 Hz), 2.62 (3H, t, J = 1.5 Hz, olefinic-CH₃), 2.49 (2H, t, J = 8.5 Hz), 1.34 (3H, t, J = 7.0 Hz, OCH₂CH₃); ¹³C NMR (CDCl₃, DEPT-135) δ 167.9 (C, O-C=O), 163.5 (C, d, J = 248.7 Hz, C-F), 145.6 (C), 141.1 (C), 138.3 (C), 134.5 (C), 130.6 (C, d, J = 3.75 Hz), 128.3 (2 x CH, d, J = 8.75 Hz), 121.0 (C), 116.0 (2 x CH, d, J = 22.5 Hz), 112.2 (CH₂), 60.4 (CH₂, OCH₂CH₃), 25.2 (CH₂), 19.3 (CH₂), 15.2 (CH₃), 14.3 (CH₃, OCH₂CH₃); HRMS (ESI-TOF) m/z 328.1463 (M + H⁺), calcd for C₁₈H₁₈FN₃O₂H 328.1461.
Ethyl 1-(1-(4-methoxyphenyl)vinyl)-4-methyl-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (4ad): Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a colourless liquid; Yield: 81% (137.0 mg); IR (Neat): $\nu_{\text{max}}$ 2982, 2930, 1701, 1479, 1438, 1371, 1283, 1205, 1050, 895, 864 and 756 cm$^{-1}$; $^1$H NMR (400 MHz, CDCl$_3$) $\delta$ 7.16 (2H, td, $J$ = 8.8, 2.4 Hz), 6.89 (2H, td, $J$ = 8.8, 2.4 Hz), 5.67 (1H, s, olefinic-H), 5.52 (1H, s, olefinic-H), 4.25 (2H, q, $J$ = 7.2 Hz, OC$_2$H$_5$CH$_3$), 3.83 (3H, s, OC$_3$H$_3$), 2.71 (2H, br t, $J$ = 8.4 Hz), 2.62 (3H, br s, olefinic-CH$_3$), 2.47 (2H, t, $J$ = 8.8 Hz), 1.33 (3H, t, $J$ = 7.2 Hz, OCH$_2$C$_6$H$_5$); $^{13}$C NMR (CDCl$_3$, DEPT-135) $\delta$ 168.0 (C, O-C=O), 160.8 (C), 145.5 (C), 141.6 (C), 138.5 (C), 134.6 (C), 127.7 (2 x CH), 126.8 (C), 120.8 (C), 114.2 (2 x CH), 110.5 (CH$_2$), 60.3 (CH$_2$, OCH$_2$CH$_3$), 55.3 (CH$_3$, OCH$_3$), 25.2 (CH$_2$), 19.3 (CH$_2$), 15.2 (CH$_3$), 14.3 (CH$_3$, OCH$_2$CH$_3$); HRMS (ESI-TOF) m/z 340.1660 (M + H$^+$), calcd for C$_{19}$H$_{21}$N$_3$O$_3$H 340.1661.

Ethyl 4-methyl-1-(1-(p-tolyl)vinyl)-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (4ae): Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a white solid; Yield: 83% (134.5 mg); Mp.: 100-102 °C; IR (Neat): $\nu_{\text{max}}$ 2982, 2920, 1686, 1629, 1603, 1567, 1515, 1365, 1283, 1200, 1159, 1055, 901, 828, 782 and 720 cm$^{-1}$; $^1$H NMR (500 MHz, CDCl$_3$) $\delta$ 7.18 (2H, br d, $J$ = 8.5 Hz), 7.11 (2H, br d, $J$ = 8.0 Hz), 5.73 (1H, s, olefinic-H), 5.59 (1H, s, olefinic-H), 4.24 (2H, q, $J$ = 7.0 Hz, OCH$_2$CH$_3$), 2.70 (2H, qt, $J$ = 9.0, 1.5 Hz), 2.62 (3H, t, $J$ = 1.5 Hz, olefinic-CH$_3$), 2.44 (2H, t, $J$ = 9.0 Hz), 2.37 (3H, s, Ar-CH$_3$), 1.33 (3H, t, $J$ = 7.0 Hz, OCH$_2$CH$_3$); $^{13}$C NMR (CDCl$_3$, DEPT-135) $\delta$ 168.0 (C, O-C=O), 145.5 (C), 142.0 (C), 140.0 (C), 138.5 (C), 134.6 (C), 129.6 (2 x CH), 126.2 (2 x CH), 120.8 (C), 111.5 (CH$_2$), 60.3 (CH$_2$, OCH$_2$CH$_3$), 25.2 (CH$_2$), 21.2 (CH$_3$), 19.4 (CH$_2$), 15.2 (CH$_3$), 14.3 (CH$_3$, OCH$_2$CH$_3$); HRMS (ESI-TOF) m/z 324.1712 (M + H$^+$), calcd for C$_{19}$H$_{21}$N$_3$O$_2$H 324.1712.

Ethyl 4-methyl-1-(1-(m-tolyl)vinyl)-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (4af): Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a colourless liquid; Yield: 82% (132.5 mg); IR (Neat): $\nu_{\text{max}}$ 2981, 2359, 1734, 1699, 1371, 1239, 1199, 1045, 893, 734, 701 and 608 cm$^{-1}$; $^1$H NMR (500 MHz, CDCl$_3$) $\delta$ 7.26 (1H, t, $J$ = 7.5 Hz), 7.04 (1H, s), 7.02 (1H, d, $J$ = 7.5 Hz), 5.76 (1H, s, olefinic-H), 5.63 (1H, s,
Ethyl 4-methyl-1-(1-(o-tolyl)vinyl)-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (4ag): Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a colourless liquid; Yield: 62% (100.5 mg); IR (Neat): $\nu$ max 2983, 1735, 1372, 1233, 1043, 917, 846, 733, 633, 607 and 461 cm$^{-1}$; $^1$H NMR (500 MHz, CDCl$_3$) $\delta$ 7.34 (1H, t, $J = 8.0$ Hz), 7.33 (1H, d, $J = 8.0$ Hz), 7.26 (1H, dt, $J = 8.0$, 0.5 Hz), 7.20 (1H, br d, $J = 8.0$ Hz), 5.96 (1H, s, olefinic-H), 5.41 (1H, s, olefinic-H), 4.22 (2H, q, $J = 7.0$ Hz, OCH$_2$CH$_3$), 2.63 (2H, qt, $J = 8.5$, 2.0 Hz), 2.59 (3H, t, $J = 2.0$ Hz, olefinic-CH$_3$), 2.20 (2H, t, $J = 8.5$ Hz), 1.97 (3H, s, Ar-CH$_3$), 1.31 (3H, t, $J = 7.0$ Hz, OCH$_2$CH$_3$); $^{13}$C NMR (CDCl$_3$, DEPT-135) $\delta$ 167.7 (C, O-C=O), 145.7 (C), 142.1 (C), 138.3 (C), 136.3 (C), 134.0 (C), 133.6 (C), 130.7 (CH), 129.74 (CH), 129.71 (CH), 126.2 (CH), 120.6 (C), 112.3 (CH$_2$), 60.2 (CH$_2$, OCH$_2$CH$_3$), 25.0 (CH$_2$), 19.2 (CH$_3$), 19.0 (CH$_3$), 15.1 (CH$_3$), 14.2 (CH$_3$, OCH$_2$CH$_3$); HRMS (ESI-TOF) m/z 324.1714 (M + H$^+$), calefd for C$_{19}$H$_{21}$N$_3$O$_2$H 324.1712.

Ethyl 4-methyl-1-(1-(naphthalen-2-yl)vinyl)-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (4ah): Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a light yellow solid; Yield: 78% (140.5 mg); Mp.: 98-100 °C; IR (Neat): $\nu$ max 2977, 2925, 2837, 1701, 1608, 1515, 1463, 1371, 1298, 1257, 1200, 1055, 1030, 833 and 771 cm$^{-1}$; $^1$H NMR (500 MHz, CDCl$_3$) $\delta$ 7.83-7.81 (2H, m), 7.76 (1H, d, $J = 7.0$ Hz), 7.61 (1H, s), 7.51-7.46 (2H, m), 7.36 (1H, d, $J = 8.0$ Hz), 5.90 (1H, s, olefinic-H), 5.71 (1H, s, olefinic-H), 4.23 (2H, q, $J = 7.0$ Hz, OCH$_2$CH$_3$), 2.67 (2H, br t, $J = 8.0$ Hz), 2.67 (3H, s, Ar-CH$_3$), 2.45 (2H, t, $J = 8.0$ Hz), 1.31 (3H, t, $J = 7.0$ Hz, OCH$_2$CH$_3$);
13C NMR (CDCl₃, DEPT-135) δ 167.6 (C, O-C=O), 145.3 (C), 141.7 (C), 138.1 (C), 134.5 (C), 133.4 (C), 132.7 (C), 131.3 (C), 128.6 (CH), 128.2 (CH), 127.5 (CH), 127.0 (CH), 126.7 (CH), 125.8 (CH), 123.1 (CH), 120.8 (C), 112.7 (CH₂), 60.1 (CH₂, OCH₂CH₃), 25.0 (CH₂), 19.1 (CH₂), 15.1 (CH₃), 14.1 (CH₃, OCH₂CH₃); HRMS (ESI-TOF) m/z 360.1713 (M + H⁺), calcd for C₂₂H₂₁N₃O₂H 360.1712.

**Ethyl (E)-4-methyl-1-styryl-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (4ai):**
Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a white solid; Yield: 86% (133.5 mg); Mp.: 140-142 °C; IR (Neat): ν max 3049, 2977, 2924, 1679, 1612, 1477, 1448, 1226, 1212, 1024, 751 and 693 cm⁻¹; ¹H NMR (400 MHz, CDCl₃) δ 7.51 (1H, d, J = 13.6 Hz, olefinic-H), 7.49 (2H, br d, J = 7.2 Hz), 7.41 (2H, br t, J = 7.2 Hz), 7.35 (1H, br t, J = 7.2 Hz), 7.32 (1H, d, J = 11.6 Hz, olefinic-H), 4.27 (2H, q, J = 7.2 Hz, OC₃H₂CH₃), 3.01 (2H, t, J = 7.6 Hz), 2.89 (2H, qt, J = 8.0, 1.2 Hz), 2.60 (3H, t, J = 1.2 Hz, olefinic-CH₃), 1.36 (3H, t, J = 7.2 Hz, OCH₂CH₃); ¹³C NMR (CDCl₃, DEPT-135) δ 167.8 (C, O-C=O), 145.8 (C), 138.3 (C), 133.7 (C), 132.7 (C), 128.9 (2 x CH), 128.8 (CH), 126.7 (2 x CH), 123.6 (CH), 120.9 (CH), 120.8 (C), 60.4 (CH₂, OCH₂CH₃), 25.1 (CH₂), 18.9 (CH₂), 15.2 (CH₃), 14.3 (CH₃, OCH₂CH₃); HRMS (ESI-TOF) m/z 310.1554 (M + H⁺), calcd for C₁₈H₁₉N₃O₂H 310.1556.

**Ethyl 4-methyl-1-(3-(4-nitrophenoxy)prop-1-en-2-yl)-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (4aj):**
Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a yellow solid; Yield: 82% (158.0 mg); Mp.: 138-140 °C; IR (Neat): ν max 2923, 1749, 1597, 1525, 1506, 1341, 1242, 1042, 854, 748, 689 and 500 cm⁻¹; ¹H NMR (500 MHz, CDCl₃) δ 8.21 (2H, d, J = 8.5 Hz), 7.07 (2H, d, J = 9.0 Hz), 7.30 (2H, t, J = 7.6 Hz), 5.64 (1H, d, J = 0.5 Hz, olefinic-H), 5.40 (1H, s, olefinic-H), 5.26 (2H, s), 4.27 (2H, q, J = 7.0 Hz, OCH₂CH₃), 2.96 (2H, t, J = 9.0 Hz), 2.87 (2H, t, J = 8.5 Hz), 2.59 (3H, s, olefinic-CH₃), 1.36 (3H, t, J = 7.0 Hz, OCH₂CH₃); ¹³C NMR (CDCl₃, DEPT-135) δ 167.6 (C, O-C=O), 162.5 (C), 145.8 (C), 142.1 (C), 137.9 (C), 137.7 (C), 133.8 (C), 125.9 (2 x CH), 121.3 (C), 114.8 (2 x CH), 109.6
(CH₂), 67.1 (CH₂), 60.4 (CH₂, OCH₂CH₃), 25.3 (CH₂), 19.7 (CH₂), 15.1 (CH₃), 14.2 (CH₃, OCH₂CH₃); HRMS (ESI-TOF) m/z 385.1512 (M + H⁺), calcd for C₁₉H₂₀N₄O₅H 385.1512.

Ethyl 4-methyl-6-phenyl-1-(1-phenylvinyl)-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (4ba): Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a white solid; Yield: 80% (155.0 mg); Mp.: 80-82 °C; IR (Neat): νₘₐₓ 2918, 2849, 1699, 1602, 1491, 1447, 1263, 1209, 1501, 964, 908, 774 and 698 cm⁻¹; ¹H NMR (400 MHz, CDCl₃) δ 7.28 (1H, br t, J = 8.0 Hz), 7.19–7.17 (3H, m), 7.13 (2H, br t, J = 8.0 Hz), 7.01–6.98 (2H, m), 6.94 (2H, td, J = 8.0, 0.8 Hz), 5.70 (1H, d, J = 0.8 Hz, olefinic-H), 5.55 (1H, d, J = 0.8 Hz, olefinic-H), 4.32 (1H, br d, J = 8.0 Hz), 4.11 (2H, q, J = 7.2 Hz, OCH₂CH₃), 3.03 (1H, dd, J = 16.8, 8.8 Hz), 2.77 (3H, d, J = 0.8 Hz, olefinic-C₃H₃), 2.52 (1H, dd, J = 16.8, 2.0 Hz), 1.17 (3H, t, J = 7.2 Hz, OCH₂CH₃); ¹³C NMR (CDCl₃, DEPT-135) δ 167.4 (C, O-C=O), 145.6 (C), 142.0 (C), 141.7 (C), 139.2 (C), 133.7 (C), 132.8 (C), 129.5 (CH₂), 128.7 (2 x CH), 126.9 (2 x CH), 126.8 (CH), 126.0 (2 x CH), 124.1 (C), 112.5 (CH₂), 60.4 (CH₂, OCH₂CH₃), 41.0 (CH), 28.3 (CH₂), 15.5 (CH₃), 14.1 (CH₃, OCH₂CH₃); HRMS (ESI-TOF) m/z 386.1869 (M + H⁺), calcd for C₂₄H₂₃N₃O₂H 386.1869.

Ethyl 6-(4-chlorophenyl)-4-methyl-1-(1-phenylvinyl)-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (4ca): Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a yellow solid; Yield: 70% (147.1 mg); Mp.: 96-98 °C; IR (Neat): νₘₐₓ 2979, 2919, 1699, 1638, 1603, 1488, 1367, 1260, 1208, 1051, 1014, 907, 733 and 720 cm⁻¹; ¹H NMR (500 MHz, CDCl₃) δ 7.31 (1H, t, J = 7.5 Hz), 7.17–7.13 (4H, m), 6.93–6.91 (4H, m), 5.70 (1H, s, olefinic-H), 5.57 (1H, s, olefinic-H), 4.29 (1H, br d, J = 8.0 Hz), 4.12 (2H, q, J = 7.0 Hz, OCH₂CH₃), 3.02 (1H, dd, J = 17.0, 8.5 Hz), 2.78 (3H, br s, olefinic-CH₃), 2.44 (1H, dd, J = 16.5, 2.0 Hz), 1.19 (3H, t, J = 7.0 Hz, OCH₂CH₃); ¹³C NMR (CDCl₃, DEPT-135) δ 167.2 (C, O-C=O), 145.5 (C), 141.7 (C), 140.5 (C), 139.7 (C), 133.8 (C), 132.6 (C), 132.5 (C), 129.7 (CH), 128.8 (2 x CH), 128.6 (2 x CH), 128.4 (2 x CH), 126.0 (2 x CH), 123.6 (C), 112.7 (CH₂), 60.5 (CH₂, OCH₂CH₃), 40.5 (CH),
28.2 (CH₂), 15.5 (CH₃), 14.1 (CH₃, OCH₂CH₃); HRMS (ESI-TOF) m/z 420.1479 (M + H⁺), calcd for C₂₄H₂₂ClN₃O₂H 420.1479.

**Ethyl (S)-4,6-diphenyl-1-(1-phenylvinyl)-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (4da):** Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a semi solid; Yield: 67% (149.5 mg); [α]D²⁵ = +24.75 (C = 0.20, CHCl₃, 89.9% ee); IR (Neat): νmax 2922, 2852, 1719, 1593, 1512, 1345, 1287, 1262, 1082, 1502, 854, 691 and 598 cm⁻¹; ¹H NMR (400 MHz, CDCl₃) δ 7.52 (2H, td, J = 6.8, 1.6 Hz), 7.45 (2H, tt, J = 6.8, 2.0 Hz), 7.41 (1H, tt, J = 6.8, 1.6 Hz), 7.29 (1H, tt, J = 7.6, 1.6 Hz), 7.24–7.23 (3H, m), 7.18–7.14 (4H, m), 6.98 (2H, td, J = 8.0, 1.2 Hz), 5.72 (1H, d, J = 1.2 Hz, olefinic-H), 5.57 (1H, d, J = 0.8 Hz, olefinic-H), 4.36 (1H, dd, J = 8.8, 2.8 Hz), 3.85-3.79 (2H, m, OCH₂CH₃), 3.17 (1H, dd, J = 16.8, 8.8 Hz), 2.63 (1H, dd, J = 16.8, 3.2 Hz), 0.77 (3H, t, J = 7.2 Hz, OCH₂CH₃); ¹³C NMR (CDCl₃, DEPT-135) δ 168.0 (C, O-C=O), 144.4 (C), 141.7 (C), 139.6 (C), 136.0 (C), 133.7 (C), 132.9 (C), 129.6 (CH), 128.8 (2 x CH), 128.7 (2 x CH), 128.6 (2 x CH), 128.3 (CH), 128.0 (2 x CH), 127.2 (CH), 127.1 (2 x CH), 126.4 (C), 126.0 (2 x CH), 112.8 (CH₂), 60.5 (CH₂, OCH₂CH₃), 42.0 (CH), 28.4 (CH₂), 13.3 (CH₃, OCH₂CH₃); HRMS (ESI-TOF) m/z 448.2024 (M + H⁺), calcd for C₂₉H₂₅N₃O₂H 448.2025.

**Ethyl 4-methyl-6-(4-nitrophenyl)-1-(1-phenylvinyl)-1H-benzo[d][1,2,3]triazole-5-carboxylate (4ea):** Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a yellow solid; Yield: 36% (78.0 mg); Mp.: 128-130 °C; IR (Neat): νmax 3054, 2919, 2856, 1719, 1595, 1513, 1341, 1267, 1046, 778 and 708 cm⁻¹; ¹H NMR (400 MHz, CDCl₃) δ 8.22 (2H, td, J = 8.8, 2.0 Hz), 7.46–7.42 (3H, m), 7.39 (2H, tt, J = 6.8, 2.8 Hz), 7.28 (2H, td, J = 6.8, 1.2 Hz), 6.83 (1H, s, Ar-H), 5.86 (1H, d, J = 1.2 Hz, olefinic-H), 5.81 (1H, d, J = 1.2 Hz, olefinic-H), 4.10 (2H, q, J = 7.2 Hz, OCH₂CH₃), 2.95 (3H, s, Ar-CH₃), 1.03 (3H, t, J = 7.2 Hz, OCH₂CH₃); ¹³C NMR (CDCl₃, DEPT-135) δ 168.1 (C, O-C=O), 147.3 (C), 147.2 (C), 145.5 (C), 142.3 (C), 138.3 (C), 134.1 (C), 132.6 (C), 130.8 (C), 130.0 (CH), 129.3 (2 x CH), 129.2 (C), 128.9 (2 x CH), 126.7 (2 x CH).
Ethyl 6-ethyl-4-methyl-1-(1-phenylvinyl)-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (4fa): Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a yellowish semi solid; Yield: 78% (132.0 mg); IR (Neat): $\nu_{\text{max}}$ 2961, 2926, 1695, 1601, 1296, 1207, 1051, 907, 773 and 695 cm$^{-1}$; $^1$H NMR (400 MHz, CDCl$_3$) $\delta$ 7.42-7.36 (3H, m), 7.23 (2H, dd, $J$ = 8.0, 2.0 Hz), 5.79 (1H, d, $J$ = 0.4 Hz, olefinic- H), 4.29-4.21 (2H, m, OCH$_2$CH$_3$), 2.97-2.91 (1H, m), 2.61 (3H, s, Ar-CH$_3$), 2.41 (1H, dd, $J$ = 16.8, 7.6 Hz), 2.41 (1H, dd, $J$ = 17.2, 1.2 Hz), 1.47-1.38 (1H, m), 1.33 (3H, t, $J$ = 7.2 Hz, OCH$_2$CH$_3$), 1.22-1.15 (1H, m), 0.67 (3H, t, $J$ = 7.2 Hz, CH$_2$CH$_3$); $^{13}$C NMR (CDCl$_3$, DEPT-135) $\delta$ 168.0 (C, O-C=O), 145.0 (C), 142.0 (C), 137.2 (C), 134.4 (C), 133.8 (C), 129.8 (CH), 128.9 (2 x CH), 126.3 (2 x CH), 126.2 (C), 112.6 (CH$_2$), 60.3 (CH$_2$, OCH$_2$CH$_3$), 36.9 (CH), 25.8 (CH$_2$), 22.9 (CH$_2$), 15.5 (CH$_3$, Ar-CH$_3$), 14.3 (CH$_3$, OCH$_2$CH$_3$), 11.2 (CH$_3$, CH$_2$CH$_3$); HRMS (ESI-TOF) m/z 338.1868 (M + H$^+$), calcd for C$_{20}$H$_{23}$N$_3$O$_2$H 338.1868.

Ethyl 4-methyl-6-phenethyl-1-(1-phenylvinyl)-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (4ga): Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a colourless liquid; Yield: 77% (160.1 mg); IR (Neat): $\nu_{\text{max}}$ 2924, 2853, 1699, 1602, 1451, 1367, 1258, 1207, 1051, 909, 749 and 698 cm$^{-1}$; $^1$H NMR (500 MHz, CDCl$_3$) $\delta$ 7.42-7.33 (3H, m), 7.24-7.20 (5H, m), 7.00 (2H, d, $J$ = 6.0 Hz), 5.78 (1H, s, olefinic-H), 4.23-4.19 (2H, m, OCH$_2$CH$_3$), 3.10-3.05 (1H, m), 2.64-2.58 (1H, m), 2.63 (3H, s, Ar-CH$_3$), 2.47-2.40 (2H, m), 2.33-2.27 (1H, m), 1.76-1.69 (1H, m), 1.55-1.47 (1H, m), 1.28 (3H, t, $J$ = 7.0 Hz, OCH$_2$CH$_3$); $^{13}$C NMR (CDCl$_3$, DEPT-135) $\delta$ 167.7 (C, O-C=O), 144.9 (C), 141.9 (C), 141.3 (C), 137.8 (C), 134.4 (C), 133.6 (C), 129.8 (CH), 128.9 (2 x CH), 128.2 (2 x CH), 128.1 (2 x CH), 126.3 (2 x CH), 125.9 (C), 125.8 (CH), 112.7 (CH$_2$), 60.3 (CH$_2$, OCH$_2$CH$_3$), 35.0 (CH), 34.1 (CH$_2$), 32.8 (CH$_2$), 23.2 (CH$_2$), 15.5 (CH$_3$), 14.2 (CH$_3$); HRMS (ESI-TOF) m/z 414.2182 (M + H$^+$), calcd for C$_{26}$H$_{27}$N$_3$O$_2$H 414.2181.
Ethyl 4-methyl-1-phenyl-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (6aa):

Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a white solid; Yield: 95% (135 mg); Mp.: 96-98 °C; IR (Neat): \( \nu_{\text{max}} \) 3066, 2988, 2930, 1699, 1605, 1508, 1449, 1285, 1201, 1054, 918, 761, 693 and 670 cm\(^{-1}\); \(^1\)H NMR (400 MHz, CDCl\(_3\)) \( \delta \) 7.55 (4H, br s), 7.50 (1H, br s), 4.28 (2H, q, \( J = 7.2 \) Hz, OCH\(_2\)CH\(_3\)), 2.97 (2H, br t, \( J = 8.0 \) Hz), 2.85 (2H, br t, \( J = 8.0 \) Hz), 2.64 (3H, br s, olefinic-C\(_{\text{H}}\)), 1.36 (3H, t, \( J = 6.8 \) Hz, OCH\(_2\)C\(_{\text{H}}\)); \(^{13}\)C NMR (CDCl\(_3\), DEPT-135) \( \delta \) 167.9 (C, O-C=O), 146.0 (C), 138.7 (C), 136.1 (C), 133.5 (C), 129.6 (2 x CH), 129.1 (CH), 123.0 (2 x CH), 120.9 (C), 60.4 (CH\(_2\), OCH\(_2\)CH\(_3\)), 25.4 (CH\(_2\)), 19.6 (CH\(_2\)), 15.3 (CH\(_3\), olefinic-CH\(_3\)), 14.3 (CH\(_3\), OCH\(_2\)CH\(_3\)); HRMS (ESI-TOF) m/z 284.1402 (M + H\(^+\)), calcd for C\(_{16}\)H\(_{17}\)N\(_3\)O\(_2\)H 284.1399.

Ethyl 4-methyl-1-(p-tolyl)-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (6ab):

Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a white solid; Yield: 88% (130.5 mg); Mp.: 100-102 °C; IR (Neat): \( \nu_{\text{max}} \) 3039, 2982, 2928, 1693, 1520, 1441, 1284, 1202, 1116, 1046, 821 and 776 cm\(^{-1}\); \(^1\)H NMR (500 MHz, CDCl\(_3\)) \( \delta \) 7.42 (2H, d, \( J = 8.5 \) Hz), 7.34 (2H, d, \( J = 8.5 \) Hz), 4.27 (2H, q, \( J = 7.0 \) Hz, OCH\(_2\)CH\(_3\)), 2.94 (2H, t, \( J = 8.0 \) Hz), 2.84 (2H, t, \( J = 8.0 \) Hz), 2.64 (3H, s, Ar-CH\(_3\)), 1.36 (3H, t, \( J = 7.0 \) Hz, OCH\(_2\)CH\(_3\)); \(^{13}\)C NMR (CDCl\(_3\), DEPT-135) \( \delta \) 167.9 (C, O-C=O), 146.0 (C), 138.7 (C), 136.1 (C), 133.5 (C), 129.6 (2 x CH), 122.9 (2 x CH), 120.8 (C), 60.4 (CH\(_2\), OCH\(_2\)CH\(_3\)), 25.4 (CH\(_2\)), 21.1 (CH\(_3\), Ar-CH\(_3\)), 19.6 (CH\(_2\)), 15.3 (CH\(_3\), olefinic-CH\(_3\)), 14.3 (CH\(_3\), OCH\(_2\)CH\(_3\)); HRMS (ESI-TOF) m/z 298.1559 (M + H\(^+\)), calcd for C\(_{17}\)H\(_{19}\)N\(_3\)O\(_2\)H 298.1556.

Ethyl 1-(4-methoxyphenyl)-4-methyl-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (6ac):

Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a white solid; Yield: 86% (134.5 mg); Mp.: 120-122 °C; IR (Neat): \( \nu_{\text{max}} \) 2992, 2982, 1693, 1520, 1441, 1284, 1202, 1116, 1046, 821 and 776 cm\(^{-1}\); \(^1\)H NMR (400 MHz, CDCl\(_3\)) \( \delta \) 7.44 (2H, td, \( J = 8.8, 3.6 \) Hz), 7.04 (2H, td, \( J = 8.8, 3.6 \) Hz), 4.27 (2H, q, \( J = 7.2 \) Hz, OCH\(_2\)CH\(_3\)), 3.87 (3H, s, OCH\(_3\)); 2.94-2.90 (2H, m), 2.86-2.82 (2H,
Ethyl 1-(4-fluorophenyl)-4-methyl-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (6ad): Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a colourless liquid; Yield: 88% (150.5 mg); IR (Neat): $\nu_{\text{max}}$ 3078, 2988, 2853, 1700, 1606, 1517, 1445, 1203, 1051, 842, 774, 703 and 603 cm$^{-1}$; $^1$H NMR (500 MHz, CDCl$_3$) $\delta$ 7.55-7.53 (2H, m), 7.27-7.23 (2H, m), 4.27 (2H, q, $J = 7.0$ Hz, OCH$_2$CH$_3$), 2.95 (2H, t, $J = 8.0$ Hz), 2.86 (2H, t, $J = 8.0$ Hz), 2.62 (3H, s, olefinic-CH$_3$), 1.36 (3H, t, $J = 7.0$ Hz, OCH$_2$CH$_3$); $^{13}$C NMR (CDCl$_3$, DEPT-135) $\delta$ 167.7 (C, O-C=O), 162.6 (C, d, $J = 248.7$ Hz, C-F), 145.9 (C), 138.4 (C), 132.2 (C, d, $J = 2.5$ Hz), 129.4 (2 x CH, d, $J = 8.75$ Hz), 121.0 (C), 116.6 (2 x CH, d, $J = 23.7$ Hz), 60.3 (CH$_2$, OCH$_2$CH$_3$), 25.3 (CH$_2$), 19.4 (CH$_2$), 15.2 (CH$_3$, olefinic-CH$_3$), 14.2 (CH$_3$, OCH$_2$CH$_3$); HRMS (ESI-TOF) m/z 302.1306 (M + H$^+$), calcd for C$_{16}$H$_{16}$FN$_3$O$_2$H 302.1305.

Ethyl 1-(4-bromophenyl)-4-methyl-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (6ae): Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a white solid; Yield: 89% (160.4 mg); Mp.: 140-142 °C; IR (neat): $\nu_{\text{max}}$ 3400, 1698, 1608, 1494, 1458, 1283, 1202, 1107, 1040, 823 and 725 cm$^{-1}$; $^1$H NMR (400 MHz, CDCl$_3$) $\delta$ 7.68 (2H, td, $J = 7.2$, 1.6 Hz), 7.44 (2H, td, $J = 7.2$, 1.6 Hz), 4.27 (2H, q, $J = 6.0$ Hz, OCH$_2$CH$_3$), 2.96 (2H, dt, $J = 6.8$, 1.2 Hz), 2.86 (2H, qt, $J = 7.2$, 1.2 Hz), 2.62 (3H, t, $J = 1.2$ Hz, olefinic-CH$_3$), 1.36 (3H, t, $J = 5.6$ Hz, OCH$_2$CH$_3$); $^{13}$C NMR (CDCl$_3$, DEPT-135) $\delta$ 167.7 (C, O-C=O), 146.2 (C), 138.4 (C), 135.1 (C), 133.3 (C), 132.8 (2 x CH), 124.3 (2 x CH), 122.9 (C), 121.1 (C), 60.4 (CH$_2$), 25.3 (CH$_2$), 19.6 (CH$_2$), 15.2 (CH$_3$, olefinic-CH$_3$), 14.3 (CH$_3$, OCH$_2$CH$_3$); HRMS (ESI-TOF) m/z 362.0504 (M + H$^+$), calcd for C$_{16}$H$_{16}$BrN$_3$O$_2$H 362.0504.
Ethyl 1-(3-bromophenyl)-4-methyl-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (6af): Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a white solid; Yield: 80% (144.4 mg); Mp.: 102-104 °C; IR (Neat): \( \nu_{\text{max}} \) 2980, 1699, 1605, 1495, 1441, 1274, 1201, 1095, 1035, 995, 869, 783, 762 and 433 cm\(^{-1}\); \(^1\)H NMR (500 MHz, CDCl\(_3\)) \( \delta \) 7.75 (1H, t, \( J = 2.0 \) Hz), 7.63 (1H, ddd, \( J = 8.0, 2.0, 1.0 \) Hz), 7.49 (1H, ddd, \( J = 8.0, 2.0, 1.0 \) Hz), 7.43 (1H, t, \( J = 8.0 \) Hz), 4.28 (2H, q, \( J = 7.5 \) Hz, OCH\(_2\)CH\(_3\)), 2.98 (2H, br t, \( J = 8.5 \) Hz), 2.87 (2H, qt, \( J = 8.0, 1.5 \) Hz), 2.63 (3H, t, \( J = 1.5 \) Hz, olefinic-C\(_3\)H\(_3\)), 1.36 (3H, t, \( J = 7.0 \) Hz, OCH\(_2\)C\(_3\)H\(_3\)); \(^{13}\)C NMR (CDCl\(_3\), DEPT-135) \( \delta \) 167.8 (C, O-C=O), 146.2 (C), 138.4 (C), 137.2 (C), 133.4 (C), 132.1 (CH), 130.9 (CH), 126.1 (CH), 123.2 (C), 121.5 (CH), 121.2 (C), 60.4 (CH\(_2\), OCH\(_2\)CH\(_3\)), 25.4 (CH\(_3\)), 15.2 (CH\(_3\), olefinic-CH\(_3\)), 14.3 (CH\(_3\), OCH\(_2\)CH\(_3\)); HRMS (ESI-TOF) \( m/z \) 362.0504 (M + H\(^+\)), calcd for C\(_{16}\)H\(_{16}\)BrN\(_3\)O\(_2\)H 362.0504.

Ethyl 1-(2-bromophenyl)-4-methyl-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (6ag): Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a colourless liquid; Yield: 64% (115.4 mg); Mp.: 252-254 °C; IR (Neat): \( \nu_{\text{max}} \) 2979, 2925, 2853, 1700, 1608, 1507, 1442, 1369, 1285, 1202, 1052, 764 and 668 cm\(^{-1}\); \(^1\)H NMR (400 MHz, CDCl\(_3\)) \( \delta \) 7.78-7.76 (1H, m), 7.52-7.45 (3H, m), 4.27 (2H, q, \( J = 6.8 \) Hz, OCH\(_2\)CH\(_3\)), 2.85 (2H, t, \( J = 7.6 \) Hz), 2.76 (2H, t, \( J = 7.6 \) Hz), 2.65 (3H, s, olefinic-CH\(_3\)), 1.35 (3H, t, \( J = 7.2 \) Hz, OCH\(_2\)CH\(_3\)); \(^{13}\)C NMR (CDCl\(_3\), DEPT-135) \( \delta \) 168.0 (C, O-C=O), 145.1 (C), 138.5 (C), 136.0 (C), 135.2 (CH), 133.7 (CH), 128.9 (CH), 128.5 (CH), 121.0 (C), 120.5 (C), 60.4 (CH\(_2\), OCH\(_2\)CH\(_3\)), 25.2 (CH\(_2\)), 19.0 (CH\(_2\)), 15.3 (CH\(_3\), olefinic-CH\(_3\)), 14.3 (CH\(_3\), OCH\(_2\)CH\(_3\)); HRMS (ESI-TOF) \( m/z \) 362.0504 (M + H\(^+\)), calcd for C\(_{16}\)H\(_{16}\)BrN\(_3\)O\(_2\)H 362.0504.

Ethyl 4-methyl-1-(4-(trifluoromethyl)phenyl)-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (6ah): Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a white solid; Yield: 89% (156.5 mg); Mp.: 143-145 °C; IR (Neat): \( \nu_{\text{max}} \) 2989, 2894, 1688, 1614, 1525, 1442, 1417, 1373, 1324, 1261, 1205, 1166, 1118, 843, 777, 738 and 596 cm\(^{-1}\); \(^1\)H NMR (400 MHz, CDCl\(_3\)) \( \delta \) 7.83 (2H, d, \( J = 7.6 \) Hz), 7.72 (2H, d, \( J = 7.6 \) Hz), 4.28
(2H, q, J = 6.8 Hz, OCH$_2$CH$_3$), 3.02 (2H, t, J = 8.0 Hz), 2.88 (2H, t, J = 8.0 Hz), 2.63 (3H, s, olefinic-CH$_3$), 1.36 (3H, t, J = 7.2 Hz, OCH$_2$CH$_3$); $^{13}$C NMR (CDCl$_3$, DEPT-135) $\delta$ 167.7 (C, O-C=O), 146.5 (C), 138.9 (C), 138.3 (C), 133.5 (C), 131.1 (C, q, J = 26 Hz), 127.0 (2 x CH, q, J = 3.0 Hz), 123.5 (C, q, J = 217.0 Hz, CF$_3$), 123.0 (2 x CH), 121.4 (C), 60.5 (CH$_2$OCH$_2$CH$_3$), 25.4 (CH$_2$), 19.8 (CH$_2$), 15.3 (CH$_3$, olefinic-CH$_3$), 14.3 (CH$_3$, OCH$_2$CH$_3$); HRMS (ESI-TOF) m/z 352.1274 (M + H$^+$), calcd for C$_{17}$H$_{16}$F$_3$N$_3$O$_2$H 352.1273.

Ethyl 4-methyl-1-(4-nitrophenyl)-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (6ai): Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a white solid; Yield: 85% (140.0 mg); Mp.: 138-140 °C; IR (neat): $\nu_{\text{max}}$ 3096, 2976, 2926, 1699, 1598, 1527, 1444, 1347, 1297, 1203, 1114, 1054, 856, 749 and 686 cm$^{-1}$; $^1$H NMR (500 MHz, CDCl$_3$) $\delta$ 8.45 (2H, td, J = 9.5, 1.5 Hz), 7.82 (2H, td, J = 9.0, 2.0 Hz), 4.29 (2H, q, J = 7.0 Hz, OCH$_2$CH$_3$), 3.07 (2H, t, J = 8.5 Hz), 2.91 (2H, t, J = 9.0 Hz), 2.63 (3H, s, olefinic-CH$_3$), 1.37 (3H, t, J = 7.0 Hz, OCH$_2$CH$_3$); $^{13}$C NMR (CDCl$_3$, DEPT-135) $\delta$ 167.6 (C, O-C=O), 147.4 (C), 146.8 (C), 140.9 (C), 138.0 (C), 133.4 (C), 125.3 (2 x CH), 123.0 (2 x CH), 121.6 (C), 60.6 (CH$_2$OCH$_2$CH$_3$), 25.4 (CH$_2$), 20.0 (CH$_2$), 15.2 (CH$_3$, olefinic-CH$_3$), 14.3 (CH$_3$, OCH$_2$CH$_3$); HRMS (ESI-TOF) m/z 329.1250 (M + H$^+$), calcd for C$_{16}$H$_{16}$N$_4$O$_4$H 329.1250.

Ethyl 4-methyl-1-(3-nitrophenyl)-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (6aj): Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a white solid; Yield: 60% (99 mg); Mp.: 108-110 °C; IR (neat): $\nu_{\text{max}}$ 2982, 1735, 1702, 1537, 1371, 1239, 1201, 1045, 779, 756, 677 and 607 cm$^{-1}$; $^1$H NMR (500 MHz, CDCl$_3$) $\delta$ 8.44 (1H, t, J = 2.0 Hz), 8.37 (1H, ddd, J = 8.5, 2.0, 1.0 Hz), 8.01 (1H, ddd, J = 8.0, 2.0, 1.0 Hz), 7.80 (1H, t, J = 8.5 Hz), 4.29 (2H, q, J = 7.0 Hz, OCH$_2$CH$_3$), 3.06 (2H, t, J = 9.0 Hz), 2.91 (2H,qt, J = 9.0, 1.5 Hz), 2.64 (3H, t, J = 2.0 Hz, olefinic-CH$_3$), 1.37 (3H, t, J = 7.0 Hz, OCH$_2$CH$_3$); $^{13}$C NMR (CDCl$_3$, DEPT-135) $\delta$ 167.6 (C, O-C=O), 148.8 (C), 146.6 (C), 138.0 (C), 137.1 (C), 133.5 (C), 130.9 (CH), 128.4 (CH), 123.6 (CH), 121.6 (C), 117.6 (CH), 60.5 (CH$_2$, OCH$_2$CH$_3$), 25.4 (CH$_2$), 19.8 (CH$_2$), 15.2 (CH$_3$, olefinic-CH$_3$), 14.3 (CH$_3$, OCH$_2$CH$_3$); HRMS (ESI-TOF) m/z 329.1251 (M + H$^+$), calcd for C$_{16}$H$_{16}$N$_4$O$_4$H 329.1250.
Ethyl 4-methyl-1-(naphthalen-1-yl)-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (6al): Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a white semisolid; Yield: 87% (145.5 mg); IR (Neat): \(\nu_{\text{max}}\) 2976, 1707, 1593, 1512, 1445, 1350, 1242, 1190, 1128, 824 and 534 cm\(^{-1}\); \(^1\)H NMR (500 MHz, CDCl\(_3\)) \(\delta\) 8.04 (1H, d, \(J = 8.0\) Hz), 7.97 (1H, d, \(J = 8.0\) Hz), 7.61-7.56 (2H, m), 7.54-7.50 (2H, m), 7.41 (1H, d, \(J = 8.5\) Hz), 4.28 (2H, q, \(J = 7.0\) Hz, OCH\(_2\)CH\(_3\)), 2.83 (2H, qt, \(J = 9.0, 1.5\) Hz), 2.71 (3H, t, \(J = 1.5\) Hz, olefinic-CH\(_3\)), 2.66 (2H, t, \(J = 9.0\) Hz), 1.35 (3H, t, \(J = 7.0\) Hz, OCH\(_2\)C\(_6\)H\(_5\)); \(^{13}\)C NMR (CDCl\(_3\), DEPT-135) \(\delta\) 167.9 (C, O-C=O), 145.1 (C), 138.5 (C), 136.2 (C), 134.1 (C), 131.9 (C), 130.6 (CH), 128.88 (C), 128.87 (CH), 127.8 (CH), 127.0 (CH), 124.9 (CH), 124.2 (CH), 122.2 (CH), 121.0 (C), 60.3 (CH\(_2\), OCH\(_2\)CH\(_3\)), 25.2 (CH\(_2\)), 18.7 (CH\(_2\)), 15.3 (CH\(_3\), olefinic-CH\(_3\)), 14.3 (CH\(_3\), OCH\(_2\)CH\(_3\)); HRMS (ESI-TOF) m/z 334.1555 (M + H\(^+\)), calcd for C\(_{20}\)H\(_{19}\)N\(_3\)O\(_2\)H 334.1556.

(2R,3R,4S,5S,6S)-2-(Acetoxymethyl)-6-(5-(ethoxycarbonyl)-4-methyl-6,7-dihydro-1H-benzo[d][1,2,3]triazol-1-yl)tetrahydro-2H-pyran-3,4,5-triyl triacetate (6am): Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (1:9 to 5:5) and was isolated as a semi solid; Yield: 69% (186.5 mg); \([\alpha]_D^{25}\) +7.63 (C = 0.059, CHCl\(_3\)); IR (Neat): \(\nu_{\text{max}}\) 2981, 2359, 1745, 1699, 1367, 1209, 1048, 982, 903, 775, 599 and 504 cm\(^{-1}\); \(^1\)H NMR (500 MHz, CDCl\(_3\)) \(\delta\) 6.10-6.07 (1H, m), 5.96-5.93 (2H, m), 5.40 (1H, t, \(J = 10.0\) Hz), 4.32 (1H, dd, \(J = 12.5, 5.5\) Hz), 4.27 (2H, q, \(J = 7.0\) Hz, OCH\(_2\)CH\(_3\)), 4.00 (1H, dd, \(J = 12.0, 2.0\) Hz), 3.84-3.82 (1H, m), 2.92-2.83 (4H, m), 2.58 (3H, s, olefinic-CH\(_3\)), 2.22 (3H, s, COCH\(_3\)), 2.08 (3H, s, COCH\(_3\)), 2.06 (3H, s, COCH\(_3\)), 2.05 (3H, s, COCH\(_3\)), 1.35 (3H, t, \(J = 7.0\) Hz, OCH\(_2\)CH\(_3\)); \(^{13}\)C NMR (CDCl\(_3\), DEPT-135) \(\delta\) 170.2 (C, O-C=O), 169.8 (C, O-C=O), 169.6 (C, O-C=O), 169.1 (C, O-C=O), 167.7 (C, O-C=O), 145.9 (C), 137.8 (C), 134.7 (C), 121.5 (C), 82.3 (CH), 71.6 (CH), 68.8 (CH), 68.4 (CH), 66.0 (CH), 61.7 (CH\(_2\)), 60.4 (CH\(_2\), OCH\(_2\)CH\(_3\)), 25.0 (CH\(_2\)), 20.7 (CH\(_3\), COCH\(_3\)), 20.59 (CH\(_3\), COCH\(_3\)), 20.57 (CH\(_3\), COCH\(_3\)), 20.5 (CH\(_3\), COCH\(_3\)), 18.3 (CH\(_2\)), 15.1 (CH\(_3\), olefinic-CH\(_3\)), 14.3 (CH\(_3\), OCH\(_2\)CH\(_3\)); HRMS (ESI-TOF) m/z 538.2037 (M + H\(^+\)), calcd for C\(_{24}\)H\(_{31}\)N\(_3\)O\(_{11}\)H 538.2037.
**Ethyl 1-benzyl-4-methyl-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (6ao):** Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a colourless liquid; Yield: 70% (104.5 mg); IR (Neat): ν max 2979, 1693, 1607, 1441, 1368, 1284, 1204, 1054, 906, 727 and 459 cm⁻¹; ¹H NMR (500 MHz, CDCl₃) δ 7.37-7.32 (3H, m), 7.20-7.19 (2H, m), 5.49 (2H, q, J = 7.0 Hz, OCH₂CH₃), 4.29 (2H, q, J = 7.0 Hz, OCH₂CH₃), 2.75 (2H, t, J = 8.5 Hz), 2.61 (2H, t, J = 8.5 Hz), 2.57 (3H, br s, olefinic-CH₃), 1.32 (3H, t, J = 7.0 Hz, OCH₂CH₃); ¹³C NMR (CDCl₃, DEPT-135) δ 168.0 (C, O-C=O), 146.0 (C), 138.6 (C), 134.4 (C), 133.8 (C), 129.1 (2 x CH), 128.5 (CH), 127.5 (2 x CH), 120.5 (C), 60.3 (CH₂, OCH₂CH₃), 52.1 (CH₂, PhCH₂N), 25.1 (CH₂), 18.5 (CH₂), 15.1 (CH₃, olefinic-CH₃), 14.3 (CH₃, OCH₂CH₃); HRMS (ESI-TOF) m/z 298.1556 (M + H⁺), calcd for C₁₉H₁₉N₃O₂H 298.1556.
Ethyl 4-methyl-1,6-diphenyl-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (7ba): Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a white solid; Yield: 80% (143.5 mg); Mp.: 104-106 °C; IR (Neat): υ_max 2917, 2849, 1684, 1596, 1503, 1364, 1225, 1203, 1079, 1031, 752, 700 and 602 cm⁻¹; 1H NMR (400 MHz, CDCl_3) δ 7.50-7.41 (5H, m), 7.21-7.15 (3H, m), 7.11 (2H, td, J = 6.4, 2.0 Hz), 4.50 (1H, br dd, J = 9.2, 1.2 Hz), 4.12 (2H, br q, J = 7.2 Hz, OCH_2CH_3), 3.50 (1H, dd, J = 16.8, 8.8 Hz), 3.11 (1H, dd, J = 16.8, 2.8 Hz), 2.77 (3H, d, J = 0.8 Hz, olefinic-CH), 1.18 (3H, t, J = 7.2 Hz, OCH_2CH_3); 13C NMR (CDCl_3, DEPT-135) δ 167.3 (C, O-C=O), 145.8 (C), 142.6 (C), 138.8 (C), 135.9 (C), 131.6 (C), 129.6 (2 x CH), 129.1 (CH), 128.6 (2 x CH), 126.95 (2 x CH), 126.91 (CH), 124.4 (C), 122.9 (2 x CH), 60.4 (CH_2, OCH_2CH_3), 41.4 (CH), 28.6 (CH_3), 15.5 (CH_3, olefinic-CH_3), 14.0 (CH_3, OCH_2CH_3); HRMS (ESI-TOF) m/z 360.1712 (M + H⁺), calcd for C_{22}H_{21}N_3O_2H 360.1712.

Ethyl 6-(4-chlorophenyl)-4-methyl-1-phenyl-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (7ca): Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a yellow solid; Yield: 77% (151.1 mg); Mp.: 96-98 °C; IR (Neat): υ_max 2983, 2919, 2852, 1699, 1508, 1484, 1284, 1191, 1084, 1033, 1011, 961, 763 and 724 cm⁻¹; 1H NMR (500 MHz, CDCl_3) δ 7.51–7.49 (2H, m), 7.48–7.44 (1H, m), 7.43–7.41 (2H, m), 7.15 (2H, td, J = 7.0, 2.5 Hz), 7.03 (2H, td, J = 8.5, 2.0 Hz), 4.48 (1H, br d, J = 8.0 Hz), 4.14 (2H, q, J = 7.0 Hz, OCH_2CH_3), 3.50 (1H, dd, J = 17.0, 9.0 Hz), 3.06 (1H, dd, J = 16.5, 2.5 Hz), 2.77 (3H, s, olefinic-CH_3), 1.21 (3H, t, J = 7.0 Hz, OCH_2CH_3); 13C NMR (CDCl_3, DEPT-135) δ 167.2 (C, O-C=O), 145.8 (C), 141.1 (C), 139.4 (C), 135.9 (C), 132.7 (C), 131.4 (C), 129.6 (2 x CH), 129.2 (CH), 128.8 (2 x CH), 128.4 (2 x CH), 123.9 (C), 122.9 (2 x CH), 60.5 (CH_2, OCH_2CH_3), 40.8 (CH), 28.6 (CH_2), 15.5 (CH_3, olefinic-CH_3), 14.1 (CH_3, OCH_2CH_3); HRMS (ESI-TOF) m/z 394.1323 (M + H⁺), calcd for C_{22}H_{20}ClN_3O_2H 394.1322.
Ethyl (R)-1,4,6-triphenyl-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (7da):
Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a colourless liquid; Yield: 65% (136.5 mg); [α]D 25 = +85.0 (C = 0.140, CHCl3, 89.63% ee); IR (Neat): νmax 3059, 2922, 2851, 1699, 1597, 1507, 1451, 1309, 1228, 1175, 1077, 762 and 724 cm⁻¹; ¹H NMR (400 MHz, CDCl3) δ 7.52–7.49 (3H, m), 7.48–7.39 (7H, m), 7.28–7.26 (4H, m), 7.24–7.19 (1H, m), 4.54 (1H, dd, J = 8.8, 4.0 Hz), 3.86-3.78 (2H, m, OCH₂CH₃), 3.62 (1H, dd, J = 16.8, 4.0 Hz), 3.22 (1H, dd, J = 16.8, 4.0 Hz), 0.77 (3H, t, J = 7.2 Hz, OCH₂C₂H₅); ¹³C NMR (CDCl₃, DEPT-135) δ 168.0 (C, O-C=O), 144.7 (C), 141.8 (C), 139.2 (C), 135.95 (C), 135.91 (C), 131.8 (C), 129.6 (2 x CH), 129.2 (CH), 128.8 (2 x CH), 128.6 (2 x CH), 128.2 (CH), 128.0 (2 x CH), 127.3 (CH), 127.1 (2 x CH), 126.8 (C), 123.1 (2 x CH), 60.5 (CH₂, OCH₂CH₃), 42.5 (CH), 28.8 (CH₂), 13.3 (CH₃, OCH₂C₂H₅); HRMS (ESI-TOF) m/z 422.1869 (M + H⁺), calcd for C₂₇H₂₃N₃O₂H 422.1869.

Ethyl 4-methyl-6-(4-nitrophenyl)-1-phenyl-1H-benzo[d][1,2,3]triazole-5-carboxylate (7ea):
Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a yellow solid; Yield: 37% (74 mg); Mp.: 118-120 °C; IR (Neat): νmax 2922, 1720, 1513, 1435, 1302, 1083, 1053, 994 and 854 cm⁻¹; ¹H NMR (500 MHz, CDCl₃) δ 8.28 (2H, d, J = 8.5 Hz), 7.77 (2H, td, J = 7.5, 1.5 Hz), 7.63 (2H, t, J = 7.5 Hz), 7.59 (2H, td, J = 8.5, 2.0 Hz), 7.55-7.53 (2H, m), 4.12 (2H, q, J = 7.5 Hz, OCH₂CH₃), 2.96 (3H, s, Ar-CH₃), 1.04 (3H, t, J = 7.0 Hz, OCH₂CH₃); ¹³C NMR (CDCl₃, DEPT-135) δ 168.1 (C, O-C=O), 147.4 (2 x C), 145.9 (C), 138.9 (C), 136.5 (C), 132.0 (C), 131.1 (C), 130.0 (2 x CH), 129.5 (2 x CH), 129.4 (C), 129.1 (CH), 123.5 (2 x CH), 123.0 (2 x CH), 108.8 (CH), 61.5 (CH₂, OCH₂CH₃), 14.5 (CH₃), 13.8 (CH₃); HRMS (ESI-TOF) m/z 403.1406 (M + H⁺), calcd for C₂₂H₁₈N₄O₂H 403.1406.

Ethyl 6-ethyl-4-methyl-1-phenyl-6,7-dihydro-1H-benzo[d][1,2,3]triazole-5-carboxylate (7fa):
Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a colourless liquid; Yield: 82% (128 mg); IR (Neat): νmax 2961, 2926, 1693, 1599, 1508, 1454, 1367, 1249, 1191, 1131, 1050, 761 and 693 cm⁻¹; ¹H NMR (400 MHz, CDCl₃) δ 7.57-7.54 (4H, m), 7.52-7.48 (1H, m), 4.32-4.24
(2H, m, OCH₂CH₃), 3.17-3.05 (2H, m), 2.94 (1H, dd, J = 16.4, 1.2 Hz), 2.64 (3H, s, olefinic-CH₃), 1.55-1.45 (1H, m), 1.36 (3H, t, J = 7.2 Hz, OCH₂CH₃), 1.31-1.26 (1H, m), 0.80 (3H, t, J = 7.6 Hz, CH₂CH₃); ¹³C NMR (CDCl₃, DEPT-135) δ 167.9 (C, O-C=O), 145.4 (C), 137.4 (C), 136.0 (C), 132.5 (C), 129.6 (2 x CH), 129.0 (CH), 126.2 (C), 122.9 (2 x CH), 60.3 (CH₂, OCH₂CH₃), 37.0 (CH), 26.1 (CH₂), 23.5 (CH₂), 15.5 (CH₃, olefinic-CH₃), 14.2 (CH₃, OCH₂CH₃), 11.3 (CH₃, CH₂CH₃); HRMS (ESI-TOF) m/z 312.1713 (M + H⁺), calcd for C₁₈H₂₁N₃O₂H 312.1712.

**Ethyl (E)-3-(5-methyl-1-phenyl-1H-1,2,3-triazol-4-yl)acrylate (9aa):** Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a white solid; Yield: 83% (107 mg); Mp.: 108-110 °C; IR (Neat): v max 2978, 2924, 1705, 1650, 1595, 1501, 1292, 1166, 1131, 1024, 766, 722, 690 and 577 cm⁻¹; ¹H NMR (500 MHz, CDCl₃) δ 7.65 (1H, d, J = 16.0 Hz, olefinic-H), 7.59-7.54 (3H, m), 7.47-7.45 (2H, m), 6.81 (1H, d, J = 16.0 Hz, olefinic-H), 4.28 (2H, q, J = 7.0 Hz, OCH₂CH₃), 2.42 (3H, s), 1.35 (3H, t, J = 7.0 Hz, OCH₂CH₃); ¹³C NMR (CDCl₃, DEPT-135) δ 167.0 (C, O-C=O), 140.8 (C), 135.9 (C), 133.3 (C), 131.7 (CH), 129.7 (CH), 129.6 (2 x CH), 125.0 (2 x CH), 119.2 (CH), 60.5 (CH₂, OCH₂CH₃), 14.3 (CH₃, OCH₂CH₃), 9.2 (CH₃); HRMS (ESI-TOF) m/z 258.1243 (M + H⁺), calcd for C₁₄H₁₄N₃O₂H 258.1243.

**Ethyl 1-phenyl-1H-1,2,3-triazole-4-carboxylate (9’aa):** Obtained as byproduct along with product 9aa in 2-3%; ¹H NMR (500 MHz, CDCl₃) δ 8.52 (1H, s), 7.76 (2H, br d, J = 7.6 Hz), 7.60-7.50 (3H, m), 4.47 (2H, q, J = 7.0 Hz, OCH₂CH₃), 1.44 (3H, t, J = 7.0 Hz, OCH₂CH₃).

**Ethyl (E)-3-(5-methyl-1-(p-tolyl)-1H-1,2,3-triazol-4-yl)acrylate (9ab):** Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a white semi solid; Yield: 81% (110 mg); IR (Neat): v max 2980, 2925, 1706, 1647, 1517, 1297, 1222, 1208, 1164, 1035, 1008, 870, 820, 733, 703, 564 and 509 cm⁻¹; ¹H NMR (500 MHz, CDCl₃) δ 7.65 (1H, d, J = 16.0 Hz, olefinic-H), 7.36-7.32 (4H, m), 6.79 (1H, d, J = 15.5 Hz, olefinic-H), 4.28 (2H, q, J = 7.0 Hz, OCH₂CH₃), 2.45 (3H, s, Ar-CH₃), 2.40 (3H, s), 1.34 (3H, t, J = 7.0 Hz, OCH₂CH₃); ¹³C NMR (CDCl₃, DEPT-135) δ 167.0 (C, O-
C=O), 140.6 (C), 139.9 (2 x C), 133.3 (C), 131.8 (CH), 130.1 (2 x CH), 124.8 (2 x CH),
118.9 (CH), 60.4 (CH₂, OCH₂CH₃), 21.1 (CH₃, Ar-CH₃), 14.2 (CH₃, OCH₂CH₃), 9.1 (CH₃);
HRMS (ESI-TOF) m/z 272.1399 (M + H⁺), calcd for C₁₅H₁₇N₃O₂H 272.1399.

**Ethyl 1-(p-tolyl)-1H-1,2,3-triazole-4-carboxylate (9'ab):**

Obtained as byproduct along with product 9ab in 3-5%; 

**¹H NMR (500 MHz, CDCl₃) δ 8.50 (1H, s), 7.63 (2H, m), 7.35 (2H, m),**
4.45 (2H, q, *J* = 7.0 Hz, OCH₂CH₃), 2.43 (3H, s, Ar-CH₃), 1.43 (3H, t, *J* = 7.0 Hz, OCH₂CH₃);

**¹³C NMR (CDCl₃, DEPT-135) δ 160.6 (C, O-C=O), 140.6 (C), 139.7 (C), 134.0 (C),**
130.3 (2 x CH), 125.4 (CH), 120.6 (2 x CH), 61.2 (CH₂, OCH₂CH₃), 21.0 (CH₃, Ar-CH₃), 14.2 (CH₃, OCH₂CH₃);
HRMS (ESI-TOF) m/z 254.0904 (M + Na⁺), calcd for C₁₂H₁₃N₃O₂Na 254.0905.

**Ethyl (E)-3-(1-(4-methoxyphenyl)-5-methyl-1H-1,2,3-triazol-4-yl)acrylate (9ac):**

Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as an orange solid; Yield: 71% (102); Mp.: 80-82 °C; IR (Neat): νmax 2923, 2851, 1708, 1648, 1517, 1300, 1253, 1174, 1035, 977, 836 and 735 cm⁻¹;

**¹H NMR (500 MHz, CDCl₃) δ 7.65 (1H, d, *J* = 16.0 Hz, olefinic-H), 7.36 (2H, td, *J* = 9.0, 3.5 Hz), 7.05 (2H, td, *J* = 9.0, 3.5 Hz),**
6.79 (1H, d, *J* = 16.0 Hz, olefinic-H), 4.28 (2H, q, *J* = 7.0 Hz, OCH₂CH₃), 3.89 (3H, s, OCH₃), 2.38 (3H, s), 1.35 (3H, t, *J* = 7.0 Hz, OCH₂CH₃);

**¹³C NMR (CDCl₃, DEPT-135) δ 167.1 (C, O-C=O), 160.5 (C), 140.6 (C), 131.9 (CH), 128.7 (C), 126.4 (2 x CH), 118.9 (CH), 114.7 (2 x CH), 60.5 (CH₂, OCH₂CH₃), 55.6 (CH₃, OCH₃), 14.3 (CH₃, OCH₂CH₃), 9.1 (CH₃);**
HRMS (ESI-TOF) m/z 288.1347 (M + H⁺), calcd for C₁₅H₁₇N₃O₃H 288.1348.

**Ethyl 1-(4-methoxyphenyl)-1H-1,2,3-triazole-4-carboxylate (9'ac):**

Obtained as byproduct along with product 9ac in 2-3%;

**¹H NMR (500 MHz, CDCl₃) δ 8.41 (1H, s), 7.63 (2H, m), 7.05 (2H, m),**
4.45 (2H, q, *J* = 7.0 Hz, OCH₂CH₃), 3.87 (3H, s, Ar-OCH₃), 1.43 (3H, t, *J* = 7.0 Hz, OCH₂CH₃);
**¹³C NMR (CDCl₃, DEPT-135) δ 167.1 (C, O-C=O), 160.4 (C), 140.6 (C), 129.7 (C), 125.6 (CH), 122.5 (2 x CH), 114.9 (2 x CH), 61.2 (CH₂, OCH₂CH₃), 55.6 (CH₃, Ar-OCH₃), 14.3 (CH₃, OCH₂CH₃);**
HRMS (ESI-TOF) m/z 248.1032 (M + H⁺), calcd for C₁₂H₁₃N₃O₂H 248.1035.
**Ethyl (E)-3-(5-methyl-1-(naphthalen-1-yl)-1H-1,2,3-triazol-4-yl)acrylate (9al):** Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a colourless liquid; Yield: 78% (120 mg); IR (Neat): $\nu_{\text{max}}$ 3059, 2979, 2926, 1705, 1647, 1597, 1440, 1296, 1230, 1188, 1034, 975, 803 and 773 cm$^{-1}$; $^1$H NMR (400 MHz, CDCl$_3$) $\delta$ 8.07 (1H, d, $J = 8.4$ Hz), 7.98 (1H, d, $J = 8.4$ Hz), 7.73 (1H, d, $J = 16.0$ Hz, olefinic-H), 7.64-7.56 (2H, m), 7.51 (2H, t, $J = 8.8$ Hz), 7.19 (1H, d, $J = 8.4$ Hz), 6.87 (1H, d, $J = 15.6$ Hz, olefinic-H), 4.50 (2H, q, $J = 7.2$ Hz, OCH$_2$C$_2$H$_5$), 2.22 (3H, s), 1.46 (3H, t, $J = 7.2$ Hz, OCH$_2$C$_2$H$_5$); $^{13}$C NMR (CDCl$_3$, DEPT-135) $\delta$ 166.9 (C, O=C=O), 140.1 (C), 135.4 (C), 134.1 (C), 131.82 (C), 131.76 (CH), 130.9 (CH), 129.4 (C), 128.3 (CH), 128.0 (CH), 127.1 (CH), 125.05 (CH), 125.0 (CH), 121.9 (CH), 119.1 (CH), 60.5 (CH$_2$, OCH$_2$CH$_3$), 14.2 (CH$_3$, OCH$_2$CH$_3$), 8.5 (CH$_3$); HRMS (ESI-TOF) m/z 308.1399 (M + H$^+$), calcd for C$_{18}$H$_{17}$N$_3$O$_2$H 308.1399.

**Ethyl (E)-3-(1-(4-chlorophenyl)-5-methyl-1H-1,2,3-triazol-4-yl)acrylate (9ap):** Prepared following the procedure A and purified by column chromatography using (0.5:9.5 to 2:8) and was isolated as a white solid; Yield: 88% (128.5 mg); Mp.: 106-108 °C; IR (neat): $\nu_{\text{max}}$ 2993, 1717, 1651, 1497, 1300, 1169, 1109, 1005, 832, 748 and 518 cm$^{-1}$; $^1$H NMR (400 MHz, CDCl$_3$) $\delta$ 7.63 (1H, d, $J = 15.6$ Hz, olefinic-H), 7.55 (2H, td, $J = 8.8, 2.8$ Hz), 7.42 (2H, td, $J = 8.8, 2.0$ Hz), 6.81 (1H, d, $J = 15.6$ Hz, olefinic-H), 4.50 (2H, q, $J = 7.2$ Hz, OCH$_2$CH$_3$), 2.42 (3H, s), 1.35 (3H, t, $J = 7.2$ Hz, OCH$_2$CH$_3$); $^{13}$C NMR (CDCl$_3$, DEPT-135) $\delta$ 166.9 (C, O=C=O), 141.0 (C), 135.8 (C), 134.3 (C), 133.2 (C), 131.4 (CH), 129.9 (2 x CH), 126.2 (2 x CH), 119.4 (CH), 60.6 (CH$_2$, OCH$_2$CH$_3$), 14.3 (CH$_3$, OCH$_2$CH$_3$), 9.2 (CH$_3$); HRMS (ESI-TOF) m/z 292.0853 (M + H$^+$), calcd for C$_{14}$H$_{14}$ClN$_3$O$_2$H 292.0853.

**Ethyl 1-(4-chlorophenyl)-1H-1,2,3-triazole-4-carboxylate (9'ap):** Obtained as byproduct along with product 9ap in 2-3%; $^1$H NMR (400 MHz, CDCl$_3$) $\delta$ 8.50 (1H, s), 7.72 (2H, td, $J = 8.8, 2.8$ Hz), 7.53 (2H, td, $J = 8.8, 2.8$ Hz), 4.45 (2H, q, $J = 7.0$ Hz, OCH$_2$CH$_3$), 1.42 (3H, t, $J = 7.0$ Hz, OCH$_2$CH$_3$).
Ethyl (E)-3-(1-(3-chlorophenyl)-5-methyl-1H-1,2,3-triazol-4-yl)acrylate (9aq): Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a white solid; Yield: 86% (124.5 mg); Mp.: 90-92 °C; IR (Neat): \( \nu_{\text{max}} \) 2980, 1706, 1648, 1549, 1298, 1252, 1221, 1172, 1034, 976, 835, 786 and 685 cm\(^{-1}\); \(^1\)H NMR (500 MHz, CDCl\(_3\)) \( \delta \) 7.62 (1H, d, \( J = 16.0 \) Hz, olefinic-\( H \)), 7.53-7.51 (3H, m), 7.39-7.37 (1H, m), 6.80 (1H, d, \( J = 15.5 \) Hz, olefinic-\( H \)), 4.28 (2H, q, \( J = 7.0 \) Hz, OCH\(_2\)CH\(_3\)), 2.44 (3H, s), 1.35 (3H, t, \( J = 7.0 \) Hz, OCH\(_2\)C\(_2\)H\(_5\)); \(^{13}\)C NMR (CDCl\(_3\), DEPT-135) \( \delta \) 166.8 (C, O-\( C-C=O \)), 141.0 (C), 136.7 (C), 135.4 (C), 133.2 (C), 131.2 (CH), 129.9 (CH), 125.2 (CH), 123.0 (CH), 119.5 (CH), 60.5 (CH\(_2\), OCH\(_2\)CH\(_3\)), 14.2 (CH\(_3\), OCH\(_2\)CH\(_3\)), 9.2 (CH\(_3\)); HRMS (ESI-TOF) m/z 292.0855 (M + H\(^+\)), calcd for C\(_{14}\)H\(_{14}\)ClN\(_3\)O\(_2\)H 292.0853.

Ethyl 1-(3-chlorophenyl)-1H-1,2,3-triazole-4-carboxylate (9'aq):\(^3,4\) Obtained as byproduct along with product 9aq in 2-3%; \(^1\)H NMR (500 MHz, CDCl\(_3\)) \( \delta \) 8.54 (1H, s), 7.83 (1H, t, \( J = 8.8 \) Hz), 7.68 (1H, m), 7.53-7.46 (2H, m), 4.47 (2H, q, \( J = 7.0 \) Hz, OCH\(_2\)CH\(_3\)), 1.45 (3H, t, \( J = 7.0 \) Hz, OCH\(_2\)CH\(_3\)); \(^{13}\)C NMR (CDCl\(_3\), DEPT-135) \( \delta \) four quaternary carbons are not appeared, 131.0 (CH), 129.5 (CH), 125.3 (CH), 121.0 (CH), 118.7 (CH), 61.6 (CH\(_2\), OCH\(_2\)CH\(_3\)), 14.2 (CH\(_3\), OCH\(_2\)CH\(_3\)); HRMS (ESI-TOF) m/z 252.0548 (M + H\(^+\)), calcd for C\(_{11}\)H\(_{10}\)ClN\(_3\)O\(_2\)H 252.0540.

Ethyl (E)-3-(1-(2-chlorophenyl)-5-methyl-1H-1,2,3-triazol-4-yl)acrylate (9ar): Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a colourless liquid; Yield: 40% (58 mg); IR (Neat): \( \nu_{\text{max}} \) 2925, 1709, 1650, 1497, 1301, 1264, 1177, 1034, 977 and 703 cm\(^{-1}\); \(^1\)H NMR (400 MHz, CDCl\(_3\)) \( \delta \) 7.66 (1H, d, \( J = 15.6 \) Hz, olefinic-\( H \)), 7.63-7.60 (1H, m), 7.55 (1H, dt, \( J = 8.0, 2.0 \) Hz), 7.52-7.48 (1H, m), 7.45 (1H, dt, \( J = 8.0, 2.0 \) Hz), 6.81 (1H, d, \( J = 16.0 \) Hz, olefinic-\( H \)), 4.29 (2H, q, \( J = 7.2 \) Hz, OCH\(_2\)CH\(_3\)), 2.29 (3H, s), 1.35 (3H, t, \( J = 7.2 \) Hz, OCH\(_2\)CH\(_3\)); \(^{13}\)C NMR (CDCl\(_3\), DEPT-135) \( \delta \) 167.0 (C, O-\( C-C=O \)), 140.2 (C), 135.2 (C), 133.5 (C), 131.9 (CH), 131.7 (C), 131.6 (CH), 130.6 (CH), 129.2 (CH), 128.0 (CH), 119.3 (CH), 60.6 (CH\(_2\), OCH\(_2\)CH\(_3\)), 14.3 (CH\(_3\), OCH\(_2\)CH\(_3\)), 8.5 (CH\(_3\)); HRMS (ESI-TOF) m/z 292.0856 (M + H\(^+\)), calcd for C\(_{14}\)H\(_{14}\)ClN\(_3\)O\(_2\)H 292.0853.
Ethyl 1-(2-chlorophenyl)-1H-1,2,3-triazole-4-carboxylate (9’ar): Obtained as byproduct along with product 9ar in 2-3%; \(^1\)H NMR (400 MHz, CDCl\(_3\)) \(\delta\) 8.54 (1H, s), 7.66-7.61 (2H, m), 7.54-7.47 (2H, m), 4.47 (2H, q, \(J = 7.0\) Hz, OCH\(_2\)CH\(_3\)), 1.45 (3H, t, \(J = 7.0\) Hz, OCH\(_2\)CH\(_3\)); \(^{13}\)C NMR (CDCl\(_3\), DEPT-135) \(\delta\) four quaternary carbons are not appeared, 131.4 (CH), 130.9 (CH), 129.5 (CH), 128.1 (CH), 127.7 (CH), 61.6 (CH\(_2\), OCH\(_2\)CH\(_3\)), 14.3 (CH\(_3\), OCH\(_2\)CH\(_3\)); HRMS (ESI-TOF) m/z 274.0364 (M + Na\(^+\)), calcd for C\(_{11}\)H\(_{10}\)ClN\(_3\)O\(_2\)Na 274.0359.

Ethyl (E)-3-(1-(4-cyanophenyl)-5-methyl-1H-1,2,3-triazol-4-yl)acrylate (9as): Prepared following the procedure A and purified by column chromatography using (0.5:9.5 to 2:8) and was isolated as a white solid; Yield: 86% (121.5 mg); Mp.: 158-160 °C; IR (neat): \(\nu_{\text{max}}\) 2982, 2923, 2230, 1708, 1649, 1606, 1512, 1300, 1273, 1221, 1172, 1305, 977, 750 and 577 cm\(^{-1}\); \(^1\)H NMR (500 MHz, CDCl\(_3\)) \(\delta\) 7.91 (2H, dd, \(J = 8.5, 1.5\) Hz), 7.70 (2H, d, \(J = 8.5\) Hz), 7.61 (1H, br d, \(J = 16.0\) Hz, olefinic-H), 6.80 (1H, br d, \(J = 15.5\) Hz, olefinic-H), 4.28 (2H, q, \(J = 7.0\) Hz, OCH\(_2\)CH\(_3\)), 2.50 (3H, s), 1.35 (3H, t, \(J = 7.0\) Hz, OCH\(_2\)CH\(_3\)); \(^{13}\)C NMR (CDCl\(_3\), DEPT-135) \(\delta\) 166.6 (C, O-C=O), 141.3 (C), 139.0 (C), 133.5 (2 x CH), 133.0 (C), 130.8 (CH), 125.0 (2 x CH), 119.7 (CH), 117.4 (C), 113.3 (C), 60.5 (CH\(_2\), OCH\(_2\)CH\(_3\)), 14.1 (CH\(_3\), OCH\(_2\)CH\(_3\)), 9.2 (CH\(_3\)); HRMS (ESI-TOF) m/z 283.1191 (M + H\(^+\)), calcd for C\(_{15}\)H\(_{14}\)N\(_4\)O\(_2\)H 283.1191.

Ethyl (E)-3-(5-methyl-1-(1-phenylvinyl)-1H-1,2,3-triazol-4-yl)acrylate (10aa): Prepared following the procedure A and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a colourless liquid; Yield: 86% (118.5 mg); IR (Neat): \(\nu_{\text{max}}\) 2980, 2359, 1709, 1646, 1370, 1298, 1261, 1184, 1094, 914, 755, 722, 697 and 524 cm\(^{-1}\); \(^1\)H NMR (500 MHz, CDCl\(_3\)) \(\delta\) 7.61 (1H, d, \(J = 15.5\) Hz, olefinic-H), 7.40-7.35 (3H, m), 7.18-7.16 (2H, m), 6.80 (1H, d, \(J = 16.0\) Hz, olefinic-H), 5.98 (1H, d, \(J = 1.0\) Hz, olefinic-H), 5.60 (1H, d, \(J = 1.0\) Hz, olefinic-H), 4.27 (2H, q, \(J = 7.0\) Hz, OCH\(_2\)CH\(_3\)), 2.15 (3H, s), 1.34 (3H, t, \(J = 7.0\) Hz, OCH\(_2\)CH\(_3\)); \(^{13}\)C NMR (CDCl\(_3\), DEPT-135) \(\delta\) 166.9 (C, O-C=O), 142.0 (C), 140.4 (C), 134.3 (C), 133.9 (C), 131.5 (CH), 129.8 (CH), 129.0 (2 x CH), 125.6 (2 x CH), 119.1 (CH), 114.5 (CH\(_2\)), 60.5 (CH\(_2\), OCH\(_2\)CH\(_3\)), 14.2
(CH₃, OCH₂CH₃), 8.7 (CH₃); HRMS (ESI-TOF) m/z 306.1218 (M + Na⁺), calcd for C₁₆H₁₇N₃O₂Na 306.1218.

**Ethyl 1-(1-phenylvinyl)-1H,1,2,3-triazole-4-carboxylate (10’aa):** Obtained as byproduct along with product 10aa in 2-3%; ¹H NMR (400 MHz, CDCl₃) δ 8.1 (1H, s), 7.50-7.30 (5H, m), 5.9 (1H, s, olefinic-H), 5.61 (1H, s, olefinic-H), 4.43 (2H, q, J = 7.0 Hz, OC₂H₂CH₃), 1.42 (3H, t, J = 7.0 Hz, OCH₂CH₃); ¹³C NMR (CDCl₃, DEPT-135) δ 160.4 (C, O-C=O), 142.4 (C), 140.3 (C), 134.3 (C), 131.4 (2 x CH), 127.5 (CH), 127.2 (2 x CH), 125.6 (CH), 110.1 (CH₂), 61.3 (CH₂, OCH₂CH₃), 14.2 (CH₃, OCH₂CH₃).

**Ethyl 4-methyl-1-(1-phenylvinyl)-1H-benzo[d][1,2,3]triazole-5-carboxylate-carboxylate (11):** Prepared following the procedure B and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a white solid; Yield: 68% (104 mg); Mp.: 110-112 °C; IR (Neat): νmax 2920, 2851, 1698, 1629, 1477, 1377, 1262, 1224, 1040, 899, 770, 594, 595, 696 and 595 cm⁻¹; ¹H NMR (500 MHz, CDCl₃) δ 7.95 (1H, d, J = 9.0 Hz), 7.43 (1H, tt, J = 7.0, 2.0 Hz), 7.38 (2H, tt, J = 7.0, 2.0 Hz), 7.28 (2H, td, J = 7.0, 2.0 Hz), 6.85 (1H, dd, J = 9.0, 0.5 Hz), 5.83 (1H, d, J = 1.0 Hz, olefinic-H), 5.80 (1H, d, J = 1.0 Hz, olefinic-H), 4.41 (2H, q, J = 7.0 Hz, OCH₂CH₃), 3.16 (3H, s, Ar-CH₃), 1.42 (3H, t, J = 7.0 Hz, OCH₂CH₃); ¹³C NMR (CDCl₃, DEPT-135) δ 167.0 (C, O-C=O), 147.0 (C), 142.4 (C), 135.6 (C), 134.3 (C), 134.0 (C), 129.9 (CH), 129.8 (CH), 128.8 (2 x CH), 126.8 (2 x CH), 125.0 (C), 111.4 (CH₂), 108.0 (CH), 61.0 (CH₂, OCH₂CH₃), 15.3 (CH₃), 14.3 (CH₂, OCH₂CH₃); HRMS (ESI-TOF) m/z 308.1396 (M + H⁺), calcd for C₁₈H₁₇N₃O₂H 308.1399.

**Ethyl 4-methyl-1-(1-phenylethyl)-1H-benzo[d][1,2,3]triazole-5-carboxylate (12):** Prepared following the procedure C and purified by column chromatography using EtOAc/hexane (0.5:9.5 to 2:8) and was isolated as a colourless liquid; Yield: 72% (112 mg); IR (Neat): νmax 2925, 1709, 1600, 1494, 1449, 1376, 1288, 1264, 1233, 1185, 1130, 1051, 730, 699 and 532 cm⁻¹; ¹H NMR (500 MHz, CDCl₃) δ 7.91 (1H, d, J = 8.5 Hz), 7.34-7.26 (5H, m), 7.05 (1H, d, J = 9.0 Hz), 6.04 (1H, q, J = 7.0 Hz), 4.38 (2H, q, J = 7.0 Hz, OCH₂CH₃), 3.11 (3H, s, OCH₂CH₃), 3.08 (3H, s, MeCO₂Et).
2.17 (3H, d, J = 7.0 Hz), 1.40 (3H, t, J = 7.0 Hz, CH₂CH₂CH₃); ¹³C NMR (CDCl₃, DEPT-135) δ 167.2 (C, O-C=O), 147.4 (C), 139.9 (C), 135.5 (C), 133.5 (C), 129.2 (CH), 128.9 (2 x CH), 128.3 (CH), 126.2 (2 x CH), 124.7 (C), 106.9 (CH), 60.9 (CH₂, OCH₂CH₃), 59.2 (CH), 21.0 (CH₃), 15.2 (CH₃), 14.3 (CH₃, OCH₂CH₃); HRMS (ESI-TOF) m/z 332.1375 (M + Na⁺), calcld for C₁₈H₁₉N₃O₂Na 332.1375.

References: