

**Fermentation of *Illigera aromatica* with *Clonostachys rogersoniana* producing novel
cytotoxic menthane-type monoterpenoid dimmers**

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Supporting Information

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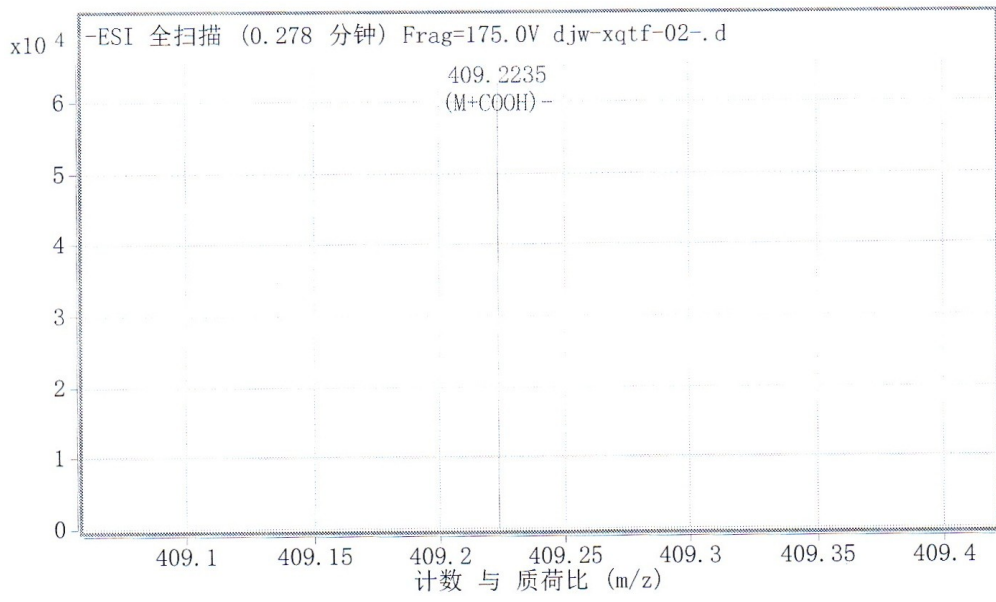


Figure S1 HRESIMS spectrum of dimericilligerate E (1)

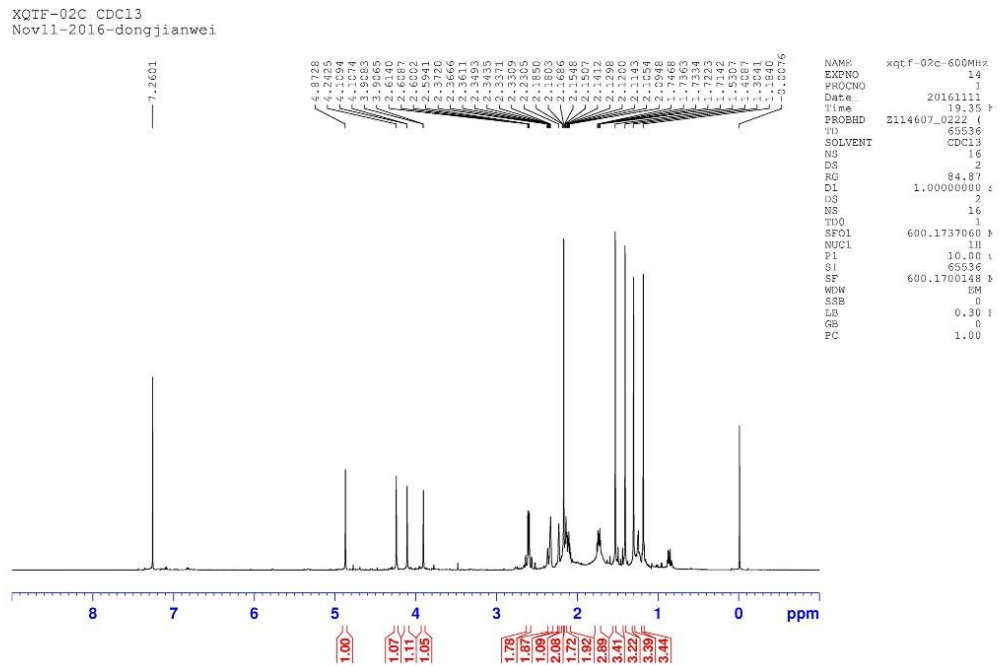


Figure S2 ¹H NMR spectrum (CDCl₃, 600 MHz) of dimericilligerate E (1)

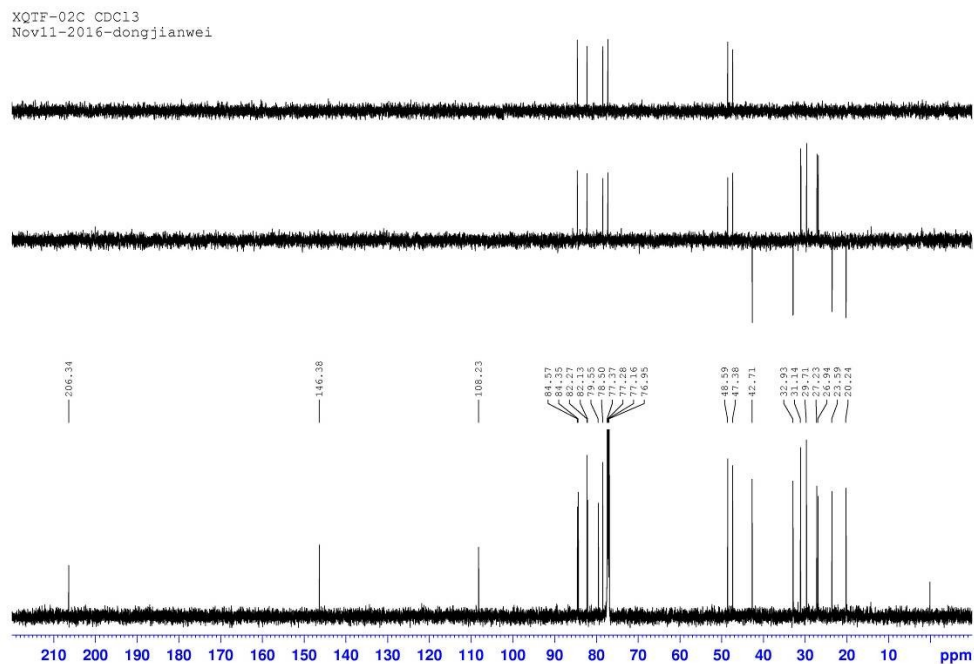


Figure S3 ^{13}C NMR and DEPT spectra (CDCl_3 , 150 MHz) of dimericilligerate E (1)

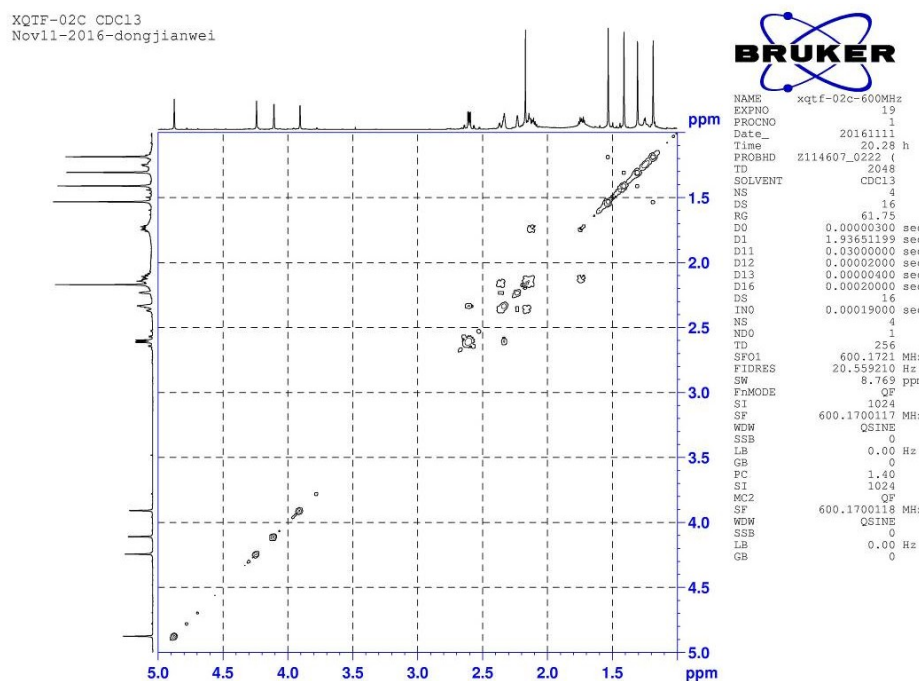


Figure S4 ^1H - ^1H COSY spectrum (CDCl_3 , 600 MHz) of dimericilligerate E (1)

XQTF-02C CDCl3
Nov11-2016-dongjianwei

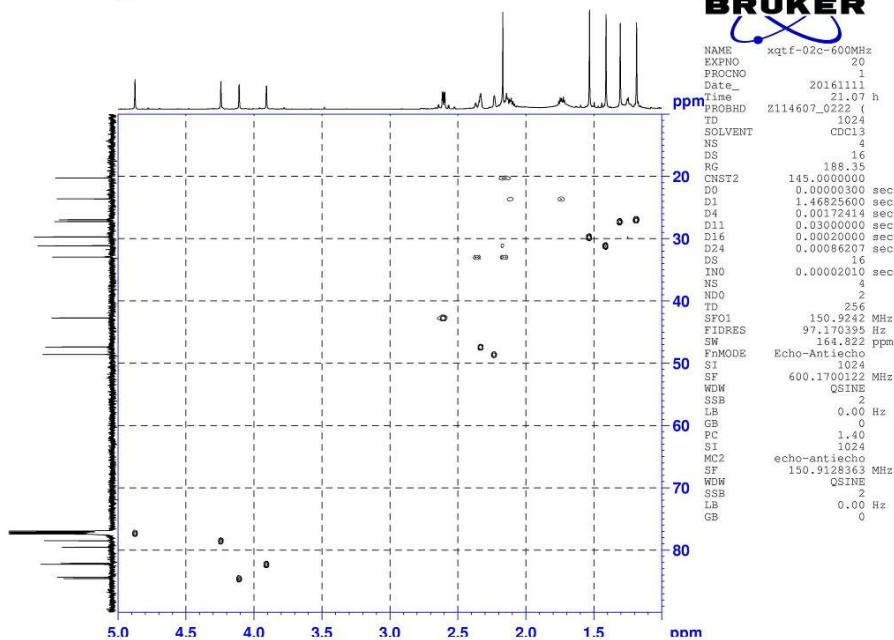


Figure S5 HSQC spectrum (CDCl₃, 600 MHz) of dimericilligerate E (1)

XQTF-02C CDCl3
Nov11-2016-dongjianwei

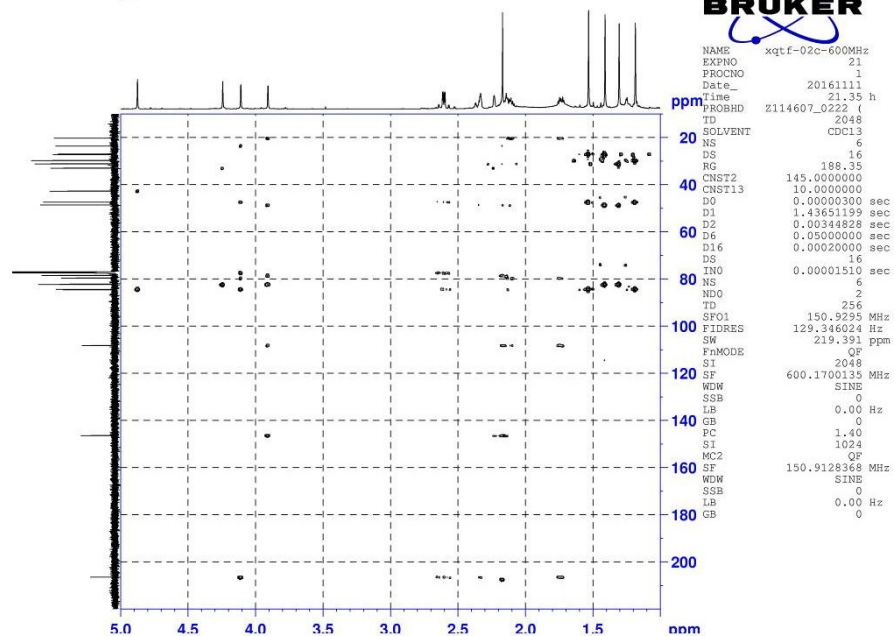


Figure S6 HMBC spectrum (CDCl₃, 600 MHz) of dimericilligerate E (1)

XQTF-02C CDCl3
Nov11-2016-dongjianwei

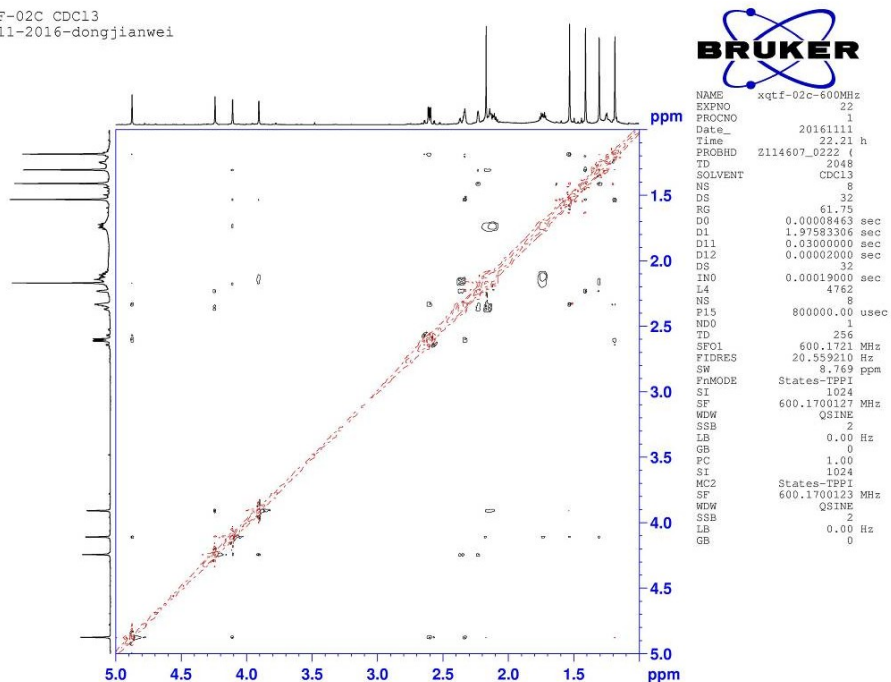


Figure S7 ROESY spectrum (CDCl₃, 600 MHz) of dimericilligerate E (1)

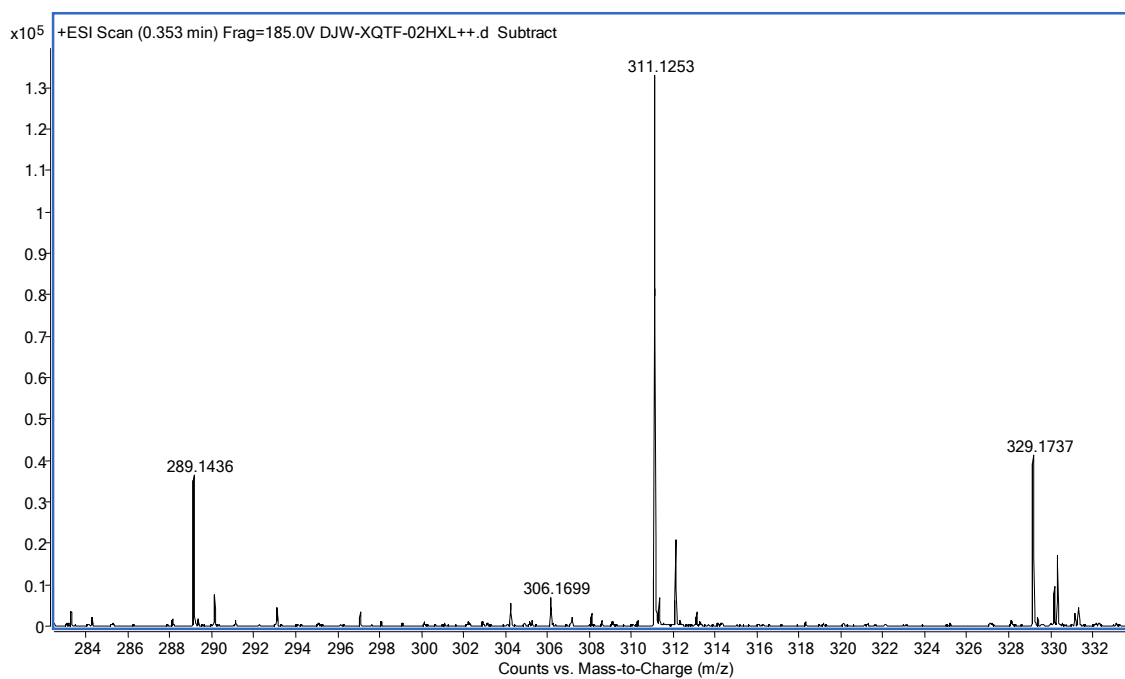


Figure S8 HRESIMS spectrum of 1a

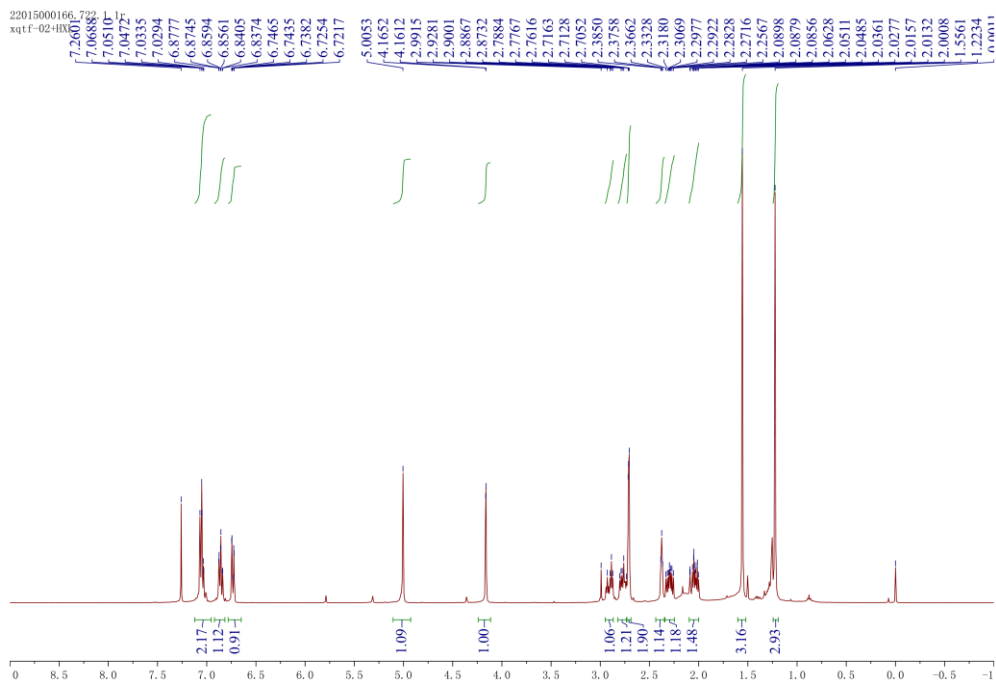


Figure S9 ^1H NMR spectrum (CDCl_3 , 400 MHz) of **1a**

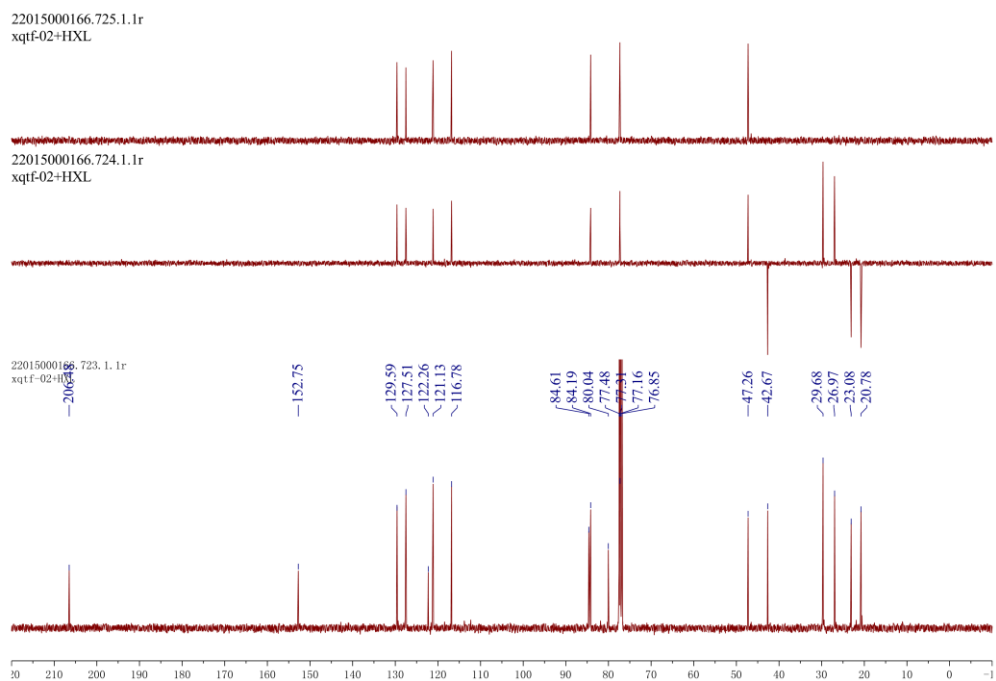


Figure S10 ^{13}C NMR and DEPT spectra (CDCl_3 , 100 MHz) of **1a**

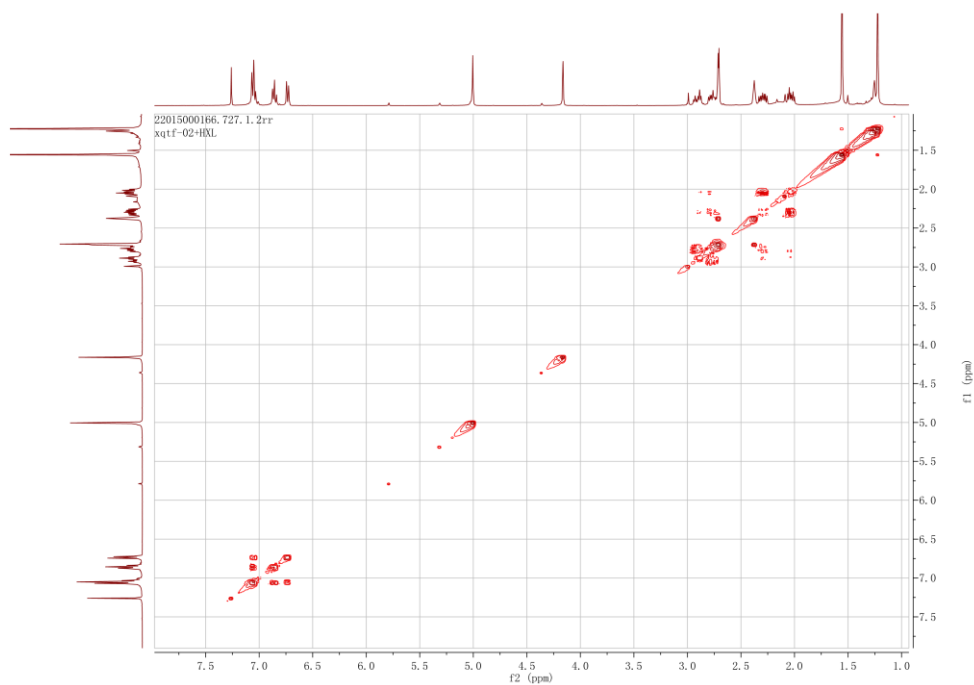


Figure S11 ^1H - ^1H COSY spectrum (CDCl_3 , 400 MHz) of 1a

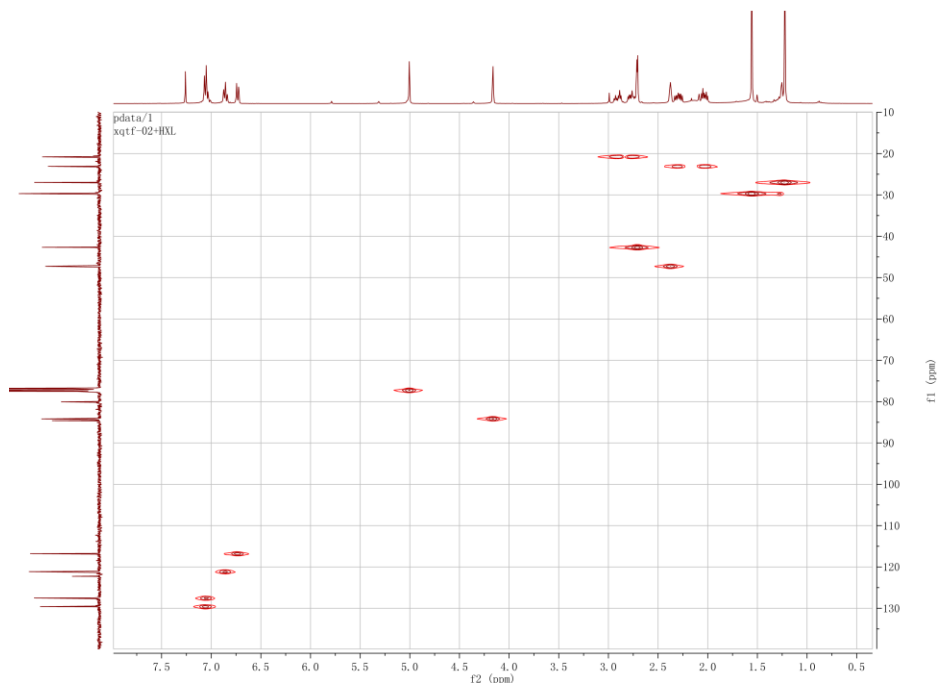


Figure S12 HSQC spectrum (CDCl_3 , 400 MHz) of 1a

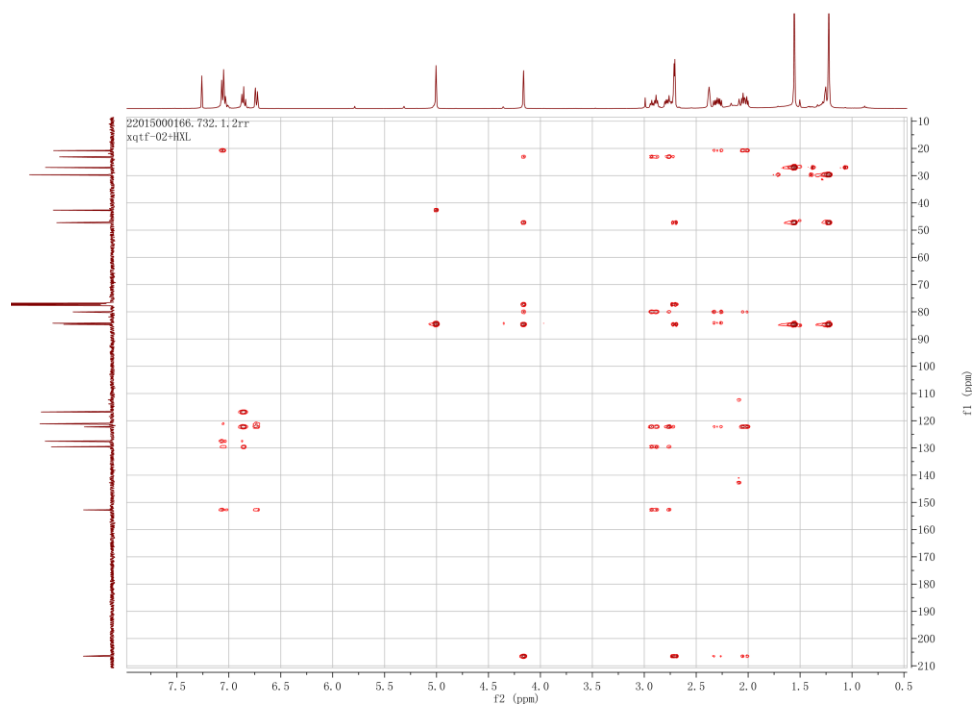


Figure S13 HMBC spectrum (CDCl₃, 400 MHz) of 1a

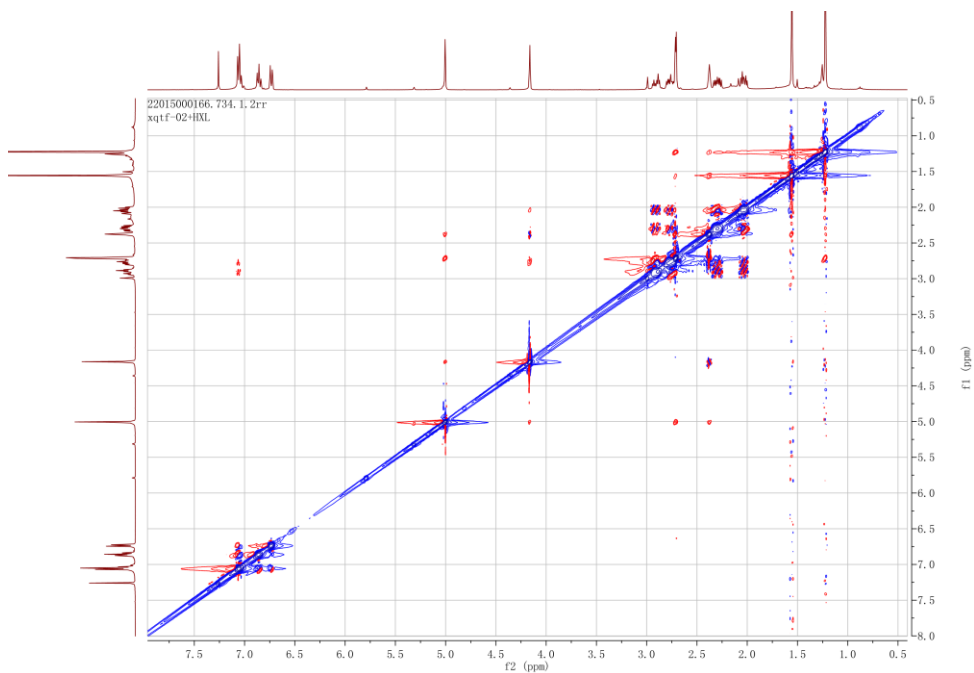


Figure S14 ROESY spectrum (CDCl₃, 400 MHz) of 1a

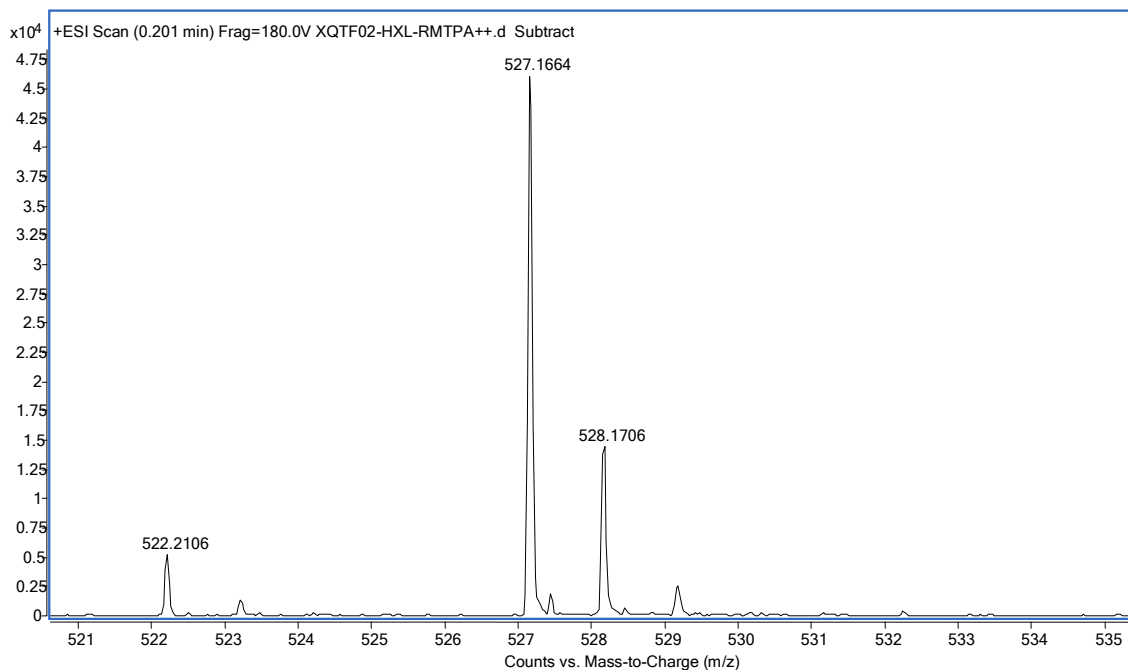


Figure S15 HRESIMS spectrum of (*R*)-MTPA ester of 1a

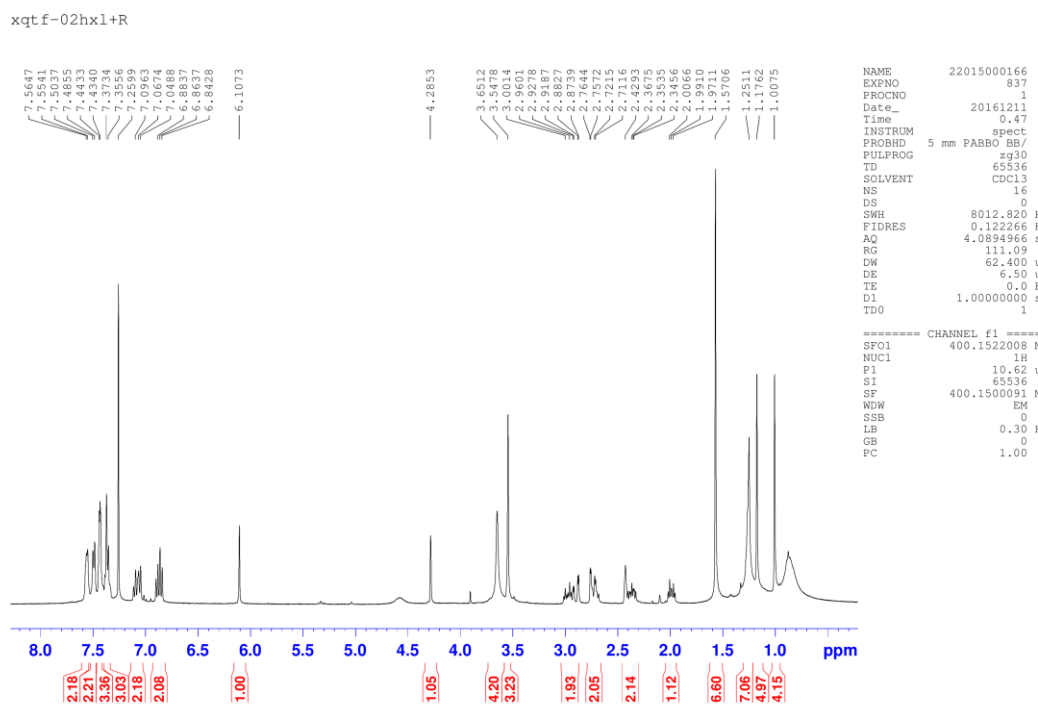


Figure S16 ¹H NMR spectrum (CDCl₃, 400 MHz) of (*R*)-MTPA ester of 1a

xqtf-02hx1+R

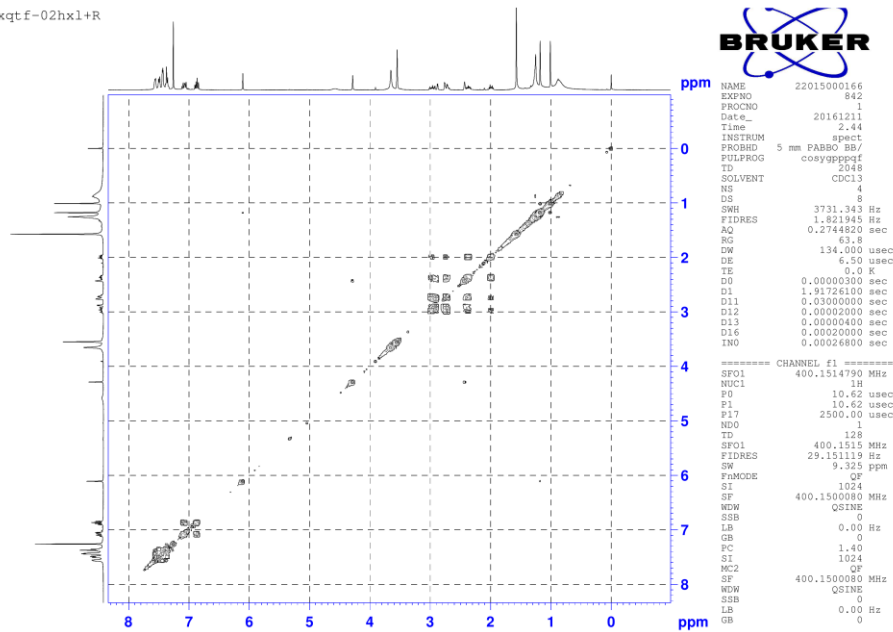


Figure S17 ^1H - ^1H COSY spectrum (CDCl_3 , 400 MHz) of (*R*)-MTPA ester of 1a

xqtf-02hx1+R

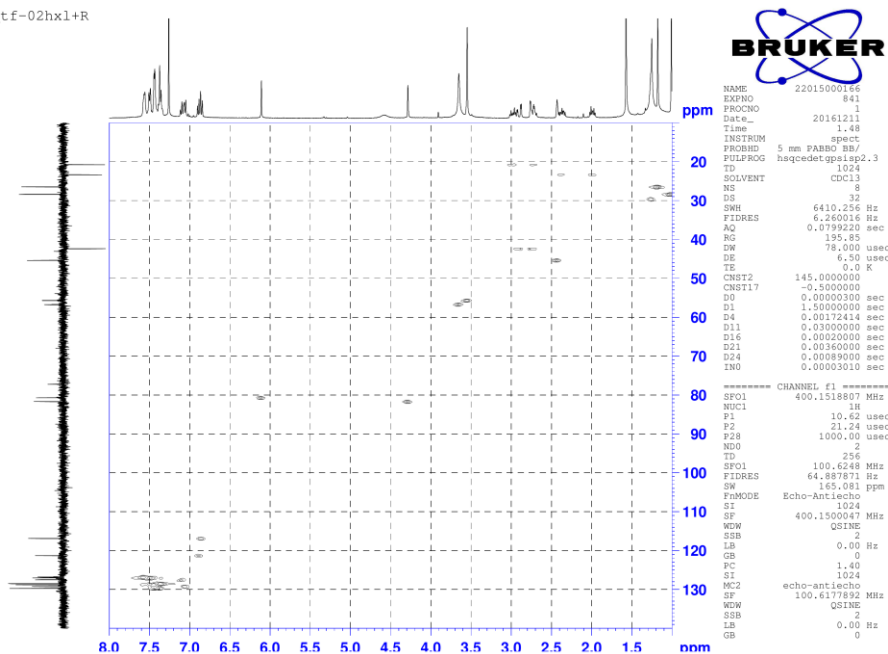


Figure S18 HSQC spectrum (CDCl_3 , 400 MHz) of (*R*)-MTPA ester of 1a

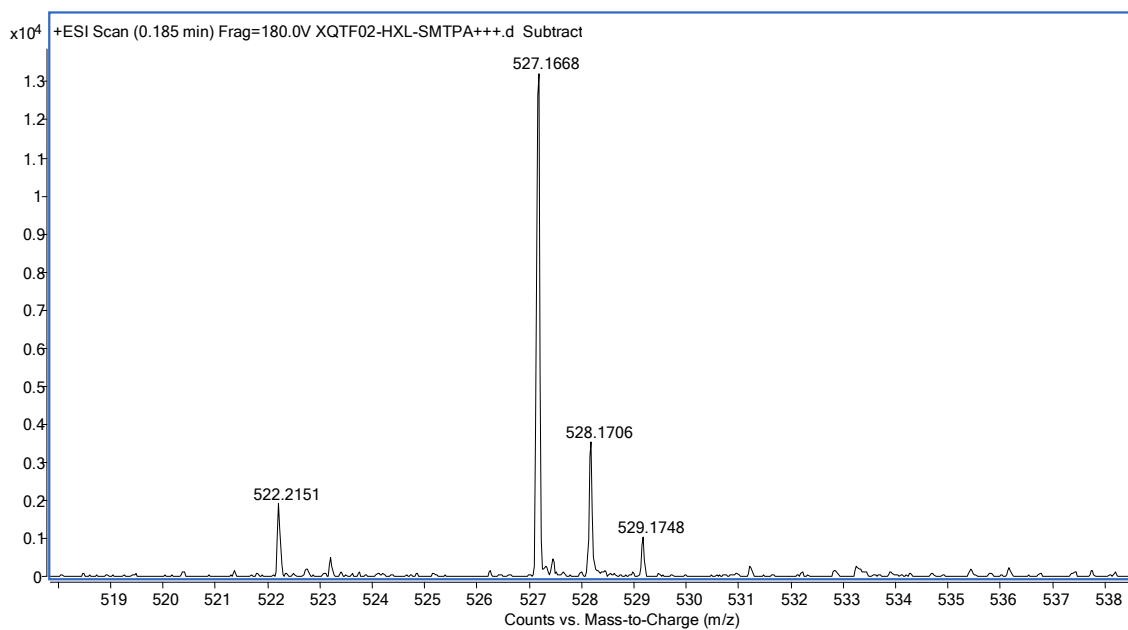


Figure S19 HRESIMS spectrum of (*S*)-MTPA ester of **1a**

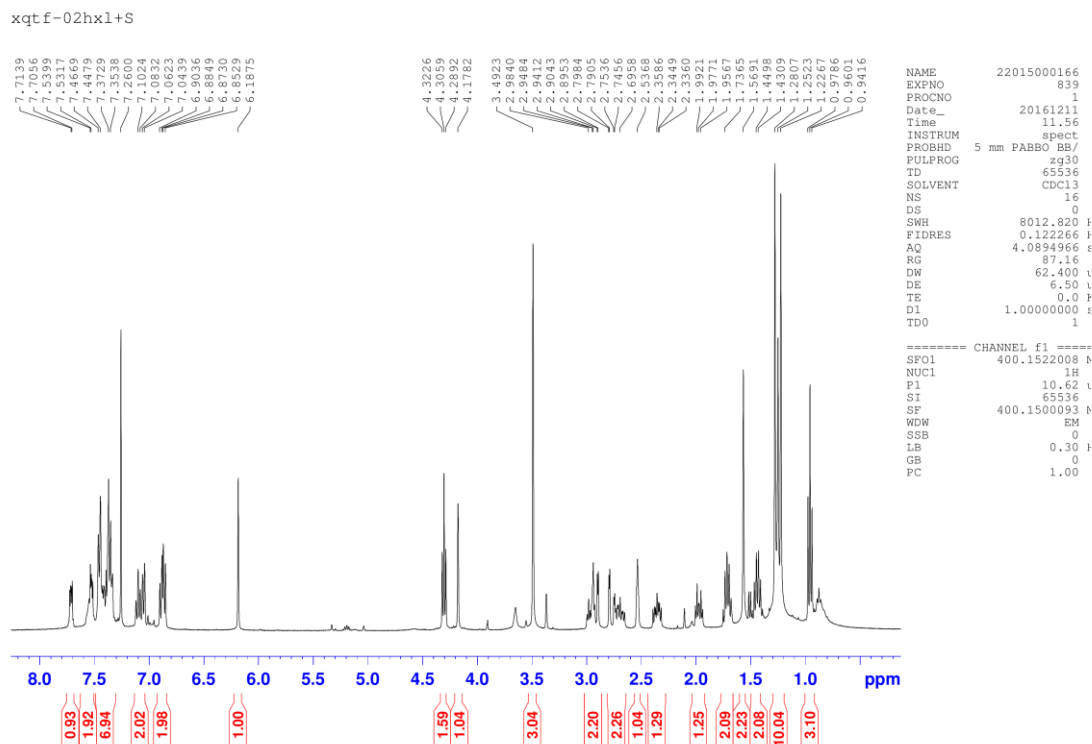


Figure S20 ¹H-NMR spectrum (CDCl₃, 400 MHz) of (*S*)-MTPA ester of **1a**

xqtf-02hx1+S

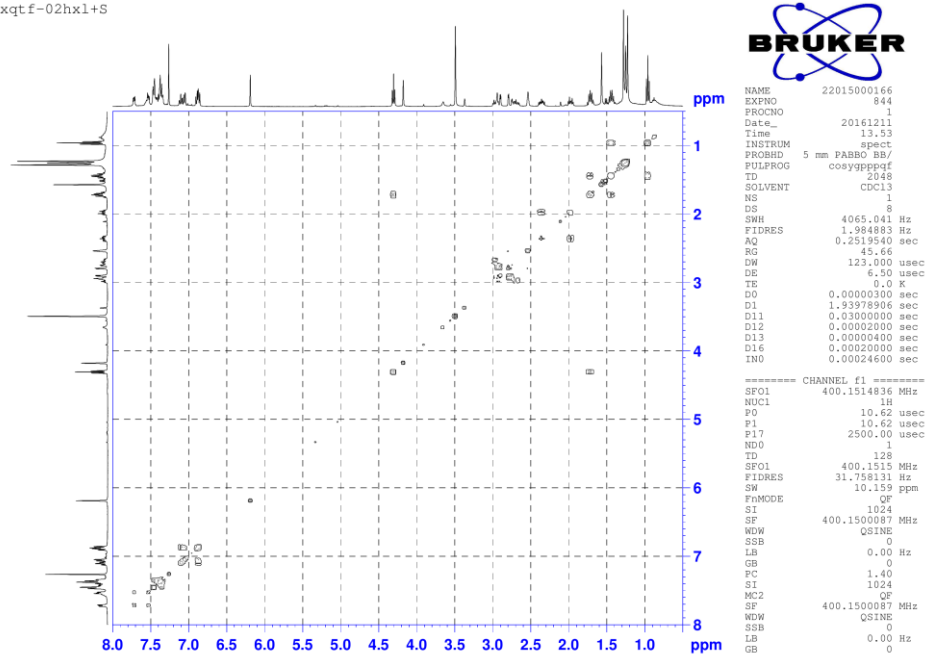


Figure S21 ^1H - ^1H COSY spectrum (CDCl_3 , 400 MHz) of (*S*)-MTPA ester of 1a

xqtf-02hx1+S

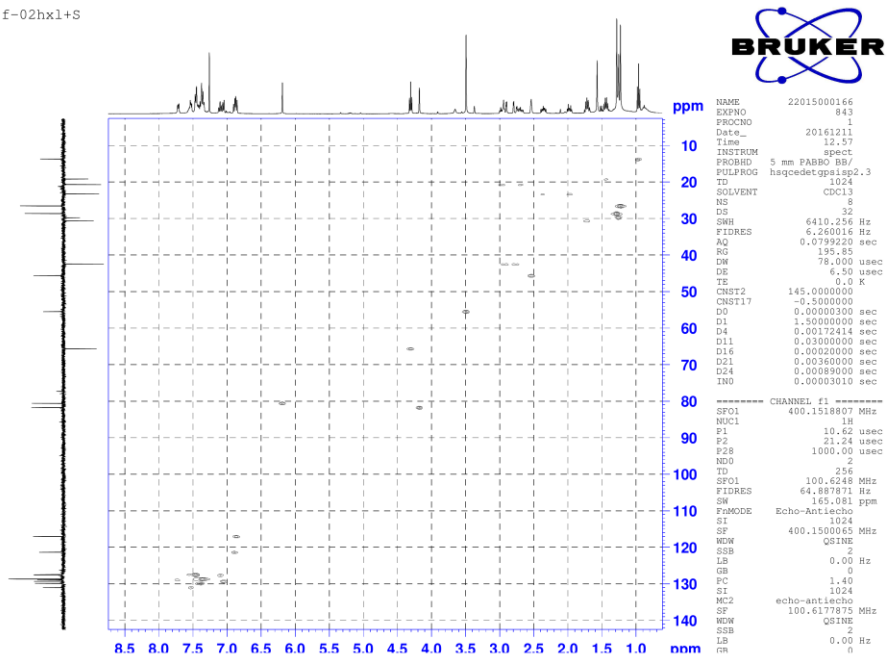
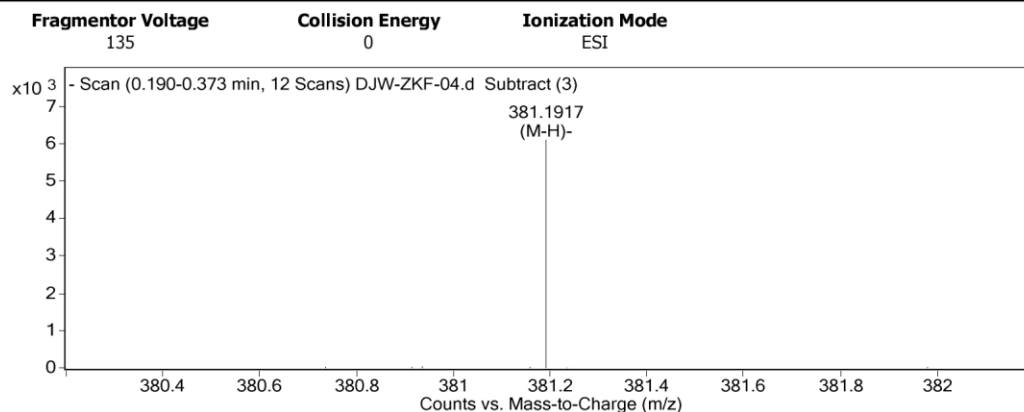


Figure S22 ROESY spectrum (CDCl_3 , 400 MHz) of (*S*)-MTPA ester of 1a

User Spectra



Formula Calculator Results

Formula	CalculatedMass	CalculatedMz	Mz	Diff. (mDa)	Diff. (ppm)	DBE
C ₂₀ H ₃₀ O ₇	382.1992	381.1919	381.1917	0.1	0.2	6.0000

Figure S23 HRESIMS spectrum of dimericilligerate F (2)

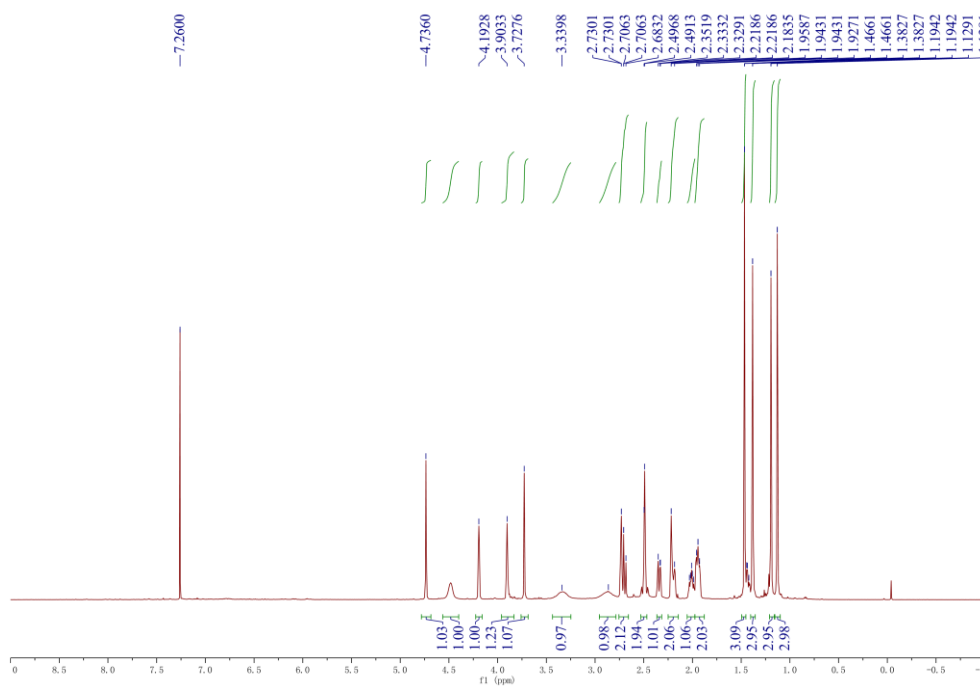


Figure S24 ¹H-NMR spectrum (CDCl₃, 600 MHz) of dimericilligerate F (2)

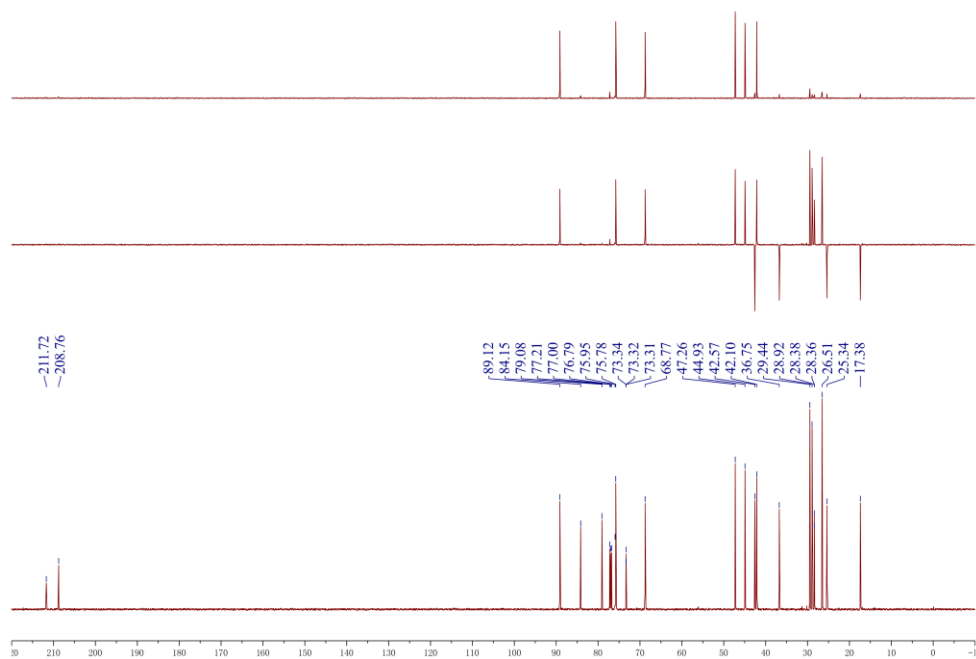


Figure S25 ^{13}C -NMR and DEPT spectra (CDCl_3 , 150 MHz) of dimericilligerate F (2)

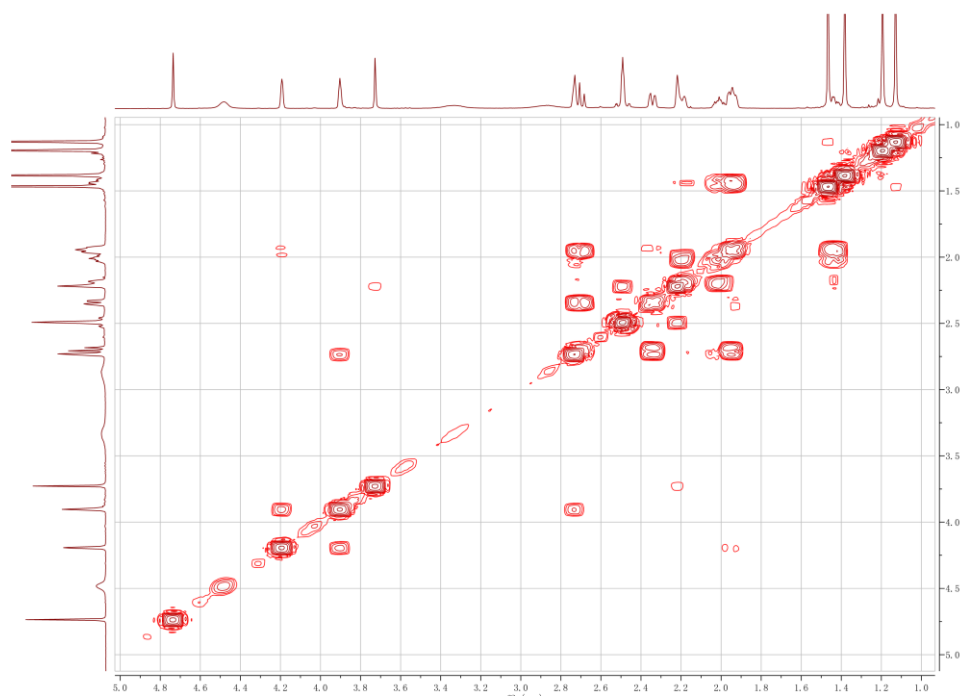


Figure S26 ^1H - ^1H COSY spectrum (CDCl_3 , 600 MHz) of dimericilligerate F (2)

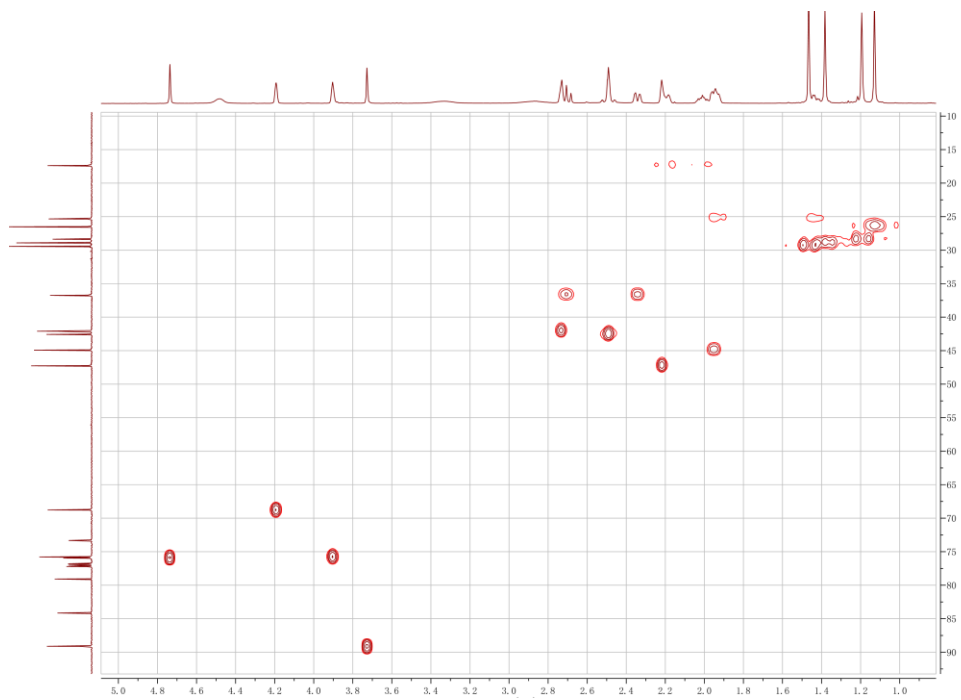


Figure S27 HSQC spectrum (CDCl₃, 600 MHz) of dimericilligerate F (2)

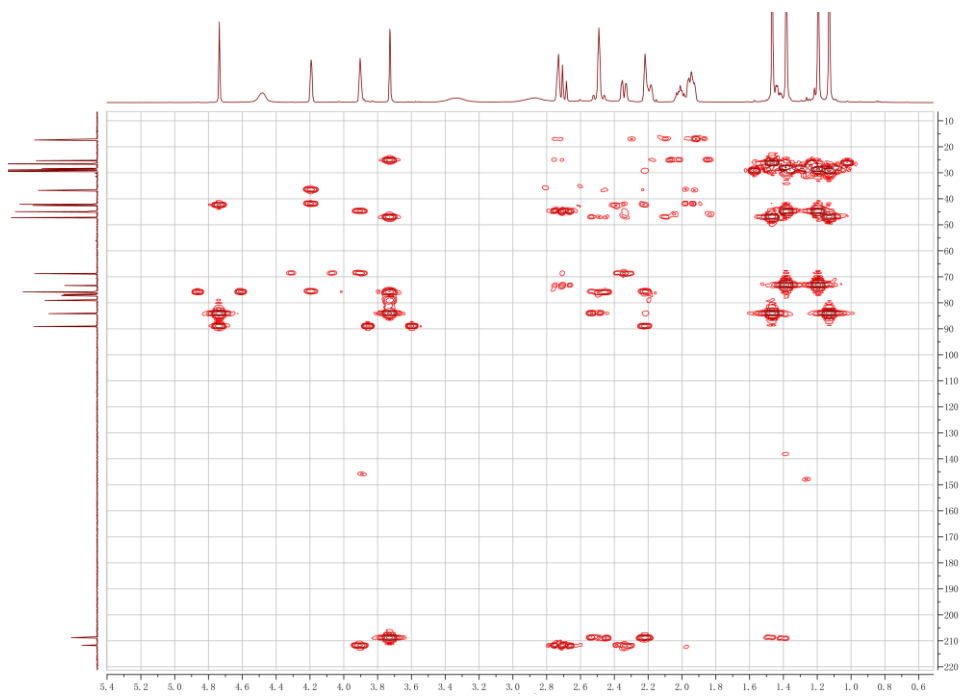


Figure S28 HMBC spectrum (CDCl₃, 600 MHz) of dimericilligerate F (2)

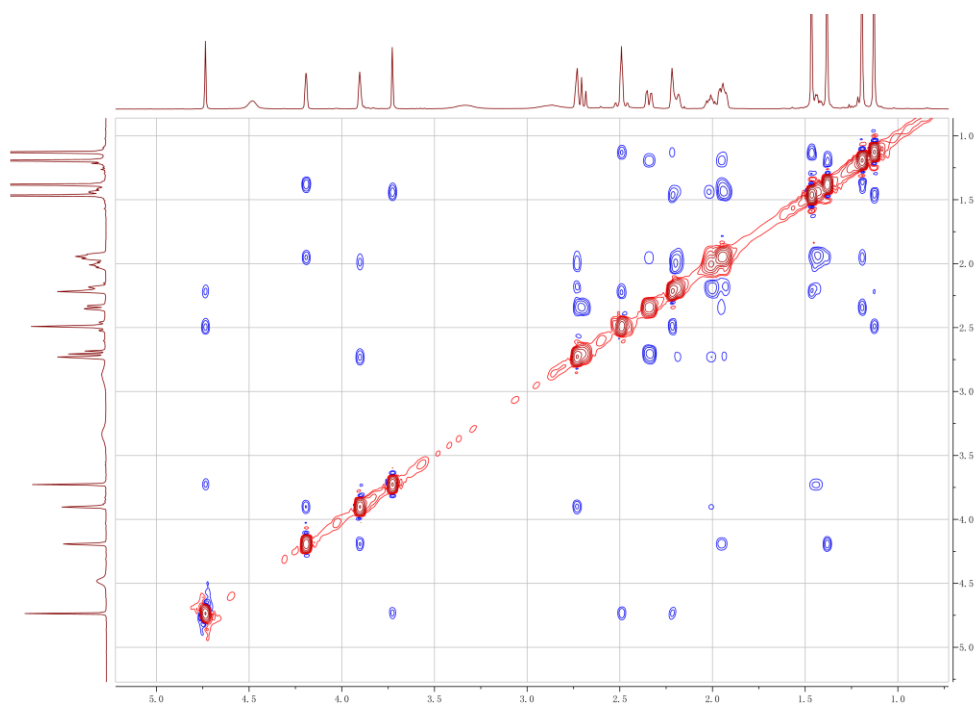


Figure S29 NOESY spectrum (CDCl₃, 600 MHz) of dimericilligerate F (2)

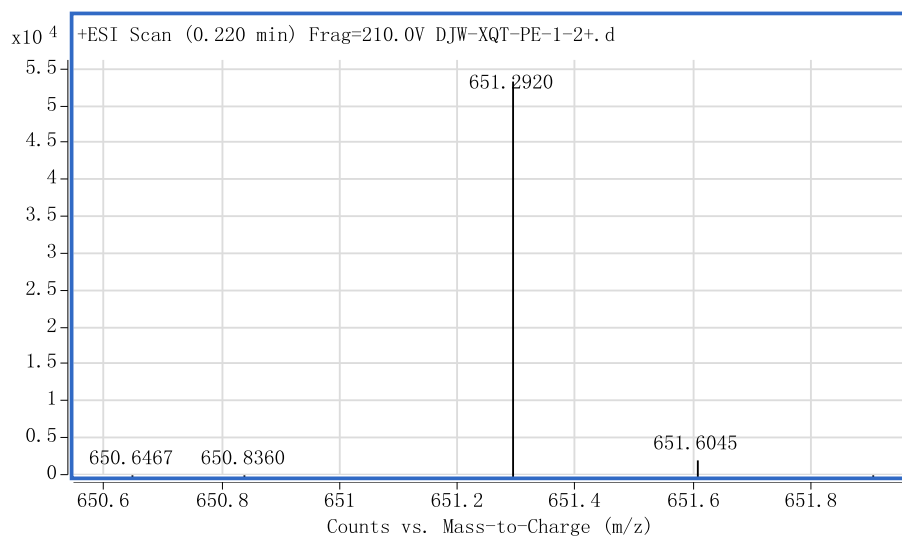


Figure S30 HRESIMS spectrum of dimericilligerate A (3)

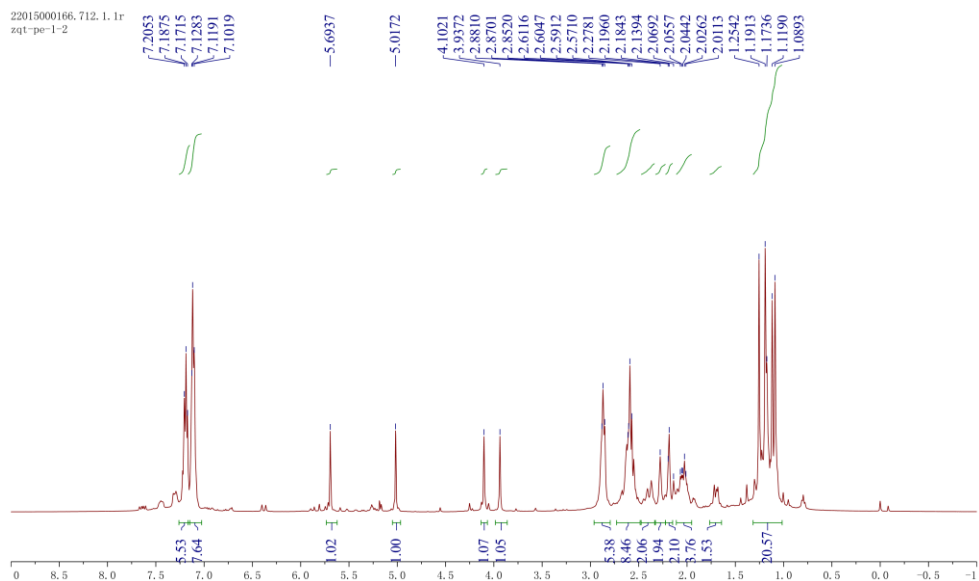


Figure S31 ^1H NMR spectrum (CDCl_3 , 400 MHz) of dimericilligerate A (3)

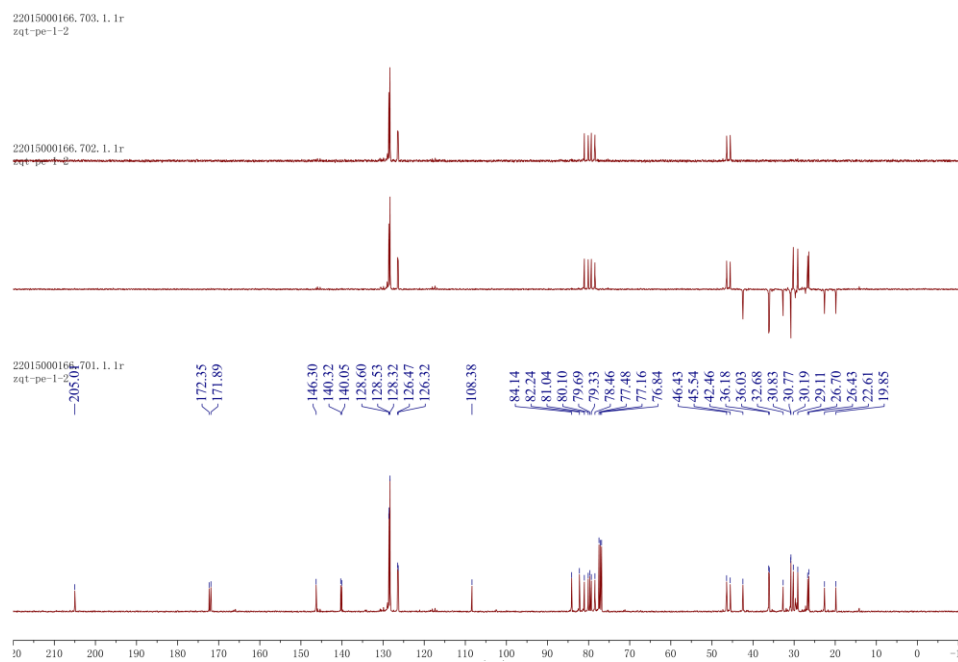


Figure S32 ^{13}C NMR and DEPT spectra (CDCl_3 , 100 MHz) of dimericilligerate A (3)

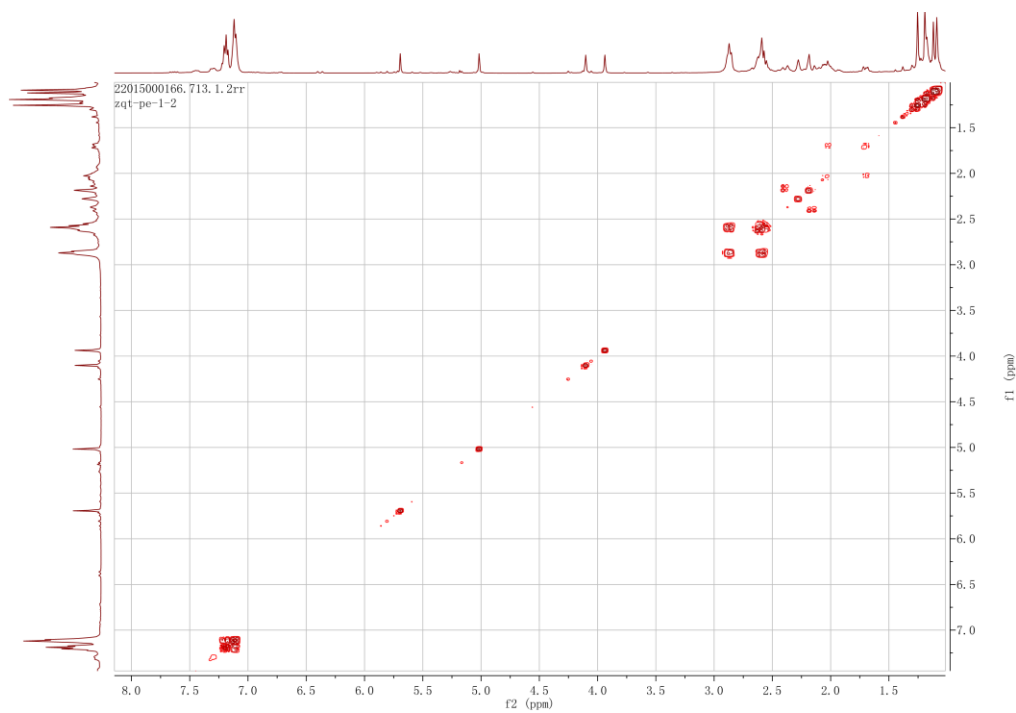


Figure S33 ^1H - ^1H COSY spectrum (CDCl_3 , 400 MHz) of dimericilligerate A (3)

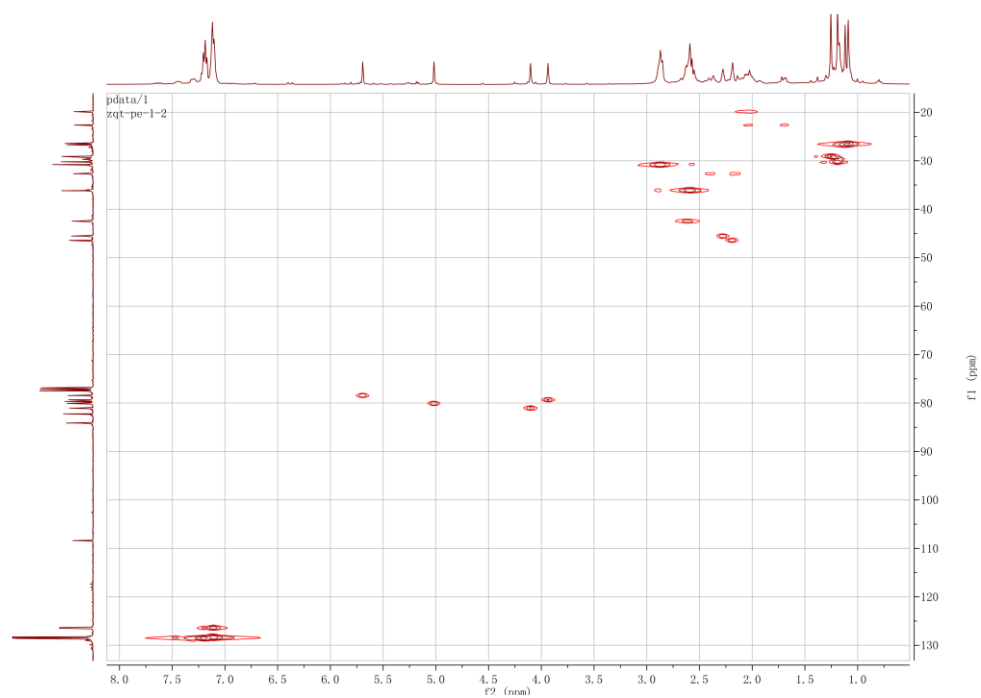


Figure S34 HSQC spectrum (CDCl_3 , 400 MHz) of dimericilligerate A (3)

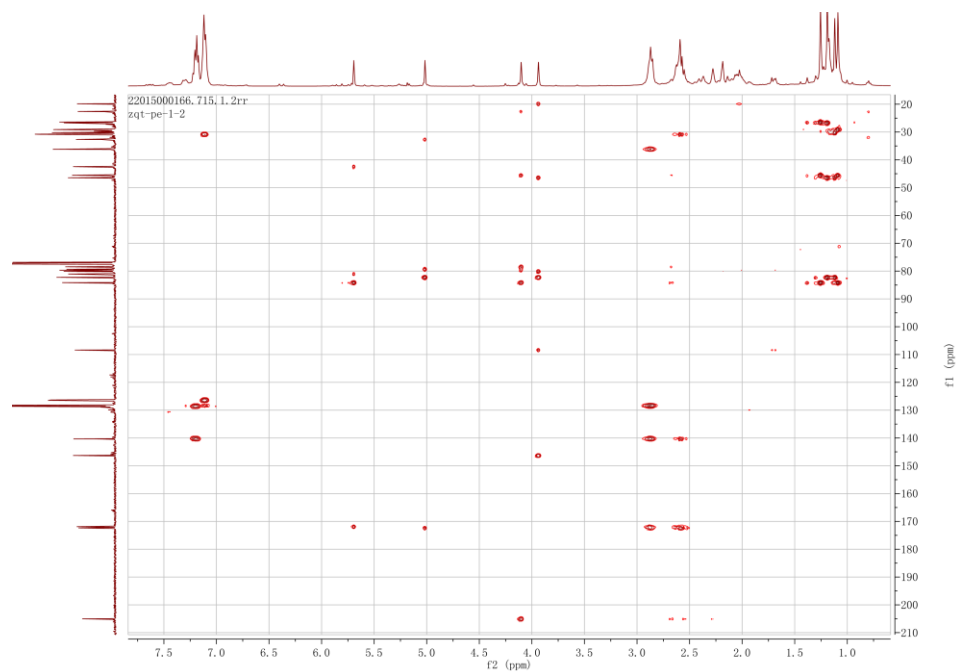


Figure S35 HMBC spectrum (CDCl₃, 400 MHz) of dimericilligerate A (3)

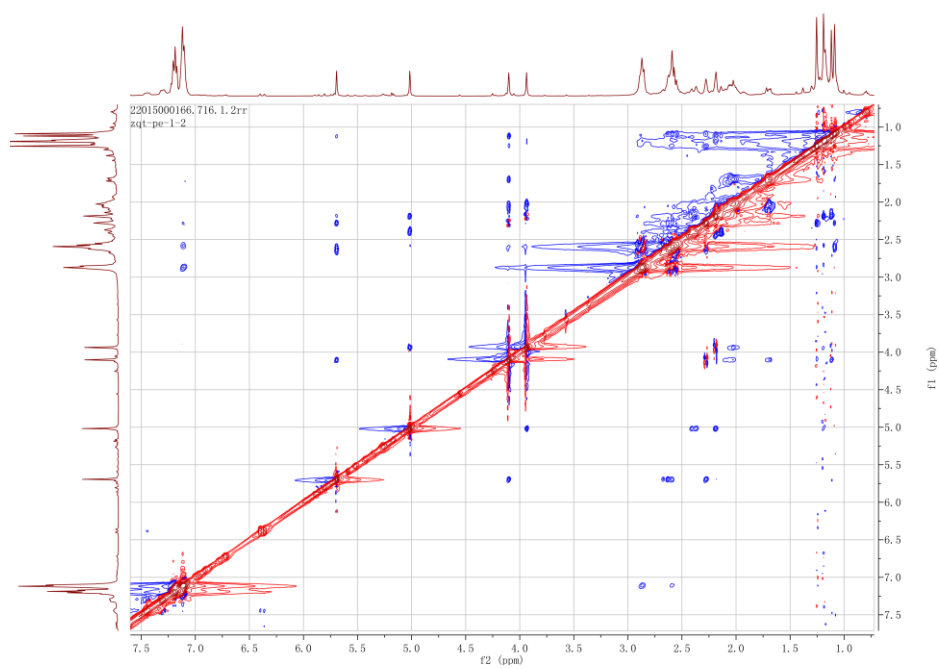


Figure S36 ROESY spectrum (CDCl₃, 400 MHz) of dimericilligerate A (3)

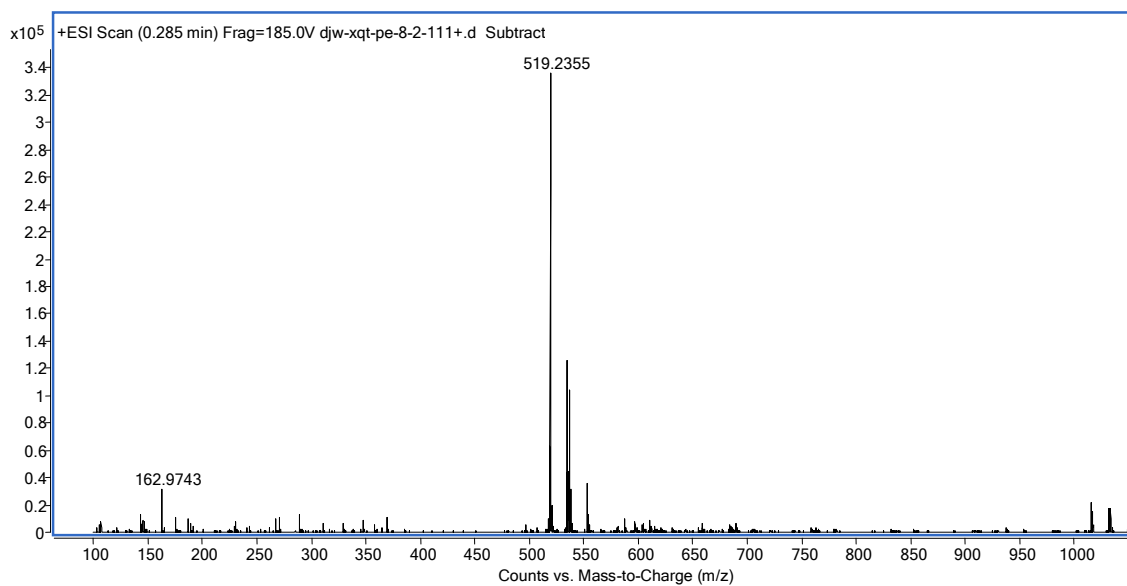


Figure S37 HRESIMS spectrum of dimericilligerate B (4)

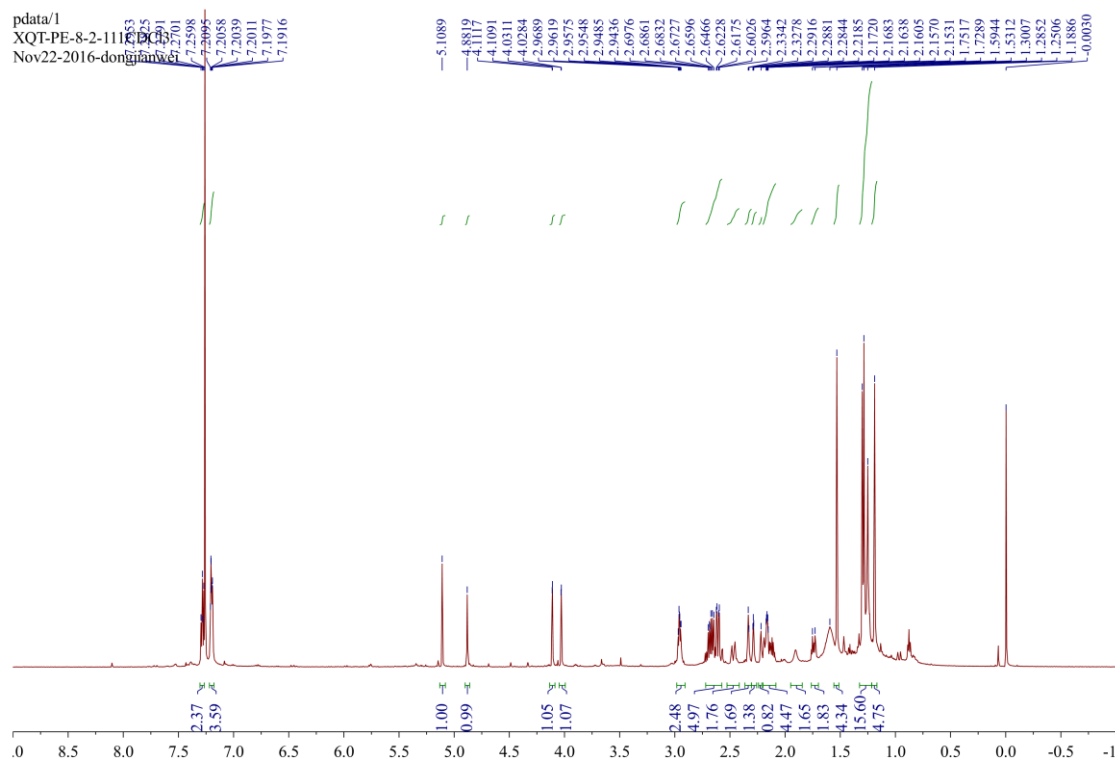


Figure S38 ^1H NMR spectrum (CDCl_3 , 600 MHz) of dimericilligerate B (4)

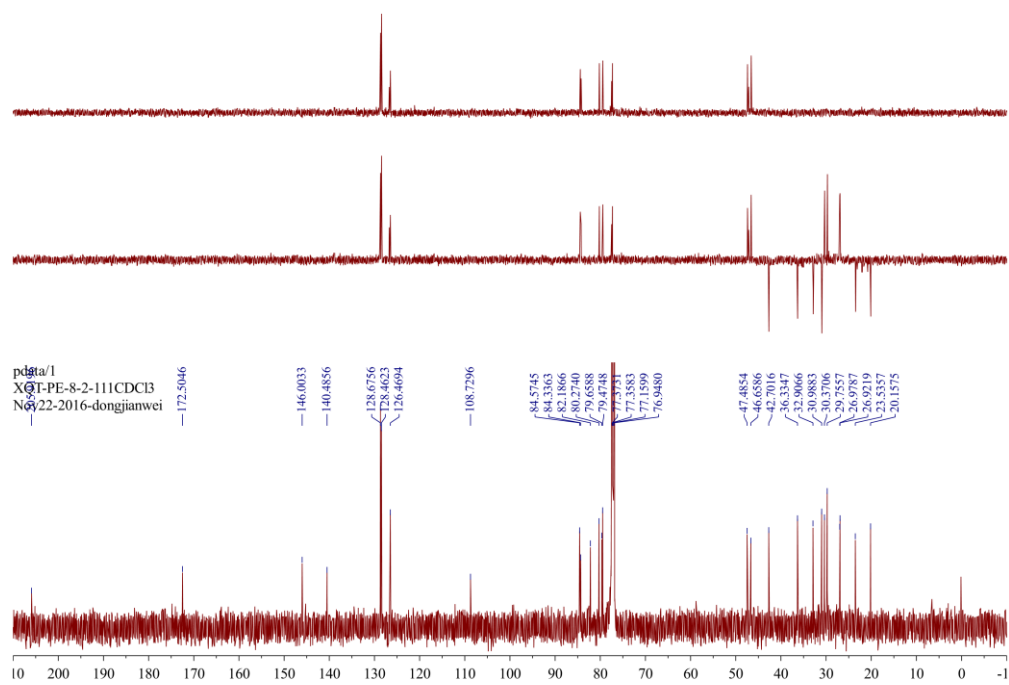


Figure S39 ^{13}C NMR and DEPT spectra (CDCl_3 , 150 MHz) of dimericilligerate B (4)

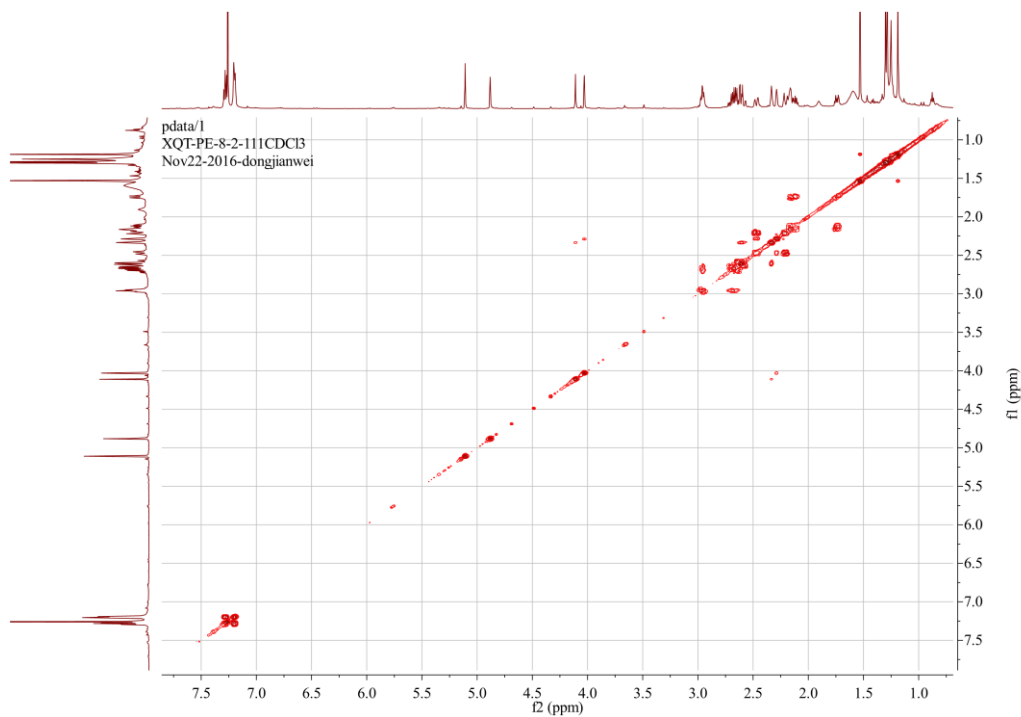


Figure S40 ^1H - ^1H COSY spectrum (CDCl_3 , 600 MHz) of dimericilligerate B (4)

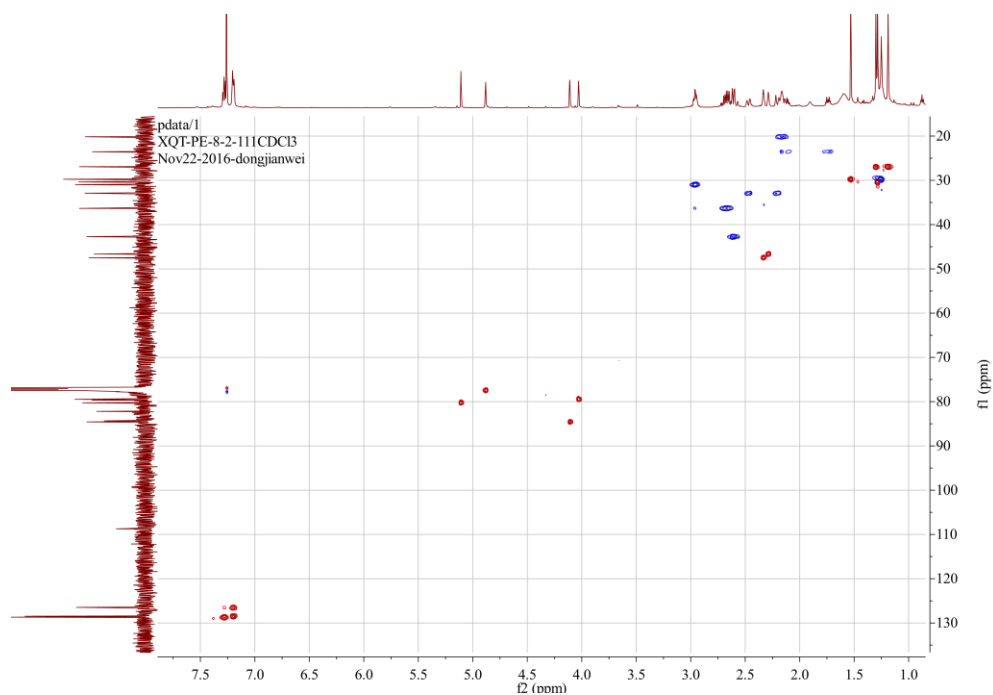


Figure S41 HSQC spectrum (CDCl₃, 600 MHz) of dimericilligerate B (4)

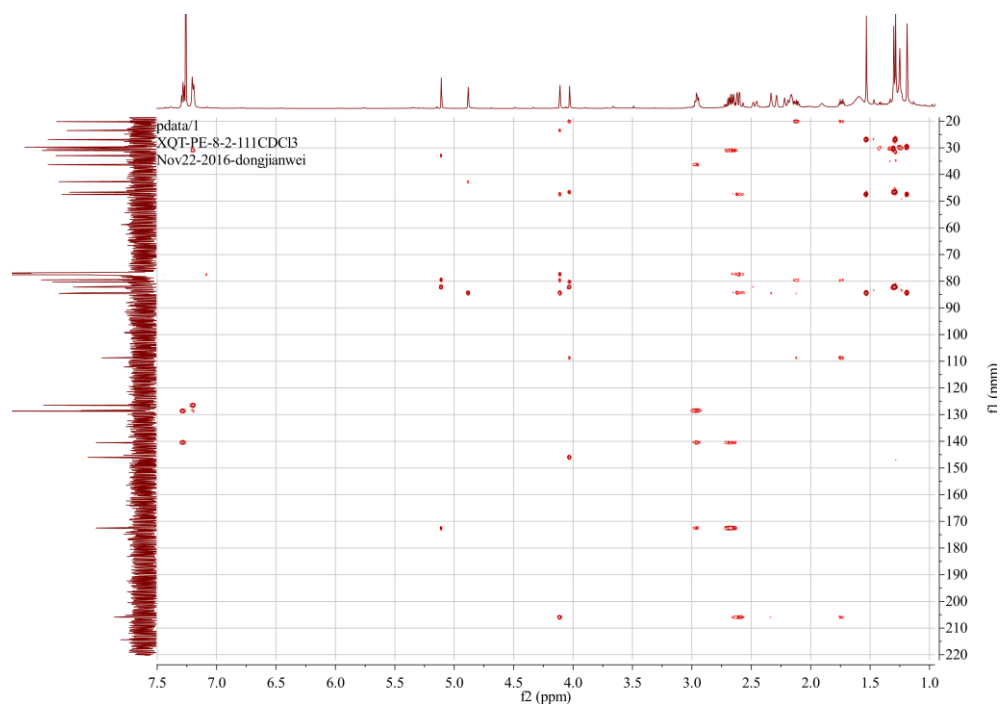


Figure S42 HMBC spectrum (CDCl₃, 600 MHz) of dimericilligerate B (4)

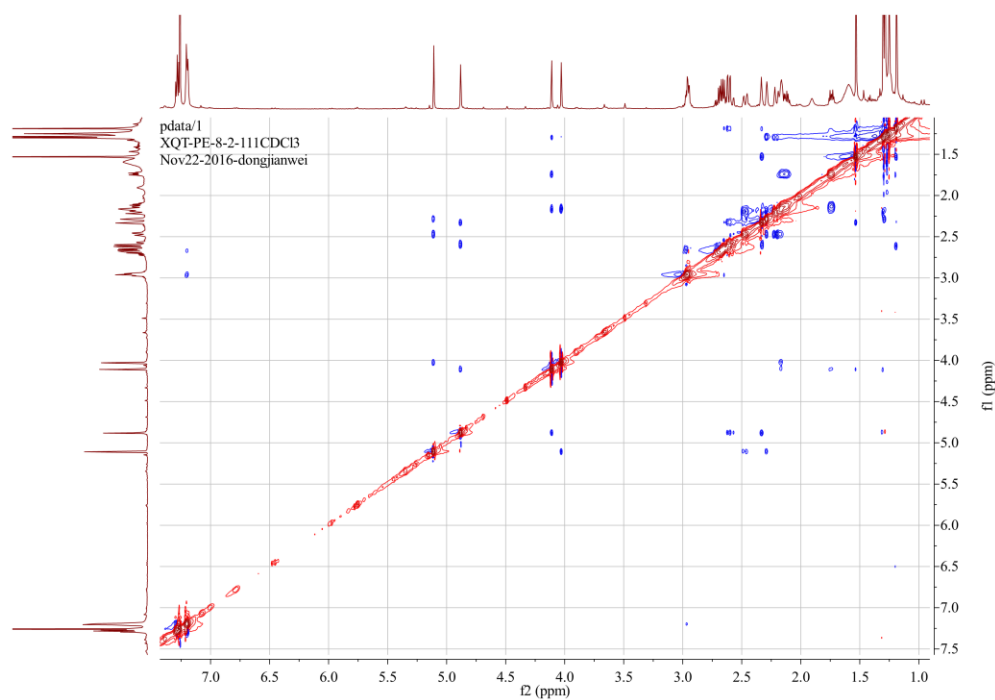


Figure S43 ROESY spectrum (CDCl₃, 600 MHz) of dimericilligerate B (4)

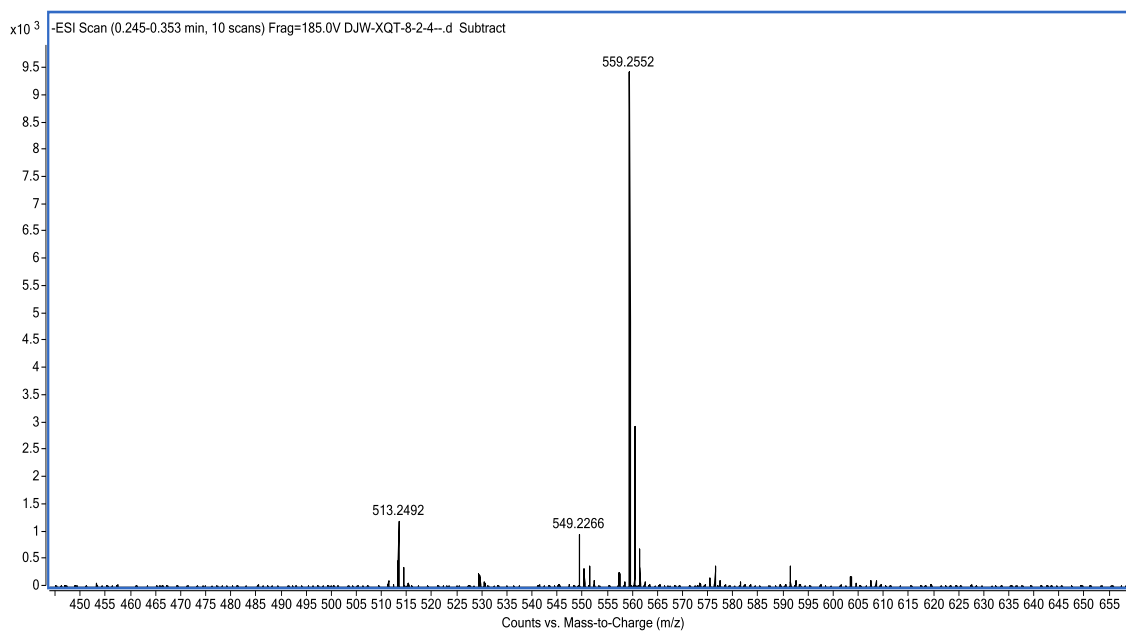


Figure S44 HRESIMS spectrum of dimericilligerate C (5)

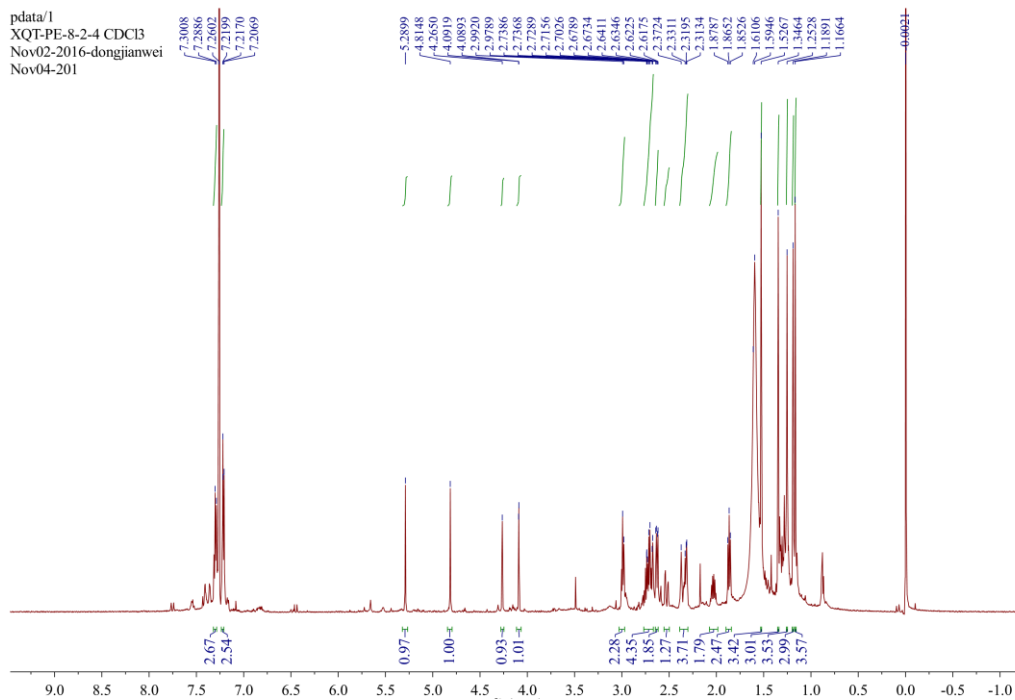


Figure S45 ^1H NMR spectrum (CDCl_3 , 600 MHz) of dimericilligerate C (5)

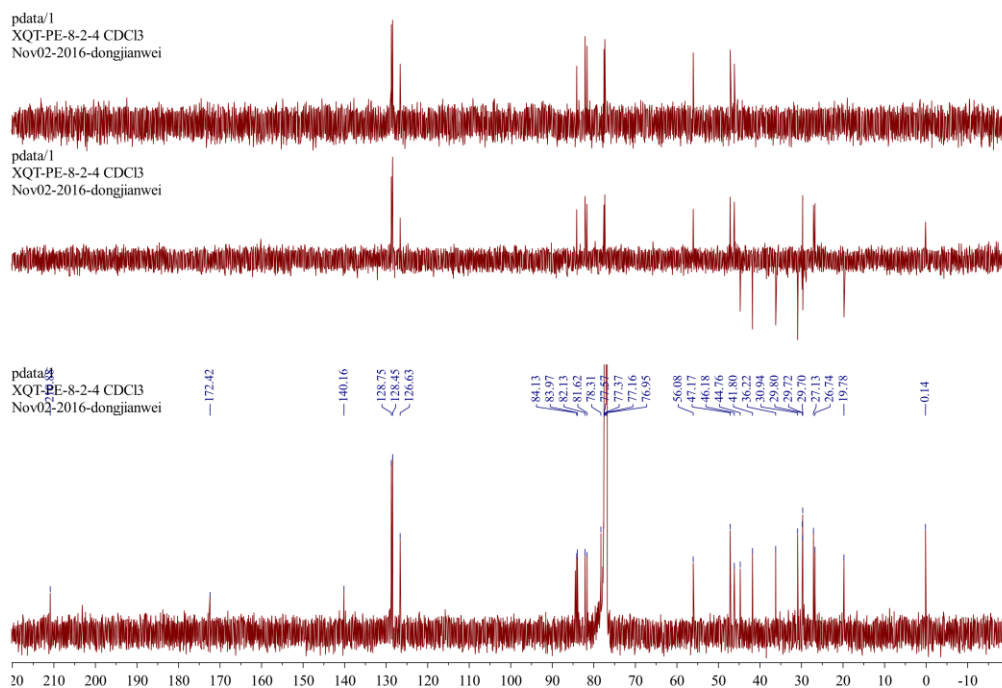


Figure S46 ^{13}C NMR and DEPT spectra (CDCl_3 , 150 MHz) of dimericilligerate C (5)

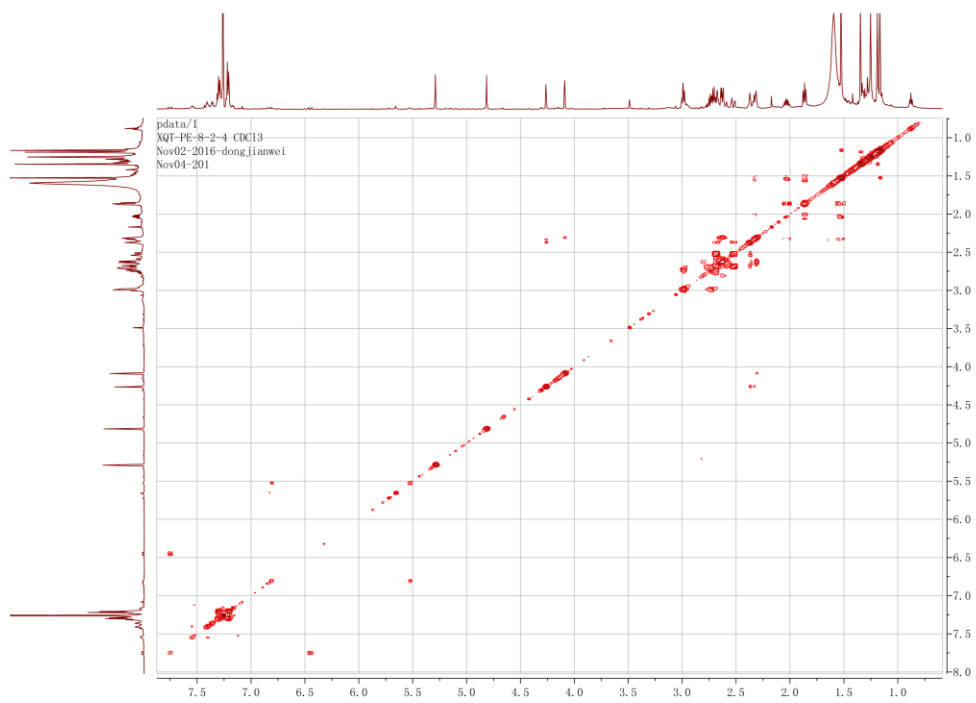


Figure S47 ^1H - ^1H COSY spectrum (CDCl_3 , 600 MHz) of dimericilligerate C (5)

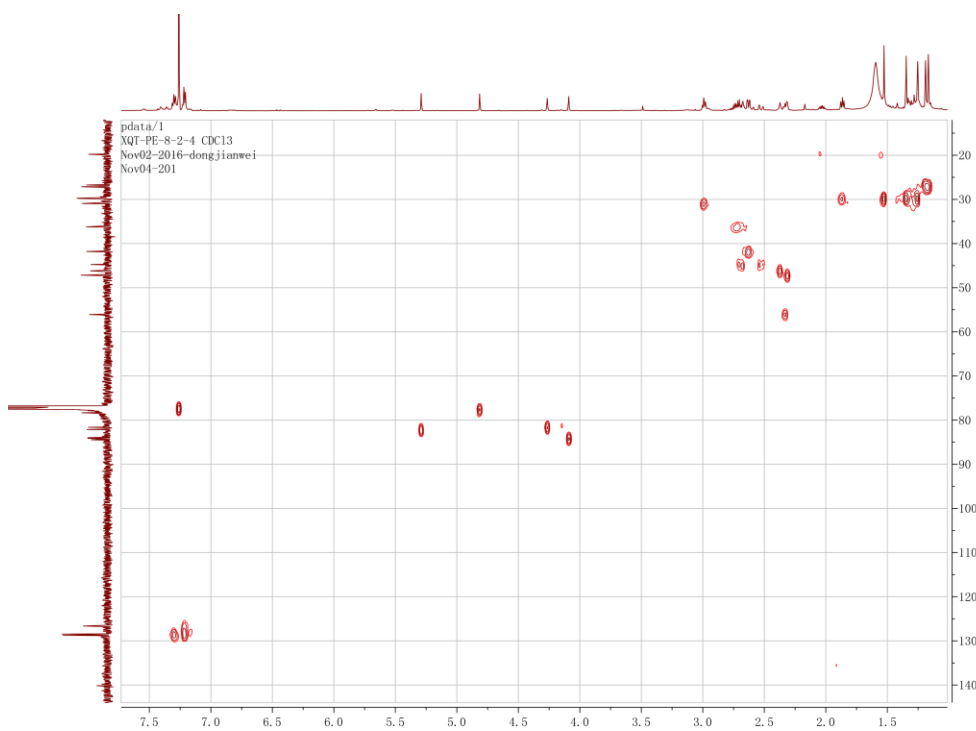


Figure S48 HSQC spectrum (CDCl_3 , 600 MHz) of dimericilligerate C (5)

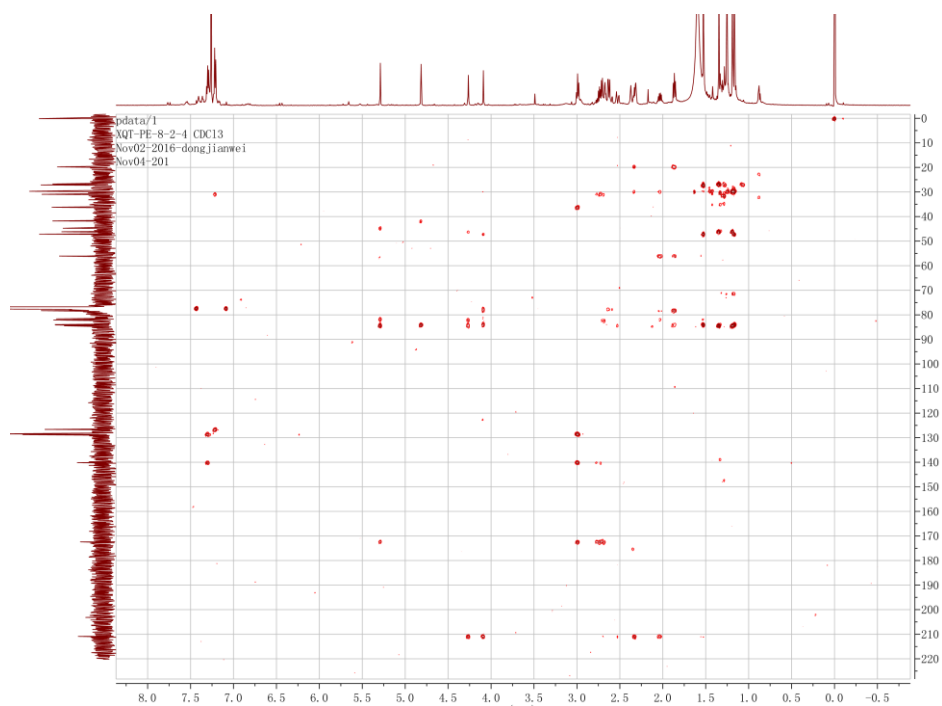


Figure S49 HMBC spectrum (CDCl₃, 600 MHz) of dimericilligerate C (5)

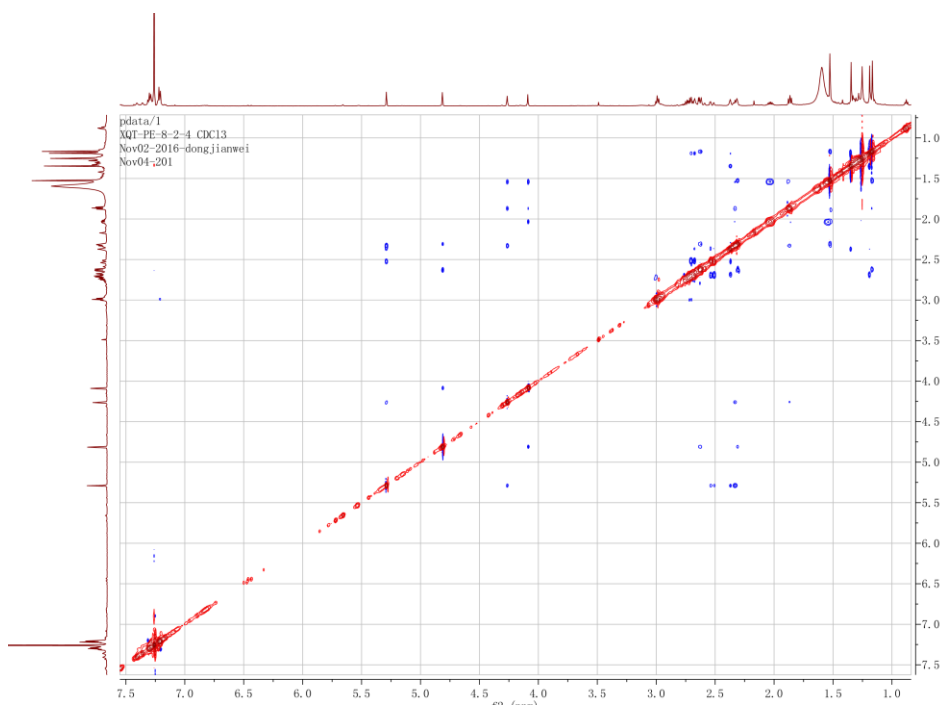


Figure S50 ROESY spectrum (CDCl₃, 600 MHz) of dimericilligerate C (5)

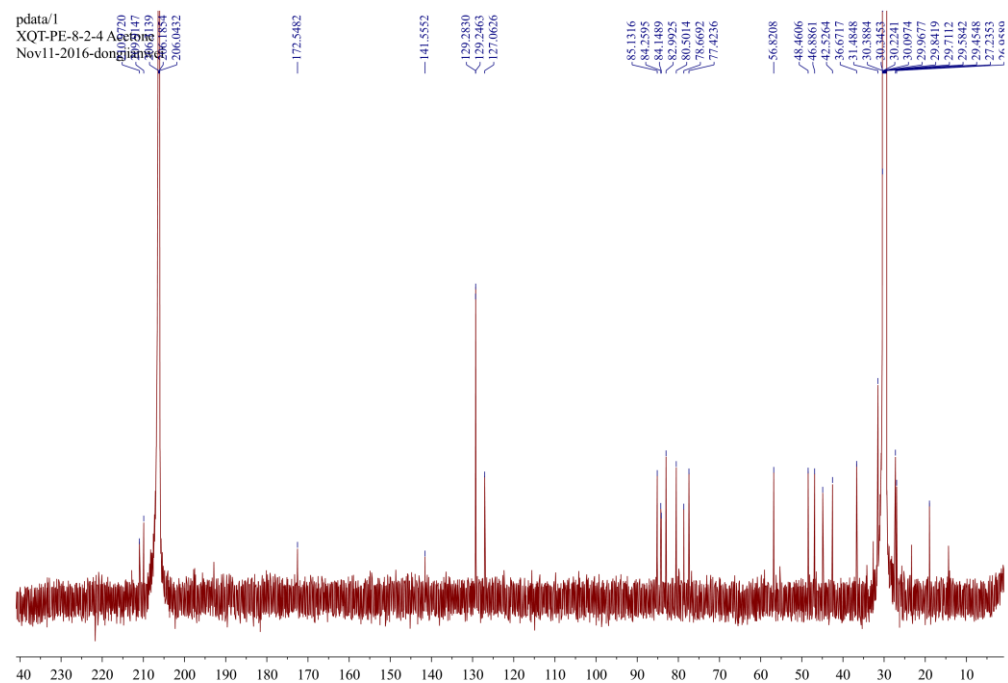


Figure S51 ^{13}C NMR spectrum (acetone- d_6 , 150 MHz) of dimericilligerate C (5)

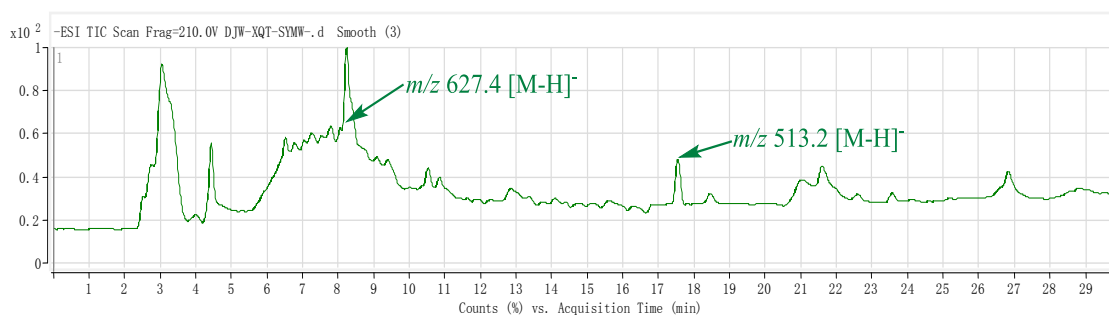


Figure S52 Total ion chromatogram (ESI-) of the petroleum ether extract.