Supporting Information

Computationally Assisted Assignment of Kahalalide Y Configuration Using an NMR-Constrained Conformational Search

Mohamed A. Albadry, [†, ‡] *Khaled M. Elokely,* [§] *Bin Wang,* [†] *John J. Bowling,* [†] *Mohamed F. Abdelwahab,* [‡] *Mohamed H. Hossein,* [‡] *Robert J. Doerksen,* [§] *Mark T. Hamann*[*, †]

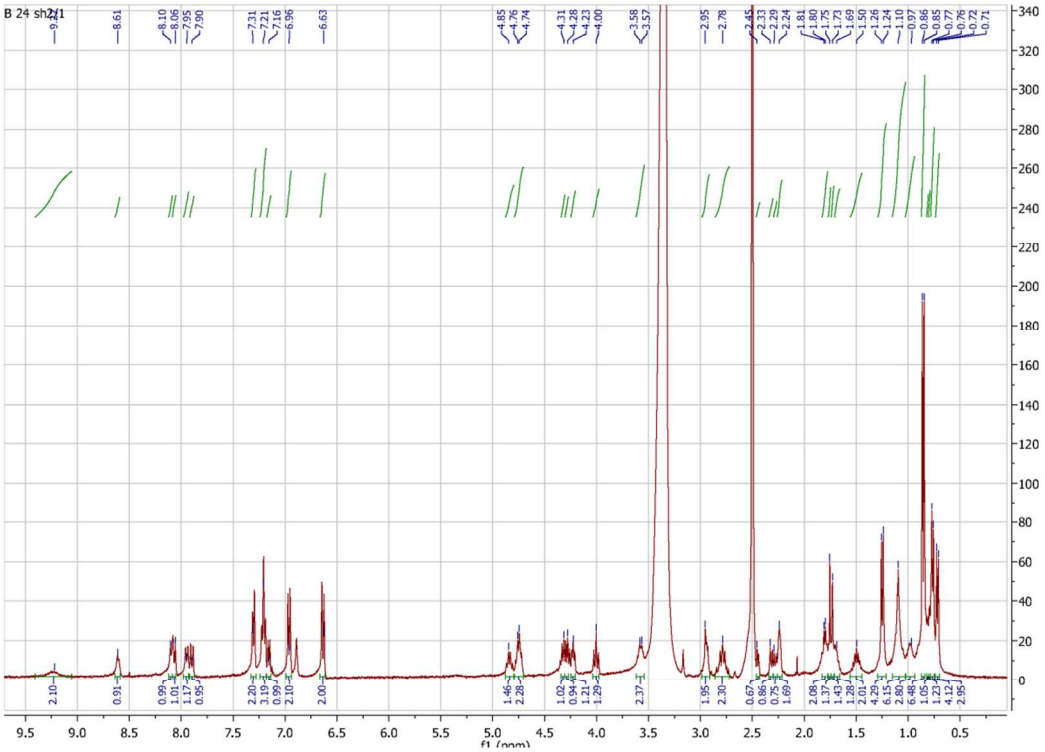
[†]Departments of Pharmacognosy, Pharmacology, Chemistry, and Biochemistry and National Center for Natural Products Research, School of Pharmacy, University of Mississippi, MS 38677.

[‡]Department of Pharmacognosy, Faculty of Pharmacy, Al-Azhar University, Cairo, Egypt

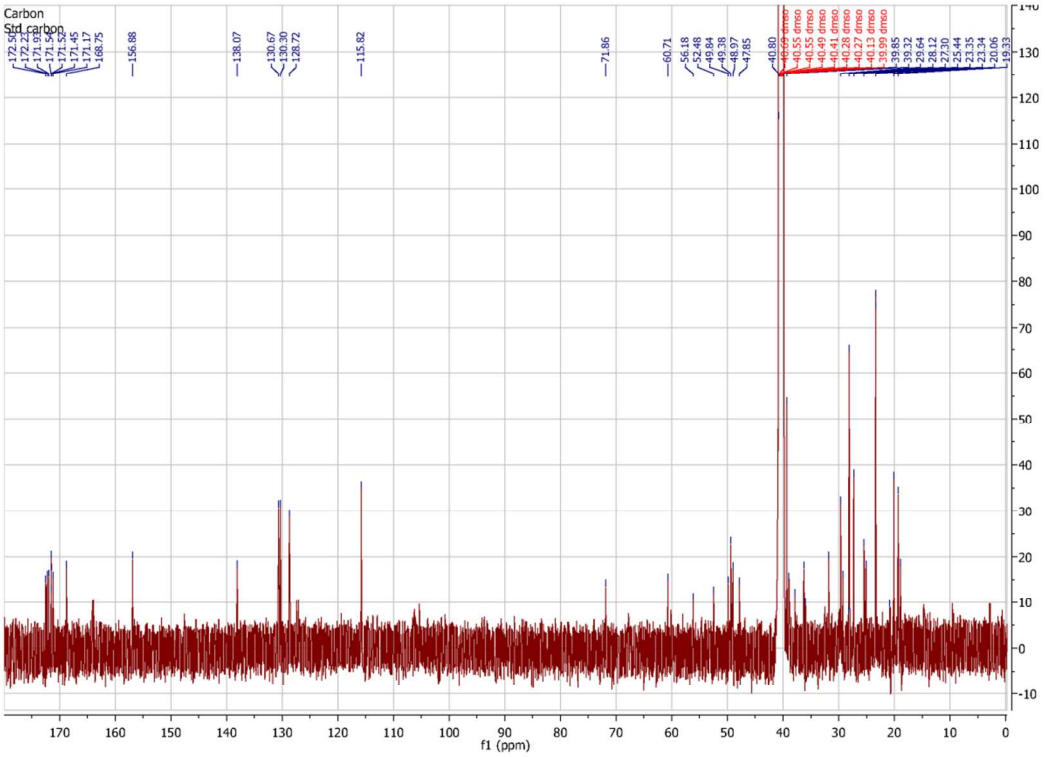
[§]Department of Medicinal Chemistry, School of Pharmacy, University of Mississippi, MS 38677

[*] To whom correspondence should be addressed. Phone 662-915-5730; Fax 662-915-6975; E-mail: mthamann@olemiss.edu

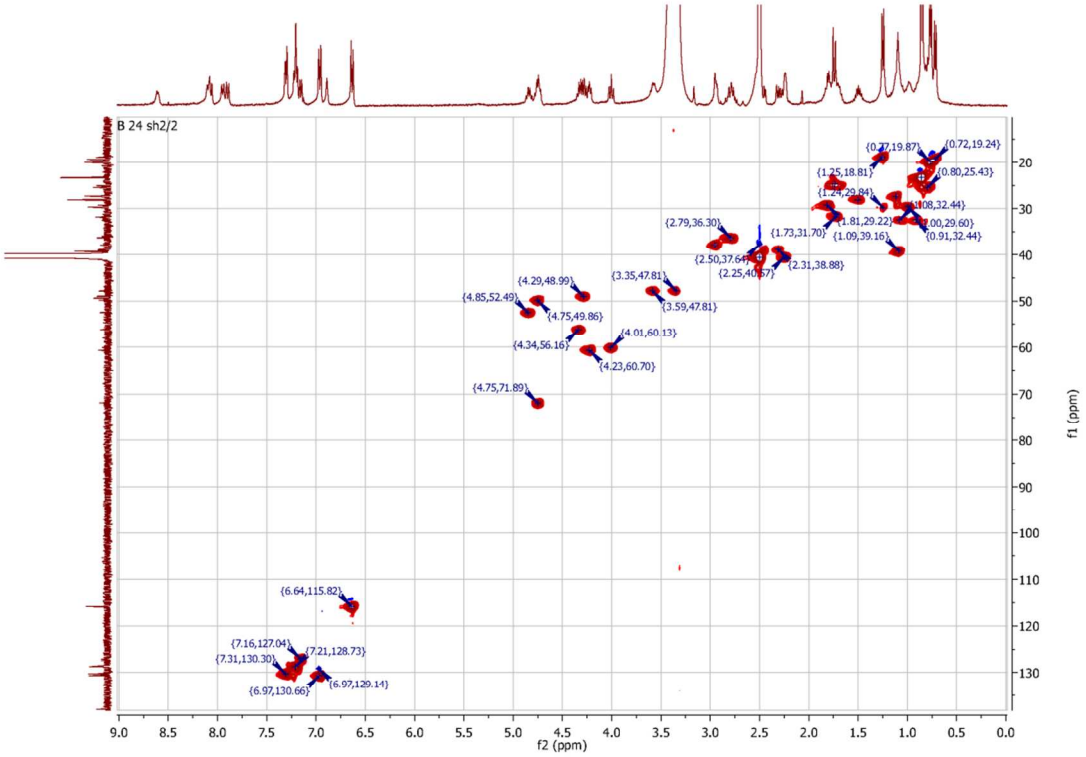
"S1. ^{1}H NMR (600 MHz, DMSO-d6) spectrum of kahalalide Y".



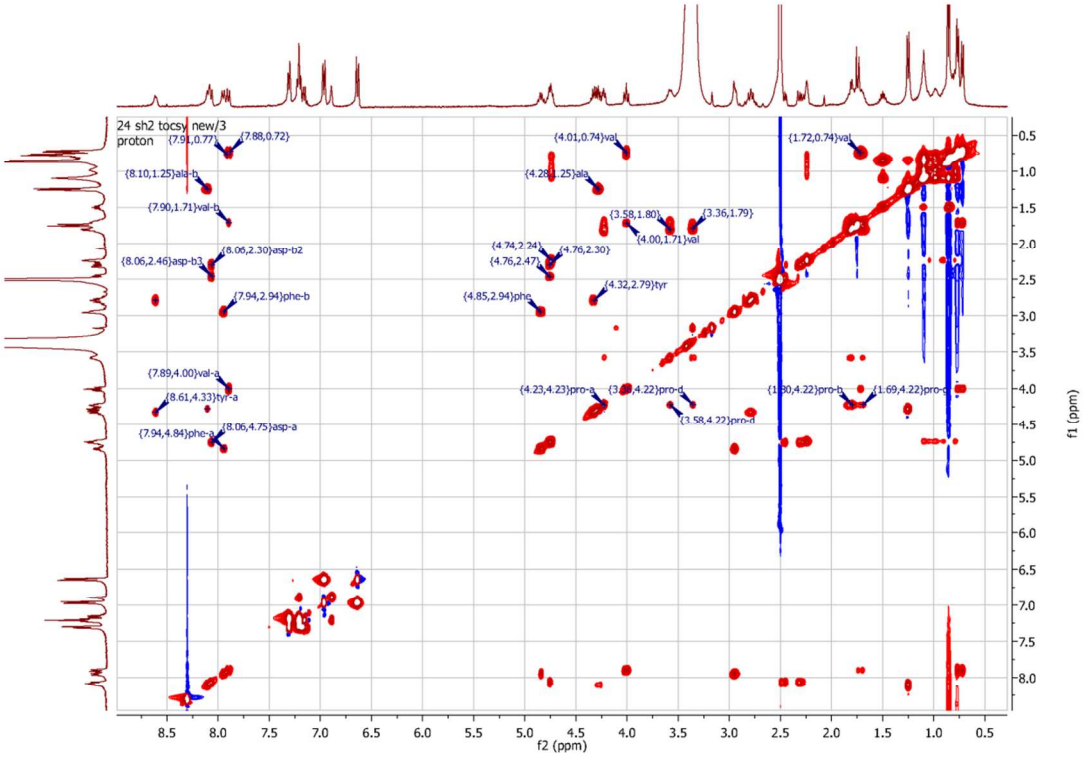
"S2. ^{13}C NMR (600 MHz, DMSO-d6) spectrum of kahalalide Y".



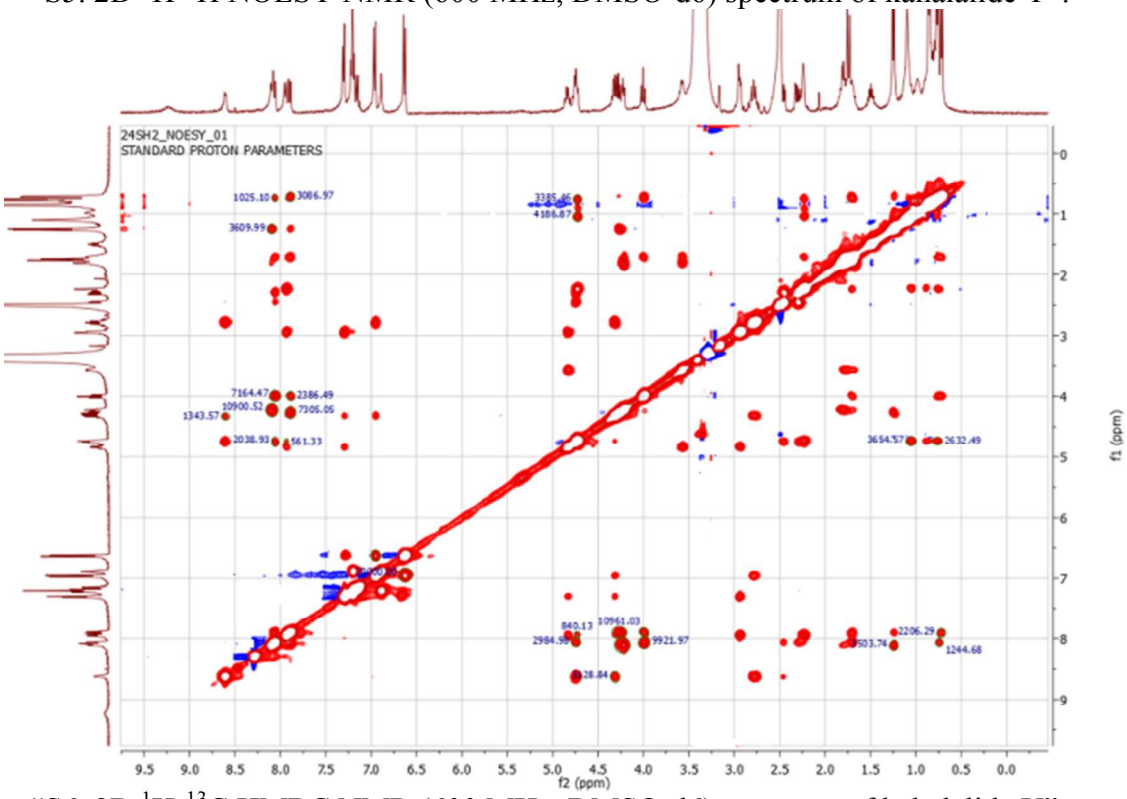
"S3. 2D ^{1}H-^{13}C HSQC NMR (600 MHz, DMSO-d6) spectrum of kahalalide Y".



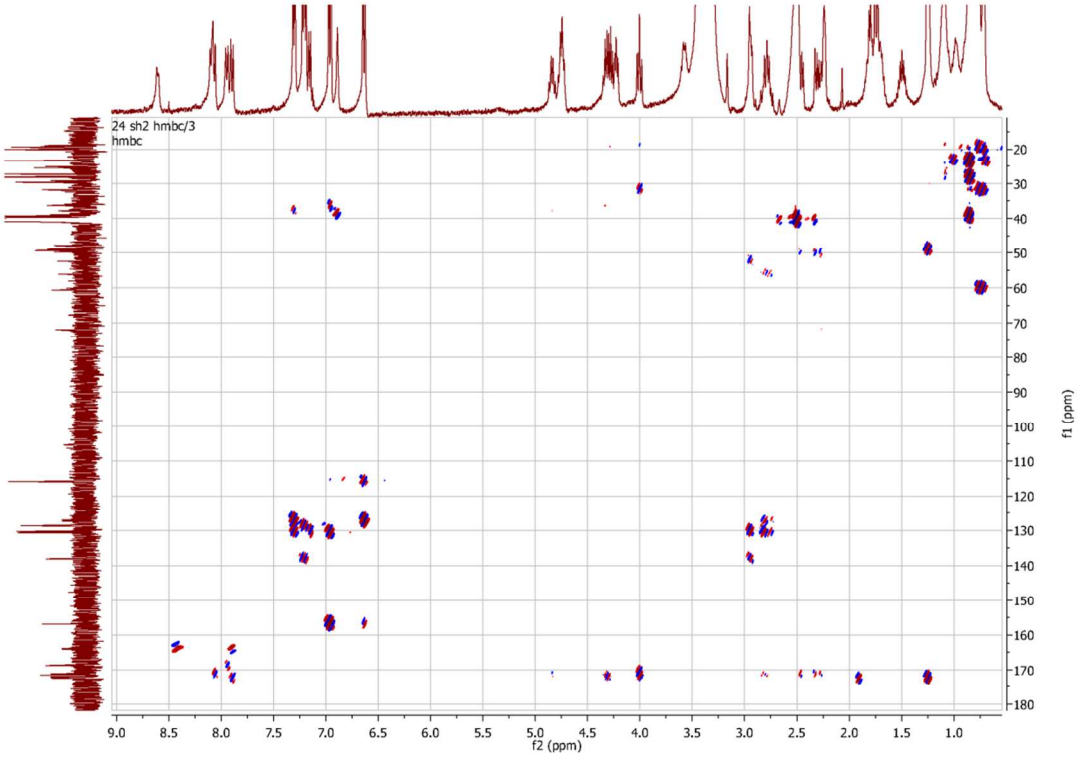
"S4. 2D ^{1}H-^{1}H TOCSY NMR (600 MHz, DMSO-d6) spectrum of kahalalide Y".



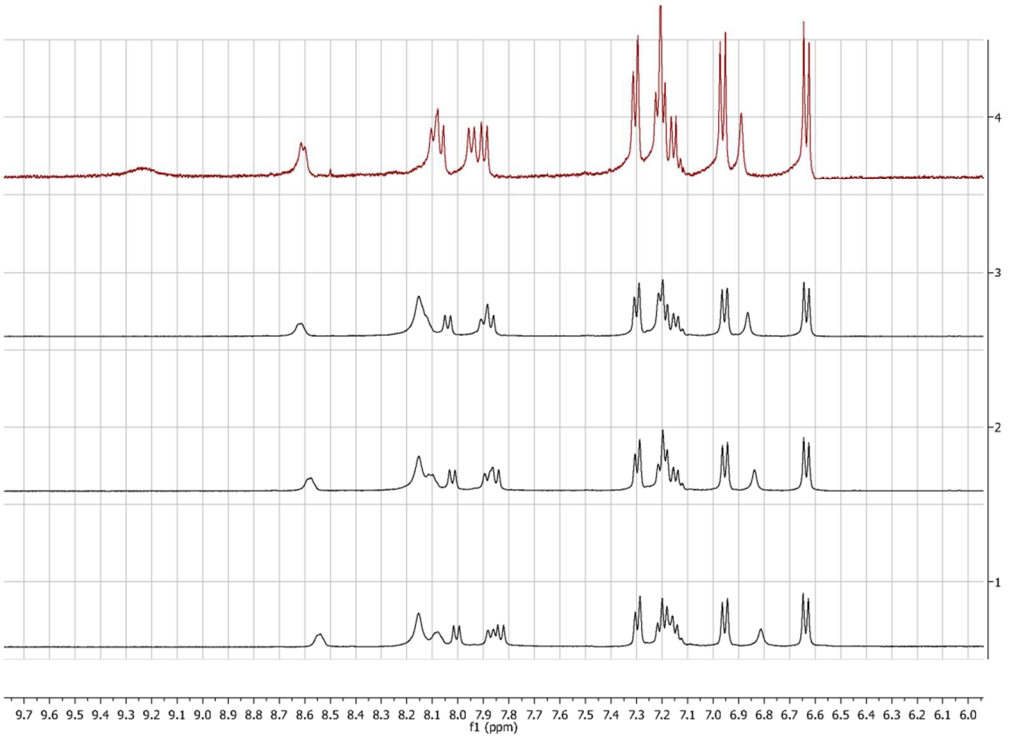
"S5. 2D ^{1}H-^{1}H NOESY NMR (600 MHz, DMSO-d6) spectrum of kahalalide Y".



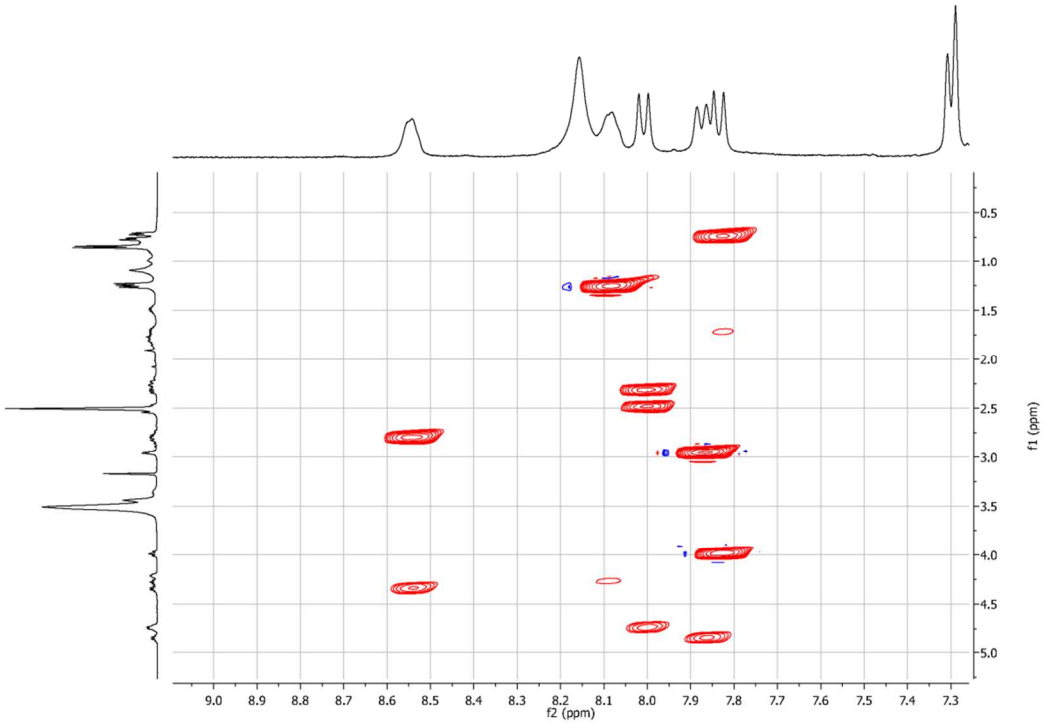
"S6. 2D ^{1}H-^{13}C HMBC NMR (600 MHz, DMSO-d6) spectrum of kahalalide Y".



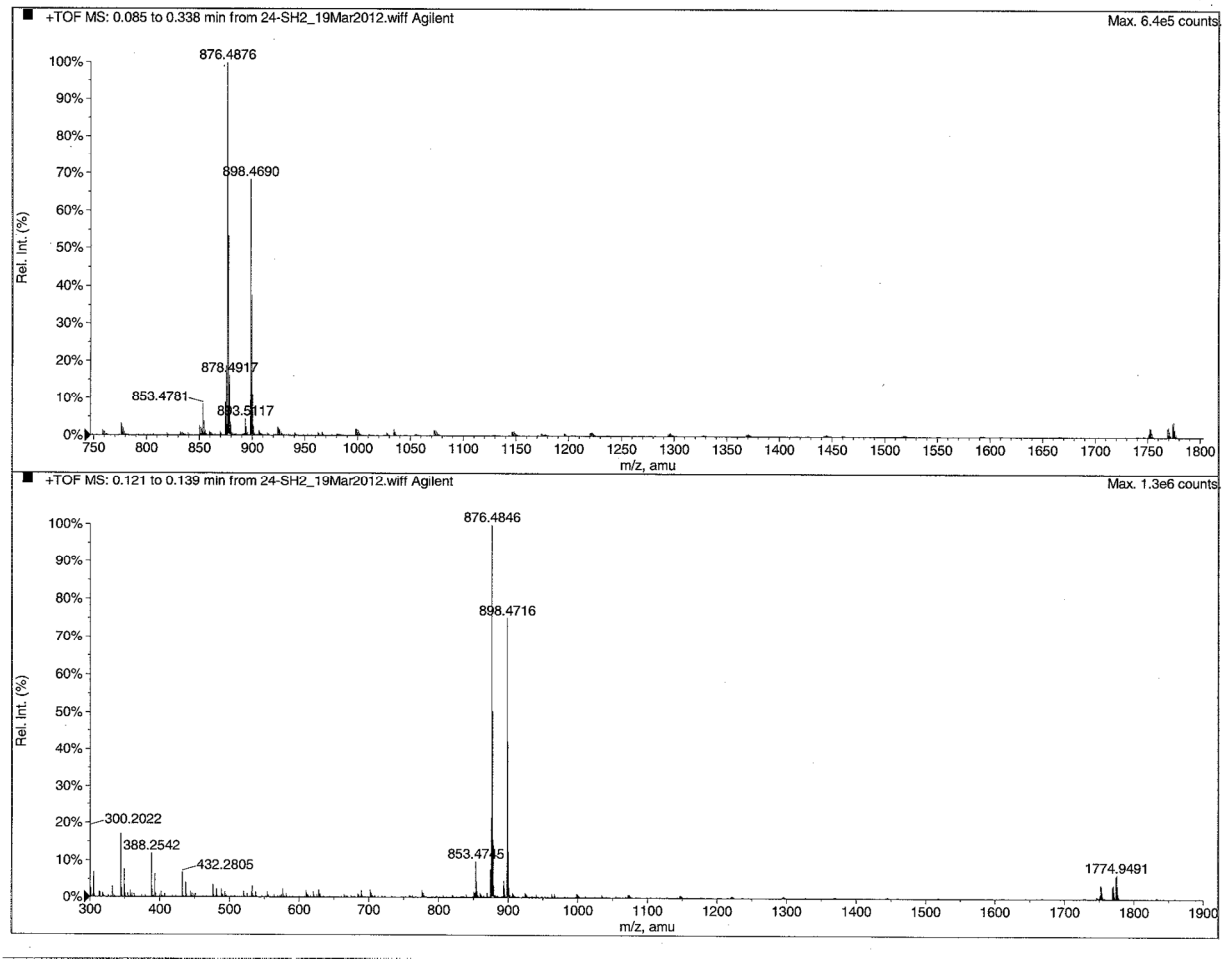
"S7. ^{1}H NMR (600 MHz, CDCl3) spectrum of kahalalide Y at different temperatures 1 at 40 ^{0}C, 2 at 35 ^{0}C, 3 at 30 ^{0}C and 4 at 25 ^{0}C".



"S8. 2D ^{1}H-^{1}H TOCSY NMR (600 MHz, DMSO-d6) spectrum of kahalalide Y at 40 ^{0}C showing amide protons region".



"S9. HRESIMS spectrum of kahalalide Y".



"S10. Measured *r*fV and other properties of the 25 lowest energy *R* stereoisomer conformers".

ID	Potential Energy kJ/mol	r_{fV} (Å)	RMSD* (Å)	ΔG kJ/mol	Boltzmann Population (%)
1	−684.9	10.1	0.1	0.0	23.6
2	−681.7	10.1	1.0	3.1	6.6
3	−681.0	10.3	0.2	3.8	5.1
4	−680.3	9.9	0.2	4.5	3.8
5	−679.9	9.9	0.2	4.1	3.2
6	−679.8	9.9	0.5	5.0	3.1
7	−679.5	9.9	0.1	5.3	2.7
8	−679.3	9.9	0.1	5.5	2.5
9	−679.1	9.9	0.7	5.8	2.3
10	−678.9	10.1	0.4	5.9	2.1
11	−678.7	10.1	0.5	6.2	1.9
12	−678.6	10.0	0.2	6.3	1.8
13	−678.5	10.0	0.1	6.3	1.8
14	−678.3	10.0	0.1	6.6	1.6
15	−678.3	10.0	0.2	6.6	1.6
16	−678.2	10.0	0.1	6.6	1.6
17	−677.9	10.0	0.3	6.9	1.4
18	−677.8	10.0	0.7	7.0	1.4
19	−677.2	9.9	0.1	7.6	1.1
20	−677.1	10.1	0.7	7.7	1.0
21	−677.1	9.9	0.1	7.7	1.0
22	−676.9	9.2	0.9	7.9	1.0
23	−676.9	9.9	0.2	7.9	0.9
24	−676.8	9.9	0.1	8.0	0.9
25	−676.8	9.4	0.2	8.1	0.9

* Root Mean Square Deviation

"S11. Measured r_{fV} and other properties of the 25 lowest energy *S* stereoisomer conformers".

ID	Potential Energy kJ/mol	r_{fV} (Å)	RMSD* (Å)	ΔG kJ/mol	Boltzmann Population (%)
1	−730.0	4.7	0.2	0.0	15.0
2	−728.4	5.4	0.0	1.6	7.8
3	−728.3	5.4	0.1	1.6	7.8
4	−728.2	5.4	0.1	1.7	7.5
5	−728.1	5.1	0.6	1.8	7.1
6	−727.8	5.5	0.2	2.2	6.1
7	−727.2	5.0	0.2	2.7	5.0
8	−726.5	5.7	0.5	3.4	3.8
9	−726.3	5.9	0.7	3.6	3.4
10	−726.1	5.4	0.1	3.8	3.1
11	−725.9	5.3	0.4	4.1	2.8
12	−724.7	5.8	0.6	5.3	1.7
13	−724.2	6.2	0.2	5.7	1.4
14	−724.1	5.9	0.4	5.8	1.4
15	−724.1	4.6	0.1	5.9	1.4
16	−724.0	5.8	0.3	5.9	1.3
17	−723.9	5.9	0.2	6.0	1.3
18	−723.8	5.9	1.5	6.1	1.2
19	−723.6	6.0	0.3	6.3	1.2
20	−723.5	4.9	0.7	6.5	1.1
21	−723.3	6.1	0.3	6.7	1.0
22	−723.2	5.7	0.8	6.8	1.0
23	−722.8	5.4	0.2	7.2	0.8
24	−722.5	5.4	0.2	7.4	0.7
25	−722.3	5.8	0.6	7.6	0.7

* Root Mean Square Deviation