Supplementary Material (ESI) for Organic & Biomolecular Chemistry

Towards New Ligands of Nuclear Receptors. Discovery of Malaitasterol A, an unique bis-secosterol from marine sponge *Theonella swinhoei*

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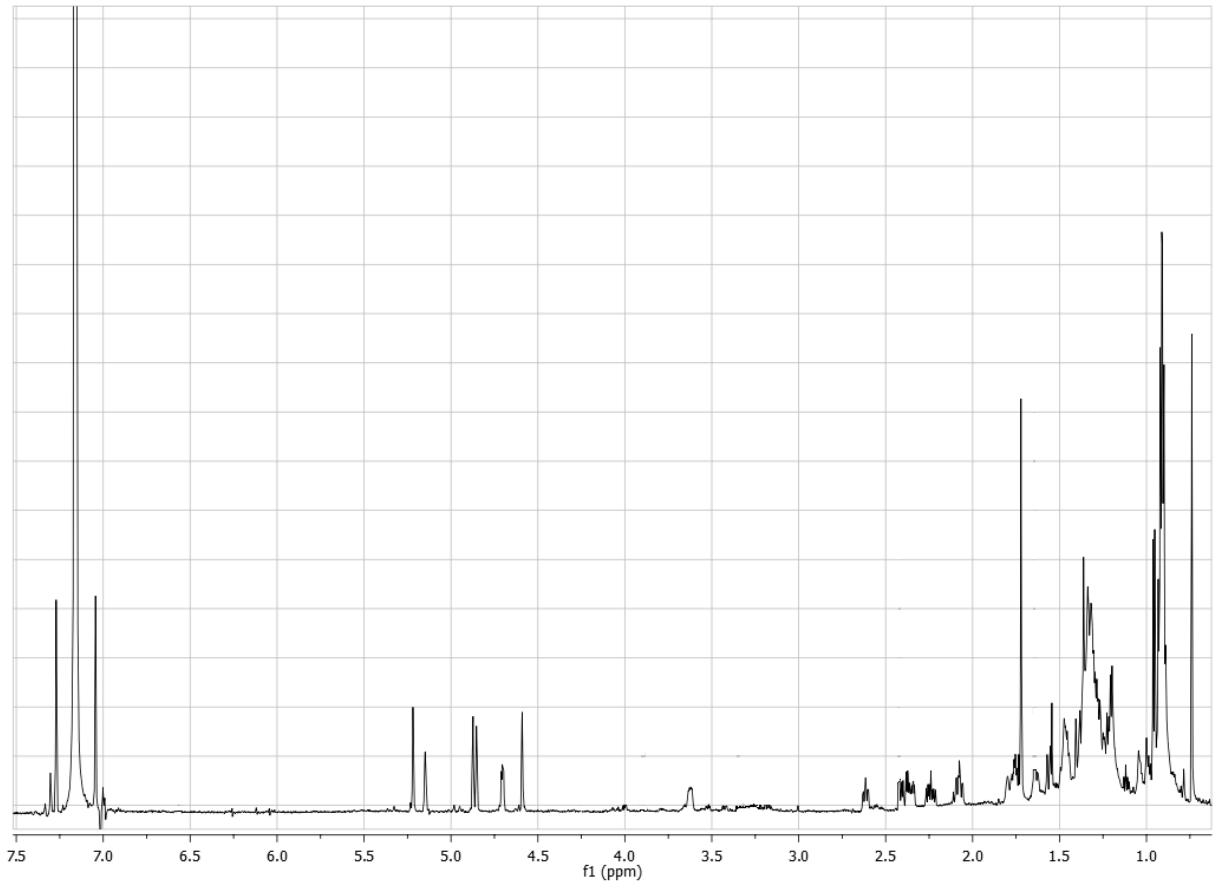
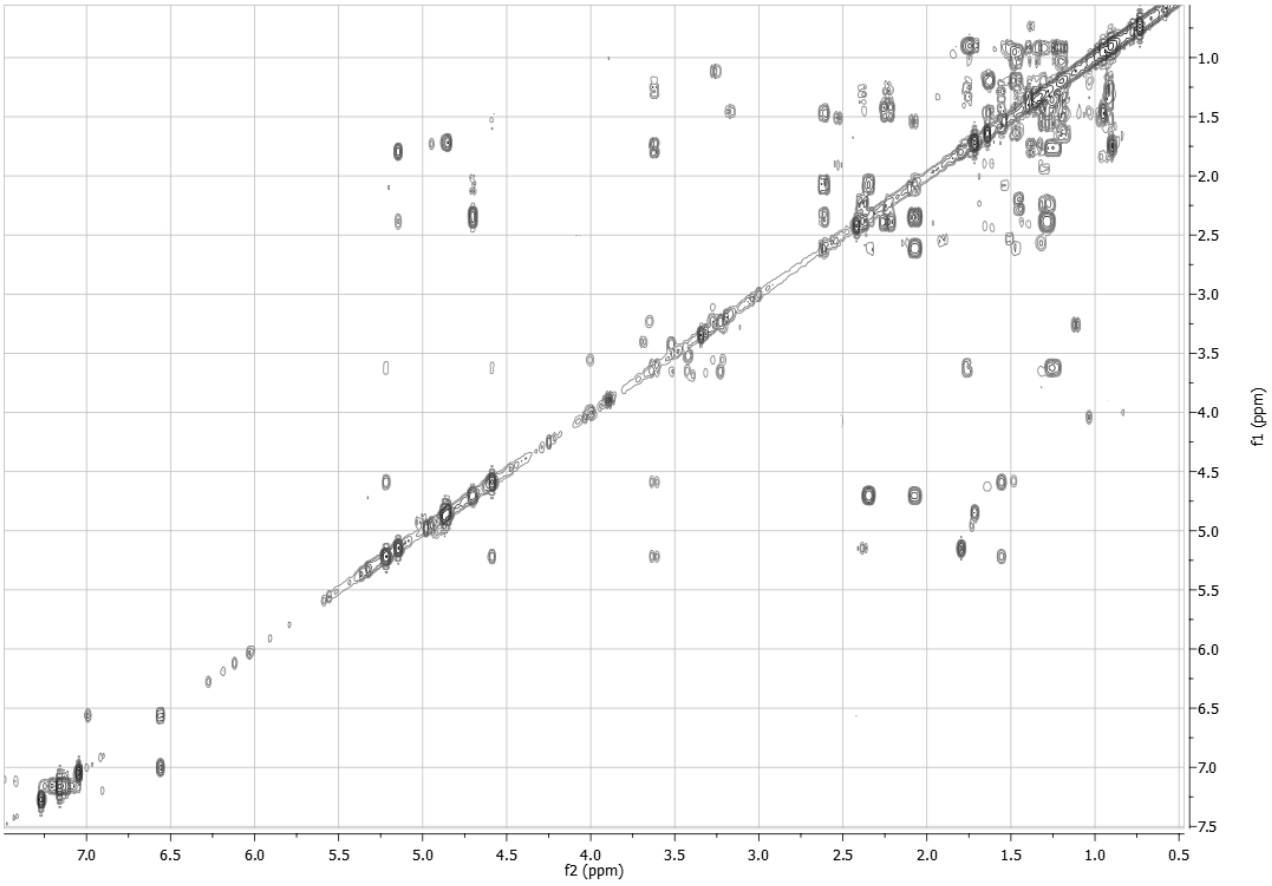
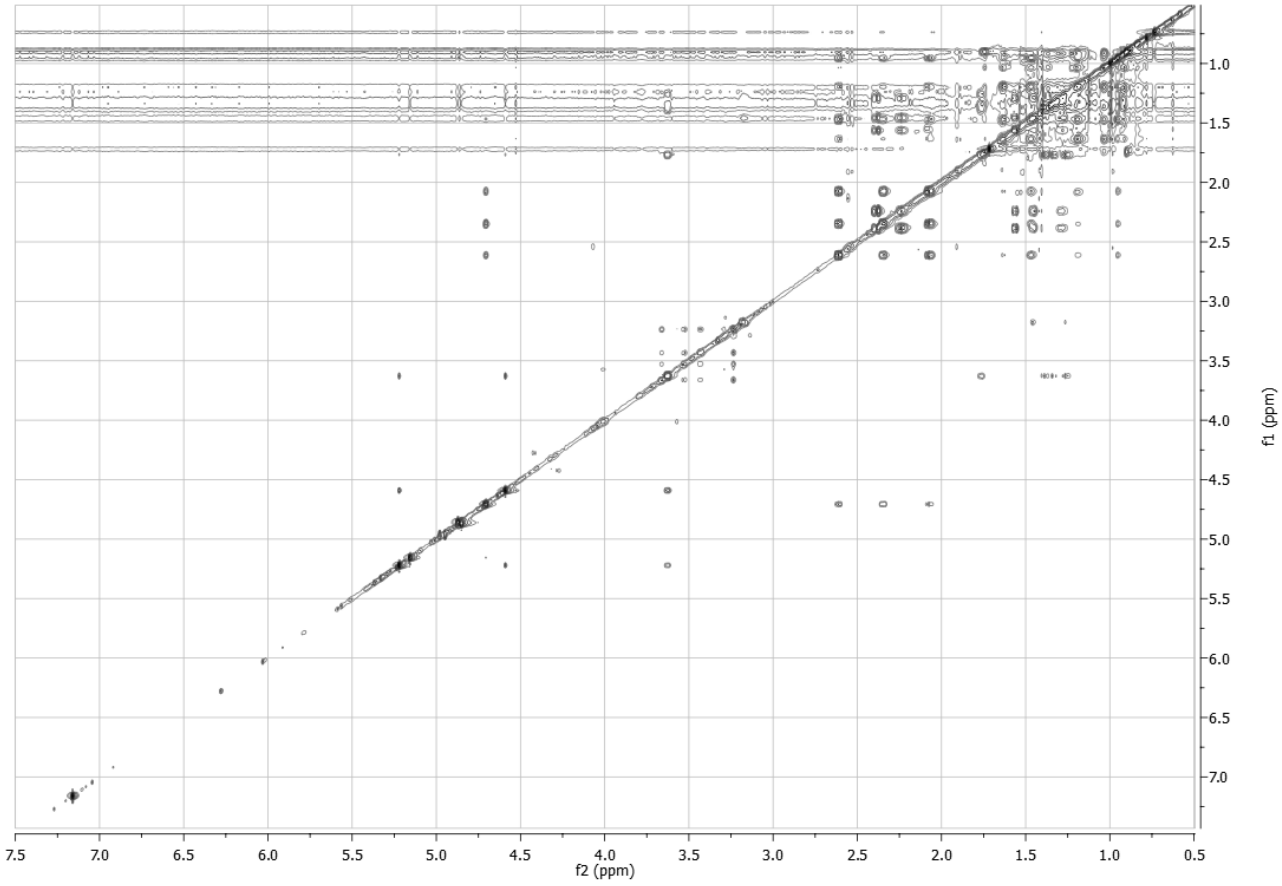
^{1}H NMR spectrum (700 MHz, C_6D_6) of Malaitasterol A (**1**)



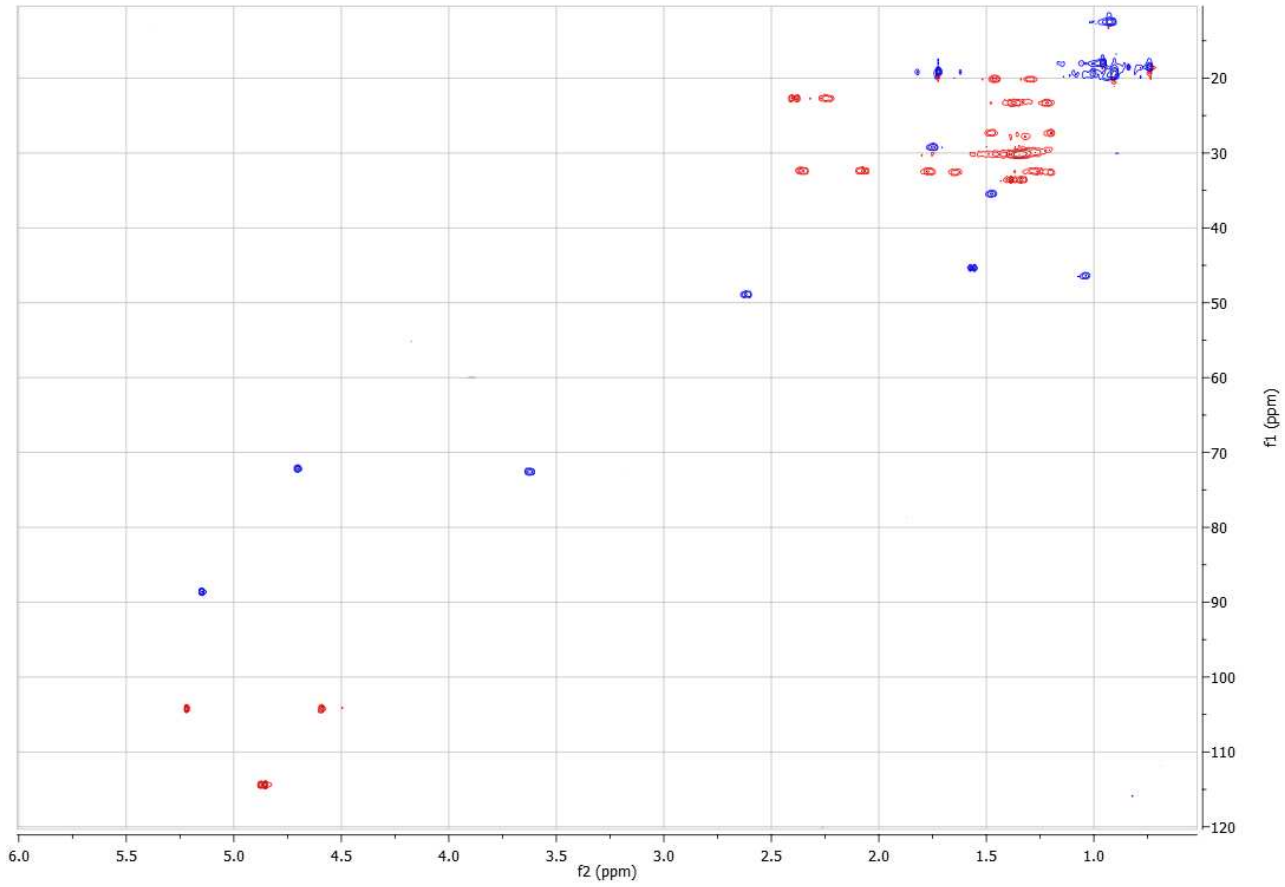
COSY spectrum (700 MHz, C_6D_6) of Malaitasterol A (**1**)



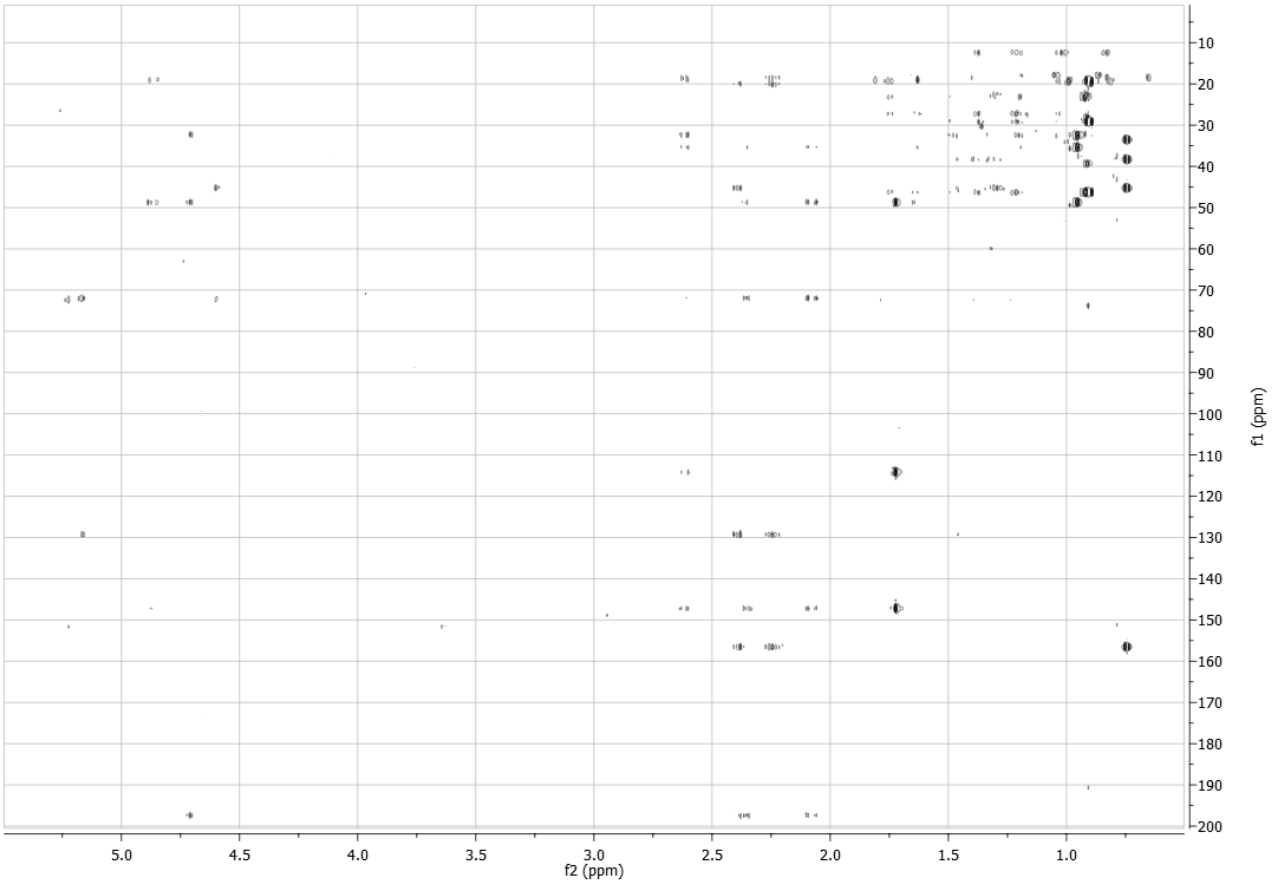
TOCSY spectrum (700 MHz, C_6D_6) of Malaitasterol A (**1**)



HSQC spectrum (700 MHz, C_6D_6) of Malaitasterol A (**1**)



HMBC spectrum (700 MHz, C_6D_6) of Malaitasterol A (**1**)



ROESY spectrum (700 MHz, C_6D_6, 200 ms) of Malaitasterol A (**1**)

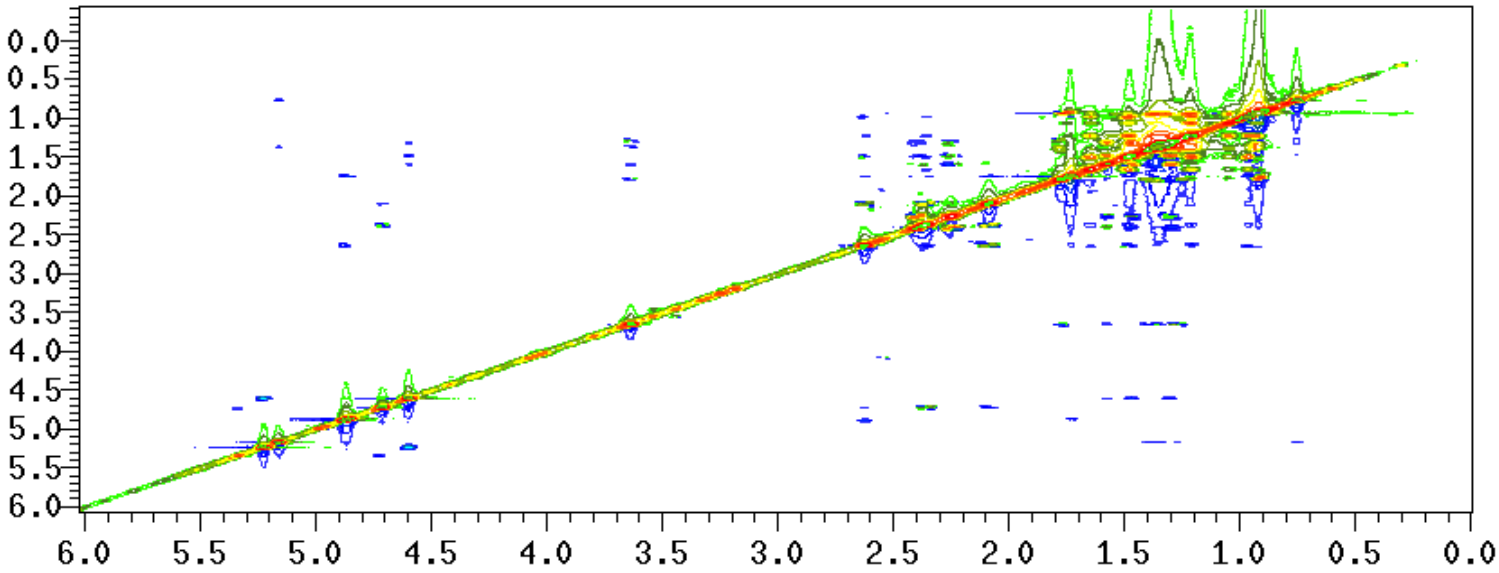


Table S1. Experimental and calculated ^{13}C NMR chemical shifts (ppm), ΔΔ [($\delta_{calcd.} - \delta_{exp.}$)], ΔΔabs [|($\delta_{calcd.} - \delta_{exp.}$)|] and MAE (Mean average error as $\sum[|\delta_{exp.}-\delta_{calcd.}|]/n$) on sp^3 atoms of **1**.

		15*R*			15*S*		
	δ_{exp}	$\delta_{calc.}$	ΔΔ	ΔΔabs	$\delta_{calc.}$	ΔΔ	ΔΔabs
C1	33.6	34.5	0.9	0.9	34.2	-0.6	0.6
C2	32.5	31.3	1.2	1.2	31.3	1.2	1.2
C3	72.6	72.5	0.1	0.1	72.6	0	0
C5	45.4	45.5	-0.1	0.1	45.5	-0.1	0.1
C6	20.3	21.9	-1.6	1.6	21.9	-1.6	1.6
C7	22.7	24.7	2.0	2.0	25.0	-2.3	2.3
C10	38.5	41.7	3.2	3.2	41.6	-3.1	3.1
C11	88.7	87.7	1.0	1.0	88.7	0	0
C15	72.2	74.8	2.6	2.6	72.7	-0.5	0.5
C16	32.4	39.1	-6.7	6.7	33.4	-1.0	1.0
C17	48.9	45.0	3.9	3.9	48.8	0.1	0.1
C18	19.2	25.3	6.1	6.1	21.8	-2.6	2.6
C19	18.7	20.6	1.9	1.9	20.6	1.9	1.9
C20	35.5	36.3	0.8	0.8	31.9	3.6	3.6
C21	18.1	22.8	4.7	4.7	19.8	-1.7	1.7
C22	32.6	30.4	2.2	2.2	32.0	0.6	0.6
C23	27.4	37.6	10.2	10.2	22.0	5.4	5.4
C24	46.4	45.7	0.7	0.7	45.3	1.1	1.1
C25	29.3	35.5	6.2	6.2	28.6	0.7	0.7
C26	19.3	16.3	3.0	3.0	16.1	3.2	3.2
C27	19.7	22.3	2.6	2.6	22.5	-2.8	2.8
C28	23.4	22.7	0.7	0.7	25.5	-2.1	2.1
C29	12.6	18.8	6.2	6.2	14.3	-1.7	1.7
$\sum[\delta_{exp.}-\delta_{calcd.}]$			-43.0	68.6		-6.1	37.9
$\sum[\delta_{exp.}-\delta_{calcd.}]/n$			-1.87			-0.26	
MAE[a]				3.00			1.65

[a]Mean average error= $\sum[|\delta_{exp.}-\delta_{calcd.}|]/n$

Table S2. Key features of the three docking pose of malaitasterol A in PXR ligand binding domain.

	Pose A	***Pose B***	***Pose C***
Free energy of binding	-9.83	-9.20	-8.97
Inhibition constant (K_I)	62 nM	180 nM	265 nM
Intermolecular energy	-11.54	-10.68	-10.84
VdW, H-bond, desolvatation energy	-11.43	-10.69	-10.89
Electrostatic energy	-0.11	-0.090	0.040
Total internal energy	-1.32	-1.44	-1.15
Torsional free energy	3.02	3.02	3.02