

## SUPPORTING INFORMATION:

### EXPERIMENTAL PART:

All air sensitive reactions were carried out under argon. Solvents were distilled under nitrogen, tetrahydrofuran (THF) and ethyl ether (Et<sub>2</sub>O) from sodium benzophenoneketyl, dichloromethane, diisopropylamine, triethylamine, dimethyl sulfoxide (DMSO) and acetonitrile from calcium hydride. Flash chromatography (FC) and dry FC were carried out using SiliCycle (230-400 mesh) and Sigma Type H (10-40 μm) silica gel, respectively. Thin layer chromatography (TLC) was performed on precoated glass plates (Merck, silica gel 60, F254). Spots were visualized by UV light (254 nm) and/or with dipping in a cerium sulfate-ammonium molybdate developing solution and charring them on a hot plate. Optical rotations were measured on a Perkin Elmer 343 Polarimeter (1 dm, 1 mL cell), all concentrations are given in g/100 mL. Proton magnetic resonance (<sup>1</sup>H NMR) and carbon magnetic resonance (<sup>13</sup>C NMR) spectra were recorded on a Bruker Spectrospin-300 or 250 spectrometer in chloroform-d (7.26 and 77.0 ppm, respectively) as solvent unless otherwise noted. Chemical shifts are reported in ppm on δ scale. Coupling constants are reported to the nearest 0.1 Hz. Infrared (IR) spectra were recorded on a Perkin Elmer 1600 FTIR spectrometer. Only diagnostic bands are reported. Mass spectra (HRMS and MS) were recorded on a VG Micromass ZAB-2F instrument.

#### Dihydrofarnesol **15** by hydrogenation of farnesol (**13**):

A hydrogenation flask was charged with farnesol (16.60 g 74.65 mmol, prepurified by chromatography (hexane/ether 8:2 to 7:3)) and methanol (60 mL). This solution was deoxygenated by a 15 minute Argon purge then (*R*)-**14** (105 mg, 0.113 mmol, Aldrich; 37765-1) was added under Argon atmosphere. The flask was placed in a hydrogenation bomb, purged three times with hydrogen (1400 psi) then it was shaken for one day at this pressure. The solution was evaporated, filtered through silica to remove the catalyst and to obtain dihydrofarnesol **15** (15.62 g, 95%). These results deteriorated by time while using catalyst from Fluka (14800) to necessitate an extra purification step after pivalate protection.

**<sup>1</sup>H NMR (250 MHz):** 5.11 (m, 2H, vinyls), 3.68 (m, 2H, CH<sub>2</sub>OH), 2.17-1.12 (m, 11H), 1.68 (d, J=1 Hz, 3H, CH<sub>3</sub>), 1.60 (s, 6H, 2xCH<sub>3</sub>), 0.91 (d, J=6.5 Hz, 3H, CH<sub>3</sub>).

**<sup>13</sup>C NMR (62.5 MHz):** 134.8, 131.2, 124.5, 124.3, 61.0, 39.8, 39.7, 37.1, 29.1, 26.6, 25.6, 25.3, 19.5, 17.6, 15.9.

**IR (neat on KBr, cm<sup>-1</sup>):** 3376 (br), 2924, 1665, 1452, 1379, 1057.

#### Pivalate **16**:

Pivaloyl chloride (8.2 mL, 68 mmol) was added to a mixture of **15** (10.00 g, 45 mmol) in CH<sub>2</sub>Cl<sub>2</sub> (150 mL) and pyridine (32 mL) at 0°C. The mixture was stirred for 3 h then the reaction was quenched with NaHCO<sub>3</sub> solution (1 M, 3.5 mL). After dilution with water (80 mL), it was acidified with HCl (cc., 30 mL), extracted with CH<sub>2</sub>Cl<sub>2</sub> (3X150 mL), washed with water, dried and evaporated. The crude product was purified by FC (silica, 5% ether in hexane) to afford compound **16** (13.2 g, 95%). When substantial overhydrogenation was observed, a second chromatographic purification was carried out on a AgNO<sub>3</sub> impregnated column prepared as follows:

Silica gel (500 g, 230-400 mesh) was added to a AgNO<sub>3</sub> solution (100 g in 800 mL water). It was diluted with methanol (1 L) then the solvents were evaporated on a rotavap with a bath temperature of 70°C in the dark. Evaporation was repeated from ethanol (1 L) and toluene (0.5 L). This silica was further dried overnight in a 50°C oven under vacuum. This quantity is suitable for purification of about 3 g of product and could be reused 15-20 times.

**<sup>1</sup>H NMR (250 MHz):** 5.09 (m, 2H, vinyls), 4.09 (td, J=6.7 and 1,8 Hz, 2H, CH<sub>2</sub>OH), 2.17-1.12 (m, 11H), 1.68 (d, J=0.8 Hz, 3H, CH<sub>3</sub>), 1.60 (s, 6H, 2xCH<sub>3</sub>), 1.19 (s, 9H, *t*-Bu), 0.91 (d, J=6.5 Hz, 3H, CH<sub>3</sub>).

**<sup>13</sup>C NMR (62.5 MHz):** 178.6, 134.9, 131.2, 124.4, 124.4, 62.9, 39.7, 38.7, 36.9, 35.5, 29.5, 27.2, 26.7, 25.6, 25.3, 19.5, 17.6, 16.0.

**IR (neat on KBr, cm<sup>-1</sup>):** 2964, 2925, 1730, 1664, 1284, 1157.

**HR-MS:** 308.2720 (308.2715 for M<sup>+</sup>: C<sub>20</sub>H<sub>36</sub>O<sub>2</sub>).

#### Alcohol 17 by Prins reaction:

To a vigorously stirred mixture of **16** (5.062 g, 16.42 mmol) and paraformaldehyde (544.7 mg, 1.05 eq) in CH<sub>2</sub>Cl<sub>2</sub> (70 mL), a precooled solution of Me<sub>2</sub>AlCl (3.06 mL, 2.0 eq) in CH<sub>2</sub>Cl<sub>2</sub> (5 mL) was added at -78 °C. This solution was warmed to 15°C over 15 min, cooled back to -78°C and quenched cautiously with NH<sub>4</sub>Cl solution (sat., 25 mL). The mixture was diluted with water (100 mL), extracted with CH<sub>2</sub>Cl<sub>2</sub> (3x100 mL), washed with water, dried and evaporated. The crude product was purified by FC (silica, 25% ether in hexane) to afford compound **17** (3.941 g, 71%).

**<sup>1</sup>H NMR (250 MHz):** 5.11 (td, J=7.0 and 1.2 Hz, 1H), 4.97 (dd J=3.5 and 1.0 Hz, 1H), 4.83 (d J=3.5 Hz, 1H) 3 vinyls, 4.09 (td, J=6.7 and 1,8 Hz, 2H, CH<sub>2</sub>OPiv), 3.51 (m, 2H, CH<sub>2</sub>OH), 2.31-1.87 (m, 5H, allyls), 1.69 and 1.61 (2s, 6H, 2xCH<sub>3</sub>), 1.72-1.25 (m, 7H), 1.19 (s, 9H, *t*-Bu), 0.91 (d, J=6.5 Hz, 3H, CH<sub>3</sub>).

**IR (neat on KBr, cm<sup>-1</sup>):** 3430 (br), 2964, 1728, 1646, 1287, 1161.

**HR-MS:** 338.2826 (338.2821 for M<sup>+</sup>: C<sub>21</sub>H<sub>38</sub>O<sub>3</sub>).

#### Aldehyde 18 by Swern oxidation of 17 and isomerization:

To a vigorously stirred solution of oxalyl chloride (3.72 mL, 42.2 mmol) in CH<sub>2</sub>Cl<sub>2</sub> (150 mL) a solution of methyl sulfoxide (4.85 mL, 68.4 mmol) in CH<sub>2</sub>Cl<sub>2</sub> (25 mL) was added in 5 minutes at -78°C. This mixture was stirred for 20 minutes then a solution of **17** (5.779 g, 17.07 mmol) in CH<sub>2</sub>Cl<sub>2</sub> (30 mL) was added. After 30 minute stirring, Et<sub>3</sub>N (23.8 mL, 169 mmol) was added then, following five more minute stirring at -78°C, the reaction mixture was warmed to room temperature. Further 5 hour stirring at RT was necessary for the isomerization to the conjugated, UV active product, monitored by TLC (hexane/ether 7:3). After the isomerization was complete, the solution was diluted with water (50 mL), acidified with HCl (cc., 10 mL), extracted with CH<sub>2</sub>Cl<sub>2</sub> (2x100 mL), washed with water, dried and evaporated. The crude product was purified by FC (silica, 15% ether in hexane) to afford aldehyde **18** (4.420 g, 77%).

**<sup>1</sup>H NMR (250 MHz):** 10.10 (s, 1H, CHO), 5.08 (td, J=7.0 and 1.2 Hz, 1H, vinyl), 4.09 (td, J=6.7 and 1,8 Hz, 2H, CH<sub>2</sub>OPiv), 2.39-2.32, 2.05-1.87 and 1.72-1.61 (3m, 6H, allyls), 2.18, 1.97 and 1.64 (3s, 9H, 3xCH<sub>3</sub>), 1.55-1.15 (m, 5H), 1.19 (s, 9H, *t*-Bu), 0.91 (d, J=6.5 Hz, 3H, CH<sub>3</sub>).

**<sup>13</sup>C NMR (62.5 MHz):** 190.5, 178.4, 154.4, 136.8, 134.6, 124.7, 62.7, 38.6, 36.8, 35.4, 29.5, 27.1, 25.2, 24.3, 23.2, 19.3, 19.1, 15.8.

**IR (neat on KBr,  $\text{cm}^{-1}$ ):** 2962, 2870, 1727, 1668, 1632, 1457, 1375, 1285, 1159, 1064, 938.

**HR-MS:** 336.2670 (336.2664 for  $\text{M}^+$ :  $\text{C}_{21}\text{H}_{36}\text{O}_3$ ).

**Alcohol 19:**

$\text{NaHB}_4$  (1.14 g, 30 mmol) and  $\text{CeCl}_3 \cdot 7\text{H}_2\text{O}$  (112 mg, 2 mol%) were added to a stirred solution of **18** (5.041 g, 15 mmol) in methanol (60 mL) at  $-78^\circ\text{C}$ . The mixture was warmed to  $-20^\circ\text{C}$  in 30 min and stirred at that temperature for 30 min. It was cooled back to  $-78^\circ\text{C}$  for quenching cautiously with HCl solution (1 M, 30 mL). Upon warming to room temperature, the reaction mixture was diluted with water (200 mL), extracted with  $\text{CH}_2\text{Cl}_2$  (3x100 mL), washed with water, dried and evaporated. The crude product was purified by FC (silica, 20% to 25% ether in hexane) to afford alcohol **19** (4.538 g, 90%).

**$^1\text{H}$  NMR (250 MHz):** 5.11 (td,  $J=7.0$  and  $1.2$  Hz, 1H, vinyl), 4.11 (s, 2H,  $\text{CH}_2\text{OH}$ ), 4.09 (td,  $J=6.7$  and  $1.8$  Hz, 2H,  $\text{CH}_2\text{OPiv}$ ), 2.28-2.21 and 2.08-1.93 (2m, 2H and 4H, respectively, allyls), 1.76, 1.70 and 1.63 (3s, 9H,  $3 \times \text{CH}_3$ ), 1.70-1.15 (m, 5H), 1.19 (s, 9H, *t*-Bu), 0.91 (d,  $J=6.5$  Hz, 3H,  $\text{CH}_3$ ).

**$^{13}\text{C}$  NMR (62.5 MHz):** 178.6, 135.7, 132.1, 130.3, 124.5, 62.8, 62.2, 38.8, 38.6, 36.8, 35.4, 29.9, 29.5, 27.1, 25.2, 20.3, 20.2, 19.4, 16.0.

**IR (neat on KBr,  $\text{cm}^{-1}$ ):** 3364 (br), 2962, 2924, 1728, 1459, 1380, 1286, 1159, 1003.

**HR-MS:** 338.2823 (338.2821 for  $\text{M}^+$ :  $\text{C}_{21}\text{H}_{38}\text{O}_3$ ).

**(*S,S*)-20 by hydrogenation over catalyst (*S*)-14:**

A hydrogenation flask was charged with **19** (5.585 g 16.5 mmol) and methanol (60 mL). This solution was deoxygenated by a 15 minute Argon purge then (*S*)-**14** (203 mg, 0.218 mmol, Aldrich; 37767-8) was added under Argon atmosphere. The flask was placed in a hydrogenation bomb, purged three times with hydrogen (1700 psi) then it was shaken for 5 days at this pressure. The solution was evaporated and purified by FC (25% ether in hexane) to afford alcohol (*S,S*)-**20** (4.271 g, 77%). These results deteriorated by time while using catalyst from Fluka (14800) to necessitate an extra purification step on a  $\text{AgNO}_3$  impregnated column as for **16**.

**$^1\text{H}$  NMR (250 MHz):** 5.11 (td,  $J=7.0$  and  $1.2$  Hz, 1H, vinyl), 4.09 (td,  $J=6.7$  and  $1.8$  Hz, 2H,  $\text{CH}_2\text{OPiv}$ ), 3.59 (dd,  $J=5.5$  and  $1.4$  Hz, 2H,  $\text{CH}_2\text{OH}$ ), 2.10-1.90 (m, 4H, allyls), 1.60 (s, 3H,  $\text{CH}_3$ ), 1.90-1.15 (m, 9H), 1.19 (s, 9H, *t*-Bu), 0.91, 0.90 and 0.89 (3d,  $J=7$  Hz, 9H,  $3 \times \text{CH}_3$ ).

**$^{13}\text{C}$  NMR (62.5 MHz):** 178.6, 135.2, 124.5, 63.5, 62.8, 46.0, 38.6, 37.8, 36.9, 35.4, 29.5, 27.7, 27.1, 25.9, 25.2, 19.7, 19.4, 19.1, 15.8.

**IR (neat on KBr,  $\text{cm}^{-1}$ ):** 3437 (br), 2960, 2874, 1728, 1287, 1161.

**$[\alpha]_{\text{D}}^{30}$ :**  $-8.80^\circ$  (c: 10,  $\text{CDCl}_3$ ).

**HR-MS:** 340.2980 (340.2977 for  $\text{M}^+$ :  $\text{C}_{21}\text{H}_{40}\text{O}_3$ ).

**( $\xi$ ,*S*)-20 by hydrogenation over Wilkinson catalyst:**

Alcohol **17** (34 mg, 100  $\mu\text{mol}$ ) was hydrogenated for 6h at  $23^\circ\text{C}$  and 1atm, over catalyst  $(\text{PPh}_3)_3\text{RhCl}$  (9 mg, 10  $\mu\text{mol}$ ) in an argon purged benzene (5 mL) solution. FC (30% ether in hexane) afforded alcohol ( $\xi$ ,*S*)-**20** (34 mg, 100%).

**Esters (*S,S*)-**21** and ( $\xi,S$ )-**21** by (*S*)-Trolox<sup>TM</sup> methyl ether derivatization:**

A mixture of alcohol (*S,S*)-**20** (5.1 mg, 15  $\mu$ mol), acid (*S*)-Trolox<sup>TM</sup> methyl ether (**22-OH**) (10.6 mg, 40  $\mu$ mol), dimethylaminopyridine (0.1 mg, 1  $\mu$ mol) and dicyclohexylcarbodiimide (75  $\mu$ L, 75  $\mu$ mol, 1 M in CH<sub>2</sub>Cl<sub>2</sub>) in CH<sub>2</sub>Cl<sub>2</sub> (1 mL) was stirred for 14 h. Upon completion, FC (15% ether in hexane) afforded ester (*S,S*)-**21** (8.5 mg, 97%). Similar procedure produced ( $\xi,S$ )-**21** from ( $\xi,S$ )-**20**.

Characterization data for (*S,S*)-**21**:

<sup>1</sup>H NMR (250 MHz): 5.05 (t, J=7.1Hz, 1H, vinyl), 4.08 (m, 3H), 3.93 (dd, J=12.1 and 6.7Hz, 1H), 3.60, 2.17, 2.14, 2.08, 1.61, 1.53 (6s, 6x3H), 2.7-2.4 (m, 4H, allyls), 1.19 (s, 9H), 0.91 (d, J=6.4Hz, 3H), 0.78 (d, J=6.8Hz, 3H), 0.72 (d, J=6.8Hz, 3H).

<sup>13</sup>C NMR (62.5 MHz): 178.7, 174.3, 150.0, 147.9, 134.7, 127.9, 125.7, 124.8, 122.8, 117.1, 77.3, 65.6, 62.8, 60.3, 42.6, 38.7, 37.5, 37.0, 35.4, 30.6, 29.6, 28.1, 27.2 (3x), 25.6 (2x), 25.3, 21.0, 19.8, 19.4, 19.0, 15.8, 12.5, 11.8, 11.6.

IR (neat on KBr, cm<sup>-1</sup>): 2959, 1729, 1458, 1156.

HR-MS: 586.4227 (586.4233 for M<sup>+</sup>: C<sub>36</sub>H<sub>58</sub>O<sub>6</sub>).

See also the <sup>1</sup>H NMR spectra of (*S,S*)-**21** and ( $\xi,S$ )-**21** following the Experimental Part.

**Aldehyde 23:**

Tetrapropylammonium perruthenate (34 mg, 5 mol%) was added to a stirred suspension of (*S,S*)-**20** (681.1 mg, 2 mmol), pulverized 4 Å molecular sieve and N-methylmorpholine N-oxide (242 mg, 1.2 eq) in CH<sub>2</sub>Cl<sub>2</sub> (20 mL) at 0°C. After 1 h, the oxidation was complete. The product was purified directly by FC (15% ether in hexane) to afford aldehyde **23** (620 mg, 91%).

<sup>1</sup>H NMR (250 MHz): 9.61 (d, J=3.1 Hz, 1H, CHO), 5.09 (td, J=7.0 and 1.0 Hz, 1H, vinyl), 4.09 (td, J=6.7 and 1.8 Hz, 2H, CH<sub>2</sub>OPiv), 3.59 (dd, J=5.5 and 1.4 Hz, 2H, CH<sub>2</sub>OH), 2.1-1.15 (m, 13H), 1.57 (s, 3H, CH<sub>3</sub>), 1.18 (s, 9H, *t*-Bu), 0.95, 0.94 and 0.80 (3d, J=7 Hz, 9H, 3xCH<sub>3</sub>).

<sup>13</sup>C NMR (62.5 MHz): 205.7, 178.6, 134.1, 125.4, 62.8, 57.5, 38.6, 37.5, 36.8, 35.4, 29.5, 28.3, 27.2, 25.3, 24.2, 20.2, 19.7, 19.4, 15.8.

IR (neat on KBr, cm<sup>-1</sup>): 2962, 1727, 1462, 1386, 1285, 1159, 1039, 970.

[ $\alpha$ ]<sub>D</sub><sup>30</sup>: +12.4° (c: 2, CH<sub>2</sub>Cl<sub>2</sub>)

HR-MS: 338.2813 (338.2821 for M<sup>+</sup>: C<sub>21</sub>H<sub>38</sub>O<sub>3</sub>).

**Sulfoxide 24:**

Butyllithium (10.5 mL, 21.1 mmol, 1.67 M in hexane) was added to a THF (25 mL) solution of diisopropylamine (2.96 mL, 21.2 mmol) at 0°C. After 15 min, this LDA solution was cannulated into a THF (25 mL) solution of methyl phenyl sulfoxide (2.96 g, 21.6 mmol) at -78°C. After an hour at 0°C, it was cannulated into a THF (50 mL) solution of aldehyde **23** (1.2 g, 3.52 mmol) at -78°C in 30 min. The mixture was stirred for 15 h at 0°C then quenched with NH<sub>4</sub>Cl (20 mL, sat.). After extraction with ethyl acetate, the crude product was purified with FC (toluene/ethyl acetate 2:1) to afford diol **24** (1.05 g, 78%) as a mixture of

four stereoisomers as a viscous colorless oil still contaminated with traces of methyl phenyl sulfoxide. This product was used in the next step without further purification.

#### Aldehyde **25**:

Dess-Martin periodinane (2.09 g, 4.91 mmol) was added to a stirred CH<sub>2</sub>Cl<sub>2</sub> (90 mL) suspension of diol **24** (778 mg, 1.97 mmol) and NaHCO<sub>3</sub> (460 mg, 5.4 mmol) at 0°C. After 2 h stirring, Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> (15 mL, sat.), NaHCO<sub>3</sub> (15 mL, sat.) and hexane (90 mL) were added. After an extractive work-up, the crude product was purified by FC (hexane/ethyl acetate, 7:3) to afford aldehyde **25** (478 mg, 62%) as a clear oil as a mixture of two diastereomers.

**<sup>1</sup>H NMR (300 MHz)**: 9.68 (1H, m, CHO), 7.66-7.62 and 7.48-7.43 (2H+3H, 2m, ArH), 5.02 (1H, J=1Hz, t, CH<sub>3</sub>C=CH), 4.88 (1H, J=1Hz, t, CH<sub>3</sub>C=CH), 4.0-3.6 (2H, m, CH<sub>2</sub>SOAr), 2.4-2.1 (3H, m, CH<sub>2</sub>C(O), CHC(O)), 2.0-1.1 (10H, m, 2xCH, 4xCH<sub>2</sub>), 1.49 (3H, s, CH<sub>3</sub>C=CH), 1.0-0.6 (9H, m, 3xCH<sub>3</sub>).

**<sup>13</sup>C NMR (75 MHz)**: 205.5, 202.8, 134.6, 131.4, 129.3, 125.0, 124.8, 124.2, 69.8, 69.7, 58.6, 58.4, 50.90, 37.4, 36.7, 29.2, 29.1, 27.6, 25.2, 24.9, 21.0, 20.8, 19.8, 19.0, 15.7, 15.6.

**IR (neat on KBr, cm<sup>-1</sup>)**: 2958, 2929, 1718, 1703, 1702, 1458, 1443, 1376, 1088, 1044, 747.

**HR-MS**: 391.2315 (391.2307 for M<sup>+</sup>: C<sub>23</sub>H<sub>35</sub>O<sub>3</sub>S).

#### (6*E*)-(3*S*,10*S*)-1-Benzenesulfinyl-6,10-dimethyl-3-isopropyl-6,13-tetradecadiene-2,12-dione (**26**):

*tert*-Butyllithium (6.14 mL, 9.52 mmol, 1.55 M in pentane) was added to an ether (30 mL) solution of vinyl bromide (4.88 mL, 4.88 mmol, 1 M in THF) at -78°C. After 30 min stirring, ether (10 mL) solution of aldehyde **25** (207 mg, 0.51 mmol) was cannulated to this vinyl lithium solution at -78°C. After 1.5 h stirring, the reaction was quenched with NH<sub>4</sub>Cl (10 mL, sat.). An extractive work-up with ether and FC (hexane/ethyl acetate 7:3) of the crude product afforded a clear oil of 403 mg (79%) allylic alcohol as a mixture of four stereoisomers. This product was used in the next step without delay.

Dess-Martin periodinane (533 mg, 1.25 mmol) was added to a stirred CH<sub>2</sub>Cl<sub>2</sub> (40 mL) suspension of allylic alcohol (403 mg, 0.97 mmol) and NaHCO<sub>3</sub> (185 mg, 2.2 mmol) at 0°C. After 1 h stirring, Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> (5 mL, sat.), NaHCO<sub>3</sub> (5 mL, sat.) and hexane (40 mL) were added. After an extractive work-up, the crude product was purified by FC (hexane/ethyl acetate, 7:3) to afford title product **26** (340 mg, 84%) as a clear oil as a mixture of two diastereomers.

**<sup>1</sup>H NMR (300 MHz)**: 7.8-7.7 and 7.6-7.5 (2H+3H, 2m, ArH), 6.4-6.1 (2H, m, CH<sub>2</sub>=CH), 5.80 (1H, J=10.4 Hz, d, CH<sub>2</sub>=CH), 5.08 (0.5H, m, CH<sub>3</sub>C=CH), 4.93 (0.5H, m, CH<sub>3</sub>C=CH), 4.1-3.7 (2H, m, CH<sub>2</sub>SOAr), 2.6-2.1 (3H, m, CHC(O), CH<sub>2</sub>C(O)), 2.1-1.1 (10H, m, 2xCH, 4xCH<sub>2</sub>), 1.57 (3H, s, CH<sub>3</sub>C=CH), 1.0-0.7 (9H, m, 3xCH<sub>3</sub>).

**<sup>13</sup>C NMR (75 MHz)**: 205.9, 205.7, 200.7, 200.6, 136.9, 129.3, 127.9, 125.3, 125.1, 124.3, 66.77, 58.6, 58.4, 46.9, 37.41, 36.9, 36.8, 36.5, 29.3, 29.2, 29.1, 29.0, 25.3, 25.2, 25.1, 24.9, 24.8, 21.0, 20.9, 19.7, 19.5, 19.1, 19.0, 15.7.

**IR (neat on KBr, cm<sup>-1</sup>)**: 2959, 2929, 2085, 1702, 1676, 1458, 1370, 1088, 1046, 998, 747.

**HR-MS**: 417.2472 (417.2463 for M<sup>+</sup>: C<sub>25</sub>H<sub>37</sub>O<sub>3</sub>S).

#### **27a and 27b by macrocyclization of 26:**

Cs<sub>2</sub>CO<sub>3</sub> (2.67 g, 8.2 mmol) was added to an acetonitrile (460 mL) to a stirred solution of dione **26** (340 mg, 0.82 mmol) at 23°C. After 4 h stirring, the mixture was filtered through a pad of celite and, following an

evaporation it was purified by FC (hexane/ethyl acetate, 7:3) to afford a 1:1 mixture of macrocycles **27a** and **27b** (223 mg, 65%). The early and late fractions of the chromatography gave pure samples for characterization.

**Macrocycle 27a:**

**<sup>1</sup>H NMR (300 MHz):** 7.8-7.4 (2H+3H, 2m, ArH), 5.1-4.8 (1H, m, CH<sub>3</sub>C=CH), 4.03 (1H, J=7.1Hz, t, CHSOAr), 2.6-2.2 (3H, m, CHC(O), CH<sub>2</sub>C(O)), 2.2-1.1(10H, m, 2xCH, 4xCH<sub>2</sub>), 1.53 (3H, s, CH<sub>3</sub>C=CH), 1.03 (3H, J=6.5 Hz, d, CH<sub>3</sub>), 0.92 (3H, J=6.8 Hz, d, CH<sub>3</sub>), 0.87 (3H, J=5.9 Hz, d, CH<sub>3</sub>).

**<sup>13</sup>C NMR (75 MHz):** 208.6, 207.9, 135.0, 132.0, 129.1, 129.0, 126.5, 126.0, 125.2, 74.0, 58.2, 53.9, 38.5, 35.3, 34.7, 27.8, 26.5, 23.9, 21.8, 21.2, 20.9, 20.5, 18.1, 15.3.

**IR (neat on KBr, cm<sup>-1</sup>):** 2956, 1706, 1443, 1369, 1307, 1085, 1048, 748.

**HR-MS:** 417.2456 (417.2463 for M<sup>+</sup>: C<sub>25</sub>H<sub>37</sub>O<sub>3</sub>S).

**Macrocycle 27b:**

**<sup>1</sup>H NMR (300 MHz):** 7.8-7.4 (2H+3H, 2m, ArH), 4.94 (1H, J=7.4 Hz, t, CH<sub>3</sub>C=CH), 4.00 (1H, J=4.2 and 8.0 Hz, dd, CHSOAr), 2.5-2.7 (1H, m, CHC(O)), 2.5-2.3 (2H, m, CH<sub>2</sub>C(O)), 2.2-1.2 (10H, m, 2xCH, 4xCH<sub>2</sub>), 1.51 (3H, s, CH<sub>3</sub>C=CH), 0.94 (3H, J = 6.8 Hz, d, CH<sub>3</sub>), 0.89 (3H, J = 6.7 Hz, d, CH<sub>3</sub>), 0.59 (3H, J=6.8 Hz, d, CH<sub>3</sub>).

**<sup>13</sup>C NMR (75 MHz):** 209.0, 207.8, 142.4, 134.8, 131.4, 129.1, 126.8, 125.4, 73.2, 56.0, 50.1, 38.9, 35.5, 34.7, 28.0, 27.6, 23.9, 21.6, 21.3, 20.6, 19.8, 17.5, 15.2.

**IR (neat on KBr, cm<sup>-1</sup>):** 2958, 1705, 1444, 1371, 1086, 1048, 748.

**HR-MS:** 417.2456 (417.2463 for M<sup>+</sup>: C<sub>25</sub>H<sub>37</sub>O<sub>3</sub>S).

**Dione 28:**

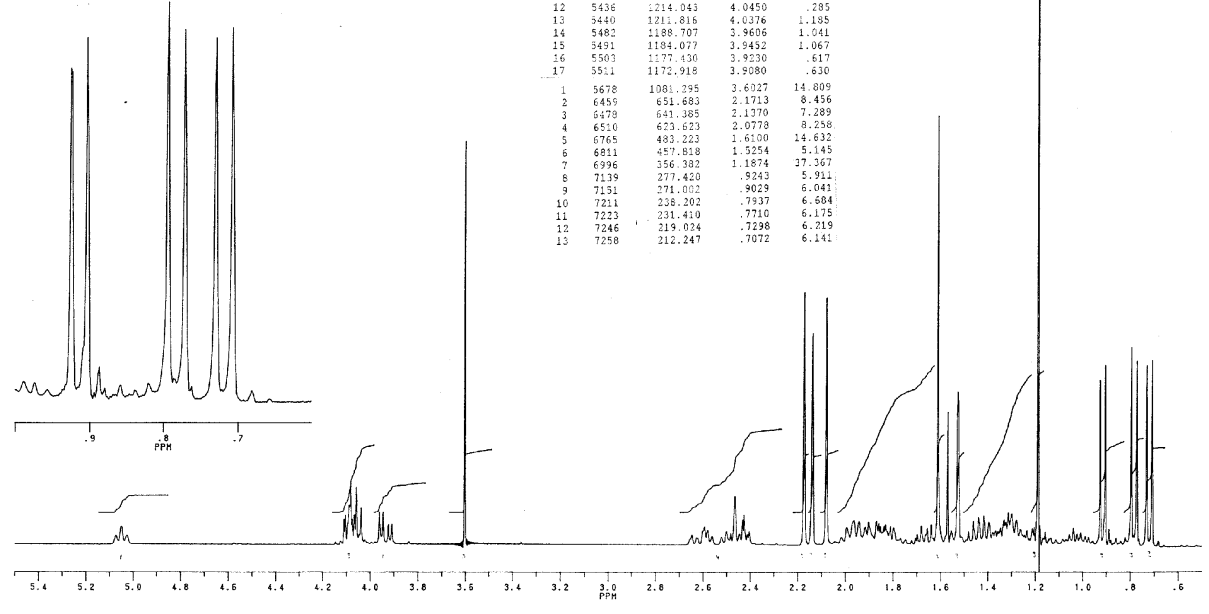
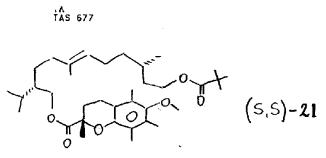
A suspension of macrocycle mixture **27** (57 mg, 0.14 mmol) and CaCO<sub>3</sub> (57 mg, 0.57 mmol) in toluene (10 mL) was refluxed for 1.5 h. After filtration over celite and evaporation, the crude product was purified by FC (hexane/ethyl acetate, 10:1) to afford dione **28** as a 3:2 mixture of two *trans*-isomers as a clear oil (35 mg, 88%).

**<sup>1</sup>H NMR (300 MHz):** 6.8-6.5 (1H, m, CH=CHC(O)), 6.21 (0.6H, J=15.6 Hz, d, CH=CHC(O)), 6.03 (0.4H, J=16.1 Hz, d, CH=CHC(O)), 4.89 (0.6H, J=6.0 Hz, t, CH<sub>3</sub>C=CH), 4.80 (0.4H, J=5.3 Hz, t, CH<sub>3</sub>C=CH), 3.5-3.0 (2H, m, CH=CHCH<sub>2</sub>C(O)), 2.7-2.3 (3H, m, CHC(O), CH<sub>2</sub>C(O)), 2.2-1.2 (10H, m, 2xCH, 4xCH<sub>2</sub>), 1.52 (1.8H, s, CH<sub>3</sub>C=CH), 1.44 (1.2H, s, CH<sub>3</sub>C=CH), , 1.0-0.8 (6H, m, 2xCH<sub>3</sub>), 0.85 (3H, J=6.8 Hz, d, CH<sub>3</sub>), 0.77 (3H, J=6.9 Hz, d, CH<sub>3</sub>).

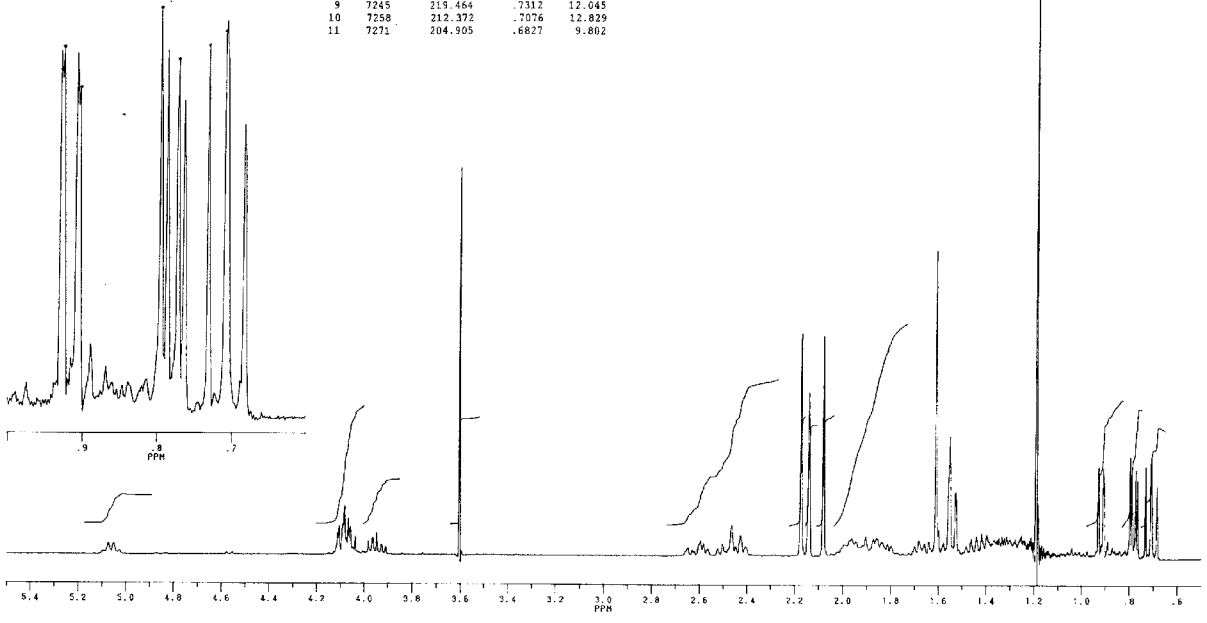
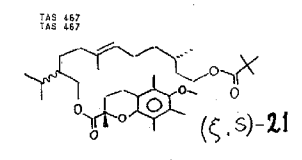
**<sup>13</sup>C NMR (75 MHz):** 207.4, 201.6, 139.4, 135.8, 135.6, 134.8, 133.8, 127.1, 126.3, 55.4, 53.2, 50.1, 48.7, 47.3, 46.7, 39.6, 37.3, 36.8, 35.7, 35.3, 31.1, 30.2, 28.9, 27.8, 24.6, 24.5, 24.2, 23.8, 21.4, 20.9, 19.9, 19.8, 19.2, 17.6, 15.1, 14.8.

**IR (neat on KBr, cm<sup>-1</sup>):** 2958, 1709, 1668, 1625, 1459, 1438, 1388, 1250, 985.

**HR-MS:** 290.2237 (290.2246 for M<sup>+</sup>: C<sub>19</sub>H<sub>30</sub>O<sub>2</sub>).



#	CURSOR	FREQUENCY	PPM	INTENSITY
1	4875	1522.425	5.0725	.243
2	4887	1515.787	5.0504	.537
3	4900	1508.872	5.0273	.241
4	5401	1233.604	4.1102	.637
5	5404	1231.768	4.1041	.929
6	5409	1228.734	4.0940	.689
7	5412	1227.073	4.0884	1.291
8	5416	1225.370	4.0818	1.955
9	5420	1222.979	4.0748	.786
10	5425	1220.413	4.0662	.994
11	5429	1217.887	4.0578	1.868
12	5436	1214.043	4.0450	1.285
13	5440	1211.816	4.0376	1.195
14	5482	1188.707	3.9606	1.041
15	5491	1184.077	3.9452	1.067
16	5503	1177.430	3.9230	.617
17	5511	1172.918	3.9080	.630
1	5678	1081.295	3.6027	14.809
2	6459	651.683	2.1713	8.456
3	6479	641.385	2.1370	7.289
4	6510	623.623	2.0778	8.258
5	6765	483.223	1.6100	14.632
6	6811	457.838	1.5254	5.145
7	6996	356.382	1.1874	17.367
8	7139	277.420	.9243	5.911
9	7151	271.002	.9029	6.041
10	7211	238.202	.7537	6.584
11	7223	231.410	.7310	6.175
12	7246	219.034	.7298	6.219
13	7258	212.247	.7072	6.141



#	CURSOR	FREQUENCY	PPM	INTENSITY
1	7137	278.578	.9282	12.280
2	7139	277.882	.9259	12.385
3	7149	272.111	.9056	11.758
4	7151	271.323	.9040	11.382
5	7210	238.366	.7949	13.250
6	7215	235.909	.7860	11.839
7	7223	231.649	.7718	11.909
8	7227	229.178	.7636	10.330
9	7245	219.464	.7312	12.045
10	7258	212.372	.7076	12.829
11	7271	204.905	.6827	9.802