## SUPPORTING INFORMATION

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All the commercially available reagents and solvents were used without further purification. 5-Methylene-6-methoxy-1,4,5,6-tetrahydropyridazines 1a–g were prepared as described previously. Chromatographic purification of compounds was carried out on silica gel (60–200 μm). TLC analysis was performed on pre-loaded (0.25 mm) glass supported silica gel plates (Kieselgel 60); compounds were visualized by exposure to UV light and by dipping the plates in 1% Ce(SO₄)·4H₂O, 2.5% (NH₄)₆Mo₇O₂₄·4H₂O in 10% sulphuric acid followed by heating on a hot plate. All ¹H NMR and ¹³C NMR spectra were recorded at 400 and 100 MHz, respectively, using CDCl₃ as solvent. Chemical shift (δ scale) are reported in parts per million (ppm) relative to the central peak of the solvent and are sorted in ascending order within each group. The following abbreviations are used to describe peak patterns where appropriate: s = singlet, d = doublet, t = triplet q = quartet and m = multiplet. All coupling constants (J value) are given in Hertz [Hz]. FT-IR spectra were obtained as Nujol mulls. Mass spectral data were obtained by electrospray ionization using a Q-TOF mass spectrometer in the positive ion mode (M+H or M+Na) as indicated. Elemental analyses were within ± 0.4 of the theoretical values (C, H, N).

2. Experimental procedures and spectral data.

General Procedure for the Synthesis of 5-Methylene-1,4-dihydropyridazine Derivatives (3):
To a solution of 5-methylene-6-methoxy-1,4,5,6-tetrahydropyridazine 1 (0.1 mmol) in CH₂Cl₂ (2 mL) at room temperature was added the appropriate nucleophile 2 (0.4 mmol) followed by the addition of BF₃·OEt₂ (0.12 mmol). After completion (0.1–0.5 h, TLC monitoring), the reaction solvent was evaporated under reduced pressure and the crude mixture was purified by column chromatography on silica gel (ethyl acetate/cyclohexane) to afford the corresponding adduct 3.
Note that the products 3a–r were unstable, so they were immediately characterized after chromatographic purification.

**Ethyl 5-(but-3-enyl)-3-phenylpyridazine-1(4H)-carboxylate (3a):**
Isolated by column chromatography on silica gel (ethyl acetate/cyclohexane, 1:9) in 73% yield. oil; ¹H NMR (400 MHz, CDCl₃, 25 °C): δ = 1.40 (t, J = 7.2 Hz, 3H, OCH₂CH₃), 2.17–2.21 (m, 2H, CH₂CH₂CH=CH₂), 2.25–2.31 (m, 2H, CH₂CH₂CH=CH₂), 3.17 (s, 2H, CCH₂C), 4.37 (q, J = 7.2 Hz, 2H, OCH₂CH₃), 4.99–5.10 (m, 2H, CH₂CH₂CH=CH₂), 5.78–5.88 (m, 1H, CH₂CH₂CH=CH₂), 6.99 (s, 1H, NCH), 7.40–7.42 (m, 3H, Ph-H), 7.82–7.84 (m, 2H, Ph-H); ¹³C NMR (100 MHz, CDCl₃, 25 °C): δ = 14.5 (q), 26.3 (t), 30.5 (t), 33.3 (t), 62.9 (t), 113.7 (s), 116.0 (t), 117.6 (d), 125.9 (d), 128.3 (d), 129.8 (d), 136.4 (s), 137.4 (d), 146.5 (s), 152.6 (s); IR (nujol): νmax = 1726 cm⁻¹; MS m/z (ESI): 285 [M + H]⁺; anal. calcd. for C₁₇H₂₀N₂O₂ (284.35): C 71.81, H 7.09, N 9.85; found: C 71.68, H 5.05, N 9.96.

**Methyl 5-(but-3-en-1-yl)-3-phenylpyridazine-1(4H)-carboxylate (3b):**
Isolated by column chromatography on silica gel (ethyl acetate/cyclohexane, 1:9) in 69% yield. oil; ¹H NMR (400 MHz, CDCl₃, 25 °C): δ = 2.17–2.21 (m, 2H, CH₂CH₂CH=CH₂), 2.25–2.31 (m, 2H, CH₂CH₂CH=CH₂), 3.17 (s, 2H, CCH₂C), 3.92 (s, 3H, OCH₃), 4.99–5.10 (m, 2H, CH₂CH₂CH=CH₂), 5.77–5.87 (m, 1H, CH₂CH₂CH=CH₂), 7.00 (s, 1H, NCH), 7.40–7.41 (m, 3H, Ph-H), 7.81–7.83 (m, 2H, Ph-H); ¹³C NMR (100 MHz, CDCl₃, 25 °C): δ = 26.5 (t), 30.7 (t), 33.3 (t), 53.8 (q), 113.9 (s), 115.4 (t), 117.6 (d), 126.0 (d), 128.4 (d), 129.9 (d), 136.4 (s), 137.4 (d), 146.4 (s), 152.6 (s); IR (nujol): νmax = 1721 cm⁻¹; MS m/z (ESI): 271 [M + H]⁺; anal. calcd. for C₁₆H₁₈N₂O₂ (270.33): C, 71.09; H, 6.71; N, 10.36; found: C, 71.22; H, 6.64; N, 10.25.

**Ethyl 3-(4-bromophenyl)-5-(but-3-en-1-yl)pyridazine-1(4H)-carboxylate (3c):**
Isolated by column chromatography on silica gel (ethyl acetate/cyclohexane, 1:9) in 75% yield. oil; ¹H NMR (400 MHz, CDCl₃, 25 °C): δ = 1.38 (t, J = 7.2 Hz, 3H, OCH₂CH₃), 2.16–2.20 (m, 2H, CH₂CH₂CH=CH₂), 2.24–2.28 (m, 2H, CH₂CH₂CH=CH₂), 3.13 (s, 2H, CCH₂C), 4.38 (q, J = 7.2 Hz, 2H, OCH₂CH₃), 5.00–5.09 (m, 2H, CH₂CH₂CH=CH₂), 5.78–5.84 (m, 1H, CH₂CH₂CH=CH₂), 6.98 (s, 1H, NCH), 7.54 (d, J = 8.8 Hz, 2H, Ph-H), 7.70 (d, J = 8.8 Hz, 2H, Ph-H); ¹³C NMR (100 MHz, CDCl₃, 25 °C): δ = 14.5 (q), 26.2 (t), 30.6 (t), 33.3 (t), 63.0 (t), 113.6 (s), 115.4 (t), 117.6 (d), 124.1 (d), 127.5 (d), 131.5 (s), 135.3 (s), 137.4 (d), 144.8 (s), 152.6 (s); IR (nujol): νmax = 1732 cm⁻¹; MS m/z (ESI): 365 (100), 363 (100) [M + H]⁺; anal. calcd. for C₁₇H₁₆BrN₂O₂ (363.25): C, 56.21; H, 5.27; N, 7.71; found: C, 56.36; H, 5.19; N, 7.63.
Ethyl 5-(but-3-enyl)-3-(4-nitrophenyl)pyrazidine-1(4H)-carboxylate (3d):
Isolated by column chromatography on silica gel (ethyl acetate/cyclohexane, 1:9) in 79% yield. oil; ¹H NMR (400 MHz, CDCl₃, 25 °C): δ = 1.40 (t, J = 7.2 Hz, 3H, OCH₂CH₃), 2.18–2.22 (m, 2H, CH₂CH₂CH=CH₂), 2.26–2.35 (m, 2H, CH₂CH₂CH=CH₂), 3.19 (s, 2H, CCH₂C), 4.38 (q, J = 7.2 Hz, 2H, OCH₂CH₃), 5.01–5.10 (m, 2H, CH₂CH₂CH=CH₂), 5.81–5.83 (m, 1H, CH₂CH₂CH=CH₂), 6.99 (s, 1H, NCH), 7.98 (d, J = 8.8 Hz, 2H, Ph-H), 8.25 (d, J = 8.8 Hz, 2H, Ph-H); ¹³C NMR (100 MHz, CDCl₃, 25 °C): δ = 14.5 (q), 26.2 (t), 30.5 (t), 33.2 (t), 63.3 (t), 114.0 (s), 115.6 (t), 117.5 (d), 123.6 (d), 126.7 (d), 136.4 (s), 137.2 (d), 142.3 (s), 148.3 (s), 152.0 (s); IR (nujol): νmax = 1725 cm⁻¹; MS m/z (ESI): 330 [M + H⁺]; anal. calcd. for C₁₇H₁₉N₃O₄ (329,35): C, 62.00; H, 5.81; N, 12.76; found: C, 62.14; H, 5.85; N, 12.66.

3-Ethyl 1-methyl 5-(but-3-en-1-yl)pyrazidine-1,3(4H)-dicarboxylate (3e):
Isolated by column chromatography on silica gel (ethyl acetate/cyclohexane, 1:9) in 26% yield. oil; ¹H NMR (400 MHz, CDCl₃, 25 °C) δ = 1.38 (t, J = 7.2 Hz, 3H, OCH₂CH₃), 2.10–2.14 (m, 2H, CH₂CH₂CH=CH₂), 2.20–2.23 (m, 2H, CH₂CH₂CH=CH₂), 3.04 (s, 2H, CCH₂C), 3.91 (s, 3H, OCH₃), 4.35 (q, J = 7.2 Hz, 2H OCH₂CH₃), 5.01–5.07 (m, 2H, CH₂CH₂CH=CH₂), 5.74–5.81 (m, 1H, CH₂CH₂CH=CH₂), 6.85 (s, 1H, NCH); ¹³C NMR (100 MHz, CDCl₃, 25 °C): δ = 14.1 (q), 25.3 (t), 30.3 (t), 33.0 (t), 54.4 (q), 62.2 (t), 115.6 (s), 116.1 (t), 117.0 (d), 137.4 (d), 139.8 (s), 152.4 (s) 164.0 (s); IR (nujol): νmax = 1723, 1706 cm⁻¹; MS m/z (ESI): 267 [M + H⁺]; anal. calcd. for C₁₇H₁₉N₃O₄ (266,29): C, 58.63; H, 6.81; N, 10.52; found: C, 58.74; H, 6.75; N, 10.59.

Ethyl 5-(but-3-enyl)-1-(phenylcarbamoyl)-1,4-dihydropyrazidine-3-carboxylate (3f):
Isolated by column chromatography on silica gel (ethyl acetate/cyclohexane, 1:9) in 31% yield. oil; ¹H NMR (400 MHz, CDCl₃, 25 °C) δ = 1.39 (t, J = 7.2 Hz, 3H, OCH₂CH₃), 4.35 (q, J = 7.2 Hz, 2H OCH₂CH₃), 4.99–5.09 (m, 2H, CH₂CH₂CH=CH₂), 5.79–5.80 (m, 1H, CH₂CH₂CH=CH₂), 7.08–7.12 (m, 2H, NCH and Ph-H), 7.31–7.35 (m, 2H, Ph-H), 7.51–7.53 (m, 2H, Ph-H), 8.62 (s, H, NH); ¹³C NMR (100 MHz, CDCl₃, 25 °C): δ = 14.2 (q), 25.5 (t), 30.2 (t), 33.2 (t), 61.9 (t), 114.9 (s), 115.4 (t), 115.5 (d), 119.7 (d), 123.8 (d), 129.0 (d), 136.6 (s), 137.2 (d), 137.5 (s), 149.6 (s); IR (nujol): νmax = 1718, 1702 cm⁻¹; MS m/z (ESI): 350 [M + Na⁺], 328 [M + H⁺]; anal. calcd. for C₁₈H₂₁N₃O₃ (327,38): C, 66.04; H, 6.47; N, 12.84; found: C, 66.19; H, 6.41; N, 12.76.

Ethyl 3-(4-bromophenyl)-5-(2,2-dimethyl-3-oxopropyl)pyrazidine-1(4H)-carboxylate (3g):
Isolated by column chromatography on silica gel (ethyl acetate/cyclohexane, 1:9) in 65% yield. oil; ¹H NMR (400 MHz, CDCl₃, 25 °C): δ = 1.12 (s, 6H, CH₂C(CH₃)₂CHO) 1.39 (t, J = 7.2 Hz, 3H, OCH₂CH₃), 2.32 (s, 2H, CH₂C(CH₃)₂CHO), 3.01 (s, 2H, CCH₂C), 4.36 (q, J = 7.2 Hz, 2H, OCH₂CH₃), 6.98 (s, 1H, NCH), 7.52
(d, J = 8.8 Hz, 2H, Ph-H), 7.64 (d, J = 8.8 Hz, 2H, Ph-H), 9.58 (s, 1H CH₂C(CH₃)₂CHO); ¹³C NMR (100 MHz, CDCl₃, 25 °C): δ = 14.5 (q), 22.1 (q), 27.6 (t), 41.6 (t), 46.2 (s), 63.2 (t), 110.2 (s), 120.7 (d), 124.4 (s), 127.6 (d), 131.6 (d), 135.0 (s), 139.4 (s), 144.9 (s), 205.6 (d); IR (nujol): v_max = 1725, 1717 cm⁻¹; MS m/z (ESI): 395 (100), 393 (100) [M + H]⁺; anal. calcd. for C₁₈H₂₁BrN₂O₃ (393,27): C, 54.97; H, 5.38; N, 7.12; found: C, 54.82; H, 5.31; N, 7.17.

**Ethyl 5-(2-benzoyl-3-oxobutyl)-3-phenylpyridazine-1(4H)-carboxylate (3h):**

Isolated by column chromatography on silica gel (ethyl acetate/cyclohexane, 1:9) in 94% yield. oil; ¹H NMR (400 MHz, CDCl₃, 25 °C): δ = 1.37 (t, J = 7.2 Hz, 3H, OCH₂CH₃), 2.17 (s, 3H CH₃CO), 2.81 (d, J = 7.2 Hz, 2H, CCH₂CH), 3.15 (s, 2H, CCH₂C), 4.33 (q, J = 7.2 Hz, 2H, OCH₂CH₃), 4.70 (t, J = 7.2 Hz, 1H, CCH₂CH), 7.01 (s, 1H, NCH), 7.49–8.01 (m, 10H, Ph-H); ¹³C NMR (100 MHz, CDCl₃, 25 °C): δ = 14.5 (q), 26.4 (q), 28.0 (t), 33.0 (t), 61.0 (d), 63.0 (t), 110.5 (s), 119.4 (d), 126.0 (d), 128.4 (d), 128.7 (d), 129.0 (d), 130.0 (d), 134.0 (d), 136.1 (s), 145.9 (s), 153.9 (s), 195.4 (s), 203.0 (s); IR (nujol): v_max = 1725, 1714 cm⁻¹; MS m/z (ESI): 405 [M + H]⁺; anal. calcd. for C₂₄H₂₄N₂O₄ (404,46): C, 71.23; H, 5.98; N, 6.93; found: C, 71.10; H, 5.89; N, 6.84.

**Ethyl 5-(2-benzoyl-3-oxobutyl)-3-(4-bromophenyl)pyridazine-1(4H)-carboxylate (3i):**

Isolated by column chromatography on silica gel (ethyl acetate/cyclohexane, 1:9) in 83% yield. oil; ¹H NMR (400 MHz, CDCl₃, 25 °C): δ = 1.36 (t, J = 7.2 Hz, 3H, OCH₂CH₃), 2.17 (s, 3H CH₃CO), 2.80 (d, J = 7.2 Hz, 2H, CCH₂CH), 3.08 (s, 2H, CCH₂C), 4.33 (q, J = 7.2 Hz, 2H, OCH₂CH₃), 4.69 (t, J = 7.2 Hz, 1H, CCH₂CH), 6.99 (s, 1H, NCH), 7.49–8.00 (m, 9H, Ph-H); ¹³C NMR (100 MHz, CDCl₃, 25 °C): δ = 14.5 (q), 26.2 (q), 28.0 (t), 32.9 (t), 61.0 (d), 63.1 (t), 110.5 (s), 119.4 (d), 124.3 (d), 127.5 (d), 128.7 (d), 129.0 (d), 130.0 (d), 134.0 (d), 136.0 (s), 136.1 (s), 145.9 (s), 153.9 (s), 195.4 (s), 203.0 (s); IR (nujol): v_max = 1732, 1714 cm⁻¹; MS m/z (ESI): 485 [M + H]⁺; anal. calcd. for C₂₄H₂₃BrN₂O₄ (483,35): C, 59.64; H, 4.80; N, 5.80; found: C, 59.51; H, 4.75; N, 5.89.

**Methyl 5-(2-acetyl-3-oxobutyl)-3-phenylpyridazine-1(4H)-carboxylate (3j):**

Isolated by column chromatography on silica gel (ethyl acetate/cyclohexane, 1:9) in 42% yield. oil; ¹H NMR (400 MHz, CDCl₃, 25 °C): δ = 2.14 (s, 6H, COCH₃ enol form), and 2.22 (s, 6H, COCH₃), 2.64 (d, J = 7.2 Hz, 2H, CCH₂CH) and 2.99 (s, 2H, CCH₂C= enol form), 3.14 (s, 2H, CCH₂C) and 3.19 (s, 2H, CCH₂C enol form), 3.92 (s, 3H, OCH₃), 3.95–3.99 (m, 1H, CCH₂CH), 6.89 (s, 1H, NCH enol form) and 7.01 (s, 1H, NCH), 7.40–7.43 (m, 3H, Ph-H) and 7.80–7.82 (m, 2H, Ph-H); ¹³C NMR (100 MHz, CDCl₃, 25 °C): δ = 23.1 (q, enol form), 26.4 (q) 26.8 (q, enol form), 29.1 (t, enol form) 29.7 (t), 32.0 (t, enol form), 32.1 (t), 54.0 (q), 66.1 (d), 104.9 (s, enol form), 110.5
(s), 112.7 (s, enol form), 117.8 (d, enol form), 119.4 (d), 125.9 (d, enol form), 126.0 (d), 128.4 (d), 128.5 (d, enol form), 130.0 (d, enol form), 130.1 (d), 136.1 (s, enol form), 145.9 (s, enol form), 146.1 (s), 153.0 (s), 191.8 (s, enol form), 202.9 (s); IR (nujol): ν_{max} = 1730, 1708 cm⁻¹; MS m/z (ESI): 329 [M + H⁺]; anal. calcd. for C_{18}H_{20}N_{2}O_{4} (328,36): C, 65.84; H, 6.14; N, 8.53; found: C, 65.71; H, 6.19; N, 8.47.

**Ethyl 5-(furan-2-ylmethyl)-3-phenylpyridazine-1(4H)-carboxylate (3k):**
Isolated by column chromatography on silica gel (ethyl acetate/cyclohexane, 1:4) in 56% yield. oil; ¹H NMR (400 MHz, CDCl₃, 25 °C): δ = 1.40 (t, J = 7.2 Hz, 3H, OCH₂CH₃), 3.15 (s, 2H, CCH₂), 3.37 (s, 2H, CCH₂CH₃), 4.37 (q, J = 7.2 Hz, 2H, OCH₂CH₃), 5.87 (d, J = 2.8 Hz, 1H, CH₂), 6.31 (d, J = 2.8 Hz, 1H, CH₂), 7.11 (s, 1H, NCH), 7.34 – 7.40 (m, 3H, Ph-H), 7.79 – 7.82 (m, 2H, Ph-H); IR (nujol): ν_{max} = 1705 cm⁻¹; MS m/z (ESI): 333 [M + Na⁺], 311 [M + H⁺]; anal. calcd. for C_{19}H_{20}N_{2}O_{3} (310,35): C, 69.66; H, 5.85; N, 9.03; found: C, 69.73; H, 5.81; N, 9.09.

**Ethyl 5-((5-methylfuran-2-yl)methyl)-3-phenylpyridazine-1(4H)-carboxylate (3l):**
Isolated by column chromatography on silica gel (ethyl acetate/cyclohexane, 1:4) in 94% yield. oil; ¹H NMR (400 MHz, CDCl₃, 25 °C): δ = 1.40 (t, J = 7.2 Hz, 3H, OCH₂CH₃), 2.26 (d, J = 0.8 Hz, 3H, CCH₃), 3.15 (s, 2H, CCH₂), 3.37 (s, 2H, CCH₂CH₃), 4.37 (q, J = 7.2 Hz, 2H, OCH₂CH₃), 5.87 (d, J = 2.8 Hz, 1H, CH₂), 5.98 (d, J = 2.8 Hz, 1H, furan), 7.10 (s, 1H, NCH), 7.39 – 7.40 (m, 3H, Ph-H), 7.79 – 7.82 (m, 2H, Ph-H); IR (nujol): ν_{max} = 1728 cm⁻¹; MS m/z (ESI): 325 [M + H⁺]; anal. calcd. for C_{19}H_{20}N_{2}O_{3} (324,37): C, 70.35; H, 6.21; N, 8.64; found: C, 70.20; H, 6.25; N, 8.58.

**Ethyl 5-((5-methylfuran-2-yl)methyl)-1-(phenylcarbamoyl)-1,4-dihydropyridazine-3-carboxylate (3m):**
Isolated by column chromatography on silica gel (ethyl acetate/cyclohexane, 1:4) in 30% yield. oil; ¹H NMR (400 MHz, CDCl₃, 25 °C): δ = 1.38 (t, J = 7.2 Hz, 3H, OCH₂CH₃), 2.25 (d, J = 0.8 Hz, 3H, CCH₃), 3.09 (s, 2H, CCH₂), 3.31 (s, 2H, CCH₂CH₃), 4.33 (q, J = 7.2 Hz, 2H, OCH₂CH₃), 5.87 (d, J = 2.8 Hz, 1H, furan), 5.98 (d, J = 2.8 Hz, 1H, furan), 7.10 (t, J = 7.6 Hz, 1H, Ph-H), 7.17 (s, 1H, NCH), 7.34 (t, J = 7.6 Hz, 2H, Ph-H), 8.61 (s, 1H, NH); IR (nujol): ν_{max}
Ethyl 5-[(1H-indol-3-yl)methyl]-3-phenylpyridazine-1(4H)-carboxylate (3n):
Isolated by column chromatography on silica gel (ethyl acetate/cyclohexane, 2:3) in 41% yield. oil; ¹H NMR (400 MHz, CDCl₃, 25 °C): δ = 1.41 (t, J = 7.2 Hz, 3H, OCH₂CH₃), 3.15 (s, 2H, CCH₂C), 3.57 (s, 2H, CCH₂C₈H₆N), 4.38 (q, J = 7.2 Hz, 2H, OCH₂CH₃), 7.04 (d, J = 2.4 Hz, 1H, Indole-H), 7.13–7.26 (m, 3H, NCH, Indole-H) 7.32–7.38 (m, 4H, Ph-H, Indole-H) 7.64 (d, J = 7.6 Hz, 1H, Indole-H) 7.74–7.76 (m, 2H, Ph-H) 8.12 (s, 1H, NH); ¹³C NMR (100 MHz, CDCl₃, 25 °C): δ = 15.5 (q), 26.1 (t), 30.2 (t), 62.9 (t), 111.2 (d), 111.6 (s), 113.7 (s), 117.9 (d), 118.9 (d), 119.5 (d), 122.1 (d), 122.5 (d), 126.0 (d), 127.5 (s), 128.2 (d), 129.7 (d), 136.4 (s), 136.4 (s), 146.4 (s), 152.5 (s); IR (nujol): νₓ = 3285, 1713 cm⁻¹; MS m/z (ESI): 360 [M + H⁺]; anal. calcd. for C₂₆H₂₁N₃O₄ (367,40): C, 65.38; H, 5.76; N, 11.44; found: C, 65.25; H, 5.74; N, 11.54.

Methyl 5-[(1H-indol-3-yl)methyl]-3-phenylpyridazine-1(4H)-carboxylate (3o):
Isolated by column chromatography on silica gel (ethyl acetate/cyclohexane, 2:3) in 49% yield. oil; ¹H NMR (400 MHz, CDCl₃, 25 °C): δ = 3.15 (s, 2H, CCH₂C), 3.57 (s, 2H, CCH₂C₈H₆N), 3.94 (s, 3H, OCH₃), 5.39 (s, 2H, OCH₂Ph), 6.90 (d, J = 8.8 Hz, 2H, Ph-H), 7.04 (d, J = 2.4 Hz, 1H, Indole), 7.10–7.20 (m, 3H, NCH, Indole-H) 7.35–7.37 (m, 4H, Ph-H, Indole-H) 7.64 (d, J = 7.6 Hz, 1H, Indole-H) 7.73–7.75 (m, 2H, Ph-H) 8.14 (s, 1H, NH); ¹³C NMR (100 MHz, CDCl₃, 25 °C): δ = 26.2 (t), 30.1 (t), 53.8 (q), 111.2 (d), 111.4 (s), 114.0 (s), 117.8 (d), 118.8 (d), 119.5 (d), 122.1 (d), 122.5 (d), 126.0 (d), 127.5 (s), 128.3 (d), 129.8 (d), 136.3 (s), 136.4 (s), 146.9 (s), 153.3 (s); IR (nujol): νₓ = 3285, 1732 cm⁻¹; MS m/z (ESI): 346 [M + H⁺]; anal. calcd. for C₂₁H₁₉N₃O₂ (345,39): C, 73.03; H, 5.54; N, 12.17; found: C, 73.17; H, 5.58; N, 12.10.

4-Methoxybenzyl 5-[(1H-indol-3-yl)methyl]-3-phenylpyridazine-1(4H)-carboxylate (3p):
Isolated by column chromatography on silica gel (ethyl acetate/cyclohexane, 2:3) in 47% yield. oil; ¹H NMR (400 MHz, CDCl₃, 25 °C): δ = 3.14 (s, 2H, CCH₂C), 3.81 (s, 3H, OCH₃), 5.39 (s, 2H, OCH₂Ph), 6.90 (d, J = 8.8 Hz, 2H, Ph-H), 7.04 (d, J = 2.4 Hz, 1H, Indole), 7.10–7.20 (m, 3H, NCH, Indole-H) 7.35–7.37 (m, 6H, Ph-H, Indole-H) 7.62 (d, J = 8.0 Hz, 1H, Indole-H) 7.73–7.75 (m, 2H, Ph-H) 8.07 (s, 1H, NH); ¹³C NMR (100 MHz, CDCl₃, 25 °C): δ = 26.1 (t), 30.1 (t), 55.3 (q), 68.1 (t), 111.2 (d), 111.6 (s), 113.9 (s), 117.9 (d), 118.9 (d), 119.6 (d), 122.2 (d), 122.5 (d), 126.0 (d), 127.5 (s), 128.2 (d), 128.2 (d), 128.6 (s), 129.7 (d), 130.0 (d), 136.3 (s), 136.4 (s), 146.6 (s), 152.7 (s), 159.6 (s); IR (nujol): νₓ = 3295, 1724 cm⁻¹; MS m/z
ESI: 452 [M + H⁺]; anal. calcd. for C_{28}H_{25}N_{3}O_{3} (451,52): C, 74.48; H, 5.58; N, 9.31; found: C, 74.31; H, 5.52; N, 9.39.

**Ethyl 5-[(1-methyl-1H-indol-3-yl)methyl]-3-phenylpyridazine-1(4H)-carboxylate (3q):**

Isolated by column chromatography on silica gel (ethyl acetate/cyclohexane, 2:3) in 58% yield. oil; ¹H NMR (400 MHz, CDCl₃, 25 °C): δ = 1.40 (t, J = 7.2 Hz, 3H, OCH₂CH₃), 3.15 (s, 2H, CH₂C), 3.56 (s, 2H, CH₂C₃H₅N), 3.76 (s, 3H, NCH₃), 4.38 (q, J = 7.2 Hz, 2H, OCH₂CH₃), 6.91 (s, 1H, Indole-H), 7.09–7.31, (m, 4H, NCH, Indole-H) 7.35–7.37 (m, 3H, Ph-H) 7.62 (d, J = 8.0 Hz, 1H, Indole-H) 7.74–7.76 (m, 2H, Ph-H); ¹³C NMR (100 MHz, CDCl₃, 25 °C): δ = 14.6 (q), 26.1 (t), 30.1 (t), 32.7 (q), 62.9 (t), 109.2 (d), 110.0 (s), 113.9 (s), 117.8 (d), 118.9 (d), 119.0 (d), 121.7 (d), 126.0 (d), 127.2 (d), 127.9 (s), 128.2 (d), 129.7 (d), 136.4 (s), 137.2 (s), 146.4 (s), 152.7 (s); IR (nujol): ν_{max} = 1718 cm⁻¹; MS m/z (ESI): 374 [M + H⁺]; anal. calcd. for C_{23}H_{23}N_{3}O_{2} (373,45): C, 73.97; H, 6.21; N, 11.25; found: C, 73.79; H, 6.25; N, 11.31.

**Ethyl 5-methyl-3-phenylpyridazine-1(4H)-carboxylate (3r):**

Isolated by column chromatography on silica gel (ethyl acetate/cyclohexane, 1:9) in 53% yield. oil; ¹H NMR (400 MHz, CDCl₃, 25 °C): δ = 1.40 (t, J = 7.2 Hz, 3H OCH₂CH₃), 1.78 (s, 3H, CH₃), 3.15 (s, 2H, CH₂C), 4.36 (q, J = 7.2 Hz, 2H, OCH₂CH₃), 6.97 (s, 1H, NCH₃), 7.40–7.42 (m, 3H, Ph-H), 7.83 (m, 2H, Ph-H); ¹³C NMR (100 MHz, CDCl₃, 25 °C): δ = 14.6 (q), 19.8 (q), 27.9 (t), 62.9 (t), 110.7 (s), 117.2 (d), 125.9 (d), 128.3 (d), 129.8 (d), 136.4 (s), 145.9 (s), 152.6 (s); IR (nujol): ν_{max} = 1725 cm⁻¹; MS m/z (ESI): 245 [M + H⁺]; anal. calcd. for C_{14}H_{16}N_{2}O_{2} (244,29): C, 68.83; H, 6.60; N, 11.47; found: C, 68.96; H, 6.65; N, 11.40.
3. References and notes

4. $^1$H and $^{13}$C NMR spectra of products.
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1H NMR (500 MHz, CDCl₃): δ 7.82 (s, 1H), 7.81 (s, 1H), 7.42 (t, 2H), 7.41 (t, 2H), 7.40 (t, 2H), 7.39 (t, 2H), 7.01 (d, 2H), 6.89 (d, 2H).

13C NMR (125 MHz, CDCl₃): δ 223.07, 220.94, 159.84, 153.04, 134.32, 130.89, 128.47, 128.45, 119.79, 117.79, 115.90, 114.93, 104.93, 53.96, 46.11, 32.88, 29.86, 29.13, 26.83, 26.35, 23.07.

Formula: C₂₅H₂₄N₂O₅
3k

N
N
O
O
O
3