Supporting Information

Stereoselective Total Synthesis of (−)-Cleistenolide

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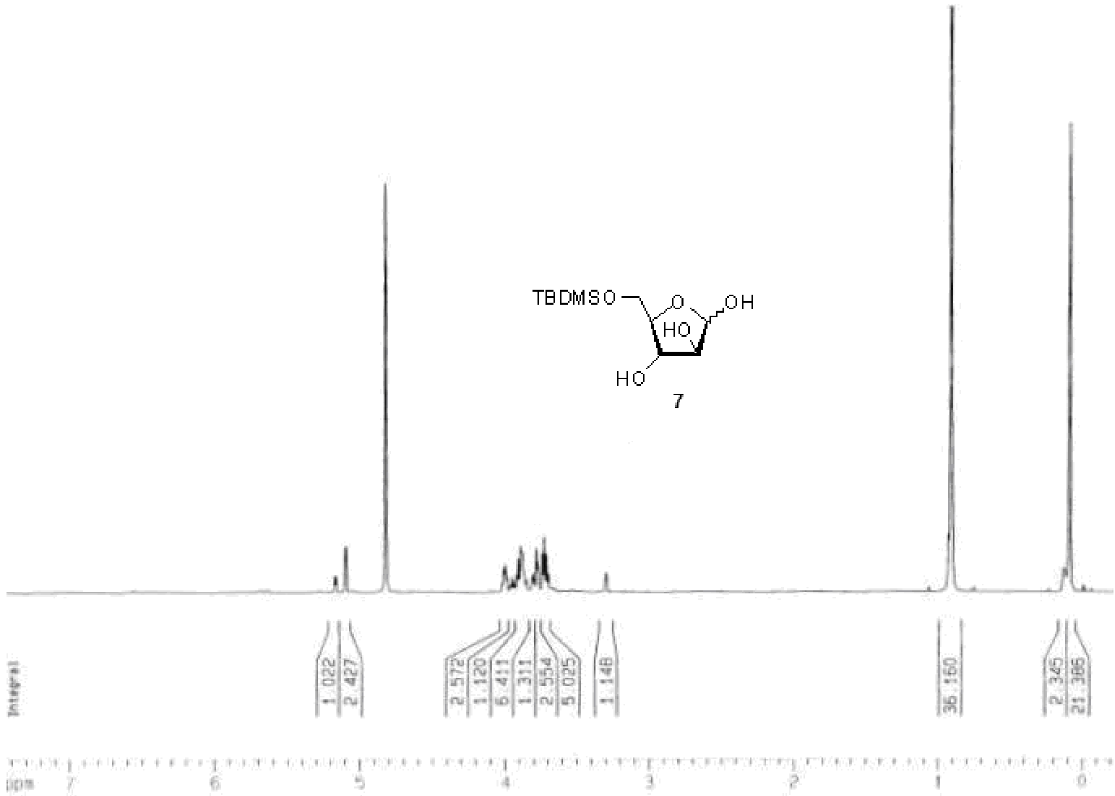
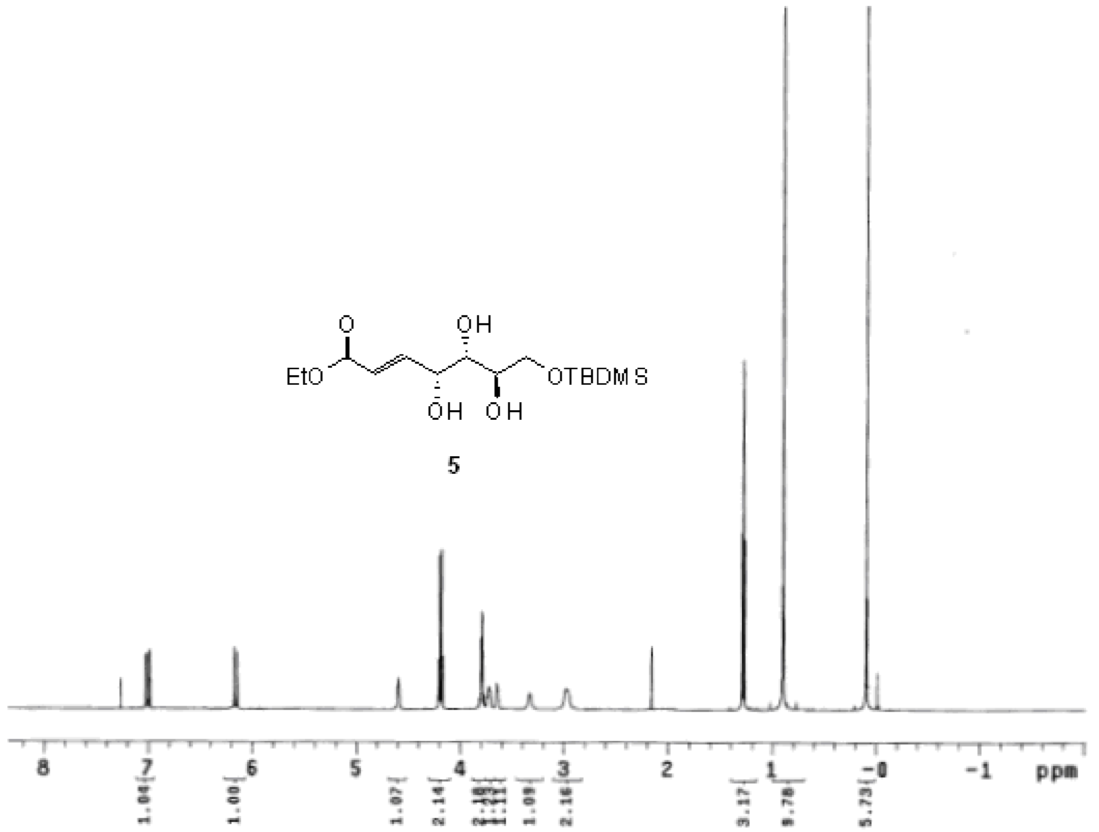
Experimental section

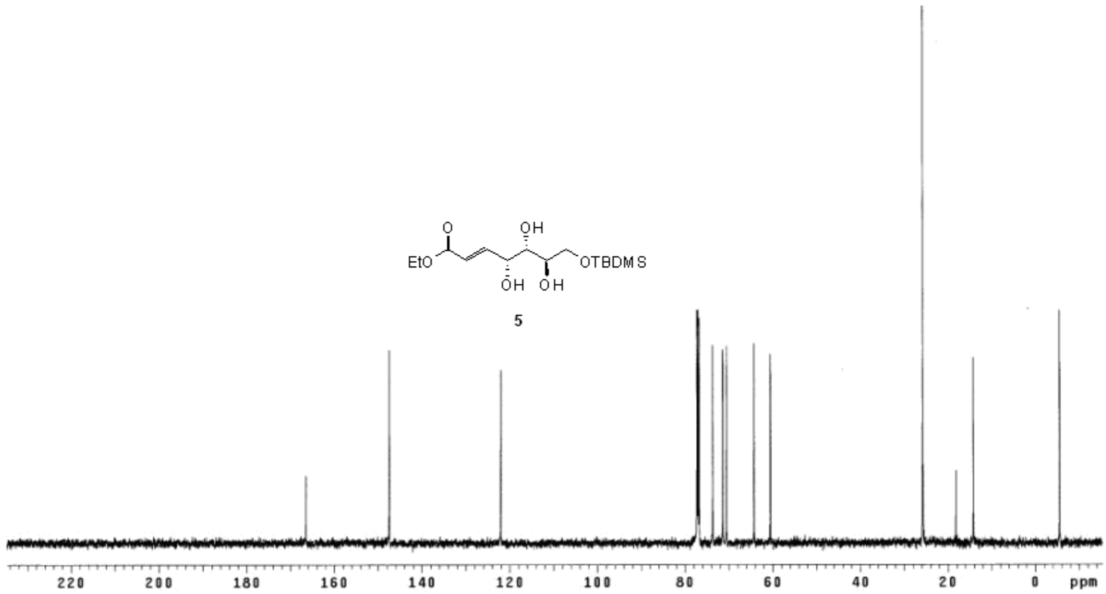
General methods: Optical rotations were determined at 25^{o}C with an automatic polarimeter. ^{1}H and ^{13}C NMR spectra were recorded with 500 or 600 MHz spectrometer for solutions in $CDCl_3$ or CD_3OD. Mass spectra were measured using electrospray ionization mass spectrometer (ESI-MS).

^{1}H NMR for compound **7**

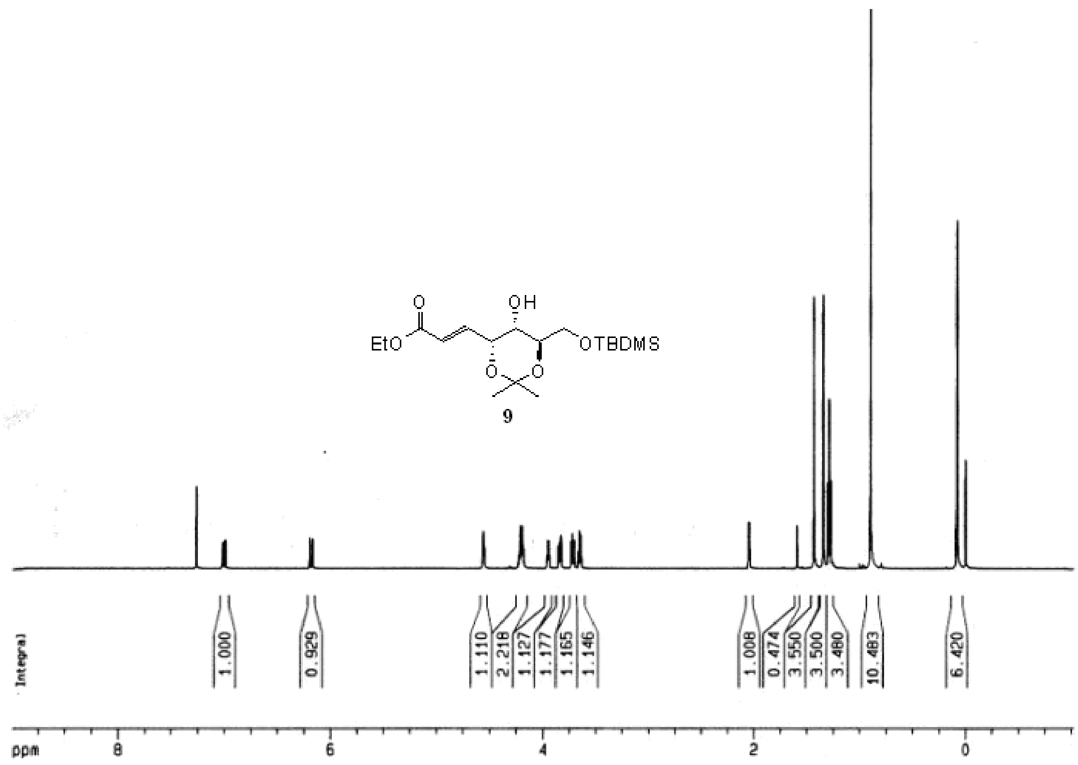


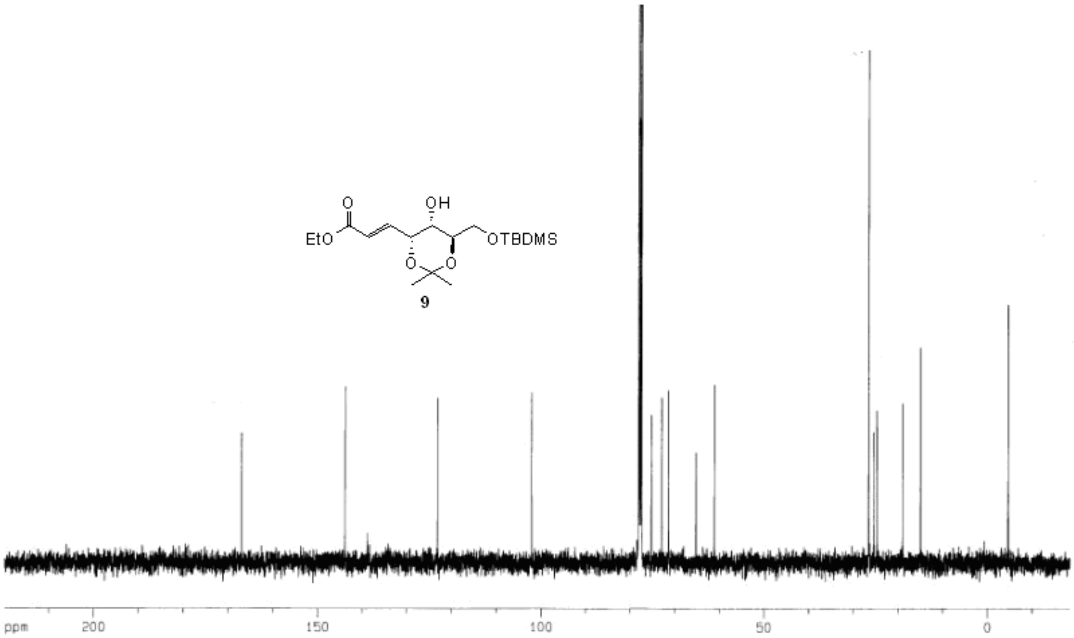
^{1}H and ^{13}C NMR for compound **5**



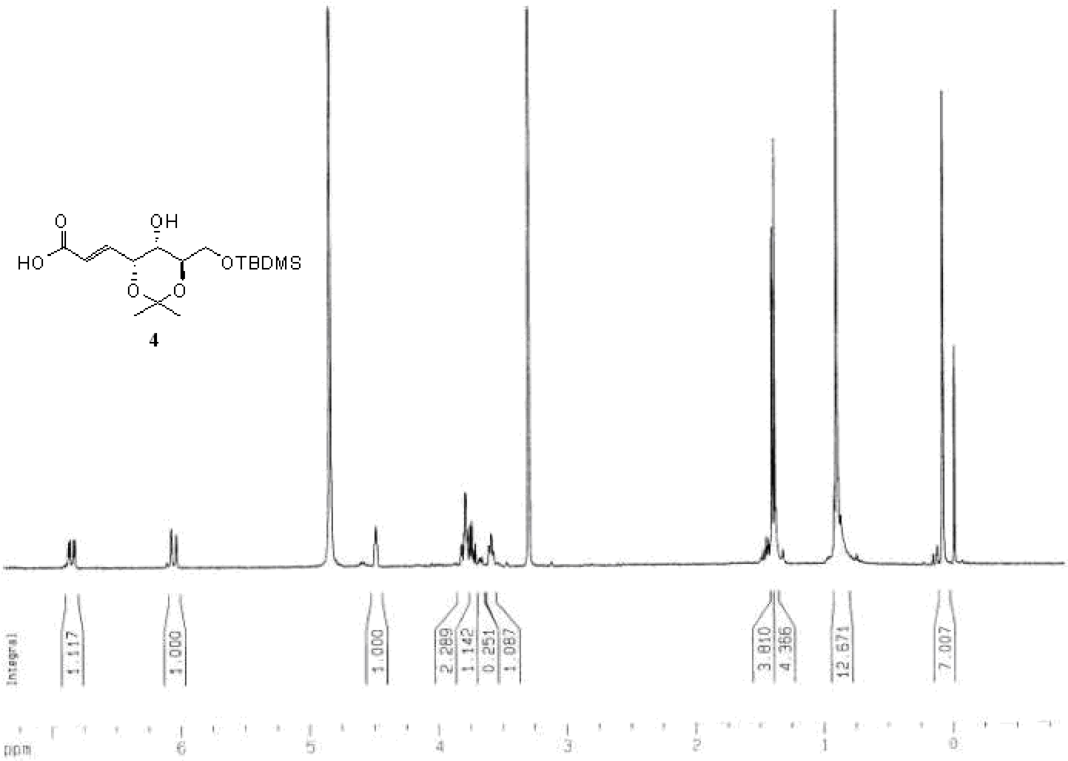


^{1}H and ^{13}C NMR for compound **9**

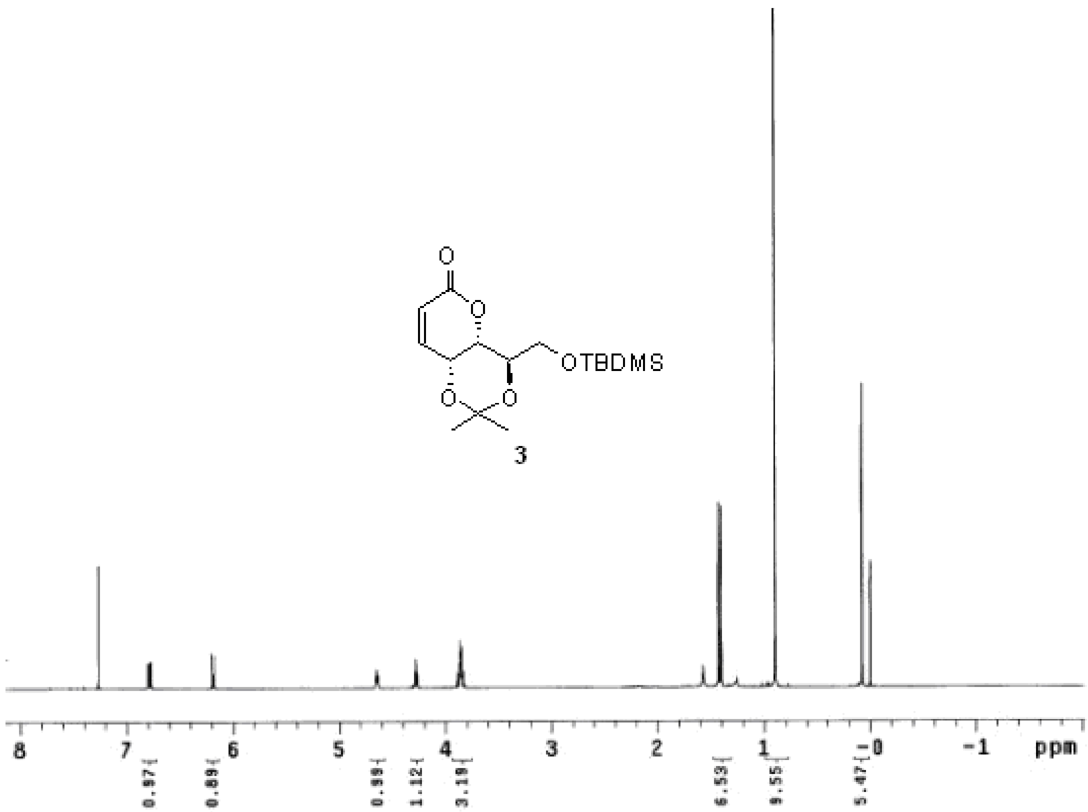


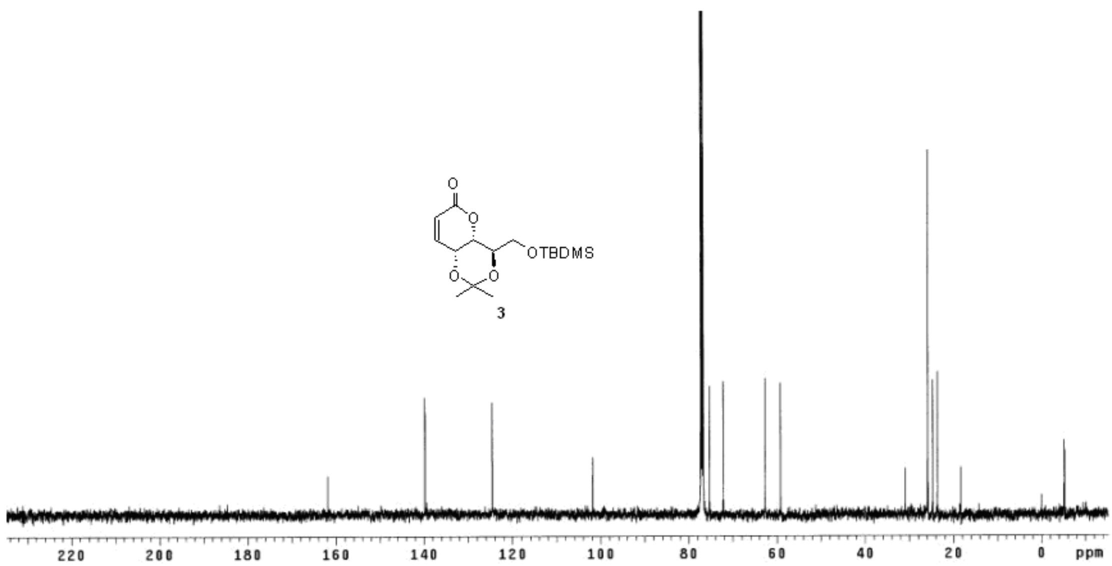


^{1}H NMR for compound **4**

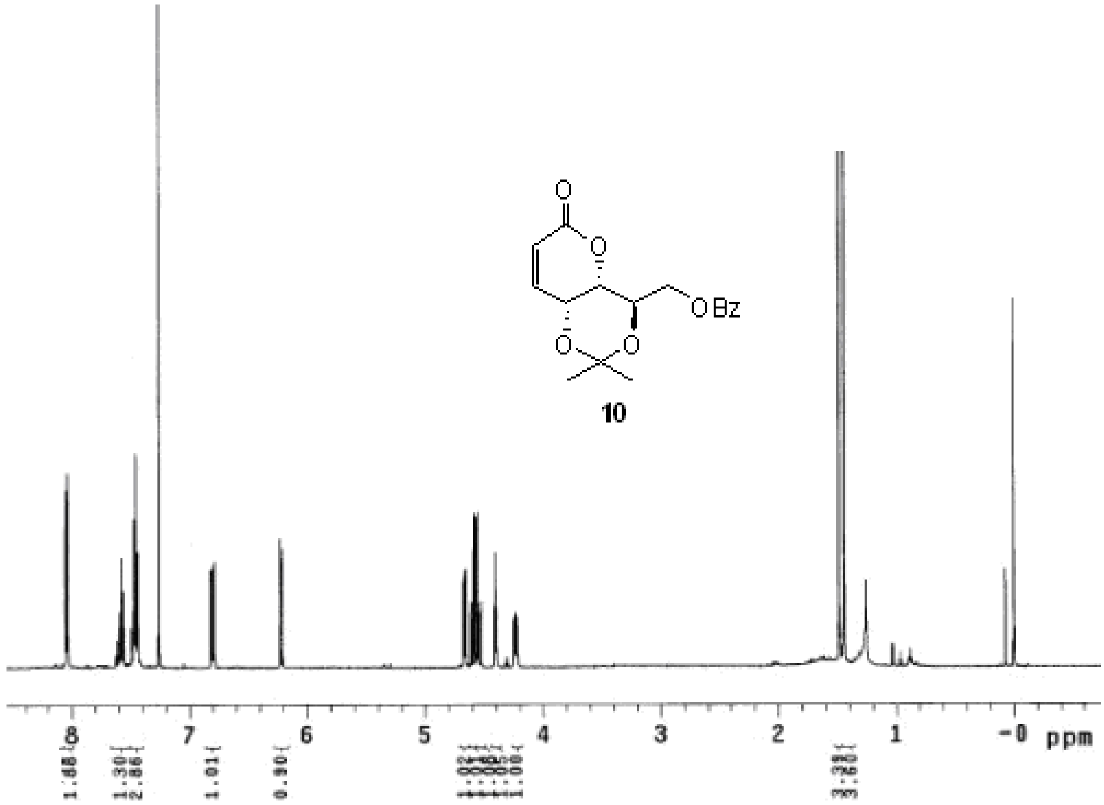


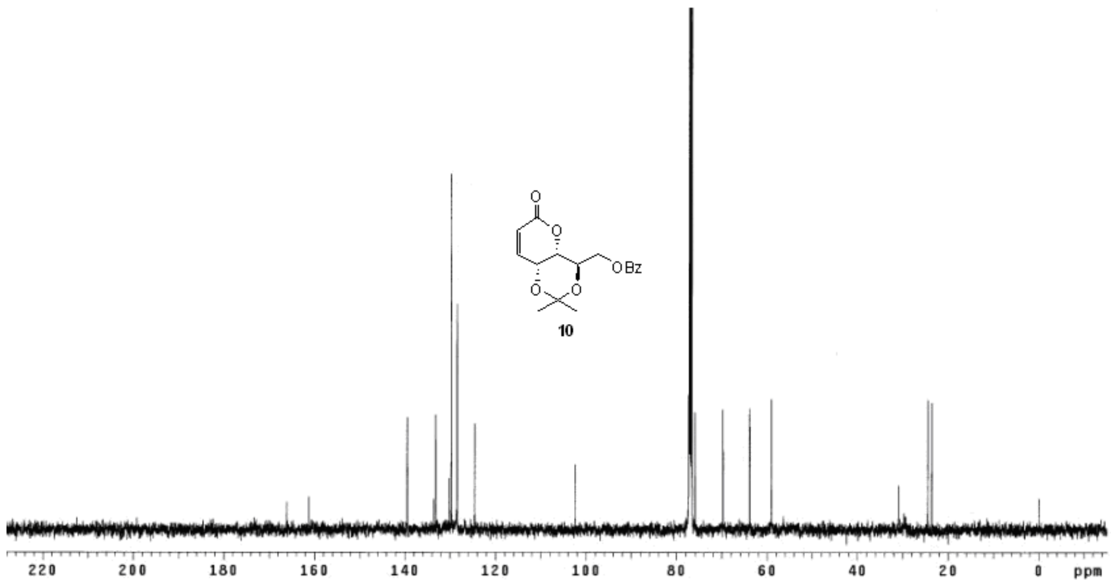
[1]H and [13]C NMR for compound **3**



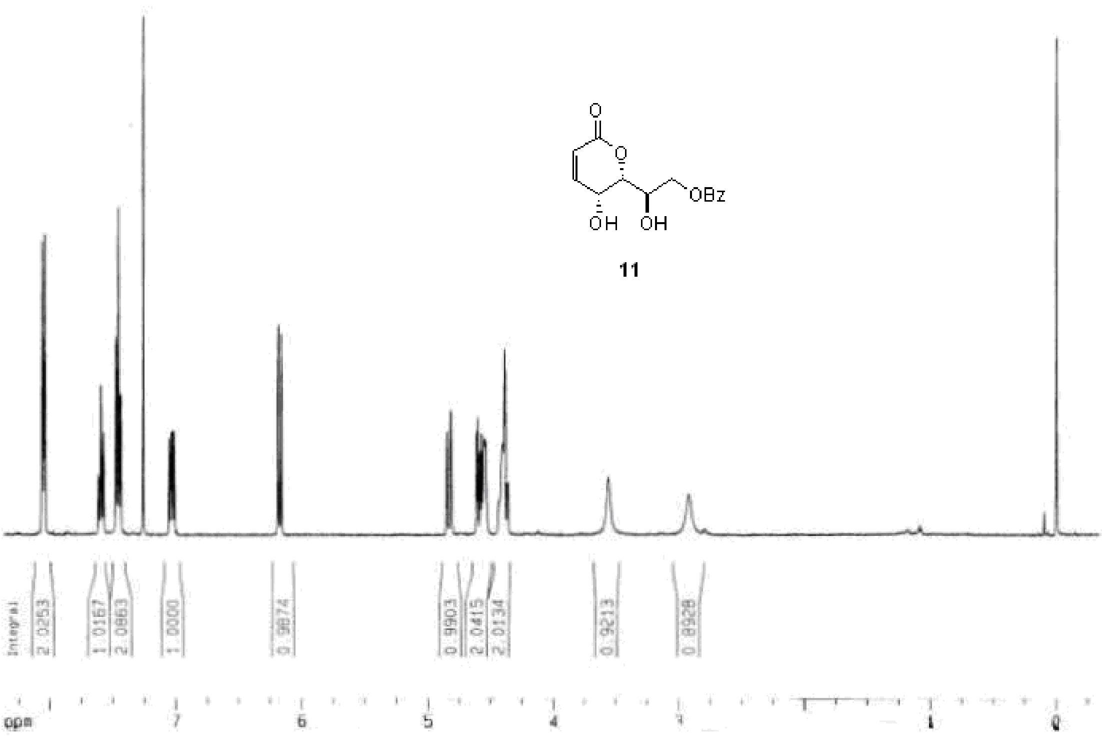


^{1}H and ^{13}C NMR for compound **10**

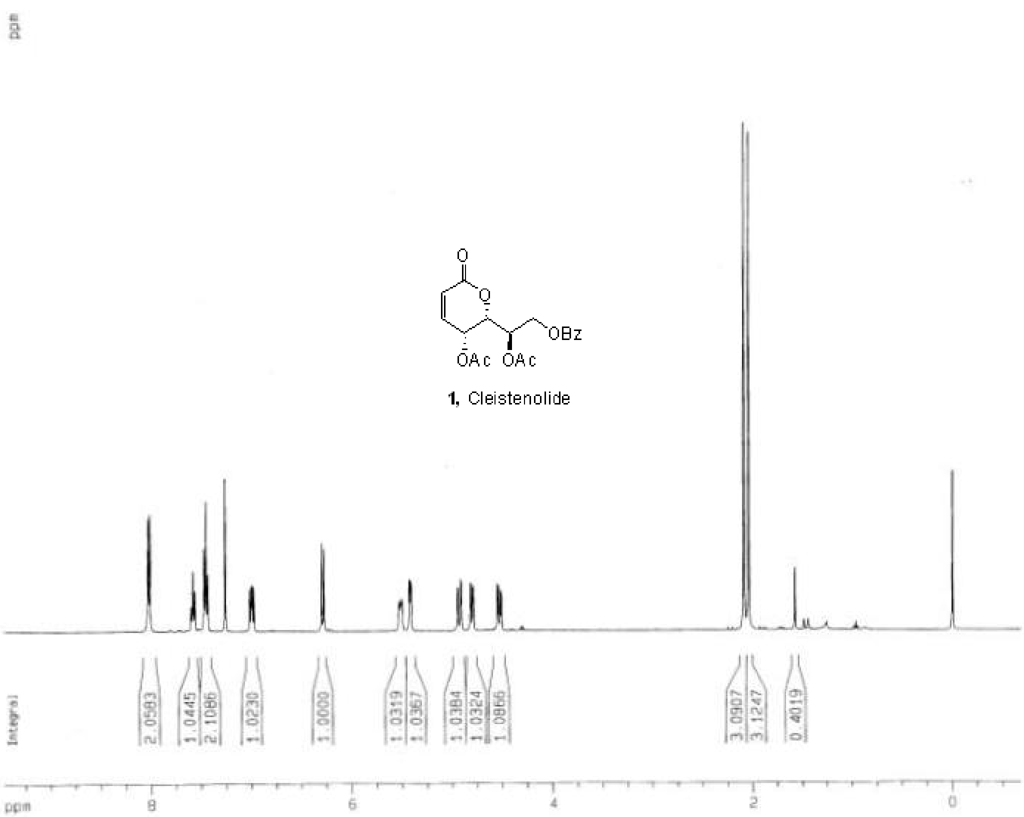




^{1}H NMR for compound **11**



^{1}H and ^{13}C NMR for compound Cleistenolide (**1**)



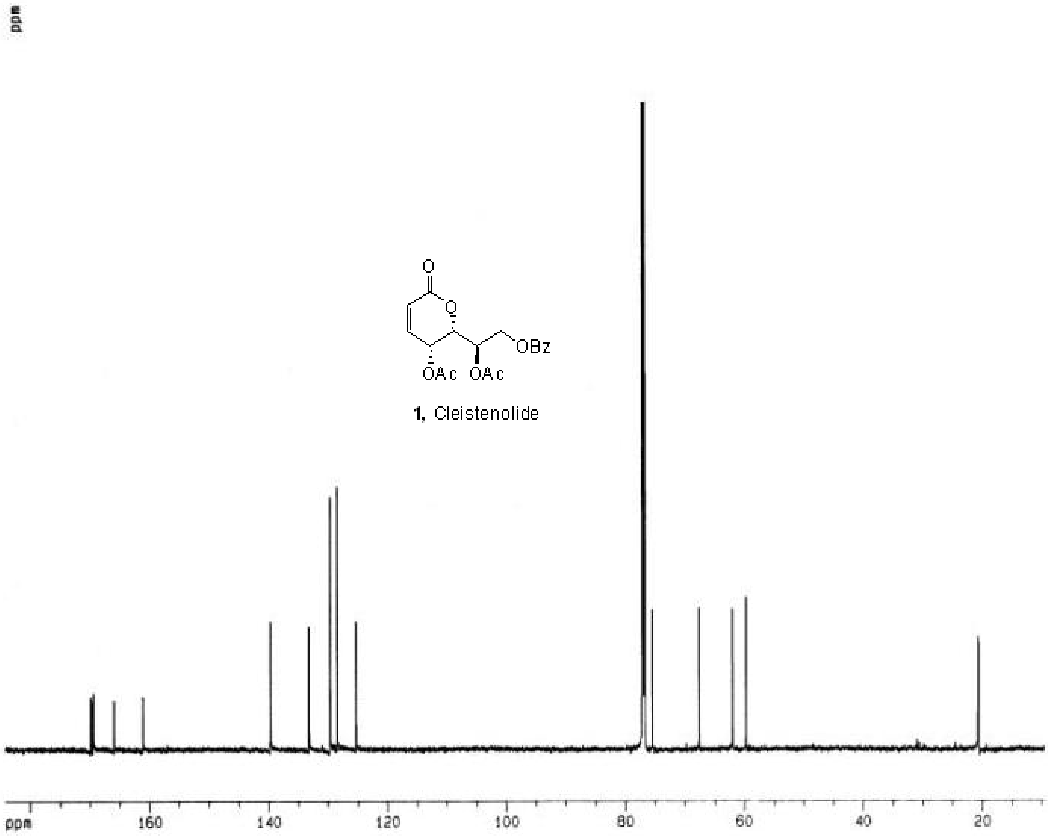

ppm
O
O
OBz
OAc OAc
1, Cleistenolide
ppm
160
140
120
100
80
60
40
20

TABLE 1. Comparison of the ^{1}H NMR data of synthetic and natural Cleistenolide

Position	**Natural**	**Synthetic (Ref. 5)**	**Synthetic (our report)**
2	6.30 (d, *J* = 9.7 Hz)	6.29 (d, *J* = 9.7 Hz)	6.29 (d, *J* = 9.7 Hz)
3	7.02 (dd, *J* = 9.7, 6.1 Hz)	7.00 (dd, *J* = 9.7, 6.1 Hz)	7.00 (dd, *J* = 9.6, 6.1 Hz)
4	5.42 (dd, *J* = 6.1, 2.7 Hz)	5.41 (dd, *J* = 6.1, 2.6 Hz)	5.42 (dd, *J* = 6.0, 2.5 Hz)
5	4.82 (dd, *J* = 9.7, 2.7 Hz)	4.80 (dd, *J* = 9.6, 2.7 Hz)	4.80 (dd, *J* = 9.6, 2.5 Hz)
7 Ac	2.08 (s)	2.04 (s)	2.04 (s)
8	5.53 (ddd, *J* = 9.6, 4.4, 2.4 Hz)	5.51(ddd, *J* = 9.9, 4.4, 2.4 Hz)	5.52 (ddd, *J* = 9.5, 4.0, 2.3 Hz)
10Ac	2.13 (s)	2.08 (s)	2.09 (s)
11a	4.54 (dd, *J* = 12.5, 2.4 Hz)	4.52 (dd, *J* = 12.5, 4.4 Hz)	4.53 (dd, *J* = 12.5, 4.4 Hz)
11b	4.93 (dd, *J* = 12.5, 4.4 Hz)	4.93 (dd, *J* = 12.5, 2.4 Hz)	4.93 (dd, *J* = 12.5, 2.0 Hz)
2’	8.05 (dd, *J* = 7.6, 1.9 Hz)	8.01 (d, *J* = 7.7 Hz)	8.02 (d, *J* = 7.7 Hz)
3’	7.49 (ddd, *J* = 7.7, 7.5, 1.8 Hz)	7.44 (dd, *J* = 7.7, 7.4 Hz)	7.45 (t, *J* = 7.6 Hz)
4’	7.60 (m)	7.57 (t, *J* = 7.5 Hz)	7.57 (t, *J* = 7.4 Hz)
5’	7.49 (ddd, *J* = 7.7, 7.5, 1.8 Hz)	7.44 (dd, *J* = 7.7, 7.4 Hz)	7.45 (t, *J* = 7.6 Hz)
6’	8.05 (dd, *J* = 7.6, 1.9 Hz)	8.01 (d, *J* = 7.7 Hz)	8.02 (d, *J* = 7.7 Hz)

TABLE 2. Comparison of the ^{13}C NMR data of synthetic and natural Cleistenolide

Position	**Natural**	**Synthetic (Ref. 5)**	**Synthetic (our report)**
5-$\underline{C}H_3$COO	20.84	20.4	20.5
7-$\underline{C}H_3$COO	21.05	20.6	20.7
C-6	60.13	59.7	59.7
C-8	62.40	62.0	62.0
C-7	68.03	67.7	67.7
C-5	75.92	75.5	75.4
C-3	125.77	125.3	125.4
C-3’	128.89	128.5	128.5
C-5’	128.89	128.5	128.5
C-1’	130.02	129.6	129.6
C-2’	130.09	129.6	129.7
C-6’	130.09	129.6	129.7
C-4’	133.68	133.2	133.3
C-4	140.10	139.7	139.7
C-2	161.54	161.0	161.1
8-O$\underline{C}$OPh	166.42	165.9	166.0
7-O$\underline{C}$OCH$_3$	170.03	169.4	169.5
5-O$\underline{C}$OCH$_3$	170.35	169.8	169.9