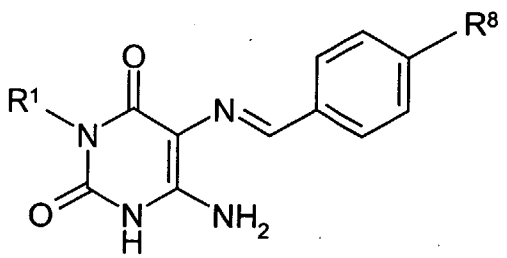
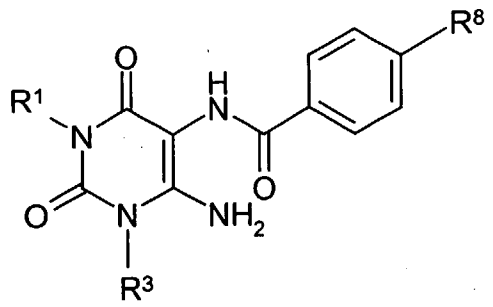
Table 1. Selected ^{1}H NMR data of synthesized compounds

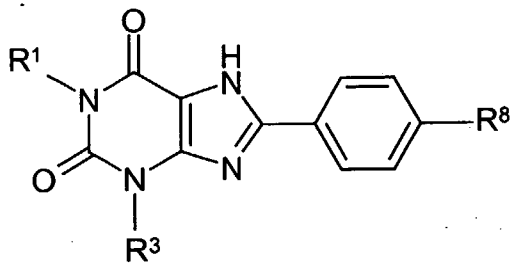


Compd.	R^1	R^8	^{1}H NMR δ (ppm)
4aa	propyl	H	0.85 (t, J=7.4 Hz, 3H, N-$CH_2CH_2\underline{CH_3}$), 1.51 (sext, J=7.5 Hz, 2H, N-$CH_2\underline{CH_2}CH_3$), 3.70 (t, J=7.4 Hz, 2H, N-$\underline{CH_2}CH_2CH_3$), 6.62 (br. s, 2H, NH_2), 7.31-7.38 (m, 3H, CH=CH Ar), 7.84 (d, 2H, CH= CH Ar), 9.67 (s,1H, N=CH).
4ba	butyl	H	0.91 (t, J=7.4 Hz, 3H, N-$CH_2CH_2CH_2\underline{CH_3}$), 1.30 (sext, J=7.5 Hz, 2H, N-$CH_2CH_2\underline{CH_2}CH_3$), 1.51 (quint, J=7.4 Hz, 2H, N-$CH_2\,\underline{CH_2}CH_2CH_3$), 3.76 (t, J=7.4 Hz, 2H, N-$\underline{CH_2}CH_2CH_2CH_3$), 6.62 (br. s, 2H, NH_2), 7.35-7.42 (m, 3H, CH=CH Ar), 7.86 (d, 2H, CH= CHAr), 9.69 (s,1H, N= CH), 10.77 (s, 1H, N1-H).
4ab	propyl	Br	0.83 (t, J=7.4 Hz, 3H, N-$CH_2CH_2\underline{CH_3}$), 1.52 (sext, J=7.4 Hz, 2H, N-$CH_2\underline{CH_2}CH_3$), 3.69 (t, J=7.3 Hz, 2H, N-$\underline{CH_2}CH_2CH_3$), 6.87 (br. S., 2H, NH_2), 7.54 (d, J=8.4 Hz, 2H,CH=CH Ar), 7.81 (d, J=8.6 Hz, 2H, CH=CH Ar), 9.67 (s, 1H, N=CH), 10.67 (br.s, 1H, N1-H).
4bb	butyl	Br	0.87 (t, J=7.2 Hz, 3H, N-$CH_2CH_2CH_2\underline{CH_3}$), 1.27 (sext, J=7.4 Hz, 2H, N-$CH_2CH_2\underline{CH_2}CH_3$), 1.49 (quint, J=7.4 Hz, 2H, N-$CH_2\underline{CH_2}CH_2CH_3$), 3.74 (t, J=7.3 Hz, 2H, N-$\underline{CH_2}CH_2CH_2CH_3$), 6.72 (br. s, 2H, NH_2), 7.54 (d, J=8.4 Hz, 2H, CH=CH Ar), 7.82 (d, J=8.4 Hz, 2H, CH=CH Ar), 9.63 (s, 1H, N=CH), 10.82 (s, 1H, N1-H),
4cb	propargyl	Br	3.03 (t, J=2.4 Hz, 1H, CH), 4.47 (d, J=2.2 Hz, 2H, CH_2), 6.80 (br. s, 2H, NH_2), 7.56 (d, J=8.5 Hz, 2H, CH=CH Ar), 7.83 (d, J=8.5 Hz, 2H, CH=CH Ar), 9.60 (s, 1H, N=CH), 10.96 (s, 1H, N1-H)
4bc	butyl	COOH	0.88 (t, J=7.4 Hz, 3H, N-$CH_2CH_2CH_2\underline{CH_3}$), 1.27 (sext, J=7.4 Hz, 2H, N-$CH_2CH_2\underline{CH_2}CH_3$),

			1.49 (quint, J=7.4 Hz, 2H, N-$CH_2\underline{CH_2}CH_2CH_3$), 3.74 (t, J=7.4 Hz, 2H, N-$\underline{CH_2}CH_2CH_2CH_3$), 6.76 (br. s, 2H, NH_2), 7.92 (d, J=8.6 Hz, 2H, CH=CH Ar), 7.95 (d, J=8.6 Hz, 2H, CH=CH Ar), 9.71 (s, 1H, N=CH), 10.38 (br. s, 1H, N1-H).
4ad	propyl	CH=CH-COOH	0.84 (t, J=7.0 Hz, 3H, N-$CH_2CH_2\underline{CH_3}$), 1.46 (sext, J=7.0 Hz, 2H, N-$CH_2\underline{CH_2}CH_3$), 3.69 (t, J=7.0 Hz, 2H, N-$\underline{CH_2}CH_2CH_3$), 6.55 (d, J=16.0 Hz, 1H, vinyl CH), 6.84 (br. S, 2H, NH_2), 7.59 (d, J=16.0 Hz, 1H, vinyl CH), 7.68 (d, J=8.0 Hz, 2H, CH=CH Ar), 7.88 (d, J=8.0 Hz, 2H, CH=CH Ar), 9.67 (s, 1H, N=CH).
4be	butyl	carboxymethyloxy	0.91 (t, J=7.4 Hz, 3H, N-$CH_2CH_2CH_2\underline{CH_3}$), 1.29 (sext, J=7.4 Hz, 2H, N-$CH_2CH_2\underline{CH_2}CH_3$), 1.52 (quint, J=7.4 Hz, 2H, N-$CH_2\underline{CH_2}CH_2CH_3$), 3.77 (t, J=7.4 Hz, 2H, N-$\underline{CH_2}CH_2CH_2CH_3$), 4.78 (s, 2H, O-$\underline{CH_2}$), 6.62 (br. s, 2H, NH2), 7.03 (d, J=8.8 Hz, 2H,CH=CH Ar), 8.00 (d, J=8.8 Hz, 2H, CH=CH Ar), 9.60 (s, 1H, N=CH), 10.78 (s, 1H, N1-H).
4af	propyl	O-CH_2-$COOCH_3$	0.85 (t, J=7.0 Hz, 3H, N-$CH_2CH_2\underline{CH_3}$), 1.53 (sext, J=7.0 Hz, 2H, N-$CH_2\underline{CH_2}CH_3$), 3.71(t, J=7.0 Hz, 2H, N-$\underline{CH_2}CH_2CH_3$), 3.71 (s, 3H, OCH_3), 4.85 (s, 2H, OCH_2), 6.87 (br. S., 2H, NH_2), 6.94 (d, J=8.4 Hz, 2H,CH=CH Ar), 7.81 (d, J=8.6 Hz, 2H, CH=CH Ar), 9.67 (s, 1H, N=CH).



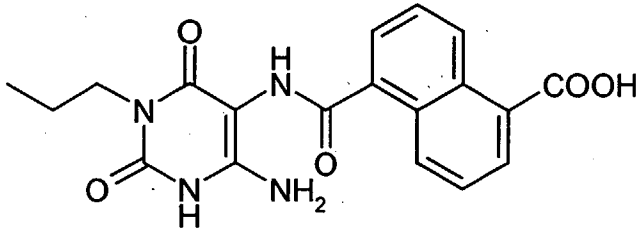
Compd.	R^1	R^3	R^8	^{1}H NMR δ (ppm)
16ag	propyl	H	$SO_3^-K^+$	0.84 (t, J=7.4 Hz, 3H, N-$CH_2CH_2\underline{CH_3}$), 1.51 (sext, J=7.4 Hz, 2H, N-$CH_2\underline{CH_2}CH_3$), 3.66 (t, J=7.4 Hz, 2H, N-$\underline{CH_2}CH_2CH_3$), 6.27 (br. s, 2H, NH_2), 7.68 (d, J=8.4 Hz, 2H,CH=CH Ar), 7.91 (d, J=8.4 Hz, 2H, CH=CH Ar), 8.88 (s, 1H, amide NH), 10.64 (s, 1H, N1-H).
16bg	butyl	H	$SO_3^-K^+$	0.86 (t, J=7.4 Hz, 3H, N-$CH_2CH_2CH_2\underline{CH_3}$), 1.27 (sext, J=7.4 Hz, 2H, N-$CH_2CH_2\underline{CH_2}CH_3$), 1.49 (quint, J=7.4 Hz, 2H, N-$CH_2\underline{CH_2}CH_2CH_3$), 3.70 (t, J=7.3 Hz, 2H, N-$\underline{CH_2}CH_2CH_2CH_3$), 6.42 (br. s, 2H, NH_2), 7.68 (d, J=8.4 Hz, 2H,CH=CH Ar), 7.91 (d, J=8.4 Hz, 2H, CH=CH Ar), 8.88 (s, 1H, amide NH), 10.64 (br. s, 1H, N1-H).
16db	propyl	propyl	Br	0.82 (t, J=7.4 Hz, 3H, N-$CH_2CH_2\underline{CH_3}$), 0.87 (t, J=7.3 Hz, 3H, N-$CH_2CH_2\underline{CH_3}$), 1.50 (m., 4H, 2x N-$CH_2\underline{CH_2}CH_3$), 3.70 (t, J=7.3 Hz, 2H, N-$\underline{CH_2}CH_2CH_3$), 3.82 (t, J=7.4 Hz, 2H, N-$\underline{CH_2}$ CH_2CH_3), 6.79 (br. s, 2H, NH_2), 7.67 (d, J=8.6 Hz, 2H,CH=CH Ar), 7.91 (d, J=8.8 Hz, 2H, CH=CH Ar), 8.99 (s, 1H, amide NH).
16dh	propyl	propyl	I	0.81 (t, J=7.4 Hz, 3H, N-$CH_2CH_2\underline{CH_3}$), 0.87 (t, J=7.1 Hz, 3H, N-$CH_2CH_2\underline{CH_3}$), 1.50 (m., 4H, 2x N-$CH_2\underline{CH_2}CH_3$), 3.69 (t, J=7.5 Hz, 2H, N-$\underline{CH_2}CH_2CH_3$), 3.82 (t, J=7.4 Hz, 2H, N-$\underline{CH_2}$ CH_2CH_3), 6.78 (br. s, 2H, NH_2), 7.74 (d, J=8.6 Hz, 2H, CH=CH Ar), 7.85 (d, J=8.4 Hz, 2H, CH=CH Ar), 8.97 (s, 1H, amide NH).
25	butyl	H	CH_2CN	0.87 (t, J=7.3 Hz, 3H, N-$CH_2CH_2CH_2\underline{CH_3}$), 1.25 (sext, J=7.5 Hz, 2H, N-$CH_2CH_2\underline{CH_2}CH_3$), 1.46 (quint, J=7.3 Hz, 2H, N-$CH_2\underline{CH_2}CH_2CH_3$), 3.68 (s, 2H, $\underline{CH_2}CN$), 3.69 (t, J=7.3 Hz, 2H, N-$\underline{CH_2}CH_2CH_2CH_3$), 6.06 (br. s, 2H, NH_2), 7.43(d, J=8.3 Hz, 2H,CH=CH Ar), 7.96 (d, J=8.5 Hz, 2H, CH=CH Ar), 8.87 (s, 1H, amide NH), 10.41 (br. s, 1H, N1-H).



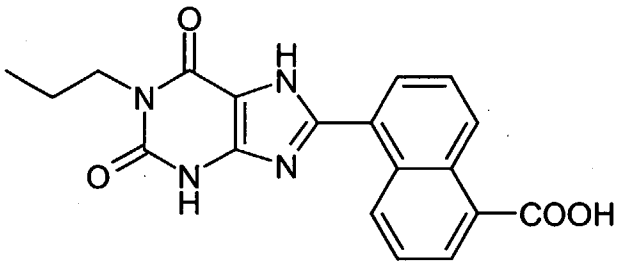
Compd.	R^1	R^3	R^8	^{1}H NMR δ (ppm)
5	propyl	H	H	0.86 (t, J=7.4 Hz, 3H, N-$CH_2CH_2\underline{CH_3}$), 1.51 (sext, J=7.46 Hz, 2H, N-$CH_2\underline{CH_2}CH_3$), 3.70 (t, J=7.4 Hz, 2H, N-$\underline{CH_2}CH_2CH_3$), 7.45-7.50 (m, 3H, CH=CH Ar), 8.07-8.09 (m, 2H, CH=CH Ar), 11.84 (br. s, 1H, N3-H), 13.63 (br. s, 1H, N7-H).
6	butyl	H	H	0.96 (t, J=7.4 Hz, 3H, N-$CH_2CH_2CH_2\underline{CH_3}$), 1.36 (sext, J=7.5 Hz, 2H,N-$CH_2CH_2\underline{CH_2}CH_3$), 1.59 (quint, J=7.4 Hz, 2H, N-$CH_2\underline{CH_2}CH_2CH_3$), 3.91 (t, J=7.4 Hz, 2H, N-$\underline{CH_2}CH_2CH_2CH_3$), 7.53-7.57 (m, 3H, CH=CH Ar), 8.16 (d, 2H, CH= CH Ar), 11.90 (br. s,1H, N-3), 13.70 (br. s, 1H, N7-H).
7	propyl	H	Br	0.86 (t, J=7.4 Hz, 3H, N-$CH_2CH_2\underline{CH_3}$), 1.56 (sext, J=7.4 Hz, 2H, N-$CH_2\underline{CH_2}CH_3$), 3.81 (t, J=7.4 Hz, 2H, N-$\underline{CH_2}CH_2CH_3$), 7.70 (d, J=8.51 Hz, 2H,CH=CH Ar), 8.01 (d, J=8.5 Hz, 2H, CH=CH Ar), 11.88 (s, 1H, N3-H), 13.74 (s, 1H, N7-H).
8	butyl	H	Br	0.88 (t, J=7.2 Hz, 3H, N-$CH_2CH_2CH_2\underline{CH_3}$), 1.28 (sext, J=7.2 Hz, 2H, N-$CH_2CH_2\underline{CH_2}CH_3$), 1.49 (quint, J=7.2 Hz, 2H, N-$CH_2\underline{CH_2}CH_2CH_3$), 3.84 (t, J=7.4 Hz,2H, N-$\underline{CH_2}CH_2CH_2CH_3$), 7.69 (d, J=8.6 Hz, 2H,CH=CH Ar), 8.00 (d, J=8.6 Hz, 2H,CH=CH Ar), 11.89 (s, 1H, N3-H).
9	propargyl	H	Br	3.06 (t, J=2.4 Hz, 1H, CH), 4.58 (d, J=2.5 Hz, 2H, CH_2), 7.70 (d, J=8.5 Hz, 2H, CH=CH Ar), 8.01 (d, J=8.5 Hz, 2H, CH=CH Ar), 12.08 (br. s,1H, N3-H), 13.85 (br. s, 1H, N7-H).
10	butyl	H	COOH	0.88 (t, J=7.3 Hz, 3H, N-$CH_2CH_2CH_2\underline{CH_3}$), 1.27 (sext, J=7.4 Hz, 2H, N-$CH_2CH_2\underline{CH_2}CH_3$), 1.49 (quint, J=7.3 Hz, 2H, N-$CH_2\underline{CH_2}CH_2CH_3$), 3.74 (t, J=7.4 Hz, 2H, N-$\underline{CH_2}CH_2CH_2CH_3$), 7.92 (d, J=8.7 Hz, 2H, CH=CH Ar), 7.95 (d, J=8.7 Hz, 2H, CH=CH Ar), 11.89 (br. s, 1H, N3-H), 13.08 (br. s, carboxylic H), 13.86 (br. s, IH, N7-H).

11	propyl	H	CH=CH-COOH	0.87 (t, J=7.0 Hz, 3H, N-$CH_2CH_2\underline{CH_3}$), 1.57 (sext, J=7.0 Hz, 2H,N-$CH_2\underline{CH_2}CH_3$), 3.81 (t, J=7.0 Hz, 2H, N-$\underline{CH_2}CH_2CH_3$), 6.62 (d, J=16.0 Hz, 1H, vinyl CH), 7.61 (d, J=16.0 Hz, 1H, vinyl CH), 7.82 (d, J=8.0 Hz, 2H, CH=CH Ar), 8.12 (d, J=8.0 Hz, 2H, CH=CH Ar), 11.93 (br. s, 1H, N3-H).
12	butyl	H	O-CH_2-COOH	0.96 (t, J=7.4 Hz, 3H, N-$CH_2CH_2CH_2\underline{CH_3}$), 1.35 (sext, J=7.4 Hz, 2H, N-$CH_2CH_2\underline{CH_2}CH_3$), 1.59 (quint, J=7.4 Hz, 2H, N-$CH_2\underline{CH_2}CH_2CH_3$), 3.90 (t, J=7.4 Hz, 2H, N-$\underline{CH_2}CH_2CH_2CH_3$), 4.80 (s, 2H, O-$\underline{CH_2}$), 7.08 (d, J=8.8 Hz, 2H, CH=CH Ar), 8.07 (d, J=8.8 Hz, 2H, CH=CH Ar), 11.86 (br. s, 1H, N3-H), 13.49 (br. s, 1H, N7-H).
13	propyl	H	O-CH_2-$COOCH_3$	0.89 (t, J=7.0 Hz, 3H, N-$CH_2CH_2\underline{CH_3}$), 1.58 (sext, J=7.0 Hz, 2H, N-$CH_2\underline{CH_2}CH_3$), 3.72 (s, 3H, OCH_3), 3.82 (t, J=7.0 Hz, 2H, N-$\underline{CH_2}CH_2CH_3$), 4.91 (s, 2H, OCH_2), 7.08 (d, J=9.0 Hz, 2H, CH=CH Ar), 8.04 (d, J=9.0 Hz, 2H, CH=CH Ar), 11.87 (br. s,1H, N3-H), 13.50 (br. s, 1H, N7-H).
14	propyl	H	CH=CH-$COOCH_3$	0.86 (t, J=7.0 Hz, 3H, N-$CH_2CH_2\underline{CH_3}$), 1.56 (sext, J=7.0 Hz, 2H,N-$CH_2\underline{CH_2}CH_3$), 3.72 (s, 3H, OCH_3), 3.81 (t, J=7.0 Hz, 2H, N-$\underline{CH_2}CH_2CH_3$), 6.67 (d, J=16.0 Hz, 1H, vinyl CH), 6.72 (d, J=16.0 Hz, 1H, vinyl CH), 7.84 (d, J=9.0 Hz, 2H, CH=CH Ar), 8.10 (d, J=9.0 Hz, 2H, CH=CH Ar), 11.92 (br. s, 1H, N3-H), 13.75 (br. s., 1H, N7-H).
15	propyl	H	O-CH_2-COOH	0.85 (t, J=7.0 Hz, 3H, N-$CH_2CH_2\underline{CH_3}$), 1.54 (sext, J=7.0 Hz, 2H, N-$CH_2\underline{CH_2}CH_3$), 3.78 (t, J=7.0 Hz, 2H, N-$\underline{CH_2}CH_2CH_3$), 4.53 (s, 2H, OCH_2), 6.99 (d, J=9.0 Hz, 2H, CH=CH Ar), 7.97 (d, J=9.0 Hz, 2H, CH=CH Ar), 11.85 (br. s, 1H, N3-H).
17	propyl	H	$SO_3^-K^+$	0.86 (t, J=7.4 Hz, 3H, N-$CH_2CH_2\underline{CH_3}$), 1.51 (sext, J=7.4 Hz, 2H, N-$CH_2\underline{CH_2}CH_3$), 3.81 (t, J=7.4 Hz, 2H, N-$\underline{CH_2}CH_2CH_3$), 7.69 (d, J=8.6 Hz, 2H, CH=CH Ar), 8.03 (d, J=8.6 Hz, 2H, CH=CH Ar), 11.85 (br.s, 1H, N1H), 13.65 (br.s, 1H, N7-H).
18	butyl	H	$SO_3^-K^+$	0.86 (t, J=7.4 Hz, 3H, N-$CH_2CH_2CH_2\underline{CH_3}$), 1.32 (sext, J=7.4 Hz, 2H, N-$CH_2CH_2\underline{CH_2}CH_3$), 1.53 (quint, J=7.4 Hz, 2H, N-$CH_2\underline{CH_2}CH_2CH_3$), 3.80 (t, J=7.3 Hz, 2H, N-$\underline{CH_2}CH_2CH_2CH_3$), 7.70 (d, J=8.5 Hz, 2H, CH=CH Ar), 8.03 (d, J=8.6 Hz, 2H, CH=CH Ar), 11.80 (br.s, 1H, N3-H), 13.65 (br. s, 1H, N7-H).
19	propyl	propyl	Br	0.89 (m, 6H, 2x N-$CH_2CH_2\underline{CH_3}$), 1.56-1.73 (m., 4H, 2x N-$CH_2\underline{CH_2}CH_3$), 3.84 (m, 2H, N-$\underline{CH_2}$ CH_2CH_3), 3.99 (m, 2H, N-$\underline{CH_2}$ CH_2CH_3), 7.70 (d, J=8.4 Hz, 2H, CH=CH Ar), 8.05 (d, J=8.5 Hz, 2H, CH=CH Ar).
26	butyl	H	CH_2-CN	0.90 (t, J=7.5 Hz, 3H, N-$CH_2CH_2CH_2\underline{CH_3}$), 1.29 (sext, J=7.5 Hz, 2H, N-$CH_2CH_2\underline{CH_2}CH_3$), 1.53 (quint, J=7.4 Hz, 2H, N-$CH_2\underline{CH_2}CH_2CH_3$), 3.85 (t, J=7.4 Hz, 2H, N-$\underline{CH_2}CH_2CH_2CH_3$), 4.09 (s., 2H, $\underline{CH_2}$-CN), 7.46 (d, J=8.7 Hz, 2H, CH=CH Ar), 8.09 (d, J=8.4 Hz, 2H, CH=CH Ar), 11.85 (br.s, 1H, N1-H), 13.59 (br. s, 1H, N7-H).
27	butyl	H	CH_2COOH	0.89 (t, J=7.4 Hz, 3H, N-$CH_2CH_2CH_2\underline{CH_3}$), 1.29 (sext, J=7.6 Hz, 2H, N-$CH_2CH_2\underline{CH_2}CH_3$), 1.53

(quint, J=7.4 Hz, 2H, N-$CH_2\underline{CH_2}CH_2CH_3$),), 3.63 (s., 2H, $\underline{CH_2}COOH$), 3.85 (t, J=7.4 Hz, 2H, N-$\underline{CH_2}CH_2CH_2CH_3$ 7.38 (d, J=8.5 Hz, 2H, CH=CH Ar), 8.01 (d, J=8.5 Hz, 2H, CH=CH Ar), 11.83 (br.s, 1H, N1-H), 12.37 (s, 1H, carboxylic H), 13.59 (br. s, 1H, N7-H).



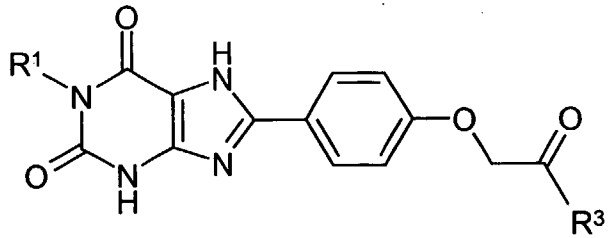
21



22

(**21**) 0.84 (t, J= 7.0 Hz, N-$CH_2CH_2\underline{CH_3}$), 1.51 (sext, J=7.0 Hz, 2H, N-$CH_2\underline{CH_2}CH_3$), 3.77 (t, J=7.0 Hz, 2H, N-$\underline{CH_2}CH_2CH_3$), 6.60 (br. s., 2H, NH_2), 7.87-8.56 (m, 6H, aromatic CH).

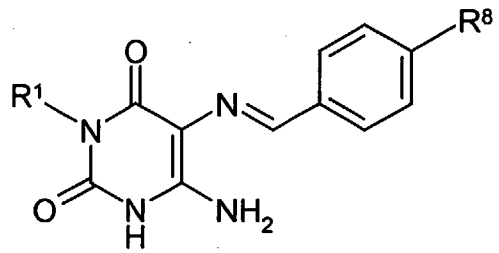
(**22**) 0.88 (t, J= 7.0 Hz, N-$CH_2CH_2\underline{CH_3}$), 1.58 (sext, J=7.0 Hz, 2H, N-$CH_2\underline{CH_2}CH_3$), 3.82 (t, J=7.0 Hz, 2H, N-$\underline{CH_2}CH_2CH_3$), 8.04-8.70 (m, 6H, aromatic CH). 11.9 (br. s, 1H, N3-H)



Compd.	R^1	R^3	^1H NMR δ (ppm)
28	propyl	2-aminoethylamino	0.87 (t, J=7.0 Hz, 3H, N-$CH_2CH_2\underline{CH_3}$), 1.58 (sext, J=7.0 Hz, 2H, N-$CH_2\underline{CH_2}CH_3$), 2.68 (t, J=6.0 Hz, 2H, N-$CH_2\underline{CH_2}NH_2$), 3.21 (t, J=6.0 Hz, 2H, N-$\underline{CH_2}CH_2NH_2$), 3.82 (t, J=7.0 Hz, 3H, N-$\underline{CH_2}CH_2CH_3$), 4.57 (s, 2H, O$\underline{CH_2}$), 7.06 (d, J=9.0 Hz, 2H, Ar CH), 8.03 (d, J=9.0 Hz, 2H, Ar CH), 8.22 (br. S., 1H, Amide NH).
29	propyl	2-hydroxyethylamino	0.87 (t, J=7.0 Hz, 3H, N-$CH_2CH_2\underline{CH_3}$), 1.57 (sext, J=7.0 Hz, 2H, N-$CH_2\underline{CH_2}CH_3$), 3.24 (t, J=6.0 Hz, 2H, N-$\underline{CH_2}CH_2OH$), 3.44 (t, J=6.0 Hz, 2H, N-$CH_2\underline{CH_2}OH$), 3.81 (t, J=7.0 Hz, 3H, N-$\underline{CH_2}CH_2CH_3$), 4.56 (s, 2H, O$\underline{CH_2}$), 7.07 (d, J=9.0 Hz, 2H, Ar CH), 8.03 (d, J=9.0 Hz, 2H, Ar CH), 8.09 (br. s., 1H, Amide NH)
30	butyl	4-carboxymethylphenylamino	0.89 (t, J=7.4 Hz, 3H, N-$CH_2CH_2CH_2\underline{CH_3}$), 1.29 (sext, J=7.4 Hz, 2H, N-$CH_2CH_2\underline{CH_2}CH_3$), 1.52 (quint, J=7.4 Hz, 2H, N-$CH_2\underline{CH_2}CH_2CH_3$), 3.50 (s, 2H, $\underline{CH_2}$-COOH.), 3.84 (t, J=7.4 Hz, 2H, N-$\underline{CH_2}CH_2CH_2CH_3$), 4.77 (s, 2H, O-$\underline{CH_2}$), 7.11 (d, J=8.8 Hz, 2H, CH=CH Ar), 7.20 (d, J=8.5 Hz, 2H, CH=CH Ar), 7.55 (d, J=8.5 Hz, 2H, CH=CH Ar), 8.03 (d, J=8.8 Hz, 2H, CH=CH Ar), 10.06 (s, 1H, exocyclic NH), 11.79 (s, 1H, N1-H), 13.34 (s, 1H, N7-H).
31	butyl	N-ethylpiperazinyl	0.89 (t, J=7.4 Hz, ,3H, N-$CH_2CH_2CH_2\underline{CH_3}$), 0.99 (t, J= 7.3 Hz, 3H, ethyl CH_3), 1.29 (sext, J=7.4 Hz, 2H, N-$CH_2CH_2\underline{CH_2}CH_3$), 1.52 (quint, J=7.4 Hz, 2H, N-$CH_2\underline{CH_2}CH_2CH_3$), 2.32-2.39 (m, 6H, ethyl CH_2 & 4H Pip.), 3.43-3-45 (m, 4H, Pip.), 3.85 (t, J=7.4 Hz, 2H, N-$\underline{CH_2}CH_2CH_2CH_3$), 4.89 (s, 2H, O-$\underline{CH_2}$), 7.02 (d, J=8.8 Hz, 2H, CH=CH Ar), 8.00 (d, J=8.8 Hz, 2H, CH=CH Ar), 11.79 (s, 1H, N1-H), 13.41 (s, 1H, N7-H).
32	butyl	N-acetylpiperazinyl	0.89 (t, 3H, J=7.4 Hz, N-$CH_2CH_2CH_2\underline{CH_3}$), 1.29 (sext, J=7.5 Hz, 2H, N-$CH_2CH_2\underline{CH_2}$

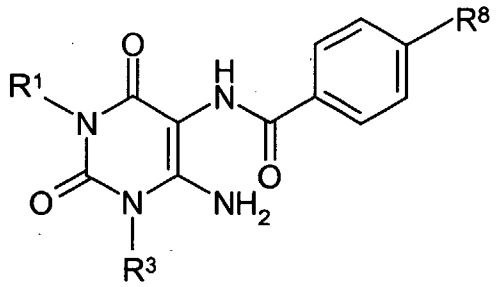
			CH_3), 1.53 (quint J=7.4 Hz, 2H, N-$CH_2\underline{CH_2}CH_2CH_3$), 2.01 (s, 3H, CO$\underline{CH_3}$), 3.42-3.49 (m, 8H, Pip.), 3.85 (t, J=7.4 Hz, 2H, N-$\underline{CH_2}CH_2CH_2CH_3$), 4.93 (s, 2H, O-$\underline{CH_2}$), 7.04 (d, J=8.8 Hz, 2H, CH=CH Ar), 8.00 (d, J=8.8 Hz, 2H, CH=CH Ar), 11.78 (s, 1H, N1-H), 13.40 (s, 1H, N7-H).
33	butyl	N-ethoxycarbonylpiperazinyl	0.90 (t, J=7.4 Hz, 3H, N-$CH_2CH_2CH_2\underline{CH_3}$), 1.19 (t, J=7.1 Hz, 3H, ethyl CH_3), 1.29 (sext, J=7.4 Hz, 2H, N-$CH_2CH_2\underline{CH_2}CH_3$), 1.52 (quint, J=7.4 Hz, 2H, N-$CH_2\underline{CH_2}$ CH_2CH_3), 3.37-3.46 (m, 8H, Pip.), 3.85 (t, J=7.4 Hz, 2H, N-$\underline{CH_2}CH_2CH_2CH_3$), 4.05(q, J=7.1 Hz, 2H, ethyl CH_2), 4.92 (s, 2H, O-$\underline{CH_2}$), 7.03 (d, J=8.8 Hz, 2H, CH=CH Ar), 8.00 (d, J=8.8 Hz, 2H, CH=CH Ar), 11.79 (s, 1H, N1-H), 13.40 (s, 1H, N7-H).
34	butyl	N-phenylpiperazinyl	0.89 (t, J=7.4 Hz, 3H, N-$CH_2CH_2CH_2\underline{CH_3}$), 1.29 (sext, J=7.4 Hz, 2H, N-$CH_2CH_2\underline{CH_2}$ CH_3), 1.52 (quint, J=7.4 Hz, 2H, N-$CH_2\underline{CH_2}CH_2CH_3$), 3.12-3.20 (m, 4H, pip.), 3.59-3.61 (m, 4H, pip.), 3.84 (t, J=7.4 Hz, 2H, N-$\underline{CH_2}CH_2CH_2CH_3$), 4.96 (s, 2H, O-$\underline{CH_2}$), 6.79 (t, 1H, CH Ar), 6.94-6.97 (m, 2H, CH Ar), 7.05 (d, J=8.8 Hz, 2H, CH=CH Ar), 7.20-7.24 (m, 2H, CH Ar), 8.00 (d, J=8.8 Hz, 2H, CH=CH Ar), 11.79 (s, 1H, N1-H), 13.41(s, 1H, N7-H).
35	butyl	N-benzylpiperazinyl	0.89 (t, J=7.4 Hz, 3H, N-$CH_2CH_2CH_2\underline{CH_3}$), 1.29 (sext, J=7.4 Hz, 2H, N-$CH_2CH_2\underline{CH_2}$ CH_3), 1.52 (quint, J=7.4 Hz, 2H, N-$CH_2\underline{CH_2}CH_2CH_3$), 2.32-2.40 (m, 4H, pip.), 3.44-3.46 (m, 4H, pip.), 3.48 (s, 2H, benzyl $\underline{CH_2}$), 3.84 (t, J=7.4 Hz, 2H, N-$\underline{CH_2}CH_2CH_2CH_3$), 4.88 (s, 2H, O-$\underline{CH_2}$), 7.01 (d, J=8.8 Hz, 2H, CH=CH Ar), 7.22-7.33 (m, 5H, CH Ar), 7.99 (d, J=8.8 Hz, 2H, CH=CH Ar), 11.79 (s, 1H, N1-H), 13.40 (s, 1H, N7-H).
36	butyl	N-2-methoxyphenylpiperazinyl	0.89 (t, J=7.4 Hz, 3H, N-$CH_2CH_2CH_2\underline{CH_3}$), 1.29 (sext, J=7.4 Hz, 2H, N-$CH_2CH_2\underline{CH_2}$ CH_3), 1.52 (quint, J=7.4 Hz, 2H, N-$CH_2\underline{CH_2}CH_2CH_3$), 2.92-2.99 (m, 4H, pip.), 3.58-3.60 (m, 4H, pip.), 3.78 (s, 3H, O$\underline{CH_3}$); 3.84 (t, J=7.4 Hz, 2H, N-$\underline{CH_2}CH_2CH_2CH_3$), 4.94 (s, 2H, O-$\underline{CH_2}$), 6.88 (d, J=7.4 Hz, 2H, CH=CH Ar), 6.94-7.06 (m, 4H, CH Ar), 8.01 (d, J=7.4 Hz, 2H, CH=CH Ar), 11.79 (s, 1H, N1-H), 13.41 (s, 1H, N7-H).
37	butyl	N-benzyloxycarbonylpiperazinyl	0.89 (t, J=7.4 Hz, 3H, N-$CH_2CH_2CH_2\underline{CH_3}$), 1.29 (sext, J=7.4 Hz 2H, N-CH_2CH_2 $\underline{CH_2}CH_3$), 1.52 (quint, J=7.4 Hz, 2H, N-$CH_2\underline{CH_2}CH_2CH_3$), 3.40-3.48 (m, 8H, Pip.), 3.85 (t, J=7.4 Hz, 2H, N-$\underline{CH_2}CH_2CH_2CH_3$), 4.92 (s, 2H, O-$\underline{CH_2}$), 5.06 (s, 2H, Benzyl CH_2) 7.03 (d, J=8.8 Hz, 2H, CH=CH Ar), 7.30-7.36 (m, 5H, Ar CH), 8.00 (d, J=8.8 Hz, 2H, CH=CH Ar), 11.79 (s, 1H, N1-H), 13.34 (s, 1H, N7-H).

Table 2. Selected ^{13}C NMR data of synthesized compounds

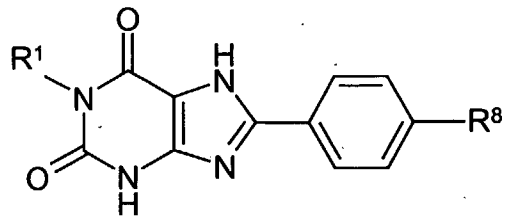


Compd.	R^1	R^8	^{13}C NMR δ (ppm)
4aa	propyl	H	11.35 (N-$CH_2CH_2\underline{CH_3}$), 21.10 (N-$CH_2\underline{CH_2}CH_3$), 40.67 (N-$\underline{CH_2}CH_2CH_3$), 98.47 (C5), 127.27 (C3′, C5′), 128.55 (C2′, C6′), 129.17 (C4′), 138.83 (C1′), 149.24 (N=CH), 151.03 (C2), 152.19 (C6), 158.66 (C4).
4ba	butyl	H	14.07 (N-$CH_2CH_2CH_2\underline{CH_3}$), 20.05 (N-$CH_2CH_2\underline{CH_2}CH_3$), 30.18 (N-$CH_2\,\underline{CH_2}CH_2CH_3$), 39.10 (N-$\underline{CH_2}CH_2CH_2CH_3$), 98.70 (C5), 127.50 (C3′, C5′), 128.77 (C2′, C6′), 129.40 (C4′), 139.04 (C1′), 149.50 (N=CH, C2), 152.29 (C6), 158.85 (C4).
4ab	propyl	Br	11.35 (N-$CH_2CH_2\underline{CH_3}$), 21.11 (N-$CH_2\underline{CH_2}CH_3$), 40.70 (N-$\underline{CH_2}CH_2CH_3$), 98.52 (C5), 122.26 (C4′), 129.15 (C2′, C6′), 131.48 (C3′, C5′), 138.12 (C1′), 147.70 (N=CH), 149.25 (C2), 152.25 (C6), 158.65 (C4).
4bb	butyl	Br	13.90 (N-$CH_2CH_2CH_2\underline{CH_3}$), 19.87 (N-$CH_2CH_2\underline{CH_2}CH_3$), 30.00 (N-$CH_2\,\underline{CH_2}CH_2CH_3$), 38.85 (N-$\underline{CH_2}CH_2CH_2CH_3$), 98.46 (C5), 122.32 (C4′), 129.21 (C2′, C6′), 131.15 (C3′, C5′), 138.15 (C1′), 147.64 (C2), 152.31 (C6), 158.65 (C4).
4cb	propargyl	Br	28.62 (N-CH_2), 72.06 (≡C-), 80.06 (≡CH), 98.30 (C5), 122.44 (C4′), 129.24 (C2′, C6′), 131.50 (C3′, C5′), 137.94 (C1′), 148.09 (N=CH), 148.61 (C2), 152.53 (C6), 157.48 (C4).
4bc	butyl	COOH	14.58 (N-$CH_2CH_2CH_2\underline{CH_3}$), 20.55 (N-$CH_2CH_2\underline{CH_2}CH_3$), 30.67 (N-$CH_2\,\underline{CH_2}CH_2CH_3$), 39.63 (N-$\underline{CH_2}CH_2CH_2CH_3$), 99.46 (C5), 127.86, 130.28, 131.60, 143.54 (aromatic carbons), 148.33

			(N=CH), 149.91 (C2), 153.28 (C6), 159.31 (C4), 168.08 (COOH).
4be	butyl	carboxymethyloxy	13.86 (N-$CH_2CH_2CH_2\underline{CH_3}$), 19.83 (N-$CH_2CH_2\underline{CH_2}CH_3$), 29.98 (N-$CH_2\,\underline{CH_2}CH_2CH_3$), 39.25 (N-$\underline{CH_2}CH_2CH_2CH_3$), 65.18 (O-$CH_2$), 98.44 (C5), 114.58(C3′, C5′), 128.68 (C2′, C6′), 132.05 (C1′), 149.05 (N=CH), 149.26 (C2), 151.84 (C6), 158.65 (C4), 159.04 (C4′), 170.57 (COOH).

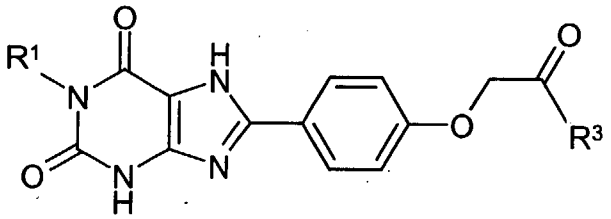


Compd.	R^1	R^3	R^8	^{13}C NMR δ (ppm)
16db	propyl	propyl	Br	10.89 (N-$CH_2CH_2\underline{CH_3}$), 11.38 (N-$CH_2CH_2\underline{CH_3}$), 21.02 (2 X N-$CH_2\underline{CH_2}CH_3$), 42.03 (N-$\underline{CH_2}CH_2CH_3$), 43.88 (N-$\underline{CH_2}CH_2CH_3$), 87.33 (C5), 125.05 (C4′), 130.27 (C2′, C6′), 131.12 (C3′, C5′), 133.91 (C1′) 150.52 (C2), 151.89 (C6), 159.26 (C4), 165.90 (C=O).
16dh	propyl	propyl	I	10.96 (N-$CH_2CH_2\underline{CH_3}$), 11.41 (N-$CH_2CH_2\underline{CH_3}$), 21.08 (2 X N-$CH_2\underline{CH_2}CH_3$), 42.07 (N-$\underline{CH_2}CH_2CH_3$), 43.91(N-$\underline{CH_2}CH_2CH_3$), 87.33 (C5), 98.29 (C4′), 130.15 (C2′, C6′), 134.21 (C3′, C5′), 137.03 (C1′), 150.52 (C2), 151.89 (C6), 159.26 (C4), 166.20 (C=O).
25	butyl	H	CH_2CN	3.85 (N-$CH_2CH_2CH_2\underline{CH_3}$), 19.76 (N-$CH_2CH_2\underline{CH_2}CH_3$), 22.45 ($\underline{CH_2}CN$), 30.00 (N-$CH_2\,\underline{CH_2}CH_2CH_3$), 39.24 (N-$\underline{CH_2}CH_2CH_2CH_3$), 87.07 (C5), 119.10 (CN), 127.84, 128.65, 134.06, 134.52 (aromatic carbons), 150.03 (C2), 150.56 (C6), 160.76(C4), 166.05 (C=O).



Compd.	R^1	R^8	^{13}C NMR δ (ppm)
5	propyl	H	11.32 (N-$CH_2CH_2\underline{CH_3}$), 21.03 (N-$CH_2\underline{CH_2}CH_3$), 41.54 (N-$\underline{CH_2}CH_2CH_3$), 107.76 (C5), 126.45, 129.03, 129.06, 130.23 (aromatic carbons), 147.83 (C4), 151.13 (C8), 151.12 (C2), 154.96 (C6).
6	butyl	H	14.08 (N-$CH_2CH_2CH_2\underline{CH_3}$), 20.00 (N-$CH_2CH_2\underline{CH_2}CH_3$), 30.13 (N-$CH_2\,\underline{CH_2}CH_2CH_3$), 39.96 (N-$\underline{CH_2}CH_2CH_2CH_3$), 108.05 (C5), 126.67, 129.26, 129.27, 130.44 (aromatic carbons), 147.98 (C4), 150.30 (C8), 151.31 (C2), 155.16 (C6).
7	propyl	Br	11.30 (N-$CH_2CH_2\underline{CH_3}$), 21.00 (N-$CH_2\underline{CH_2}CH_3$), 41.56 (N-$\underline{CH_2}CH_2CH_3$), 108.03 (C5), 123.68 (C4′), 128.26 (C3′, C5′), 128.36 (C2′, C6′), 132.10 (C1′), 147.75 (C4), 149.03 (C8), 151.10 (C2), 154.96 (C6).
8	butyl	Br	13.93 (N-$CH_2CH_2CH_2\underline{CH_3}$), 19.85 (N-$CH_2CH_2\underline{CH_2}CH_3$), 29.94 (N-$CH_2\underline{CH_2}CH_2CH_3$), 38.85 (N-$\underline{CH_2}\,CH_2CH_2CH_3$), 108.17 (C5), 123.72 (C4′), 128.30 (C3′, C5′, C2′, C6′), 132.15 (C1′), 147.70 (C4), 149.01 (C8), 151.10 (C2), 154.98 (C6).
9	propargyl	Br	29.61 (N-CH_2), 72.75 (≡C-), 79.95 (≡CH), 107.78 (C5), 123.86, 128.12, 131.37, 132.10, 132.14 (aromatic carbons), 148.10 (C4), 149.50 (C8), 150.45 (C2), 154.00 (C6).
10	butyl	COOH	14.59 (N-$CH_2CH_2CH_2\underline{CH_3}$), 20.51 (N-$CH_2CH_2\underline{CH_2}CH_3$), 30.61 (N-$CH_2\,\underline{CH_2}CH_2CH_3$), 40.54 (N-$\underline{CH_2}CH_2CH_2CH_3$), 109.11 (C5), 127.21 (C2′, C6′), 130.70 (C3′, C5′), 132.57 (C4′), 133.50 (C1′), 148.51 (C4), 149.63 (C8), 151.80 (C2), 155.72 (C6), 167.60 (COOH)
12	butyl	O-CH_2-COOH	14.09 (N-$CH_2CH_2CH_2\underline{CH_3}$), 20.00 (N-$CH_2CH_2\underline{CH_2}CH_3$), 30.15 (N-$CH_2\,\underline{CH_2}CH_2CH_3$), 39.96 (N-$\underline{CH_2}CH_2CH_2CH_3$), 65.00 (O$\underline{C}H_2$), 107.63 (C5), 115.25 (C3′, C5′), 122.24 (C1′), 128.29 (C2′, C6′), 148.09 (C4), 150.44 (C8), 151.31 (C2), 155.05 (C6), 159.68 (C4′), 170.30 ($\underline{C}$OOH).
26	butyl	CH_2-CN	13.87 (N-$CH_2CH_2CH_2\underline{CH_3}$), 19.78 (N-$CH_2CH_2\underline{CH_2}CH_3$), 22.45 ($CH_2$-CN) 29.91 (N-$CH_2\,\underline{CH_2}CH_2CH_3$), 39.72 (N-$\underline{CH_2}CH_2CH_2CH_3$), 107.95 (C5), 119.04 (CN), 127.00 (C2′, C6′), 128.47 (C4′), 128.80 (C3′, C5′), 133.37 (C1′), 147.77 (C4), 149.56 (C8), 151.11 (C2), 154.96 (C6).

27	butyl	CH_2-COOH	13.87 (N-$CH_2CH_2CH_2\underline{CH_3}$), 19.78 (N-$CH_2CH_2\underline{CH_2}CH_3$), 29.92 (N-$CH_2\,\underline{CH_2}CH_2CH_3$), 39.72 (N-$\underline{CH_2}CH_2CH_2CH_3$), 107.95 (C5), 126.39, 127.46, 130.13, 137.36 (aromatic carbons), 147.83 (C4), 150.09 (C8), 151.10 (C2), 154.92 (C6), 172.45 (COOH).



Compd.	R^1	R^3	^{13}C NMR δ (ppm)
30	butyl	4-carboxymethylphenylamino	13.87 (N-$CH_2CH_2CH_2\underline{CH_3}$), 19.78 (N-$CH_2CH_2\underline{CH_2}CH_3$), 29.93 (N-$CH_2\,\underline{CH_2}CH_2CH_3$), 39.62 (N-$\underline{CH_2}CH_2CH_2CH_3$), 40.24 ($\underline{CH_2}$-COOH), 67.28 (O$\underline{C}H_2$), 107.38 (C5), 115.27 (C3′, C5′), 119.78 (C2″, C6″), 122.22 (C1′), 128.11 (C2′, C6′), 129.78 (C3″, C5″), 130.52 (C4″), 137.10 (C1″), 147.91 (C4), 150.22 (C8), 151.10 (C2), 154.82 (C6), 159.52 (C4′), 166.25 (amide C=O), 172.83 ($\underline{C}$OOH).
31	butyl	N-ethylpiperazinyl	11.91 (ethyl CH_3), 13.87 (N-$CH_2CH_2CH_2\underline{CH_3}$), 19.78 (N-$CH_2CH_2\underline{CH_2}CH_3$), 29.93 (N-$CH_2\,\underline{CH_2}CH_2CH_3$), 39.79 (N-$\underline{CH_2}CH_2CH_2CH_3$), 44.23, 52.54 (pip.), 51.61 (ethyl CH_2), 65.99 (O$\underline{C}H_2$), 107.32 (C5), 115.18 (C3′, C5′), 121.88 (C1′), 127.97 (C2′, C6′), 147.90 (C4), 150.29 (C8), 151.10 (C2), 154.83 (C6), 159.78 (C4′), 165.57 (amide C=O).
32	butyl	N-acetylpiperazinyl	13.89 (N-$CH_2CH_2CH_2\underline{CH_3}$), 19.80 (N-$CH_2CH_2\underline{CH_2}CH_3$), 21.93 (acetyl CH_3), 29.93 (N-$CH_2\,\underline{CH_2}CH_2CH_3$), 39.96 (N-$\underline{CH_2}CH_2CH_2CH_3$), 43.98, 55.03 (pip.), 65.95 (O$\underline{C}H_2$), 107.37 (C5), 115.22 (C3′, C5′), 121.93 (C1′), 127.98 (C2′, C6′), 147.90 (C4), 150.27 (C8) , 151.10 (C2), 154.84 (C6), 159.74 (C4′), 165.95 (amide C=O), 168.63 (acetyl C=O).
33	butyl	N-ethoxycarbonylpiperazinyl	13.87 (N-$CH_2CH_2CH_2\underline{CH_3}$), 14.68 (ethyl CH_3), 19.77 (N-$CH_2CH_2\underline{CH_2}CH_3$), 29.92 (N-$CH_2\,\underline{CH_2}CH_2CH_3$), 39.96 (N-$\underline{CH_2}CH_2CH_2CH_3$), 43.98, 52.00 (pip.), 61.07 (ethyl CH_2), 65.67 (O$\underline{C}H_2$), 107.33 (C5), 115.22 (C3′, C5′), 121.91 (C1′), 127.98 (C2′, C6′), 147.90 (C4), 150.29 (C8), 151.09 (C2), 154.76 (C6), 159.74 (C4′), 165.91 (amide C=O).

34	butyl	N-phenylpiperazinyl	13.89 (N-$CH_2CH_2CH_2\underline{CH_3}$), 19.80 (N-$CH_2CH_2\underline{CH_2}CH_3$), 29.94 (N-$CH_2\,\underline{CH_2}CH_2CH_3$), 39.79 (N-$\underline{CH_2}CH_2CH_2CH_3$), 44.14, 48.76 (pip.), 66.02 (O$\underline{C}H_2$), 107.32 (C5), 115.24 (C3′, C5′), 116.04 (C2″, C6″), 119.51 (C4″), 121.92 (C1′), 128.01 (C2′, C6′), 129.16 (C3″, C5″), 147.89 (C4), 150.31 (C8), 150.91 (C1″), 151.12 (C2), 154.85 (C6), 159.80 (C4′), 166.77 (amide C=O).
35	butyl	N-benzylpiperazinyl	13.87 (N-$CH_2CH_2CH_2\underline{CH_3}$), 19.78 (N-$CH_2CH_2\underline{CH_2}CH_3$), 29.93 (N-$CH_2\,\underline{CH_2}CH_2CH_3$), 39.96 (N-$\underline{CH_2}CH_2CH_2CH_3$), 44.31, 52.80 (pip.), 61.98 (benzyl CH_2), 65.99 (O$\underline{C}H_2$), 107.36 (C5), 115.18 (C3′, C5′), 121.88 (C1′), 127.16 (C4″), 127.98 (C3″, C5″), 128.34 (C2′, C6′), 129.02 (C2″, C6″), 137.91 (C1″), 147.90 (C4), 150.29 (C8), 151.11 (C2), 154.83 (C6), 159.77 (C4′), 165.60 (amide C=O).
36	butyl	N-(2-methoxyphenyl)piperazinyl	13.88 (N-$CH_2CH_2CH_2\underline{CH_3}$), 19.78 (N-$CH_2CH_2\underline{CH_2}CH_3$), 29.93 (N-$CH_2\,\underline{CH_2}CH_2CH_3$), 39.96 (N-$\underline{CH_2}CH_2CH_2CH_3$), 44.63, 50.49 (pip.), 55.53 (O$\underline{CH_3}$), 66.04 (O$\underline{C}H_2$), 107.37 (C5), 112.13, 118.47 (C3″, C6″), 115.22 (C3′, C5′), 120.99, 123.07 (C4″, C5″), 121.91 (C1′), 127.99 (C2′, C6′), 140.92 (C1″), 147.90 (C4), 150.29 (C8), 151.10 (C2), 152.19 (C2″), 154.84 (C6), 159.79 (C4′), 165.73 (amide C=O).