

## SUPPORTING INFORMATION

# Trivirensols: Selectively Bacteriostatic Sesquiterpene Trimers from the Australian Termite Nest-derived Fungus *Trichoderma virens* CMB-TN16

Wei-Hua Jiao,<sup>†,‡,§</sup> Angela A. Salim,<sup>†,§</sup> Zeinab G. Khalil,<sup>†,§</sup> Pradeep Dewapriya,<sup>†</sup> Hou-Wen Lin,<sup>‡</sup> Mark Butler<sup>†</sup> and Robert J. Capon\*,<sup>†</sup>

<sup>†</sup>Division of Chemistry and Structural Biology, Institute for Molecular Bioscience, The University of Queensland, St Lucia, QLD 4072, Australia

<sup>‡</sup>Research Center for Marine Drugs, State Key Laboratory of Oncogenes and Related Genes, Department of Pharmacy, Ren Ji Hospital, School of Medicine, Shanghai Jiao Tong University, Shanghai, 200127, People's Republic of China

<sup>§</sup> joint first authors

## Table of contents

<b>1</b>	<b>Spectroscopic characterization of metabolites 11 – 17 .....</b>	<b>5</b>
1.1	Trivirensol A ( <b>11</b> ) .....	5
1.2	Trivirensol B ( <b>12</b> ).....	7
1.3	Trivirensol C ( <b>13</b> ).....	9
1.4	Trivirensol D ( <b>14</b> ) .....	11
1.5	Trivirensol E ( <b>15</b> ).....	13
1.6	Trivirensol F ( <b>16</b> ) .....	15
1.7	Trivirensol G ( <b>17</b> ) .....	17
<b>2</b>	<b>Antibacterial and antifungal assays data .....</b>	<b>43</b>
<b>3</b>	<b>Time-kill (bacteriocidal vs bacteriostatic) assays for divirensols and trivirensols ( 11 – 13 and 17).....</b>	<b>46</b>
<b>4</b>	<b>Cytotoxicity assays .....</b>	<b>47</b>

### List of Tables

<b>Table S1.</b>	<b><math>^1\text{H}</math> and <math>^{13}\text{C}</math> NMR data for trivirensol A (<b>11</b>) in <math>\text{DMSO}-d_6</math> .....</b>	<b>5</b>
<b>Table S2.</b>	<b><math>^1\text{H}</math> and <math>^{13}\text{C}</math> NMR data for trivirensol B (<b>12</b>) in <math>\text{DMSO}-d_6</math>.....</b>	<b>7</b>
<b>Table S3.</b>	<b><math>^1\text{H}</math> and <math>^{13}\text{C}</math> NMR data for trivirensol C (<b>13</b>) in <math>\text{DMSO}-d_6</math>.....</b>	<b>9</b>
<b>Table S4.</b>	<b><math>^1\text{H}</math> and <math>^{13}\text{C}</math> NMR data for trivirensol D (<b>14</b>) in <math>\text{DMSO}-d_6</math>.....</b>	<b>11</b>
<b>Table S5.</b>	<b><math>^1\text{H}</math> and <math>^{13}\text{C}</math> NMR data for trivirensol E (<b>15</b>) in <math>\text{DMSO}-d_6</math> .....</b>	<b>13</b>
<b>Table S6.</b>	<b><math>^1\text{H}</math> and <math>^{13}\text{C}</math> NMR data for trivirensol F (<b>16</b>) in <math>\text{DMSO}-d_6</math> .....</b>	<b>15</b>
<b>Table S7.</b>	<b><math>^1\text{H}</math> and <math>^{13}\text{C}</math> NMR data for trivirensol G (<b>17</b>) in <math>\text{DMSO}-d_6</math>.....</b>	<b>17</b>

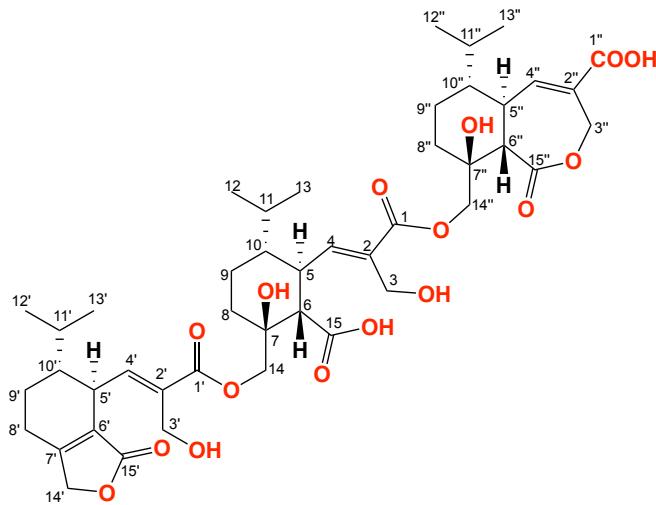
## List of Figures

<b>Figure S1.</b> $^1\text{H}$ NMR spectrum of trivirensol A ( <b>11</b> ) in DMSO- $d_6$ .....	19
<b>Figure S2.</b> $^{13}\text{C}$ NMR spectrum of trivirensol A ( <b>11</b> ) in DMSO- $d_6$ .....	19
<b>Figure S3.</b> HSQC spectrum of trivirensol A ( <b>11</b> ) in DMSO- $d_6$ .....	20
<b>Figure S4.</b> HSQC spectrum of trivirensol A ( <b>11</b> ) in DMSO- $d_6$ .....	20
<b>Figure S5.</b> HSQC spectrum of trivirensol A ( <b>11</b> ) in DMSO- $d_6$ .....	21
<b>Figure S6.</b> HSQC spectrum of trivirensol A ( <b>11</b> ) in DMSO- $d_6$ .....	21
<b>Figure S7.</b> HSQC spectrum of trivirensol A ( <b>11</b> ) in DMSO- $d_6$ .....	22
<b>Figure S8.</b> $^1\text{H}$ - $^1\text{H}$ COSY spectrum of trivirensol A ( <b>11</b> ) in DMSO- $d_6$ .....	22
<b>Figure S9.</b> $^1\text{H}$ - $^1\text{H}$ COSY spectrum of trivirensol A ( <b>11</b> ) in DMSO- $d_6$ .....	23
<b>Figure S10.</b> $^1\text{H}$ - $^1\text{H}$ COSY spectrum of trivirensol A ( <b>11</b> ) in DMSO- $d_6$ .....	23
<b>Figure S11.</b> HMBC spectrum of trivirensol A ( <b>11</b> ) in DMSO- $d_6$ .....	24
<b>Figure S12.</b> HMBC spectrum of trivirensol A ( <b>11</b> ) in DMSO- $d_6$ .....	24
<b>Figure S13.</b> HMBC spectrum of trivirensol A ( <b>11</b> ) in DMSO- $d_6$ .....	25
<b>Figure S14.</b> HMBC spectrum of trivirensol A ( <b>11</b> ) in DMSO- $d_6$ .....	25
<b>Figure S15.</b> HMBC spectrum of trivirensol A ( <b>11</b> ) in DMSO- $d_6$ .....	26
<b>Figure S16.</b> HMBC spectrum of trivirensol A ( <b>11</b> ) in DMSO- $d_6$ .....	26
<b>Figure S17.</b> HMBC spectrum of trivirensol A ( <b>11</b> ) in DMSO- $d_6$ .....	27
<b>Figure S18.</b> ROESY spectrum of trivirensol A ( <b>11</b> ) in DMSO- $d_6$ .....	27
<b>Figure S19.</b> ROESY spectrum of trivirensol A ( <b>11</b> ) in DMSO- $d_6$ .....	28
<b>Figure S20.</b> ROESY spectrum of trivirensol A ( <b>11</b> ) in DMSO- $d_6$ .....	28
<b>Figure S21.</b> ROESY spectrum of trivirensol A ( <b>11</b> ) in DMSO- $d_6$ .....	29
<b>Figure S22.</b> ROESY spectrum of trivirensol A ( <b>11</b> ) in DMSO- $d_6$ .....	29
<b>Figure S23.</b> HRESIMS spectrum of trivirensol A ( <b>11</b> ) .....	30
<b>Figure S24.</b> $^1\text{H}$ NMR spectrum of trivirensol B ( <b>12</b> ) in DMSO- $d_6$ .....	31
<b>Figure S25.</b> $^{13}\text{C}$ NMR spectrum of trivirensol B ( <b>12</b> ) in DMSO- $d_6$ .....	31
<b>Figure S26.</b> HRESIMS spectrum of trivirensol B ( <b>12</b> ) .....	32
<b>Figure S27.</b> $^1\text{H}$ NMR spectrum of trivirensol C ( <b>13</b> ) in DMSO- $d_6$ .....	33
<b>Figure S28.</b> $^{13}\text{C}$ NMR spectrum of trivirensol C ( <b>13</b> ) in DMSO- $d_6$ .....	33
<b>Figure S29.</b> HRESIMS spectrum of trivirensol C ( <b>13</b> ) .....	34
<b>Figure S30.</b> $^1\text{H}$ NMR spectrum of trivirensol D ( <b>14</b> ) in DMSO- $d_6$ .....	35
<b>Figure S31.</b> $^{13}\text{C}$ NMR spectrum of trivirensol D ( <b>14</b> ) in DMSO- $d_6$ .....	35
<b>Figure S32.</b> HRESIMS spectrum of trivirensol D ( <b>14</b> ).....	36
<b>Figure S33.</b> $^1\text{H}$ NMR spectrum of trivirensol E ( <b>15</b> ) in DMSO- $d_6$ .....	37
<b>Figure S34.</b> $^{13}\text{C}$ NMR spectrum of trivirensol E ( <b>15</b> ) in DMSO- $d_6$ .....	37
<b>Figure S35.</b> HRESIMS spectrum of trivirensol E ( <b>15</b> ) .....	38
<b>Figure S36.</b> $^1\text{H}$ NMR spectrum of trivirensol F ( <b>16</b> ) in DMSO- $d_6$ .....	39
<b>Figure S37.</b> $^{13}\text{C}$ NMR spectrum of trivirensol F ( <b>16</b> ) in DMSO- $d_6$ .....	39
<b>Figure S38.</b> HRESIMS spectrum of trivirensol F ( <b>16</b> ) .....	40
<b>Figure S39.</b> $^1\text{H}$ NMR spectrum of trivirensol G ( <b>17</b> ) in DMSO- $d_6$ .....	41
<b>Figure S40.</b> $^{13}\text{C}$ NMR spectrum of trivirensol G ( <b>17</b> ) in DMSO- $d_6$ .....	41
<b>Figure S41.</b> HRESIMS spectrum of trivirensol G ( <b>17</b> ).....	42
<b>Figure S42.</b> Graphs for antimicrobial studies against susceptible, MDR strains and fungus of trivirensols ( <b>11 – 17</b> ) in broth micro-dilution assay .....	45

<b>Figure S43.</b> Graphs for antimicrobial studies against susceptible and MDR strains of divirensols A – D and F – G, trivirensols ( <b>11 – 17</b> ) in broth micro-dilution assay.....	45
<b>Figure S44.</b> Colony forming units (CFU) for bacteriostatic studies of divirensols A – D and G and trivirensols A – D and G (30 $\mu$ M) against (a, c) VRE and (b, d) <i>E. faecalis</i> at different timepoints, 1, 3, 6 and 24 h. Data are means $\pm$ SD of three replicate wells obtained in three independent experiments. Each treated group was compared to DMSO treatment using One-Way Anova, Dunnett's correction. ....	46
<b>Figure S45.</b> HRESIMS spectrum of trivirensol G dehydrated product Figure 8, (i) .....	47
<b>Figure S46.</b> Graphs for cytotoxic activities on trivirensols A-G ( <b>11 – 17</b> ) .....	48

## 1 Spectroscopic characterization of metabolites 11 – 17

### 1.1 Trivirensol A (11)



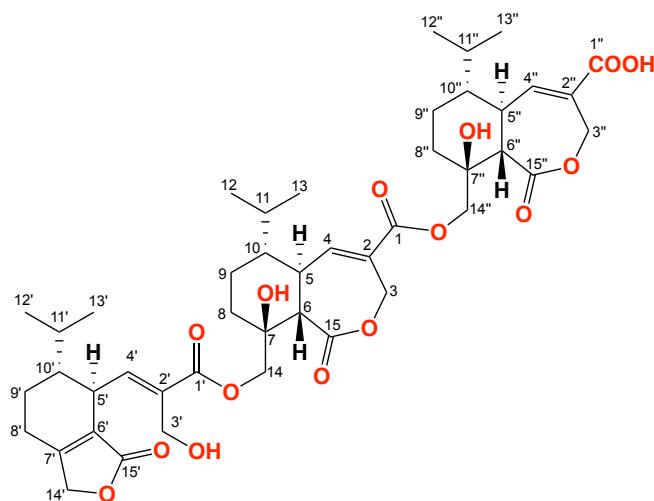
**Table S1.**  $^1\text{H}$  and  $^{13}\text{C}$  NMR data for trivirensol A (**11**) in  $\text{DMSO}-d_6$

Position	$\delta_{\text{C}}$ , mult	$\delta_{\text{H}}$ ( $J$ in Hz)	COSY	HMBC (H→C)	ROESY
1	166.9, <sup>a</sup> C				
2	133.4, C				
3a	55.4, $\text{CH}_2$	4.19, d (11.9)	3b	1, 2, 4	5
3b		4.12, d (11.9)	3a	1, 2, 4	5
4	145.1, <sup>b</sup> CH	6.42, d (10.8)	5	1, 2, 5, 10	6, 10, 11
5	39.9, CH	2.75, ddd (11.4, 10.8, 10.8)	4, 6, 10	6	3a, 3b, 11, 12, 14a
6	58.1, CH	2.44, d (11.4)	5	7, 14, 15	4, 10
7	71.2, C				
8a	34.6, <sup>c</sup> $\text{CH}_2$	2.12, m	8b		
8b		1.32, m	8a, 9b		
9a	20.4, $\text{CH}_2$	1.52, <sup>e</sup> m	9b	10	
9b		1.12, m	8b, 9a, 10		14a
10	45.7, CH	1.34, m	5, 9b		4, 6
11	27.9, CH	1.62, m	12, 13	10, 12, 13	4, 5, 12, 13
12	15.6, $\text{CH}_3$	0.71, d (6.6)	11	10, 11, 13	5, 11
13	21.2, <sup>d</sup> $\text{CH}_3$	0.85, <sup>f</sup> d (6.6)	11	10, 11, 12	11
14a	65.6, $\text{CH}_2$	4.37, d (12.0)	14b	1'	5, 9b
14b		4.24, d (12.0)	14a	7, 8, 1'	
15	173.9, C				
1'	166.7, <sup>a</sup> C				
2'	133.9, C				
3'a	55.6, $\text{CH}_2$	4.35, d (11.4)	3'b	1', 2', 4'	5'
3'b		4.30, d (11.4)	3'a	1', 2', 4'	5'
4'	144.4, CH	6.44, d (10.2)	5'	1', 2', 3', 6', 10'	10'

Position	$\delta_C$ , mult	$\delta_H$ ( $J$ in Hz)	COSY	HMBC (H→C)	ROESY
5'	33.7, CH	3.48,* m	4', 10'	15'	3'a, 3'b, 11', 12', 13'
6'	124.0, C				
7'	165.2, C				
8'	22.4, CH <sub>2</sub>	2.38, m	9'a	6', 7'	14'
9'a	20.1, CH <sub>2</sub>	1.81, m	8', 10'	5'	
9'b		1.51, <sup>e</sup> m		5'	
10'	44.8, CH	1.46, m	5', 9'a		4'
11'	27.3, CH	1.64, m	12', 13'		5', 12', 13'
12'	17.7, CH <sub>3</sub>	0.83, <sup>f</sup> d (6.6)	11'	10', 11', 13'	5', 11'
13'	21.4, <sup>d</sup> CH <sub>3</sub>	0.95, d (6.6)	11'	10', 11', 12'	5', 11'
14'	71.6, CH <sub>2</sub>	4.82, m		6', 7', 15'	8'
15'	173.0, C				
1''	166.9, <sup>a</sup> C				
2''	129.4, C				
3''a	60.9, CH <sub>2</sub>	5.28, d (14.4)	3''b	1'', 4''	6''
3''b		4.84, d (14.9)	3''a	1'', 2'', 4'', 15''	
4''	145.2, <sup>b</sup> CH	7.07, d (3.6)	5''	1'', 3'', 6''	5'', 11'', 12''
5''	39.4, CH	2.58, ddd (12.4, 12.4, 3.6)	4'', 6'', 10''		4'', 9''b, 12'', 14''b
6''	51.7, CH	3.66, d (12.4)	5''	5'', 7'', 14'', 15''	3''a, 8b'', 10''
7''	71.8, C				
8''a	34.8, <sup>c</sup> CH <sub>2</sub>	2.16, m	8''b		
8''b		1.35, m	8''a, 9''b		6''
9''a	20.9, CH <sub>2</sub>	1.58, m	9''b	5''	
9''b		1.16, m	8''b, 9''a, 10		5'', 14''b
10''	47.6, CH	1.52, m	5'', 9''b		6''
11''	27.0, CH	1.95, m	12'', 13''	13''	4'', 13''
12''	15.2, CH <sub>3</sub>	0.84, <sup>f</sup> d (6.6)	11''	10'', 11'', 13''	4'', 5'', 11''
13''	21.3, <sup>d</sup> CH <sub>3</sub>	0.89, d (6.6)	11''	10'', 11'', 12''	11''
14''a	65.0, CH <sub>2</sub>	5.01, d (12.0)	14''b	1, 6'', 7'', 8''	
14''b		4.35, d (12.0)	14''a	1	5'', 9''b
15''	171.8, C				

<sup>a-f</sup>Assignments of overlapping resonances with the same superscript may be interchanged. \*signal obscured under H<sub>2</sub>O resonance.

## 1.2 Trivirensol B (12)



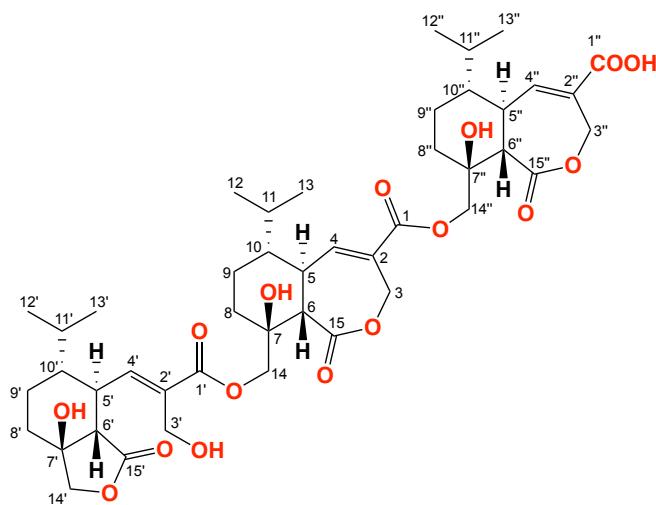
**Table S2.**  $^1\text{H}$  and  $^{13}\text{C}$  NMR data for trivirensol B (**12**) in  $\text{DMSO}-d_6$

Position	$\delta_{\text{C}}$ , mult	$\delta_{\text{H}}$ ( $J$ in Hz)	COSY	HMBC ( $\text{H} \rightarrow \text{C}$ )	ROESY
1	165.3, <sup>a</sup> C				
2	129.0, C				
3a	60.9, <sup>b</sup> $\text{CH}_2$	5.33, d (14.4)	3b, 4	1, 4	6
3b		4.89, d (14.4)	3a	1, 2, 4, 15	
4	146.1, CH	7.13, d (2.5)	3a, 5	1, 2, 3, 5, 6	5, 11, 12
5	39.4, <sup>c</sup> CH	2.62, <sup>l</sup> m	4, 6, 10		4, 9b, 14b
6	52.0, CH	3.67, <sup>m</sup> d (13.8)	5	5, 7, 14, 15	3a, 8b, 10, 7-OH
7	71.7, <sup>d</sup> C				
7-OH		5.15, s		6, 7	6
8a	34.8, <sup>e</sup> $\text{CH}_2$	2.16, ddd (12.8, 2.5, 2.5)	8b,	10	
8b		1.35, <sup>n</sup> m	8a, 9b		6
9a	20.9, <sup>f</sup> $\text{CH}_2$	1.59, <sup>o</sup> m	9b	10	
9b		1.19, <sup>p</sup> m	8b, 9a, 10		5, 14b
10	47.6, <sup>g</sup> CH	1.53, <sup>q</sup> m	5, 9b		
11	27.0, <sup>h</sup> CH	1.98, <sup>r</sup> m	12, 13	12, 13	4, 12, 13
12	15.2, <sup>i</sup> $\text{CH}_3$	0.84, <sup>s</sup> d (6.6)	11	10, 11, 13	4
13	21.4, <sup>j</sup> $\text{CH}_3$	0.90, <sup>t</sup> d (6.6)	11	10, 11, 12	
14a	65.2, $\text{CH}_2$	4.98, d (12.0)	14b	7, 8, 1'	
14b		4.39, d (12.0)	14a	7, 8, 1'	5, 9b
15	171.9, <sup>k</sup> C				
1'	166.7, C				
2'	134.0, C				
3'a	55.6, $\text{CH}_2$	4.35, d (12.0)		1', 2', 4'	5'
3'b		4.30, d (12.0)		1', 2', 4'	5'
4'	144.3, CH	6.44, d (10.8)	5'	1', 2', 3', 5', 6'	10'
5'	33.7, CH	3.49,* m	4', 10'		3'a, 12'
6'	124.0, C				

Position	$\delta_{\text{C}}$ , mult	$\delta_{\text{H}}$ ( $J$ in Hz)	COSY	HMBC (H→C)	ROESY
7'	165.2, <sup>a</sup> C				
8'	22.4, CH <sub>2</sub>	2.40, m	9'a, 9b		9'a, 9'b, 14'
9'a	20.1, CH <sub>2</sub>	1.82, m	8', 9b', 10'	5', 11'	8'
9'b		1.50, m	8', 9a'	5', 10'	8'
10'	44.8, CH	1.45, m	5', 9a'		4'
11'	27.3, CH	1.64, m	12', 13'	9', 10', 12', 13'	
12'	17.7, CH <sub>3</sub>	0.84, <sup>s</sup> d (6.6)	11'	10', 11', 13'	5'
13'	21.4, CH <sub>3</sub>	0.95, d (6.6)	11'	10', 11', 12'	
14'	71.8, <sup>d</sup> CH <sub>2</sub>	4.84, m		6', 7', 8', 15'	8'
15'	173.0, C				
1''	166.9, C				
2''	129.4, C				
3''a	61.0, <sup>b</sup> CH <sub>2</sub>	5.26, d (14.0)	3''b, 4''	1'', 2''	6''
3''b		4.84, d (14.0)	3''a	1'', 2'', 4'', 15''	
4''	145.1, CH	7.06, d (3.0)	3''a, 5''	1'', 2'', 3'', 6''	5'', 11'', 12''
5''	39.4, <sup>c</sup> CH	2.60, <sup>l</sup> m	4'', 6'', 10''		4'', 14''b
6''	51.7, CH	3.65, <sup>m</sup> d (13.8)	5''	5'', 7'', 14'', 15''	3''a, 8''b, 10'', 7''-OH
7''	71.6, <sup>d</sup> C				
7''-OH		5.10, s		6'', 7''	6''
8''a	34.8, <sup>e</sup> CH <sub>2</sub>	2.09, m	8''b	6'', 14''	14''a
8''b		1.36, <sup>n</sup> m	8''a, 9''b		6'', 14''a
9''a	20.9, <sup>f</sup> CH <sub>2</sub>	1.59, <sup>o</sup> m	9''b		
9''b		1.19, <sup>p</sup> m	8''b, 9''a, 10''		5'', 14''b
10''	47.6, <sup>g</sup> CH	1.52, <sup>q</sup> m	5'', 9''b		5'', 6''
11''	27.0, <sup>h</sup> CH	1.98, <sup>r</sup> m	12'', 13''	12'', 13''	4'', 12'', 13''
12''	15.2, <sup>i</sup> CH <sub>3</sub>	0.84, <sup>s</sup> d (6.6)	11''	10'', 11'', 13''	4''
13''	21.4, <sup>j</sup> CH <sub>3</sub>	0.90, <sup>t</sup> d (6.6)	11''	10'', 11'', 12''	4''
14''a	65.9, CH <sub>2</sub>	5.10, d (12.0)	14''b	1, 7'', 8''	
14''b		4.35, d (12.0)	14''a	1	5'', 9''b
15''	171.8, <sup>k</sup> C				

<sup>a-t</sup>Assignments of overlapping resonances with the same superscript may be interchanged. \*signal is obscured under H<sub>2</sub>O resonance.

### 1.3 Trivirensol C (13)



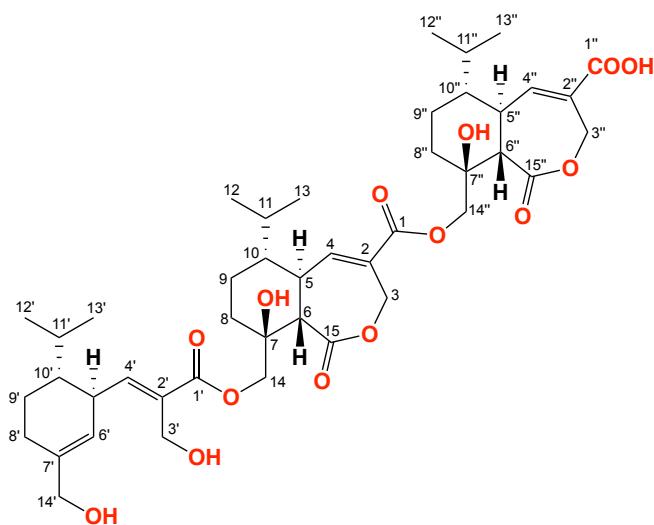
**Table S3.**  $^1\text{H}$  and  $^{13}\text{C}$  NMR data for trivirensol C (13) in  $\text{DMSO}-d_6$

Position	$\delta_{\text{C}}$ , mult	$\delta_{\text{H}}$ ( $J$ in Hz)	COSY	HMBC (H $\rightarrow$ C)	ROESY
1	165.3, C				
2	129.0, C				
3a	60.9, <sup>a</sup> CH <sub>2</sub>	5.35, d (14.4)	3b	1, 4	6
3b		4.89, d (14.4)	3a	1, 2, 4, 15	
4	146.1, CH	7.13, d (3.5)	5	1, 2, 3, 5, 6	5, 11, 12
5	39.4, <sup>b</sup> CH	2.62, m	4, 6, 10		4, 9b, 12, 14b
6	51.7, CH	3.69, d (12.5)	5	7, 14, 14	3a, 8b, 10
7	71.7, <sup>c</sup> C				
8a	34.8, <sup>d</sup> CH <sub>2</sub>	2.19, ddd (12.5, 2.5, 2.5)	8b	6, 7, 10	9a, 9b
8b		1.36, <sup>m</sup> m	8a, 9b		6
9a	20.9, <sup>e</sup> CH <sub>2</sub>	1.60, <sup>n</sup> m	9b		8a
9b		1.18, <sup>o</sup> m	8b, 9a, 10		5, 8a, 14
10	47.5, <sup>f</sup> CH	1.53, <sup>p</sup> m	5, 9b		6, 10, 11
11	27.0, <sup>g</sup> CH	1.96, <sup>q</sup> m	12, 13	10, 13	4, 13
12	15.2, <sup>h</sup> CH <sub>3</sub>	0.84, <sup>r</sup> d (6.6)	11	10, 11, 13	4, 5
13	21.2, <sup>i</sup> CH <sub>3</sub>	0.89, <sup>s</sup> d (6.6)	11	10, 11, 12	11
14a	65.1, CH <sub>2</sub>	5.04, d (12.0)	14b	7, 8, 1'	
14b		4.36, d (12.0)	14a	1'	5, 9b
15	171.8, <sup>j</sup> C				
1'	166.7, C				
2'	133.4, C				
3'a	55.4, CH <sub>2</sub>	4.10, d (12.0)	3'b	1', 2', 4'	
3'b		3.96, d (12.0)	3'a	1', 2', 4'	5'
4'	144.1, CH	6.55, d (10.2)	5'	1', 2', 3', 6', 10'	6', 10', 11'
5'	39.5, <sup>b</sup> CH	2.60, m	4', 6', 10'	2', 4', 6', 10', 15'	3'b , 9b', 12', 14'a

Position	$\delta_{\text{C}}$ , mult	$\delta_{\text{H}}$ ( $J$ in Hz)	COSY	HMBC (H→C)	ROESY
6'	52.0, <sup>k</sup> CH	2.03, d (11.4)	5'	4', 5', 7', 15'	4', 8b', 10'
7'	74.4, <sup>l</sup> C				
8'a	31.8, CH <sub>2</sub>	1.90, ddd (13.0, 2.5, 2.5)	8'b	7', 10', 14'	
8'b		1.57, m	8'a, 9'b		
9'a	20.7, <sup>e</sup> CH <sub>2</sub>	1.60, <sup>n</sup> m	9'b		
9'b		1.18, <sup>o</sup> m	8'b, 9'a, 10'		5', 14'a
10'	44.7, CH	1.25, m	5', 9'b		4', 6'
11'	28.0, CH	1.64, m	12', 13'	10', 12', 13'	4', 12', 13'
12'	15.6, CH <sub>3</sub>	0.71, d (6.6)	11'	10', 11', 13'	5', 11'
13'	21.2, <sup>i</sup> CH <sub>3</sub>	0.88, <sup>s</sup> d (6.6)	11'	10', 11', 12'	11'
14'a	74.5, <sup>l</sup> CH <sub>2</sub>	4.43, d (9.6)	14'b		5', 9'b
14'b		3.94, d (9.0)	14'a	6', 7', 15'	
15'	176.7, C				
1''	166.8, C				
2''	129.3, C				
3''a	61.0, <sup>a</sup> CH <sub>2</sub>	5.26, d (14.4)	3''b	1'', 4''	6''
3''b		4.84, d (14.4)	3''a	1'', 2'', 4'', 15''	
4''	145.1, CH	7.06, d (3.5)	5''	1'', 2'', 3'', 5'', 6''	5'', 11'', 12''
5''	39.4, <sup>b</sup> CH	2.59, m	4'', 6'', 10''		4'', 9b'', 12'', 14''b
6''	52.0, <sup>k</sup> CH	3.66, d (12.2)	5''	5'', 7'', 10'', 14'', 15''	3''a, 8b'', 10''
7''	71.8, <sup>c</sup> C				
8''a	34.8, <sup>d</sup> CH <sub>2</sub>	2.10, ddd (12.6, 3.1, 3.1)	8''b		9''a, 9''b
8''b		1.36, <sup>m</sup> m	8''a, 9''b		6''
9''a	20.9, <sup>e</sup> CH <sub>2</sub>	1.60, <sup>n</sup> m	9''b		8''a
9''b		1.18, <sup>o</sup> m	8''b, 9''a, 10''		5'', 8''a
10''	47.6, <sup>f</sup> CH	1.53, <sup>p</sup> m	5'', 9''b		6'', 11''
11''	27.0, <sup>g</sup> CH	1.96, <sup>q</sup> m	12'', 13''	13''	4'', 10'', 13''
12''	15.2, <sup>h</sup> CH <sub>3</sub>	0.84, <sup>r</sup> d (6.6)	11''	10'', 11'', 13''	4'', 5''
13''	21.4, CH <sub>3</sub>	0.89, <sup>s</sup> d (6.6)	11''	10'', 11'', 12''	11''
14''a	65.9, CH <sub>2</sub>	5.11, d (12.0)	14''b	1, 7'', 8''	
14''b		4.35, d (12.0)	14''a	1	5'', 9''b
15''	171.9, <sup>j</sup> C				

<sup>a-s</sup>Assignments of overlapping resonances with the same superscript may be interchanged.

#### 1.4 Trivirensol D (**14**)



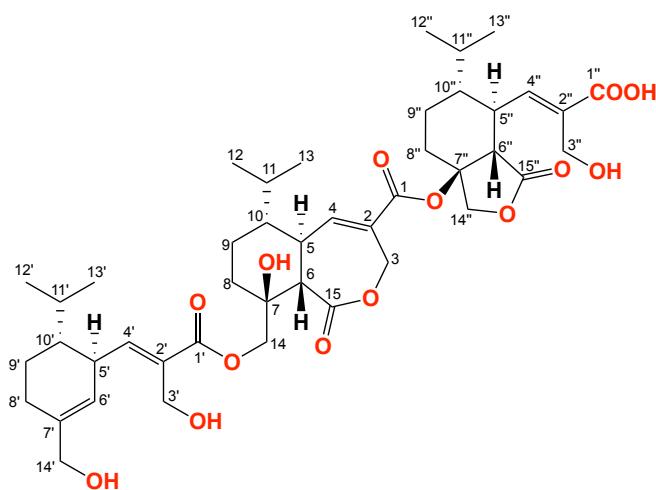
**Table S4.**  $^1\text{H}$  and  $^{13}\text{C}$  NMR data for trivirensol D (**14**) in  $\text{DMSO}-d_6$

Position	$\delta_{\text{C}}$ , mult	$\delta_{\text{H}}$ ( $J$ in Hz)	COSY	HMBC (H $\rightarrow$ C)	ROESY
1	165.3, C				
2	129.0, C				
3a	60.9, $\text{CH}_2$	5.34, d (14.4)	3b, 4	1, 4	6
3b		4.89, <sup>k</sup> d (14.4)	3a	1, 2, 4, 15	
4	146.1, <sup>a</sup> CH	7.13, d (3.6)	3a, 5	1, 2, 3, 6	5, 10, 11, 12, 8''a
5	39.4, <sup>b</sup> CH	2.63, ddd (12.3, 10.6, 3.6)	4, 6, 10		4, 9b, 12, 14b
6	51.8, CH	3.68, d (12.3)	5	5, 7, 8, 10, 14, 15	3a, 8b, 10
7	71.8, <sup>c</sup> C				
7-OH		5.10, s		6, 7, 8	
8a	34.8, <sup>d</sup> $\text{CH}_2$	2.17, ddd (12.8, 2.9, 2.9)	8b	6, 10	9a, 9b, 4'
8b		1.35, <sup>l</sup> m	8a, 9b		6
9a	20.9, <sup>e</sup> $\text{CH}_2$	1.59, <sup>m</sup> m	9b		8a
9b		1.17, <sup>n</sup> m	8b, 9a, 10		5, 8a, 14b
10	47.6, <sup>f</sup> CH	1.54, m	5, 9b		4, 6
11	27.0, <sup>g</sup> CH	1.99, <sup>o</sup> m	12, 13	10, 12, 13	4
12	15.2, <sup>h</sup> $\text{CH}_3$	0.84, <sup>p</sup> d (6.6)	11	10, 11, 13	4, 5
13	21.2, <sup>i</sup> $\text{CH}_3$	0.89, <sup>q</sup> d (6.6)	11	10, 11, 12	
14a	65.0, $\text{CH}_2$	4.95, d (12.2)	14b	7, 8, 1'	
14b		4.40, d (12.2)	14a	1'	5, 9b
15	171.8, <sup>j</sup> C				
1'	166.9, C				
2'	132.1, C				
3'a	55.2, $\text{CH}_2$	4.24, d (11.4)	3'b, 3'-OH	1', 2', 4'	5', 6'
3'b		4.20, d (11.4)	3'a, 3'-OH	1', 2', 4'	5'
3'-OH		4.75, m	3'a, 3'b		

Position	$\delta_{\text{C}}$ , mult	$\delta_{\text{H}}$ ( $J$ in Hz)	COSY	HMBC (H $\rightarrow$ C)	ROESY
4'	149.0, CH	6.52, d (10.2)	5'	1', 2', 3', 5', 6', 10'	6', 10', 11', 8a
5'	38.1, CH	3.22,* m	4', 6', 10'		3'a, 3'b, 6', 11', 12', 13'
6'	121.2, CH	5.23, m	5', 8'a, 8'b, 14'a, 14'b,	4', 5', 8', 10', 14'	3'a, 4', 5', 14'a, 14'b
7'	140.0, C				
8'a	25.3, CH <sub>2</sub>	2.01, m	6', 8'b		
8'b		1.91, m	6', 8'a		
9'a	21.1, <sup>c</sup> CH <sub>2</sub>	1.70, m	9'b, 10'		
9'b		1.26, m	9'a		
10'	44.9, CH	1.26, m	5', 9'a		4'
11'	28.5, CH	1.59, m	12', 13'		5'
12'	17.7, CH <sub>3</sub>	0.78, d (7.2)	11'	10', 11', 13'	5'
13'	21.2, <sup>i</sup> CH <sub>3</sub>	0.90, <sup>q</sup> d (7.2)	11'	10', 11', 12'	5'
14'a	64.6, CH <sub>2</sub>	3.80, d (14.0)	6', 14'b , 14'-OH	6', 7'	6'
14'b		3.78, d (14.4)	6', 14'a, 14'-OH		6'
14'-OH		4.71, br s	14'a, 14'b		
1''	166.9, C				
2''	130.7, C				
3''a	61.4, CH <sub>2</sub>	5.22, d (14.4)	3''b, 4''	1''	6''
3''b		4.88, <sup>k</sup> d (14.4)	3''a	1'', 2'', 4'', 15''	
4''	146.1, <sup>a</sup> CH	7.01, d (2.5)	3''a, 5''	1'', 3'', 6''	5'', 10'', 11'', 12''
5''	39.2, <sup>b</sup> CH	2.56, ddd (12.3, 10.6, 2.5)	4'', 6'', 10''		4'', 9b'', 12'', 14''b
6''	52.1, CH	3.63, d (12.3)	5''	5'', 7'', 8'', 10'', 14'', 3''a, 8b'', 10'' 15''	
7''	71.7, <sup>c</sup> C				
8''a	34.8, <sup>d</sup> CH <sub>2</sub>	2.09, ddd (12.8, 2.7, 2.7)	8''b	7'', 10''	9''a, 9''b, 4
8''b		1.35, <sup>l</sup> m	8''a, 9''b		6''
9''a	20.9, <sup>e</sup> CH <sub>2</sub>	1.59, <sup>m</sup> m	9''b		8''a
9''b		1.17, <sup>n</sup> m	8''b, 9''a, 10''		5'', 8''a, 14''b
10''	47.5, <sup>f</sup> CH	1.50, m	5'', 9''b		4'', 6''
11''	26.9, <sup>g</sup> CH	1.99, <sup>o</sup> m	12'', 13''	10'', 12'', 13''	4'', 12'', 13''
12''	15.2, <sup>h</sup> CH <sub>3</sub>	0.83, <sup>p</sup> d (6.6)	11''	10'', 11'', 13''	4'', 5''
13''	21.2, <sup>i</sup> CH <sub>3</sub>	0.89, <sup>q</sup> d (6.6)	11''	10'', 11'', 12''	
14''a	65.9, CH <sub>2</sub>	5.11, d (12.0)	14''b	1, 6'', 7'', 8''	
14''b		4.35, d (12.0)	14''a	1	5'', 9''b
15''	172.1, <sup>j</sup> C				

<sup>a-q</sup>Assignments of overlapping resonances with the same superscript may be interchanged. \*signal is obscured under H<sub>2</sub>O resonance.

## 1.5 Trivirensol E (15)



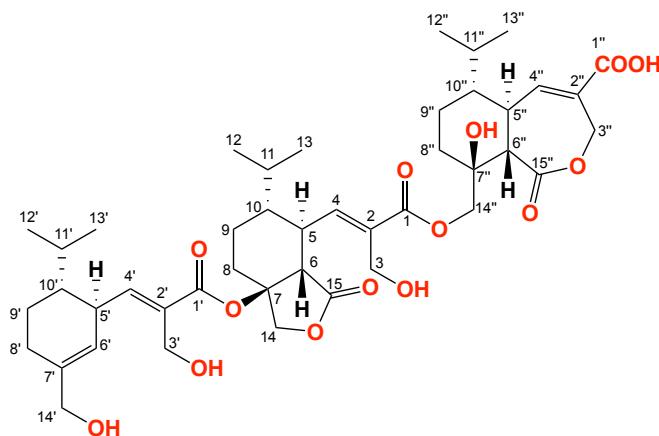
**Table S5.**  $^1\text{H}$  and  $^{13}\text{C}$  NMR data for trivirensol E (**15**) in  $\text{DMSO}-d_6$

Position	$\delta_{\text{C}}$ , mult	$\delta_{\text{H}}$ ( $J$ in Hz)	COSY	HMBC (H $\rightarrow$ C)	ROESY
1	164.2, C				
2	129.0, C				
3a	60.7, $\text{CH}_2$	5.30, d (14.4)	3b, 4	1, 4	6
3b		4.77, d (14.4)	3a	1, 2, 4, 15	
4	146.9, CH	7.05, d (3.5)	3a, 5	1, 2, 3, 5, 6	5, 10, 11, 12, 6''
5	39.7, CH	2.59, ddd (12.0, 12.0, 3.5)	4, 6, 10		4, 9b, 12, 14b
6	51.7, CH	3.66, d (12.0)	5	5, 7, 8, 10, 14, 15	3a, 8b, 10, 7-OH
7	71.8, C				
7-OH		5.09, s		6, 7, 8, 14	6, 8a, 8b, 14a
8a	34.7, $\text{CH}_2$	2.15, d (12.6)	8b	6	9a, 9b, 14b, 7-OH, 4'
8b		1.33, m	8a, 9b		6, 7-OH
9a	21.0, <sup>a</sup> $\text{CH}_2$	1.57, m	9b		8a
9b		1.15, m	8b, 9a, 10		5, 8a, 14b
10	47.5, CH	1.50, m	5, 9b		4, 6
11	27.1, CH	1.89, m	12, 13	10, 12, 13	4, 8a
12	15.4, $\text{CH}_3$	0.82, d (6.6)	11	10, 11, 13	4, 5
13	21.1, <sup>a</sup> $\text{CH}_3$	0.87, d (6.6)	11	10, 11, 12	
14a	64.9, $\text{CH}_2$	4.94, d (12.0)	14b	7, 8, 1'	7-OH
14b		4.38, d (12.0)	14a	1'	5, 8a, 9b
15	171.7, C				
1'	167.0, C				
2'	132.1, C				
3'a	55.2, $\text{CH}_2$	4.24, dd (11.6, 2.5)	3'b, 3'-OH		5', 3'-OH
3'b		4.19, dd (11.6, 2.5)	3'a, 3'-OH	1'	5', 3'-OH
3'-OH		4.75, m	3'a, 3'b		3'a, 3'b
4'	149.0, CH	6.51, br d (10.6)	5'	1', 2', 3', 5', 6,	6', 10', 11', 8a

Position	$\delta_{\text{C}}$ , mult	$\delta_{\text{H}}$ ( $J$ in Hz)	COSY	HMBC (H→C)	ROESY
				10'	
5'	38.1, <sup>b</sup> CH	3.20, m	4', 6', 10'		3'a, 3'b, 6', 11', 12'
6'	121.2, CH	5.23, s	5', 14'a, 14'b	4', 5', 8', 10', 14'	3'a, 3'b, 4', 5', 10', 14'a, 14'b
7'	140.0, C				
8'a	25.3, CH <sub>2</sub>	2.00, br d (14.4)	8'b		14'a, 14'b
8'b		1.92, m	8'a, 9'a		
9'a	21.0, <sup>a</sup> CH <sub>2</sub>	1.71, m	9'b		
9'b		1.26, m	8'b, 9'a, 10'		
10'	44.9, CH	1.27, m	5', 9'b		4', 6'
11'	28.5, CH	1.58, m	12', 13'	5', 10', 12', 13'	4', 5'
12'	17.1, CH <sub>3</sub>	0.77, d (6.6)	11'	10', 11', 13'	5'
13'	21.1, CH <sub>3</sub>	0.89, <sup>c</sup> d (6.6)	11'	10', 11', 12'	
14'a	64.6, CH <sub>2</sub>	3.80, d (14.0)	6', 14'b , 14'-OH	6', 7'	6', 8'a, 14'-OH
14'b		2.78, d (14.0)	6', 14'a, 14'-OH	6', 7'	6', 8'a, 14'-OH
14'-OH		4.71, br s	14'a, 14'b		14'a, 14'b
1''	168.5,* C				
2''	134.6,* C				
3''a	55.7, CH <sub>2</sub>	4.07, d (12.0)	3''b	1'', 2'', 4''	5''
3''b		3.97, d (12.0)	3''a	1'', 2'', 4''	5''
4''	141.7,* CH	6.48, d (10.0)	5''	1'', 3''	6'', 10'', 11''
5''	38.2, <sup>b</sup> CH	2.83, ddd (10.0, 10.0, 10.0)	4'', 6'', 10''		3''a, 3''b, 12'', 14''a
6''	49.1, CH	2.70, d (10.0)	5''	4'', 5'', 7'', 14'', 15''	4'', 8b'', 10'', 4
7''	86.1, C				
8''a	27.4, CH <sub>2</sub>	2.45, ddd (14.0, 3.5, 3.5)	8''b, 9''a		9''a, 9''b, 14''a, 14''b
8''b		1.90, m	8''a, 9''b		6'', 14''a
9''a	19.7, CH <sub>2</sub>	1.64, <sup>d</sup> m	8''a, 9''b, 10''		8''a
9''b		1.32, m	8''b, 9''a		8''a
10''	43.7, CH	1.36, m	5'', 9''a		4'', 5'', 6''
11''	27.7, CH	1.64, <sup>d</sup> m	12'', 13''	5'', 10'', 12'', 13''	4''
12''	15.7, CH <sub>3</sub>	0.71, d (6.6)	11''	10'', 11'', 13''	5''
13''	21.4, <sup>a</sup> CH <sub>3</sub>	0.89, <sup>c</sup> d (6.6)	11''	10'', 11'', 12''	
14''a	70.8, CH <sub>2</sub>	4.67, d (11.2)	14''b	7'', 15''	5'', 8''a, 8''b
14''b		4.60, d (11.2)	14''a	7'', 15''	8''a
15''	174.8, C				

<sup>a-d</sup>Assignments of overlapping resonances with the same superscript may be interchanged. \*signals were detected from HMBC correlations.

## 1.6 Trivirensol F (16)



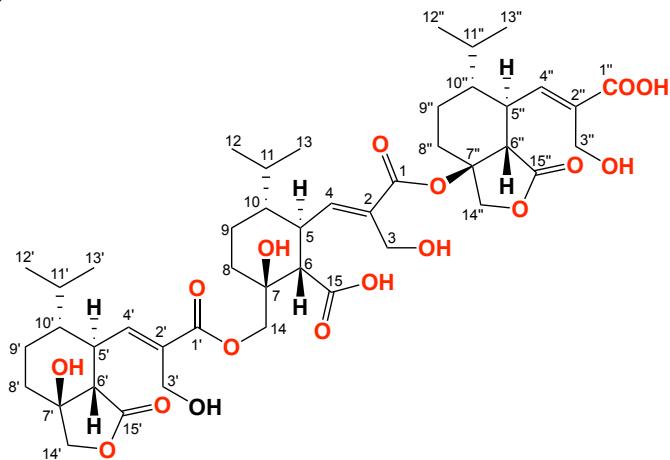
**Table S6.**  $^1\text{H}$  and  $^{13}\text{C}$  NMR data for trivirensol F (**16**) in  $\text{DMSO}-d_6$

Position	$\delta_{\text{C}}$ , mult	$\delta_{\text{H}}$ ( $J$ in Hz)	COSY	HMBC (H→C)	ROESY
1	166.7, C				
2	133.7, C				
3a	55.5, $\text{CH}_2$	4.13, <sup>c</sup> d (11.8)	3b	1, 2, 4	5
3b		4.04, d (11.8)	3a	1, 2, 4	5
4	143.7, CH	6.65, d (10.5)	5	1, 2, 3	6, 10, 11, 8' <sup>a</sup>
5	38.2, <sup>a</sup> CH	2.87, ddd (10.5, 10.2, 10.2)	4, 6, 10	4, 6	3a, 3b, 9b, 12, 14a
6	48.8, CH	2.76, d (10.2)	5	4, 5, 7, 14, 15	4, 8b, 10, 14b
7	84.8, C				
8a	27.3, $\text{CH}_2$	2.42, ddd (13.7, 3.3, 3.3)	8b		9a, 9b, 14a
8b		1.91, <sup>d</sup> m	8a	7	6
9a	19.8, $\text{CH}_2$	1.64, <sup>e</sup> m	9b		8a
9b		1.31, m	9a, 10		5, 8a, 14a
10	43.7, CH	1.42, m	5, 9b		4, 6
11	27.9, CH	1.64, <sup>e</sup> m	12, 13	10	4
12	15.9, $\text{CH}_3$	0.73, d (6.6)	11	10, 11, 13	5
13	21.3, <sup>b</sup> $\text{CH}_3$	0.90, <sup>f</sup> d (6.6)	11	10, 11, 12	
14a	71.1, $\text{CH}_2$	4.67, d (10.8)	14b	7, 15	5, 8a, 9b
14b		4.64, d (10.8)	14a	7, 15	6
15	175.2, C				
1'	165.9, C				
2'	132.3, C				
3'a	55.0, $\text{CH}_2$	4.14, d (11.4)	3'b	1', 2', 4'	4', 5', 6'
3'b		4.13, <sup>c</sup> d (11.4)	3'a	1', 2', 4'	4', 5', 6'
4'	149.2, CH	6.43, d (10.5)	5'	1', 3', 10'	3'a, 3'b, 6', 10', 11'
5'	38.3, <sup>a</sup> CH	3.19, dd (10.5, 10.5)	4', 6', 10'	6'	3'a, 3'b, 6', 12'
6'	120.8, CH	5.20, s	5', 14'a,	5', 8', 10', 14'	3'a, 3'b, 4', 5', 14'a,
			14'b		14'b
7'	140.2, C				
8'a	25.2, $\text{CH}_2$	1.97, m	8'b		14'a, 14'b

Position	$\delta_{\text{C}}$ , mult	$\delta_{\text{H}}$ ( $J$ in Hz)	COSY	HMBC (H→C)	ROESY
8'b		1.90, <sup>d</sup> m	8'a, 9'a		
9'a	20.9, <sup>b</sup> CH <sub>2</sub>	1.69, m	9'b, 8'b, 10'		
9'b		1.21, m	9'a		
10'	44.6, CH	1.27, m	5', 9'a		4'
11'	28.4, CH	1.55, m	12', 13'		4'
12'	16.9, CH <sub>3</sub>	0.76, d (6.6)	11'	10', 11', 13'	5'
13'	21.2, <sup>b</sup> CH <sub>3</sub>	0.88, <sup>f</sup> d (6.6)	11'	10', 11', 12'	
14'a	64.5, CH <sub>2</sub>	3.79, d (14.0)	6', 14'b	6', 7'	6', 8'a
14'b		3.76, d (14.0)	14'a	6', 7'	6', 8'a
1''	166.9, C				
2''	129.4, C				
3''a	60.9, CH <sub>2</sub>	5.29, d (14.4)	3''b, 4''	1'', 4''	6''
3''b		4.84, d (14.4)	3''a	1'', 2'', 4'', 15''	
4''	145.2, CH	7.07, d (4.2)	3''a, 5''	1'', 2'', 3'', 5'', 6''	5'', 11'', 12''
5''	39.4, CH	2.59, ddd (12.4, 10.8, 3.6)	4'', 6'', 10''	4'', 6''	4'', 9'b, 12'', 14'b
6''	51.7, CH	3.67, d (12.4)	5''	5'', 7'', 10'', 14'', 15''	3''a, 8''b, 10''
7''	71.8, C				
8''a	34.8, CH <sub>2</sub>	2.20, ddd (12.1, 2.2, 2.2)	8''b		9''a, 9''b, 4
8''b		1.36, m	8''a		6''
9''a	20.9, <sup>b</sup> CH <sub>2</sub>	1.60, m	9''b		8''a
9''b		1.17, m	9''a, 10''		8''a
10''	47.6, CH	1.52, m	5'', 9''b		6''
11''	27.0, CH	1.96, m	12'', 13''	10'', 13''	4''
12''	15.2, CH <sub>3</sub>	0.84, d (7.2)	11''	10'', 11'', 13''	4'', 5''
13''	21.2, <sup>b</sup> CH <sub>3</sub>	0.89, <sup>f</sup> d (6.6)	11''	10'', 11'', 12''	
14''a	65.0, CH <sub>2</sub>	5.03, d (12.0)	14''b	1, 7'', 8''	
14''b		4.37, d (12.0)	14''a	1	5'', 9''b
15''	171.8, C				

<sup>a-f</sup>Assignments of overlapping resonances with the same superscript may be interchanged.

### 1.7 Trivirensol G (17)



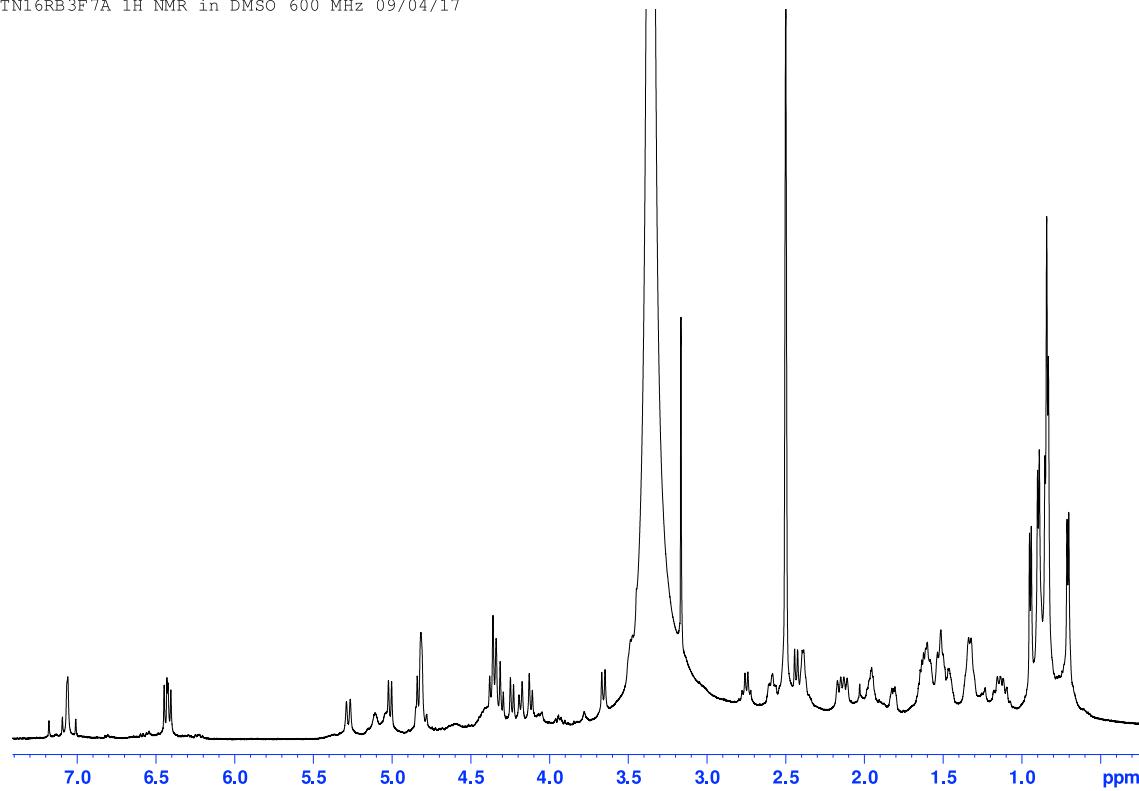
**Table S7.**  $^1\text{H}$  and  $^{13}\text{C}$  NMR data for trivirensol G (17) in  $\text{DMSO}-d_6$

Position	$\delta_{\text{C}}$ , mult	$\delta_{\text{H}}$ ( $J$ in Hz)	COSY	HMBC ( $\text{H} \rightarrow \text{C}$ )	ROESY
1	166.0, C				
2	133.3, C				
3a	55.2, $\text{CH}_2$	4.12, d (12.0)	3b	1, 2, 4	5
3b		4.06, d (12.0)	3a	1, 2, 4	5
4	145.5, CH	6.32, d (10.4)	5	1, 2, 3	6, 10, 11
5	40.0, CH	2.73, m	4, 6, 10		3a, 3b, 9b, 11, 12, 14a
6	57.9, CH	2.42, d (11.4)	5	4, 7, 14, 15	4, 8b, 10
7	71.3, C				
8a	34.8, $\text{CH}_2$	2.14, ddd (12.0, 2.1, 2.1)	8b		9a, 9b, 14a, 4'
8b		1.34, m	8a, 9b		6
9a	20.3, $\text{CH}_2$	1.52, m	9b		8a
9b		1.09, m	8b, 9a, 10		5, 8a
10	45.4, CH	1.33, m	5, 9b		4, 6
11	27.9, <sup>a</sup> CH	1.56, m	12, 13	10, 13	4, 5
12	15.6, <sup>b</sup> $\text{CH}_3$	0.70, <sup>f</sup> d (6.6)	11	10, 11, 13	5
13	21.3, <sup>c</sup> $\text{CH}_3$	0.84, d (6.6)	11	10, 11, 12	
14a	65.5, $\text{CH}_2$	4.34, d (12.6)	14b	1'	5, 9b
14b		4.27, d (12.0)	14a	7, 8, 1'	5
15	173.8, C				
1'	166.7, C				
2'	133.7, C				
3'a	55.5, <sup>d</sup> $\text{CH}_2$	4.09, <sup>g</sup> d (12.0)	3'b	1', 2', 4'	5'
3'b		3.96, d (12.0)	3'a	1', 2', 4'	5'
4'	144.1, CH	6.55, d (10.8)	5'	1', 2', 3', 6'	6', 10', 11', 8a
5'	39.6, CH	2.60, ddd (10.5, 10.5, 10.5)	4', 6', 10'	4', 6'	3'a, 3'b, 9'b, 12', 14'a
6'	52.0, CH	2.03, d (10.8)	5'	4', 7', 14', 15'	4', 8b', 10'
7'	74.4, <sup>e</sup> C				
8'a	31.8, $\text{CH}_2$	1.89, m	8'b	7'	14'a

Position	$\delta_C$ , mult	$\delta_H$ ( $J$ in Hz)	COSY	HMBC (H→C)	ROESY
8'b		1.56, m	8'a, 9'b		6
9'a	20.7, CH <sub>2</sub>	1.60, m	9'b		
9'b		1.17, m	8'b, 9'a, 10'		5', 14'a
10'	44.6, CH	1.26, m	5', 9'b		4', 6'
11'	28.0, <sup>a</sup> CH	1.62, <sup>h</sup> m	12', 13'	10', 12', 13'	
12'	15.6, <sup>b</sup> CH <sub>3</sub>	0.70, <sup>f</sup> d (6.6)	11'	10', 11', 13'	5'
13'	21.4, <sup>c</sup> CH <sub>3</sub>	0.88, d (6.6)	11'	10', 11', 12'	
14'a	74.5, <sup>e</sup> CH <sub>2</sub>	4.42, d (9.6)	14'b	7'	5', 8'a, 9'b
14'b		3.93, d (9.6)	14'a	7', 15'	6', 8'a,
15'	176.7, C				
1''	168.2, C				
2''	134.2, C				
3''a	55.4, <sup>d</sup> CH <sub>2</sub>	4.09, <sup>g</sup> d (12.0)	3''b	1'', 2'', 4''	5''
3''b		3.98, d (12.0)	3''a	1'', 4''	5''
4''	142.7, CH	6.54, d (10.3)	5''	1'', 2'', 3'', 6'', 10''	6'', 10'', 11''
5''	37.9, CH	2.87, ddd (10.3, 9.6, 9.6)	4'', 6'', 10''	4'', 6''	3''a, 3''b, 9''b, 12'', 14''a
6''	48.7, CH	2.76, d (9.6)	5''	4'', 5'', 7'', 14'', 15''	4'', 8b'', 10'', 14''b
7''	84.7, C				
8''a	26.9, CH <sub>2</sub>	2.32, ddd (14.0, 4.1, 4.1)	8''b		14''a, 14''b
8''b		1.90, m	8''a, 9''b	7''	6''
9''a	19.4, CH <sub>2</sub>	1.63, m	9''b		
9''b		1.33, m	8''b, 9''a, 10''		5'', 14''a
10''	43.6, CH	1.37, m	5'', 9''b		4''
11''	27.7, <sup>a</sup> CH	1.64, <sup>h</sup> m	12''	10''	4''
12''	15.9, CH <sub>3</sub>	0.72, <sup>f</sup> d (6.6)	11''	10'', 11'', 13''	5''
13''	21.3, <sup>c</sup> CH <sub>3</sub>	0.91, d (6.6)		10'', 11'', 12''	
14''a	71.2, CH <sub>2</sub>	4.63, d (10.8)	14''b		5'', 8''a, 9''b
14''b		4.56, d (10.8)	14''a	7'', 15''	6'', 8''a
15''	174.9, C				

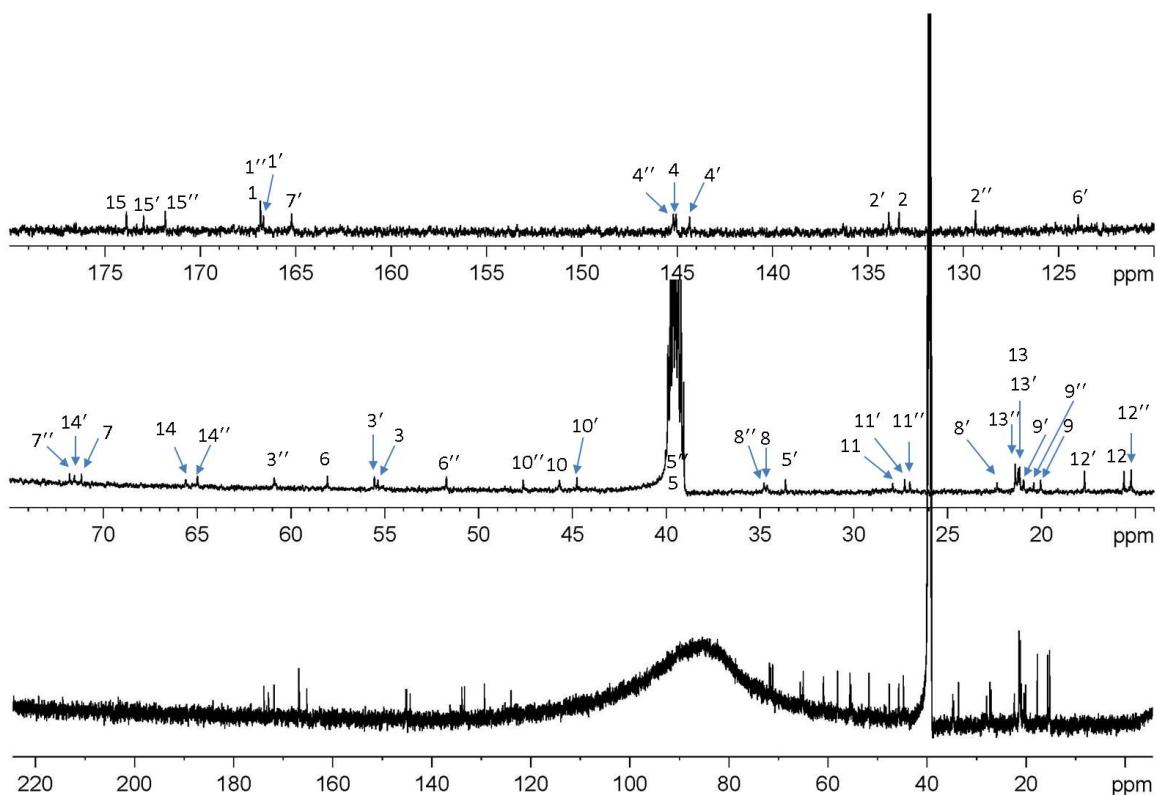
<sup>a-g</sup>Assignments of overlapping resonances with the same superscript may be interchanged.

TN16RB3F7A 1H NMR in DMSO 600 MHz 09/04/17

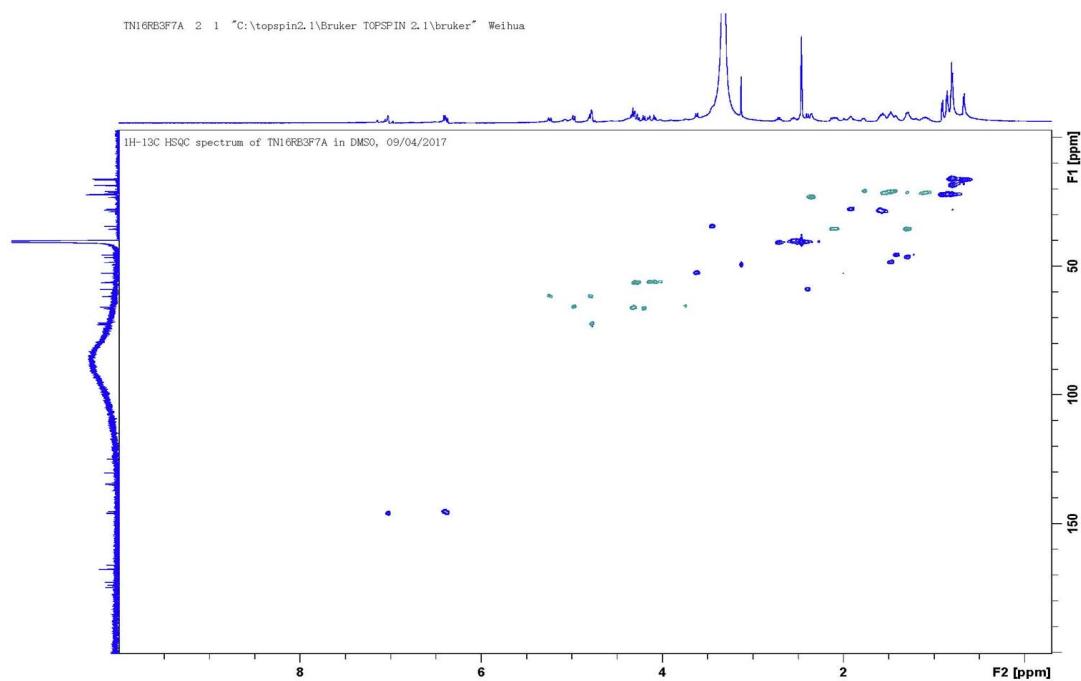


**Figure S1.**  $^1\text{H}$  NMR spectrum of trivirensol A (**11**) in  $\text{DMSO}-d_6$

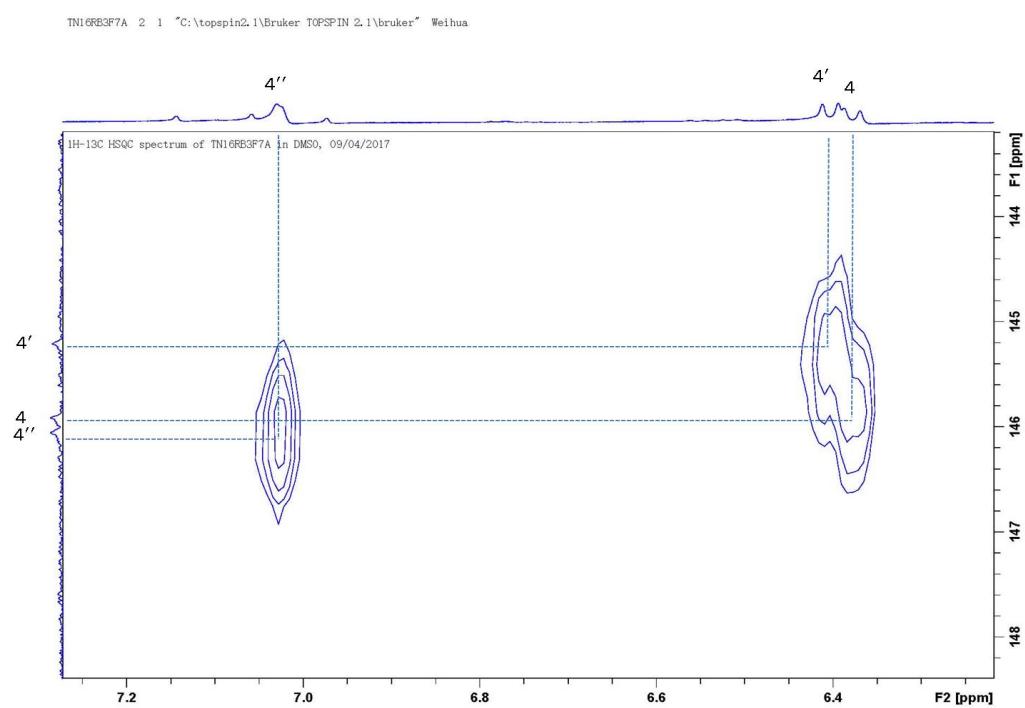
13C NMR Spectrum of TN16RB3F7A in DMSO, 09/04/2017



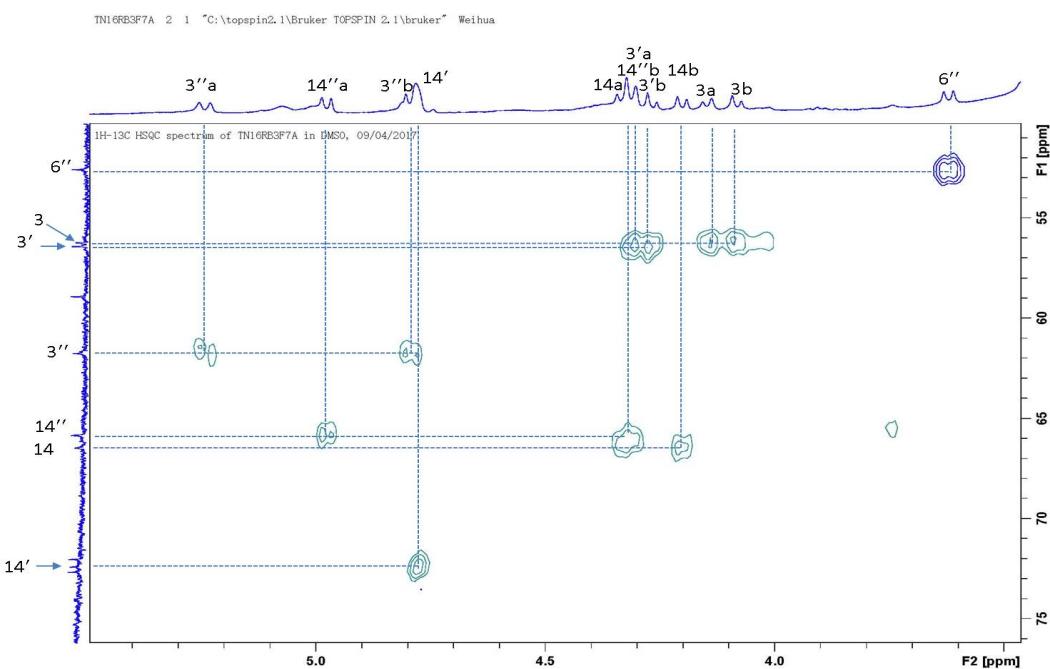
**Figure S2.**  $^{13}\text{C}$  NMR spectrum of trivirensol A (**11**) in  $\text{DMSO}-d_6$



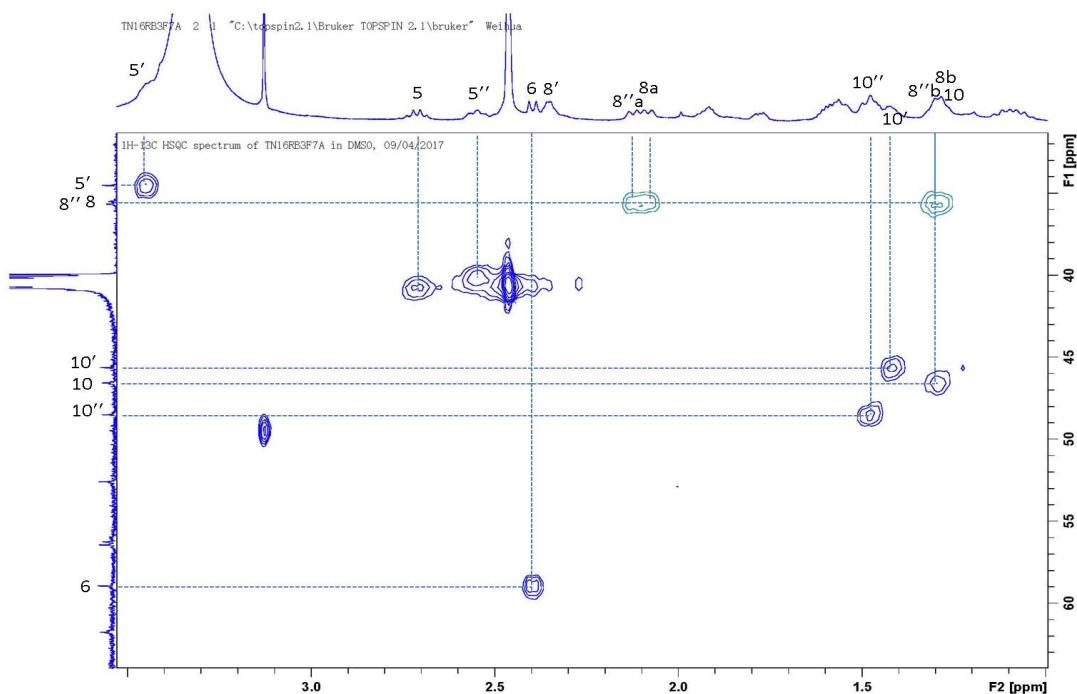
**Figure S3.** HSQC spectrum of trivirensol A (**11**) in DMSO-*d*<sub>6</sub>



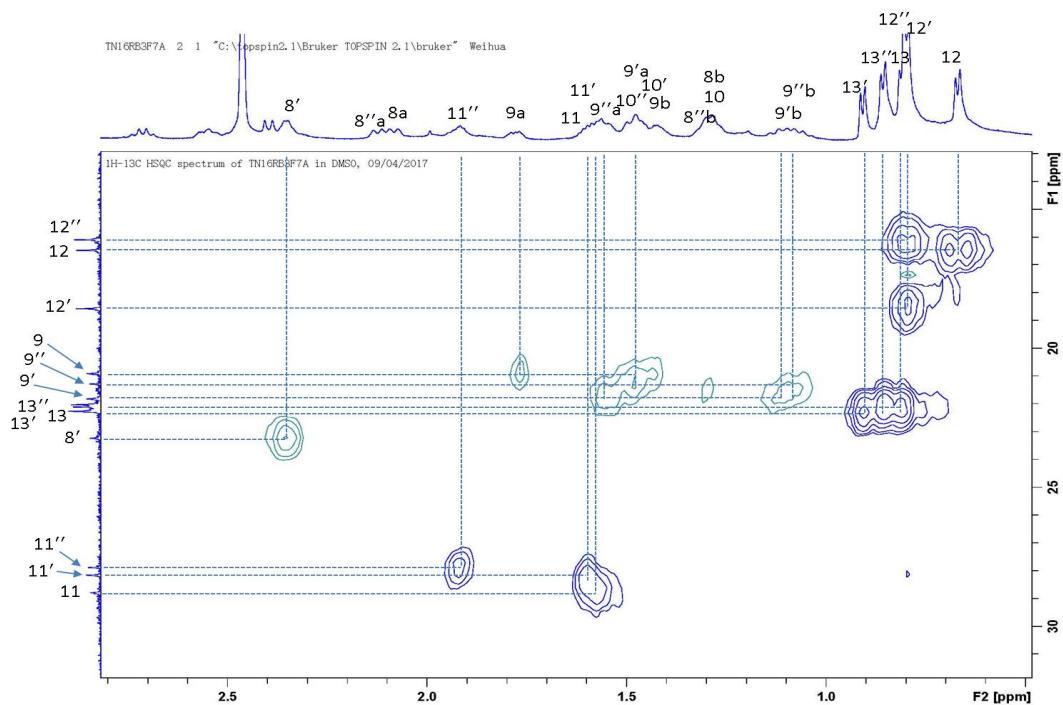
**Figure S4.** HSQC spectrum of trivirensol A (**11**) in DMSO-*d*<sub>6</sub>



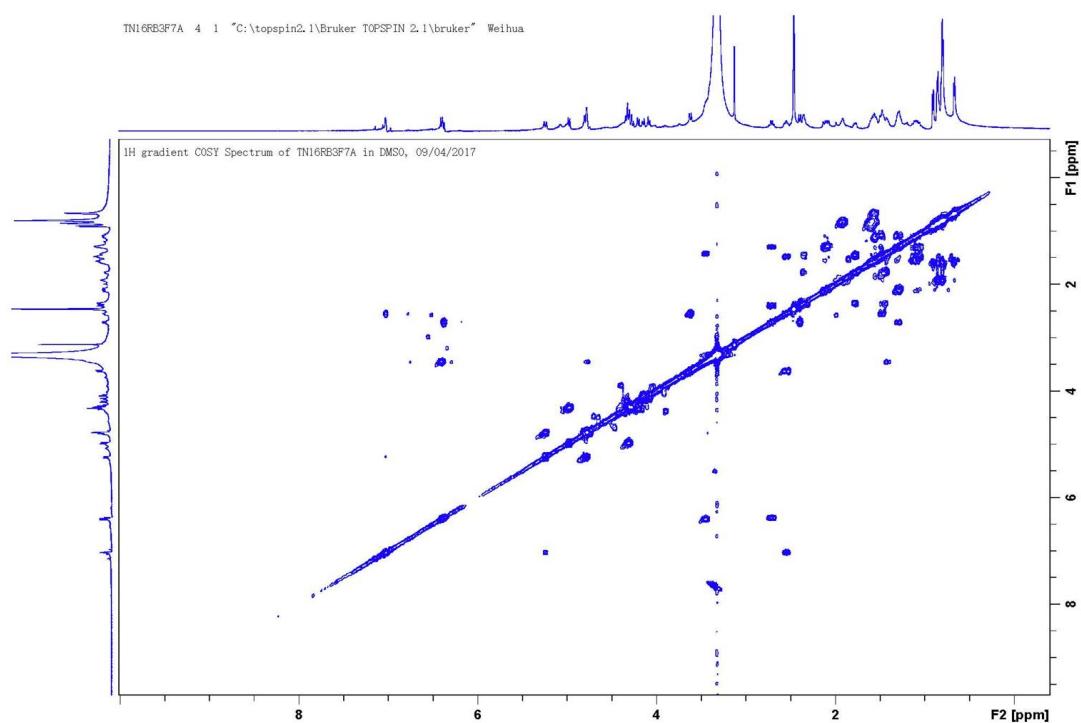
**Figure S5.** HSQC spectrum of trivirensol A (**11**) in DMSO-*d*<sub>6</sub>



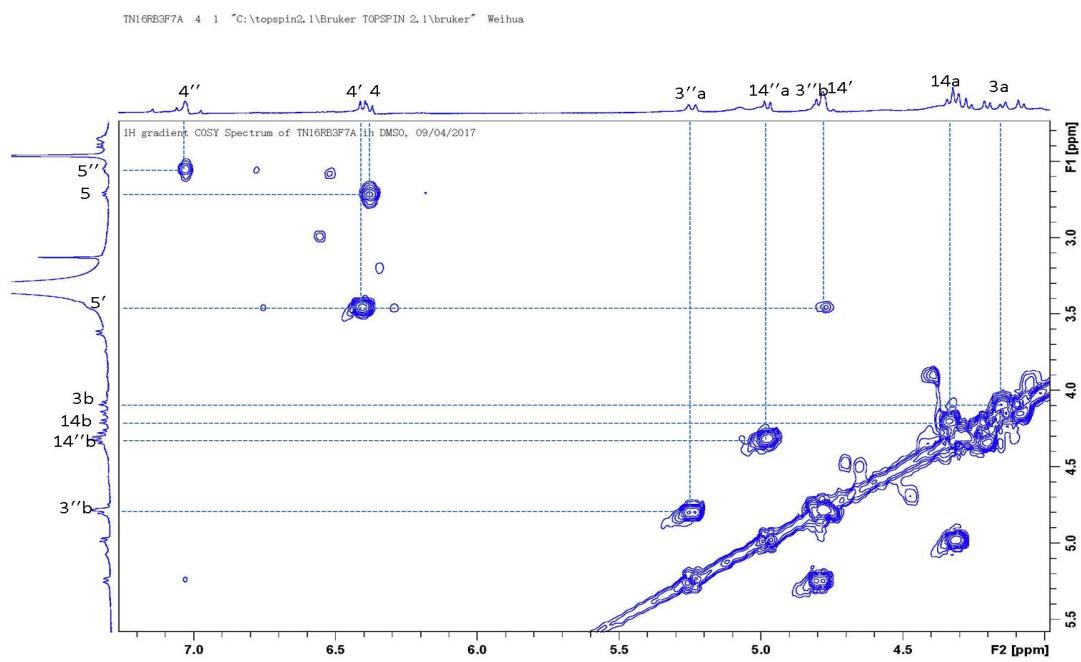
**Figure S6.** HSQC spectrum of trivirensol A (**11**) in  $\text{DMSO}-d_6$



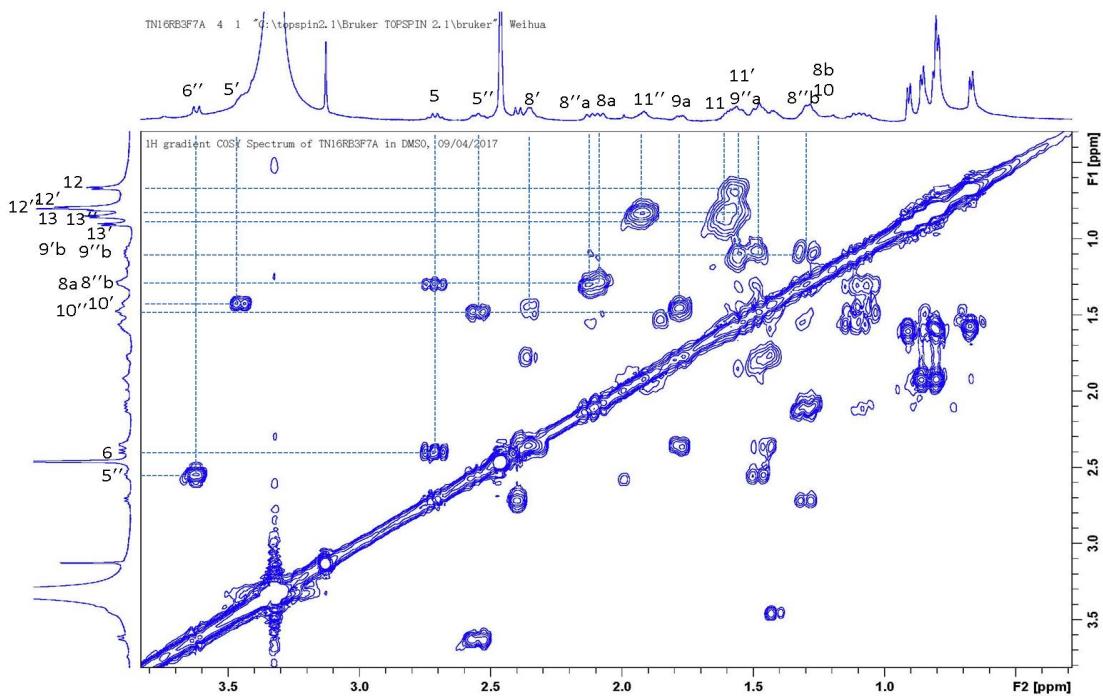
**Figure S7.** HSQC spectrum of trivirensol A (**11**) in  $\text{DMSO}-d_6$



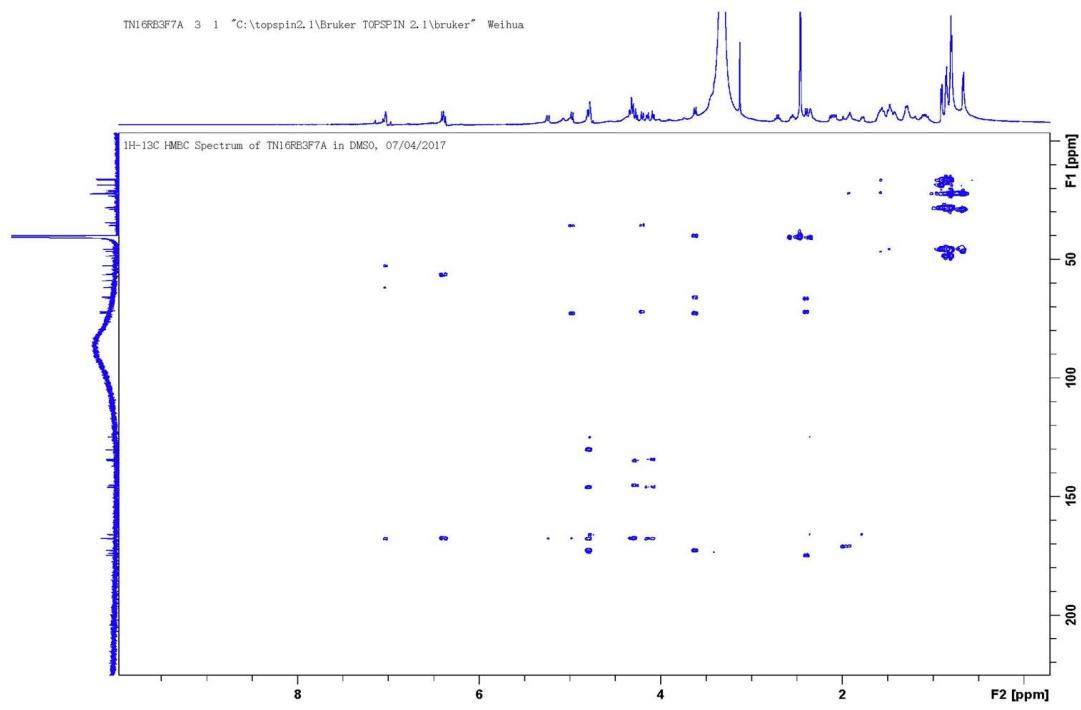
**Figure S8.**  $^1\text{H}$ - $^1\text{H}$  COSY spectrum of trivirensol A (**11**) in  $\text{DMSO}-d_6$



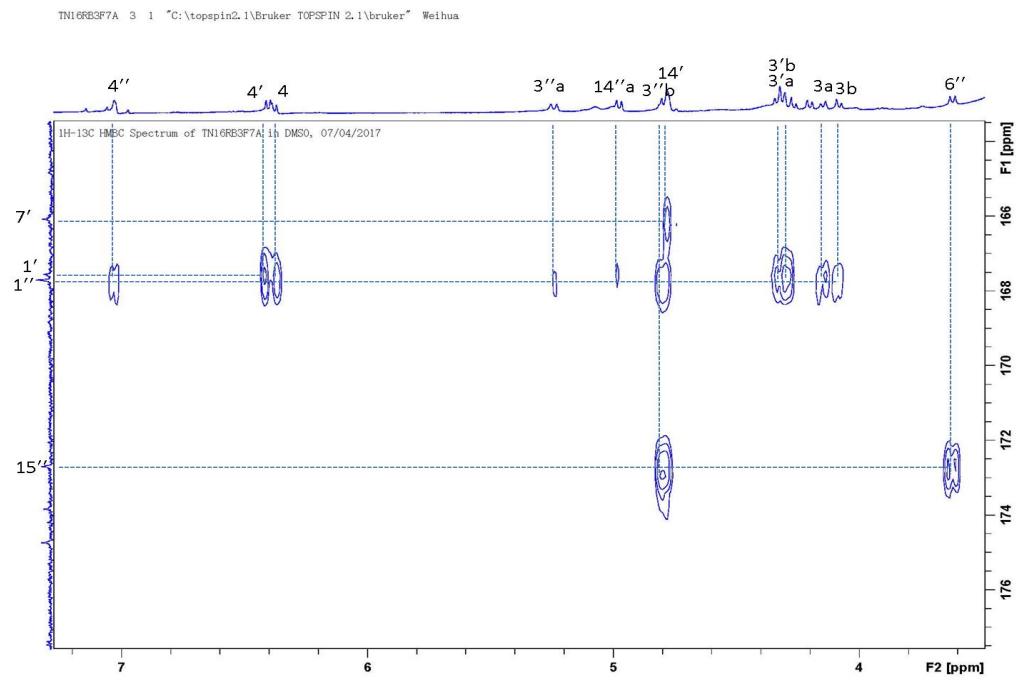
**Figure S9.**  $^1\text{H}$ - $^1\text{H}$  COSY spectrum of trivirensol A (**11**) in  $\text{DMSO}-d_6$



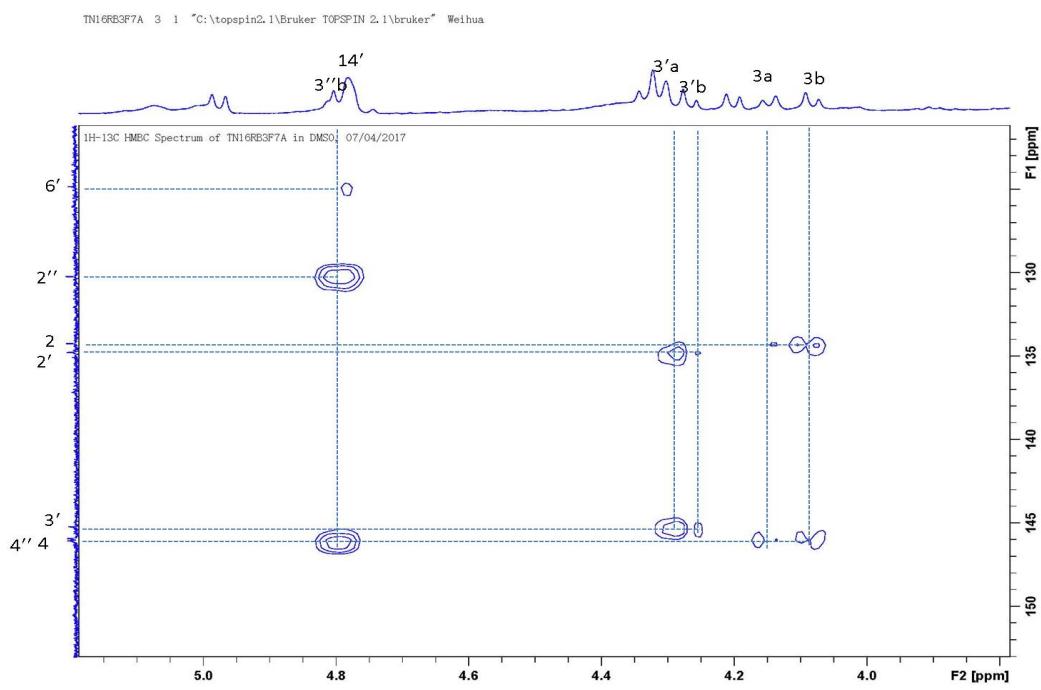
**Figure S10.**  $^1\text{H}$ - $^1\text{H}$  COSY spectrum of trivirensol A (**11**) in  $\text{DMSO}-d_6$



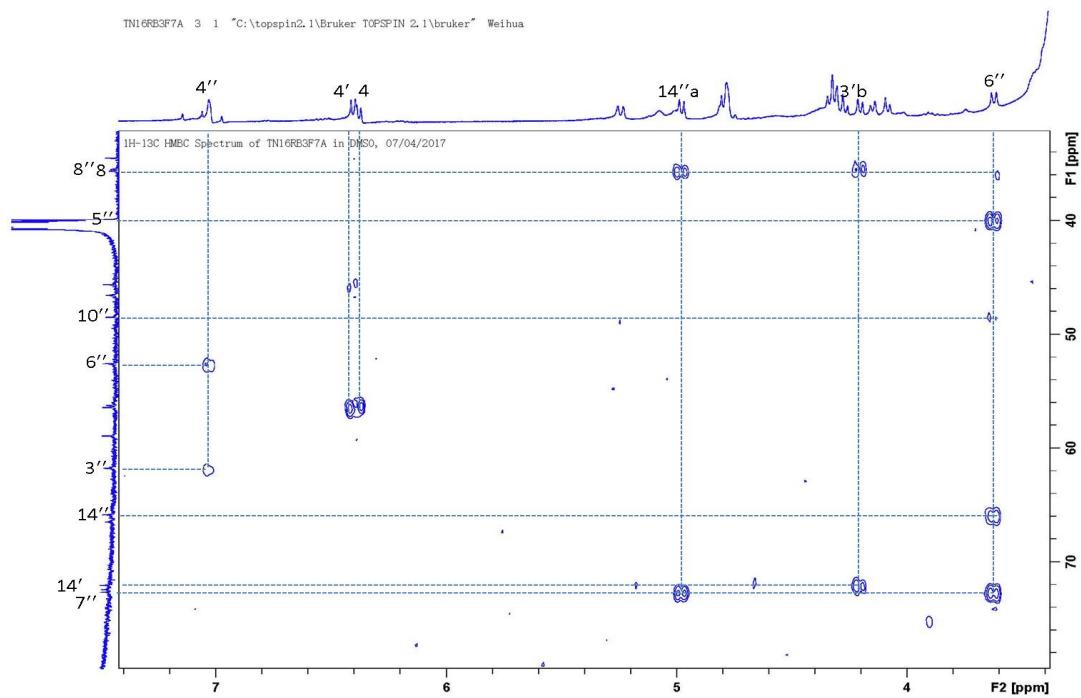
**Figure S11.** HMBC spectrum of trivirensol A (**11**) in  $\text{DMSO}-d_6$



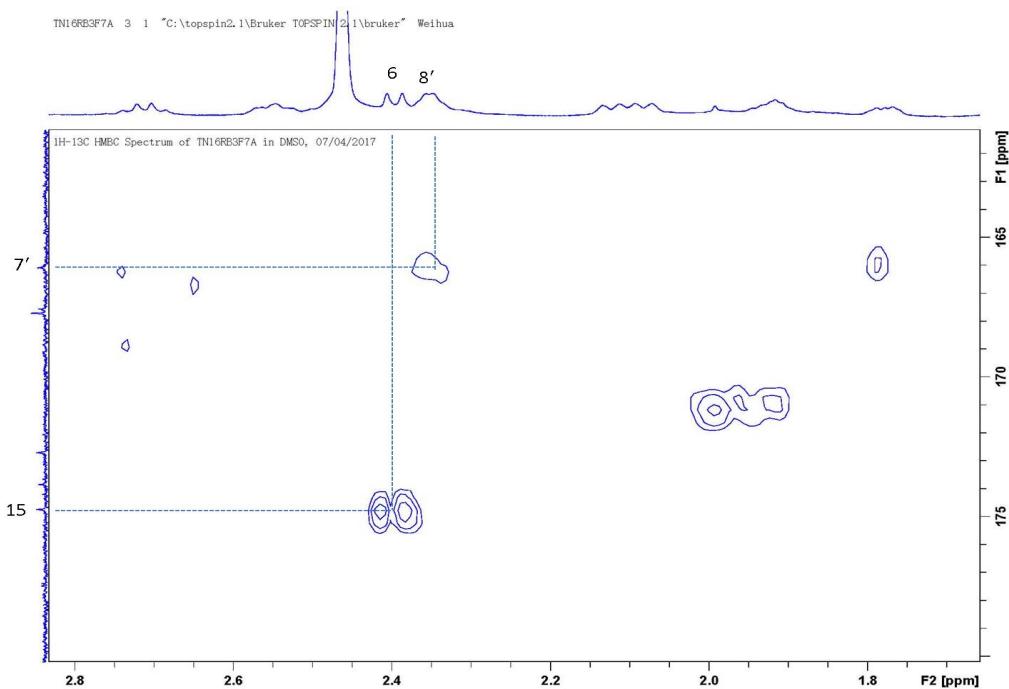
**Figure S12.** HMBC spectrum of trivirensol A (**11**) in  $\text{DMSO}-d_6$



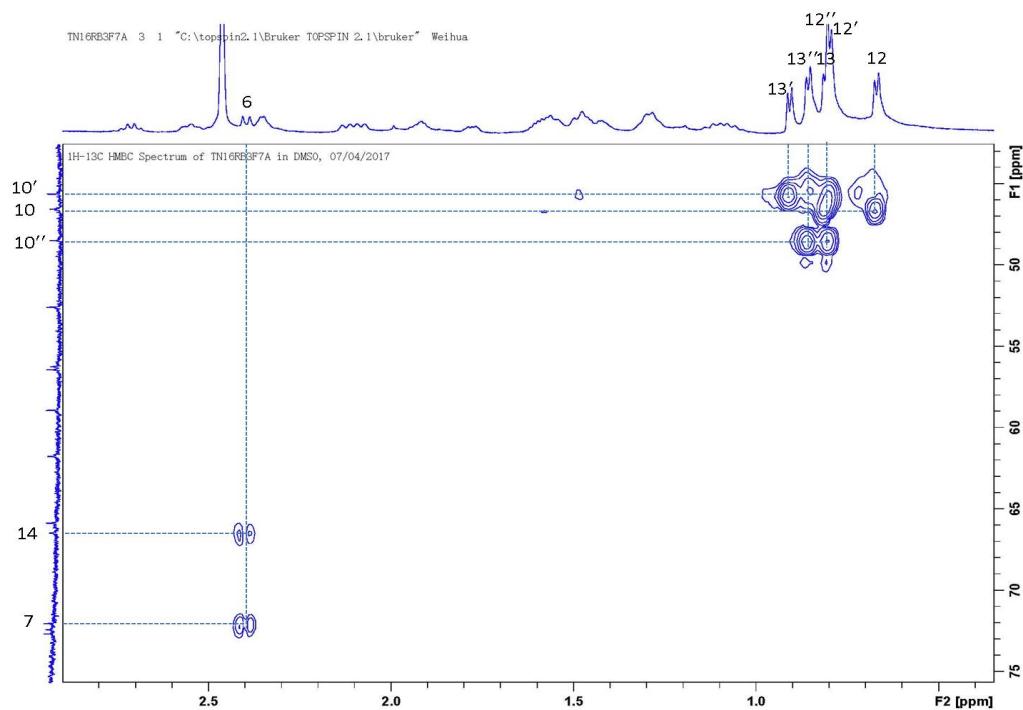
**Figure S13.** HMBC spectrum of trivirensol A (**11**) in  $\text{DMSO}-d_6$

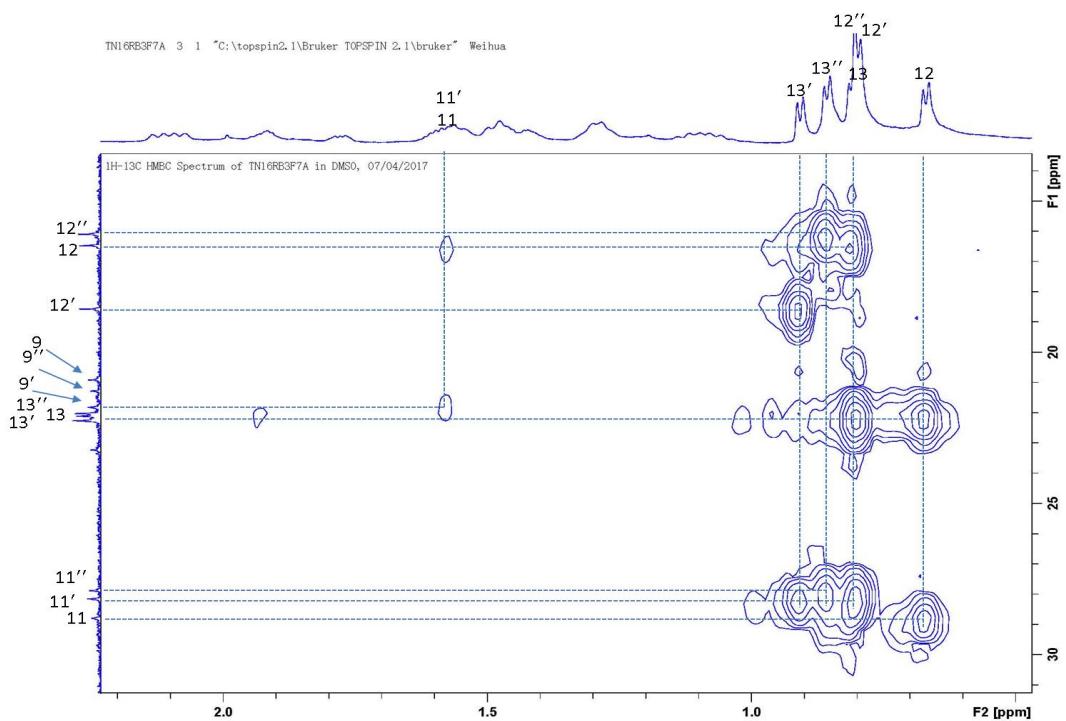


**Figure S14.** HMBC spectrum of trivirensol A (**11**) in  $\text{DMSO}-d_6$

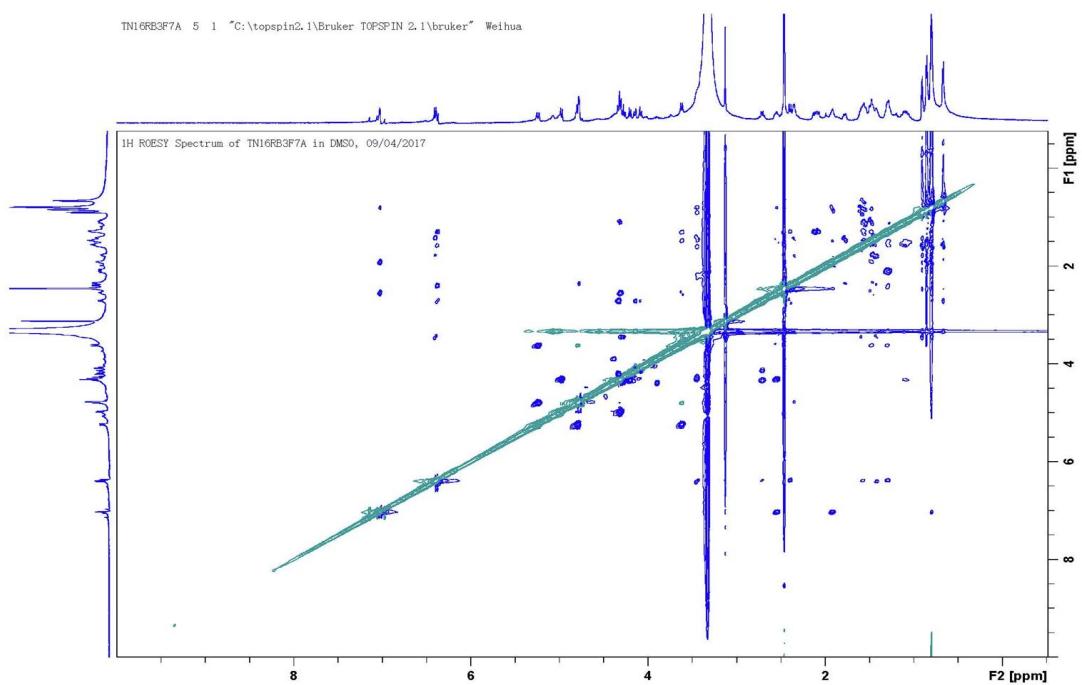


**Figure S15.** HMBC spectrum of trivirensol A (**11**) in  $\text{DMSO}-d_6$

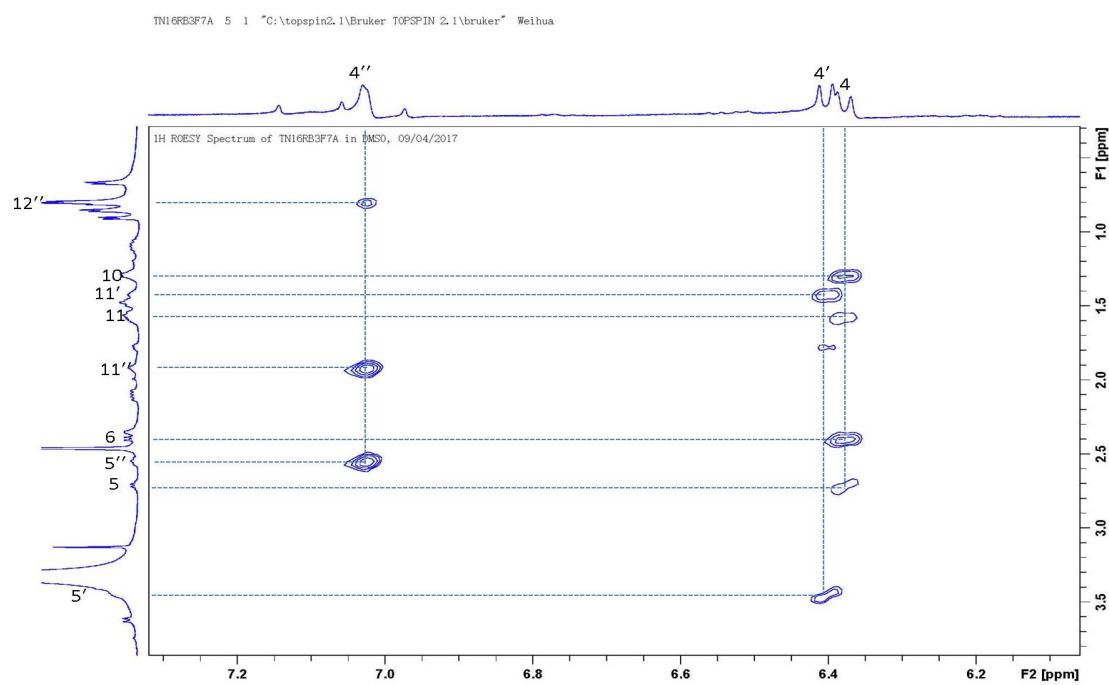




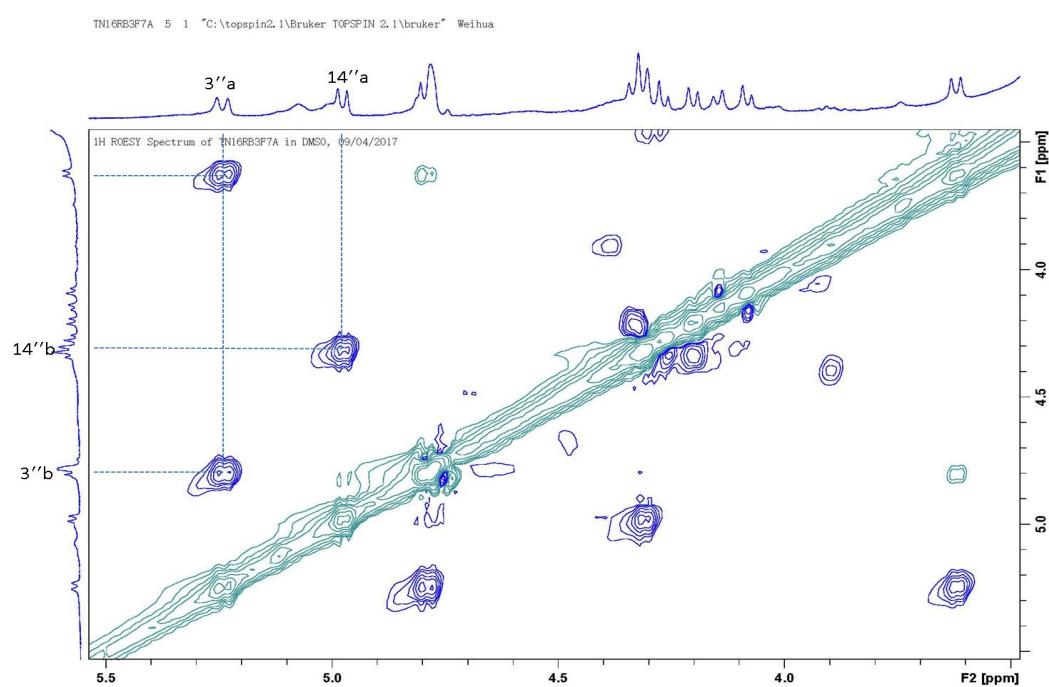
**Figure S17.** HMBC spectrum of trivirensol A (**11**) in  $\text{DMSO}-d_6$



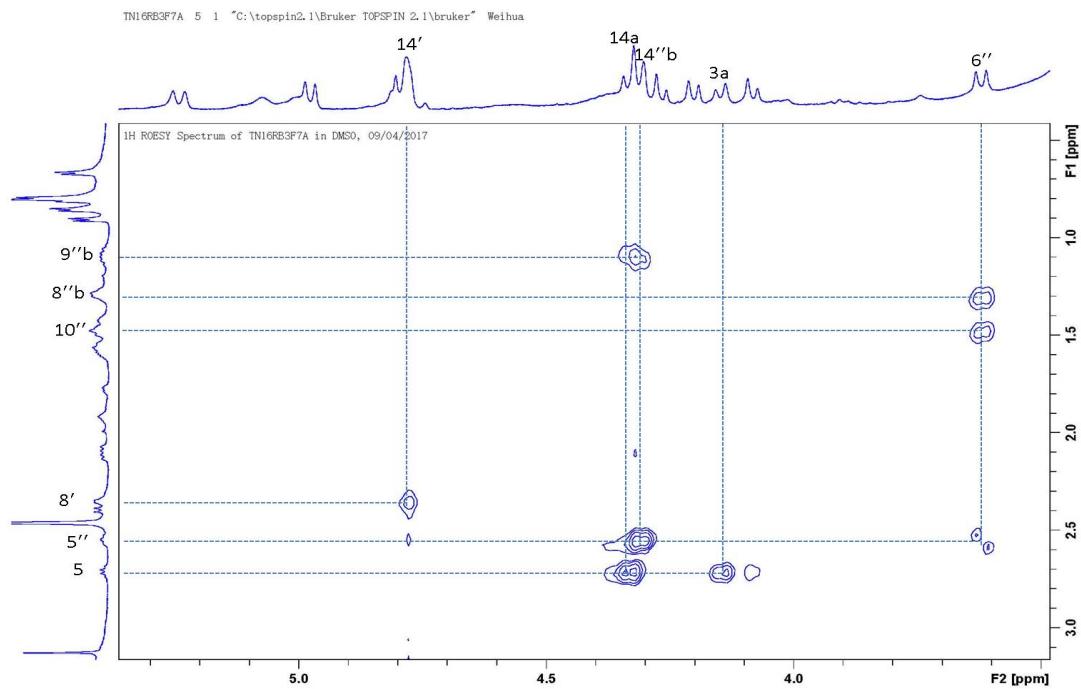
**Figure S18.** ROESY spectrum of trivirensol A (**11**) in  $\text{DMSO}-d_6$



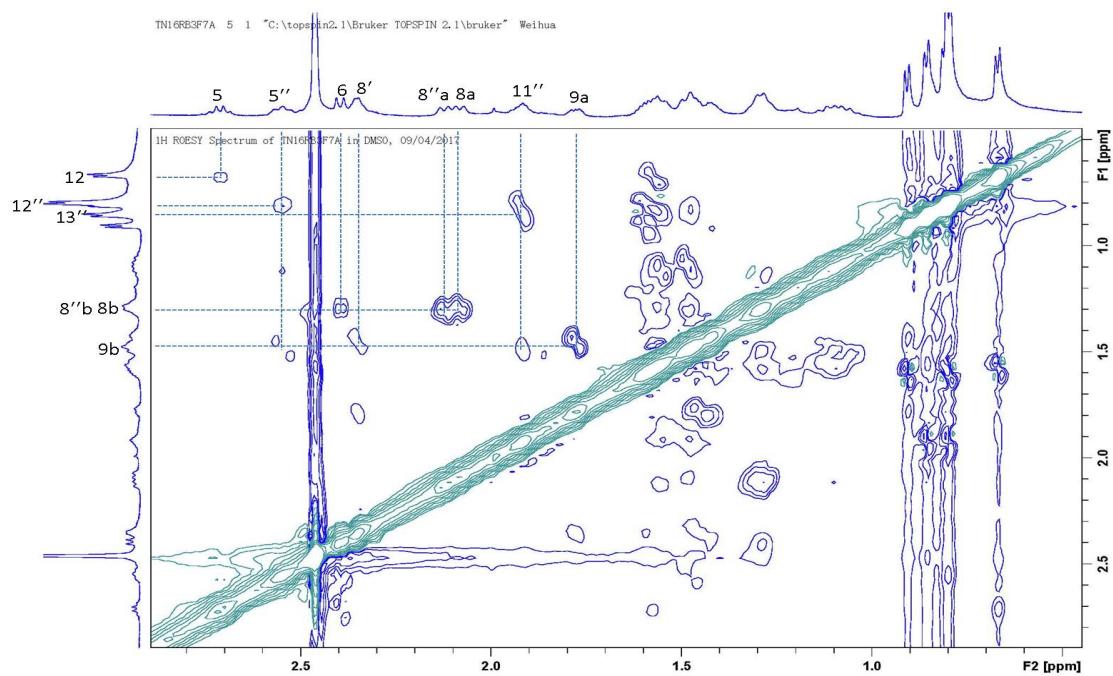
**Figure S19.** ROESY spectrum of trivirensol A (**11**) in  $\text{DMSO}-d_6$



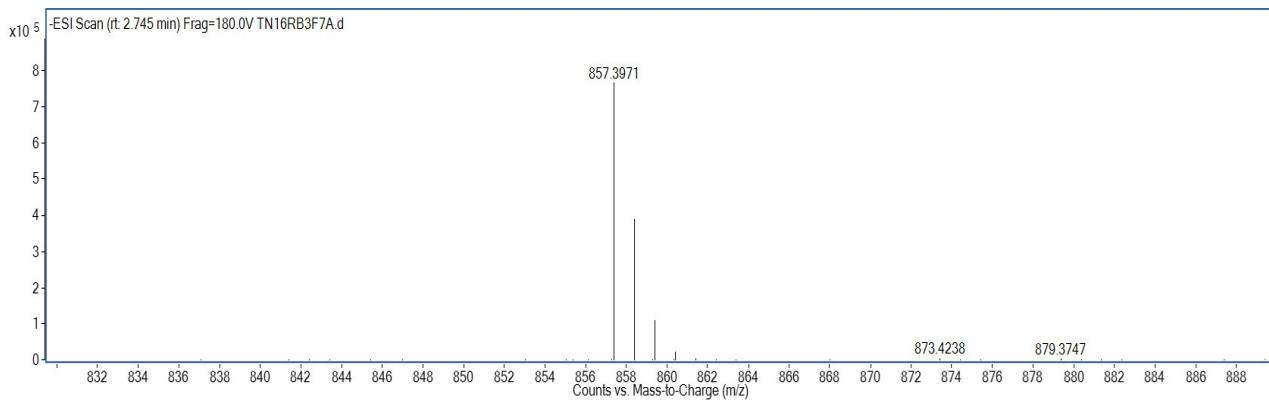
**Figure S20.** ROESY spectrum of trivirensol A (**11**) in  $\text{DMSO}-d_6$



**Figure S21.** ROESY spectrum of trivirensol A (**11**) in DMSO-*d*<sub>6</sub>



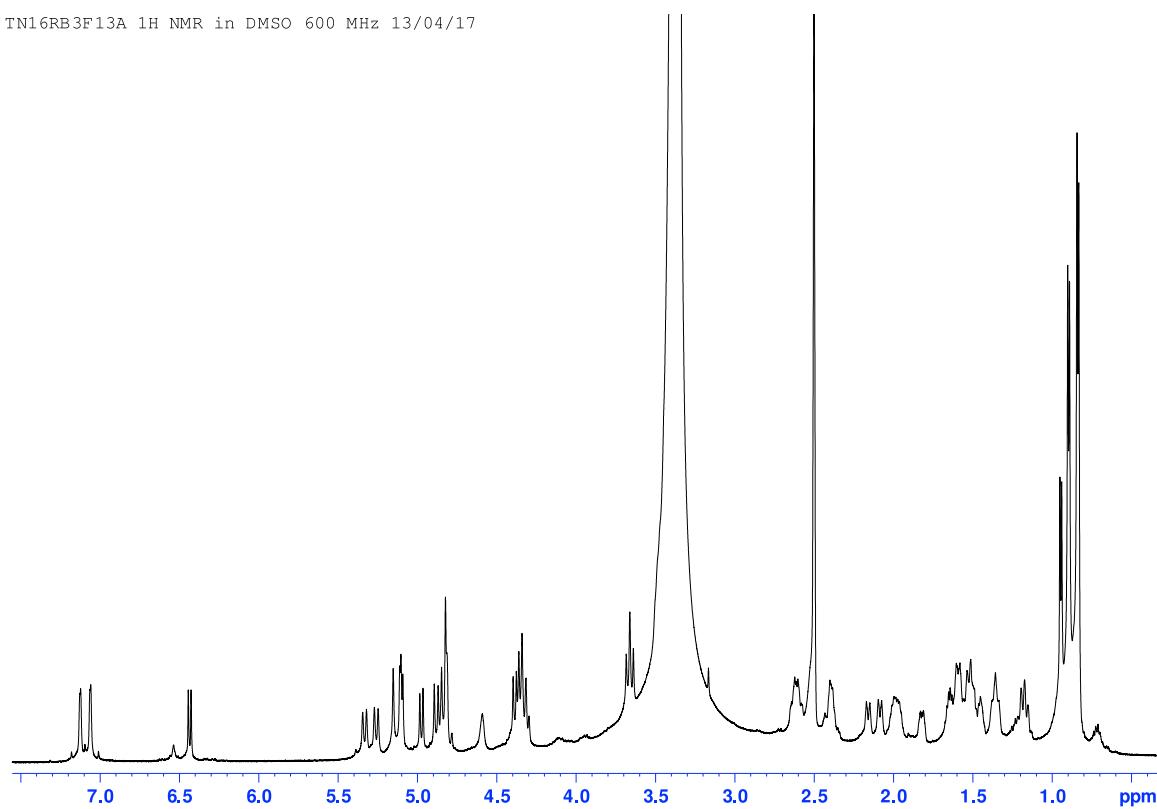
**Figure S22.** ROESY spectrum of trivirensol A (**11**) in DMSO-*d*<sub>6</sub>



Best	ID	Source	Formula	Species	m/z	Score	Diff (ppm)	Score (MFG)	Mass (MFG)/	DBE
<input checked="" type="checkbox"/>	<input checked="" type="radio"/>	MFG	C45 H62 O16	(M-H)-	857.3971	98.77	-0.28	98.77	858.4038	15
Species	m/z	Score (iso. abund)	Score (mass)	Score (MFG, MS/MS)	Score (MS)	Score (MFG)	Score (iso. spacing)	Height	Ion Formula	
(M-H)-	857.3971	97.52	99.87		98.77	98.77	98.08	765246.1	C45 H61 O16	
Height (Calc)	Height Sum% (Calc)	Height % (Calc)	m/z (Calc)	Diff (mDa)	Height	Height %	Height Sum %	m/z	Diff (ppm)	
760945	59.1	100	857.3965	-0.6	765246.1	100	59.5	857.3971	-0.71	
380334.3	29.6	50	858.3999	0.2	389693.5	50.9	30.3	858.3997	0.25	
118064.8	9.2	15.5	859.4028	0.4	109768.3	14.3	8.5	859.4024	0.44	
27344.4	2.1	3.6	860.4056	1.3	21980.6	2.9	1.7	860.4042	1.53	

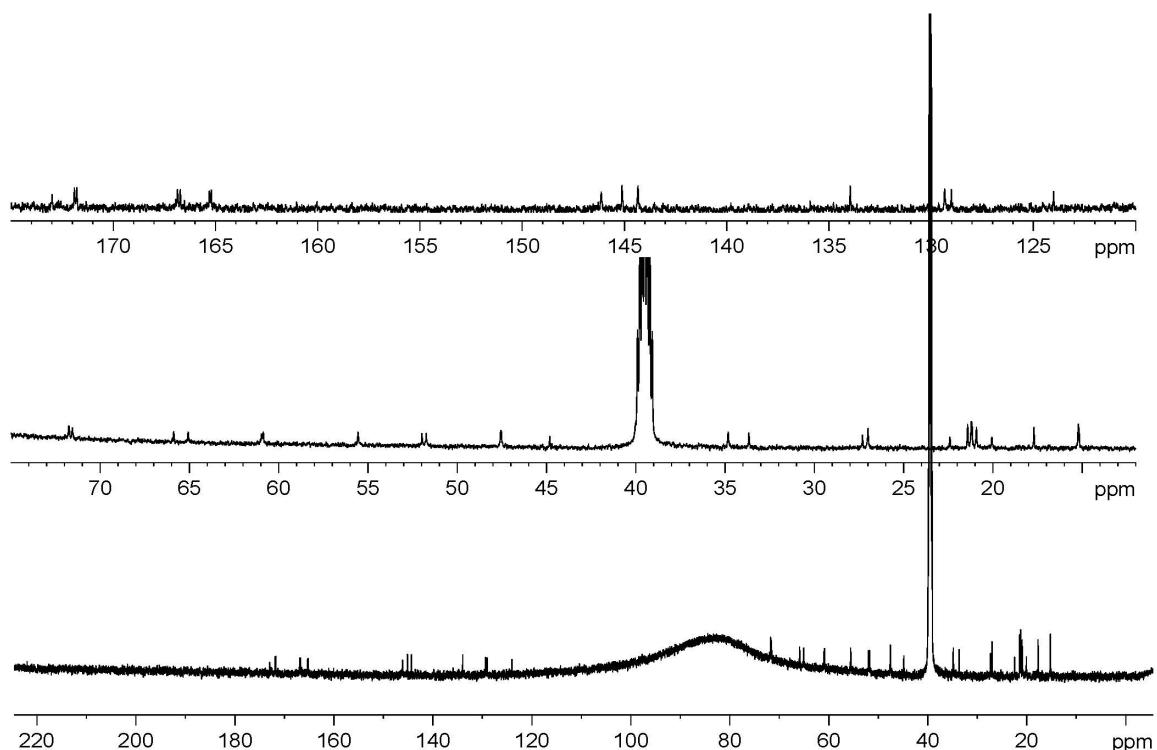
**Figure S23.** HRESIMS spectrum of trivirensol A (**11**)

TN16RB3F13A 1H NMR in DMSO 600 MHz 13/04/17

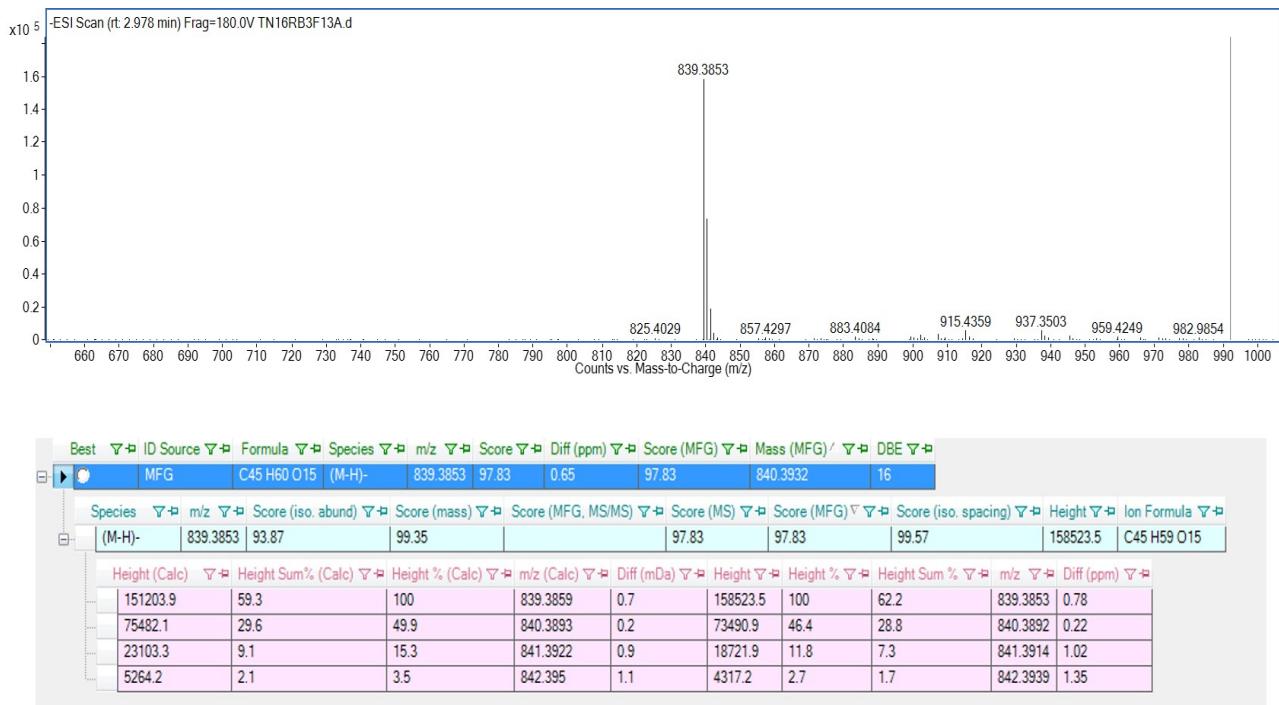


**Figure S24.**  $^1\text{H}$  NMR spectrum of trivirensol B (**12**) in  $\text{DMSO}-d_6$

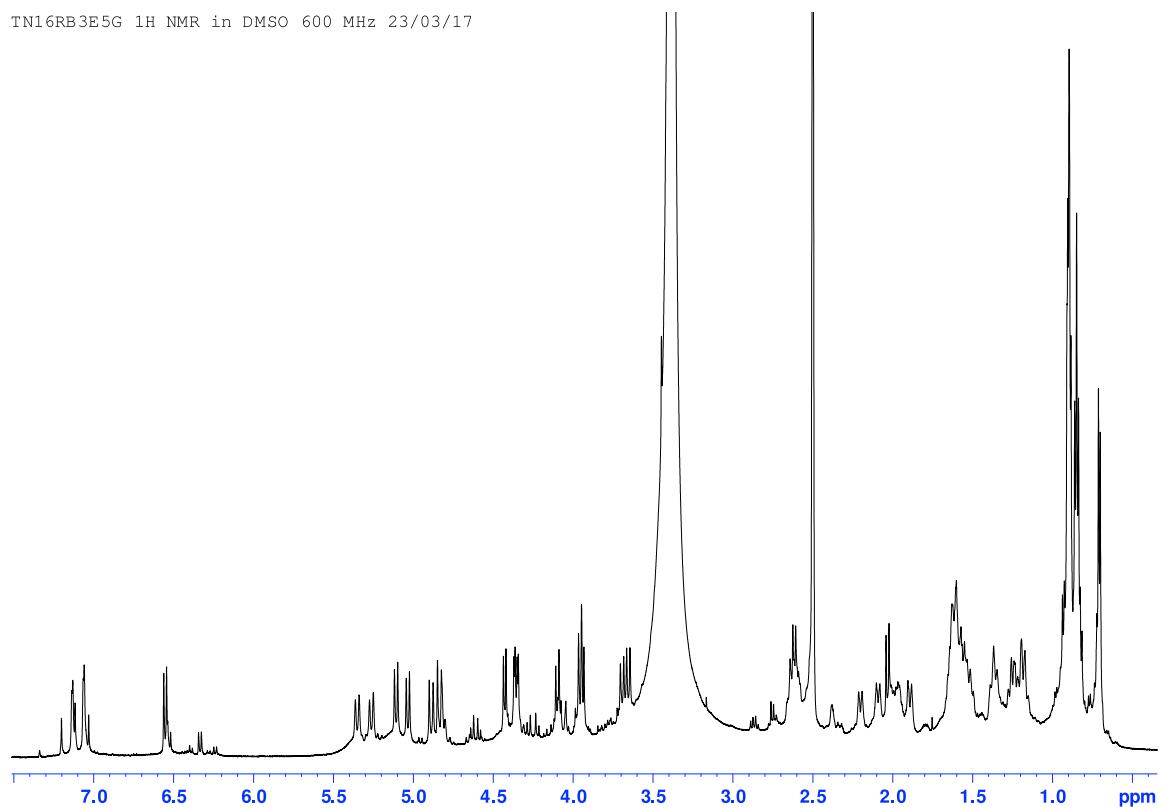
$^{13}\text{C}$  NMR Spectrum of TN16RB3F13A in DMSO, 13/04/2017



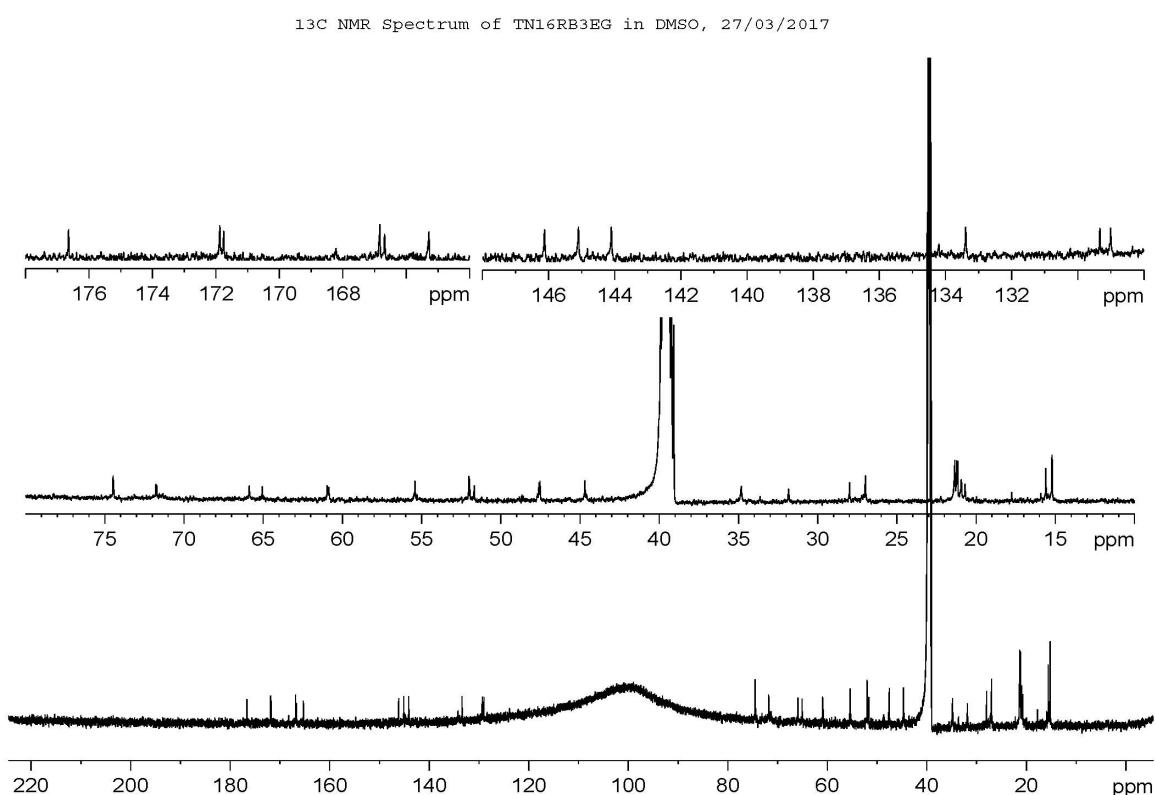
**Figure S25.**  $^{13}\text{C}$  NMR spectrum of trivirensol B (**12**) in  $\text{DMSO}-d_6$



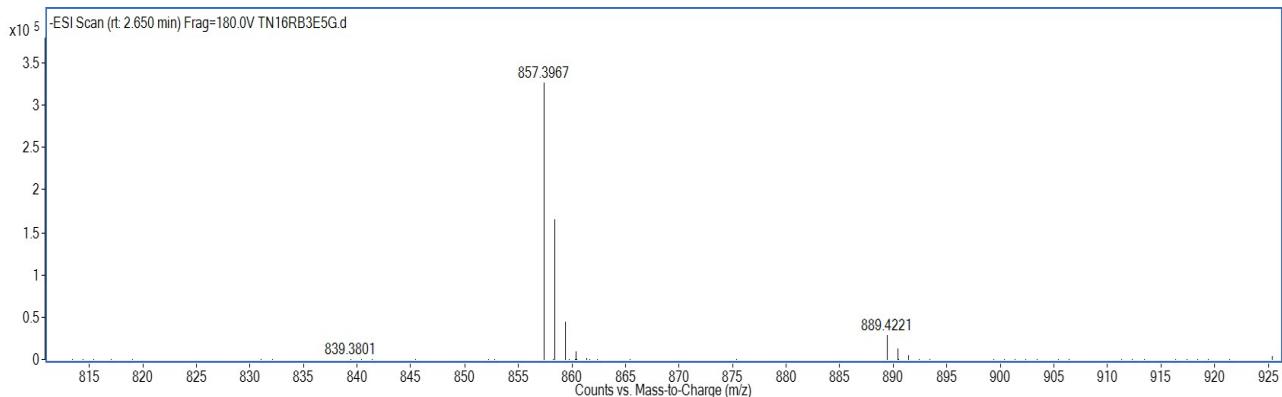
**Figure S26.** HRESIMS spectrum of trivirensol B (**12**)



**Figure S27.**  $^1\text{H}$  NMR spectrum of trivirensol C (**13**) in  $\text{DMSO}-d_6$



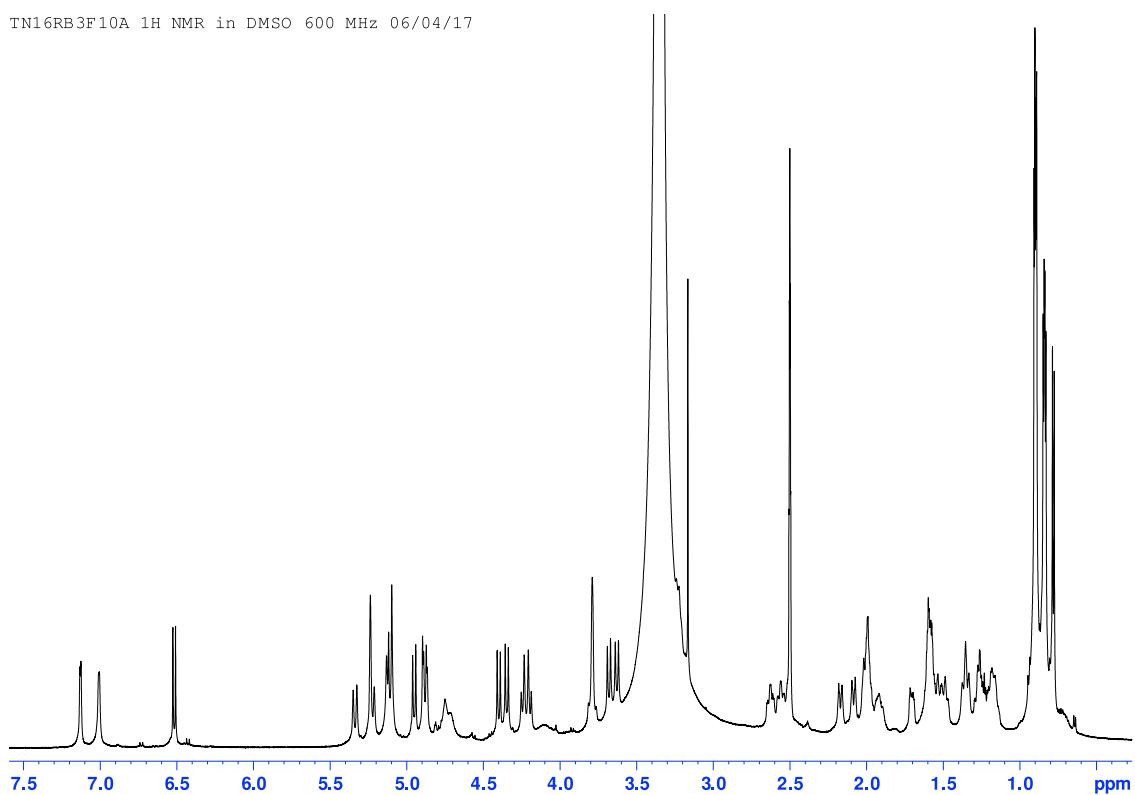
**Figure S28.**  $^{13}\text{C}$  NMR spectrum of trivirensol C (**13**) in  $\text{DMSO}-d_6$



Best	ID Source	Formula	Species	m/z	Score	Diff (ppm)	Score (MFG)	Mass (MFG)	DBE
(M-H)-	MFG	C45 H62 O16	(M-H)-	857.3967	98.85	-0.04	98.85	858.4038	15
Species	m/z	Score (iso. abund)	Score (mass)	Score (MFG, MS/MS)	Score (MS)	Score (MFG)	Score (iso. spacing)	Height	Ion Formula
(M-H)-	857.3967	96.46	100		98.85	98.85	99.4	327019.7	C45 H61 O16
Height (Calc)	59.1	100	857.3965	-0.2	327019.7	100	59.9	857.3967	-0.19
161459.2	29.6	50	858.3999	0.3	165399.9	50.6	30.3	858.3996	0.32
50120.8	9.2	15.5	859.4028	-0.7	44477.4	13.6	8.1	859.4035	-0.86
11608.2	2.1	3.6	860.4056	2.3	9327.1	2.9	1.7	860.4032	2.72

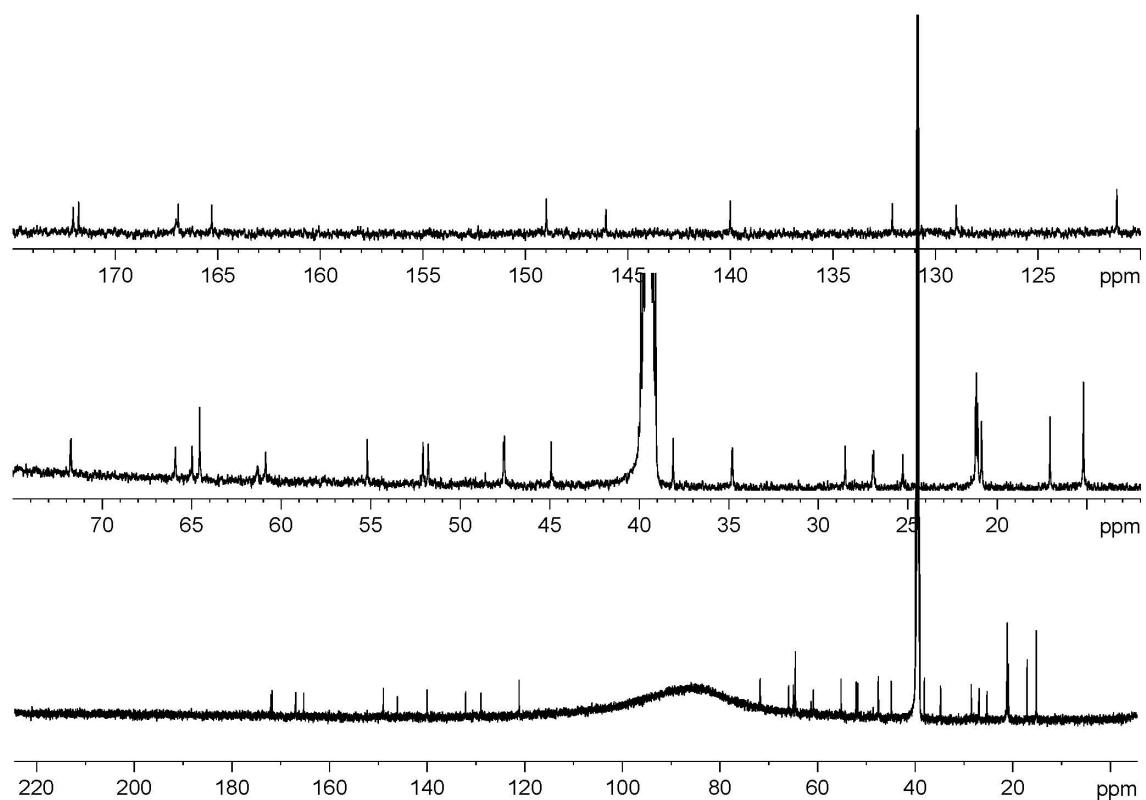
**Figure S29.** HRESIMS spectrum of trivirensol C (**13**)

TN16RB3F10A 1H NMR in DMSO 600 MHz 06/04/17

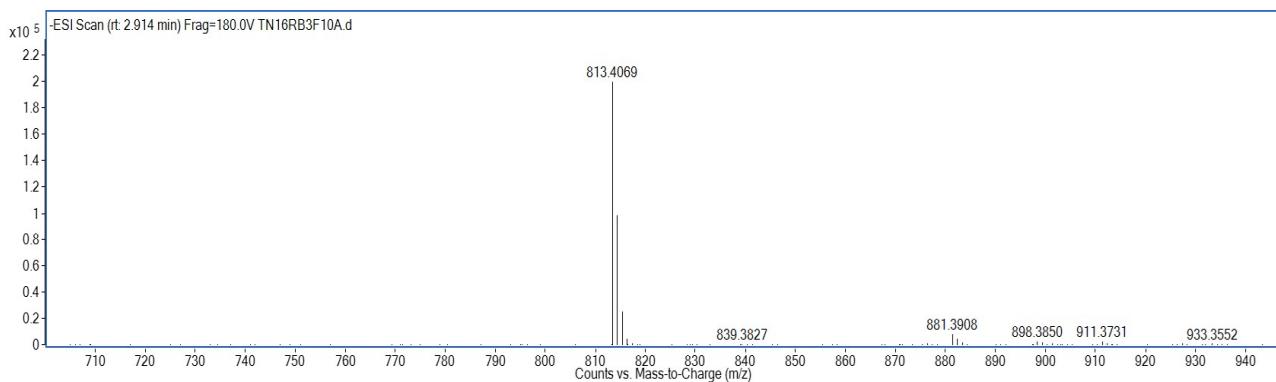


**Figure S30.**  $^1\text{H}$  NMR spectrum of trivirensol D (**14**) in  $\text{DMSO}-d_6$

$^{13}\text{C}$  NMR Spectrum of TN16RB3F10A in DMSO, 06/04/2017



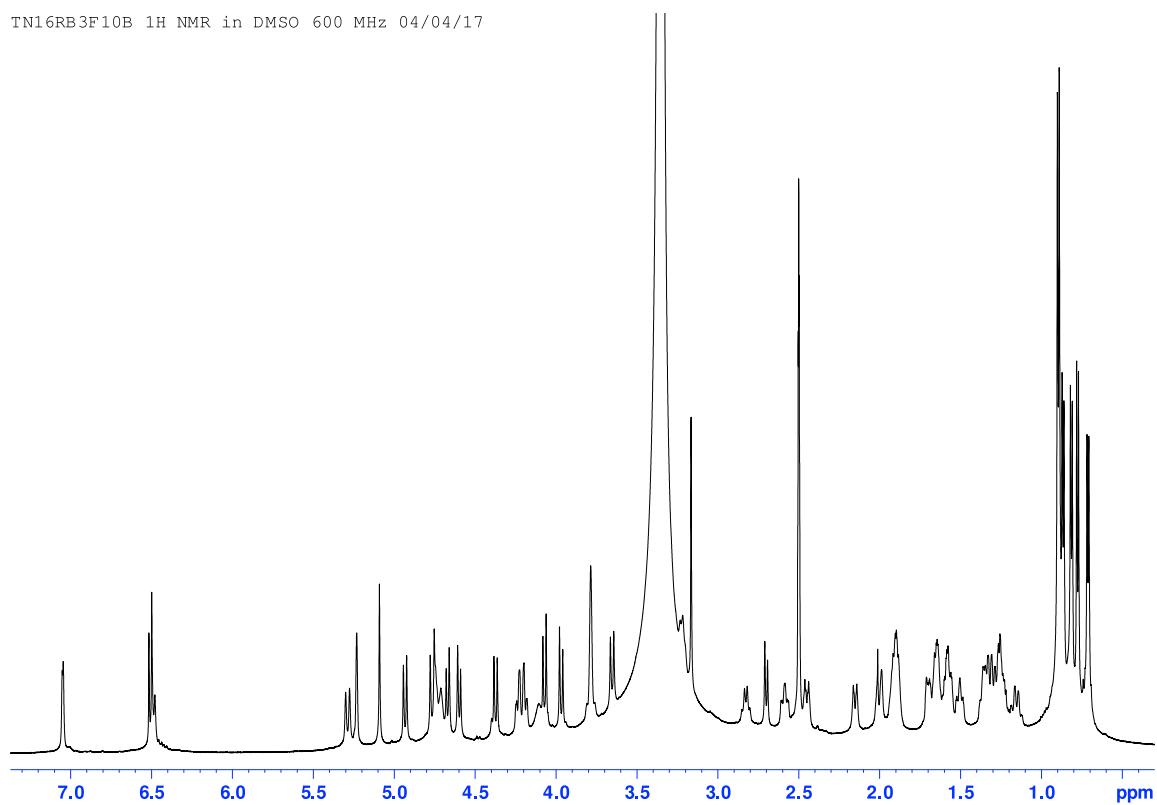
**Figure S31.**  $^{13}\text{C}$  NMR spectrum of trivirensol D (**14**) in  $\text{DMSO}-d_6$



Best:	ID Source	Formula	Species	m/z	Score	Diff (ppm)	Score (MFG)	Mass (MFG)	DBE
	MFG	C44 H62 O14	(M-H)-	813.4069	98.7	0.01	98.7	814.414	14
Species	m/z	Score (iso. abund)	Score (mass)	Score (MFG, MS/MS)	Score (MS)	Score (MFG)	Score (iso. spacing)	Height	Ion Formula
(M-H)-	813.4069	96.11	100		98.7	98.7	99.23	199863.2	C44 H61 O14
Height (Calc)	Height Sum% (Calc)	Height % (Calc)	m/z (Calc)	Diff (mDa)	Height	Height %	Height Sum %	m/z	Diff (ppm)
196589	60	100	813.4067	-0.2	199863.2	100	61	813.4069	-0.28
95982.8	29.3	48.8	814.4101	0.4	98241.4	49.2	30	814.4097	0.44
28581	8.7	14.5	815.413	0.2	24967.1	12.5	7.6	815.4128	0.19
6329.1	1.9	3.2	816.4158	1.8	4410.1	2.2	1.3	816.414	2.16

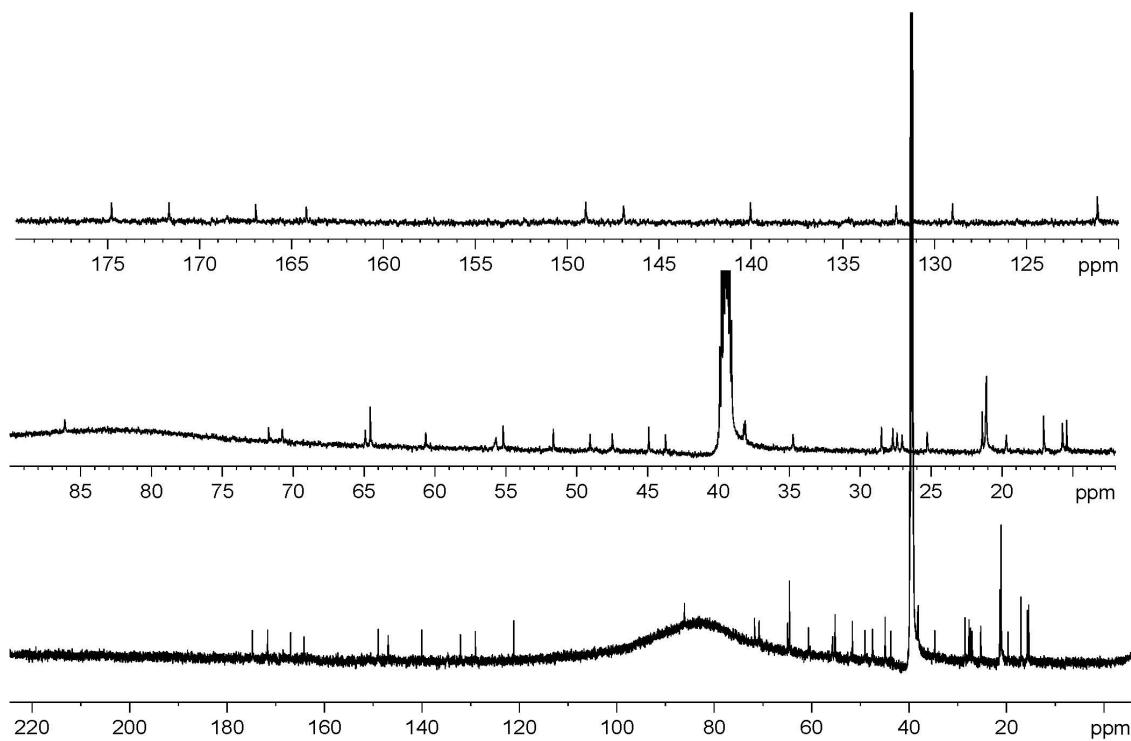
**Figure S32.** HRESIMS spectrum of trivirensol D (**14**)

TN16RB3F10B 1H NMR in DMSO 600 MHz 04/04/17

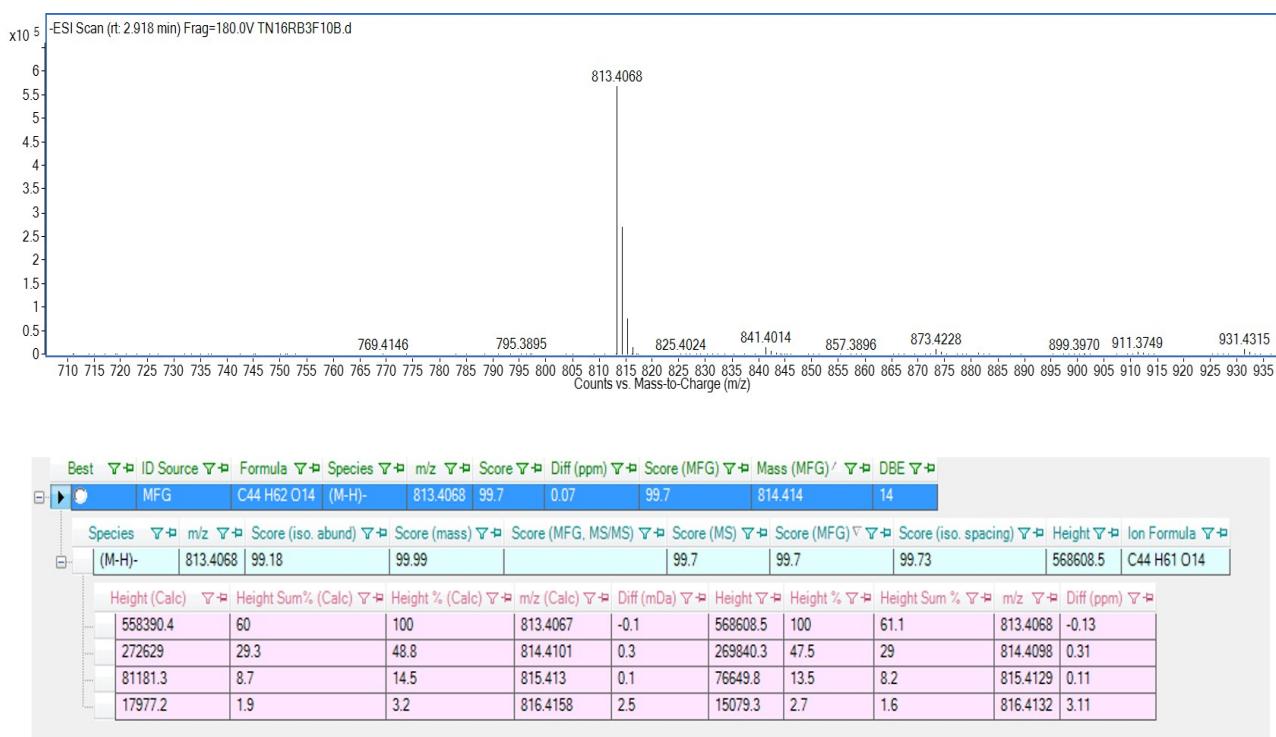


**Figure S33.**  $^1\text{H}$  NMR spectrum of trivirensol E (15) in  $\text{DMSO}-d_6$

13C NMR Spectrum of TN16RB3F10B in DMSO, 04/04/2017

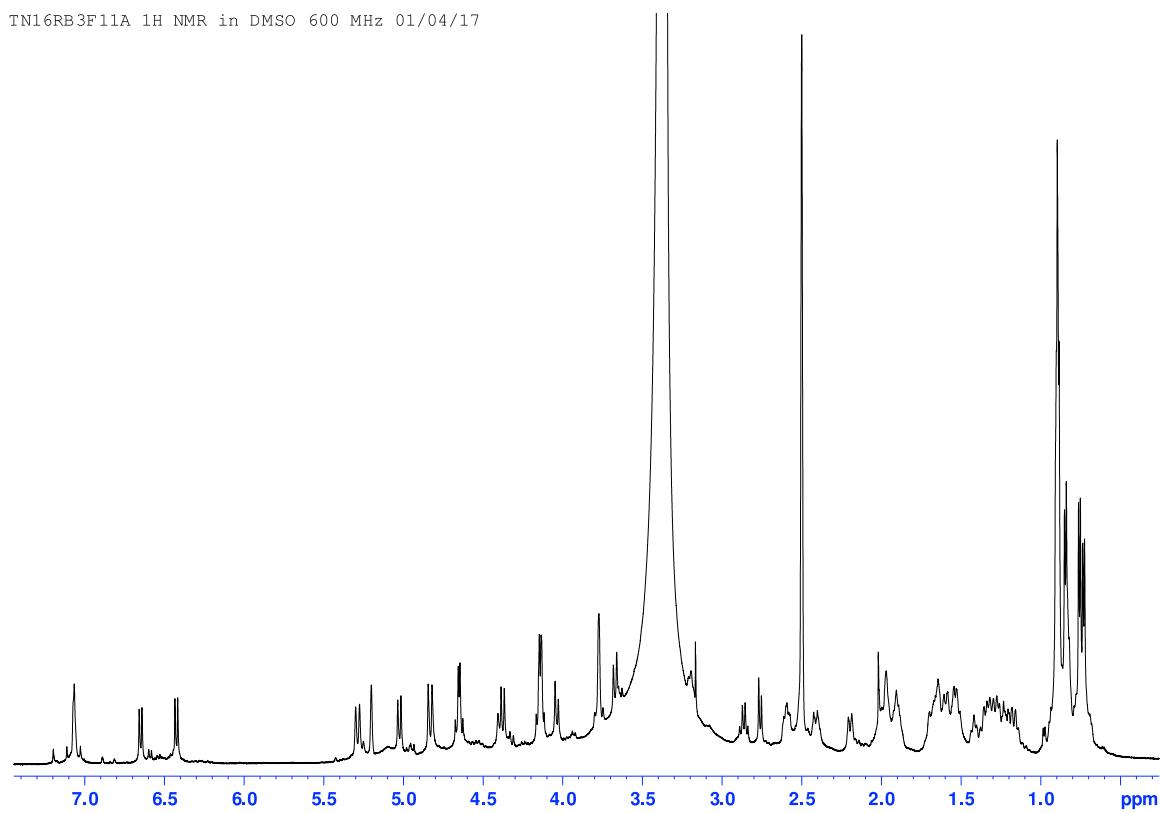


**Figure S34.**  $^{13}\text{C}$  NMR spectrum of trivirensol E (15) in  $\text{DMSO}-d_6$



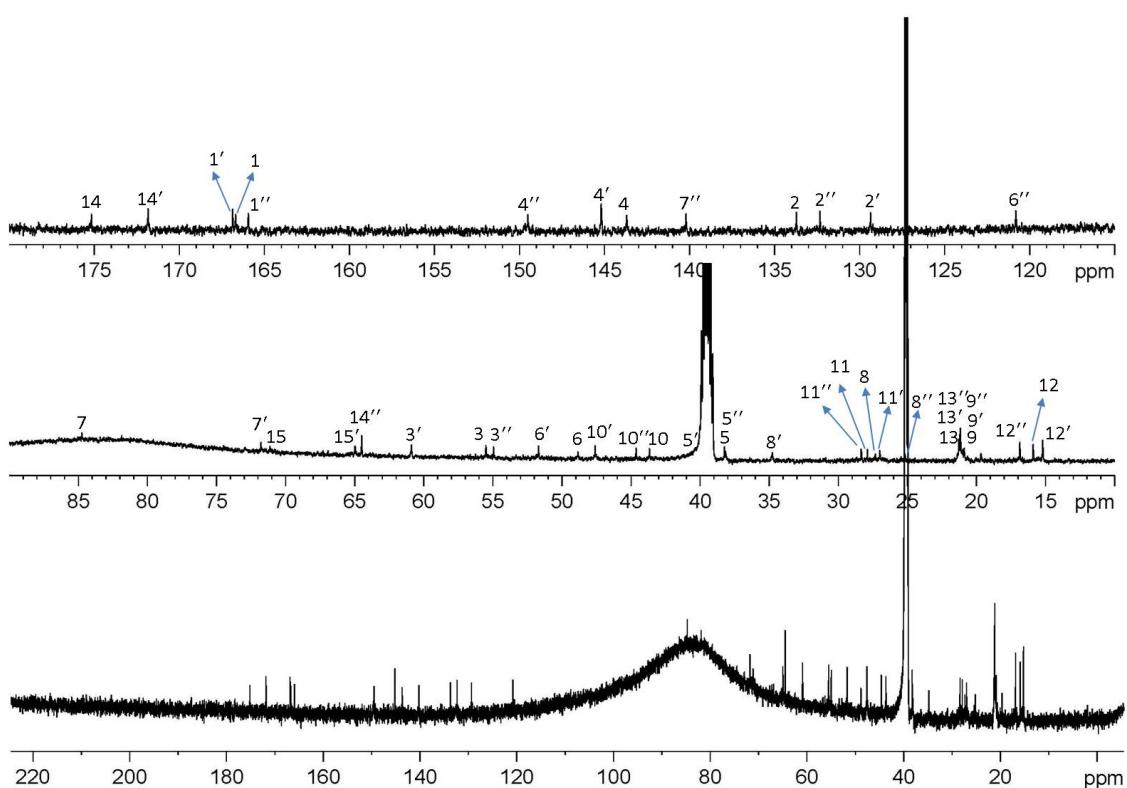
**Figure S35.** HRESIMS spectrum of trivirensol E (**15**)

TN16RB3F11A 1H NMR in DMSO 600 MHz 01/04/17

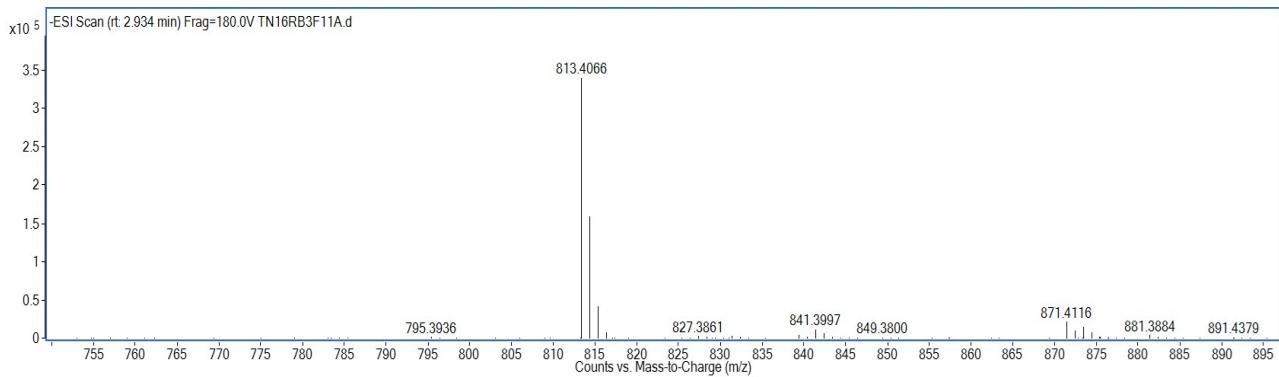


**Figure S36.**  $^1\text{H}$  NMR spectrum of trivirensol F (**16**) in  $\text{DMSO}-d_6$

$^{13}\text{C}$  NMR Spectrum of TN16RB3F11A in DMSO, 01/04/2017



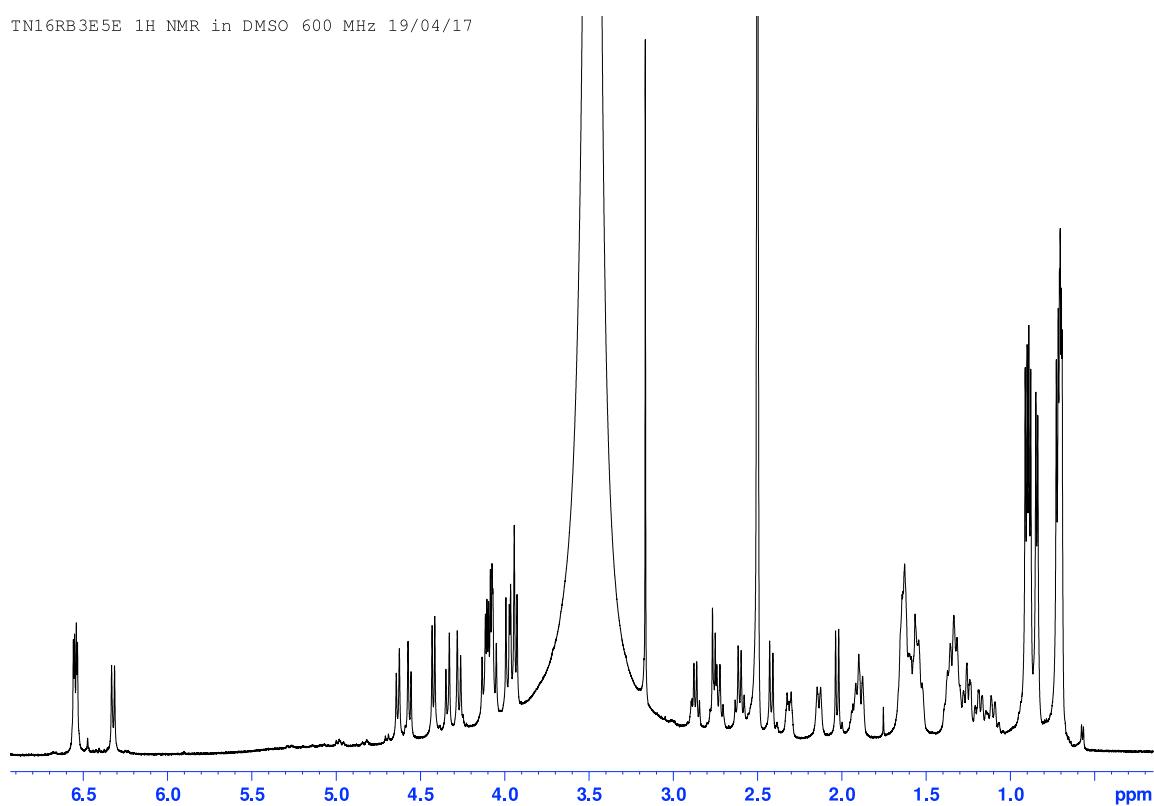
**Figure S37.**  $^{13}\text{C}$  NMR spectrum of trivirensol F (**16**) in  $\text{DMSO}-d_6$



Best	ID Source	Formula	Species	m/z	Score	Diff (ppm)	Score (MFG)	Mass (MFG)/	DBE	
	MFG	C44 H62 O14	(M-H)-	813.4066	99.21	-0.02	99.21	814.414	14	
	Species	m/z	Score (iso. abund)	Score (mass)	Score (MFG, MS/MS)	Score (MS)	Score (MFG)	Score (iso. spacing)	Height	Ion Formula
	(M-H)-	813.4066	97.45	100		99.21	99.21	99.72	340238.6	C44 H61 O14
		Height (Calc)	Height Sum% (Calc)	Height % (Calc)	m/z (Calc)	Diff (mDa)	Height	Height %	Height Sum %	m/z Diff (ppm)
		329870.7	60	100	813.4067	0.1	340238.6	100	61.9	813.4066   0.09
		161056.4	29.3	48.8	814.4101	-0.2	159342.1	46.8	29	814.4103   -0.26
		47958.1	8.7	14.5	815.4113	-0.3	42308.3	12.4	7.7	815.4133   -0.38
		10620.1	1.9	3.2	816.4158	1.8	7616.3	2.2	1.4	816.414   2.23

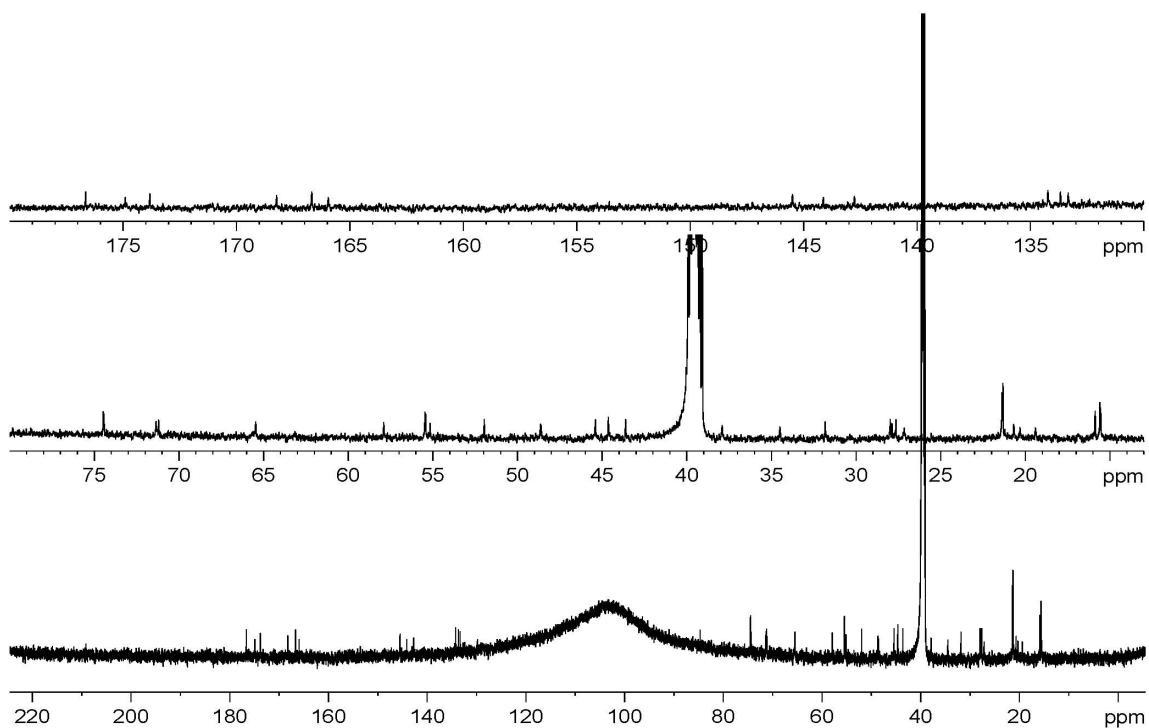
**Figure S38.** HRESIMS spectrum of trivirensol F (**16**)

TN16RB3E5E 1H NMR in DMSO 600 MHz 19/04/17

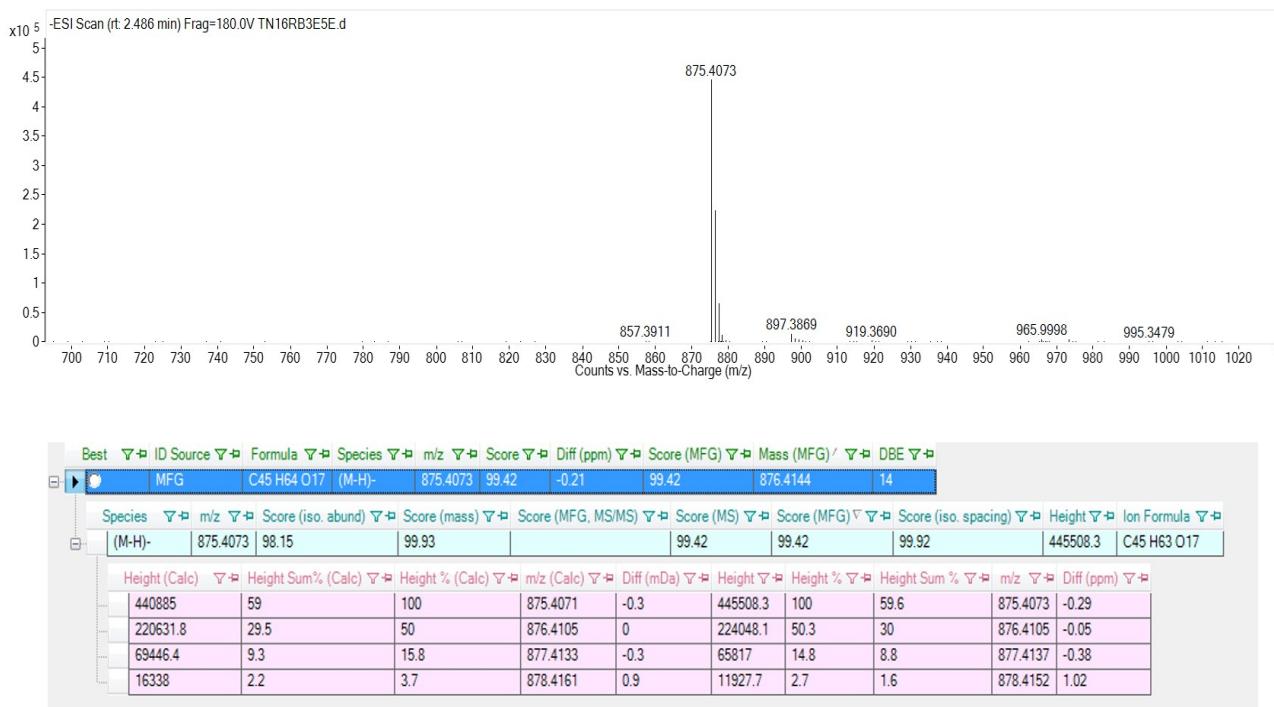


**Figure S39.** <sup>1</sup>H NMR spectrum of trivirensol G (17) in DMSO-*d*<sub>6</sub>

13C NMR Spectrum of TN16RB3E5E in DMSO, 19/04/2017



**Figure S40.** <sup>13</sup>C NMR spectrum of trivirensol G (17) in DMSO-*d*<sub>6</sub>

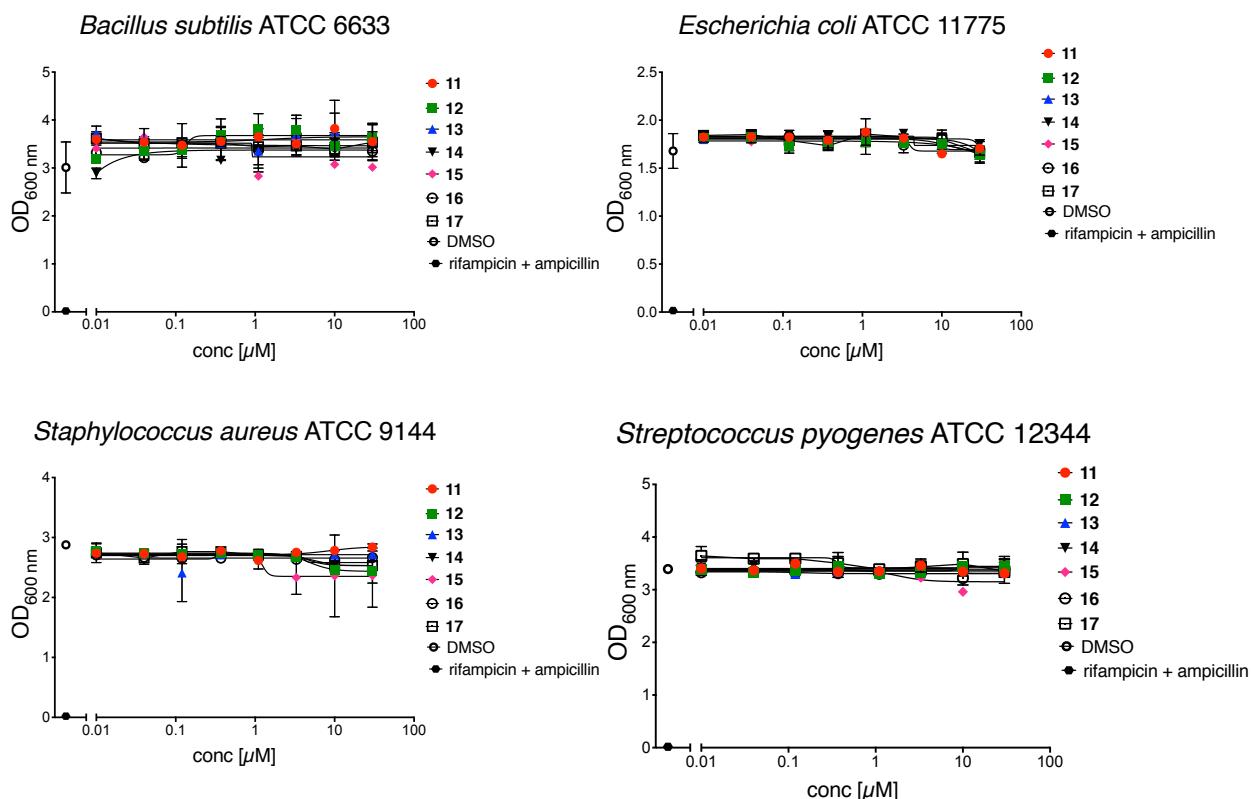


**Figure S41.** HRESIMS spectrum of trivirensol G (17)

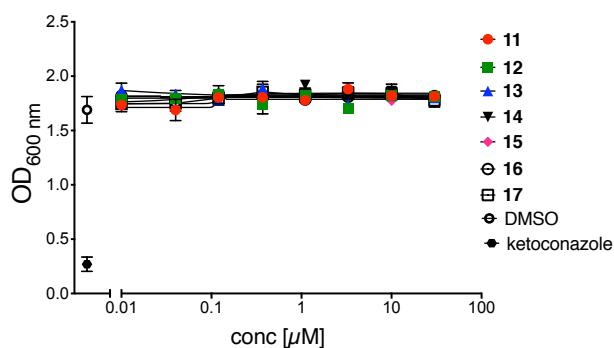
## 2 Antibacterial and antifungal assays data

Antifungal assay methodology:

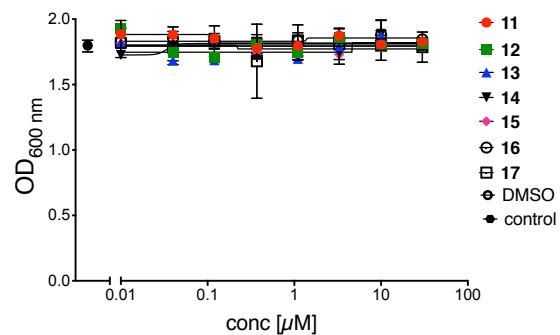
The fungus *Candida albicans* ATCC 10231 was streaked onto a Sabouraud agar plate and incubated at 37 °C for 48 h. One colony was then transferred to fresh Sabouraud broth (15 mL) and the cell density adjusted to 104-105 CFU/mL. The compounds to be tested were dissolved in DMSO and diluted with H<sub>2</sub>O to return 600 µM stock solutions (20% DMSO). Aliquots (10 µL) were transferred to 96-well microtiter plates and pre-loaded with freshly prepared microbial broth (190 µL), to give a final concentration of 30 µM in 1% DMSO. The plates were incubated at 37 °C for 24 h and the optical density of each well was measured spectrophotometrically at 600 nm using a POLARstar Omega plate reader (BMG LABTECH). Amphotericin B was used as a positive control (30 µg/mL in 10% DMSO). Where relevant, IC<sub>50</sub> value were calculated as the concentration of the compound or antifungal drug required for 50% inhibition of the fungal cells using Prism 8.0 (GraphPad Software Inc.).



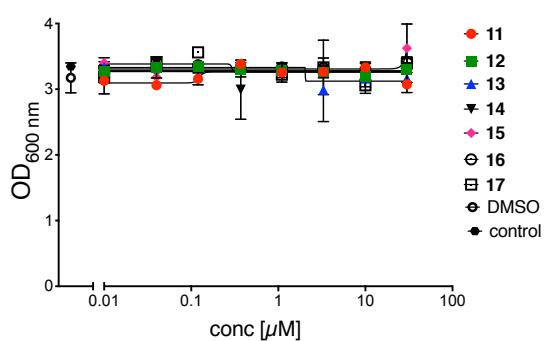
*Candida albicans* ATCC 90028



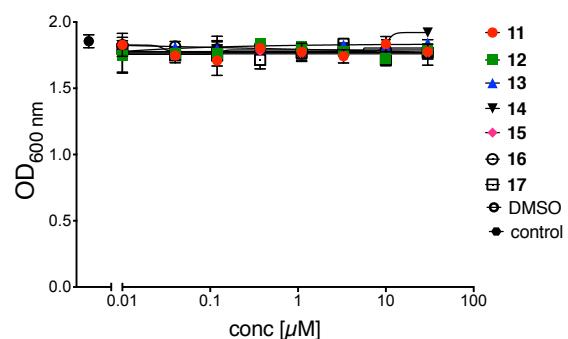
ESBL *Escherichia coli*



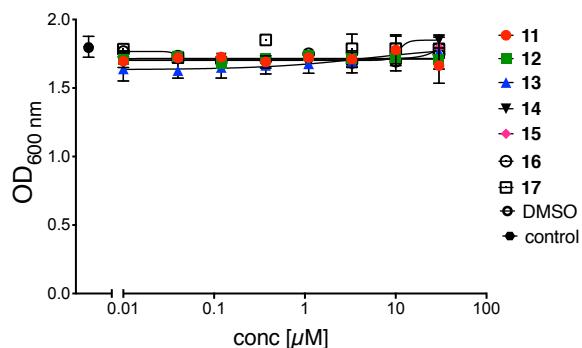
IMP *Pseudomonas aeruginosa*



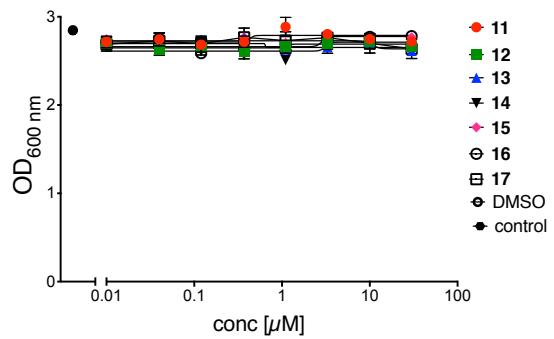
NDM *Klebsiella pneumoniae*



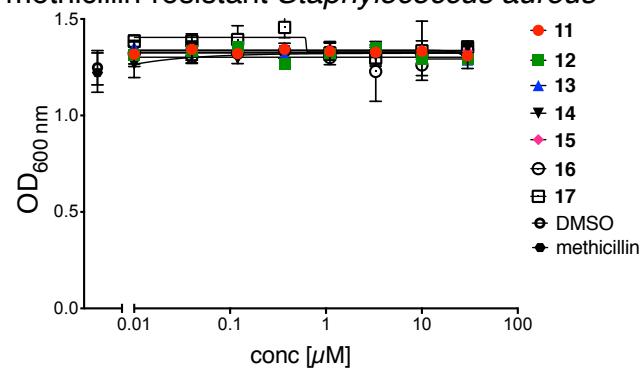
OXA-48 *Klebsiella pneumoniae*



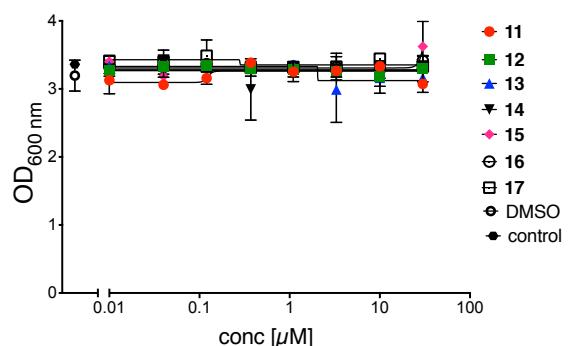
OXA-23 *Acinetobacter baumannii*



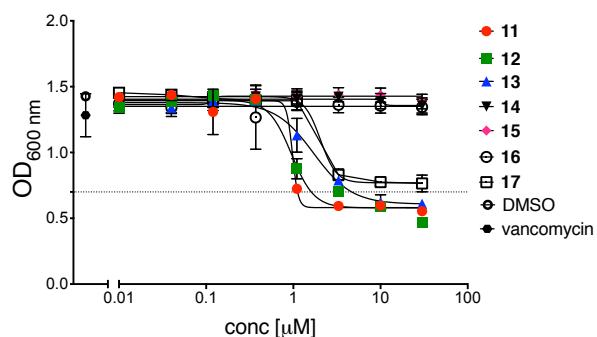
methicillin-resistant *Staphylococcus aureus*



VIM *Pseudomonas aeruginosa*

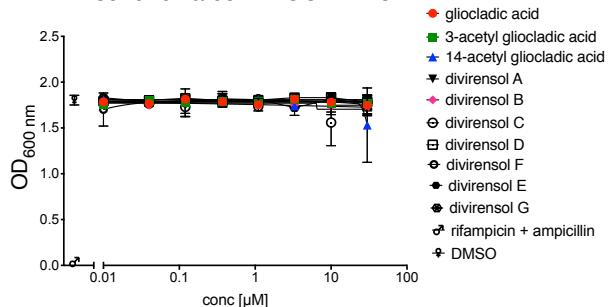


vancomycin-resistant *E. faecalis*

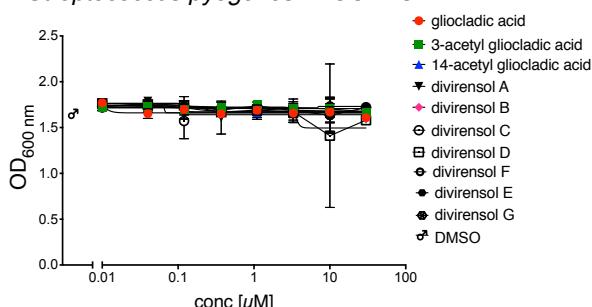


**Figure S42.** Graphs for antimicrobial studies against susceptible, MDR strains and fungus of trivirensols (**11 – 17**) in broth micro-dilution assay

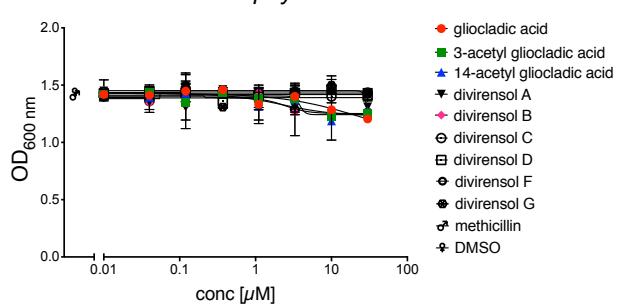
*Escherichia coli* ATCC 11775



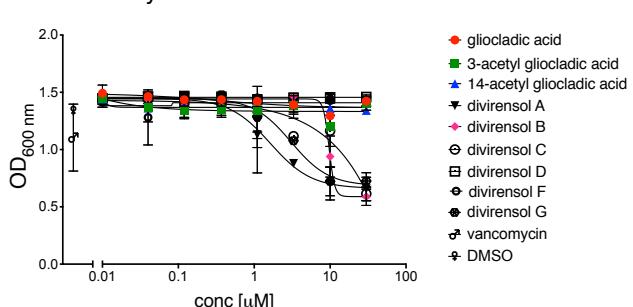
*Streptococcus pyogenes* ATCC 12344



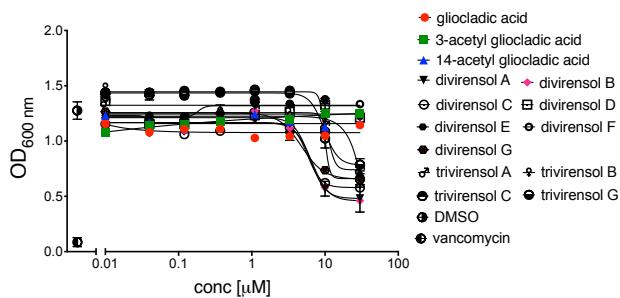
methicillin-resistant *Staphylococcus aureus*



vancomycin-resistant *E. faecalis*

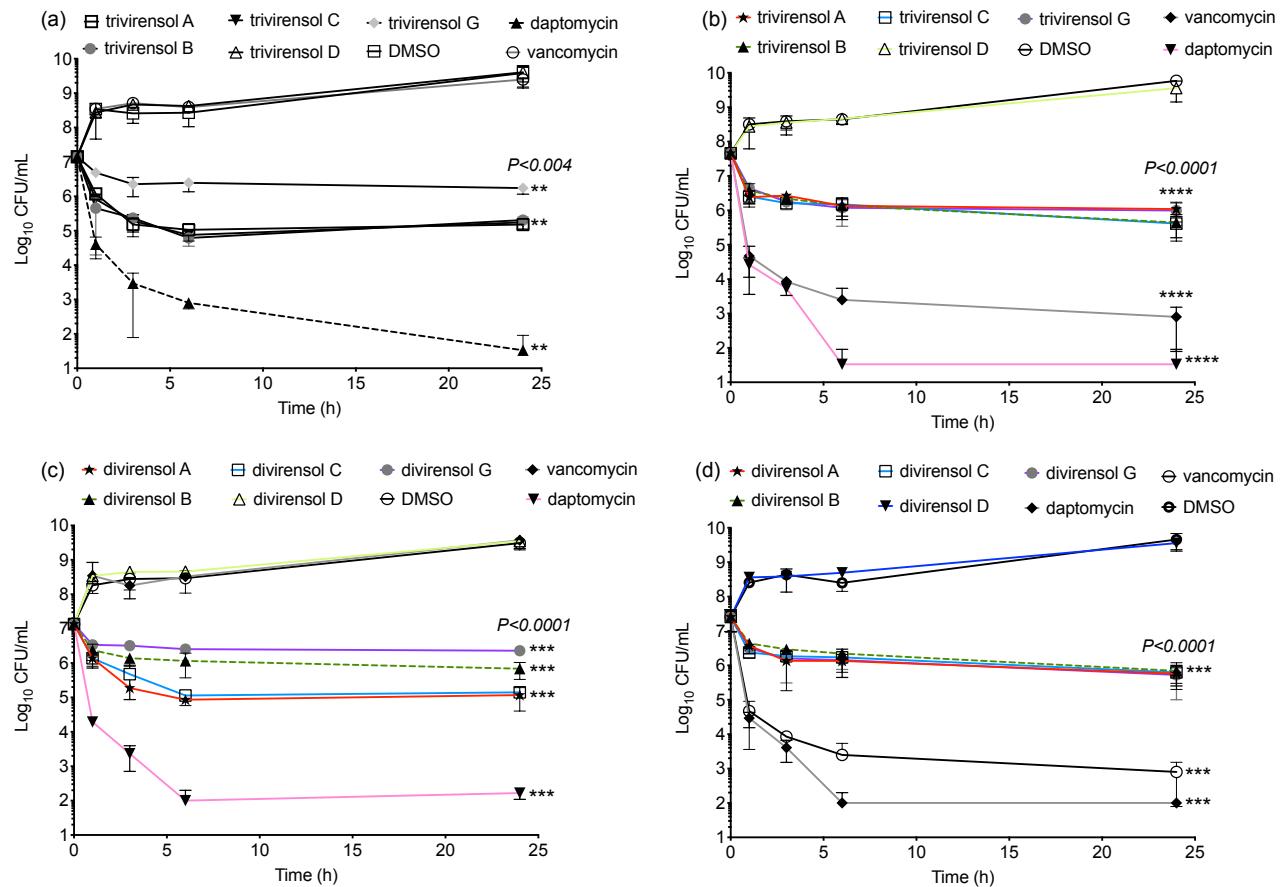


*Enterococcus faecalis* ACM 5184

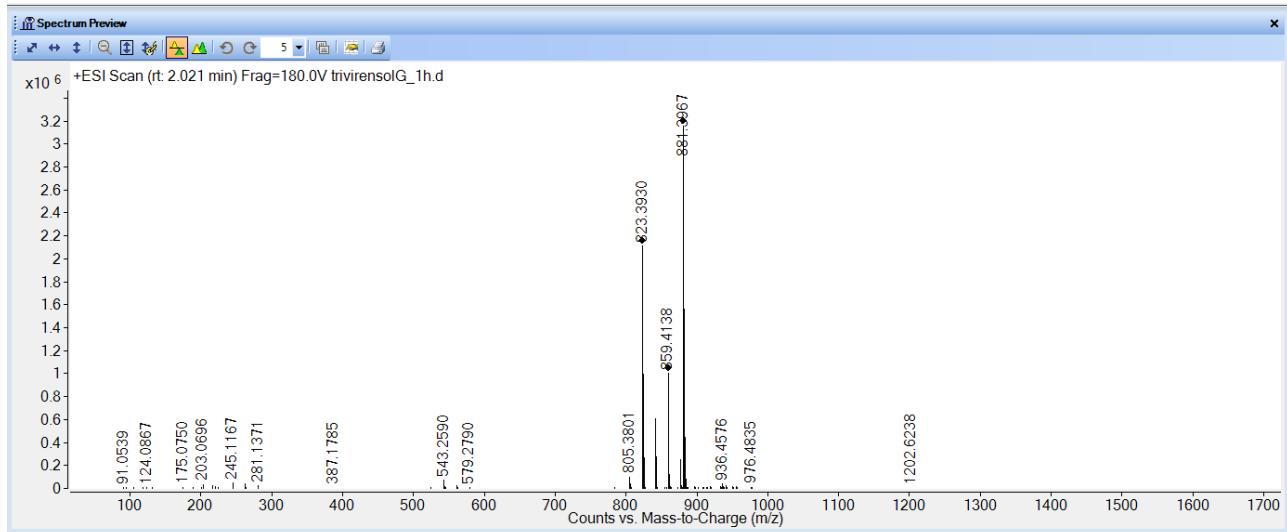


**Figure S43.** Graphs for antimicrobial studies against susceptible and MDR strains of divirenols A – D and F – G, trivirensols (**11 – 17**) in broth micro-dilution assay

### 3 Time-kill (bacteriocidal vs bacteriostatic) assays for divirensols and trivirensols ( 11 – 13 and 17)



**Figure S44.** Colony forming units (CFU) for bacteriostatic studies of divirensols A – D and G and trivirensols A – D and G ( $30 \mu\text{M}$ ) against (a, c) VRE and (b, d) *E. faecalis* at different timepoints, 1, 3, 6 and 24 h. Data are means  $\pm$  SD of three replicate wells obtained in three independent experiments. Each treated group was compared to DMSO treatment using One-Way Anova, Dunnett's correction.

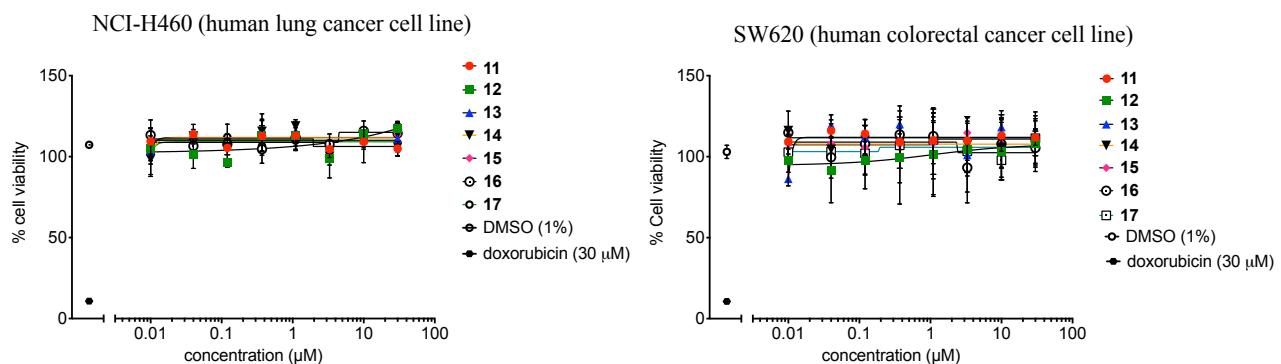


Best	ID	Source	Name	Formula	Species	m/z	Score	Score (RT)	RT Diff	Diff (ppm)	Score (Lib)	Score (DB)	Score (MFG)
⊕	MFG		C45 H62 O16	(M+H)+ (M+Na)+	859.4138 881.3967	92.04			-3.08				92.04
			Species	m/z	Score (iso. abund)	Score (mass)	Score (MFG, MS/MS)	Score (MS)	Score (MFG)	Score (iso. spacing)	Height	Ion Formula	
			(M+H)+	859.4138	92.54	86.02		92.04	92.04	98.67	1002767.2	C45 H63 O16	
			(M+Na)+	881.3967	98.15	77.65		91.23	91.23	99.23	3156499.5	C45 H62 Na O16	

**Figure S45.** HRESIMS spectrum of trivirensol G dehydrated product Figure 8, (i)

## Cytotoxicity assays

Adherent cell human colorectal (SW620) and lung (NCI-H460) carcinoma cells were cultured in RPMI medium 1640. All cells were cultured as adherent mono-layers in flasks supplemented with 10% foetal bovine serum, L-glutamine (2 mM), penicillin (100 unit/mL) and streptomycin (100 µg/mL), in a humidified 37 °C incubator supplied with 5% CO<sub>2</sub>. Briefly, cells were harvested with trypsin and dispensed into 96-well microtiter assay plates at 3,000 cells/well after which they were incubated for 18 h at 37 °C with 5% CO<sub>2</sub> (to allow cells to attach as adherent mono-layers). Test compounds were dissolved in 20% DMSO in PBS (v/v) and aliquots (10 µL) applied to cells over a series of final concentrations ranging from 10 nM to 30 µM. After 48 h incubation at 37 °C with 5% CO<sub>2</sub> an aliquot (20 µL) of MTT in PBS (5 mg/mL) was added to each well (final concentration 0.5 mg/mL), and microtiter plates were incubated for a further 4 h at 37 °C with 5% CO<sub>2</sub>. After final incubation, the medium was aspirated, and precipitated formazan crystals dissolved in DMSO (100 µL/well). The absorbance of each well was measured at 580 nm with a PowerWave XS Microplate Reader from Bio-Tek Instruments Inc. IC<sub>50</sub> values were calculated using Prism 7.0 (GraphPad Software Inc.), as the concentration of analyte required for 50% inhibition of cancer cell growth (compared to negative controls). Negative controls comprised 1% aqueous DMSO, while positive controls used doxorubicin as the test sample. All experiments were performed in duplicate.



**Figure S46.** Graphs for cytotoxic activities on trivirensols A-G (11 – 17)