Supporting Information
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Experimental Section:
All the chemicals were procured from either Sigma Aldrich Chemicals Pvt. Ltd. or Spectrochem, India. Silica gel [(60-120 mesh) was used for chromatographic separation. Silica gel G [E-Merck (India)] was used for TLC. Petroleum ether refers to the fraction boiling between 60 °C and 80 °C. IR spectra were recorded on a Perkin-Elmer L 120-000A spectrometer (ν max in cm⁻¹) on KBr disks. ¹H NMR and ¹³C spectra were recorded on a Bruker DPX-400 in CDCl₃ (chemical shift in δ) with TMS as internal standard. MS were recorded on a Q-TOF micro Tm instrument at the Indian Institute of Chemical Biology. CHN was recorded on a Perkin-Elmer 2400 series II CHN analyzer. Melting points were determined in open capillaries and are uncorrected. HRMS were recorded on a Q-tof Micro YA263 instrument.

General procedure for the preparation of compound 3a-i: A mixture of 5-allyl-6-amino-2H-chromen-2-one or 5-allyl-6-amino-1-alkylquinolin-2(1H)-one (I) (1.0 equiv.) and aromatic aldehyde (2a-h) (1.0 equiv.) was stirred in toluene at r.t. for 10 minutes. After addition of 10 mol % InCl₃ (mol % calculated relative to I), the reaction mixture was refluxed for 6.5h. (completion of the reaction was monitored by TLC). Each of the reaction mixture was cooled and avoiding any further work-up, was directly dry packed over a silica gel (230-400 mesh) column. The pure products (3a-i) were obtained by eluting the column with 4:1 petroleum ether-ethyl acetate mixture.

9-Methyl-8-phenyl-3H-pyrano[3,2-f]quinolin-3-one (3a):
White powder. Yield 93 %, m.p. 240 °C. IR (KBr): 2924, 2853, 1728 cm⁻¹. ¹H NMR (CDCl₃, 400 MHz): δH = 2.57 (s, 3H, CH₃), 6.63 (d, 1H, J = 10 Hz, ArH), 7.47-7.54 (m, 3H, ArH), 7.60-7.66 (m, 3H, ArH), 8.28 (d, 1H, J = 9.2 Hz, ArH), 8.40 (s, 1H, ArH), 8.46 (d, 1H, J = 9.6 Hz) ppm. ¹³C NMR (CDCl₃, 100 MHz): δC = 21.2, 112.1, 116.2, 119.8, 123.4, 128.5, 128.6, 128.9, 130.8, 131.4, 134.4, 138.4, 140.0, 143.7, 153.6, 160.3, 160.7 ppm. HRMS (ES+) calcd for C₁₉H₁₃NO₂ (M +H) 288.0017 found 287.9302.

8-(4-Bromophenyl)-9-methyl-3H-pyrano[3,2-f]quinolin-3-one (3b):
White powder. Yield 84 %, m.p. 264-266 °C. IR (KBr): 2923, 2853, 1728 cm⁻¹. ¹H NMR (CDCl₃, 400 MHz): δH = 2.57 (s, 3H, CH₃), 6.62 (d, 1H, J = 10 Hz, ArH), 7.47-7.54 (m, 3H, ArH), 7.60-7.66 (m, 3H, ArH), 8.28 (d, 1H, J = 9.2 Hz, ArH), 8.40 (s, 1H, ArH), 8.43 (d, 1H, J = 9.6 Hz, ArH) ppm. MS: m/z = 365.93 (M+H)⁺, 367.92 (M+H+2)⁺. Anal. Calcd (%) for C₁₉H₁₂BrNO₂: C, 62.32; H, 3.30; N, 3.82; Found: C, 62.18; H, 3.39; N, 3.94.

8-(2-Chlorophenyl)-9-methyl-3H-pyrano[3,2-f]quinolin-3-one (3c):
White powder. Yield 89 %, m.p. 206-208 °C. IR (KBr): 2920, 2851, 1717 cm⁻¹. ¹H NMR (CDCl₃, 400 MHz): δH = 2.41 (s, 3H, CH₃), 6.63 (d, 1H, J = 9.6 Hz, ArH), 7.42 (m, 3H, ArH), 7.52 (m, 1H, ArH), 7.66 (d, 1H, J = 9.2 Hz, ArH), 8.26 (d, 1H, J = 9.2 Hz, ArH), 8.42 (s, 1H, ArH), 8.46 (d, 1H, J = 10 Hz, ArH) ppm. HRMS (ESI) calcd for C₁₉H₁₂ClNO₂ (M +H)+ 322.0625 found 322.0629.
8-(4-Methoxyphenyl)-9-methyl-3H-pyrano[3,2-f]quinolin-3-one (3d):
White powder. Yield 94%, m.p. 226-228 °C. IR (KBr): 2917, 2849, 1726 cm⁻¹. ¹H NMR (CDCl₃, 400 MHz): δH = 2.60 (s, 3H, CH₃), 3.89 (s, 3H, OCH₃), 6.61 (d, 1H, J = 9.6 Hz, ArH), 7.04 (d, 2H, J = 8.8 Hz, ArH), 7.58 (d, 2H, J = 8.8 Hz, ArH), 7.62 (d, 1H, J = 9.2 Hz, ArH), 8.25 (d, 1H, J = 8.8 Hz, ArH), 8.37 (s, 1H, ArH), 8.44 (d, 1H, J = 10Hz, ArH) ppm. HRMS (ESI) calcd for C₂₀H₁₅NO₃ (M +H)⁺ 318.1136 found 318.1184.

8-(3,4-Dimethoxyphenyl)-9-methyl-3H-pyrano[3,2-f]quinolin-3-one (3e):
White powder. Yield 90%, m.p. 230-232 °C. IR (KBr): 2923, 2852, 1723 cm⁻¹. ¹H NMR (CDCl₃, 400 MHz): δH = 2.60 (s, 3H, CH₃), 3.95 (s, 6H, OCH₃), 6.62 (d, 1H, J = 10 Hz, ArH), 6.99 (d, 1H, J = 8.8 Hz, ArH), 7.17 (d, 1H, J = 9.2 Hz, ArH), 7.25 (s, 1H, ArH), 7.64 (d, 1H, J = 9.2 Hz, ArH), 8.26 (d, 1H, J = 9.2 Hz, ArH), 8.38 (s, 1H, ArH), 8.44 (d, 1H, J = 9.6 Hz) ppm. HRMS (ESI) calcd for C₂₁H₁₇NO₄ (M +H)⁺ 348.1236 found 348.0956.

9-Methyl-8-(thiophen-2-yl)-3H-pyrano[3,2-f]quinolin-3-one (3f):
White powder. Yield 88%, m.p. 236-238 °C. IR (KBr): 2922, 2853, 1691 cm⁻¹. ¹H NMR (CDCl₃, 400 MHz): δH = 2.82 (s, 3H, CH₃), 6.60 (d, 1H, J = 10 Hz, ArH), 7.19 (t, 1H, J = 4.8 Hz, ArH), 7.51 (d, 1H, J = 5.2 Hz, ArH), 7.61 (d, 1H, J = 9.2 Hz, ArH), 7.65 (d, 1H, J = 3.2 Hz, ArH), 8.21 (d, 1H, J = 9.2 Hz, ArH), 8.33 (s, 1H, ArH), 8.40 (d, 1H, J = 9.6 Hz, ArH) ppm. HRMS (ESI) calcd for C₁₇H₁₁NO₂S (M +H)⁺ 294.0547 found 294.0583.

8-(4-Chlorophenyl)-4,9-dimethyl-4,7-phenanthrolin-3(4H)-one (3g):
White powder. Yield 89%, m.p. 246-248 °C. IR (KBr): 2918, 1658 cm⁻¹. ¹H NMR (CDCl₃, 400 MHz): δH = 2.57 (s, 3H, CH₃), 3.90 (s, 3H, NCH₃), 6.93 (d, 1H, J = 9.6 Hz, ArH), 7.48 (m, 2H, ArH), 7.58 (d, 2H, J = 8.4 Hz, ArH), 7.79 (d, 1H, J = 9.6 Hz, ArH), 8.26 (d, 1H, J = 9.2 Hz, ArH), 8.49 (s, 1H, ArH), 8.52 (m, 1H, ArH) ppm. ¹³C NMR (CDCl₃, 100 MHz): HRMS (ESI) calcd for C₂₀H₁₅ClN₂O (M +H)⁺ 335.0938 found 335.0946.

4-Ethyl-9-methyl-8-p-tolyl-4,7-phenanthrolin-3(4H)-one (3h):
White powder. Yield 94%, m.p. 242-244 °C. IR (KBr): 2922, 2853, 1668 cm⁻¹. ¹H NMR (CDCl₃, 400 MHz): δH = 1.45 (t, 3H, J = 7.2 Hz, -CH₂CH₃), 2.44 (s, 3H, -CH₃), 2.57 (s, 3H, -CH₃), 4.53 (q, 2H, J = 7.2 Hz, CH₂CH₃), 6.91 (d, 1H, J = 9.6 Hz, ArH), 7.31 (d, 2H, J = 7.6 Hz, ArH), 7.52 (d, 2H, J = 8 Hz, ArH), 7.77 (d, 1H, J = 9.2 Hz, ArH), 8.28 (d, 1H, J = 9.2 Hz, ArH), 8.50 (d, 2H, J = 7.2 Hz, ArH) ppm. HRMS (ESI) calcd for C₂₂H₂₀N₂O (M +H)⁺ 329.0953 found 329.0800.

8-(4-Chlorophenyl)-4-ethyl-9-methyl-4,7-phenanthrolin-3(4H)-one (3i):
White powder. Yield 83%, m.p. 234-236 °C, IR (KBr): 2918, 2869, 1665 cm⁻¹. ¹H NMR (CDCl₃, 400 MHz): δH = 1.46 (t, 3H, J = 7.2 Hz, -CH₂CH₃), 2.57 (s, 3H, -CH₃), 4.53 (q, 2H, J = 7.2 Hz, CH₂CH₃), 6.92 (d, 1H, J = 10 Hz, ArH), 7.49 (d, 2H, J = 8.4 Hz, ArH), 7.58 (d, 2H, J = 8.4 Hz, ArH), 7.79 (d, 1H, J = 9.6 Hz, ArH), 8.26 (d, 1H, J = 9.6 Hz, ArH), 8.50 (d, 2H, J = 12 Hz, ArH) ppm. HRMS (ESI) calcd for C₂₁H₁₇ClN₂O (M +H)⁺ 349.1108 found 349.0956.
General procedure for the preparation of compound 5a-l: A mixture of 6-allyl-5-amino-1,3-dimethylpyrimidine-2,4(1H,3H)-dione (4) (1.0 equiv.) and suitable aromatic aldehyde (1.0 equiv.) was stirred in toluene at r.t. for 10 minutes. After addition of 10 mol % InCl₃ (22.5mg, mol % calculated relative to 4), the reaction mixture was refluxed for 6.5h (the completion of the reaction was monitored by TLC). Each of the reaction mixture was cooled and without any further work-up, was dry packed over a silica gel (230-400 mesh) column. The pure product was obtained by eluting the column with 1:1 petroleum ether-ethyl acetate mixture. The products thus obtained were recrystallized from CH₃CN to give compounds (5a-l).

1,3,7-Trimethyl-6-phenylpyrido[3,2-d]pyrimidine-2,4(1H,3H)-dione (5a):
White powder. Yield 91 %, m.p. 218-220 °C. IR (KBr): 2948, 1714, 1666, cm⁻¹. ¹H NMR (CDCl₃, 400 MHz): δ₇ = 2.51 (s, 3H, CH₃), 3.54 (s, 3H, NCH₃), 3.64 (s, 3H, NCH₃), 7.41-7.48 (m, 4H, ArH), 7.45-7.56 (m, 2H, ArH), ppm. ¹³C NMR (CDCl₃, 100 MHz): δC = 21.1(CH₃), 29.0, 30.6, 123.6, 128.2, 128.4, 129.3, 129.8, 136.6, 137.9, 138.8, 150.8, 155.3, 160.7 ppm. HRMS (ESI) calcd for C₁₆H₁₅N₃O₂ (M +H)⁺ 282.1250 found 282.1237.

6-(4-Bromophenyl)-1,3,7-trimethylpyrido[3,2-d]pyrimidine-2,4(1H,3H)-dione (5b):
White powder. Yield 89 %, m.p. 216-218 °C. IR (KBr): 2921, 1705, 1660, cm⁻¹. ¹H NMR (CDCl₃, 400 MHz): δ₇ = 2.49 (s, 3H, CH₃), 3.52 (s, 3H, NCH₃), 3.63 (s, 3H, NCH₃), 7.42 (d, 2H, J = 8 Hz, ArH), 7.50 (s, 1H, ArH), 7.56 (d, 2H, J = 8 Hz, ArH), ppm. HRMS (ESI) calcd for C₁₆H₁₄BrN₃O₂ (M +H)⁺ 360.0348 found 360.0245 & 362.0217 (M + H + 2)⁺.

6-(4-Methoxyphenyl)-1,3,7-trimethylpyrido[3,2-d]pyrimidine-2,4(1H,3H)-dione (5c):
White powder. Yield 95 %, m.p. 250-252 °C IR (KBr): 2841,1704, 1662 cm⁻¹. ¹H NMR (CDCl₃, 400 MHz): δ₇ = 2.52 (s, 3H, CH₃), 3.54 (s, 3H, NCH₃), 3.63 (s, 3H, NCH₃), 3.86 (s, 3H, OCH₃), 6.97 (d, 2H, J = 8.8 Hz, ArH), 7.46 (s, 1H, ArH), 7.51 (dd, 2H, J = 2 Hz, 8.8 Hz, ArH) ppm. HRMS (ESI) calcd for C₁₇H₁₇N₃O₃ (M +H)⁺ 312.1328 found 312.1343.

1,3,7-Trimethyl-6-(thiophen-2-yl)pyrido[3,2-d]pyrimidine-2,4(1H,3H)-dione (5d):
White powder. Yield 87 %, m.p. 221-223 °C. IR (KBr): 2952, 1710, 1663, cm⁻¹. ¹H NMR (CDCl₃, 400 MHz): δ₇ = 2.72 (s, 3H, CH₃), 3.53 (s, 3H, NCH₃), 3.62 (s, 3H, NCH₃), 7.13 (t, 1H, J = 3.6 Hz, ArH), 7.43 (s, 1H, ArH), 7.45 (dd, 1H, J = 0.8 Hz, 5.2 Hz, ArH), 7.52 (d, J = 3.6 Hz, 1H, ArH) ppm. HRMS (ESI) calcd for C₁₄H₁₃N₃O₂S (M +H)⁺ 288.0781 found 288.0801.

6-(4-Chlorophenyl)-1,3,7-trimethylpyrido[3,2-d]pyrimidine-2,4(1H,3H)-dione (5e):
White powder. Yield 91 %, m.p. 228-230 °C. IR (KBr): 2951, 1701, 1666 cm⁻¹. ¹H NMR (CDCl₃, 400 MHz): δ₇ = 2.50 (s, 3H, CH₃), 3.53 (s, 3H, NCH₃), 3.64 (s, 3H, NCH₃), 7.41 (d, 2H, J = 8.0 Hz, ArH), 7.49 (d, 2H, J = 8.4 Hz, ArH), 7.51 (s, 1H, ArH) ppm. HRMS (ESI) calcd for C₁₆H₁₄ClN₃O₂ (M +Na)⁺ 338.0672 found 338.0691.

1,3,7-Trimethyl-6-p-tolylpyrido[3,2-d]pyrimidine-2,4(1H,3H)-dione (5f):
White powder. Yield 94%, m.p. 218-220 °C. IR (KBr): 2919, 1710, 1665 cm⁻¹. ¹H NMR (CDCl₃, 400 MHz): δH = 2.40 (s, 3H, CH₃), 2.51 (s, 3H, CH₃), 3.54 (s, 3H, NCH₃), 3.63 (s, 3H, NCH₃), 7.24 (d, 2H, J = 7.2 Hz, ArH), 7.45 (m, 3H, ArH) ppm. HRMS (ESI) calcd for C₁₇H₁₇N₃O₂ (M +H)⁺ 296.1406 found 296.1393.

6-(3-Chlorophenyl)-1,3,7-trimethylpyrido[3,2-d]pyrimidine-2,4(1H,3H)-dione (5g):
White powder. Yield 86%, m.p. 232-234 °C. IR (KBr): 2954, 1707, 1663 cm⁻¹. ¹H NMR (CDCl₃, 400 MHz): δH = 2.50 (s, 3H, CH₃), 3.54 (s, 3H, NCH₃), 3.64 (s, 3H, NCH₃), 7.36-7.41 (m, 3H, ArH), 7.49 (s, 1H, ArH), 7.55 (s, 1H, ArH) ppm. HRMS (ESI) calcd for C₁₆H₁₄ClN₃O₂ (M +H)⁺ 316.0859 found 316.0847.

6-(2-Methoxyphenyl)-1,3,7-trimethylpyrido[3,2-d]pyrimidine-2,4(1H,3H)-dione (5h):
White powder. Yield 88%, m.p. 240-242 °C. IR (KBr): 2833, 1708, 1659 cm⁻¹. ¹H NMR (CDCl₃, 400 MHz): δH = 2.31 (s, 3H, CH₃), 3.53 (s, 3H, NCH₃), 3.64 (s, 3H, NCH₃), 3.74 (s, 3H, OCH₃), 6.93 (d, 1H, J = 8.4 Hz, ArH), 7.05 (t, 1H, J = 7.6 Hz, ArH), 7.31 (dd, 1H, J = 1.6 Hz, 7.2 Hz, ArH), 7.39 (td, 1H, J = 1.6 Hz, 9.6Hz, ArH) 7.44 (s, 1H, ArH) ppm. HRMS (ESI) calcd for C₁₇H₁₇N₃O₃ (M +H)⁺ 312.1328 found 312.1341.

6-(2,5-Dimethoxyphenyl)-1,3,7-trimethylpyrido[3,2-d]pyrimidine-2,4(1H,3H)-dione (5i):
White powder. Yield 87%, m.p. 194-196 °C. IR (KBr): 2941, 1704, 1663 cm⁻¹. ¹H NMR (CDCl₃, 400 MHz): δH = 2.31 (s, 3H, CH₃), 3.53 (s, 3H, NCH₃), 3.62 (s, 3H, NCH₃), 3.72 (s, 3H, OCH₃), 3.85 (s, 3H, OCH₃), 6.50 (d, 1H, J = 2.0 Hz, ArH), 6.57 (dd, 1H, J = 2 Hz, 8 Hz, ArH) 7.25 (d, 2H, J = 8.4 Hz, ArH), 7.43 (s, 1H, ArH) ppm. HRMS (ESI) calcd for C₁₈H₁₉N₃O₄ (M +Na)⁺ 364.1273 found 364.1264.

6-(5-Chloro-2-methoxyphenyl)-1,3,7-trimethylpyrido[3,2-d]pyrimidine-2,4(1H,3H)-dione (5j):
White powder. Yield 84%, m.p. 240-242 °C. IR (KBr): 2835, 1704, 1667 cm⁻¹. ¹H NMR (CDCl₃, 400 MHz): δH = 2.31 (s, 3H, CH₃), 3.53 (s, 3H, NCH₃), 3.63 (s, 3H, NCH₃), 3.72 (s, 3H, OCH₃), 6.85 (d, 1H, J = 8.8 Hz, ArH), 7.29 (d, 1H, J = 2.0 Hz, ArH), 7.29 (dd, 1H, J = 2 Hz, 8 Hz, ArH) 7.32 (dd, 1H, J = 2.4 Hz, 8.8 Hz, ArH), 7.46 (s, 1H, ArH) ppm. HRMS (ESI) calcd for C₁₇H₁₆ClN₃O₃ (M +H)⁺ expected 346.0938, found 346.0953.

6-(5-Tert-butyl-2-methoxyphenyl)-1,3,7-trimethylpyrido[3,2-d]pyrimidine-2,4(1H,3H)-dione (5k):
White powder. Yield 91%, m.p. 234-236 °C. IR (KBr): 2959, 1712, 1667 cm⁻¹. ¹H NMR (CDCl₃, 400 MHz): δH = 1.30 (s, 9H, C(CH₃)3), 2.30 (s, 3H, CH₃), 3.54 (s, 3H, NCH₃), 3.64 (s, 3H, NCH₃), 3.71 (s, 3H, OCH₃), 6.85 (d, 1H, J = 8.8 Hz, ArH), 7.25 (s, 1H. ArH), 7.37 (dd, 1H, J = 2.4 Hz, 8.8 Hz, ArH), 7.44 (s, 1H, ArH) ppm. HRMS (ESI) calcd for C₂₁H₂₅N₃O₃ (M +H)⁺ 368.1953 found 368.1969.

6-(Furan-2-yl)-1,3,7-trimethylpyrido[3,2-d]pyrimidine-2,4(1H,3H)-dione (5l):
Grayish solid. Yield 96%, m.p. 222-224 °C. IR (KBr): 3114, 1712, 1667 cm⁻¹. ¹H NMR (CDCl₃, 400 MHz): δH = 2.71 (s, 3H, -CH₃), 3.53 (s, 3H, NCH₃), 3.61 (s, 3H, NCH₃), 6.56 (t, 1H, J = 1.6 Hz, ArH), 7.12 (d, 1H, J = 3.2 Hz, ArH), 7.40 (s, 1H, ArH), 7.59 (s, 1H, ArH) ppm. HRMS (ESI) calcd for C₁₄H₁₃N₃O₃ (M +Na)⁺ 294.0885 found 294.0836.