

Supporting informations
for
Stereoselective Synthesis and Antiproliferative
Activity of Steviol-Based Diterpene 1,3-Aminoalcohol
Regioisomers

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Table S1. Antiproliferative effects of the investigated compounds

Comp.	Cc. (μ M)	Growth inhibition (%) \pm SEM and calculated IC ₅₀ values (μ M)*					
		HeLa	SiHa	MCF-7	MDA-MB-231	A2780	NIH/3T3
6	10	23.23 \pm 1.97	< 20	36.44 \pm 3.48	25.84 \pm 2.49	24.82 \pm 5.19	22.06 \pm 1.54
	30	93.94 \pm 0.55	68.24 \pm 0.61	98.58 \pm 0.22	97.60 \pm 0.67	82.50 \pm 4.66	98.27 \pm 0.37
7	10	24.87 \pm 2.49	< 20	43.12 \pm 3.79	28.03 \pm 1.84	27.03 \pm 4.31	< 20
	30	96.89 \pm 0.54	88.56 \pm 2.01	99.33 \pm 0.24	97.67 \pm 0.67	91.63 \pm 1.97	97.76 \pm 0.70
8	10	< 20	< 20	45.43 \pm 1.94	< 20	20.30 \pm 2.05	25.69 \pm 0.97
	30	97.49 \pm 0.52	95.34 \pm 1.23	98.90 \pm 0.18	97.89 \pm 0.66	98.25 \pm 0.40	98.27 \pm 0.37
9	10	< 20	< 20	79.84 \pm 1.59	57.99 \pm 2.59	73.56 \pm 2.61	< 20
	30	95.35 \pm 0.58	85.99 \pm 2.92	98.07 \pm 0.35	93.42 \pm 0.39	99.01 \pm 0.11	93.88 \pm 1.94
10	10	41.90 \pm 4.29	< 20	86.52 \pm 0.88	78.67 \pm 2.63	38.96 \pm 1.87	20.31 \pm 2.93
	30	97.65 \pm 0.64	97.61 \pm 0.90	100.0 \pm 0.20	98.09 \pm 0.59	98.38 \pm 0.51	96.59 \pm 1.10
11	10	< 20	< 20	49.48 \pm 3.06	< 20	74.25 \pm 2.10	22.16 \pm 2.22
	30	94.48 \pm 0.84	83.71 \pm 3.19	96.94 \pm 0.57	90.78 \pm 1.35	98.12 \pm 0.30	93.61 \pm 2.02
12	10	< 20	< 20	48.62 \pm 0.50	< 20	64.73 \pm 1.95	29.23 \pm 1.33
	30	90.80 \pm 3.71	82.43 \pm 2.09	92.35 \pm 2.89	91.59 \pm 2.36	98.32 \pm 0.23	95.53 \pm 0.49
13	10	< 20	24.18 \pm 3.46	56.73 \pm 3.88	< 20	83.65 \pm 1.95	< 20
	30	92.34 \pm 2.70	87.92 \pm 1.62	96.84 \pm 0.55	94.30 \pm 1.83	99.02 \pm 0.39	96.88 \pm 0.74
14	10	24.62 \pm 2.79	34.15 \pm 2.53	78.87 \pm 4.11	53.21 \pm 2.44	93.33 \pm 1.99	50.36 \pm 2.91
	30	95.13 \pm 1.60	88.88 \pm 0.87	97.44 \pm 0.53	94.95 \pm 1.24	99.57 \pm 0.35	97.15 \pm 0.60
15	10	< 20	< 20	53.99 \pm 3.39	31.33 \pm 1.89	89.51 \pm 1.76	< 20
	30	94.88 \pm 2.04	87.89 \pm 1.33	97.43 \pm 0.59	94.23 \pm 0.98	99.67 \pm 0.49	96.50 \pm 0.77
16	10	55.42 \pm 2.81	80.05 \pm 1.41	80.95 \pm 2.03	84.43 \pm 2.92	97.64 \pm 2.81	< 20
	30	95.69 \pm 1.12	89.39 \pm 1.03	97.95 \pm 0.56	93.61 \pm 1.23	100.3 \pm 0.57	96.83 \pm 0.66
	IC ₅₀	3.40	6.33	3.88	4.51	4.43	17.44
17	10	90.55 \pm 1.34	83.33 \pm 1.58	86.31 \pm 2.86	91.46 \pm 1.24	100.6 \pm 0.76	20.50 \pm 1.70
	30	93.53 \pm 2.50	86.66 \pm 1.74	97.42 \pm 0.71	95.03 \pm 0.91	100.0 \pm 0.91	96.54 \pm 0.62
	IC ₅₀	3.51	5.37	2.47	5.62	4.06	8.70
19	10	31.57 \pm 1.34	< 20	< 20	< 20	< 20	< 20
	30	46.86 \pm 0.27	< 20	38.02 \pm 1.36	< 20	41.72 \pm 1.99	< 20
20	10	< 20	< 20	< 20	< 20	< 20	< 20
	30	< 20	< 20	30.71 \pm 0.93	< 20	27.04 \pm 2.25	< 20
22	10	59.22 \pm 6.61	69.00 \pm 2.02	90.56 \pm 0.98	90.95 \pm 0.40	69.51 \pm 3.98	49.04 \pm 1.37
	30	90.87 \pm 0.35	80.80 \pm 2.91	94.23 \pm 0.82	89.66 \pm 0.28	96.04 \pm 0.45	94.25 \pm 0.45
23	10	70.14 \pm 1.97	68.12 \pm 1.85	95.81 \pm 0.84	92.99 \pm 0.39	79.97 \pm 1.60	81.84 \pm 3.07
	30	90.41 \pm 0.78	80.48 \pm 3.16	95.33 \pm 1.05	91.40 \pm 0.39	95.71 \pm 0.58	93.62 \pm 0.77
	IC ₅₀	5.07	4.41	1.59	3.28	4.39	5.15
24	10	< 20	< 20	34.80 \pm 1.99	< 20	< 20	21.83 \pm 2.15
	30	96.56 \pm 0.88	78.10 \pm 1.56	93.61 \pm 0.94	97.59 \pm 1.01	99.28 \pm 0.52	97.69 \pm 0.87
25	10	< 20	< 20	40.09 \pm 1.44	< 20	< 20	< 20
	30	32.24 \pm 2.88	< 20	78.81 \pm 1.52	69.28 \pm 1.96	73.83 \pm 0.57	93.70 \pm 1.11
26	10	49.50 \pm 1.23	63.39 \pm 0.91	90.70 \pm 1.57	87.61 \pm 0.59	61.39 \pm 1.45	25.74 \pm 1.93
	30	93.63 \pm 1.56	86.89 \pm 1.69	97.49 \pm 0.53	93.09 \pm 1.53	98.21 \pm 0.43	95.62 \pm 0.96
27	10	< 20	< 20	79.62 \pm 2.89	67.25 \pm 1.94	59.04 \pm 1.68	< 20
	30	96.38 \pm 0.83	86.89 \pm 2.27	97.63 \pm 0.31	93.69 \pm 0.42	98.92 \pm 0.22	93.97 \pm 1.64
28	10	46.83 \pm 1.44	63.43 \pm 2.66	90.63 \pm 0.54	88.00 \pm 0.54	60.10 \pm 2.24	< 20
	30	94.66 \pm 0.63	86.13 \pm 3.79	97.75 \pm 0.39	92.92 \pm 1.04	98.53 \pm 0.42	93.97 \pm 1.95
29	10	< 20	< 20	32.51 \pm 0.92	< 20	21.89 \pm 0.73	< 20
	30	92.17 \pm 0.38	79.47 \pm 2.33	93.08 \pm 0.30	95.30 \pm 0.97	74.95 \pm 1.79	32.03 \pm 1.30
30	10	40.79 \pm 0.99	< 20	79.51 \pm 1.01	50.73 \pm 3.21	33.06 \pm 1.23	21.47 \pm 0.48
	30	94.51 \pm 0.19	101.40 \pm 0.6	95.63 \pm 0.55	98.70 \pm 0.49	99.71 \pm 0.27	100.70 \pm 0.2
31	10	< 20	< 20	72.69 \pm 3.15	49.47 \pm 3.47	37.30 \pm 1.04	< 20
	30	96.02 \pm 0.89	95.68 \pm 0.81	99.42 \pm 0.23	96.82 \pm 0.65	97.52 \pm 0.80	97.62 \pm 0.71
32	10	97.09 \pm 0.79	95.59 \pm 2.12	99.59 \pm 0.13	97.12 \pm 0.60	97.94 \pm 0.60	96.93 \pm 0.92

	30	97.18 ± 0.76	96.46 ± 1.09	99.88 ± 0.23	96.32 ± 1.02	98.01 ± 0.60	96.61 ± 1.05
	IC ₅₀	3.09	5.77	1.04	2.30	3.78	3.71
33	10	< 20	< 20	57.13 ± 2.13	< 20	41.14 ± 1.23	54.53 ± 1.93
	30	23.94 ± 5.01	< 20	60.27 ± 3.65	< 20	51.53 ± 1.41	78.89 ± 2.52
34	10	< 20	< 20	37.49 ± 2.10	< 20	31.77 ± 1.60	< 20
	30	75.20 ± 1.26	58.82 ± 2.24	81.29 ± 2.02	50.12 ± 2.41	89.59 ± 0.45	72.46 ± 0.96
35	10	< 20	< 20	69.95 ± 3.11	< 20	43.21 ± 1.63	54.79 ± 1.40
	30	88.11 ± 0.75	81.41 ± 2.84	88.79 ± 0.44	92.44 ± 0.59	97.37 ± 0.38	93.02 ± 1.01
36	10	< 20	< 20	45.89 ± 3.40	< 20	29.33 ± 1.68	< 20
	30	89.32 ± 0.63	79.36 ± 3.17	91.80 ± 0.74	91.38 ± 0.65	96.31 ± 0.53	92.91 ± 0.87
Cisplatin**	10	42.61 ± 2.33	60.98 ± 0.92	53.03 ± 2.29	67.51 ± 1.01	83.57 ± 1.21	73.88 ± 1.63
	30	99.93 ± 0.26	88.95 ± 0.53	86.90 ± 1.22	87.75 ± 1.10	95.02 ± 0.28	97.10 ± 0.15

*: for selected outstandingly active compounds; **: data from reference
10.3390/ijms24021121 (Bai D, Int J Mol Sci 2023, Lit. 24 in manuscript)

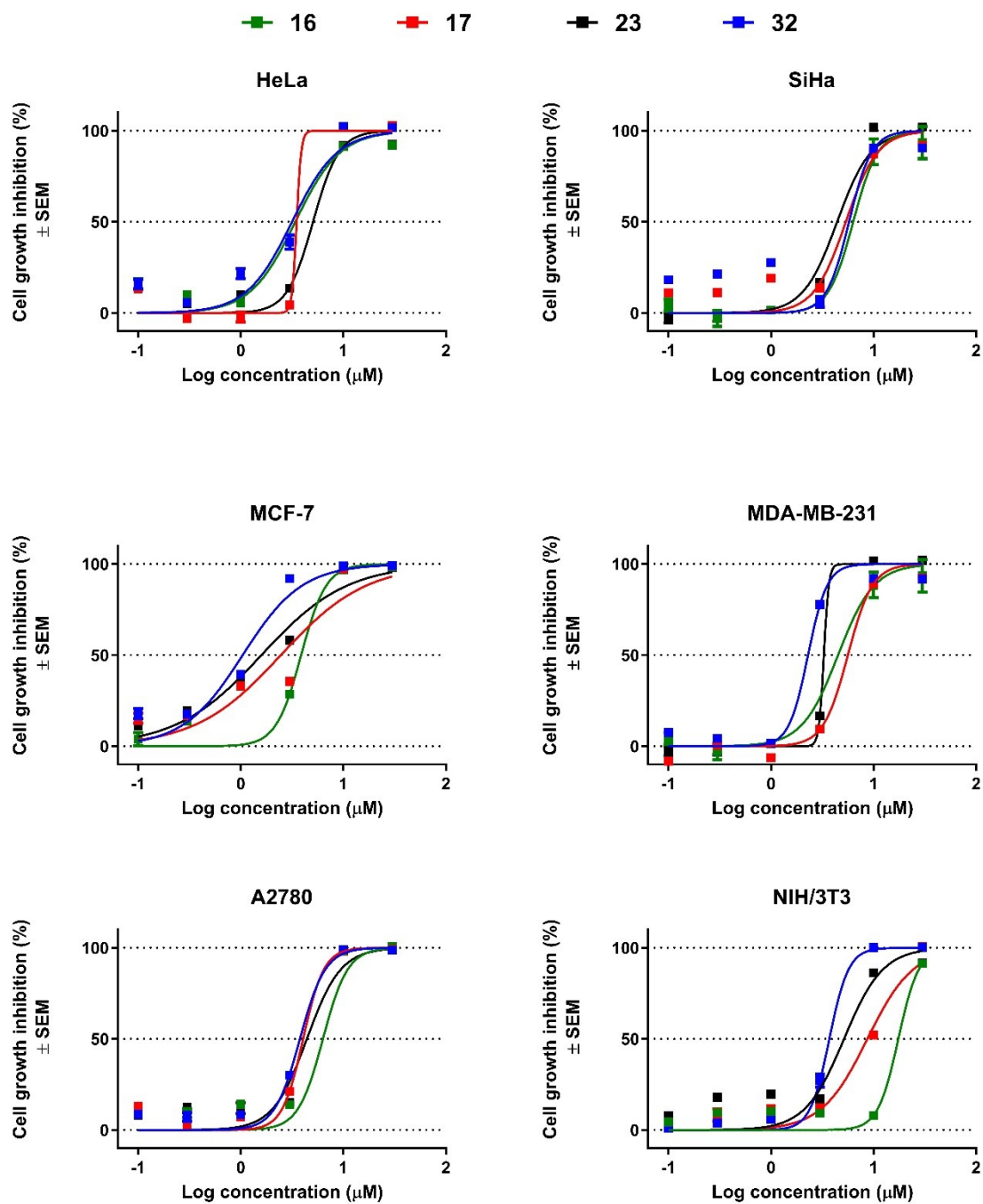
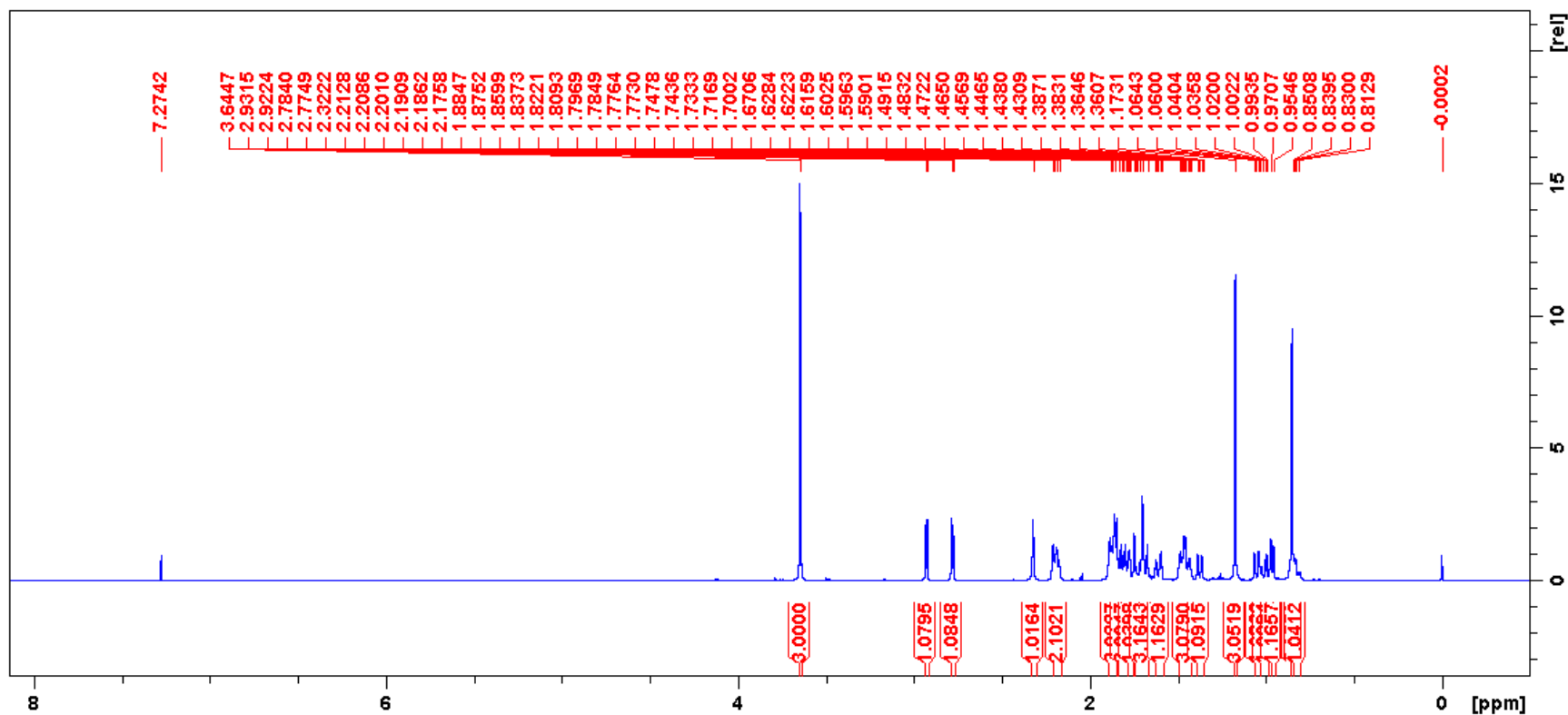
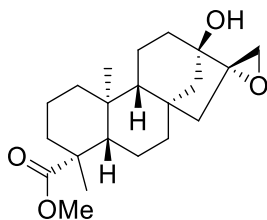
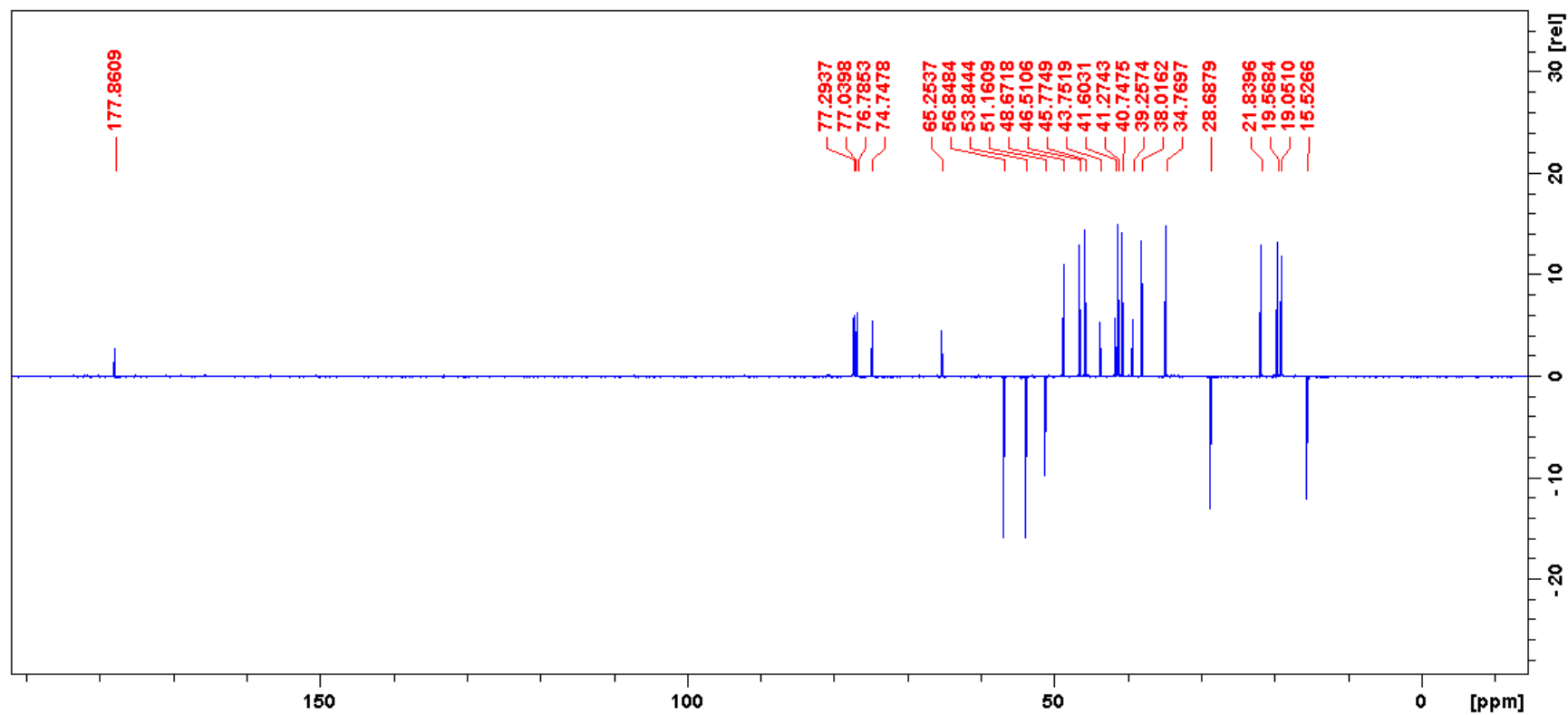
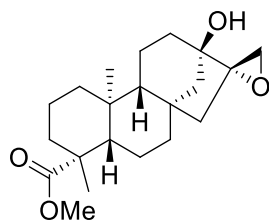


Figure S1 Concentration–response curves of *antiproliferative* activity for compound **16**, **17**, **23** and **32**

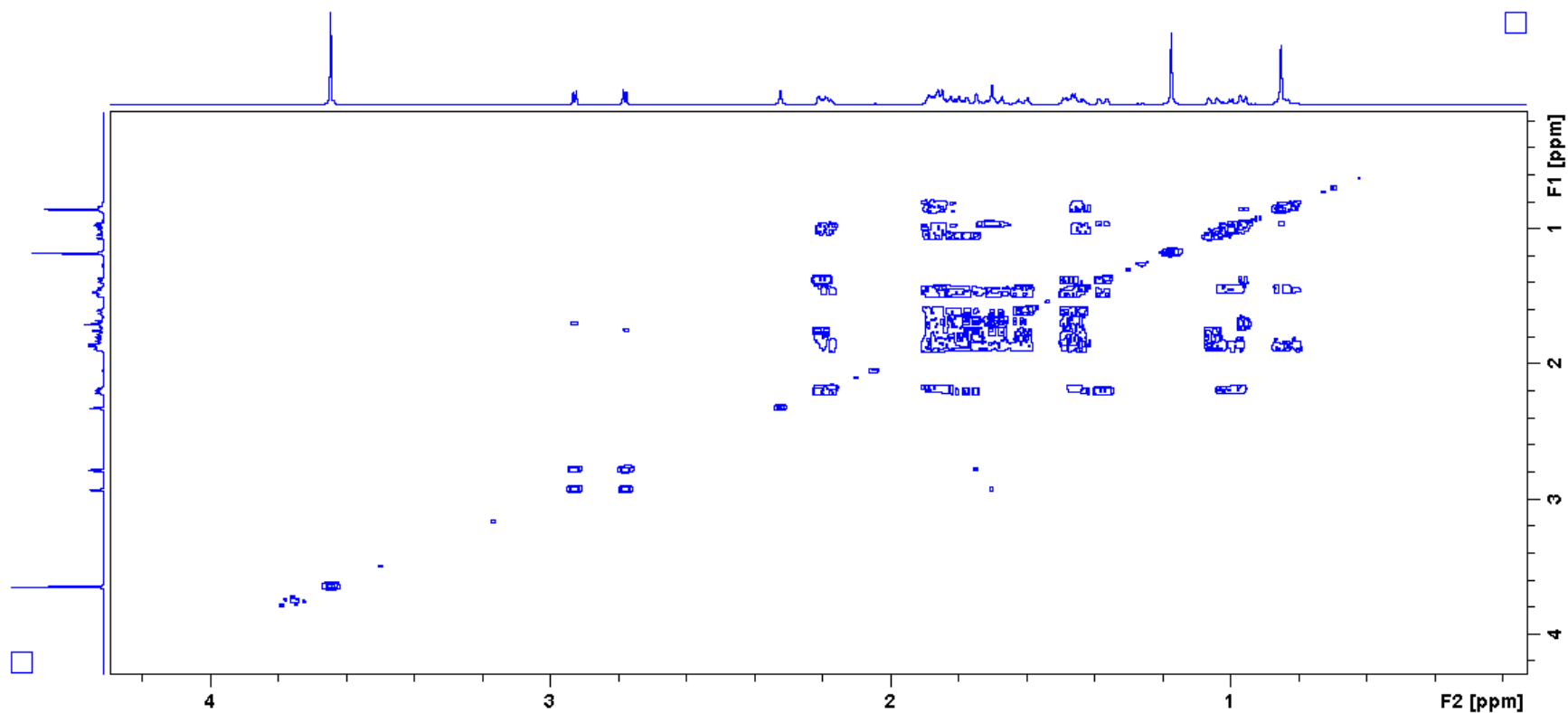
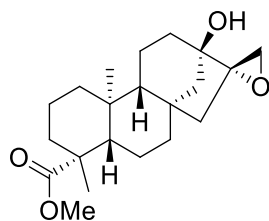
^1H -NMR of compound (2'S,4R,4aS,6aS,11aR,11bS)-methyl 9-hydroxy-4,11b-dimethyldodecahydro-1H-spiro[6a,9-methanocyclohepta[a]naphthalene-8,2'-oxirane]-4-carboxylate (**3**)



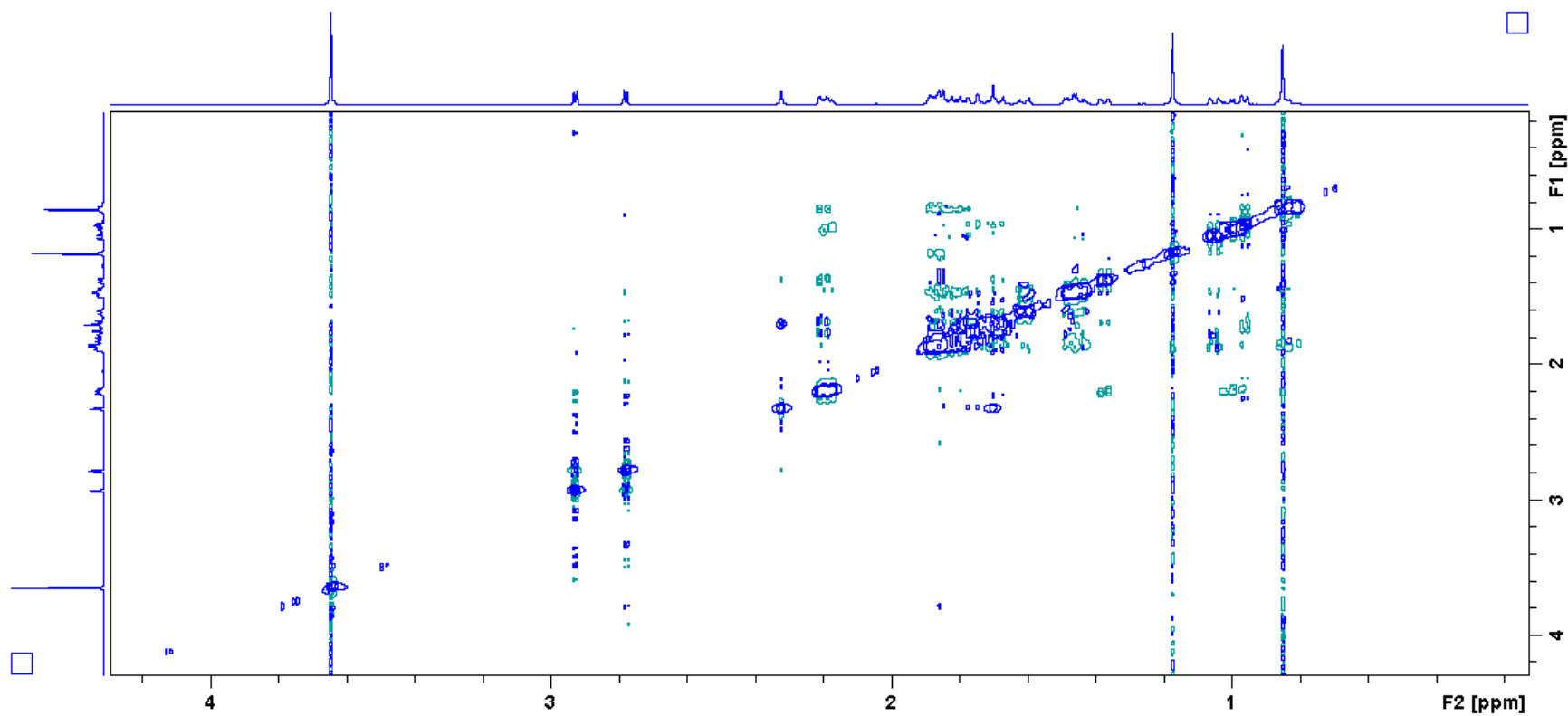
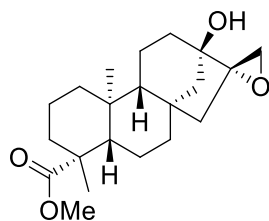
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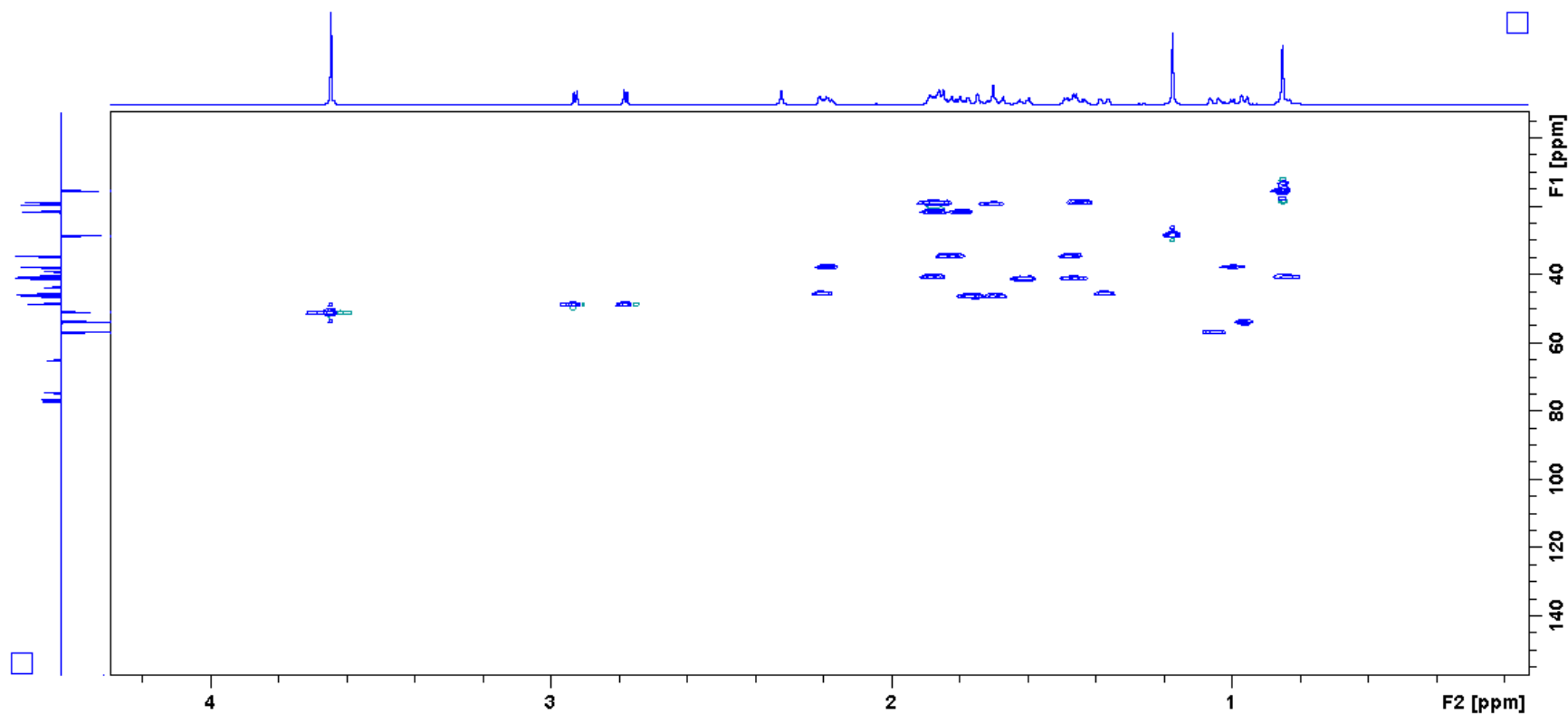
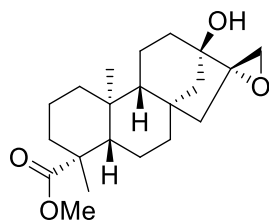
COSY of compound (2'S,4R,4aS,6aS,11aR,11bS)-methyl 9-hydroxy-4,11b-dimethyldodecahydro-1H-spiro[6a,9-methanocyclohepta[a]naphthalene-8,2'-oxirane]-4-carboxylate (**3**)



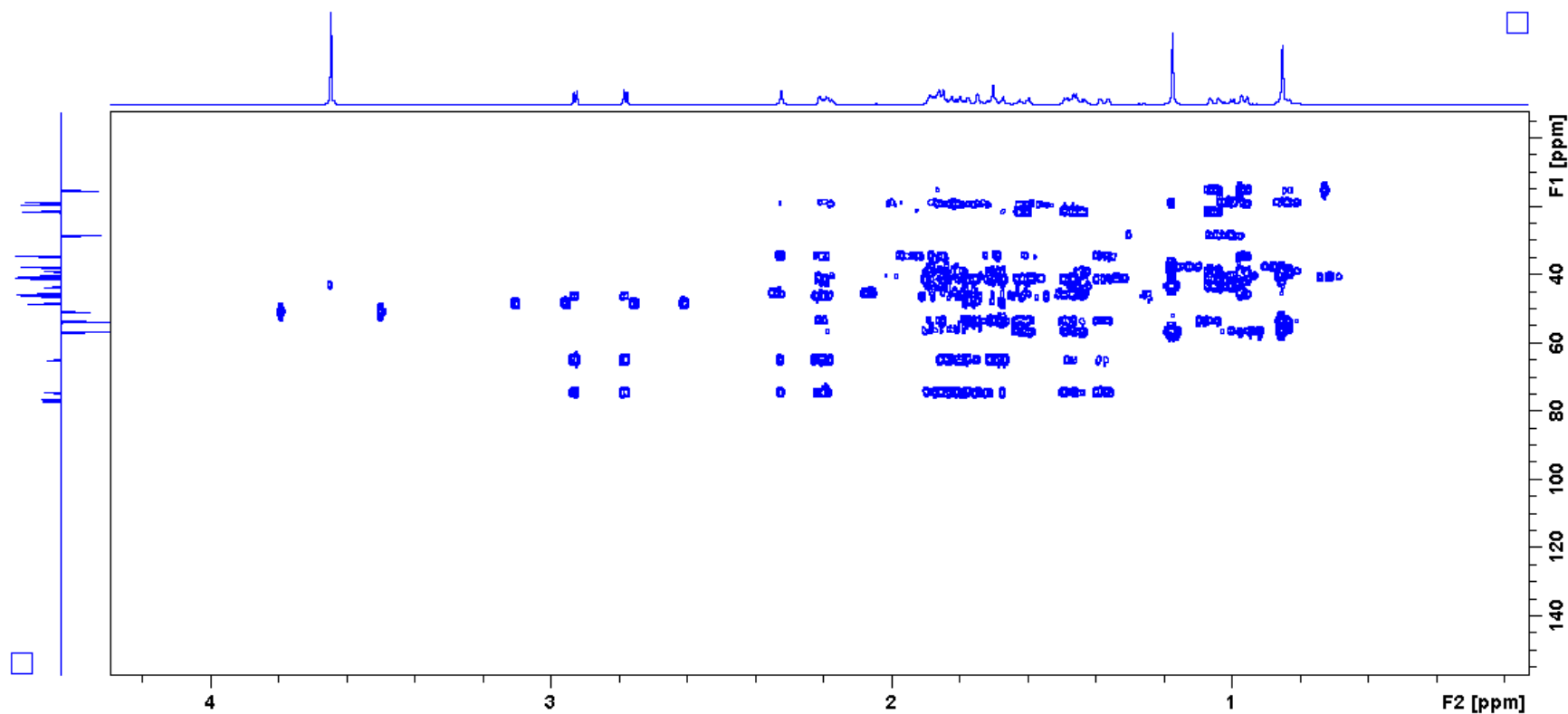
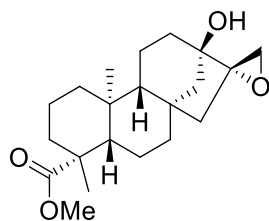
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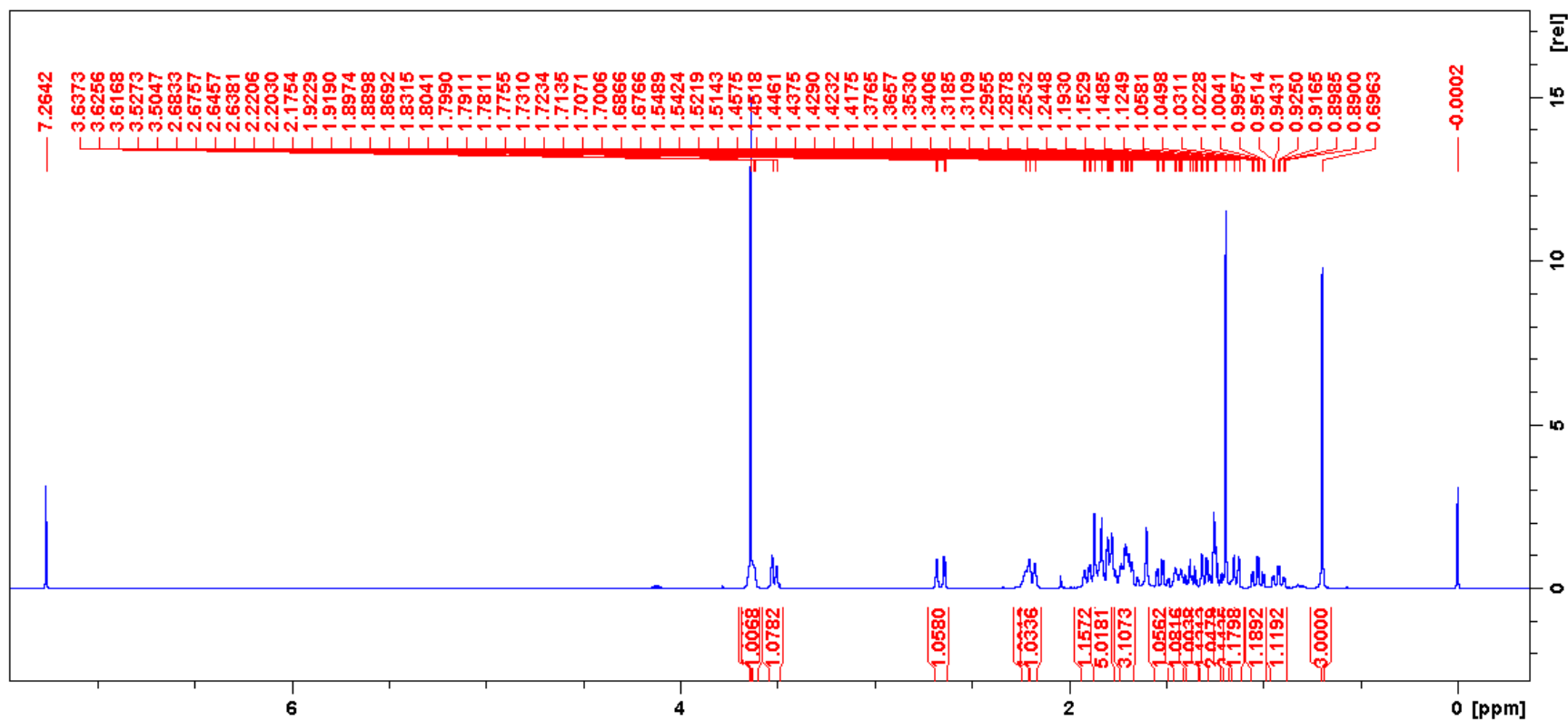
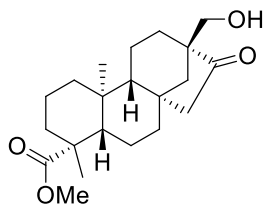
HSQC of compound (2'*S*,4*R*,4*aS*,6*aS*,11*aR*,11*bS*)-methyl 9-hydroxy-4,11b-dimethyldodecahydro-1*H*-spiro[6*a*,9-methanocyclohepta[*a*]naphthalene-8,2'-oxirane]-4-carboxylate (**3**)



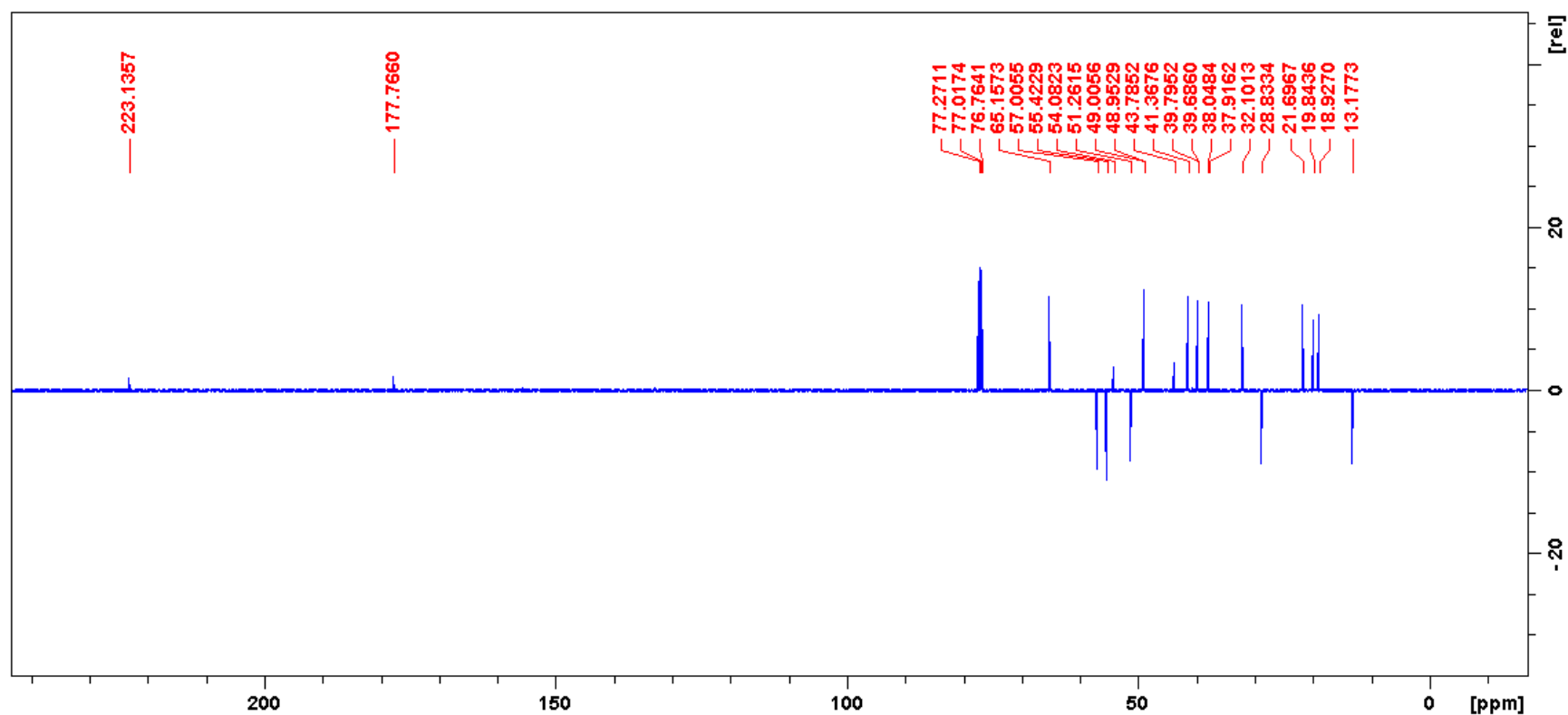
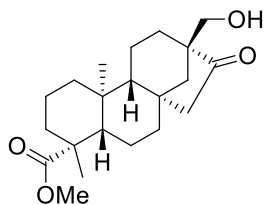
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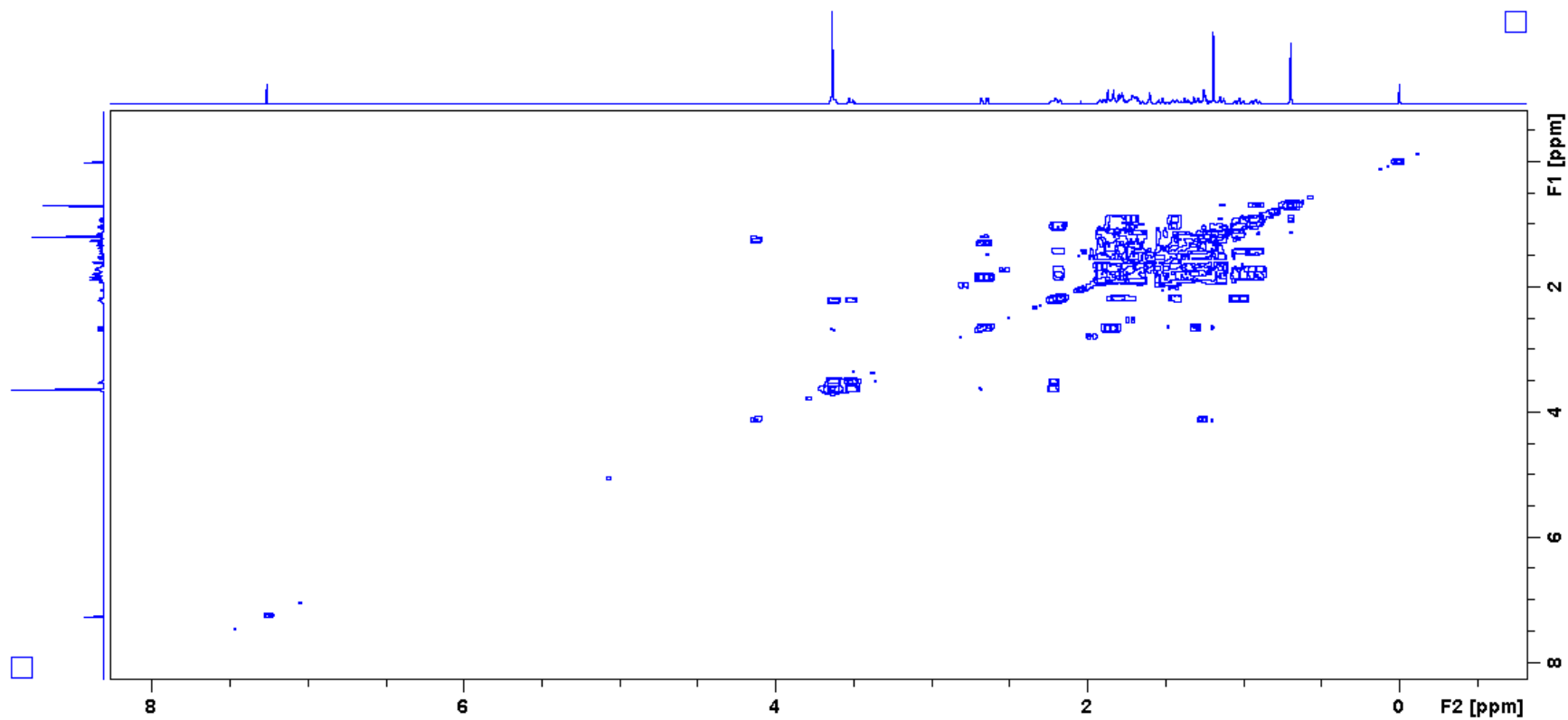
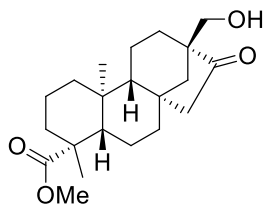
^1H -NMR of compound (4*R*,4*aS*,6*aR*,9*S*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-oxotetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**4**)



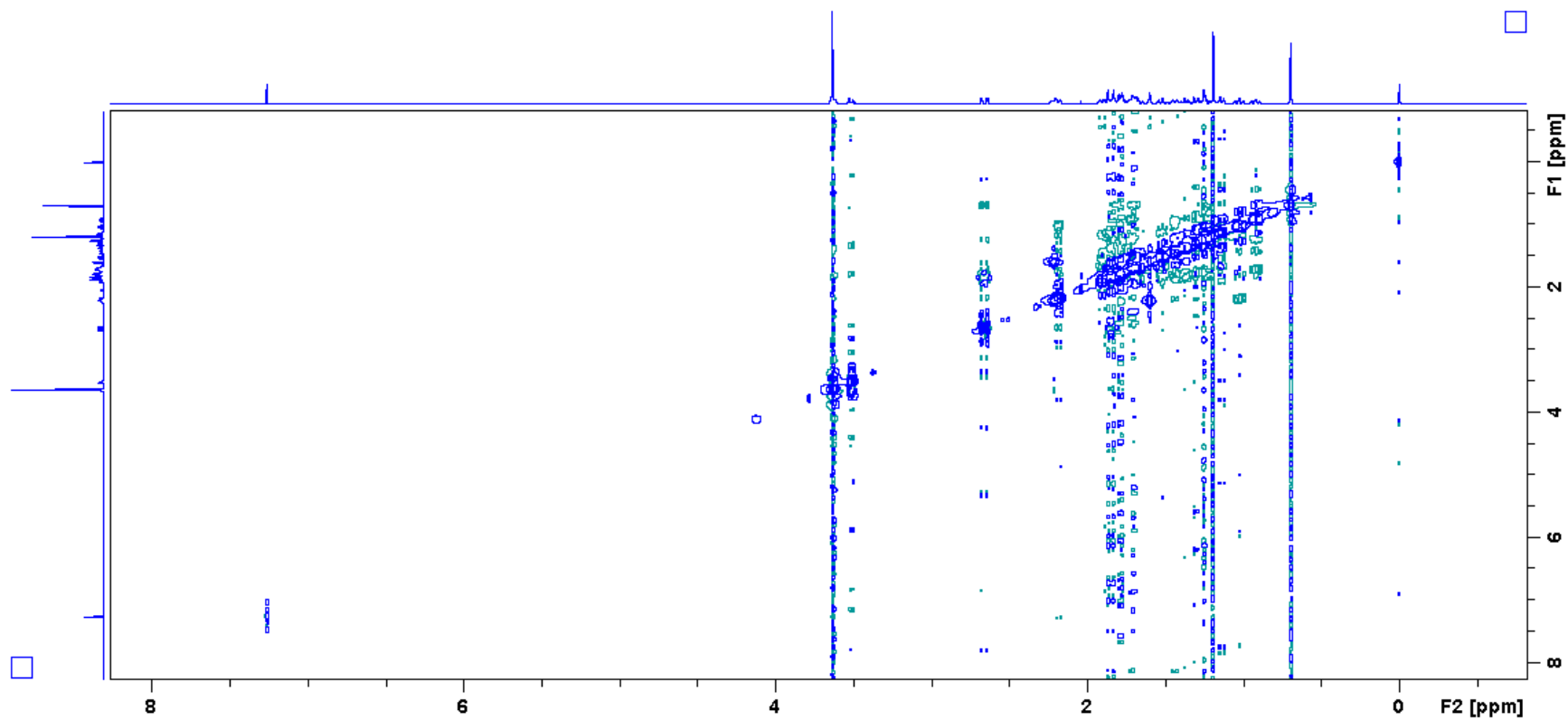
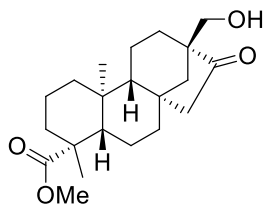
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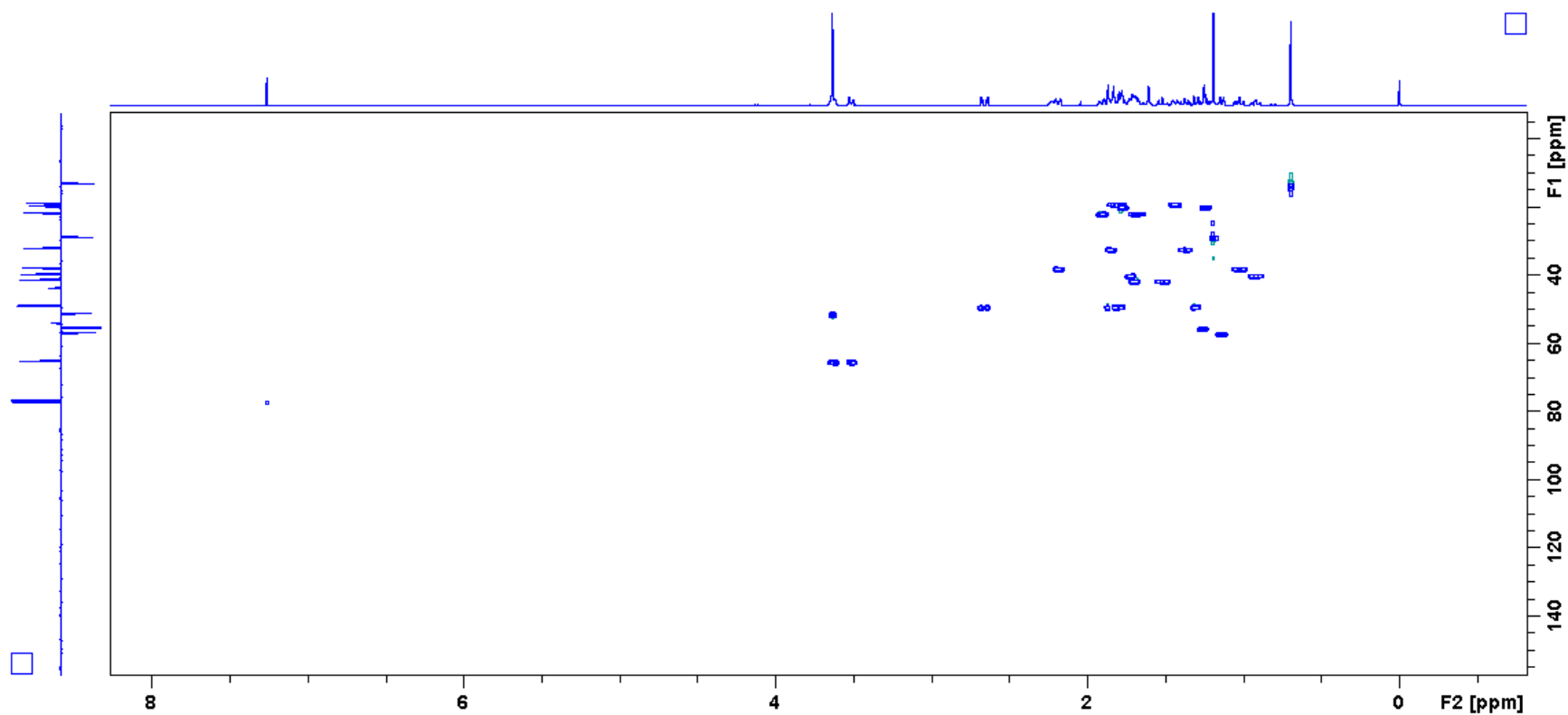
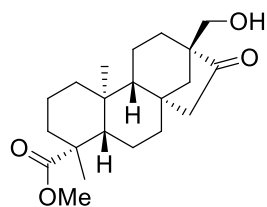
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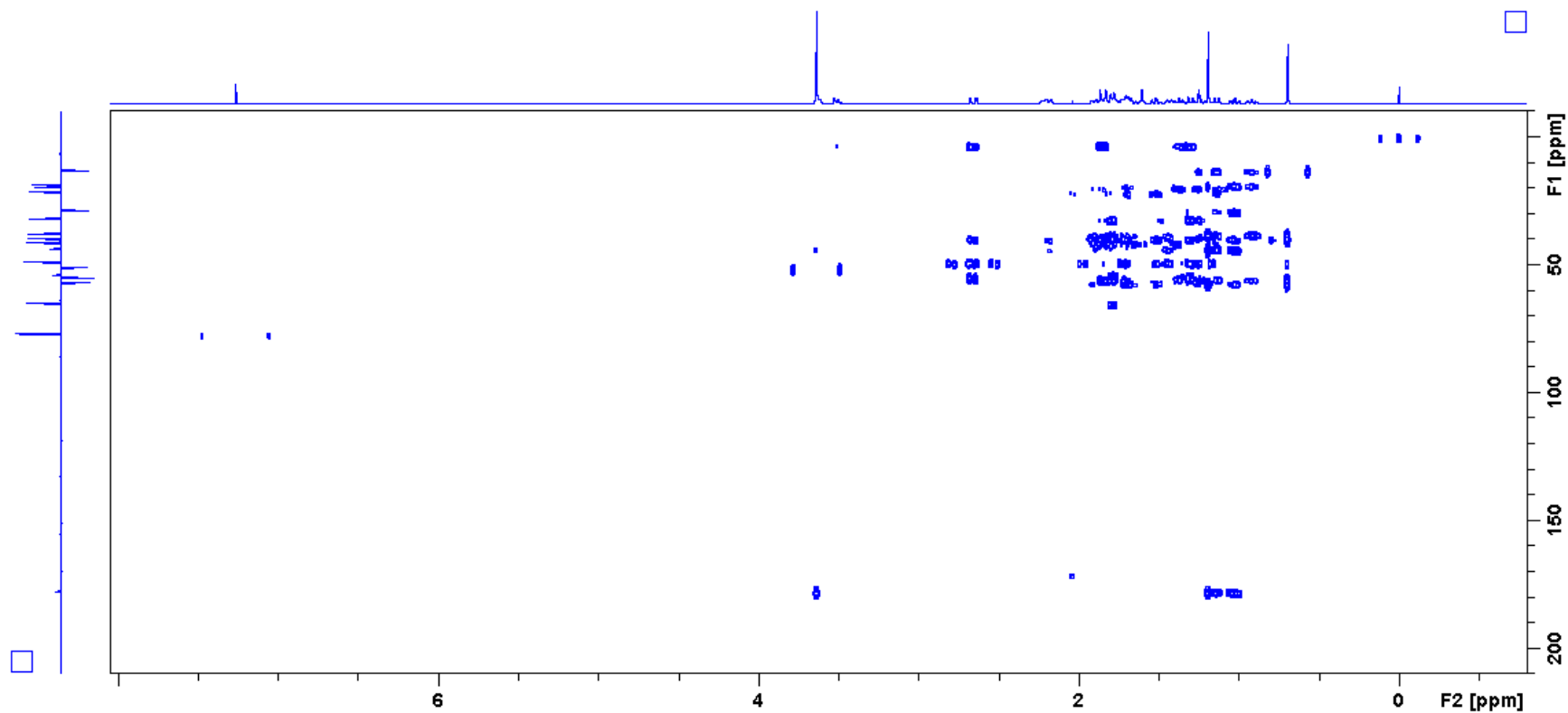
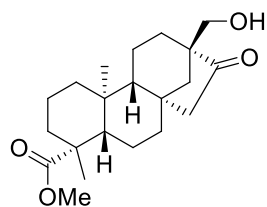
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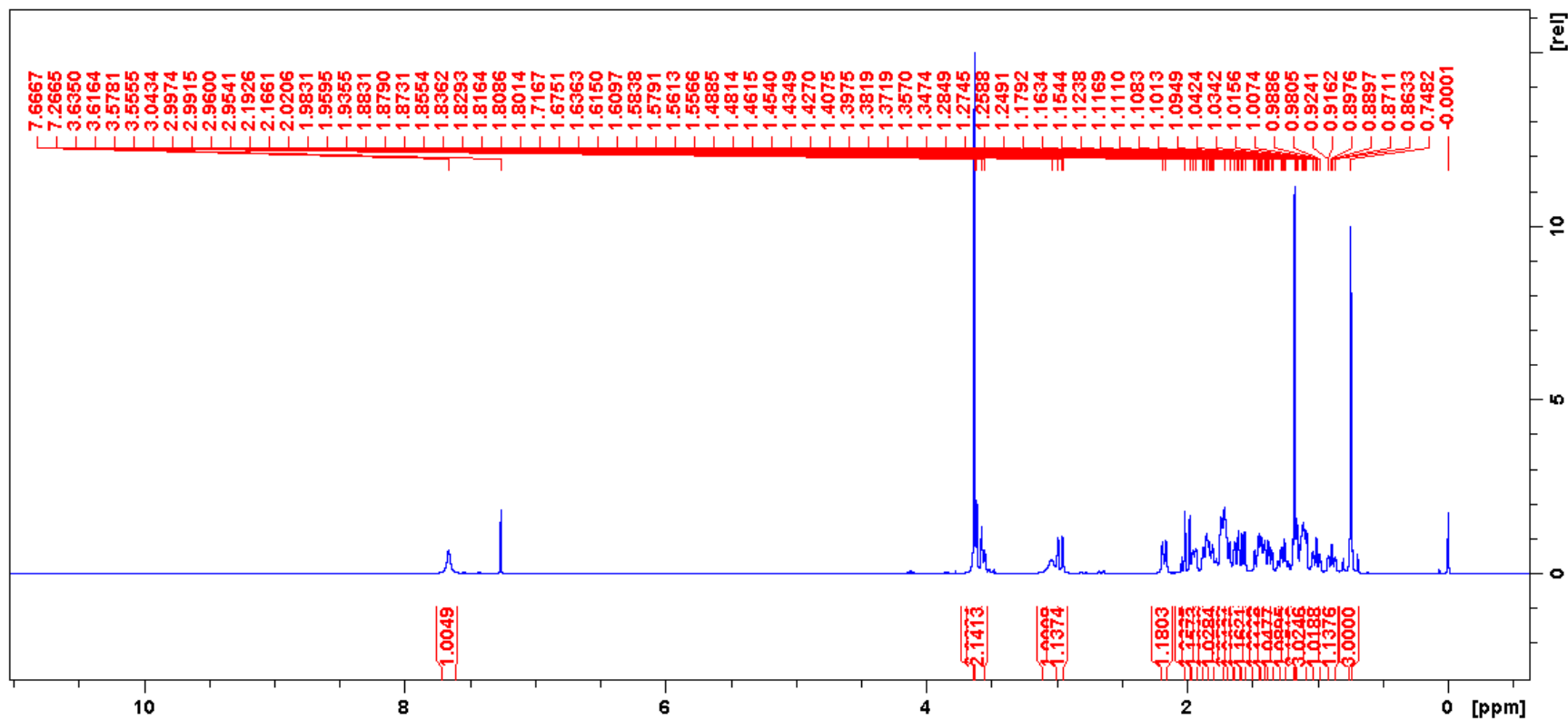
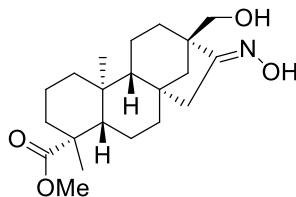
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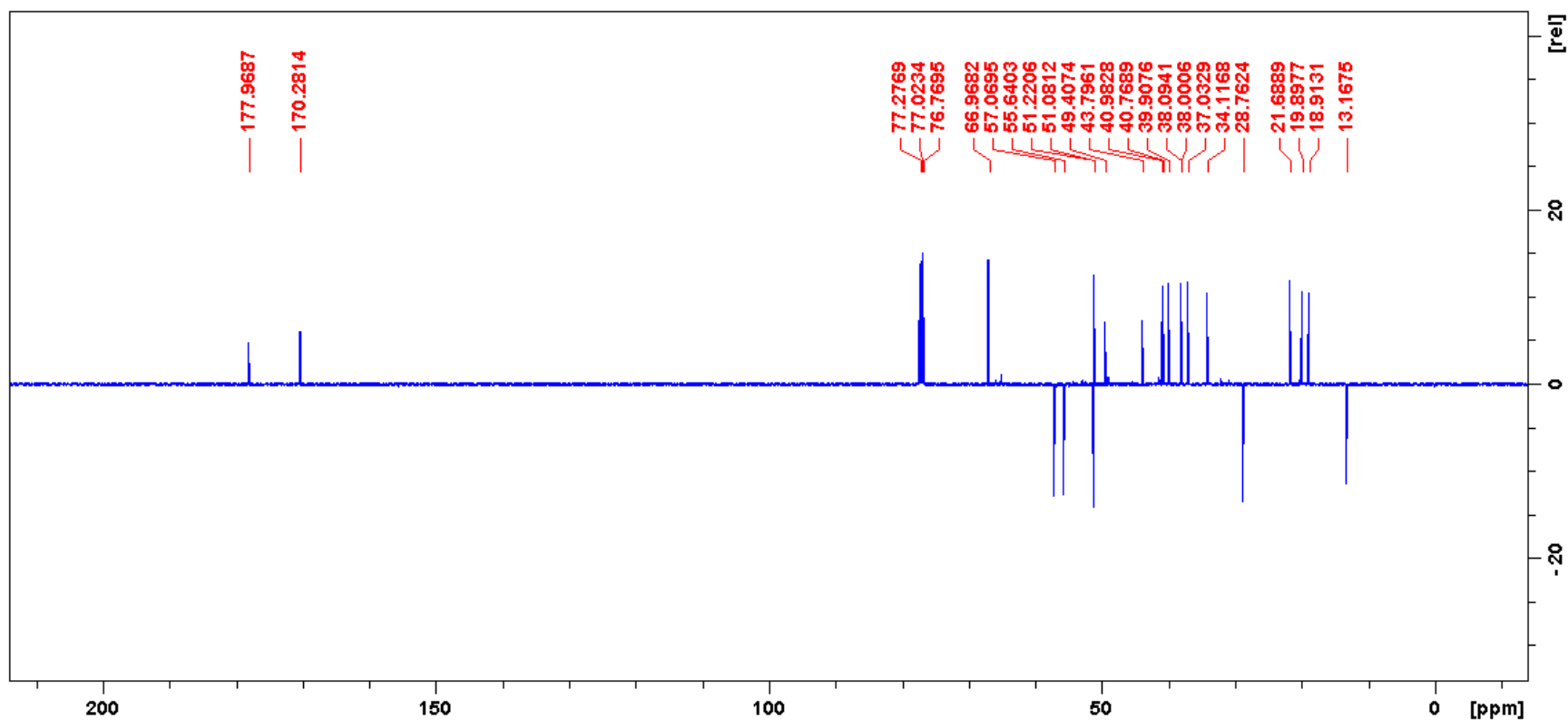
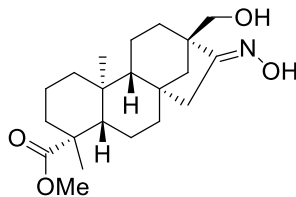
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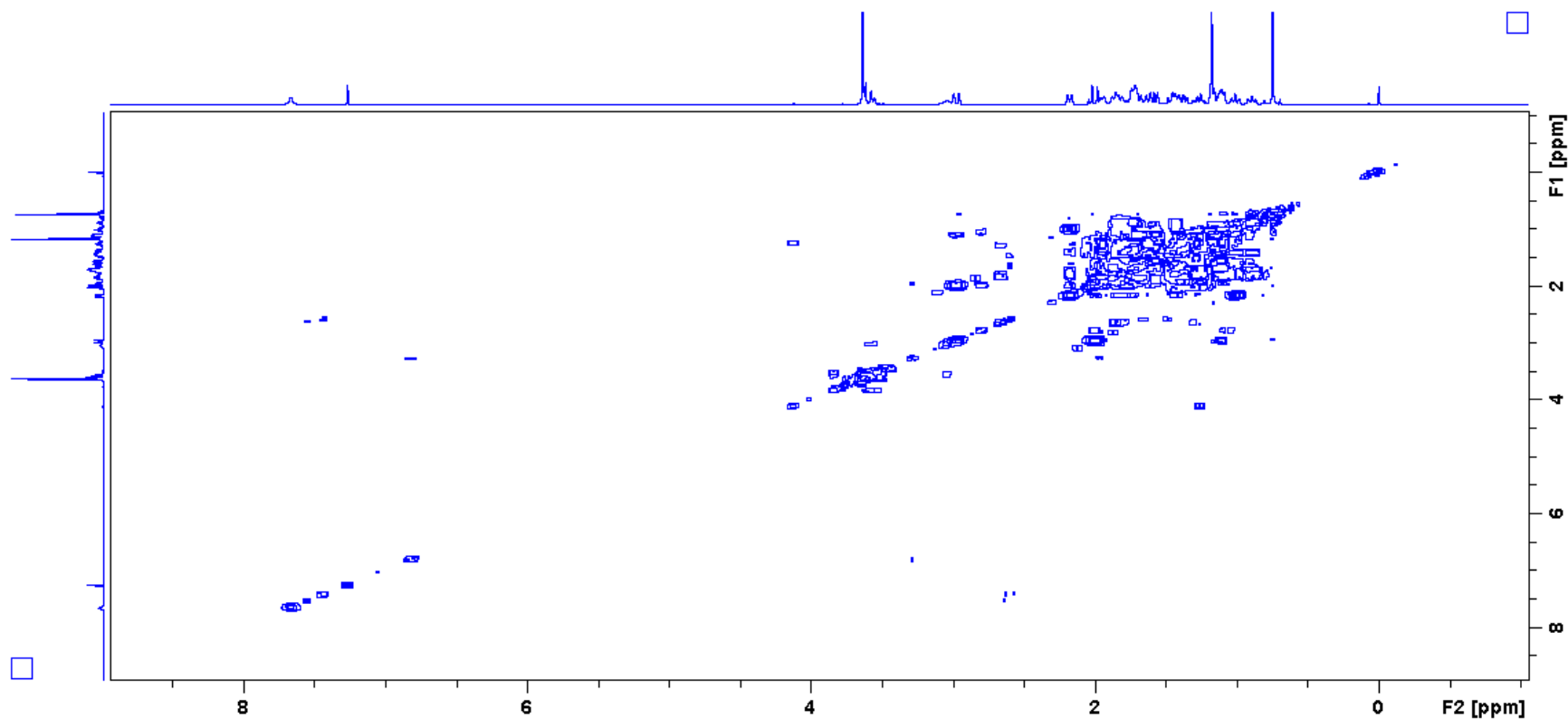
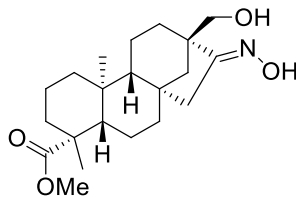
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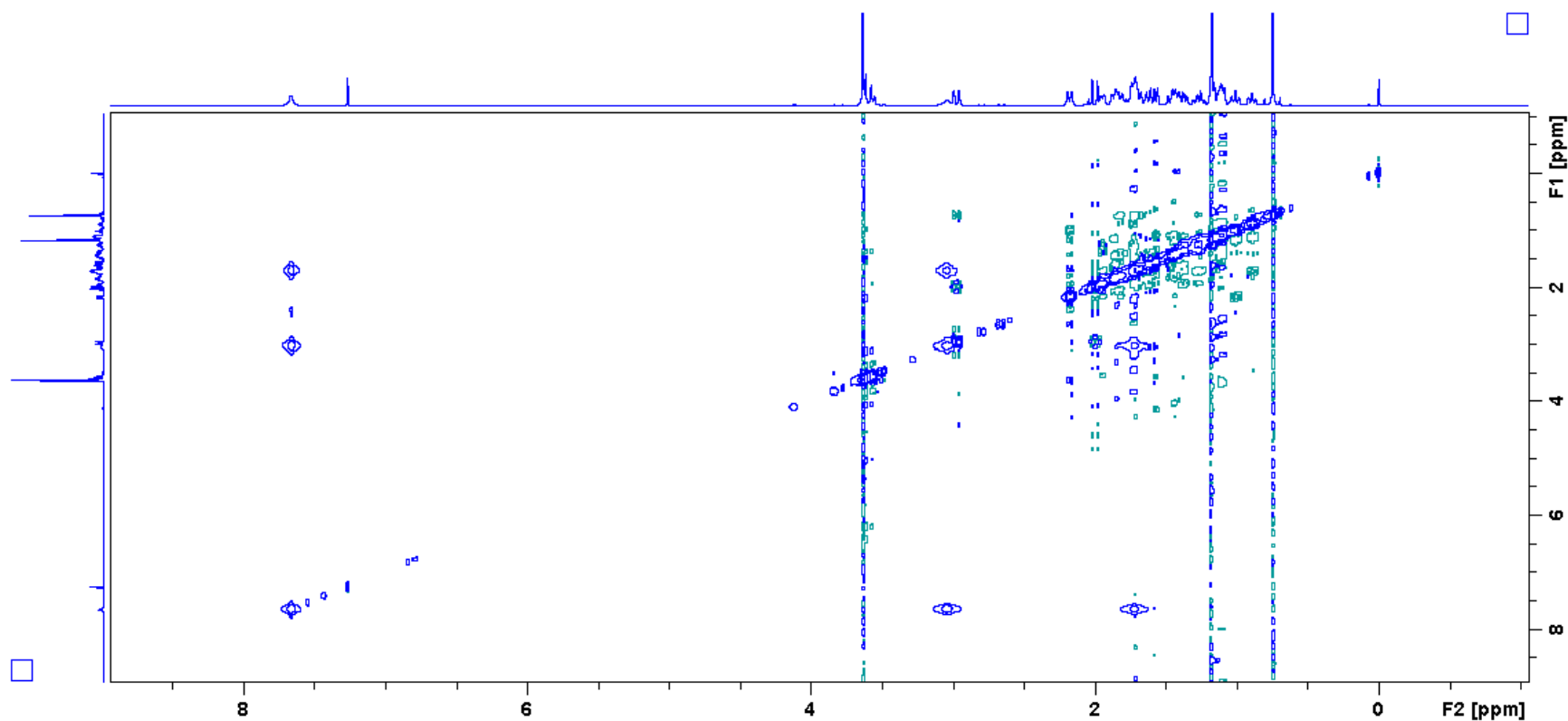
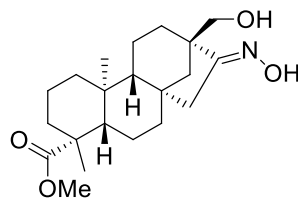
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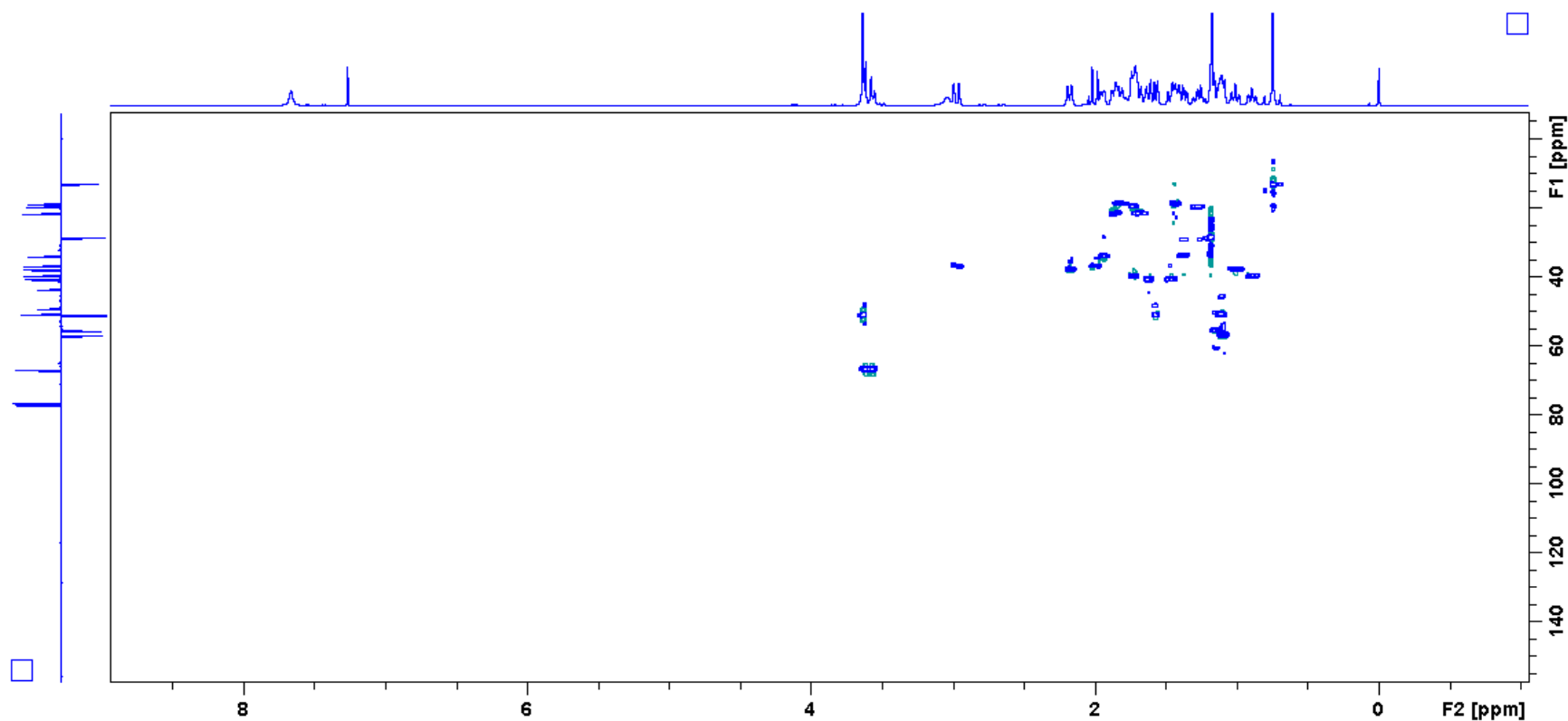
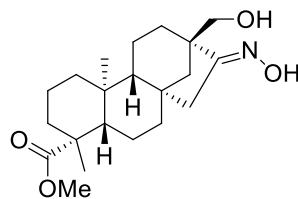
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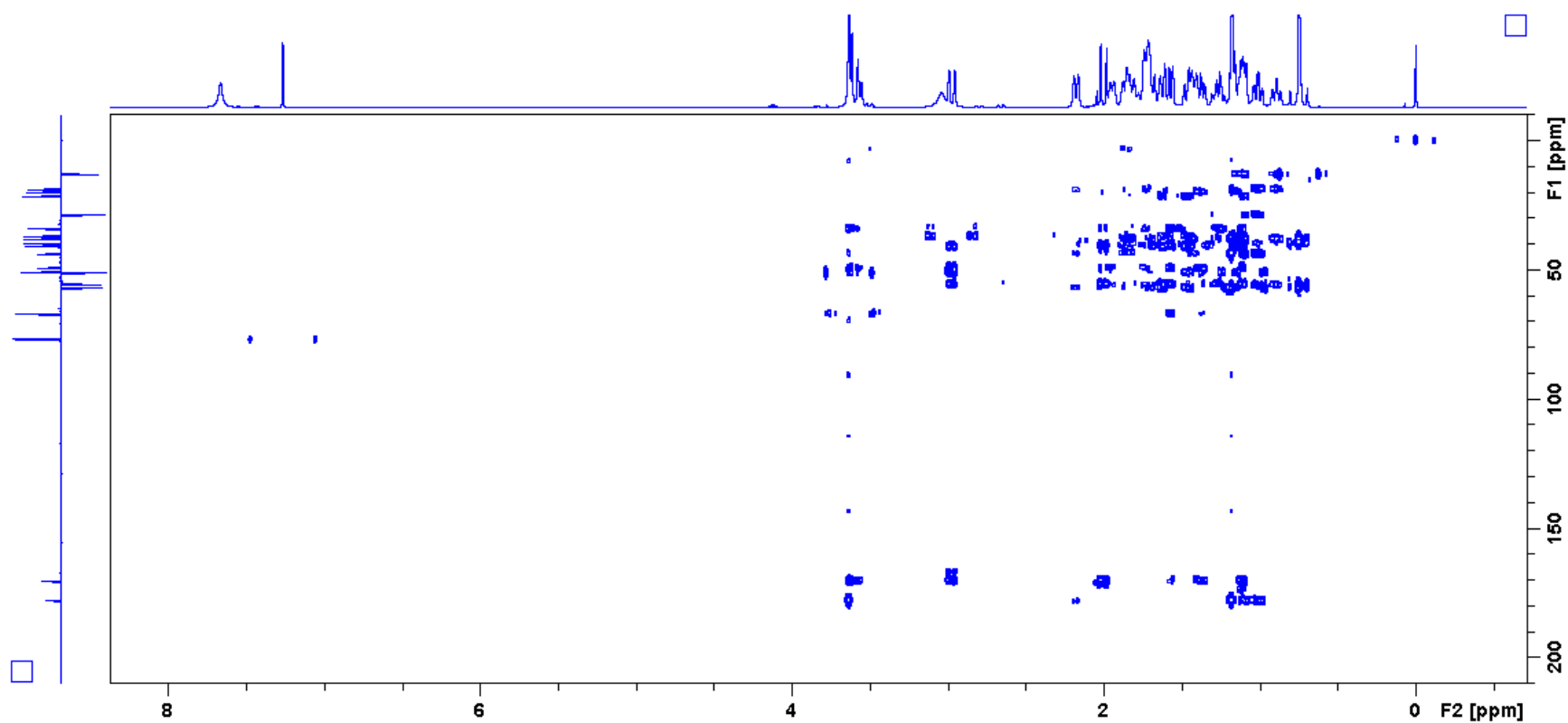
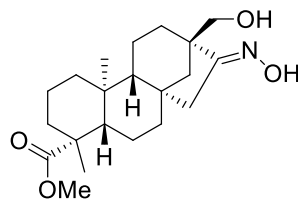
NOESY of compound (4*R*,4*aS*,6*aR*,9*R*,11*aR*,11*bS*,*E*)-methyl 8-(hydroxyimino)-9-(hydroxymethyl)-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**5**)



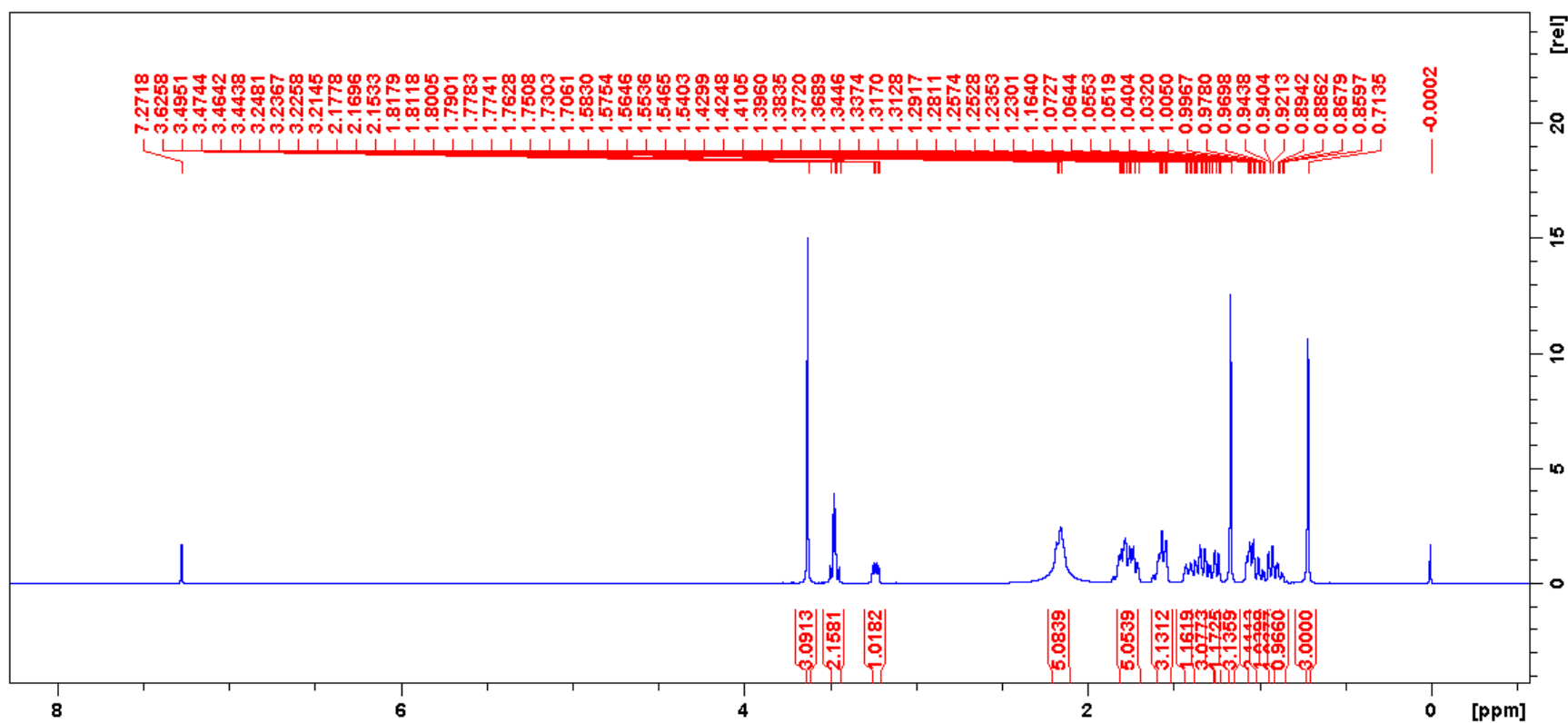
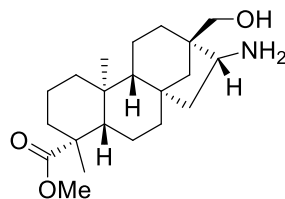
HSQC of compound (4*R*,4*aS*,6*aR*,9*R*,11*aR*,11*bS*,*E*)-methyl 8-(hydroxyimino)-9-(hydroxymethyl)-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**5**)



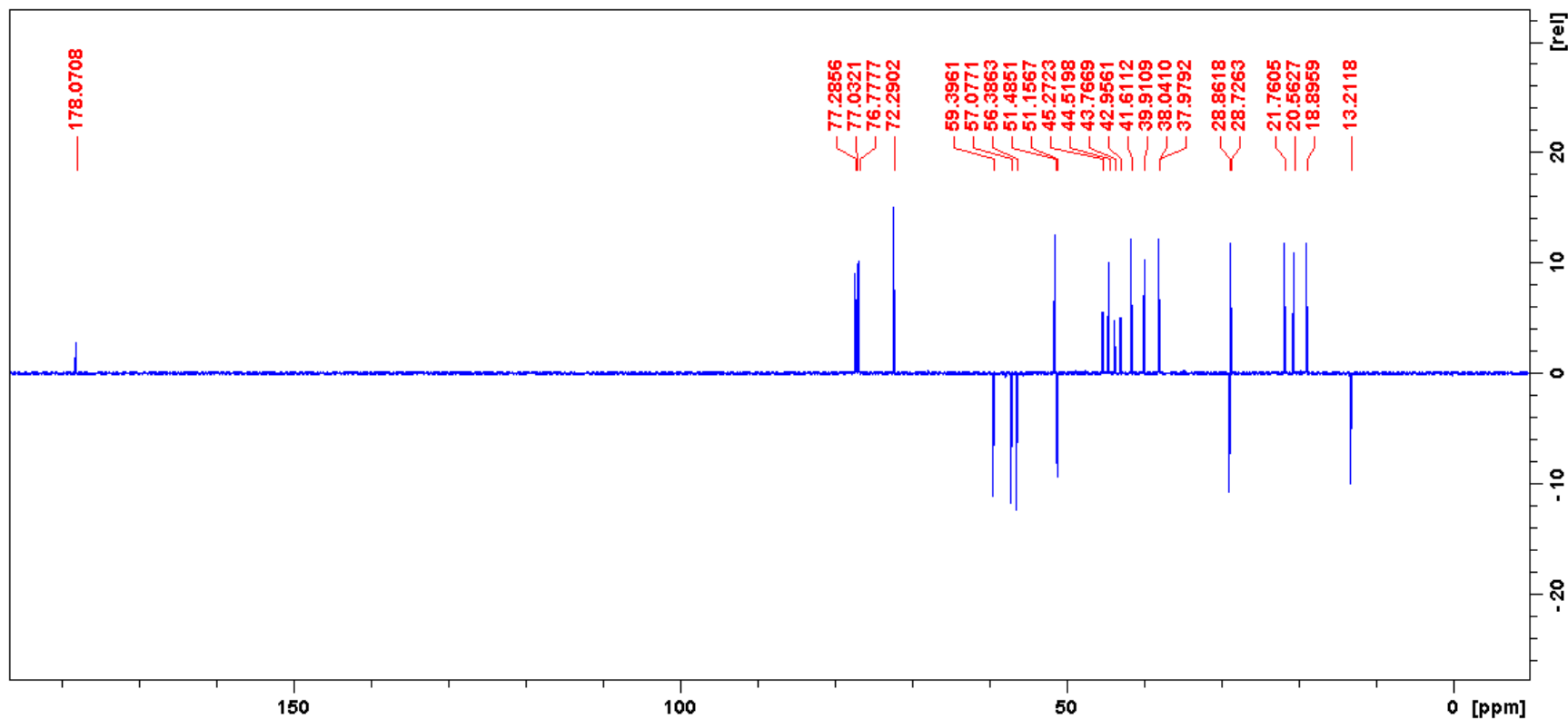
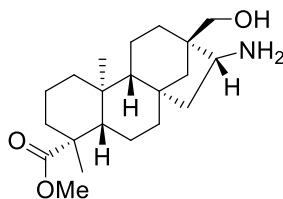
HMBC of compound (4*R*,4*aS*,6*aR*,9*R*,11*aR*,11*bS*,*E*)-methyl 8-(hydroxyimino)-9-(hydroxymethyl)-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**5**)



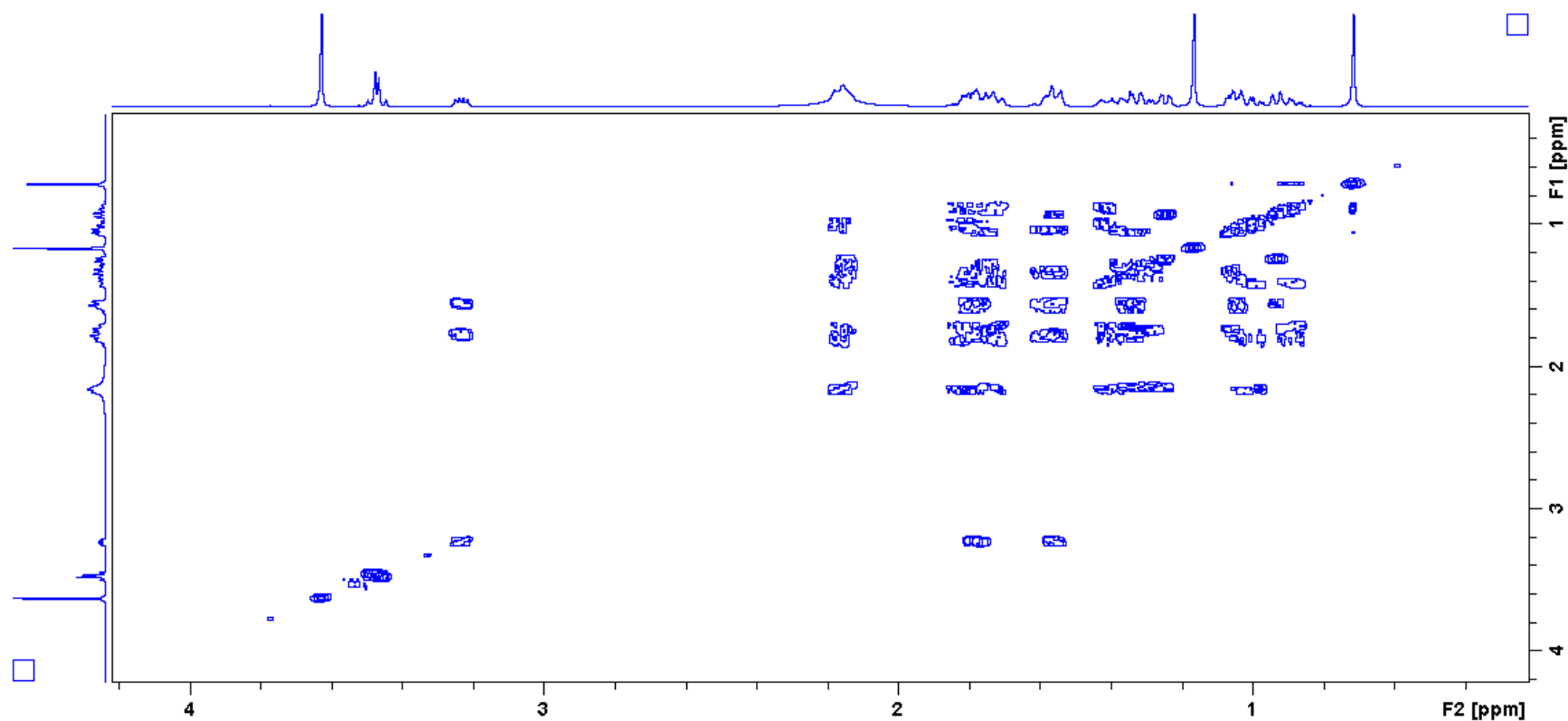
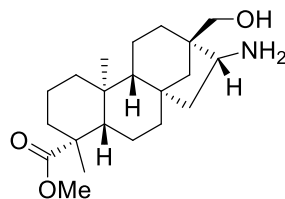
^1H -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 8-amino-9-(hydroxymethyl)-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**6**)



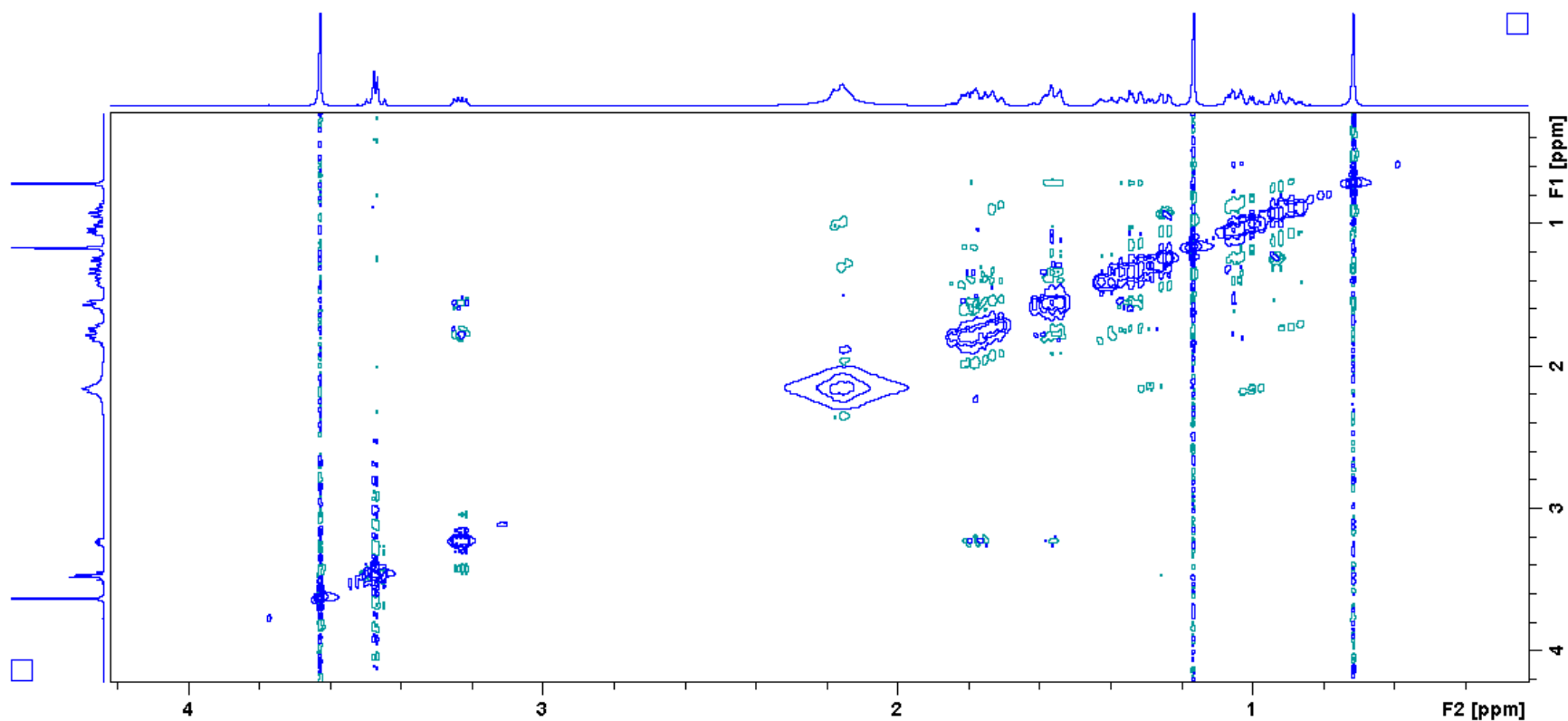
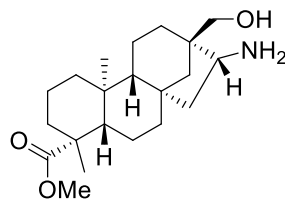
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 8-amino-9-(hydroxymethyl)-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**6**)



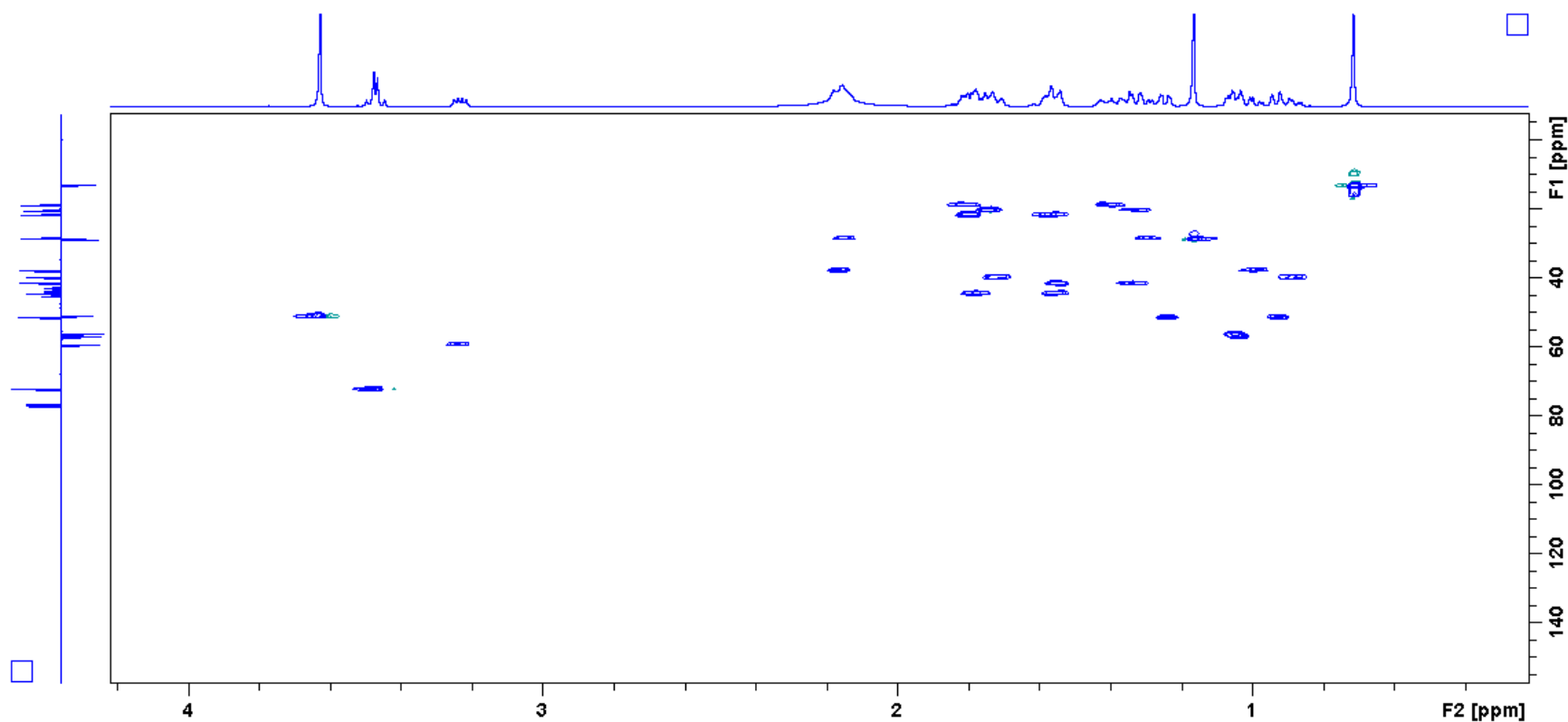
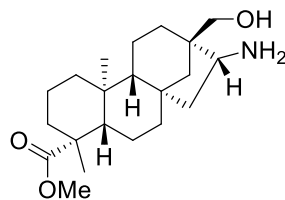
COSY of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 8-amino-9-(hydroxymethyl)-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**6**)



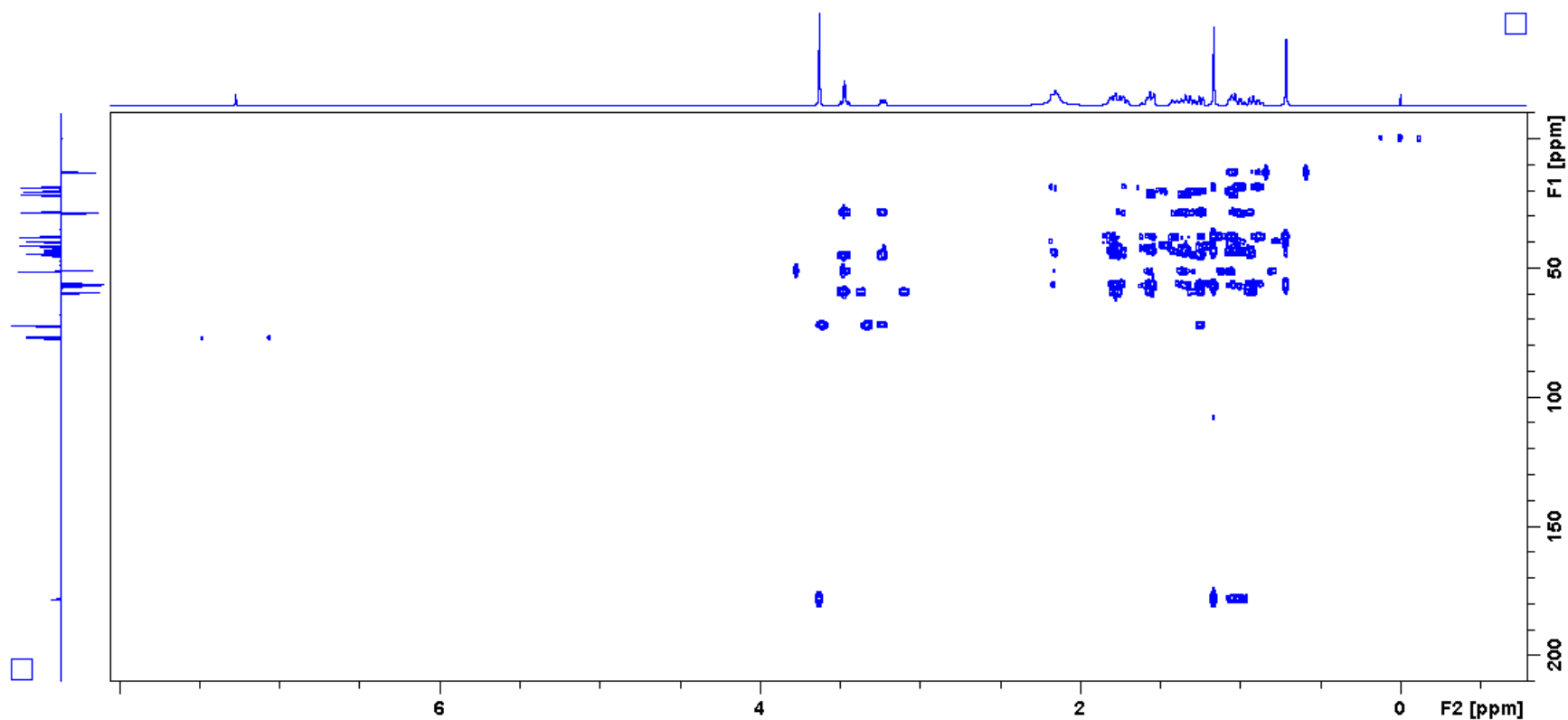
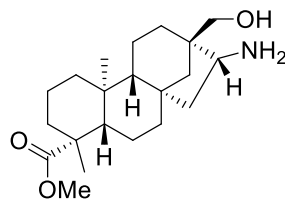
NOESY of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 8-amino-9-(hydroxymethyl)-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**6**)



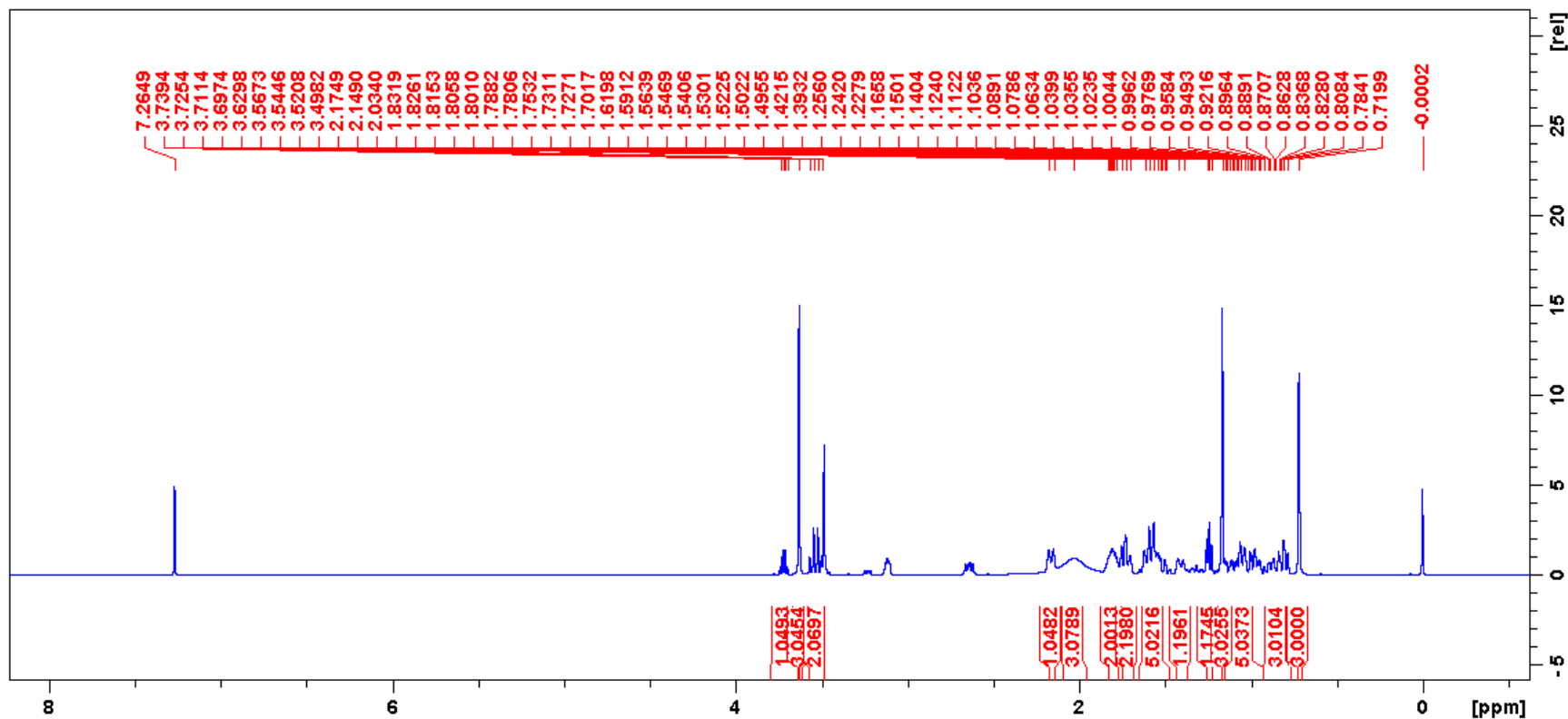
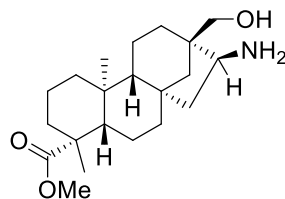
HSQC of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 8-amino-9-(hydroxymethyl)-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**6**)



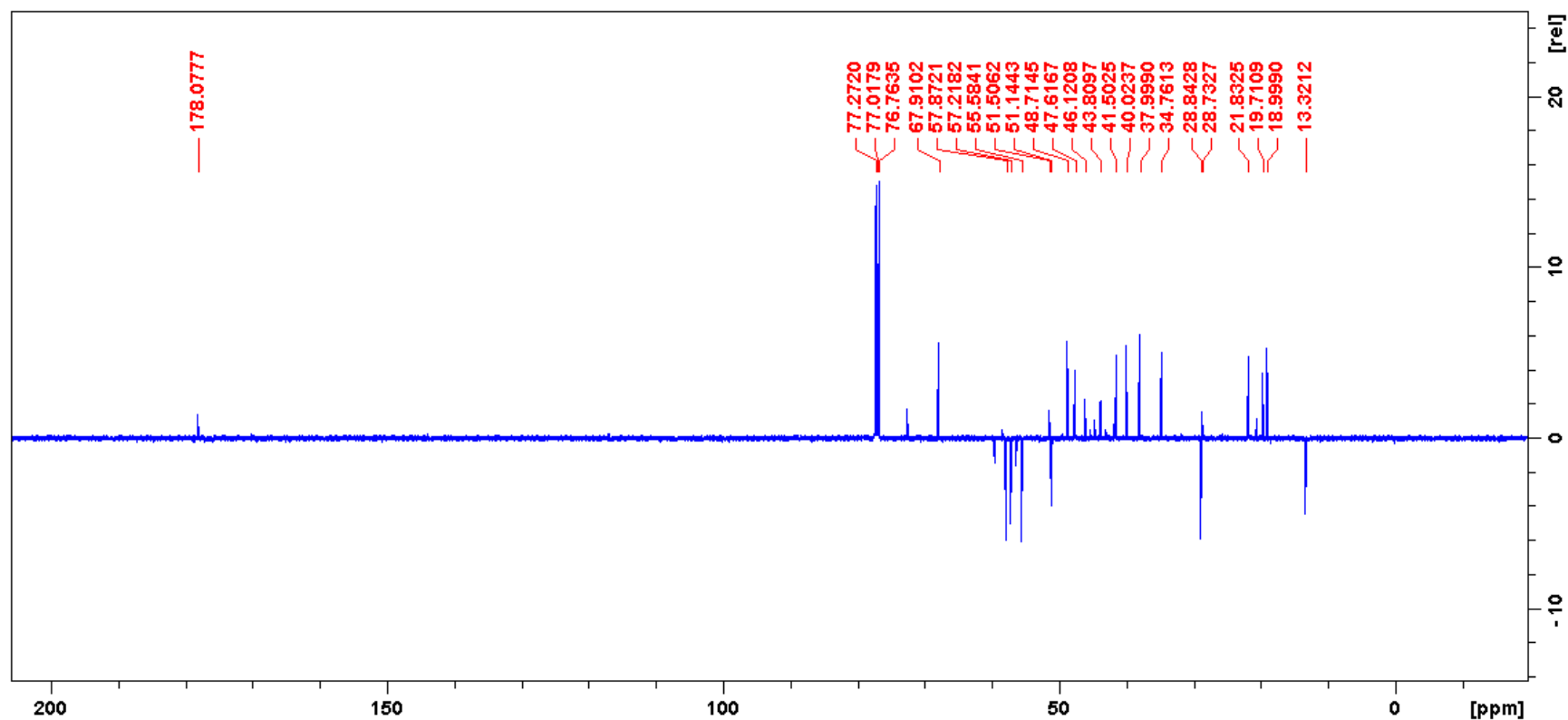
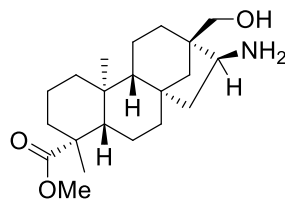
HMBC of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 8-amino-9-(hydroxymethyl)-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**6**)



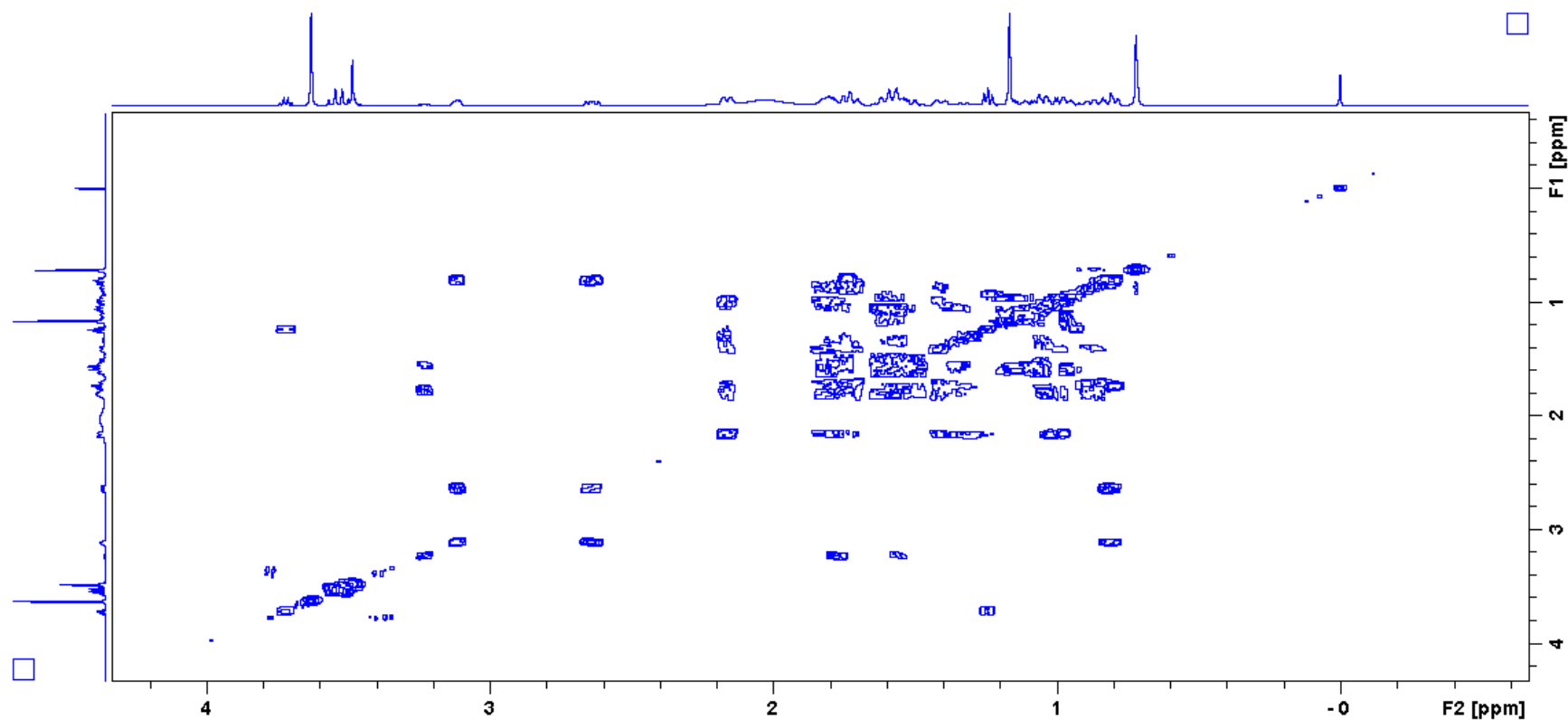
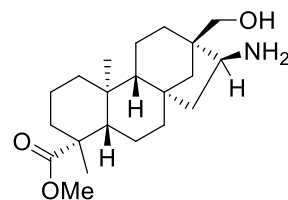
^1H -NMR of compound (4*R*,4*aS*,6*aR*,8*S*,9*R*,11*aR*,11*bS*)-methyl 8-amino-9-(hydroxymethyl)-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**7**)



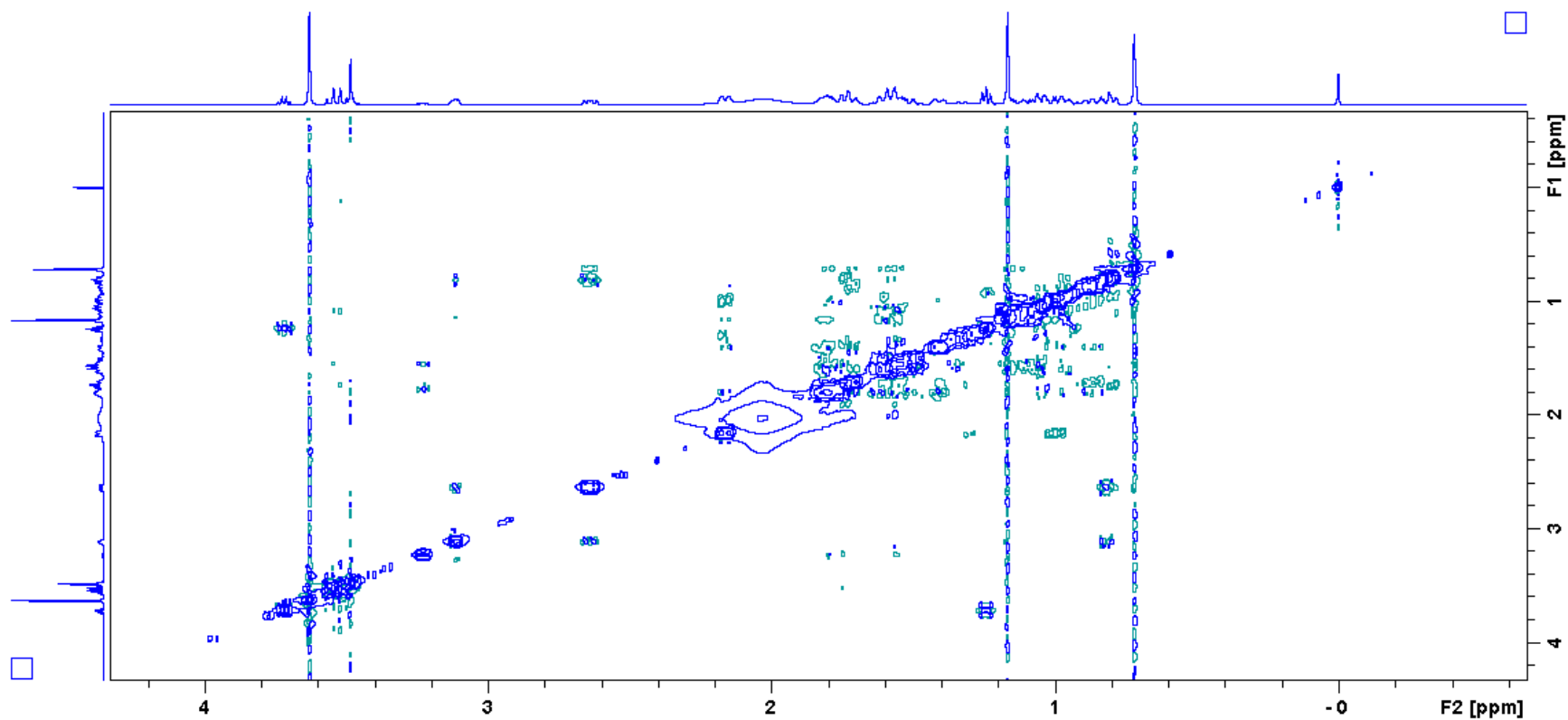
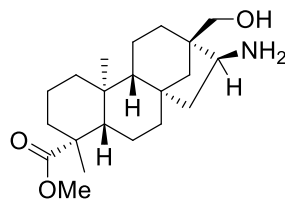
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,8*S*,9*R*,11*aR*,11*bS*)-methyl 8-amino-9-(hydroxymethyl)-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**7**)



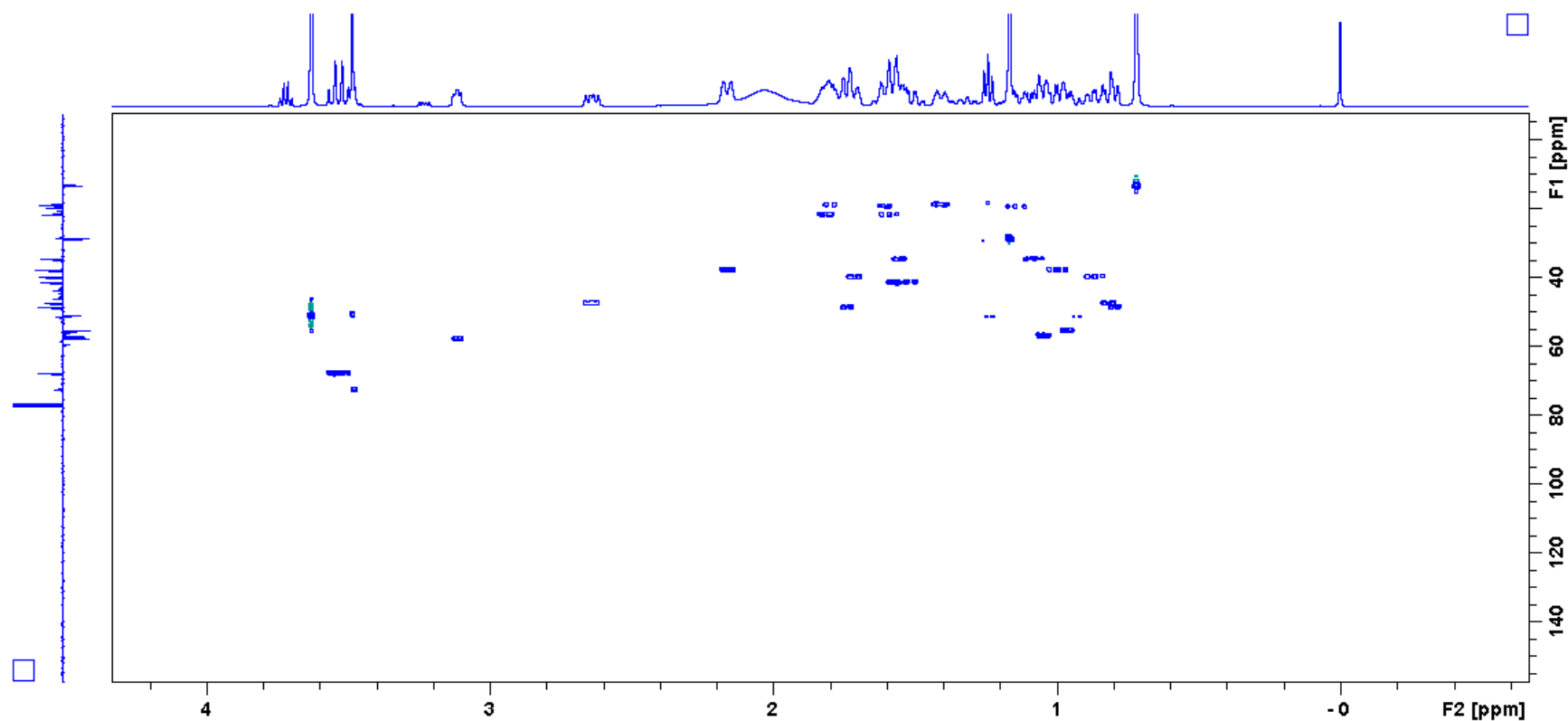
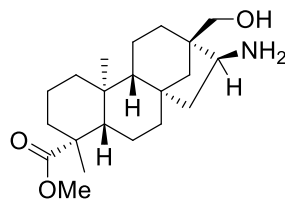
COSY of compound (4*R*,4*aS*,6*aR*,8*S*,9*R*,11*aR*,11*bS*)-methyl 8-amino-9-(hydroxymethyl)-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**7**)



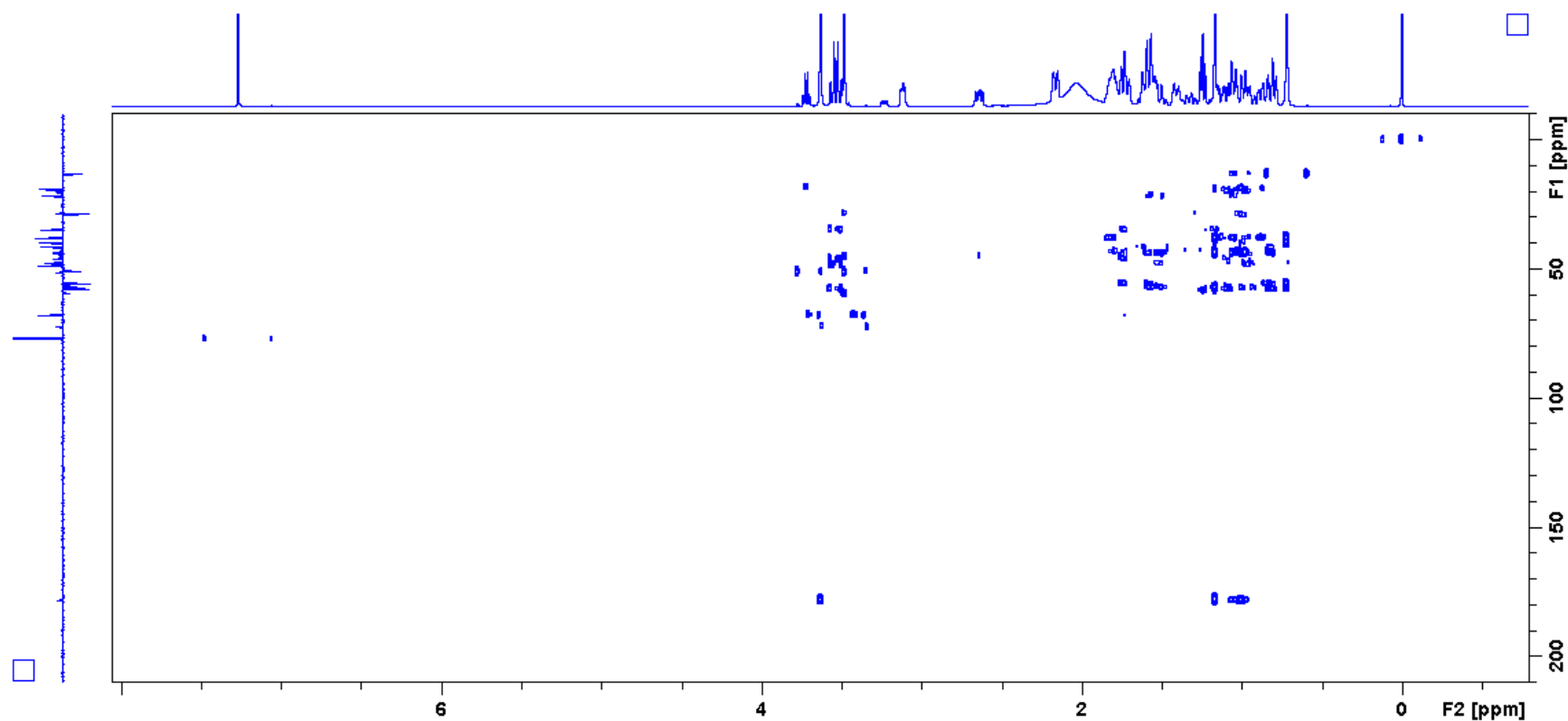
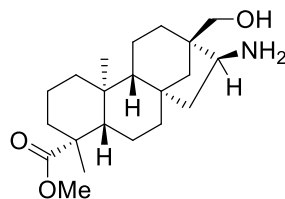
NOESY of compound (4*R*,4*aS*,6*aR*,8*S*,9*R*,11*aR*,11*bS*)-methyl 8-amino-9-(hydroxymethyl)-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**7**)



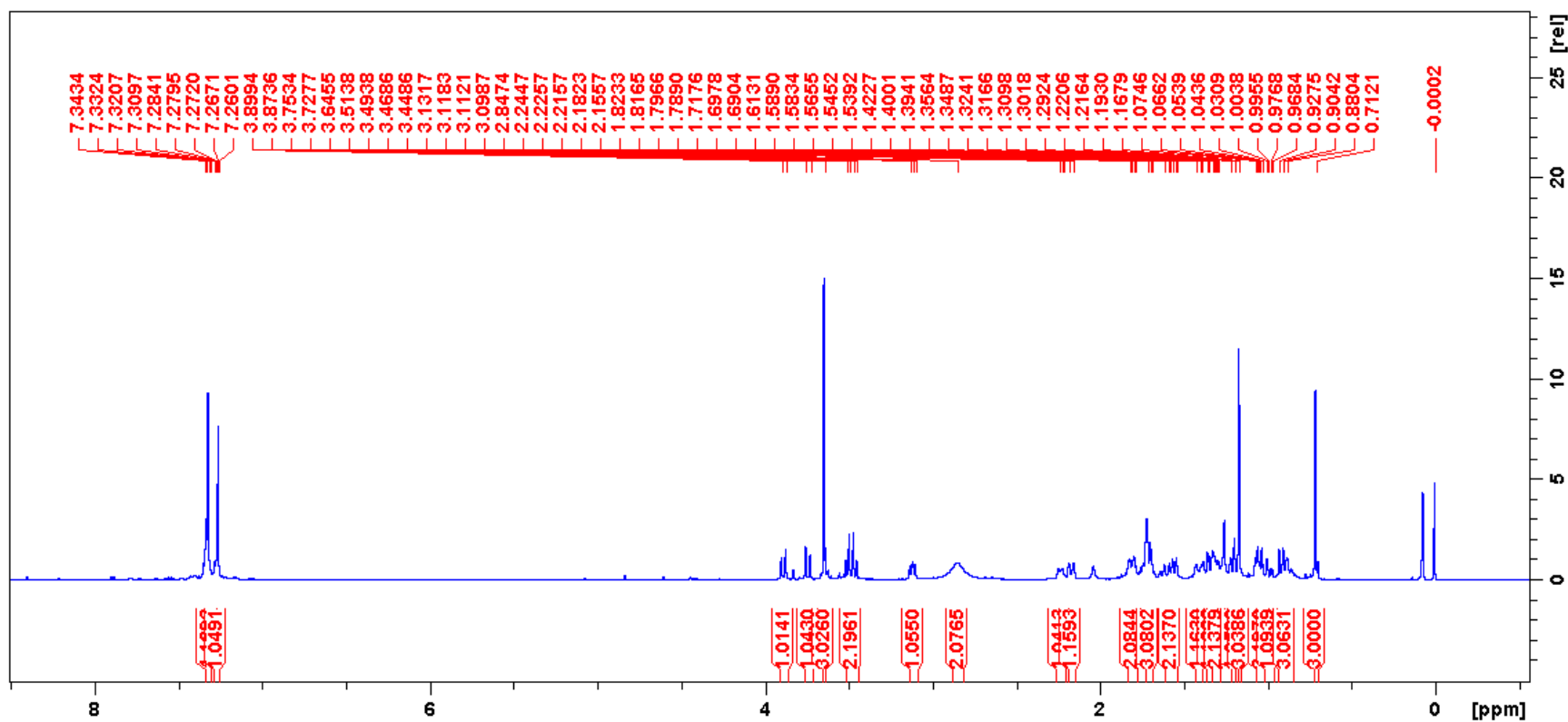
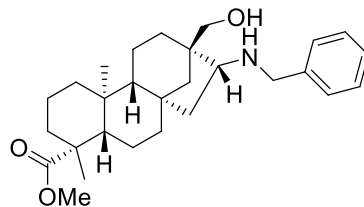
HSQC of compound (4*R*,4*aS*,6*aR*,8*S*,9*R*,11*aR*,11*bS*)-methyl 8-amino-9-(hydroxymethyl)-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**7**)

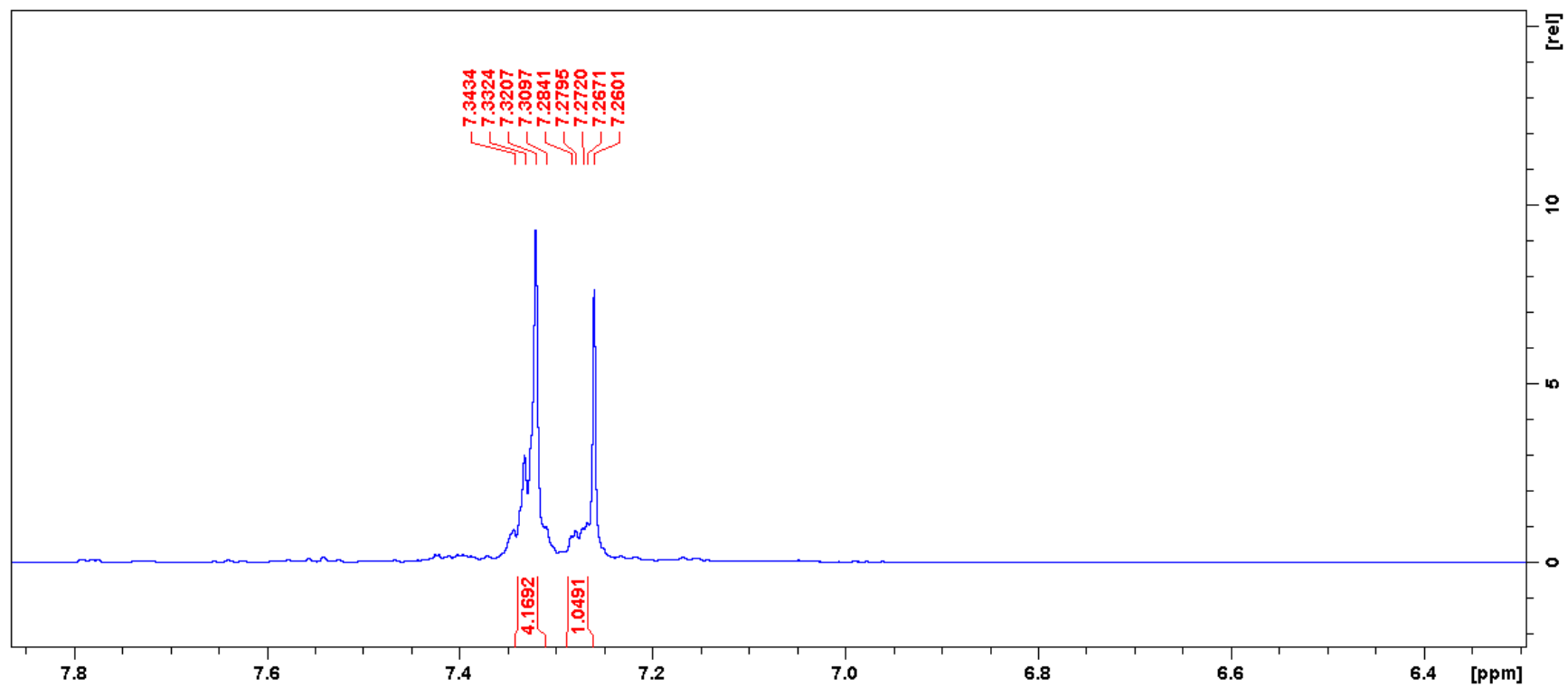


HMBC of compound (4*R*,4*aS*,6*aR*,8*S*,9*R*,11*aR*,11*bS*)-methyl 8-amino-9-(hydroxymethyl)-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**7**)

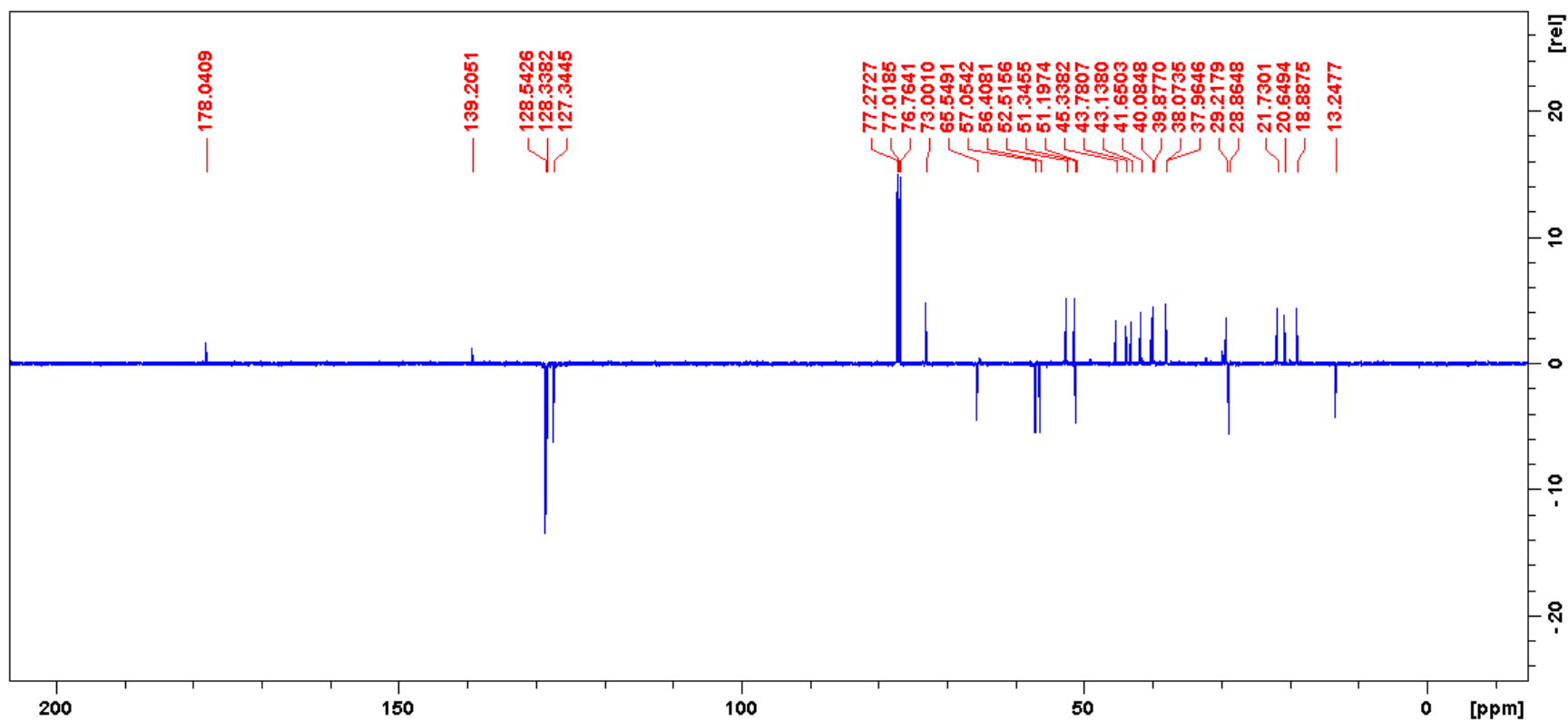
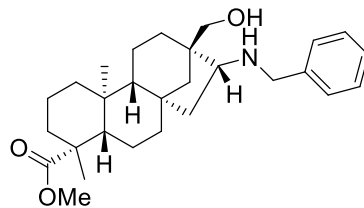


^1H -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 8-(benzylamino)-9-(hydroxymethyl)-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**8**)

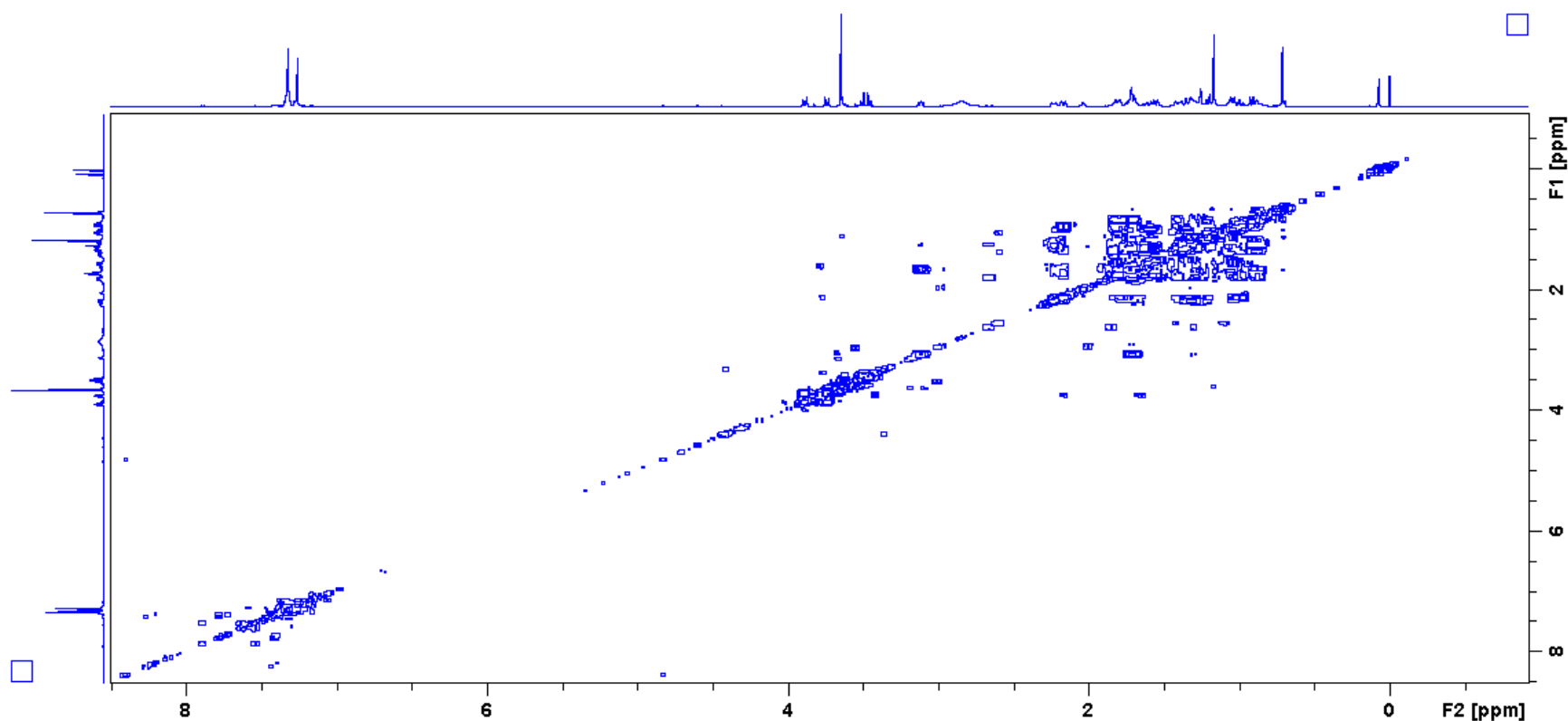
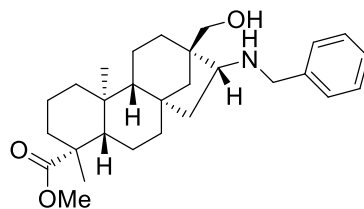




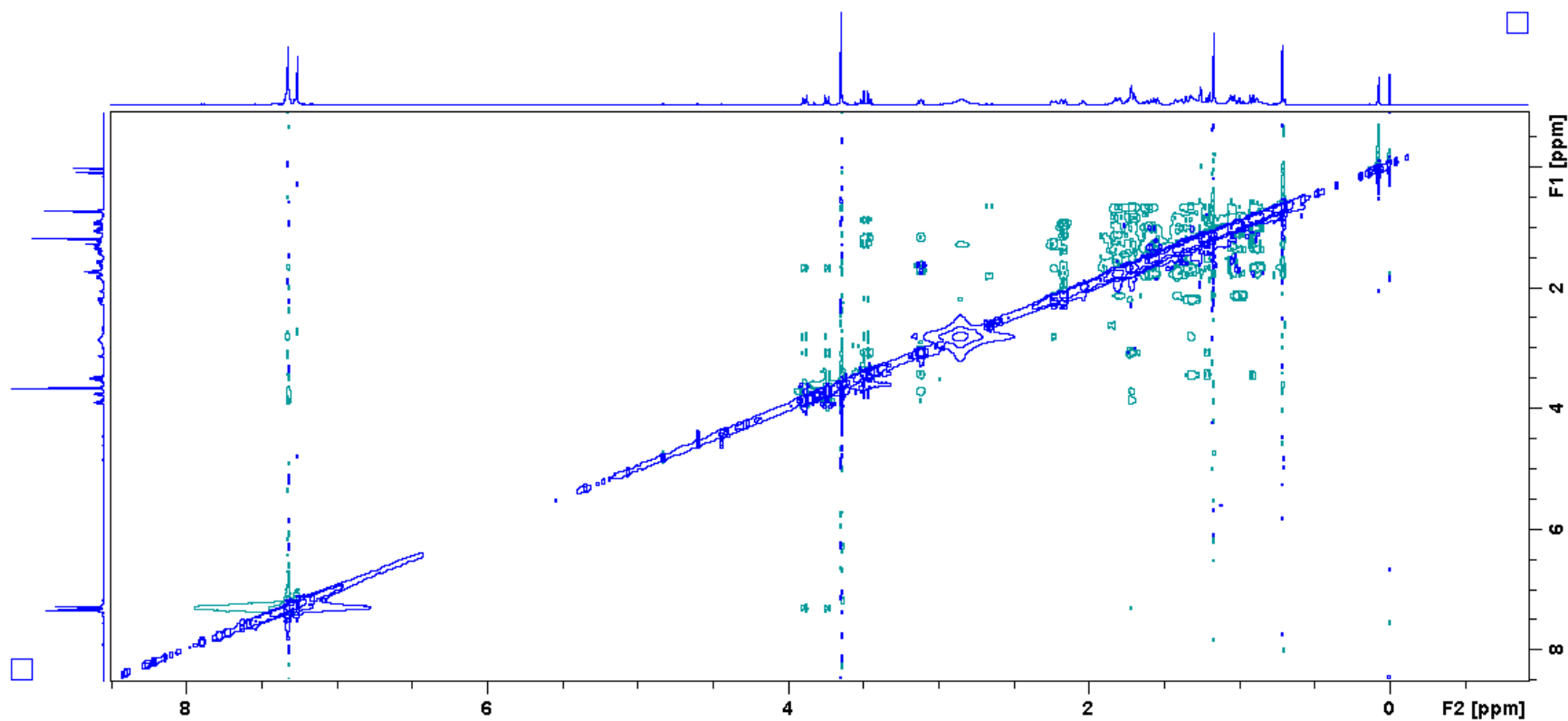
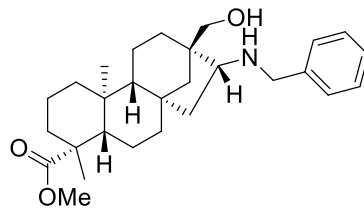
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 8-(benzylamino)-9-(hydroxymethyl)-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**8**)



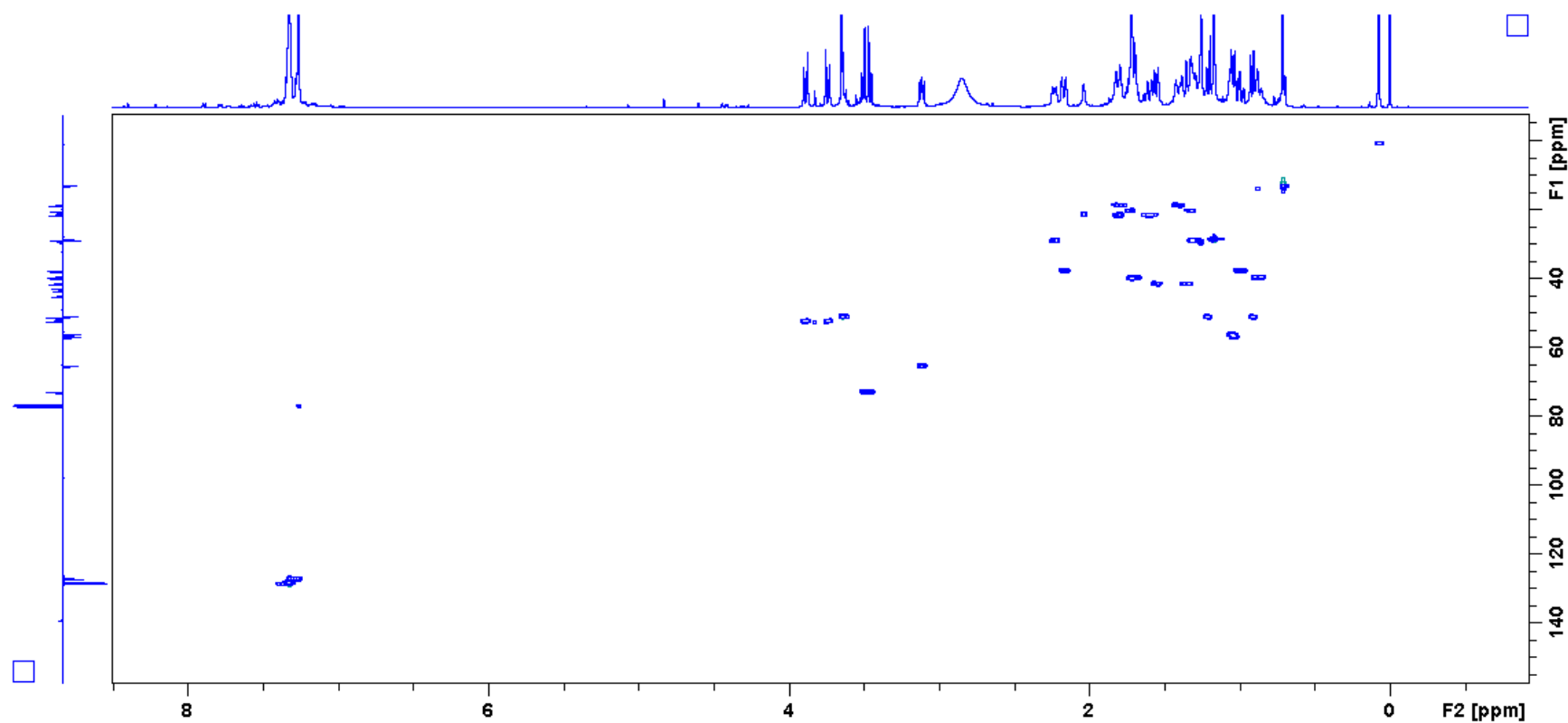
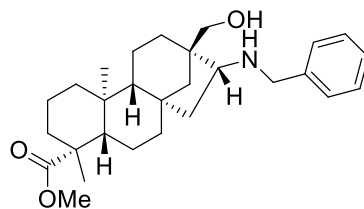
COSY of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 8-(benzylamino)-9-(hydroxymethyl)-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**8**)



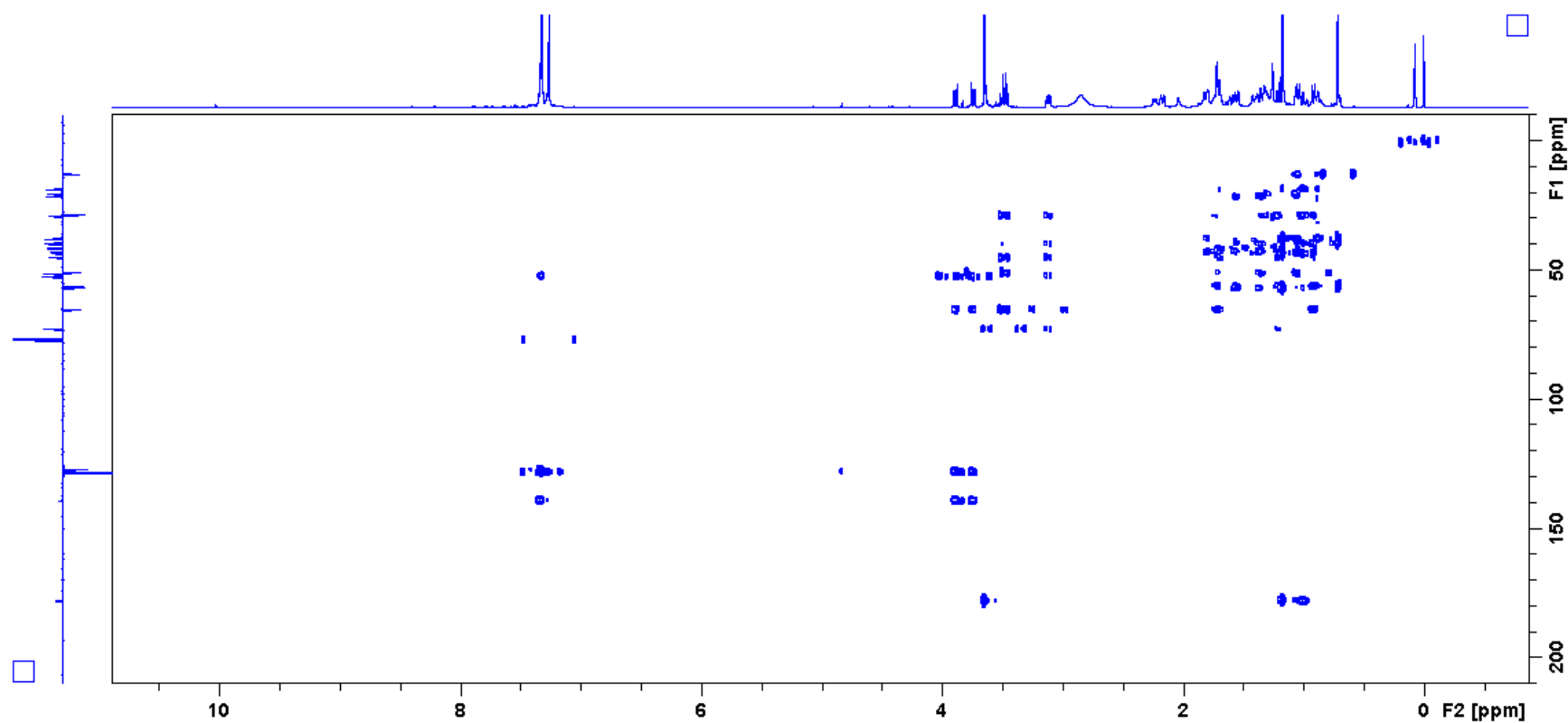
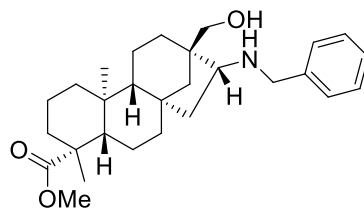
NOESY of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 8-(benzylamino)-9-(hydroxymethyl)-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**8**)



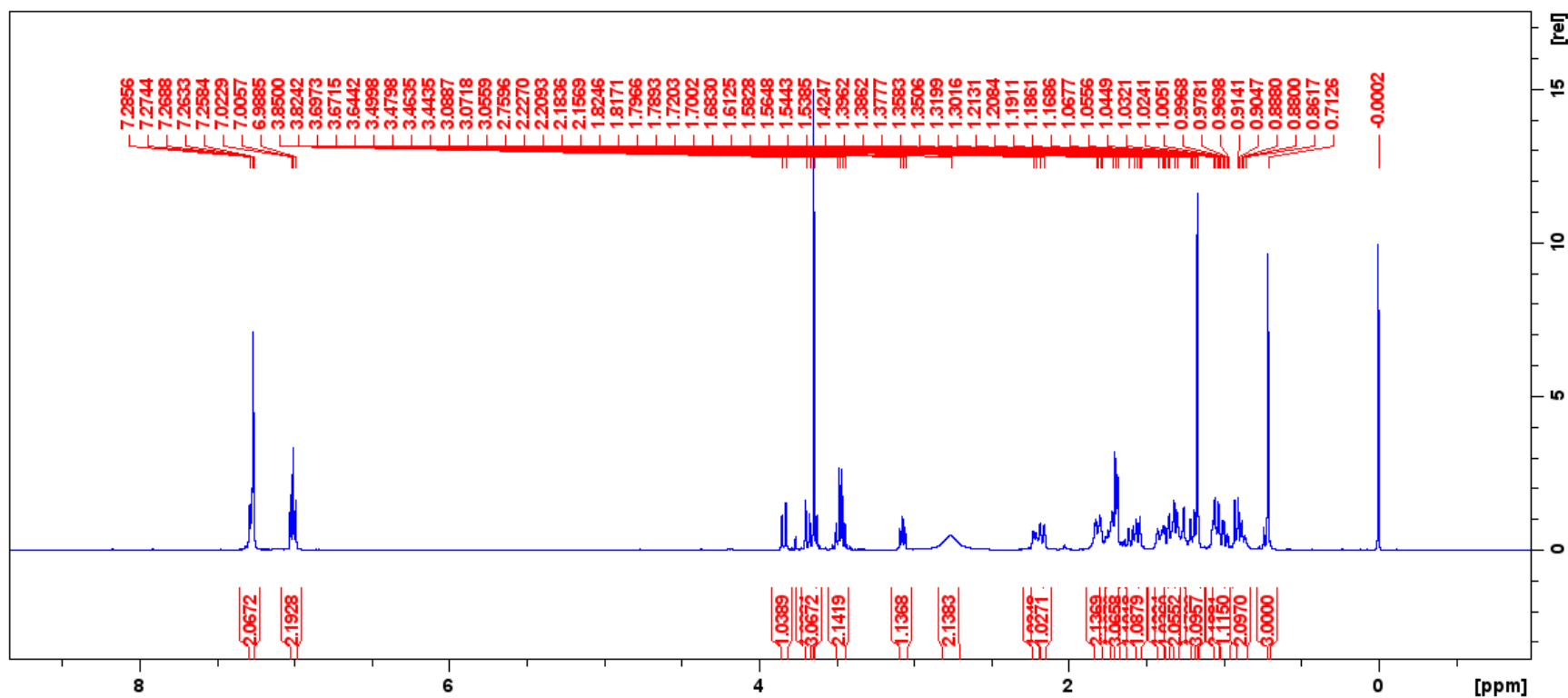
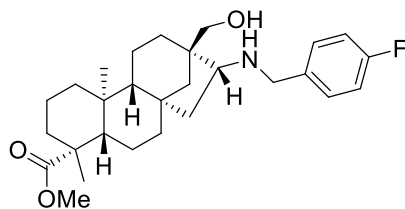
HSQC of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 8-(benzylamino)-9-(hydroxymethyl)-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**8**)



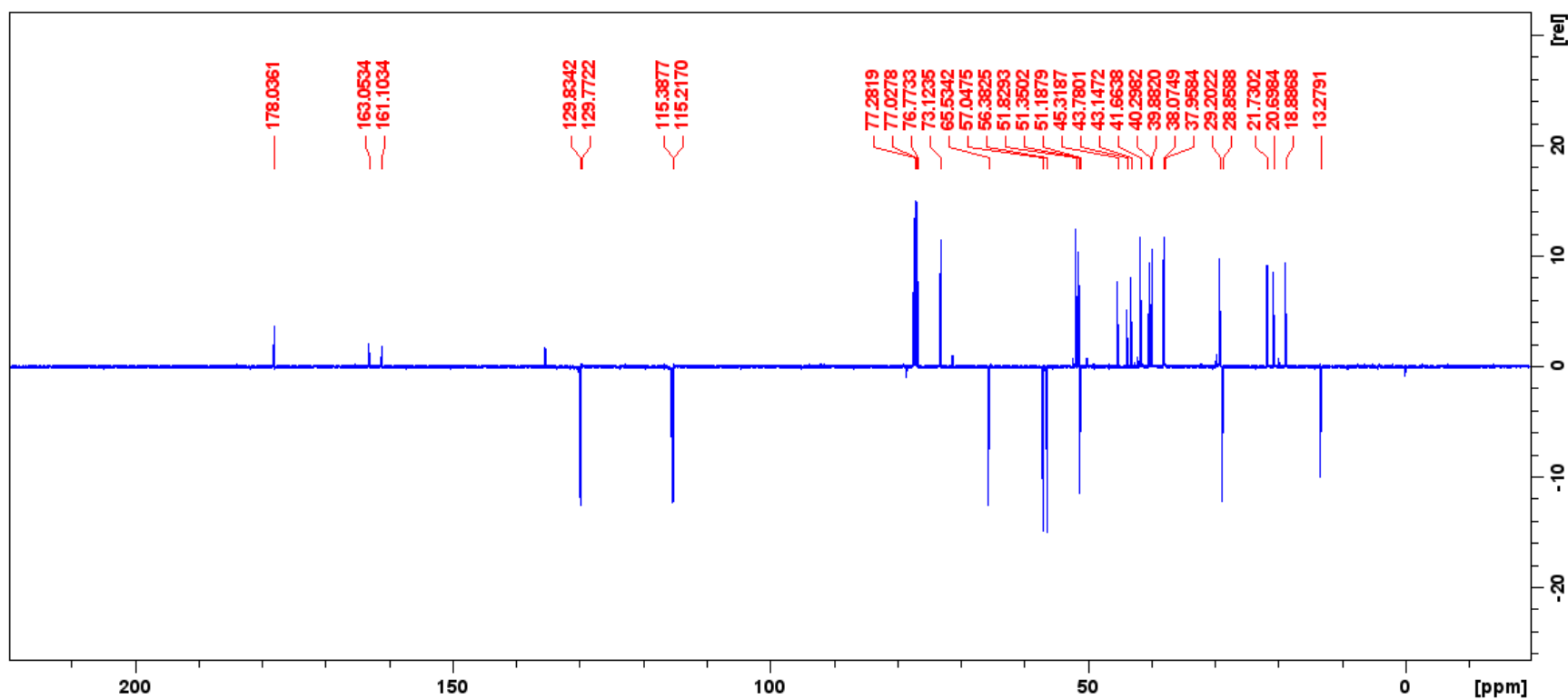
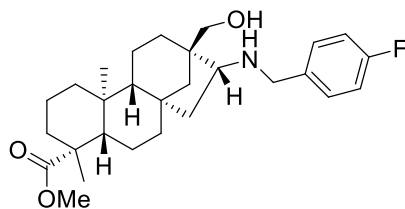
HMBC of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 8-(benzylamino)-9-(hydroxymethyl)-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**8**)



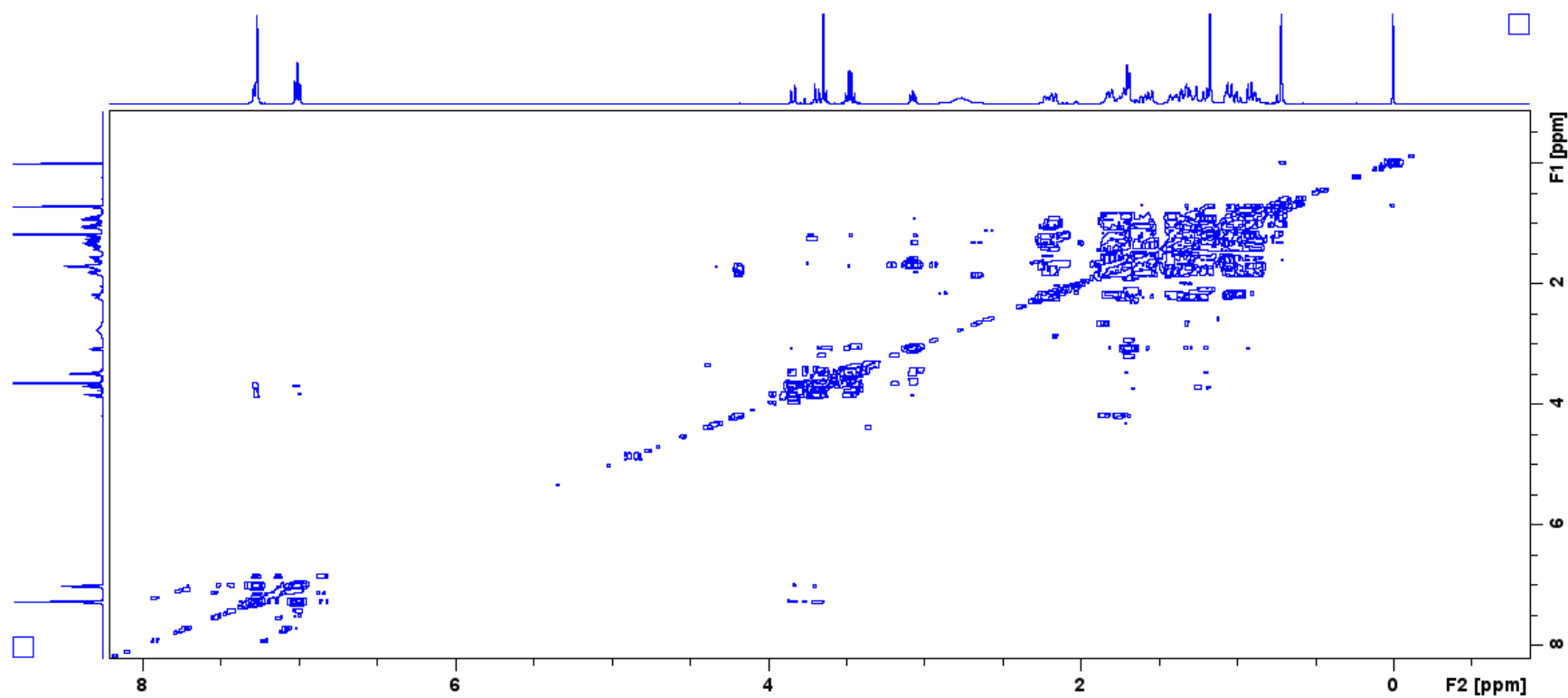
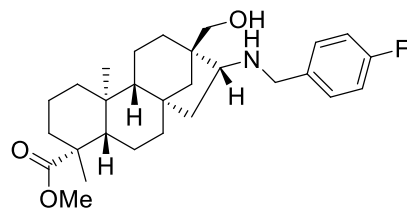
^1H -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 8-((4-fluorobenzyl)amino)-9-(hydroxymethyl)-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**9**)



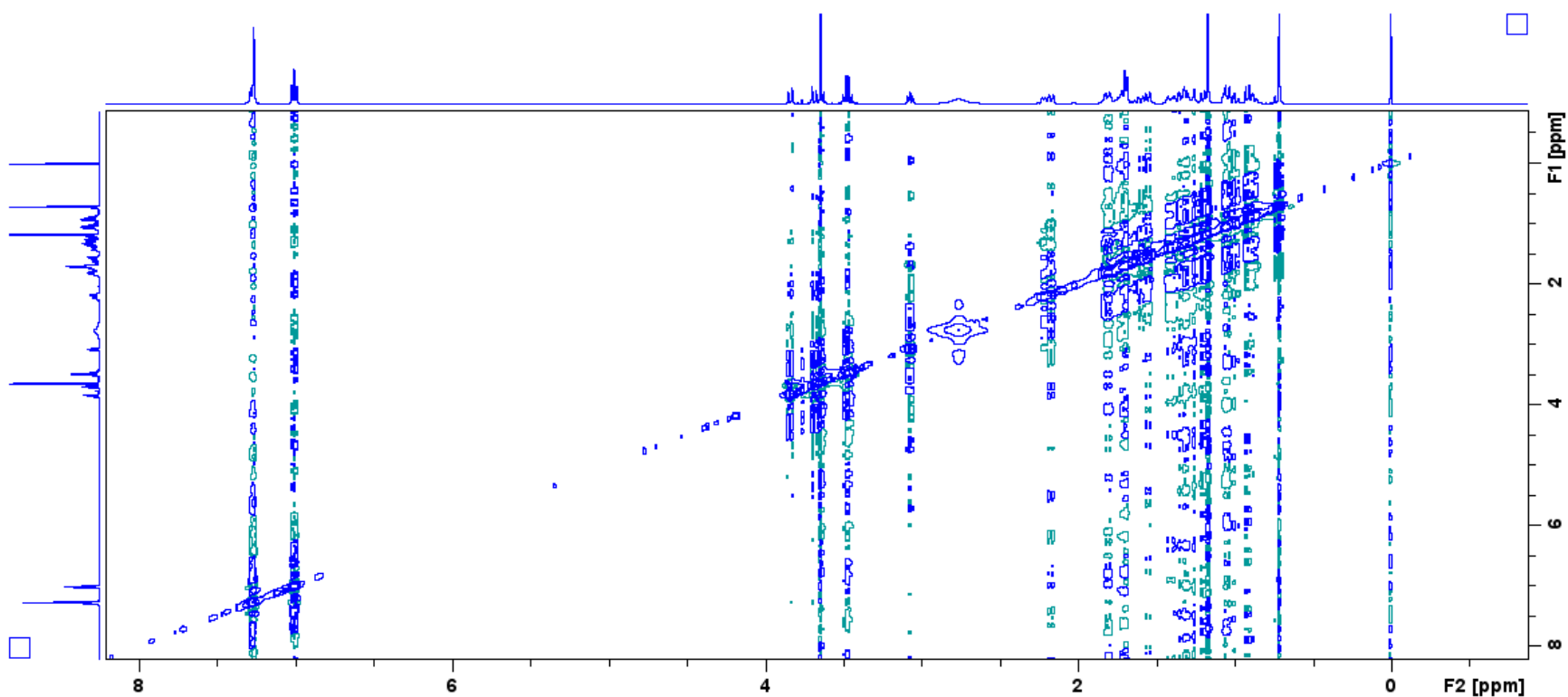
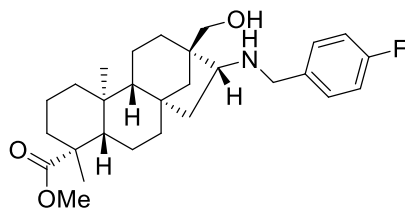
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 8-((4-fluorobenzyl)amino)-9-(hydroxymethyl)-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**9**)



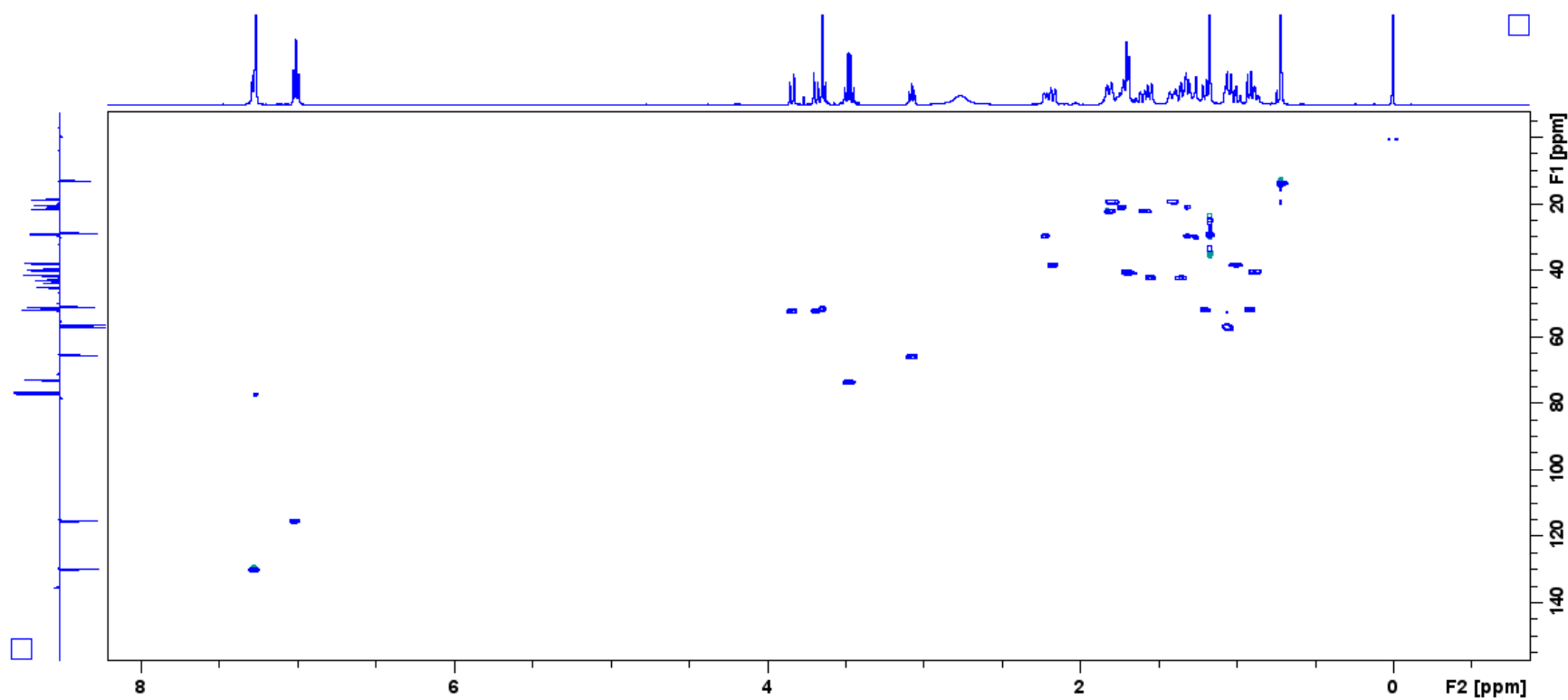
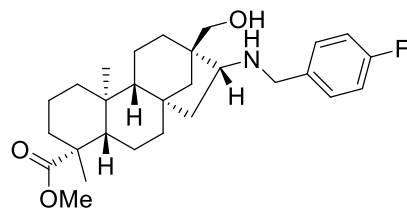
COSY of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 8-((4-fluorobenzyl)amino)-9-(hydroxymethyl)-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**9**)



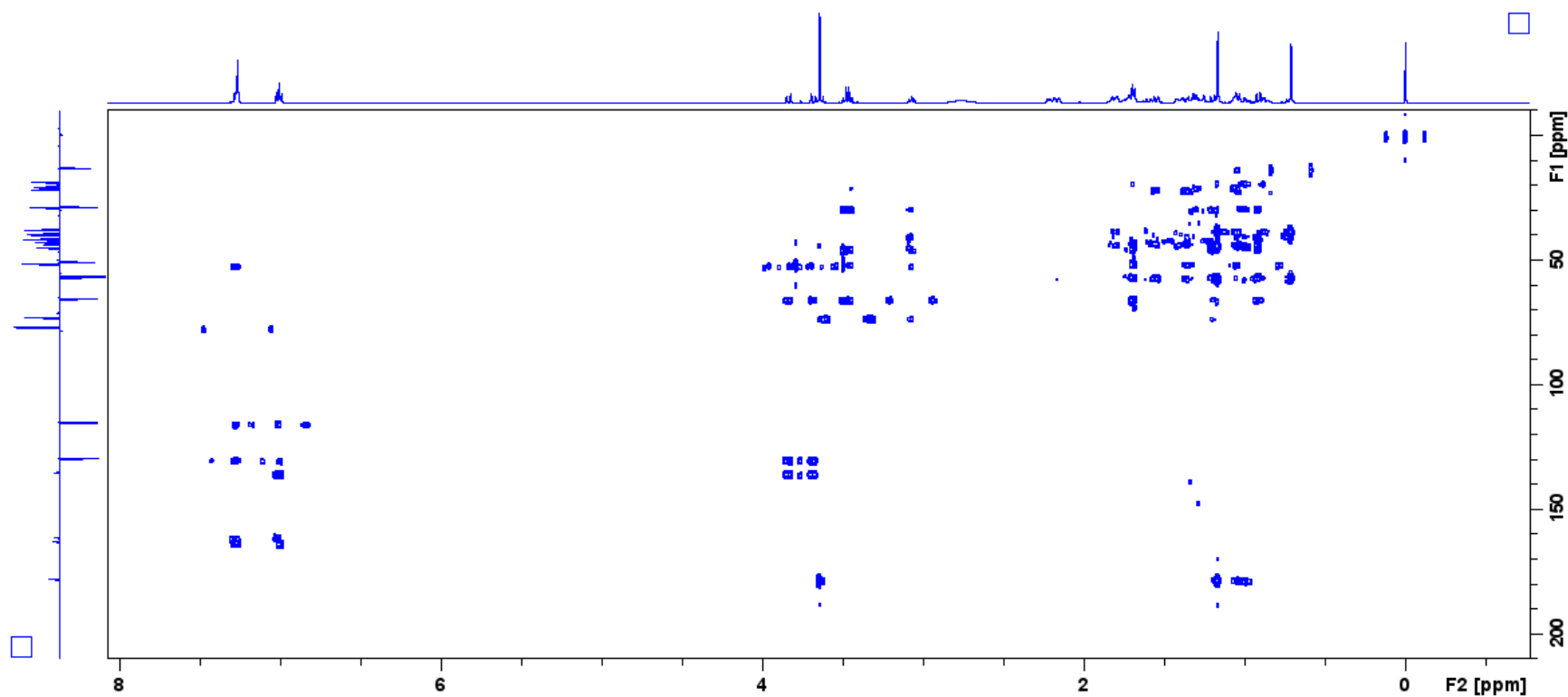
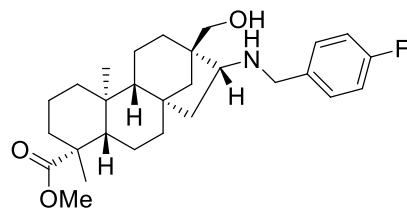
NOESY of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 8-((4-fluorobenzyl)amino)-9-(hydroxymethyl)-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**9**)



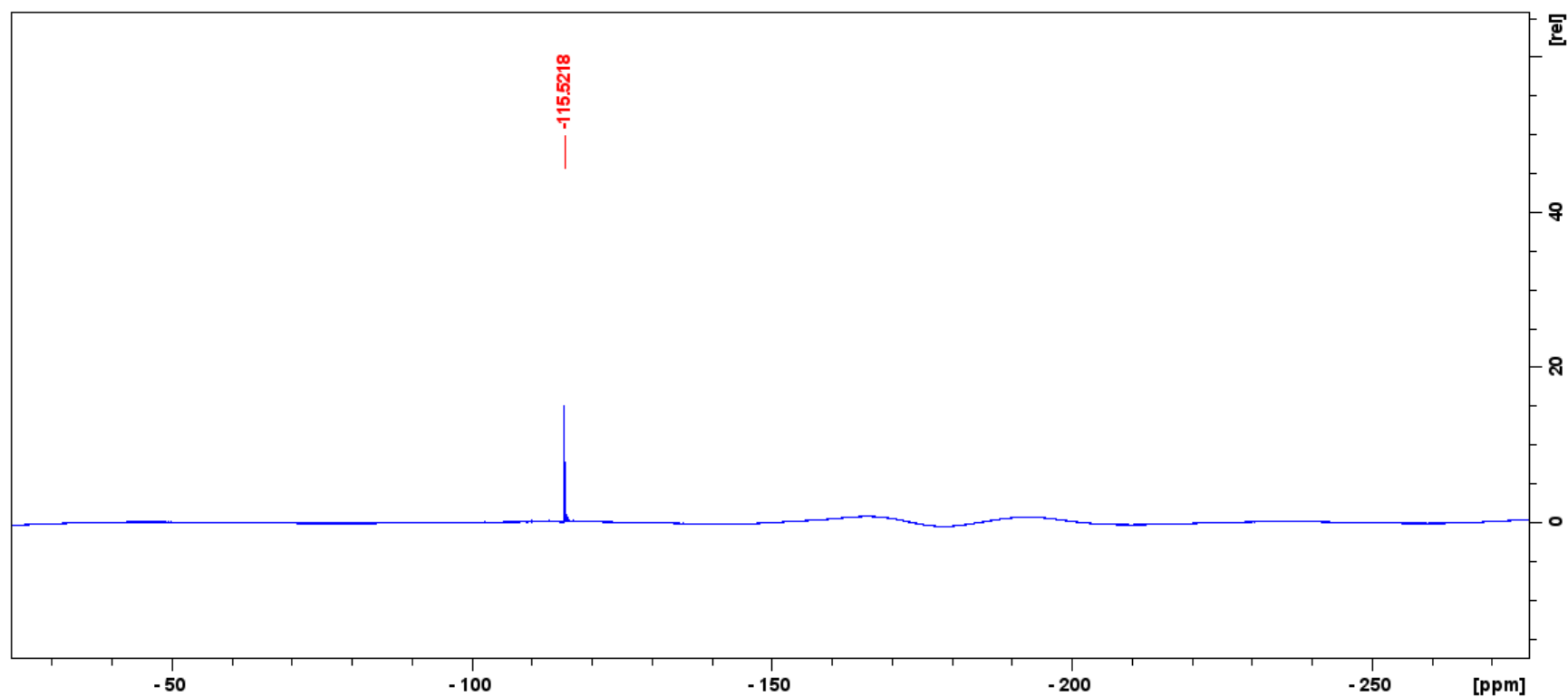
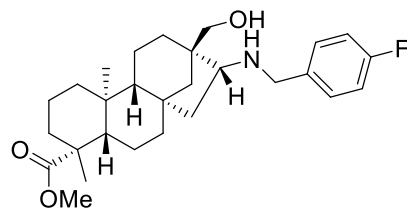
HSQC of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 8-((4-fluorobenzyl)amino)-9-(hydroxymethyl)-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**9**)



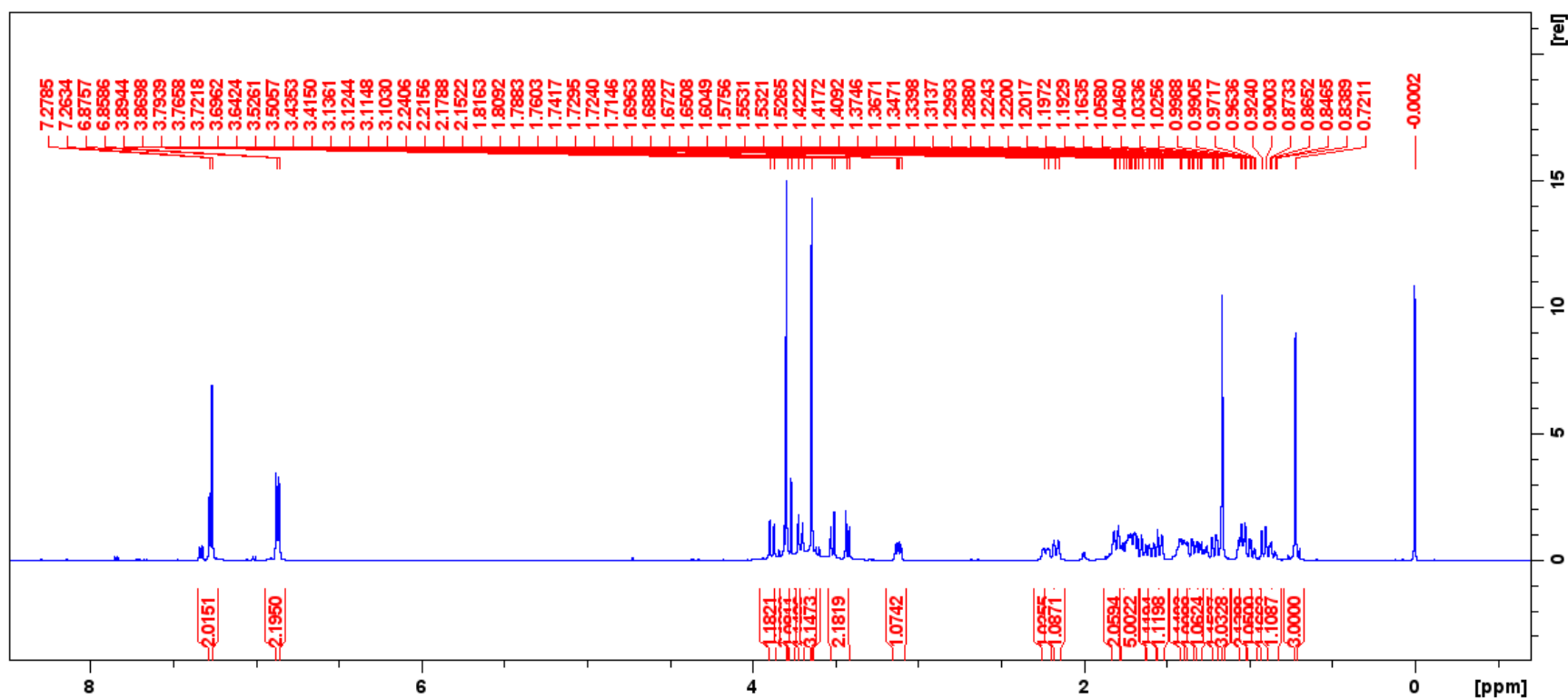
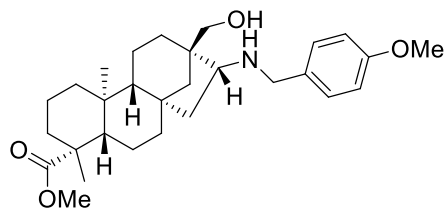
HMBC of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 8-((4-fluorobenzyl)amino)-9-(hydroxymethyl)-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**9**)



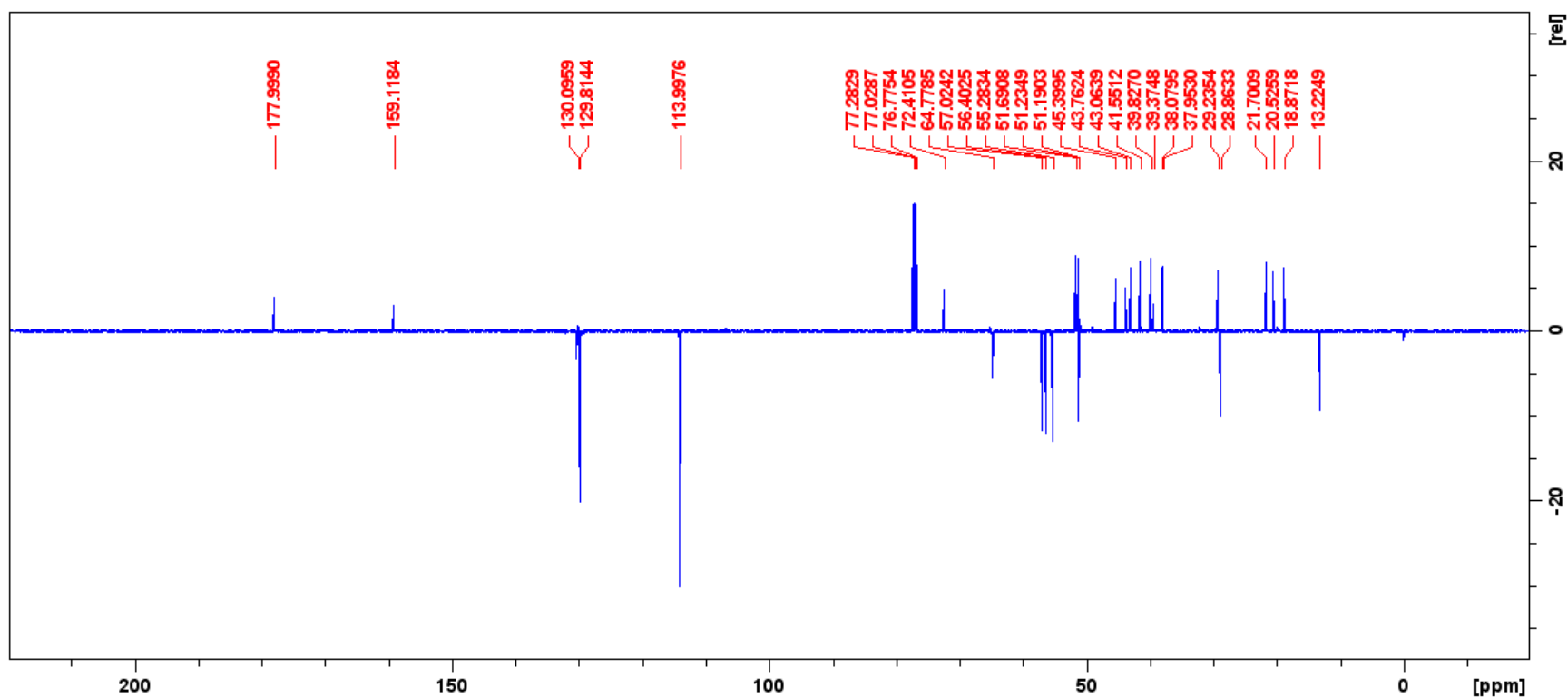
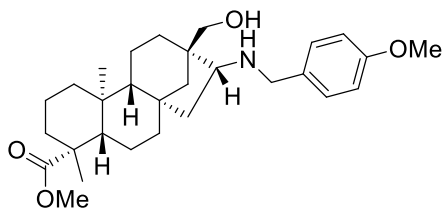
^{19}F -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 8-((4-fluorobenzyl)amino)-9-(hydroxymethyl)-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**9**)



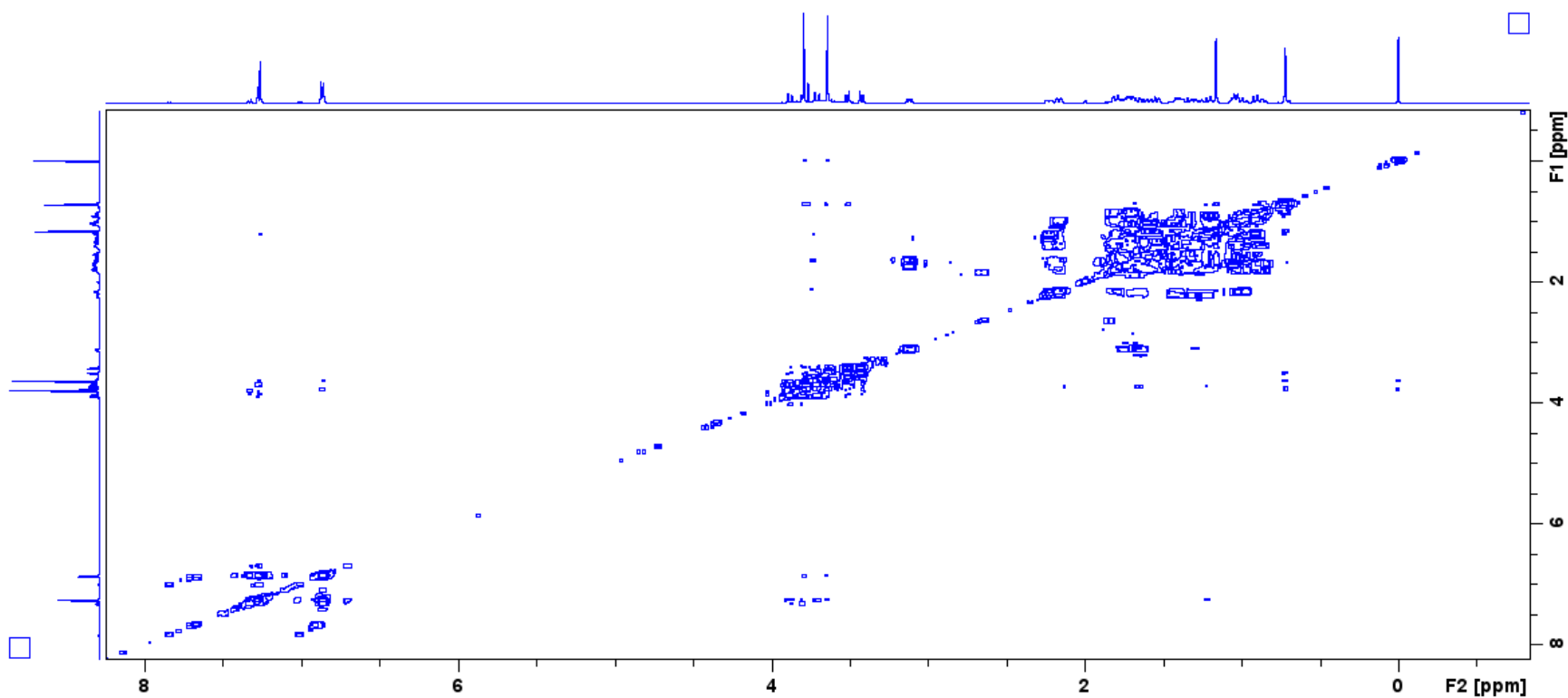
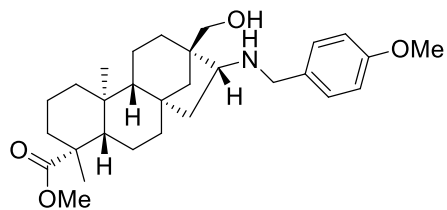
^1H -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-8-((4-methoxybenzyl)amino)-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**10**)



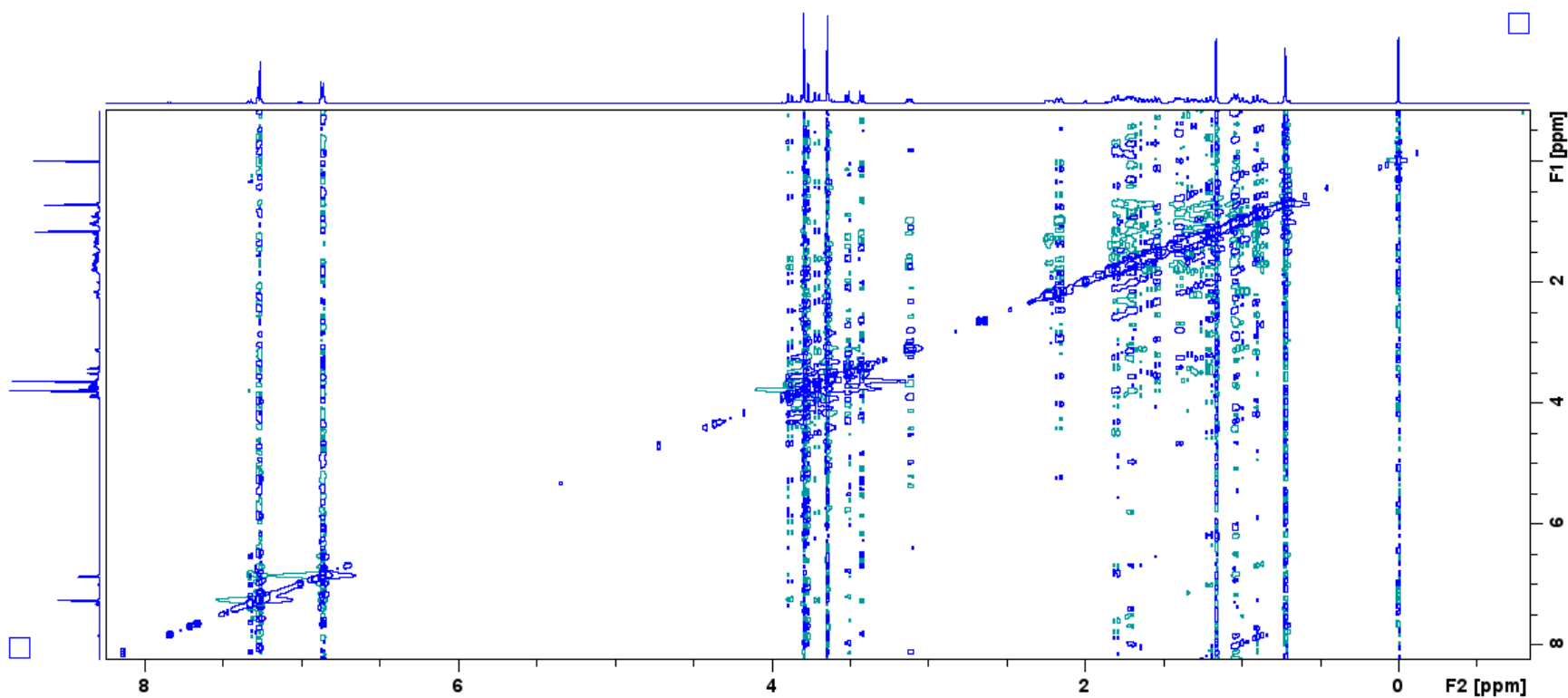
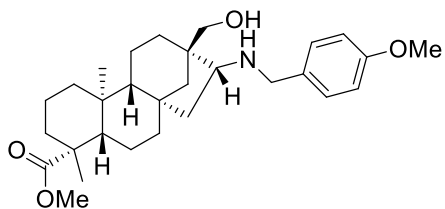
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-8-((4-methoxybenzyl)amino)-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**10**)



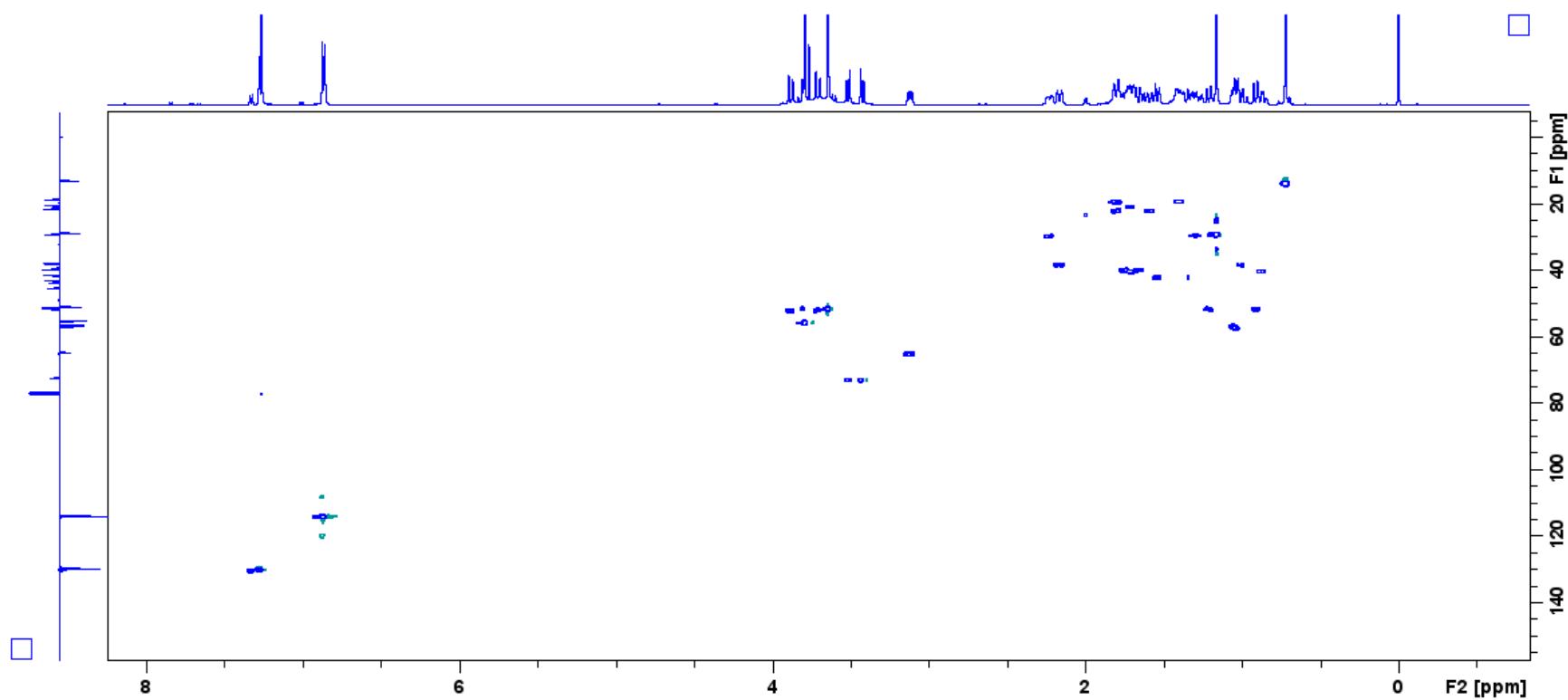
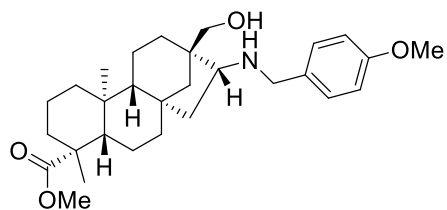
COSY of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-8-((4-methoxybenzyl)amino)-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**10**)



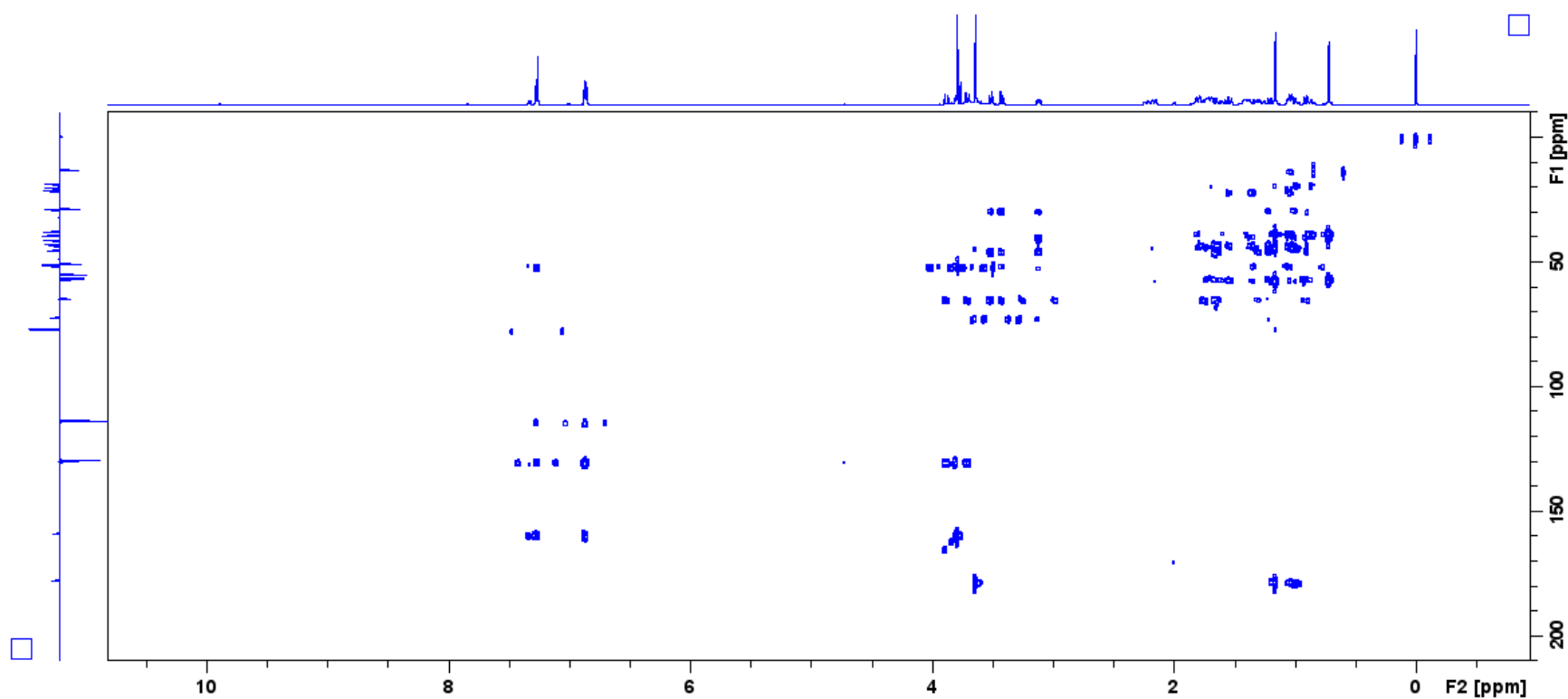
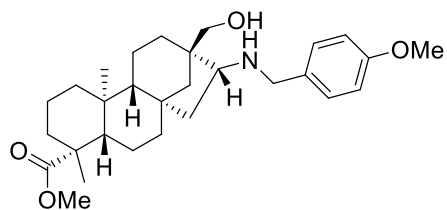
NOESY of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-8-((4-methoxybenzyl)amino)-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**10**)



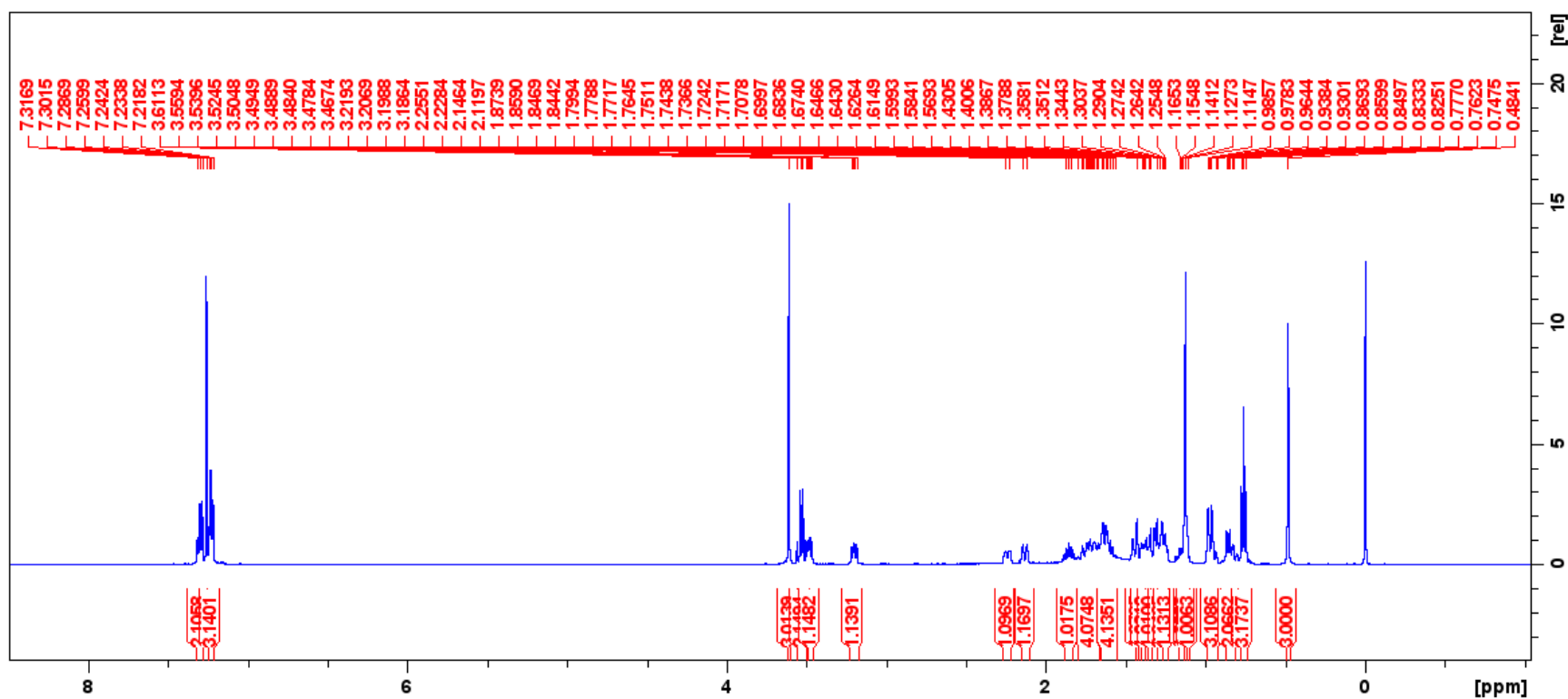
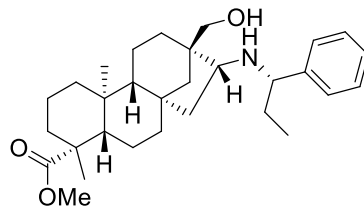
HSQC of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-8-((4-methoxybenzyl)amino)-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**10**)



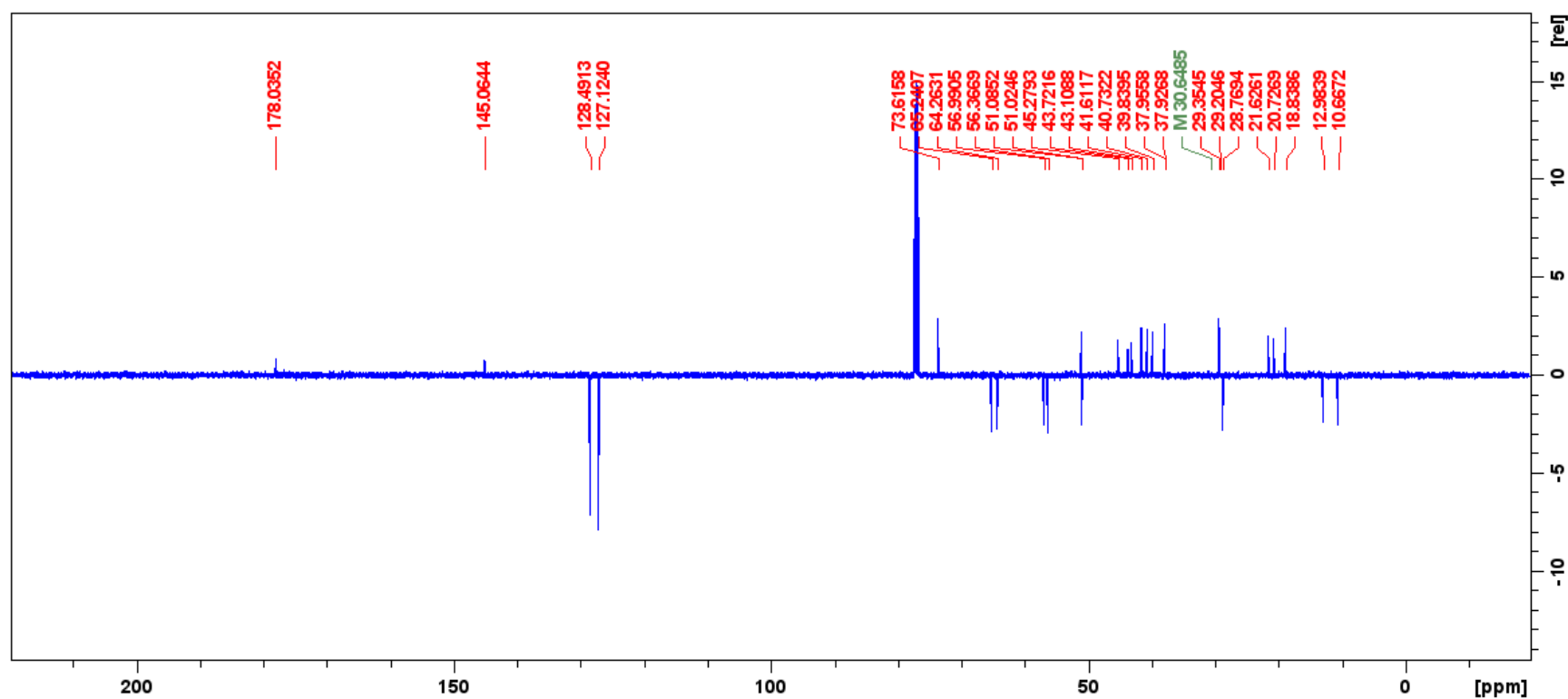
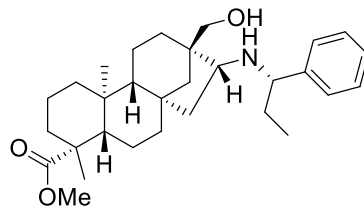
HMBC of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-8-((4-methoxybenzyl)amino)-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**10**)



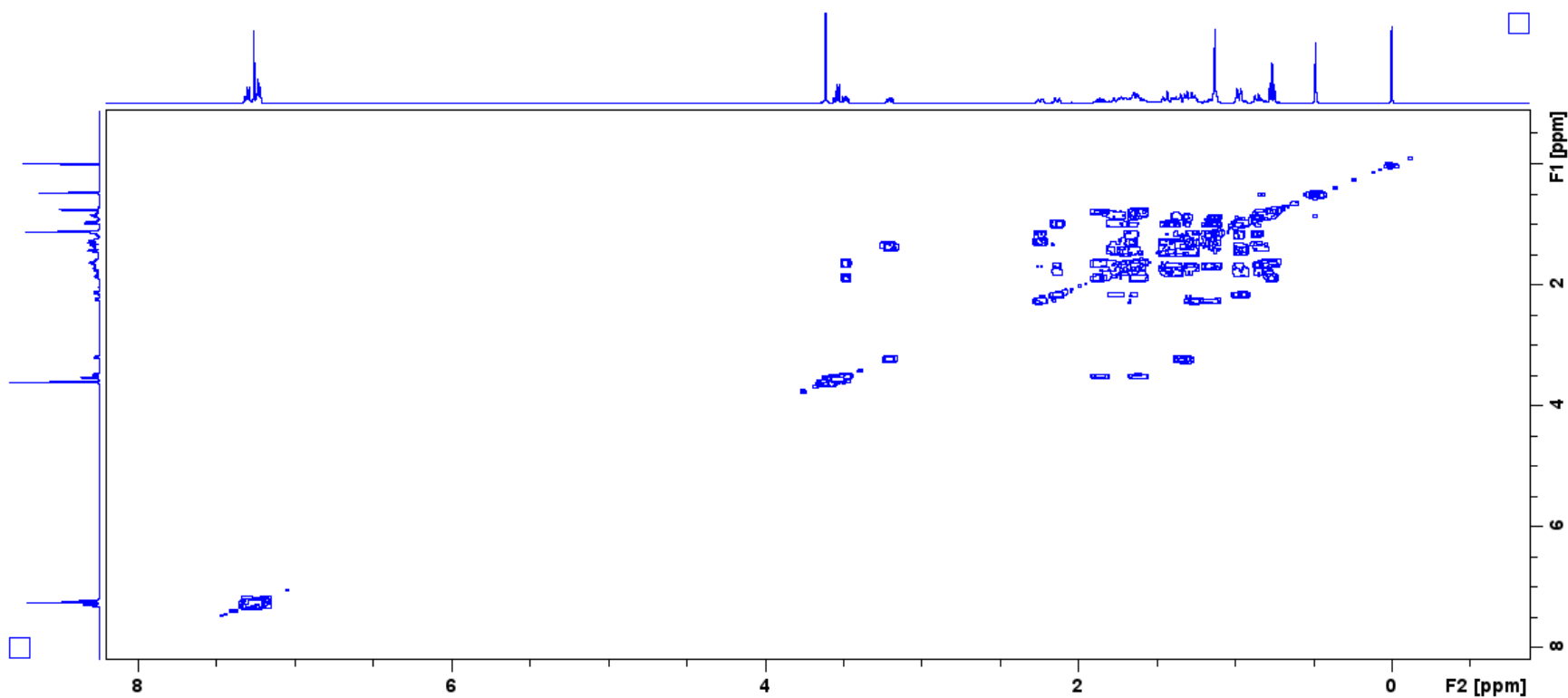
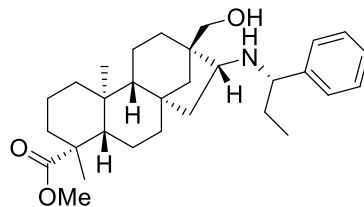
^1H -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*S*)-1-phenylpropyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**11**)



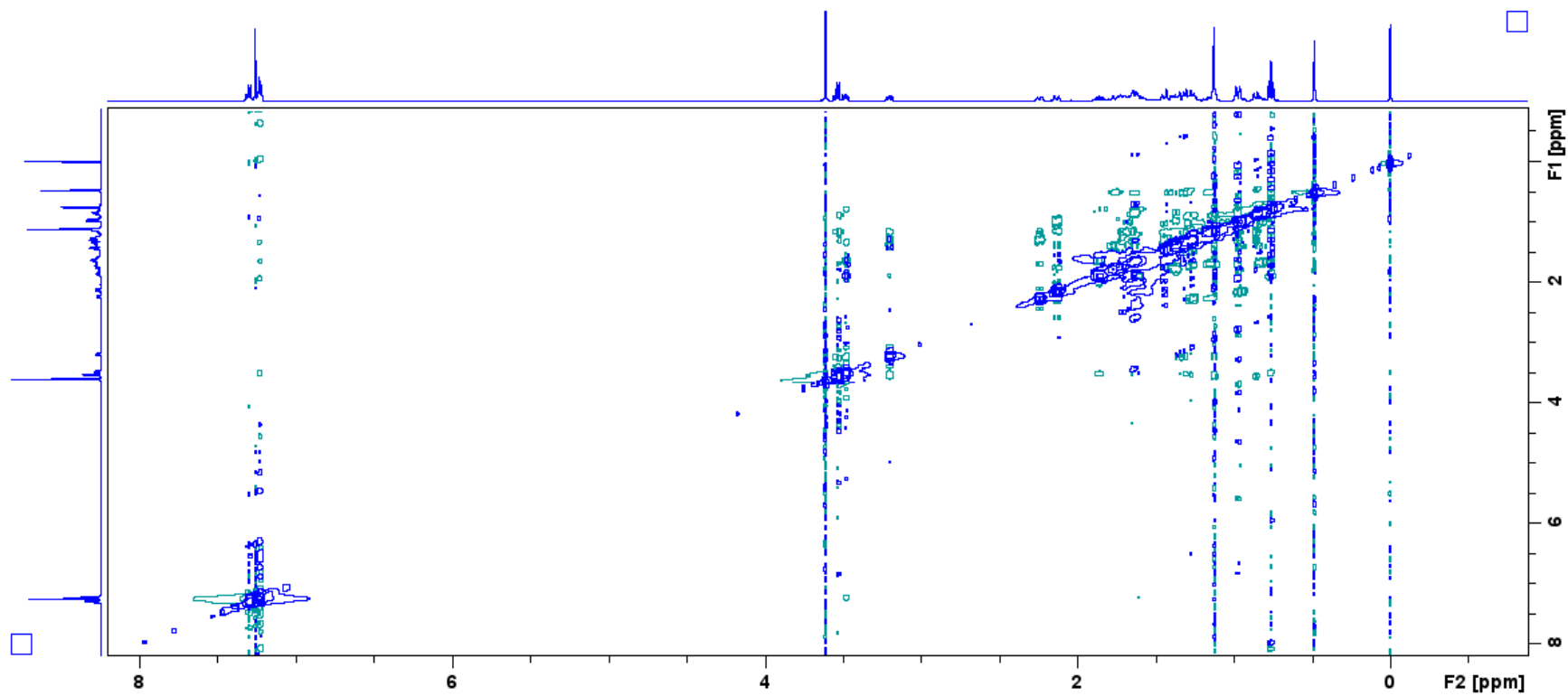
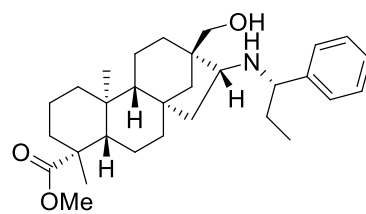
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*S*)-1-phenylpropyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**11**)



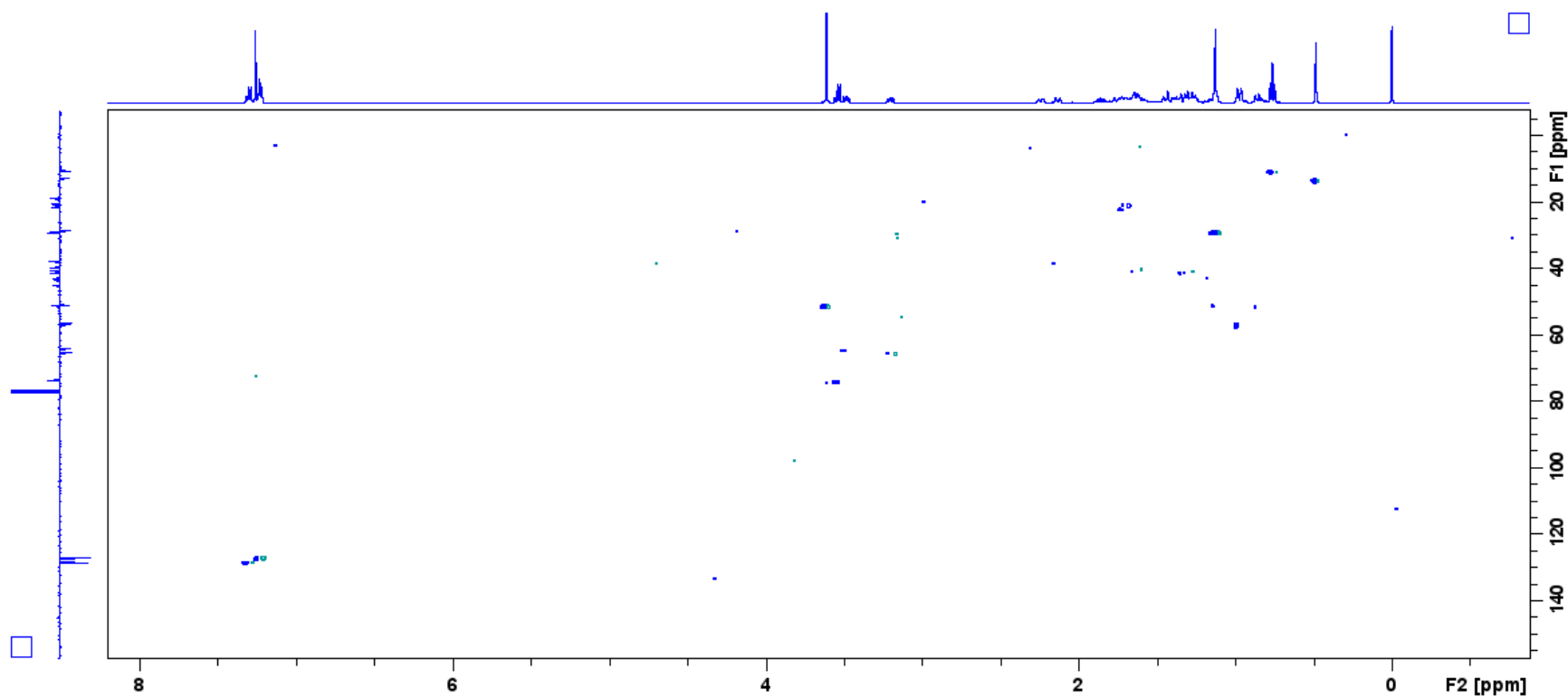
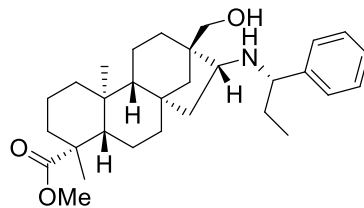
COSY of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*S*)-1-phenylpropyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**11**)



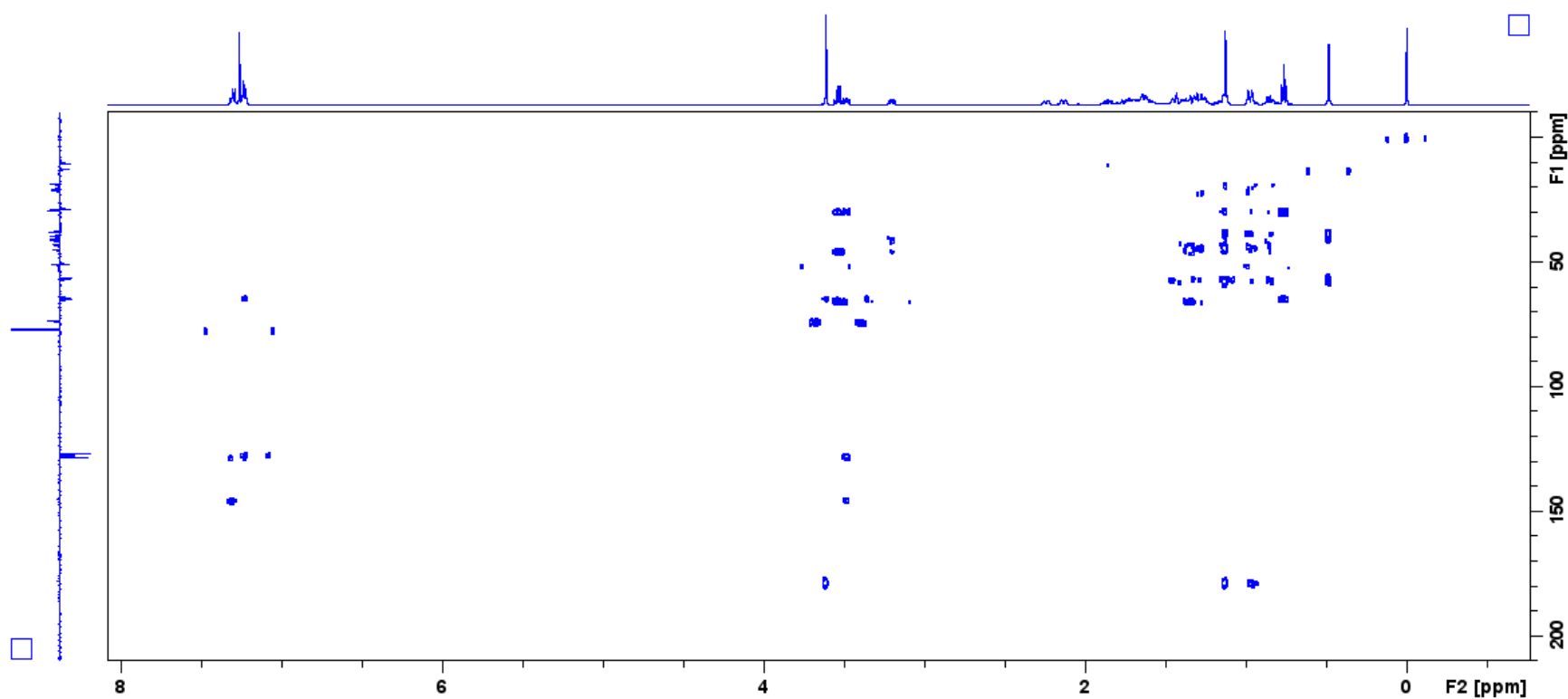
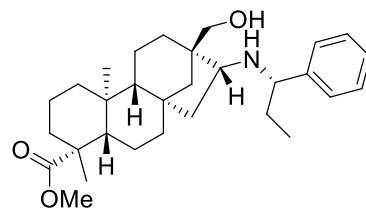
NOESY of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*S*)-1-phenylpropyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**11**)



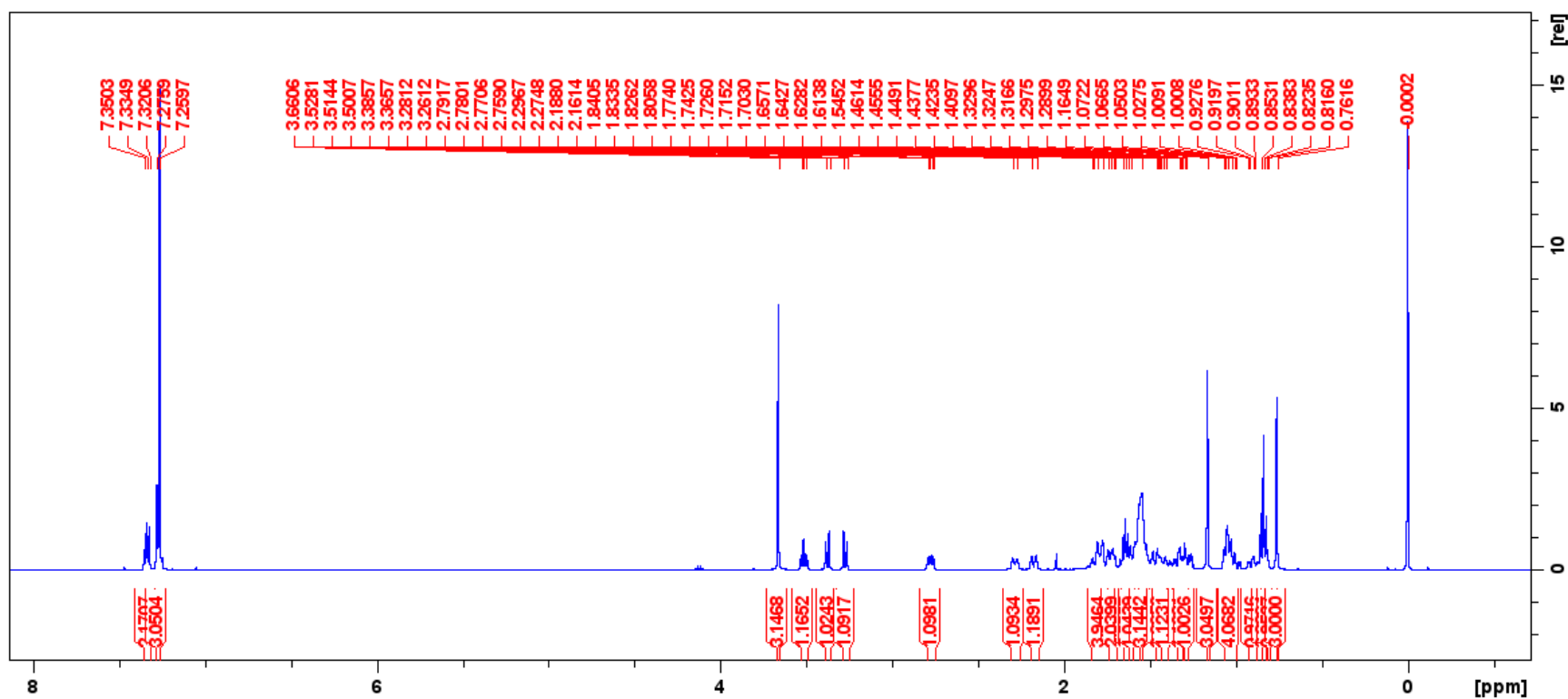
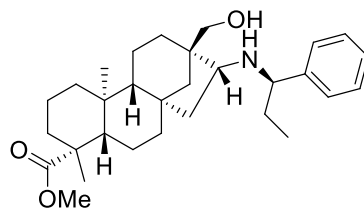
HSQC of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*S*)-1-phenylpropyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**11**)

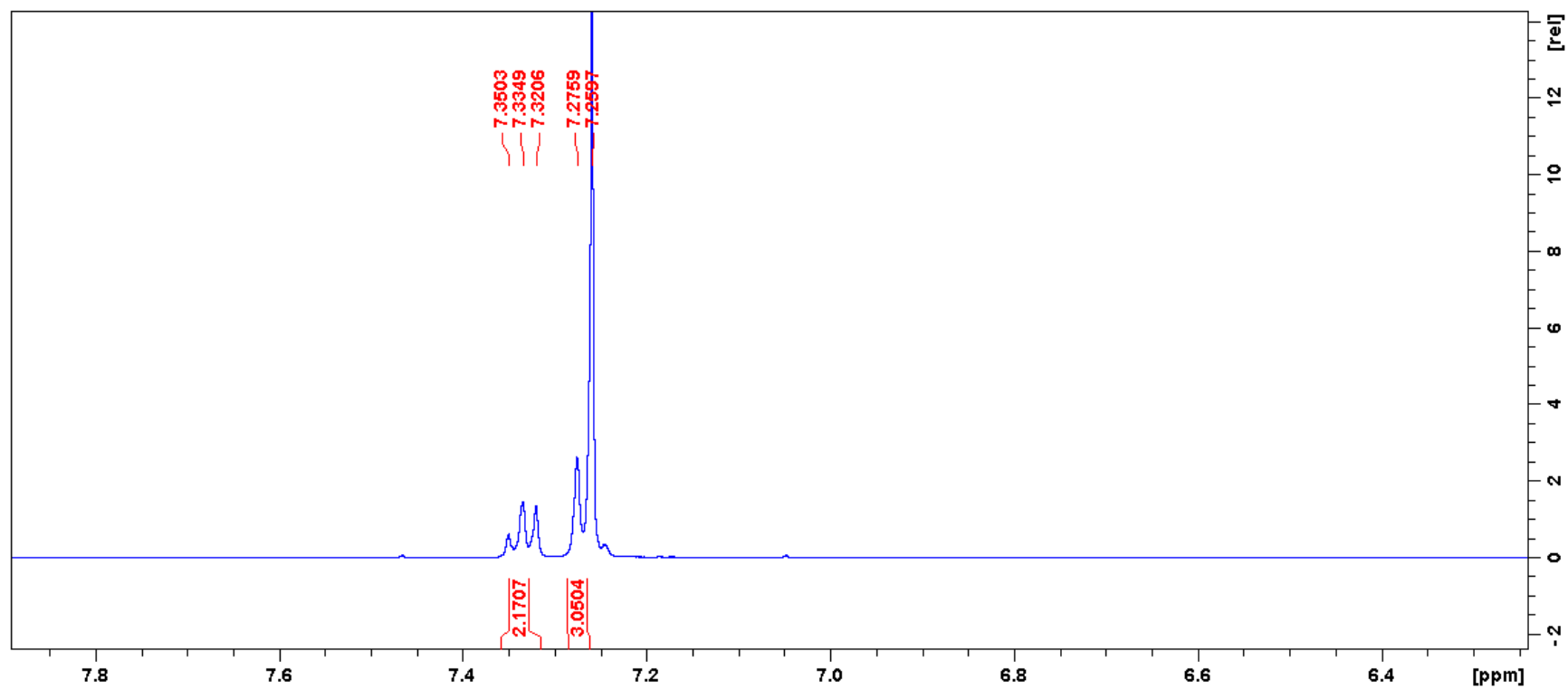


HMBC of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*S*)-1-phenylpropyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**11**)

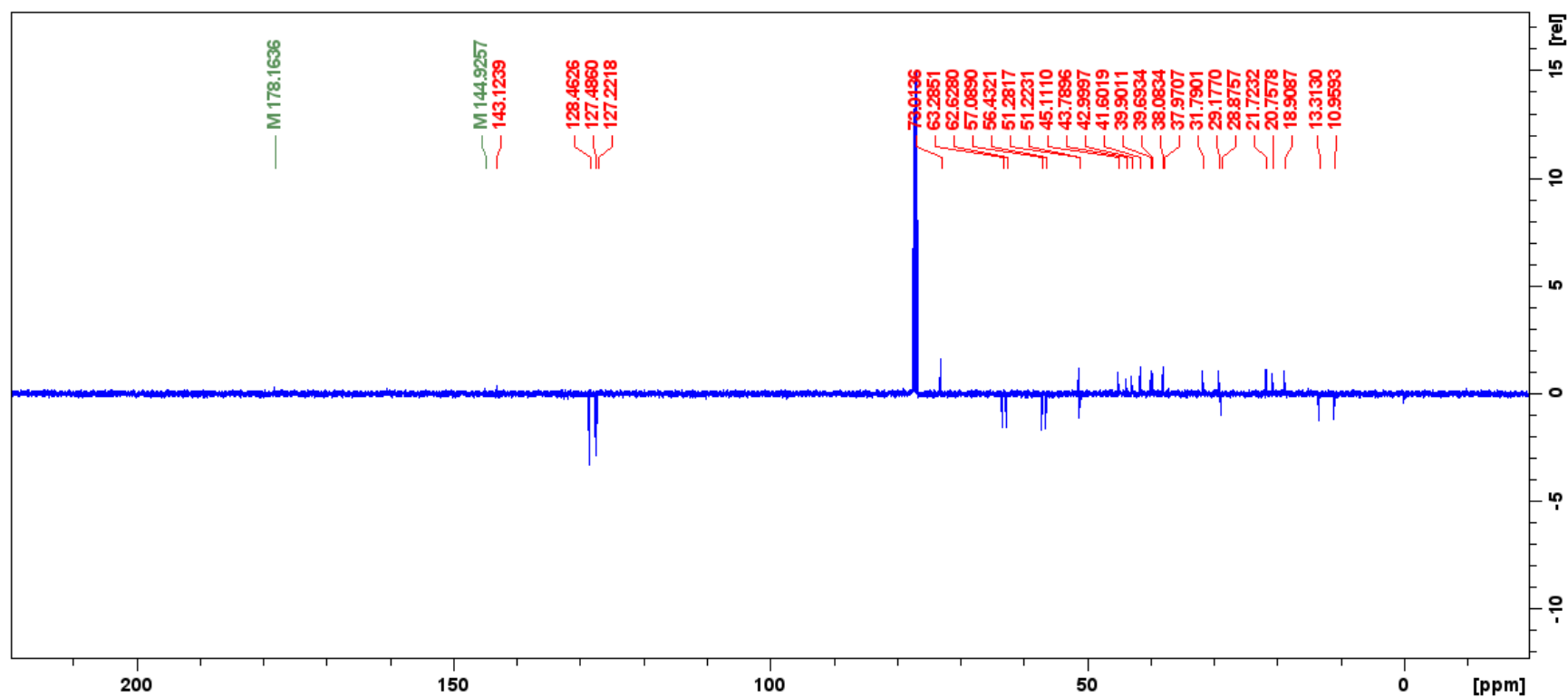
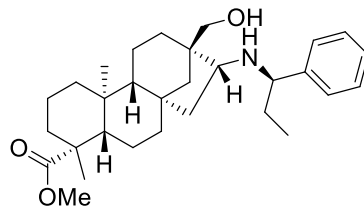


^1H -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*R*)-1-phenylpropyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**12**)

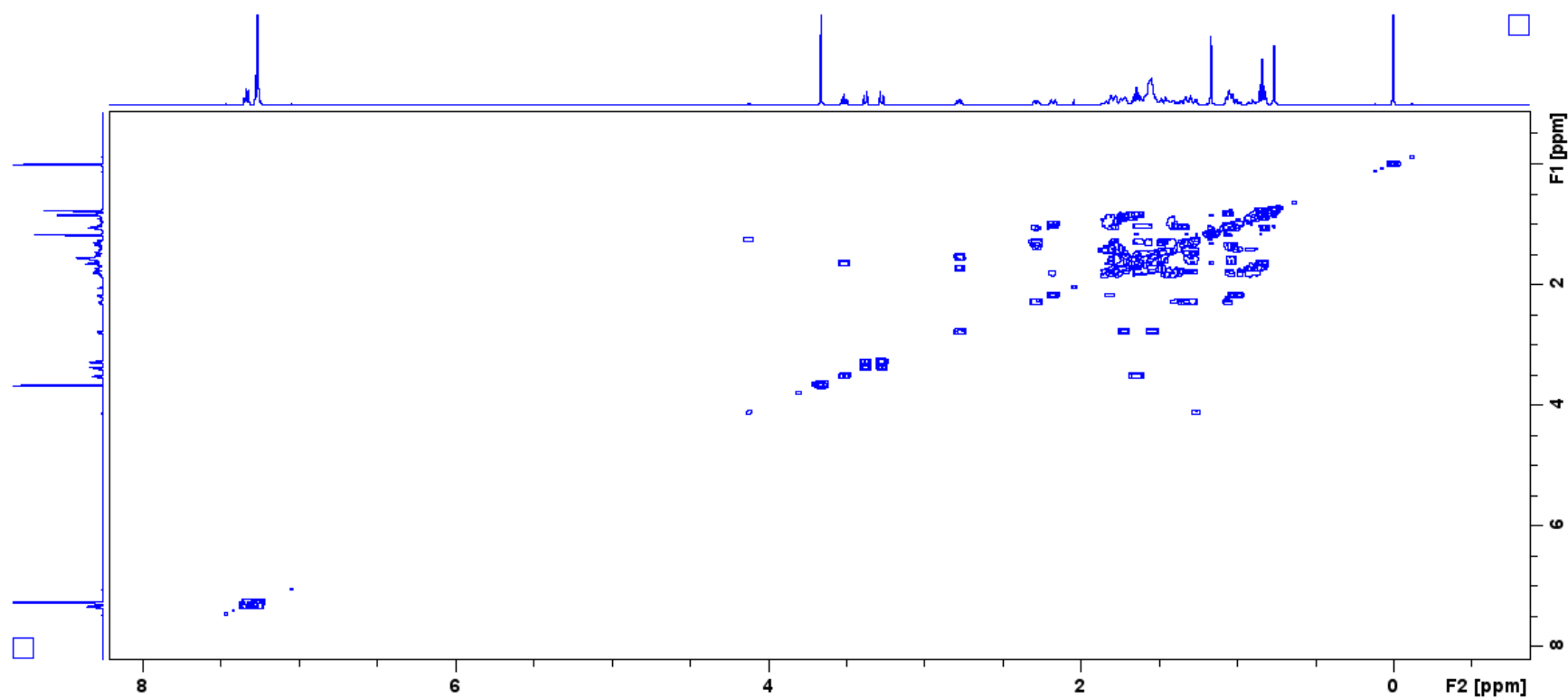
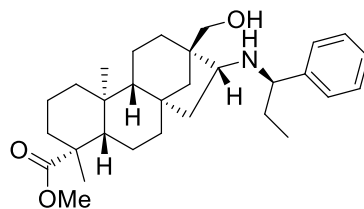




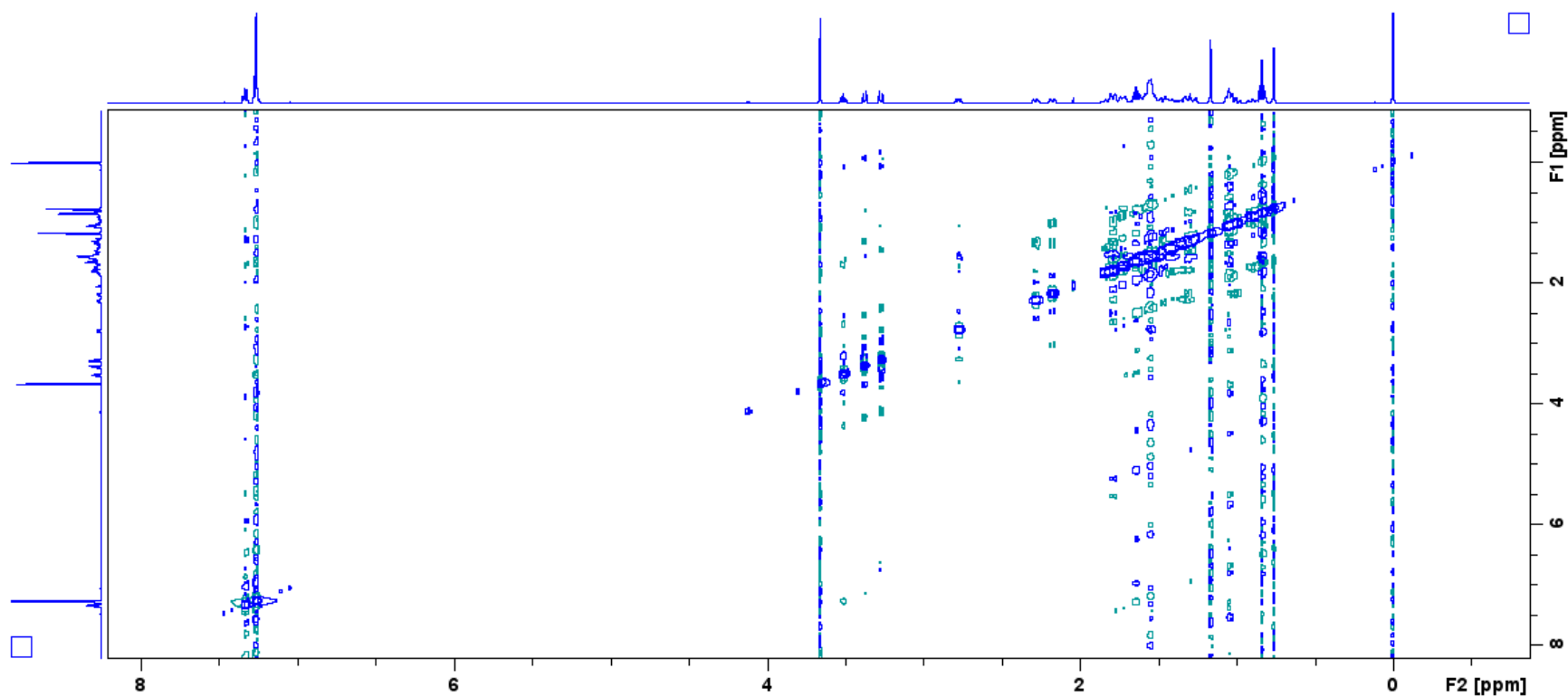
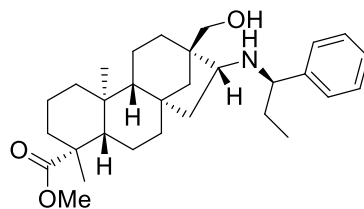
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*R*)-1-phenylpropyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**12**)



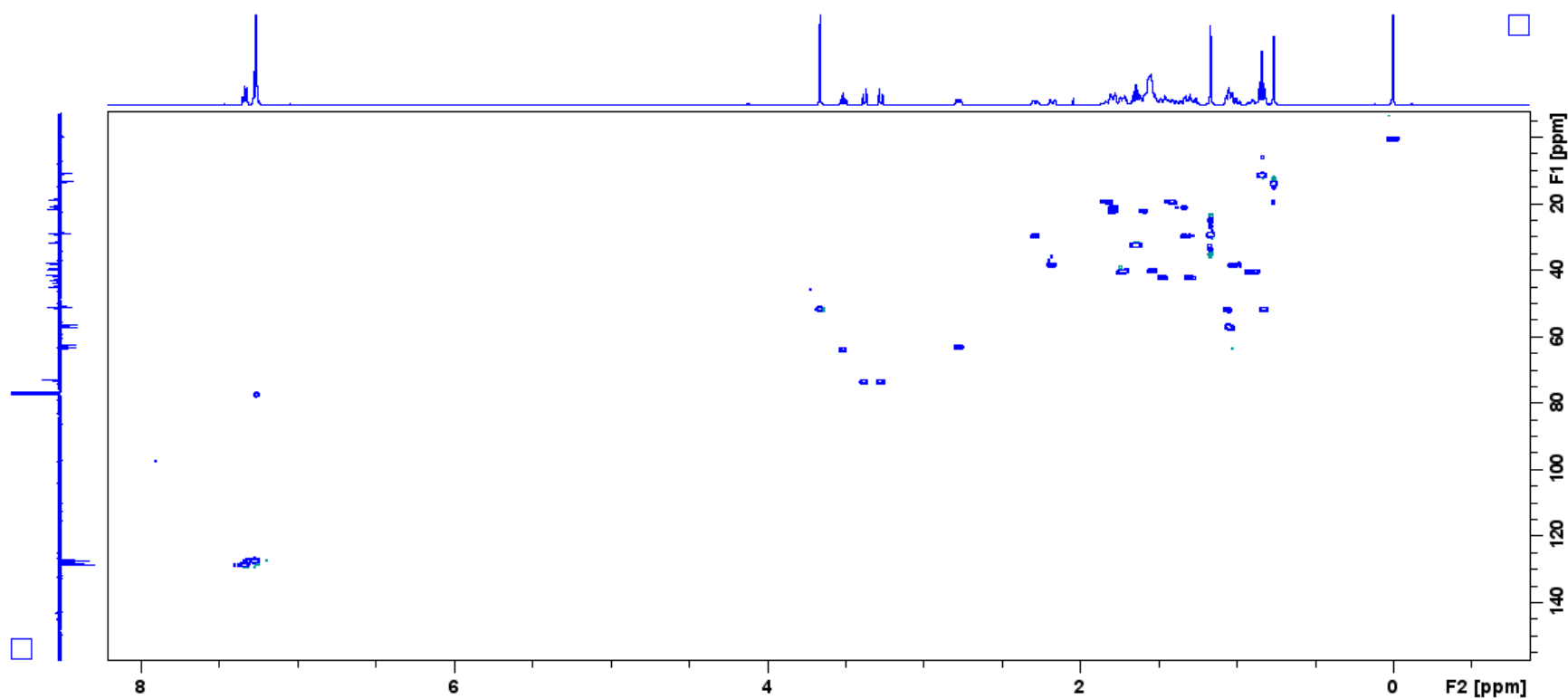
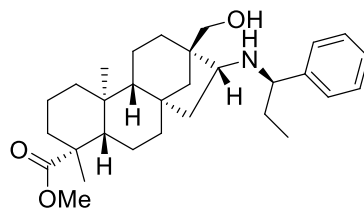
COSY of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*R*)-1-phenylpropyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**12**)



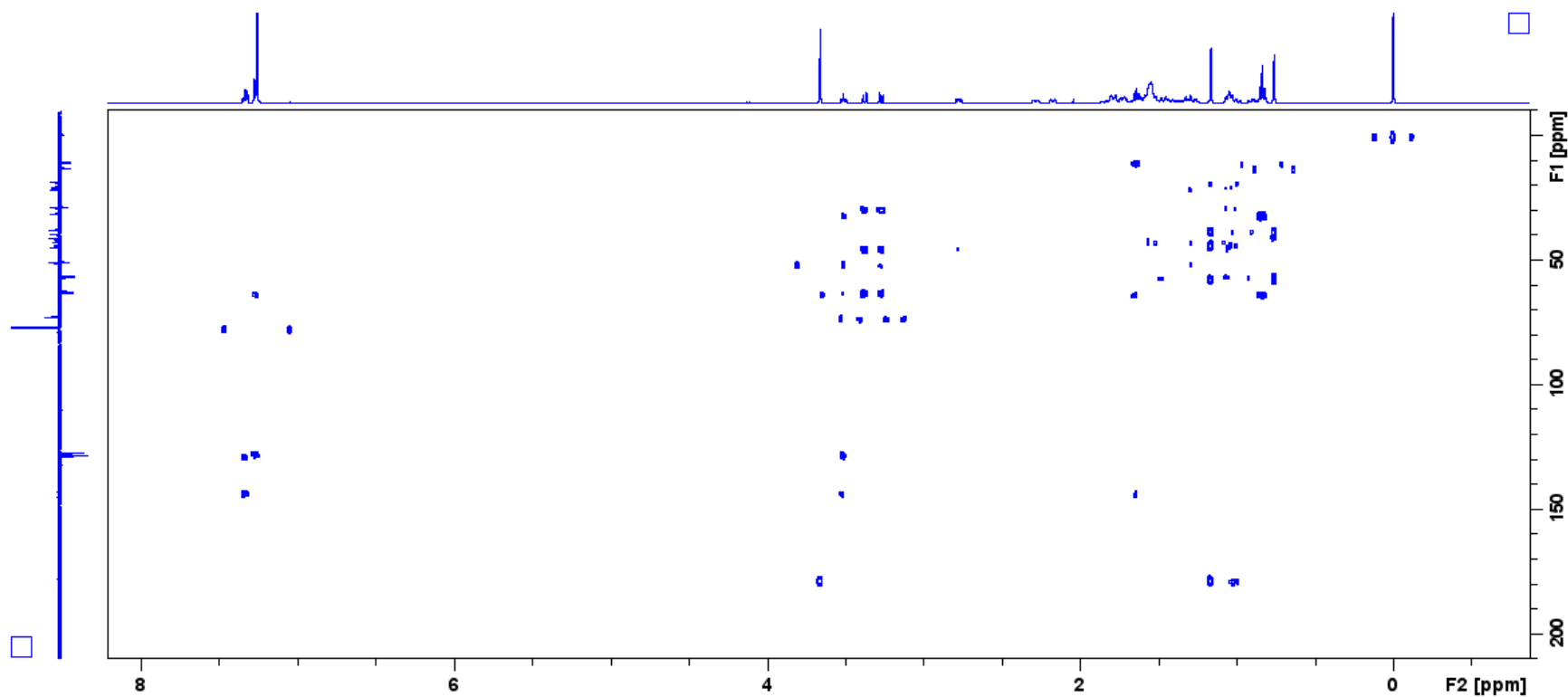
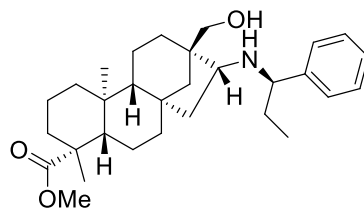
NOESY of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*R*)-1-phenylpropyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**12**)



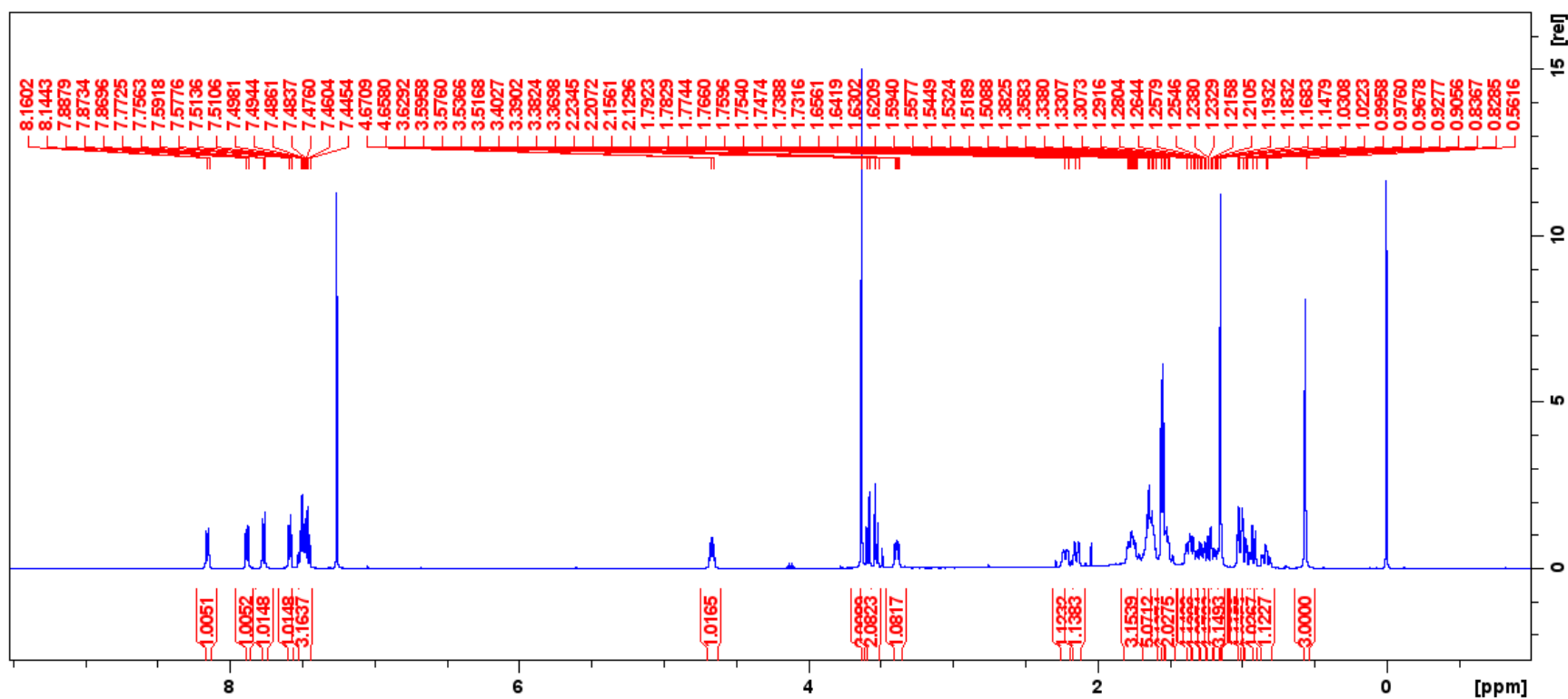
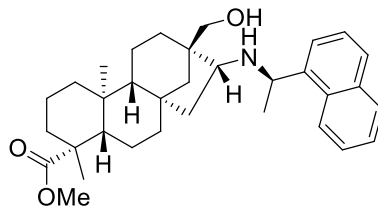
HSQC of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*R*)-1-phenylpropyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**12**)



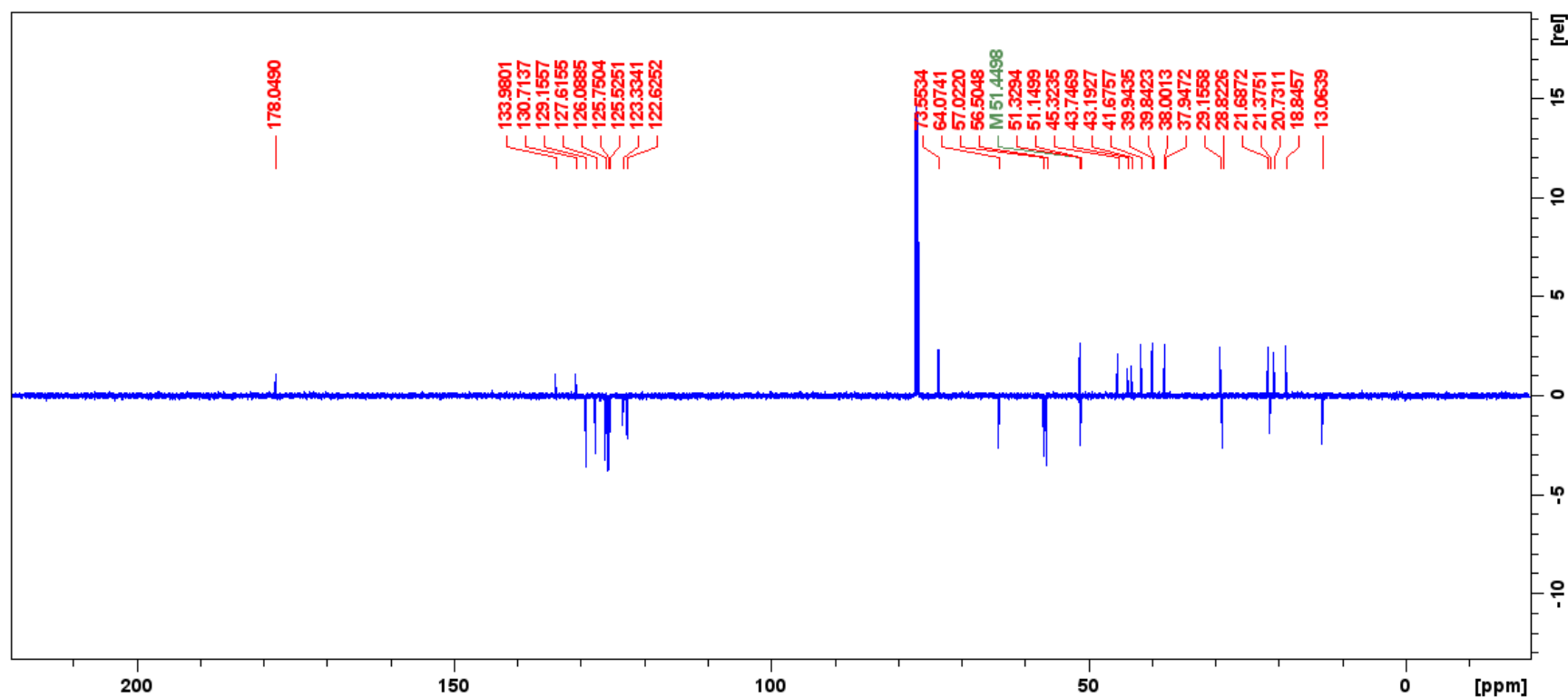
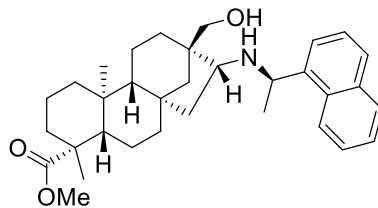
HMBC of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*R*)-1-phenylpropyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**12**)



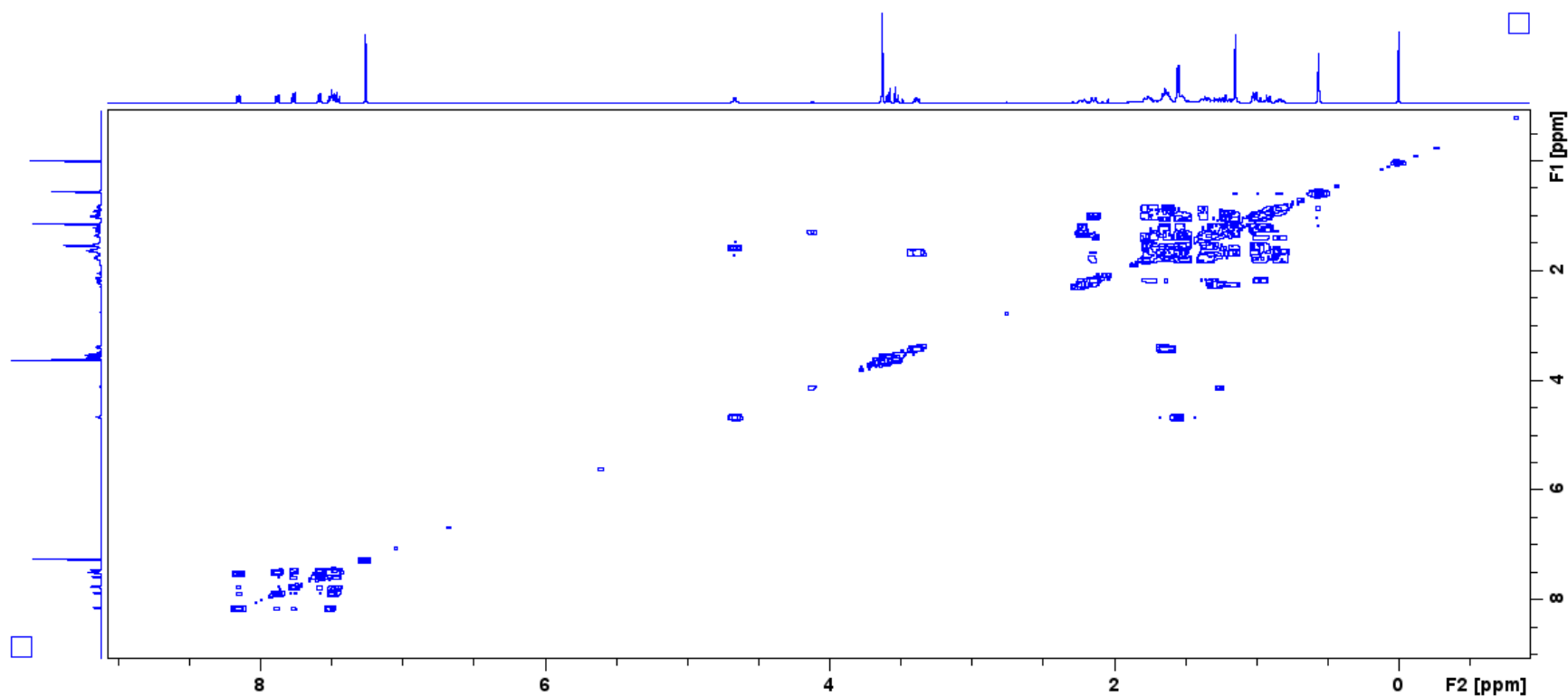
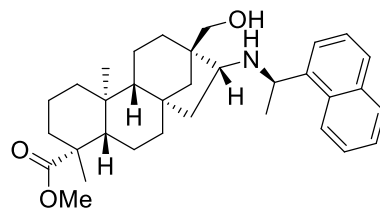
^1H -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*R*)-1-(naphthalen-1-yl)ethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**13**)



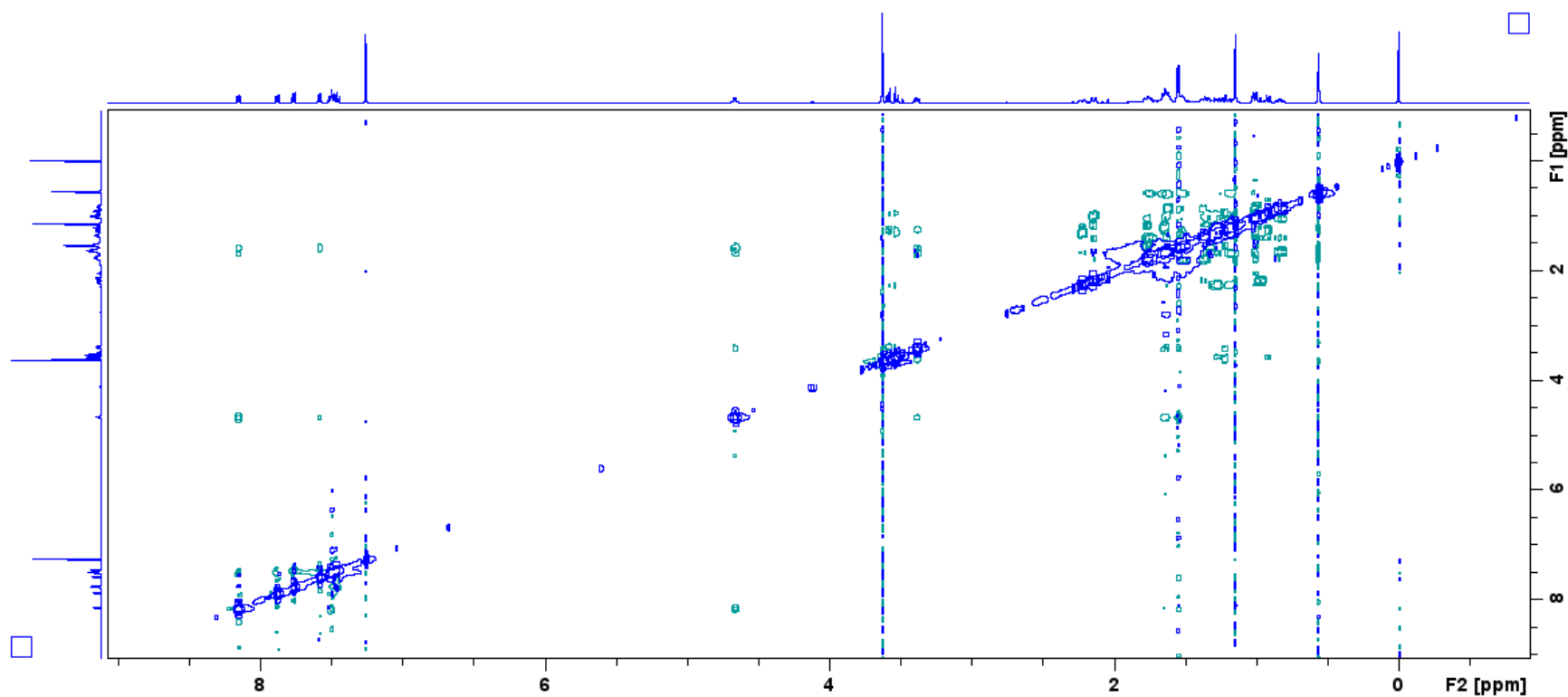
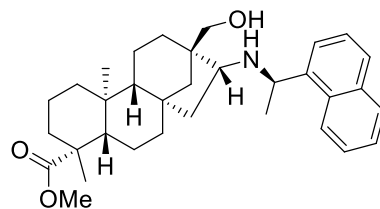
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*R*)-1-(naphthalen-1-yl)ethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**13**)



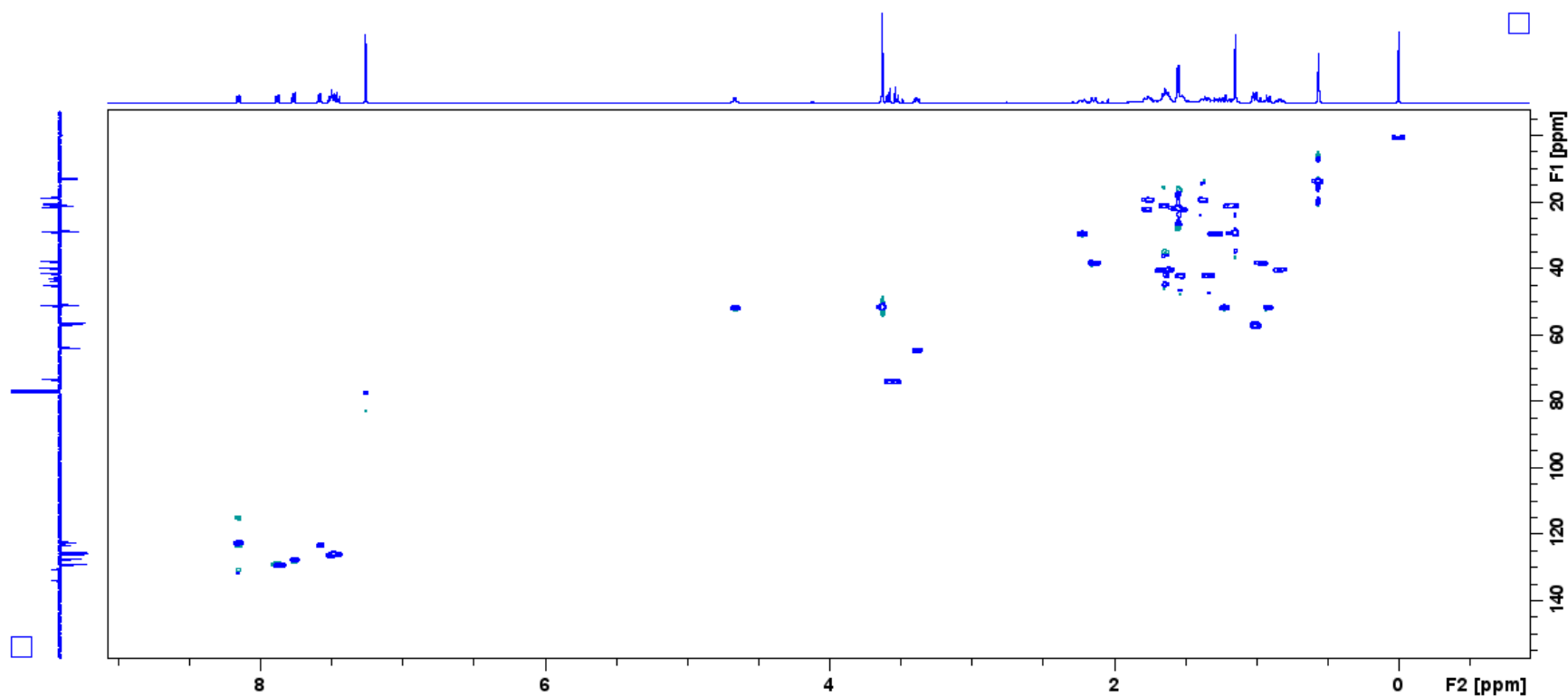
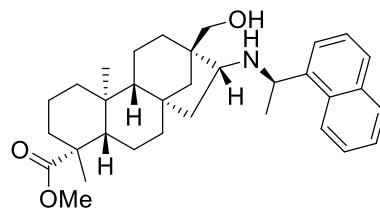
COSY of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*R*)-1-(naphthalen-1-yl)ethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**13**)



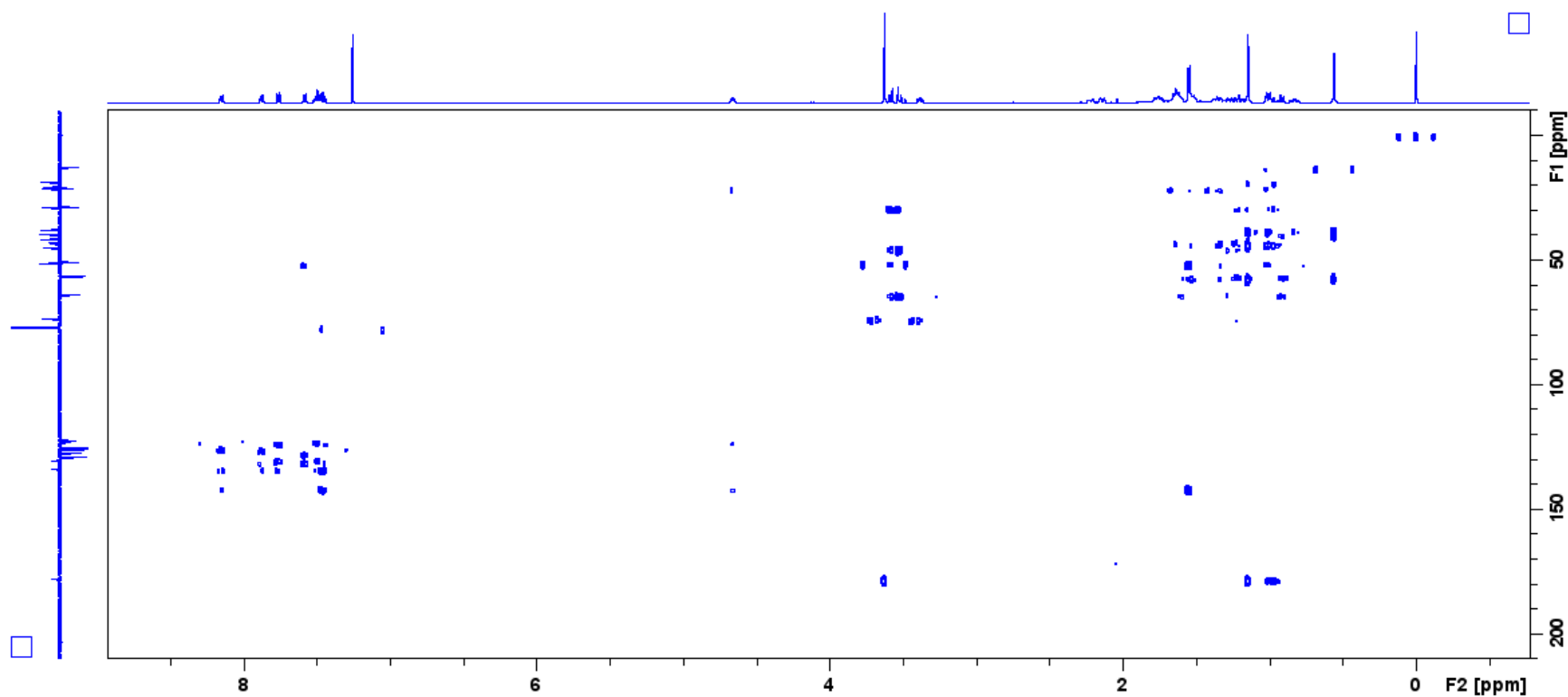
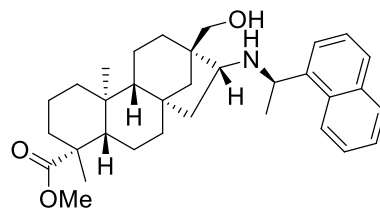
NOESY of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*R*)-1-(naphthalen-1-yl)ethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**13**)



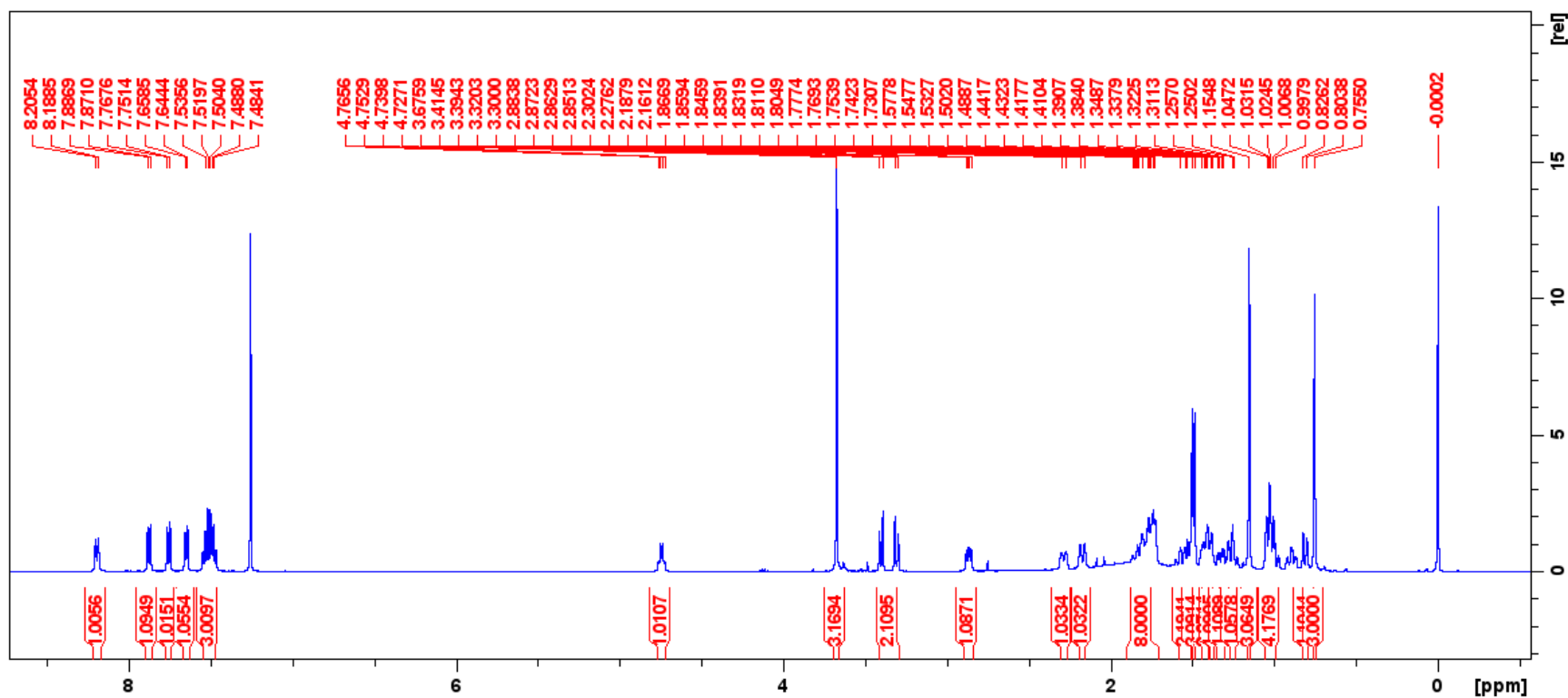
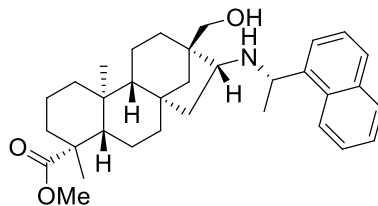
HSQC of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*R*)-1-(naphthalen-1-yl)ethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**13**)



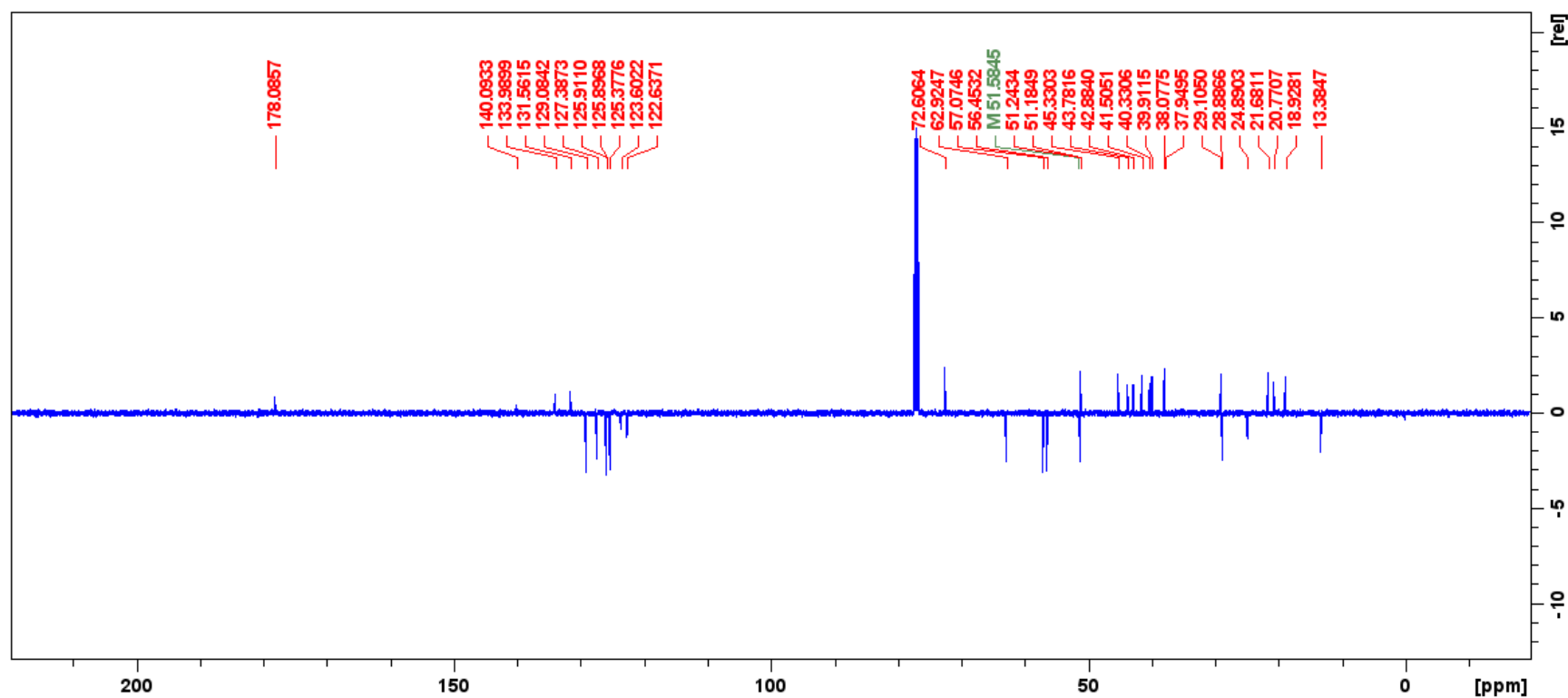
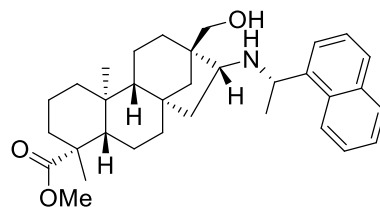
HMBC of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*R*)-1-(naphthalen-1-yl)ethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**13**)



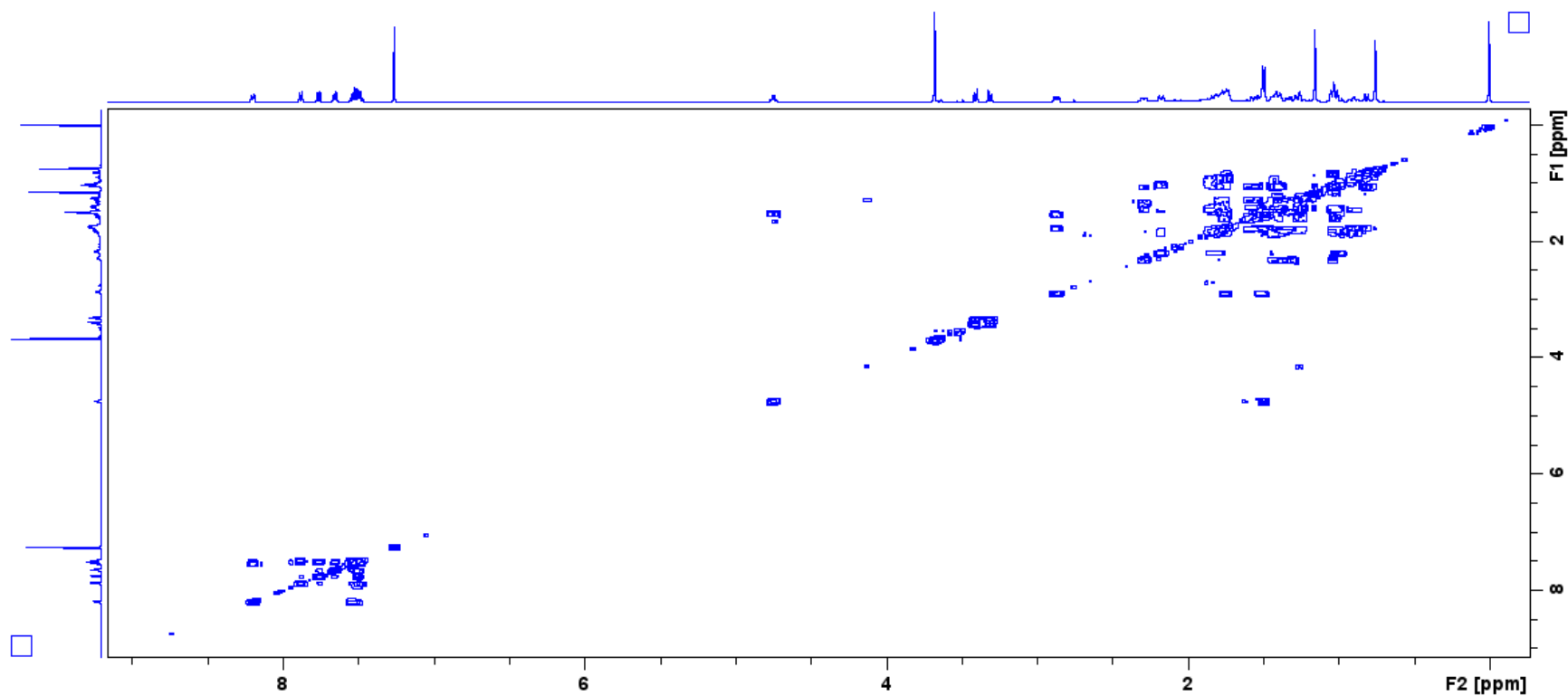
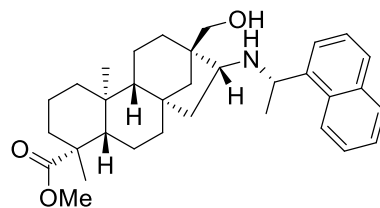
^1H -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*S*)-1-(naphthalen-1-yl)ethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**14**)



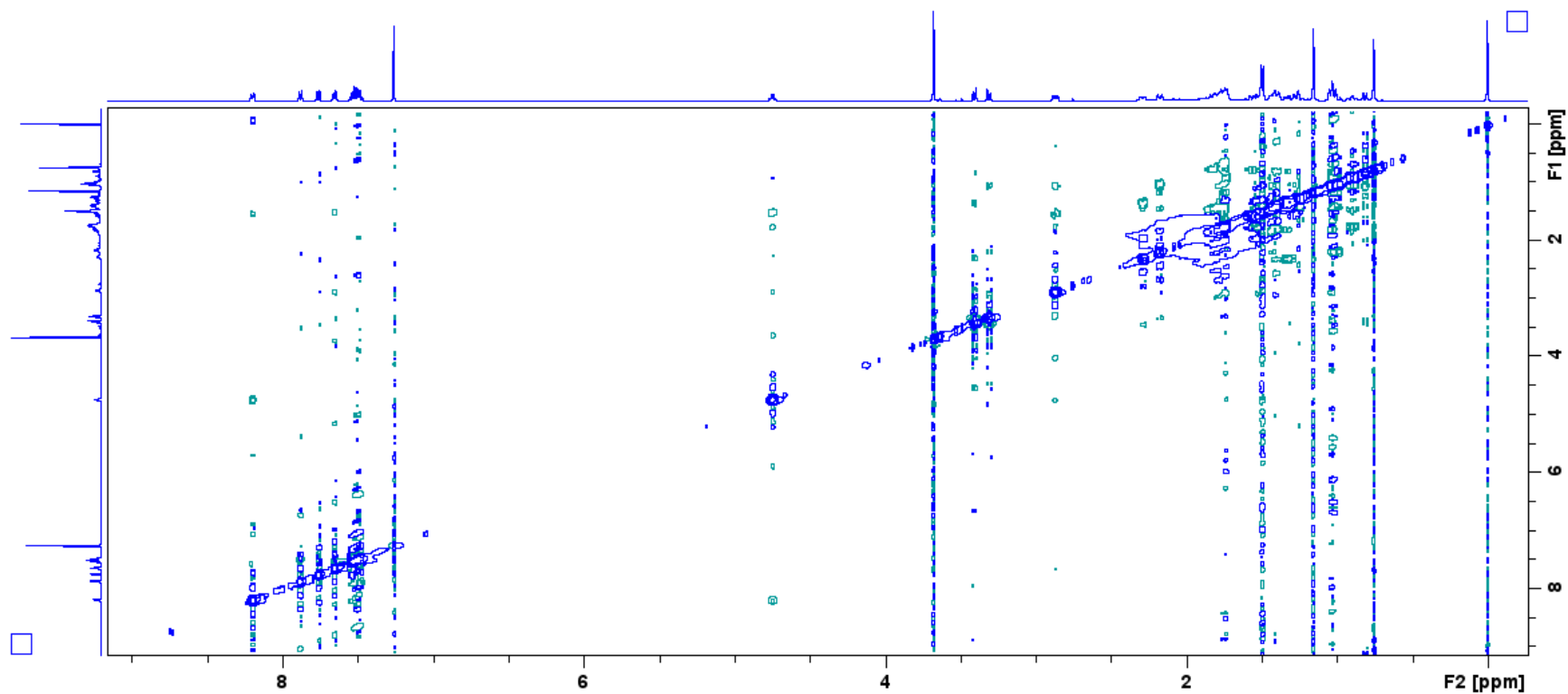
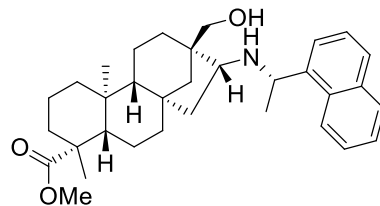
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*S*)-1-(naphthalen-1-yl)ethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**14**)



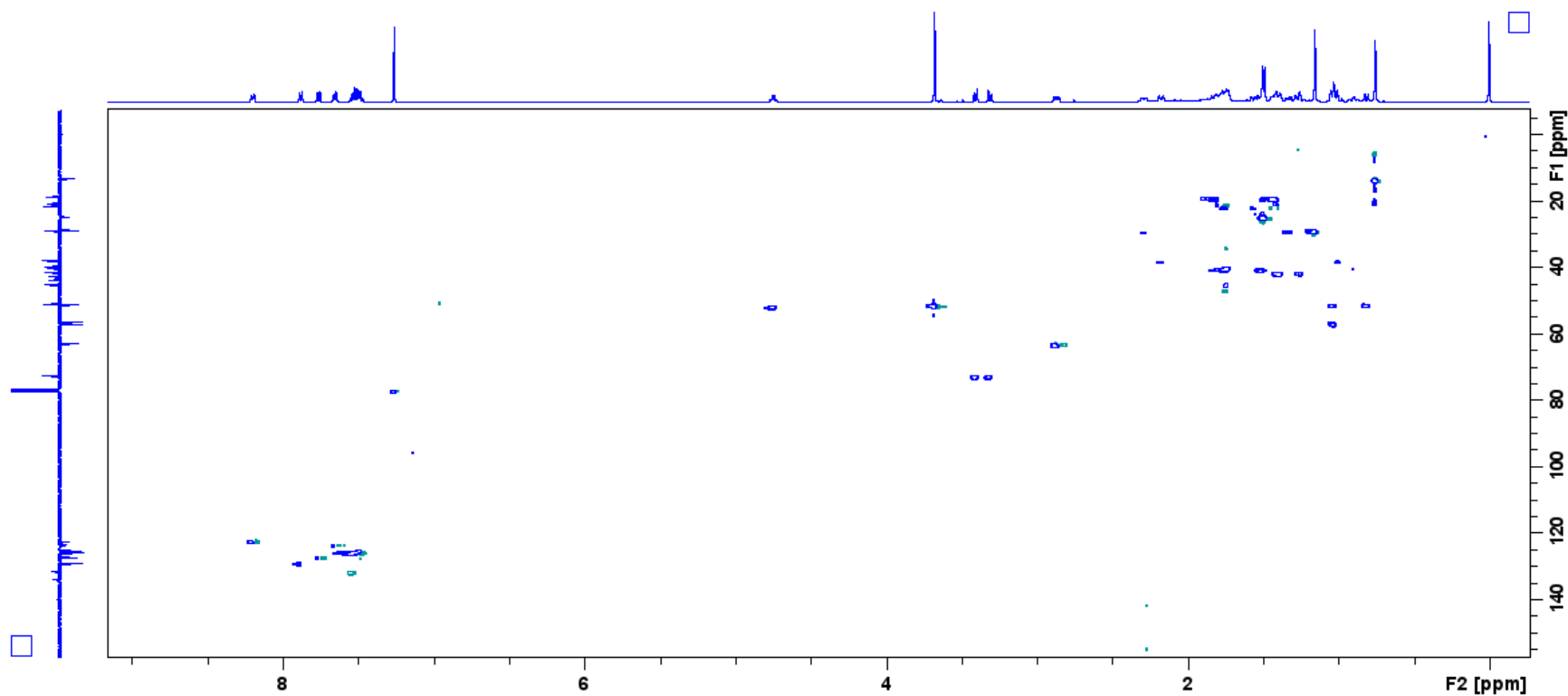
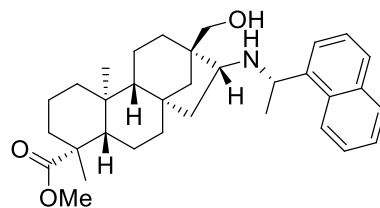
COSY of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*S*)-1-(naphthalen-1-yl)ethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**14**)



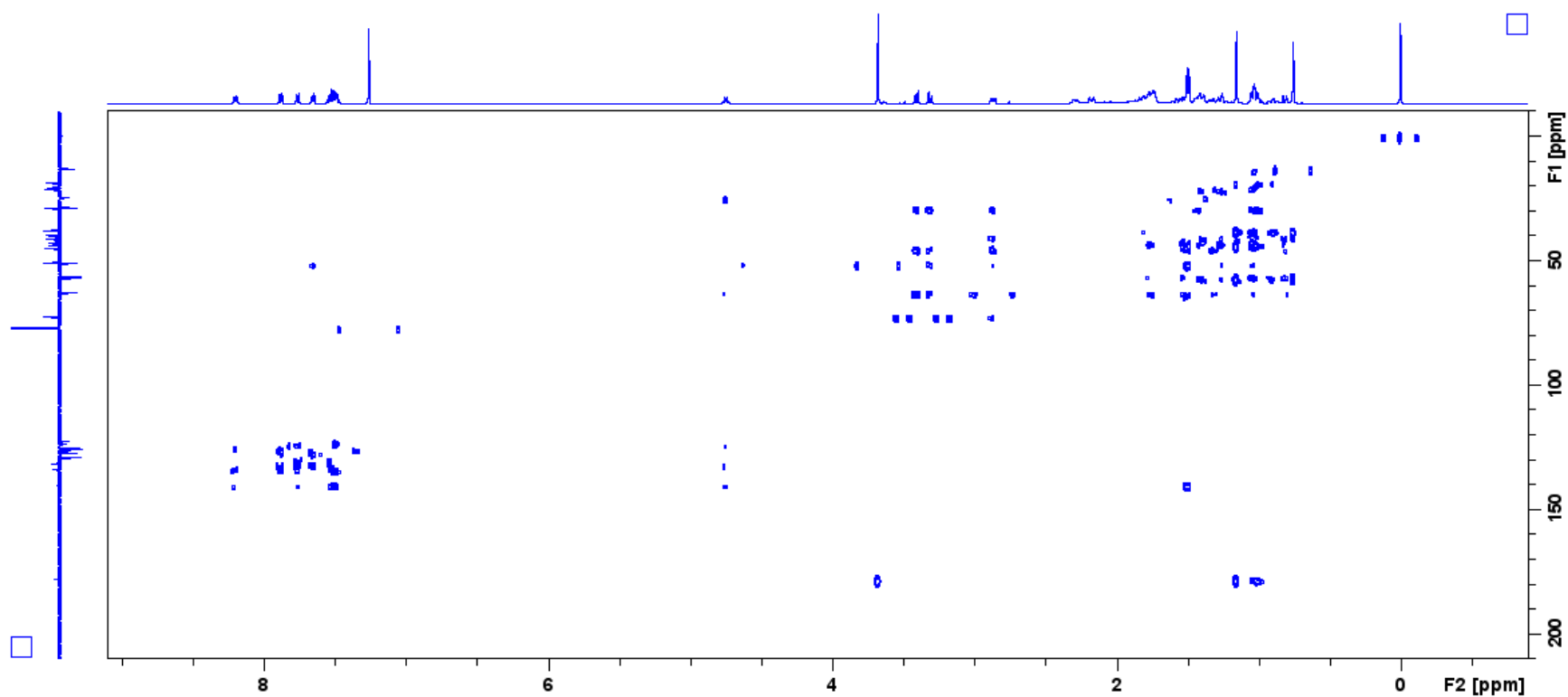
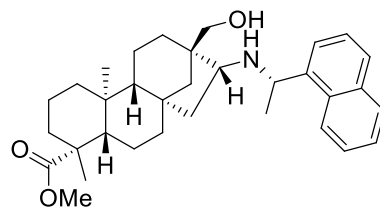
NOESY of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*S*)-1-(naphthalen-1-yl)ethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**14**)



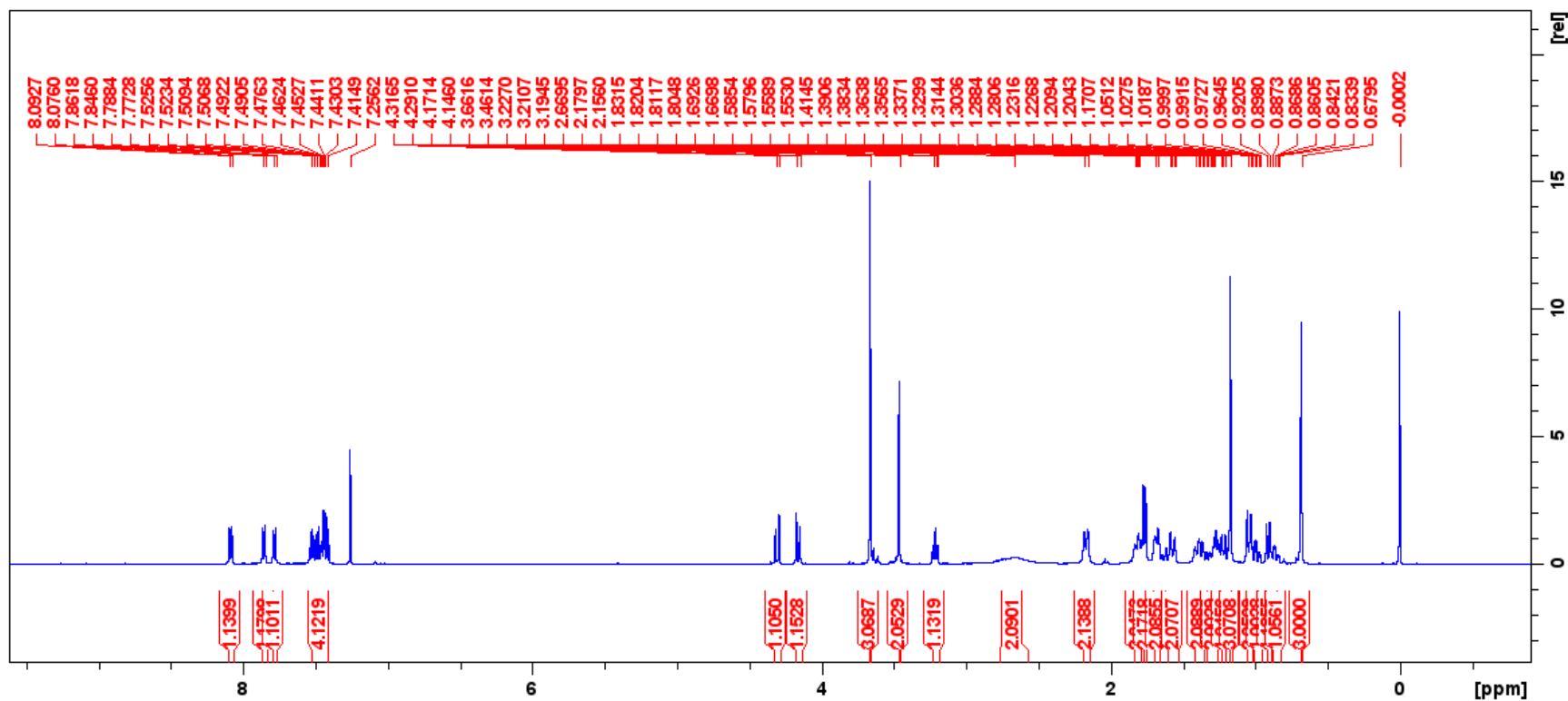
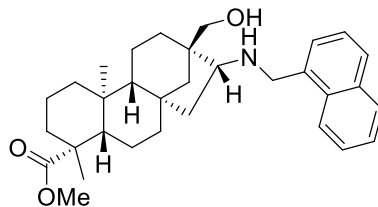
HSQC of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*S*)-1-(naphthalen-1-yl)ethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**14**)



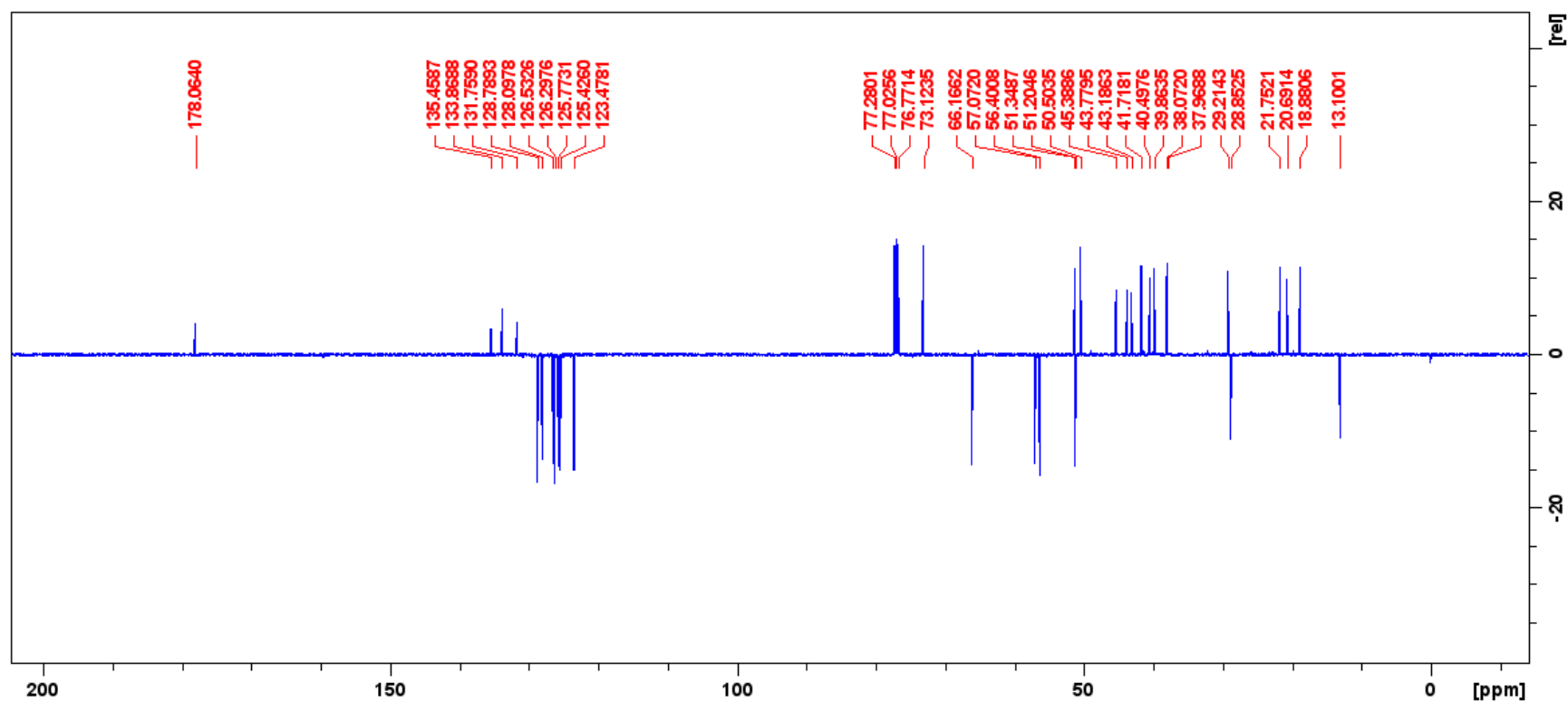
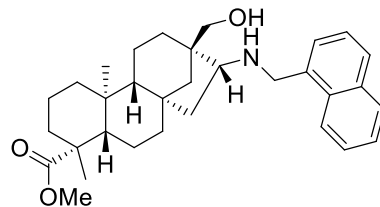
HMBC of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*S*)-1-(naphthalen-1-yl)ethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**14**)



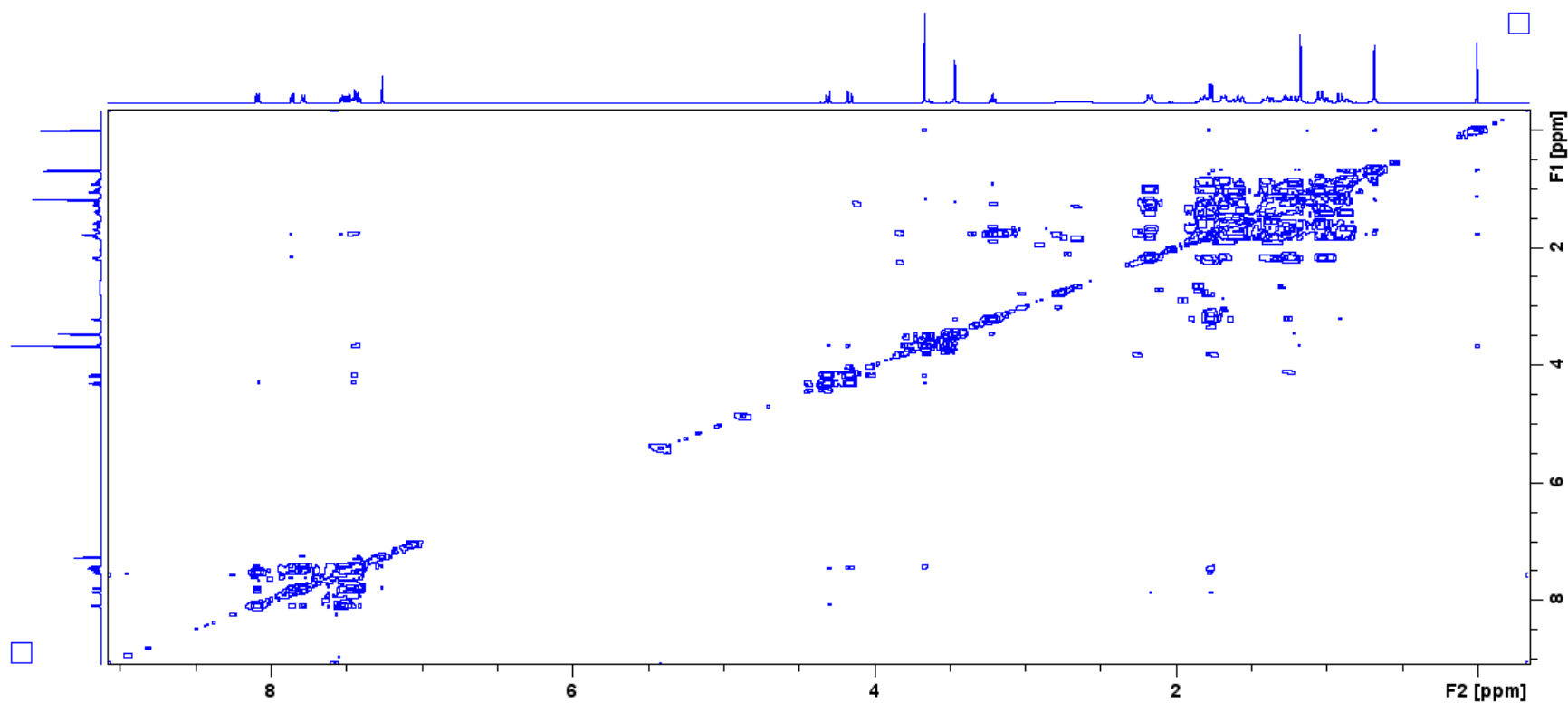
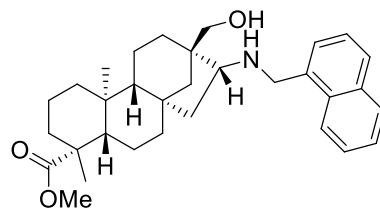
^1H -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-((naphthalen-1-ylmethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**15**)



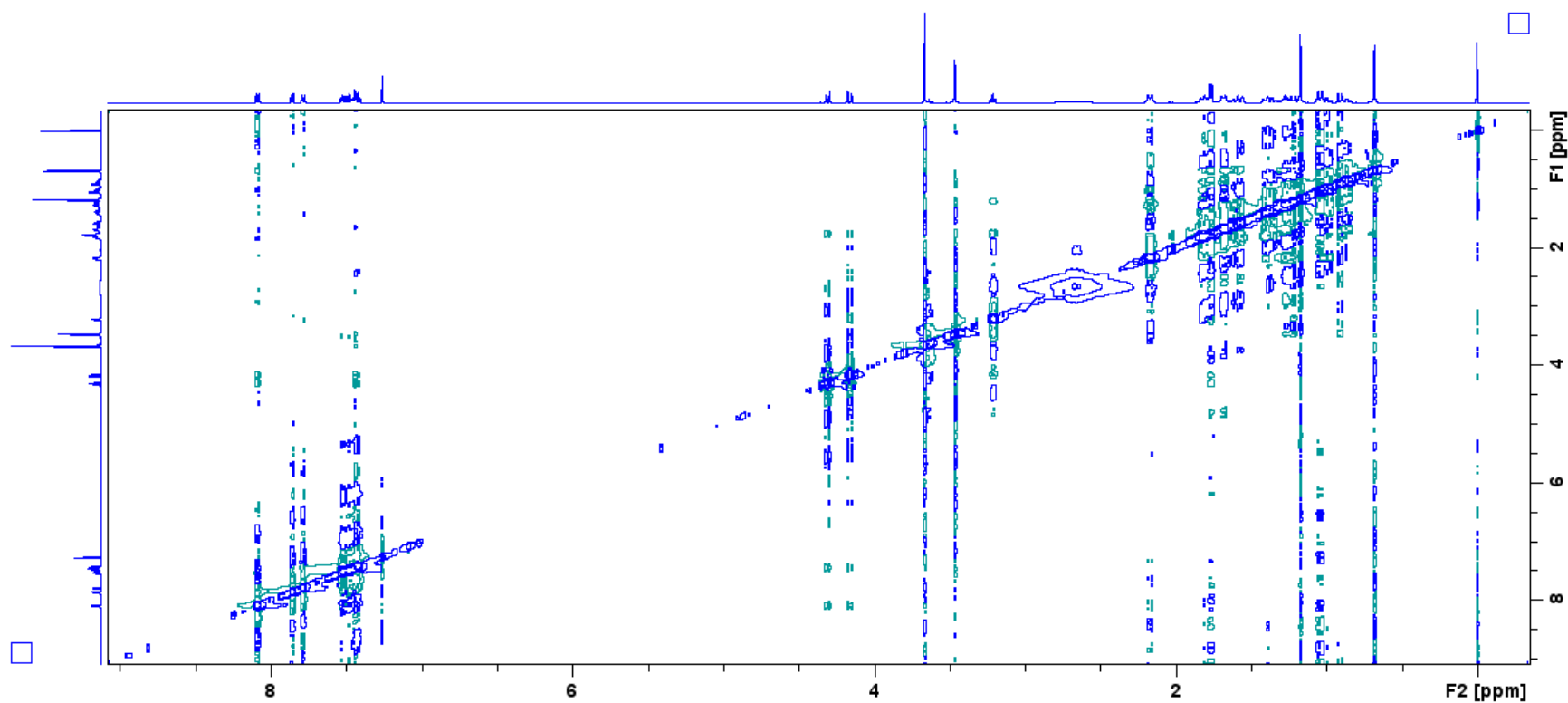
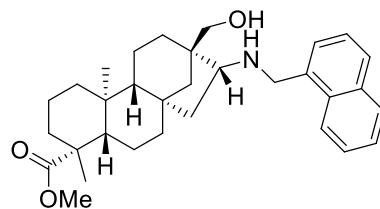
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-((naphthalen-1-ylmethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**15**)



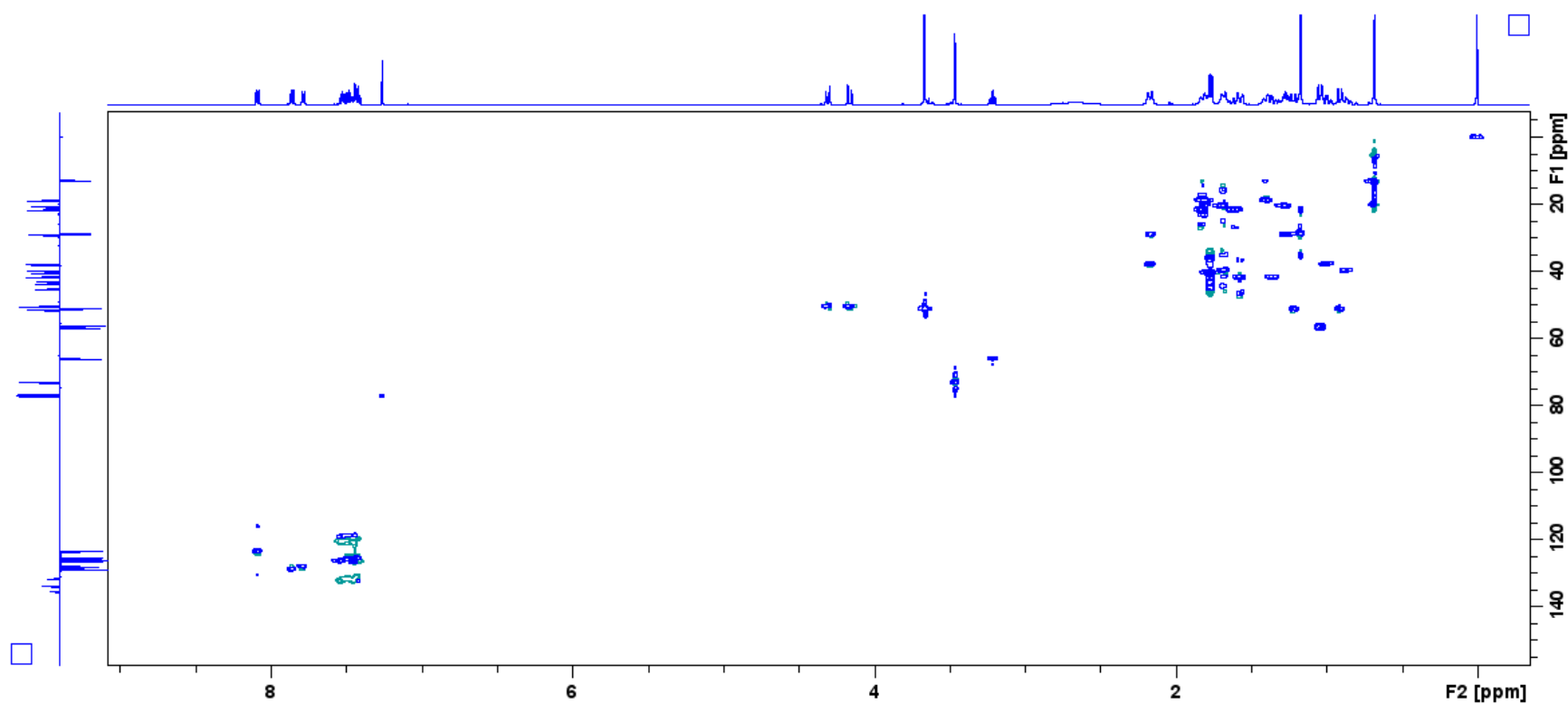
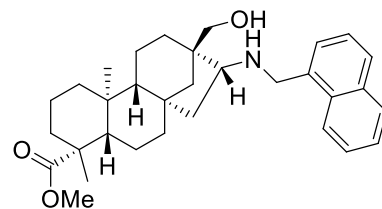
COSY of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-((naphthalen-1-ylmethyl)amino)tetradecaahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**15**)



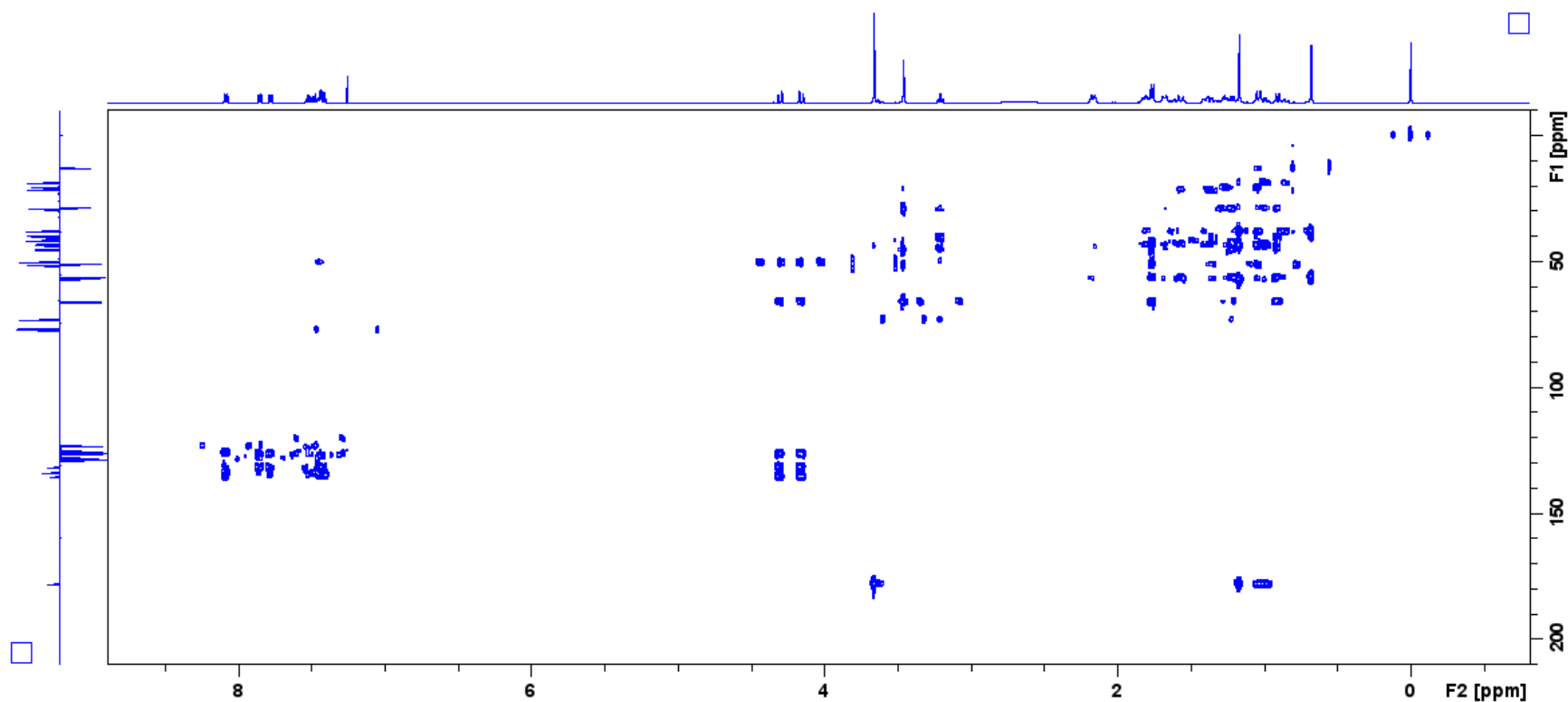
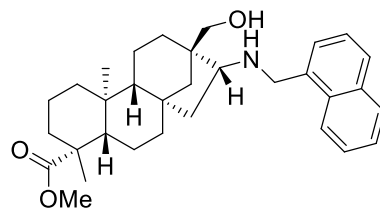
NOESY of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-((naphthalen-1-ylmethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**15**)



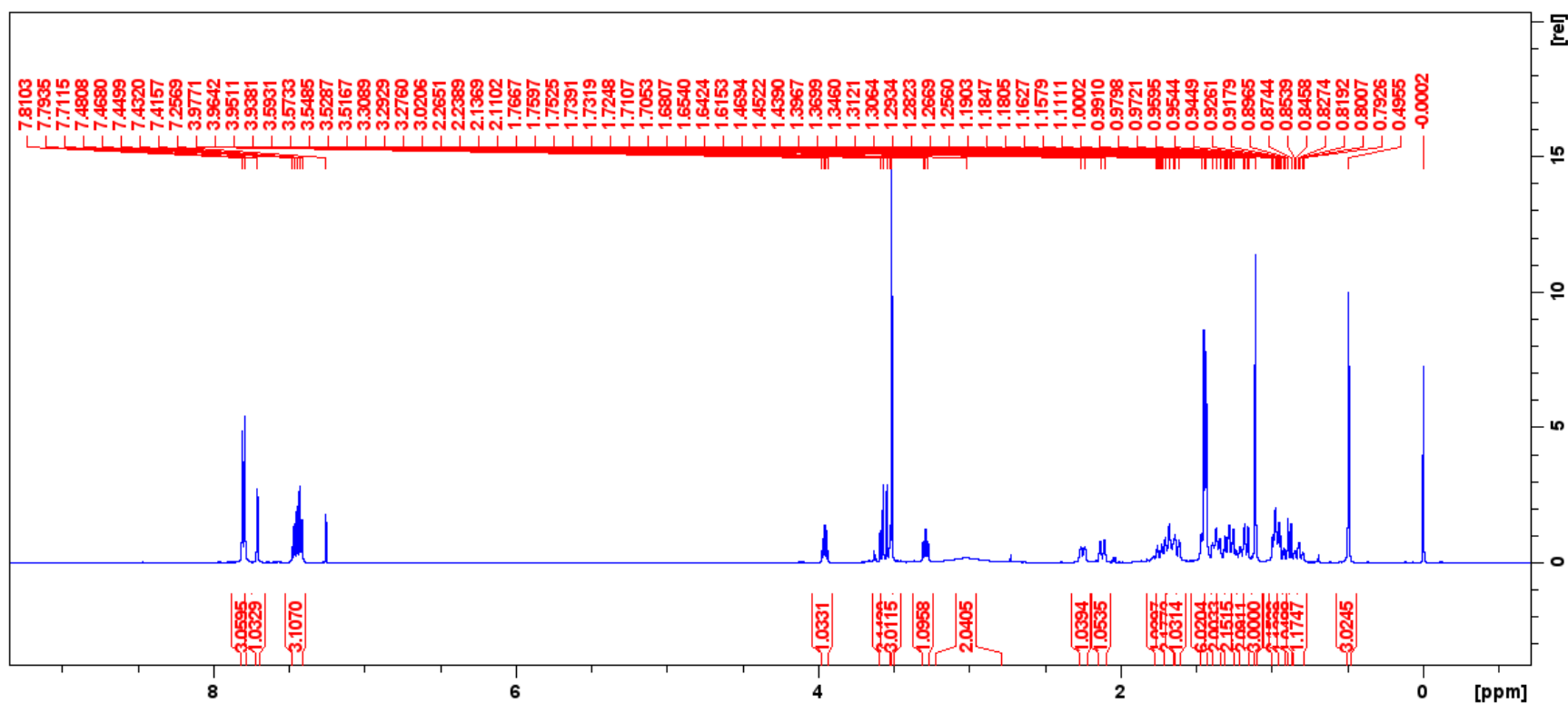
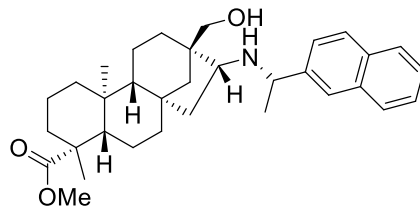
HSQC of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-((naphthalen-1-ylmethyl)amino)tetradecaahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**15**)



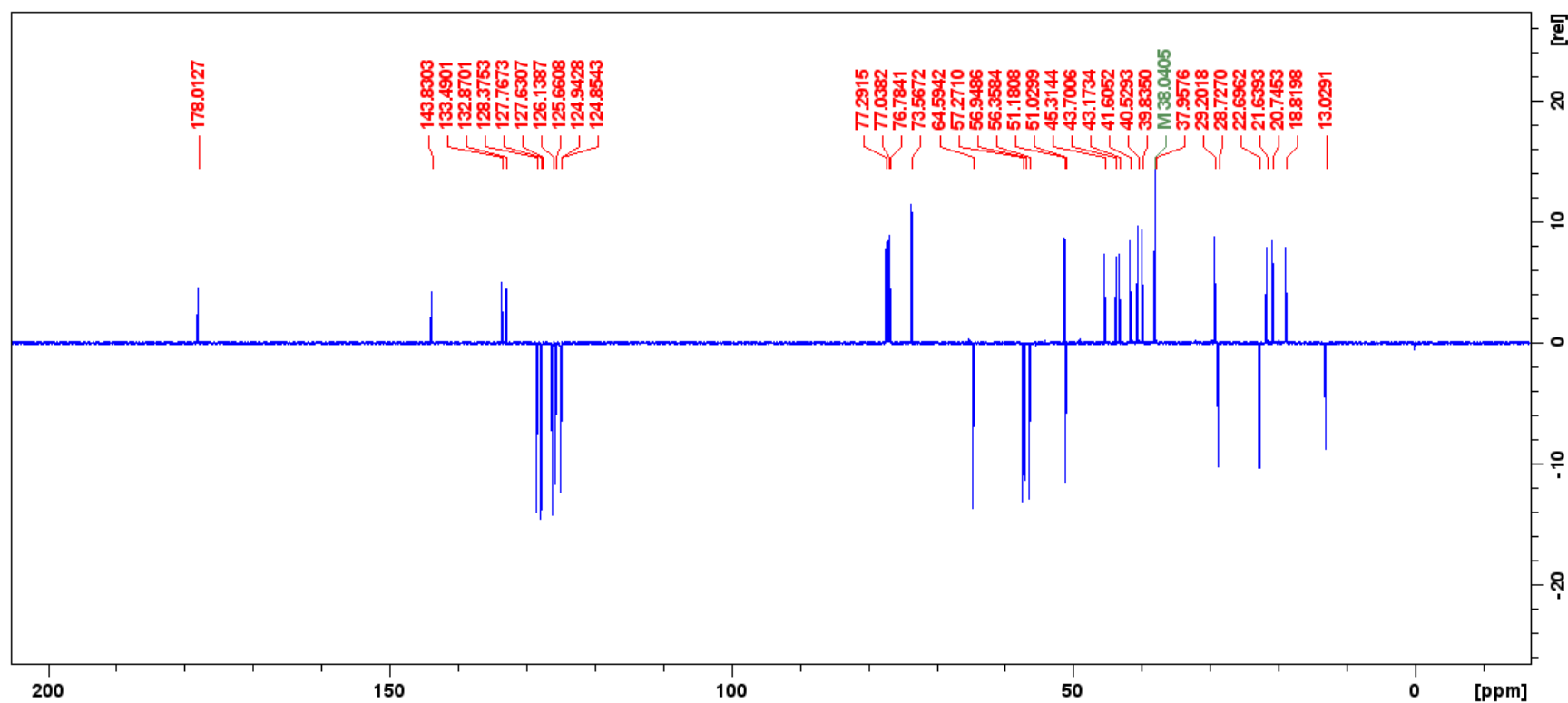
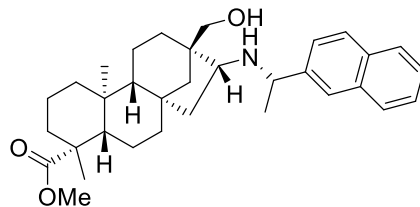
HMBC of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-((naphthalen-1-ylmethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**15**)



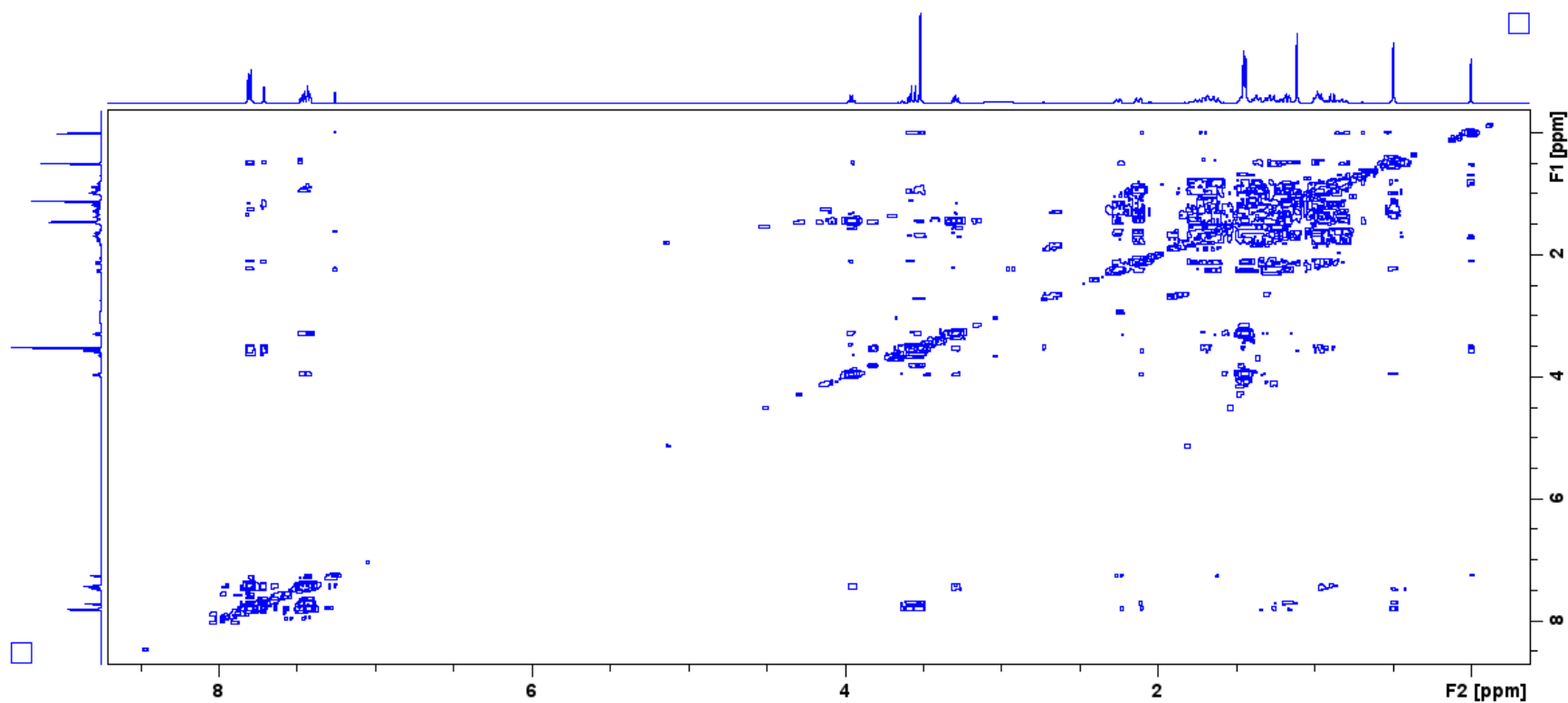
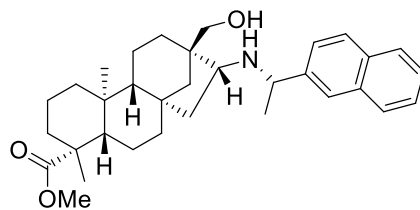
^1H -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*S*)-1-(naphthalen-2-yl)ethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**16**)



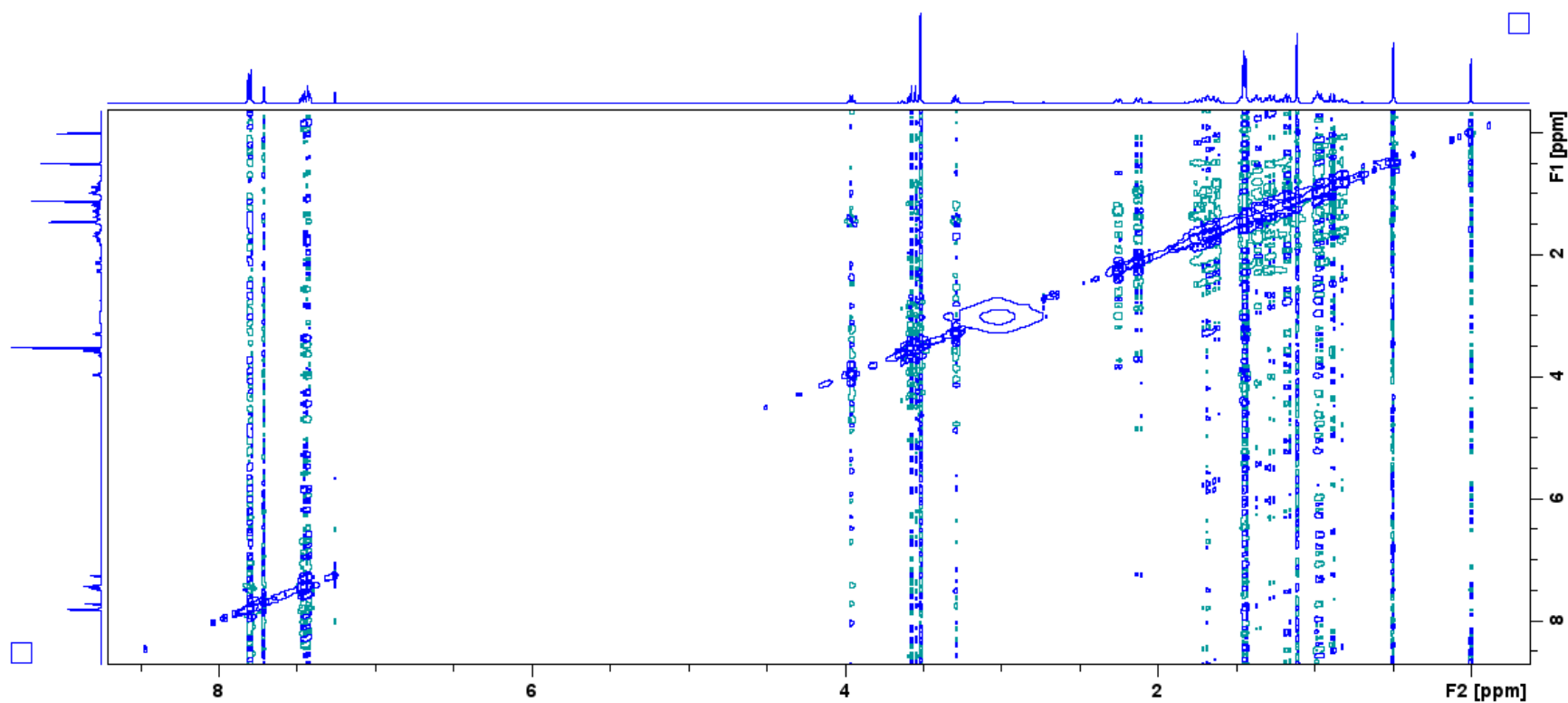
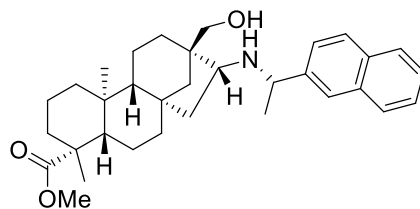
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*S*)-1-(naphthalen-2-yl)ethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**16**)



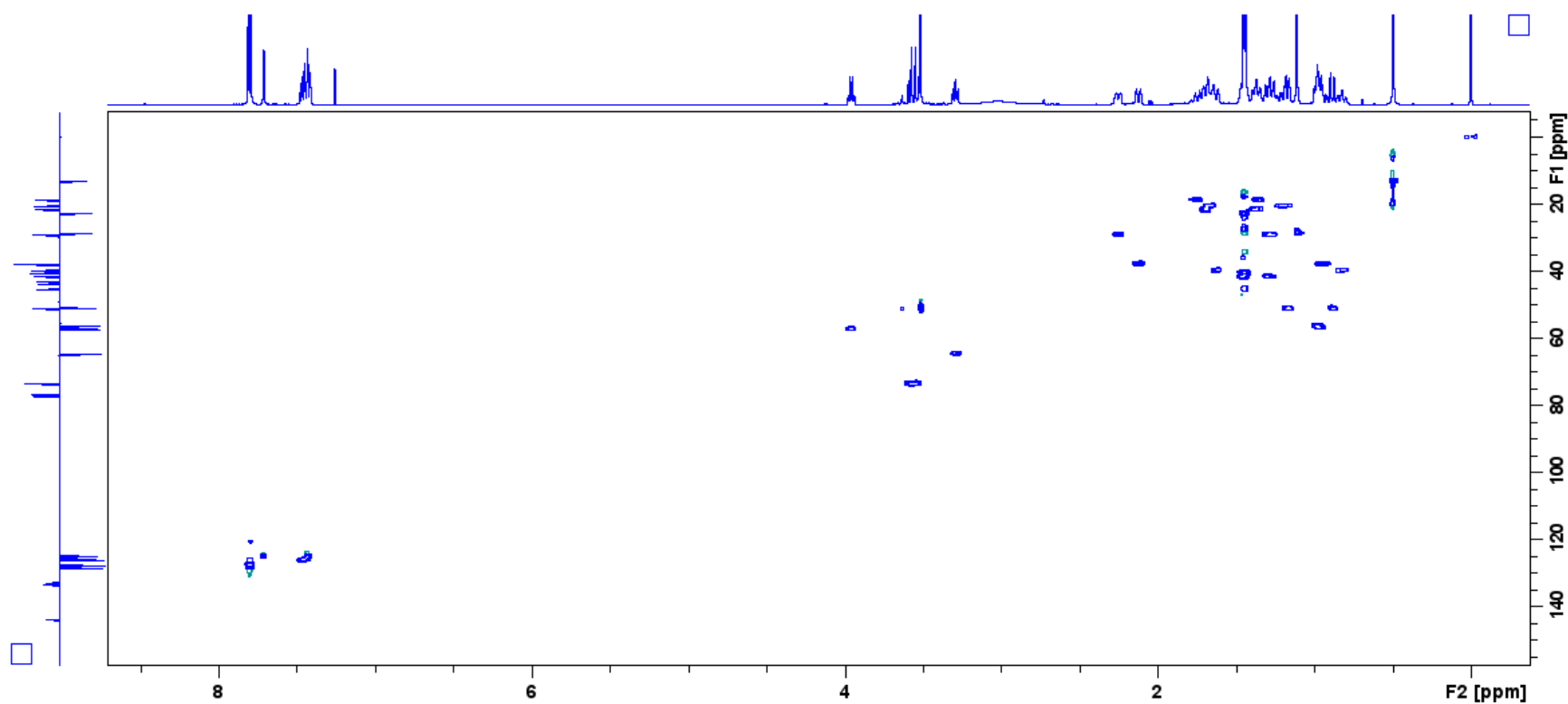
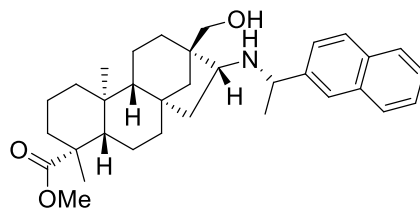
COSY of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*S*)-1-(naphthalen-2-yl)ethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**16**)



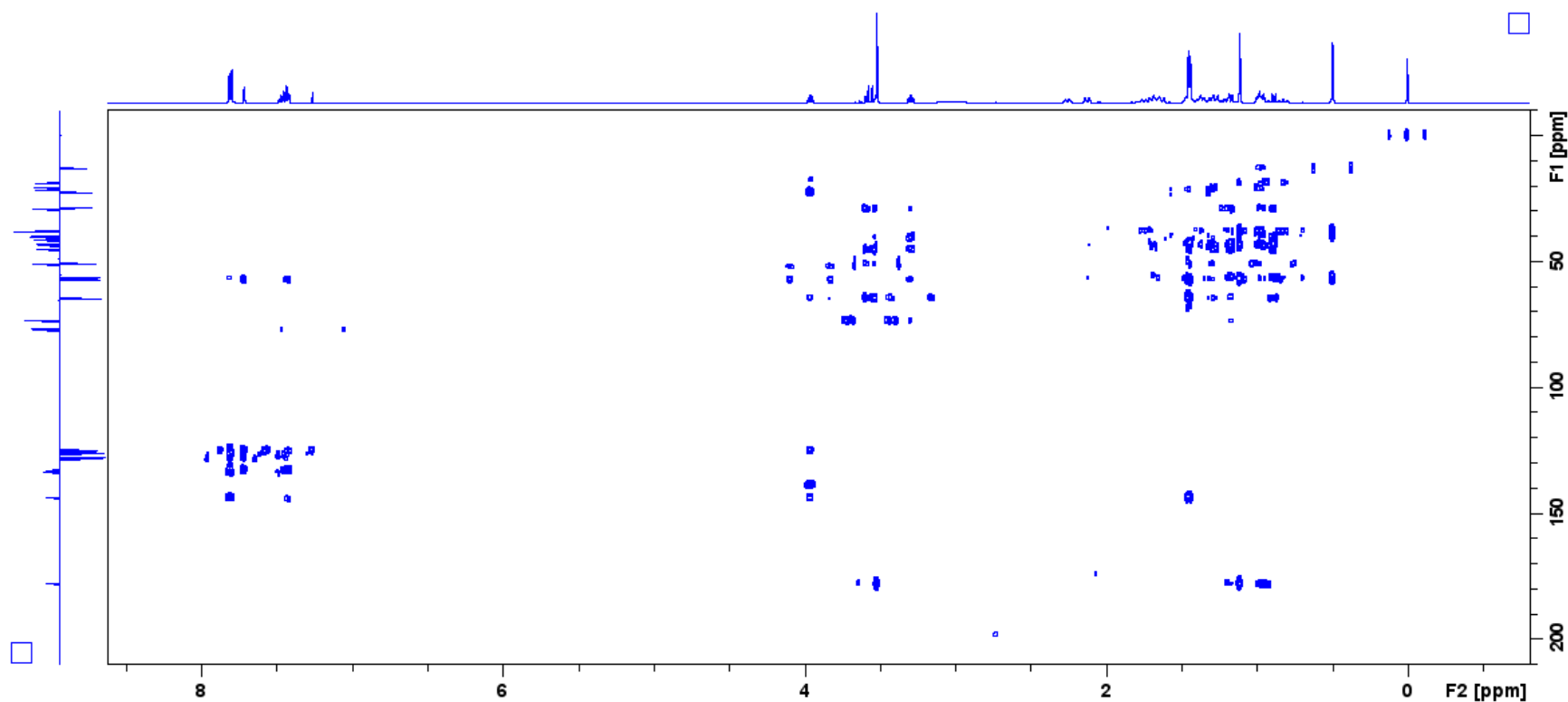
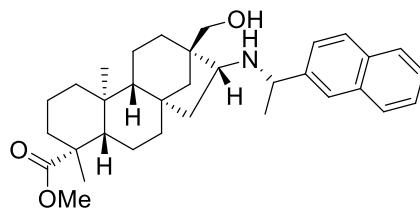
NOESY of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*S*)-1-(naphthalen-2-yl)ethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**16**)



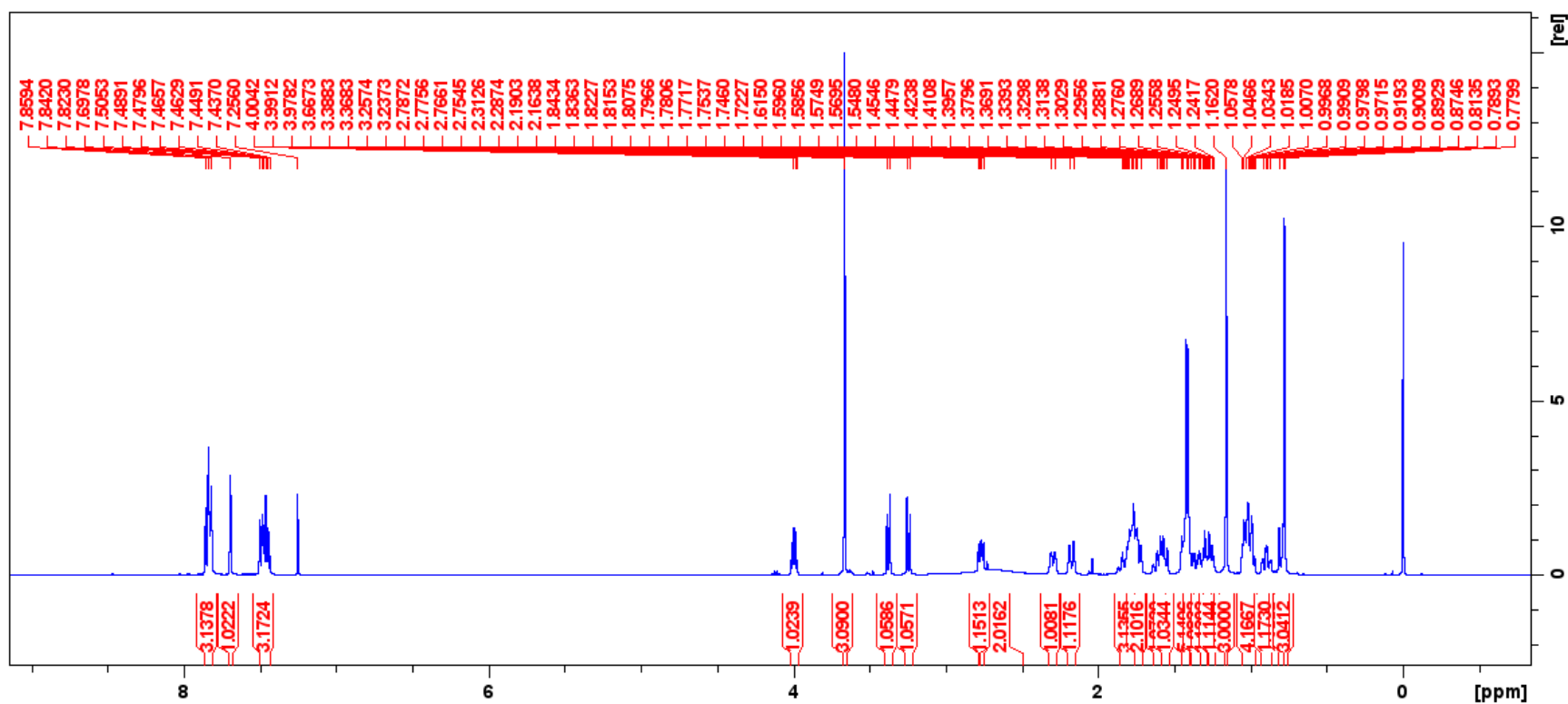
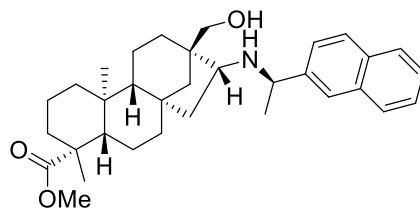
HSQC of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*S*)-1-(naphthalen-2-yl)ethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**16**)



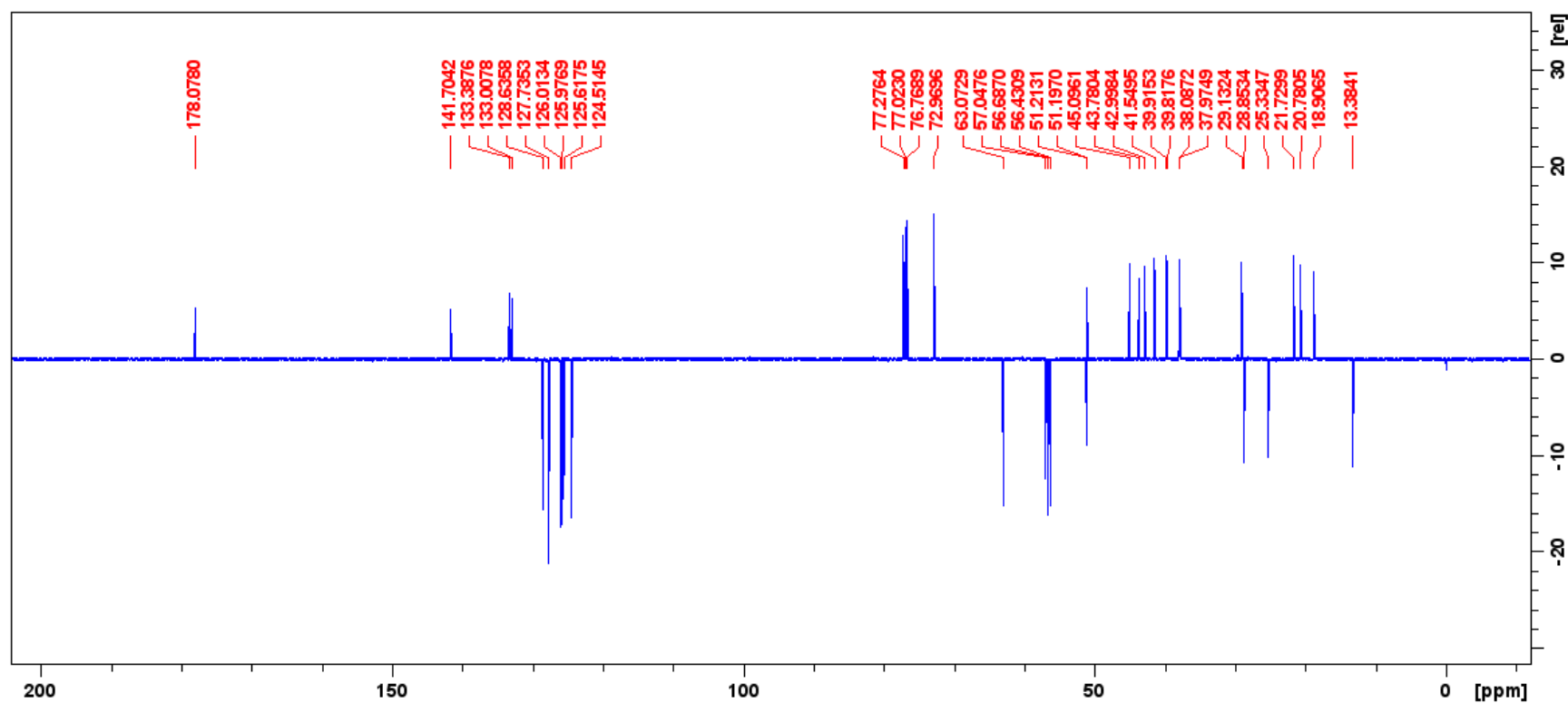
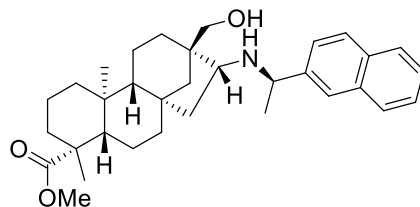
HMBC of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*S*)-1-(naphthalen-2-yl)ethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**16**)



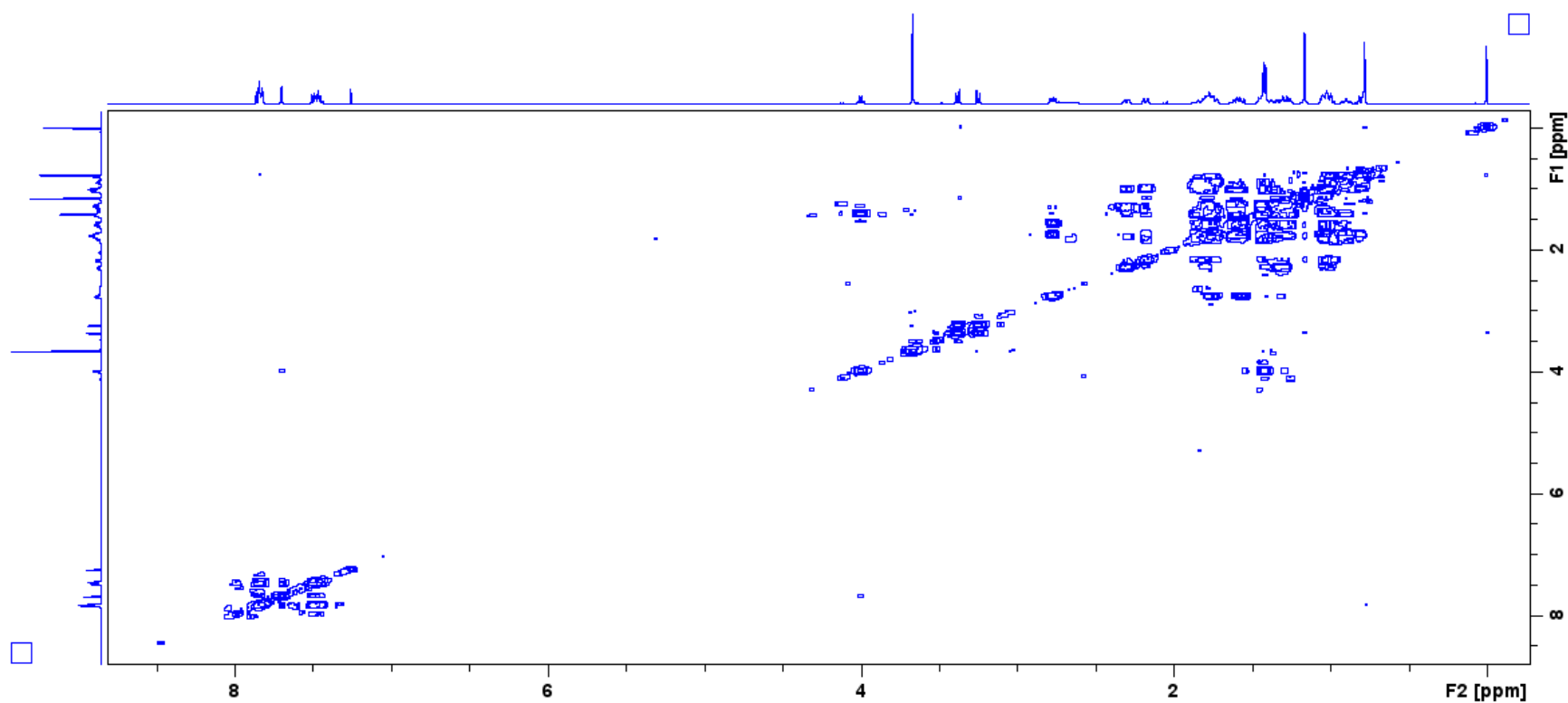
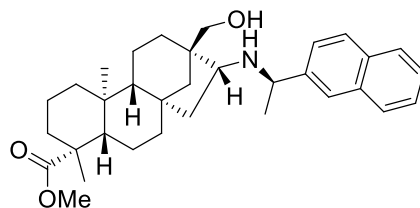
^1H -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*R*)-1-(naphthalen-2-yl)ethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**17**)



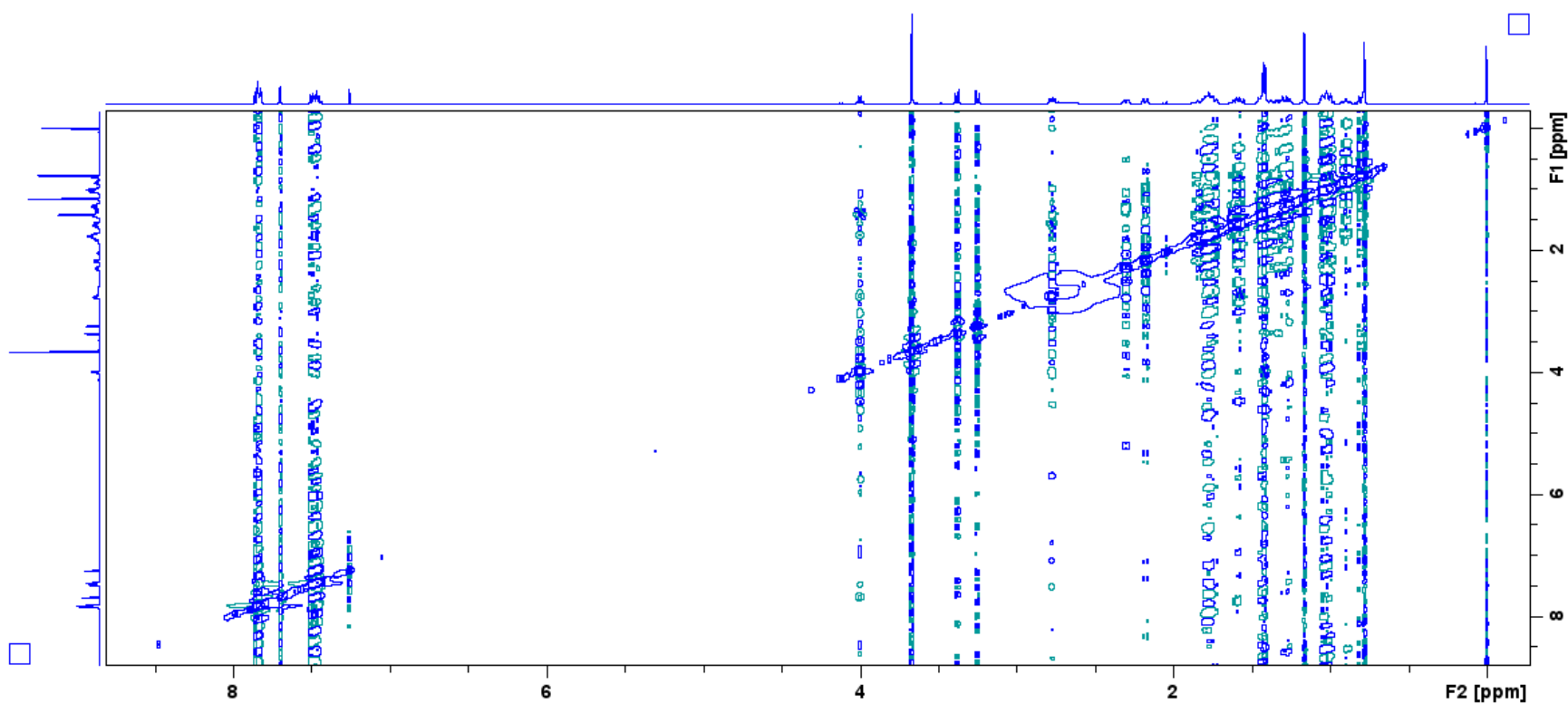
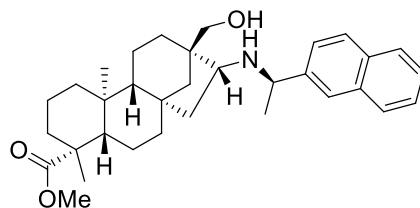
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*R*)-1-(naphthalen-2-yl)ethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**17**)



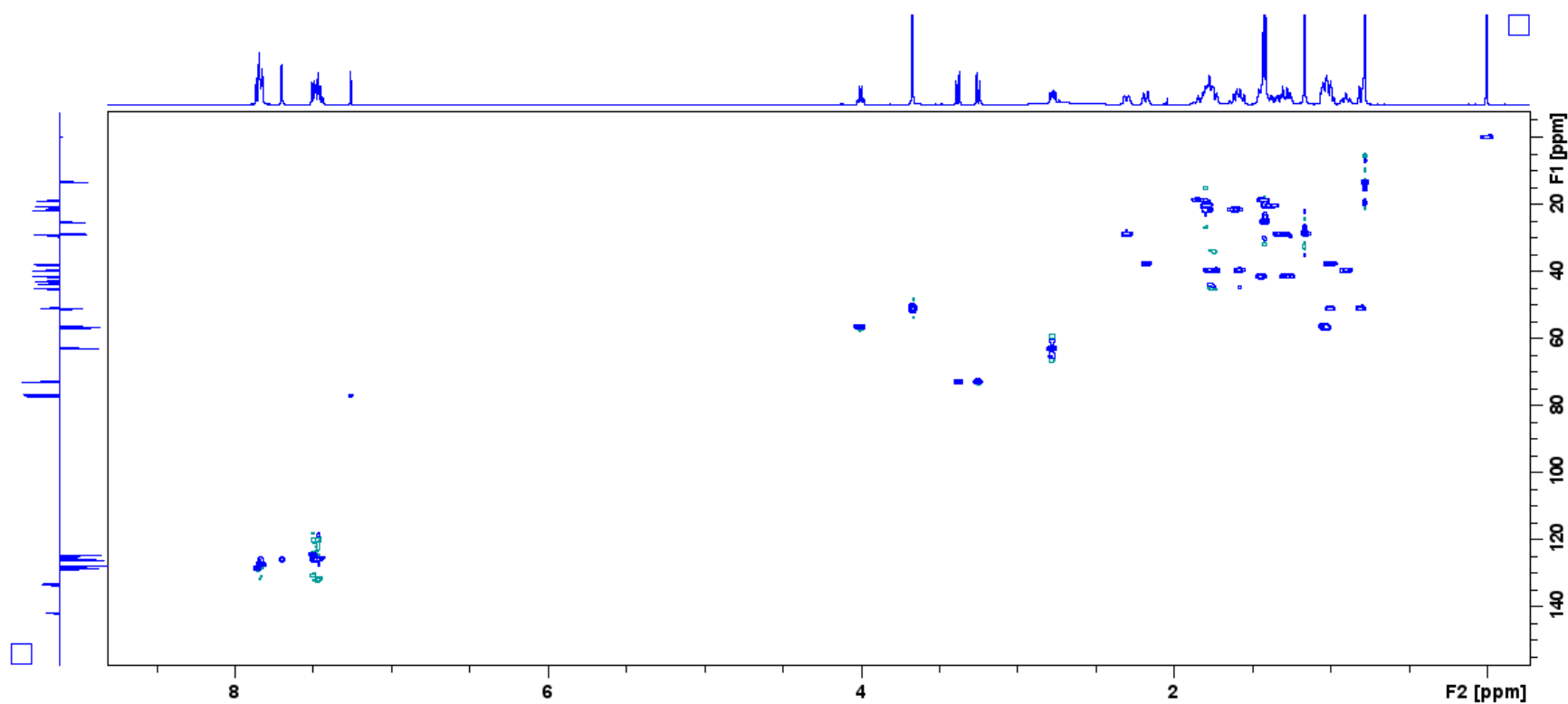
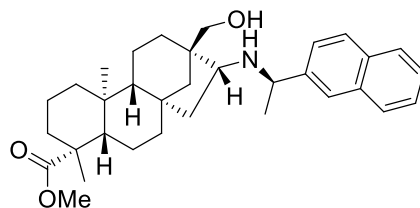
COSY of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*R*)-1-(naphthalen-2-yl)ethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**17**)



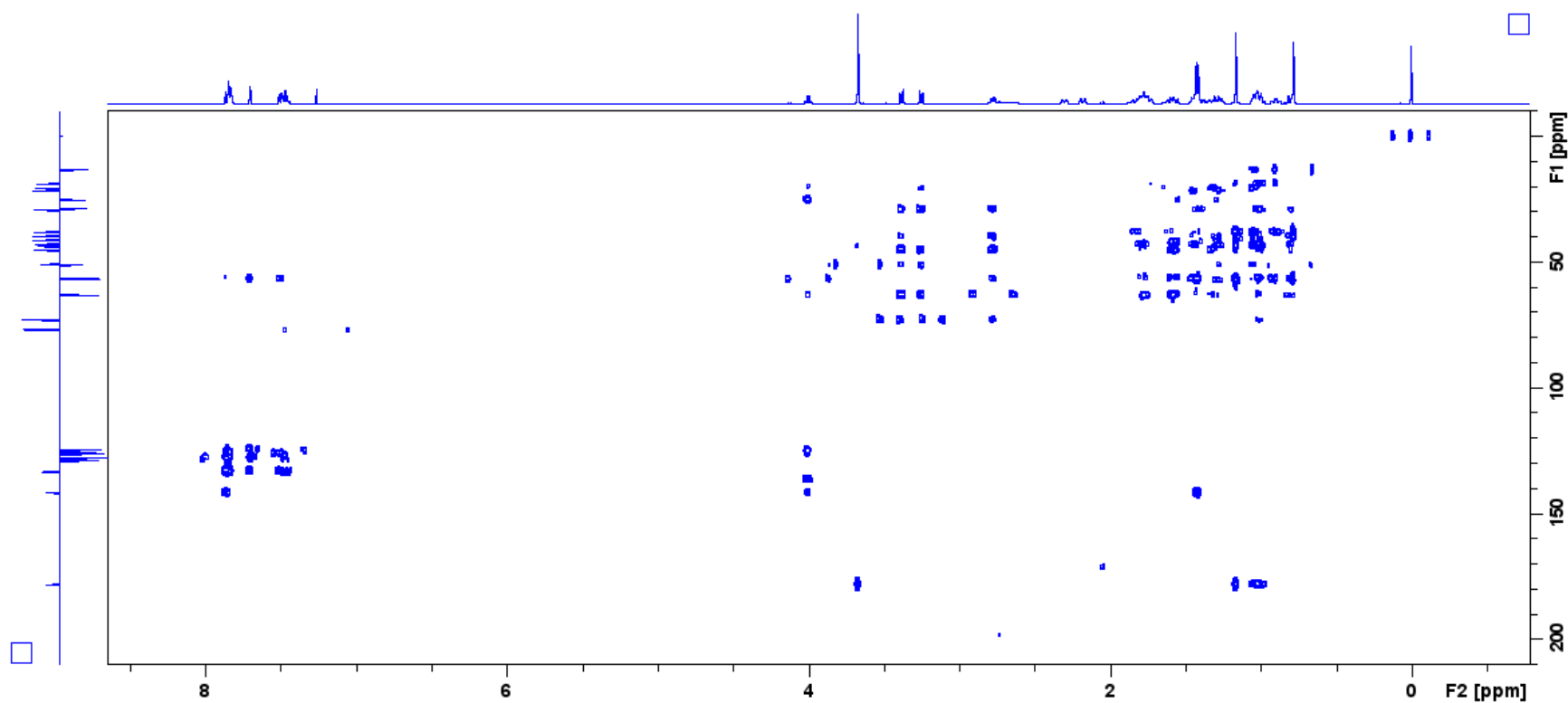
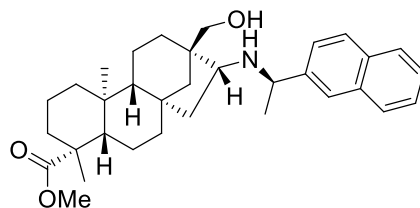
NOESY of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*R*)-1-(naphthalen-2-yl)ethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**17**)



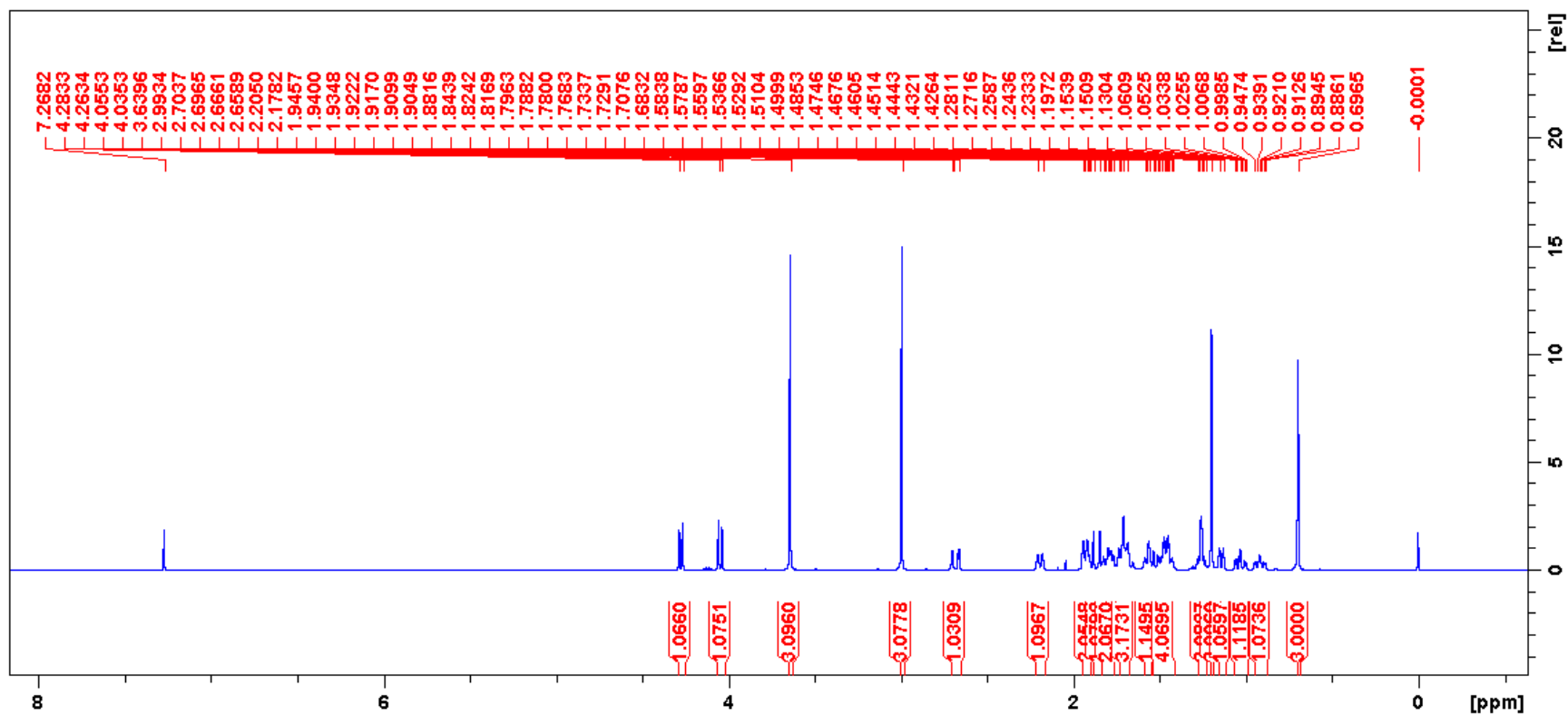
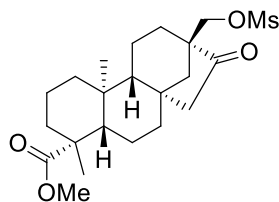
HSQC of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*R*)-1-(naphthalen-2-yl)ethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**17**)



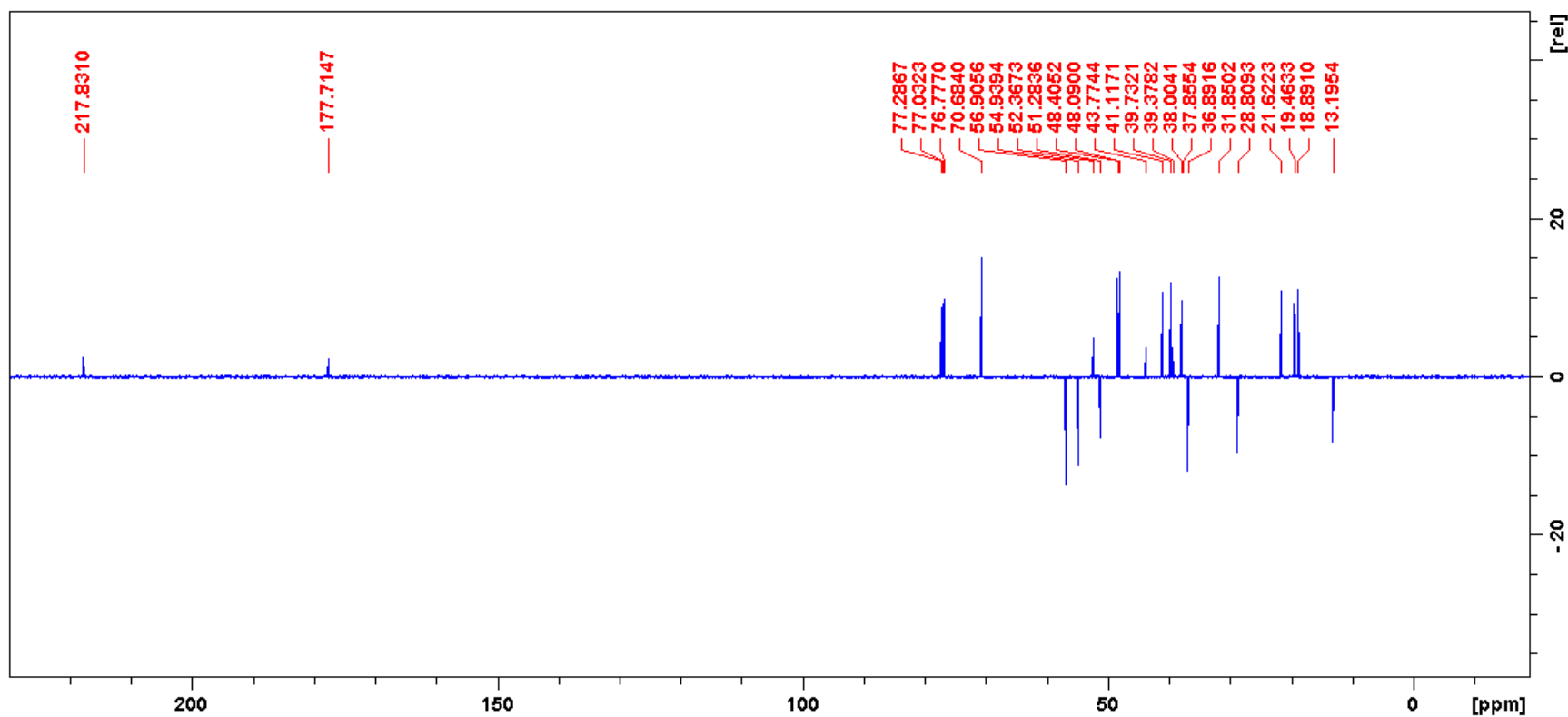
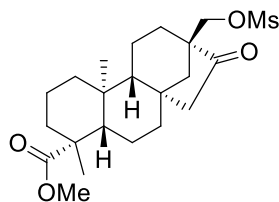
HMBC of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*R*)-1-(naphthalen-2-yl)ethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**17**)



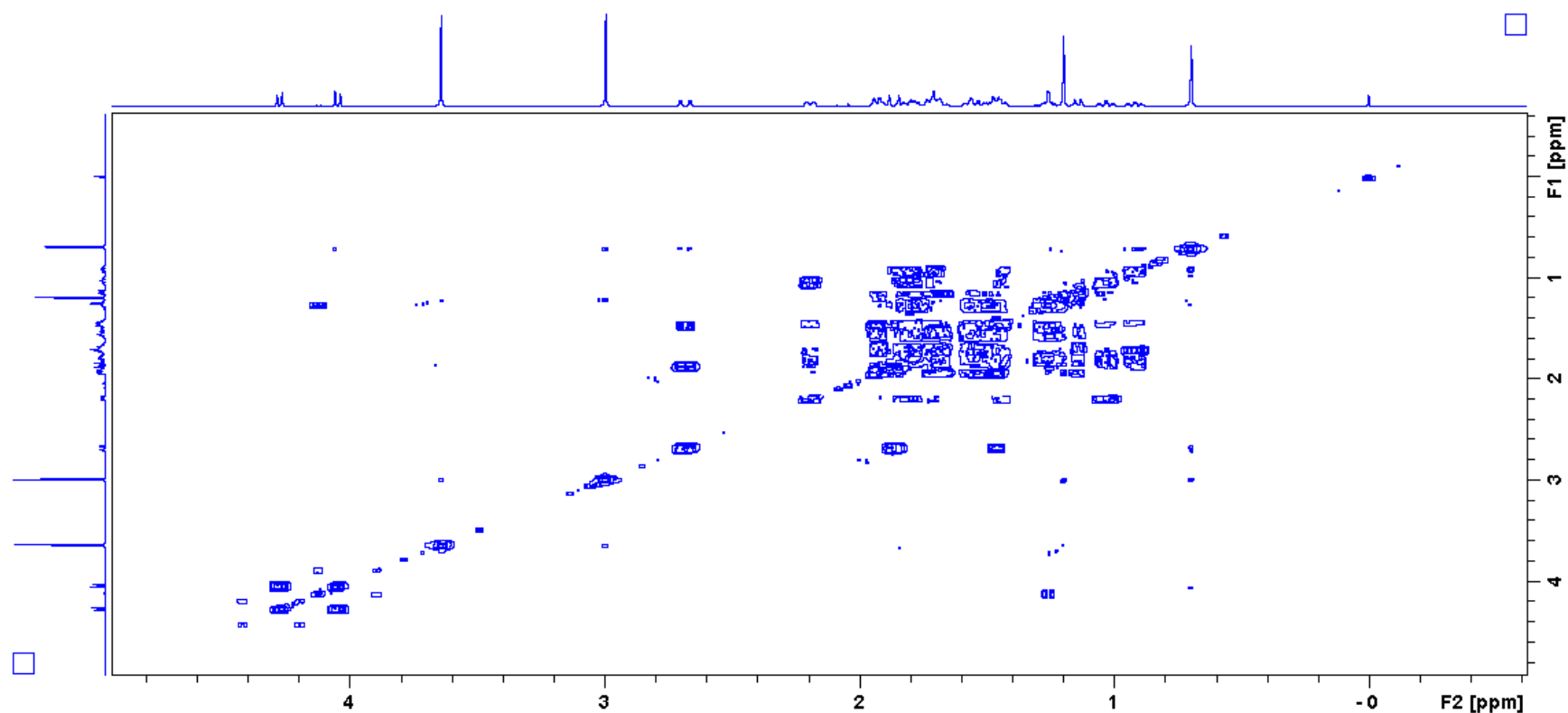
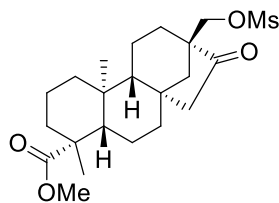
^1H -NMR of compound (4*R*,4*aS*,6*aR*,9*S*,11*aR*,11*bS*)-methyl 4,11*b*-dimethyl-9-(((methylsulfonyl)oxy)methyl)-8-oxotetradecaahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**18**)



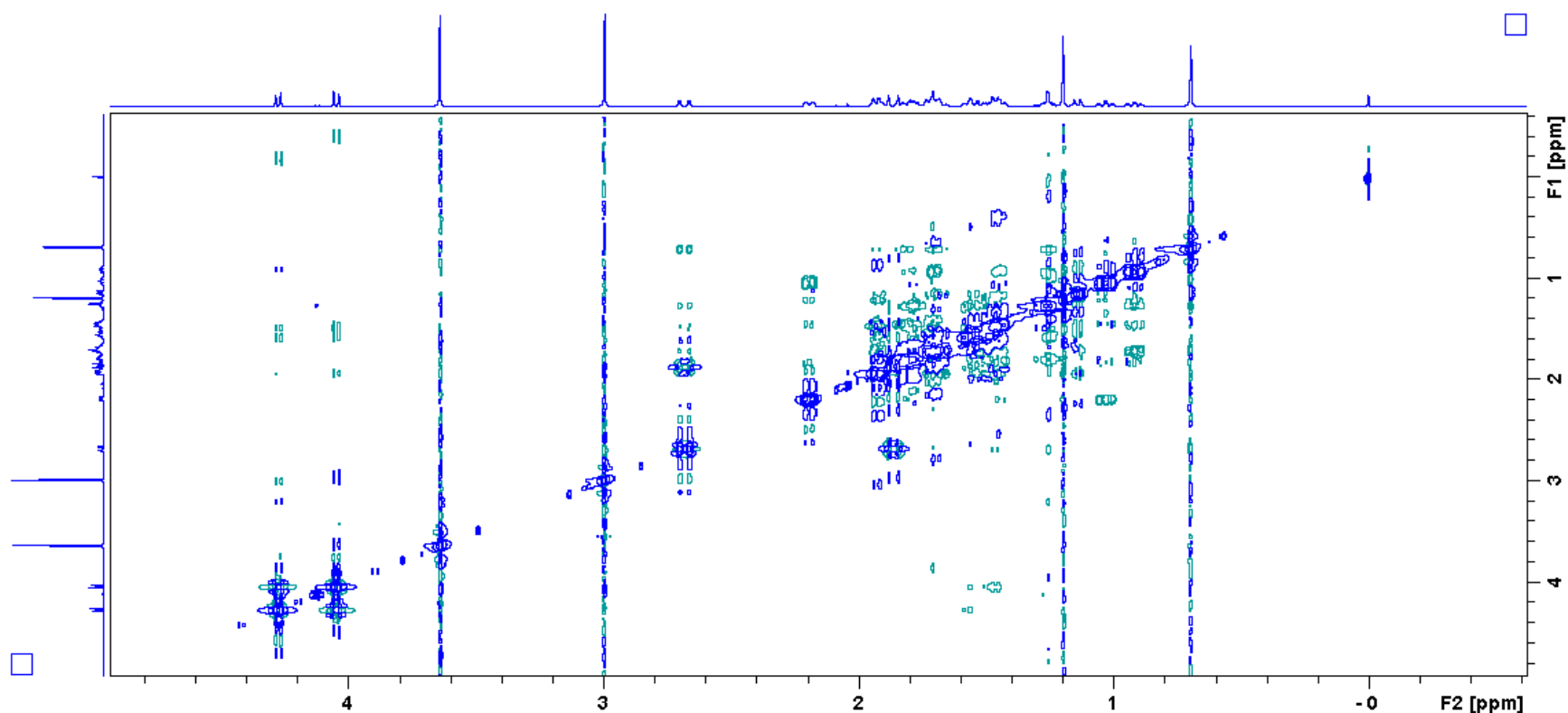
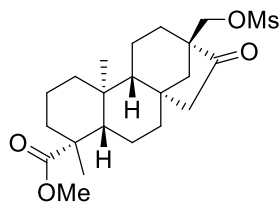
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,9*S*,11*aR*,11*bS*)-methyl 4,11*b*-dimethyl-9-(((methylsulfonyl)oxy)methyl)-8-oxotetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**18**)



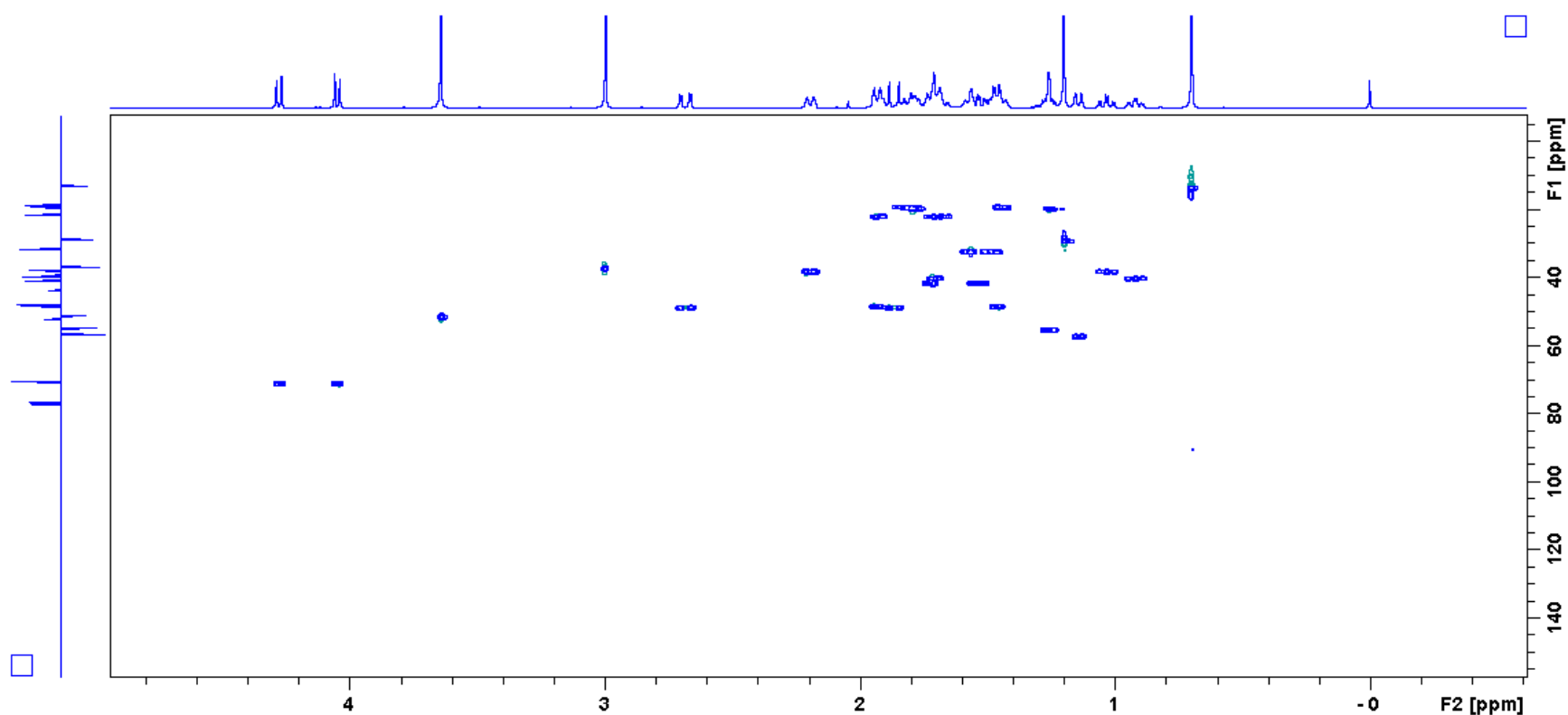
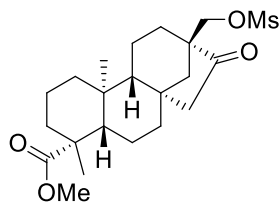
COSY of compound (4*R*,4*aS*,6*aR*,9*S*,11*aR*,11*bS*)-methyl 4,11*b*-dimethyl-9-(((methylsulfonyl)oxy)methyl)-8-oxotetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**18**)



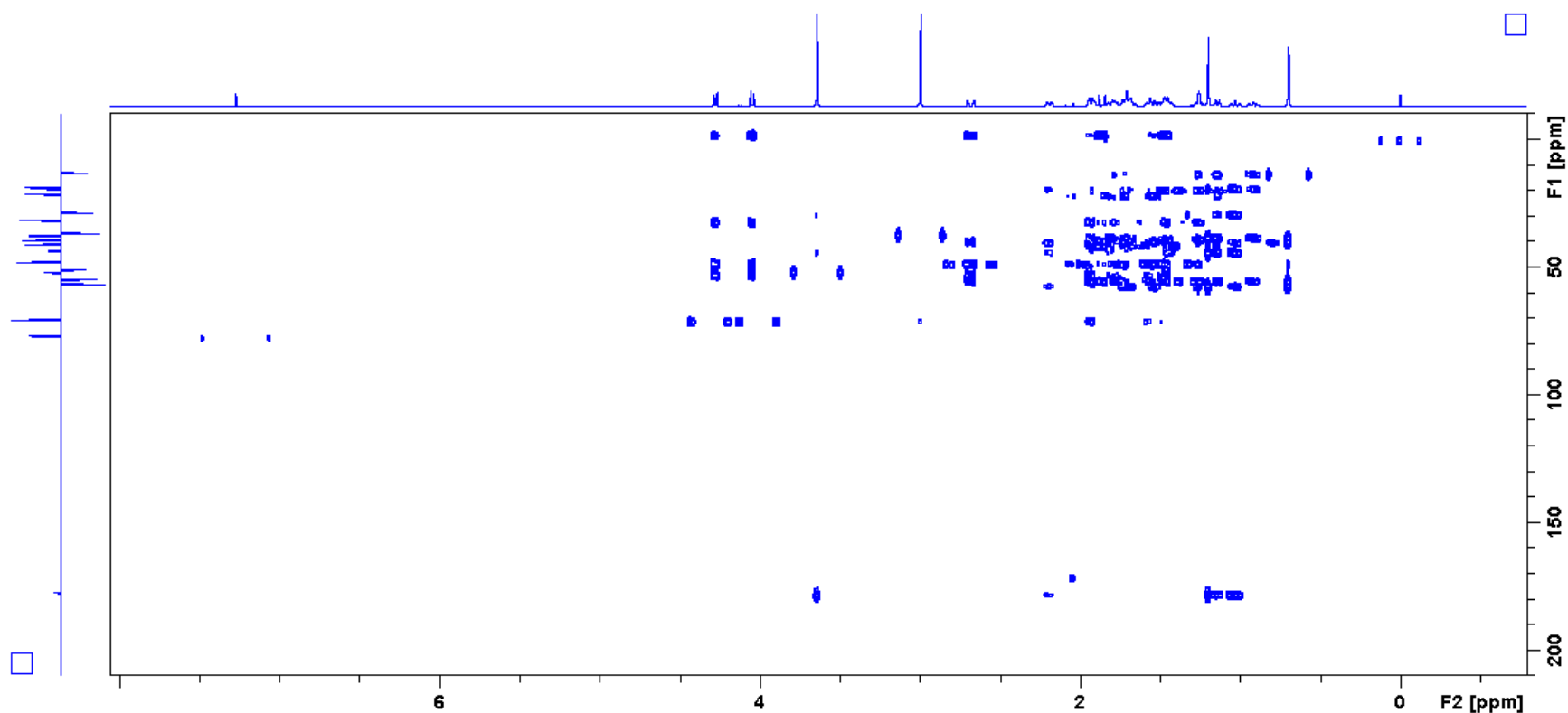
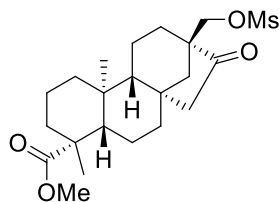
NOESY of compound (4*R*,4*aS*,6*aR*,9*S*,11*aR*,11*bS*)-methyl 4,11*b*-dimethyl-9-(((methylsulfonyl)oxy)methyl)-8-oxotetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**18**)



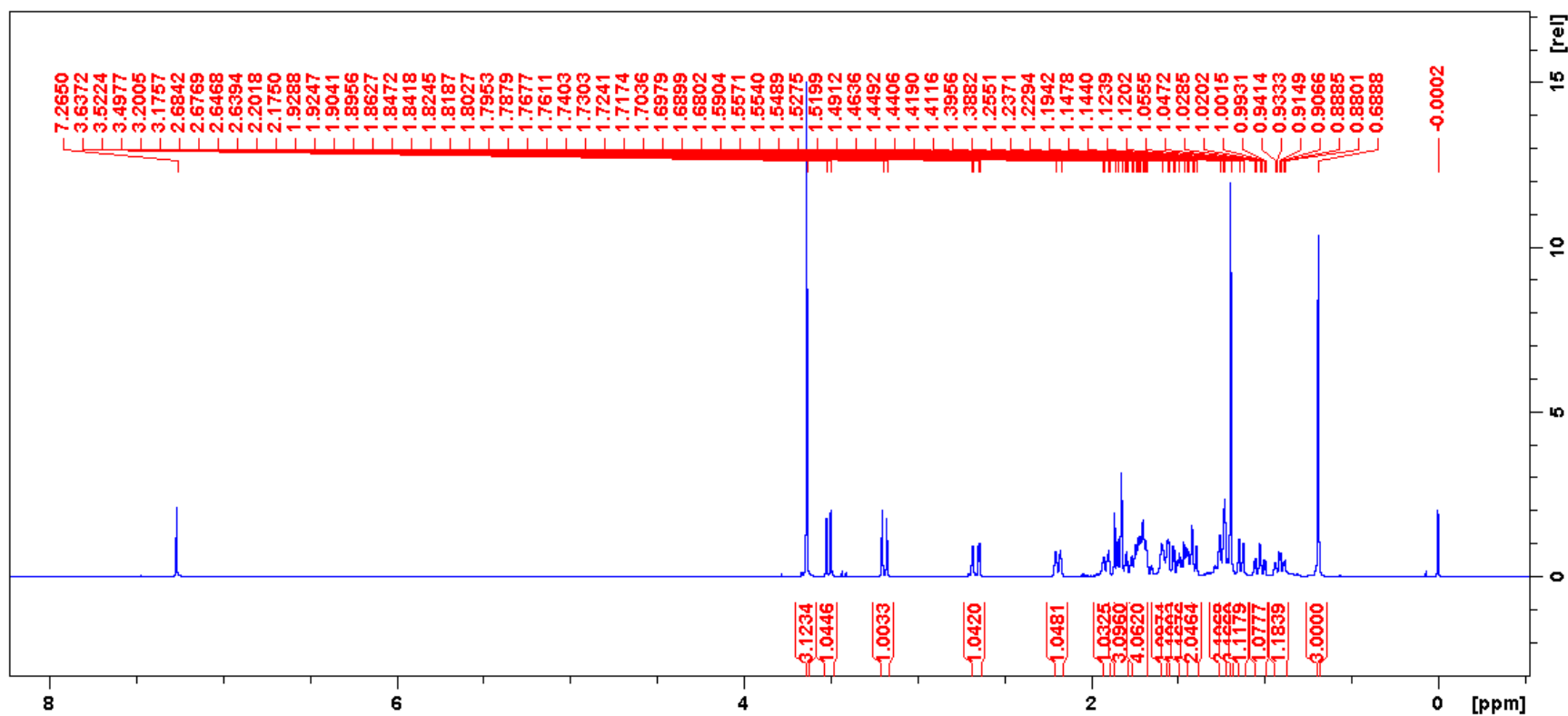
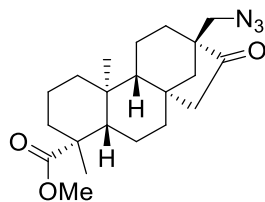
HSQC of compound (4*R*,4*aS*,6*aR*,9*S*,11*aR*,11*bS*)-methyl 4,11b-dimethyl-9-(((methylsulfonyl)oxy)methyl)-8-oxotetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**18**)



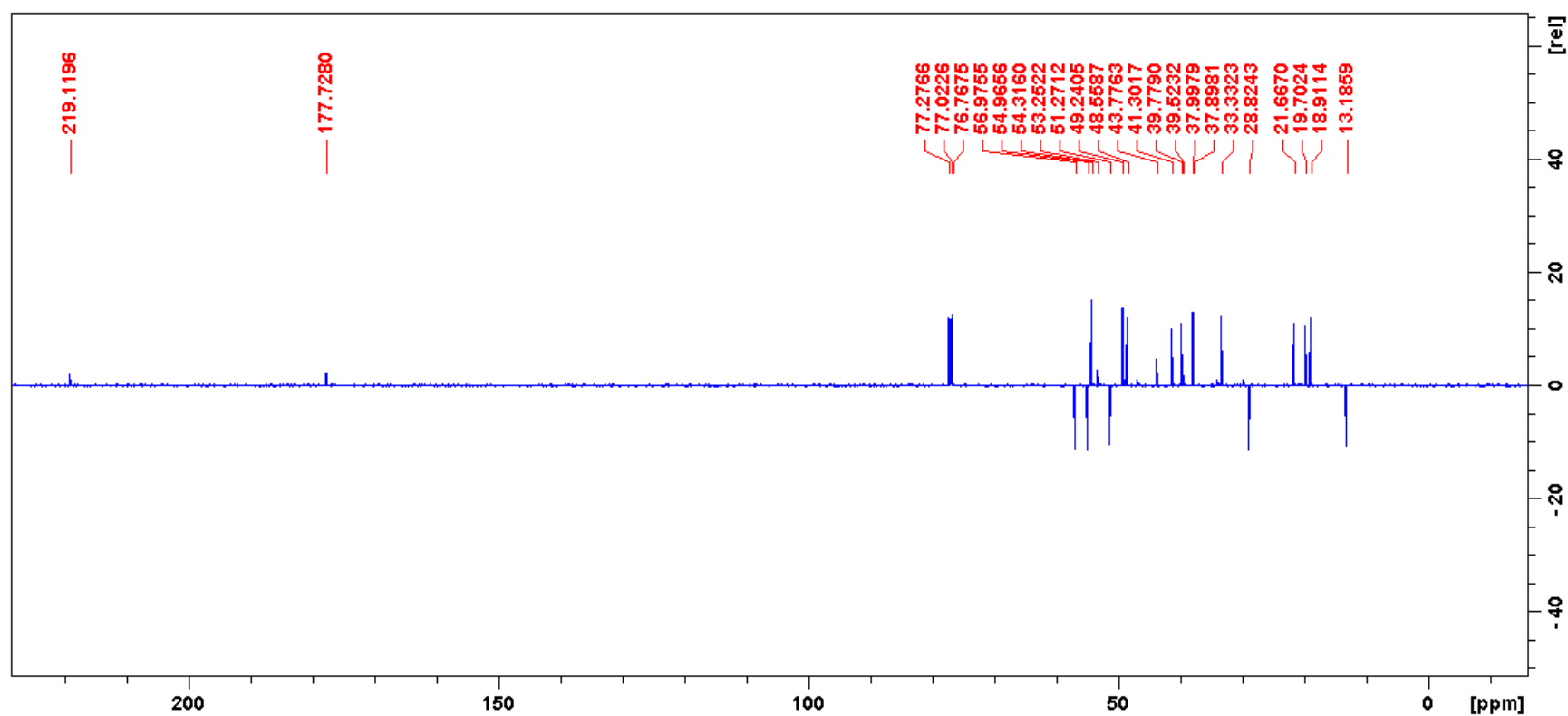
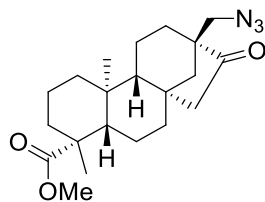
HMBC of compound (4*R*,4*aS*,6*aR*,9*S*,11*aR*,11*bS*)-methyl 4,11*b*-dimethyl-9-(((methylsulfonyl)oxy)methyl)-8-oxotetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**18**)



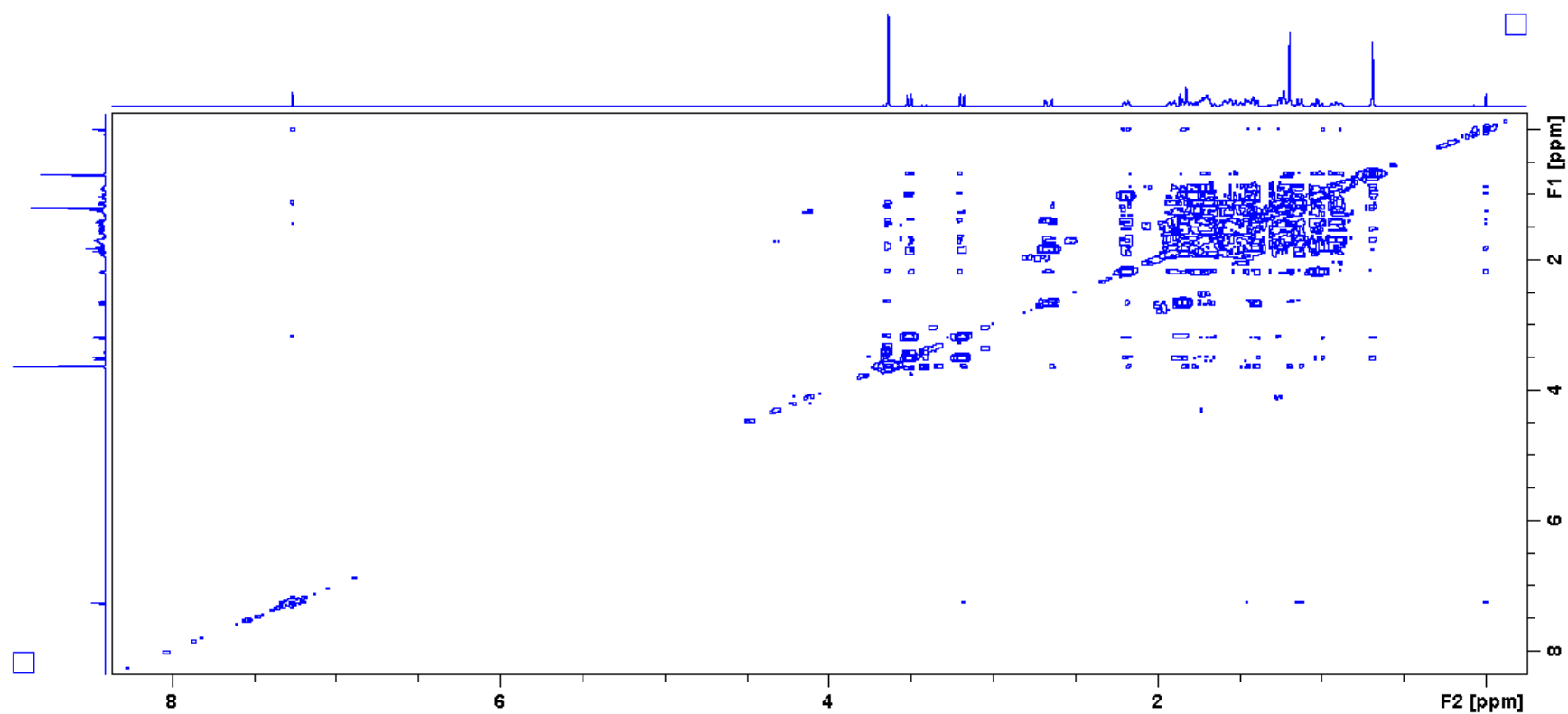
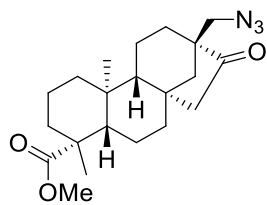
^1H -NMR of compound (4*R*,4*aS*,6*aR*,9*S*,11*aR*,11*bS*)-methyl 9-(azidomethyl)-4,11*b*-dimethyl-8-oxotetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**19**)



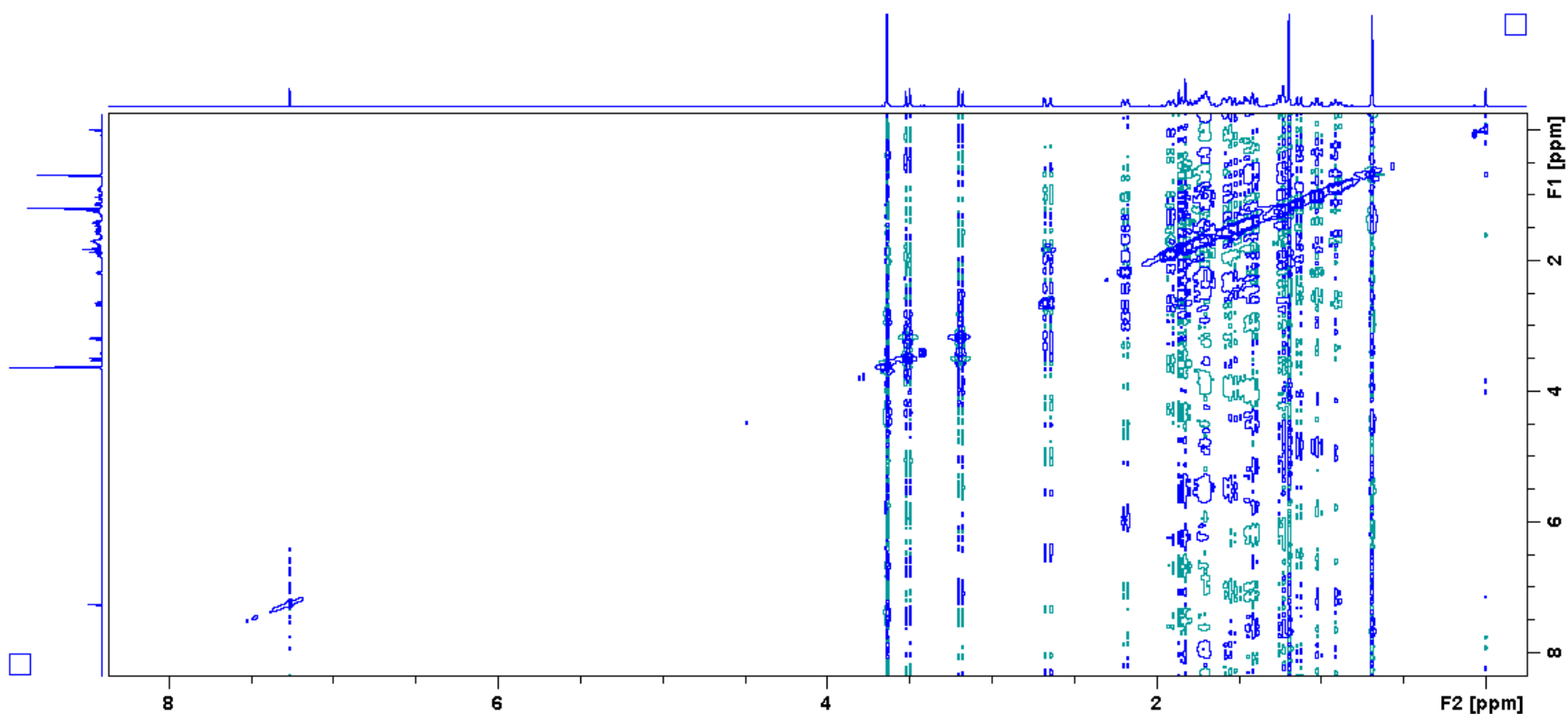
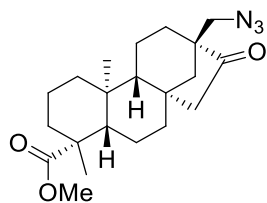
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,9*S*,11*aR*,11*bS*)-methyl 9-(azidomethyl)-4,11*b*-dimethyl-8-oxotetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**19**)



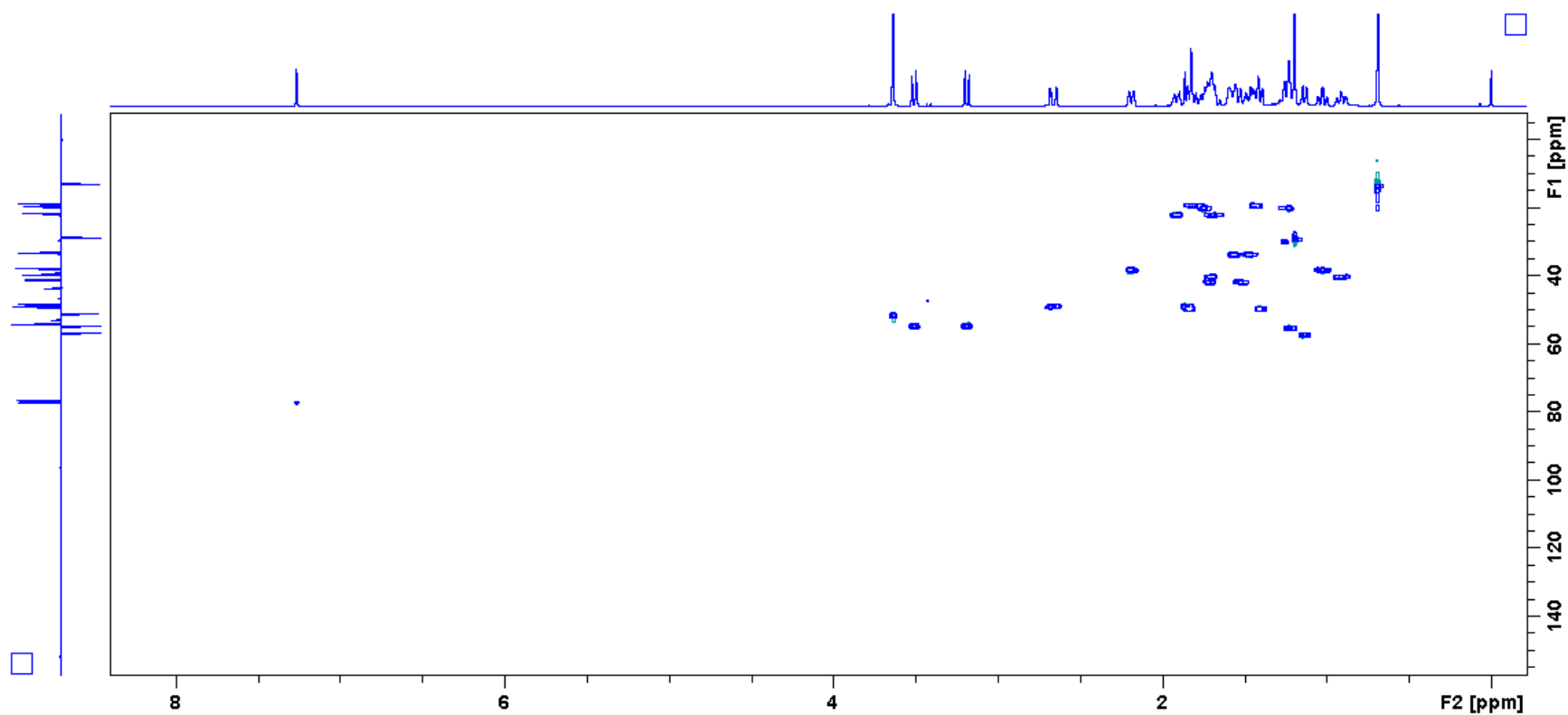
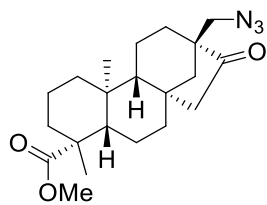
COSY of compound (4*R*,4*aS*,6*aR*,9*S*,11*aR*,11*bS*)-methyl 9-(azidomethyl)-4,11*b*-dimethyl-8-oxotetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**19**)



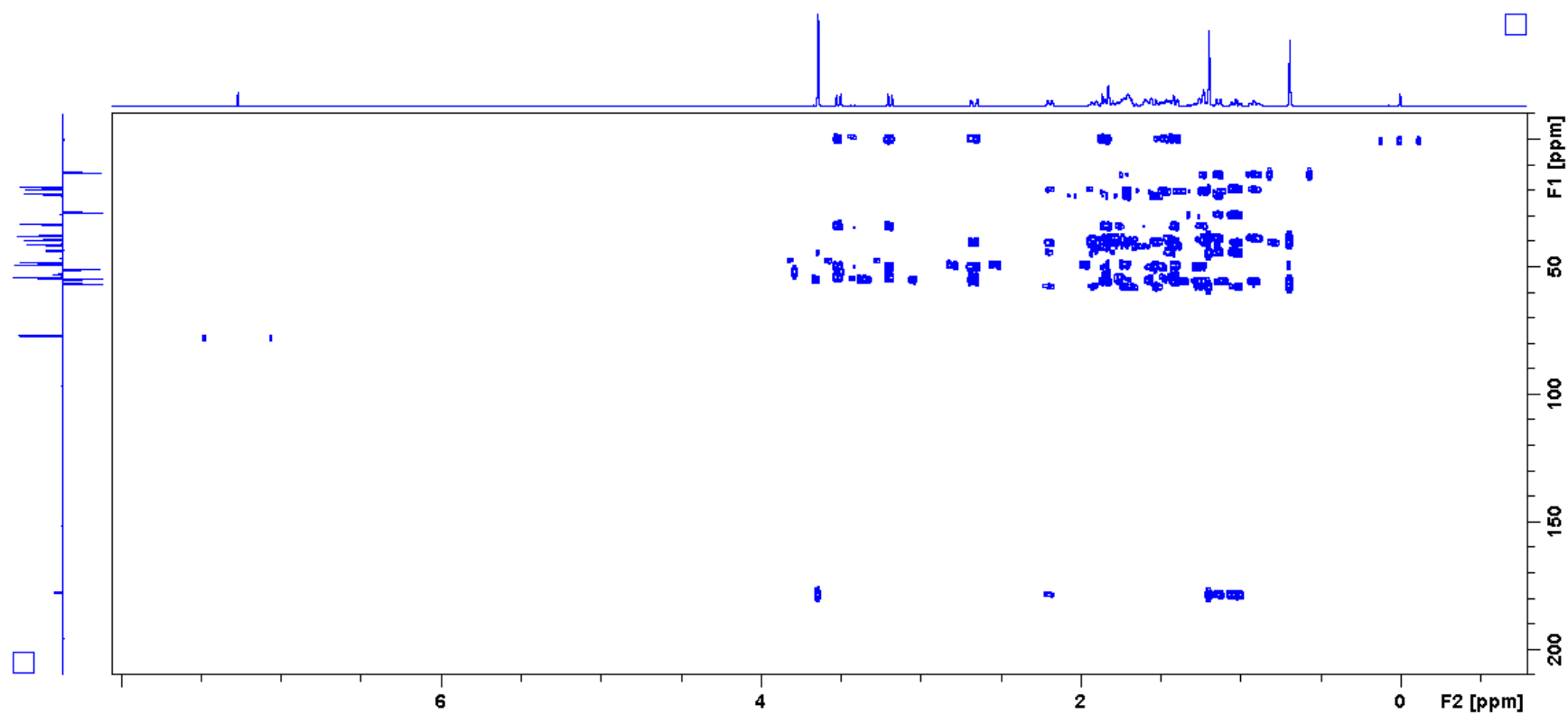
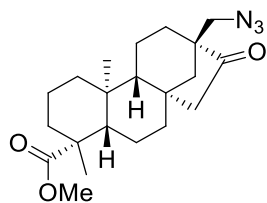
NOESY of compound (4*R*,4*aS*,6*aR*,9*S*,11*aR*,11*bS*)-methyl 9-(azidomethyl)-4,11*b*-dimethyl-8-oxotetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**19**)



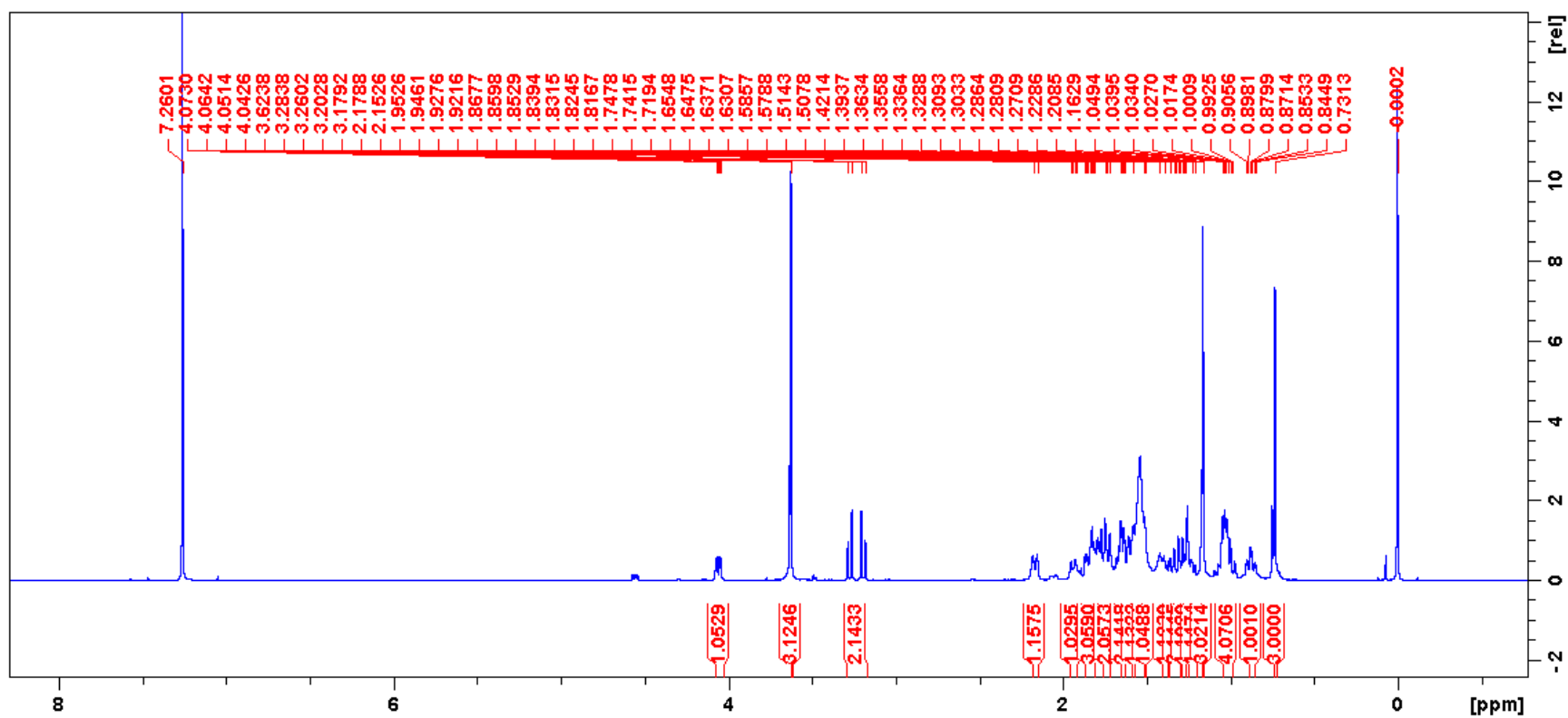
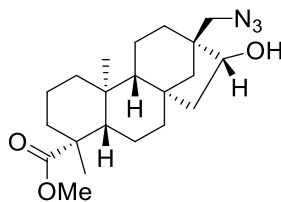
HSQC of compound (4*R*,4*aS*,6*aR*,9*S*,11*aR*,11*bS*)-methyl 9-(azidomethyl)-4,11*b*-dimethyl-8-oxotetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**19**)



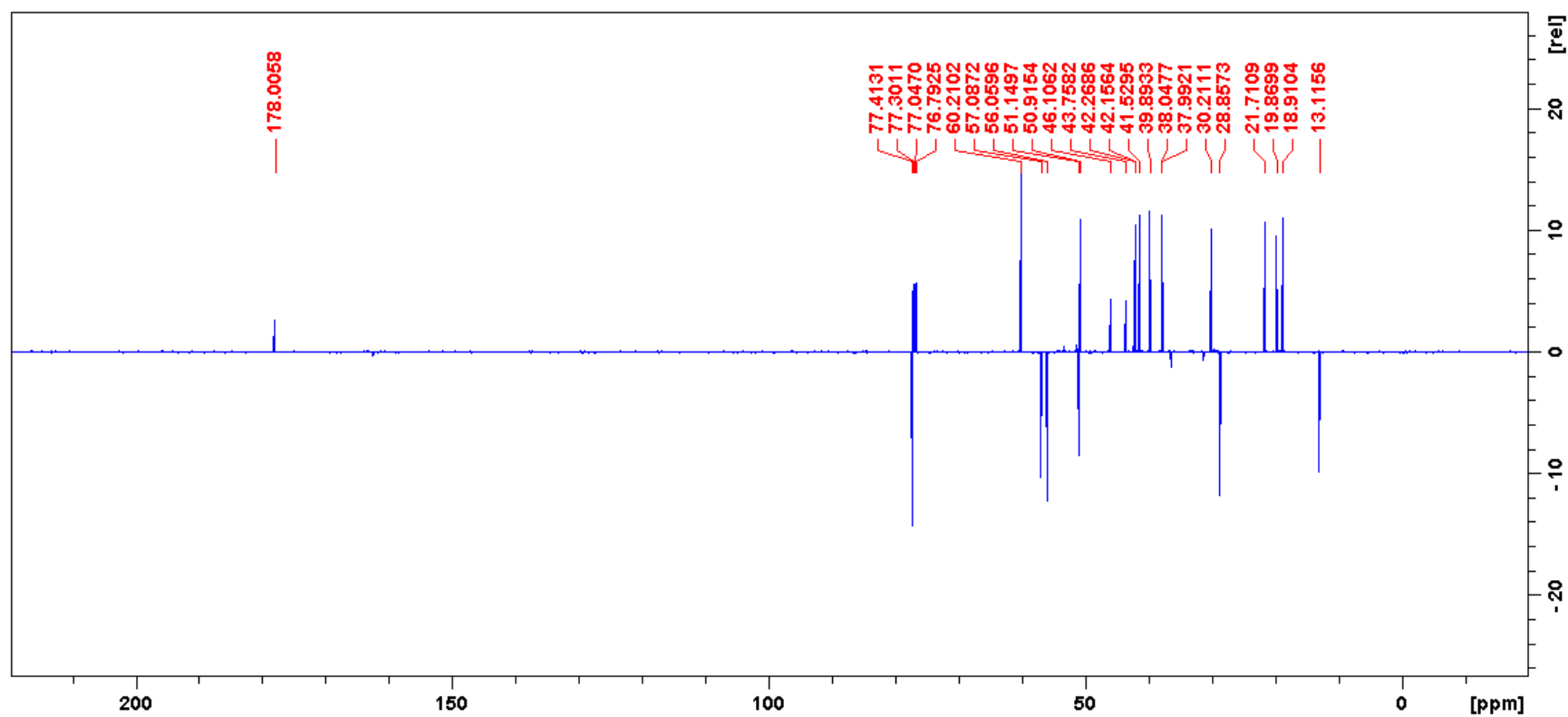
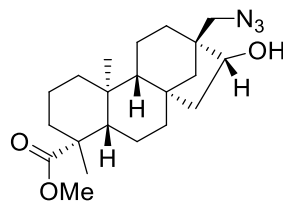
HMBC of compound (4*R*,4*aS*,6*aR*,9*S*,11*aR*,11*bS*)-methyl 9-(azidomethyl)-4,11*b*-dimethyl-8-oxotetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**19**)



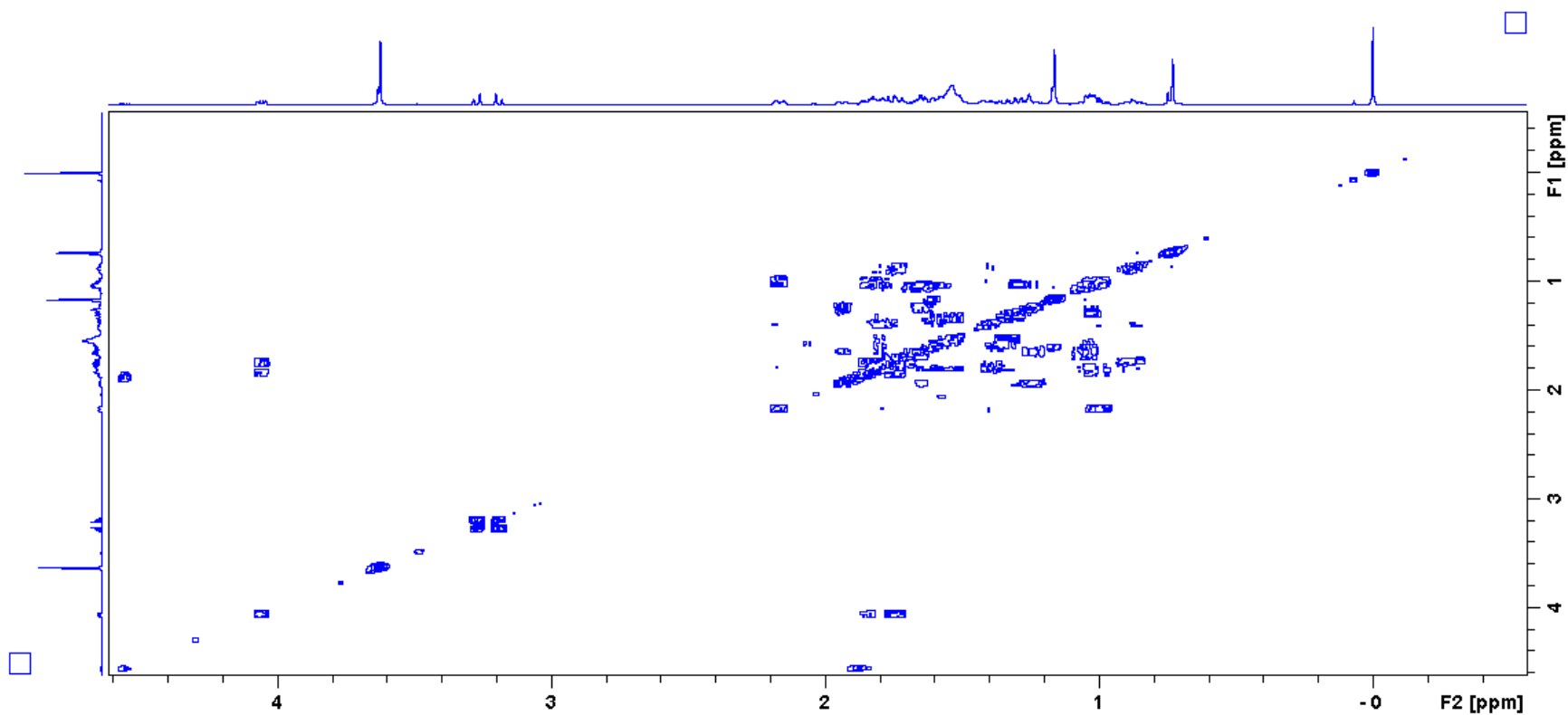
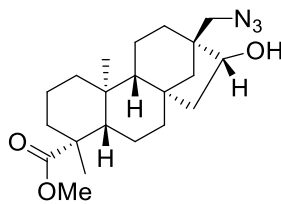
^1H -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-(azidomethyl)-8-hydroxy-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**20**)



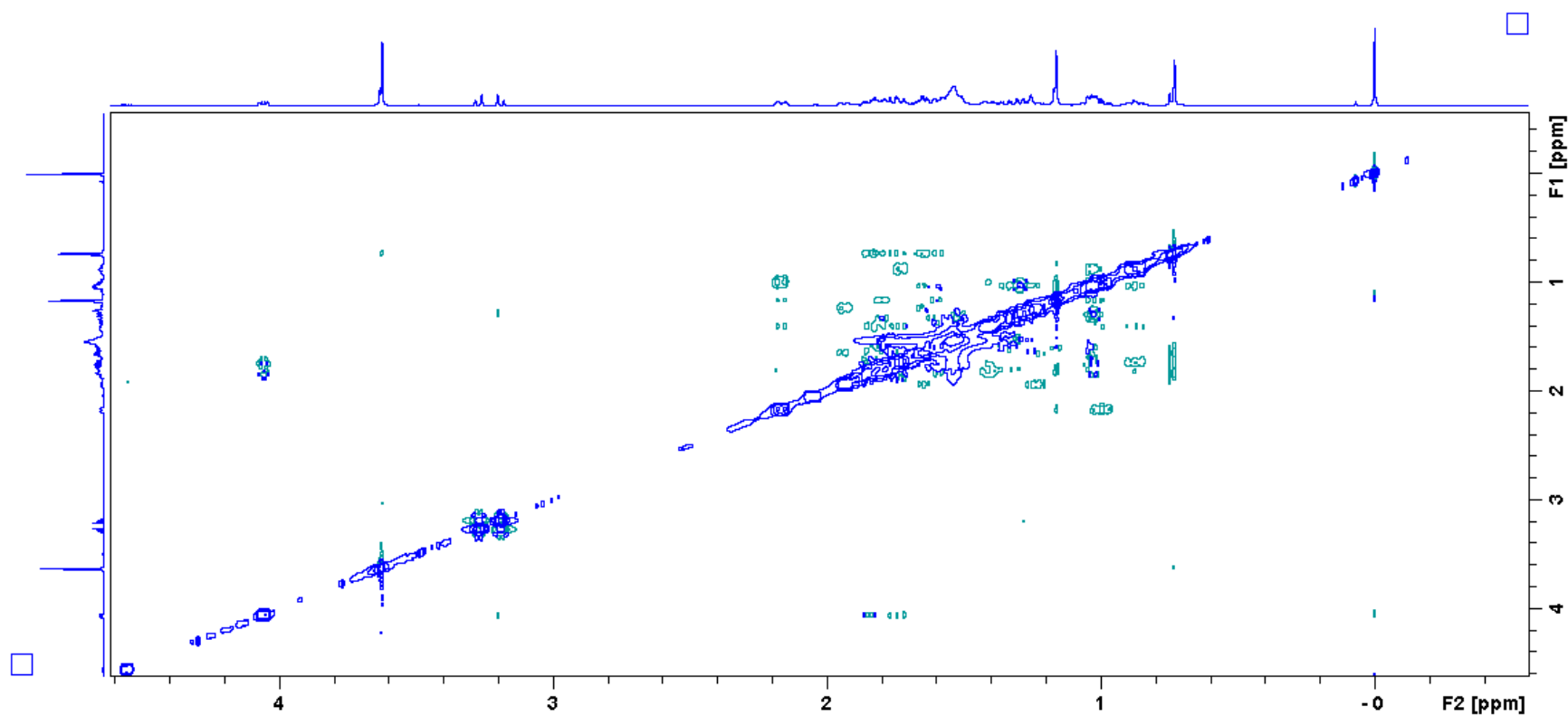
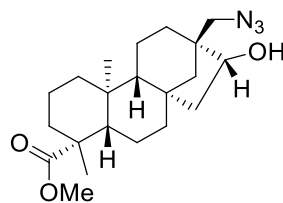
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-(azidomethyl)-8-hydroxy-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**20**)



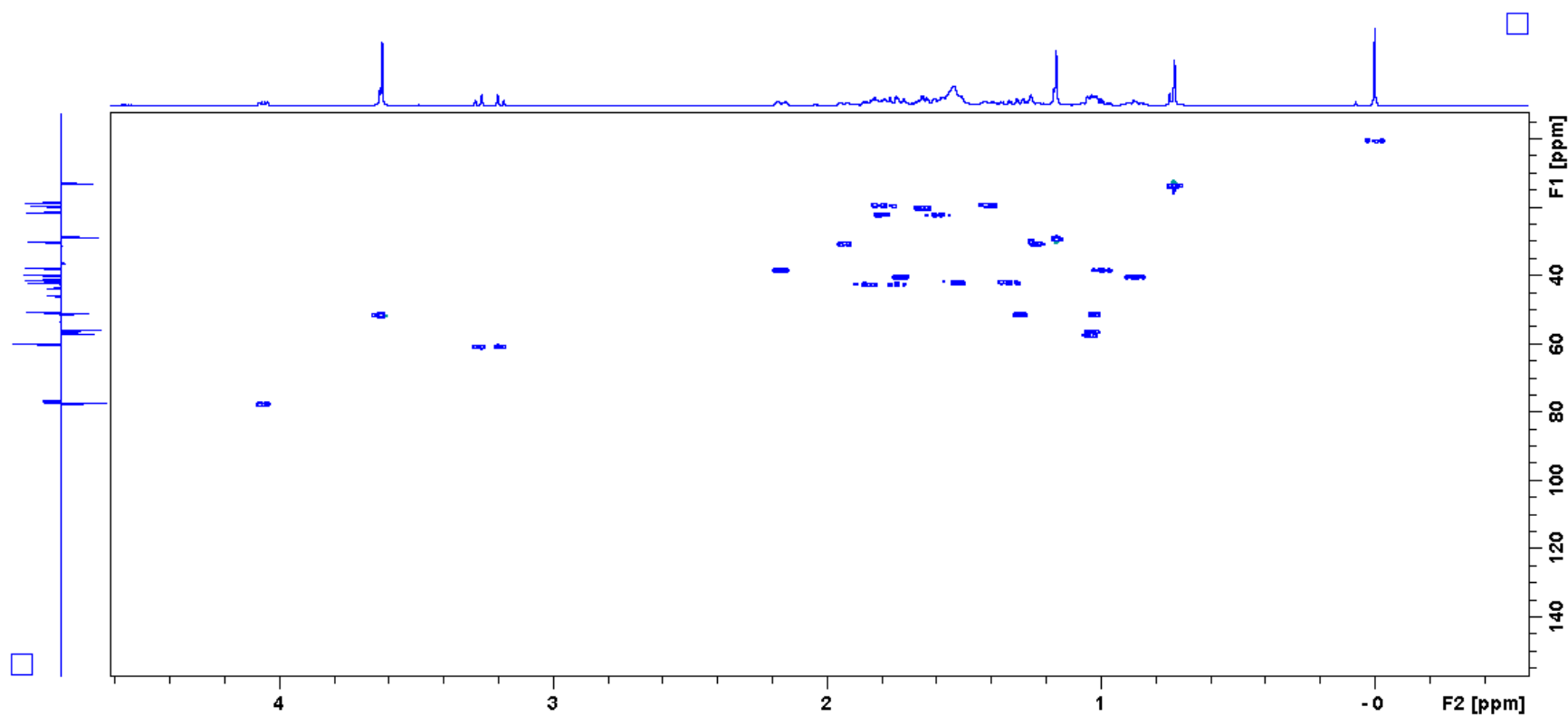
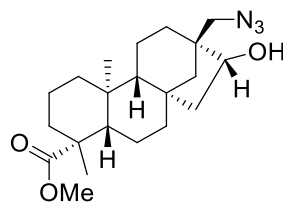
COSY of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-(azidomethyl)-8-hydroxy-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**20**)



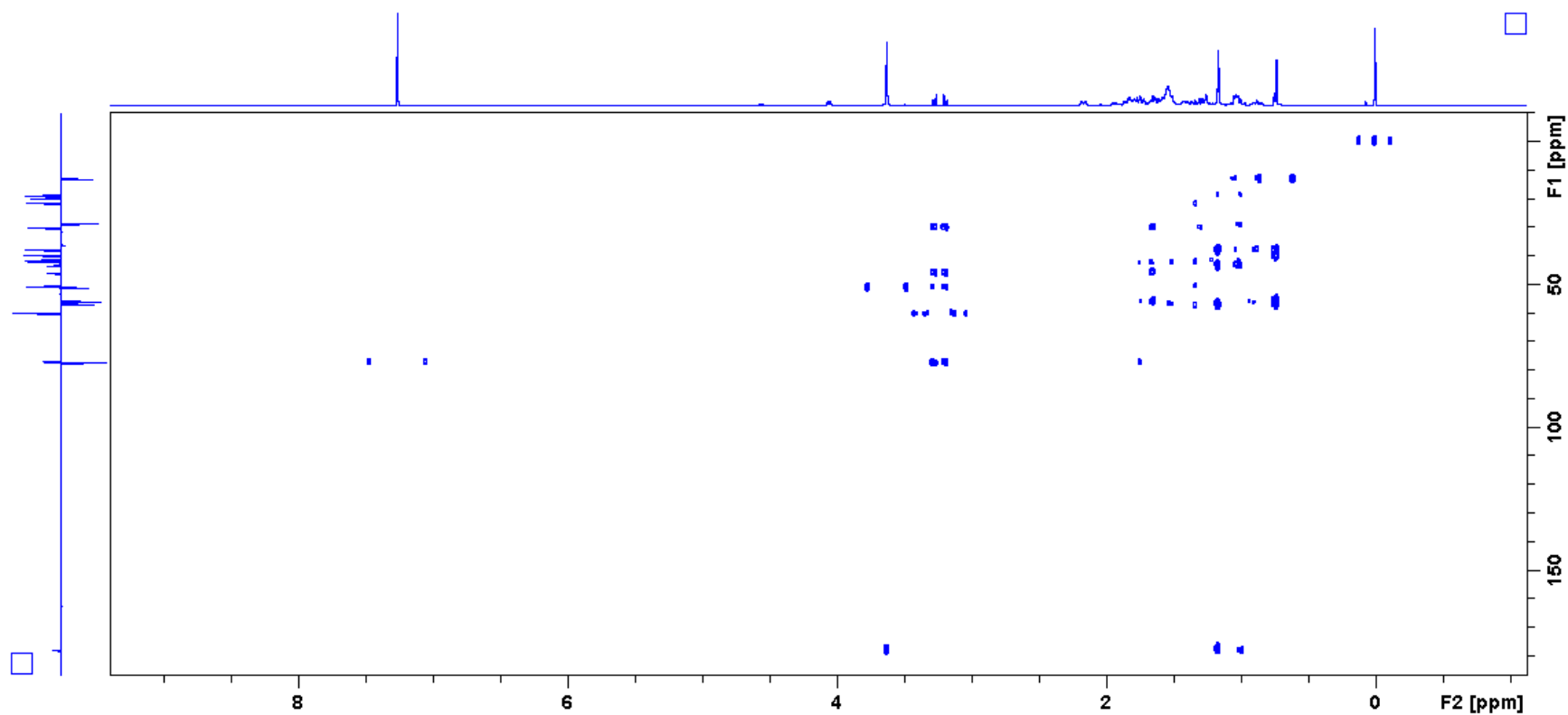
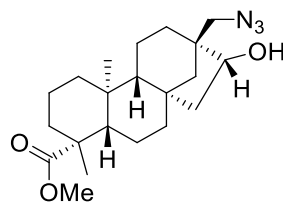
NOESY of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-(azidomethyl)-8-hydroxy-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**20**)



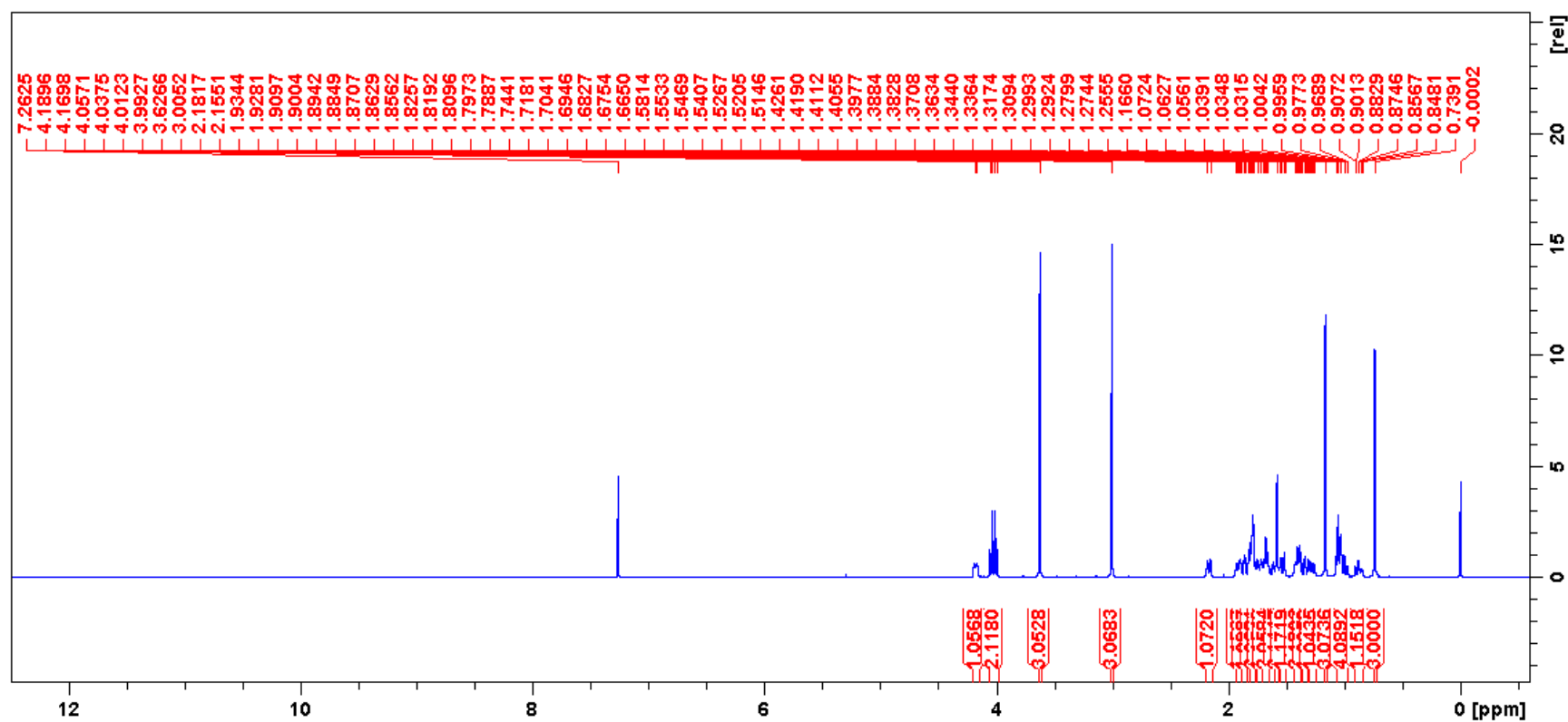
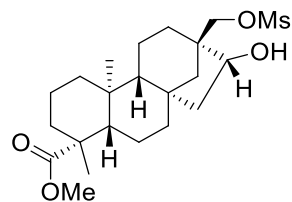
HSQC of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-(azidomethyl)-8-hydroxy-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**20**)



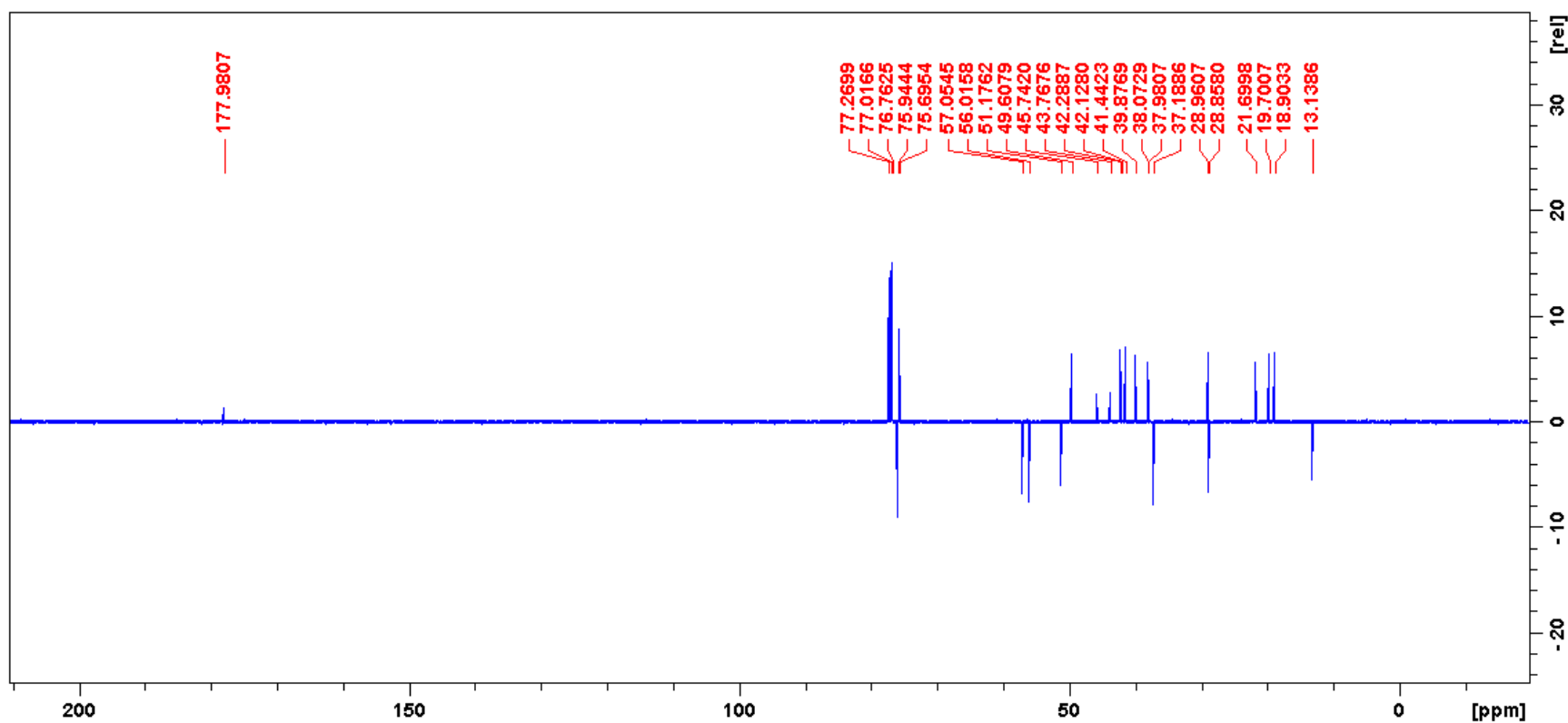
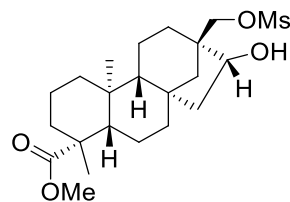
HMBC of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-(azidomethyl)-8-hydroxy-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**20**)



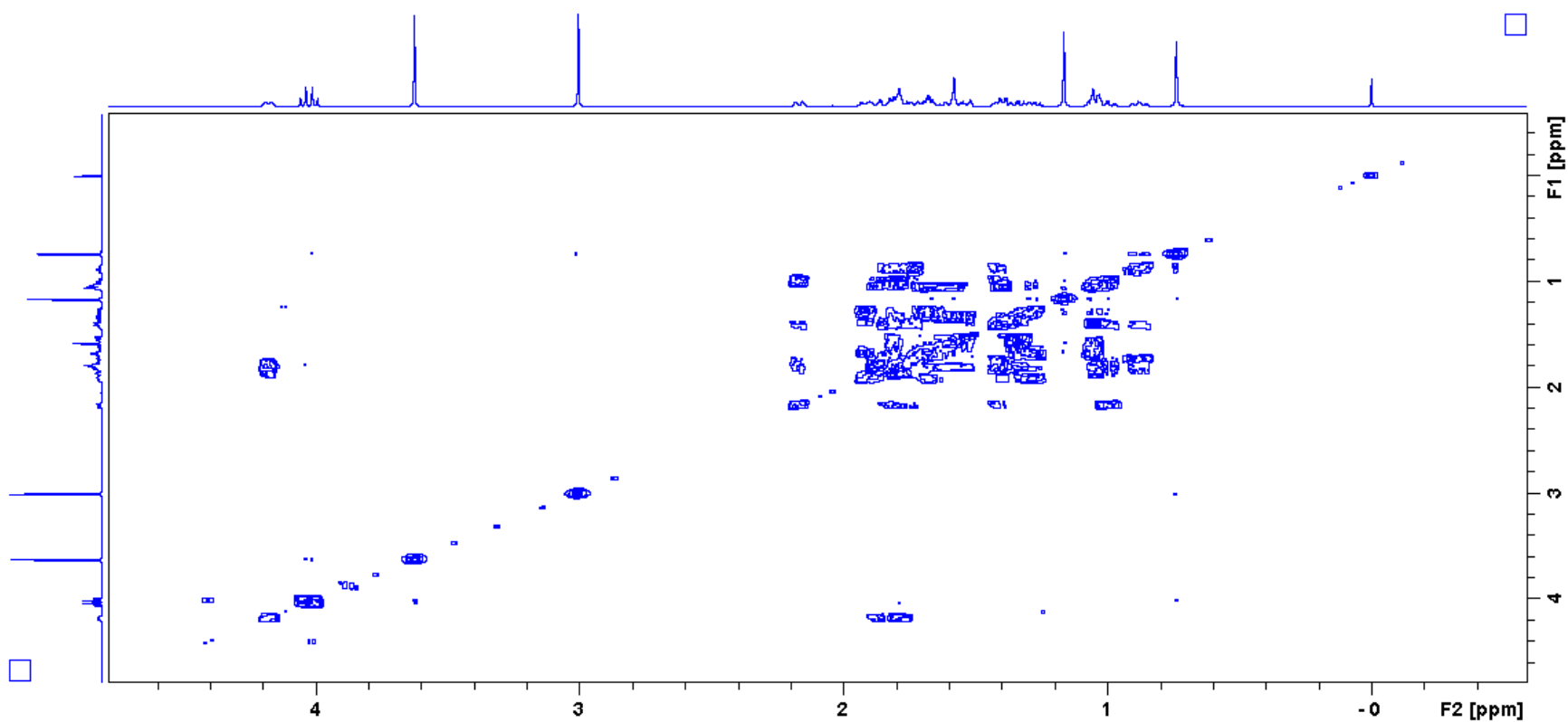
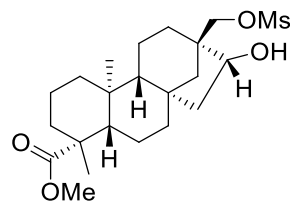
^1H -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-(((methylsulfonyl)oxy)methyl)tetradecaahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**21**)



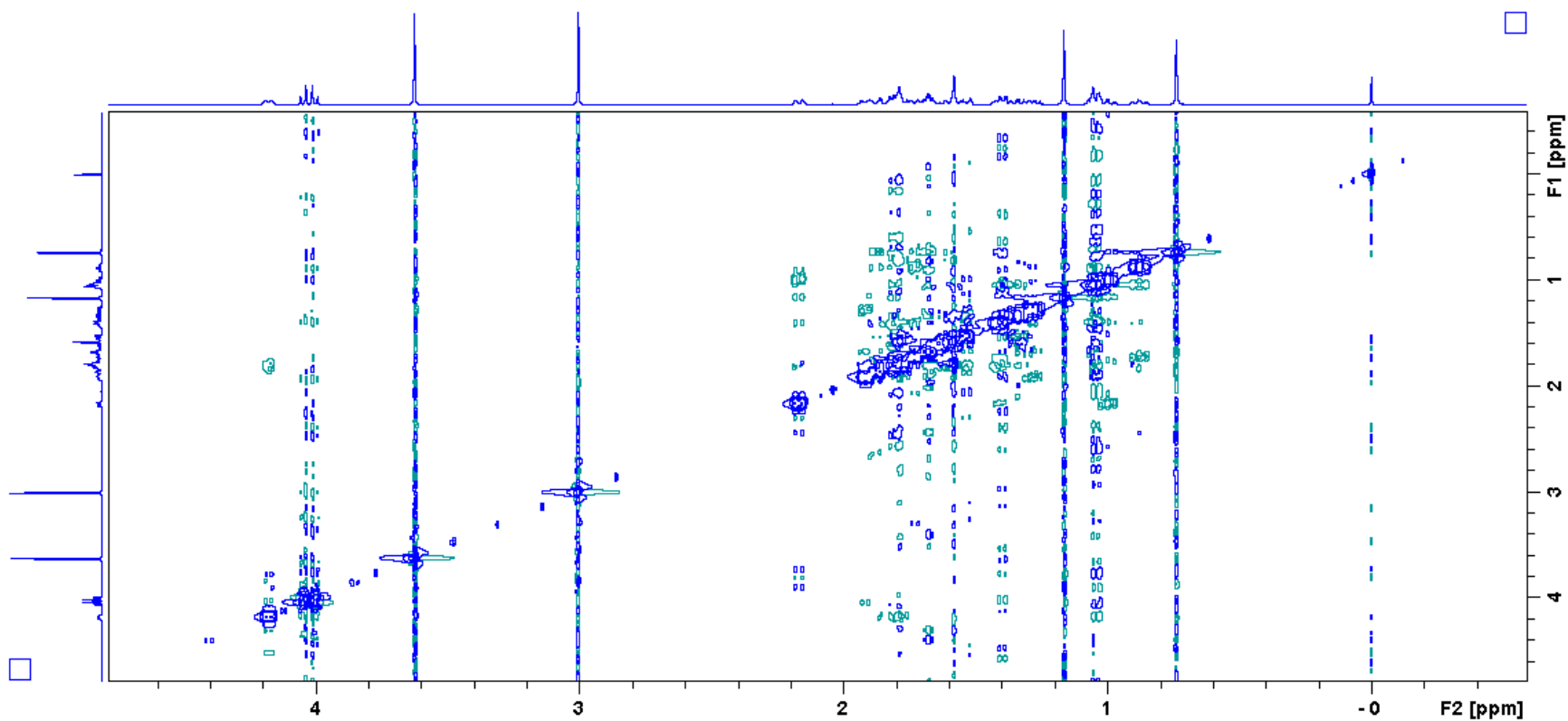
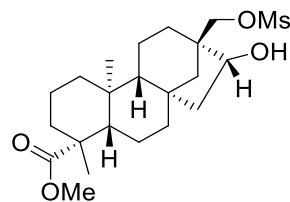
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-(((methylsulfonyl)oxy)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**21**)



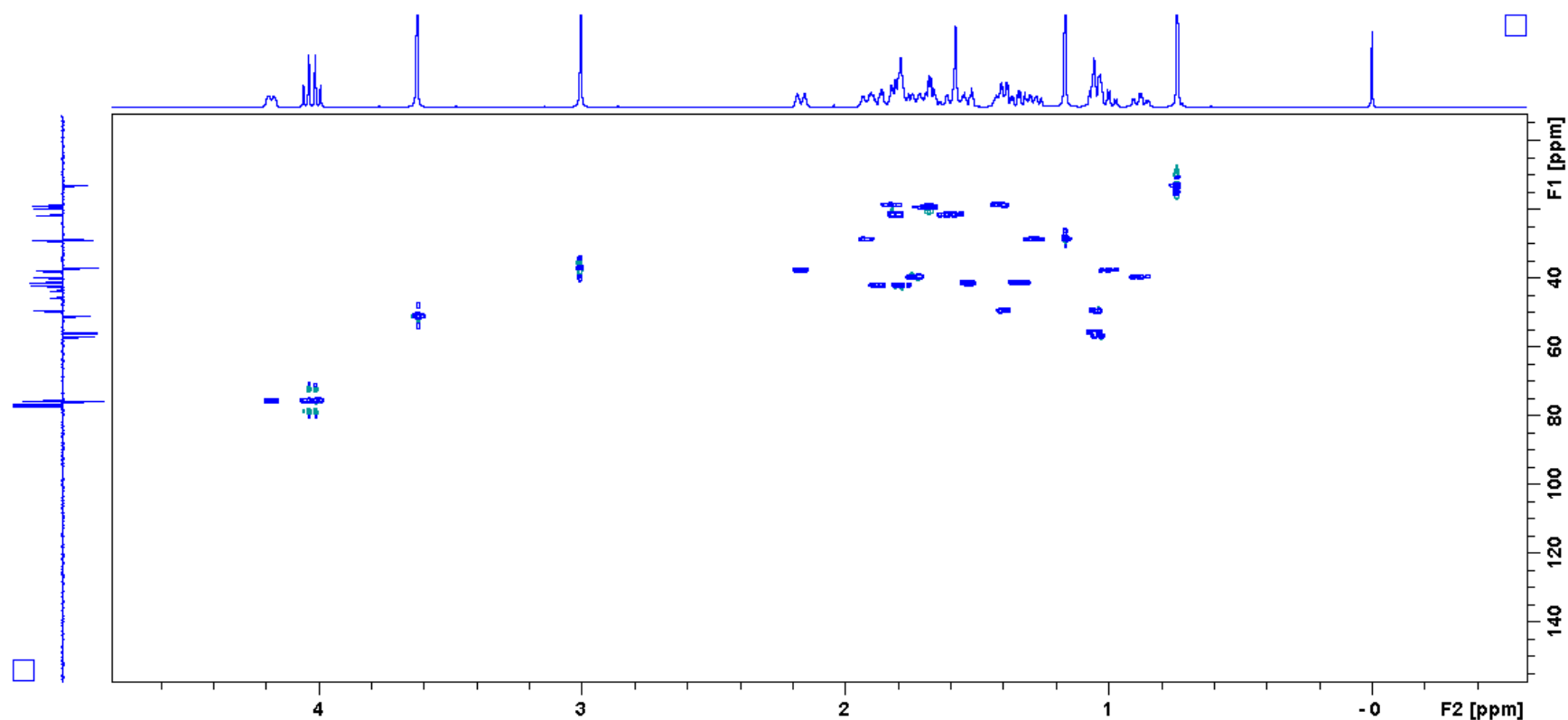
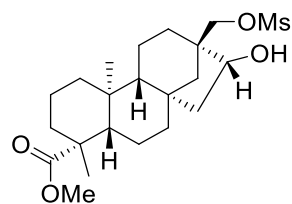
COSY of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-(((methylsulfonyl)oxy)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**21**)



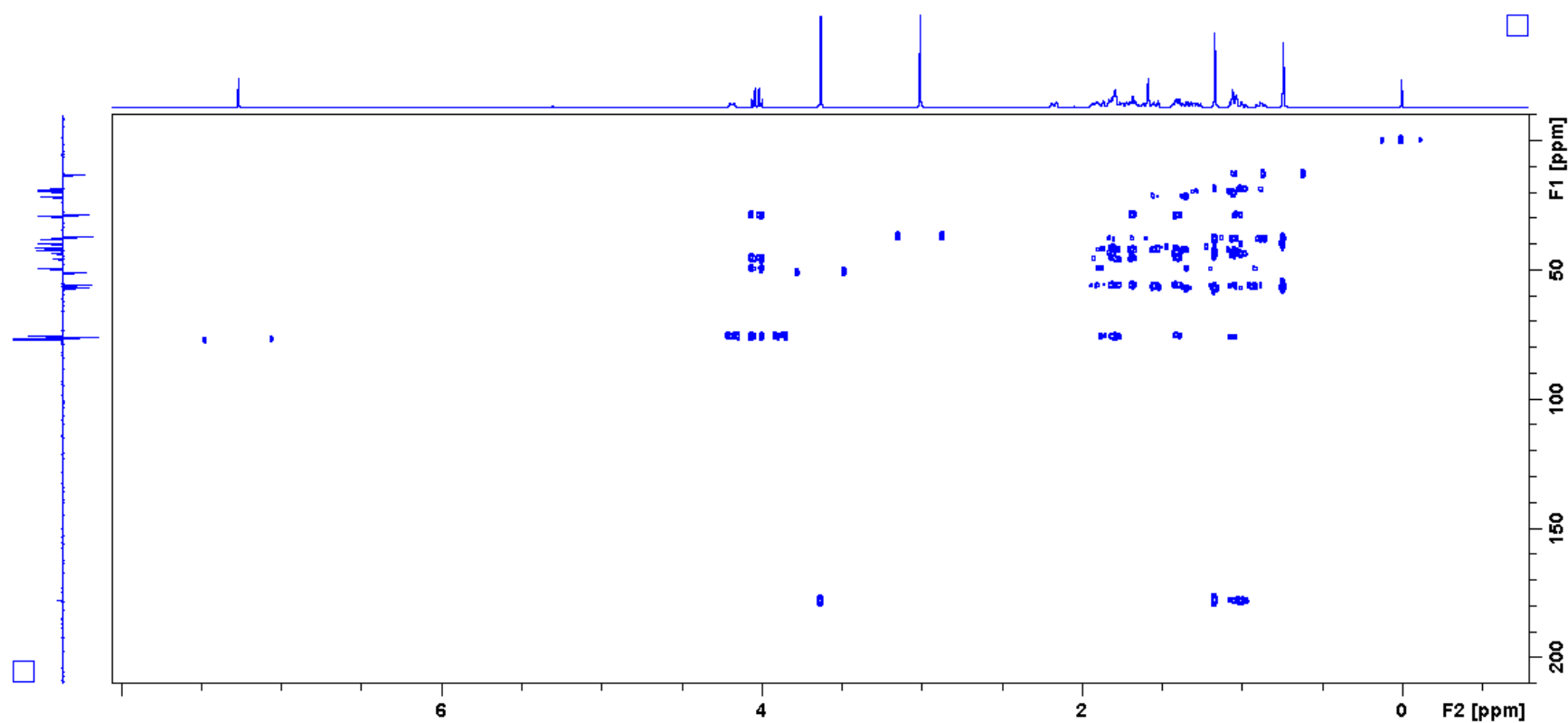
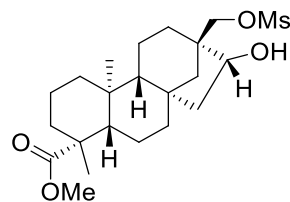
NOESY of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-(((methylsulfonyl)oxy)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**21**)



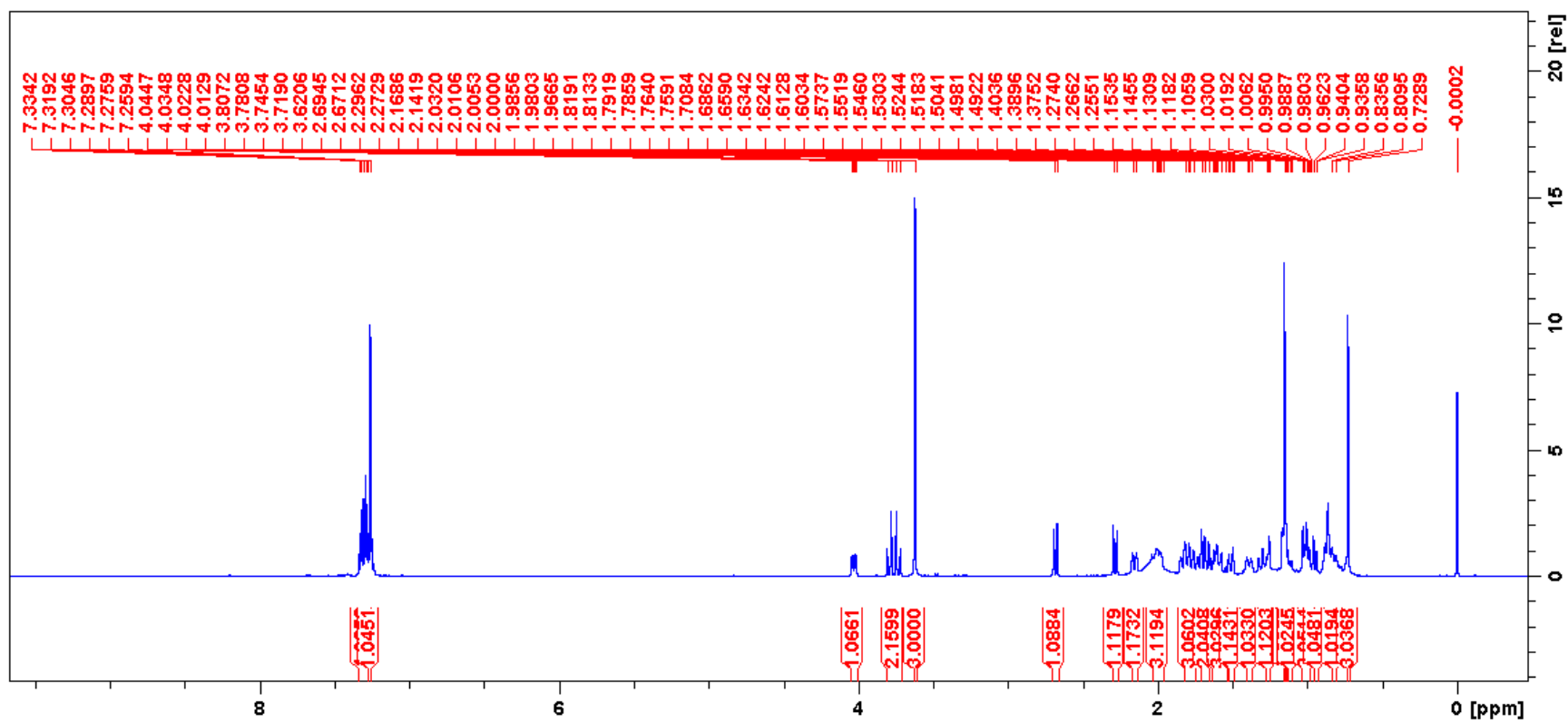
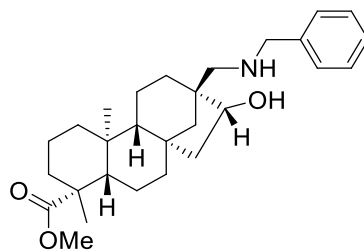
HSQC of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-(((methylsulfonyl)oxy)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**21**)



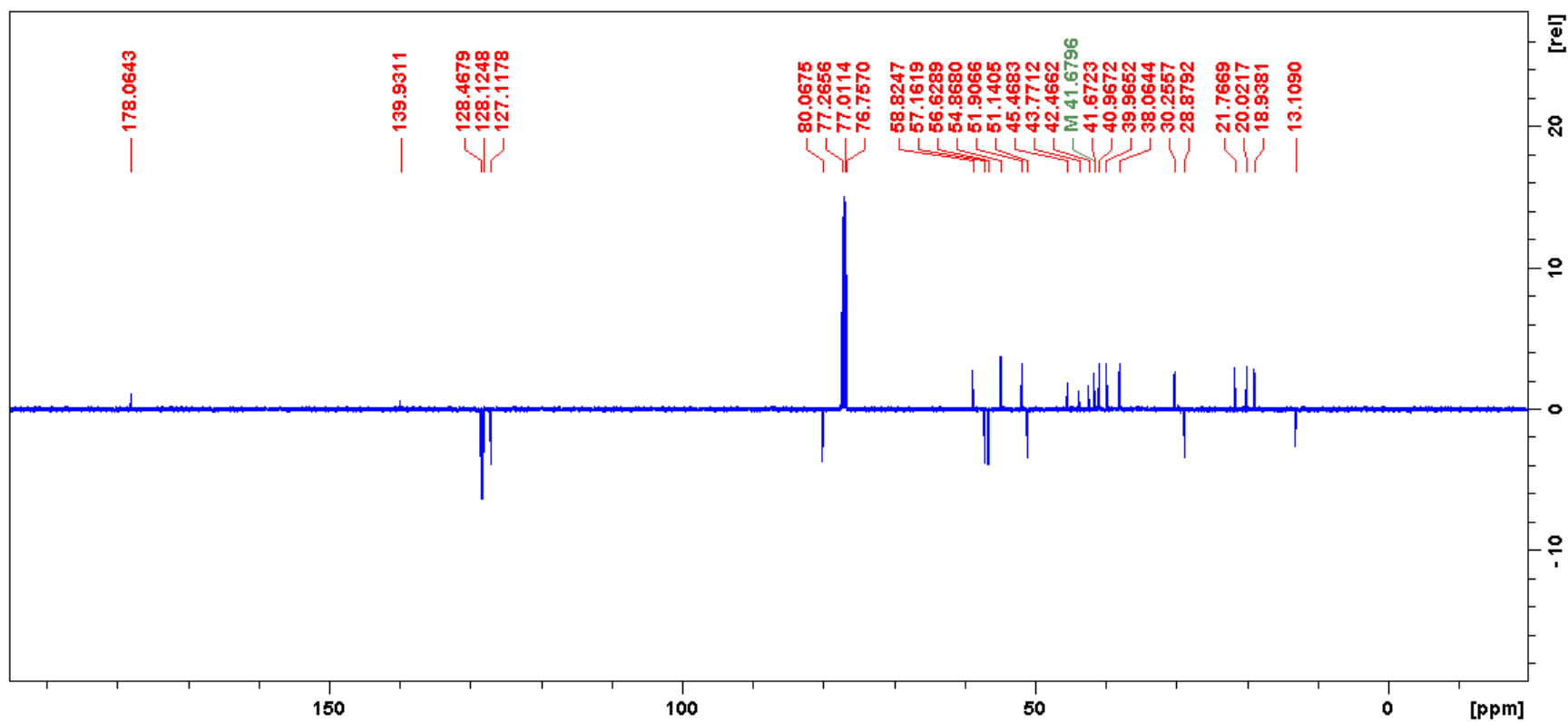
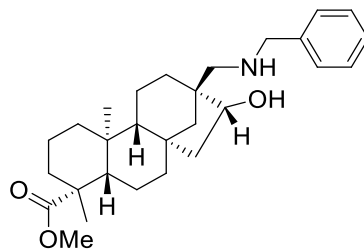
HMBC of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-(((methylsulfonyl)oxy)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**21**)



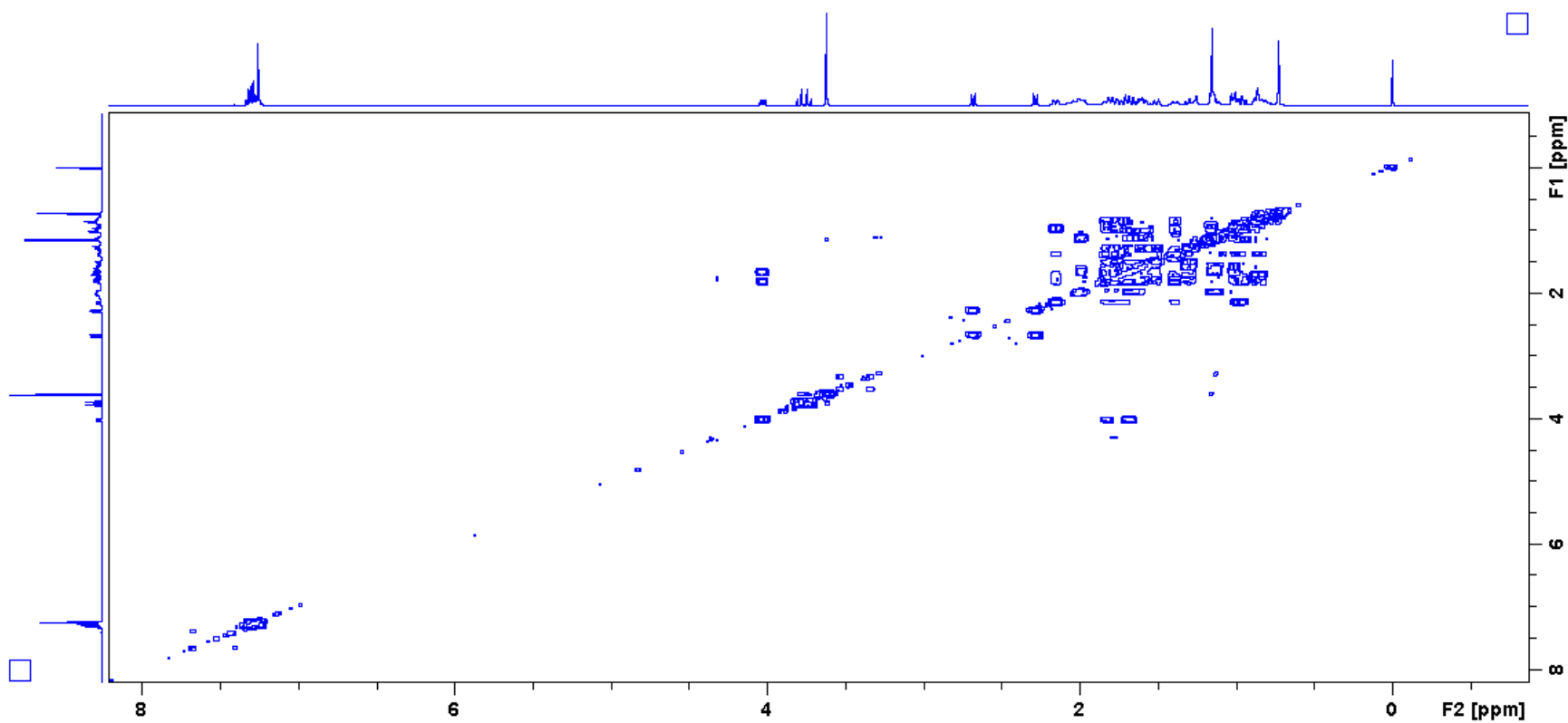
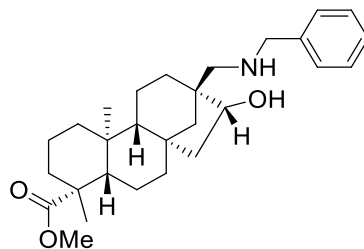
^1H -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-((benzylamino)methyl)-8-hydroxy-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**22**)



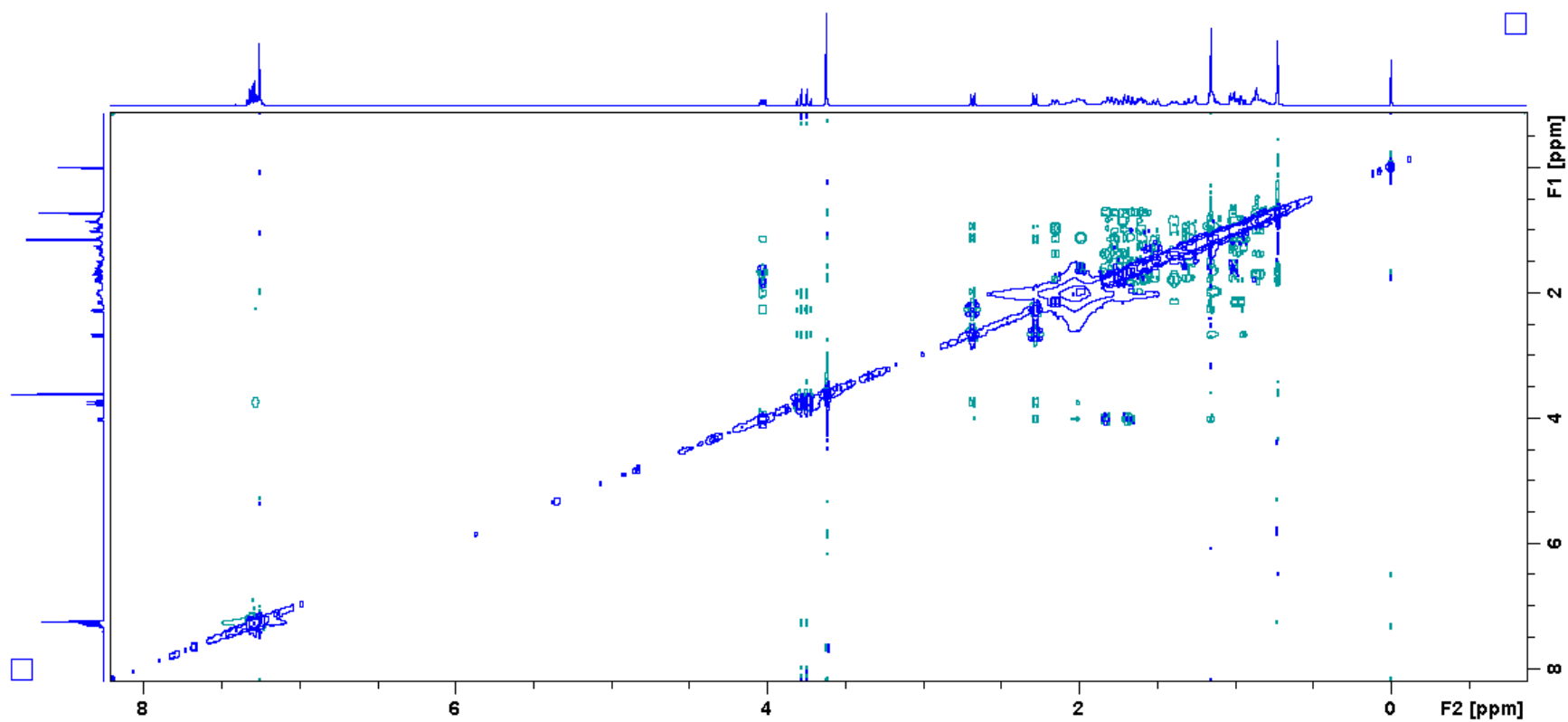
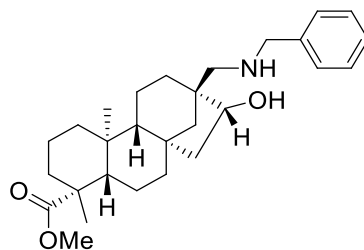
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-((benzylamino)methyl)-8-hydroxy-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**22**)



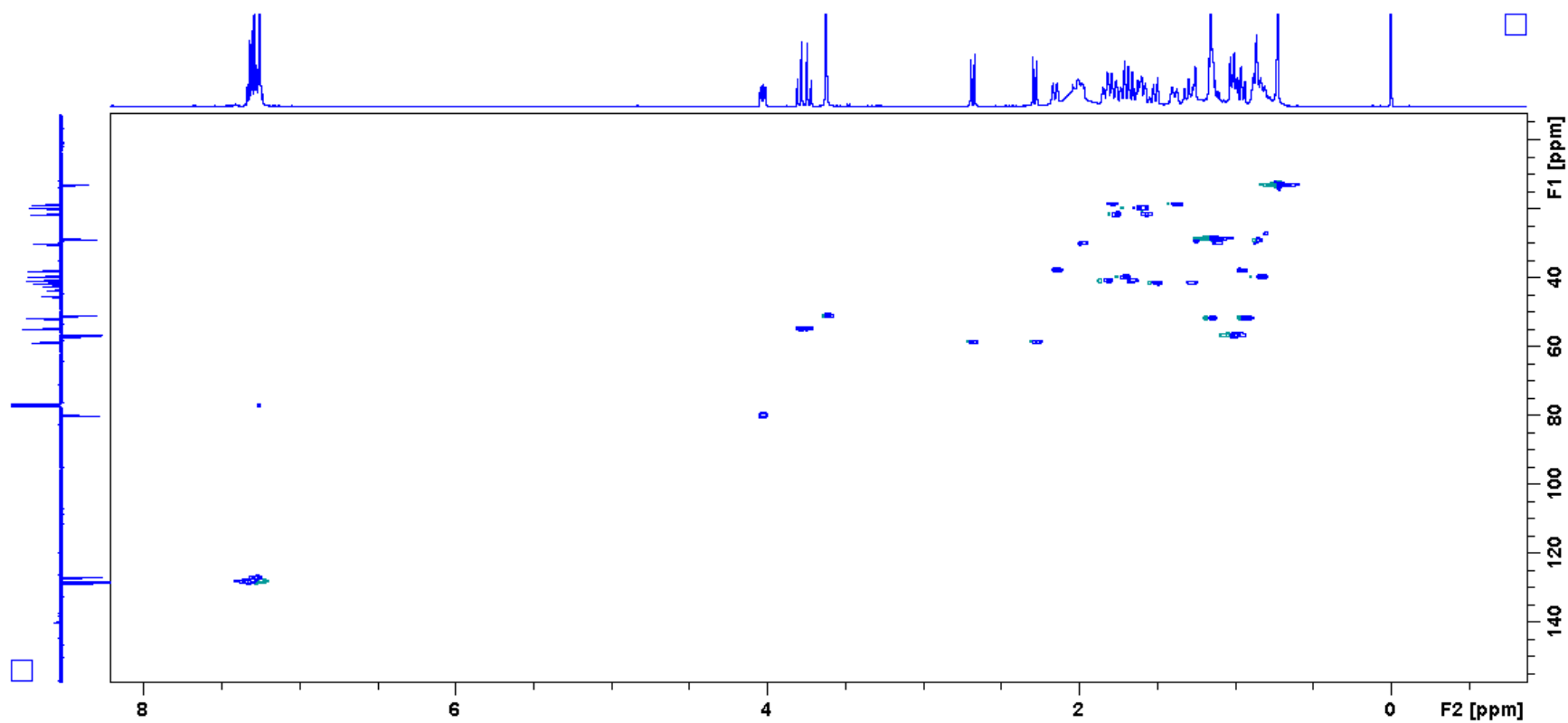
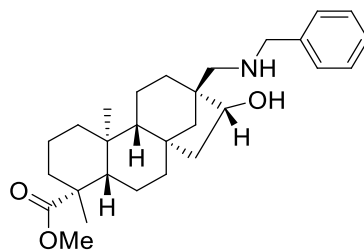
COSY of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-((benzylamino)methyl)-8-hydroxy-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**22**)



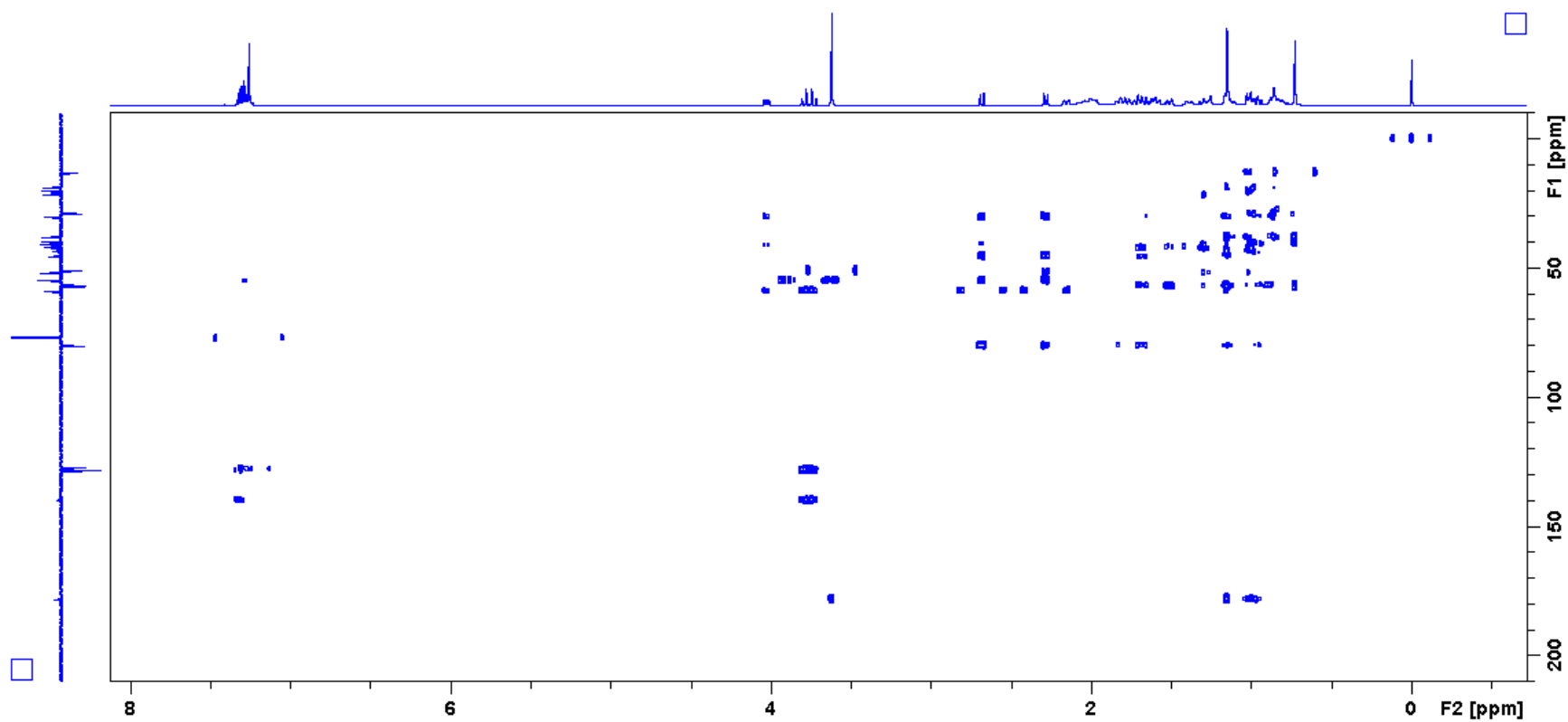
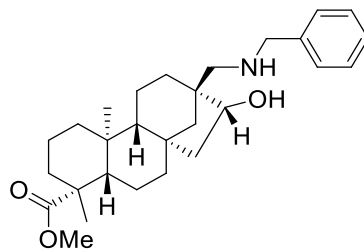
NOESY of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-((benzylamino)methyl)-8-hydroxy-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**22**)



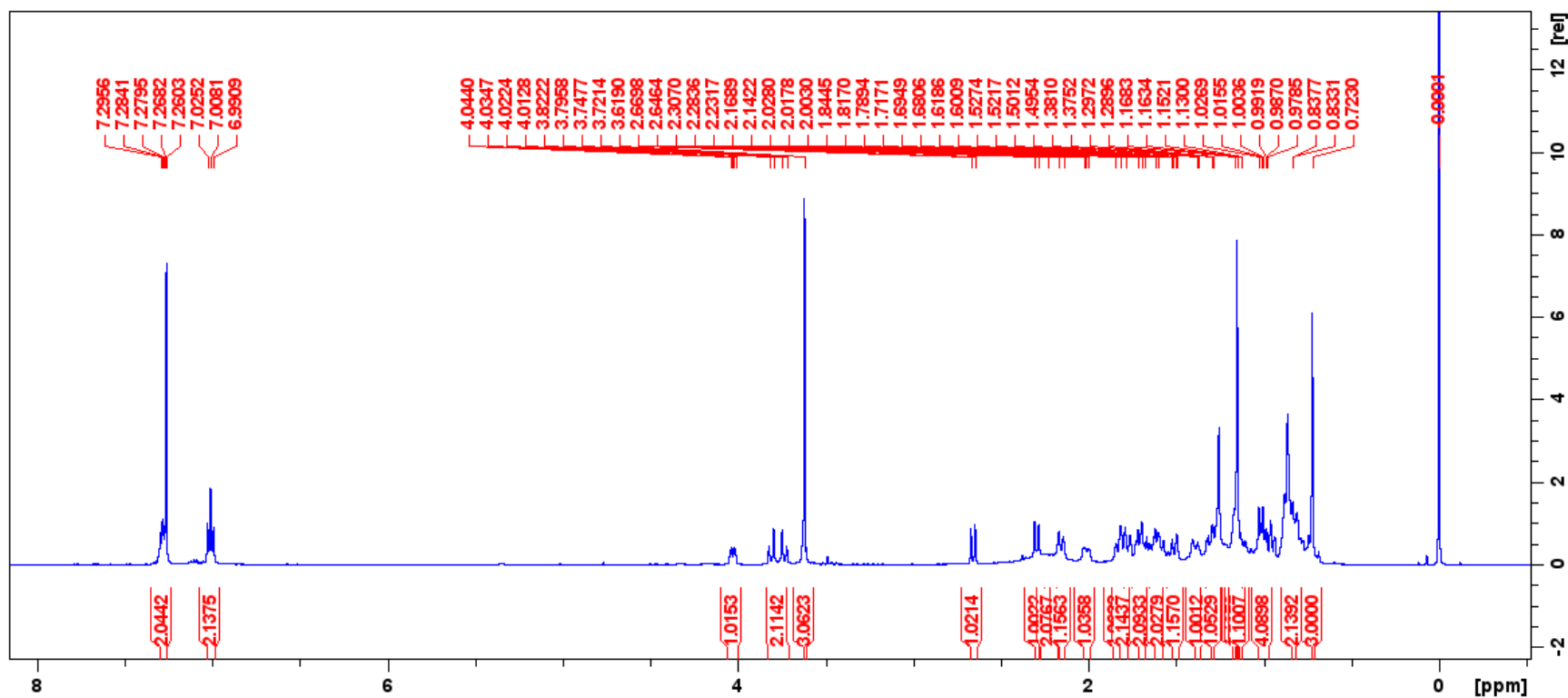
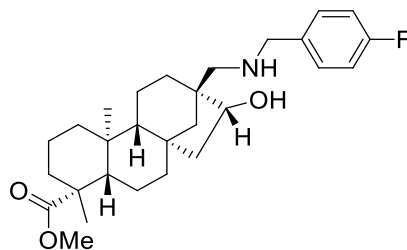
HSQC of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-((benzylamino)methyl)-8-hydroxy-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**22**)



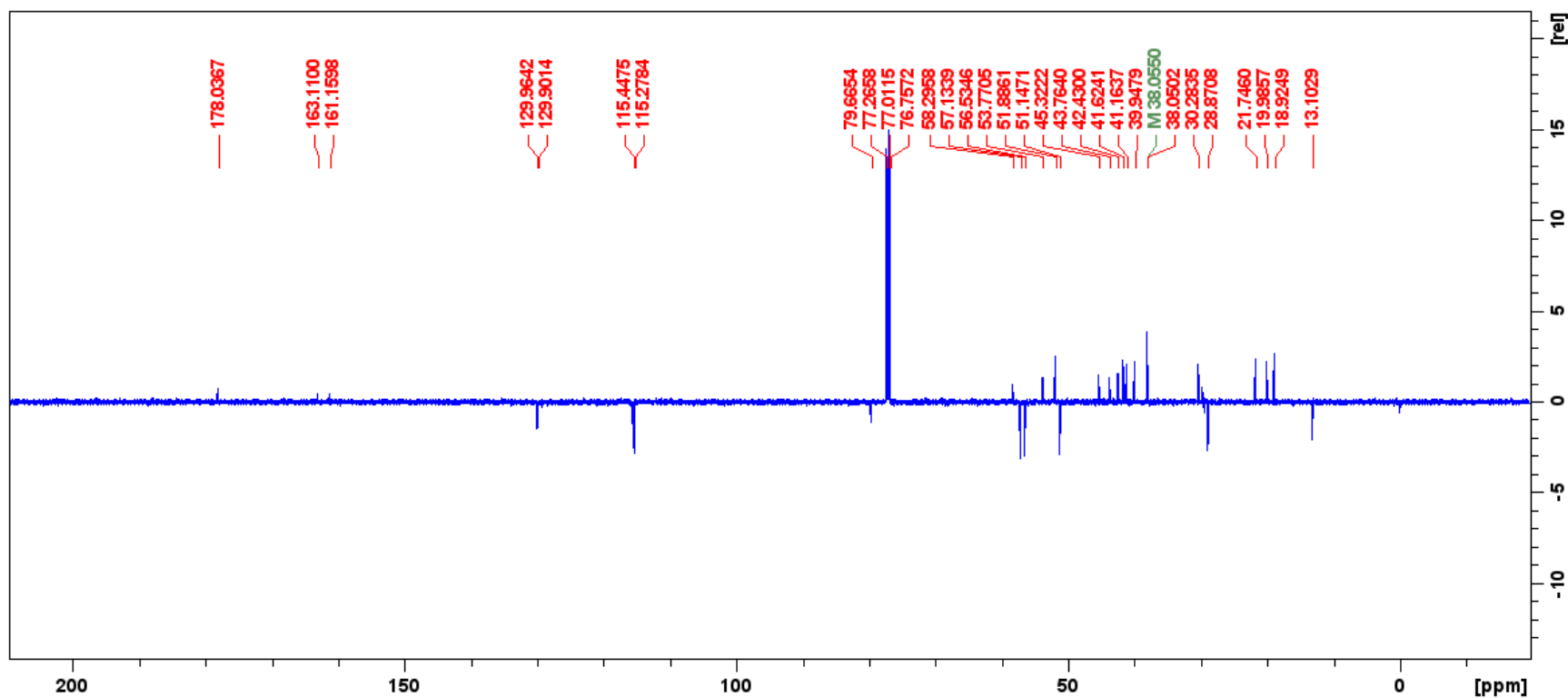
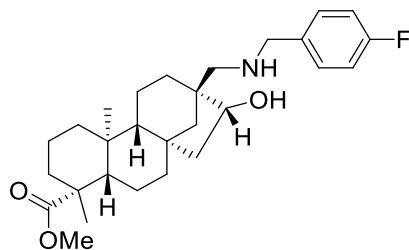
HMBC of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-((benzylamino)methyl)-8-hydroxy-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**22**)



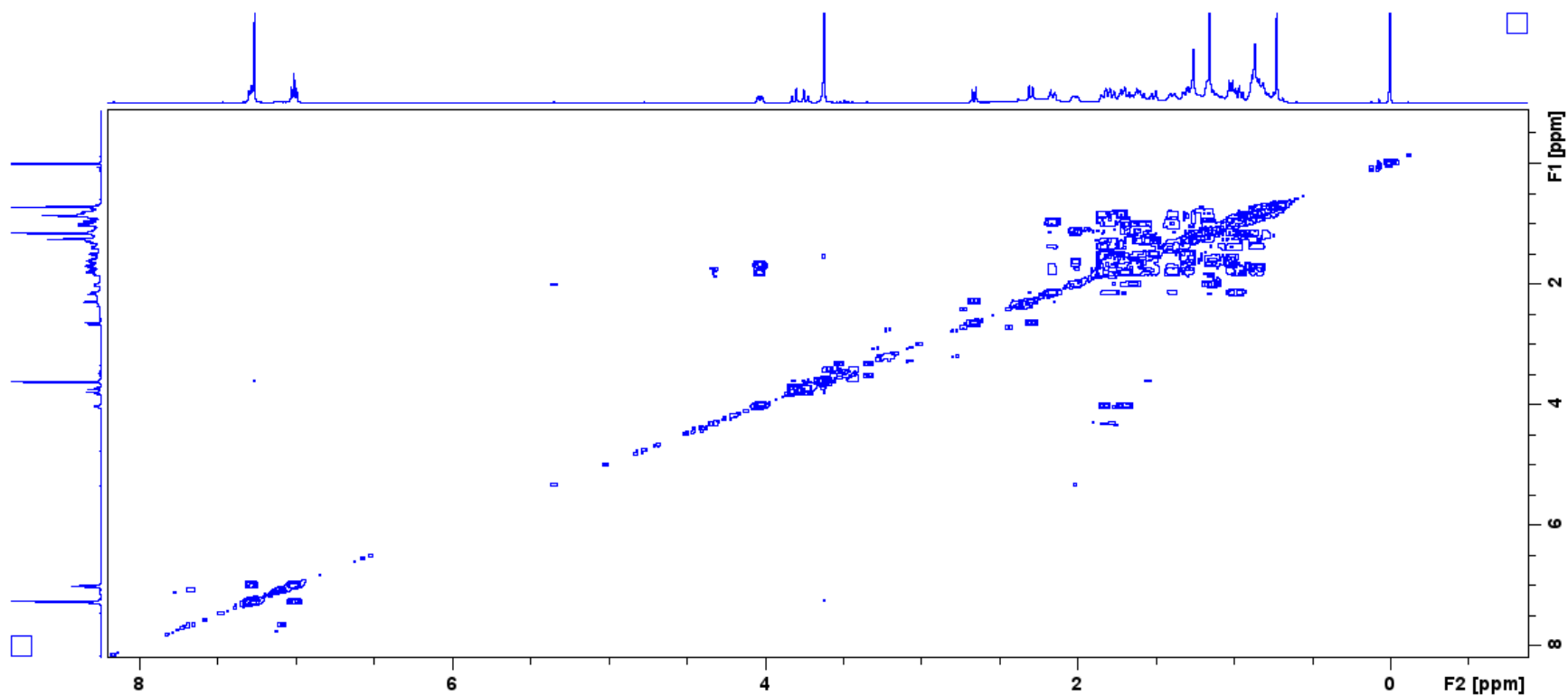
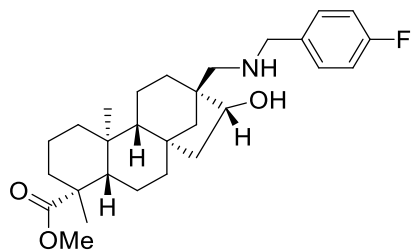
^1H -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-(((4-fluorobenzyl)amino)methyl)-8-hydroxy-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**23**)



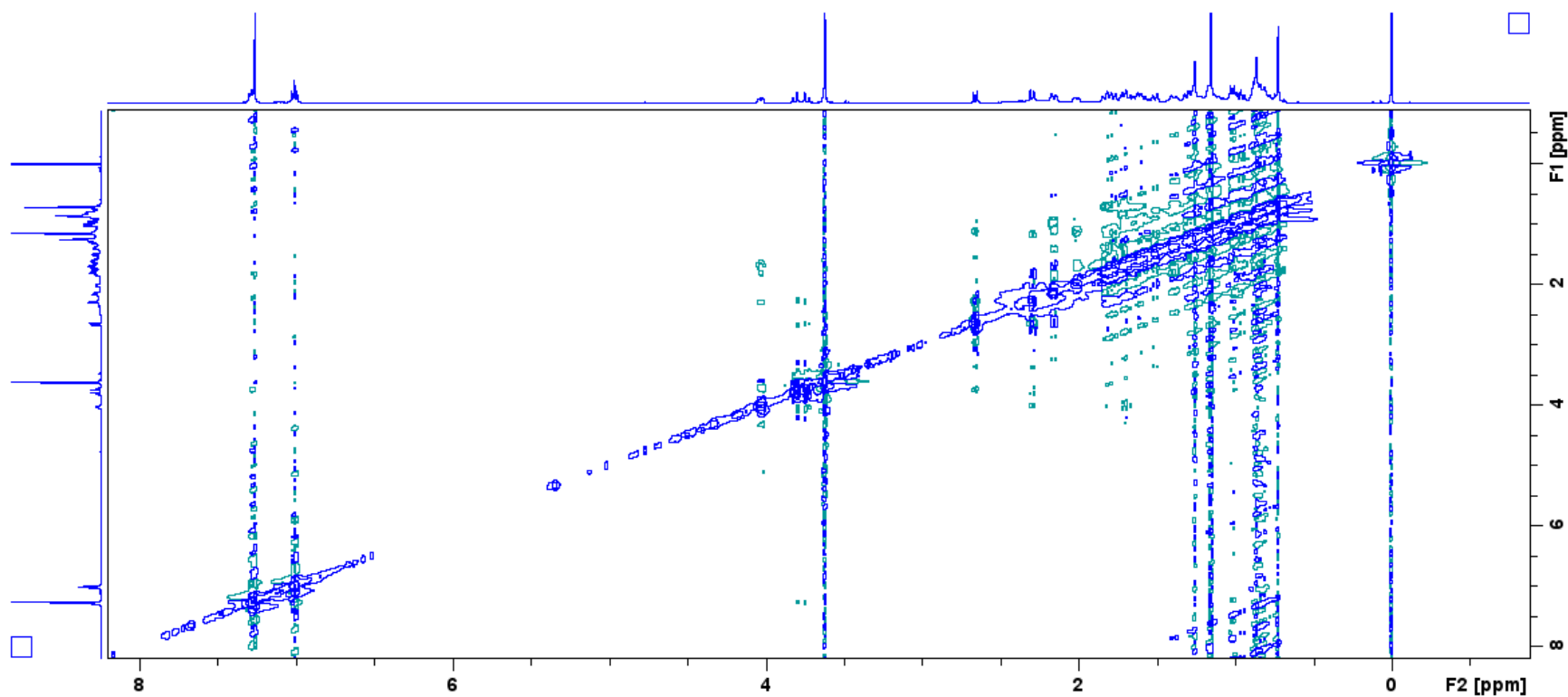
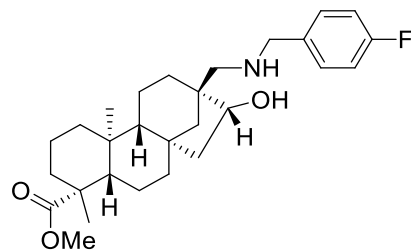
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-(((4-fluorobenzyl)amino)methyl)-8-hydroxy-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**23**)



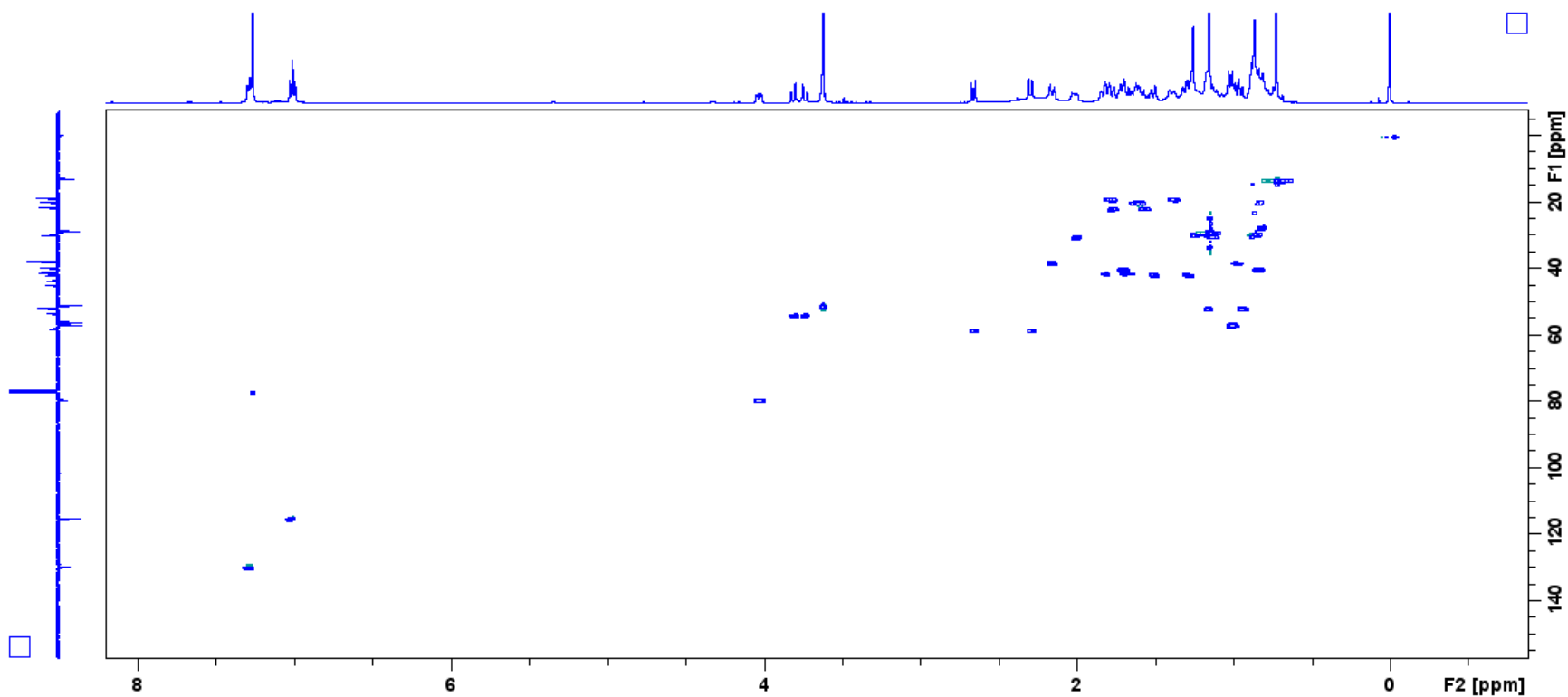
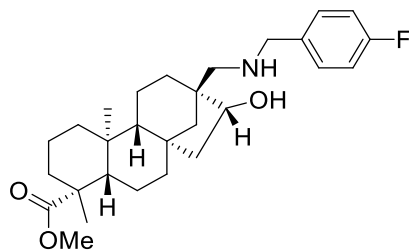
COSY of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-(((4-fluorobenzyl)amino)methyl)-8-hydroxy-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**23**)



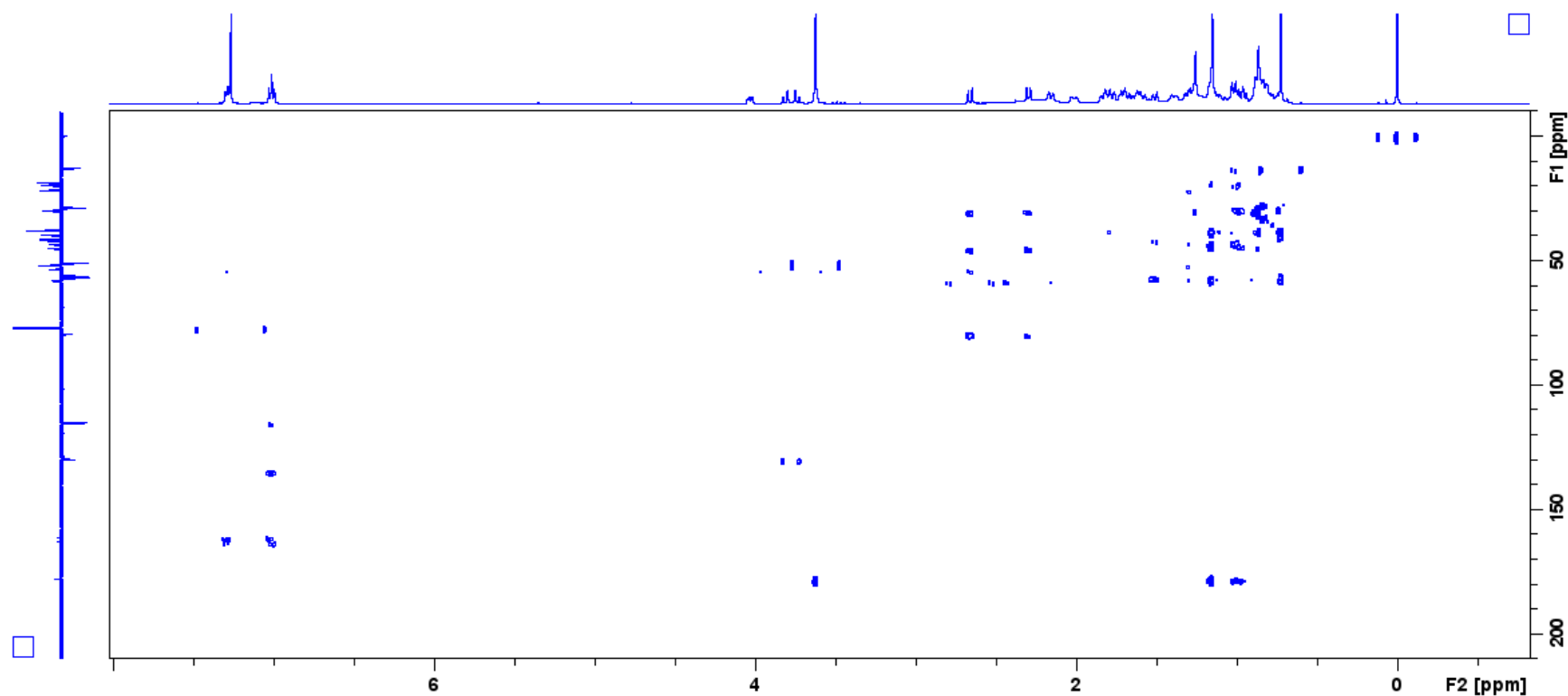
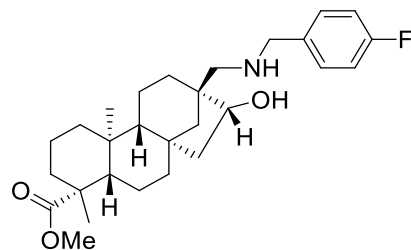
NOESY of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-(((4-fluorobenzyl)amino)methyl)-8-hydroxy-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**23**)



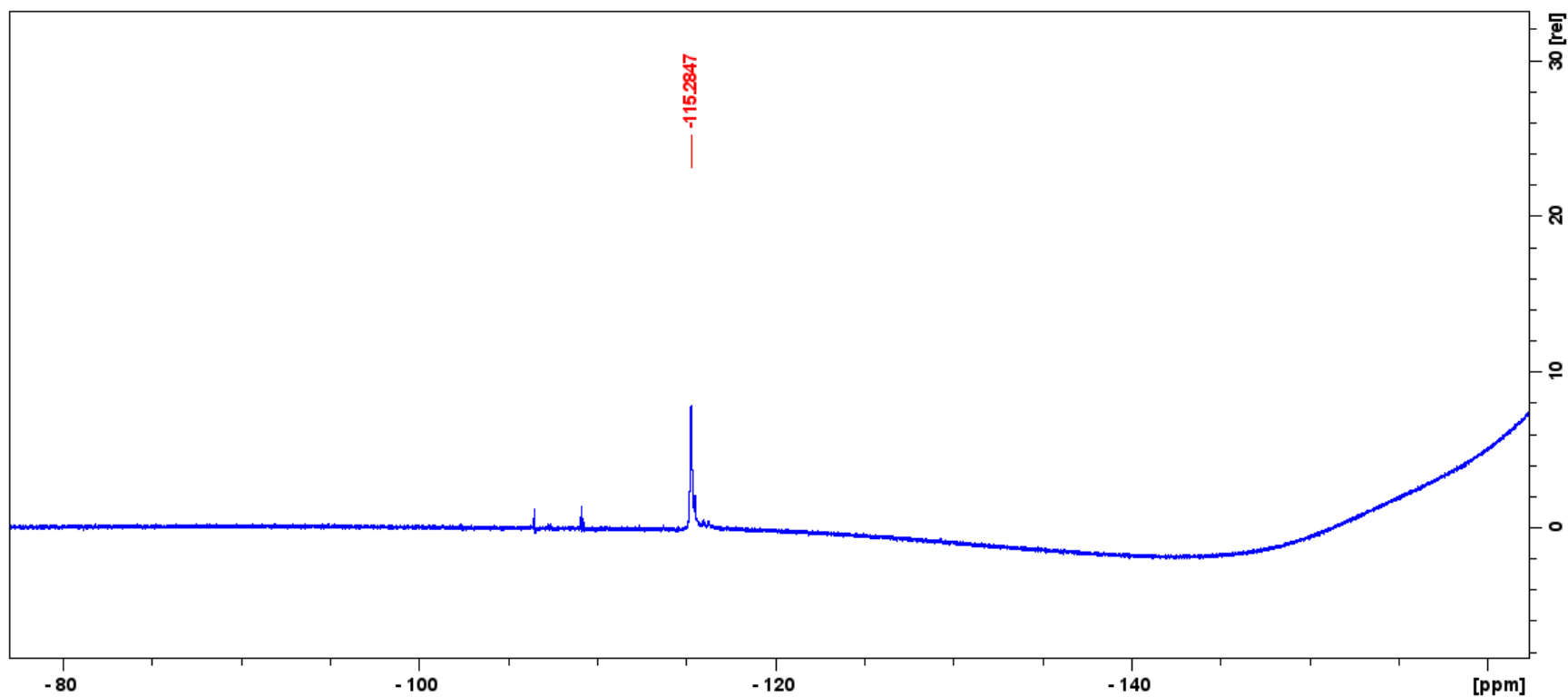
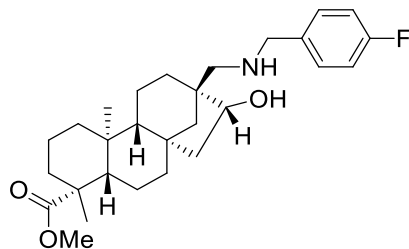
HSQC of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-(((4-fluorobenzyl)amino)methyl)-8-hydroxy-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**23**)



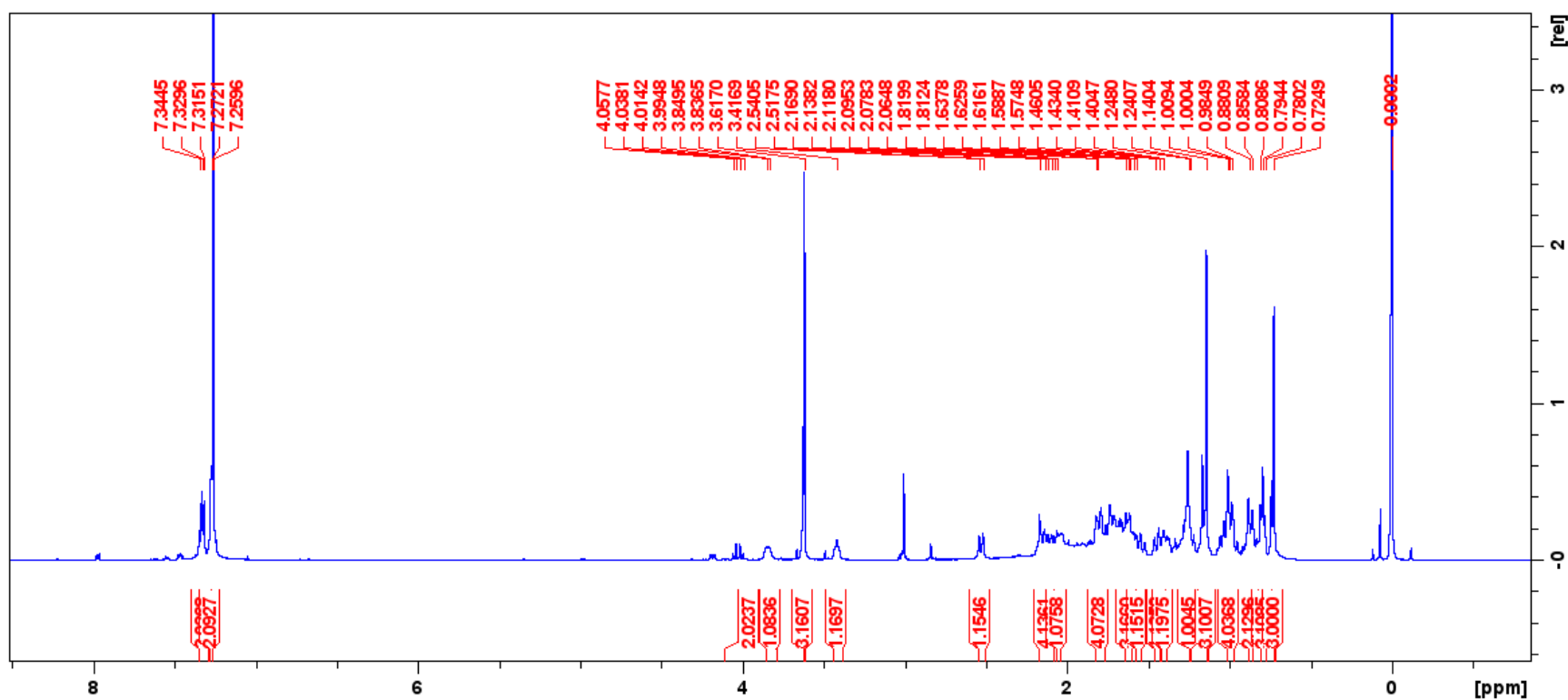
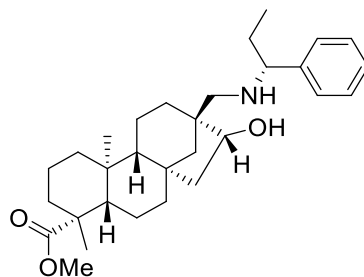
HMBC of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-(((4-fluorobenzyl)amino)methyl)-8-hydroxy-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**23**)



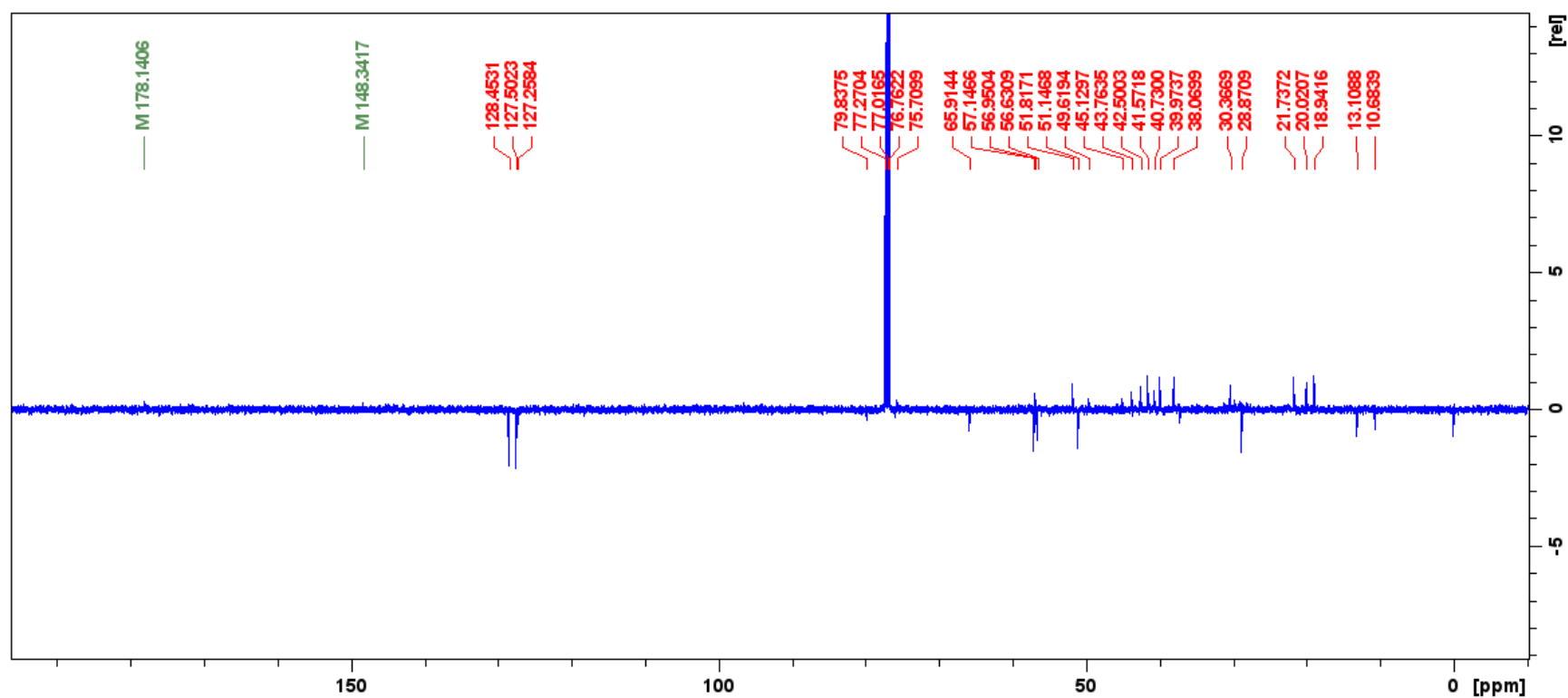
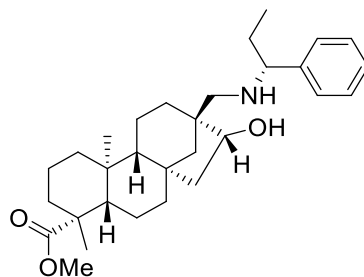
^{19}F -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-(((4-fluorobenzyl)amino)methyl)-8-hydroxy-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**23**)



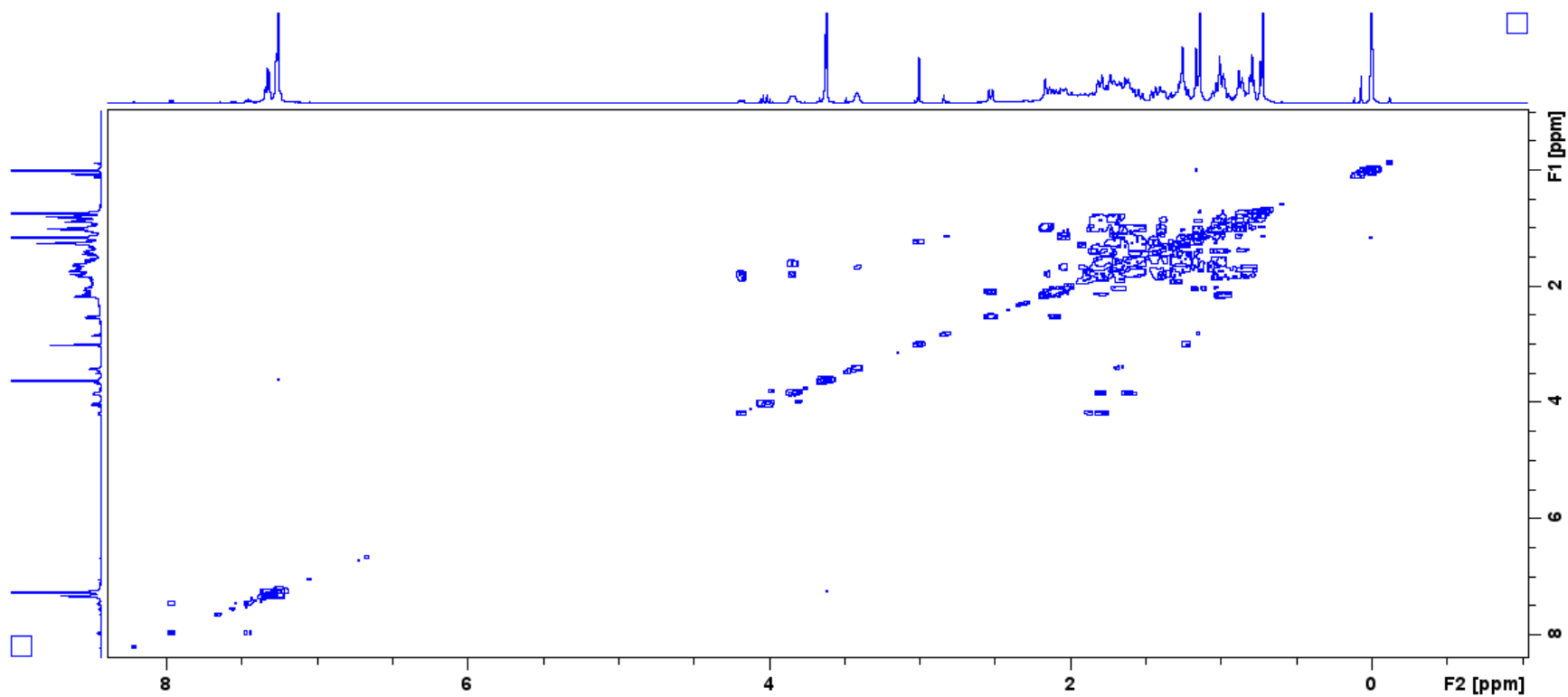
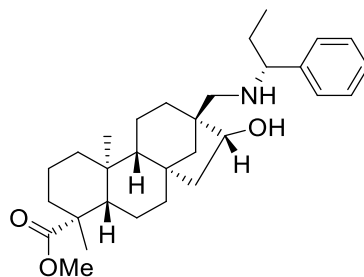
^1H -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*R*)-1-phenylpropyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**24**)



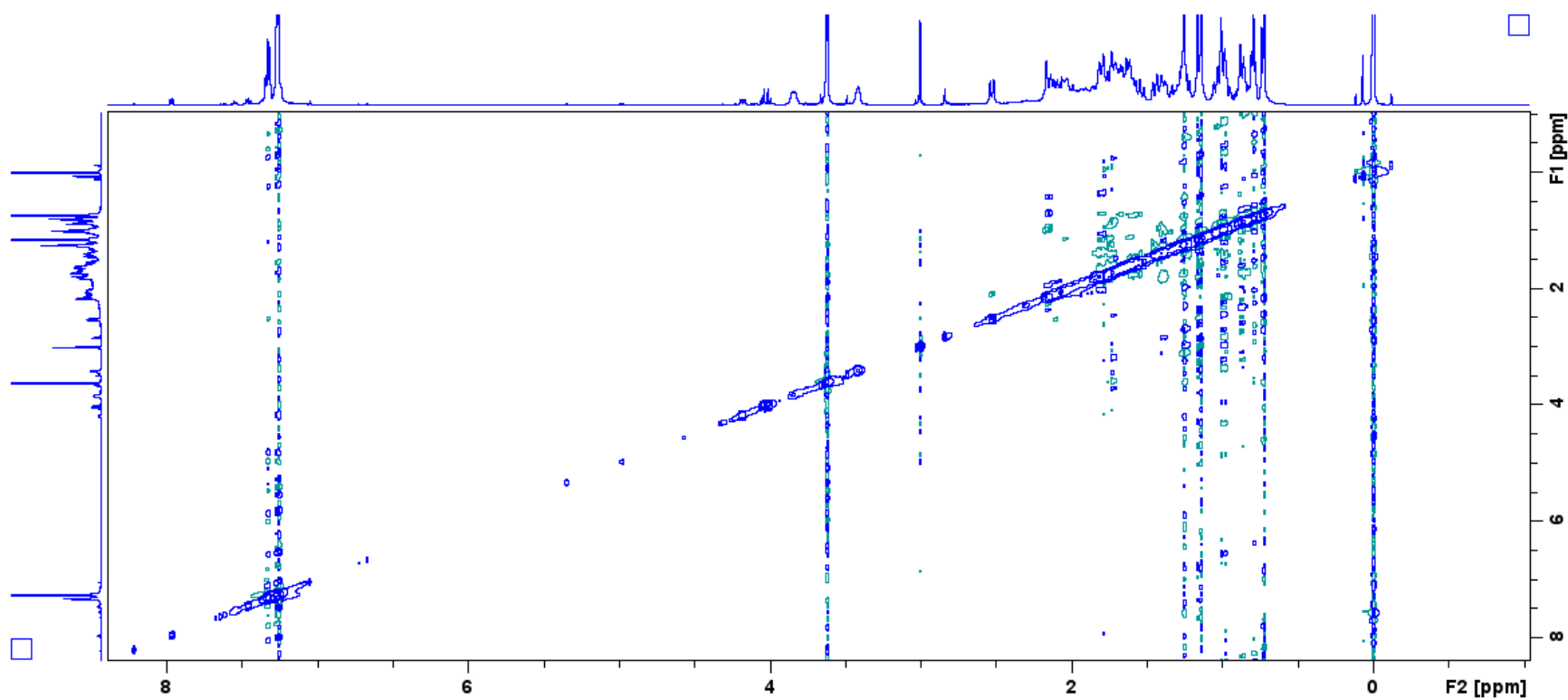
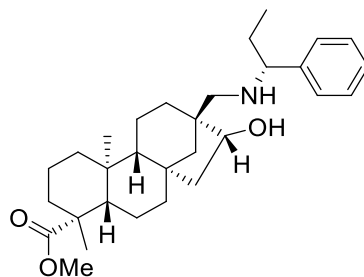
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*R*)-1-phenylpropyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**24**)



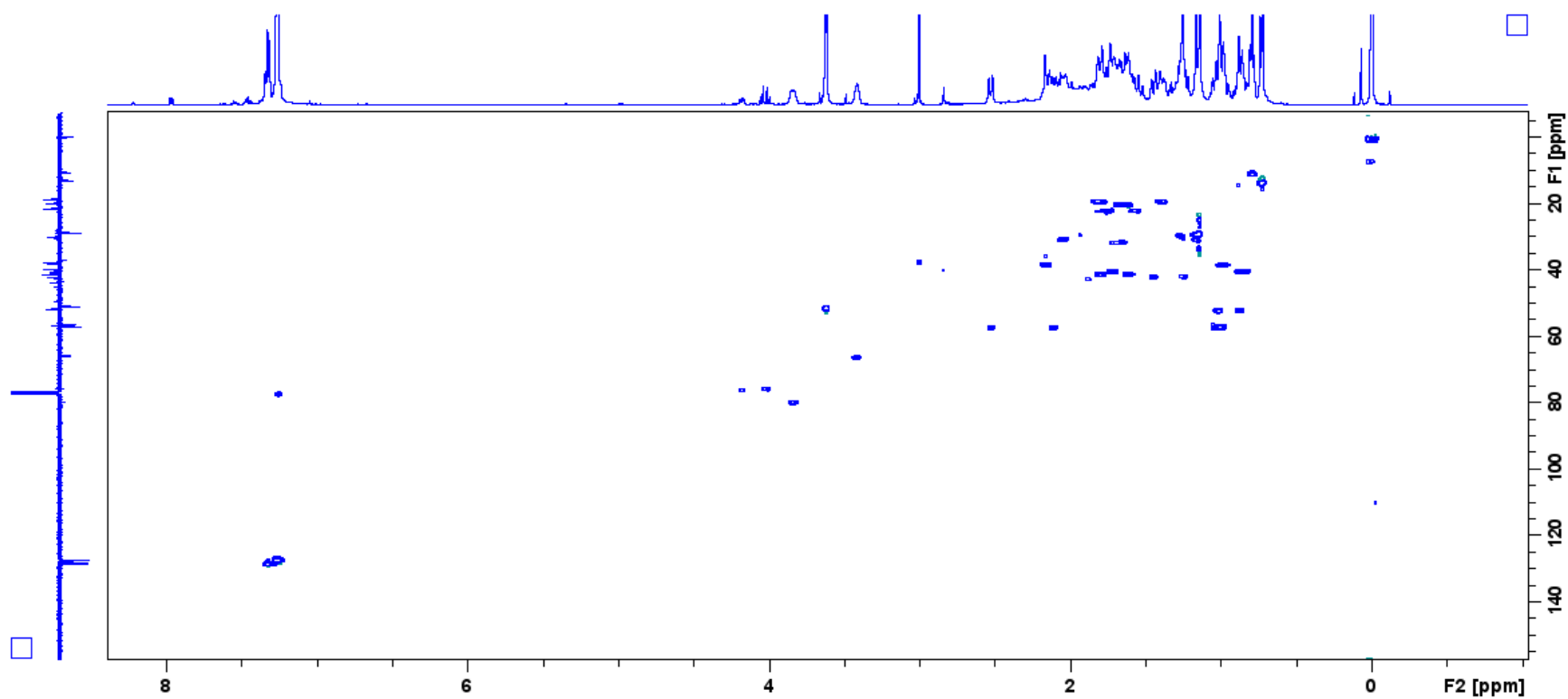
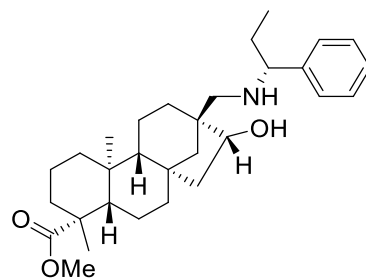
COSY of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*R*)-1-phenylpropyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**24**)



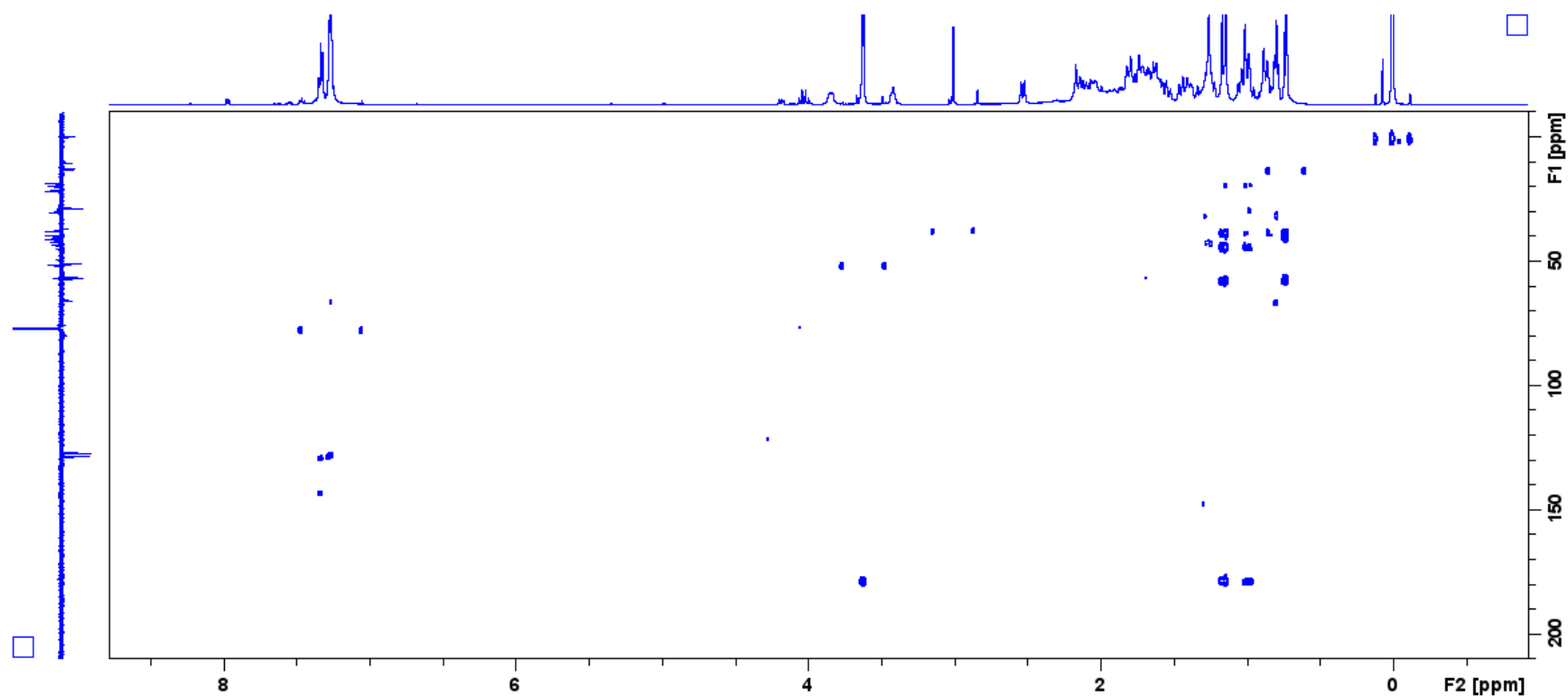
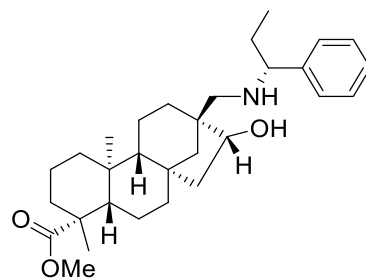
NOESY of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-(((*R*)-1-phenylpropyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**24**)



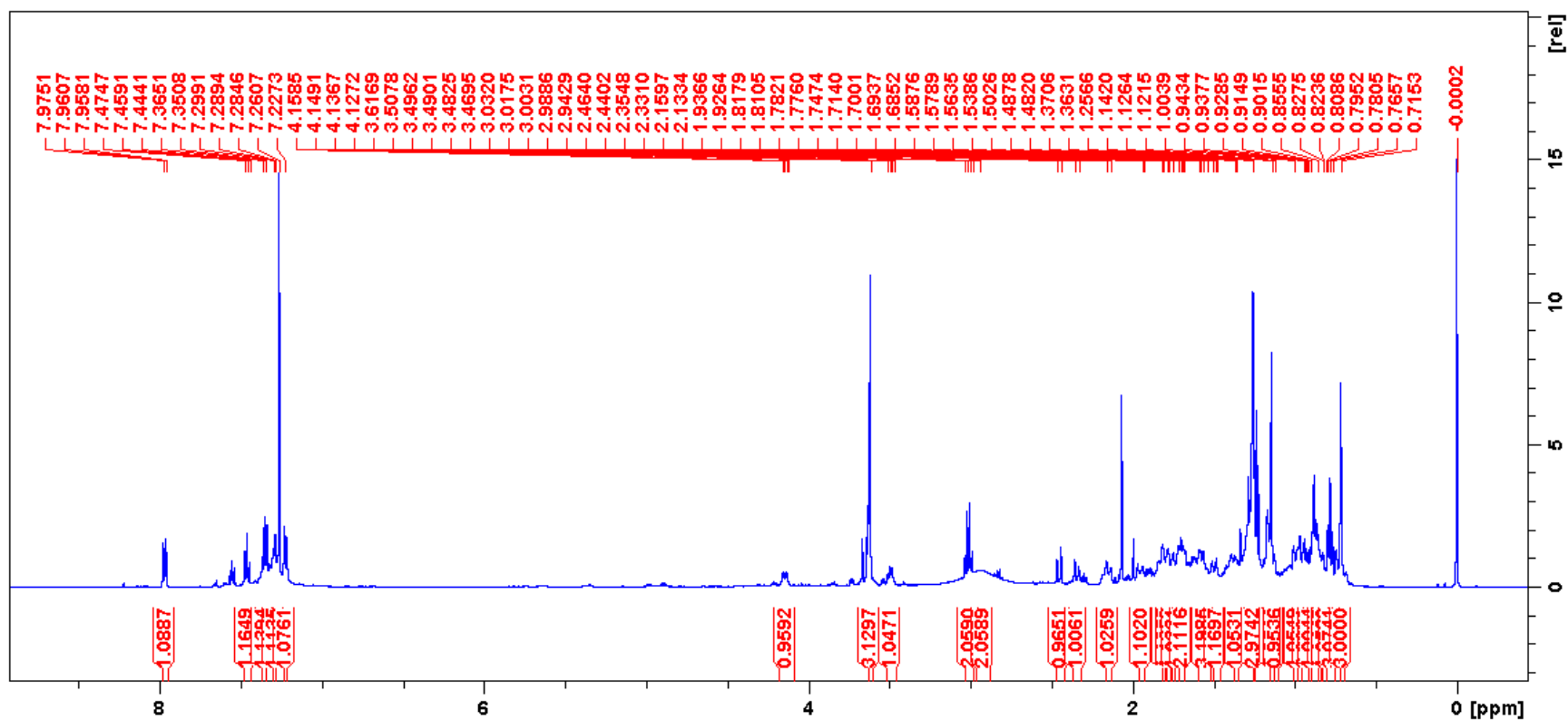
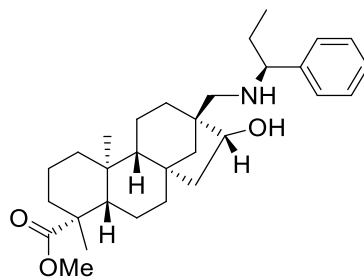
HSQC of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*R*)-1-phenylpropyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**24**)



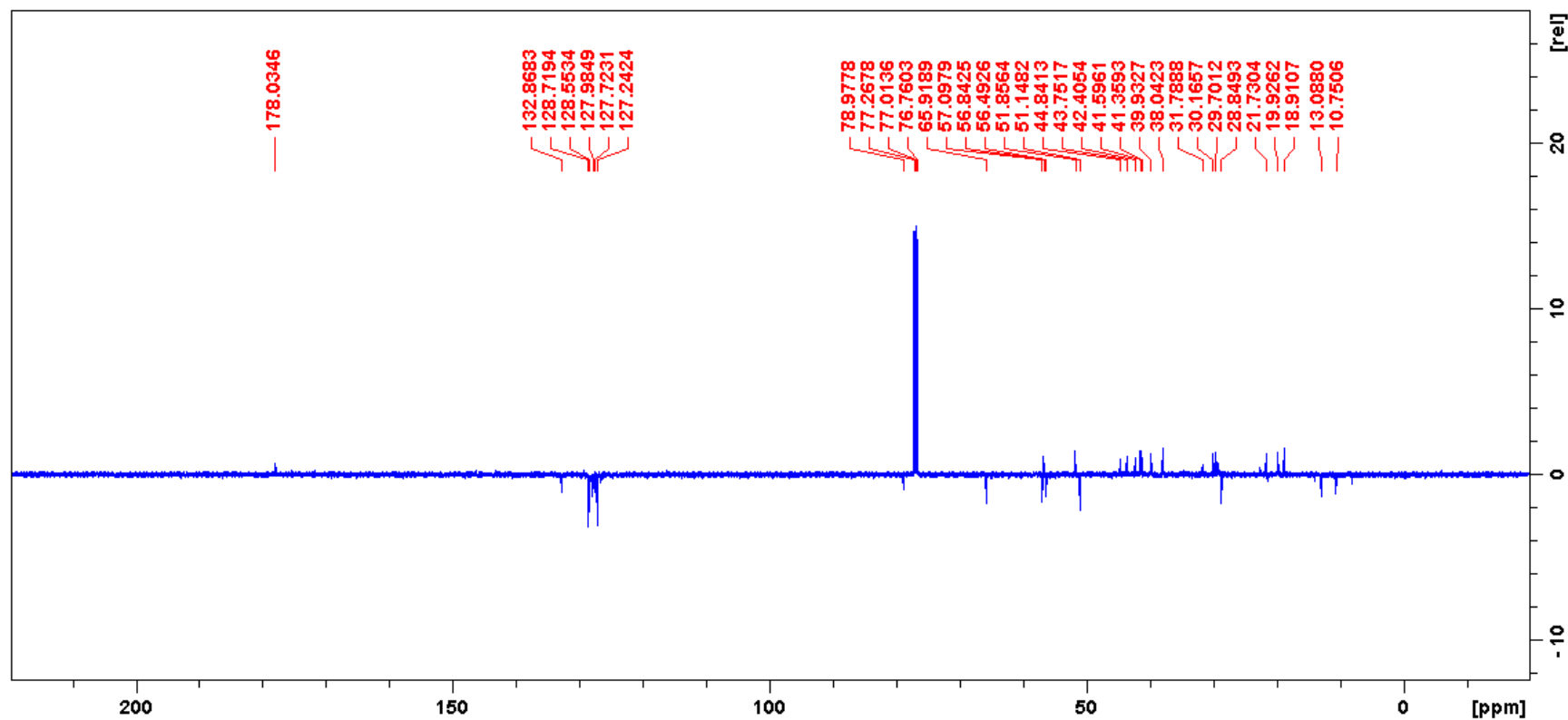
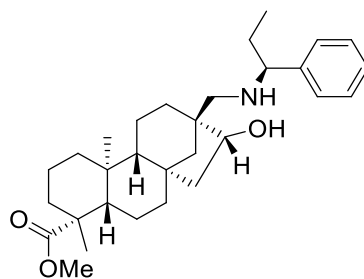
HMBC of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*R*)-1-phenylpropyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**24**)



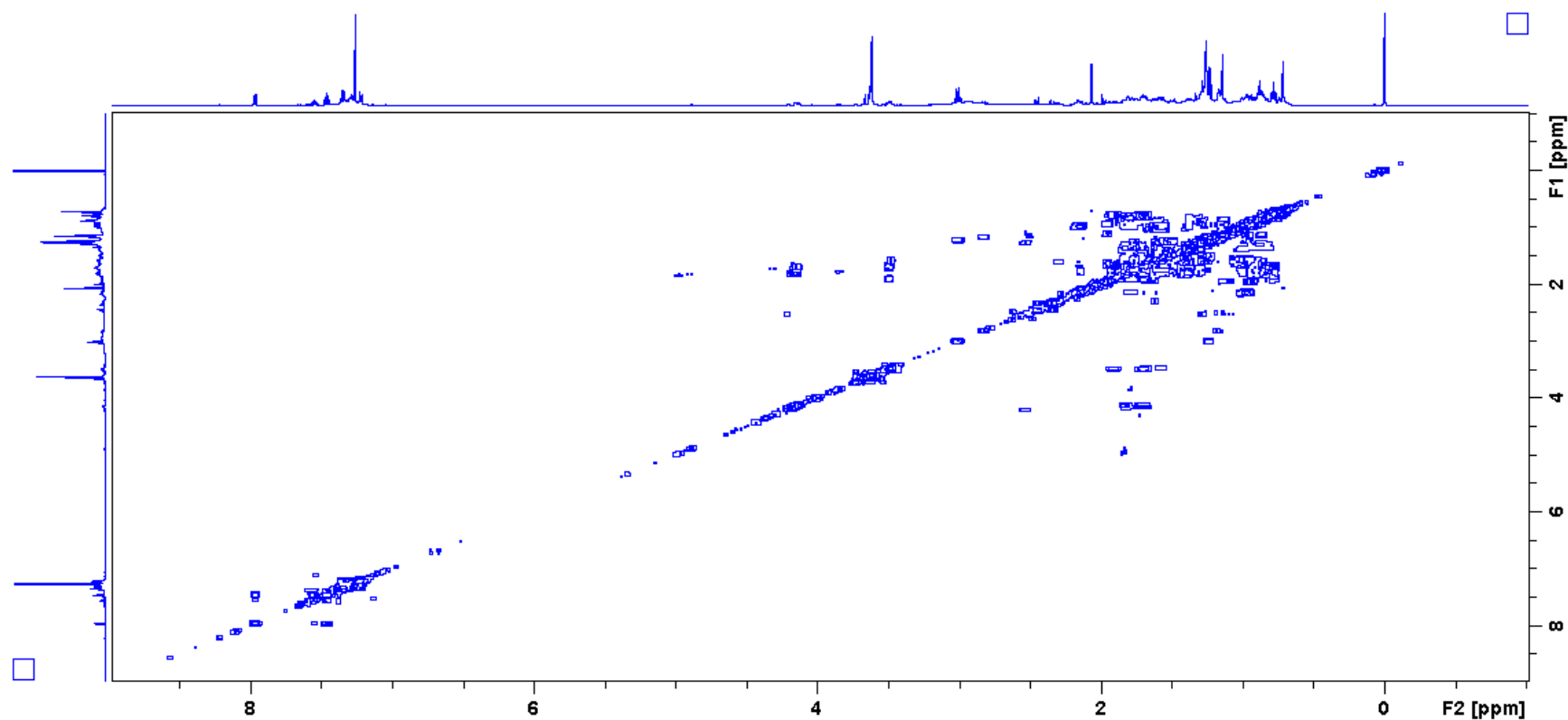
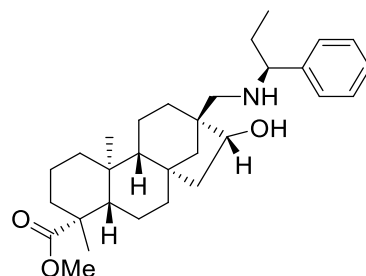
^1H -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*S*)-1-phenylpropyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**25**)



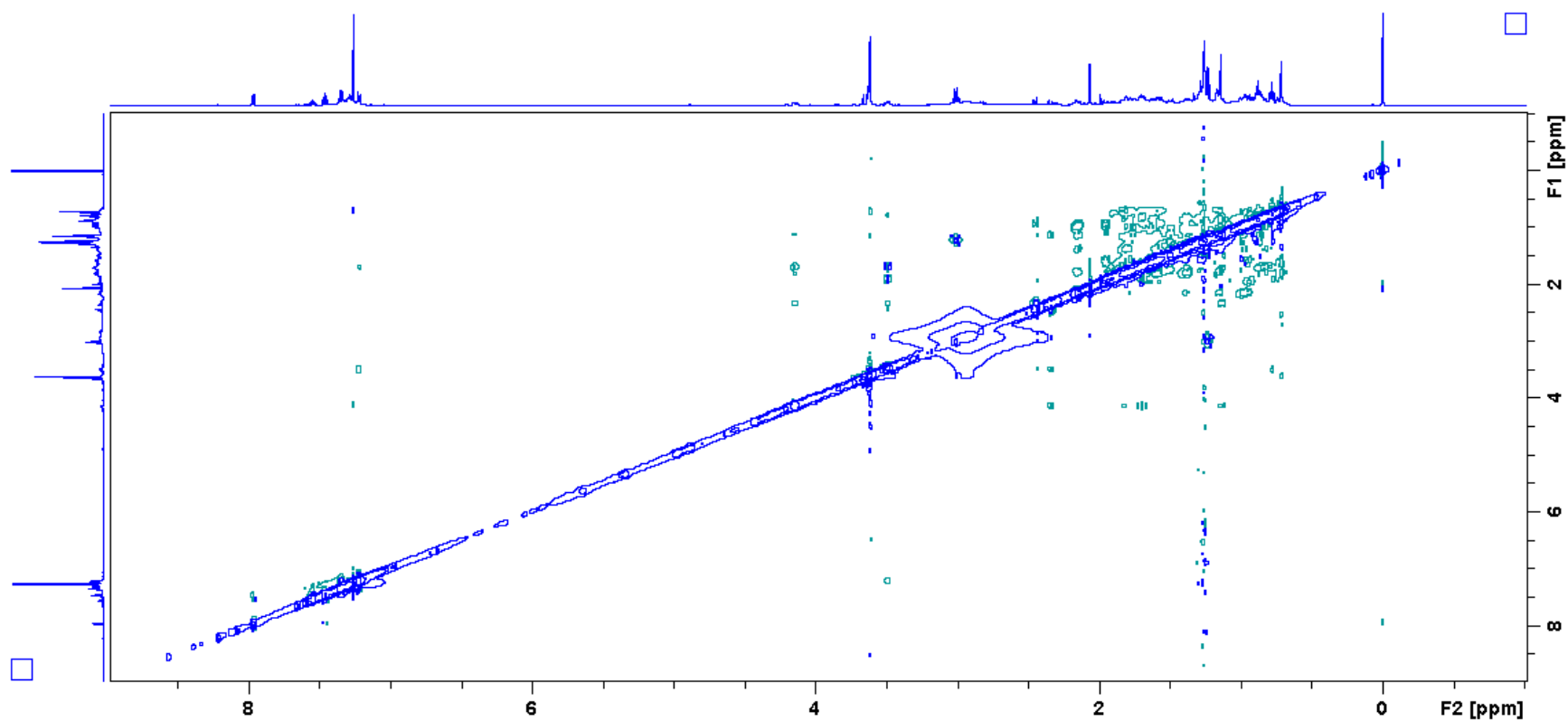
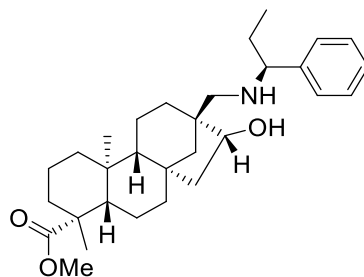
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*S*)-1-phenylpropyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**25**)



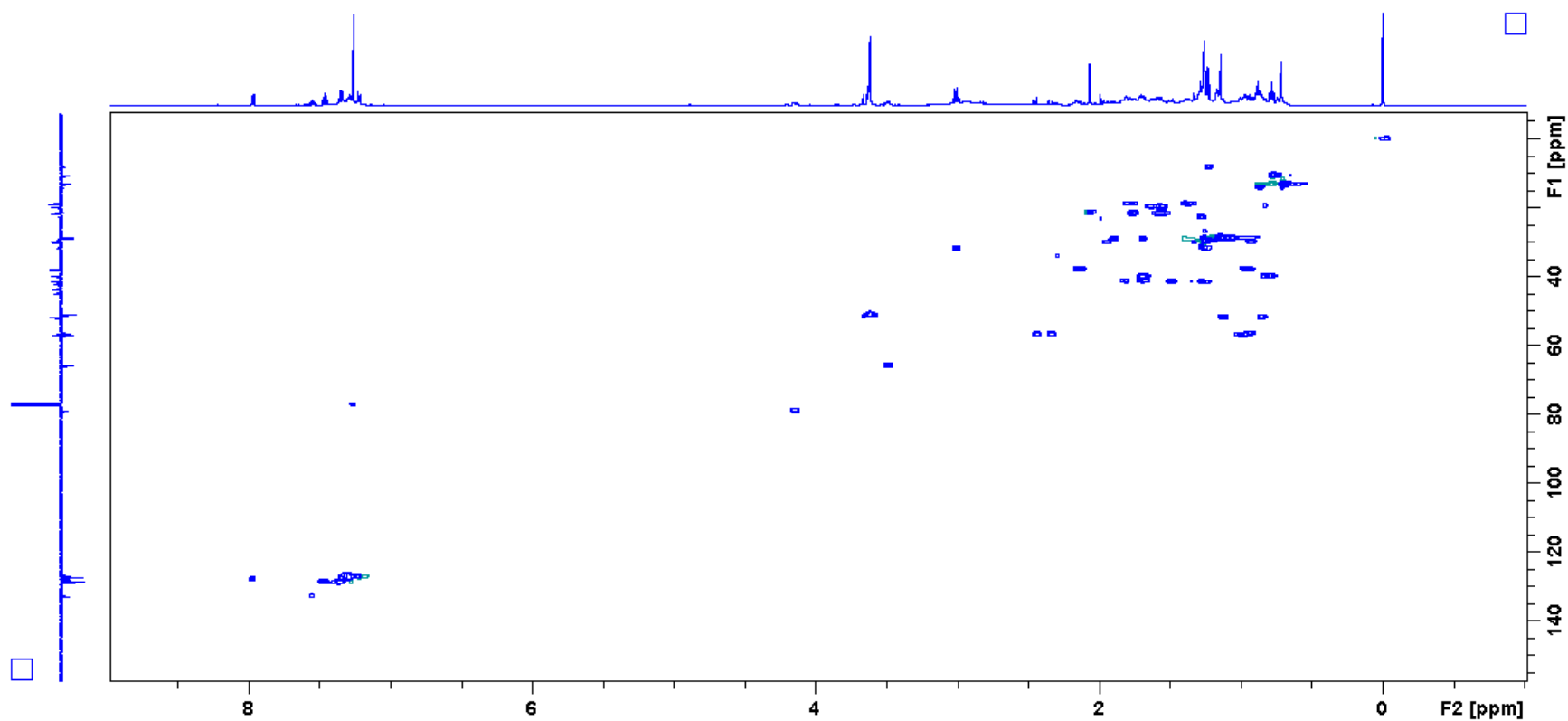
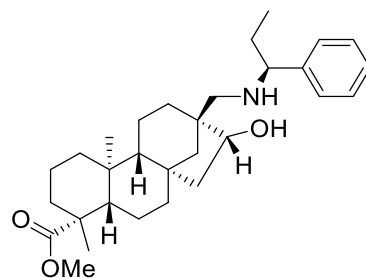
COSY of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*S*)-1-phenylpropyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**25**)



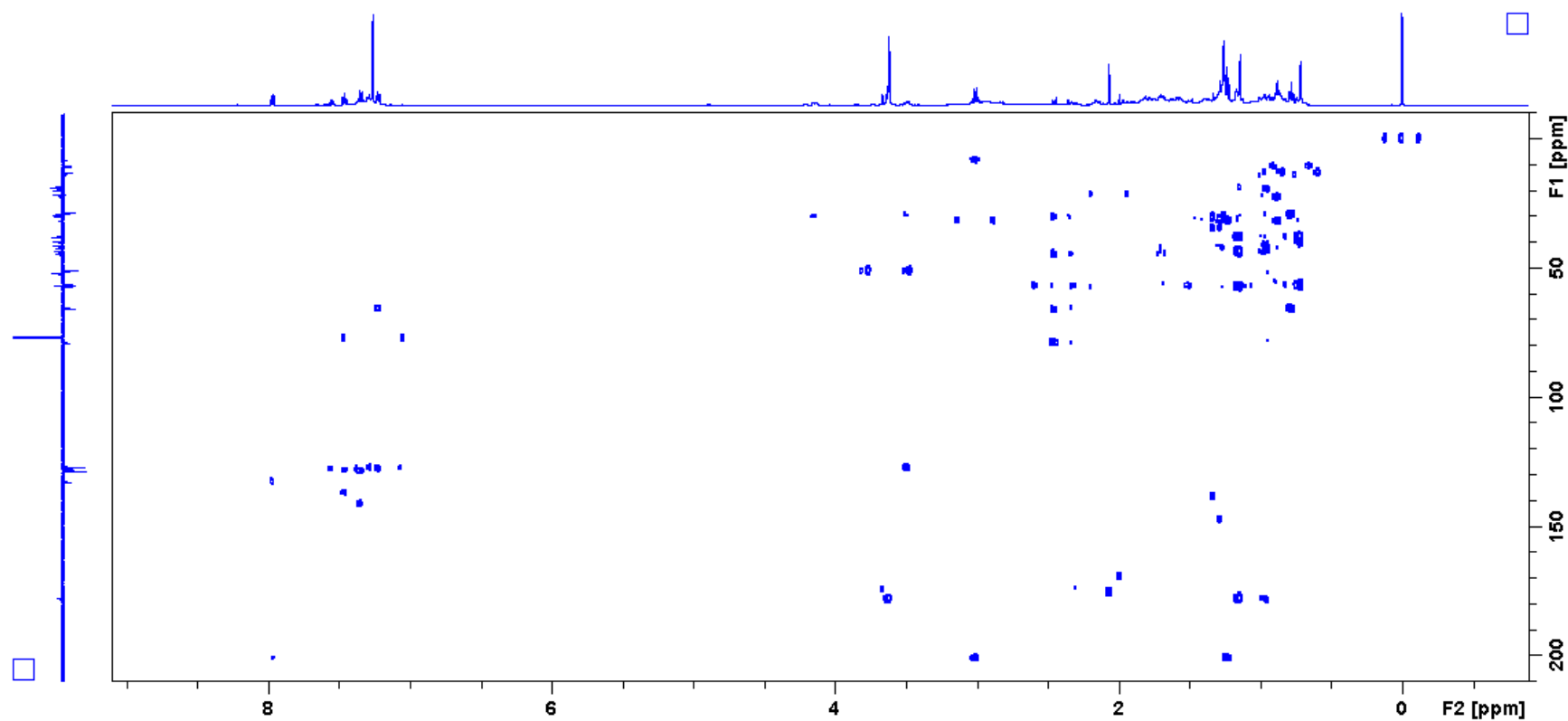
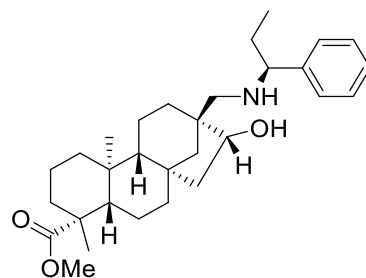
NOESY of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*S*)-1-phenylpropyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**25**)



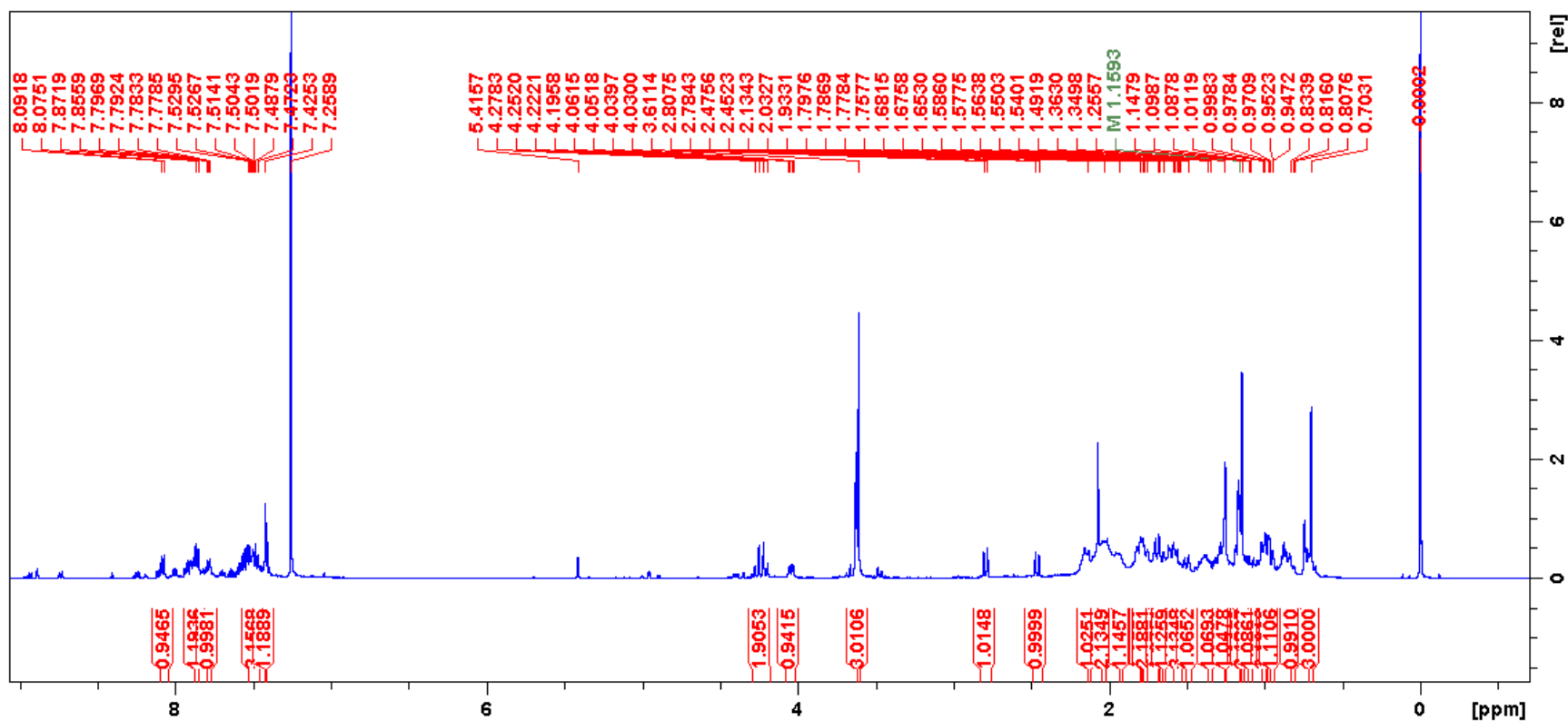
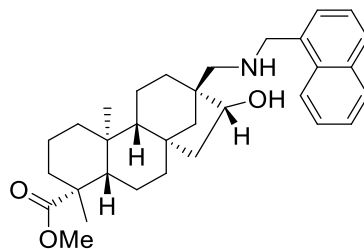
HSQC of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*S*)-1-phenylpropyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**25**)



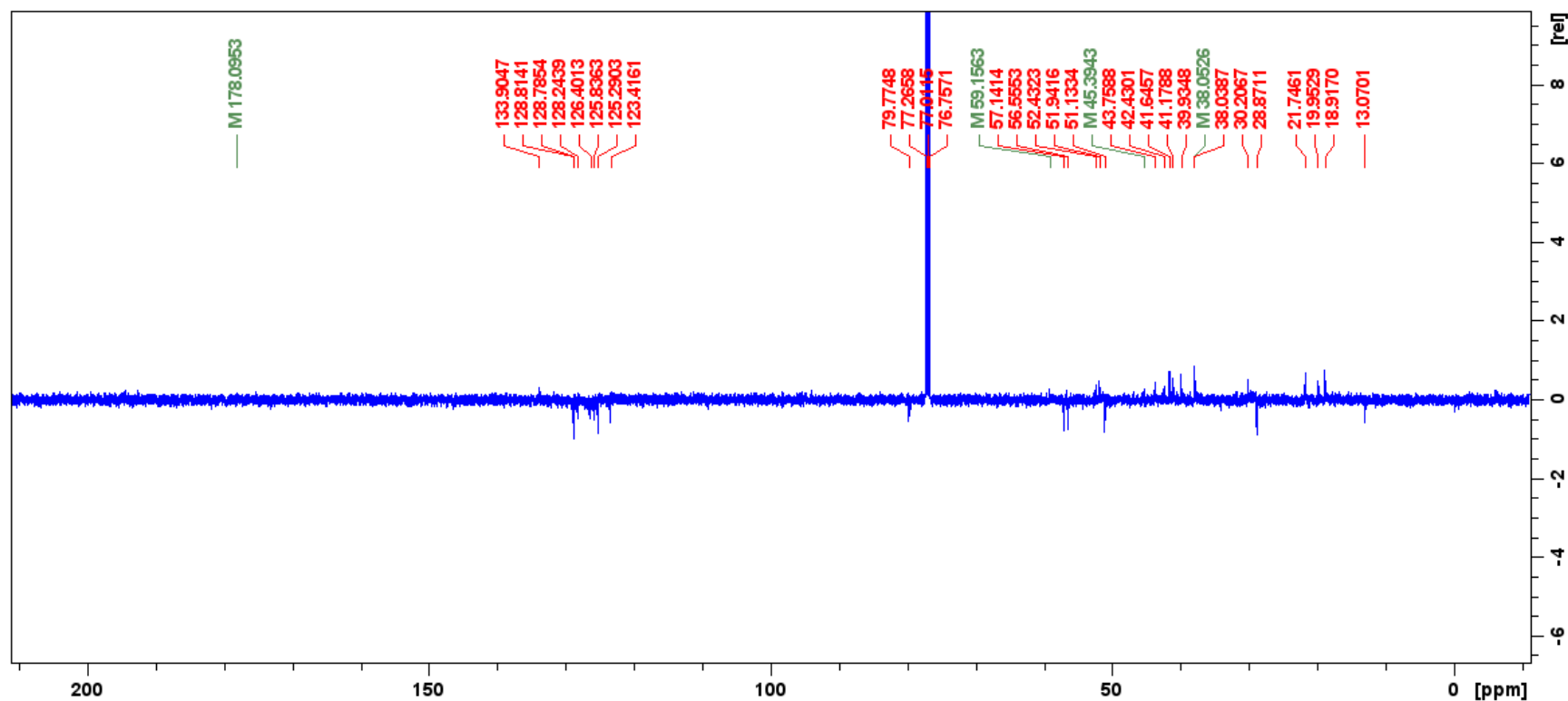
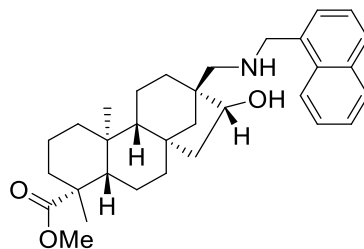
HMBC of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*S*)-1-phenylpropyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**25**)



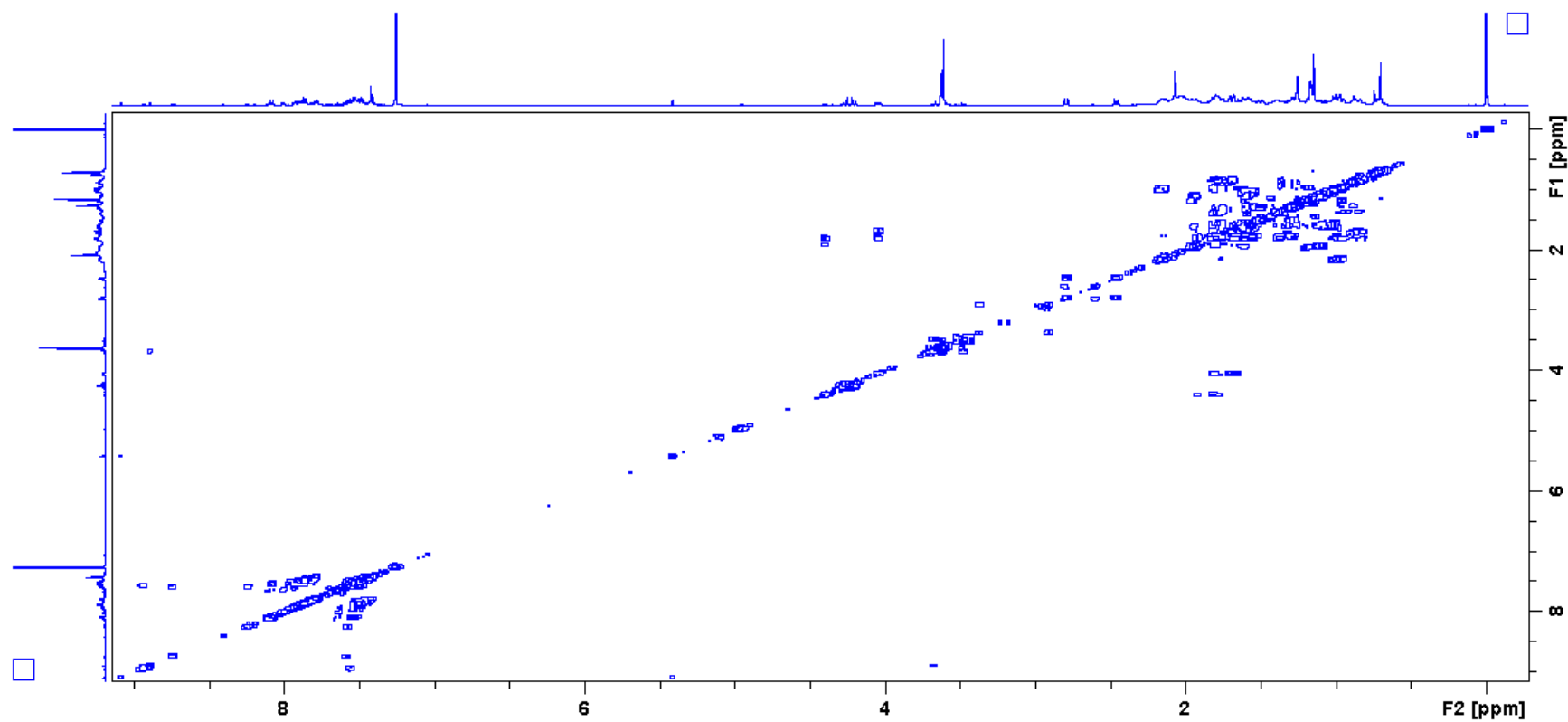
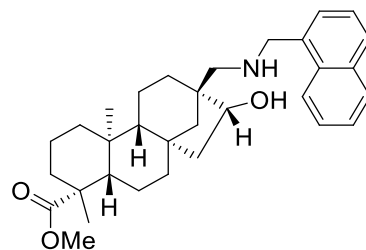
^1H -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-(((naphthalen-1-ylmethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**26**)



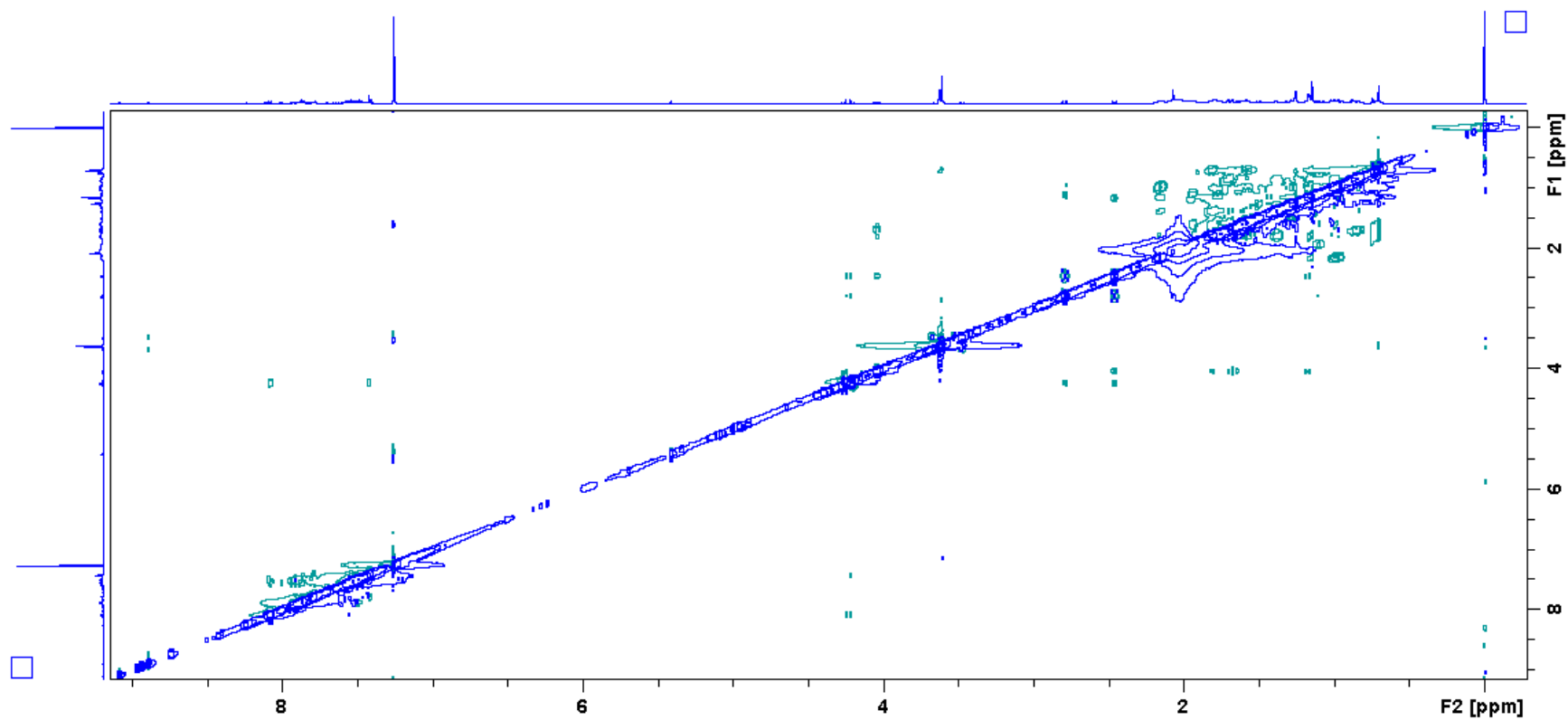
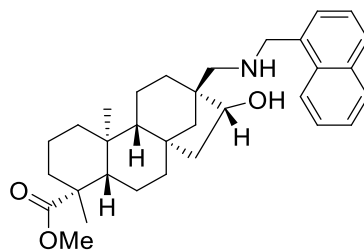
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-(((naphthalen-1-ylmethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**26**)



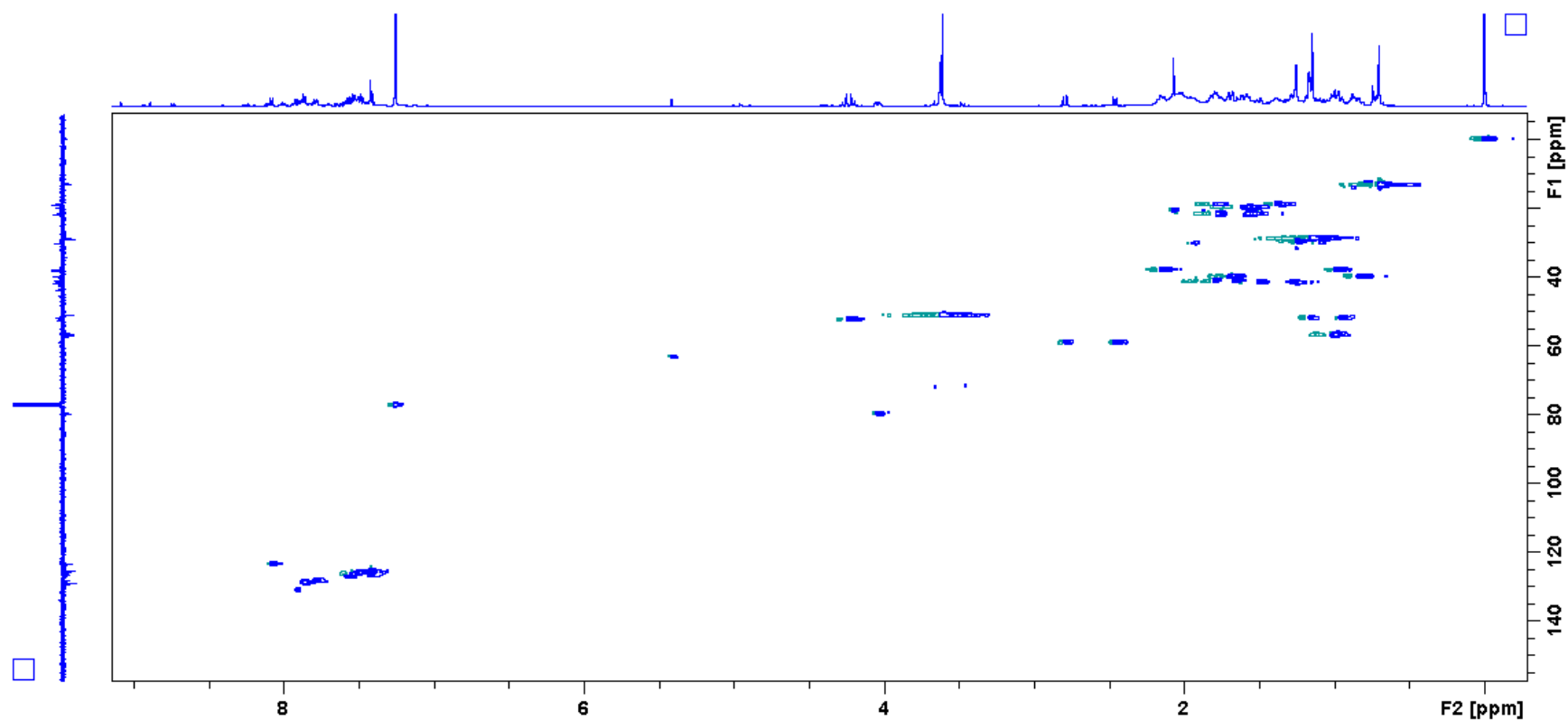
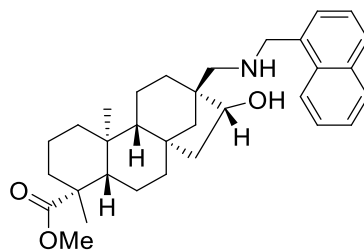
COSY of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-(((naphthalen-1-ylmethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**26**)



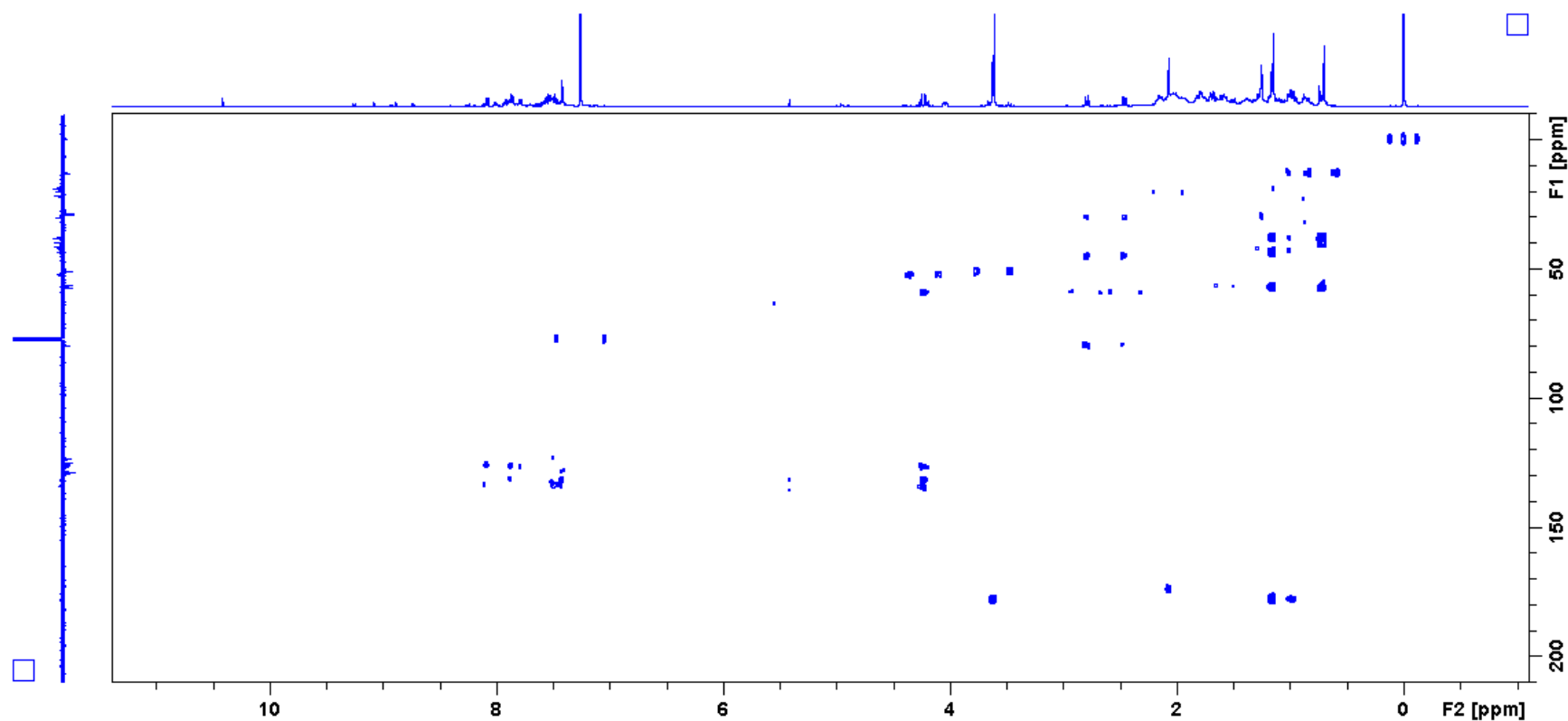
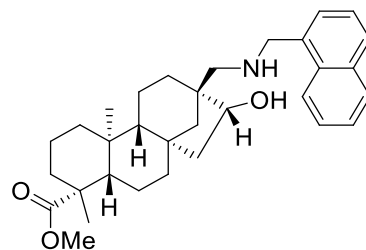
NOESY of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11b-dimethyl-9-(((naphthalen-1-ylmethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**26**)



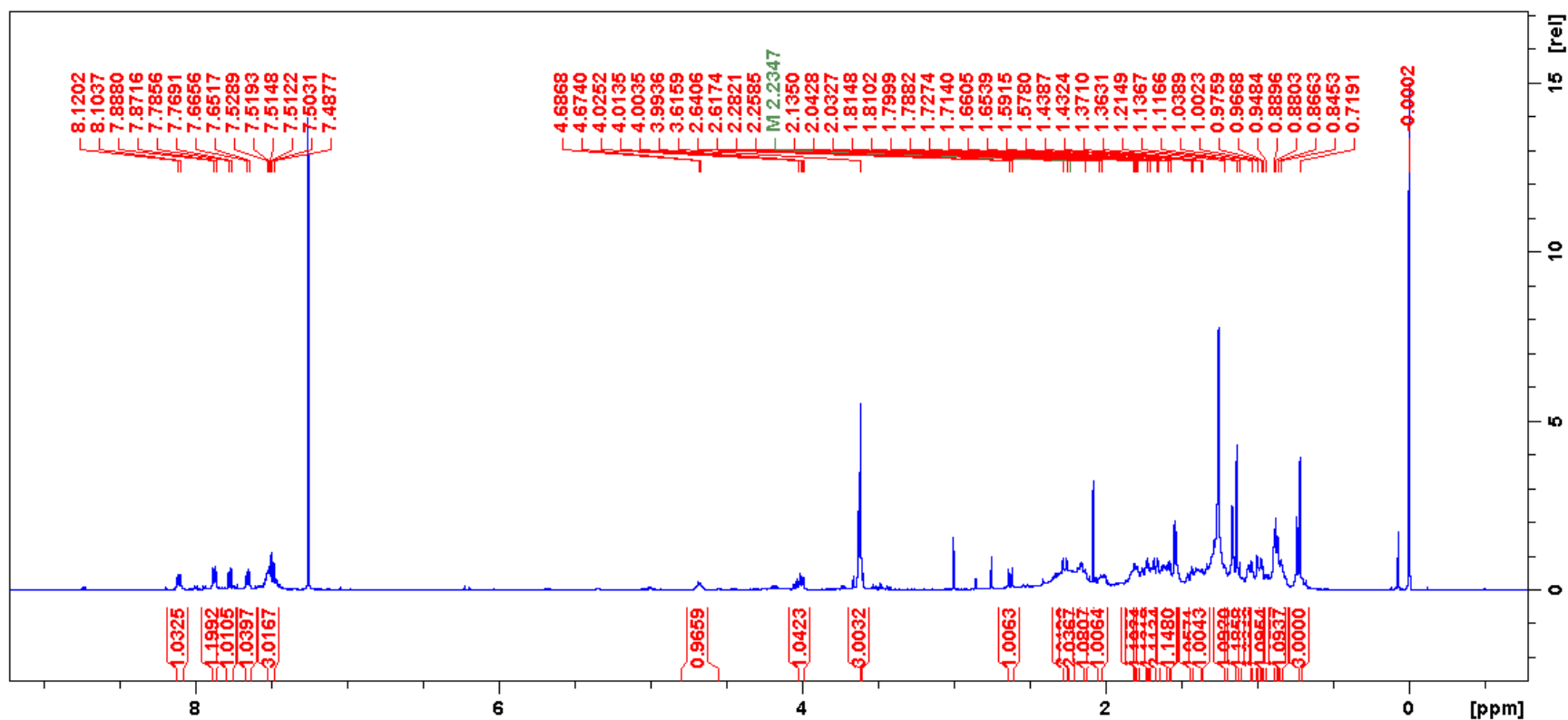
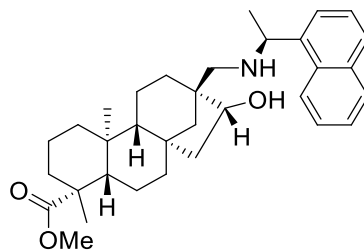
HSQC of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-(((naphthalen-1-ylmethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**26**)



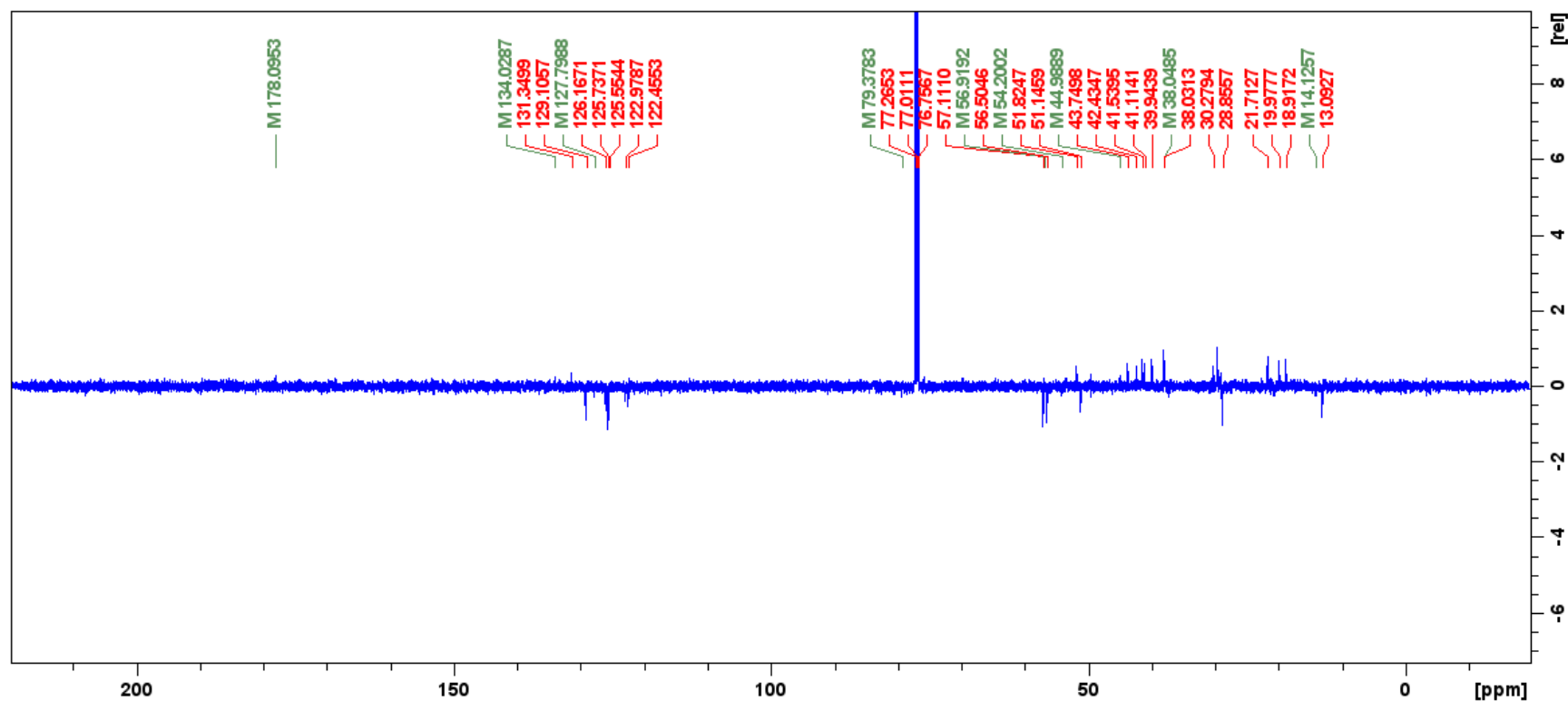
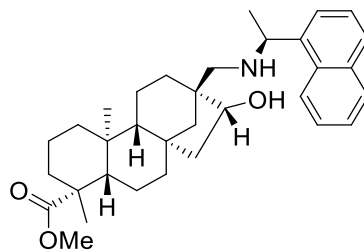
HMBC of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-(((naphthalen-1-ylmethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**26**)



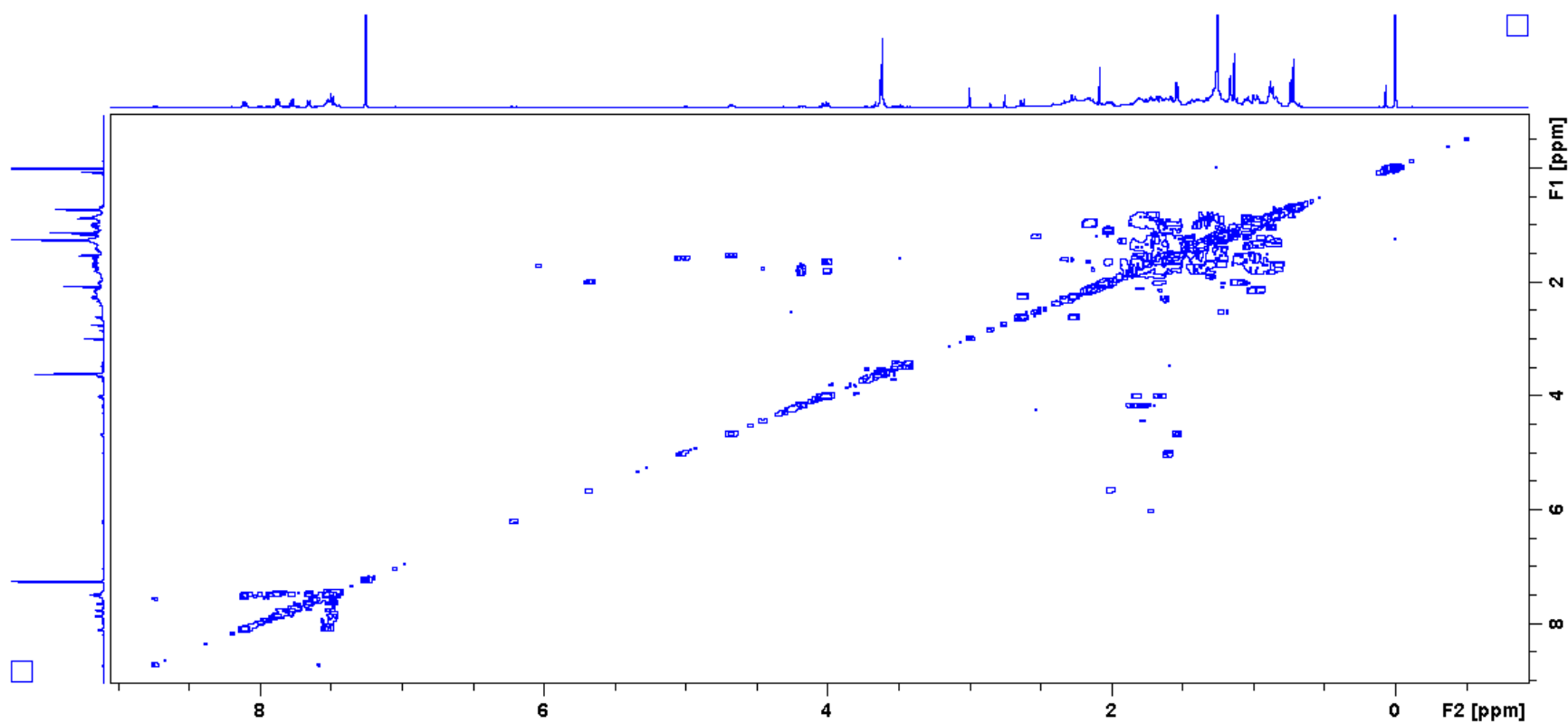
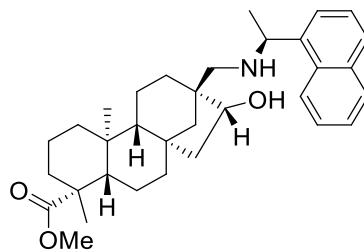
^1H -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*S*)-1-(naphthalen-1-yl)ethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**27**)



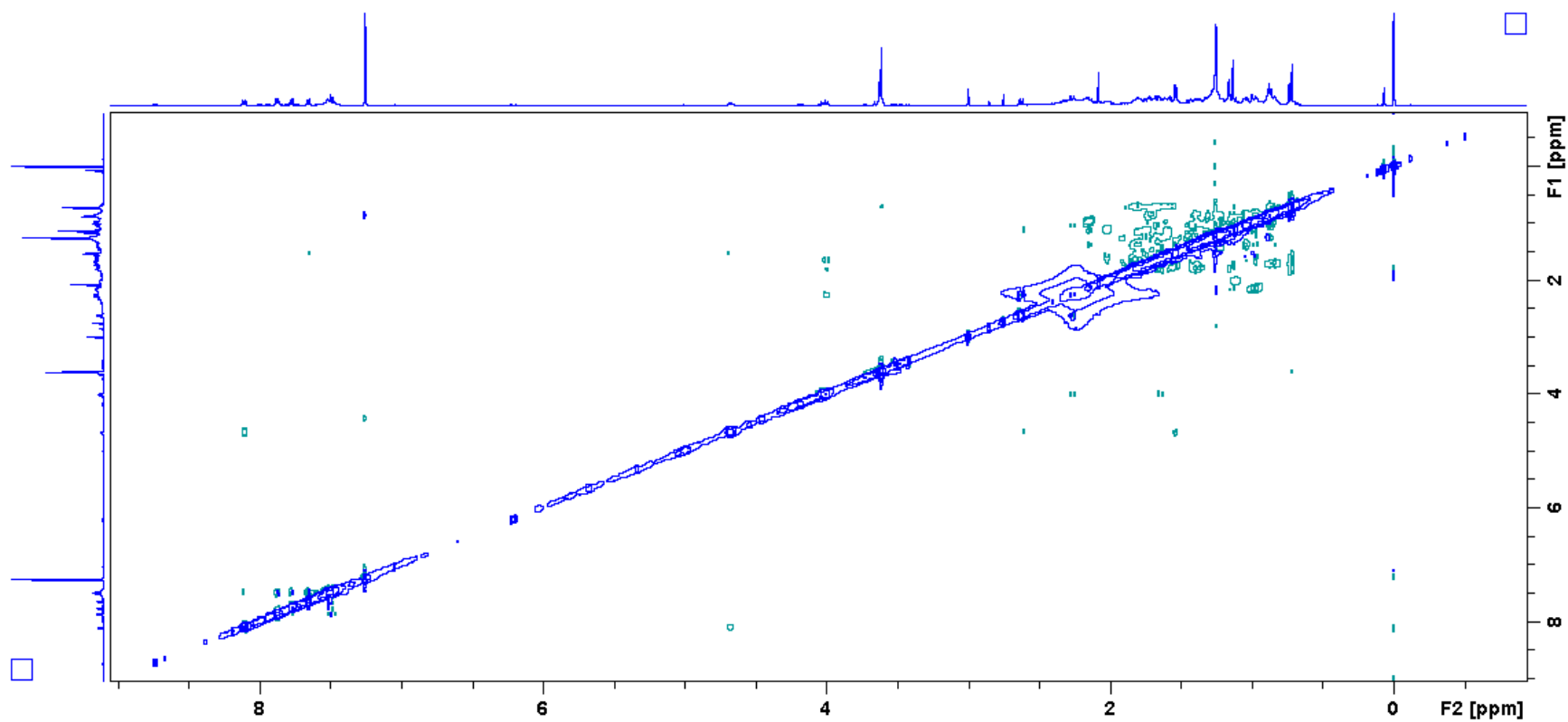
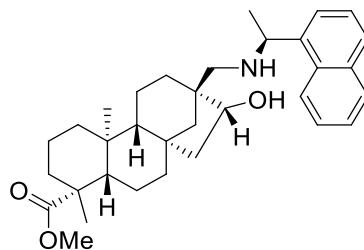
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*S*)-1-(naphthalen-1-yl)ethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**27**)



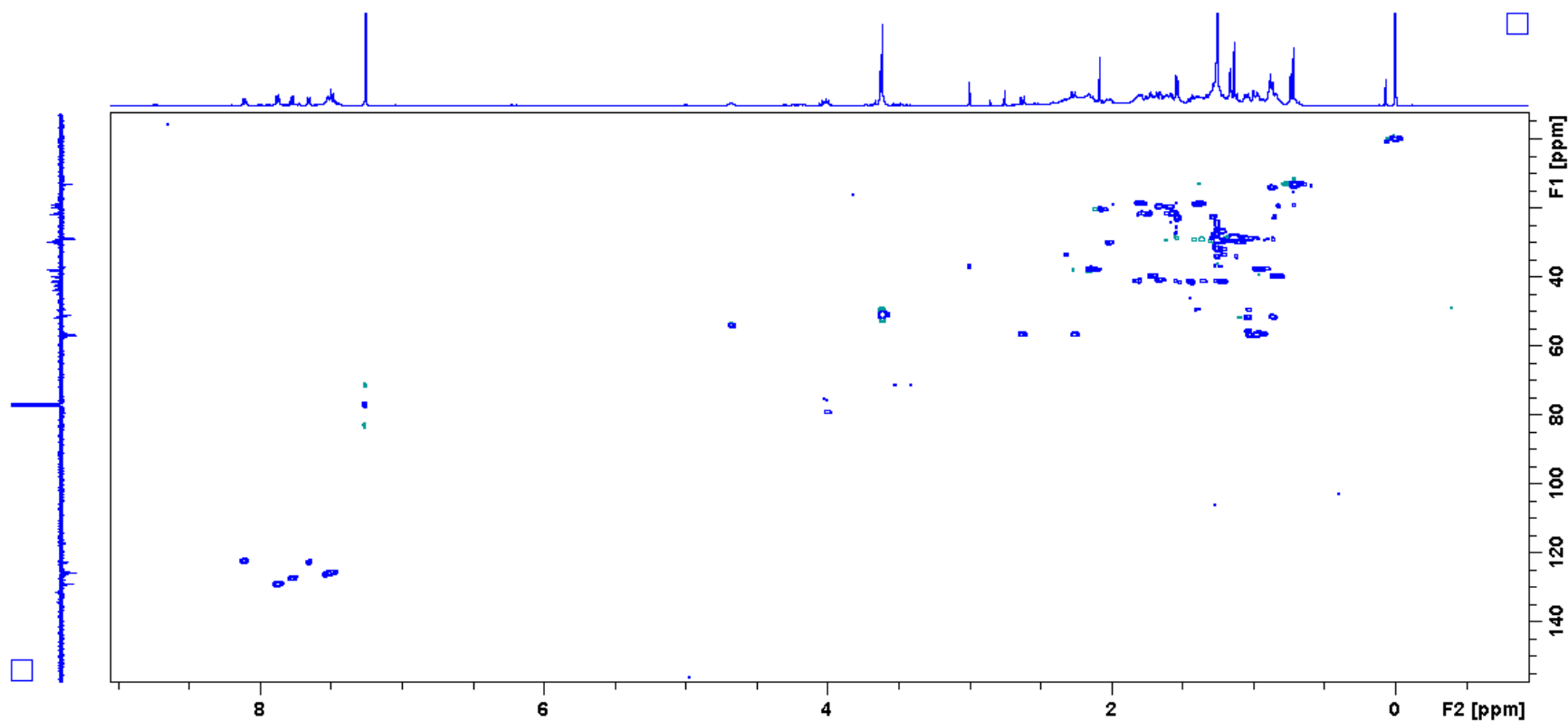
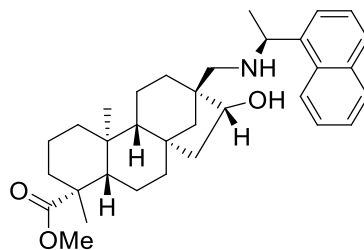
COSY of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*S*)-1-(naphthalen-1-yl)ethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**27**)



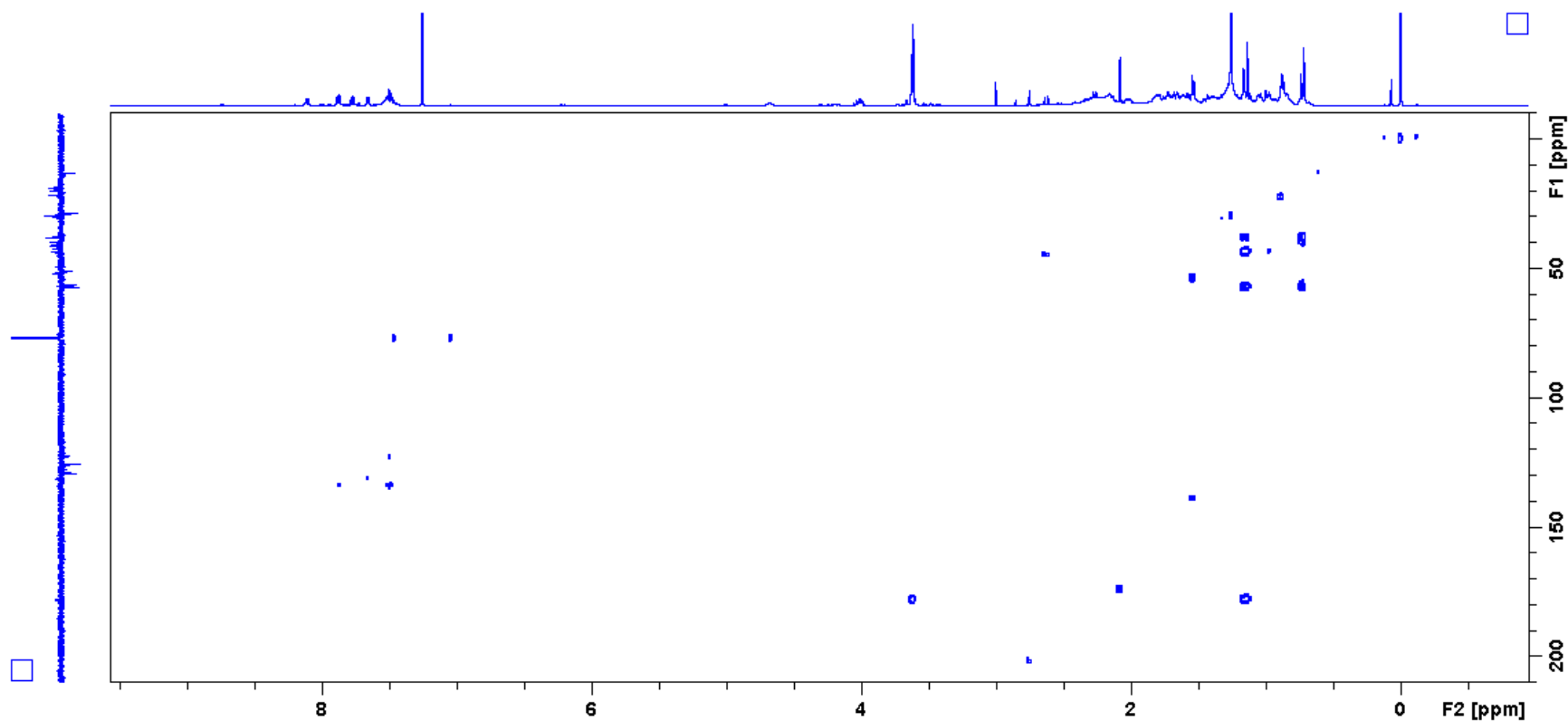
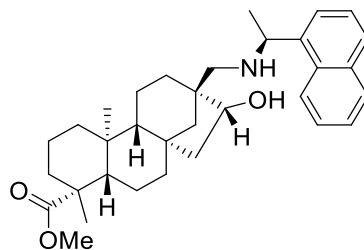
NOESY of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11b-dimethyl-9-(((*S*)-1-(naphthalen-1-yl)ethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**27**)



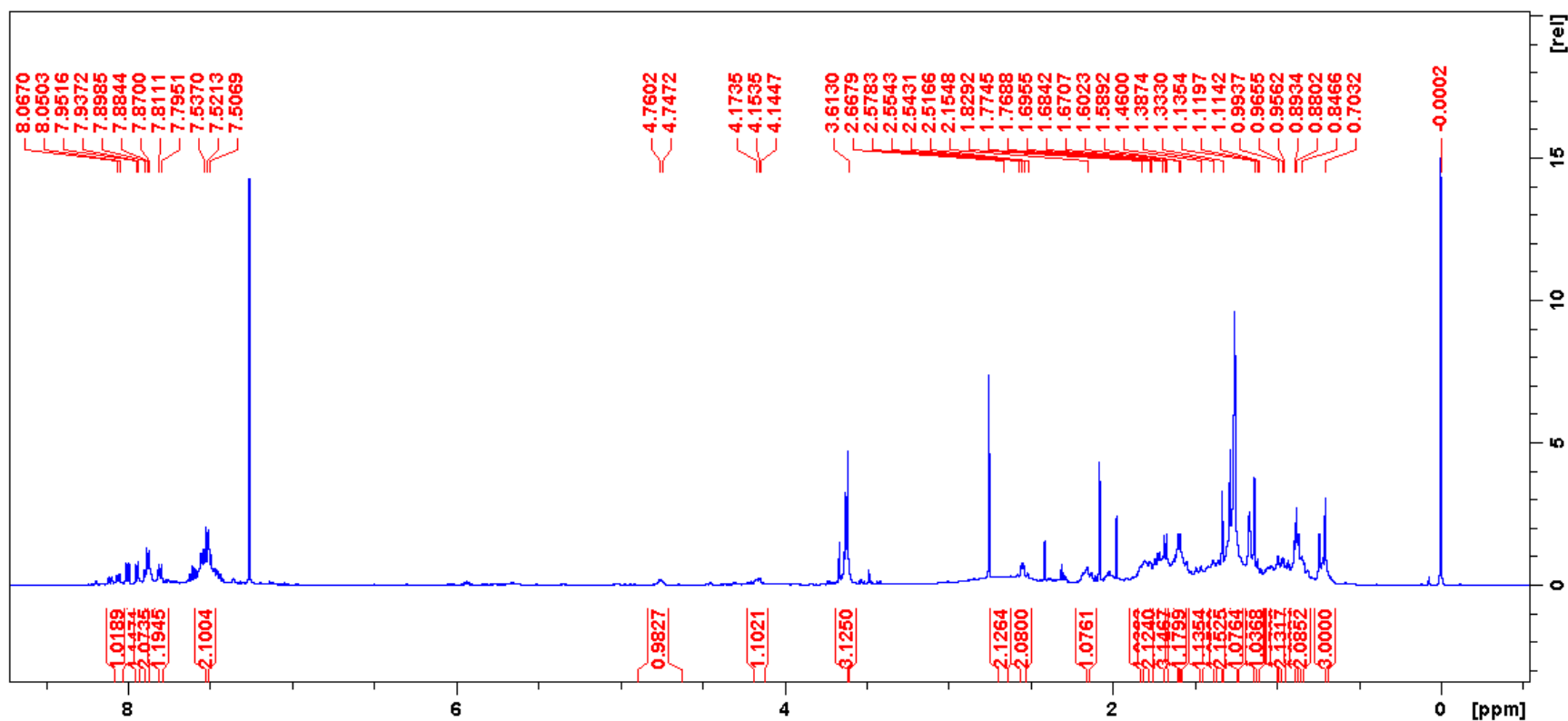
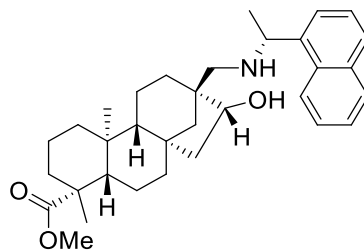
HSQC of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*S*)-1-(naphthalen-1-yl)ethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**27**)



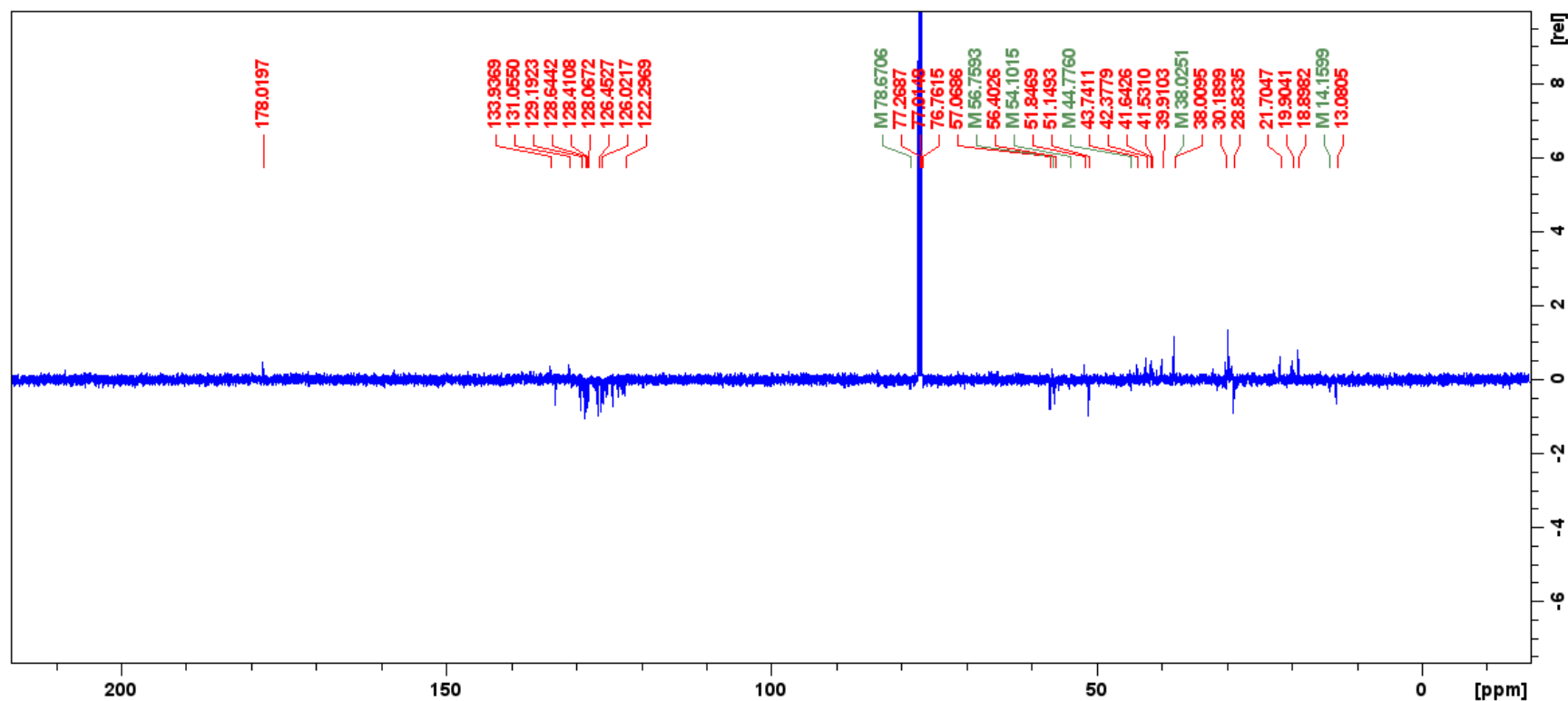
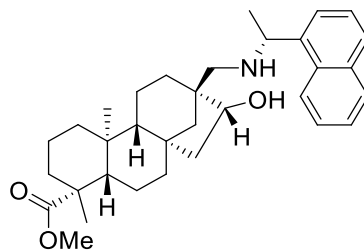
HMBC of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-(((*S*)-1-(naphthalen-1-yl)ethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**27**)



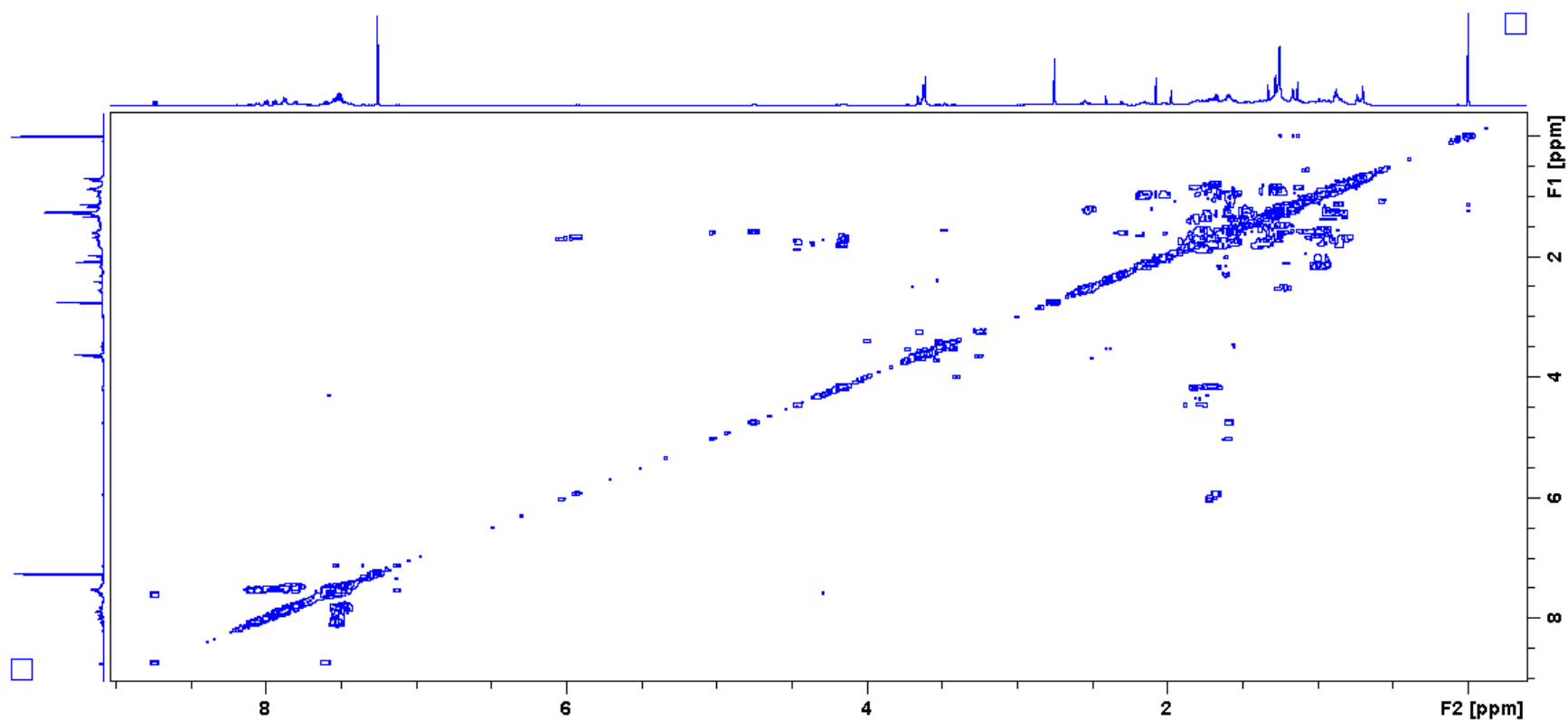
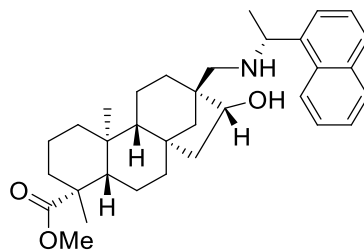
^1H -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*R*)-1-(naphthalen-1-yl)ethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**28**)



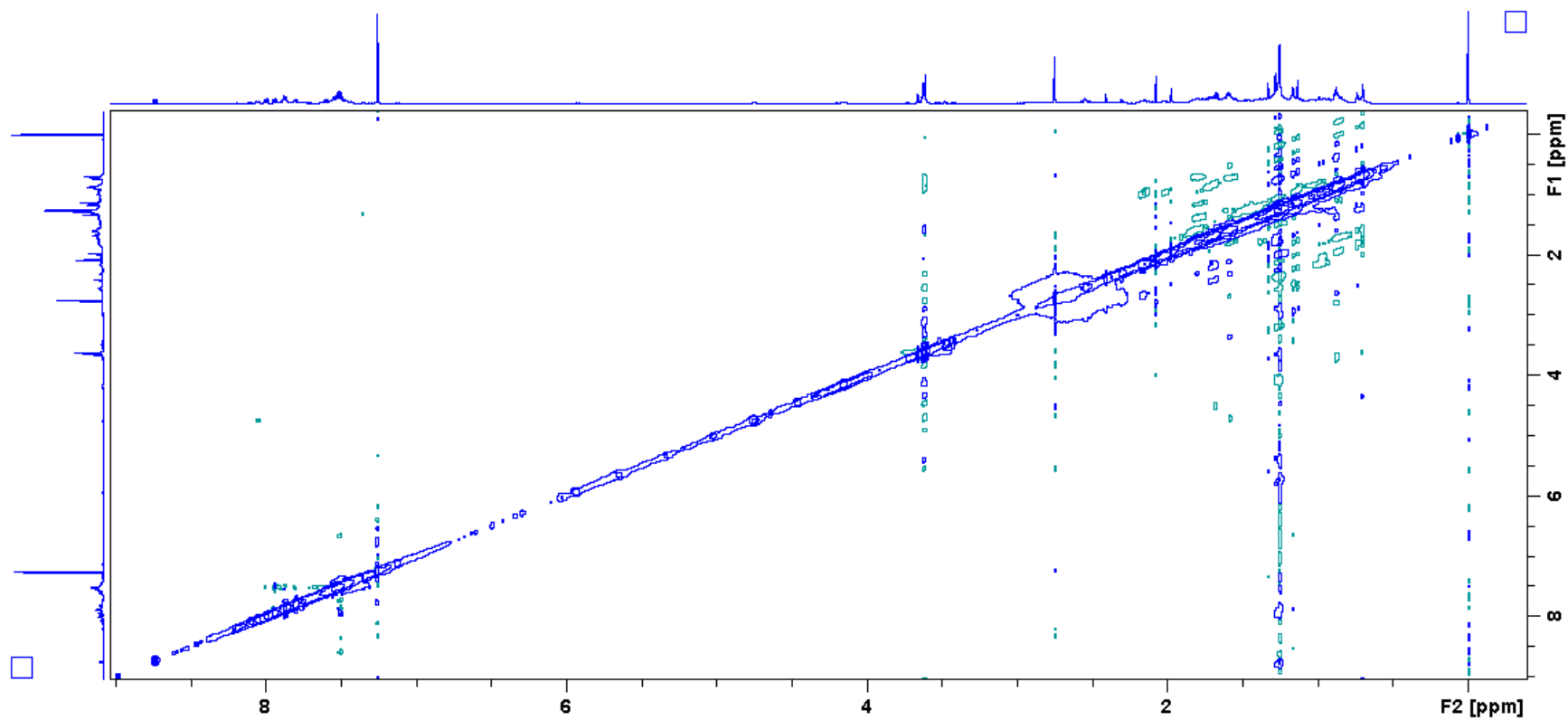
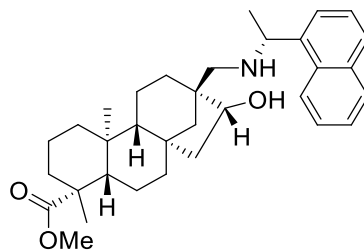
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11b-dimethyl-9-((((*R*)-1-(naphthalen-1-yl)ethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**28**)



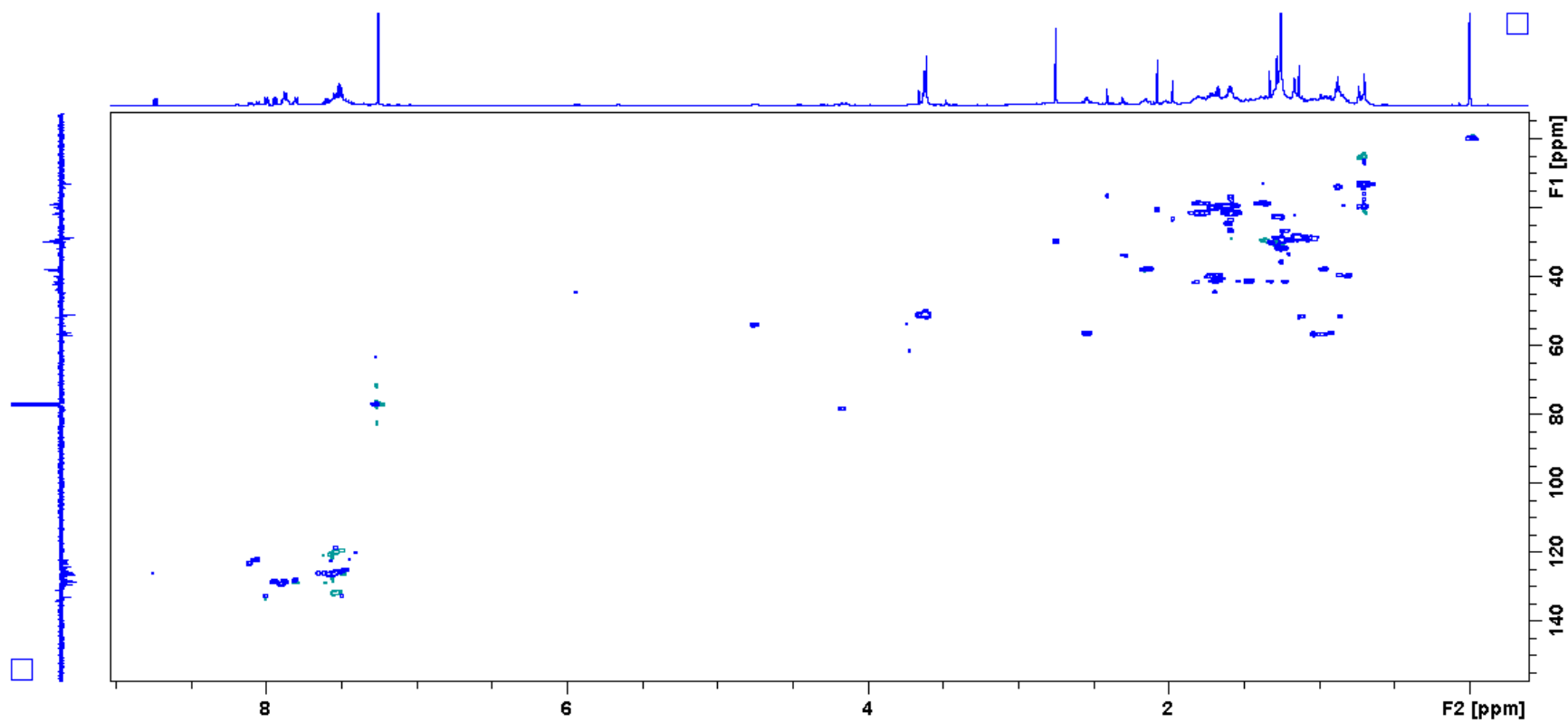
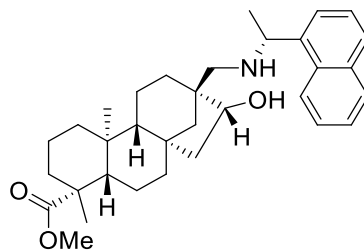
COSY of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-(((*R*)-1-(naphthalen-1-yl)ethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**28**)



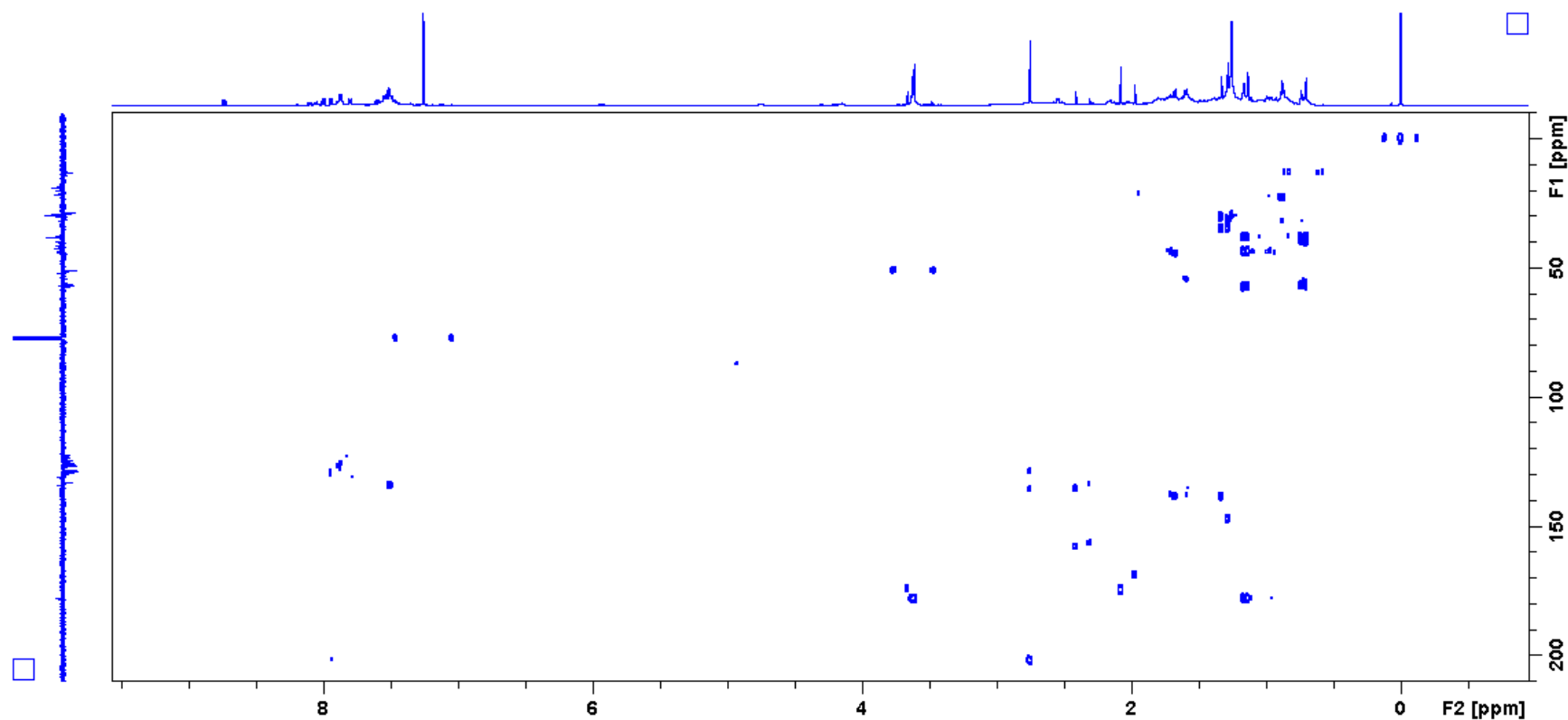
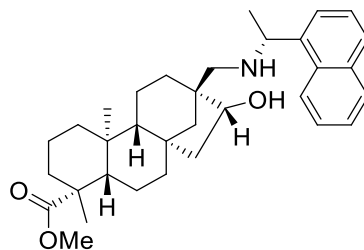
NOESY of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-(((*R*)-1-(naphthalen-1-yl)ethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**28**)



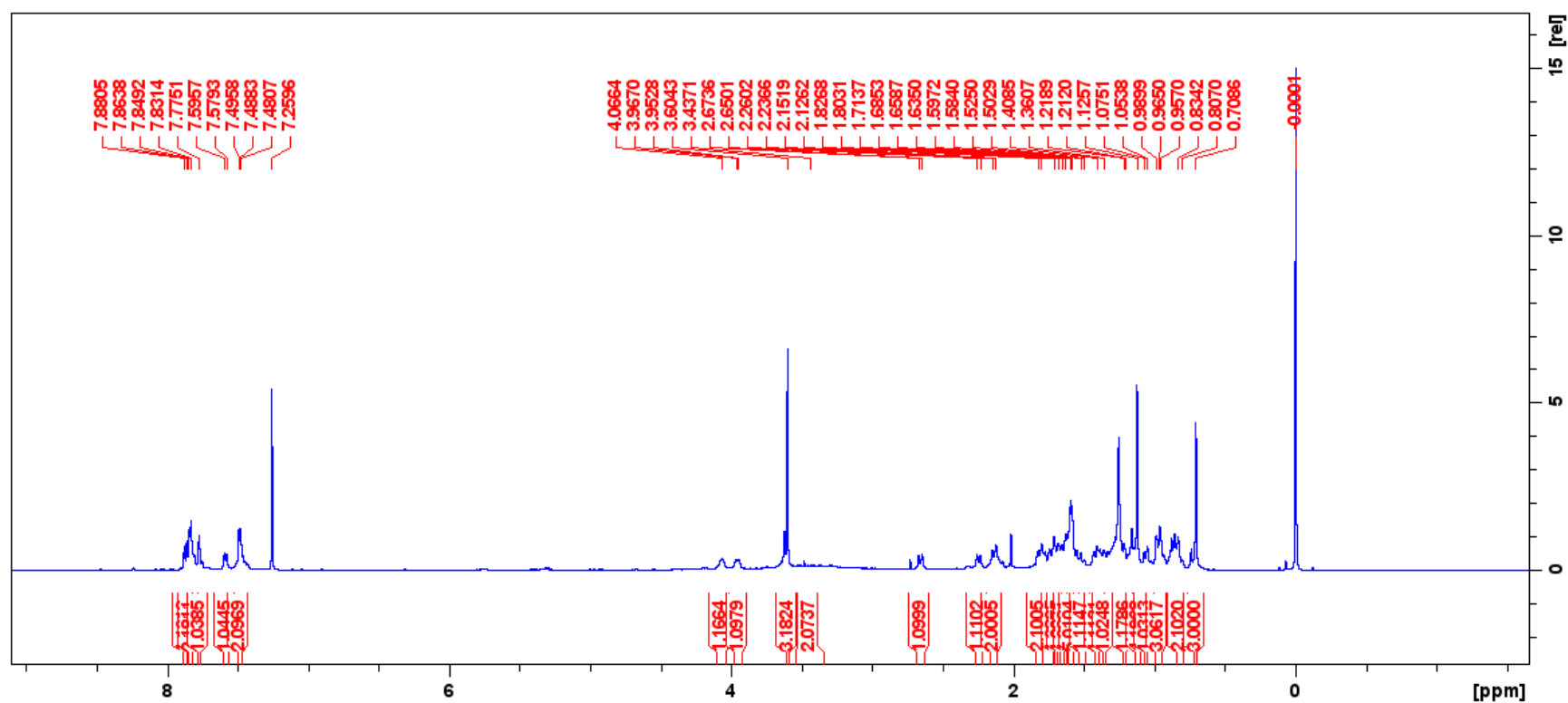
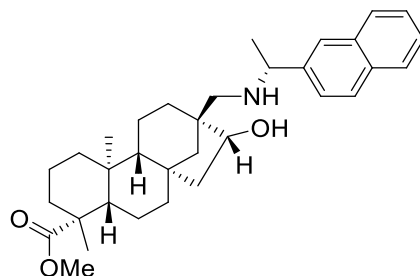
HSQC of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*R*)-1-(naphthalen-1-yl)ethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**28**)



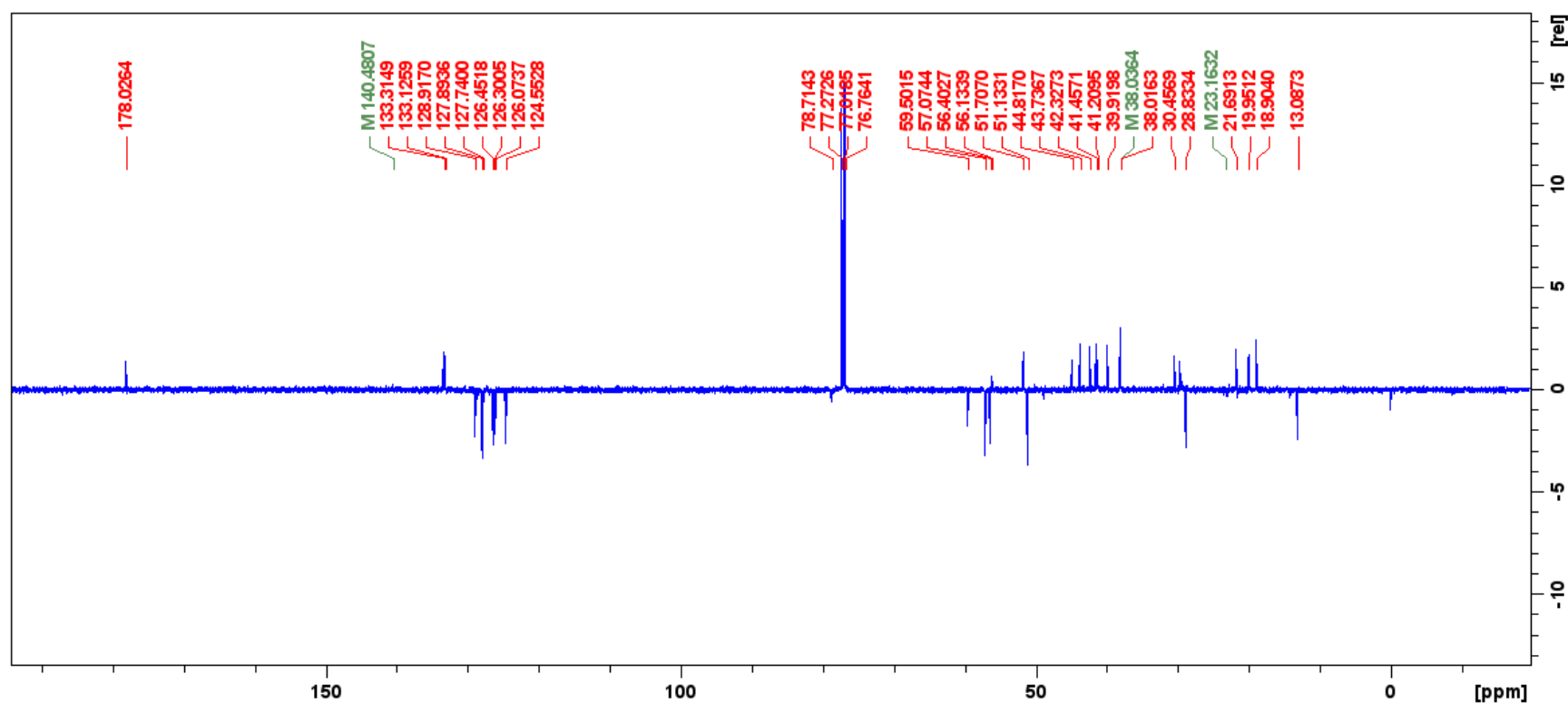
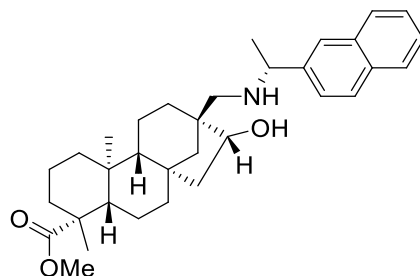
HMBC of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*R*)-1-(naphthalen-1-yl)ethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**28**)



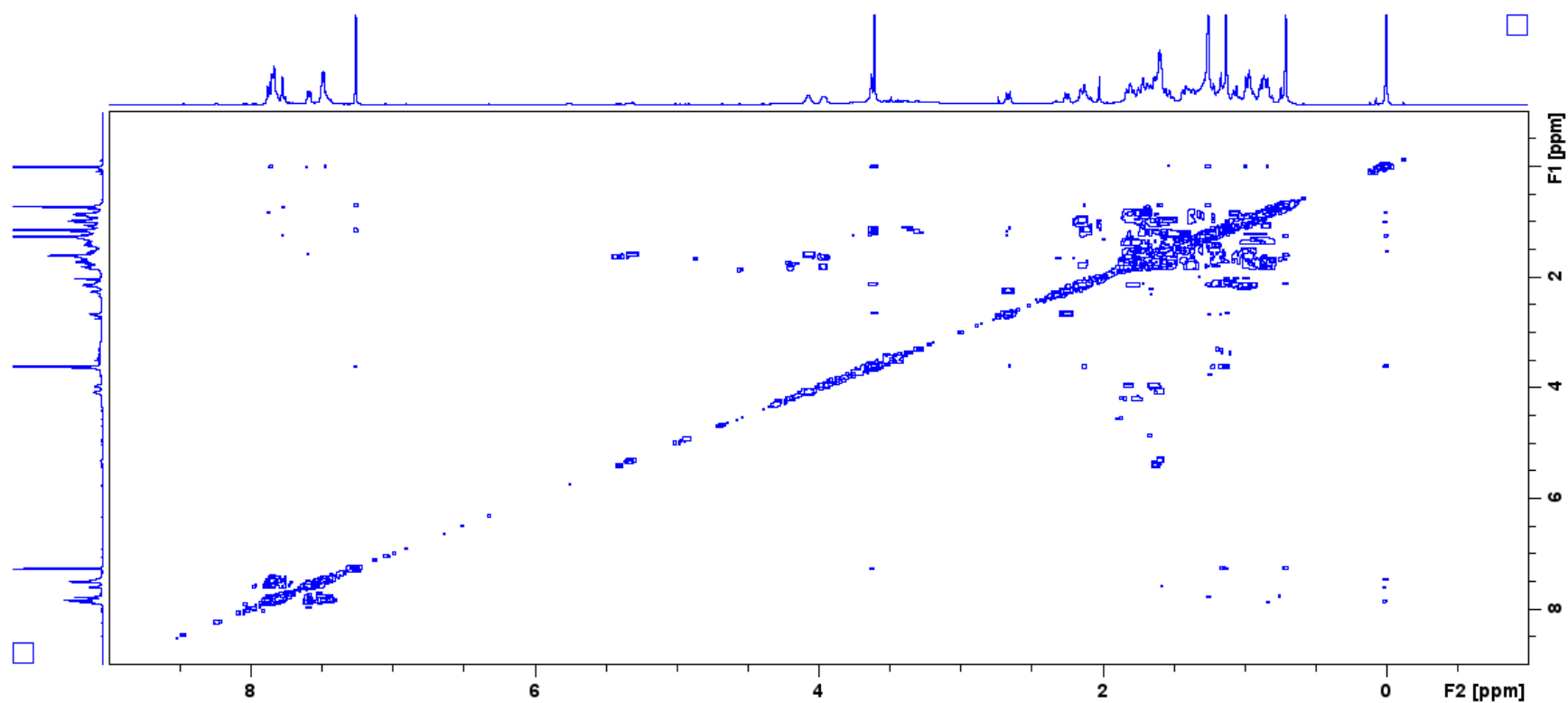
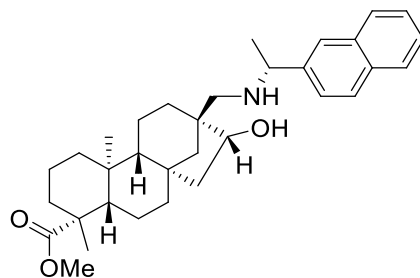
^1H -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*R*)-1-(naphthalen-2-yl)ethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**29**)



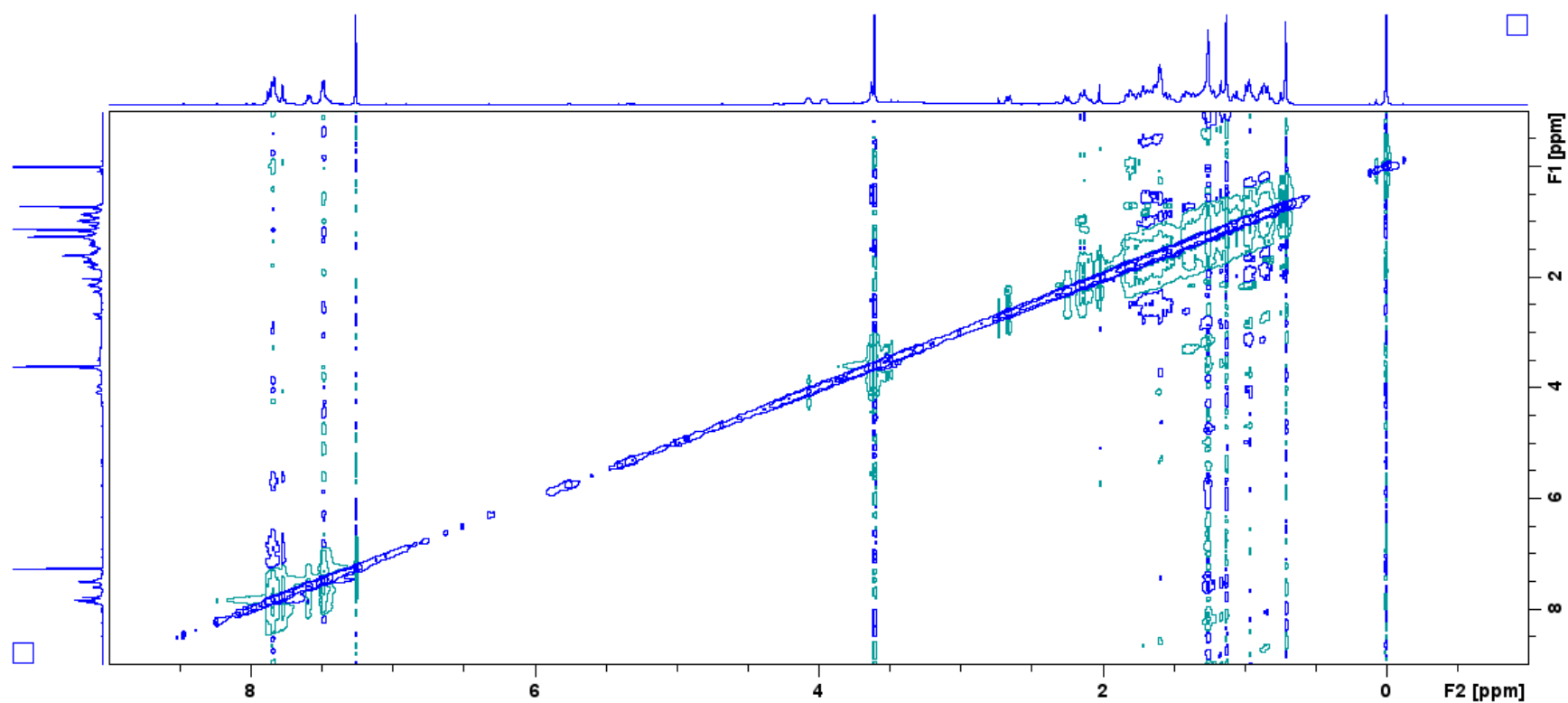
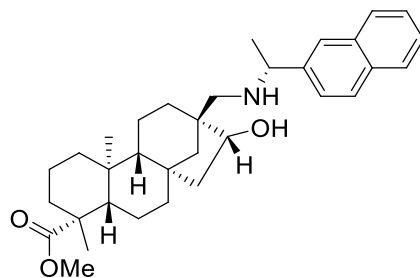
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*R*)-1-(naphthalen-2-yl)ethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**29**)



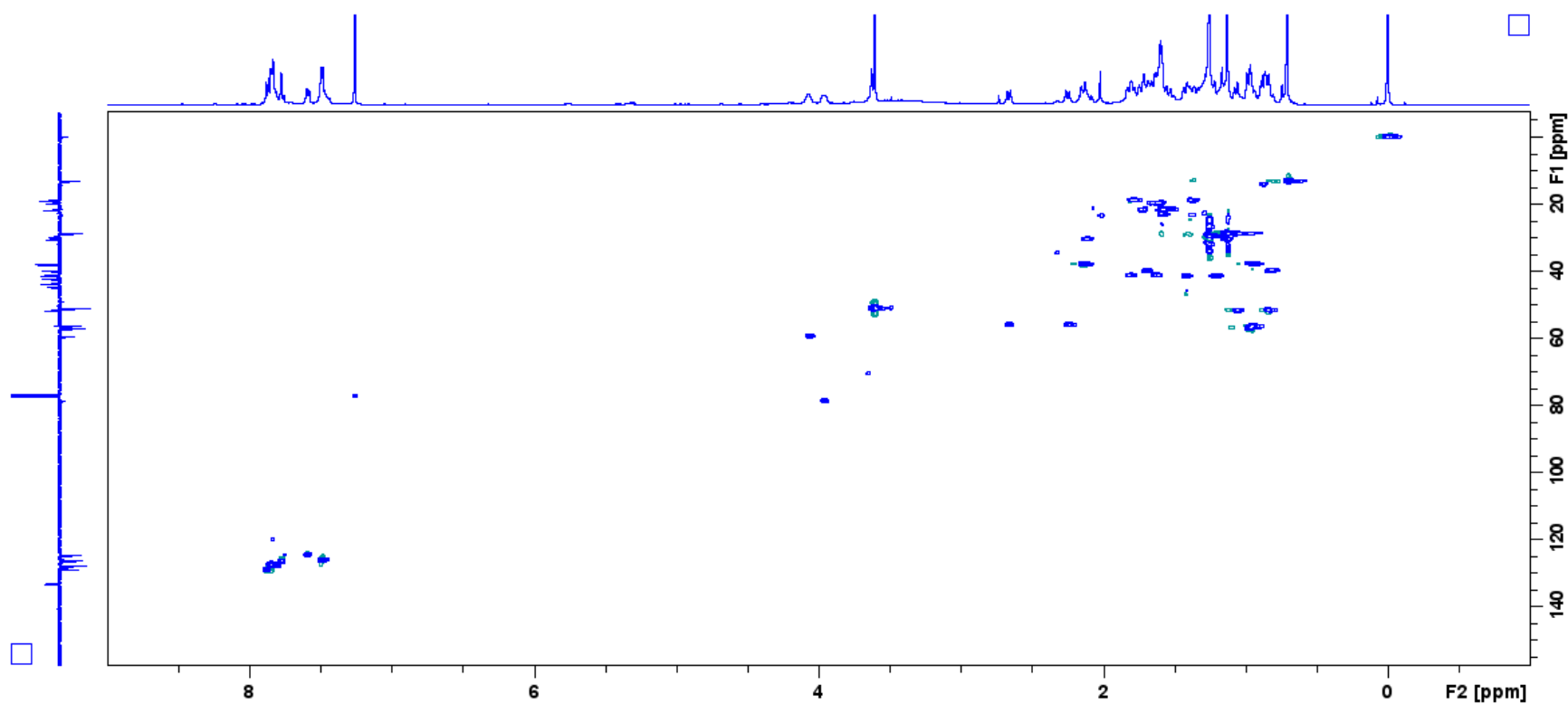
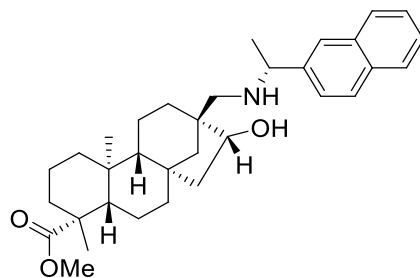
COSY of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*R*)-1-(naphthalen-2-yl)ethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**29**)



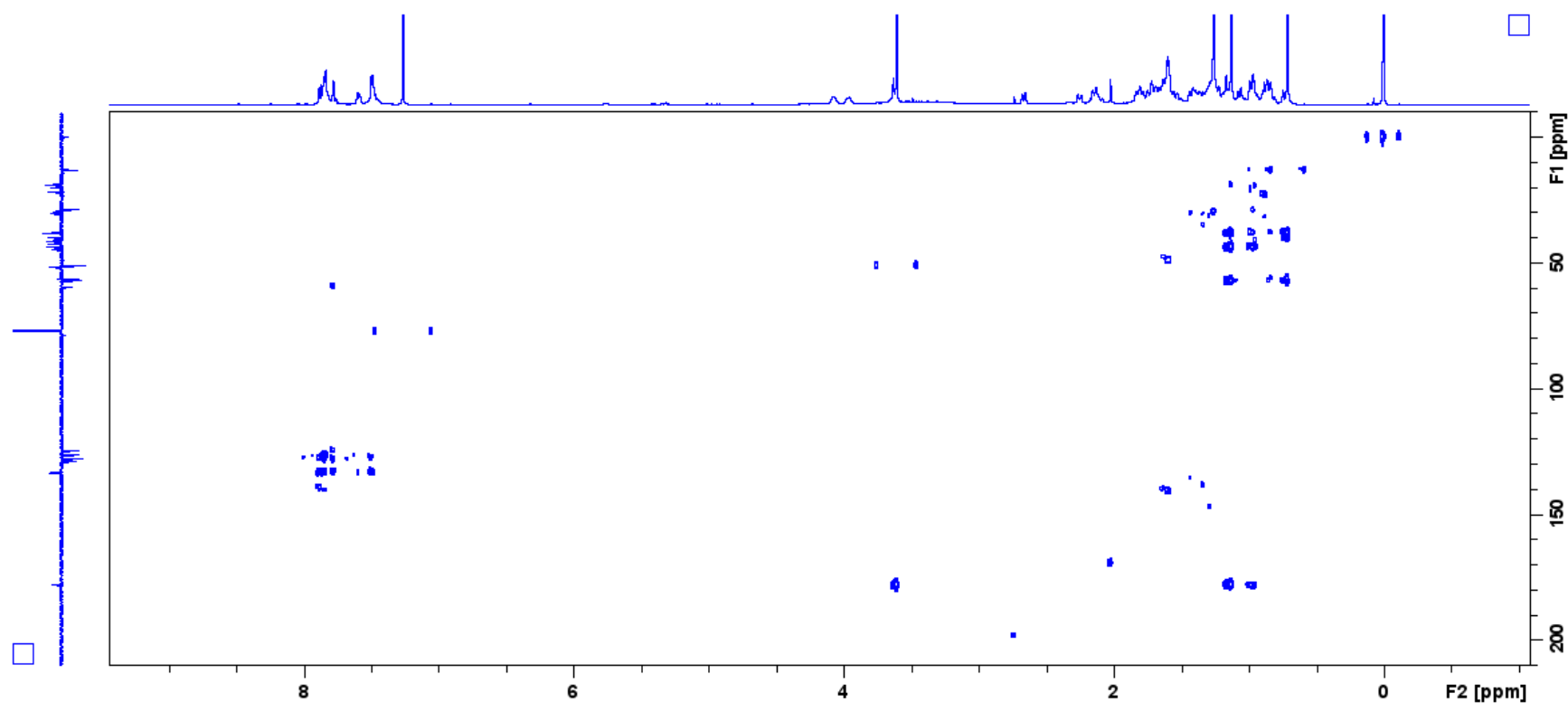
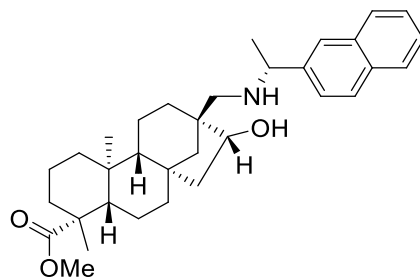
NOESY of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*R*)-1-(naphthalen-2-yl)ethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**29**)



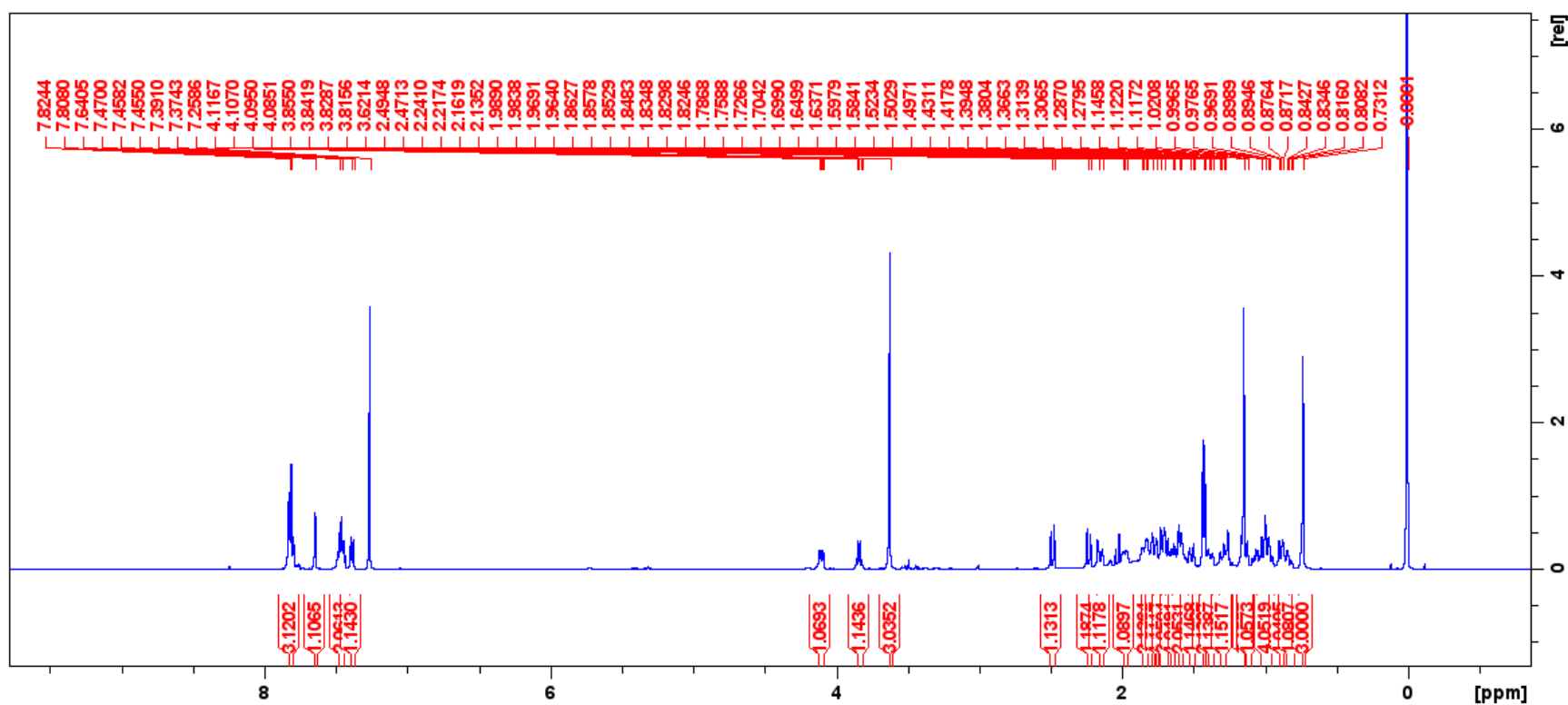
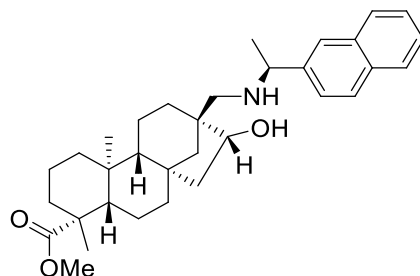
HSQC of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*R*)-1-(naphthalen-2-yl)ethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**29**)



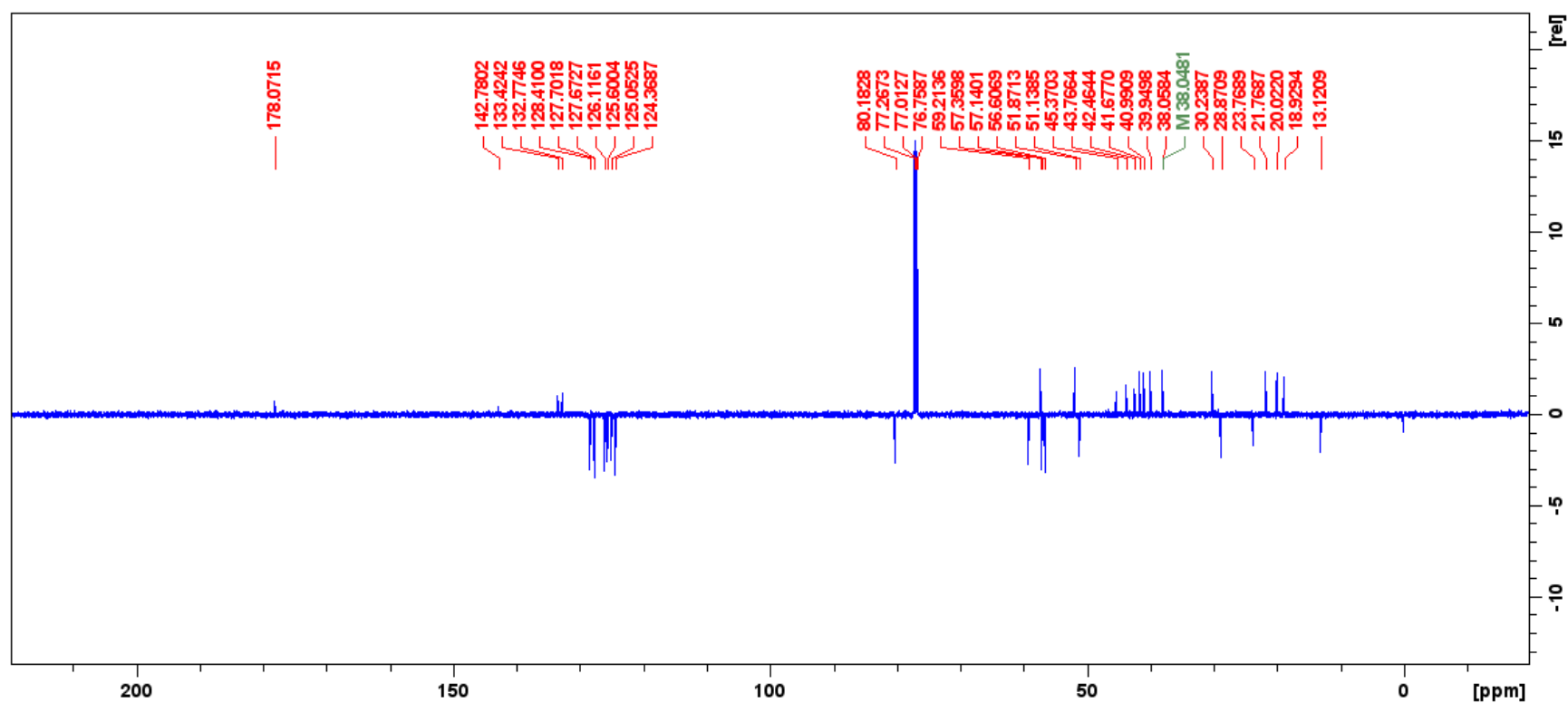
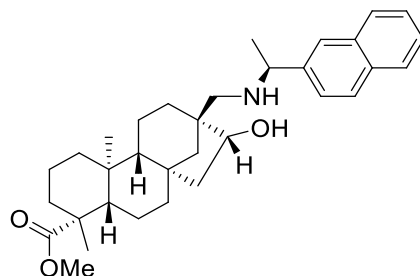
HMBC of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*R*)-1-(naphthalen-2-yl)ethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**29**)



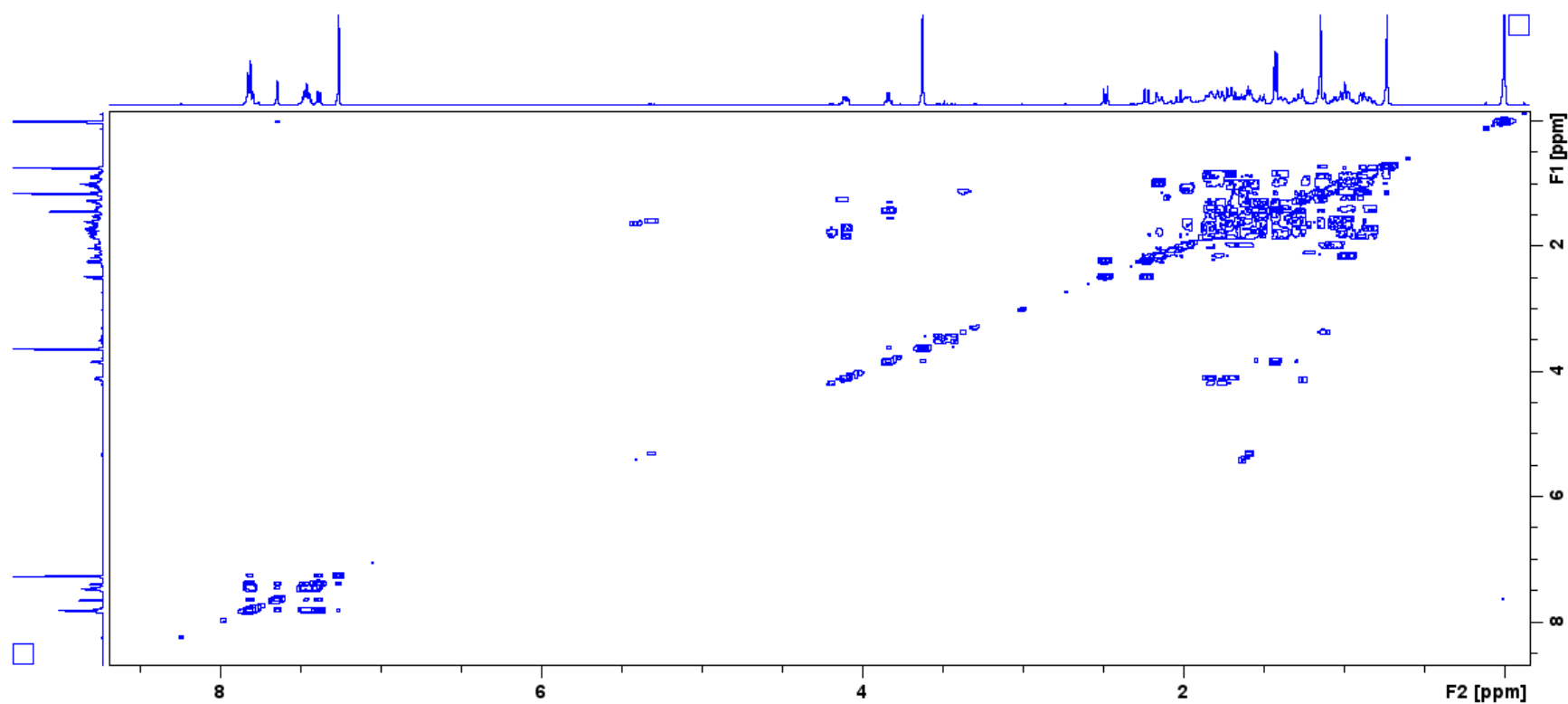
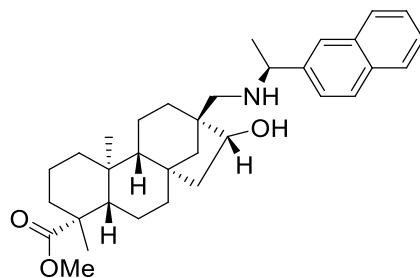
^1H -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*S*)-1-(naphthalen-2-yl)ethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**30**)



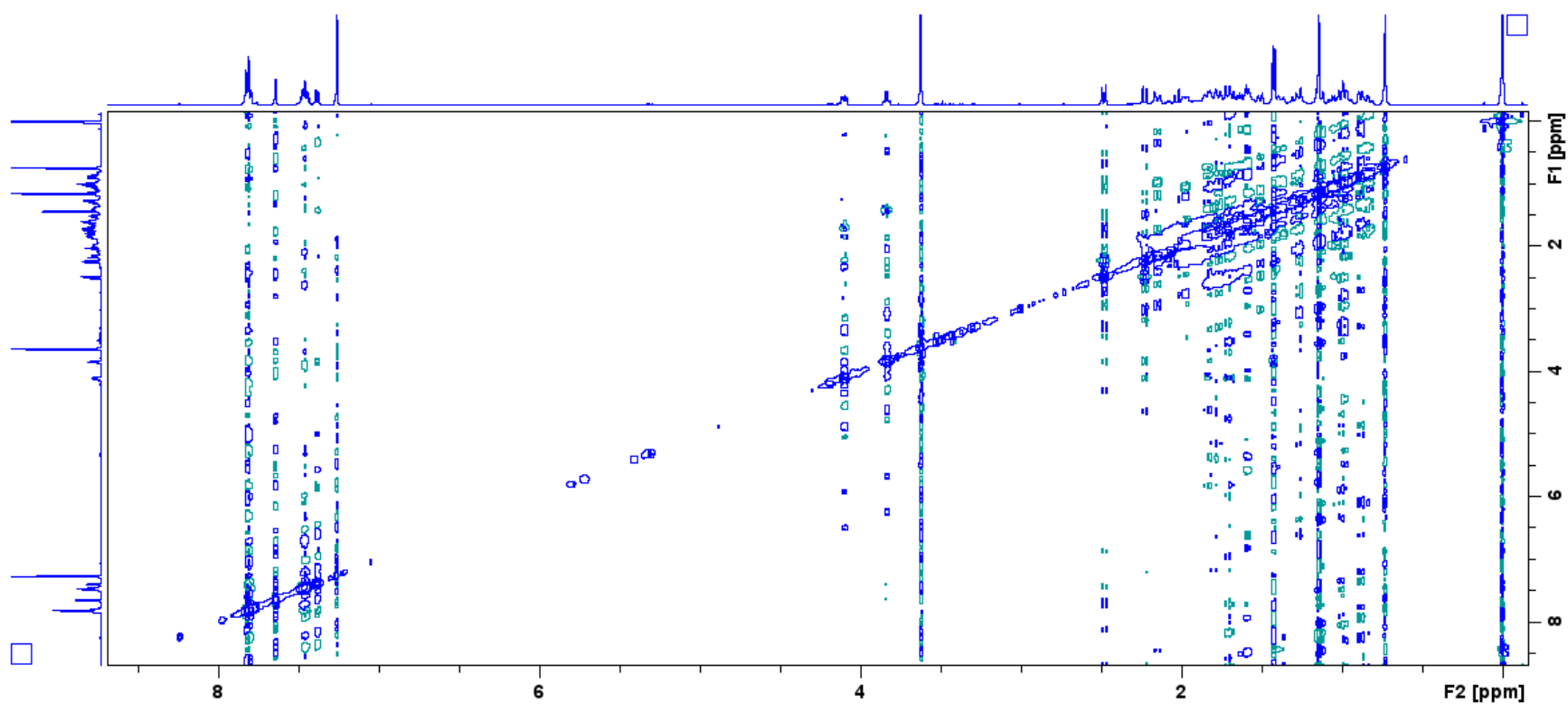
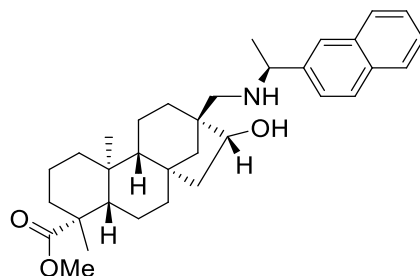
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*S*)-1-(naphthalen-2-yl)ethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**30**)



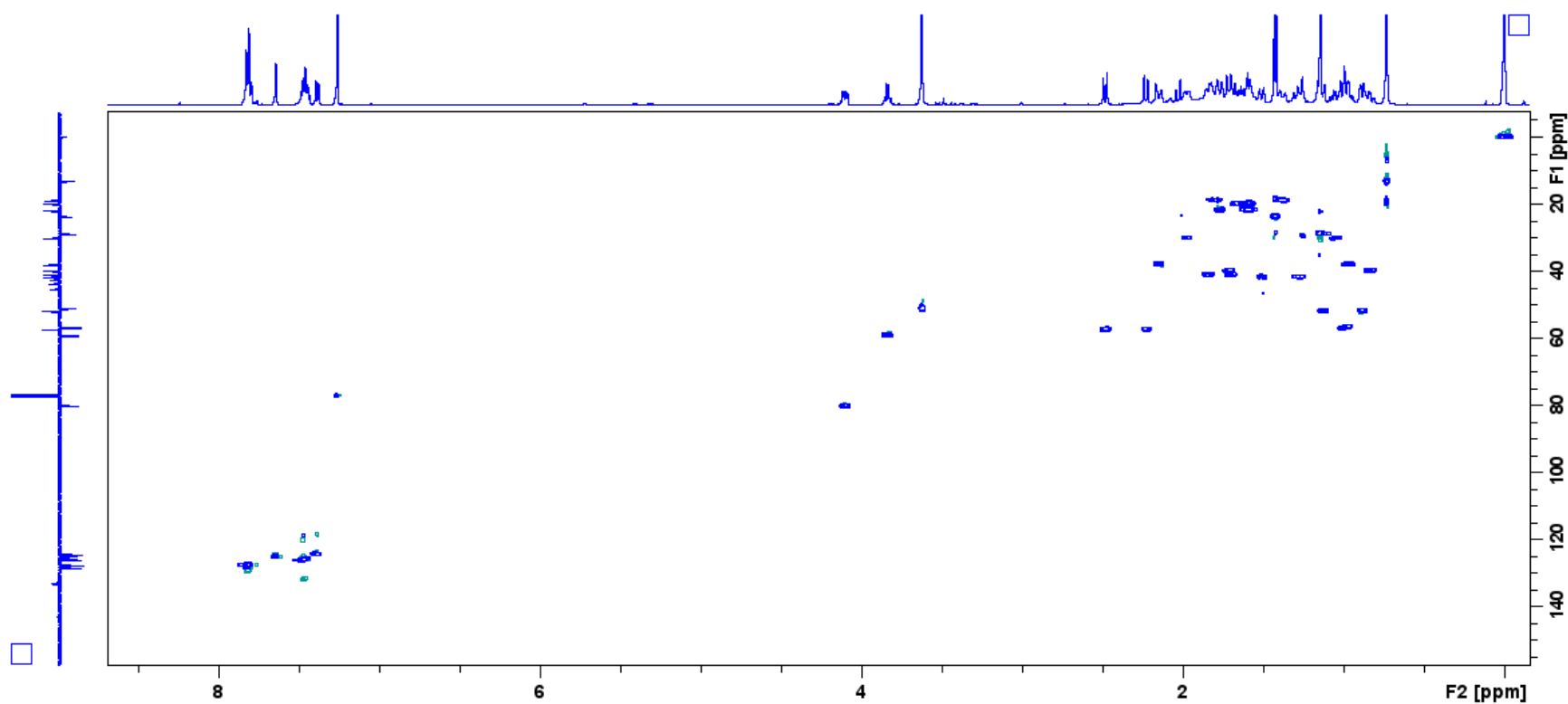
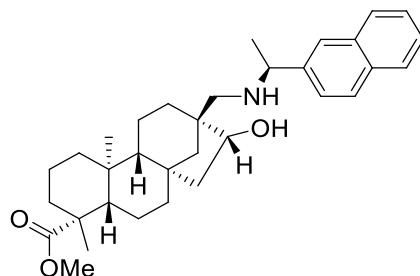
COSY of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*S*)-1-(naphthalen-2-yl)ethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**30**)



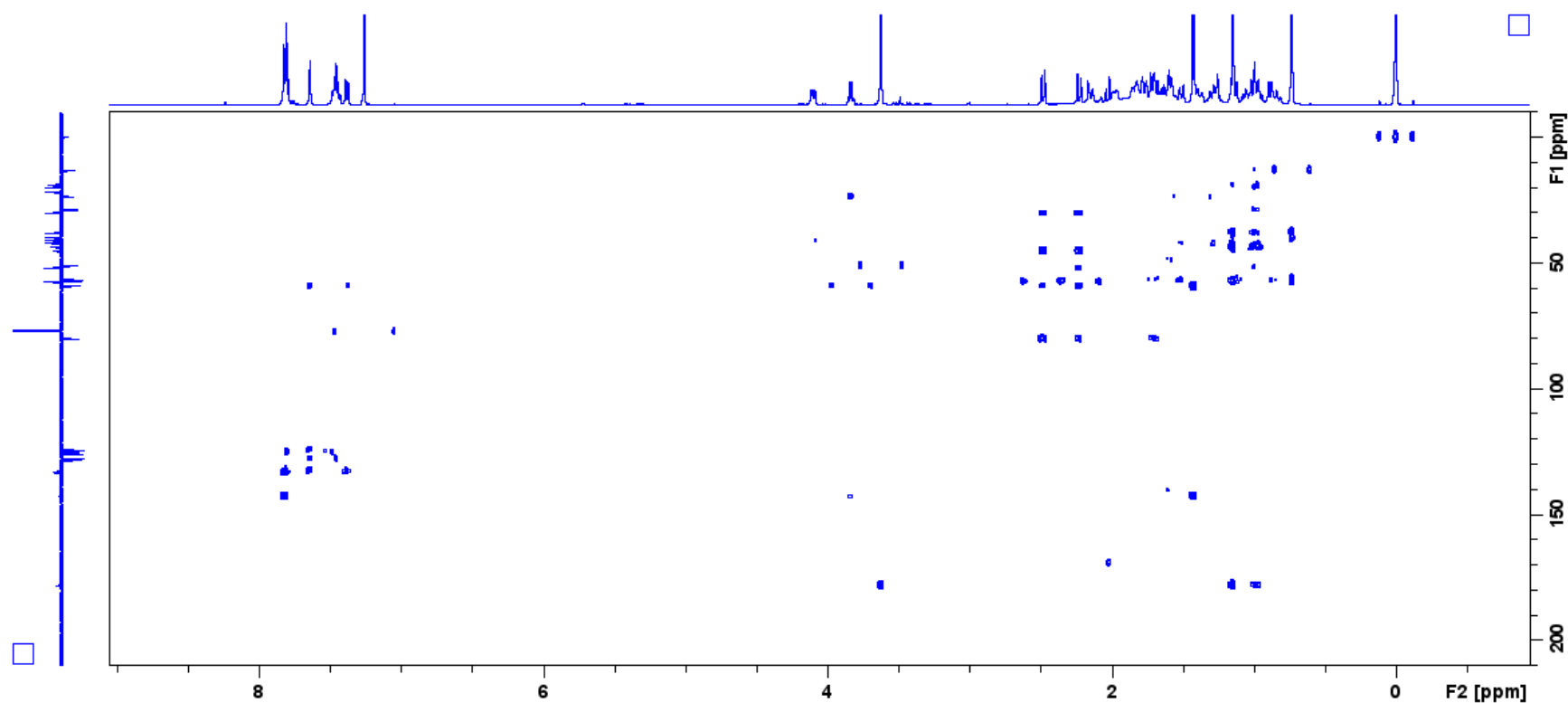
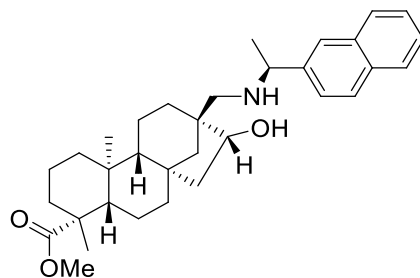
NOESY of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*S*)-1-(naphthalen-2-yl)ethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**30**)



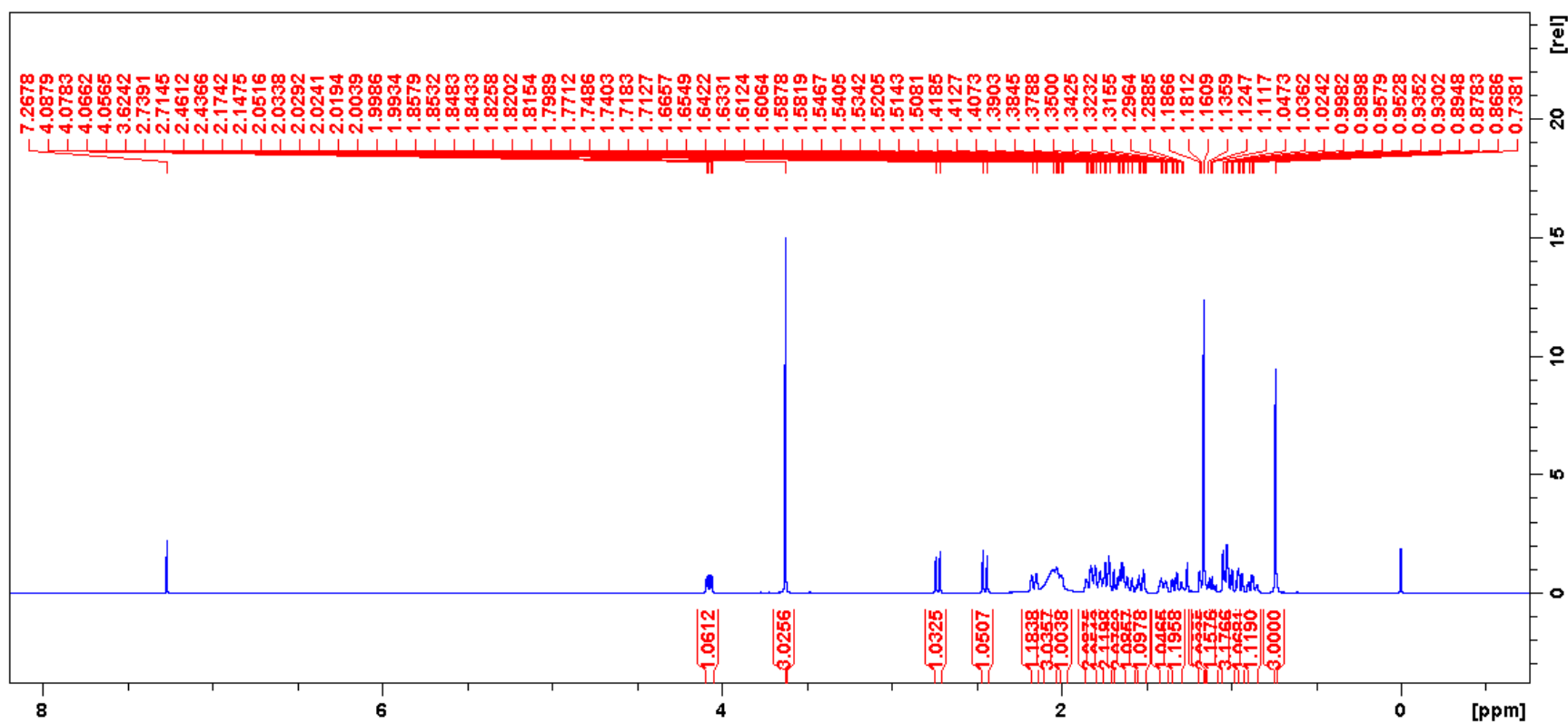
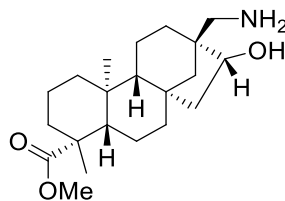
HSQC of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*S*)-1-(naphthalen-2-yl)ethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**30**)



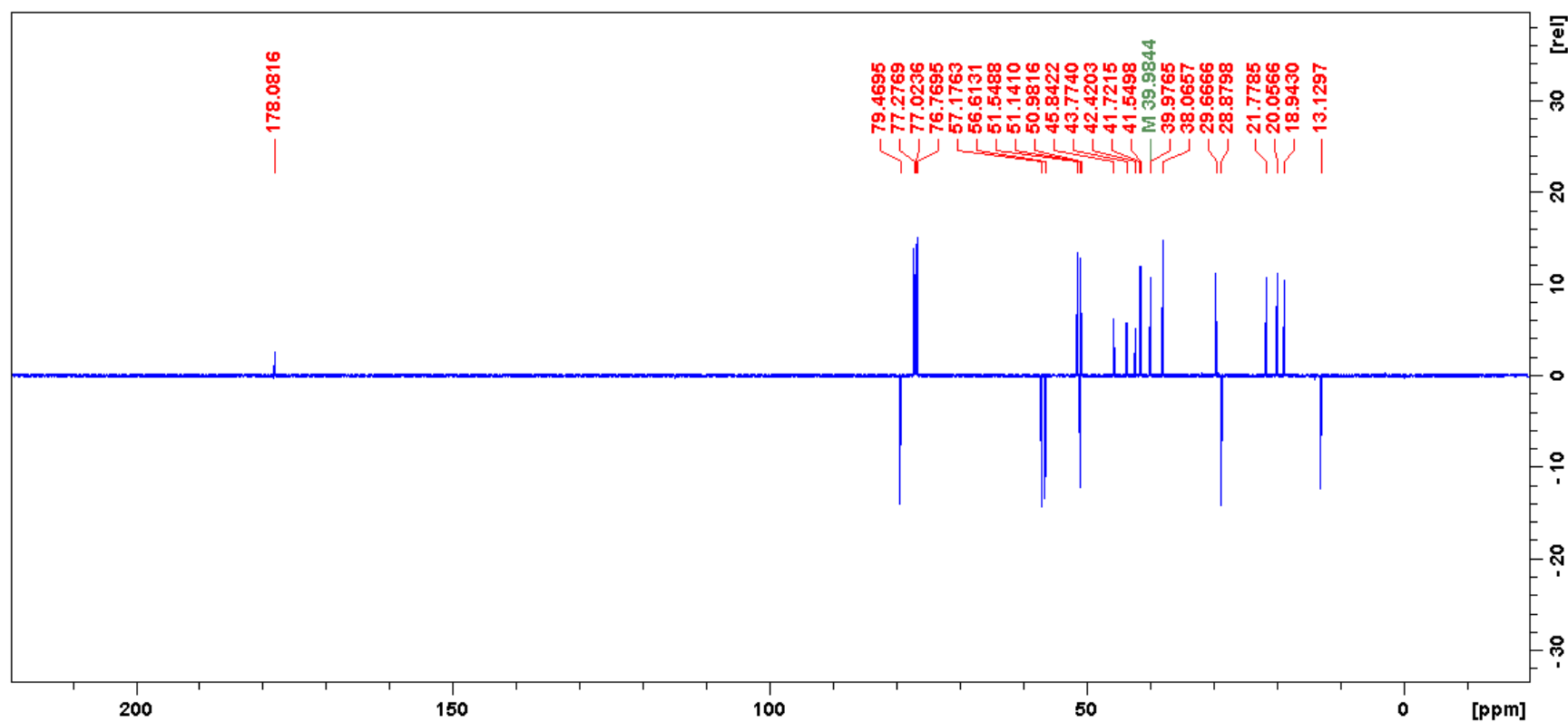
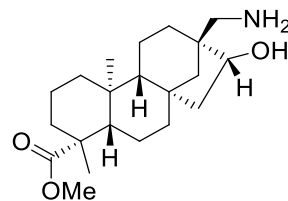
HMBC of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-(((*S*)-1-(naphthalen-2-yl)ethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**30**)



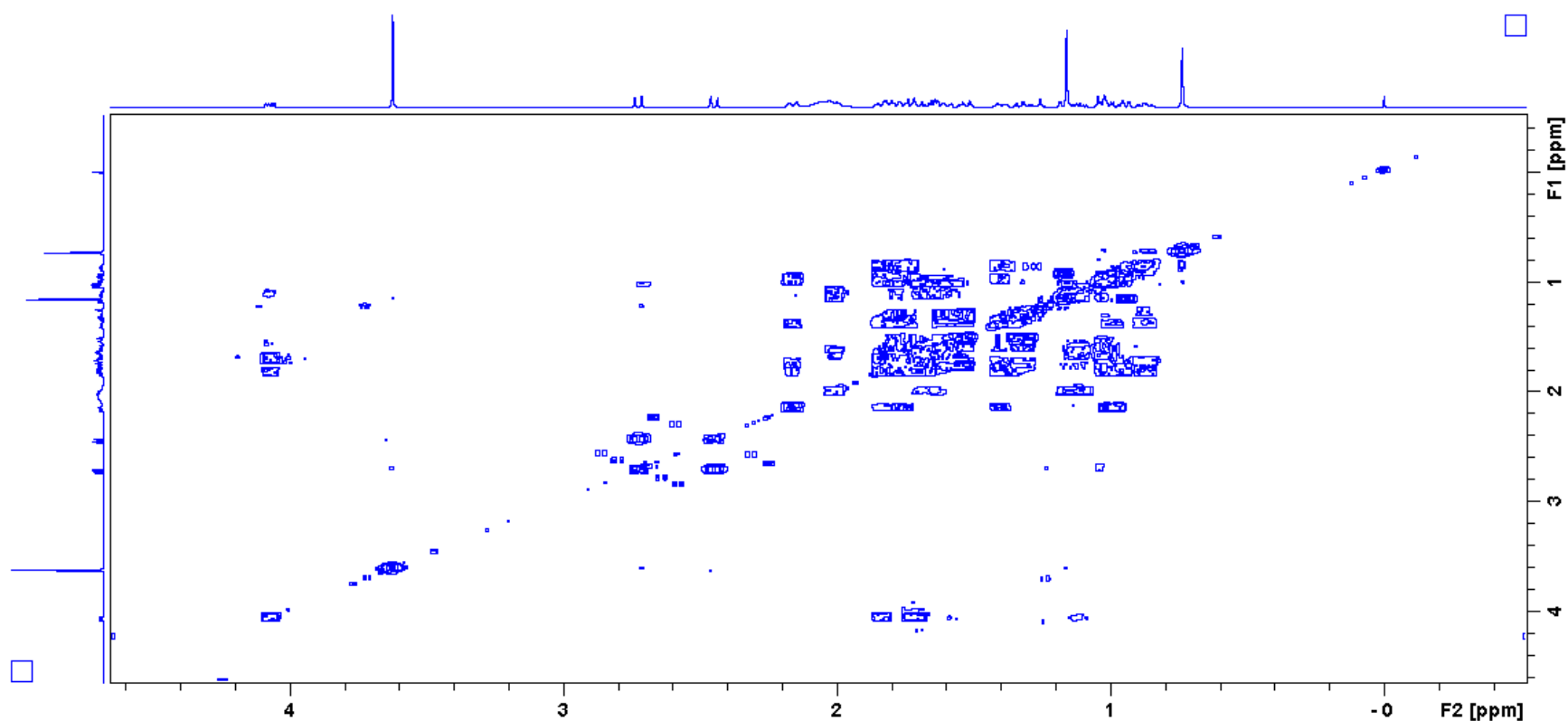
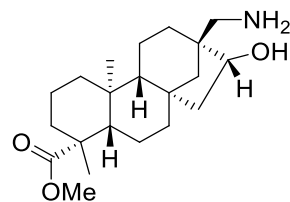
^1H -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-(aminomethyl)-8-hydroxy-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**31**)



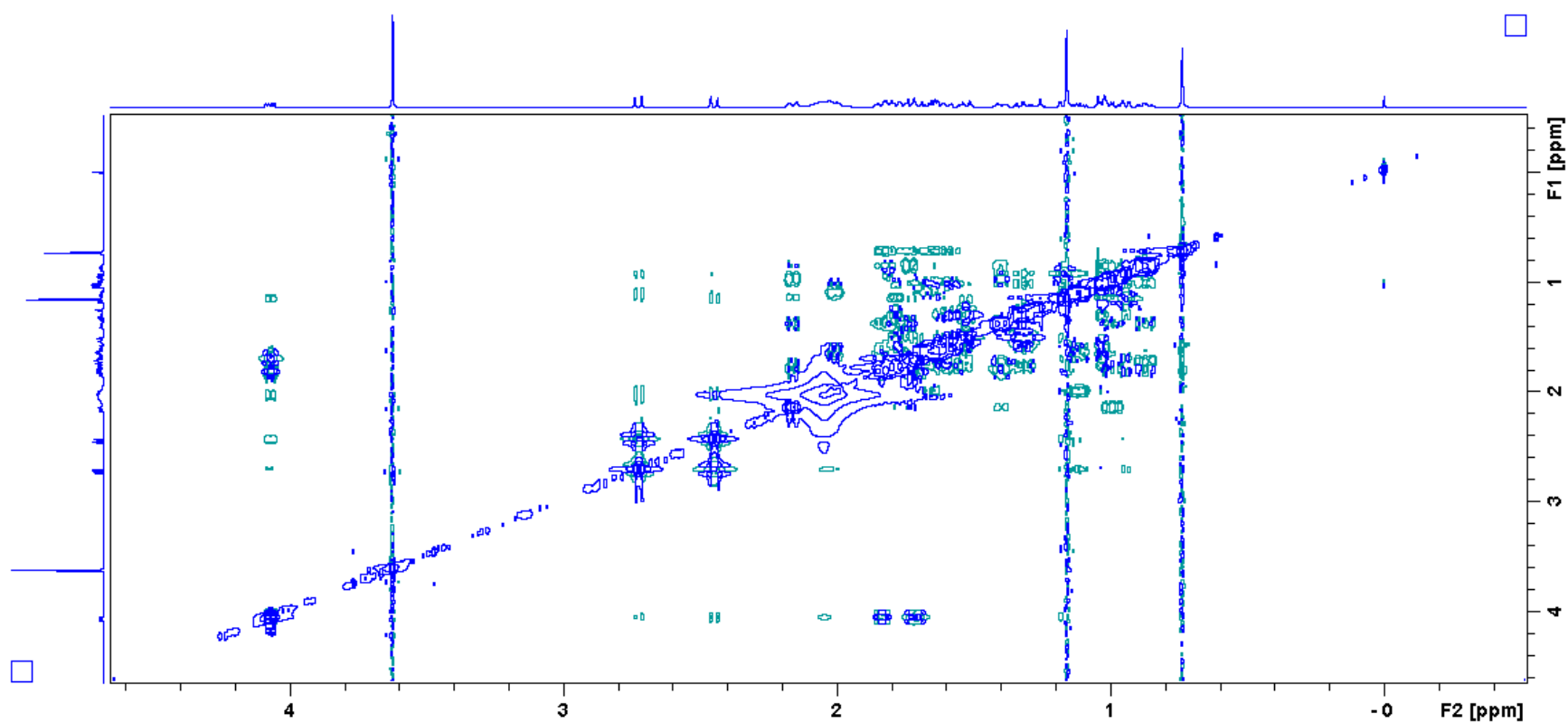
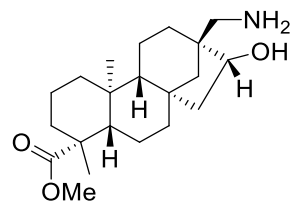
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-(aminomethyl)-8-hydroxy-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**31**)



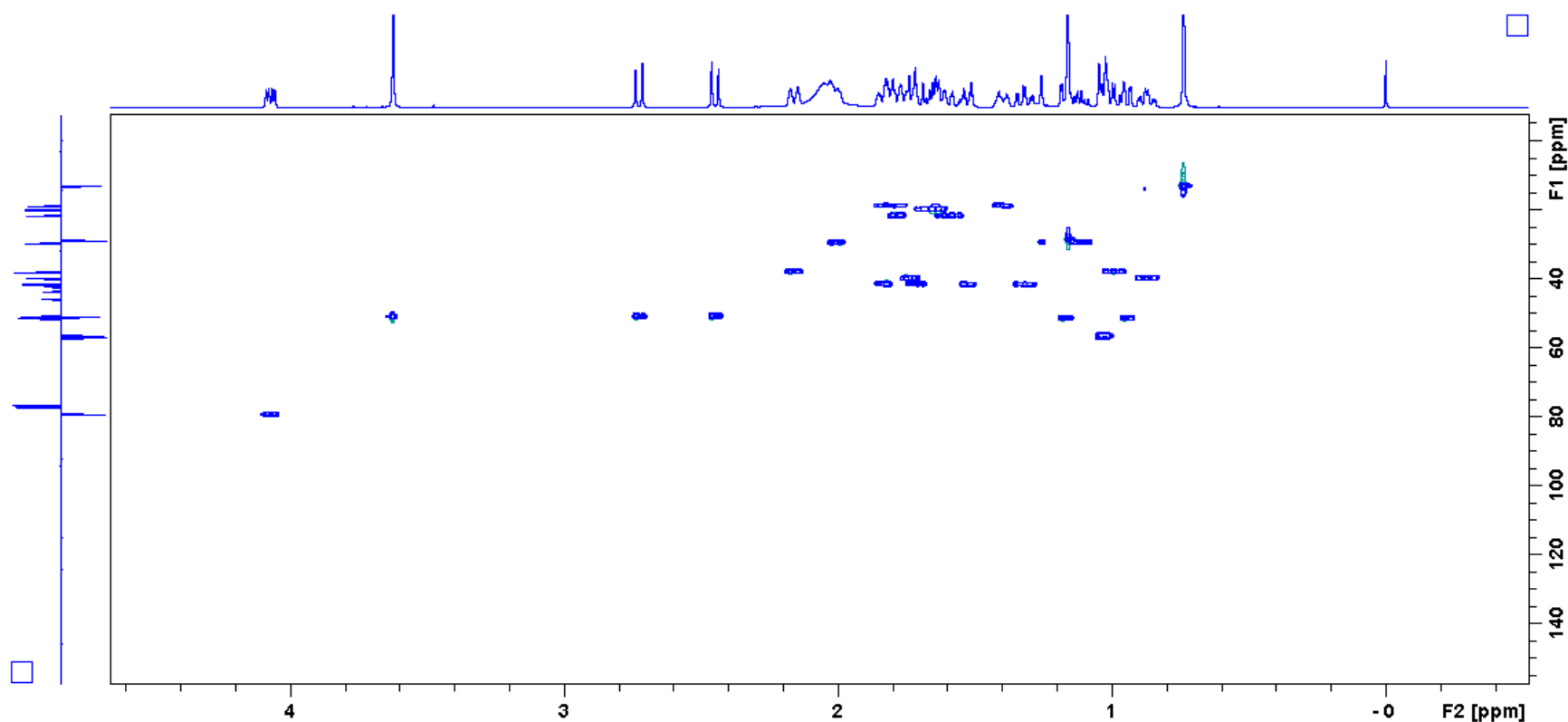
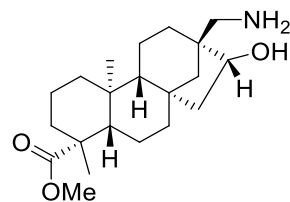
COSY of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-(aminomethyl)-8-hydroxy-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**31**)



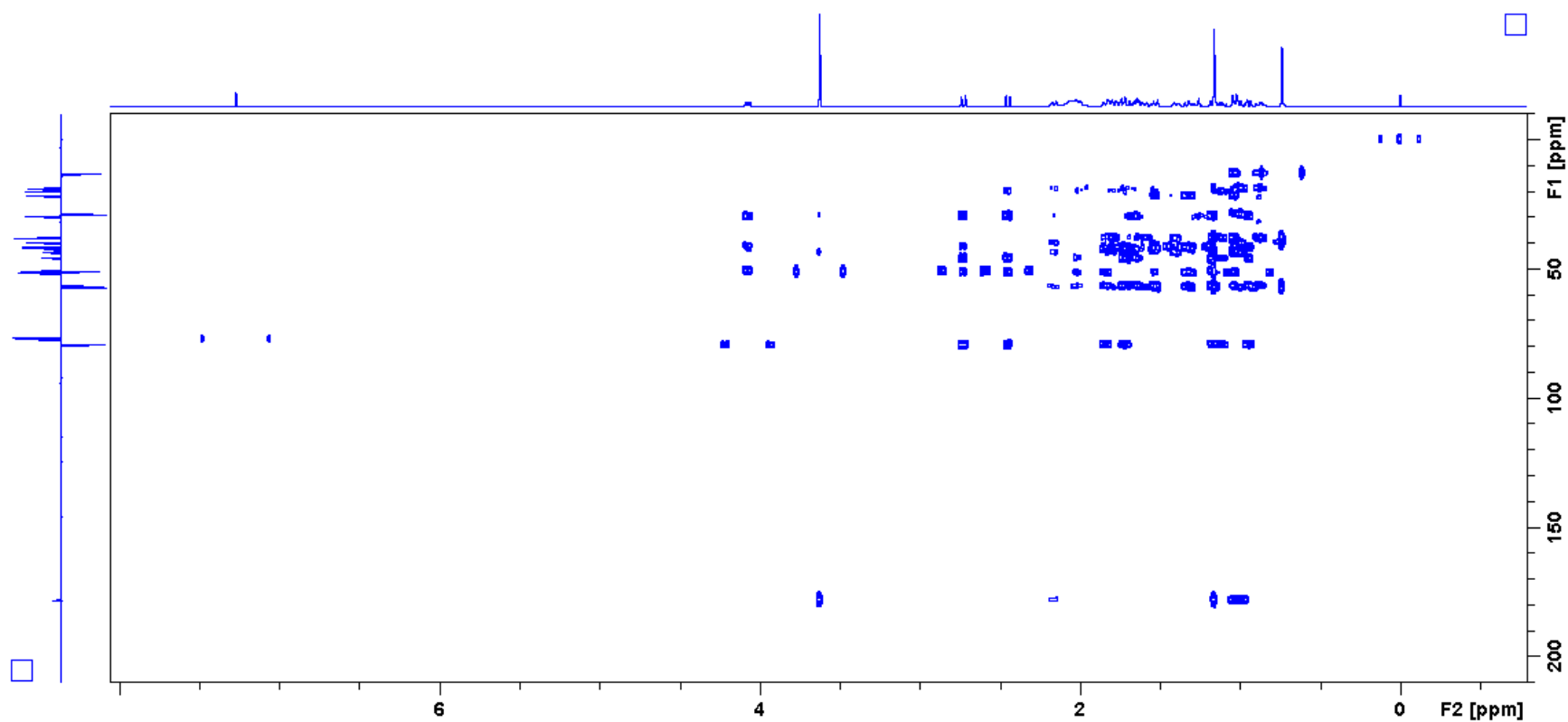
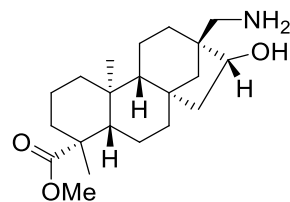
NOESY of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-(aminomethyl)-8-hydroxy-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**31**)



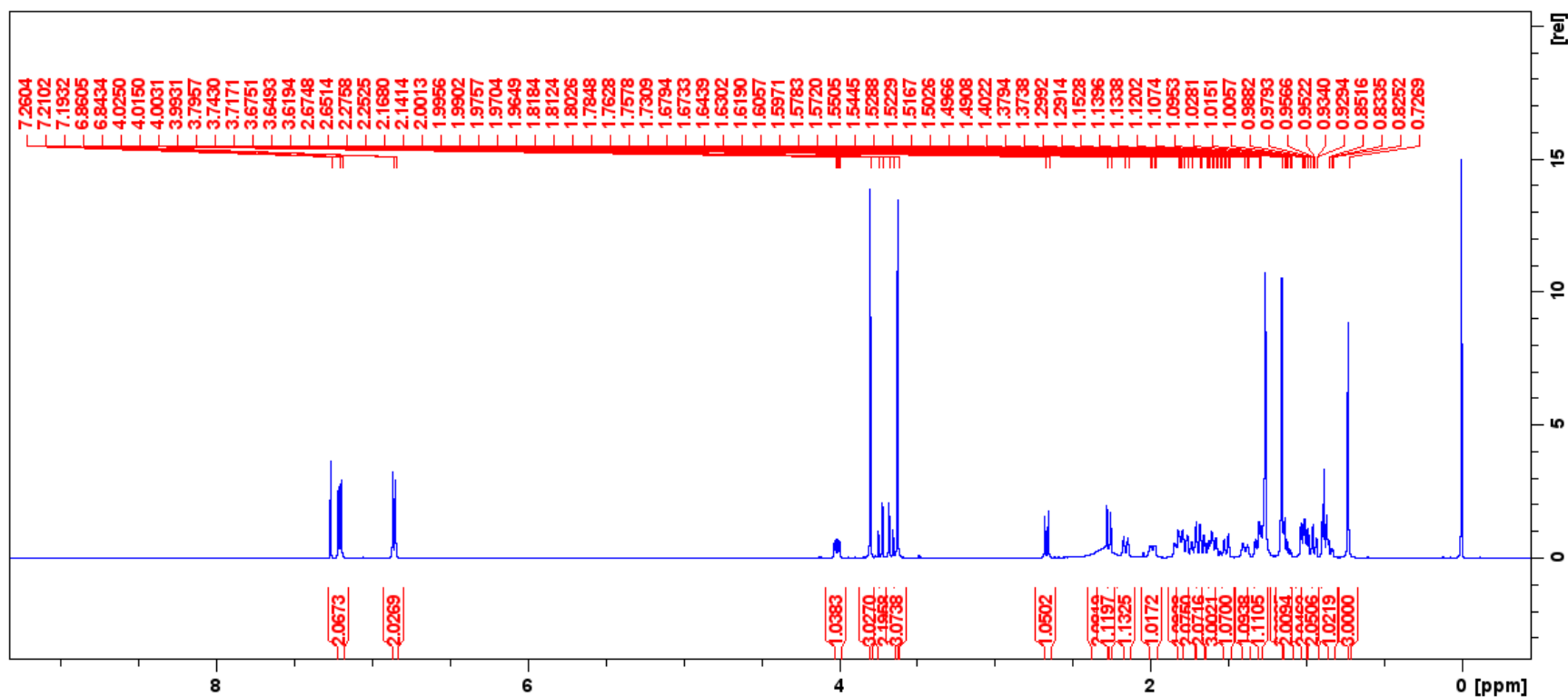
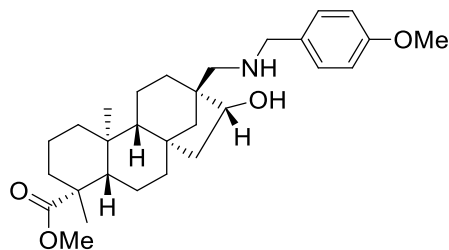
HSQC of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-(aminomethyl)-8-hydroxy-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**31**)



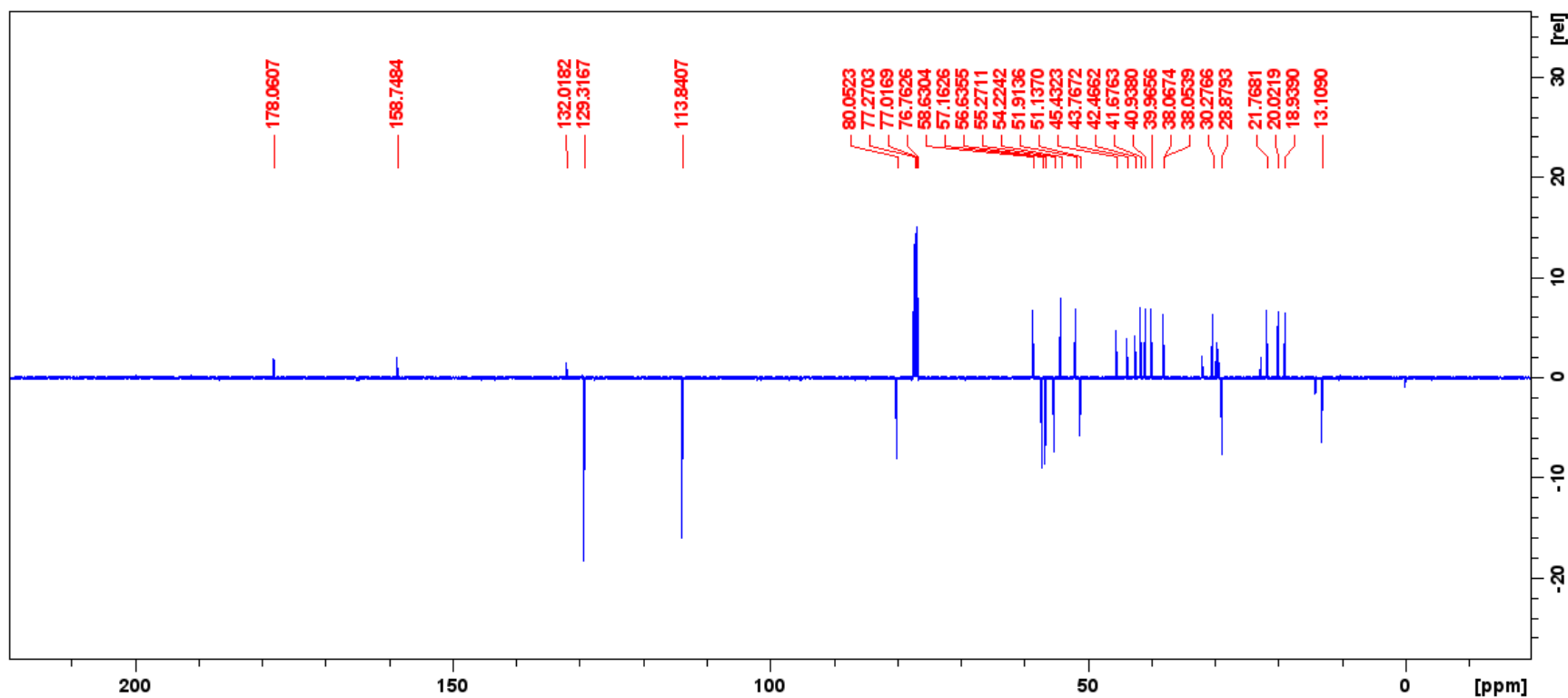
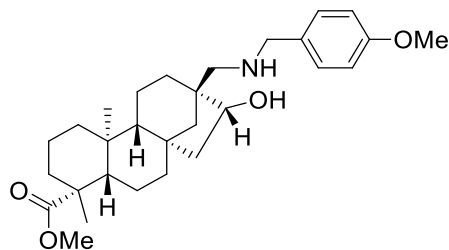
HMBC of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-(aminomethyl)-8-hydroxy-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**31**)



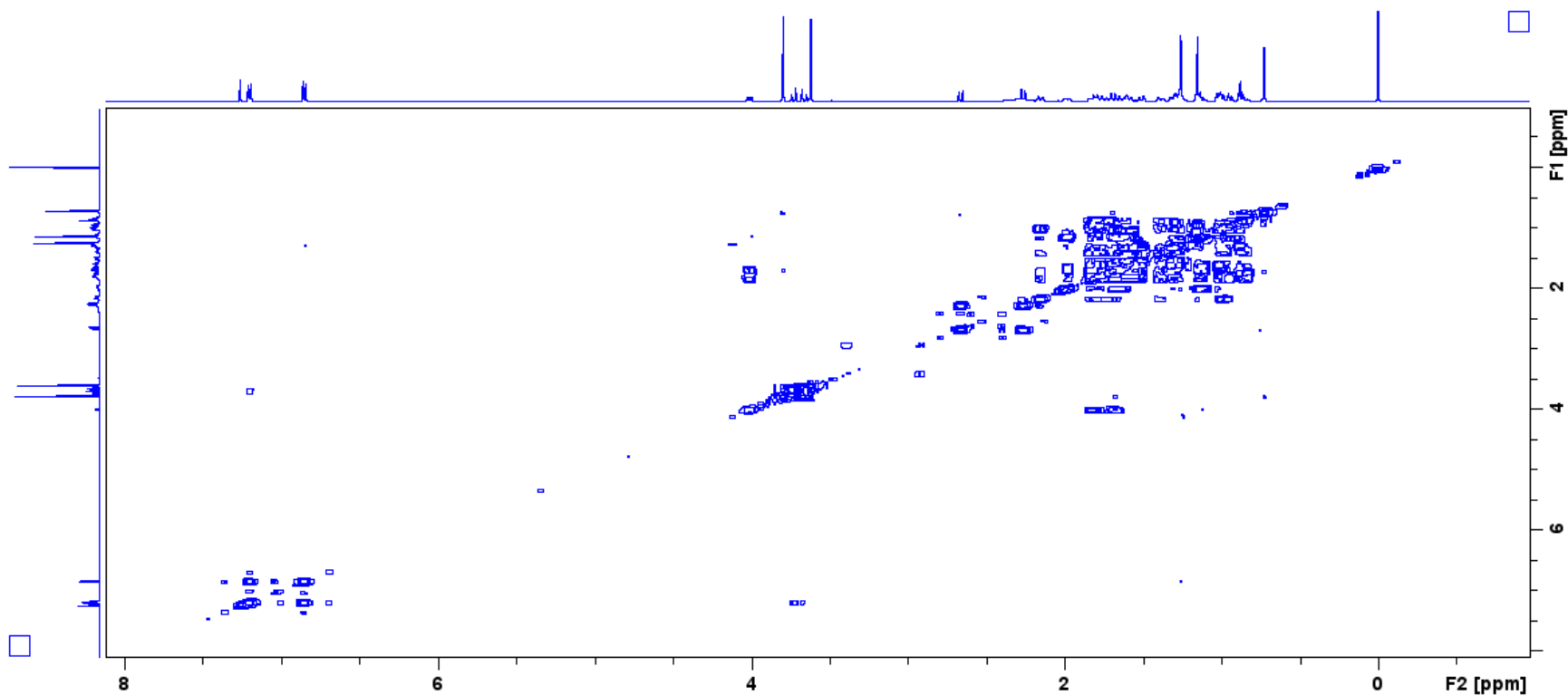
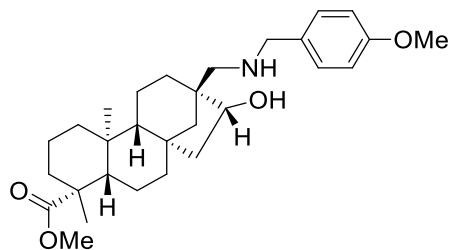
^1H -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-9-(((4-methoxybenzyl)amino)methyl)-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**32**)



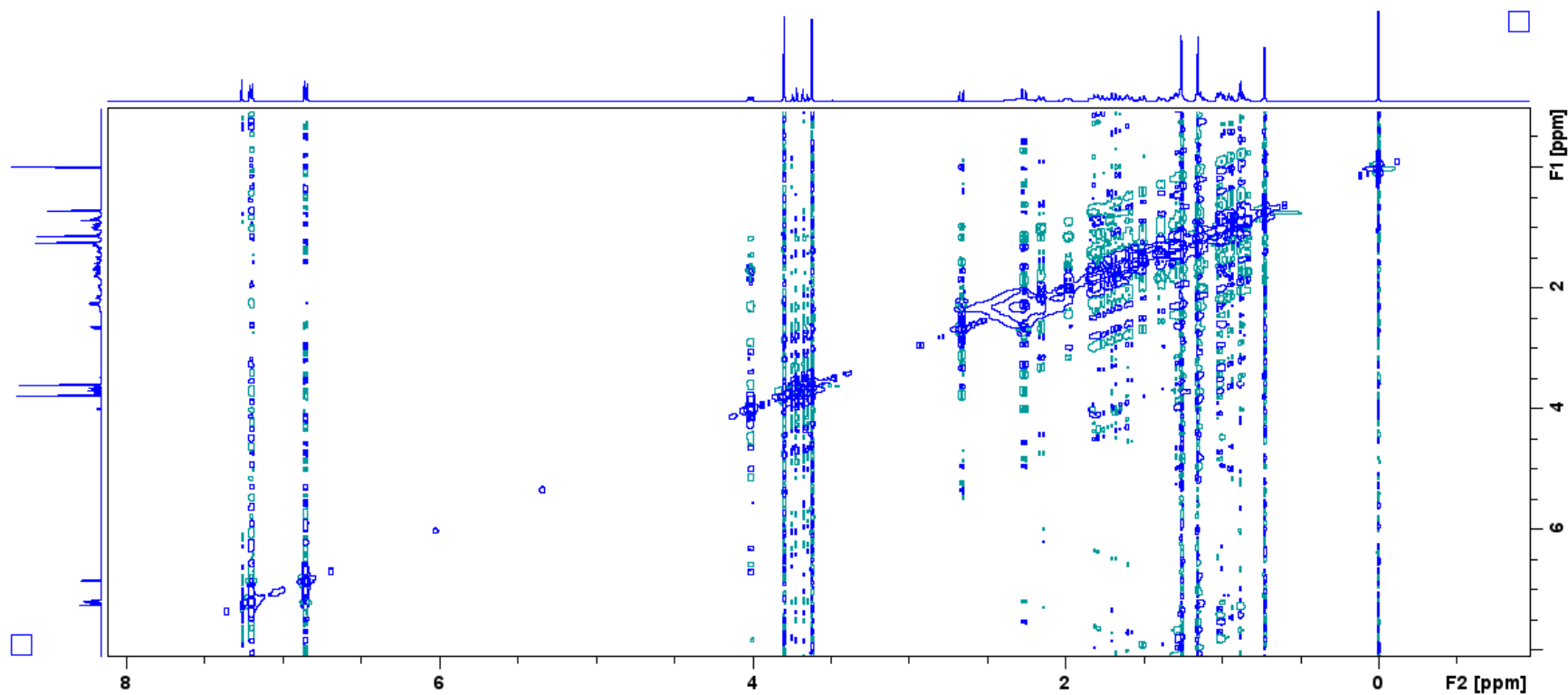
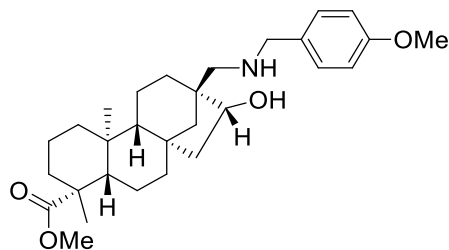
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-9-(((4-methoxybenzyl)amino)methyl)-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**32**)



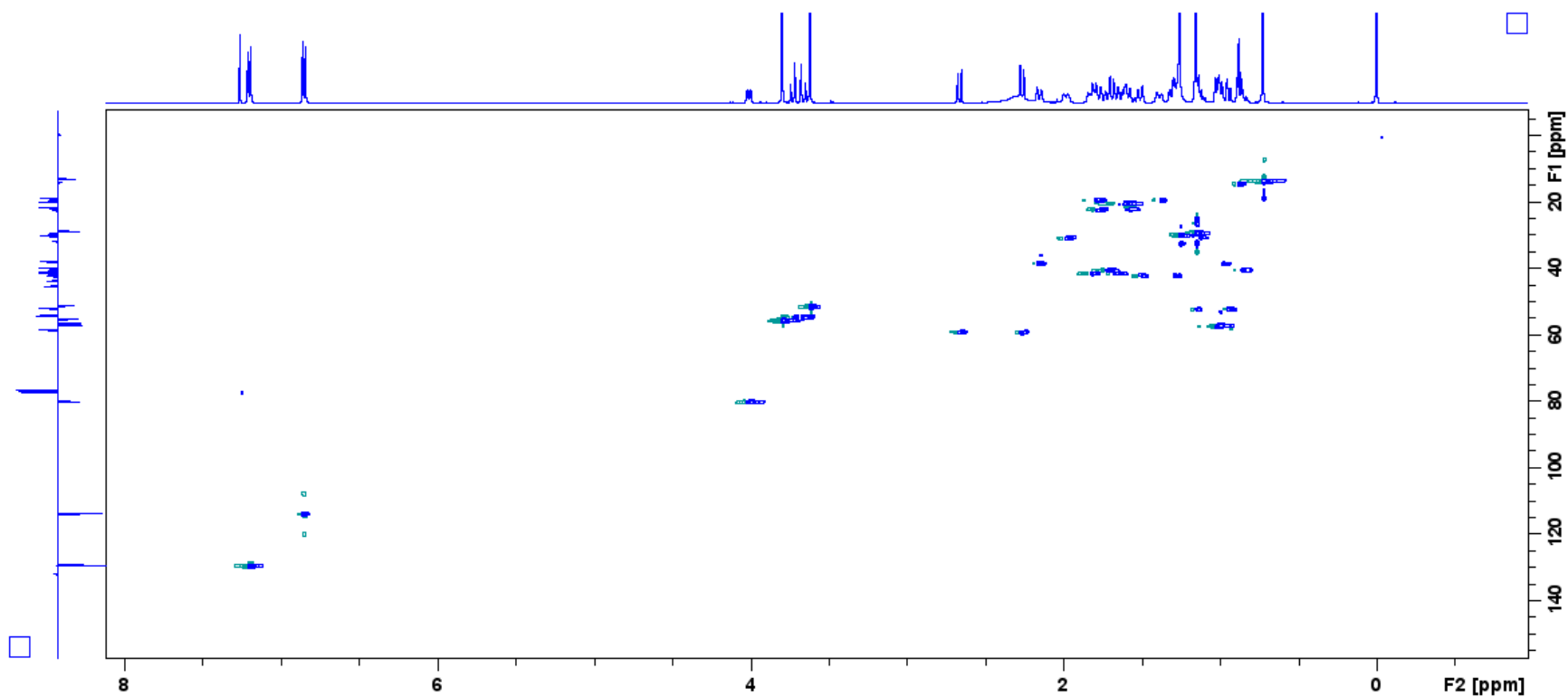
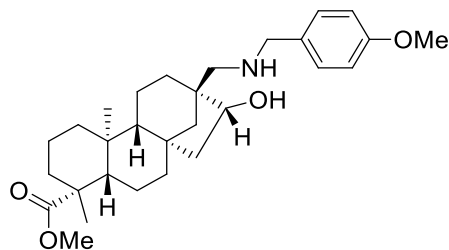
COSY of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-9-(((4-methoxybenzyl)amino)methyl)-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**32**)



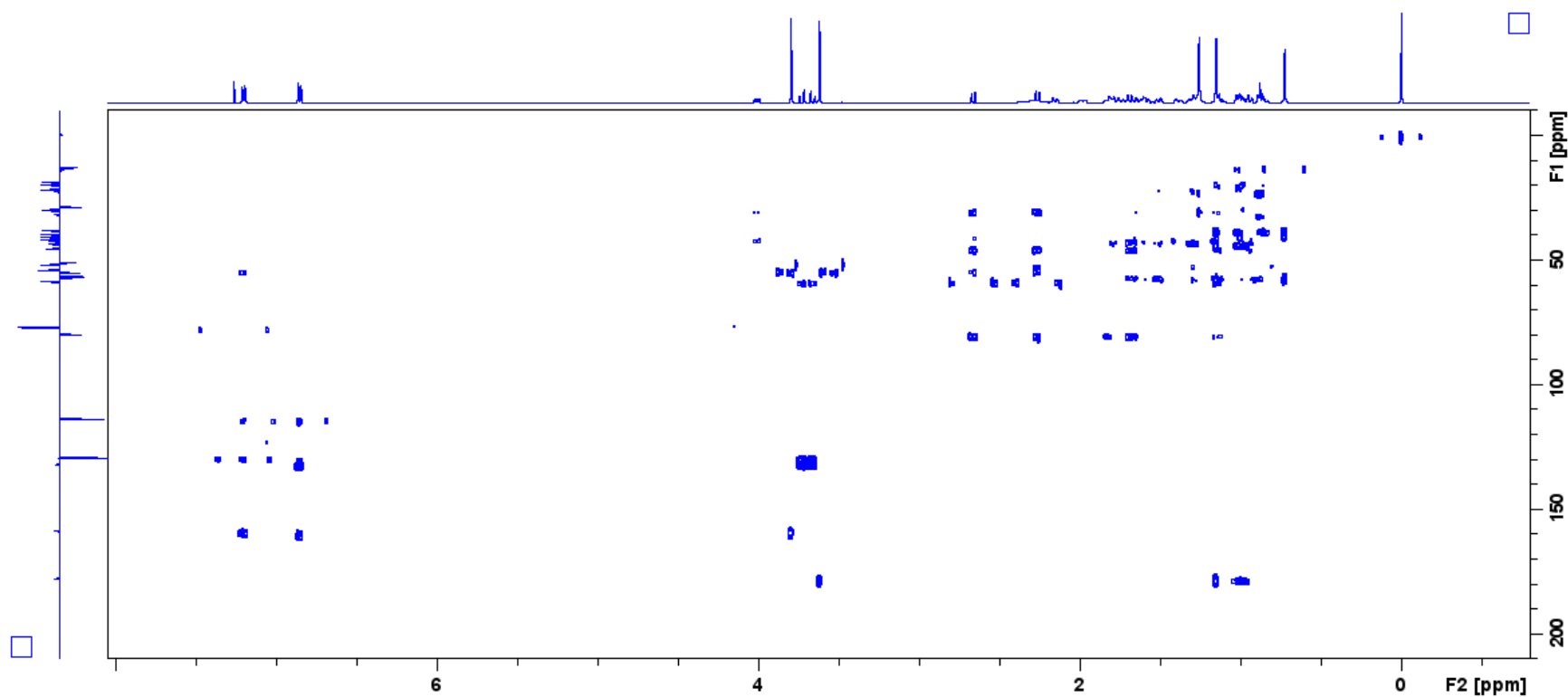
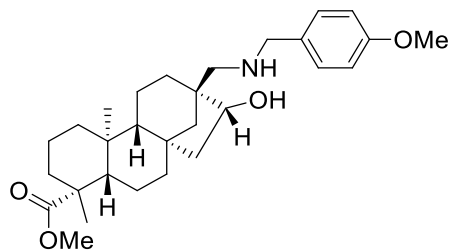
NOESY of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-9-(((4-methoxybenzyl)amino)methyl)-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**32**)



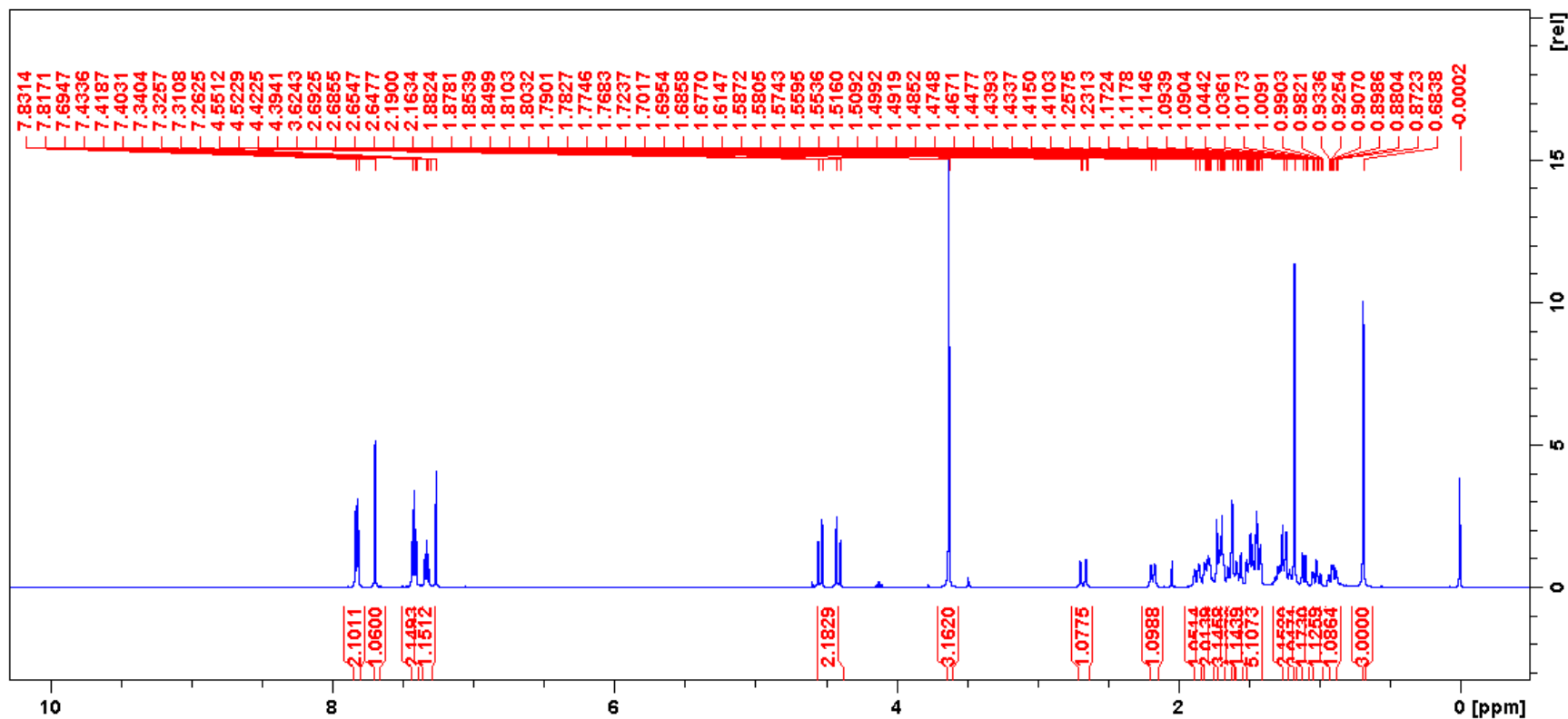
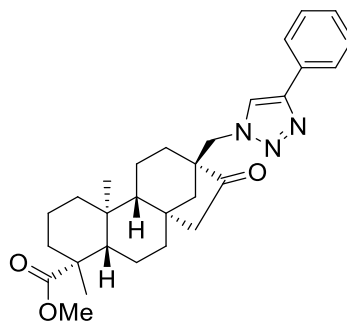
HSQC of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-9-(((4-methoxybenzyl)amino)methyl)-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**32**)



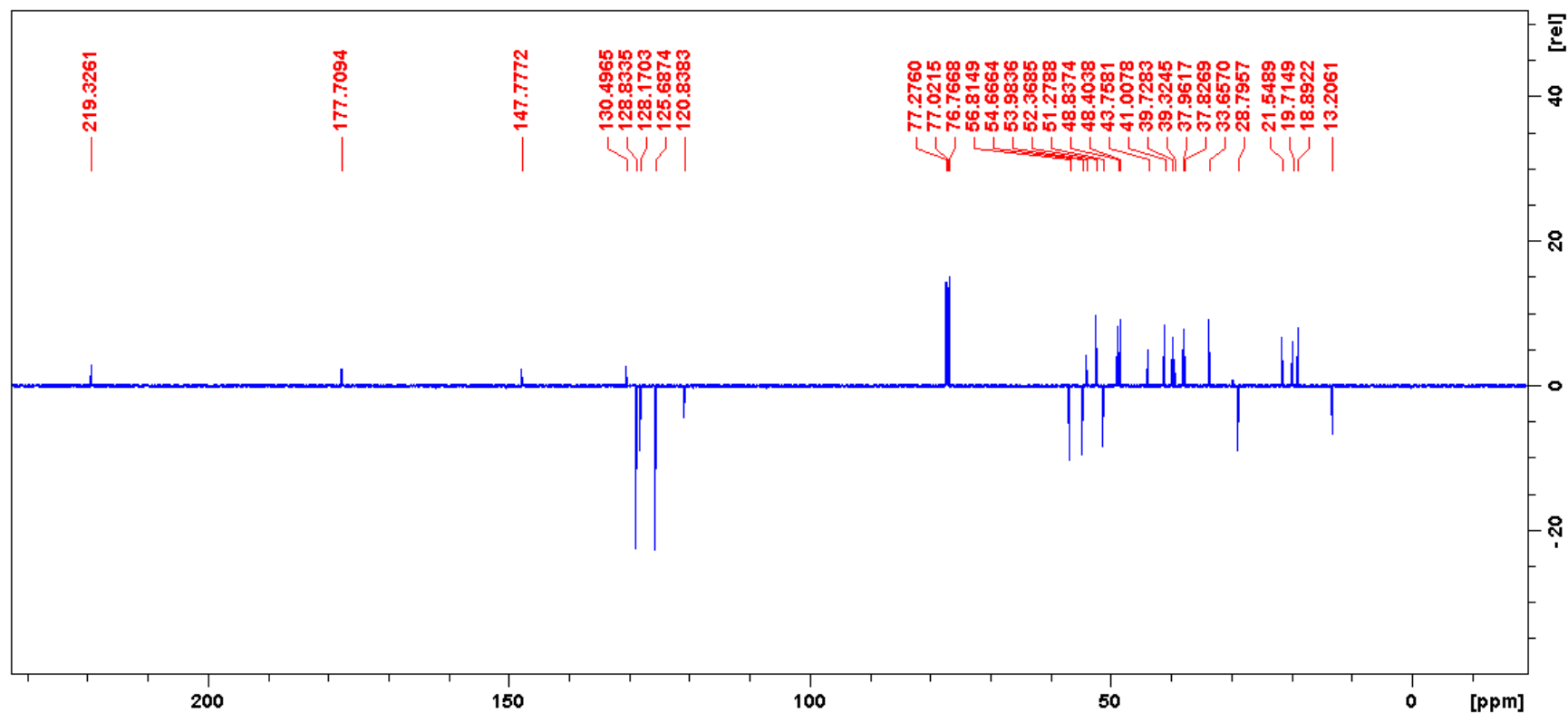
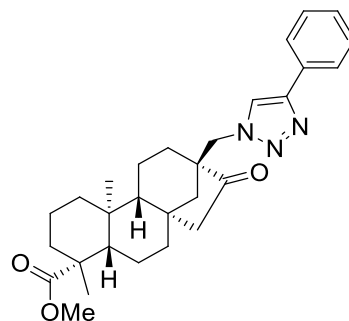
HMBC of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-9-(((4-methoxybenzyl)amino)methyl)-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**32**)



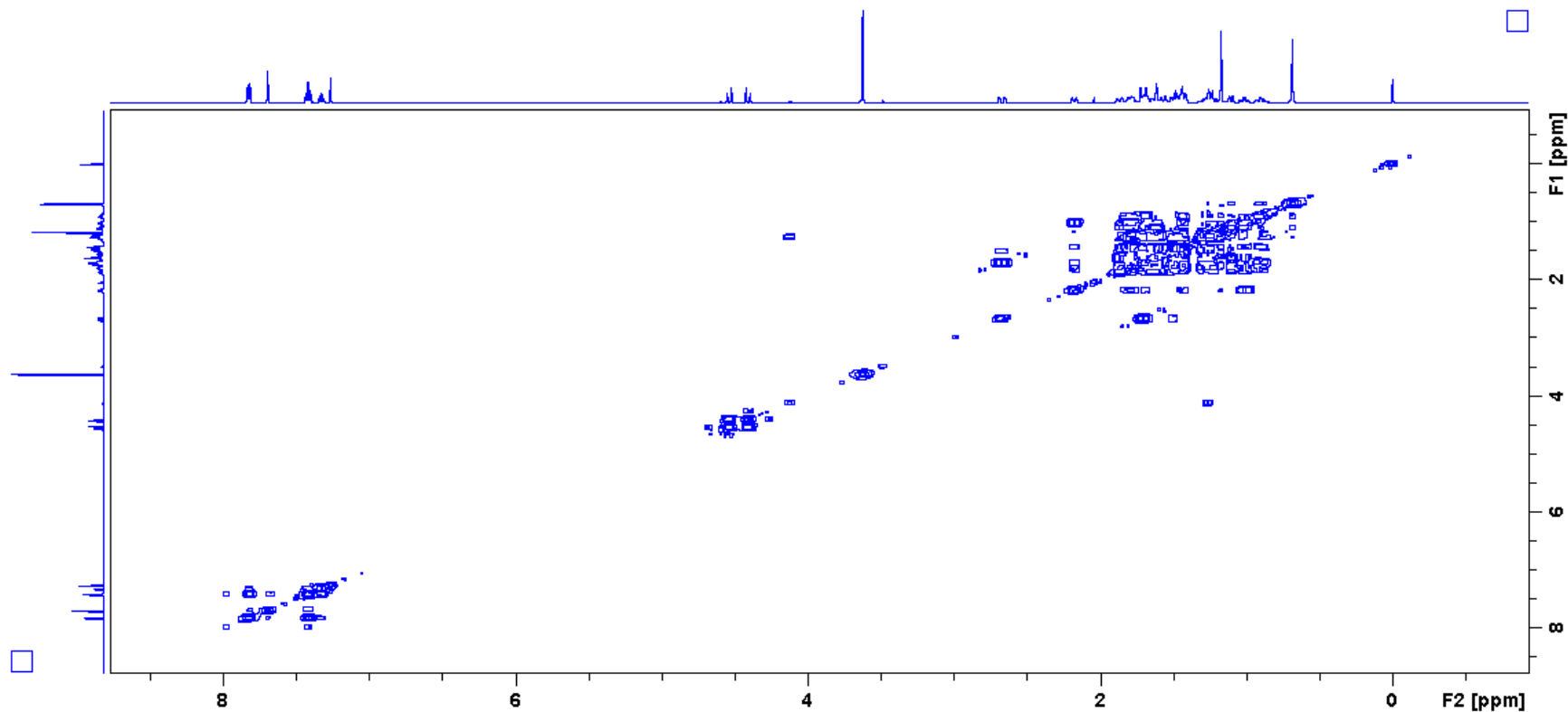
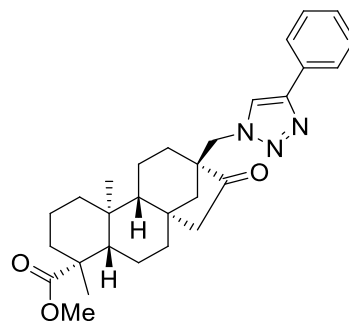
¹H-NMR of compound (4*R*,4*aS*,6*aR*,9*S*,11*aR*,11*bS*)-methyl 4,11*b*-dimethyl-8-oxo-9-((4-phenyl-1*H*-1,2,3-triazol-1-yl)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**33**)



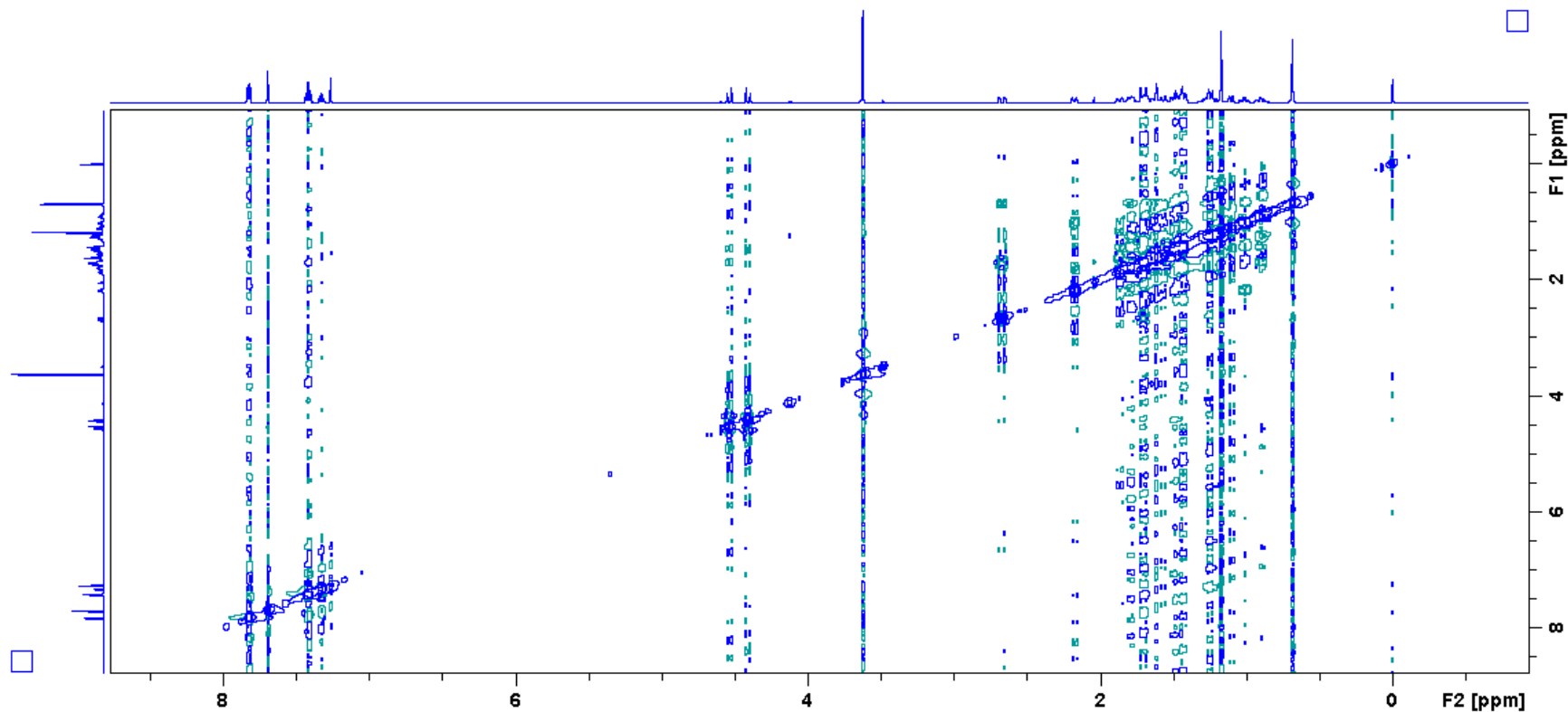
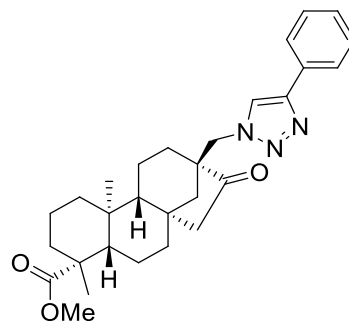
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,9*S*,11*aR*,11*bS*)-methyl 4,11*b*-dimethyl-8-oxo-9-((4-phenyl-1*H*-1,2,3-triazol-1-yl)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**33**)



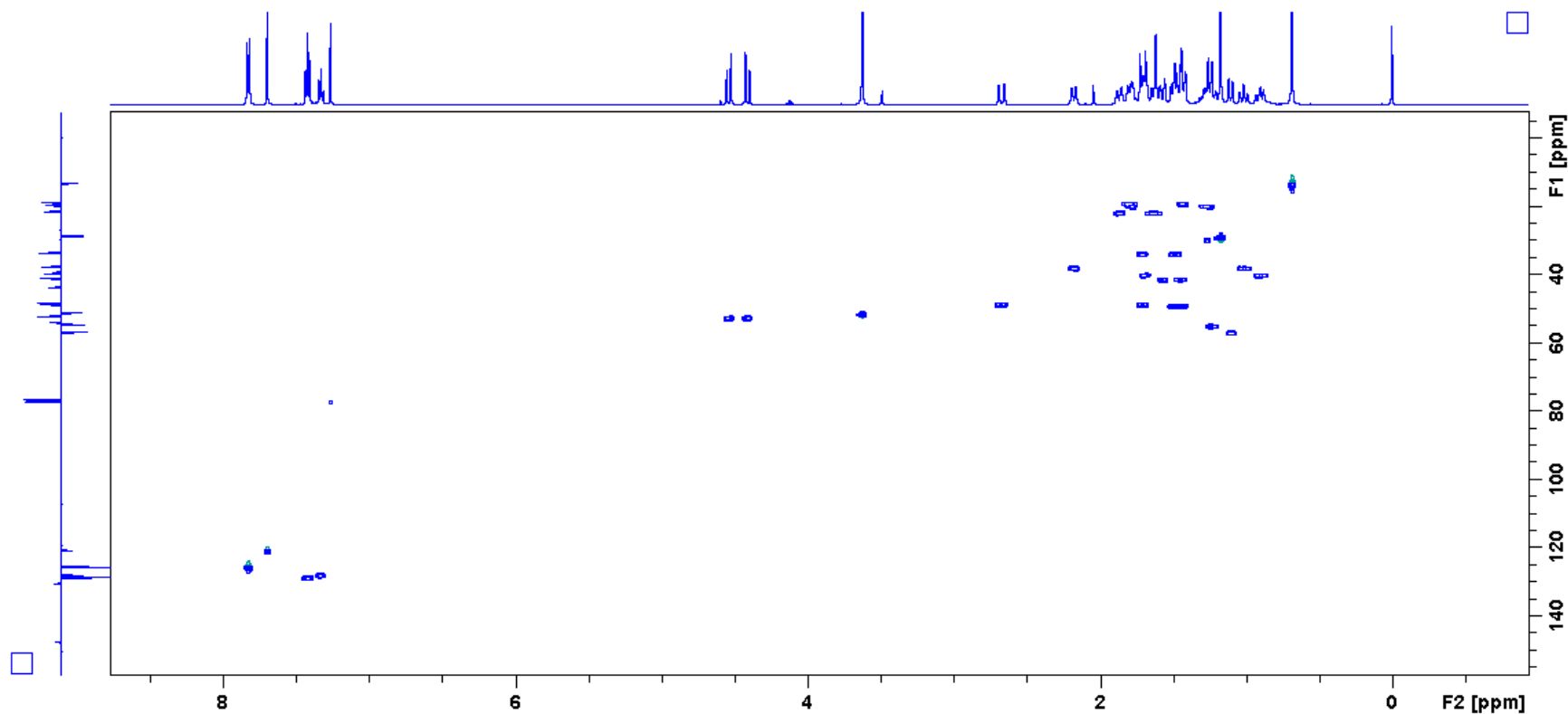
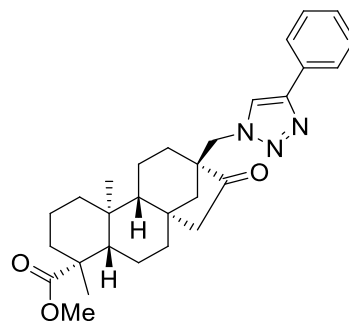
COSY of compound (4*R*,4*aS*,6*aR*,9*S*,11*aR*,11*bS*)-methyl 4,11*b*-dimethyl-8-oxo-9-((4-phenyl-1*H*-1,2,3-triazol-1-yl)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**33**)



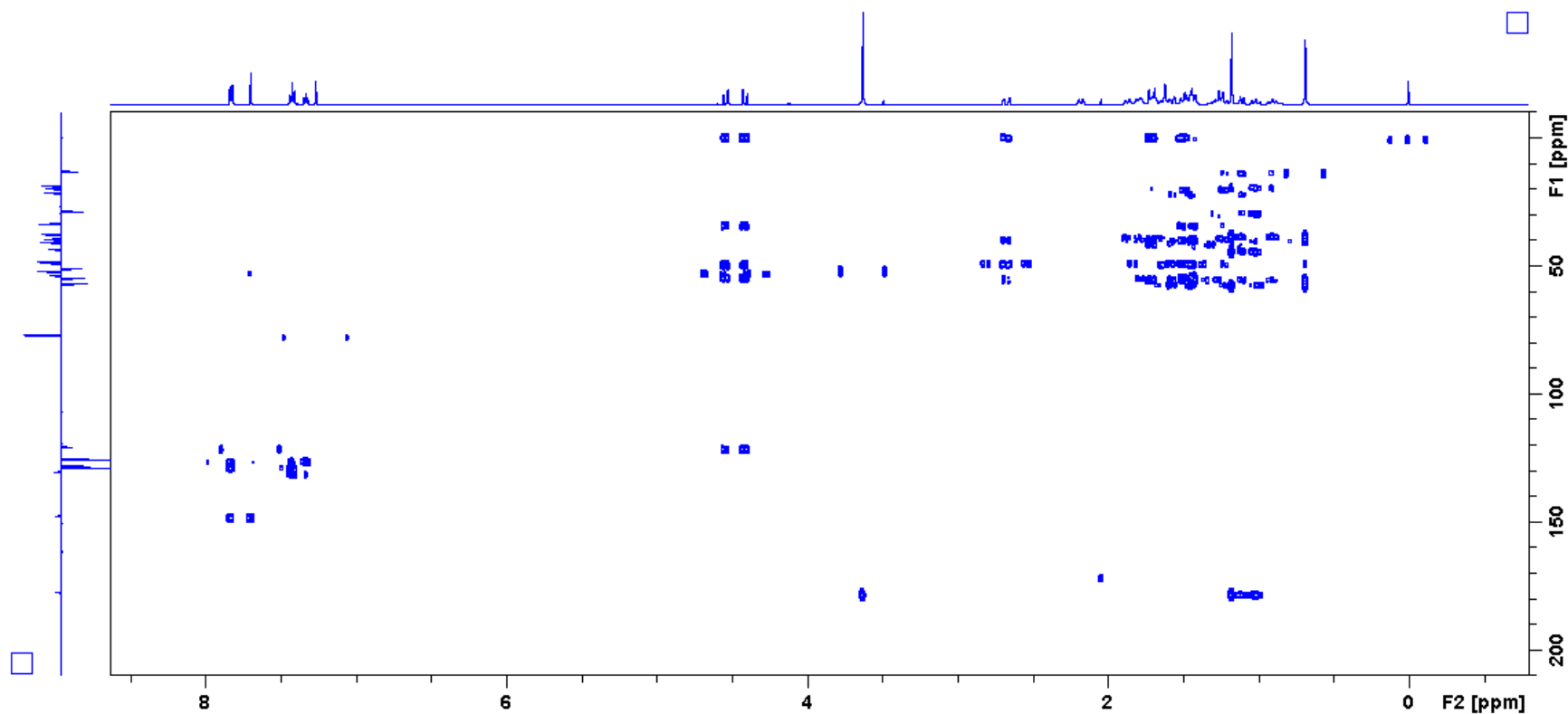
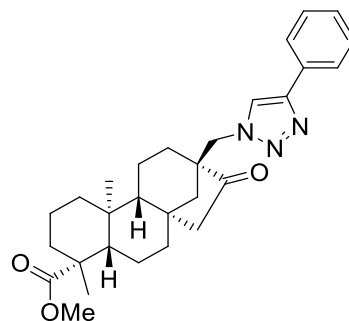
NOESY of compound (4*R*,4*aS*,6*aR*,9*S*,11*aR*,11*bS*)-methyl 4,11b-dimethyl-8-oxo-9-((4-phenyl-1*H*-1,2,3-triazol-1-yl)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**33**)



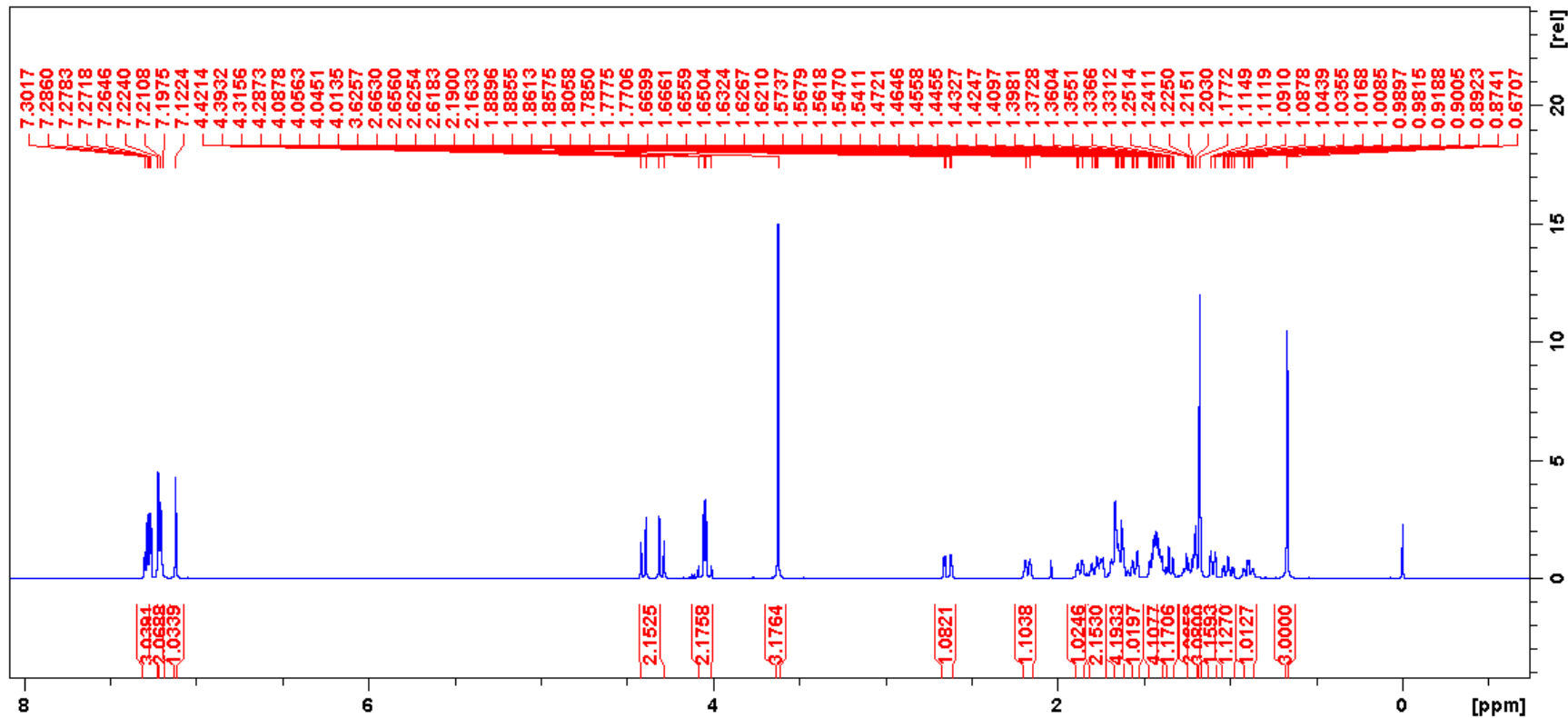
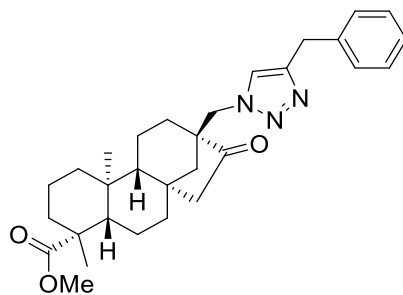
HSQC of compound (4*R*,4*aS*,6*aR*,9*S*,11*aR*,11*bS*)-methyl 4,11b-dimethyl-8-oxo-9-((4-phenyl-1*H*-1,2,3-triazol-1-yl)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**33**)



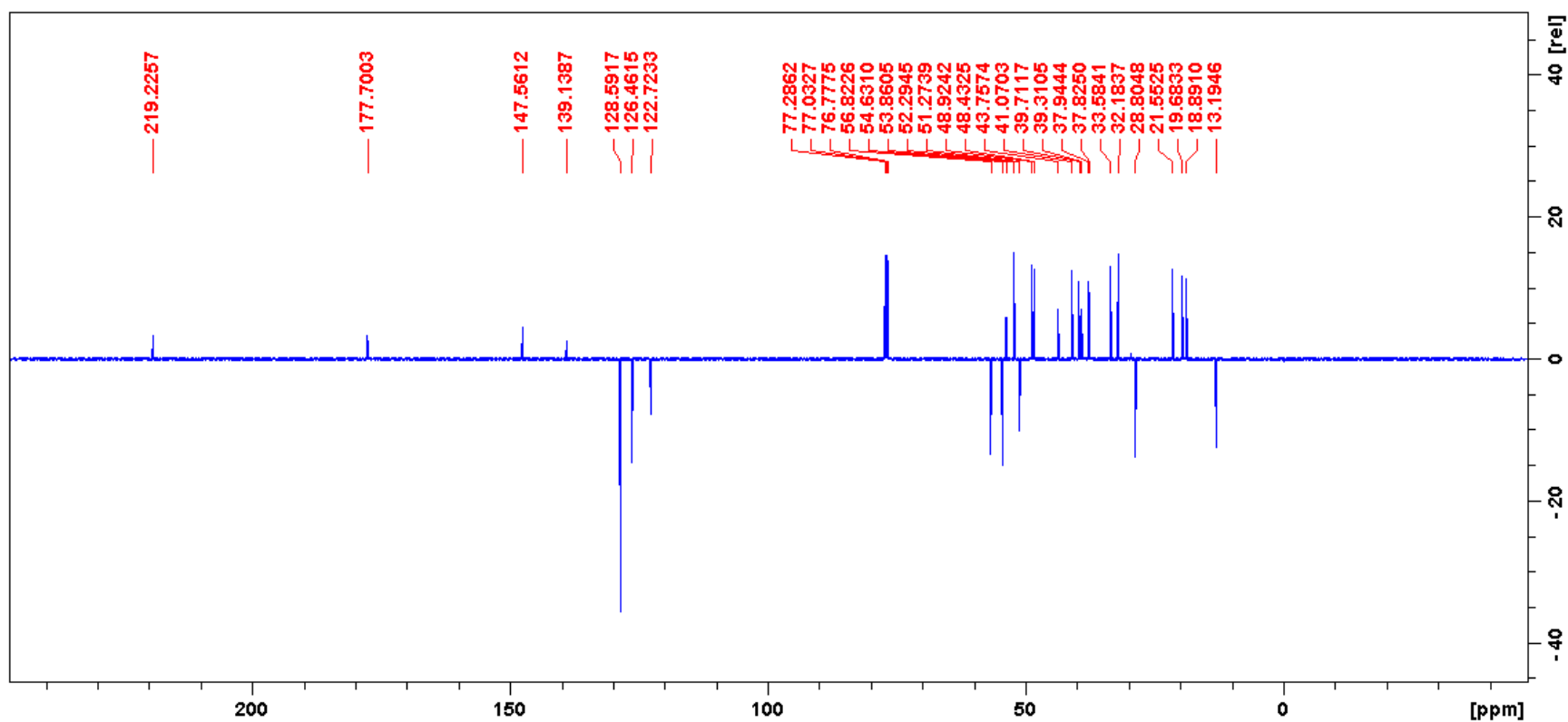
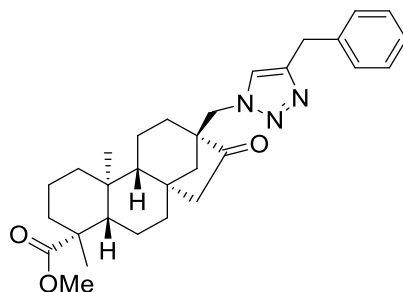
HMBC of compound (4*R*,4*aS*,6*aR*,9*S*,11*aR*,11*bS*)-methyl 4,11*b*-dimethyl-8-oxo-9-((4-phenyl-1*H*-1,2,3-triazol-1-yl)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**33**)



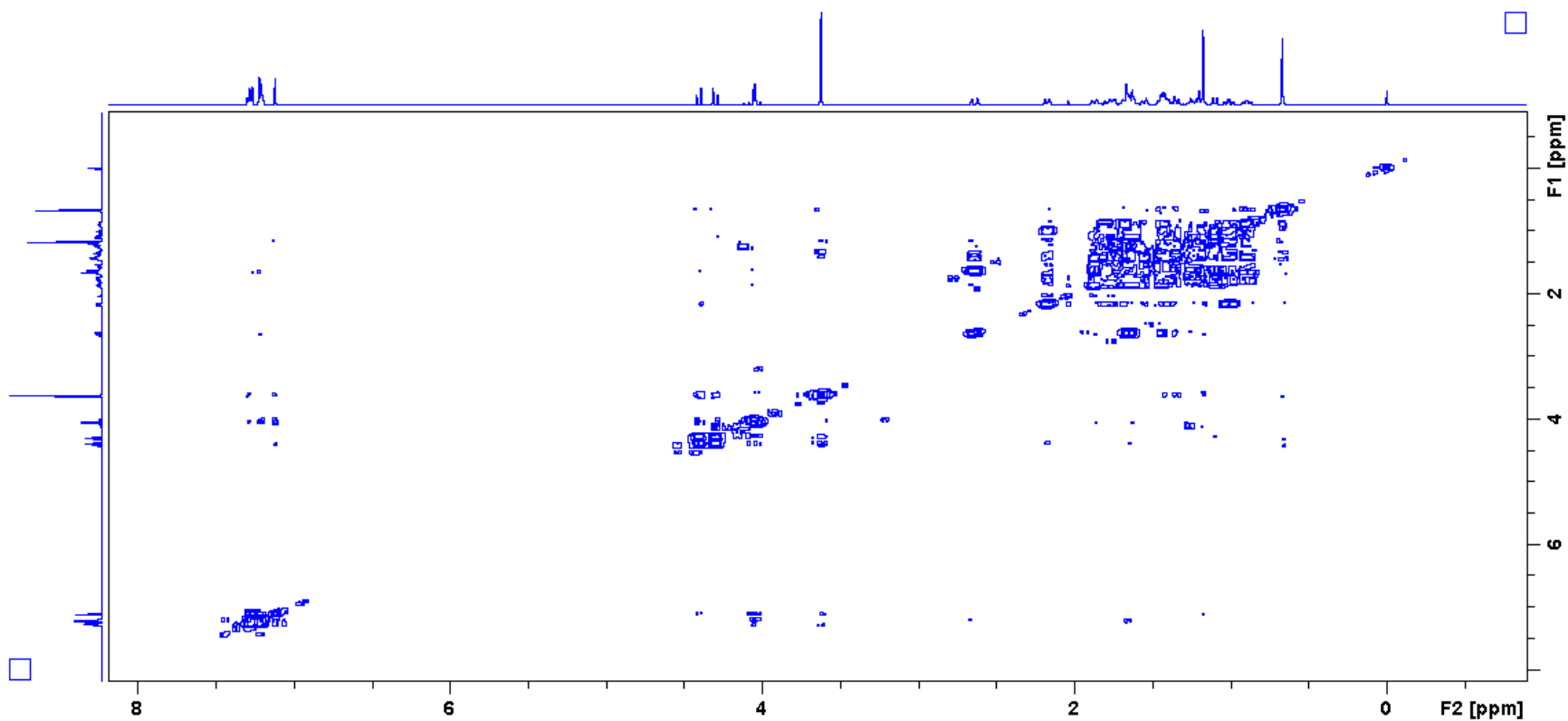
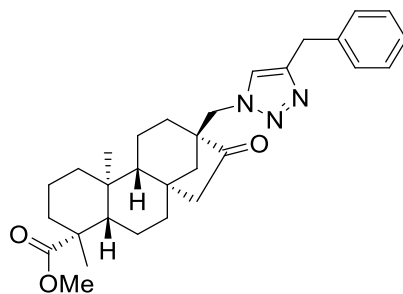
^1H -NMR of compound (4*R*,4*aS*,6*aR*,9*S*,11*aR*,11*bS*)-methyl 9-((4-benzyl-1*H*-1,2,3-triazol-1-yl)methyl)-4,11*b*-dimethyl-8-oxotetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**34**)



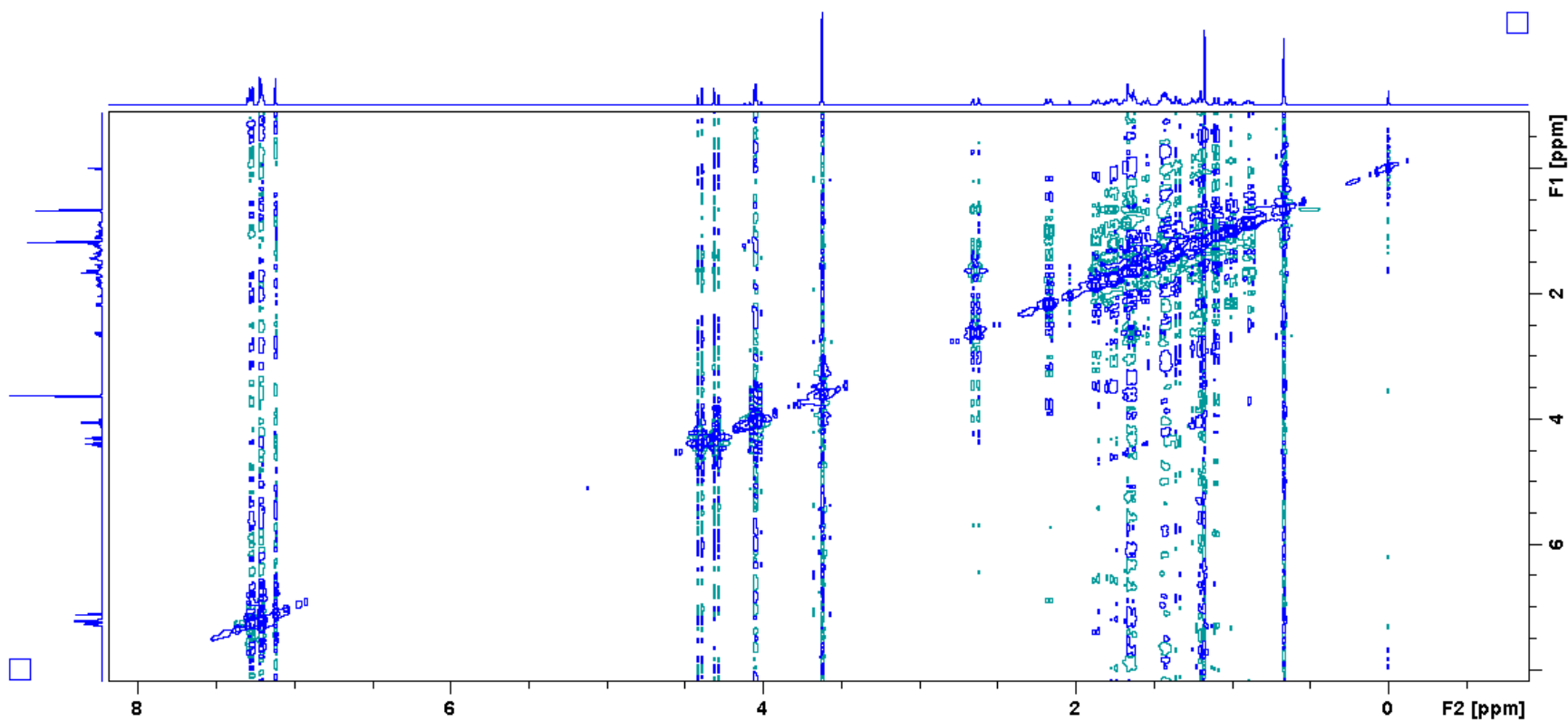
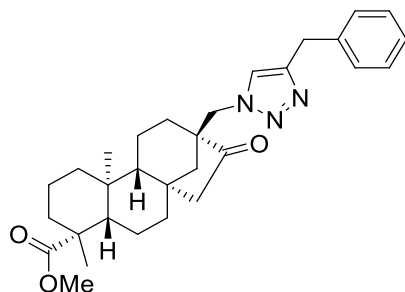
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,9*S*,11*aR*,11*bS*)-methyl 9-((4-benzyl-1*H*-1,2,3-triazol-1-yl)methyl)-4,11*b*-dimethyl-8-oxotetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**34**)



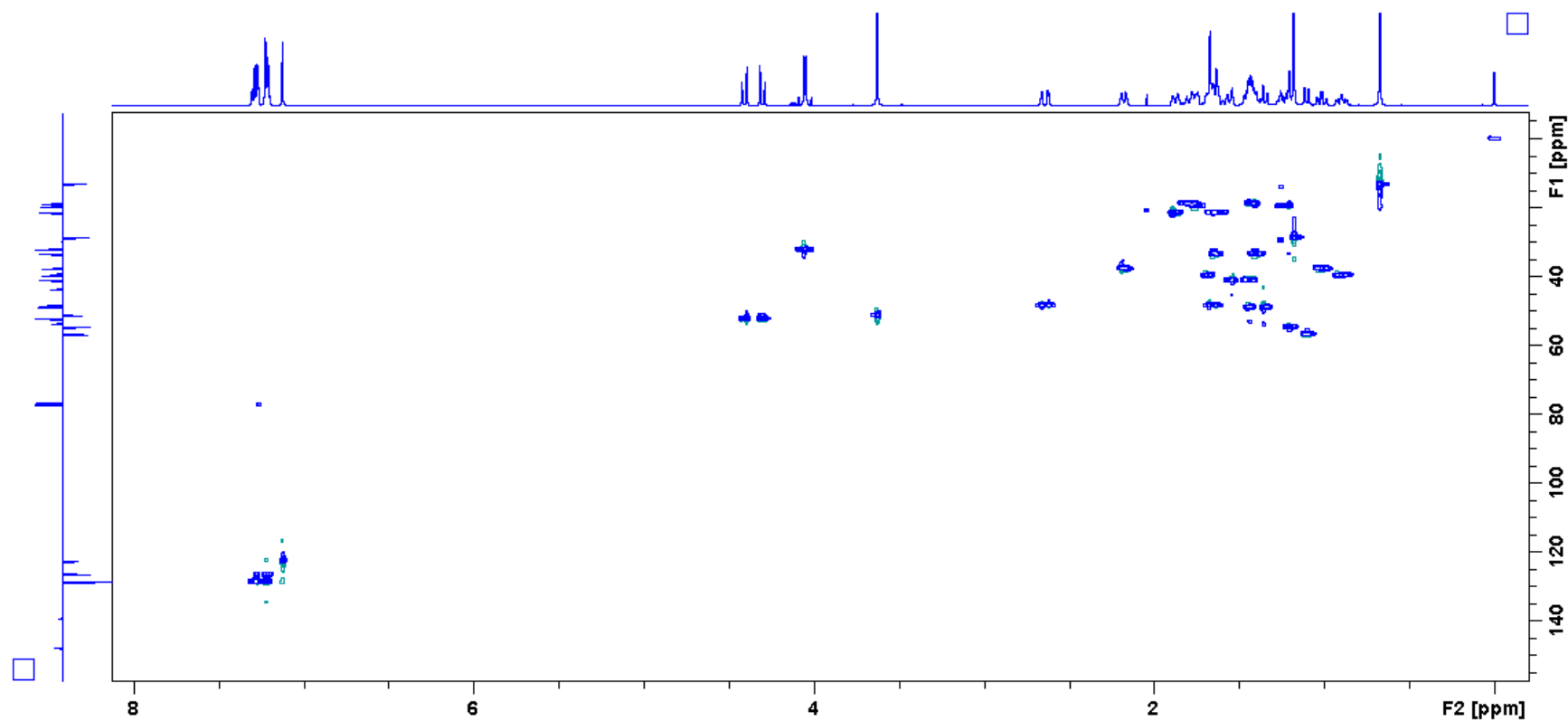
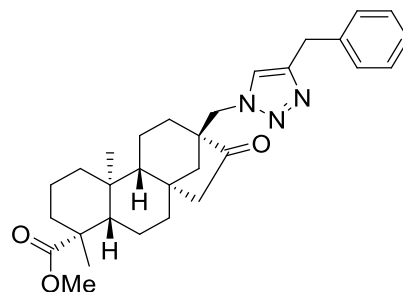
COSY of compound (4*R*,4*aS*,6*aR*,9*S*,11*aR*,11*bS*)-methyl 9-((4-benzyl-1*H*-1,2,3-triazol-1-yl)methyl)-4,11*b*-dimethyl-8-oxotetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**34**)



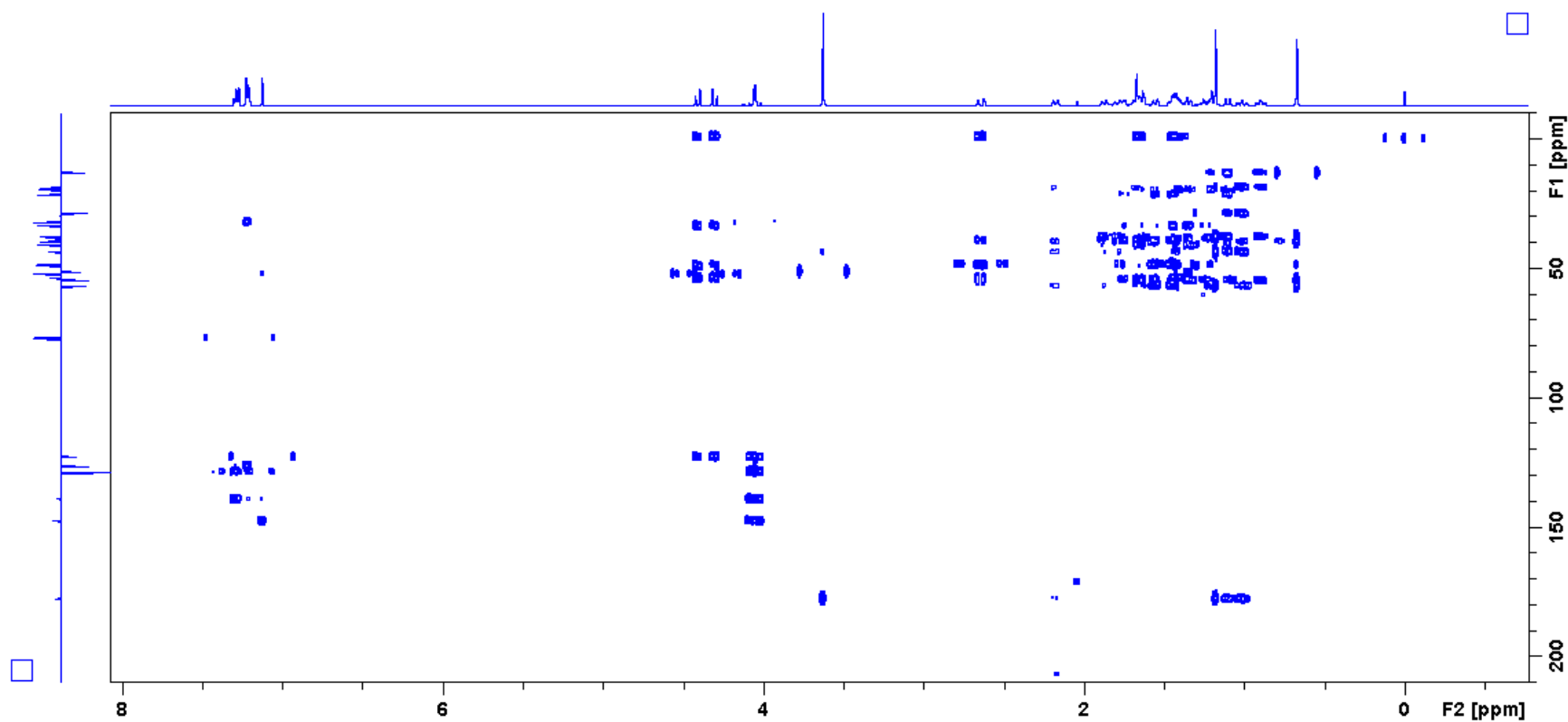
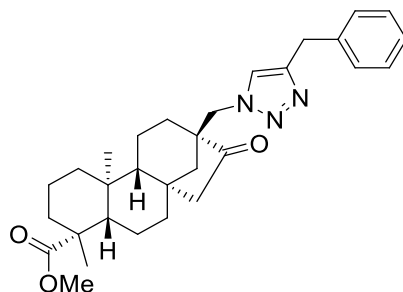
NOESY of compound (4*R*,4*aS*,6*aR*,9*S*,11*aR*,11*bS*)-methyl 9-((4-benzyl-1*H*-1,2,3-triazol-1-yl)methyl)-4,11*b*-dimethyl-8-oxotetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**34**)



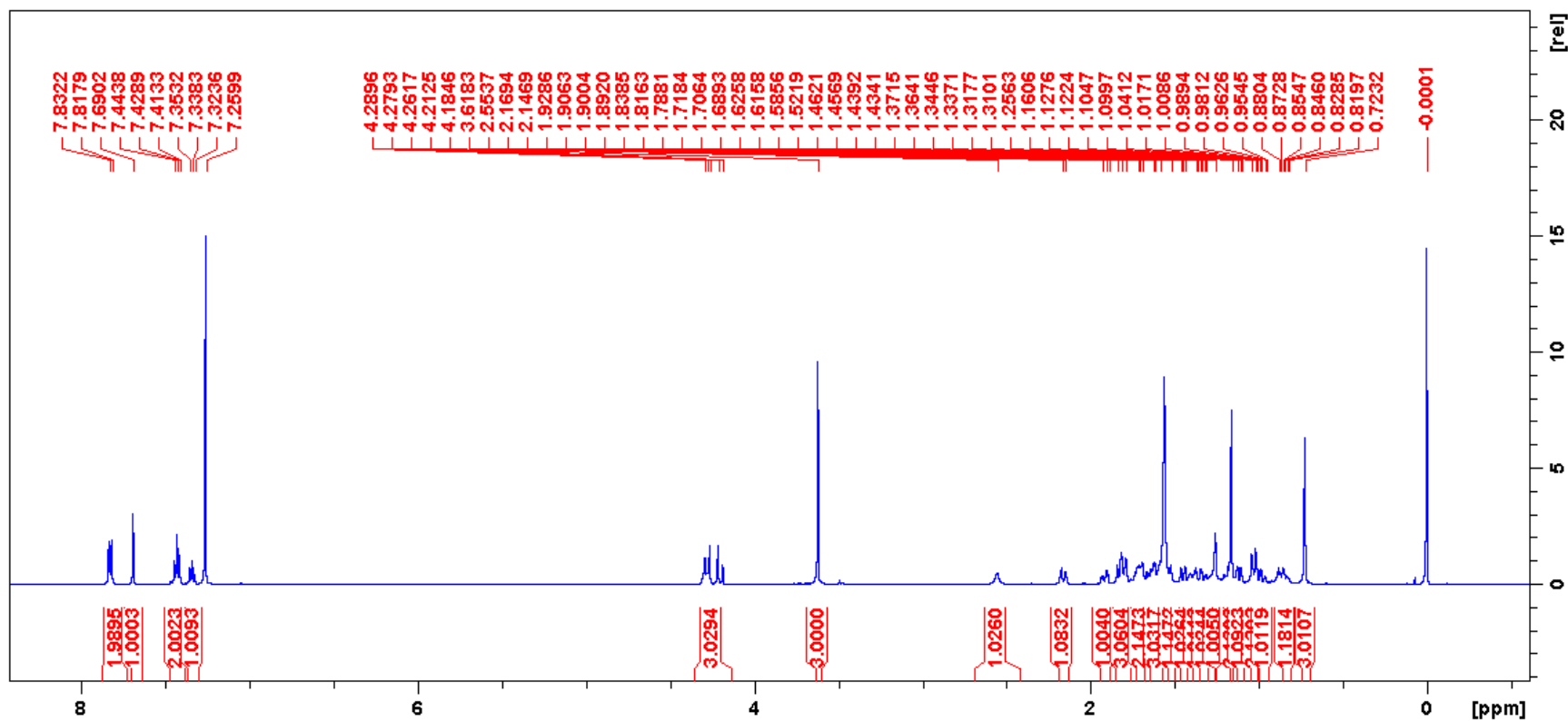
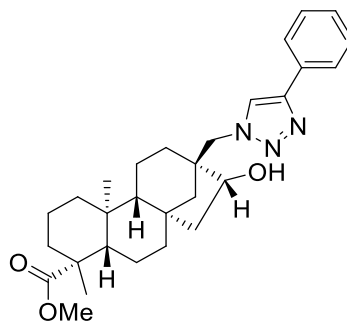
HSQC of compound (4*R*,4*aS*,6*aR*,9*S*,11*aR*,11*bS*)-methyl 9-((4-benzyl-1*H*-1,2,3-triazol-1-yl)methyl)-4,11*b*-dimethyl-8-oxotetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**34**)



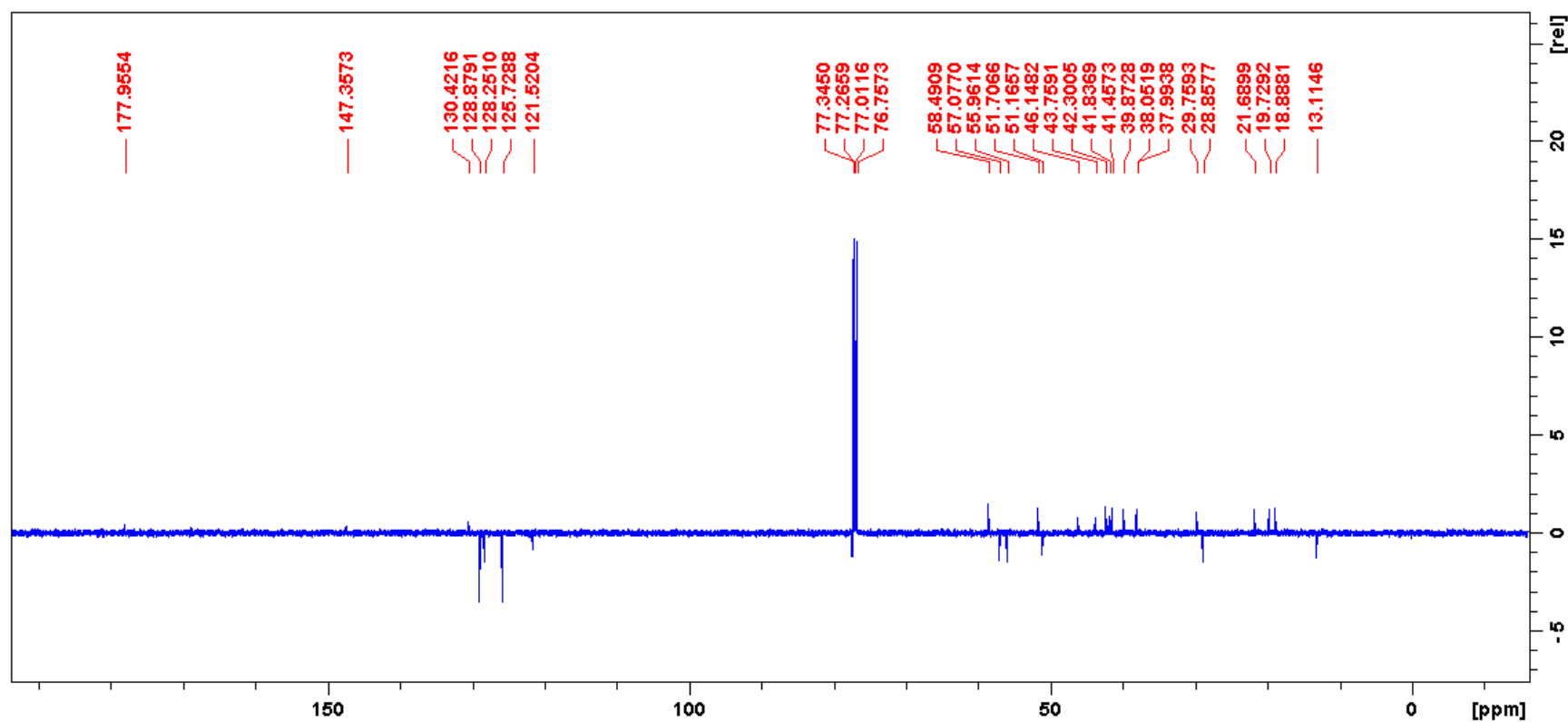
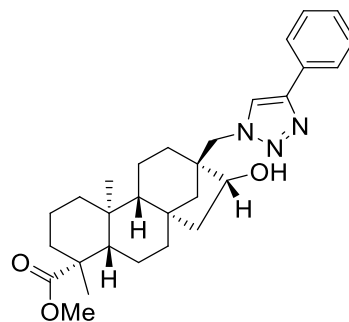
HMBC of compound (4*R*,4*aS*,6*aR*,9*S*,11*aR*,11*bS*)-methyl 9-((4-benzyl-1*H*-1,2,3-triazol-1-yl)methyl)-4,11*b*-dimethyl-8-oxotetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**34**)



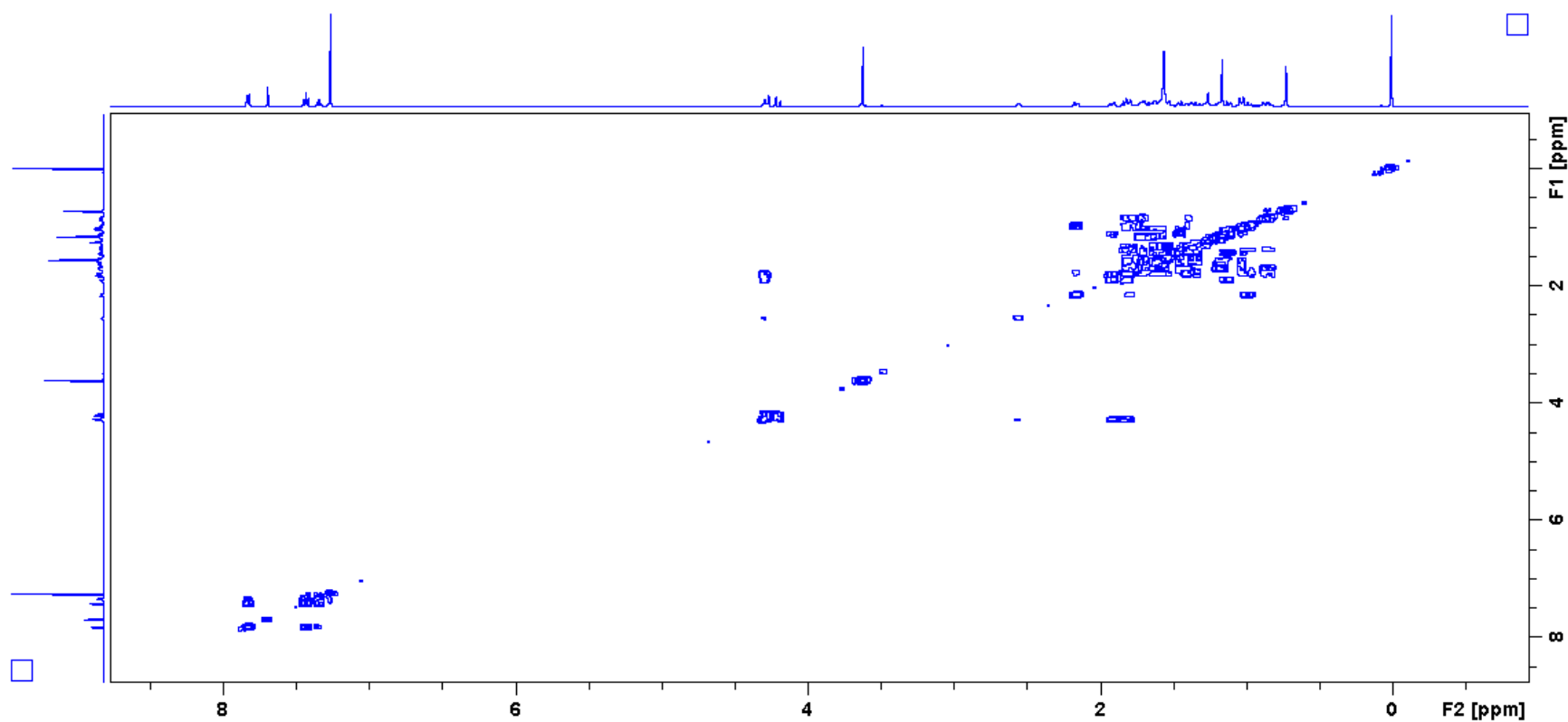
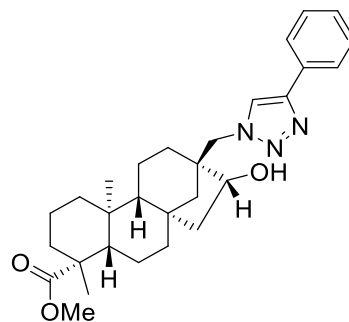
^1H -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((4-phenyl-1*H*-1,2,3-triazol-1-yl)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**35**)



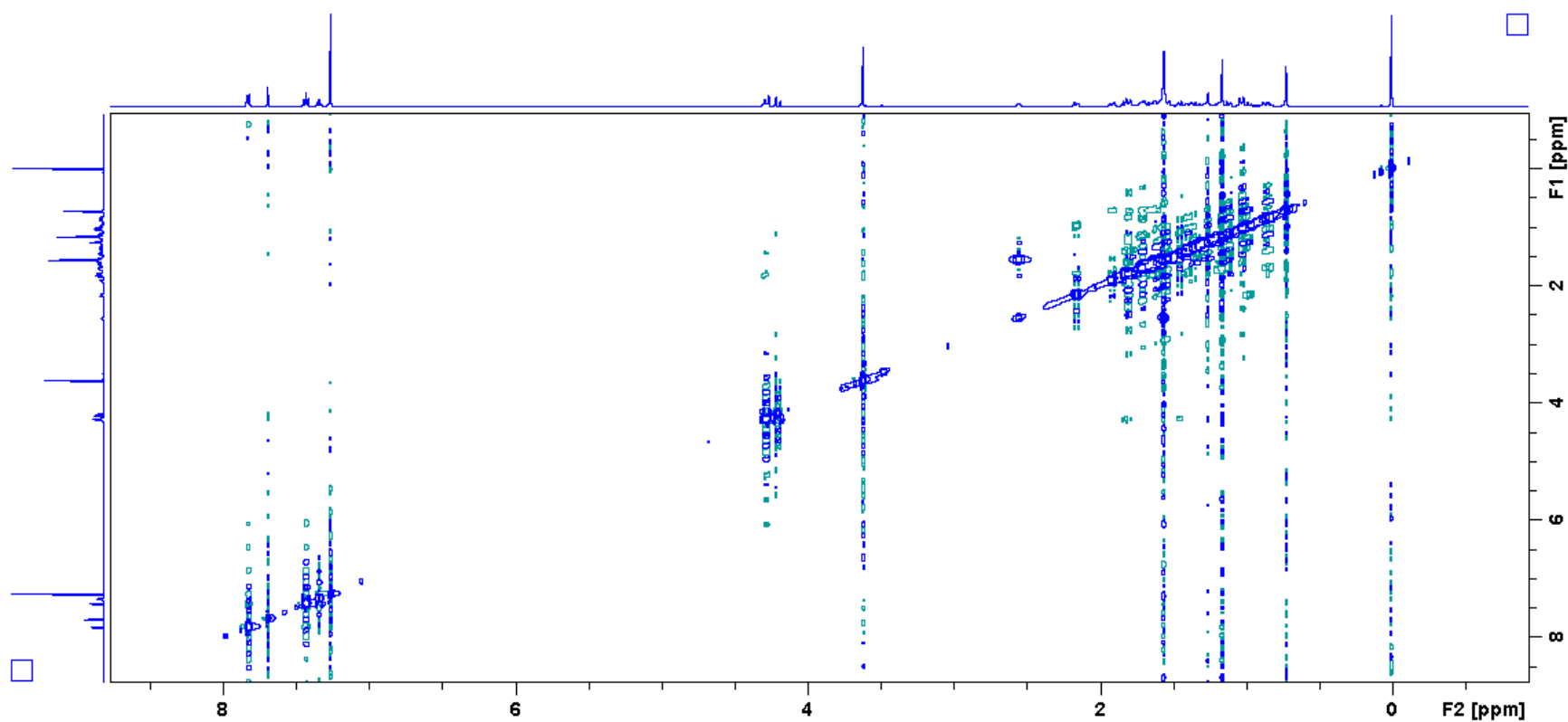
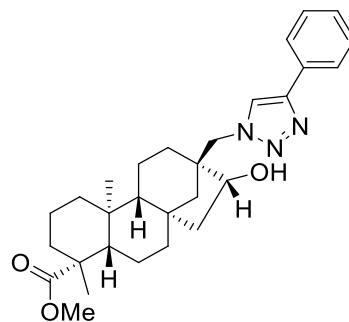
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((4-phenyl-1*H*-1,2,3-triazol-1-yl)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**35**)



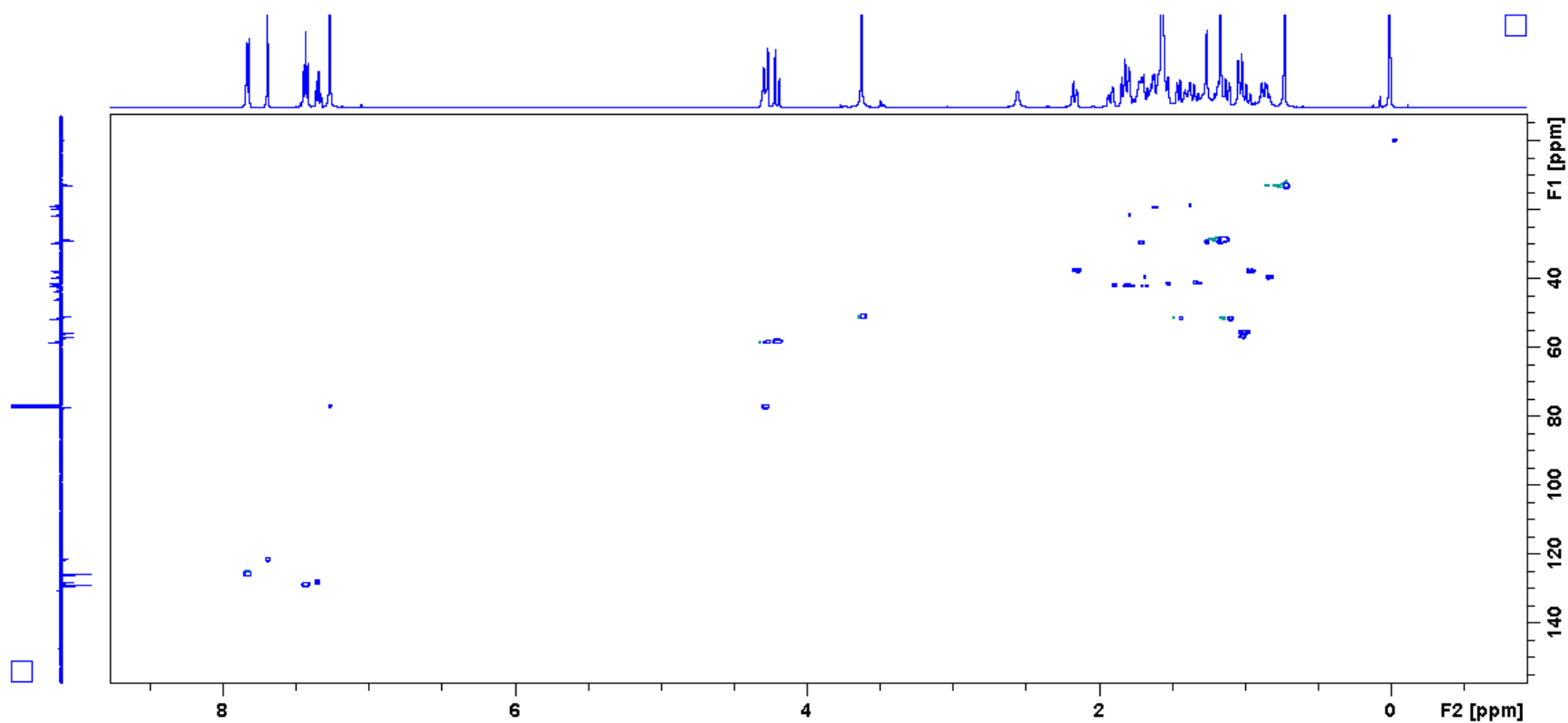
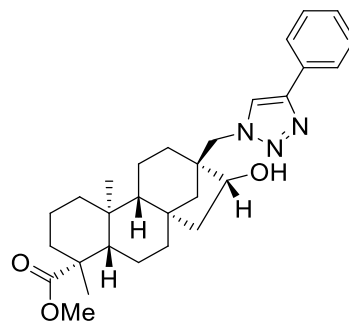
COSY of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((4-phenyl-1*H*-1,2,3-triazol-1-yl)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**35**)



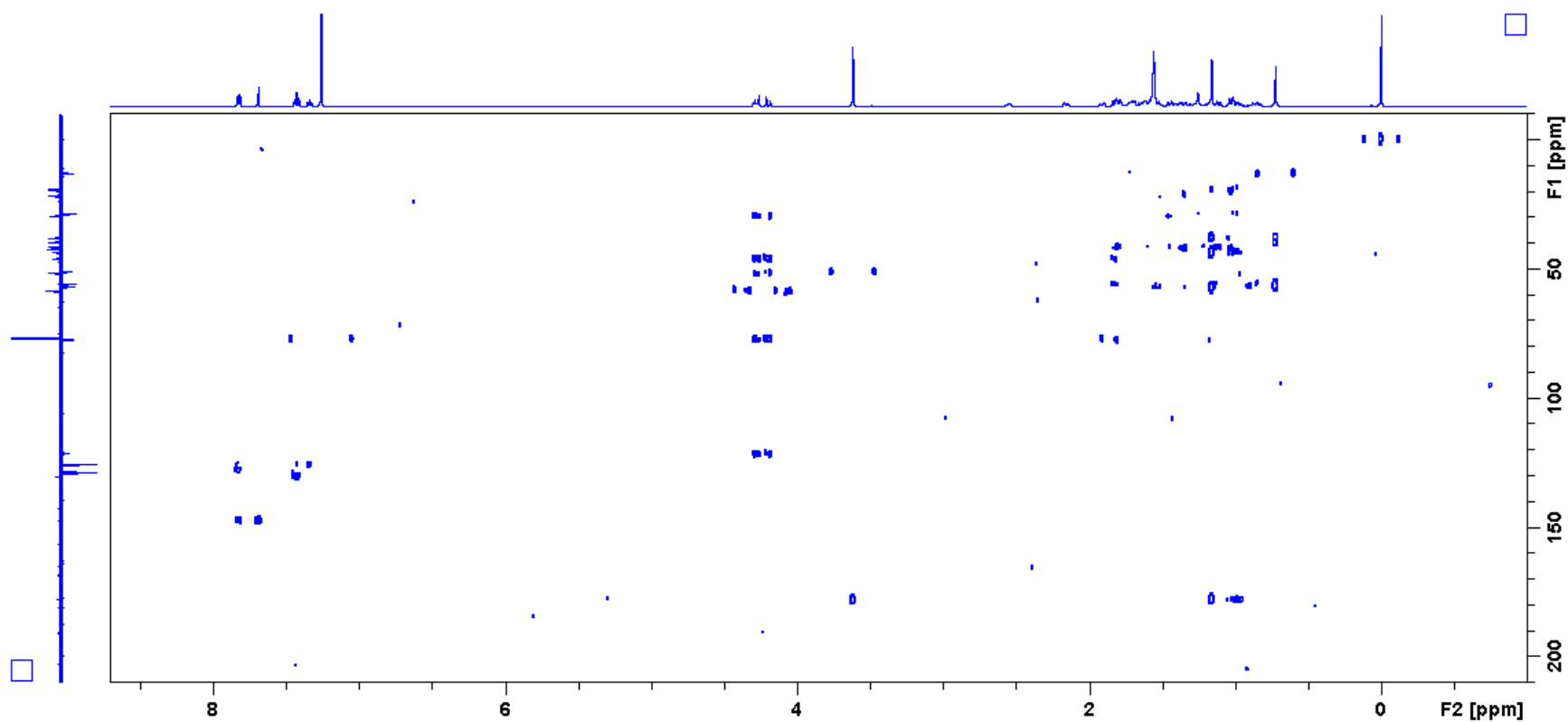
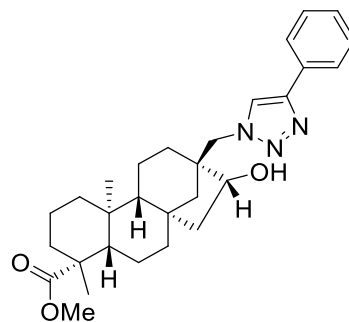
NOESY of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11b-dimethyl-9-((4-phenyl-1*H*-1,2,3-triazol-1-yl)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**35**)



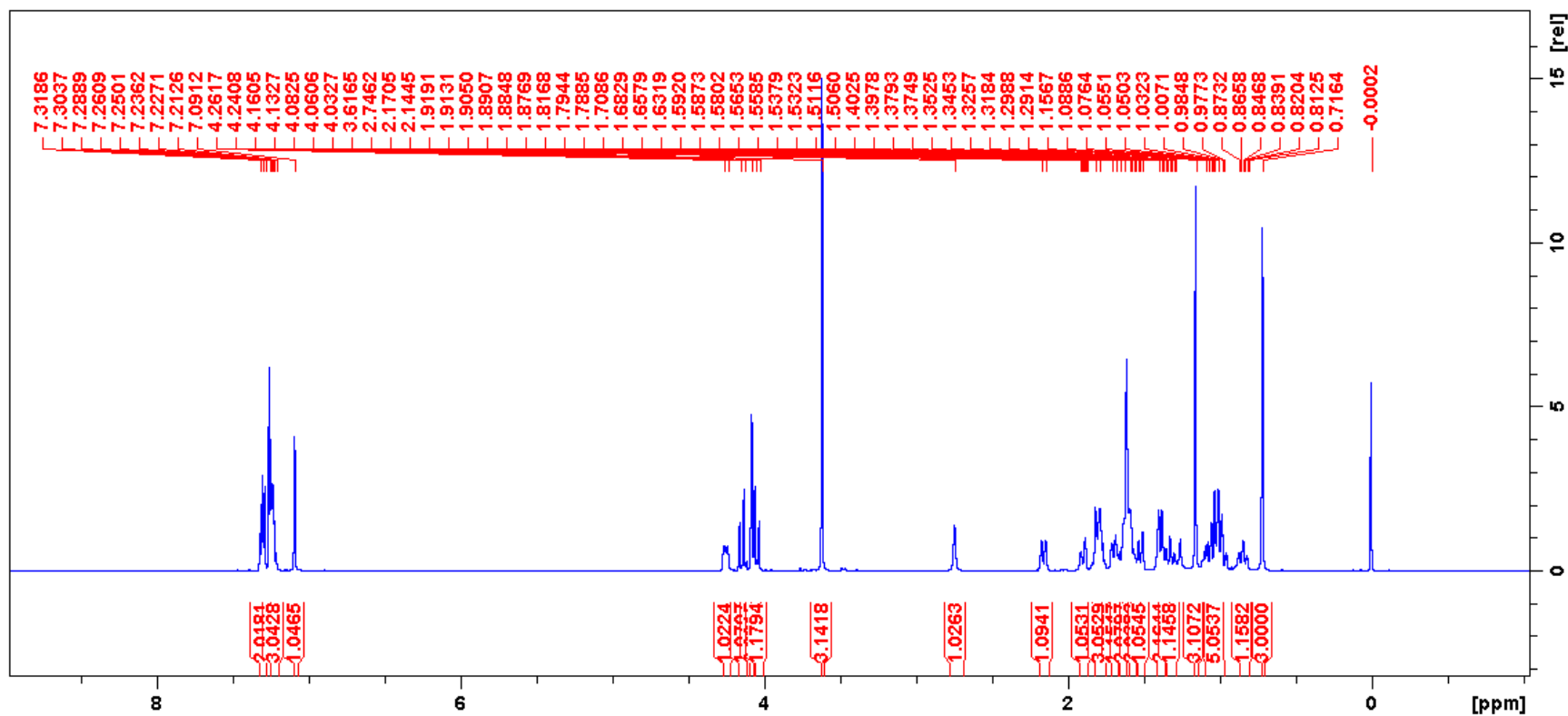
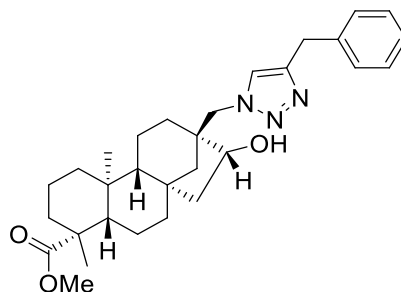
HSQC of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((4-phenyl-1*H*-1,2,3-triazol-1-yl)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**35**)



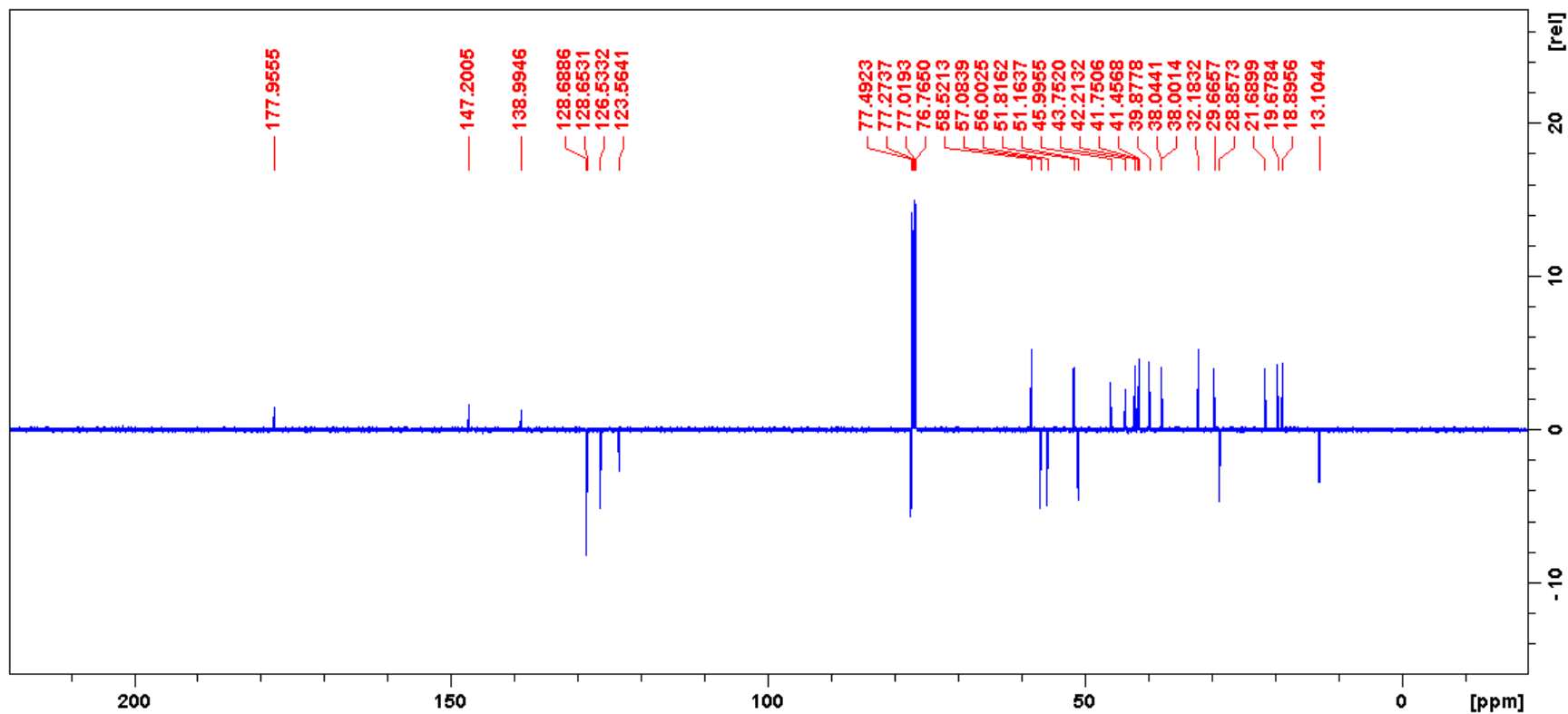
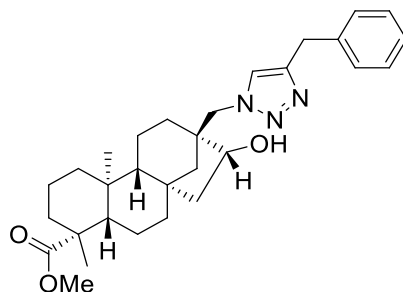
HMBC of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((4-phenyl-1*H*-1,2,3-triazol-1-yl)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**35**)



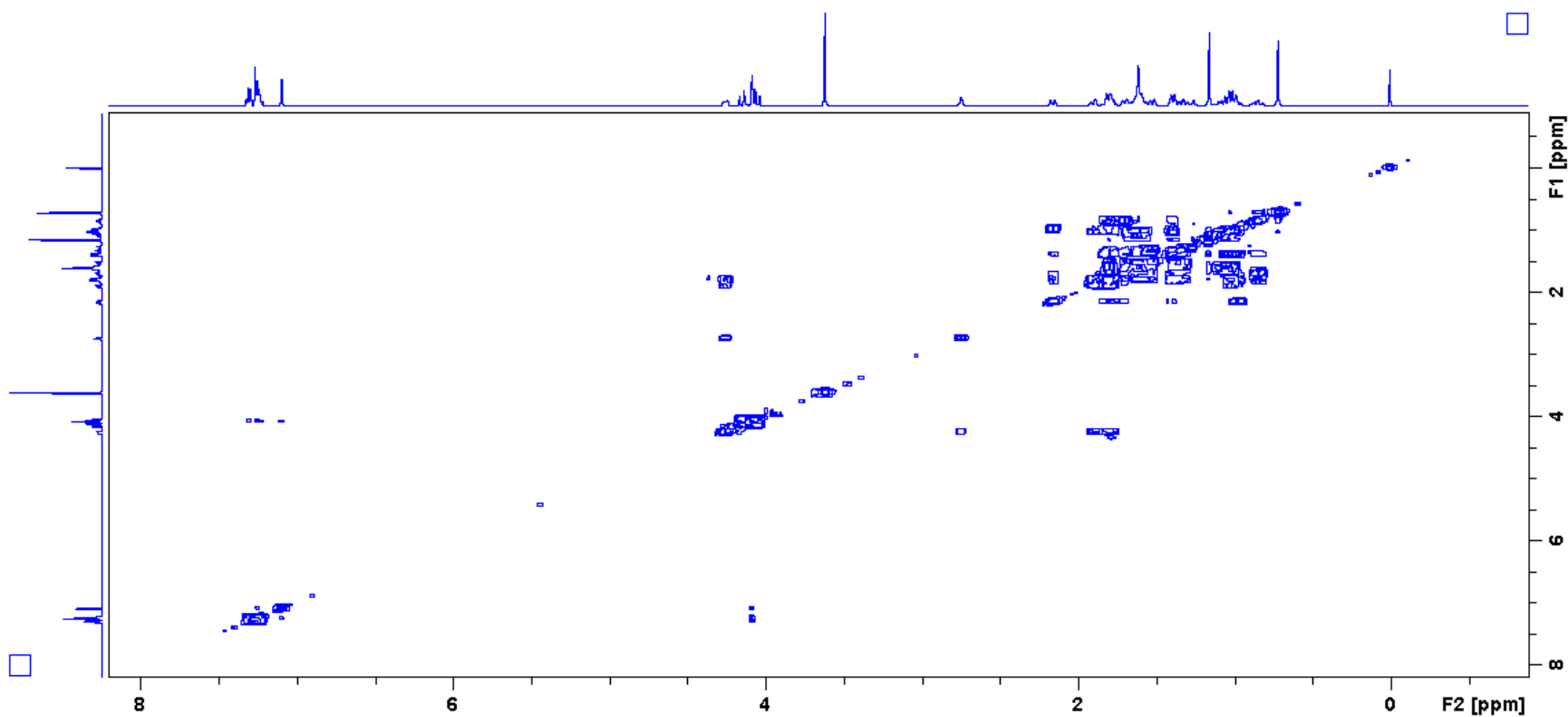
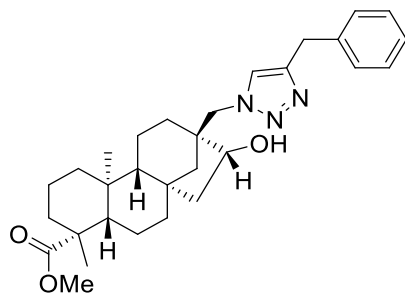
^1H -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-((4-benzyl-1*H*-1,2,3-triazol-1-yl)methyl)-8-hydroxy-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**36**)



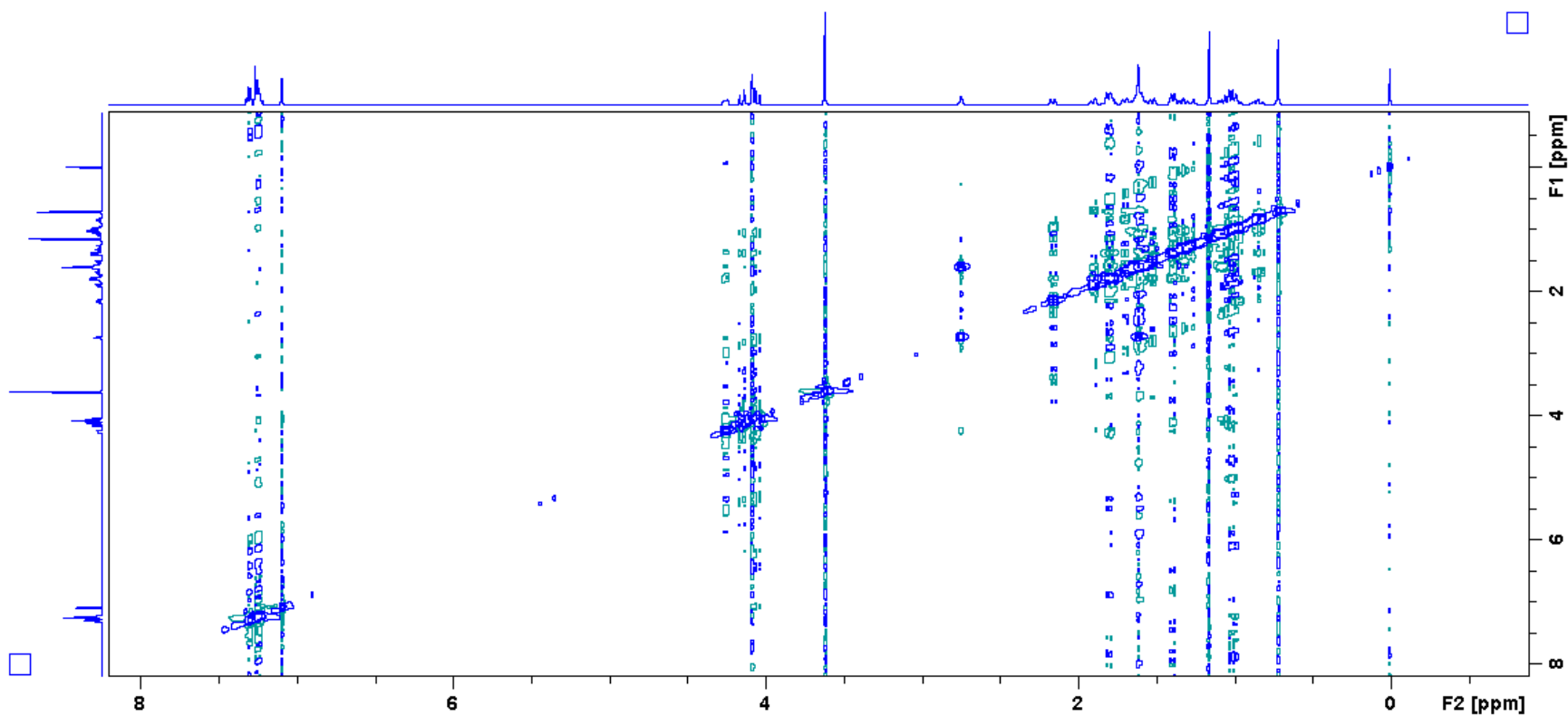
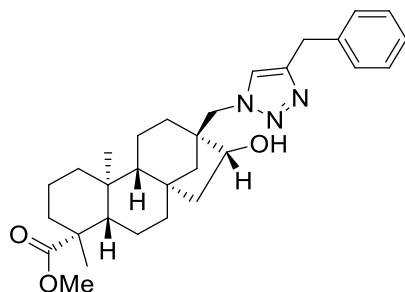
^{13}C -NMR of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-((4-benzyl-1*H*-1,2,3-triazol-1-yl)methyl)-8-hydroxy-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**36**)



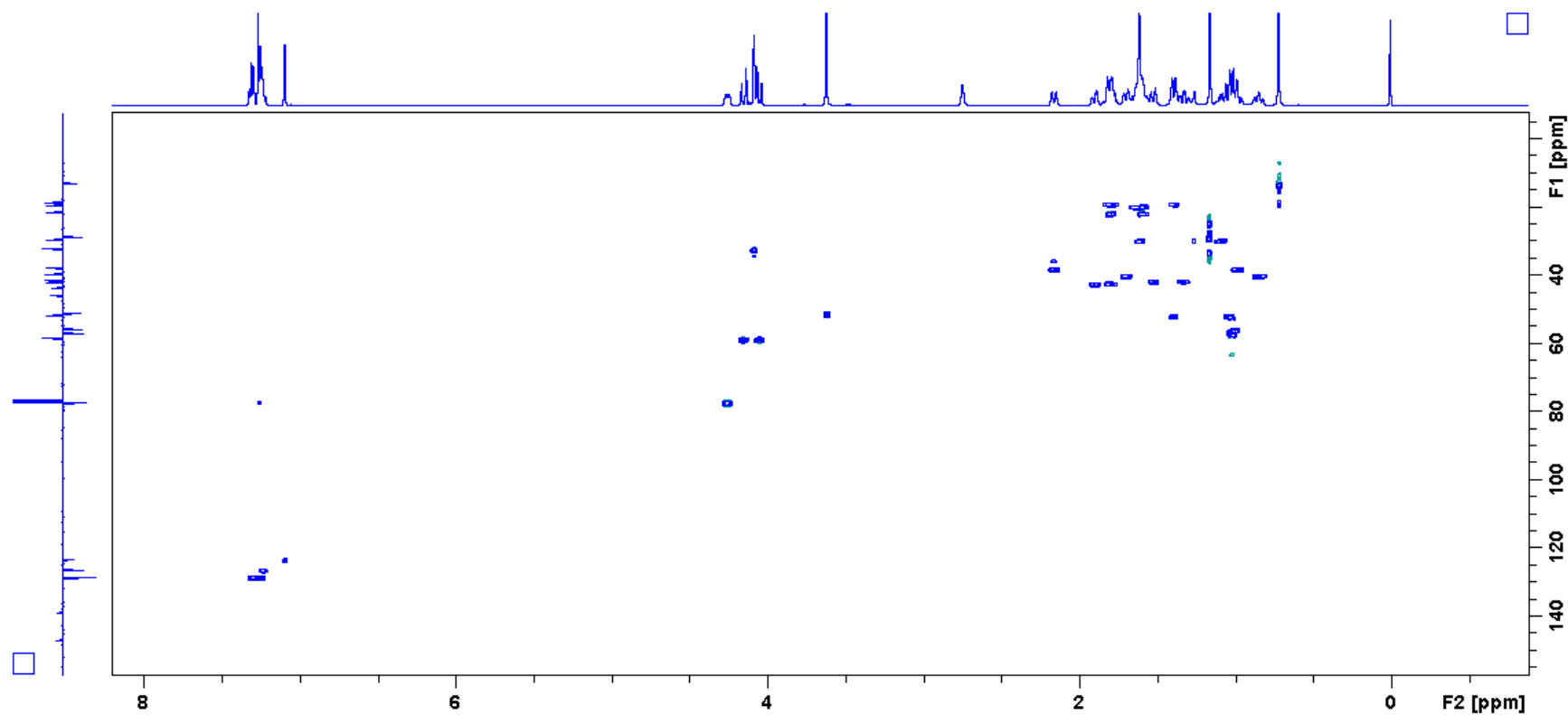
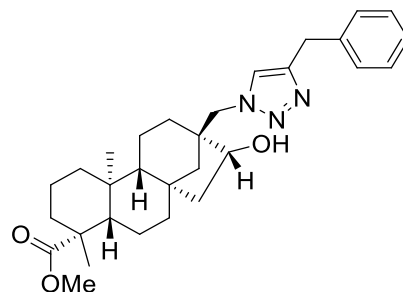
COSY of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-((4-benzyl-1*H*-1,2,3-triazol-1-yl)methyl)-8-hydroxy-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**36**)



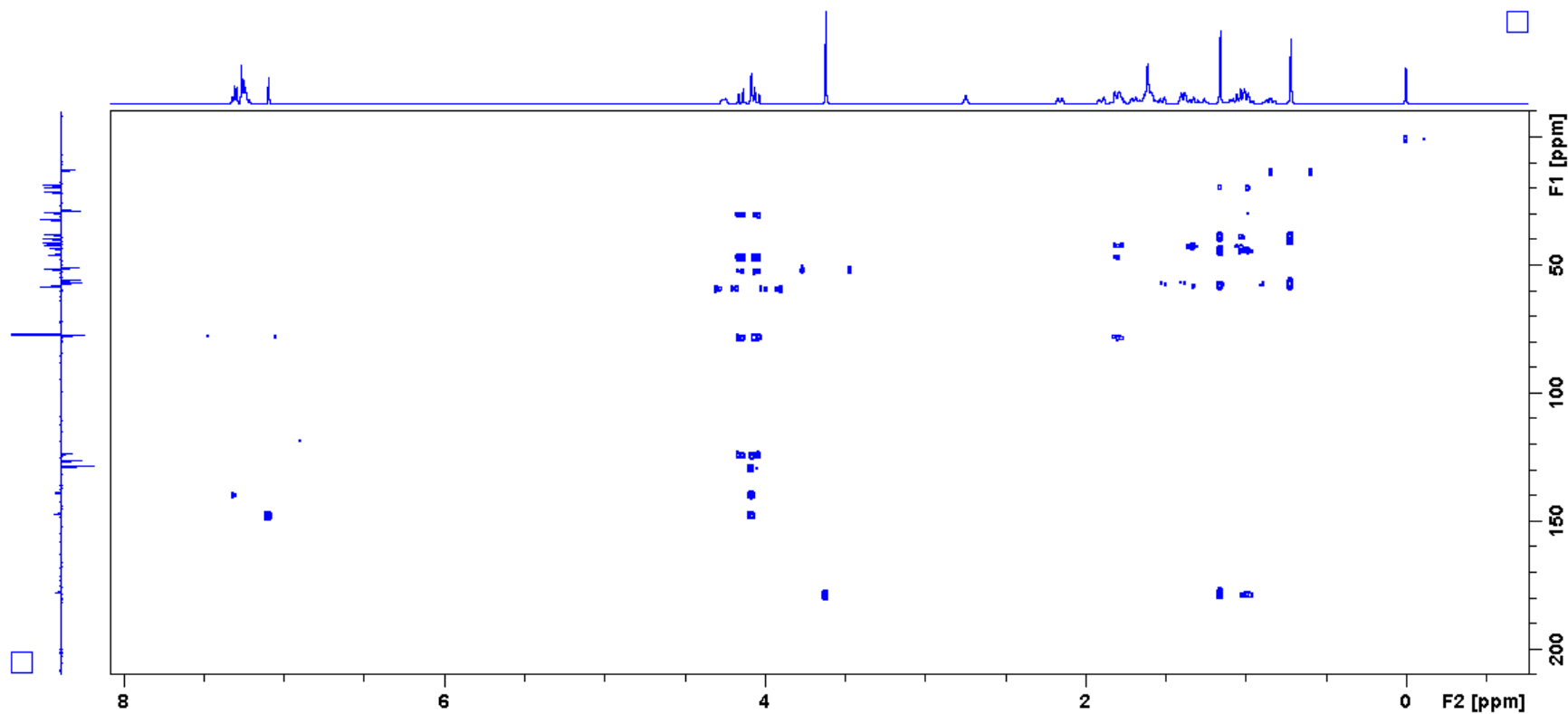
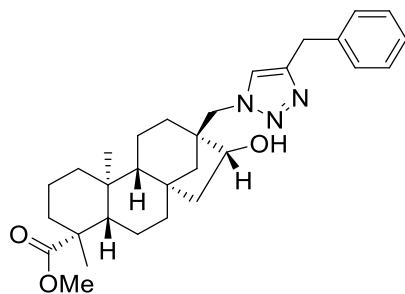
NOESY of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-((4-benzyl-1*H*-1,2,3-triazol-1-yl)methyl)-8-hydroxy-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**36**)



HSQC of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-((4-benzyl-1*H*-1,2,3-triazol-1-yl)methyl)-8-hydroxy-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**36**)



HMBC of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-((4-benzyl-1*H*-1,2,3-triazol-1-yl)methyl)-8-hydroxy-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**36**)



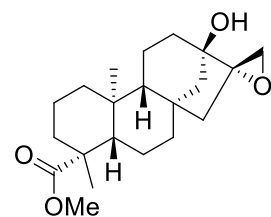
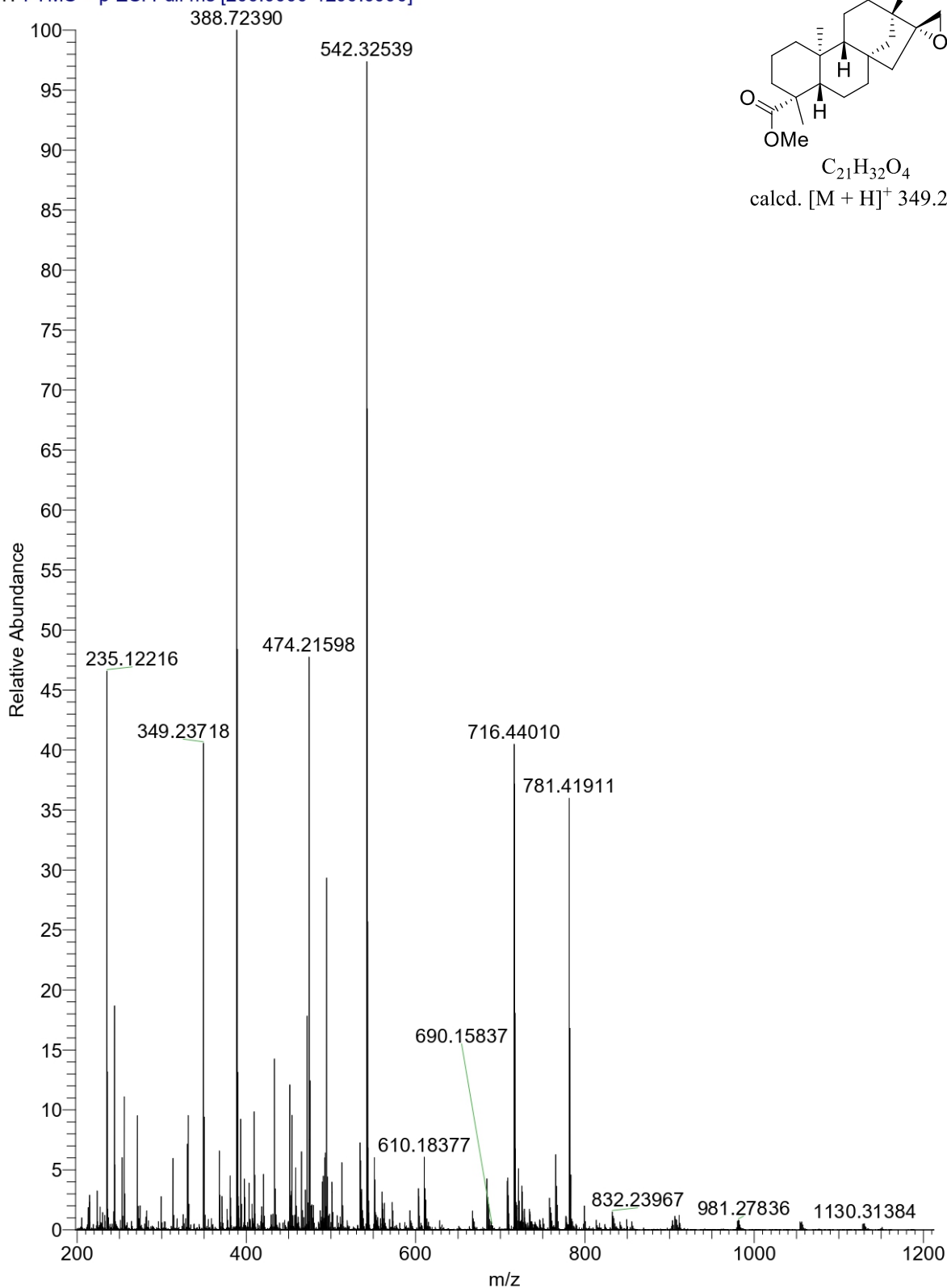
HRMS of compound (2'S,4R,4aS,6aS,11aR,11bS)-methyl 9-hydroxy-4,11b-dimethyldodecahydro-1H-spiro[6a,9-methanocyclohepta[a]naphthalene-8,2'-oxirane]-4-carboxylate (**3**)

D:\DATA\...\Robi\20230927\GYK-20230927-1
D3-tol

09/27/23 16:24:56

GYK-20230927-1 #33426-33468 RT: 74.20-74.30 AV: 43 NL: 1.88E7

T: FTMS + p ESI Full ms [200.0000-1200.0000]



$C_{21}H_{32}O_4$

calcd. $[M + H]^+$ 349.2373

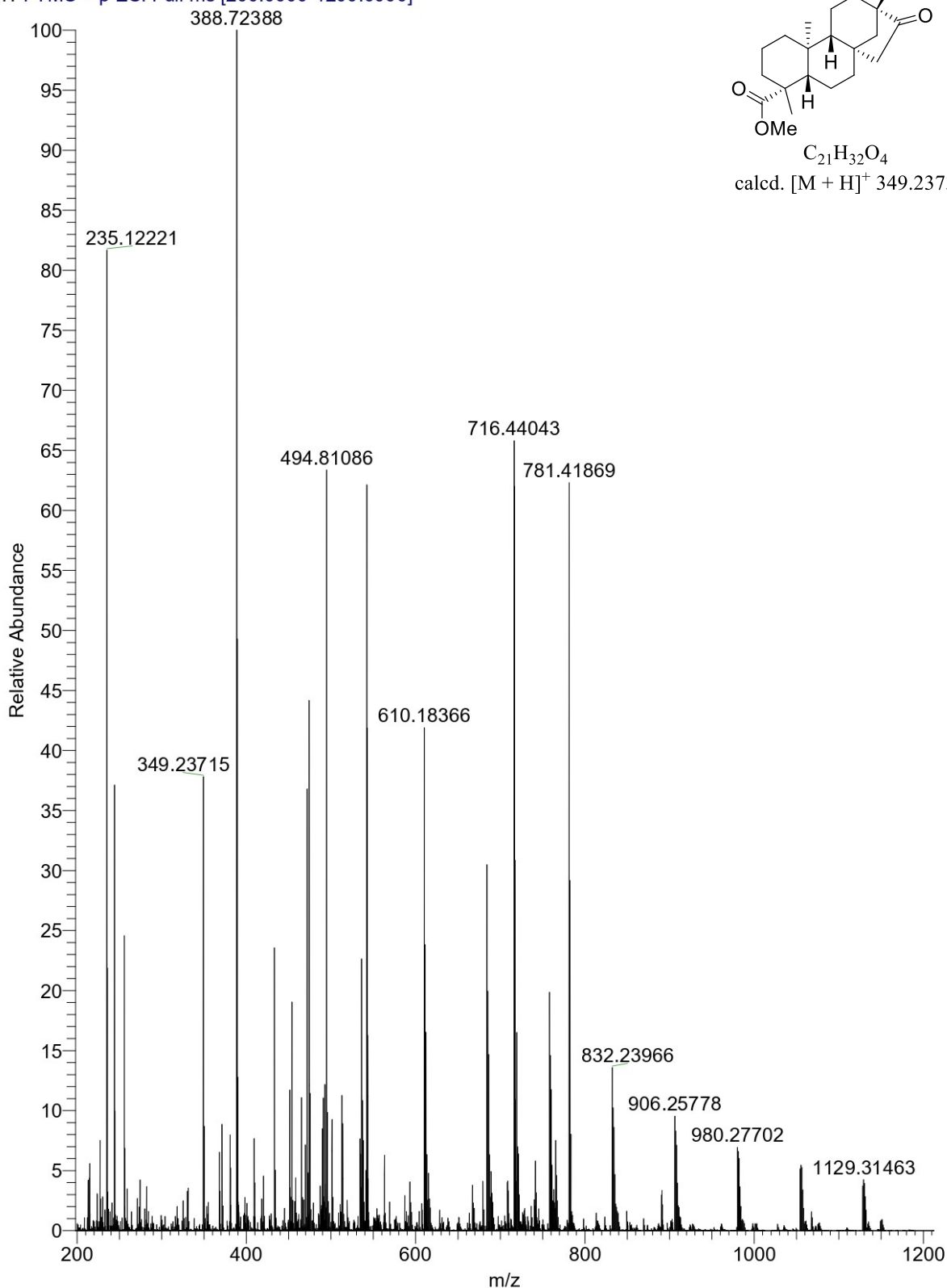
HRMS of compound (4*R*,4*aS*,6*aR*,9*S*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-oxotetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**4**)

D:\DATA\...Robi\20230927\GYK-20230927-1
D3-tol

09/27/23 16:24:56

GYK-20230927-1 #34157-34205 RT: 75.83-75.93 AV: 49 NL: 9.18E6

T: FTMS + p ESI Full ms [200.0000-1200.0000]



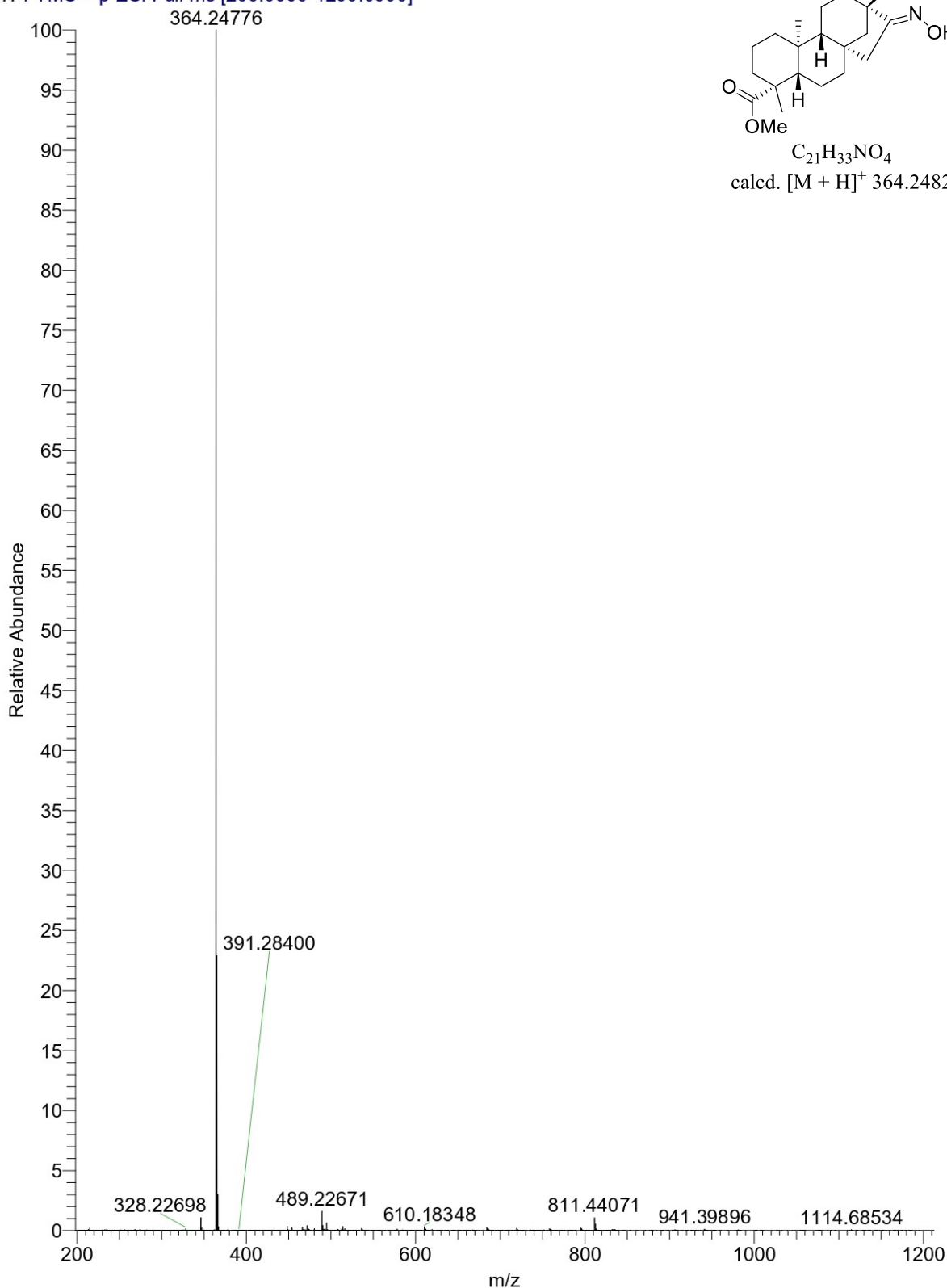
HRMS of compound (4*R*,4*aS*,6*aR*,9*R*,11*aR*,11*bS*,*E*)-methyl 8-(hydroxyimino)-9-(hydroxymethyl)-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**5**)

D:\DATA\...\Robi\20230927\GYK-20230927-1
D3-tol

09/27/23 16:24:56

GYK-20230927-1 #34900-34948 RT: 77.48-77.58 AV: 49 NL: 3.55E8

T: FTMS + p ESI Full ms [200.0000-1200.0000]



HRMS of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 8-amino-9-(hydroxymethyl)-4,11b-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**6**)

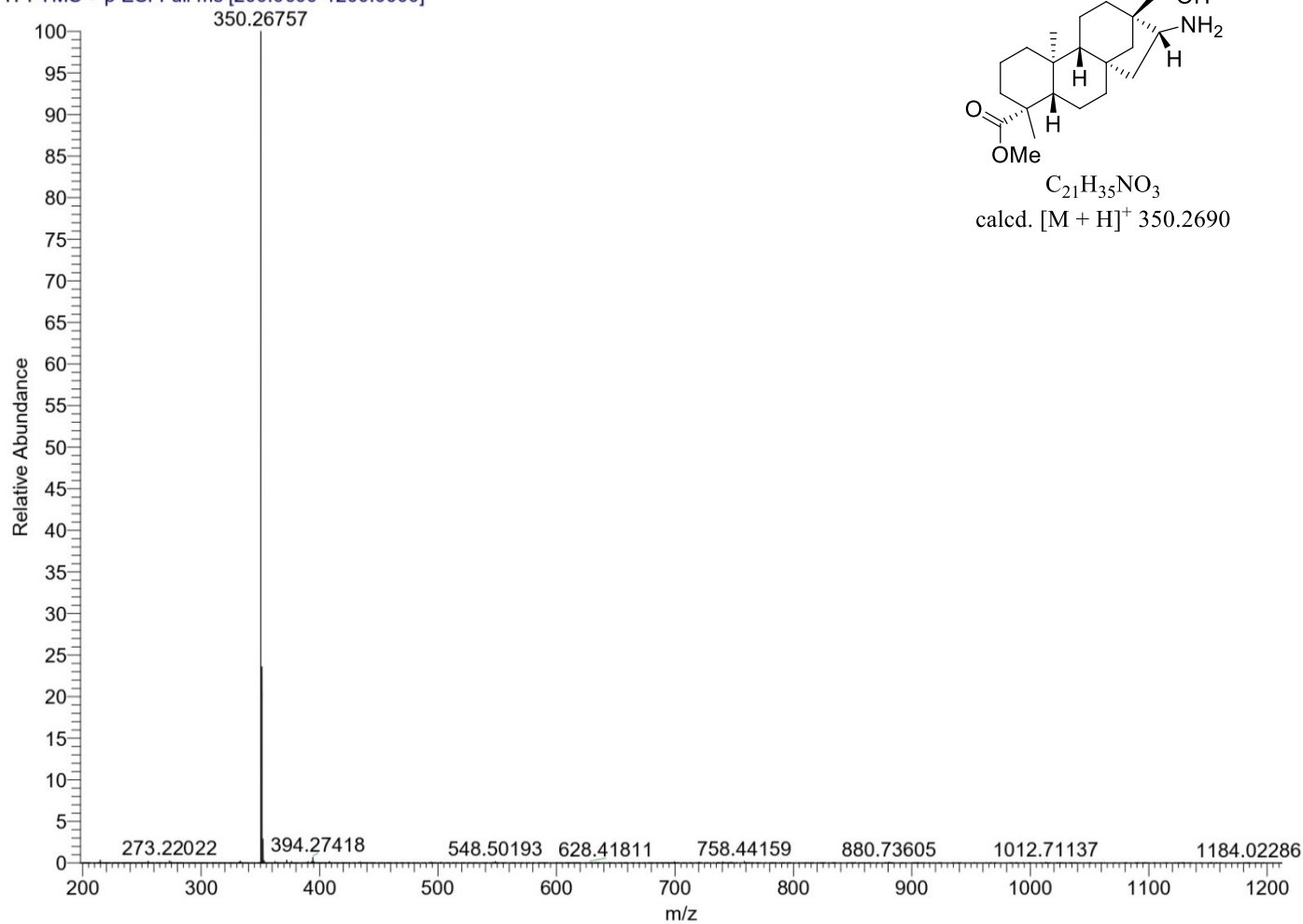
D:\DATAExp\...\20231103\GYK-20230927

11/03/23 11:26:54

FR, HG, HM

GYK-20230927 #761-799 RT: 1.69-1.77 AV: 39 NL: 2.23E9

T: FTMS + p ESI Full ms [200.0000-1200.0000]



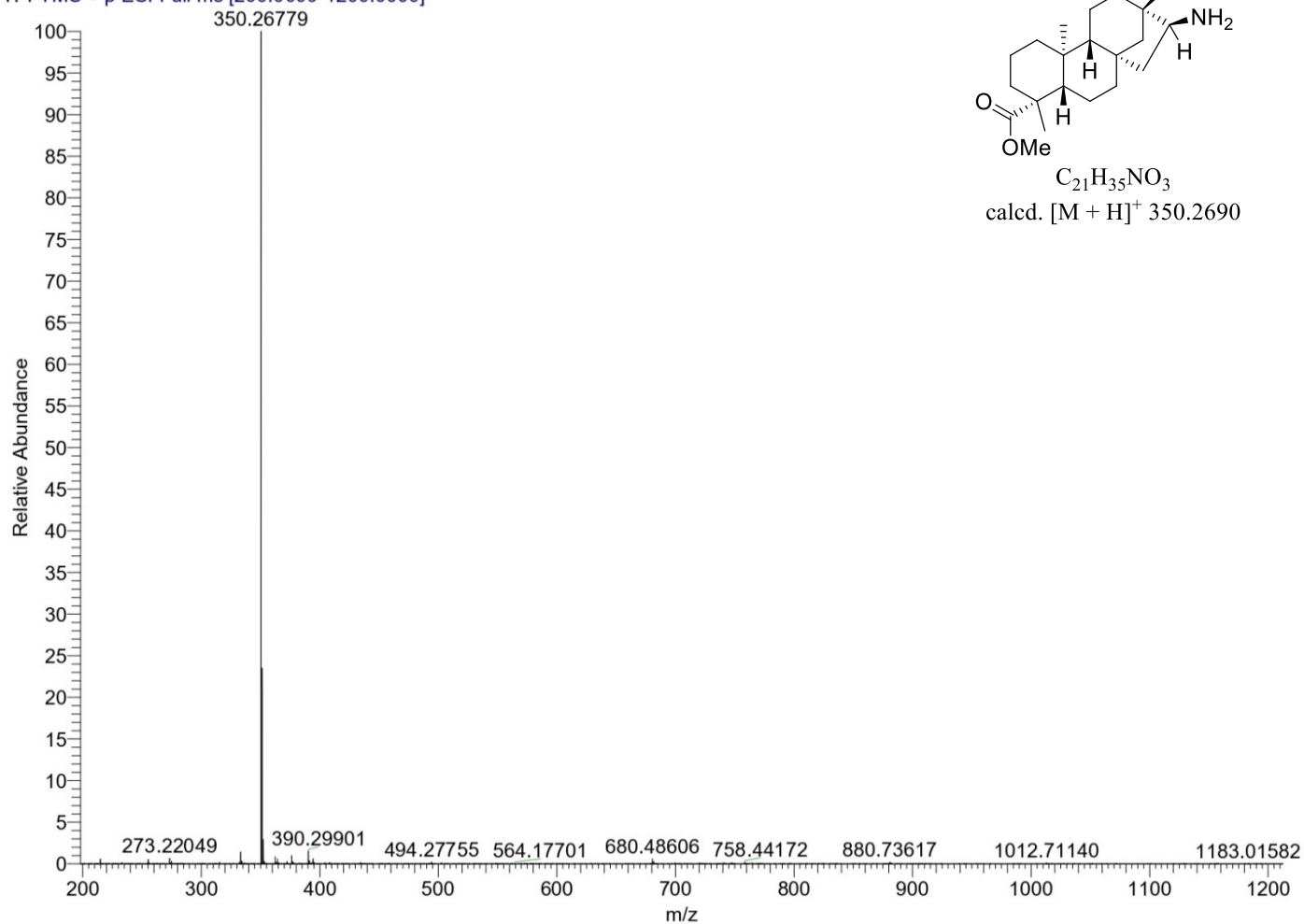
HRMS of compound (4*R*,4*aS*,6*aR*,8*S*,9*R*,11*aR*,11*bS*)-methyl 8-amino-9-(hydroxymethyl)-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**7**)

D:\DATAExp\...\20231103\GYK-20230927
FR, HG, HM

11/03/23 11:26:54

GYK-20230927 #1527-1552 RT: 3.39-3.44 AV: 26 NL: 2.05E9

T: FTMS + p ESI Full ms [200.0000-1200.0000]



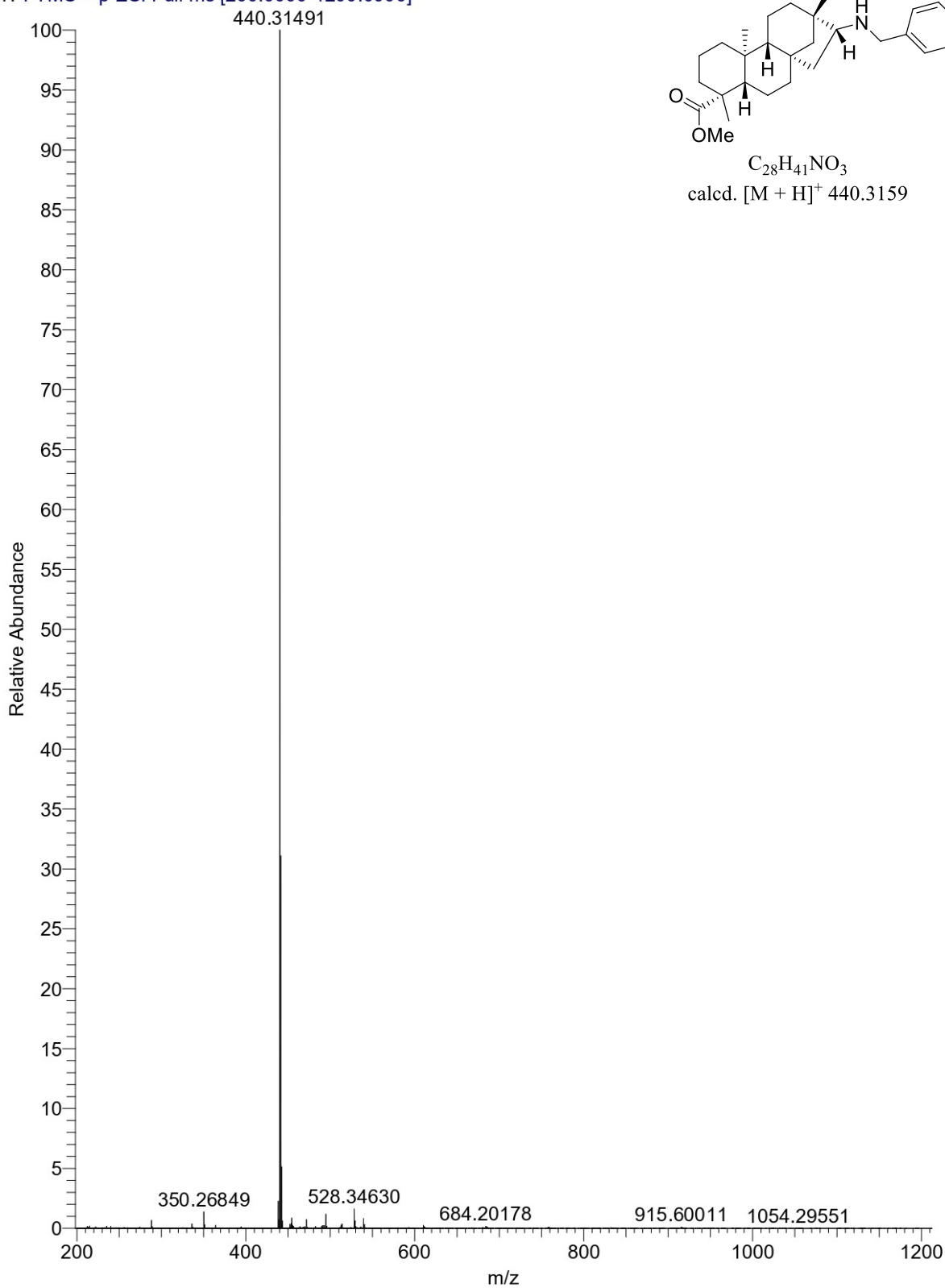
HRMS of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 8-(benzylamino)-9-(hydroxymethyl)-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**8**)

D:\DATA\...Robi\20230927\GYK-20230927-1
D3-tol

09/27/23 16:24:56

GYK-20230927-1 #35605-35679 RT: 79.04-79.21 AV: 75 NL: 4.44E8

T: FTMS + p ESI Full ms [200.0000-1200.0000]



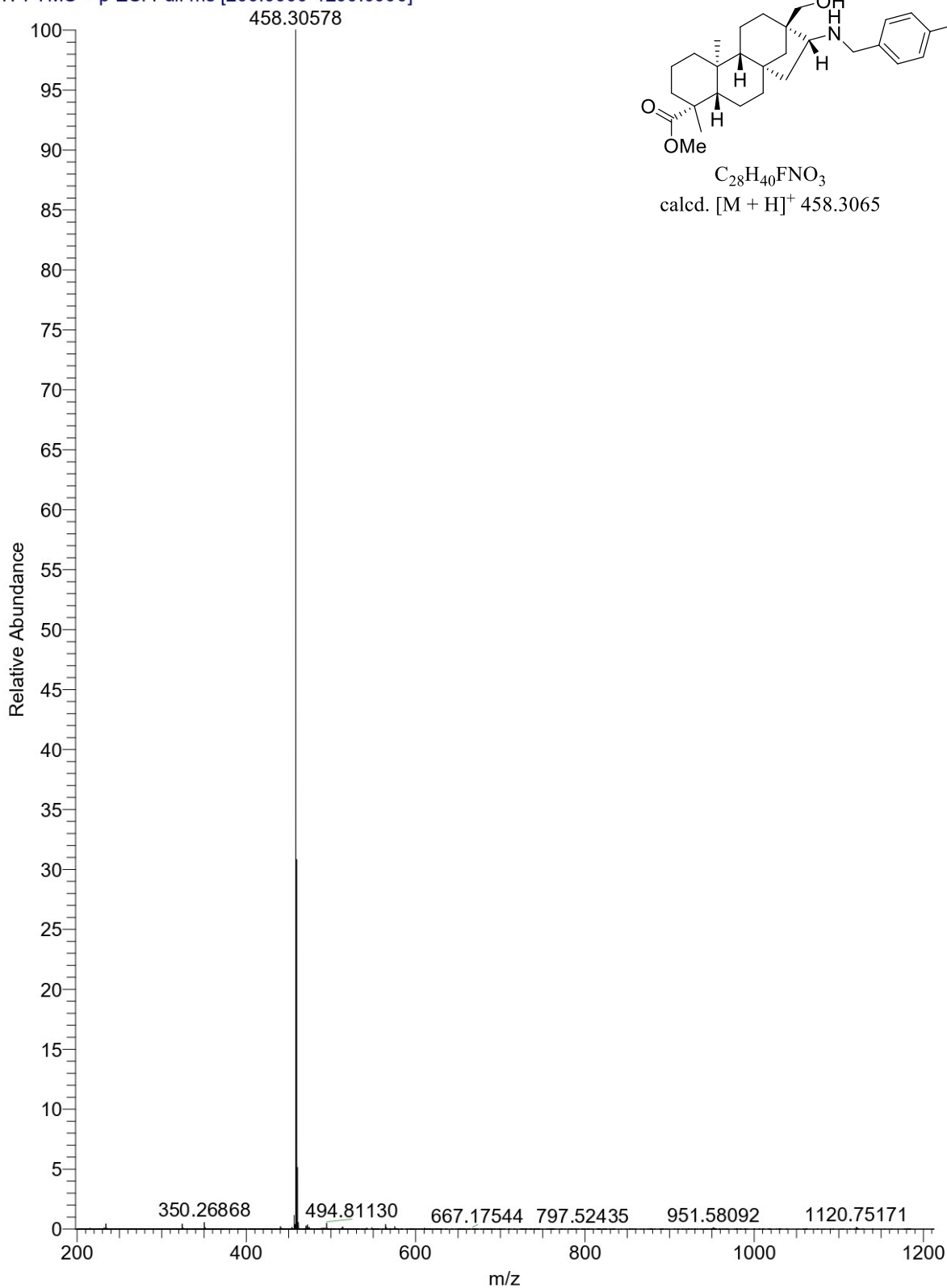
HRMS of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 8-((4-fluorobenzyl)amino)-9-(hydroxymethyl)-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**9**)

D:\DATA\...\Robi\20230927\GYK-20230927-1
D3-tol

09/27/23 16:24:56

GYK-20230927-1 #36348-36406 RT: 80.69-80.82 AV: 59 NL: 6.56E8

T: FTMS + p ESI Full ms [200.0000-1200.0000]



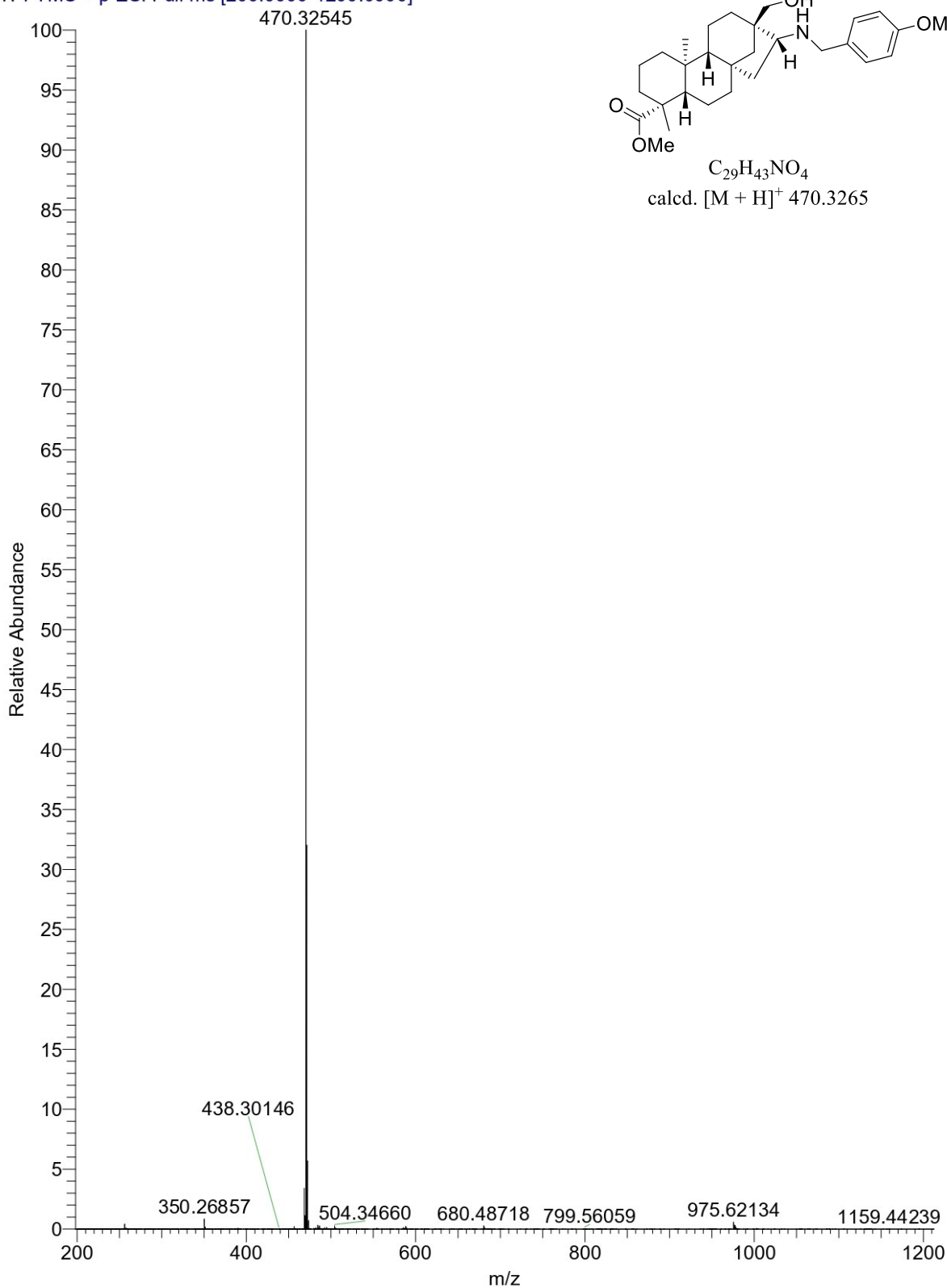
HRMS of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-8-((4-methoxybenzyl)amino)-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**10**)

D:\DATA\...\Robi\20230927\GYK-20230927-1
D3-tol

09/27/23 16:24:56

GYK-20230927-1 #42238-42278 RT: 93.77-93.86 AV: 41 NL: 1.36E9

T: FTMS + p ESI Full ms [200.0000-1200.0000]



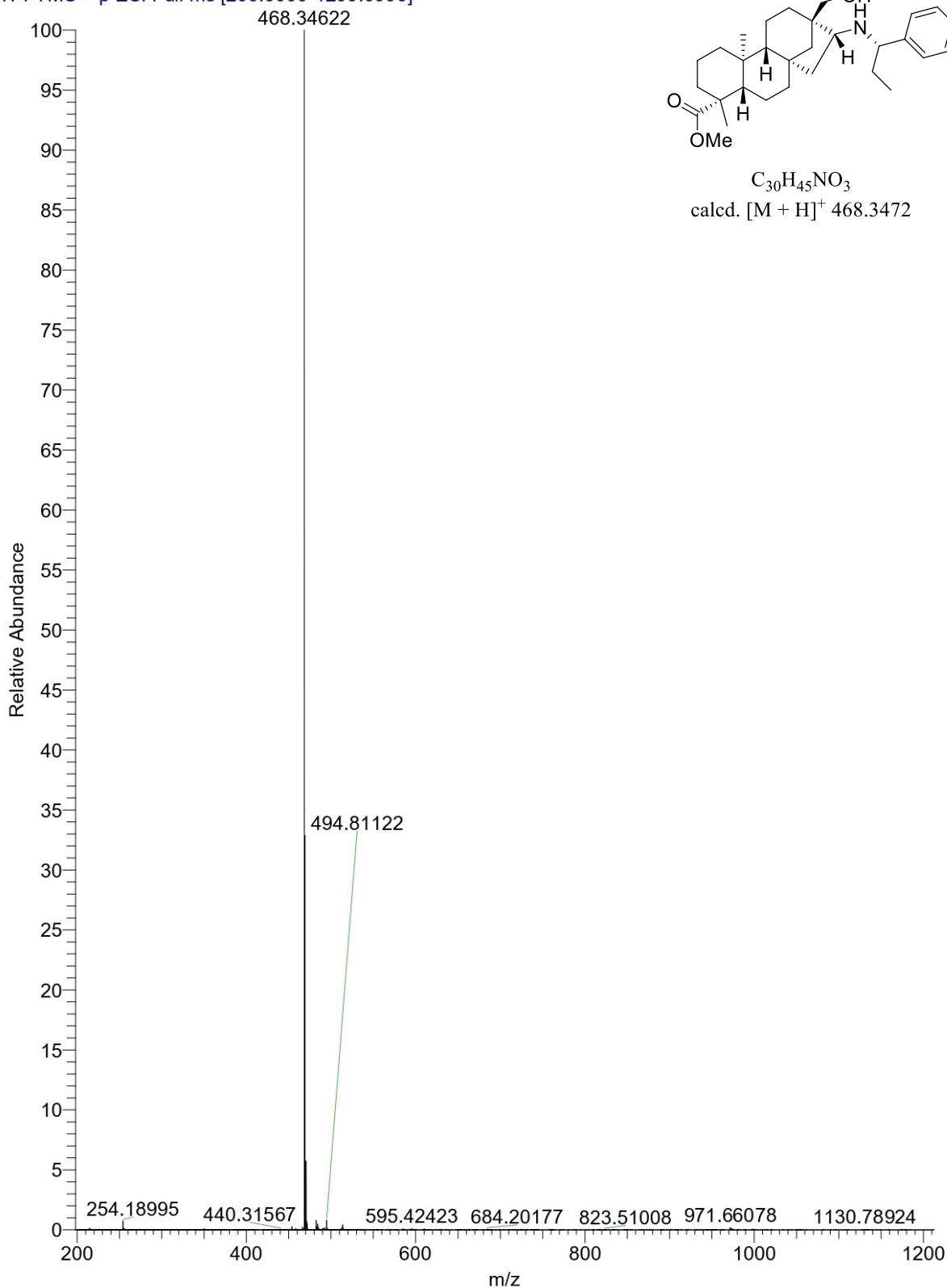
HRMS of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*S*)-1-phenylpropyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (11)

D:\DATA\...IRobil\20230927\GYK-20230927-1
D3-tol

09/27/23 16:24:56

GYK-20230927-1 #37079-37132 RT: 82.31-82.43 AV: 54 NL: 7.46E8

T: FTMS + p ESI Full ms [200.0000-1200.0000]



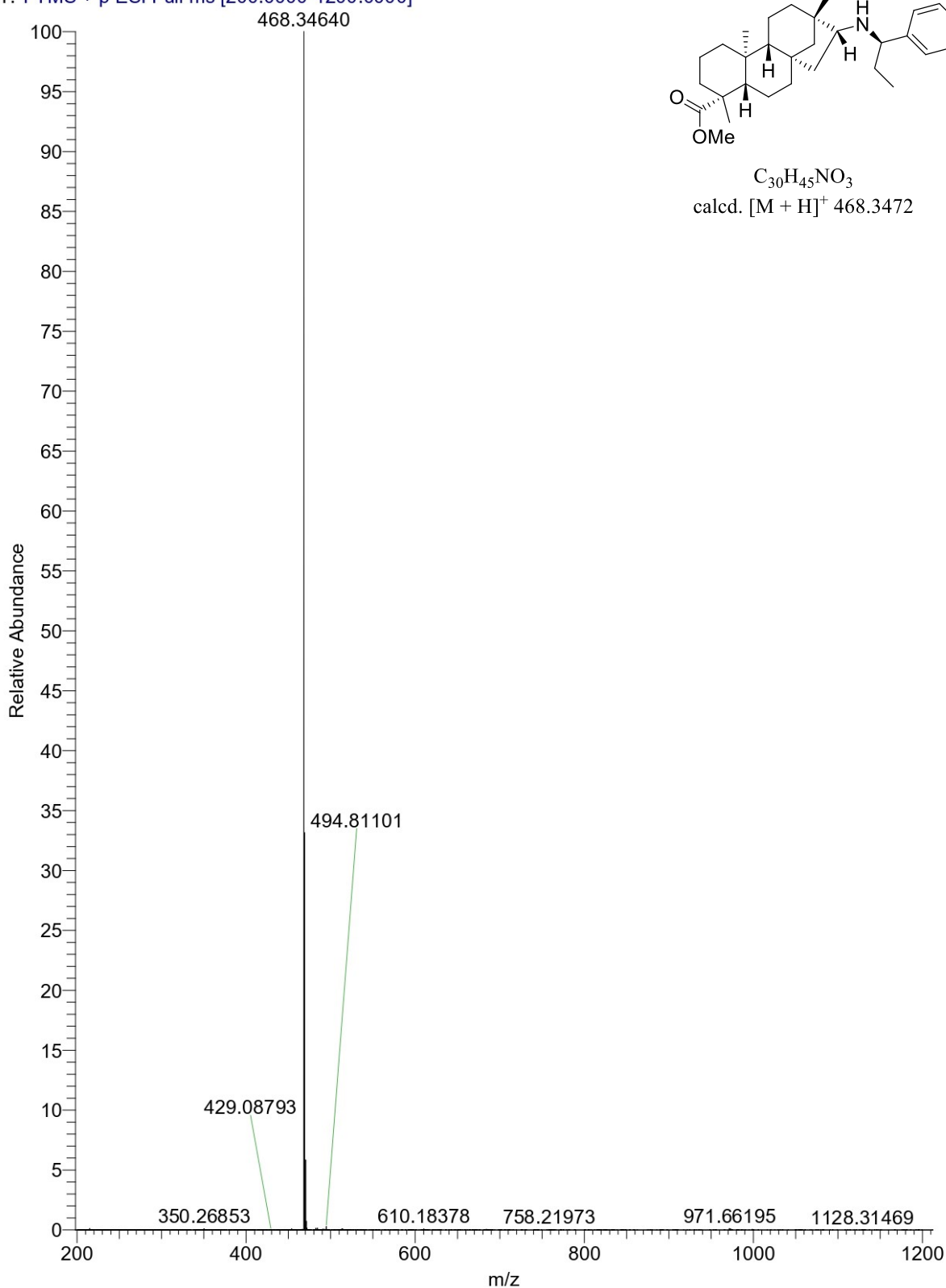
HRMS of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*R*)-1-phenylpropyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (12)

D:\DATA\...IRobil\20230927\GYK-20230927-1
D3-tol

09/27/23 16:24:56

GYK-20230927-1 #37806-37859 RT: 83.93-84.04 AV: 54 NL: 1.04E9

T: FTMS + p ESI Full ms [200.0000-1200.0000]



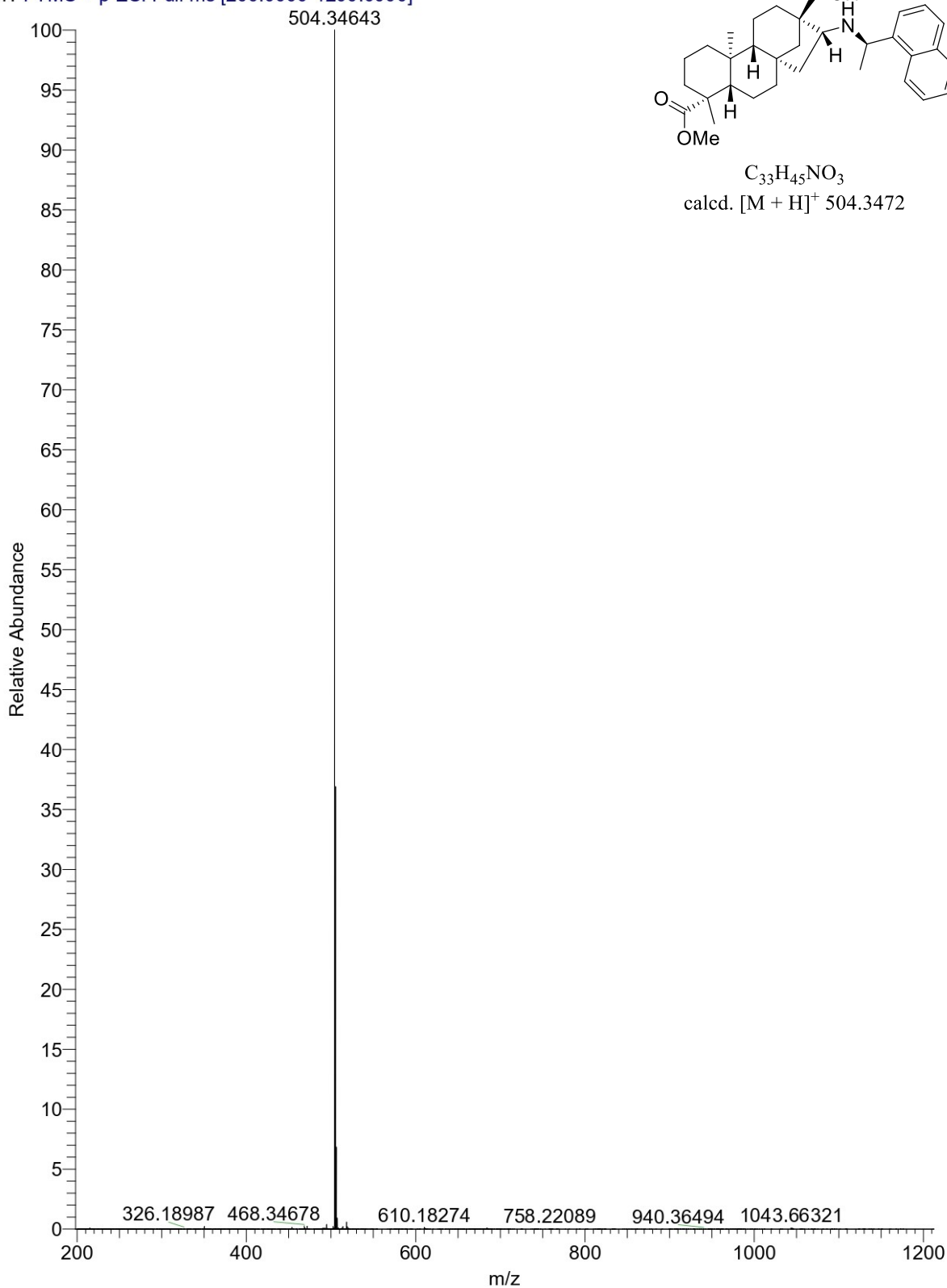
HRMS of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*R*)-1-(naphthalen-1-yl)ethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**13**)

D:\DATA\...\Robi\20230927\GYK-20230927-1
D3-tol

09/27/23 16:24:56

GYK-20230927-1 #38591-38633 RT: 85.67-85.76 AV: 43 NL: 1.01E9

T: FTMS + p ESI Full ms [200.0000-1200.0000]



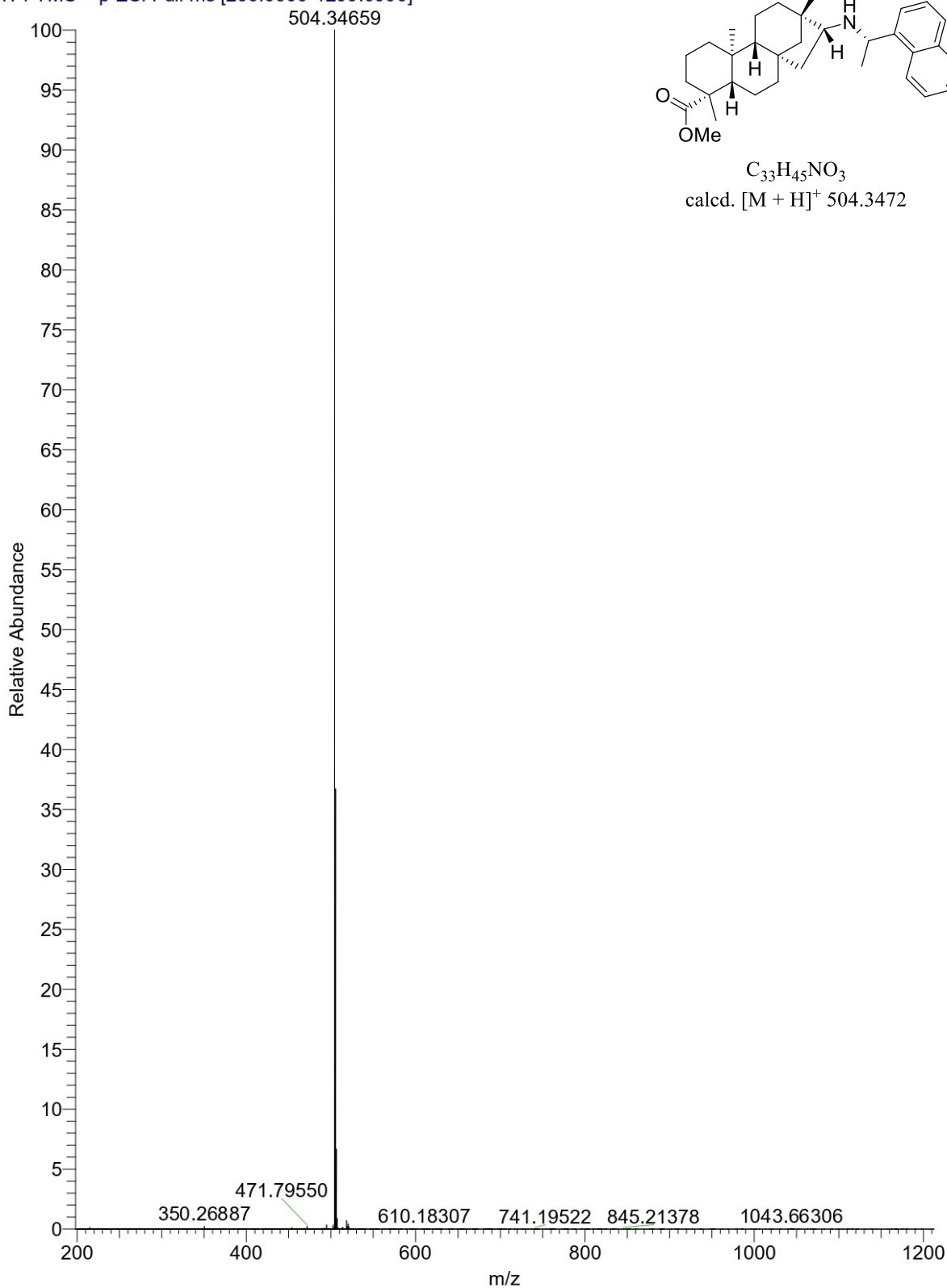
HRMS of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*S*)-1-(naphthalen-1-yl)ethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**14**)

D:\DATA\...\Robi\20230927\GYK-20230927-1
D3-tol

09/27/23 16:24:56

GYK-20230927-1 #39323-39370 RT: 87.29-87.40 AV: 48 NL: 7.54E8

T: FTMS + p ESI Full ms [200.0000-1200.0000]



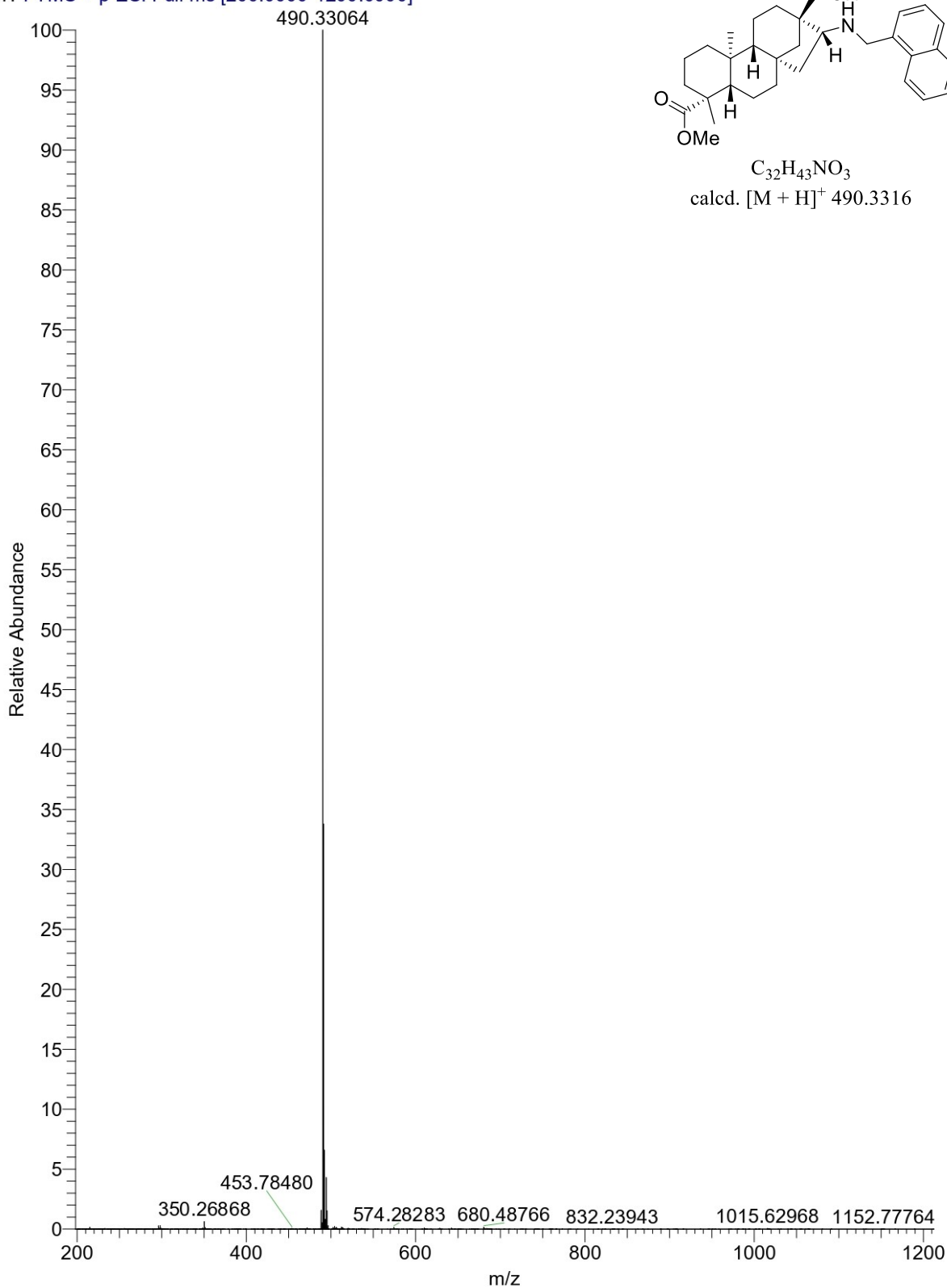
HRMS of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-((naphthalen-1-ylmethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**15**)

D:\DATA\...\Robi\20230927\GYK-20230927-1
D3-tol

09/27/23 16:24:56

GYK-20230927-1 #40060-40091 RT: 88.93-89.00 AV: 32 NL: 1.07E9

T: FTMS + p ESI Full ms [200.0000-1200.0000]



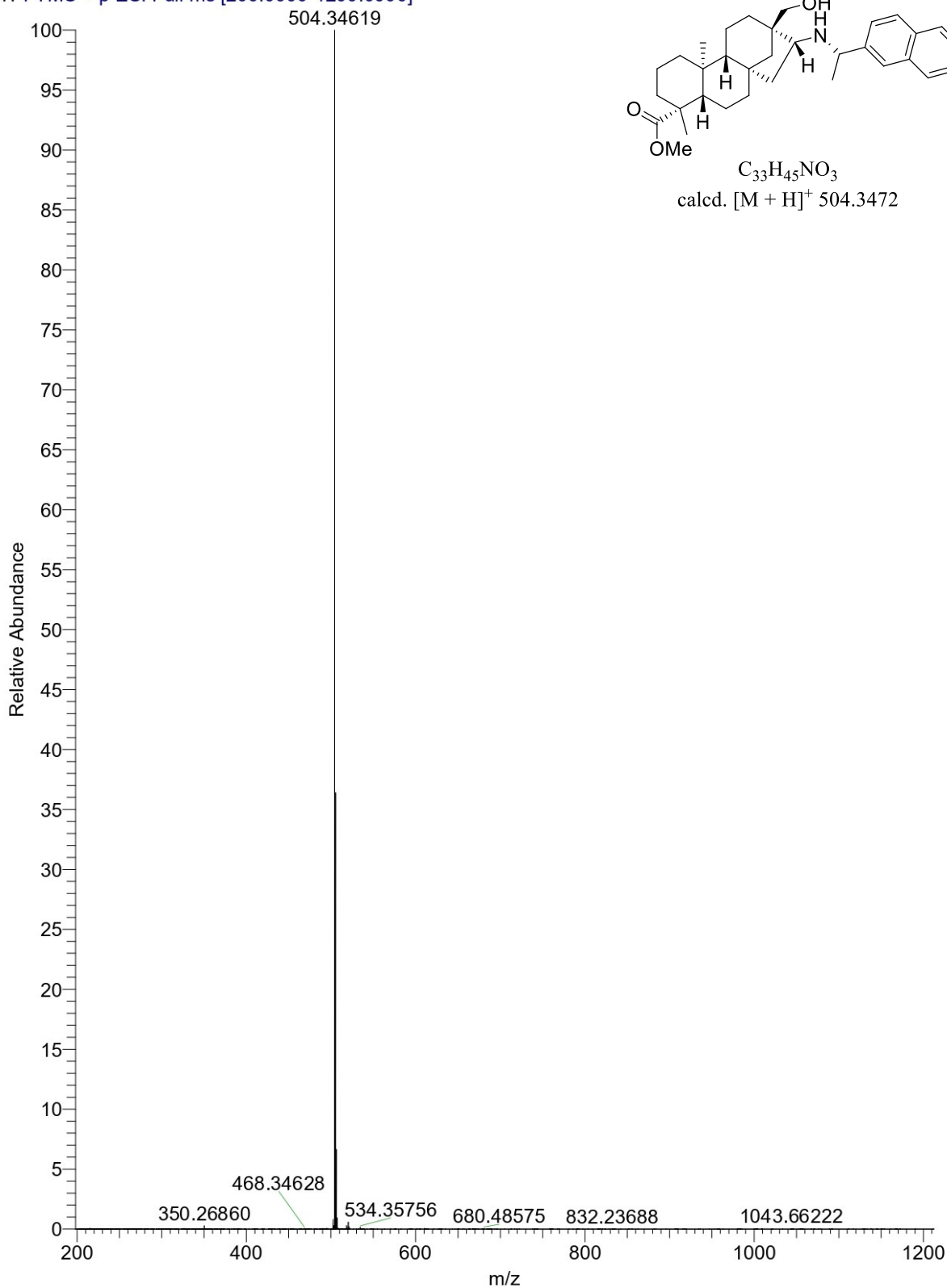
HRMS of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*S*)-1-(naphthalen-2-yl)ethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**16**)

D:\DATA\...\Robi\20230927\GYK-20230927-1
D3-tol

09/27/23 16:24:56

GYK-20230927-1 #40780-40812 RT: 90.53-90.60 AV: 33 NL: 1.40E9

T: FTMS + p ESI Full ms [200.0000-1200.0000]



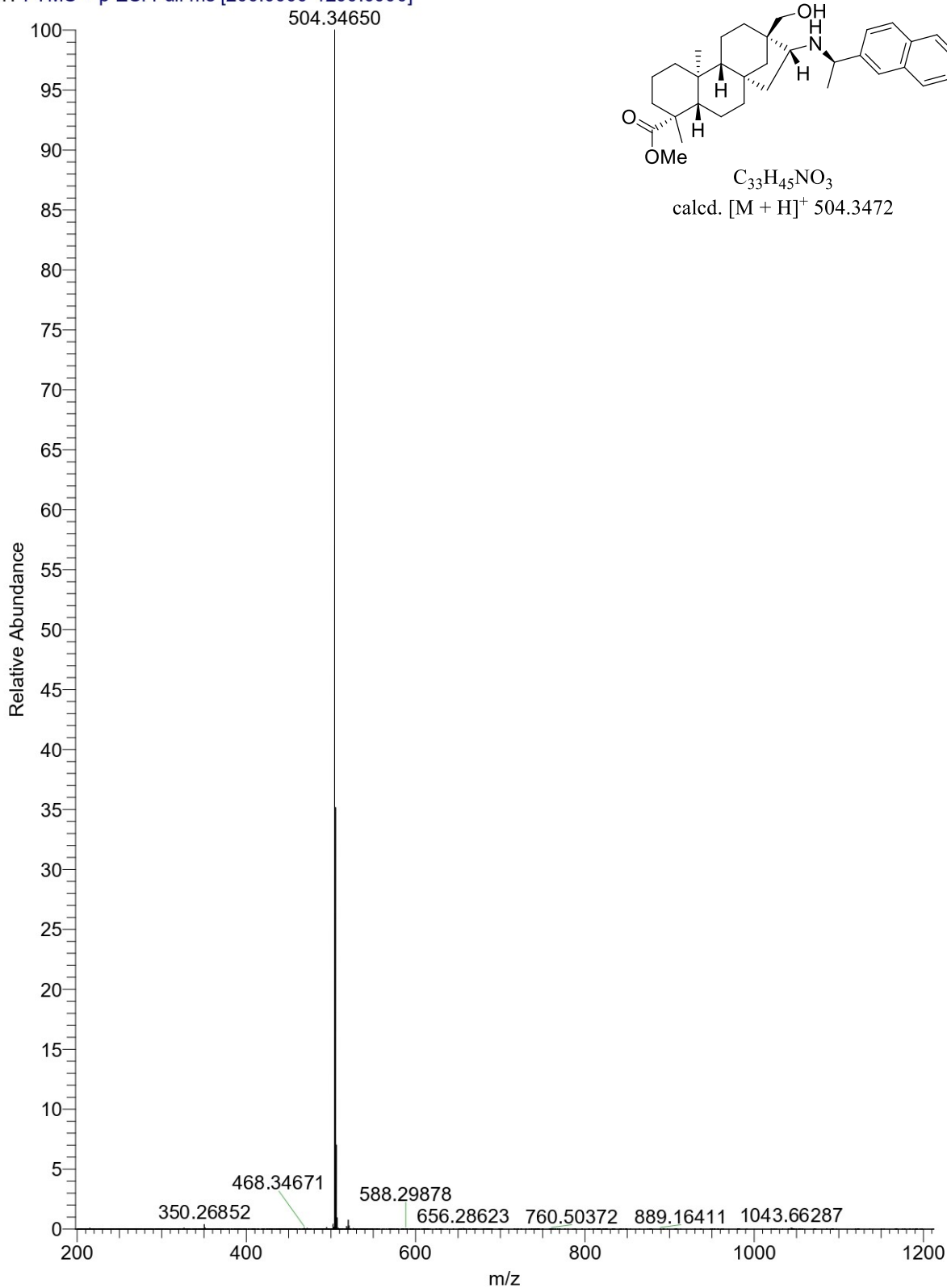
HRMS of compound (4*R*,4*aS*,6*aR*,8*R*,9*R*,11*aR*,11*bS*)-methyl 9-(hydroxymethyl)-4,11*b*-dimethyl-8-(((*R*)-1-(naphthalen-2-yl)ethyl)amino)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**17**)

D:\DATA\...\Robi\20230927\GYK-20230927-1
D3-tol

09/27/23 16:24:56

GYK-20230927-1 #41506-41531 RT: 92.14-92.20 AV: 26 NL: 1.39E9

T: FTMS + p ESI Full ms [200.0000-1200.0000]



HRMS of compound (4*R*,4*aS*,6*aR*,9*S*,11*aR*,11*bS*)-methyl 4,11*b*-dimethyl-9-(((methylsulfonyl)oxy)methyl)-8-oxotetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**18**)

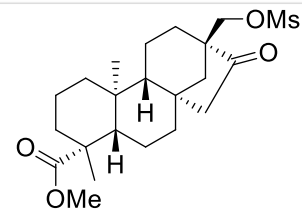
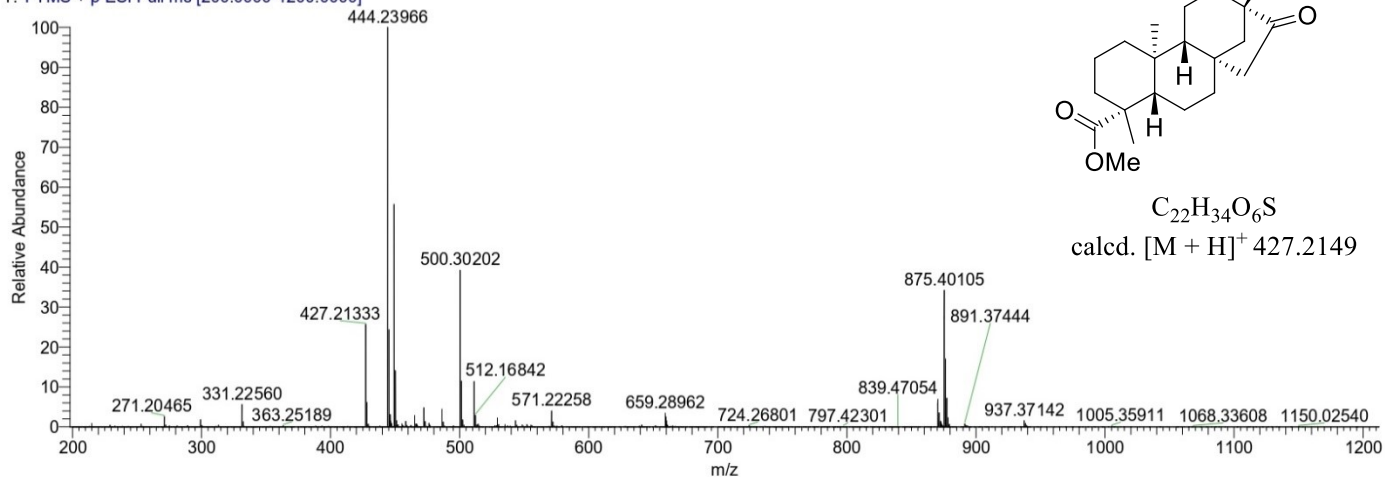
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11/03/23 11:26:54

FR, HG, HM

GYK-20230927 #2266-2308 RT: 5.03-5.12 AV: 43 NL: 5.84E8

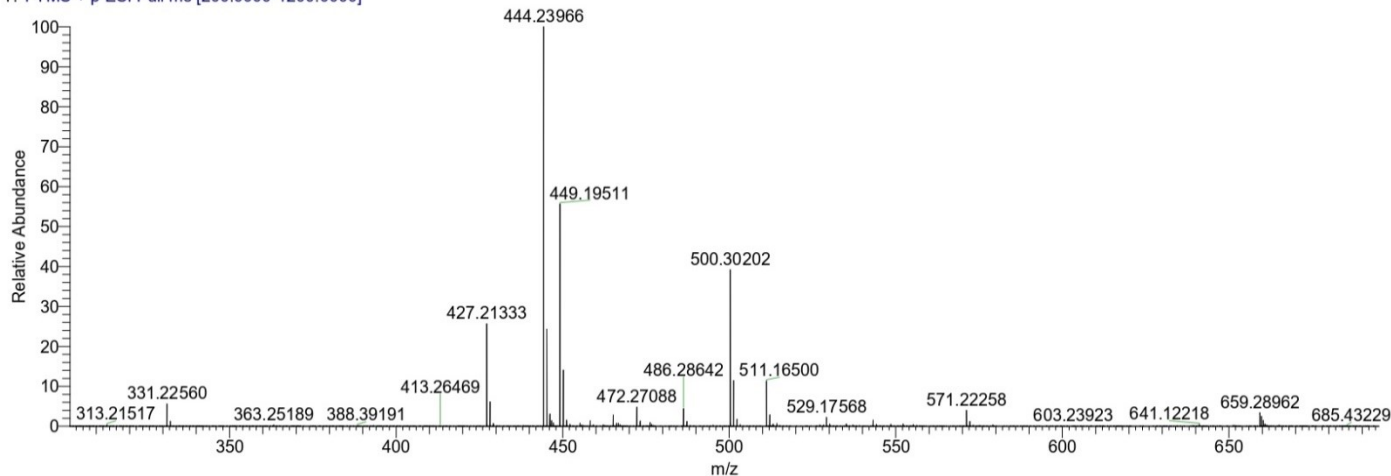
T: FTMS + p ESI Full ms [200.0000-1200.0000]



$C_{22}H_{34}O_6S$
calcd. $[M + H]^+$ 427.2149

GYK-20230927 #2266-2308 RT: 5.03-5.12 AV: 43 NL: 5.84E8

T: FTMS + p ESI Full ms [200.0000-1200.0000]



HRMS of compound (4*R*,4*aS*,6*aR*,9*S*,11*aR*,11*bS*)-methyl 9-(azidomethyl)-4,11*b*-dimethyl-8-oxotetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**19**)

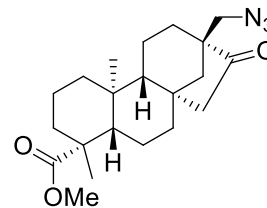
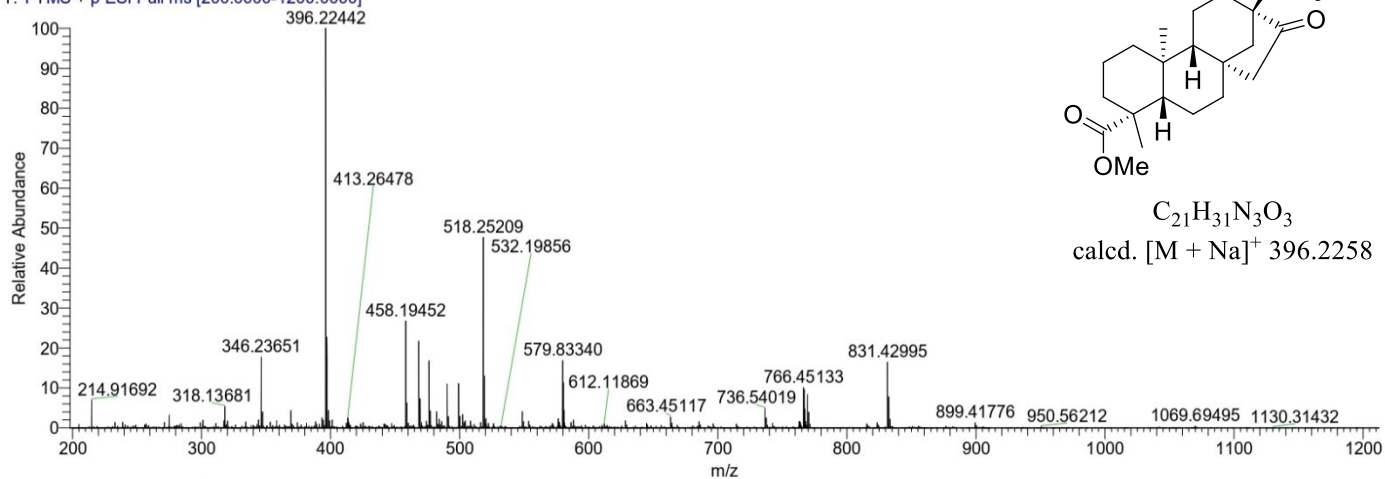
D:\DATAExp\...\20231103\GYK-20230927

11/03/23 11:26:54

FR, HG, HM

GYK-20230927 #2999-3029 RT: 6.65-6.72 AV: 31 NL: 9.51E7

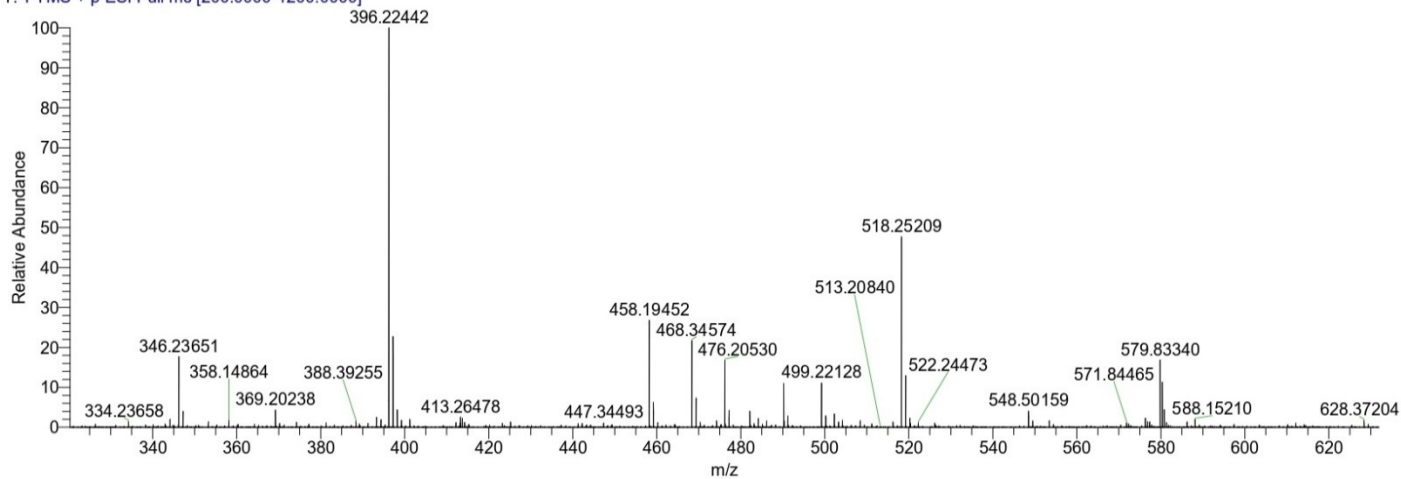
T: FTMS + p ESI Full ms [200.0000-1200.0000]



C₂₁H₃₁N₃O₃
calcd. [M + Na]⁺ 396.2258

GYK-20230927 #2999-3029 RT: 6.65-6.72 AV: 31 NL: 9.51E7

T: FTMS + p ESI Full ms [200.0000-1200.0000]



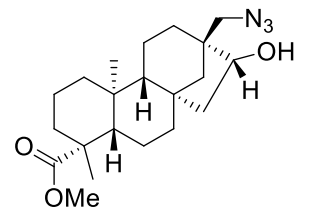
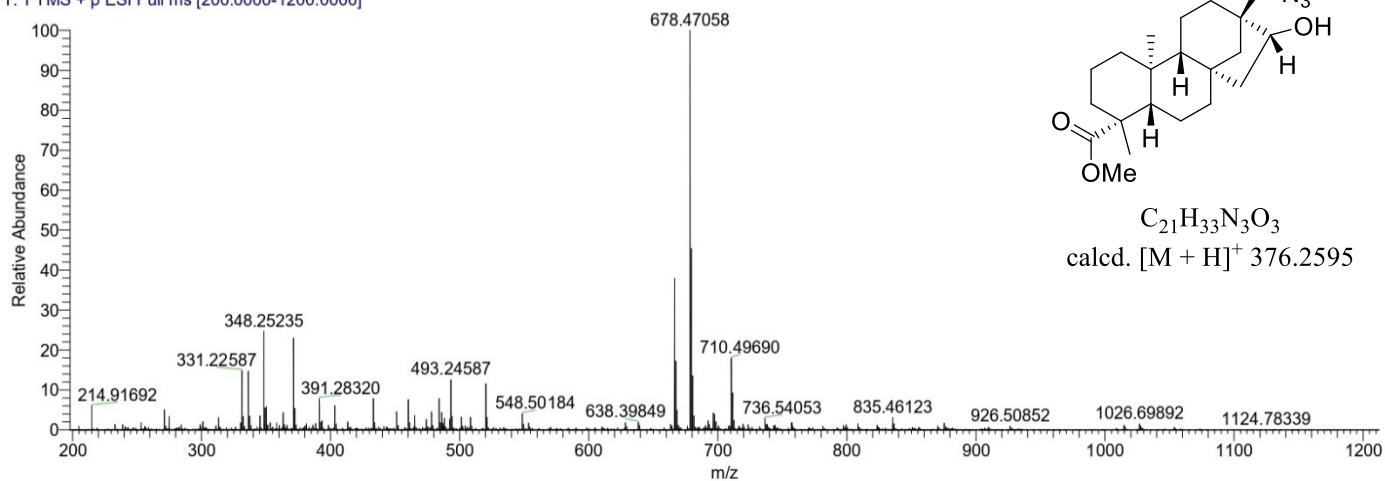
HRMS of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-(azidomethyl)-8-hydroxy-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**20**)

D:\DATAExp\...\20231103\GYK-20230927
FR, HG, HM

11/03/23 11:26:54

GYK-20230927 #3724-3751 RT: 8.26-8.32 AV: 28 NL: 8.45E7

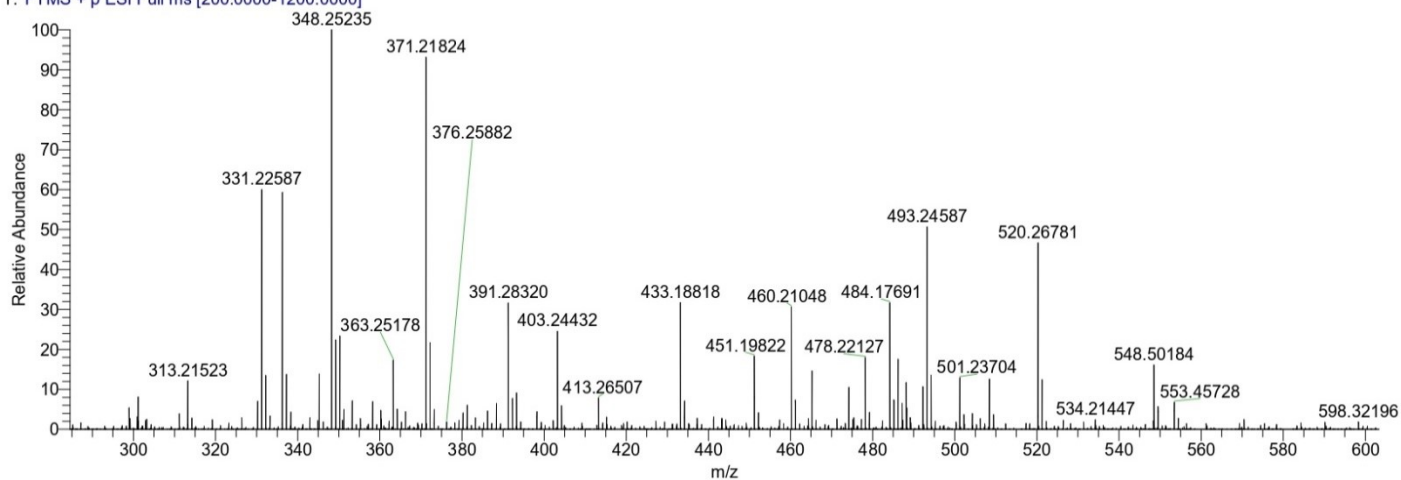
T: FTMS + p ESI Full ms [200.0000-1200.0000]



$C_{21}H_{33}N_3O_3$
calcd. $[M + H]^+$ 376.2595

GYK-20230927 #3724-3751 RT: 8.26-8.32 AV: 28 NL: 2.09E7

T: FTMS + p ESI Full ms [200.0000-1200.0000]



HRMS of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-(((methylsulfonyl)oxy)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**21**)

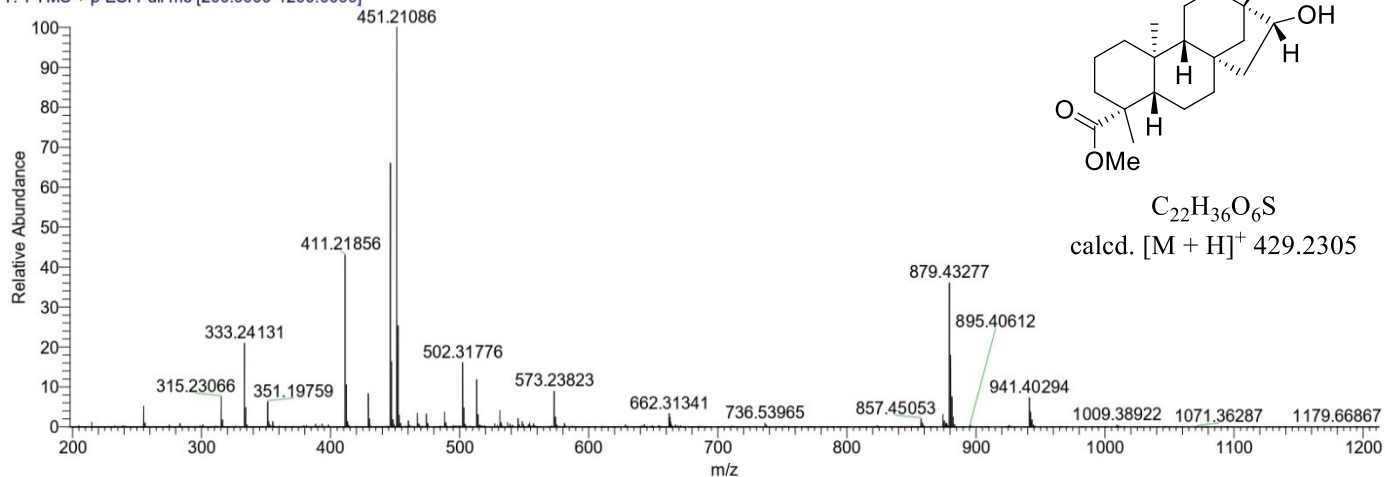
D:\DATAExp\...20231103\GYK-20230927

11/03/23 11:26:54

FR, HG, HM

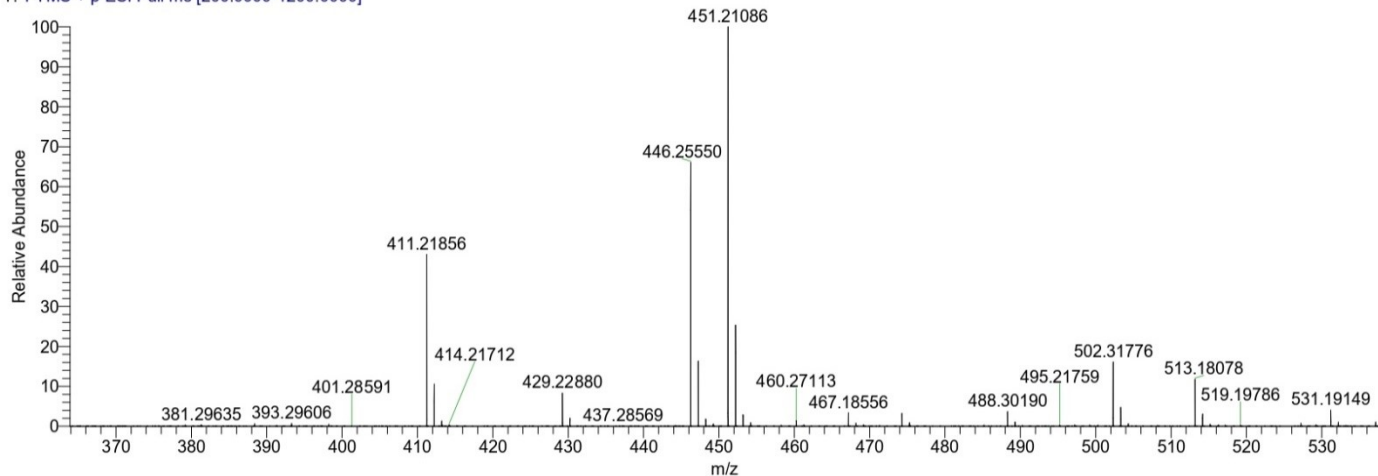
GYK-20230927 #4448-4486 RT: 9.87-9.95 AV: 39 NL: 2.61E8

T: FTMS + p ESI Full ms [200.0000-1200.0000]



GYK-20230927 #4448-4486 RT: 9.87-9.95 AV: 39 NL: 2.61E8

T: FTMS + p ESI Full ms [200.0000-1200.0000]



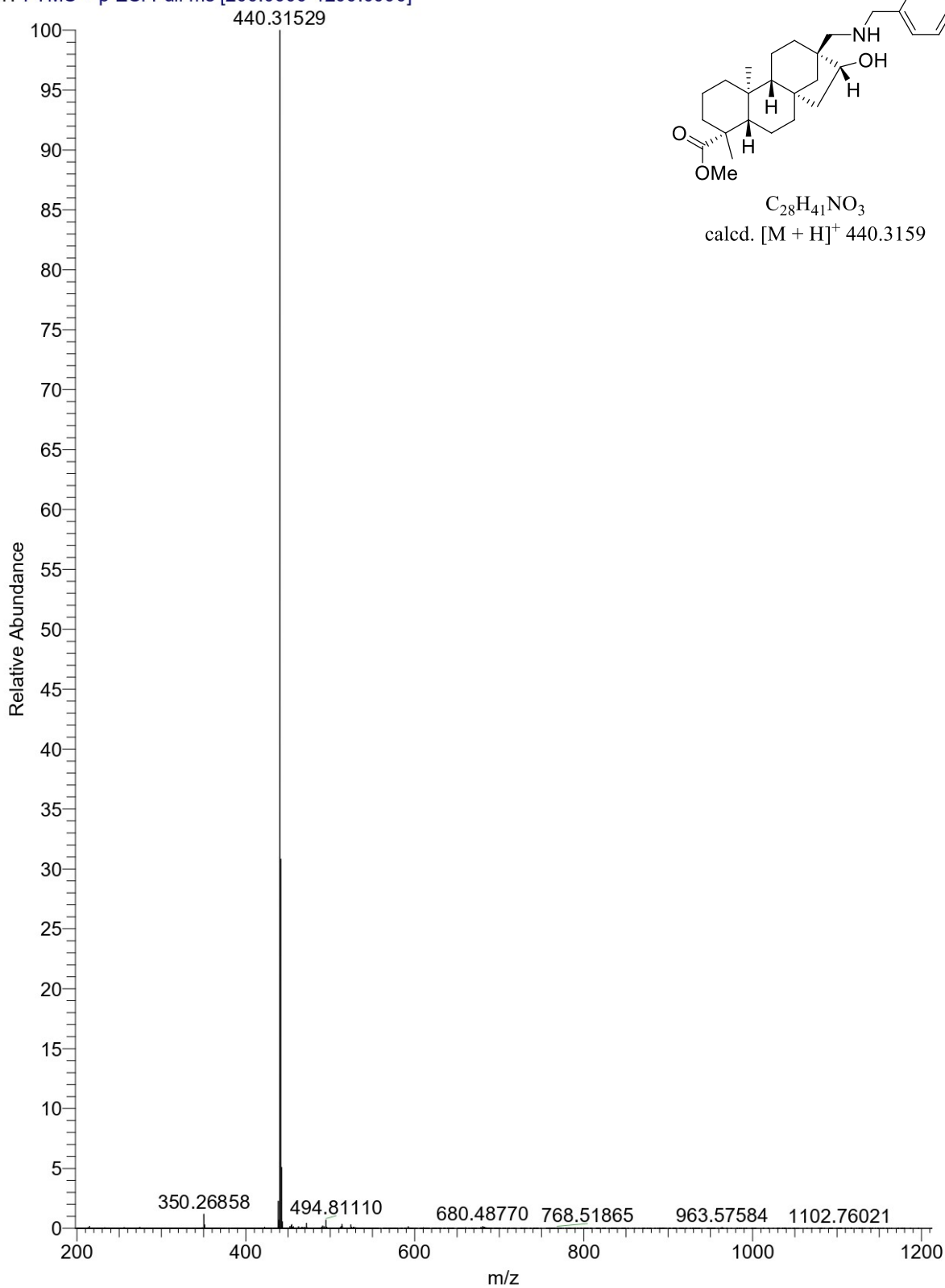
HRMS of compound (4*R*,4*a**S*,6*a**R*,8*R*,9*S*,11*a**R*,11*b**S*)-methyl 9-((benzylamino)methyl)-8-hydroxy-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**22**)

D:\DATA\...\Robi\20230927\GYK-20230927-1
D3-tol

09/27/23 16:24:56

GYK-20230927-1 #46710-46769 RT: 103.69-103.83 AV: 60 NL: 4.48E8

T: FTMS + p ESI Full ms [200.0000-1200.0000]



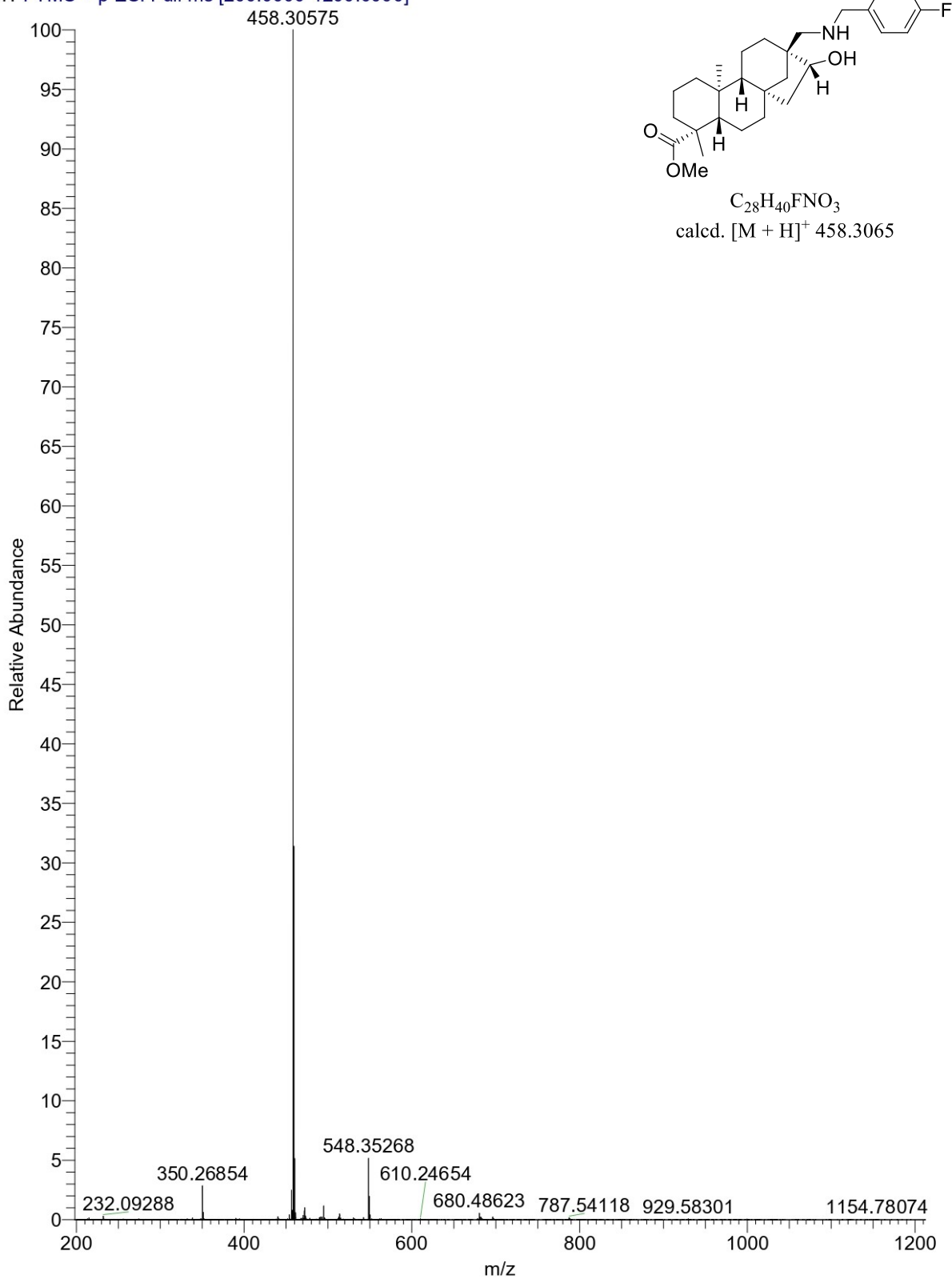
HRMS of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-(((4-fluorobenzyl)amino)methyl)-8-hydroxy-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**23**)

D:\DATA\...\Robi\20230927\GYK-20230927-1
D3-tol

09/27/23 16:24:56

GYK-20230927-1 #47446-47511 RT: 105.33-105.47 AV: 66 NL: 5.46E8

T: FTMS + p ESI Full ms [200.0000-1200.0000]



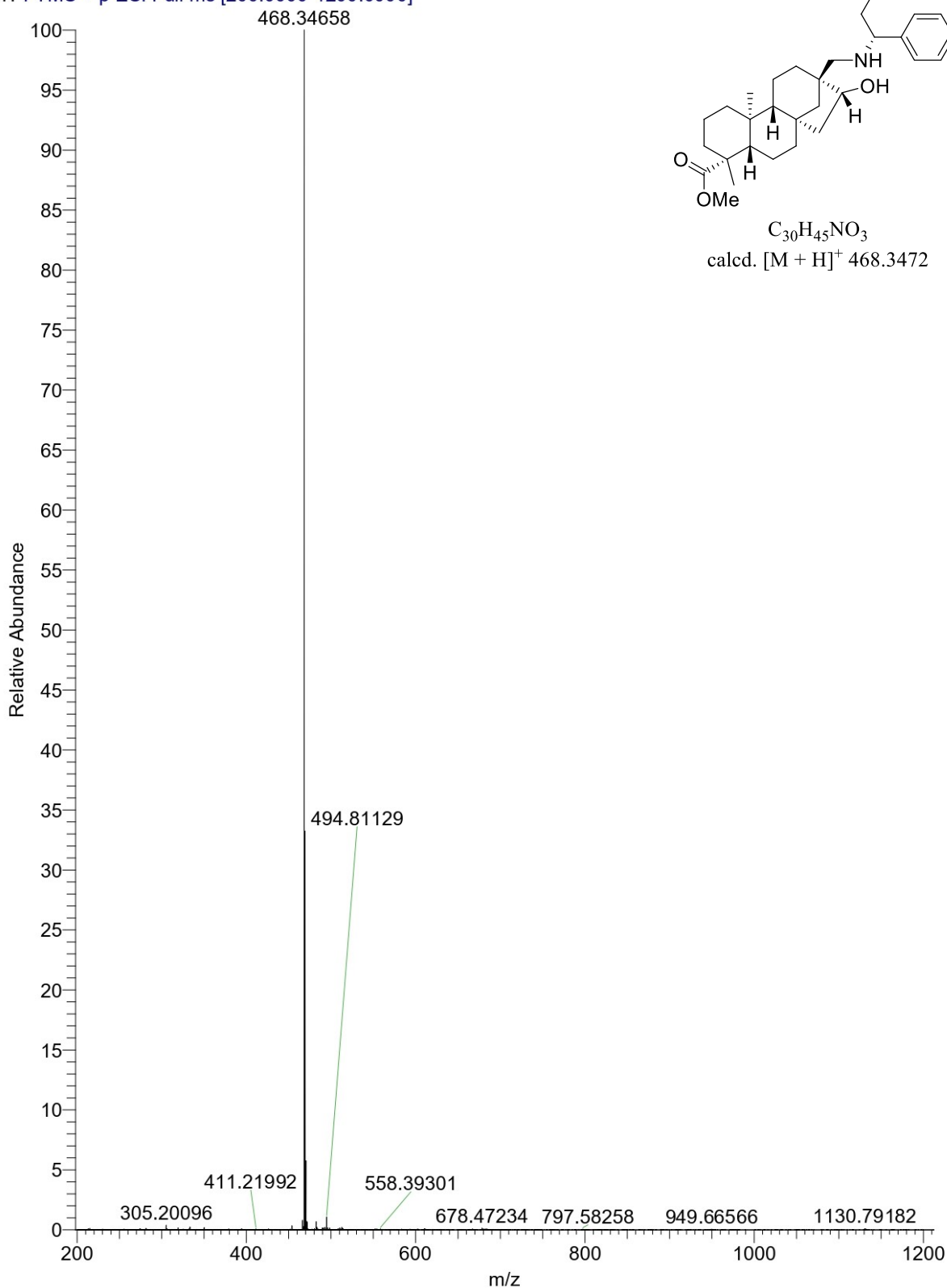
HRMS of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*R*)-1-phenylpropyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (24)

D:\DATA\...IRobil\20230927\GYK-20230927-1
D3-tol

09/27/23 16:24:56

GYK-20230927-1 #49666-49754 RT: 110.26-110.45 AV: 89 NL: 3.93E8

T: FTMS + p ESI Full ms [200.0000-1200.0000]



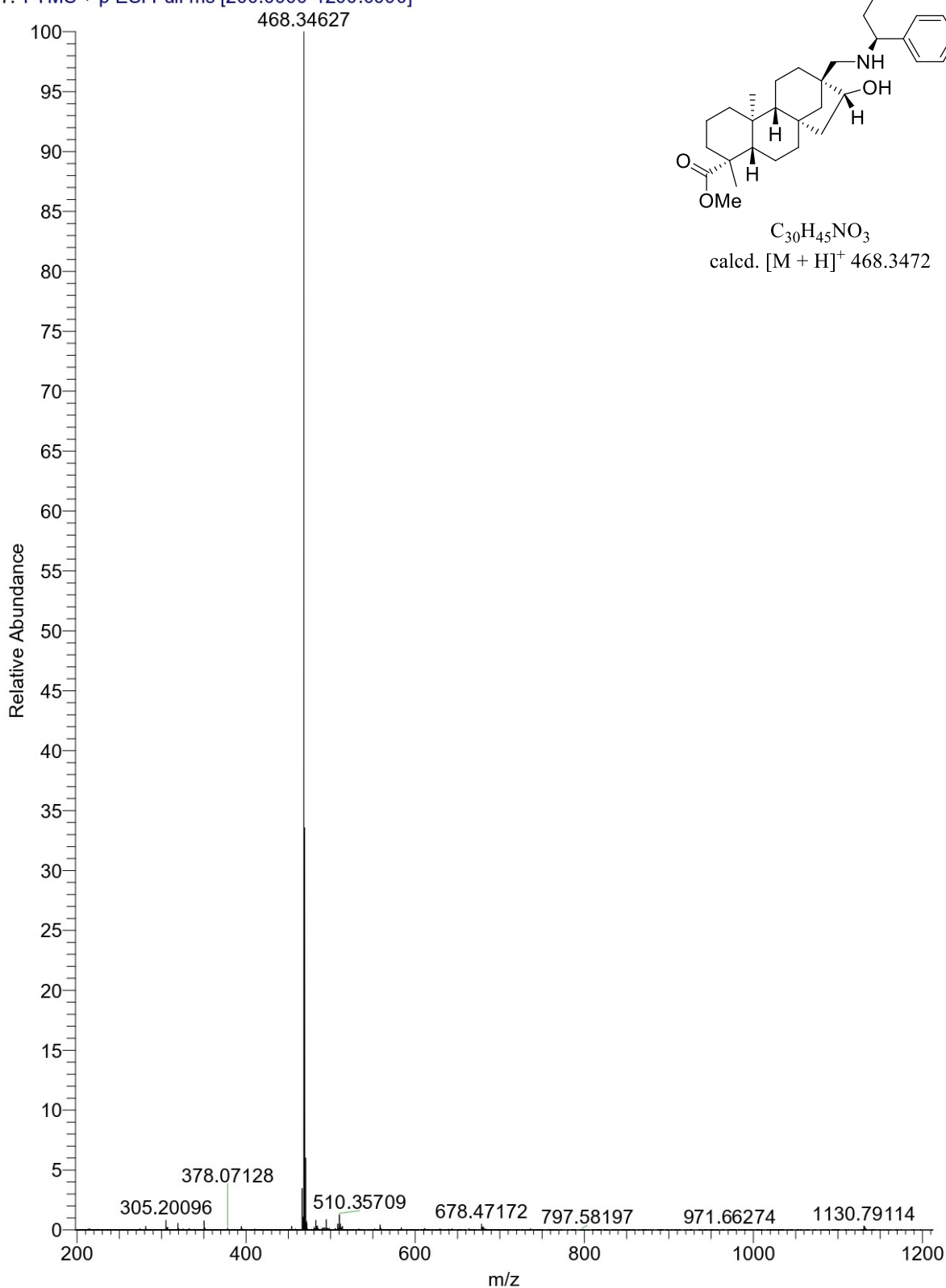
HRMS of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*S*)-1-phenylpropyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (25)

D:\DATA\...IRobil\20230927\GYK-20230927-1
D3-tol

09/27/23 16:24:56

GYK-20230927-1 #52728-52816 RT: 117.06-117.25 AV: 89 NL: 4.32E8

T: FTMS + p ESI Full ms [200.0000-1200.0000]



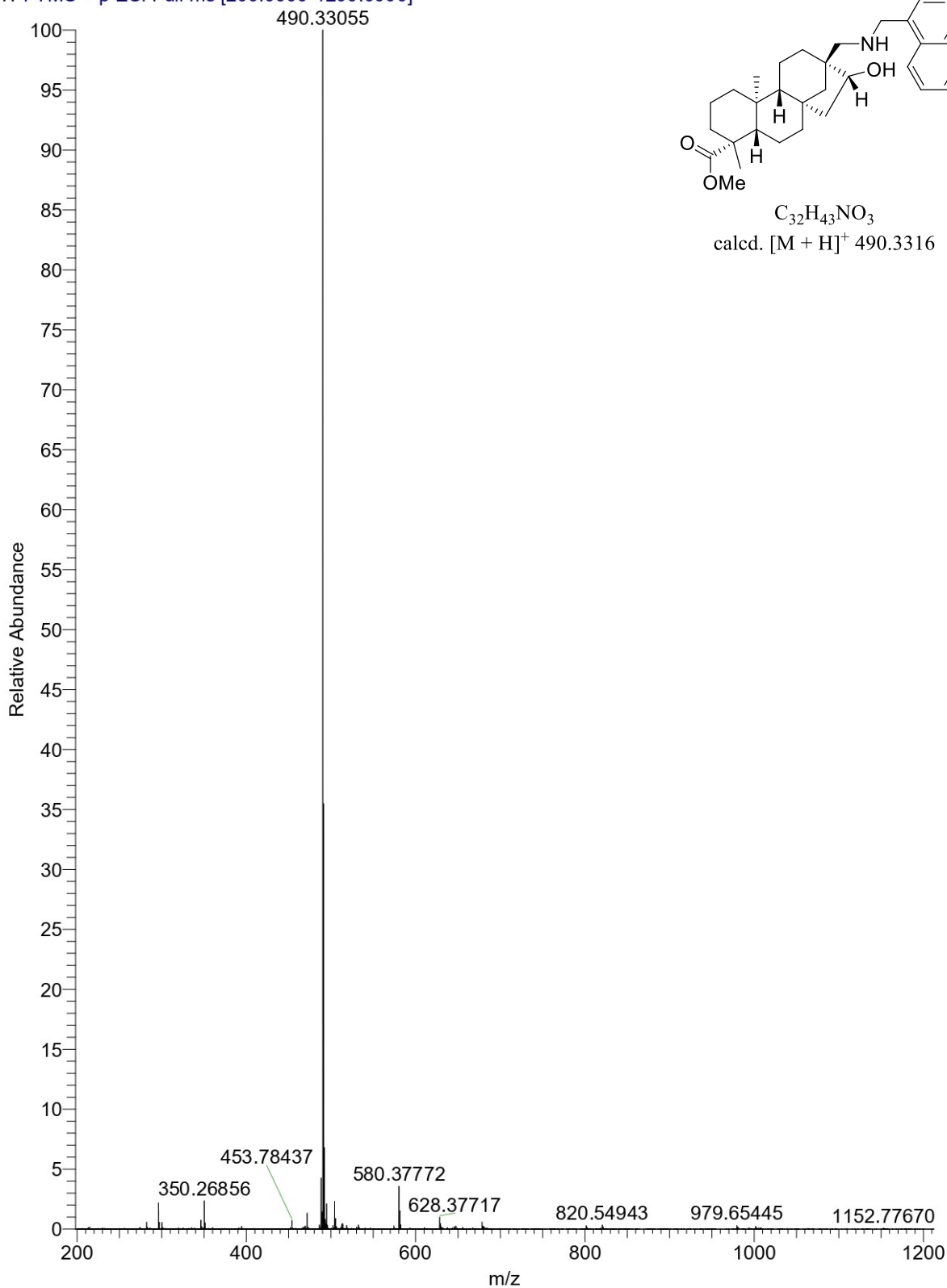
HRMS of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-(((naphthalen-1-ylmethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**26**)

D:\DATA\...\Robi\20230927\GYK-20230927-1
D3-tol

09/27/23 16:24:56

GYK-20230927-1 #50445-50544 RT: 111.99-112.21 AV: 100 NL: 2.73E8

T: FTMS + p ESI Full ms [200.0000-1200.0000]



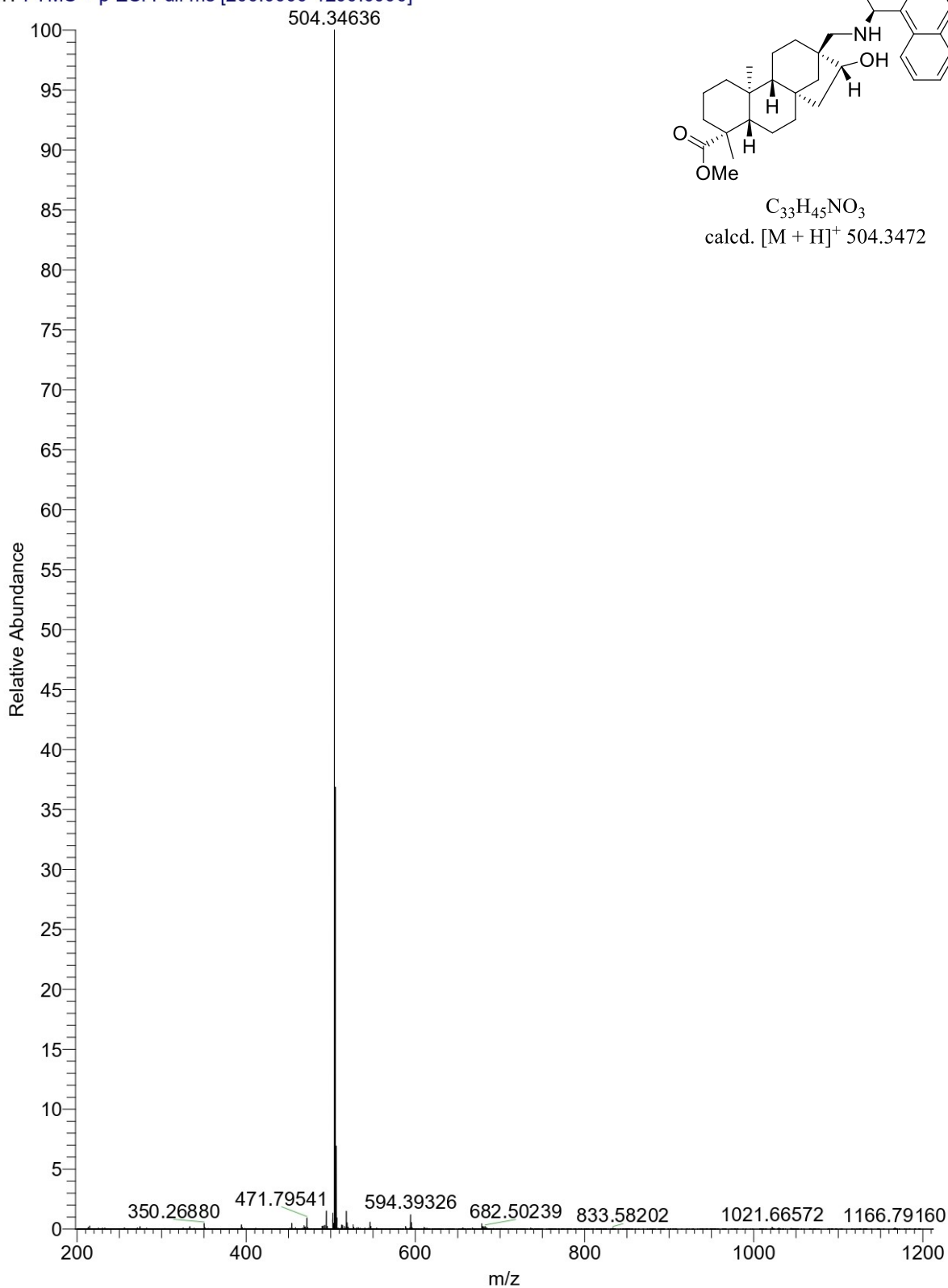
HRMS of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*S*)-1-(naphthalen-1-yl)ethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**27**)

D:\DATA\...\Robi\20230927\GYK-20230927-1
D3-tol

09/27/23 16:24:56

GYK-20230927-1 #53431-53508 RT: 118.62-118.79 AV: 78 NL: 2.50E8

T: FTMS + p ESI Full ms [200.0000-1200.0000]



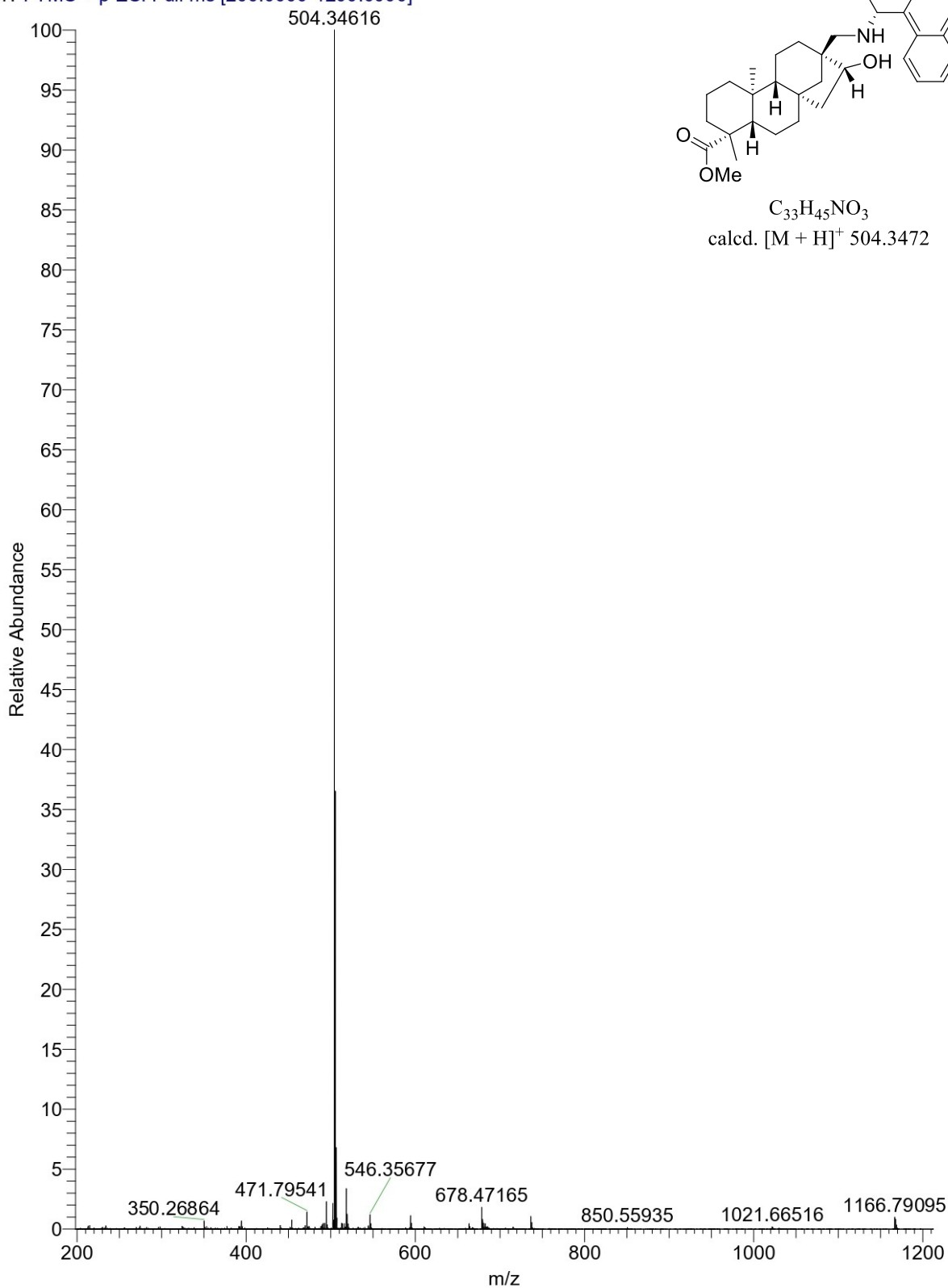
HRMS of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*R*)-1-(naphthalen-1-yl)ethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**28**)

D:\DATA\...\Robi\20230927\GYK-20230927-1
D3-tol

09/27/23 16:24:56

GYK-20230927-1 #54177-54265 RT: 120.27-120.47 AV: 89 NL: 1.75E8

T: FTMS + p ESI Full ms [200.0000-1200.0000]



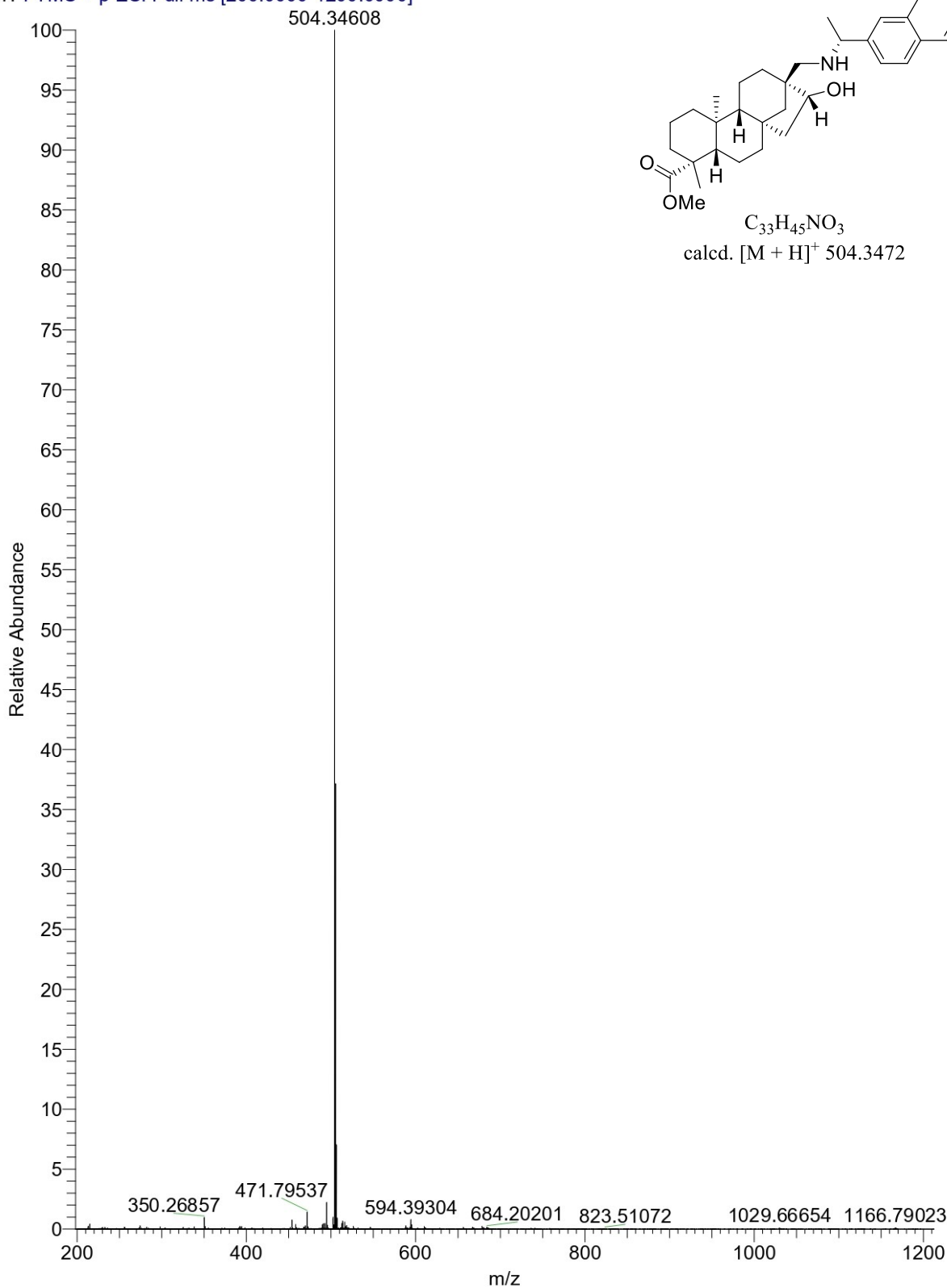
HRMS of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*R*)-1-(naphthalen-2-yl)ethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**29**)

D:\DATA\...\Robi\20230927\GYK-20230927-1
D3-tol

09/27/23 16:24:56

GYK-20230927-1 #54934-55011 RT: 121.95-122.12 AV: 78 NL: 1.50E8

T: FTMS + p ESI Full ms [200.0000-1200.0000]



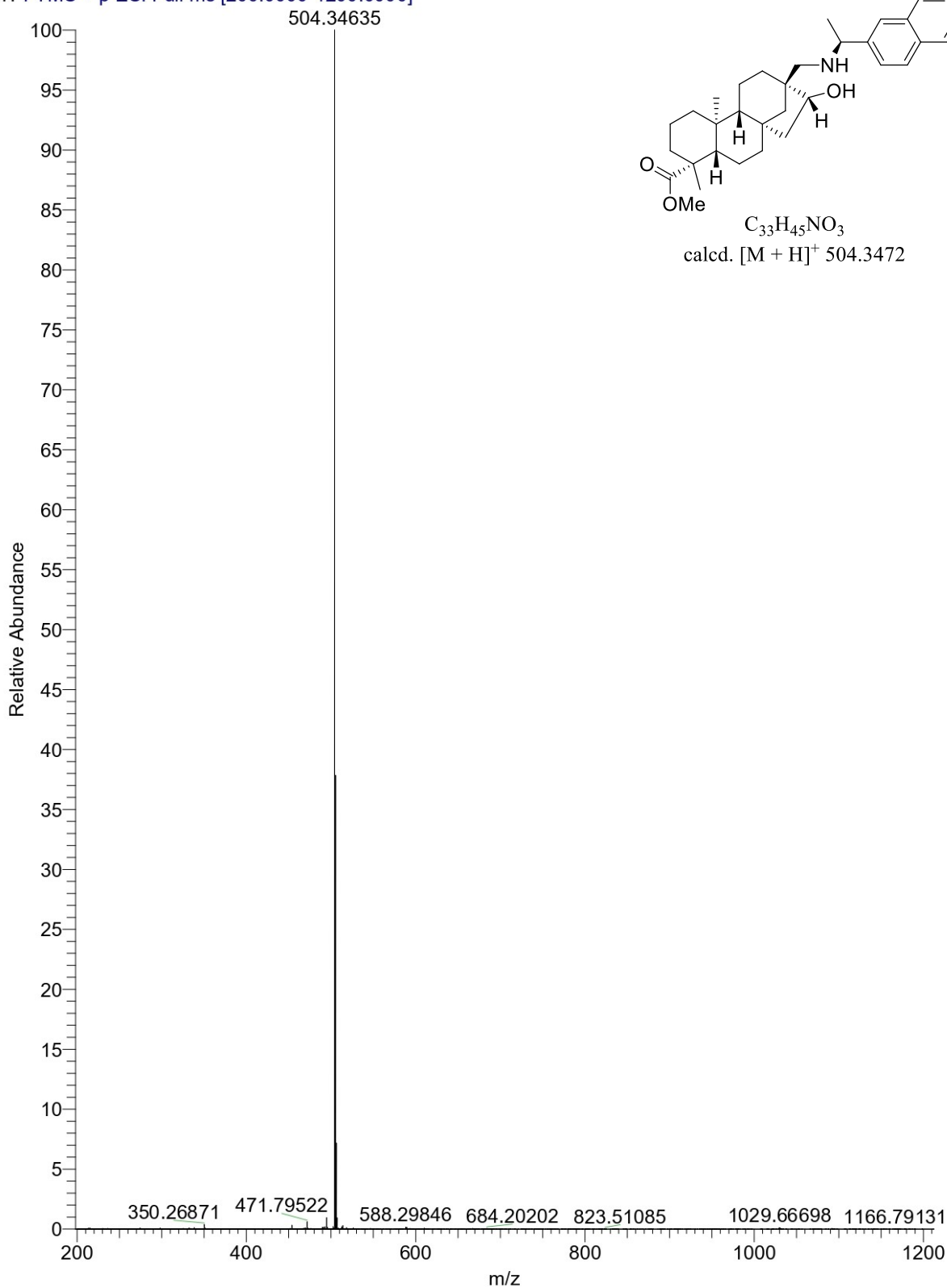
HRMS of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((((*S*)-1-(naphthalen-2-yl)ethyl)amino)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**30**)

D:\DATA\...\Robi\20230927\GYK-20230927-1
D3-tol

09/27/23 16:24:56

GYK-20230927-1 #55703-55801 RT: 123.66-123.88 AV: 99 NL: 3.89E8

T: FTMS + p ESI Full ms [200.0000-1200.0000]



HRMS of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-(aminomethyl)-8-hydroxy-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**31**)

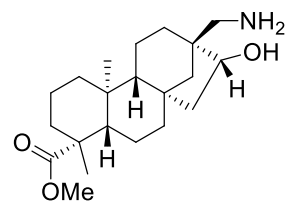
D:\DATAExp\...\20231103\GYK-20230927

11/03/23 11:26:54

FR, HG, HM

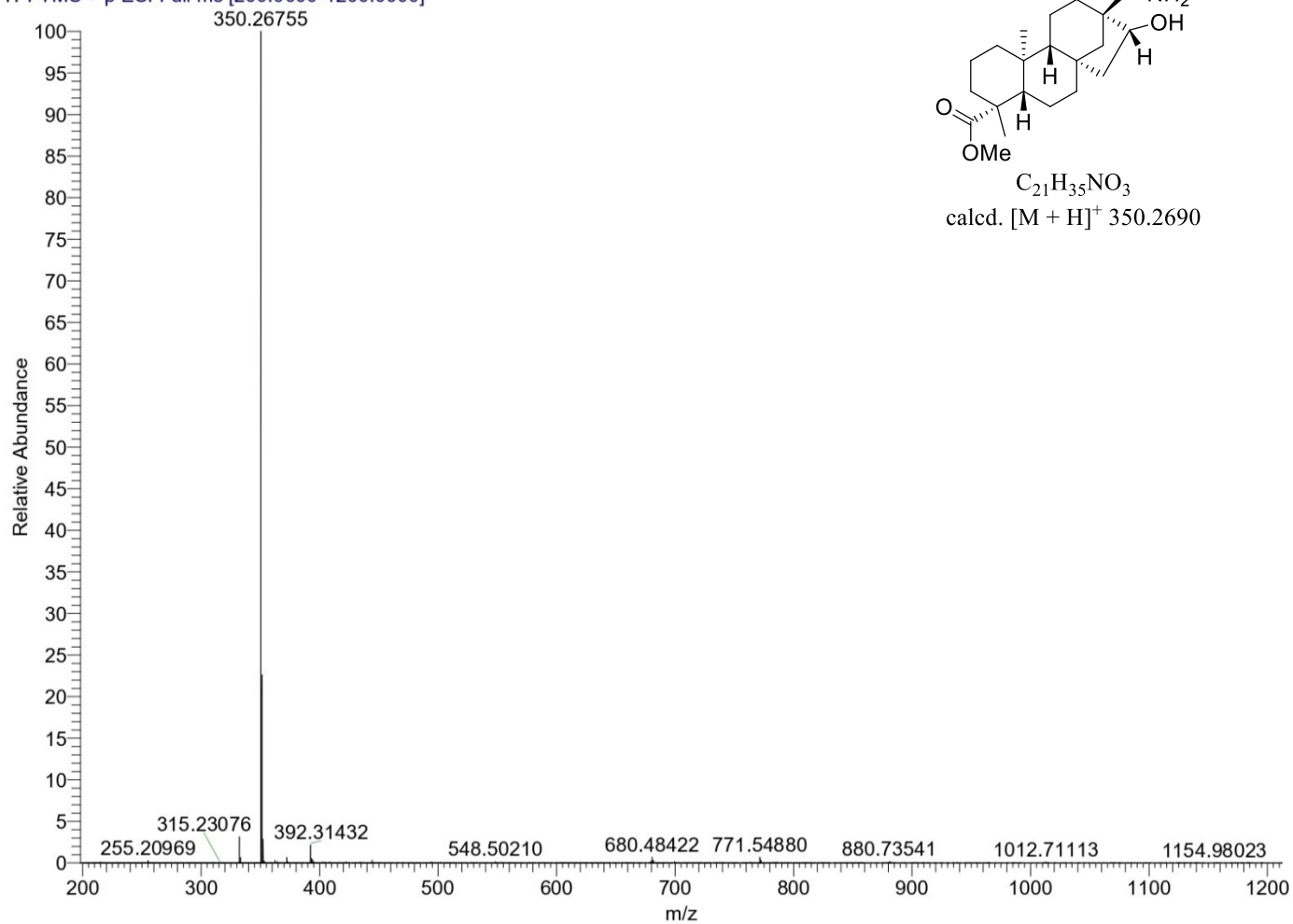
GYK-20230927 #5228-5284 RT: 11.60-11.72 AV: 57 NL: 2.04E9

T: FTMS + p ESI Full ms [200.0000-1200.0000]



C₂₁H₃₅NO₃

calcd. [M + H]⁺ 350.2690



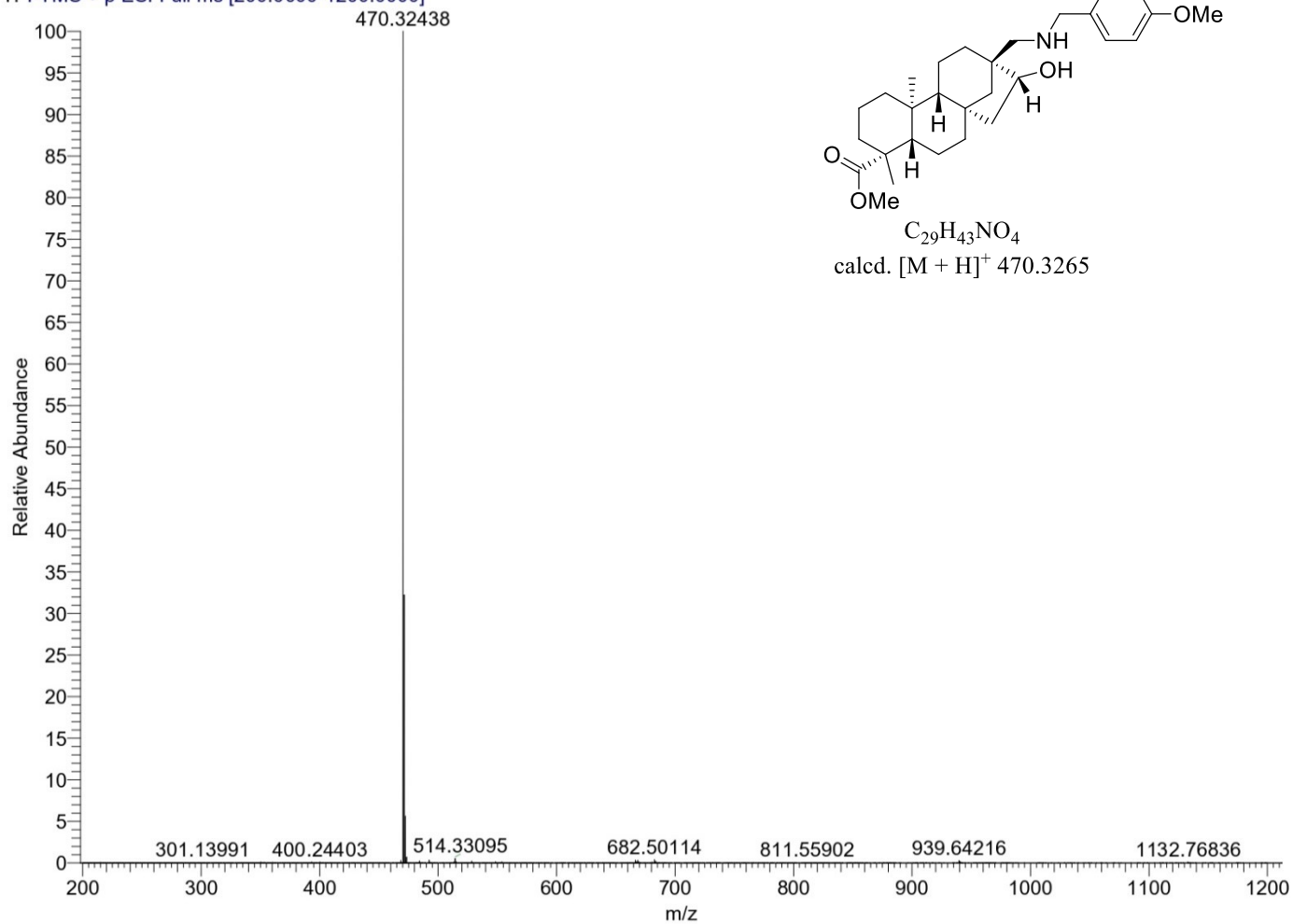
HRMS of compound (4*R*,4*a**S*,6*a**R*,8*R*,9*S*,11*a**R*,11*b**S*)-methyl 8-hydroxy-9-(((4-methoxybenzyl)amino) methyl)-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**32**)

D:\DATAExp\...\20231103\GYK-20230927
FR, HG, HM

11/03/23 11:26:54

GYK-20230927 #5967-6026 RT: 13.24-13.37 AV: 60 NL: 2.03E9

T: FTMS + p ESI Full ms [200.0000-1200.0000]



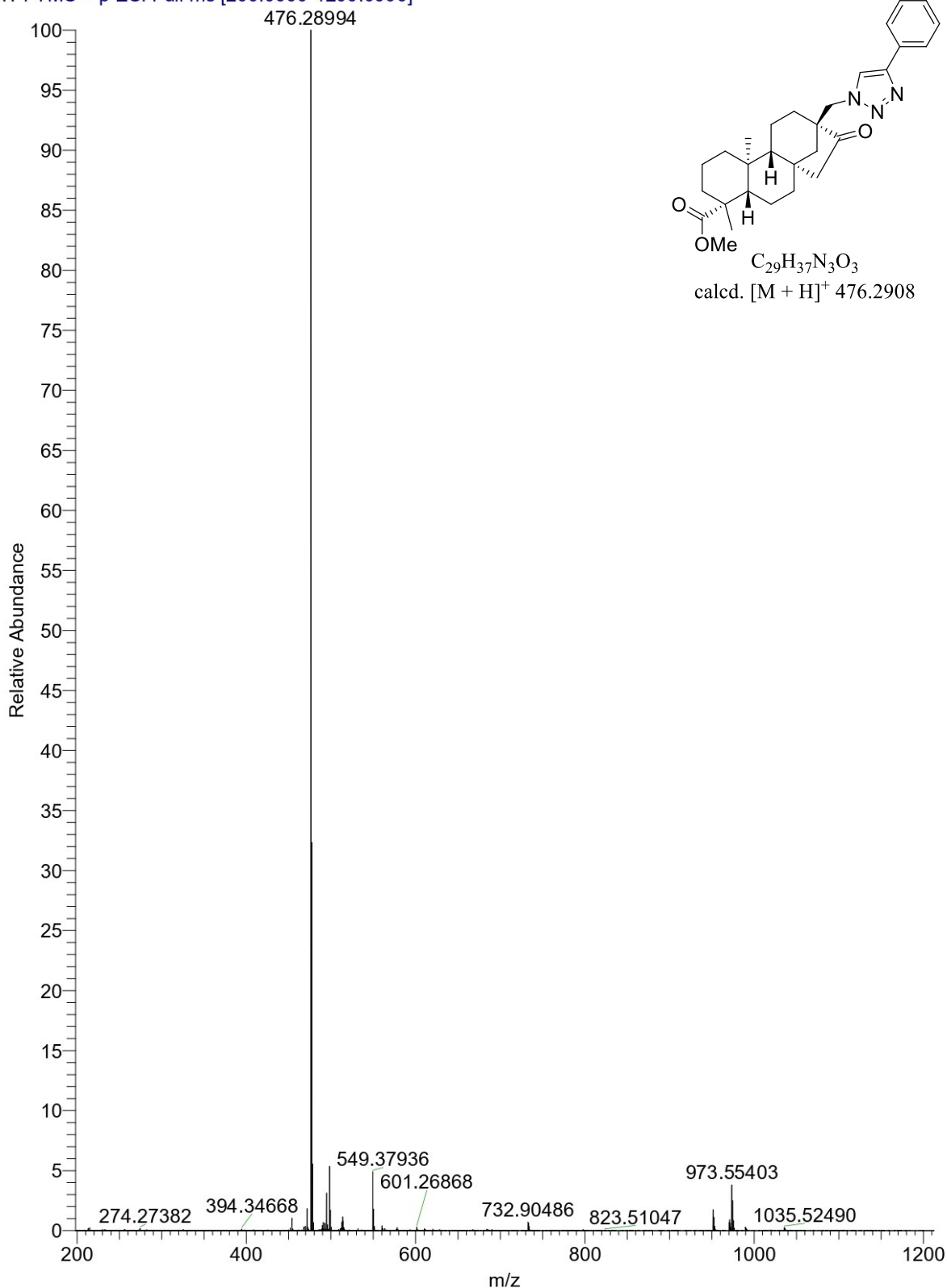
HRMS of compound (4*R*,4*aS*,6*aR*,9*S*,11*aR*,11*bS*)-methyl 4,11*b*-dimethyl-8-oxo-9-((4-phenyl-1*H*-1,2,3-triazol-1-yl)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**33**)

D:\DATA\...\Robi\20230927\GYK-20230927-1
D3-tol

09/27/23 16:24:56

GYK-20230927-1 #51214-51291 RT: 113.69-113.86 AV: 78 NL: 2.89E8

T: FTMS + p ESI Full ms [200.0000-1200.0000]



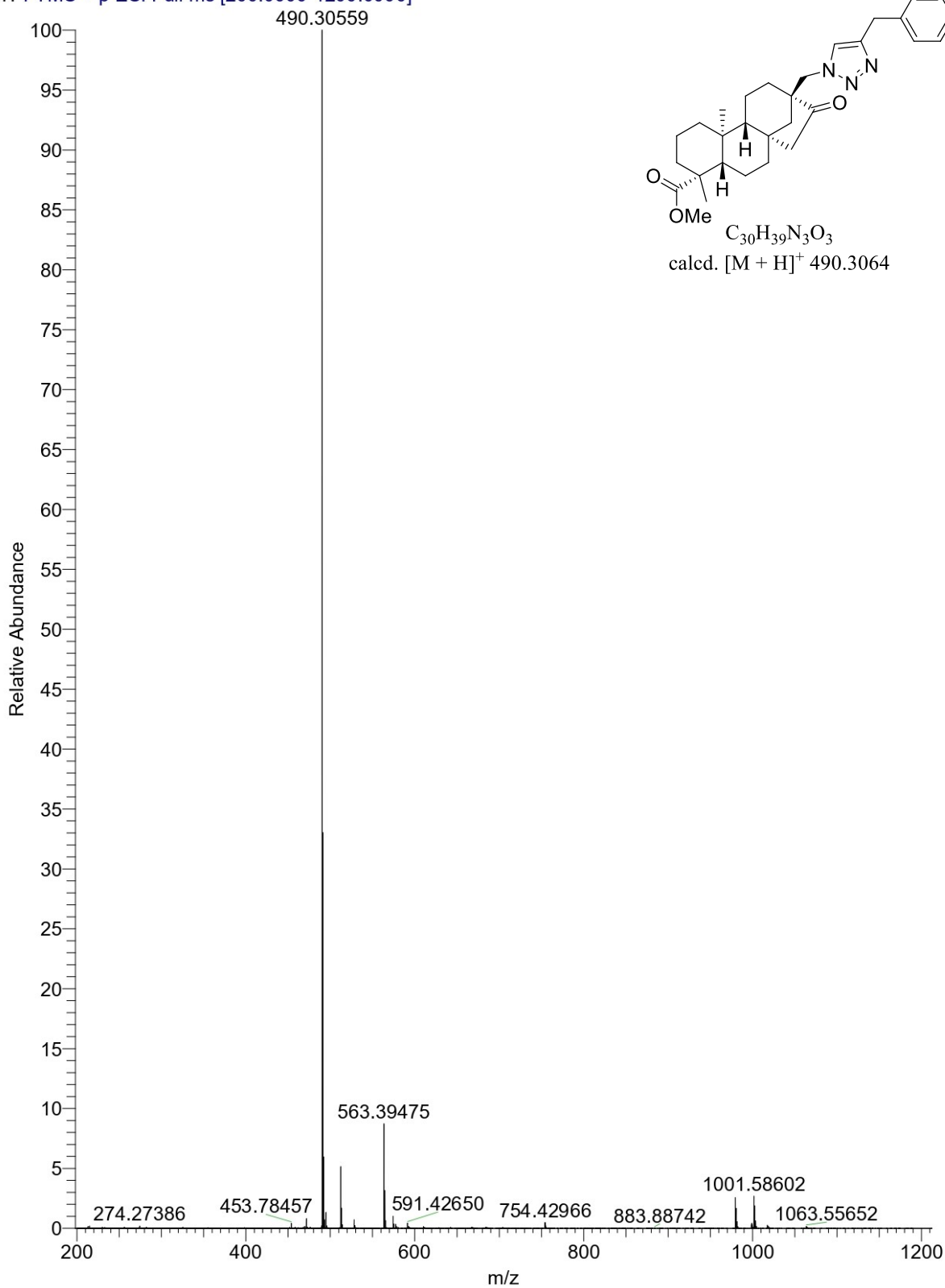
HRMS of compound (4*R*,4*aS*,6*aR*,9*S*,11*aR*,11*bS*)-methyl 9-((4-benzyl-1*H*-1,2,3-triazol-1-yl)methyl)-4,11*b*-dimethyl-8-oxotetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**34**)

D:\DATA\...\Robi\20230927\GYK-20230927-1
D3-tol

09/27/23 16:24:56

GYK-20230927-1 #51960-52037 RT: 115.35-115.52 AV: 78 NL: 2.47E8

T: FTMS + p ESI Full ms [200.0000-1200.0000]



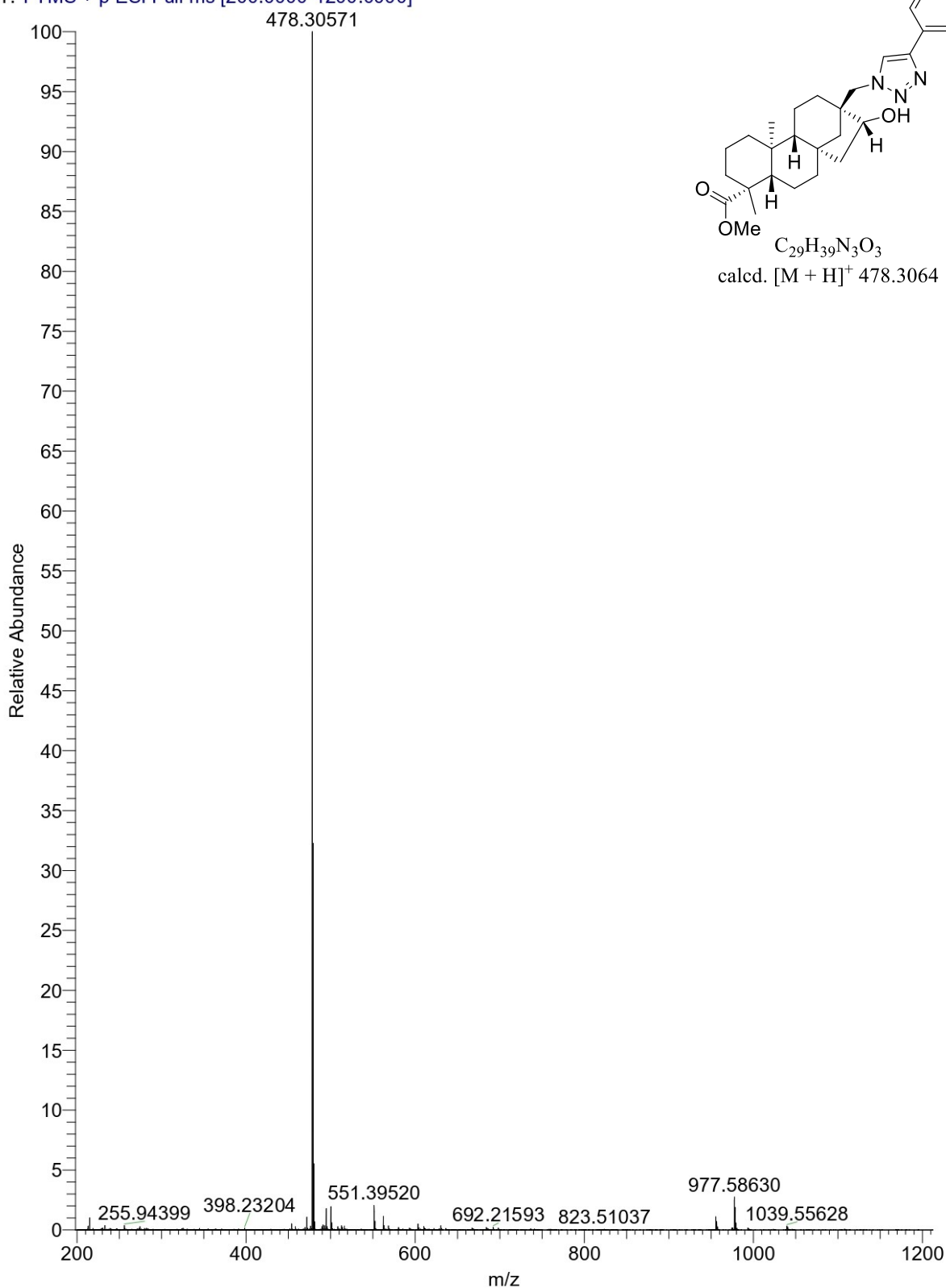
HRMS of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 8-hydroxy-4,11*b*-dimethyl-9-((4-phenyl-1*H*-1,2,3-triazol-1-yl)methyl)tetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (35)

D:\DATA\...IRobil\20230927\GYK-20230927-1
D3-tol

09/27/23 16:24:56

GYK-20230927-1 #48168-48213 RT: 106.93-107.03 AV: 46 NL: 1.46E8

T: FTMS + p ESI Full ms [200.0000-1200.0000]



HRMS of compound (4*R*,4*aS*,6*aR*,8*R*,9*S*,11*aR*,11*bS*)-methyl 9-((4-benzyl-1*H*-1,2,3-triazol-1-yl)methyl)-8-hydroxy-4,11*b*-dimethyltetradecahydro-6*a*,9-methanocyclohepta[*a*]naphthalene-4-carboxylate (**36**)

D:\DATA\...\Robi\20230927\GYK-20230927-1
D3-tol

09/27/23 16:24:56

GYK-20230927-1 #48930-48996 RT: 108.62-108.77 AV: 67 NL: 1.85E8

T: FTMS + p ESI Full ms [200.0000-1200.0000]

