Supporting Information

Discovery of the 2-Phenyl-4,5,6,7-Tetrahydro-1*H*-indole as a Novel Anti-Hepatitis C Virus Targeting Scaffold.

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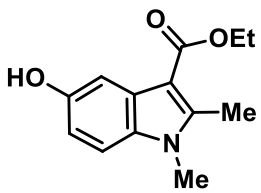
Compounds 1-33 have been procured from the EDASA Scientific public available compound repertory (http://www.edasascientific.com/page/catalogue). A report of their characterization via **^{1}H NMR**, **^{13}C NMR** and **m.p.** can be found on pages S2 to S11.

The synthetic procedure and compound characterization of compounds **34-44** is reported on pages S12 to S22.

Ethyl 1,2-dimethyl-5-hydroxy-indole-3-carboxylate (1)[1]



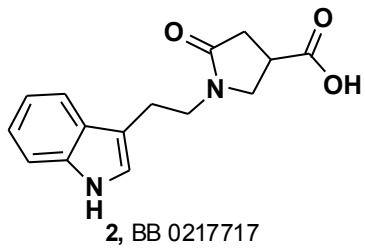
1, BB 0216474

m.p. = 208 – 209 °C.

^{1}H NMR (DMSO-d_6, 400 MHz): δ = 1.35 (t, *J* = 7.1 Hz, 3H), 2.66 (s, 3H), 3.63 (s, 3H), 4.26 (q, *J* = 7.1 Hz, 2H), 6.68 (dd, *J* = 8.7, 2.4 Hz, 1H), 7.26 (d, *J* = 8.7 Hz, 1H), 7.38 (d, *J* = 2.2 Hz, 1H), 8.94 (s, 1H).

^{13}C NMR: (DMSO-d_6, 100 MHz): δ = 11.7, 14.5, 29.6, 58.6, 101.9, 105.5, 110.3, 111.3, 127.1, 130.7, 145.3, 152.6, 165.2.

1-[2-(1H-Indol-3-yl)ethyl]-5-oxopyrrolidine-3-carboxylic acid (2)



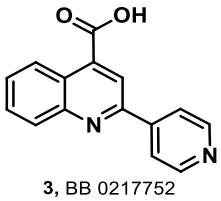
2, BB 0217717

m.p. = 217 – 220 °C.

^{1}H NMR (DMSO-d_6, 400 MHz): δ = 2.40 - 2.55 (m, 2H), 2.87 (t, *J* = 7.5 Hz, 2H), 3.17 (tdd, *J* = 9.1, 7.3, 6.0 Hz, 1H), 3.47 (dd, *J* = 8.9, 7.8 Hz, 2H), 3.50-3.61 (m, 2H), 6.99 (ddd, *J* = 8.0, 7.1, 1.0 Hz, 1H), 7.08 (td, *J* = 7.5, 1.1 Hz, 1H), 7.16 (d, *J* = 2.3 Hz, 1H), 7.35 (d, *J* = 8.1 Hz, 1H), 7.55 (d, *J* = 7.8 Hz, 1H), 10.83 (s, 1H), 12.60 (br. s, 1H).

^{13}C NMR: (DMSO-d_6, 100 MHz): δ = 22.9, 33.7, 35.5, 42.5, 49.7, 111.3, 111.4, 118.2, 118.3, 121.0, 122.7, 127.1, 136.3, 171.8, 174.6.

2-Pyridin-4-ylquinoline-4-carboxylic acid (3)[2]



3, BB 0217752

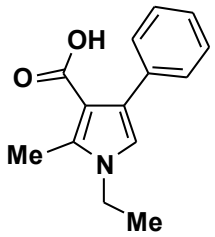
m.p. = 310 – 312 °C.

^{1}H NMR (DMSO-d_6, 400 MHz): δ = 7.77 (t, *J* = 7.6 Hz, 1H), 7.90 (t, *J* = 7.6 Hz, 1H), 8.22 (d, *J*=8.6 Hz, 1H), 8.26 (d, *J* = 5.1 Hz, 1H), 8.55 (s, 1H), 8.68 (d, *J* = 8.4 Hz, 1H), 8.79 (d, *J* = 5.0 Hz, 2H).

^{13}C NMR: (DMSO-d_6, 100 MHz): δ = 119.1, 121.3 (2C), 124.1, 125.5, 128.7, 130.0, 130.6, 138.3, 144.8, 148.3, 150.5 (2C), 153.6, 167.5.

[1] Velezheva, V. S.; Kornienko, A. G.; Topilin, S. V.; Turashev, A. D.; Peregudov, A. S.; Brennan, P. J. *Journal of Heterocyclic Chemistry*, **2006**, *43*, 873 – 879.
[2] ASTRAZENECA AB Patents: WO2009/82346 A1,2009; WO 2009/082346 A1

1-Ethyl-2-methyl-4-phenyl-1H-pyrrole-3-carboxylic acid (4)



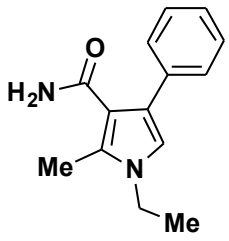
4, BB 0218157

m.p. = 195 °C (decomp.).

^{1}H NMR (DMSO-d_6, 400 MHz): δ = 1.29 (t, *J* = 7.3 Hz, 3H), 2.47 (s, 3H), 3.90 (q, *J* = 7.2 Hz, 2H), 6.78 (s, 1H), 7.08-7.22 (m, 1H), 7.24-7.34 (m, 4H), 10.26-12.42 (br. s, 1H).

^{13}C NMR: (DMSO-d_6, 100 MHz): δ = 11.0, 16.0, 40.9, 110.1, 119.6, 124.9, 125.5, 127.4 (2C), 128.8 (2C), 135.1, 136.2, 166.6.

1-Ethyl-2-methyl-4-phenyl-1*H*-pyrrole-3-carboxamide (5)



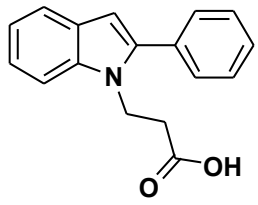
5, BB 266469

Viscous oil.

^{1}H NMR ($CDCl_3$, 400 MHz): δ = 1.40 (t, *J* = 7.3 Hz, 3H), 2.56 (s, 3H), 3.90 (q, *J* = 7.3 Hz, 2H), 5.30 (br. s., 1H), 5.50 (br. s, 1H), 6.54 (s, 1H), 7.29-7.33 (m, 1H), 7.34-7.44 (m, 4H).

^{13}C NMR: ($CDCl_3$, 100 MHz): δ = 11.1, 16.2, 41.4, 112.9, 118.5, 123.6, 127.0, 128.7 (2C), 129.5 (2C), 134.6, 135.4, 168.4.

3-(2-Phenyl-1H-indol-1-yl)propanoic acid (6)



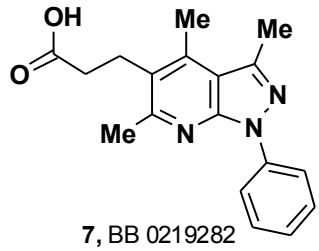
6, BB 0218161

m.p. = 137 °C.

^{1}H NMR (DMSO-d_6, 400 MHz): δ = 2.58 (t, *J* = 7.6 Hz, 2H), 4.45 (t, *J* = 7.6 Hz, 2H), 6.54 (s, 1H), 7.09 (t, *J* = 7.5 Hz, 1H), 7.20 (td, *J* = 8.1, 0.9 Hz, 1H), 7.43-7.49 (m, 1H), 7.49 - 7.61 (m, 6H), 12.40 (br. s., 1H).

^{13}C NMR: (DMSO-d_6, 100 MHz): δ = 34.2, 39.5, 102.3, 110.5, 119.8, 120.3, 121.7, 127.8, 128.2, 128.8 (2C), 129.1 (2C), 132.4, 137.1, 140.7, 172.1.[3]

3-(3,4,6-Trimethyl-1-phenyl-1H-pyrazolo[3,4-b]pyridin-5-yl)propanoic acid (7)



7, BB 0219282

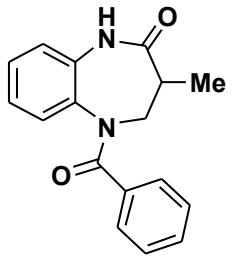
m.p. > 250 °C.

^{1}H NMR (DMSO-d_6, 400 MHz): δ = 2.41 (t, *J* = 8.1 Hz, 2H), 2.61 (s, 3H), 2.62 (s, 3H), 2.66 (s, 3H), 2.97 (t, *J* = 8.1 Hz, 2H), 7.25 (t, *J* =7.3 Hz, 1H), 7.50 (t, *J* =7.9 Hz, 2H), 8.28 (d, *J* =7.9 Hz, 2H), 12.30 (br. s., 1H).

^{13}C NMR: (DMSO-d_6, 100 MHz): δ = 14.8, 15.5, 23.6, 23.8, 33.4, 115.0, 119.6 (2C), 124.8, 126.7, 129.0 (2C), 139.5, 140.9, 142.4, 148.8, 157.5, 173.8.

[3] One aliphatic signal is overlapping with the center of DMSO-d_6 septet.

5-Benzoyl-3-methyl-1,3,4,5-tetrahydro-2*H*-1,5-benzodiazepin-2-one (8)[4]



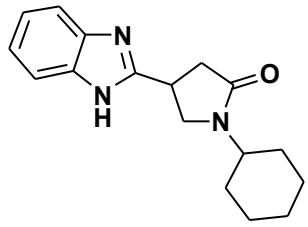
8, BB 0219743

m.p. = 171 – 173 °C.

^{1}H NMR (CDCl$_3$, 400 MHz): δ = 1.24 (d, *J* = 6.5 Hz, 3H), 2.89-3.01 (m, 1H), 3.87 (dd, *J* = 11.3, 5.6 Hz, 1H), 4.50 (t, *J* = 12.9 Hz, 1H), 6.74 (d, *J* = 7.7 Hz, 1H), 6.86 (t, *J* = 6.9 Hz, 1H), 7.10-7.27 (m, 7H), 8.96 (br. s, 1H).

^{13}C NMR: (CDCl$_3$, 75 MHz): δ = 12.9, 35.0, 56.8, 122.7, 126.1, 128.0 (2C), 128.4 (2C), 128.5, 130.38, 130.31, 135.0, 135.2, 135.4, 171.2, 176.0.

4-(1H-Benzimidazol-2-yl)-1-cyclohexylpyrrolidin-2-one (9)



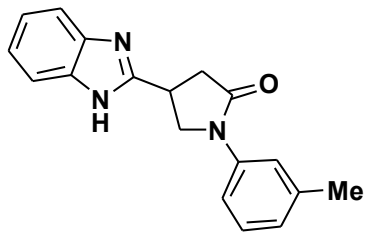
9, BB 0219747

m.p. = 235 °C.

^{1}H NMR (DMSO-*d*$_6$, 400 MHz): δ = 1.00-1.14 (m, 1H), 1.20-1.50 (m, 4H), 1.52-1.65 (m, 3H), 1.74 (t, *J* = 11.6 Hz, 2H), 2.73 (d, *J* = 8.2 Hz, 2H), 3.58-3.67 (m, 1H), 3.71-3.87 (m, 3H), 5.48 (br. s., 1H), 7.13 (dd, *J* = 5.9, 3.1 Hz, 2H), 7.50 (tq, *J* = 3.2, 3.1 Hz, 2H).

^{13}C NMR: (DMSO-*d*$_6$, 100 MHz): δ = 25.0, 25.1, 25.2, 29.6, 29.8, 31.4, 36.5, 46.9, 50.1, 114.7 (2C), 121.4 (2C), 138.8, 155.6, 171.4.

4-(1*H*-Benzimidazol-2-yl)-1-(3-methylphenyl)pyrrolidin-2-one (10)



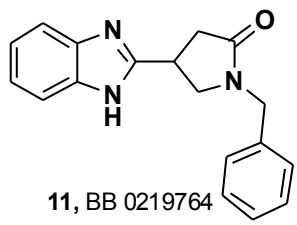
10, BB 0219760

m.p. = 175 – 178 °C.

^{1}H NMR (DMSO-*d*$_6$, 400 MHz): δ = 2.31 (s, 3H), 3.02 (dd, *J* = 7.9, 6.4 Hz, 2H), 4.00 (ddt, *J* = 7.8, 7.6, 7.5 Hz, 1H), 4.16-4.33 (m, 2H), 6.96 (d, *J* = 7.5 Hz, 1H), 7.16 (dd, *J* = 5.9, 3.1 Hz, 2H), 7.26 (t, *J* = 8.1 Hz, 1H), 7.47-7.59 (m, 4H), 12.45 (br. s., 1H).

^{13}C NMR: (DMSO-*d*$_6$, 100 MHz): δ = 21.2, 30.7, 37.6, 52.3, 116.7, 120.1, 121.6, 124.8, 128.6, 138.0, 139.3, 155.1, 172.0.

4-(1H-Benzimidazol-2-yl)-1-benzylpyrrolidin-2-one (11)



11, BB 0219764

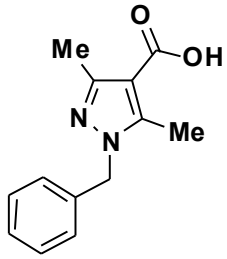
m.p. = 150 – 153 °C.

^{1}H NMR (DMSO-*d*$_6$, 400 MHz): δ = 2.84 (d, *J*=8.3 Hz, 2H), 3.57 (dd, *J*=9.6, 6.5 Hz, 1H), 3.70 (t, *J*=8.9 Hz, 1H), 3.88 (ddd, *J*= 16.6, 8.3, 6.9 Hz, 1H), 4.45 (s, 2H), 7.10-7.18 (m, 2H), 7.23-7.29 (m, 3H), 7.29-7.35 (m, 2H), 7.46-7.55 (m, 2H), 12.36 (br. s., 1H)

^{13}C NMR: (DMSO-*d*$_6$, 100 MHz): δ = 31.0, 35.7, 45.4, 50.7, 121.5, 127.3, 127.7 (2C), 128.6 (2C), 136.75, 155.3, 172.3.

[4] R. Janciene, A. Vektariene, G. Mikulskiene, T. Javorskis, G. Vektaris, A. Klimaviciusa. *ARKIVOC*, **2013**, iv, 1-19.

1-Benzyl-3,5-dimethyl-1H-pyrazole-4-carboxylic acid (12)



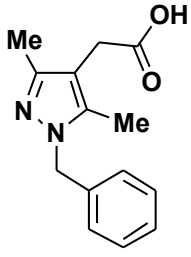
12, BB 0220572

m.p. = 143 – 145 °C.

^{1}H NMR (DMSO-d_6, 400 MHz): δ = 2.30 (s, 3H), 2.42 (s, 3H), 5.27 (s, 2H), 7.12 (d, *J* = 7.0 Hz, 2H), 7.24-7.30 (m, 1H), 7.30-7.36 (m, 2H).

^{13}C NMR: (DMSO-d_6, 100 MHz): δ = 10.9, 14.1, 51.8, 109.6, 127.0 (2C), 127.5, 128.7 (2C), 136.9, 143.7, 149.4, 165.3.

(1-Benzyl-3,5-dimethyl-1H-pyrazol-4-yl)acetic acid (13)



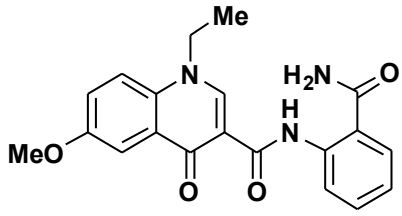
13, BB 0252160

m.p. = 123 – 125°C.

^{1}H NMR (DMSO-d_6, 400 MHz): δ = 2.06 (s, 3H), 2.09 (s, 3H), 3.27 (s, 2H), 5.19 (s, 2H), 7.10 (d, *J* = 7.1 Hz, 2H), 7.22-7.28 (m, 1H), 7.29-7.35 (m, 2H), 12.18 (br. s., 1H).

^{13}C NMR: (DMSO-d_6, 100 MHz): δ = 9.3, 11.7, 29.2, 51.8, 109.9, 126.9 (2C), 127.3, 128.5 (2C), 136.8, 138.0, 145.4, 172.8.

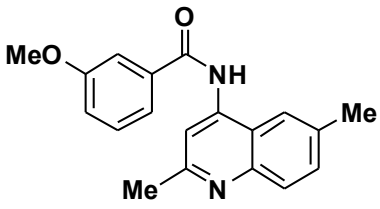
N-(2-Carbamoylphenyl)-1-ethyl-6-methoxy-4-oxo-1,4-dihydroquinoline-3-carboxamide (14)



14, BB 0221807

^{1}H NMR (CD$_3$OD, 400 MHz): δ = 1.56 (t, *J* = 7.3 Hz, 3H), 2.17 (s, 3H), 3.98 (s, 3H), 4.54 (q, *J* = 7.2 Hz, 2H), 7.23 (td, *J* = 7.6, 1.0 Hz, 1H), 7.48-7.54 (m, 2H), 7.64 (dd, *J* =7.6, 1.2 Hz, 1H), 7.87 (d, *J* = 9.3 Hz, 1H), 7.98 (d, *J* = 2.8 Hz, 1H), 8.35 (dd, *J* = 8.1, 1.0 Hz, 1H), 8.92 (s, 1H).

***N*-(2,6-Dimethylquinolin-4-yl)-3-methoxybenzamide (15)**



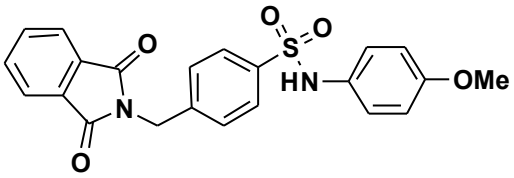
15, BB 0221908

m.p. = 177 – 178 °C.

^{1}H NMR (DMSO-d_6, 400 MHz): δ = 2.50 (s, 3H), 2.64 (s, 3H), 3.87 (s, 3H), 7.22 (dd, *J* = 8.2, 2.4 Hz, 1H), 7.50 (t, *J* = 7.9 Hz, 1H), 7.57 (dd, *J* = 8.7, 1.6 Hz, 1H), 7.63 (s, 1H), 7.68 (d, *J* = 7.6 Hz, 1H), 7.75 (s, 1H), 7.85 (d, *J* =8.6 Hz, 1H), 7.94 (s, 1H), 10.51 (s, 1H).

^{13}C NMR: (DMSO-d_6, 100 MHz): δ = 21.3, 25.0, 55.4, 113.2, 115.9, 117.9, 120.3, 121.1, 121.8, 128.4, 129.7, 131.5, 134.5, 135.7, 141.3, 147.0, 157.8, 159.3, 166.2.

4-[(1,3-Dioxo-1,3-dihydro-2H-isoindol-2-yl)methyl]-*N*-(4-methoxyphenyl)benzene sulfonamide (16)



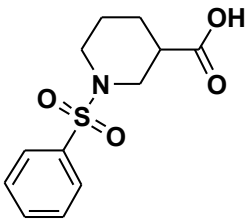
16, BB 0222063

m.p. = 225 – 230 °C.

^{1}H NMR (DMSO-d_6, 400 MHz): δ = 3.65 (s, 3H), 4.82 (s, 2H), 6.78 (dt, *J* = 9.1, 2.9 Hz, 2H), 6.98 (dt, *J* = 9.1, 2.9 Hz, 2H), 7.46 (d, *J* = 8.4 Hz, 2H), 7.66 (d, *J* = 8.4 Hz, 2H), 7.82-7.91 (m, 4H), 9.95 (s, 1H).

^{13}C NMR: (DMSO-d_6, 100 MHz): δ = 40.4, 55.1, 114.3 (2C), 123.2 (2C), 123.3 (2C), 127.0 (2C), 127.8 (2C), 130.1, 131.6, 134.6 (2C), 138.6, 141.5, 156.5, 167.7.

1-(Phenylsulfonyl)piperidine-3-carboxylic acid (17)



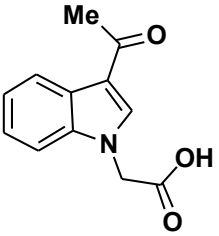
17, BB 0238610

m.p. = 126 – 128 °C.

^{1}H NMR (DMSO-d_6, 400 MHz): δ = 1.26-1.41 (m, 1H), 1.42-1.55 (m, 1H), 1.65-1.74 (m, 1H), 1.75-1.83 (m, 1H), 2.39 (td, *J* = 10.9, 2.4 Hz, 1H), 2.45-2.56 (m, 2H), 3.29-3.37 (m, 1H), 3.48-3.59 (m, 1H), 7.61-7.69 (m, 2H), 7.69-7.79 (m, 3H), 12.39 (br. s., 1H).

^{13}C NMR: (DMSO-d_6, 100 MHz): δ = 23.4, 25.6, 40.1, 46.1, 47.5, 127.4 (2C), 129.5 (2C), 133.2, 135.4, 173.8.

(3-Acetyl-1H-indol-1-yl)acetic acid (18)



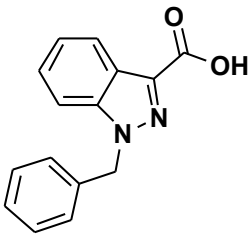
18, BB 0241842

m.p. = 200 – 220 °C (dec.).

^{1}H NMR (DMSO-d_6, 400 MHz): δ = 2.45 (s, 3H), 5.13 (s, 2H), 7.17-7.30 (m, 2H), 7.47-7.53 (m, 1H), 8.16-8.24 (m, 1H), 8.33 (s, 1H), 13.19 (br. s., 1H).

^{13}C NMR: (DMSO-d_6, 100 MHz): δ = 27.3, 47.6, 110.7, 116.3, 121.5, 122.1, 123.0, 125.6, 137.3, 138.2, 169.8, 192.4.

1-Benzyl-1H-indazole-3-carboxylic acid (19)



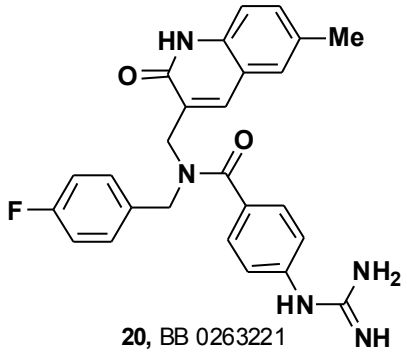
19, BB 0255255

m.p. = 202 – 203 °C.

^{1}H NMR (DMSO-d_6, 400 MHz): δ = 5.89 (s, 2H), 7.04 (d, *J* = 7.2 Hz, 2H), 7.13 (t, *J* = 7.5 Hz, 1H), 7.16-7.22 (m, 1H), 7.22-7.31 (m, 2H), 7.36 (d, *J* = 7.0 Hz, 1H), 7.53 (d, *J* = 8.4 Hz, 1H), 7.71 (d, *J* = 7.9 Hz, 1H), 12.91 (br. s., 1H).

^{13}C NMR: (DMSO-d_6, 100 MHz): δ = 46.9, 110.5, 111.3, 120.7, 122.4, 124.9, 125.6, 126.3 (2C), 127.0, 128.5 (2C), 138.7, 139.0, 163.0.

***N*-(4-Fluorobenzyl)-4-guanidino-*N*-((6-methyl-2-oxo-1,2-dihydroquinolin-3-yl)methyl)benzamide (20)**

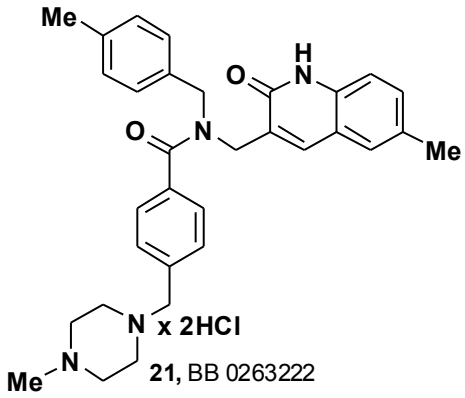


20, BB 0263221

m.p. > 230 °C (dec.).

^{1}H NMR: (DMSO, 400 MHz) δ = 2.36 (s, 3H), 4.34 (br. s, 2H), 4.66 (br. s, 2H), 7.10-7.19 (m, 4H), 7.20-7.25 (m, 1H), 7.26-7.38 (m, 3H), 7.45-7.56 (m, 3H), 7.67 (br. s, 1H), 8.40 (br. s, 1H). Guanidine protons are overlapped with water.

***N*-((6-Methyl-2-oxo-1,2-dihydroquinolin-3-yl)methyl)-*N*-(4-methylbenzyl)-4-((4-methylpiperazin-1-yl)methyl)benzamide dihydrochloride (21)**



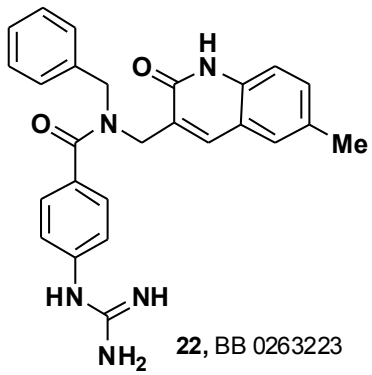
21, BB 0263222

m.p. = 199 – 201 °C.

^{1}H NMR: ($CDCl_3$, 400 MHz) δ = 2.35 (s, 3H), 2.38 (s, 3H), 2.42 (s, 3H), 2.55 (br. s, 8H), 3.50 (br. s, 2H), 4.49 (br. s, 1H), 4.59-4.76 (m, 2H), 4.81 (br. s, 1H),7.15 (br. s, 3H), 7.21-7.41 (m, 7H), 7.45 (d, *J* = 7.2 Hz, 2H), 12.11 (br. s, 1H).

^{13}C NMR: ($CDCl_3$, 100 MHz) δ = 21.1, 21.2, 29.8, 45.6, 48.1, 52.4, 54.9 (2C), 62.4 (2C), 115.7, 119.7, 120.0, 126.7, 127.1, 127.2, 128.5, 129.2 (2C), 129.5, 129.6, 131.8, 132.0, 132.3, 132.6, 134.0, 134.1, 135.1, 137.4, 140.0, 163.0, 172.9.

***N*-Benzyl-4-guanidino-*N*-((6-methyl-2-oxo-1,2-dihydroquinolin-3-yl)methyl)benzamide (22)**

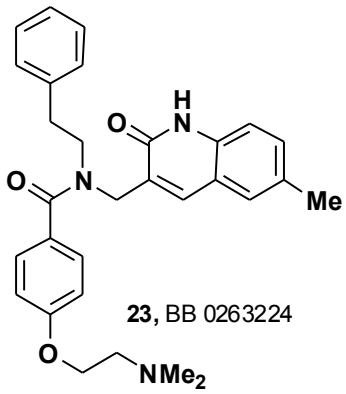


22, BB 0263223

m.p. > 200 °C (dec.).

^{1}H NMR: (DMSO, 400 MHz) δ = 2.36 (s, 3H), 4.21-4.45 (m, 2H), 4.69 (br. s, 2H), 7.11-7.25 (m, 4H), 7.25-7.40 (m, 5H), 7.44-7.61 (m, 3H), 7.61-8.05 (m, 4H), 8.40 (br. s, 1H), 11.80 (br. s, 1H).

4-(2-(Dimethylamino)ethoxy)-*N*-((6-methyl-2-oxo-1,2-dihydroquinolin-3-yl)methyl)-*N*-phenethylbenzamide (23)

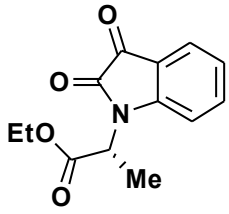


23, BB 0263224

m.p. = 233 – 235 °C.

^{1}H NMR: (DMSO, 400 MHz) δ = 2.19 (br. s, 6H), 2.33 (br. s, 3H), 2.54-2.73 (m, 2H), 2.73-3.06 (m, 2H), 3.44-3.73 (m, 2H), 4.05 (br. s, 2H), 4.22 (br. s, 1H), 4.54 (br. s, 1H), 6.77-7.08 (m, 3H), 7.11-7.45 (m, 8H), 7.53 (br. s, 1H), 7.68 (br. s, 1H), 11.83 (br. s, 1H).

(*R*)-Ethyl 2-(2,3-dioxoindolin-1-yl)propanoate (24)[5]



24, BB 0263354

Orange solid

m.p. = 58 °C.

$[\alpha]_D^{23}$ = + 18 (*c* = 1, CH_2Cl_2).

^{1}H NMR ($CDCl_3$, 400 MHz): δ = 1.22 (t, *J* = 7.2 Hz, 3H), 1.69 (d, *J* = 7.5 Hz, 3H), 4.23 (q, *J* = 7.2 Hz, 2H), 5.16 (q, *J* = 7.5 Hz, 1H), 6.85 (d, *J* = 7.7 Hz, 1H), 7.15 (td, *J* = 7.7, 0.7 Hz, 1H), 7.57 (td, *J* = 7.7, 1.4 Hz, 1H), 7.65 (ddd, *J* = 7.7, 1.4, 0.7 Hz, 1H).

^{13}C NMR: ($CDCl_3$, 100 MHz): δ = 14.1, 14.3, 49.2, 62.2, 111.5, 117.9, 123.9, 125.6, 138.2, 149.5, 157.7, 169.4, 182.7.

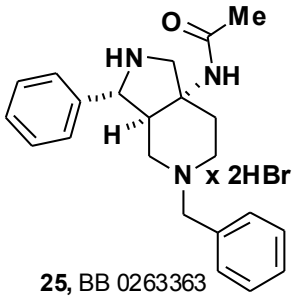
IR ν_{max} (KBr): 3467, 2993, 1739 (CO), 1608, 1468, 1367, 1309, 1246, 1113, 750, 476 cm^{-1}.

m/z (I_{rel}, %): 247 [M+], 174 [M-CO_2Et], 146 [M-CH_3CHCO_2Et], 128 (0.8), 117 (6), 91 (12), 77 (26), 51 (9).

Anal. Calcd for $C_{13}H_{13}NO_4$: C, 63.15; H, 5.30; N, 5.66. **Found**: C, 63.20; H, 5.43; N, 5.81.

[5] a) Kurkin, A. V.; Bernovskaya, A. A.; Yurovskaya, M. A. *Tetrahedron: Asymmetry* **2009**, *20*, 1500 – 1505; b) Kurkin, A. V.; Bernovskaya, A. A.; Yurovskaya, M. A. *Tetrahedron: Asymmetry* **2010**, 21, 2100 – 2107; c) Kurkin, A. V.; Bernovskaya, A. A.; Yurovskaya, M. A. *Chem. Heterocycl. Compd.* **2011**, *46*, 1208 – 1214.

N-((3*RS*,3a*SR*,7a*RS*)-5-Benzyl-3-phenyloctahydro-1H-pyrrolo[3,4-c]pyridin-7a-yl)acetamide dihydrobromide (25)



25, BB 0263363

m.p. = 240 – 242°C.

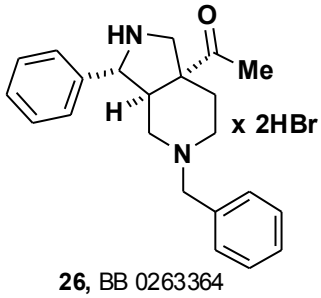
^{1}H NMR (DMSO-d_6, 400 MHz): δ = 1.96 (s, 3H), 2.19-2.33 (m, 1H), 2.42-2.55 (m, 1H), 2.76 (d, *J* = 13.7 Hz, 1H), 3.13-3.28 (m, 2H), 3.33-3.48 (m, 1H), 3.50-3.63 (m., 2H), 3.63-3.73 (m, 1H), 4.30-4.51 (m, 2H), 5.32-5.45 (m, 1H), 7.37-7.43 (m, 3H), 7.43-7.50 (m, 3H), 7.56-7.71 (m, 4H), 8.55 (s, 1H), 9.24 (br. s., 1H), 10.22 (br. s., 2H).

^{13}C NMR: (DMSO-d_6, 100 MHz): δ = 23.0, 27.4, 44.0, 44.4, 47.3, 52.8, 54.6, 59.2, 59.5, 128.6 (2C), 128.7 (2C), 129.0 (2C), 129.6, 129.8, 131.5, 132.4, 170.5.

IR ν_{max} (KBr): 2920, 2872, 2856, 2702, 2623, 2590, 1699, 1529, 1464, 1414, 1377, 748, 696 cm^{-1}.

HRMS (ESI) for $C_{22}H_{28}N_3O$ $[M+H]^+$ calcd 350.2227, found 350.2224.

1-((3*RS*,3a*SR*,7a*RS*)-5-Benzyl-3-phenyloctahydro-1H-pyrrolo[3,4-c]pyridin-7a-yl)ethanone dihydrobromide (26)



26, BB 0263364

m.p. = 298 – 300 °C (dec.).

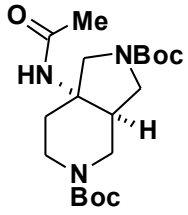
^{1}H NMR (DMSO-d_6, 400 MHz): δ = 2.39 (s + m, 3 + 1H), 2.52-2.61 (m, 1H), 2.64-2.95 (m, 2H), 3.01-3.29 (m, 2H), 3.36-3.57 (m, 2H), 3.80 (d, *J* = 12.1 Hz, 1H), 4.09-4.57 (m, 2H), 5.47 (d, *J* = 10.5 Hz, 1H), 7.31-7.40 (m, 3H), 7.41-7.50 (m, 3H), 7.52-7.67 (m, 2H), 7.68-7.83 (m, 2H), 9.26 (br. s., 1H), 10.31 (br. s., 2H).

^{13}C NMR: (DMSO-d_6, 100 MHz): δ = 26.1, 26.6, 43.0, 45.6, 48.4, 50.4, 51.7, 59.0, 61.2, 128.6 (2C), 128.8 (2C), 128.9 (2C), 129.5, 129.7, 131.5 (2C), 132.1, 206.2.

IR ν_{max} (KBr): 3543, 3469, 3234, 2931, 2914, 1624, 1549, 1462, 1377, 756, 704 cm^{-1}.

HR–MS (ESI) for $C_{22}H_{27}N_2O$ $[M+H]^+$ calcd 335.2118, found 335.2117.

(3a*RS*,7a*SR*)-di-tert-Butyl 7a-acetamidotetrahydro-1H-pyrrolo[3,4-c]pyridine-2,5(3H,6H)-dicarboxylate (27)



27, BB 0265816

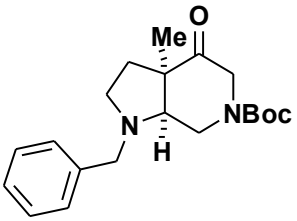
m.p. = 105 – 110 °C.

Mixture of rotamers.

^{1}H NMR ($CDCl_3$, 400 MHz): δ = 1.43 (s, 18H), 1.63-1.83 (m, 1H), 1.96 (s, 3H), 2.12 (d, *J* = 13.7 Hz, 1H), 2.24-2.49 (m, 0.5H), 2.51-2.75 (m, 1.5H), 2.98-3.19 (m, 2H), 3.27 (d, *J* = 13.9 Hz, 1H), 3.42-3.78 (m, 4H), 6.23 (s, 1H).

^{13}C NMR: ($CDCl_3$, 100 MHz): δ = (23.68, 23.72), (28.3, 28.4) (3C), 29.0, 40.2 (br., 2C), (45.6, 46.1), (54.7, 55.3), (57.0, 57.5), (79.68, 79.72), (80.03, 80.05), (154.7, 154.8, 155.0), 170.7.

(3a*RS*,7a*SR*)-tert-Butyl 1-benzyl-3a-methyl-4-oxohexahydro-1H-pyrrolo[2,3-c]pyridine-6(2H)-carboxylate (28)



28, BB 0263365

m.p. = 72 – 74 °C.

Mixture of two rotamers.

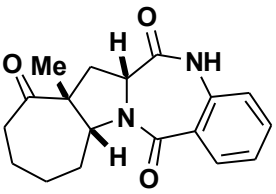
^{1}H NMR: ($CDCl_3$, 400 MHz) δ = 1.24 (br. s., 3H), 1.45-1.50 (br. s + m, 10H), 2.17-2.36 (m, 2H), 2.59 (br. s., 1H), 2.88 (d, *J* =18.3 Hz, 1H), 3.23 (d, *J* = 12.3 Hz, 0.5H), 3.39 (d, *J* = 12.5 Hz, 0.5H), 3.50 (d, *J* = 14.1 Hz, 1H), 3.72 (d, *J* = 12.8 Hz, 0.5H), 3.91-4.08 (m, 2H), 4.14 (d, *J* = 12.5 Hz, 0.5H), 4.24 (d, *J* = 18.6 Hz, 1H), 7.18 - 7.41 (m, 5H).

^{13}C NMR (400 MHz, $CDCl_3$) δ = (23.2, 23.5), 28.5 (3C), 33.8, (41.8, 43.9), (50.9, 51.1), (52.2, 53.2), 52.9, 57.7, (69.5, 69.8), 80.5, 127.1, 128.2 (2C), (128.7, 128.9) (2C), (138.6, 138.8), 154.5, 210.5.

IR ν_{max} (KBr): 2912, 2870, 1705, 1462, 1456, 1377, 1169, 1140, 758, 744, 731, 102 cm^{-1}.

HRMS (ESI) calcd for $C_{20}H_{29}N_2O_3$ $[M+H]^+$ 345.2173, found 345.2171.

(6a*RS*,11a*RS*,12a*RS*)-3,4-Benzo-11a-methyl-6a,7,8,9,10,11a,12,12a-octahydrocyclohepta[4,5]pyrrolo[1,2-*a*][1,4]diazepine-1,5,11(2*H*)-trione (29)



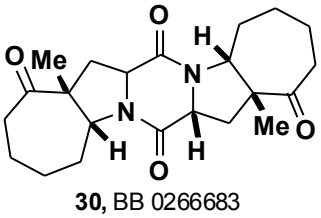
29, BB 0265807

m.p. > 220 °C (dec.).

^{1}H NMR: ($CDCl_3$, 400 MHz) δ = 1.21-1.31 (m, 1H), 1.28 (s, 3H), 1.31-1.53 (m, 2H), 1.59-1.76 (m, 1H), 1.80-1.92 (m, 1H), 1.93-2.06 (m, 3H), 2.38-2.50 (m, 1H), 2.71 (td, *J* = 12.8, 1.8 Hz, 1H), 3.24 (dd, *J* = 14.1, 9.1 Hz, 1H), 4.12 (t, *J* = 8.6 Hz, 1H), 4.41 (d, *J* = 11.1 Hz, 1H), 7.12 (d, *J* = 8.1 Hz, 1H), 7.27 (t, *J* = 7.3 Hz, 1H), 7.51 (td, *J* = 8.0, 1.3 Hz, 1H), 8.00 (dd, *J* = 7.8, 1.1 Hz, 1H), 9.70 (s, 1H).

^{13}C NMR (400 MHz, $CDCl_3$) δ = 24.6, 27.7, 28.0, 31.9, 33.6, 41.1, 55.0, 57.0, 65.9, 121.4, 125.3, 126.0, 131.2, 132.9, 135.4, 165.8, 171.1, 213.6.

Diketopiperazine (30)



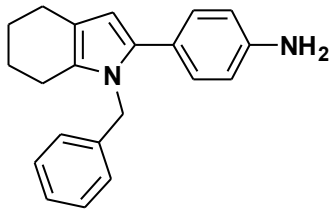
30, BB 0266683

^{1}H NMR: ($CDCl_3$, 400 MHz) δ = 1.01 (dd, *J* = 24.7, 12.0 Hz, 2H), 1.34 (s, 6H), 1.36-1.50 (m, 2H), 1.51-1.67 (m, 2H), 1.86 (d, *J* = 11.7 Hz, 2H), 1.96 (d, *J* = 9.8 Hz, 2H), 2.12 (dd, *J* = 13.6, 6.7 Hz, 4H), 2.39-2.52 (m, 4H), 2.68 (t, *J* = 11.0 Hz, 2H), 3.91 (d, *J* = 10.8 Hz,

2H), 4.23 (dd, J = 10.9, 7.1 Hz, 2H).

^{13}C NMR (400 MHz, $CDCl_3$) δ = 23.6, 27.6, 27.7, 32.3, 32.4, 40.8, 58.0, 59.1, 64.6, 167.7, 212.5.

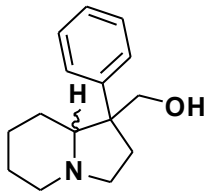
4-(1-Benzyl-4,5,6,7-tetrahydro-1*H*-indol-2-yl)aniline (31)[6]



The full synthetic procedure for THI **31** and analogs **34**-**44** as well as for intermediate aminopropargylic alcohols **46a-e** will be reported below. Though these compounds and synthetic procedures are already thoroughly described in our previous article[6] they will be given in this SI for convenience.

Copies of the NMR spectra (^{1}H and ^{13}C) are provided below only for unknown compounds: aminopropargylic alcohols **46d,e** and 4,5,6,7-tetrahydro-1H-indoles **37** and **38**. For others see reference.[6]

(1-Phenyloctahydroindolizin-1-yl)methanol (32)



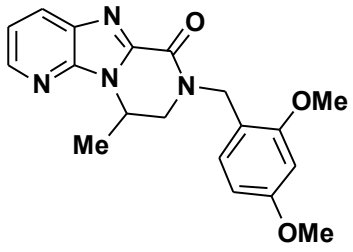
32, BB 0266673

brown oil

Mixture of racemic diastereoisomers (~ 2:1)

^{1}H NMR: ($CDCl_3$, 400 MHz) δ = 1.20-1.73 (m, 6H), 1.85-2.02 (m, 2H), 2.11 (ddd, *J* = 12.8, 10.2, 2.5 Hz, 1H), 2.26-2.34 (m, 1H), 2.41-2.73 (m, 2H), 3.06 (dt, *J* = 12.6, 2.0 Hz, 0.4H), 3.16 (d, *J* = 11.0 Hz, 0.6H), 3.20-3.29 (m, 1H), 3.67 (dd, *J* = 10.0, 1.3 Hz, 0.5H), 3.75 (d, *J* = 10.4 Hz, 0.5H), 3.87 (d, *J* = 10.4 Hz, 0.5H), 4.06 (d, *J*=10.0 Hz, 0.5H), 7.19 - 7.37 (m, 5 H).

7-(2,4-Dimethoxybenzyl)-9-methyl-7H,9H-pyrido[3',2':4,5]imidazo[1,2-a]pyrazine-6,8-dione (33)[7]



33, BB 0268581

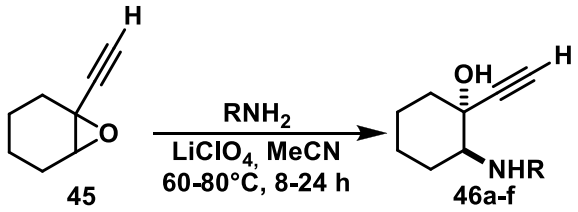
m.p. = 174 – 176 ºC.

^{1}H NMR ($CDCl_3$, 400 MHz): δ = 2.02 (d, *J* = 7.1 Hz, 3H), 3.78 (s, 3H), 3.81 (s, 3H), 5.10-5.13 (m, 1H), 5.31-5.33 (m, 1H), 5.52 (q, *J* = 7.0 Hz, 1H), 6.41-6.43 (m, 2H), 7.20 (d, *J* = 8.8 Hz, 1H), 7.42 (dd, *J* = 8.2, 4.6 Hz, 1H), 8.28 (dd, *J* = 8.2, 1.2 Hz, 1H), 8.59 (dd, *J* = 4.6, 1.2, 1H).

^{13}C NMR: ($CDCl_3$, 100 MHz): δ = 20.7, 39.6, 54.2, 55.4, 55.5, 98.6, 104.1, 115.9, 118.6, 120.7, 130.5, 130.6, 136.1, 145.8, 147.8, 155.3, 158.5, 160.6, 169.0.

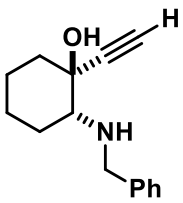
[6] I. A. Andreev, D. S. Belov, A. V. Kurkin, M. A. Yurovskaya, *Eur. J. Org. Chem*. **2013**, 649 − 652.
[7] Bukhryakov, K. V.; Kurkin, A. V.; Yurovskaya, M. A. *Chemistry of Heterocyclic Compounds*, **2012**, *48*, 773 – 784.

General procedure for lithium perchlorate mediated epoxide opening with various amines.



To a vigorously stirred solution of epoxide **45** (1 equiv) and amine (1.5 to 3 equiv), alanine ethyl ester[▾] (2 equiv), glycine amide (2 equiv) or alanine amide[·] (2 equiv) in acetonitrile (1 M solution of epoxide) lithium perchlorate (1.5 equiv) was added in one portion. The reaction mixture was stirred at 50-80°C until the full consumption of the starting epoxide (TLC control, typically 8-24 h). The overheating is strictly undesirable and leads to the decrease in yields. The reaction mixture was cooled to an ambient temperature and poured into 2 volumes of water followed by the extraction with 2 to 3 times (half of the reaction mixture volume each time) of dichloromethane. The combined organic extracts were dried over an anhydrous sodium sulfate and concentrated under reduced pressure on a rotary evaporator. The residue was purified by flash chromatography (eluting with petroleum ether (PE) – EtOAc (EA) in proportions varying from 10:1 to 1:1 in the case of **46a-d** or with CH_2Cl_2 – MeOH in proportions varying from 30:1 to 15:1 in the case of **46e,f**) to afford amino propargylic alcohols **46a-f** as bright to dark yellow/orange oils (**46a-d**) or white solids (**46e,f**).

(1*RS*,2*SR*)-2-(Benzylamino)-1-ethynylcyclohexanol (46a)[6]



Compound **46a** was synthesized according to the general procedure from epoxide **45** (20.00 g, 163.7 mmol) and benzylamine (35.09 g, 327.4 mmol, 2 equiv) at 60°C and isolated in the amount of 34.17 g (91%) as a bright-yellow oil. R_f =0.20 (petroleum ether – EtOAc, 3**:**1).

^{1}H NMR: ($CDCl_3$, 400 MHz) δ = 1.18-1.52 (m, 4H), 1.55-1.82 (m, 3H), 2.09-2.21 (m, 2H), 2.38 (dd, *J* = 11.3, 3.8 Hz, 1H), 2.45 (s, 1H), 3.71 (d, *J* = 13.0 Hz, 1H), 4.01 (d, *J*= 13.0 Hz, 1H), 4.33 (br. s., 1H), 7.24-7.29 (m, 1H), 7.31-7.38 (m, 4H).

^{13}C NMR: ($CDCl_3$, 100 MHz) δ = 23.1, 25.1, 28.7, 37.8, 50.8, 64.7, 71.8, 74.1, 85.2, 127.2, 128.2 (2C), 128.5 (2C), 140.3.

IR ν_{max} (KBr): 3465 (br), 3296, 2935, 2858, 1452, 1369, 1095, 1072, 1032, 741, 700 cm^{-1};

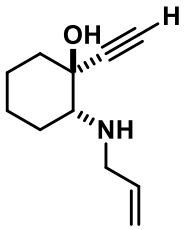
[▾] Ethyl ester of L-alanine was preliminary obtained in a free base form from the corresponding hydrochloride by the CH_2Cl_2 extraction from K_2CO_3 solution in 73% yield.

[·] The free base of glycine and alanine amide was obtained by the treatment of a vigorously stirred 1M suspension of hydrochloride in *i*PrOH with 1 equiv of solid NaOH followed by the filtration (typically after 10-12 h) of the precipitated NaCl and subsequent evaporation of the filtrate in 93% and 98% yield respectively.

m/z (I_{rel}, %): 229 (MH^+, 2), 138 (9), 132 (11), 120 (9), 92 (12), 91 (100), 65 (26), 53 (18), 53 (18), 41 (14), 39 (18).

Anal. Calcd for $C_{15}H_{19}NO$: C, 78.56; H, 8.35; N, 6.11. **Found:** C, 78.47; H, 8.17; N, 6.00.

(1*RS*,2*SR*)-2-(Prop-2-en-1-ylamino)-1-ethynylcyclohexanol (46b)[6]



Compound **46b** was synthesized according to the general procedure from epoxide **45** (5.00 g, 40.9 mmol) and allylamine (9.2 ml, 122.8 mmol, 3 equiv) at 50°C and isolated in the amount of 6.53 g (89%) as non-viscous orange oil after the flash chromatography with PE/EA = 10:1. R_f = 0.18 (petroleum ether – EtOAc, 3**:**1).

^{1}H NMR: ($CDCl_3$, 400 MHz) δ = 1.06 (br. s., 1H), 1.19-1.33 (m, 2H), 1.48 (td, *J* = 12.6, 4.0Hz, 1H), 1.54-1.82 (m, 3H), 2.02-2.17 (m, 2H), 2.32 (dd, *J* = 10.9, 3.6Hz, 1H), 2.46 (s, 1H), 3.18 (dd, *J* = 13.9, 5.9Hz, 1H), 3.47 (dd, *J* = 13.9, 5.9, Hz, 1H), 4.32 (br. s., 1H), 5.10 (d, *J* = 10.2 Hz, 1H), 5.20 (dd, *J* = 17.1, 1.6Hz, 1H), 5.90 (dddd, *J* = 17.1, 11.1, 5.9, 1.6Hz, 1H).

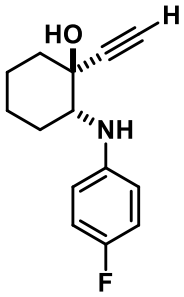
^{13}C NMR: ($CDCl_3$, 100 MHz) δ = 23.2, 25.2, 28.9, 37.9, 49.5, 64.7, 71.8, 74.0, 85.3, 116.0, 137.3.

m/z ($I_{rel.}$, %): 179 (0.7, MH^+), 68 (31), 65 (28), 56 (25), 55 (25), 54 (26), 53 (54), 41 (100), 39 (46), 32 (34).

IR ν_{max} (KBr): 3464 (br.),3306 (br.), 3079w, 2934s, 2860m, 1642w, 1448m, 1369m, 1074m, 921m, 850m, 776m, 648m cm^{-1}.

Anal. Calcd for $C_{17}H_{21}NO$: C, 79.96; H, 8.29; N, 5.49. **Found:** C, 80.01; H, 8.01; N, 5.50.

(1*RS*,2*SR*)-1-Ethynyl-2-[(4-fluorophenyl)amino]cyclohexanol (46c)[6]



Compound **46c** was synthesized according to the general procedure from epoxide **45** (2.00 g, 16.4 mmol) and 4-fluoroaniline (3.64 g, 32.7 mmol, 2 equiv), stirring the reaction mixture at 70°C for 24 h, and isolated in the amount of 2.89 g (76%) as a brown solid with **m.p.** = 78 – 80°C. R_f = 0.42 (petroleum ether – EtOAc, 3**:**1); R_f = 0.13 (petroleum ether – EtOAc, 10**:**1).

^{1}H NMR: ($CDCl_3$, 400 MHz) δ = 1.24-1.42 (m, 2H), 1.56-1.70 (m, 2H), 1.70-1.82 (m, 2H), 1.97-2.04 (m, 1H), 2.19-2.25 (m, 1H), 2.60 (s, 1H), 2.74 (dd, *J* = 11.1, 3.4 Hz, 1H), 3.46 (s, 1H), 3.51 (br. s., 1H), 6.69 (dd, *J* = 8.9, 4.4 Hz, 2H), 6.69 (t, *J* = 8.9, 2H).

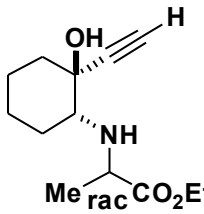
^{13}C NMR: ($CDCl_3$, 100 MHz) δ = 23.3, 25.1, 30.1, 38.1, 62.9, 72.5, 75.1, 84.4, 115.9 (d, *J* = 15.4 Hz, 2C), 116.1 (2C), 143.5, 156.6 (d, *J* = 236.4 Hz).

m/z (I_{rel}, %): 233 (46), 150 (78), 137 (60), 136 (65), 124 (100), 122 (49), 111 (45), 95 (47).

IR ν_{max} (KBr): 3510 (w), 3408 (w), 3298, 2937, 2862, 1512, 1219, 1063, 823, 656 cm^{-1}.

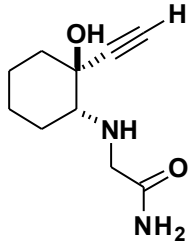
Anal. Calcd for $C_{14}H_{16}FNO$: C, 72.08; H, 6.91; N, 6.00. **Found:** C, 72.25; H, 6.80; N, 5.83.

Ethyl 2-{[(1*RS*,2*SR*)-2-ethynyl-2-hydroxycyclohexyl]amino}propanoate (46d)[6]



Compound **46d** was synthesized according to the general procedure from epoxide **45** (4.99 g, 40.8 mmol) and ethyl L-alaninate (9.57 g, 81.7 mmol, 2 equiv, free base form) stirring at 65°C for 24 h and isolated as a ~1:1 mixture of two diastereomers as dark-yellow oil (4.57 g, 47%; MH^+ = 239, $\mathbf{I_{rel}}$= 2%). R_f = 0.22÷0.34 (mixture of diastereomers, petroleum ether – EtOAc, 3**:**1). The increase of the quantity of either amino acid ester or lithium perchlorate doesn't improve the yield of **2f**. Obtained diastereomeric mixture was subjected directly to the cyclization step without separation.

2-((1*RS*,2*SR*)-2-Ethynyl-2-hydroxycyclohexylamino)acetamide (46e)



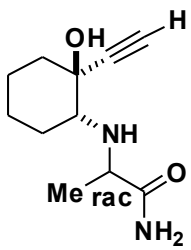
Compound **46e** was synthesized according to the general procedure from epoxide **45** (500 mg, 4.1 mmol) and glycine amide (606 mg, 8.2 mmol, 2equiv, free base form), stirring the reaction mixture at a reflux temperature for 16 h (the complete consumption of the starting epoxide occurred). The reaction mixture was poured into water and washed twice with dichloromethane prior to the saturation with an appropriate cooling with a solid potassium carbonate to achieve a 50% aqueous solution approx. The solids were filtered off and washed with EtOAc. The filtrate was extracted with EtOAc, dried over an anhydrous sodium sulfate and concentrated under reduced pressure on a rotary evaporator to afford 824 mg of a crude amino propargylic alcohol. Flash-chromatography of the residue by dichloromethane – methanol, 15**:**1 affords 571 mg (71%) of a yellow oil which slowly crystallizes into light-yellow (or beige) solid with **m.p.** = 134 – 136 °C. R_f = 0.22 (CH_2Cl_2 – MeOH, 15**:**1; $KMnO_4$ visualization – white spot).

On a ten times bigger quantities (5.12 g of **45** and 6.2 g of glycine amide free base) instead of chromatographic purification to prevent prolonged separations (the title compound absorbs decently on SiO_2) crystallization techniques were applied. Almost completely evaporated EtOAc extract was treated with a minimal amount of CH_2Cl_2. The resulting precipitate was filtered off and washed with Et_2O with rubbing to afford 3.59 g (~ 44%) of an off-white solid. The filtrate was evaporated to dryness, treated with hot benzene and decanted from orange insoluble oil. The extract was evaporated to dryness and treated with rubbing with ether. The resulting light-yellow solid was filtered off, washed with ether and dried on air to provide the second less pure portion in the amount of 2.03 g (~ 25%). The total yield was 5.62 g (68%).

^{1}H NMR: (DMSO-d_6, 400 MHz) δ = 1.05-1.21 (m, 2H), 1.33-1.48 (m, 2H), 1.51-1.66 (m, 2H), 1.75-1.89 (m, 2H), 1.93 (br. s., 1H), 2.16 (dd, *J* = 10.0, 3.2 Hz, 1H), 3.02 (d, *J* = 16.6 Hz, 1H), 3.21 (d, *J* = 16.6 Hz, 1H), 3.27 (s, 1H), 5.59 (s, 1H), 7.03 (s, 1H), 7.53 (s, 1H).

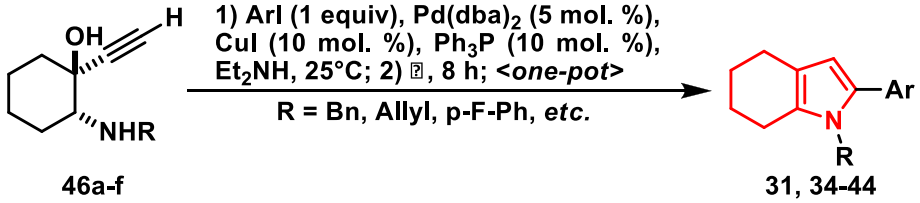
^{13}C NMR: (DMSO-d_6, 100 MHz) δ = 22.9, 24.1, 29.1, 39.1, 49.9, 65.1, 71.4, 75.8, 86.0, 174.3.

2-((1*RS*,2*SR*)-2-Ethynyl-2-hydroxycyclohexylamino)propanamide (46f)



Compound **46f** was synthesized according to the general procedure from epoxide **45** (4.00 g, 32.7 mmol) and alanine amide (5.77 g, 65.5 mmol, 2equiv, free base form) stirring the reaction mixture at a reflux temperature for 24 h (the complete consumption of the starting epoxide occurred). The reaction mixture was poured into 100 ml of water and saturated with an appropriate cooling with a solid potassium carbonate to achieve a 50% aqueous solution approx. The solids were filtered off and washed with EtOAc. The filtrate was extracted with EtOAc, dried over an anhydrous sodium sulfate and concentrated under reduced pressure on a rotary evaporator to afford ~ 7 g of a crude amino propargylic alcohol. Flash-chromatography of the residue by dichloromethane – methanol, 30**:**1 affords 4.00 g (58%) of yellow oily crystals of **46f** as a ~1:1 mixture of two diastereomers. R_f = 0.19 (CH_2Cl_2 – MeOH, 30**:**1; $KMnO_4$ visualization – white spot). Rubbing of the residue in Et_2O and subsequent filtration affords 2.63 g (38%) as a fluffy white solid with **m.p.** = 121 – 123 °C. Obtained diastereomeric mixture was subjected directly to the cyclization step without separation.

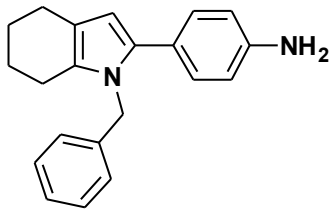
General procedure for the synthesis of 4,5,6,7-tetrahydro-1*H*-indoles: *one-pot* tandem Sonogashira coupling/5-endo-dig metal-catalyzed cyclization, employing aminopropargylic alcohols 2a-f as a starting material.[6]



46a-f **31, 34-44**

1 equiv (typically **1.00 g** unless otherwise stated) of amino propargylic alcohol **46a-e**, 1 equiv of aryl iodide and 0.1 equiv of triphenylphosphine are placed in a 50 ml oven-dried Schlenk flask equipped with a magnetic stirring bar and a water condenser fitted with an oil bubbler. The reaction vessel is charged with 20 equiv of diethyl amine (**commonly 9 ml**) and after the complete dissolution of the starting material a strong nitrogen flush is introduced for a period of 2-3 minutes. The pressure of inert gas is decreased and 0.05 equiv of $Pd(dba)_2$ followed by 0.1 equiv of CuI are added. The vessel is flushed with a strong stream of nitrogen once again (1 min), the pressure of inert gas is decreased and the reaction mixture is stirred under a slow stream of nitrogen at an ambient temperature overnight (10 to 20 hours). Then reaction mixture is refluxed under a slow stream of nitrogen for 8-12 h (TLC control is possible, generally applying petroleum ether – EtOAc, 3**:**1). The reaction mixture is cooled to an ambient temperature and poured into 50 ml of saturated NH_4Cl solution. The resulting mixture is extracted 3-4 times with 50 ml portions of CH_2Cl_2. Combined organic extracts are dried over anhydrous Na_2SO_4 and concentrated under reduced pressure on a rotary evaporator. The resulting crude mixture is subjected to the flash chromatography, generally (unless otherwise noted) eluting with petroleum ether – EtOAc, 100**:**1 to 50**:**1 to obtain an analytically pure compound.

4-(1-Benzyl-4,5,6,7-tetrahydro-1*H*-indol-2-yl)aniline (31)[6]



The crude reaction mixture was flash chromatographied with petroleum ether – EtOAc, 4**:**1 to afford 1.01 g (77%) of **31** as a deep orange thick oil. R_f = 0.27 (petroleum ether – EtOAc, 3**:**1).

^{1}H NMR: ($CDCl_3$, 400 MHz) δ = 1.73-1.88 (m, 4H), 2.35-2.49 (m, 2H), 2.56-2.69 (m, 2H), 3.64 (s, 2H), 5.07 (s, 2H), 6.06 (s, 1H), 6.62 (d, *J*= 8.3 Hz, 2H), 7.00 (d, *J*= 7.2 Hz, 2H), 7.13 (d, *J*= 8.5 Hz, 2H), 7.22-7.29 (m, 1H), 7.29-7.36 (m, 2H).

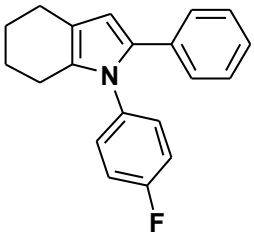
^{13}C NMR: ($CDCl_3$, 100 MHz) δ =22.4, 23.2, 23.5, 23.8, 47.3, 106.4, 115.0 (2C), 117.5, 124.2, 125.9 (2C), 126.9, 128.7 (2C), 130.0 (2C), 134.0, 138.0, 139.6, 145.3.

m/z (I_{rel}, %):303 (13), 302 (57, MH^+), 212 (17), 211 (100), 120 (17), 92 (18), 91 (78), 65 (36), 41 (11), 39 (15).

IR ν_{max} (KBr): 3459m (br.), 3363s (br.), 3217w, 3026m, 2926s (br.), 2847s (br.), 1953w, 1887w, 1620s, 1534s, 1482s, 1443s, 1385s, 1285s, 1177s, 833s, 784s, 738scm^{-1}.

Anal. Calcd for $C_{21}H_{22}N_2$: C, 83.40; H, 7.33; N, 9.26. **Found**: C, 83.78; H, 7.16; N, 9.04.

1-(4-Fluorophenyl)-2-phenyl-4,5,6,7-tetrahydro-1*H*-indole (34)[6, 8]



Crude reaction mixture is flash chromatographied with petroleum ether – EtOAc, 10**:**1 to afford 1.15 g (92%) of **34** as a light-brown solid with **m.p.** = 129 – 131 °C, **lit. m.p.**[8] = 129 – 130 °C. R_f = 0.60 (petroleum ether – EtOAc, 3**:**1).

^{1}H NMR: ($CDCl_3$, 400 MHz) δ = 1.77-1.90 (m, 4H), 2.39-2.48 (m, 2H), 2.59-2.70 (m, 2H), 6.27 (s, 1H), 7.00-7.22 (m, 9H).

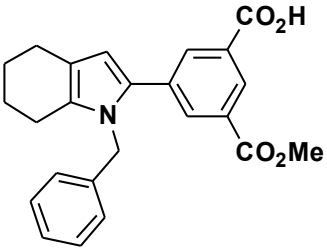
^{13}C NMR: ($CDCl_3$, 100 MHz) δ = 23.2, 23.3, 23.5, 23.7, 108.8, 115.9 (d, *J*= 23.0 Hz, 2C), 118.6, 125.9, 128.0 (2C), 128.1 (2C), 129.6 (d, *J*= 8.4 Hz, 2C), 131.2, 133.3, 133.3, 135.3, 161.4 (d, *J*= 246.9 Hz, C).

m/z (I_{rel}, %): 292 (23), 291 (100, MH^+), 290 (18), 264 (12), 263 (56), 262 (35), 95 (22), 77 (16), 75 (15), 39 (11).

IR ν_{max} (KBr): 3057 (w), 2926 (s), 2851 (m), 1896 (w), 1651 (w), 1601 (m), 1506 (s), 1441 (m), 1387 (m), 1287 (w), 1217 (s), 1138 (w), 1090 (m), 974 (w), 845 (s), 820 (m), 802 (m), 758 (s), 698 (s), 577 (m) cm^{-1}.

Anal. Calcd for $C_{20}H_{18}FN$: C, 82.45; H, 6.23; N, 4.81; F, 6.52. **Found**: C, 82.32; H, 6.03; N, 4.90.

3-(Methoxycarbonyl)-5-(1-benzyl-4,5,6,7-tetrahydro-1*H*-indol-2-yl)benzoic acid (35)[6]



Flash chromatography with CH_2Cl_2 – MeOH = 20**:**1 affords 1.33 g (78%) of **35** as dark orange foam (*sample is of **non**-analytical purity*). R_f = 0.59 ($CHCl_3$ – MeOH, 7**:**1). To obtain the sample of the analytical purity in addition to flash chromatography, compound was subjected to column chromatography (eluting firstly with CH_2Cl_2 and then with CH_2Cl_2 – MeOH = 20**:**1). Thus obtained dark yellow foam was dissolved in 1 ml of diethyl ether followed by 1 ml of petroleum ether yielding gum which was rubbed. The resulting solid was filtered off, washed with small portions of petroleum ether and dried on air to afford 120 mg (7%) of **35** as a pistachio-green solid of analytical purity with **m.p.** = 161 – 163 °C.

[8] K. Nagarajan, P. K. Talwalker, R. K. Shah, S. R. Mehta, G. V. Nayak, *Ind. J. Chem., Section B: Org. Chem. Incl. Med. Chem.* **1985**, 24, 98 − 111.

^{1}H NMR: ($CDCl_3$, 400 MHz) δ = 1.73-1.90 (m, 4H), 2.48 (t, *J*= 5.6 Hz, 2H), 2.61 (t, *J*= 5.5 Hz, 2H), 3.88 (s, 3H), 5.12 (s, 2H), 6.26 (s, 1H), 6.92 (d, *J*= 7.2 Hz, 2H), 7.20-7.35 (m, 3H),8.18 (t, *J*=1.6 Hz, 1H), 8.56 (t, *J*=1.5 Hz, 1H).

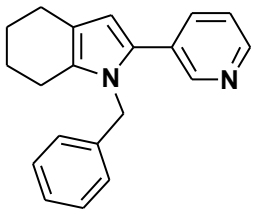
^{13}C NMR: ($CDCl_3$, 100 MHz) δ = 22.4, 23.2, 23.4, 23.8, 47.6, 52.5, 109.3, 118.7, 125.8 (2C), 127.3, 128.9 (2C), 130.1, 131.0, 131.4, 131.5, 132.3, 133.8, 134.0, 134.8, 166.2, 171.1.

m/z (I_{rel}, %): 390 (5), 389 (22, MH^+),298 (13), 239 (3), 194 (7), 92 (11), 91 (100), 65 (14), 59 (4), 77 (4).

IR ν_{max} (KBr): 2928m, 2844m, 2626m (br.), 1724s, 1696s, 1603m, 1501w, 1436m, 1395w, 1323m, 1265s, 1139w, 1077w, 998w, 917w, 757m, 727w, 697w cm^{-1}.

Anal. Calcd for $C_{24}H_{23}NO_4$: C, 74.02; H, 5.95; N, 3.60; O, 16.43. **Found**: C, 73.80; H, 5.99; N, 3.40.

1-Benzyl-2-pyridin-3-yl-4,5,6,7-tetrahydro-1*H*-indole (36)[6]



The crude reaction mixture was flash chromatographied with petroleum ether – EtOAc, 3**:**1 to afford 0.98 g (78%) of **36** as a deep orange thick oil. R_f = 0.75 (petroleum ether – EtOAc, 1**:**1).

^{1}H NMR: ($CDCl_3$, 400 MHz) δ = 1.72-1.86 (m, 4H), 2.38-2.49 (m, 2H), 2.55-2.65 (m, 2H), 3.88 (s, 3H), 5.07 (s, 2H), 6.18 (s, 1H), 6.93 (d, *J*= 7.5 Hz, 2H), 7.18 (dd, *J*= 7.5, 4.8 Hz, 1H),7.21-7.27 (m, 1H), 7.30 (t, *J*= 7.6 Hz, 2H), 7.53 (d, *J*= 7.8 Hz, 1H), 8.44 (br. s., 1H), 8.59 (br. s., 1H).

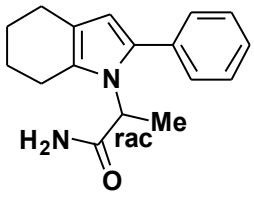
^{13}C NMR: ($CDCl_3$, 100 MHz) δ = 22.3, 23.2, 23.4, 23.7, 47.4, 108.8, 118.6, 123.3, 125.7 (2C), 127.3, 128.9 (2C), 129.8, 129.9, 131.2, 135.3, 138.8, 147.6, 149.4.

m/z (I_{rel}, %): 288 (31, MH^+),197 (17), 195 (24), 92 (23), 91 (100), 77 (17), 65 (54), 51 (23), 39 (26), 32 (32).

IR ν_{max} (KBr): 3028w, 2930s, 2849m, 1594w, 1564m, 1496m, 1452m, 1380m, 1301m, 1022m, 793m, 726s cm^{-1}.

Anal. Calcd for $C_{20}H_{20}N_2$: C, 83.3; H, 6.99; N, 9.71. **Found**: C, 83.32; H, 6.82; N, 9.95.

2-(2-Phenyl-4,5,6,7-tetrahydro-1H-indol-1-yl)propanamide (37)

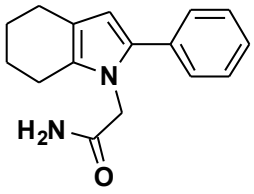


Compound **37** was obtained according to the general procedure as a beige solid with **m.p.** = 164 – 166 °C in a racemic form in the amount of 835 mg (65%) after two successive flash chromatographic separations eluting with CH_2Cl_2 – MeOH, 100**:**1. R_f = 0.27 (CH_2Cl_2 – MeOH, 100**:**1).

^{1}H NMR: ($CDCl_3$, 400 MHz) δ = 1.66 (d, *J* = 7.3 Hz, 3H), 1.69-1.77 (m, 2H), 1.77-1.86 (m, 1H), 1.87-1.98 (m, 1H), 2.50-2.70 (m, 4H), 4.88 (q, *J* = 7.3 Hz, 1H), 5.27 (br. s, 1H), 5.67 (br. s, 1H), 6.04 (s, 1H), 7.28-7.35 (m, 3H), 7.35-7.43 (m, 2H).

^{13}C NMR: ($CDCl_3$, 100 MHz) δ = 16.7, 23.2, 23.5, 23.7, 24.1, 54.4, 109.0, 119.9, 127.3, 128.8 (2C), 129.0 (2C), 129.5, 133.3, 134.7, 174.8.

2-(2-Phenyl-4,5,6,7-tetrahydro-1H-indol-1-yl)acetamide (38)

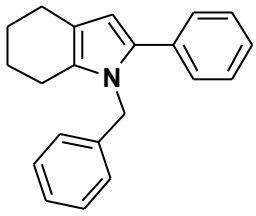


The starting amino propargylic alcohol **46d** (522 mg, 2.7 mmol) was insoluble in diethyl amine. Thus, after the addition of the catalyst the reaction mixture was heated to reflux with a heatgun for 5 min to afford a turbid solution and immediately cooled to an ambient temperature by the means of external bath (containing cold water) which led to an orange transparent solution. TLC control showed the complete consumption of the starting material (R_f = 0.22 (CH_2Cl_2 – MeOH, 15**:**1); $KMnO_4$ visualization – white spot) and presumably the appearance of the arylated amino propargylic alcohol with R_f = 0.42 (CH_2Cl_2 – MeOH, 15**:**1). The reaction mixture was then refluxed for 10 h, cooled to r.t. and worked up as usual. Flash chromatography with CH_2Cl_2 – MeOH, 50**:**1 afforded 515 mg (76%) of **38** as a tan solid with **m.p.** = 190 – 192 °C. R_f = 0.23 (CH_2Cl_2 – MeOH, 50**:**1); R_f = 0.16 (CH_2Cl_2 – MeOH, 100**:**1).

^{1}H NMR: ($CDCl_3$, 400 MHz) δ = 1.72-1.82 (m, 2H), 1.83-1.93 (m, 2H), 2.54 (t, *J* = 5.9 Hz, 4H), 4.47 (s, 2H), 5.45 (br. s, 1H), 6.06 (br. s, 1H), 6.10 (s, 1H), 7.26-7.34 (m, 3H), 7.35-7.41 (m, 2H).

^{13}C NMR: ($CDCl_3$, 100 MHz) δ = 22.1, 23.1, 23.3, 23.6, 47.7, 109.1, 119.4, 127.2, 128.5 (2C), 128.9 (2C), 130.0, 132.8, 133.8, 172.4.

1-Benzyl-2-phenyl-4,5,6,7-tetrahydro-1*H*-indole (39)[6, 9]



Flash chromatography affords **39** as a yellow solid with **m.p.** = 83 – 84°C, **lit. m.p.**[9] = 72 – 73°C in the amount of 0.97 g (75%). R_f = 0.86 (petroleum ether – EtOAc, 3**:**1).

^{1}H NMR: ($CDCl_3$, 400 MHz) δ = 1.74-1.87 (m, 4H), 2.42 (t, *J*= 5.5 Hz, 2H), 2.62 (t, *J*= 5.5 Hz, 2H), 5.11 (s, 2H), 6.14 (s, 1H), 6.99 (d, *J*= 7.4 Hz, 2H), 7.21-7.37 (m, 8H).

^{13}C NMR: ($CDCl_3$, 100 MHz) δ = 22.4, 23.2, 23.5, 23.8, 47.5, 107.6, 118.1, 125.9 (2C), 126.6, 127.0, 128.5 (2C), 128.7 (2C), 128.8 (2C), 130.0, 133.8, 133.9, 139.4.

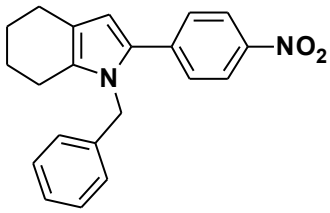
m/z (I_{rel}, %): 288 (19), 287 (82, MH^+), 259 (10), 241 (27), 240 (100), 213 (13), 197 (10), 196 (66), 194 (12), 91 (100), 77 (11), 65 (25), 39 (9).

IR ν_{max} (KBr): 3062w, 3029w, 2928s, 2849s, 1604m, 1443m, 1356m, 1299m, 793w, 761s, 723m, 698s cm^{-1}.

[9] M. A. Volodina, E. A. Pronina, V. G. Mishina, A. P. Terentev, *J. Gen. Chem. USSR* **1963**, 33, 3223.

Anal. Calcd for $C_{21}H_{21}N$: C, 87.76; H, 7.36; N, 4.87. **Found**: C, 87.71; H, 7.21; N, 4.89.

1-Benzyl-2-(4-nitrophenyl)-4,5,6,7-tetrahydro-1*H*-indole (40)[6]



Flash chromatography affords 1.34 g (93%) of **40** as a bright yellow crystals with **m.p.** = 115 – 117°C. R_f = 0.77 (petroleum ether – EtOAc, 3**:**1). To increase the dissolution rate of the starting aryl iodide after addition of the catalyst, 1-iodo-4-nitrobenzene is preliminary grinded into an amorphous mass.

^{1}H NMR: ($CDCl_3$, 400 MHz) δ = 1.74-1.87 (m, 4H), 2.42-2.50 (m, 2H), 2.59-2.65 (m, 2H), 5.15 (s, 2H), 6.99 (d, *J*=7.2 Hz, 2H), 7.26-7.38 (m, 3H),7.40 (d, *J*=9.0 Hz, 2H), 8.14 (d, *J* = 9.0 Hz, 2H).

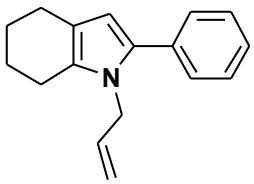
^{13}C NMR: ($CDCl_3$, 100 MHz) δ = 22.4, 23.1, 23.3, 23.6, 47.8, 110.7, 119.5, 124.2 (2C), 125.6 (2C), 127.5, 127.6 (2C), 129.1 (2C), 131.6, 133.4, 138.4, 140.1, 145.6.

m/z (I_{rel}, %): 333 (12), 332 (54, MH^+),195 (17), 194 (13), 92 (16), 91 (100), 65 (18).

IR ν_{max} (KBr): 2927, 1593, 1508, 1335, 856, 729 cm^{-1}.

Anal. Calcd for $C_{21}H_{20}N_2O_2$: C, 75.88; H, 6.06; N, 8.43. **Found**: C, 75.77; H, 6.08; N, 8.14.

2-Phenyl-1-prop-2-en-1-yl-4,5,6,7-tetrahydro-1*H*-indole (41)[6]



Flash chromatography affords **41** in the amount of 0.99 g (75%). The sample contains approx. 20 mol% (according to **^{1}H NMR** analysis) of 2H tetrahydroindole, which is inseparable by chromatographic methods. $Pd(OAc)_2$ catalyzed cyclization of the intermediate arylated tetrahydroindole[10] brings out 0.81 g (87%) of **41** as a yellow solid with **m.p.** = 64 – 65°C. R_f = 0.82 (petroleum ether – EtOAc, 3**:**1).

^{1}H NMR: ($CDCl_3$, 400 MHz) δ = 1.73-1.82 (m, 2H), 1.82-1.91 (m, 2H), 2.51-2.61 (m, 4H), 4.43 (ddd, *J* = 4.0, 2.2, 1.8 Hz, 2H), 4.94 (dq, *J* = 17.1, 1.6 Hz, 1H), 5.18 (dq, *J* = 10.4, 1.6 Hz, 1H), 5.86-5.99 (m, 1H), 6.06 (s, 1H), 7.22-7.30 (m, 1H), 7.31-7.43 (m, 4H).

^{13}C NMR: ($CDCl_3$, 100 MHz) δ = 22.3, 23.2, 23.5, 23.9, 46.4, 107.4, 116.1, 117.7, 126.5, 128.4 (2C), 128.6 (2C), 129.9, 133.4, 134.0, 135.2.

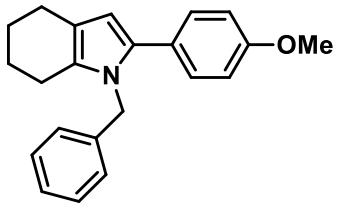
m/z (I_{rel}, %): 287 (82, MH^+), 237 (77), 236 (22), 209 (35), 208 (39), 196 (26), 194 (28), 115 (18), 77 (25), 41 (100), 39 (70).

IR ν_{max} (KBr): 3086w, 2912m, 2833m, 1648w, 1601m, 1389m, 1301m, 931m, 793m, 756s, 696s, 596w, 547w, 488w cm^{-1}.

Anal. Calcd for $C_{17}H_{19}N$: C, 86.03; H, 8.07; N, 5.90. **Found**: C, 85.91; H, 8.10; N, 5.94.

[10] I. A. Andreev, I. O. Ryzhkov, A. V. Kurkin, M. A. Yurovskaya, *Chem. Heterocycl. Compd.* **2012**, *48*, 715 − 719.

1-Benzyl-2-(4-methoxyphenyl)-4,5,6,7-tetrahydro-1*H*-indole (42)[6]



An orange oil with R_f = 0.60 (petroleum ether – EtOAc, 3**:**1) obtained by flash chromatography contained a small amount of the corresponding aryl iodide. The flask with the substance is placed in an oil bath with the internal temperature of 110-120°C for 2-3 hours and aryl iodide is distilled off on a high-vac system. The residue crystallizes to afford 1.17 g (85%) of **42** as an orange solid with **m.p.** = 94 – 96°C.

^{1}H NMR: ($CDCl_3$, 400 MHz) δ = 1.72-1.87 (m, 4H), 2.37-2.46 (m, 2H), 2.58-2.66 (m, 2H), 3.80 (s, 3H), 5.06 (s, 2H), 6.07 (s, 1H), 6.82-6.88 (m, 2H), 6.98 (d, *J*= 7.0 Hz, 2H), 7.21-7.27 (m, 3H), 7.29-7.36 (m, 2H).

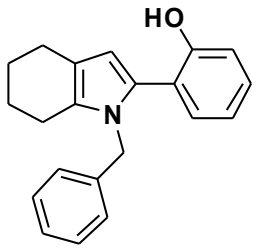
^{13}C NMR: ($CDCl_3$, 100 MHz) δ = 22.4, 23.3, 23.5, 23.9, 47.3, 55.4, 106.9, 113.9 (2C), 117.7, 125.9 (2C), 126.5, 127.0, 128.8 (2C), 129.2, 130.1 (2C), 133.5, 139.5, 158.6.

m/z (I_{rel}, %):318 (13), 317 (54, MH^+), 227 (11), 226 (62), 183 (11), 115 (8), 92 (9), 91 (100), 77 (8), 65 (22).

IR ν_{max} (KBr): 3027w, 2925s, 2851s, 1613w, 1531s, 1483s, 1450s, 1378m, 1283s, 1244s, 1174s, 1105m, 1028s, 838s, 785s, 736s, 694m, 648w, 597m, 555m cm^{-1}.

Anal. Calcd for $C_{22}H_{23}NO$: C, 83.24; H, 7.30; N, 4.41; O, 5.04. **Found**: C, 83.28; H, 7.09; N, 4.21.

2-(1-Benzyl-4,5,6,7-tetrahydro-1*H*-indol-2-yl)phenol (43)[6]



2-Iodophenol was insoluble in diethyl amine. Thus, after the addition of the catalyst the reaction mixture was heated to reflux with a heatgun and immediately cooled to an ambient temperature by the means of external bath (containing cold water) to afford a bright orange solution. Typical protocol employed afterwards lead to 0.86 g of an orange oil, which was contaminated with the corresponding aryl iodide. Flask containing substance was placed in an oil bath with the internal temperature of 80 – 90°C for 2-3 hours and aryl iodide was distilled off on a high-vac system. The residue was subjected once again to flash chromatography (eluting with petroleum ether – EtOAc, 10**:**1) to afford 0.53 g (40%) of **43** as a dark orange oil. R_f = 0.93 (petroleum ether – EtOAc, 3**:**1).

^{1}H NMR: ($CDCl_3$, 400 MHz) δ = 1.74-1.87 (m, 4H), 2.41-2.49 (m, 2H), 2.56-2.64 (m, 2H), 4.95 (s, 2H), 6.01 (s, 1H), 6.14 (s, 1H), 6.83 (dd, *J*= 7.4, 1.2 Hz, 1H), 6.84-6.89 (m, 2H), 6.95-7.00 (m, 1H), 7.08 (dd, *J*= 7.6, 1.6 Hz, 1H), 7.18-7.31 (m, 4H).

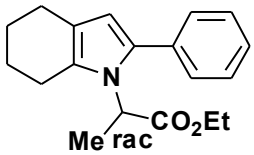
^{13}C NMR: ($CDCl_3$, 100 MHz) δ = 22.5, 23.2, 23.4, 23.7, 47.3, 108.1, 115.3, 118.4, 119.5, 120.0, 125.6, 126.0 (2C), 127.1, 128.7 (2C), 129.5, 130.7 (2C), 138.8, 154.3.

m/z (I_{rel}, %): 303 (27, MH^+), 212 (63), 115 (15), 92 (14), 91 (100), 89 (11), 77 (16), 65 (41), 41 (13), 39 (19).

IR ν_{max} (KBr): 3445s, 3269m (br.), 3061m, 2940s, 2847m, 1670m, 1603m, 1452s, 1391m, 1344m, 1283m, 1215m, 1180s, 1026m, 933w, 799w, 754s, 696mcm^{-1}.

Anal. Calcd for $C_{21}H_{21}NO$: C, 83.13; H, 6.98; N, 4.62; O, 5.27. **Found**: C, 82.99; H, 6.75; N, 4.72.

Ethyl (2*RS*)-2-(2-phenyl-4,5,6,7-tetrahydro-1*H*-indol-1-yl)propanoate (44)[6]



Compound **44** was obtained according to the general procedure as a dark orange non viscous oil in a racemic form in the amount of 1.03 g (83%). R_f = 0.84 (petroleum ether – EtOAc, 3**:**1).

^{1}H NMR: ($CDCl_3$, 400 MHz) δ = 1.30 (t, *J*= 7.0 Hz, 3H), 1.60 (d, *J*= 7.2 Hz, 3H), 1.73-1.88 (m, 3H), 1.88-1.98 (m, 1H), 2.44-2.54 (m, 1H), 2.57-2.69 (m, 3H), 4.25 (q, *J*= 7.0 Hz, 2H), 5.00 (q, *J*= 7.2 Hz, 1H), 6.04 (s, 1H), 7.30-7.37 (m, 1H), 7.38-7.46 (m, 4H).

^{13}C NMR: ($CDCl_3$, 100 MHz) δ = 14.3, 17.8, 23.3, 23.6, 23.7 (2C), 53.3, 61.6, 108.1, 118.7, 127.0, 128.5 (2C), 129.1, 129.4 (2C), 133.9, 134.2, 171.8.

m/z(I_{rel}, %): 297 (31, MH^+), 224 (32), 197 (16), 196 (100), 194 (12), 115 (13), 91 (16), 77 (18), 41 (10), 29 (88).

IR ν_{max} (KBr): 3062w, 2932s, 2849m, 1738s, 1603w, 1520w, 1443m, 1374m, 1309w, 1221s, 1075w, 1030w, 792w, 764m, 701mcm^{-1}.

Anal. Calcd for $C_{19}H_{23}NO_2$: C, 76.74; H, 7.80; N, 4.71; O, 10.76. **Found**: C, 76.85; H, 7.59; N, 4.75.

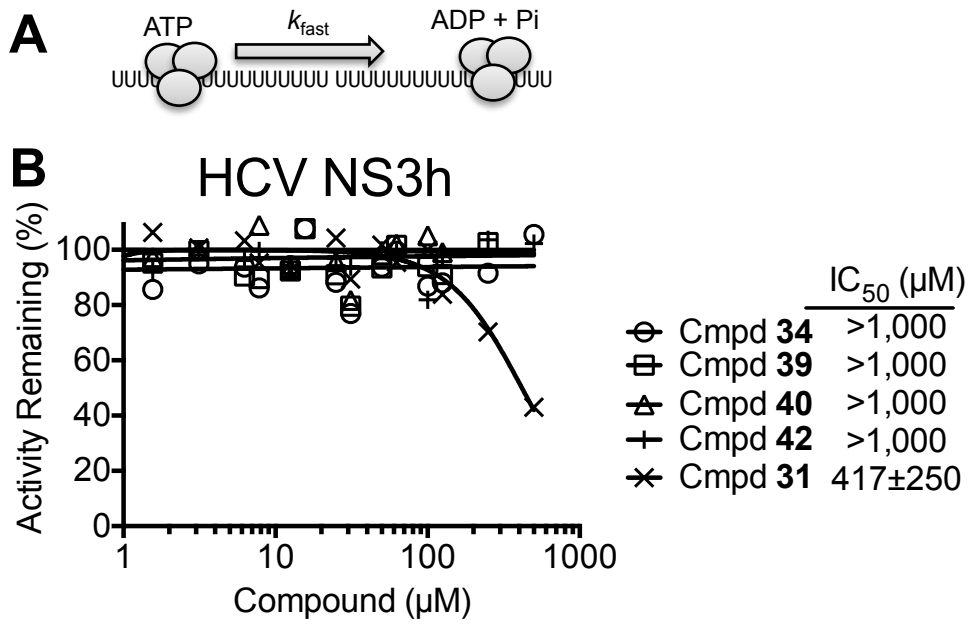


Fig. S1. Effect of compounds on RNA-stimulated helicase-catalyzed ATP hydrolysis (A) Compounds were added to assays monitoring helicase catalyzed ATP hydrolysis in the presence of RNA (B) Activity remaining in reactions catalyzed by the HCV genotype 1b (con1) NS3h in the presence of various concentrations of each compound.