Supporting Information for

Alscholarines A and B, two rearranged monoterpene indole alkaloids from *Alstonia scholaris*

Guanqun Zhan,‡ Fuxin Zhang,‡ Kailing Yang, Tao Yang, Ruixi Zhou, Wenwen Chen, Jingwei Zhang, Xinxin Zhang, Zengjun Guo*

School of Pharmacy, Health Science Center, Xi'an Jiaotong University, Xi'an 710061, P. R. China

List of Supplementary Data

* Corresponding authors:

Zengjun Guo: *orcid.org/0000-0003-3266-6280; TEL:* +86-29-82655133 *Email: guozj@mail.xjtu.edu.cn*

1. Computational calculations section

1.1 Conformational analysis and structure optimization

Conformational analysis was performed using OpenBabel with genetic algorithm at MMFF94 force field for the configurations of the calculated compounds.[1] The conformers of each configuration were then optimized with the software package Gaussian 09 at the M062X/6-31G(d) level.[2] Room-temperature equilibrium populations were calculated according to Boltzmann distribution law:

$$\frac{N_i}{N} = \frac{g_i e^{-\frac{E_i}{k_B T}}}{\sum g_i e^{-\frac{E_i}{k_B T}}}$$

where N_i is the number of conformer *i* with energy E_i and degeneracy g_i at temperature *T*, and k_B is Boltzmann constant.

Table S1 Energies of molecule **1a** at M062X/6-31G(d) level.

Conformers	Energy（Hartree）	Population (%)
1a-1	−1204.3391457	50.01
1a-2	−1204.3391455	49.99

Table S2 Energies of molecule **2a** at M062X/6-31G(d) level.

Conformers	Energy（Hartree）	Population (%)
2a-1	−1186.461837	49.89
2a-2	−1186.461810	48.47
2a-3	−1186.458614	1.64

1.2 NMR calculation

NMR calculations were carried out by Gaussian 09 following the protocol adapted from Michael *et al*.[3] The theoretical calculation of NMR was conducted using the Gauge-Including Atomic Orbitals (GIAO) method at mPW1PW91/6-31G(d) by the SMD model. Finally, the calculated NMR chemical shift values were averaged according to Boltzmann distribution for each conformer and

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1 O'Boyle, N. M.; Banck, M.; James, C. A.; Morley, C.; Vandermeersch, T.; Hutchison, G. R. *J. Cheminformatics* 2011, 3, 33.

2 Frisch, M. J.; Trucks, G. W.; Schlegel, H. B.; Scuseria,G. E.;Robb, M. A.; Cheeseman, J. R.; Scalmani, G.; Barone, V.; Mennucci, B.; Petersson, G. A.; Nakatsuji, H.; Caricato, M.; Li, X.; Hratchian, H. P.; Izmaylov, A. F. Bloino, J.; Zheng, G.; Sonnenberg, J. L.; Hada, M.; Ehara, M.; Toyota, K.; Fukuda, R.; Hasegawa, J.; Ishida, M.; Nakajima, T.; Honda, Y.; Kitao, O.; Nakai, H.; Vreven, T.; Montgomery Jr, J. A.; Peralta, J. E.; Ogliaro, F.; Bearpark, M.; Heyd, J. J.; Brothers, E.Kudin, K. N.; Staroverov, V. N.; Kobayashi, R.; Normand, J.; Raghavachari, K.; Rendell, A.; Burant, J. C.; Iyengar, S. S.; Tomasi, J.; Cossi, M.; Rega, N.; Millam, J. M.; Klene, M.; Knox, J. E.; Cross, J. B.; Bakken, V.; Adamo, C.; Jaramillo, J.; Gomperts, R.; Stratmann, R. E.; Yazyev, O.; Austin, A. J.; Cammi, R.; Pomelli, C.; Ochterski, J. W.; Martin, R. L.; Morokuma, K.; Zakrzewski, V. G.; Voth, G. A.; Salvador, P.; Dannenberg, J. J.; Dapprich, S.; Daniels, A. D.; Farkas, O.; Foresman, J. B.; Ortiz, J. V.; Cioslowski, J.; Fox, D. J. Gaussian 09 Revision D.01. Gaussian Inc. Wallingford CT **2009**.

3. Michael, W. L.; Matthew, R. S.; Dean, J. T. *Chem. Rev.* **2012**, *112*, 1839−1862.

fitting to the experimental values by linear regression.

Table S3 Experimental and calculated ^{13}C NMR of **2**

No.	$\delta_{exptl.}$	$\delta_{calcd-1}$	$\delta_{calcd-2}$	$\delta_{calcd-3}$	δ_{calcd}	$\delta_{calcd}-\delta_{expt}$	RMSE
2	133.2	134.8759568	134.9083569	135.1440705	134.9	1.7	1.91
3	54.2	53.46524064	53.42906574	52.75180874	53.4	-0.8	
6	28	28.00660585	27.99905631	28.25165146	28.0	0.0	
7	110.8	108.4019084	108.387019	108.6188529	108.4	-2.4	
8	127.9	124.9749397	124.9757785	124.577645	125.0	-2.9	
9	118.9	118.1994338	118.1912551	118.2464087	118.2	-0.7	
10	119.7	118.3079585	118.299675	118.1390374	118.3	-1.4	
11	122.8	121.112614	121.0921673	121.1239383	121.1	-1.7	
12	112.1	110.3037643	110.3113138	110.2496592	110.3	-1.8	
13	138.7	133.9756737	133.9918213	133.5237496	134.0	-4.7	
14	20.4	19.68082206	19.6784104	20.4961728	19.7	-0.7	
15	37	37.4852679	37.50791654	37.43703471	37.5	0.5	
16	53.6	53.02610884	53.02841564	53.79291182	53.0	-0.6	
17	67.9	70.81461676	70.835378	70.09101395	70.8	2.9	
18	11.2	11.48914753	11.49533396	11.3204362	11.5	0.3	
19	85.8	83.62870924	83.61119849	83.63374227	83.6	-2.2	
20	47.4	45.47478243	45.47499214	45.82898186	45.5	-1.9	
21	62.2	61.04078851	61.0514837	60.18097934	61.0	-1.2	
22	175.5	176.6545035	176.6358394	175.0112195	176.6	1.1	
23	53	53.1173324	53.1402956	53.6326937	53.1	0.1	

		9	9	2			

1.3 ECD calculation

The theoretical calculations were carried out using Gaussian 09.[2] Firstly, conformers were optimized using density functional theory method and at B3LYP/6-31G (d) and filtered by Boltzmann-based population. The remaining conformers were finally calculated to obtain the ECD spectrum. The ECD calculation was conducted using Time-dependent Density functional theory (TD-DFT) at CAM-B3LYP/6-31G (d) level. Rotatory strengths for a total of 70 excited states were calculated. The ECD spectrum was simulated in SpecDis1.70 by overlapping Gaussian functions for each transition according to the following equation.[4]

$$\Delta\varepsilon(E) = \frac{1}{2.297\times10^{-39}} \times \frac{1}{\sqrt{2\pi\sigma}} \sum_{i}^{A} \Delta E_i R_i e^{-\left(\frac{E-E_i}{2\sigma}\right)^2}$$

where σ represents the width of the band at $1/e$ height, and ΔE_i and R_i are the excitation energies and rotatory strengths for transition i, respectively.

4 Bruhn, T.; Schaumloeffel, A.; Hemberger, Y.; Bringmann, G. *Chirality* **2013**, *25*, 243−249.

Table S1 Vasorelaxant activities of compounds **1**−**3**

Compounds	Concentration (μm)	Vasorelaxant rate (%)
1	100	70.93 ± 3.58
2	100	80.73 ± 4.14
3	100	71.67 ± 3.46
PTM[a]	EC_{50} = 0.11 ± 0.01 μm	

[a] Phentolamine mesylate (PTM) was used as a positive control.

Table S2 Anti-inflammatory activity of compounds **1**−**3** on NO production in LPS-induced RAW264.7 mouse macrophages and the cell survival rates.

Compounds	**Inhibition (%)**	**Survival rates (%) of RAW 264.7 at 200 μM**	
		LPS (0 μg/mL)	**LPS (1 μg/mL)**
1	13.17 ± 3.00	98.13 ± 1.76	95.14 ± 3.25
2	18.05 ± 1.04	97.57 ± 3.26	96.74 ± 2.39
3	11.73 ± 0.90	96.48 ± 3.84	97.25 ± 3.12
L-NMMA[b]	IC_{50} = 33.74±2.13	92.43 ± 3.53	94.48 ± 2.47

[b] NG-Monomethyl-*L*-arginine (L-NMMA) was used as a positive control.

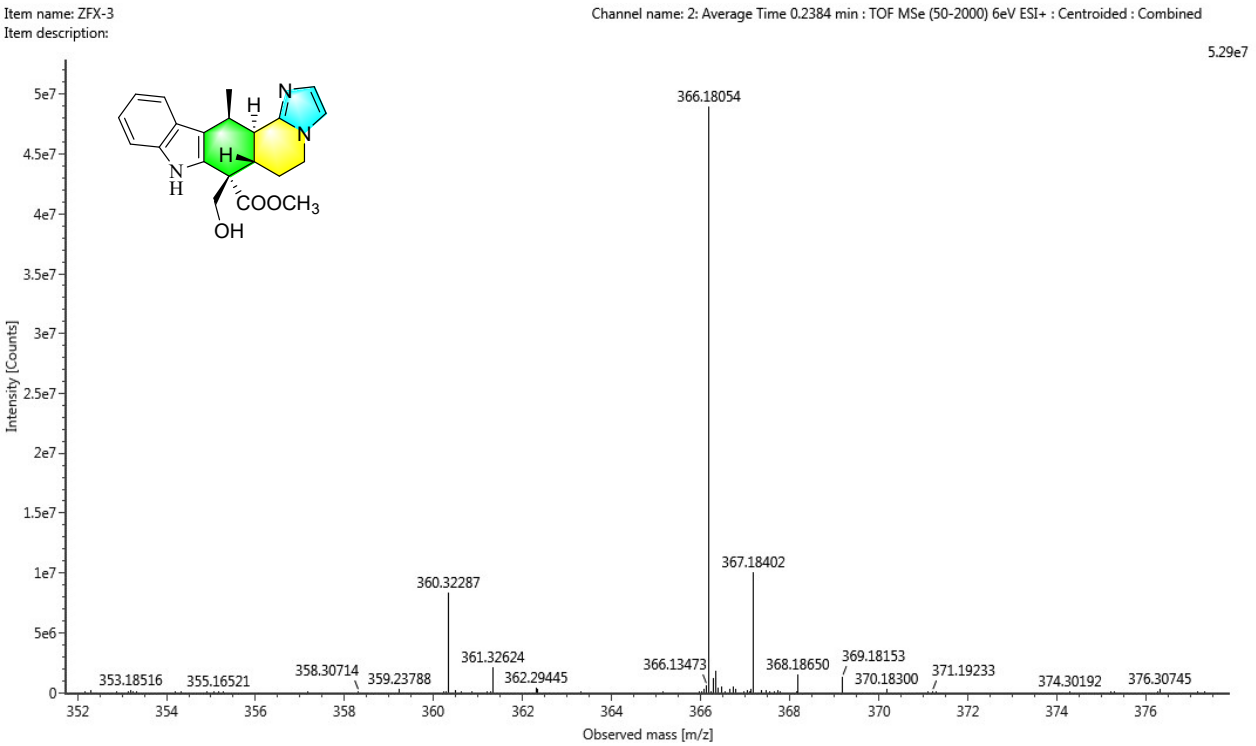

Figure S1. (+)-HR-ESI-MS spectrum of **1**

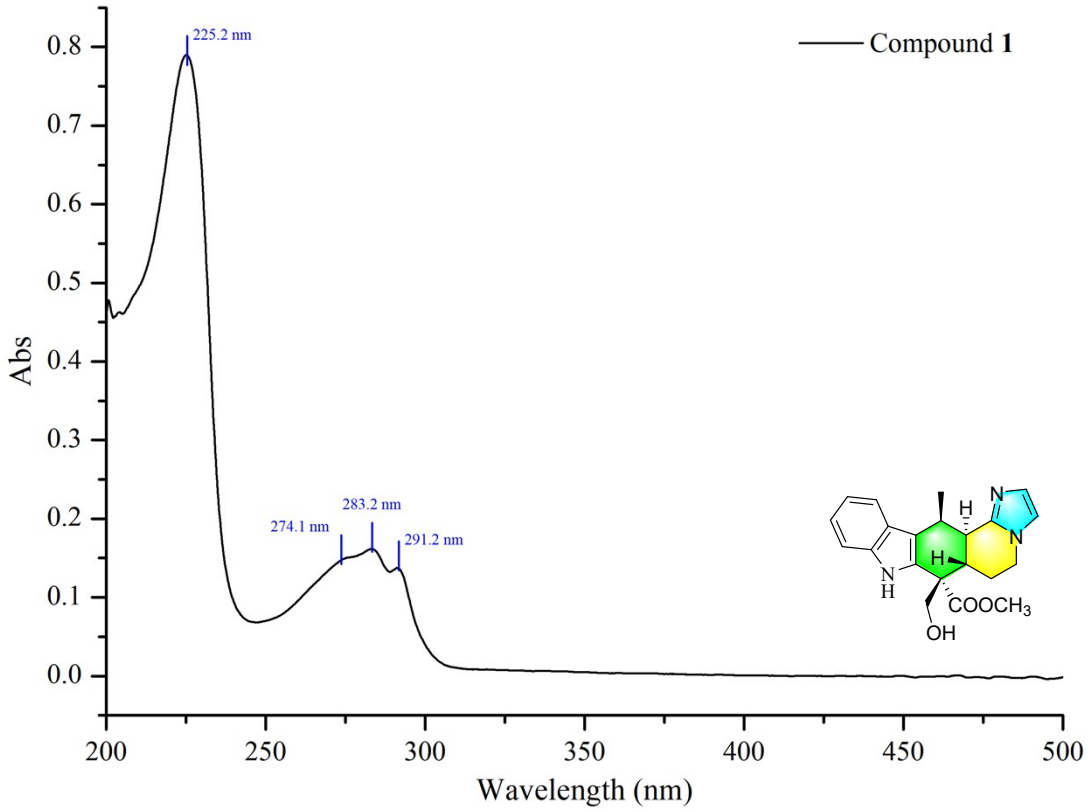

Figure S2. UV spectrum of **1** in MeOH

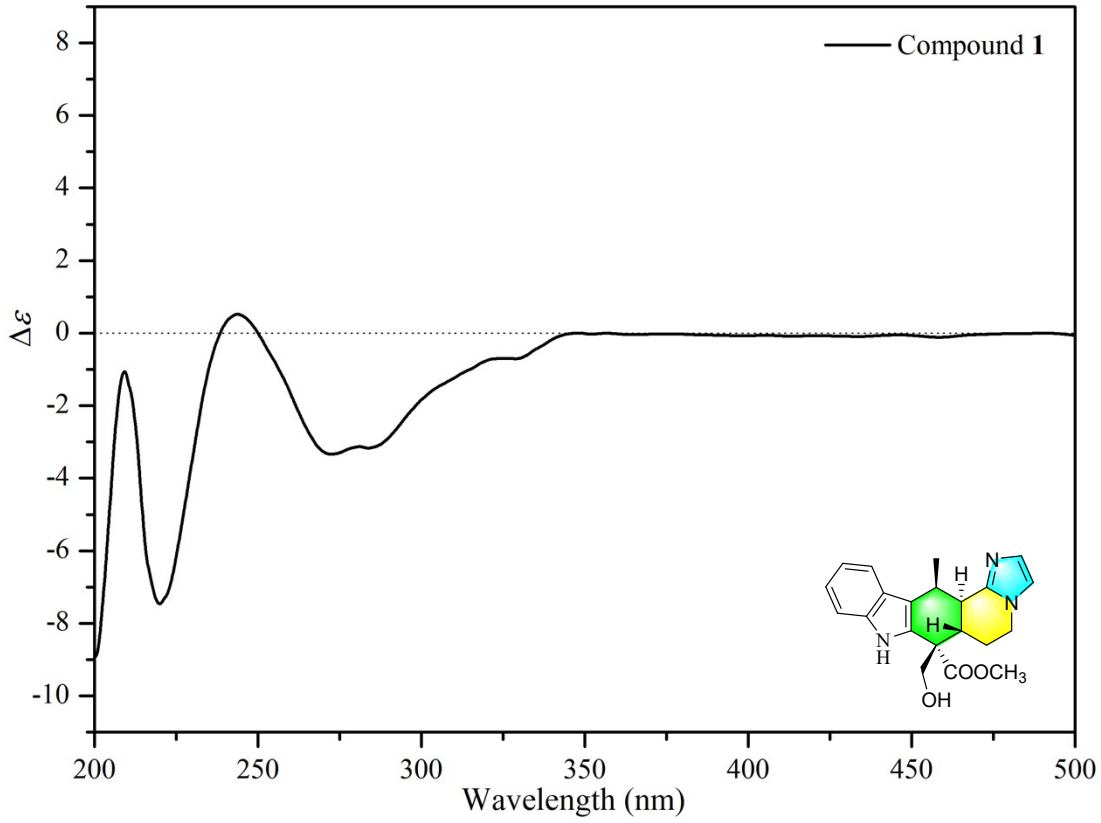

Figure S3. ECD spectrum of **1** in MeOH

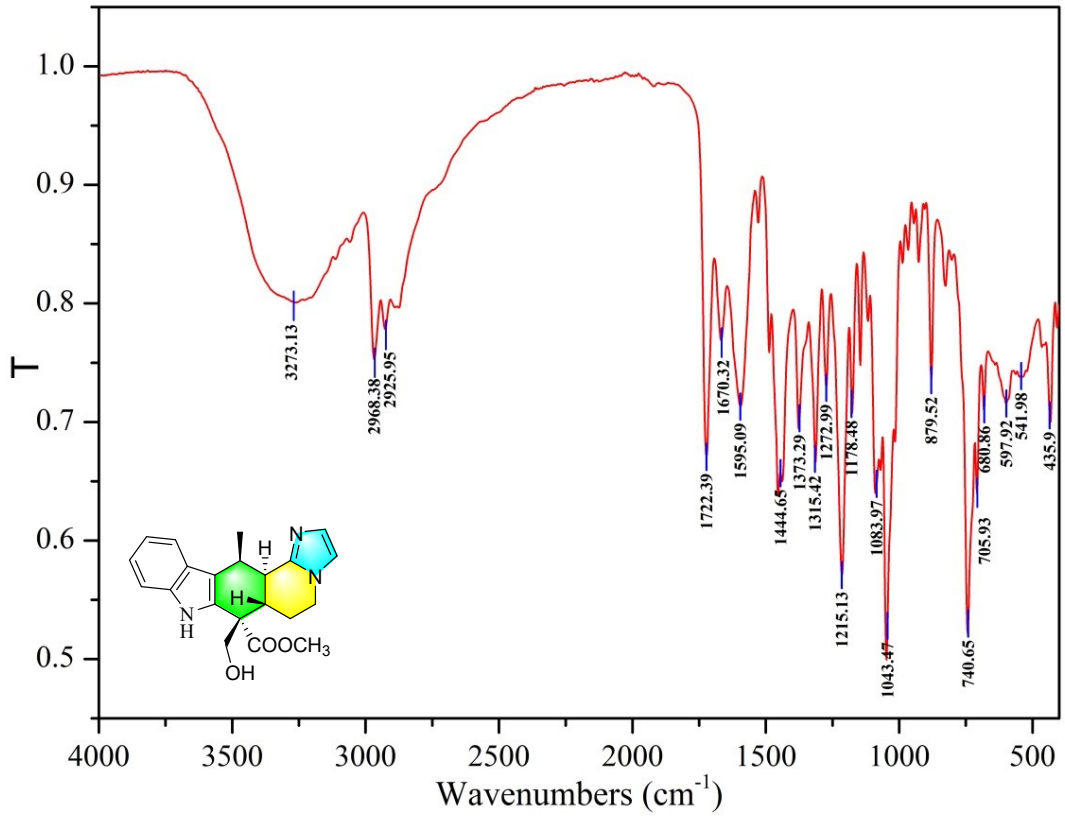

Figure S4. IR spectrum of **1**

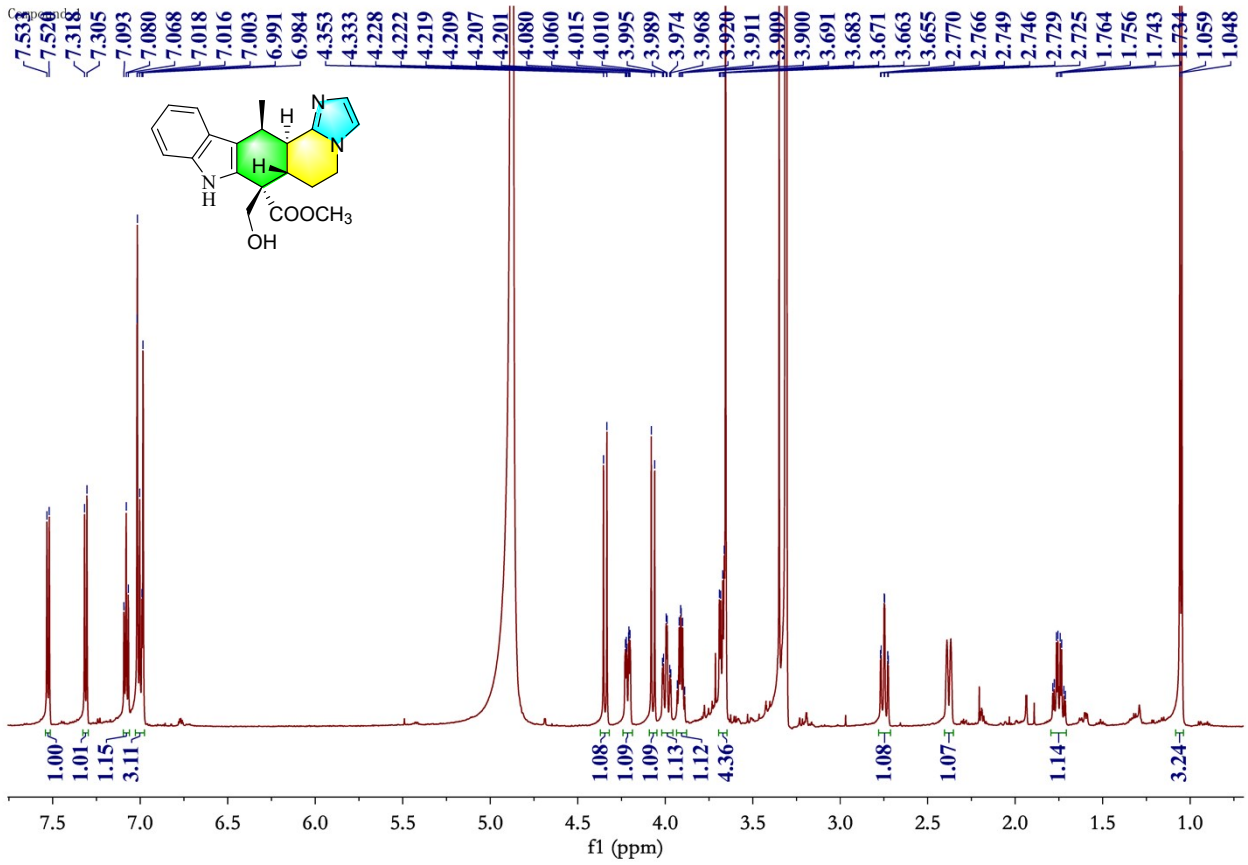

Figure S5. ^{1}H NMR (600 MHz) spectrum of **1** in CD_3OD

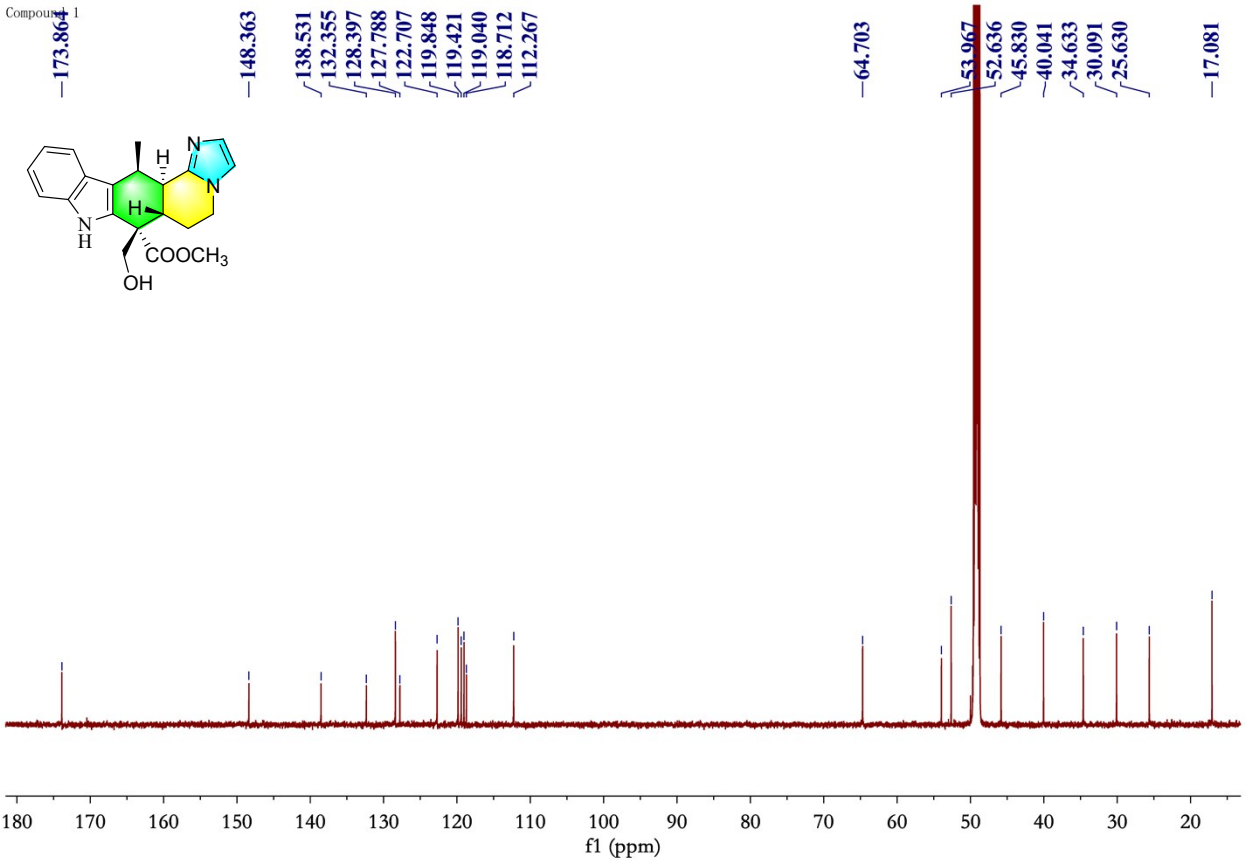

Figure S6. ^{13}C NMR (150 MHz) spectrumof **1** in CD_3OD

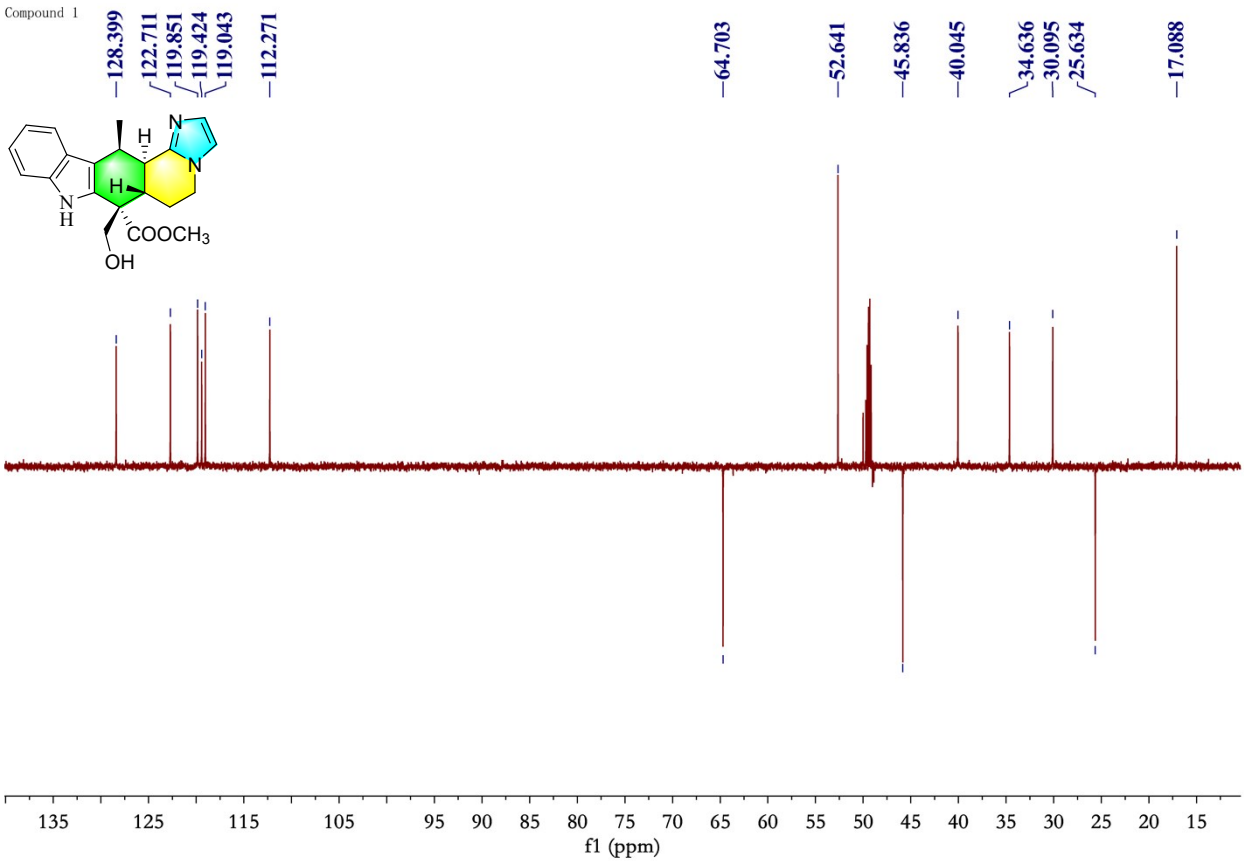

Figure S7. DEPT 135 spectrum of **1** in CD_3OD

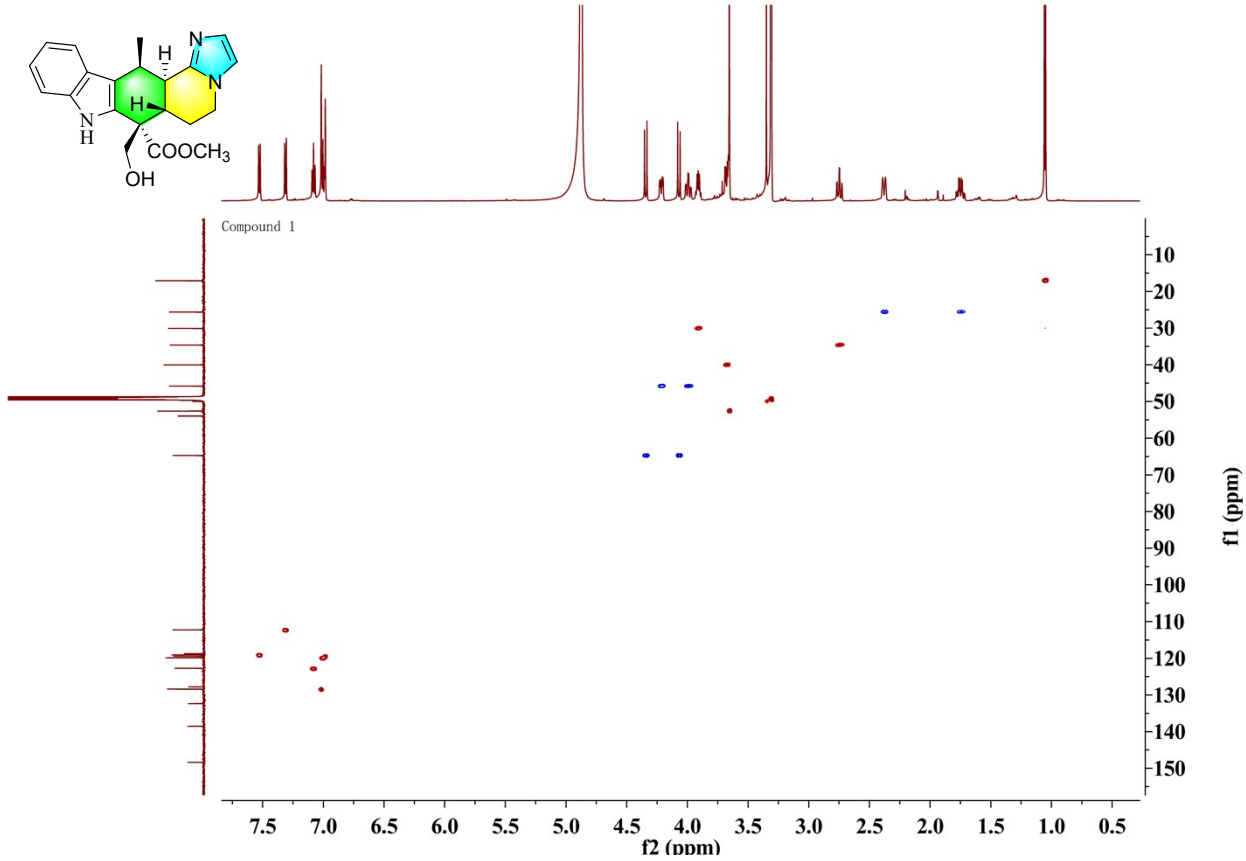

Figure S8. HSQC spectrum of **1** in CD_3OD

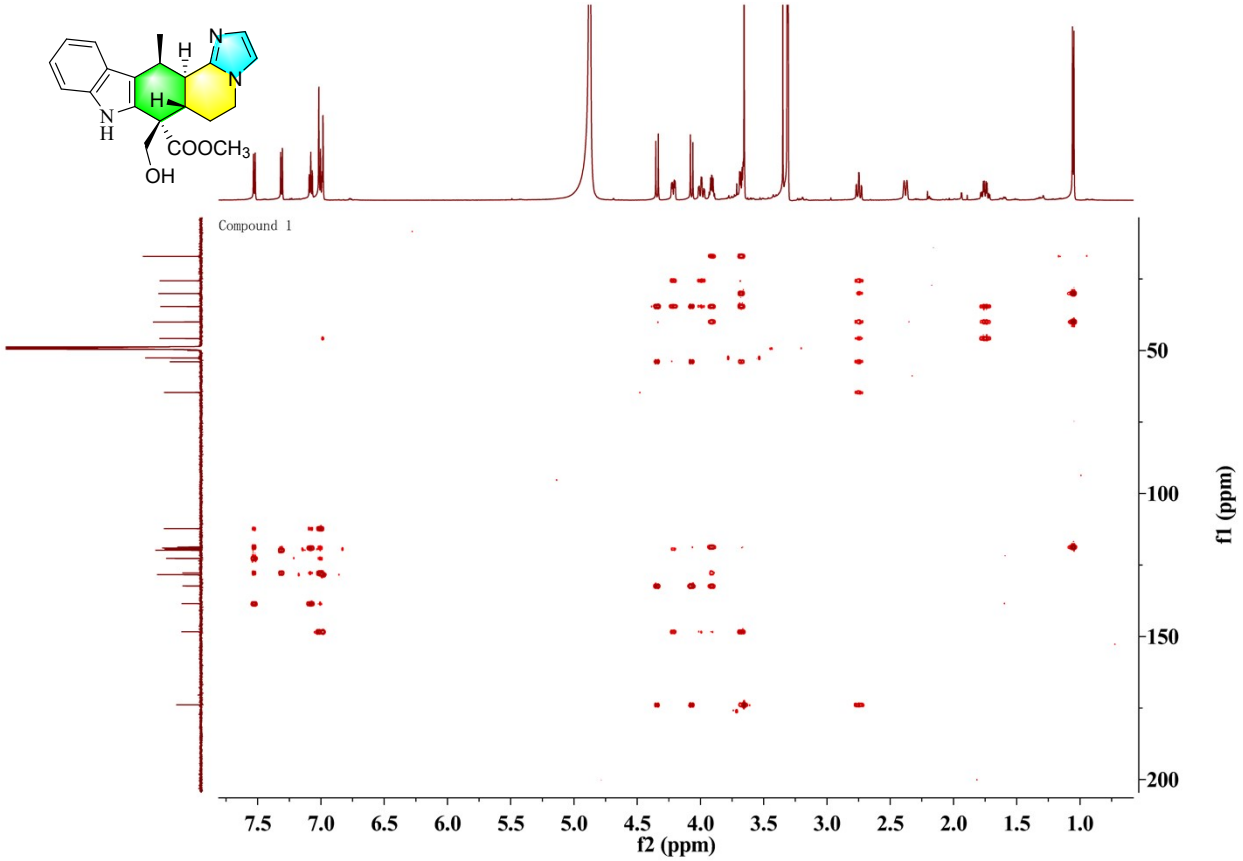

Figure S9. HMBC spectrum of **1** in CD_3OD

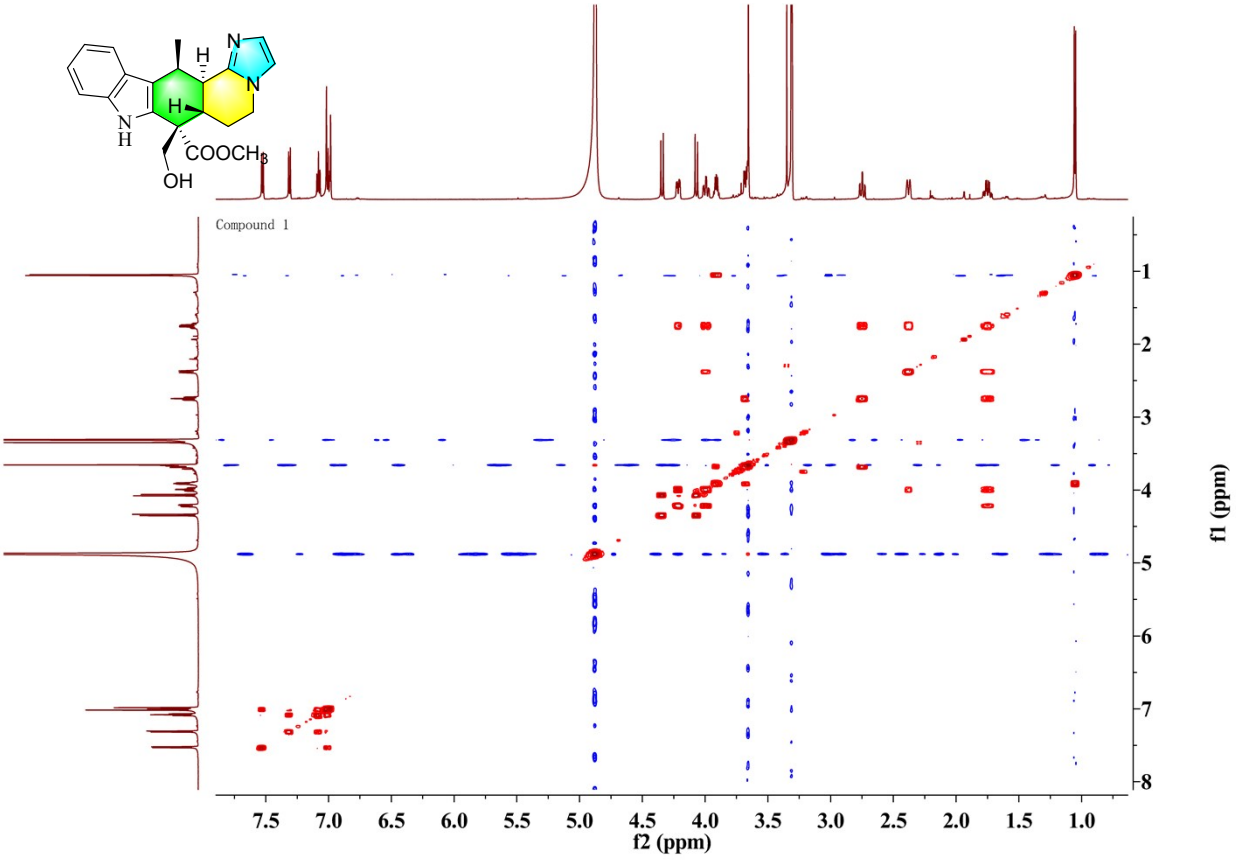

Figure S10. $^1H-^1H$ COSY spectrum of **1** in CD_3OD

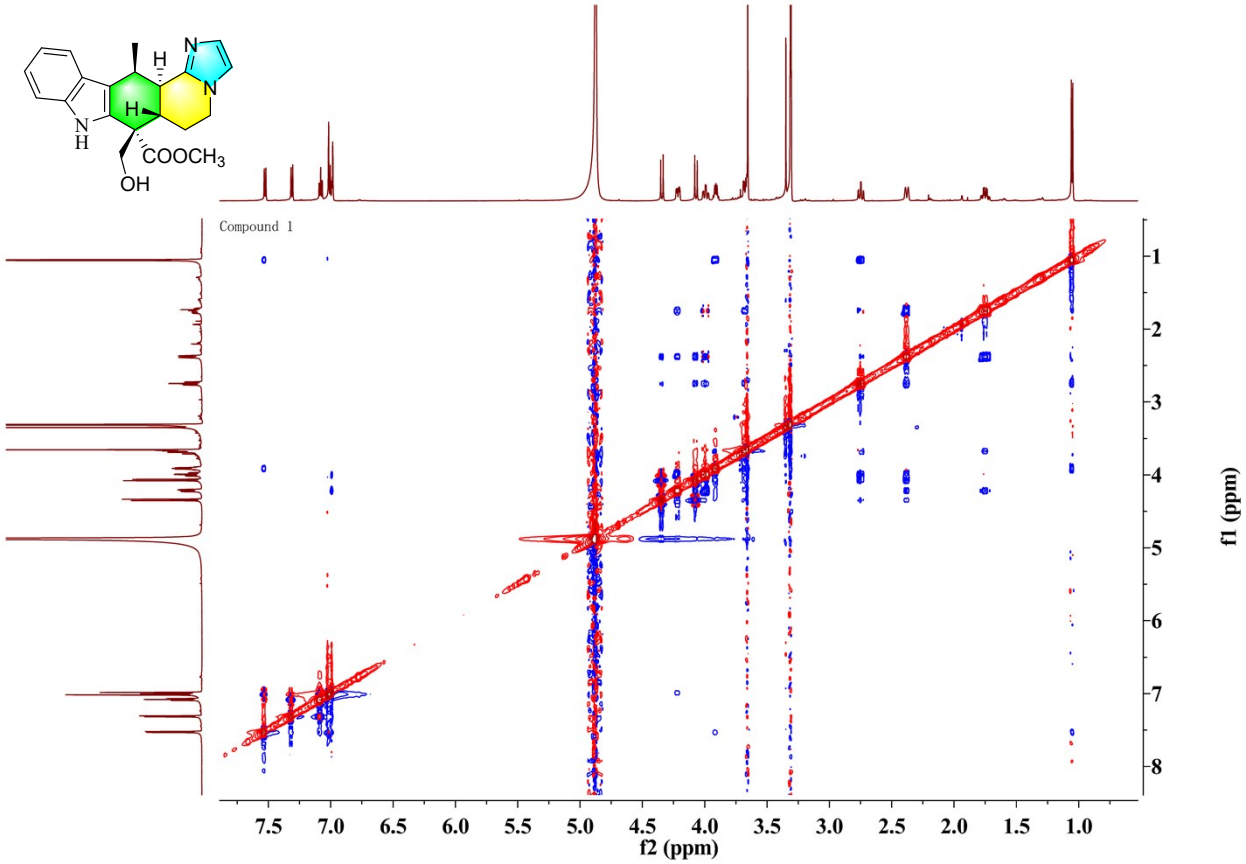

Figure S11. NOESY spectrum of **1** in CD_3OD

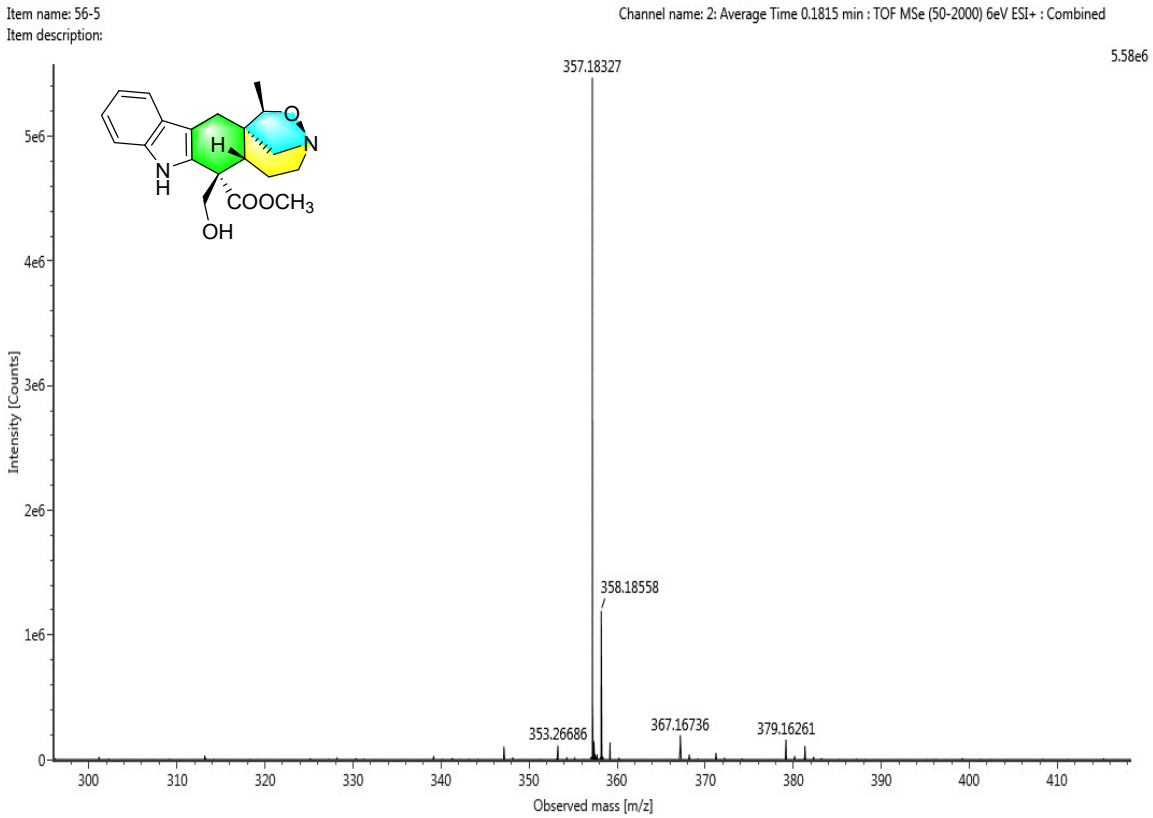

Figure S12. (+)-HR-ESI-MS spectrum of **2**

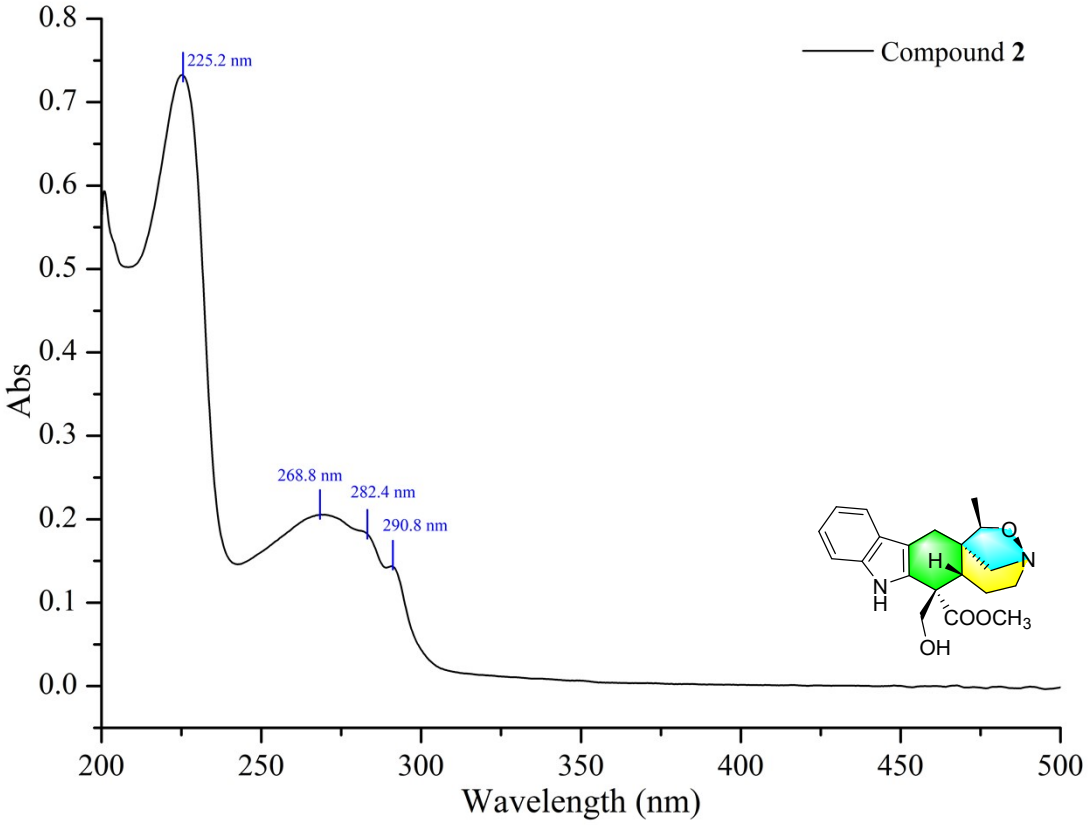

Figure S13. UV spectrum of **2** in MeOH

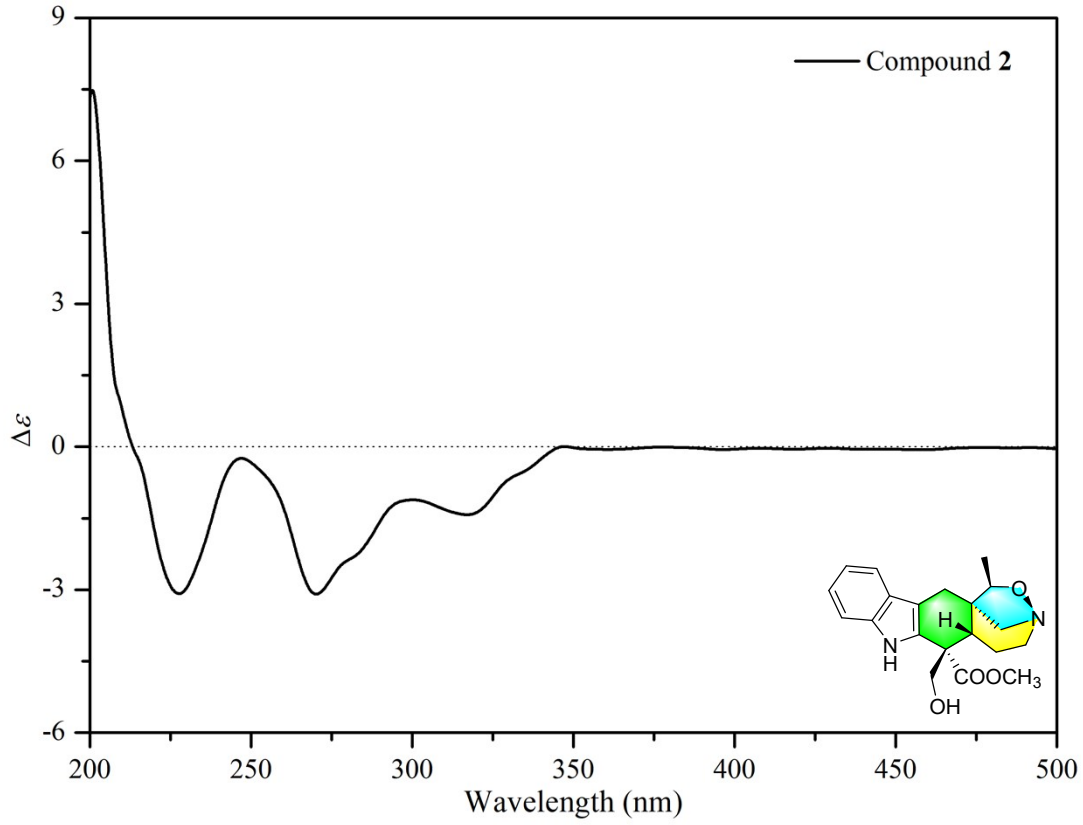

Figure S14. ECD spectrum of **2** in MeOH

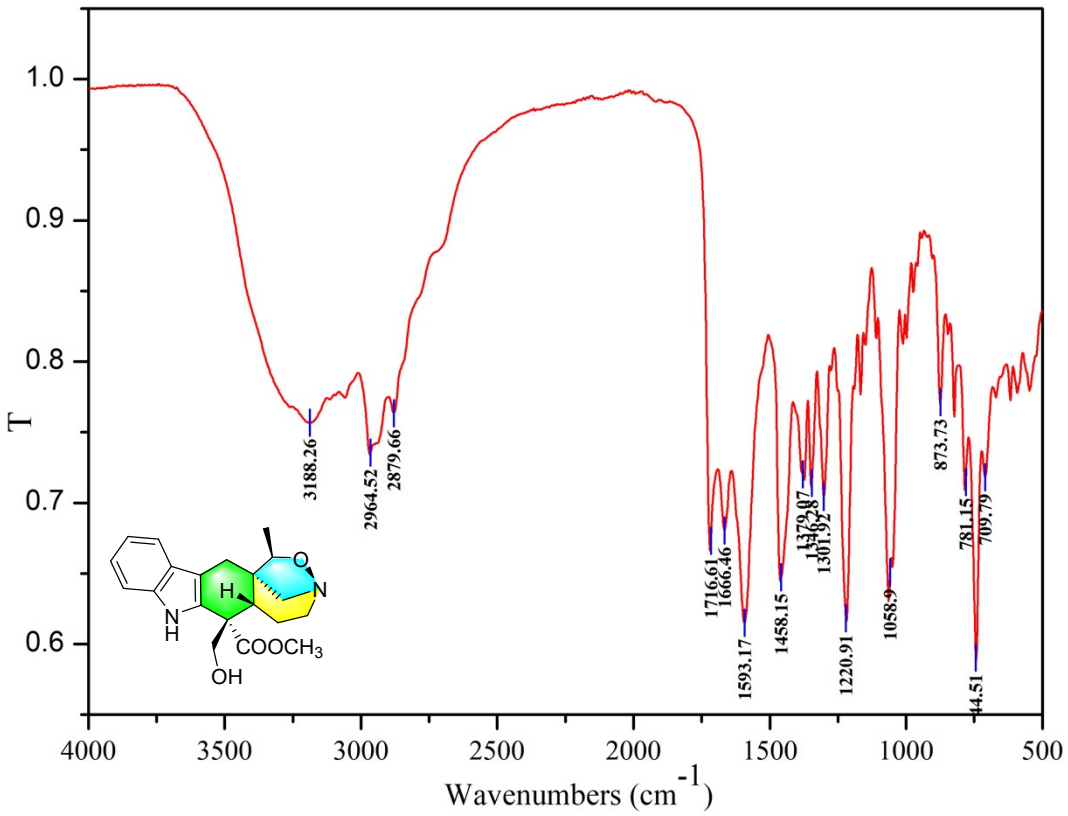

Figure S15. IR spectrum of **2**

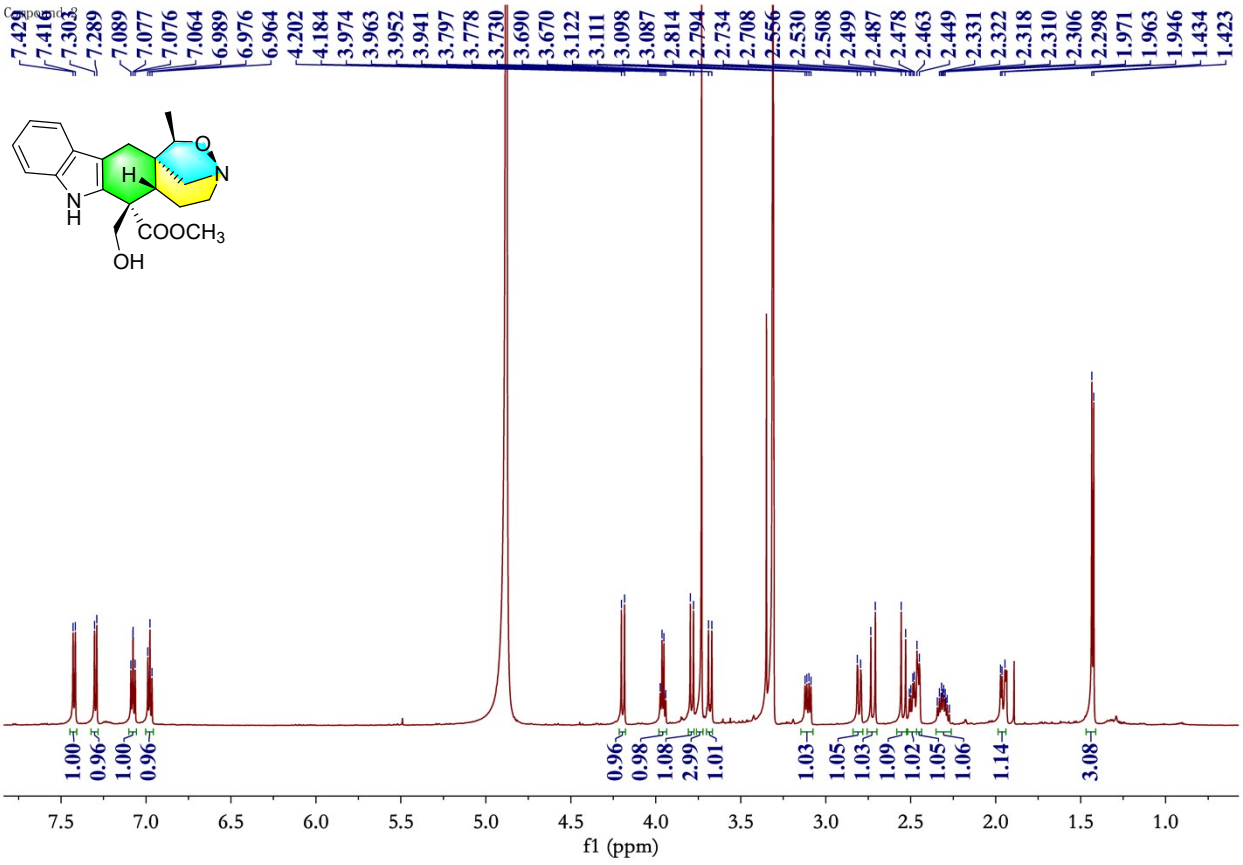

Figure S16. ^{1}H NMR (600 MHz) spectrum of **2** in CD_3OD

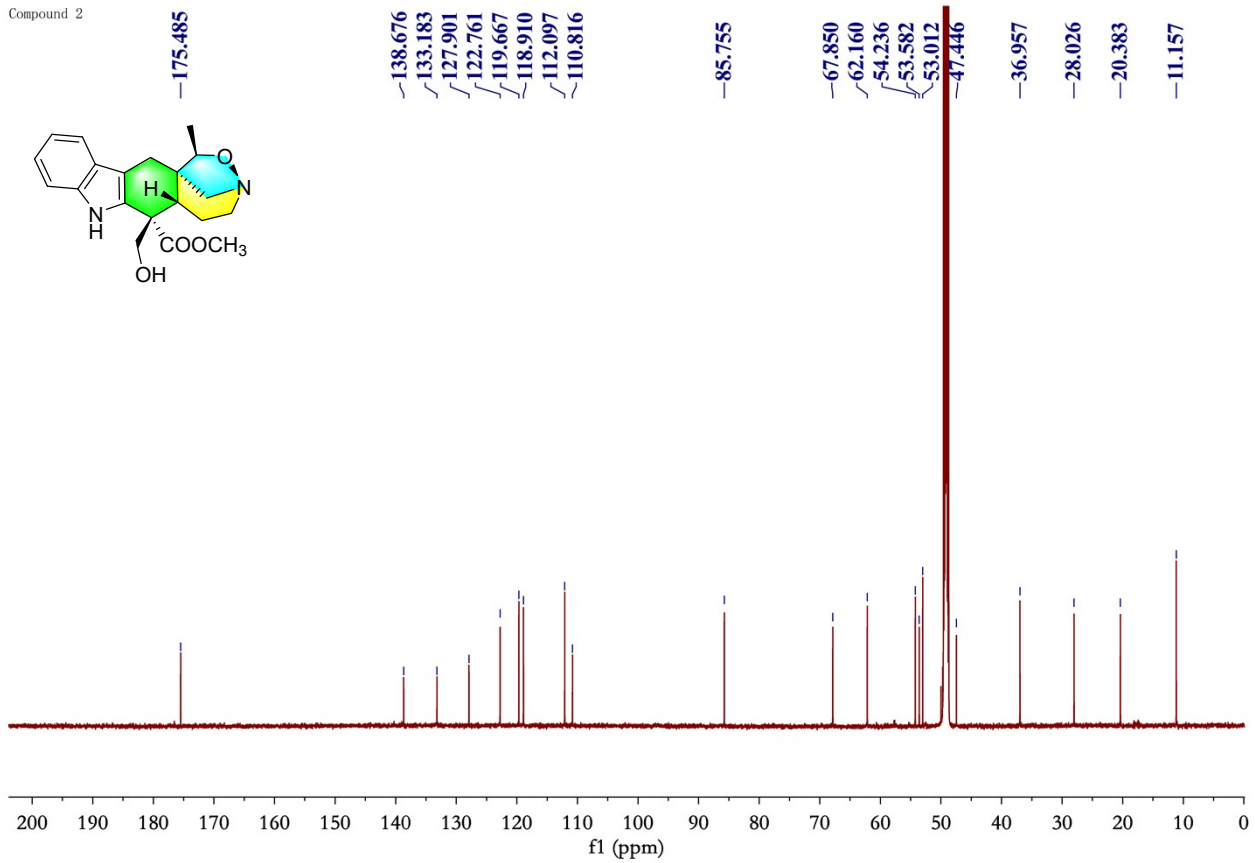

Figure S17. ^{13}C NMR (150 MHz) spectrumof **2** in CD_3OD

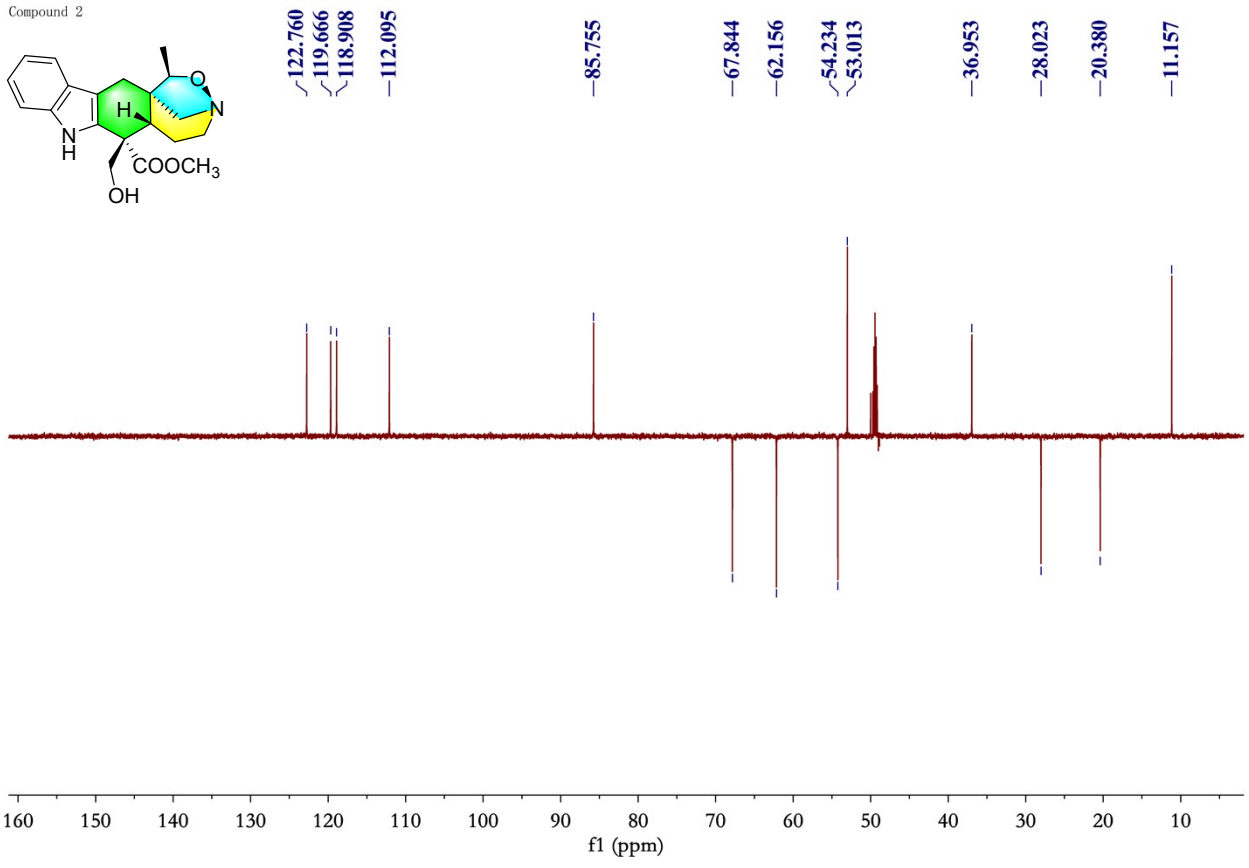

Figure S18. DEPT 135 spectrum of **2** in CD_3OD

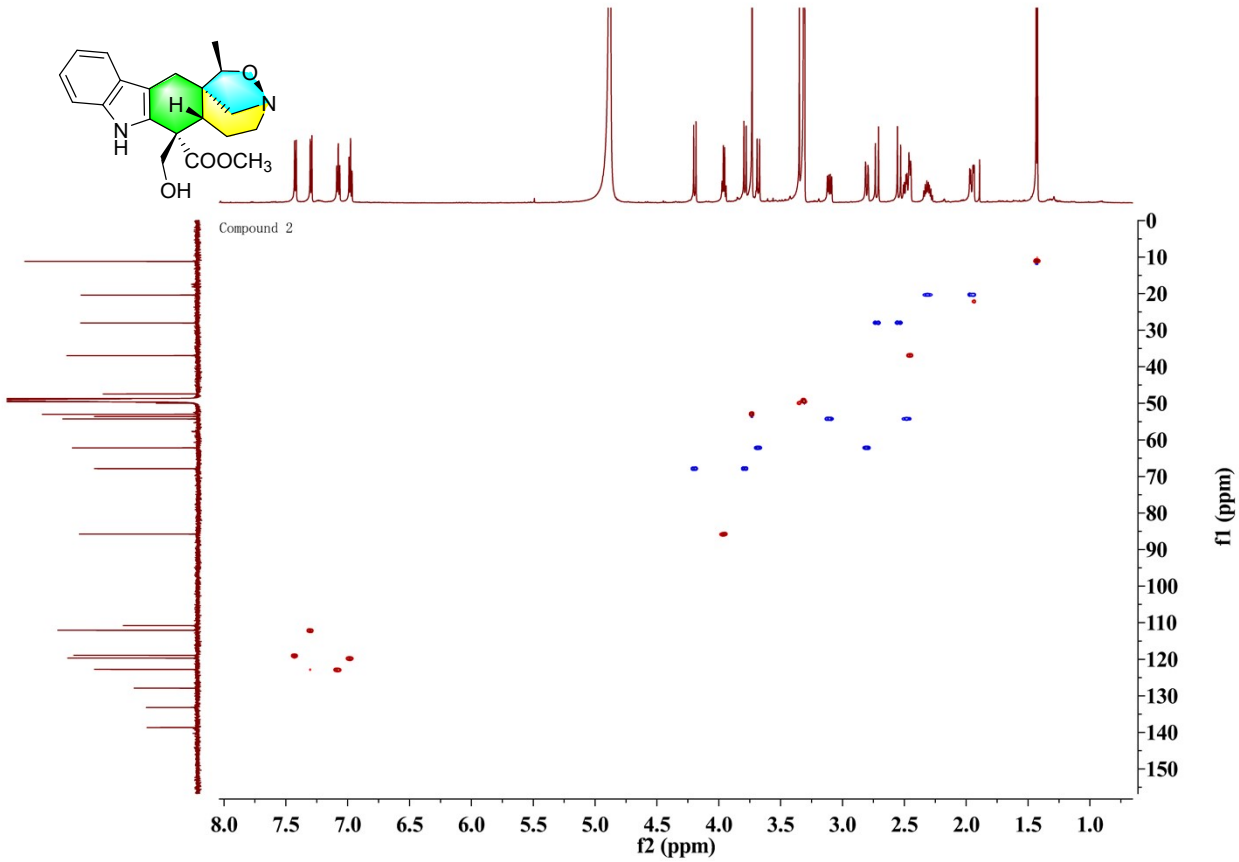

Figure S19. HSQC spectrum of **2** in CD_3OD

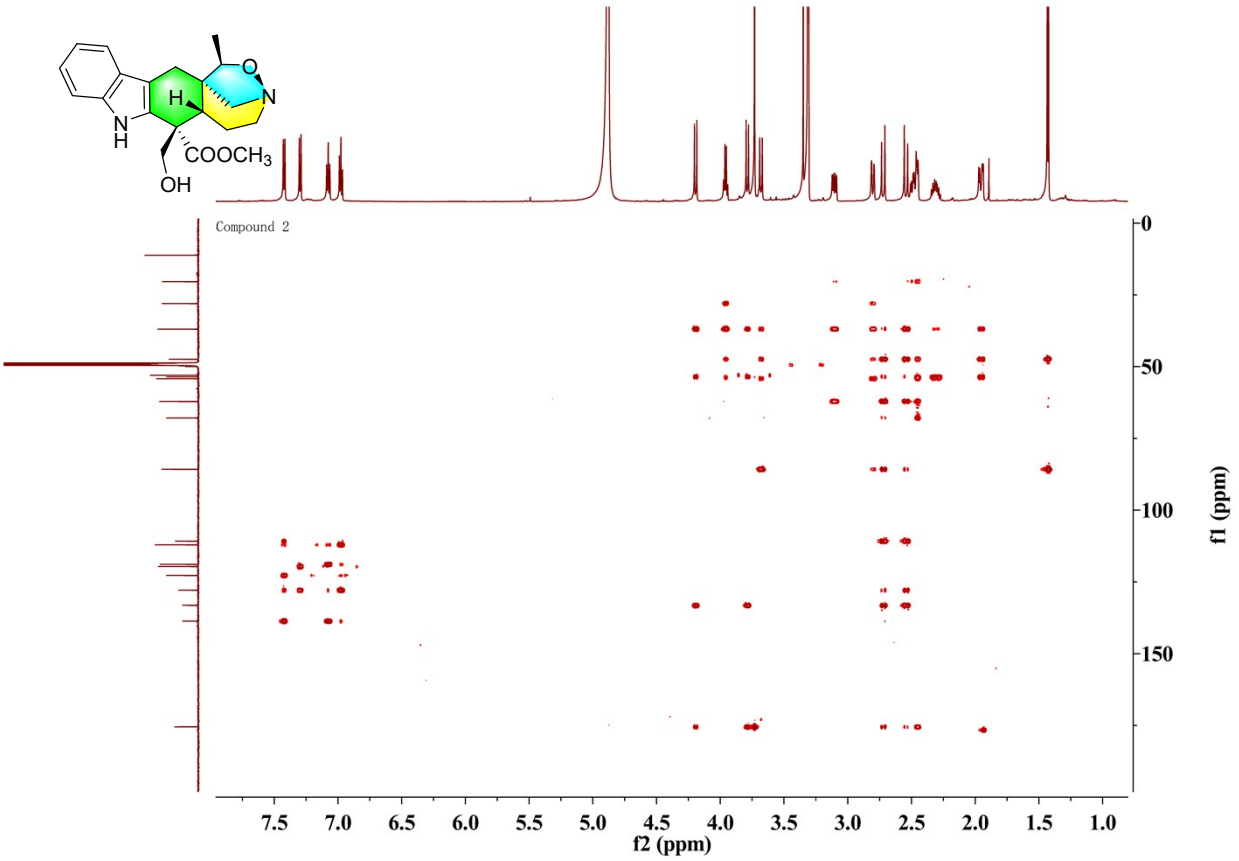

Figure S20. HMBC spectrum of **2** in CD_3OD

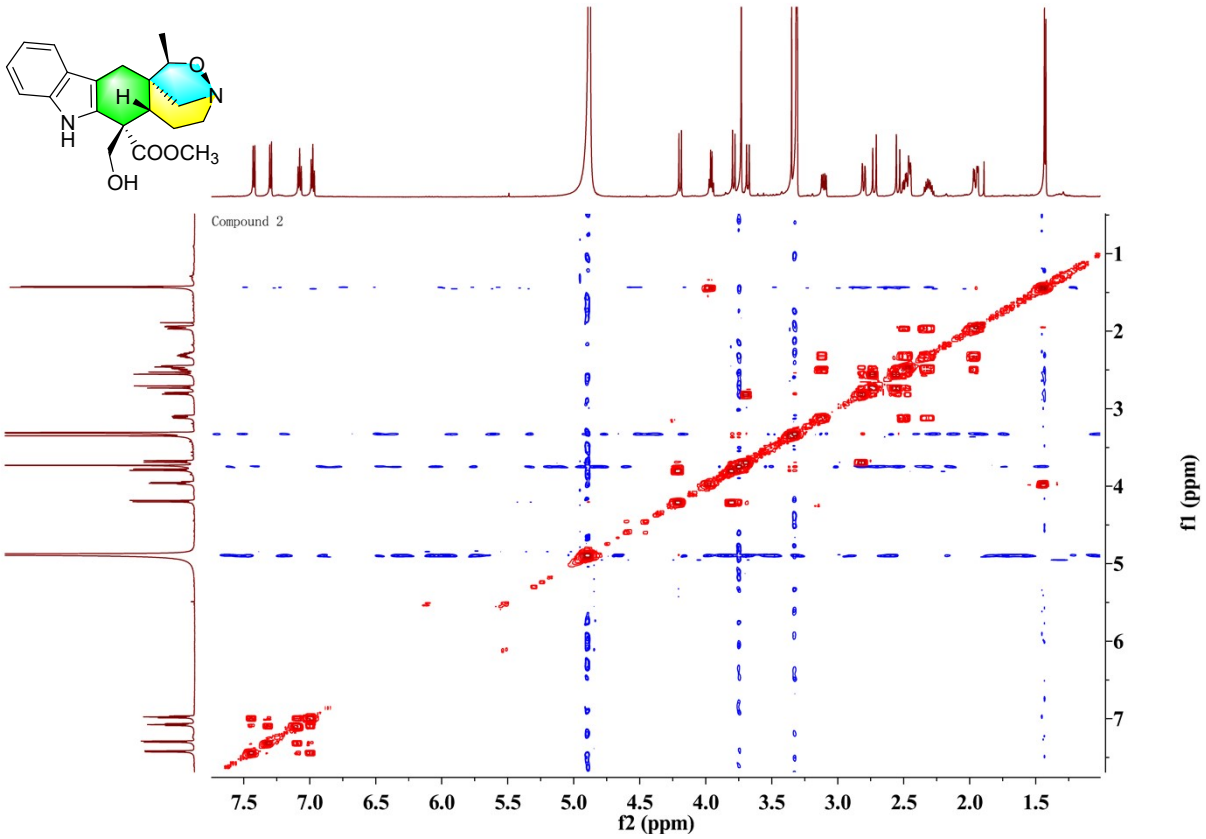

Figure S21. $^{1}H-^{1}H$ COSY spectrum of **2** in CD_3OD

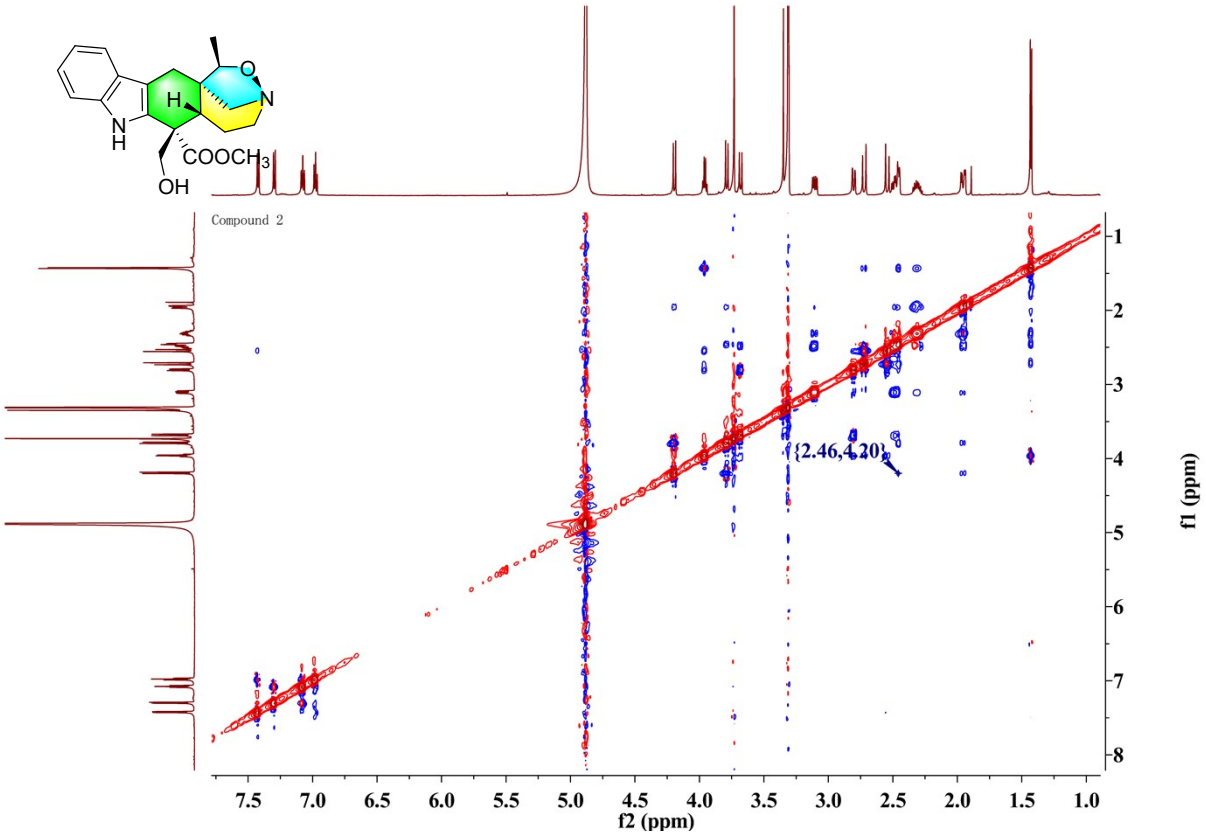

Figure S22. NOESY spectrum of **2** in CD_3OD