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SUPPLEMENTARY MATERIAL TO

Microwave-assisted synthesis of novel 4*H*-chromene derivatives bearing phenoxypyrazole and their antimicrobial activity assessment

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ANALYTICAL, PHYSICAL AND SPECTROSCOPIC DATA OF THE SYNTHESIZED COMPOUNDS

*2-Amino-4-(3-methyl-5-phenoxy-1-phenyl-1*H*-pyrazol-4-yl)-5-oxo-5,6,7,8-tetrahydro-4*H*-chromene-3-carbonitrile (**4a**)*. Yield: 78 %; m.p.: 159–160 °C; Anal. Calcd. for $C_{26}H_{22}N_4O_3$ (FW: 438.48): C, 71.22; H, 5.06; N, 12.78 %. Found: C, 71.13; H, 5.13; N, 12.69 %; IR (KBr, cm^{-1}): 3395 and 3310 (asym. and sym. stretching of $-NH_2$), 2200 (–C≡N stretching), 1680 (C=O str.), 1230 (C–O–C ether stretching); ^{1}H-NMR (400 MHz, DMSO-d_6, δ / ppm): 1.68–2.17 (6H, *m*, 3×CH_2), 2.37 (3H, *s*, CH_3), 4.20 (1H, *s*, CH), 6.68–7.41 (12H, *m*, Ar–H + NH_2); ^{13}C-NMR (100 MHz, DMSO-d_6, δ / ppm): 13.10 (CH_3), 19.45 (CH_2), 25.00 (CH), 26.48 (CH_2), 36.49 (CH_2), 56.30 (**C**–CN), 111.20, 112.54, 115.26, 115.53, 120.50, 121.49, 126.85, 129.61, 138.34, 145.63, 147.80, 150.20, 155.43, 159.00, 164.30 (Ar–C + CN), 196.19 (C=O); MS (*m*/*z*): 439.2 (M+1).

*2-Amino-4-[3-methyl-5-(4-methylphenoxy)-1-phenyl-1*H*-pyrazol-4-yl]-5-oxo--5,6,7,8-tetrahydro-4*H*-chromene-3-carbonitrile (**4b**)*. Yield: 90 %; m.p.: 217––218 °C; Anal. Calcd. for $C_{27}H_{24}N_4O_3$ (FW: 452.50): C, 71.67; H, 5.35; N, 12.38 %. Found: C, 71.83; H, 5.45; N, 12.21 %; IR (KBr, cm^{-1}): 3405 and 3200 (asym. and sym. stretching of $-NH_2$), 2190 (–C≡N stretching), 1700 (C=O str.), 1210 (C–O–C ether stretching); ^{1}H-NMR (400 MHz, DMSO-d_6, δ / ppm): 1.71––2.24 (6H, *m*, 3xCH_2), 2.23, 2.25 (2×3H, *s*, CH_3), 4.29 (1H, *s*, CH), 6.75–7.51 (11H, *m*, Ar–H + NH_2); ^{13}C-NMR (100 MHz, DMSO-d_6, δ / ppm): 12.95 (CH_3), 19.72 (CH_2), 20.50 (CH_3), 24.98 (CH), 26.55 (CH_2), 36.60 (CH_2), 57.25 (**C**–CN), 110.72, 112.22, 115.20, 115.75, 120.18, 121.39, 126.54, 129.60, 138.12, 145.57, 147.69, 150.14, 155.15, 159.17, 164.36 (Ar–C+ CN), 196.11 (C=O); MS (*m*/*z*): 453.2 (M+1).

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*2-Amino-4-[5-(4-methoxyphenoxy)-3-methyl-1-phenyl-1*H*-pyrazol-4-yl]-5-oxo--5,6,7,8-tetrahydro-4*H*-chromene-3-carbonitrile (**4c**)*. Yield: 84 %; m.p.: 143––145 °C; Anal. Calcd. for $C_{27}H_{24}N_4O_4$ (FW: 468.50): C, 69.22; H, 5.16; N, 11.96 %. Found: C, 69.09; H, 5.33; N, 12.03 %; IR (KBr, cm^{-1}): 3410 and 3340 (asym. and sym. stretching of $–NH_2$), 2200 (–C≡N stretching), 1640 (C=O str.), 1205 (C–O–C ether stretching); ^{1}H-NMR (400 MHz, DMSO-d_6, δ / ppm): 1.73––2.13 (6H, *m*, CH_2), 2.33 (3H, *s*, CH_3), 3.65 (3H, *s*, OCH_3), 4.15 (1H, *s*, CH), 6.60–7.53 (11H, *m*, Ar–H + NH_2); ^{13}C-NMR (100 MHz, DMSO-d_6, δ / ppm): 13.19 (CH_3), 19.59 (CH_2), 25.20 (CH), 26.68 (CH_2), 36.45 (CH_2), 55.90 (OCH_3), 56.37 (**C**–CN), 111.57, 112.28, 115.26, 115.71, 120.47, 121.49, 126.84, 129.60, 138.26, 145.65, 147.73, 150.19, 155.34, 159.13, 164.36 (Ar–C + CN), 196.27 (C=O); MS (*m*/*z*): 469.2 (M+1).

*2-Amino-4-[5-(4-chlorophenoxy)-3-methyl-1-phenyl-1*H*-pyrazol-4-yl]-5-oxo--5,6,7,8-tetrahydro-4*H*-chromene-3-carbonitrile (**4d**)*. Yield: 69 %; m.p.: 173––174 °C; Anal. Calcd. for $C_{26}H_{21}ClN_4O_3$ (FW: 472.92): C, 66.03; H, 4.48; N, 11.85 %. Found: C, 65.90; H, 4.63; N, 12.00 %; IR (KBr, cm^{-1}): 3375 and 3320 (asym. and sym. stretching of $–NH_2$), 2190 (–C≡N stretching), 1695 (C=O str.), 1215 (C–O–C ether stretching); ^{1}H-NMR (400 MHz, DMSO-d_6, δ / ppm): 1.65––2.19 (6H, *m*, CH_2), 2.43 (3H, *s*, CH_3), 4.38 (1H, *s*, CH), 6.73–7.50 (11H, *m*, Ar–H + NH_2); ^{13}C-NMR (100 MHz, DMSO-d_6, δ / ppm): 13.14 (CH_3), 19.55 (CH_2), 25.15 (CH), 26.58 (CH_2), 36.54 (CH_2), 57.25 (**C**–CN), 110.42, 112.01, 115.13, 115.65, 120.55, 121.11, 126.80, 129.13, 138.24, 145.18, 147.12, 150.00, 155.66, 159.18, 163.98 (Ar–C + CN), 196.14 (C=O); MS (*m*/*z*): 473.1 (M+1).

*2-Amino-4-[3-methyl-1-(4-methylphenyl)-5-phenoxy-1*H*-pyrazol-4-yl]-5-oxo--5,6,7,8-tetrahydro-4*H*-chromene-3-carbonitrile (**4e**)*. Yield: 80 %; m.p.: 189––190 °C; Anal. Calcd. for $C_{27}H_{24}N_4O_3$ (FW: 452.50): C, 71.67; H, 5.35; N, 12.38 %. Found: C, 71.75; H, 5.44; N, 12.25 %; IR (KBr, cm^{-1}): 3410 and 3240 (asym. and sym. stretching of $–NH_2$), 2210 (–C≡N stretching), 1665 (C=O str.), 1215 (C–O–C ether stretching). ^{1}H-NMR (400 MHz, DMSO-d_6, δ / ppm): 1.70––2.10 (6H, *m*, CH_2), 2.35 (3H, *s*, CH_3), 4.18 (1H, *s*, CH), 6.69–7.44 (11H, *m*, Ar–H + NH_2); ^{13}C-NMR (100 MHz, DMSO-d_6, δ / ppm): 13.01 (CH_3), 19.40 (CH_2), 20.55 (CH_3), 25.23 (CH), 26.42 (CH_2), 36.38 (CH_2), 56.18 (**C**–CN), 111.40, 112.22, 115.17, 116.01, 120.53, 121.19, 126.11, 129.61, 138.27, 145.60, 147.73, 150.19, 155.16, 160.00, 164.10 (Ar–C + CN), 196.15 (C=O); MS (*m*/*z*): 453.2 (M+1).

*2-Amino-4-[3-methyl-5-(4-methylphenoxy)-1-(4-methylphenyl)-1*H*-pyrazol--4-yl]-5-oxo-5,6,7,8-tetrahydro-4*H*-chromene-3-carbonitrile (**4f**)*. Yield: 84 %, m.p.: 129–130 °C; Anal. Calcd. for $C_{28}H_{26}N_4O_3$ (FW: 466.53): C, 71.09; H, 5.62; N, 12.01 %. Found: C, 71.14; H, 5.70; N, 11.87 %; IR (KBr, cm^{-1}): 3400 and 3225 (asym. and sym. stretching of $–NH_2$), 2200 (–C≡N stretching), 1700 (C=O str.), 1200 (C–O–C ether stretching); ^{1}H-NMR (400 MHz, DMSO-d_6,

δ / ppm): 1.73–2.22 (6H, *m*, CH_2), 2.20, 2.26 (2×3H, *s*, CH_3), 4.17 (1H, *s*, CH), 6.63–7.40 (10H, *m*, Ar–H + NH_2); ^{13}C-NMR (100 MHz, DMSO-d_6, δ / ppm): 12.90 (CH_3), 19.80 (CH_2), 20.54, 20.65 (2×CH_3), 24.70 (CH), 26.62 (CH_2), 36.57 (CH_2), 56.35 (**C**–CN), 110.35, 111.94, 115.20, 115.45, 120.59, 121.50, 126.84, 129.61, 138.11, 145.70, 147.84, 150.20, 155.55, 159.95, 163.28 (Ar–C + CN), 196.29 (C=O); MS (*m*/*z*): 467.2 (M+1).

*2-Amino-4-[5-(4-methoxyphenoxy)-3-methyl-1-(4-methylphenyl)-1*H*-pyrazol--4-yl]-5-oxo-5,6,7,8-tetrahydro-4*H*-chromene-3-carbonitrile (**4g**)*. Yield: 72 %; m.p.: 244–246 °C, Anal. Calcd. for $C_{28}H_{26}N_4O_4$ (FW: 482.53): C, 69.70; H, 5.43; N, 11.61 %. Found: C, 70.00; H, 5.19; N, 11.80 %; IR (KBr, cm^{-1}): 3425 and 3195 (asym. and sym. stretching of –NH_2), 2200 (–C≡N stretching), 1690 (C=O str.), 1190 (C–O–C ether stretching); ^{1}H-NMR (400 MHz, DMSO-d_6, δ / ppm): 1.66–2.14 (6H, *m*, CH_2), 2.31 (3H, *s*, CH_3), 3.66 (3H, *s*, OCH_3), 4.20 (1H, *s*, CH), 6.75–7.46 (10H, *m*, Ar–H + NH_2); ^{13}C-NMR (100 MHz, DMSO-d_6, δ / ppm): 13.11 (CH_3), 19.47 (CH_2), 20.72 (CH_3), 25.62 (CH), 26.65 (CH_2), 36.30 (CH_2), 55.88 (OCH_3), 58.20 (**C**–CN), 110.98, 112.03, 115.30, 115.74, 120.20, 121.67, 126.89, 129.62, 137.88, 145.12, 147.98, 149. 91, 155.35, 159.12, 164.50 (Ar–C + CN), 196.31 (C=O); MS (*m*/*z*): 483.2 (M+1).

*2-Amino-4-[5-(4-chlorophenoxy)-3-methyl-1-(4-methylphenyl)-1*H*-pyrazol--4-yl]-5-oxo-5,6,7,8-tetrahydro-4*H*-chromene-3-carbonitrile (**4h**)*. Yield: 64 %; m.p.: 153–154 °C; Anal. Calcd. for $C_{27}H_{23}ClN_4O_3$ (FW: 486.95): C, 66.60; H, 4.75; N, 11.51 %. Found: C, 66.45; H, 4.94; N, 11.73 %; IR (KBr, cm^{-1}): 3370 and 3330 (asym. and sym. stretching of –NH_2), 2215 (–C≡N stretching), 1685 (C=O str.), 1210 (C–O–C ether stretching); ^{1}H-NMR (400 MHz, DMSO-d_6, δ / ppm): 1.74–2.20 (6H, *m*, CH_2), 2.49 (3H, *s*, CH_3), 4.22 (1H, *s*, CH), 6.72––7.55 (10H, *m*, Ar–H + NH_2); ^{13}C-NMR (100 MHz, DMSO-d_6, δ / ppm): 13.20 (CH_3), 19.60 (CH_2), 20.63 (CH_3), 24.92 (CH), 26.70 (CH_2), 36.38 (CH_2), 56.25 (**C**–CN), 111.60, 111.99, 114.17, 119.12, 121.70, 123.02, 126.67, 128.72, 129.71, 138.01, 145.53, 148.27, 155.95, 158.04, 164.35 (Ar–C + CN), 196.26 (C=O); MS (*m*/*z*): 487.1 (M+1).

*2-Amino-7,7-dimethyl-4-[3-methyl-5-phenoxy-1-phenyl-1*H*-pyrazol-4-yl]-5--oxo-5,6,7,8-tetrahydro-4*H*-chromene-3-carbonitrile (**4i**)*. Yield: 90 %; m.p.: 249–250 °C; Anal. Calcd. for $C_{28}H_{26}N_4O_3$ (FW: 466.53): C, 72.09; H, 5.62; N, 12.01 %. Found: C, 71.84; H, 5.52; N, 12.17 %; IR (KBr, cm^{-1}): 3380 and 3180 (asym. and sym. stretching of –NH_2), 2200 (–C≡N stretching), 1680 (C=O str.), 1220 (C–O–C ether stretching); ^{1}H-NMR (400 MHz, DMSO-d_6, δ / ppm): 1.02, 1.04 (3H, *s*, 2xCH_3) 1.95, 2.13 (2×2H, *s*, CH_2), 2.50 (3H, *s*, CH_3), 4.36 (1H, *s*, CH), 6.76–7.55 (12H, *m*, Ar–H + NH_2); ^{13}C-NMR (100 MHz, DMSO-d_6, δ / ppm): 12.86 (CH_3), 24.60 (CH), 27.68, 28.77 (2×CH_3), 32.01 (C), 40.25, 50.43 (2×CH_2), 60.64 (**C**–CN), 110.20, 111.80, 114.79, 119.00, 121.81, 122.92,

126.51, 128.92, 129.76, 138.01, 145.50, 148.21, 156.45, 157.94, 161.64 (Ar–C + CN), 196.17 (C=O); MS (*m*/*z*): 467.2 (M+1).

*2-Amino-7,7-dimethyl-4-[3-methyl-5-(4-methylphenoxy)-1-phenyl-1*H*-pyrazol-4-yl]-5-oxo-5,6,7,8-tetrahydro-4*H*-chromene-3-carbonitrile (**4j**)*. Yield: 75 %; m.p.: 136–137 °C; Anal. Calcd. for $C_{29}H_{28}N_4O_3$ (FW: 480.56): C, 72.48; H, 5.87; N, 11.66 %. Found: C, 72.45; H, 5.98; N, 11.88 %; IR (KBr, cm^{-1}): 3415 and 3265 (asym. and sym. stretching of $–NH_2$), 2220 (–C≡N stretching), 1660 (C=O str.), 1205 (C–O–C ether stretching); ^{1}H-NMR (400 MHz, DMSO-d_6, δ / ppm): 0.95, 0.98 (2×3H, *s*, CH_3) 1.98, 2.08 (2×2H, *s*, CH_2), 2.28, 2.55 (2×3H, *s*, CH_3), 4.23 (1H, *s*, CH), 6.74–7.46 (11H, *m*, Ar–H + NH_2); ^{13}C-NMR (100 MHz, DMSO-d_6, δ / ppm): 13.25 (CH_3), 20.58 (CH_3), 25.08 (CH), 27.27, 28.89 (2×CH_3), 32.00 (C), 40.00 50.34 (2×CH_2), 58.69 (**C**–CN), 110.54, 111.48, 115.36, 115.70, 120.48, 121.51, 129.98, 135.85, 136.27, 145.54, 147.43, 150.23, 155.52, 159.00, 162.05 (Ar–C + CN), 196.22 (C=O); MS (*m*/*z*): 481.2 (M+1).

*2-Amino-7,7-dimethyl-4-[5-(4-methoxyphenoxy)-3-methyl-1-phenyl-1*H*-pyrazol-4-yl]-5-oxo-5,6,7,8-tetrahydro-4*H*-chromene-3-carbonitrile (**4k**)*. Yield: 87 %; m.p.: 179–180 °C; Anal. Calcd. for $C_{29}H_{28}N_4O_4$ (FW: 496.56): C, 70.15; H, 5.68; N, 11.28 %. Found: C, 70.24; H, 5.78; N, 11.01 %; IR (KBr, cm^{-1}): 3380 and 3210 (asym. and sym. stretching of $–NH_2$), 2195 (–C≡N stretching), 1645 (C=O str.), 1200 (C–O–C ether stretching). ^{1}H-NMR (400 MHz, DMSO-d_6, δ / ppm): 1.05, 1.07 (2×3H, *s*, CH_3) 1.90, 2.01 (2×2H, *s*, CH_2), 2.25 (3H, *s*, CH_3), 3.64 (3H, *s*, OCH_3), 4.17 (1H, *s*, CH), 6.70–7.48 (11H, *m*, Ar–H + NH_2); ^{13}C-NMR (100 MHz, DMSO-d_6, δ / ppm): 13.00 (CH_3) 25.24 (CH), 27.42, 28.80 (2×CH_3), 32.07 (C), 40.15 50.40 (2×CH_2), 55.89 (OCH_3), 57.31 (**C**–CN), 111.25, 112.02, 114.81, 119.06, 121.94, 123.11, 126.52, 128.62, 129.86, 138.19, 145.84, 148.28, 156.45, 157.90, 161.50 (Ar–C + CN), 196.35 (C=O); MS (*m*/*z*): 497.2 (M+1).

*2-Amino-4-[5-(4-chlorophenoxy)-3-methyl-1-phenyl-1*H*-pyrazol-4-yl]-7,7-dimethyl-5-oxo-5,6,7,8-tetrahydro-4*H*-chromene-3-carbonitrile (**4l**)*. Yield: 65 %; m.p.: 203–205 °C; Anal. Calcd. for $C_{28}H_{25}ClN_4O_3$ (FW: 500.98): C, 67.13; H, 5.03; N, 11.18 %. Found: C, 67.02; H, 5.25; N, 11.37 %; IR (KBr, cm^{-1}): 3430 and 3190 (asym. and sym. stretching of $–NH_2$), 2210 (–C≡N stretching), 1690 (C=O str.), 1220 (C–O–C ether stretching). ^{1}H-NMR (400 MHz, DMSO-d_6, δ / ppm): 0.88, 0.93 (2×3H, *s*, CH_3) 1.81, 2.11 (2×2H, *s*, CH_2), 2.39 (3H, *s*, CH_3), 4.12 (1H, *s*, CH), 6.64–7.50 (11H, *m*, Ar–H + NH_2); ^{13}C-NMR (100 MHz, DMSO-d_6, δ / ppm): 12.80 (CH_3), 24.50 (CH), 27.25, 28.94 (2×CH_3), 31.90 (C), 39.92, 50.30 (2×CH_2), 60.64 (**C**–CN), 110.27, 111.18, 115.52, 115.71, 120.55, 121.87, 130.00, 135.86, 136.20, 145.54, 147.17, 150.33, 155.51, 159.17, 162.10 (Ar–C + CN), 196.13 (C=O); MS (*m*/*z*): 501.2 (M+1).

*2-Amino-7,7-dimethyl-4-[3-methyl-1-(4-methylphenyl)-5-phenoxy-1*H*-pyrazol-4-yl]-5-oxo-5,6,7,8-tetrahydro-4*H*-chromene-3-carbonitrile (**4m**)*. Yield: 88

%; m.p.: 240–241 °C; Anal. Calcd. for $C_{29}H_{28}N_4O_3$ (FW: 480.56): C, 72.48; H, 5.87; N, 11.66 %. Found: C, 72.63; H, 6.00; N, 11.80 %; IR (KBr, cm^{-1}): 3400 and 3340 (asym. and sym. stretching of $–NH_2$), 2200 (–C≡N stretching), 1705 (C=O str.), 1200 (C–O–C ether stretching); ^{1}H-NMR (400 MHz, DMSO-d_6, δ / ppm): 0.97, 1.01 (2×3H, *s*, CH_3), 1.92, 2.04 (2×2H, *s*, CH_2), 2.25, 2.50 (2×3H, *s*, CH_3), 4.30 (1H, *s*, CH), 6.76–7.45 (11H, *m*, Ar–H + NH_2); ^{13}C-NMR (100 MHz, DMSO-d_6, δ / ppm): 13.18 (CH_3), 20.75 (CH_3), 25.25 (CH), 27.48, 28.91 (2×CH_3), 32.10 (C), 40.20 50.45 (2×CH_2), 57.91 (**C**–CN), 110.94, 111.81, 114.78, 118.79, 121.75, 122.88, 126.44, 128.90, 129.70, 138.00, 145.51, 148.12, 156.51, 157.88, 162.25 (Ar–C + CN), 196.28 (C=O); MS (*m*/*z*): 481.2 (M+1).

*2-Amino-7,7-dimethyl-4-[3-methyl-5-(4-methylphenoxy)-1-(4-methylphenyl)--1*H*-pyrazol-4-yl]-5-oxo-5,6,7,8-tetrahydro-4*H*-chromene-3-carbonitrile* ***(4n)***. Yield: 90 %; m.p.: 223–224 °C; Anal. Calcd. for $C_{30}H_{30}N_4O_3$ (FW: 494.58): C, 72.85; H, 6.11; N, 11.33 %. Found: C, 72.70; H, 6.20; N 11.45 %; IR (KBr, cm^{-1}): 3420 and 3300 (asym. and sym. stretching of $–NH_2$), 2205 (–C≡N stretching), 1680 (C=O str.), 1225 (C–O–C ether stretching); ^{1}H-NMR (400 MHz, DMSO-d_6, δ / ppm): 1.01, 1.03 (2×3H, *s*, CH_3) 1.97, 2.09 (2×2H, *s*, CH_2), 2.25, 2.27, 2.32 (3×3H, *s*, CH_3), 4.18 (1H, *s*, CH), 6.71–7.43 (10H, *m*, Ar–H + NH_2); ^{13}C-NMR (100 MHz, DMSO-d_6, δ / ppm): 12.92 (CH_3), 20.60, 20.90 (CH_3), 25.03 (CH), 27.32, 28.75 (2×CH_3), 31.94 (C), 40.10 50.37 (2×CH_2), 57.91 (**C**–CN), 110.94, 111.24, 115.38, 115.64, 120.23, 121.94, 130.56, 135.84, 136.20, 145.55, 147.39, 150.21, 155.30, 159.18, 162.25 (Ar–C + CN), 196.28 (C=O); MS (*m*/*z*): 495.2 (M+1).

*2-Amino-4-[5-(4-methoxyphenoxy)-3-methyl-1-(4-methylphenyl)-1*H*-pyrazol--4-yl]-7,7-dimethyl-5-oxo-5,6,7,8-tetrahydro-4*H*-chromene-3-carbonitrile* ***(4o)***. Yield: 92 %; m.p.: 149–150 °C; Anal. Calcd. for $C_{30}H_{30}N_4O_4$ (FW: 510.58): C, 70.57; H, 5.92; N, 10.97 %. Found: C, 70.69; H, 6.04; N, 11.13 %; IR (KBr, cm^{-1}): 3385 and 3230 (asym. and sym. stretching of $–NH_2$), 2205 (–C≡N stretching), 1710 (C=O str.), 1195 (C–O–C ether stretching); ^{1}H-NMR (400 MHz, DMSO-d_6, δ / ppm): 0.90, 0.93 (2×3H, *s*, CH_3) 1.85, 2.07 (2×2H, *s*, CH_2), 2.23, 2.30 (2×3H, *s*, CH_3), 3.66 (3H, *s*, OCH_3), 4.16 (1H, *s*, CH), 6.59–7.40 (10H, *m*, Ar–H + NH_2); ^{13}C-NMR (100 MHz, DMSO-d_6, δ / ppm): 13.10 (CH_3), 20.86 (CH_3), 25.03 (CH), 27.29, 28.95 (2×CH_3), 31.98 (C), 39.90 50.31 (2×CH_2), 55.88 (OCH_3), 56.20 (**C**–CN), 111.18, 111.24, 115.36, 115.69, 120.43, 121.44, 130.04, 135.91, 136.21, 145.50, 147.40, 150.16, 155.26, 159.08, 162.24 (Ar–C + CN), 196.14 (C=O); MS (*m*/*z*): 511.2 (M+1).

*2-Amino-4-[5-(4-chlorophenoxy)- 3-methyl-1-(4-methylphenyl)-1*H*-pyrazol--4-yl]-7,7-dimethyl-5-oxo-5,6,7,8-tetrahydro-4*H*-chromene-3-carbonitrile* ***(4p)***. Yield: 73 %; m.p.: 168–169 °C; Anal. Calcd. for $C_{29}H_{27}ClN_4O_3$ (FW: 515.00): C, 67.63; H, 5.28; N, 10.88 %. Found: C, 67.76; H, 5.44; N, 10.92 %; IR (KBr, cm^{-1}): 3390 and 3300 (asym. and sym. stretching of $–NH_2$), 2200 (–C≡N stretch-

ing), 1685 (C=O str.), 1200 (C–O–C ether stretching); ^{1}H-NMR (400 MHz, DMSO-d_6, δ / ppm): 1.03, 1.06 (2×3H, *s*, CH_3) 1.83, 2.15 (2×2H, *s*, CH_2), 2.28, 2.45 (2×3H, *s*, CH_3), 4.14 (1H, *s*, CH), 6.67–7.53 (10H, *m*, Ar–H + NH_2); ^{13}C--NMR (100 MHz, DMSO-d_6, δ / ppm): 13.07 (CH_3), 20.80 (CH_3), 25.11 (CH), 27.50, 28.93 (2×CH_3), 32.05 (C), 40.25 50.41 (2×CH_2), 59.11 (**C**–CN), 111.15, 111.39, 115.40, 115.70, 120.73, 121.60, 130.11, 135.85, 136.17, 145.44, 147.35, 150.00, 155.15, 159.08, 161.50 (Ar–C + CN), 196.20 (C=O); MS (*m*/*z*): 515.2 (M+1).