3,9-Dihydro-2*H*-[1,2,4]-oxadiazolo[3,2-*b*]quinazolin-2-ones: First Synthesis of the Parent Heterocycle, 7- and 9-Substituted Derivatives

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Abstract: A first synthesis of 3,9-dihydro-9-aryl-2*H*-[1,2,4]-oxadiazolo[3,2-*b*]quinazolin-2-ones is described via the thermal cyclisation of ethyl-(4-aryl-3-oxido-2-quinazolinyl)-carbamates followed by borohydride reduction. A more direct route to 3,9-dihydro-2*H*-[1,2,4]-oxadiazolo[3,2-*b*]quinazolin-2-ones, involving the reductive-ring closure of ethyl-(3-oxido-2-quinazolinyl)-carbamate, gives access to the parent unsubstituted heterocycle in good yield. This reaction has been extended to a variety of 7- and 9-substituted 3,9-dihydro-2*H*-[1,2,4]-oxadiazolo[3,2-*b*]quinazolin-2-ones.

Keywords: [1,2,4]oxadiazolo[3,2-*b*]quinazolin-2-one, thermal cyclisation, borohydride reduction, reductive-ring closure

The 1,2,3,5-tetrahydro-imidazo[2,1-*b*]quinazolin-2[3*H*]-one ring system is a common pharmacophore found in several phosphodiesterase (PDE) inhibitors such as Anagrelide (BL-4162A), DH-6471 and Revizinone (R-80122).

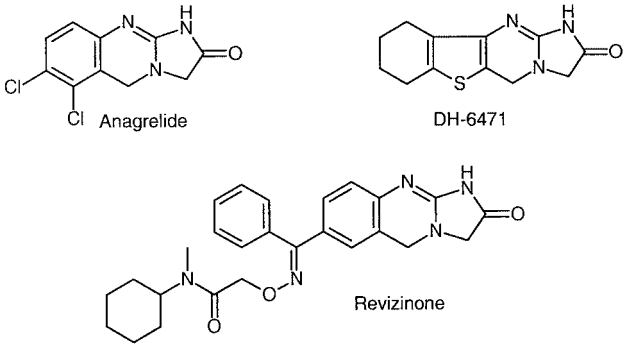
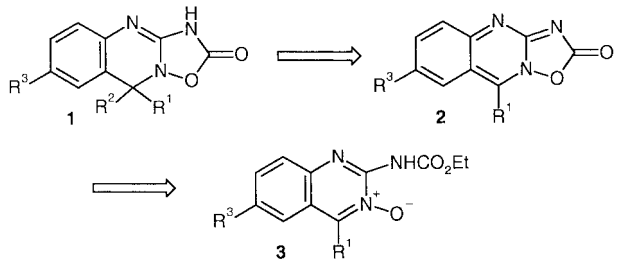


Figure PDE inhibitors based on the 1,2,3,5-tetrahydro-imidazo[2,1-*b*]quinazolin-2[3*H*]-one ring system

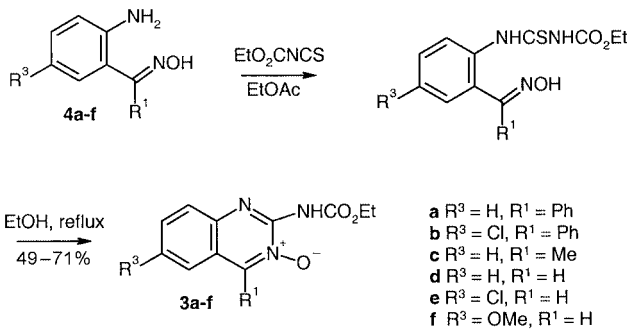
Bioisosteric replacement is an efficient way to discover new biologically active compounds. As part of a program aimed at the discovery of new PDE inhibitors, we investigated the possible replacement of the CH_2 of the imidazolinone ring of the PDE pharmacophore by either a NH or an O. We report here the development of synthetic routes to the previously unreported 3,9-dihydro-2*H*-[1,2,4]-oxadiazolo[3,2-*b*]quinazolin-2-one ring system **1**.

Our first retrosynthetic approach to 3,9-dihydro-2*H*-[1,2,4]-oxadiazolo[3,2-*b*]quinazolin-2-ones was the following :



Scheme 1

The dihydro derivative **1** may be obtained by reduction (R^2 = H) or by the addition of a nucleophile (R^2 = OR or NR_2) on the intermediate **2**. By analogy with Katritzky's cyclisation of ethyl-(1-oxido-2-pyrimidinyl)-carbamate,[1] the intermediate **2** could be obtained from ethyl-(3-oxido-2-quinazolinyl)-carbamates **3**, which were synthesised according to Scheme 2.

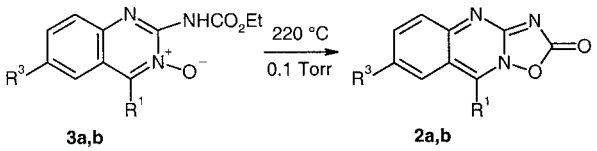


Scheme 2

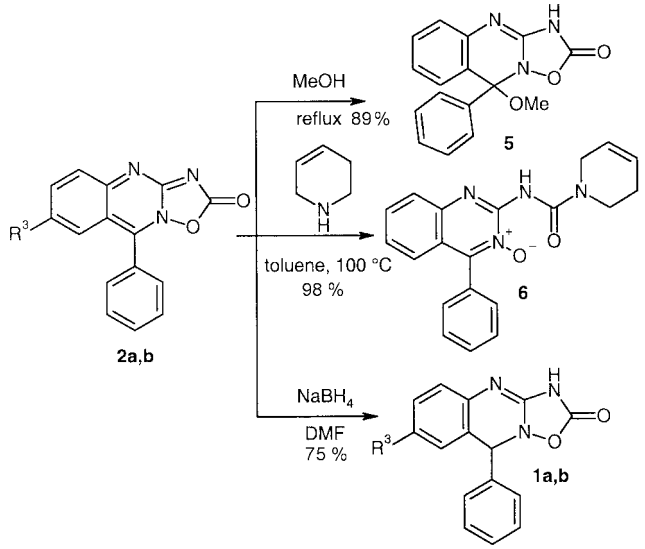
This route is a modification of the reported synthesis of ethyl-(4-methyl-3-oxido-2-quinazolinyl)-carbamate **3c**.[2] Reaction of ethoxycarbonyl isothiocyanate with the known amino oximes **4a**–**f** in ethyl acetate gave the intermediate thioureas, which spontaneously cyclised in refluxing ethanol to afford the desired substituted ethyl-(3-oxido-2-quinazolinyl)-carbamates **3a**–**f** in good yields. Either *E*, *Z* or a mixture of *E*- and *Z*-oximes can be used as starting material. In particular, we have shown that *E*-oxime **4c** and *Z*-oxime **4c** can be separately and efficiently converted to **3c**.

The thermal cyclisation of the oxides **3** was then investigated (Scheme 3). To be efficient, this reaction required

drastic conditions: the quinazoline oxides (**3a**–**d**) were heated at 220 °C under 0.1 Torr for 10–20 minutes. In the case of 4-aryl derivatives, this reaction afforded very clean products **2a**,**b**, whose spectroscopic characteristics are in agreement with the proposed structures. The ^{1}H NMR spectra of **2a**,**b** showed the disappearance of the ethyl group and the presence of aromatic protons only. The IR spectra showed a strong ν CO band at 1805 cm^{-1}. However, these products were found to be air sensitive and should be kept under an inert atmosphere or used directly in the next step. Refluxing compound **2a** with alcohols, e.g., methanol, afforded the adduct **5** (Scheme 4). Surprisingly, reaction of **2a** with amines such as 1,2,3,6-tetrahydropyridine in toluene at 100 °C gave the urea **6**. Finally, the reaction of sodium borohydride in a non-nucleophilic solvent such as DMF with **2a** and **2b** led to the desired dihydro derivatives **1a** and **1b**.

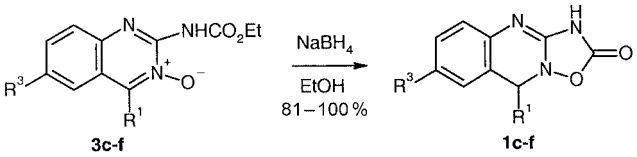


Scheme 3



Scheme 4

In contrast to the 4-aryl derivatives **3a**, **b**, the thermal reaction conditions applied to 4-methyl (R^1 = Me) or to unsubstituted (R^1 = H) *N*-oxides (**3c**, **d**) led only to intractable reaction mixtures. To circumvent this problem, we investigated a second route to the desired 3,9-dihydro-2*H*-[1,2,4]-oxadiazolo[3,2-*b*]quinazolin-2-ones starting from the same *N*-oxides **3** but involving the attack of a hydride on the C-4, N-3 double bond in order to trigger the ring closure. Hydride reduction of heteroaromatic *N*-oxides generally leads to the deoxygenated products[3] instead of the corresponding cyclic hydroxylamines. However, reduction of nitrones to hydroxylamines is well documented.[4] We anticipated that if the C-4, N-3 double bond is reactive enough towards, for example, sodium borohydride, the resulting intermediate hydroxylamine (or probably its corresponding oxy-anion) could attack the carbonyl of ethyl carbamate to afford the desired product in one step (Scheme 5).



Scheme 5

This reaction proceeded smoothly in ethanol and allowed the synthesis of the desired parent heterocycle **1d**. From **3c**, we could isolate the intermediate hydroxylamine which then cyclised to the target product **1c**. The generality of this synthesis is exemplified by the synthesis of the diversely substituted heterocycles **1c**–**f**. Finally, the *N*-oxide **3a** was directly reduced with a 75% yield to a product (**1a**), which proved to be identical in all respects to that obtained according to Scheme 4. In conclusion, the two methods described in this paper could give access to a large variety of compounds encompassing the new 3,9-dihydro-2*H*-[1,2,4]-oxadiazolo[3,2-*b*]quinazolin-2-one ring system.

Mps were determined on a Büchi melting point apparatus and are uncorrected. IR spectra were measured on a Perkin–Elmer 782 spectrophotometer. ^{1}H and ^{13}C NMR spectra were obtained on a Bruker WP 80 and AC 300 spectrometers using TMS as internal reference. MS spectra were measured with a Nermag Model R30-10 spectrometer. Structural assignments for all new compounds are consistent with their spectra. Elemental analyses were performed on a Perkin–Elmer 240C apparatus.

Ethyl 3-Oxido-4-phenylquinazolin-2-ylcarbamate (3a)

To a solution of **4a**[5] (10.8 g, 50 mmol) in EtOAc (100 mL) was added dropwise ethoxycarbonyl isothiocyanate (6.7 g, 51 mmol) over 30 min. The mixture was stirred for 5 h at r.t. and cooled to −18 °C for 1 h. The resulting precipitate was filtered (15.3 g) and suspended in absolute EtOH (300 mL). The mixture was refluxed for 6 h and cooled to −18 °C overnight. The precipitate was filtered and recrystallised from 95% EtOH to afford the desired product **3a** (10.4 g, 68%) as a white powder; mp: 180–182 °C.

IR (KBr): ν = 3300, 1765, 1620, 1510, 1220, 1170 cm^{-1}.

^{1}H NMR (80 MHz, $CDCl_3$): δ = 1.38 (t, 3H, *J* = 7.6 Hz), 4.36 (q, 2H, *J* = 7.6 Hz), 7.20–8.10 (m, 9H), 10.1 (s, 1H).

^{13}C NMR (20 MHz, $CDCl_3$): δ = 14.1, 62.5, 121.2, 125.7, 126.2, 127.4, 128.0, 128.3, 129.1, 130.2, 130.7, 132.1, 141.4, 145.8, 151.2.

Anal. Calcd for $C_{17}H_{15}N_3O_3$ (309.33): C, 66.00; H, 4.89; N, 13.58. Found: C, 65.96; H, 4.86; N, 13.49.

Ethyl 6-Chloro-3-oxido-4-phenylquinazolin-2-ylcarbamate (3b)

The title compound was prepared as described for **3a**, starting from **4b**[6] (24.0 g, 97.3 mmol) and ethoxycarbonyl isothiocyanate (14.03 g, 107 mmol) to provide a precipitate which was recrystallised from *i*-PrOH to give **3b** as white crystals (27.42 g, 70%). The product crystallised with one molecule of *i*-PrOH; mp: 189 °C.

IR (KBr): ν = 3240, 1765, 1625, 1505, 1230, 1155 $cm^{-1.}$

^{1}H NMR (80 MHz, Pyridine-d_5): δ = 1.21 (t, 3H, *J* = 7.1 Hz), 1.32 (d, 6H, *J* = 7.5 Hz), 4.05 (sep, 1H, *J* = 7.5 Hz), 4.31 (q, 2H, *J* = 7.1 Hz), 7.45 (d, 1H, *J* = 1.5 Hz), 7.40−7.90 (m, 6H), 8.05 (d, 1H, *J* = 6.7 Hz).

Anal. Calcd for $C_{17}H_{14}ClN_3O_3 \cdot C_3H_8O$ (343.77): C, 59.33; H, 5.73; N, 10.38; Cl, 8.76. Found: C, 59.64; H, 5.39; N, 10.51; Cl, 8.60.

Ethyl 4-Methyl-3-oxidoquinazolin-2-ylcarbamate (3c)

The title compound was prepared as described for **3a**, starting from **4c**[7] (0.75 g, 5.0 mmol) and ethoxycarbonyl isothiocyanate (0.65 g, 5.0 mmol) to give **3c** as yellow needles (0.8 g, 65%); mp: 146 °C (EtOH) (Lit.[2] 144−146 °C).

IR (KBr): ν = 3280, 1770, 1620, 1515, 1270, 1220 cm^{-1}.

^{1}H NMR (300 MHz, $CDCl_3$): δ = 1.38 (t, 3H, *J* = 7.1 Hz), 2.92 (s, 3H), 4.36 (q, 2H, *J* = 7.1 Hz), 7.52 (m, 1H), 7.73 (m, 1H), 7.81(d, 1H, *J* = 8.4 Hz), 7.98 (d, 1H, *J* = 8.3 Hz), 10.08 (s, 1H).

^{13}C NMR (75 MHz, DMSO-d_6): δ = 12.9, 14.2, 61.8, 120.7, 124.5, 127.0, 127.1, 132.0, 139.1, 144.4, 150.3, 150.7.

MS (CI^+, NH_3): *m/z* = 248 $(M+H)^+$.

Anal. Calcd for $C_{12}H_{13}N_3O_3$ (247.26): C, 58.29; H, 5.29; N, 16.99. Found: C, 58.18; H, 5.32; N, 17.10.

Ethyl 3-Oxidoquinazolin-2-ylcarbamate (3d)

The title compound was prepared as described for **3a**, starting from **4d**[8] (10.0 g, 73.5 mmol) and ethoxycarbonyl isothiocyanate (9.64 g, 73.5 mmol) to give **3d** as a white solid (12.4 g, 71%); mp: 142 °C (EtOAc).

IR (KBr): ν = 3300, 3280, 1770, 1750, 1620, 1520, 1270, 1250 cm^{-1}.

^{1}H NMR (300 MHz, $CDCl_3$): δ = 1.38 (t, 3H, *J* = 7.1 Hz), 4.36 (q, 2H, *J* = 7.1 Hz), 7.40−8.00 (m, 4H), 8.90 (s, 1H), 9.90 (s, 1H).

^{13}C NMR (75 MHz, $CDCl_3$): δ = 14.3, 62.6, 121.1, 124.9, 127.7, 132.7, 139.7, 141.5, 145.7, 150.9.

Anal. Calcd for $C_{11}H_{11}N_3O_3$ (233.23): C, 56.65; H, 4.75; N, 18.02. Found: C, 56.60; H, 4.68; N, 18.18.

Ethyl 6-Chloro-3-oxidoquinazolin-2-ylcarbamate (3e)

The title compound was prepared as described for **3a**, starting from **4e**[9] (13.0 g, 76 mmol) and ethoxycarbonyl isothiocyanate (10.0 g, 76 mmol) to give **3e** as a white solid (10 g, 49%); mp: 208 °C (EtOH).

IR (KBr): ν = 3270, 1760, 1625, 1530, 1270, 1240 cm^{-1}.

^{1}H NMR (300 MHz, DMSO-d_6): δ = 1.29 (t, 3H, *J* = 7.2 Hz), 4.24 (q, 2H, *J* = 7.2 Hz), 7.78 (m, 2H), 7.98 (d, 1H, *J* = 0.9 Hz), 9.33 (s, 1H), 10.13 (s, 1H).

MS (CI^+, NH_3): *m/z* = 268 $(M+H)^+$.

Anal. Calcd for $C_{11}H_{10}ClN_3O_3$ (267.67): C, 49.36; H, 3.77; N, 15.70; Cl, 13.25. Found: C, 49.24; H, 3.75; N, 15.62; Cl, 13.20.

Ethyl 6-Methoxy-3-oxidoquinazolin-2-ylcarbamate (3f)

The title compound was prepared as described for **3a**, starting from **4f**[10] (0.22 g, 1.3 mmol) and ethoxycarbonyl isothiocyanate (0.17 g, 1.3 mmol) to give **3f** as a yellowish solid (0.20 g, 58%); mp: 144 °C (EtOH).

IR (KBr): ν = 3260, 1760, 1620, 1525, 1500, 1380, 1235 cm^{-1}.

^{1}H NMR (80 MHz, DMSO-d_6): δ = 1.29 (t, 3H, *J* = 7.1 Hz), 3.88 (s, 3H), 4.24 (q, 2H, *J* = 7.1 Hz), 7.20−7.50 (m, 2H), 7.70 (d, 1H, *J* = 9.4 Hz), 9.26 (s, 1H), 9.90 (s, 1H).

^{13}C NMR (20 MHz, DMSO-d_6): δ = 14.1, 55.7, 61.6, 103.7, 122.5, 124.3, 127.9, 135.8, 139.3, 143.9, 150.5, 158.0.

Anal. Calcd for $C_{12}H_{13}N_3O_4$ (263.26): C, 54.75; H, 4.97; N, 15.96. Found: C, 54.65; H, 5.01; N, 16.05.

3,9-Dihydro-9-methoxy-9-phenyl-2*H*-[1,2,4]oxadiazolo[3,2-*b*]quinazolin-2-one (5)

Compound **3a** (5.5 g, 17.8 mmol) was heated at 220 °C under reduced pressure (0.1 Torr) for 20 min. After cooling under an Ar atm, 9-phenyl-2*H*-[1,2,4]oxadiazolo[3,2-*b*]quinazolin-2-one (**2a**) was obtained as a yellow solid, which was air sensitive and was used directly in the next step.

IR (KBr): ν = 1805, 1650, 1610, 1480, 1420, 1400, 1360, 1300, 1285, 1240 cm^{-1}.

^{1}H NMR (80 MHz, DMSO-d_6): δ = 7.05−7.45 (m, 9H).

The crude **2a** was dissolved in MeOH (50 mL) and the solution was refluxed for 45 min and kept overnight at −18 °C. The obtained solid was filtered and dried to give 4.7 g (89%) of **5** as white crystals; mp: 246 °C.

IR (KBr): ν = 3100, 1750, 1630, 1580, 1490 cm^{-1}.

^{1}H NMR (80 MHz, DMSO-d_6): δ = 3.16 (s, 3H), 7.10−7.40 (m, 9H), 11.66 (br s, 1H).

^{13}C NMR (20 MHz, DMSO-d_6): δ = 50.9, 91.8, 116.5, 120.5, 124.8, 126.4, 127.9, 128.7, 129.2, 130.9, 134.1, 139.4, 161.2, 161.9.

Anal. Calcd for $C_{16}H_{13}N_3O_3$ (295.30): C, 65.08; H, 4.44; N, 14.23. Found: C, 65.12; H, 4.45; N, 14.28.

***N*-(3-oxido-4-phenylquinazolin-2-yl)-3,6-dihydropyridine-1(2*H*)-carboxamide (6)**

Compound **3a** (1 g, 3.2 mmol) was heated at 220 °C under reduced pressure (0.1 Torr) for 10 min. After cooling under an Ar atm, the resulting yellow solid (**2a**) was suspended in a mixture of toluene (2 mL) and 1,2,3,6-tetrahydropyridine (1 mL), which was refluxed for 15 min. After cooling, the resulting solution was kept overnight at r.t. The obtained solid was filtered and dried to give 1.1 g (98%) of **6** as yellow crystals; mp: 170 °C.

IR (KBr): ν = 3200, 1700, 1650, 1620, 1580, 1510, 1400, 1300 cm^{-1}.

^{1}H NMR (80 MHz, DMSO-d_6): δ = 2.20 (m, 2H), 3.60 (t, 2H, *J* = 5.5 Hz), 4.05 (m, 2H), 5.80 (m, 2H), 7.20−7.45 (m, 2H), 7.60 (m, 5H), 7.65−7.80 (m, 2H), 9.90 (br s, 1H).

^{13}C NMR (20 MHz, DMSO-d_6): δ = 24.7, 41.0, 43.9, 120.2, 124.3, 125.2, 125.3, 126.4, 128.6, 129.3, 130.1, 131.7, 140.5, 147.3, 148.8, 151.6.

MS (CI^+, NH_3): *m/z* = 347 $(M+H)^+$, 264 $(M-C_5H_8N)^+$.

Anal. Calcd for $C_{20}H_{18}N_4O_2$ (346.39): C, 69.35; H, 5.24; N, 16.18. Found: C, 69.27; H, 5.23; N, 16.07.

3,9-Dihydro-9-phenyl-2*H*-[1,2,4]oxadiazolo[3,2-*b*]quinazolin-2-one (1a)

Compound **3a** (5.0 g, 16 mmol) was heated at 220 °C under reduced pressure (0.1 Torr) for 20 min. After cooling under an Ar atm, the resulting yellow solid (**2a**) was dissolved in DMF (10 mL) and $NaBH_4$ (1.5 g, 40 mmol) was added in portions. The mixture was stirred for 30 min and poured into H_2O (200 mL). The product was

extracted with EtOAc. The organic layers were washed with H_2O, dried ($MgSO_4$), and concentrated in vacuo to give a crude product (5.1 g), which was recrystallised in MeOH to give 3.2 g (75%) of **1a** as white crystals; mp: 242 °C.

IR (KBr): ν = 3100, 1790, 1660, 1590, 1500 cm^{-1}.

^1H NMR (300 MHz, DMSO-d_6): δ = 6.25 (s, 1H), 6.92 (d, 1H, *J* = 7.6 Hz), 7.09 (m, 2H), 7.44−7.30 (m, 6H), 11.90 (br s, 1H).

^{13}C NMR (75 MHz, DMSO-d_6): δ = 63.0, 116.7, 121.9, 124.4, 127.9, 128.2, 129.2, 129.7, 133.0, 137.4, 163.1, 165.0.

MS (CI^+, NH_3): *m/z* = 266 $(M+H)^+$, 283 $(M+NH_3)^+$.

Anal. Calcd for $C_{15}H_{11}N_3O_2$ (265.27): C, 67.91; H, 4.18; N, 15.84. Found: C, 68.00; H, 4.20; N, 15.83.

7-Chloro-3,9-dihydro-9-phenyl-2*H*-[1,2,4]oxadiazolo[3,2-*b*]quinazolin-2-one (1b)

The title compound was prepared as described for **1a**, starting from **3b** (10 g, 30 mmol) and $NaBH_4$ (4.4 g, 110 mmol) to give **1b** as a white solid (6.8 g, 75%); mp: 254 °C (DMF/H_2O).

IR (KBr): ν = 3100, 3050, 1770, 1640, 1580, 1480 cm^{-1}.

^1H NMR (80 MHz, DMSO-d_6): δ = 6.28 (s, 1H), 7.01 (d, 1H, *J* = 2.7 Hz), 7.14 (d, 1H, *J* = 8.2 Hz), 7.20−7.55 (m, 6H), 11.20 (br s, 1H).

^{13}C NMR (20 MHz, DMSO-d_6): δ = 62.6, 118.5, 123.9, 127.8, 128.0, 129.4, 129.7, 132.3, 136.8, 162.9, 164.8.

MS (CI^+, NH_3): *m/z* = 300 $(M+H)^+$, 317 $(M+NH_3)^+$.

Anal. Calcd for $C_{15}H_{10}ClN_3O_2$ (299.72): C, 60.11; H, 3.36; N, 14.02; Cl, 11.83. Found: C, 60.03; H, 3.41; N, 14.08; Cl, 11.98.

3,9-Dihydro-9-methyl-2*H*-[1,2,4]oxadiazolo[3,2-*b*]quinazolin-2-one (1c)

To a solution of **3c** (63 mg, 0.255 mmol) in EtOH (5 mL) was added $NaBH_4$ (13 mg, 0.34 mmol).The resulting solution was stirred at r.t. for 2 h and at 50 °C for 6 h. The solvent was then removed in vacuo and the residue was taken into 5% $KHSO_4$ (10 mL). The resulting suspension was filtered. The solid was washed with the $KHSO_4$ solution, twice with H_2O, and dried to give 53 mg of **1c** (100%); mp: 252−253 °C (EtOH).

IR (KBr): ν = 2795, 1765, 1640, 1490, 1160, 880, 750 cm^{-1}.

^1H NMR (300 Hz, $CDCl_3$): δ = 1.62 (d, 3H, *J* = 6.3 Hz), 5.09 (q, 1H, *J* = 6.3 Hz), 7.14 (m, 2H), 7.26 (m, 1H), 7.37 (m, 1H), 12.24 (br s, 1H).

^{13}C NMR (75 MHz, $CDCl_3$): δ = 18.5, 56.6, 117.3, 121.9, 124.9, 128.4, 130.0, 131.9, 162.2, 163.9.

MS (CI^+, NH_3): *m/z* = 204 $(M+H)^+$, 221 $(M+NH_3)^+$.

Anal. Calcd for $C_{10}H_9N_3O_2$ (203.20): C, 59.11; H, 4.46; N, 20.68. Found: C, 58.98; H, 4.48; N, 20.46.

3,9-Dihydro-2*H*-[1,2,4]oxadiazolo[3,2-*b*]quinazolin-2-one (1d)

The title compound was prepared as described for **1c**, starting from **3d** (1.05 g, 4.5 mmol) and $NaBH_4$ (0.17 g, 4.5 mmol) to give **1d** as a white solid (0.74 g, 86%); mp: 252 °C (EtOH).

IR (KBr): ν = 3100, 1790, 1650, 1600, 1500 cm^{-1}.

^1H NMR (80 MHz, DMSO-d_6): δ = 4.86 (s, 2H), 7.00−7.35 (m, 4H), 11.60 (s, 1H).

MS (CI^+, NH_3): *m/z* = 190 $(M+H)^+$, 207 $(M+NH_3)^+$.

Anal. Calcd for $C_9H_7N_3O_2$ (189.18): C, 57.14; H, 3.73; N, 22.21. Found: C, 56.93; H, 3.65; N, 22.19.

7-Chloro-3,9-dihydro-2*H*-[1,2,4]oxadiazolo[3,2-*b*]quinazolin-2-one (1e)

The title compound was prepared as described for **1c**, starting from **3e** (100 mg, 0.371 mmol) and $NaBH_4$ (17 mg, 0.449 mmol) to give **1e** as a white solid (68 mg, 81%); mp: 270 °C (HOAc).

IR (KBr): ν = 1794, 1660, 1584, 1529, 1487, 1390, 1327, 1256, 1159, 1090 cm^{-1}.

^1H NMR (300 MHz, DMSO-d_6): δ = 4.86 (s, 2H), 7.00 (d, 1H, *J* = 7.2 Hz), 7.4, (d, 1H, *J* = 7.2 Hz), 7.42 (s, 1H), 11.75 (s, 1H).

Anal. Calcd for $C_9H_6ClN_3O_2$ (223.62): C, 48.34; H, 2.70; N, 18.79. Found: C, 47.90; H, 2.57; N, 18.48**.**

3,9-Dihydro-7-methoxy-2*H*-[1,2,4]oxadiazolo[3,2-*b*]quinazolin-2-one (1f)

The title compound was prepared as described for **1c**, starting from **3f** (100 mg, 0.38 mmol) and $NaBH_4$ (17 mg, 0.448 mmol) to give **1f** as a white solid (70 mg, 84%); mp: 221 °C.

IR (KBr): ν = 1792, 1654, 1587, 1560, 1506, 1407, 1337, 1286, 1240, 1171, 1122, 1036 cm^{-1}.

^1H NMR (300 MHz, DMSO-d_6): δ = 3.73 (s, 3H), 4.80 (s, 2H), 6.92 (m, 3H), 11.49 (s, 1H).

Anal. Calcd for $C_{10}H_9N_3O_3$ (219.20): C, 54.79; H, 4.14; N, 19.17. Found: C, 54.74; H, 3.99; N, 18.94.

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