marine drugs

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Supporting Information

Structural Characterization and Heparanase Inhibitory Activity of Fucosylated Glycosaminoglycan from *Holothuria floridana*

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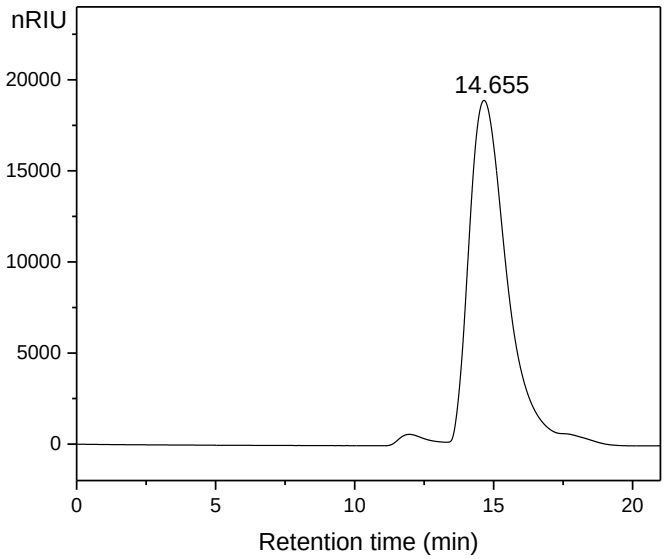


Figure S1. HPLC of 2.0 M fraction (HfFG-2M)

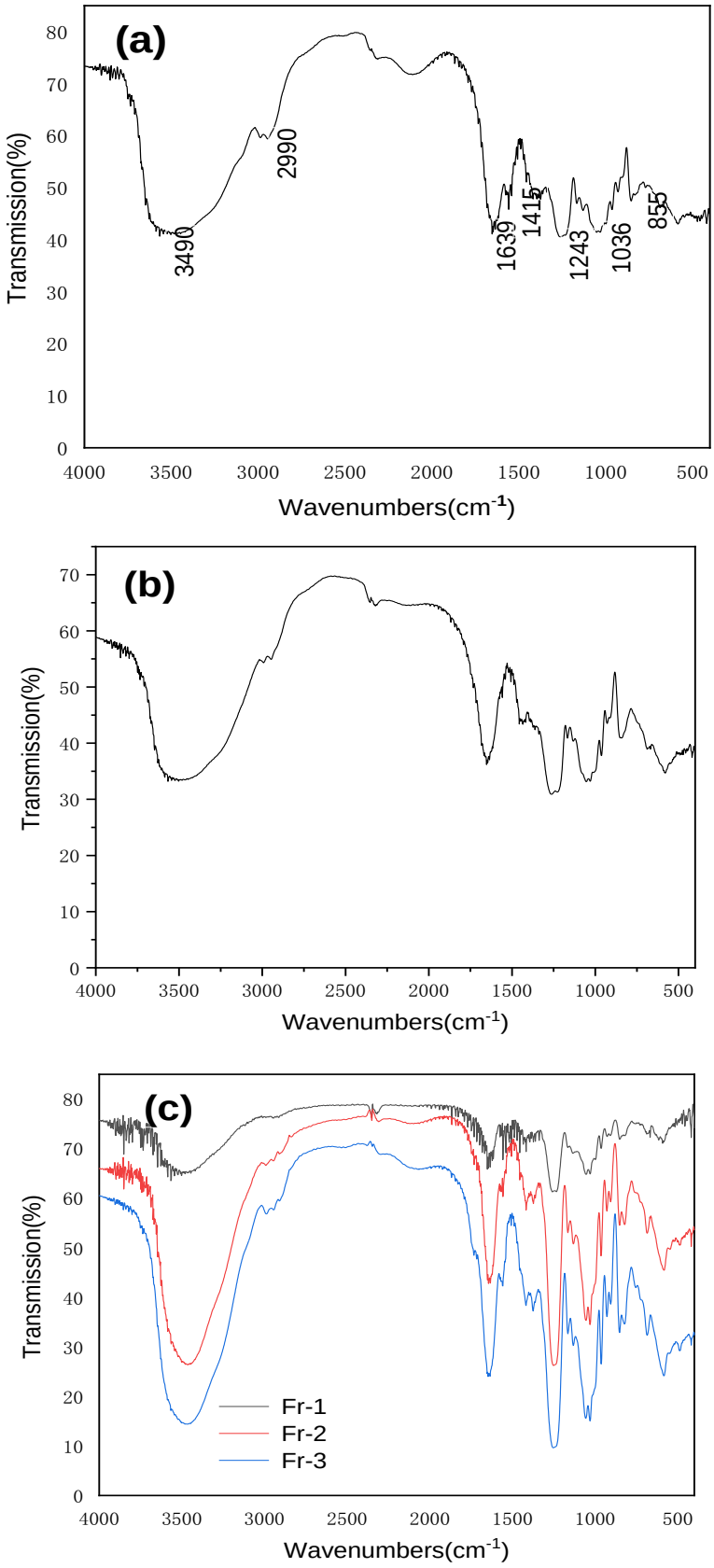


Figure S2. IR spectra of HfFG (**a**), dHfFG (**b**), Fr-1, Fr-2 and Fr-3 (**c**)

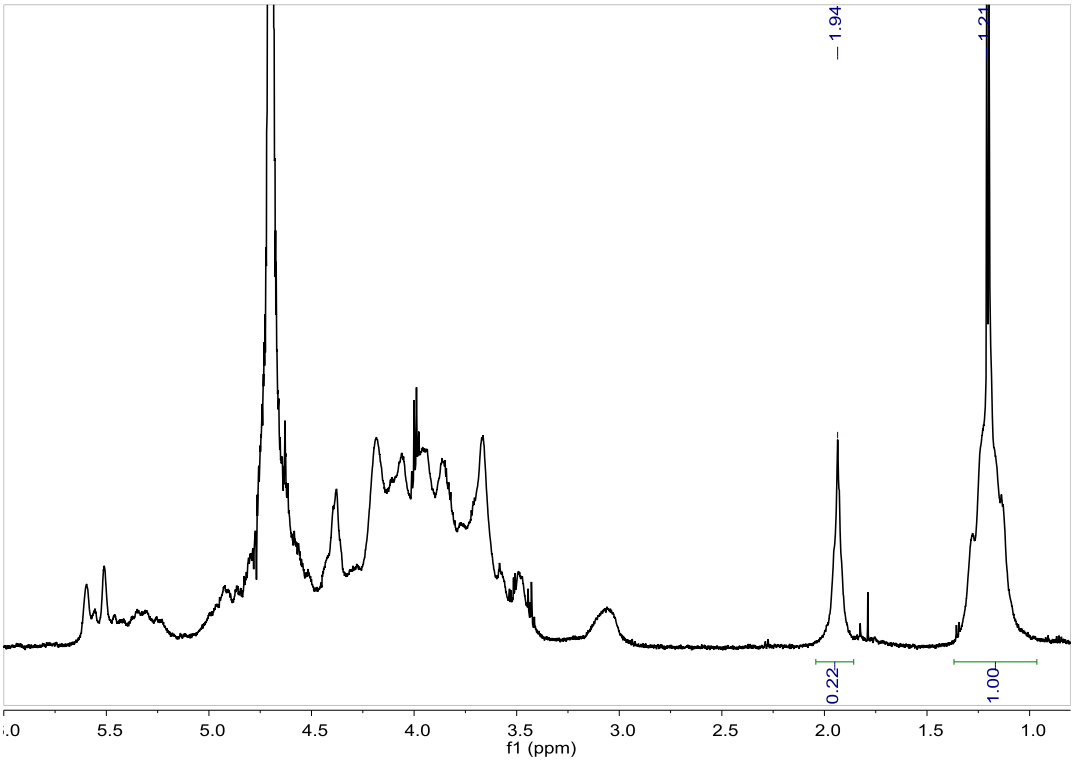
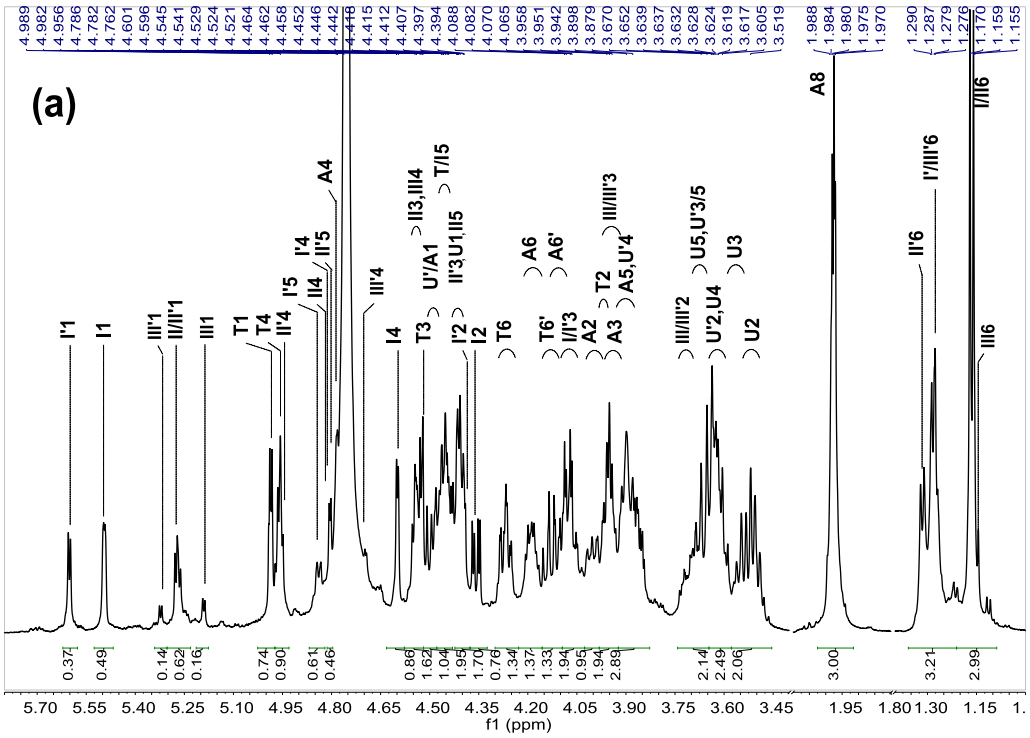
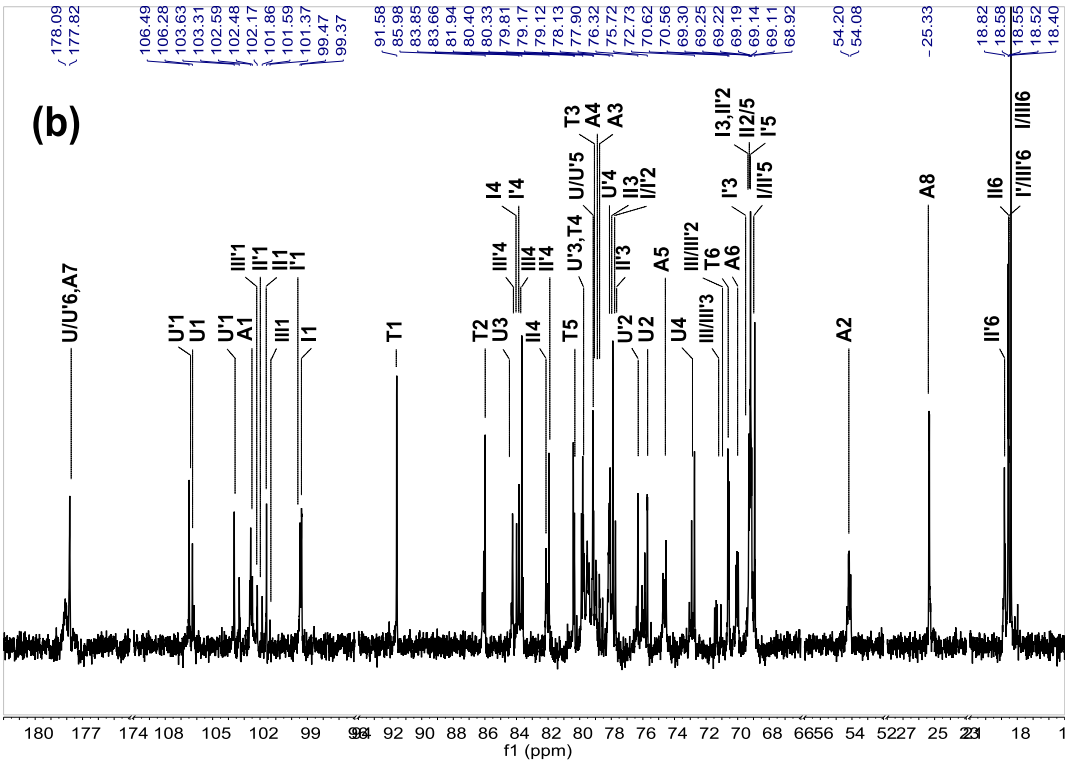
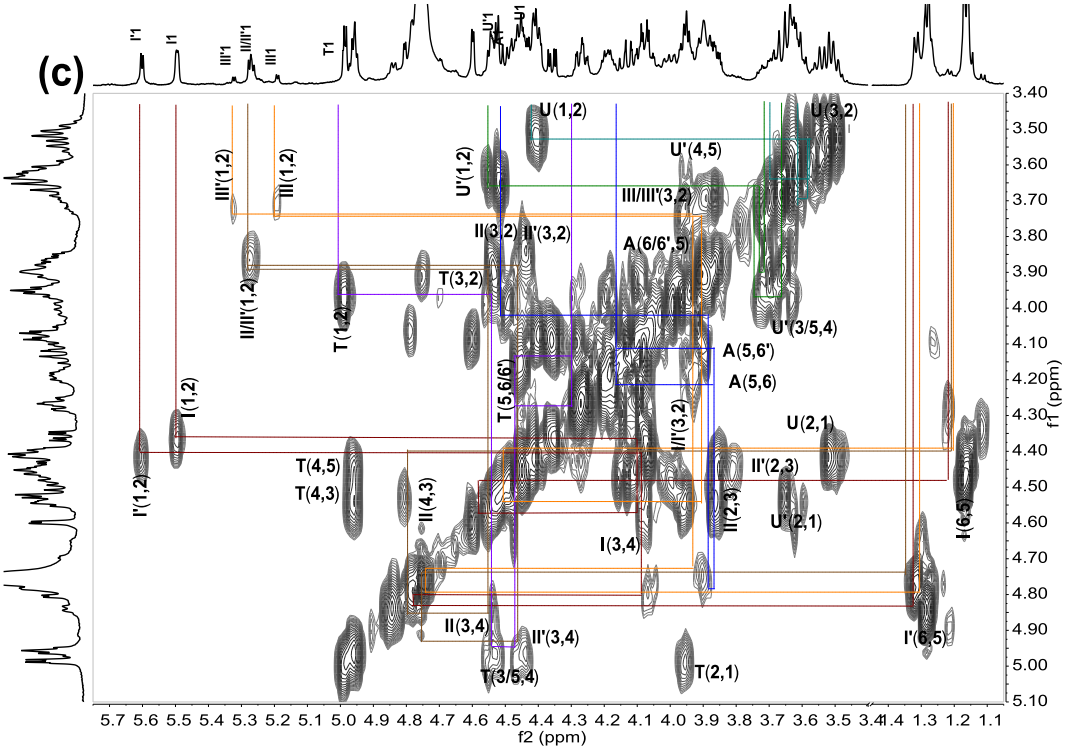
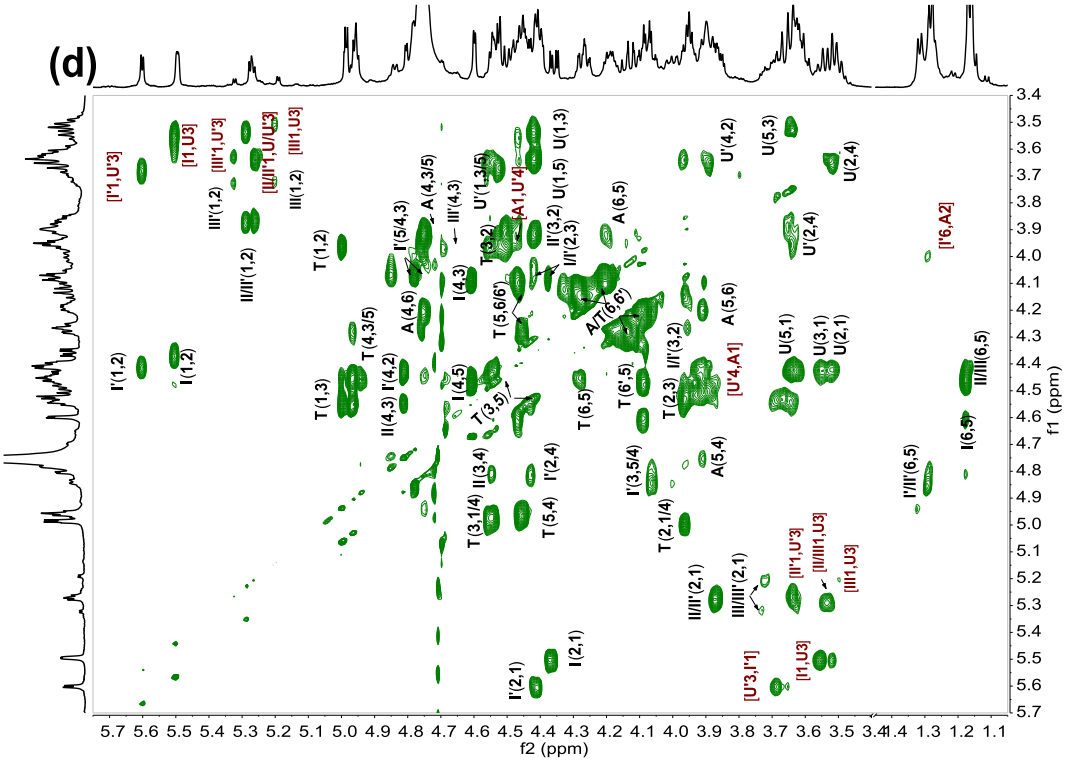


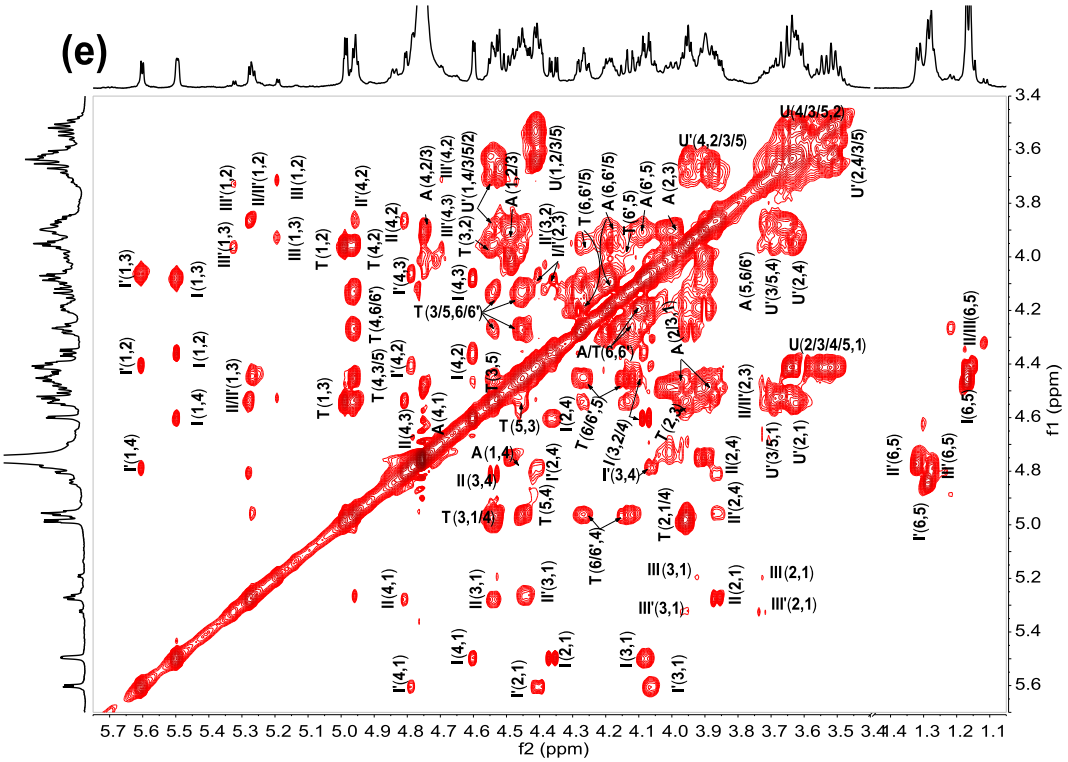
Figure S3. [1]H NMR spectrum of partially deacetylated HfFG




(b)
U/U'6,A7
U'1
U1
U'1
A1
III'1
II'1
III1
II1
I'1
I1
T1
T2
U3
II4
III'4
III4
II'4
I4
I'4
T5
U'3,T4
U/U'5
T3
A4
A3
U'4
II3
I/II'2
II'3
U'2
U2
A5
U4
III/III'3
III/III'2
T6
A6
I3,II'2
II2/5
I'5
I'3
I/II'5
A2
A8
II'6
II6
I'/III'6
I/III6
f1 (ppm)


(c)
I'1
I1
III'1
III/III'1
III1
T1
U'1
U1
U(1,2)
U(3,2)
U'(4,5)
III/III'(3,2)
III'(1,2)
III(1,2)
U'(1,2)
II(3,2)
II'(3,2)
A(6/6',5)
T(3,2)
II/II'(1,2)
T(1,2)
U'(3/5,4)
A(5,6')
A(5,6)
T(5,6/6')
I(1,2)
U(2,1)
I'(1,2)
T(4,5)
T(4,3)
II(4,3)
II'(2,3)
II(2,3)
U'(2,1)
I(3,4)
I(6,5)
II(3,4)
II'(3,4)
I'(6,5)
T(3/5,4)
T(2,1)
f2 (ppm)
f1 (ppm)


(d)
f2 (ppm)
f1 (ppm)


(e)
f2 (ppm)
f1 (ppm)

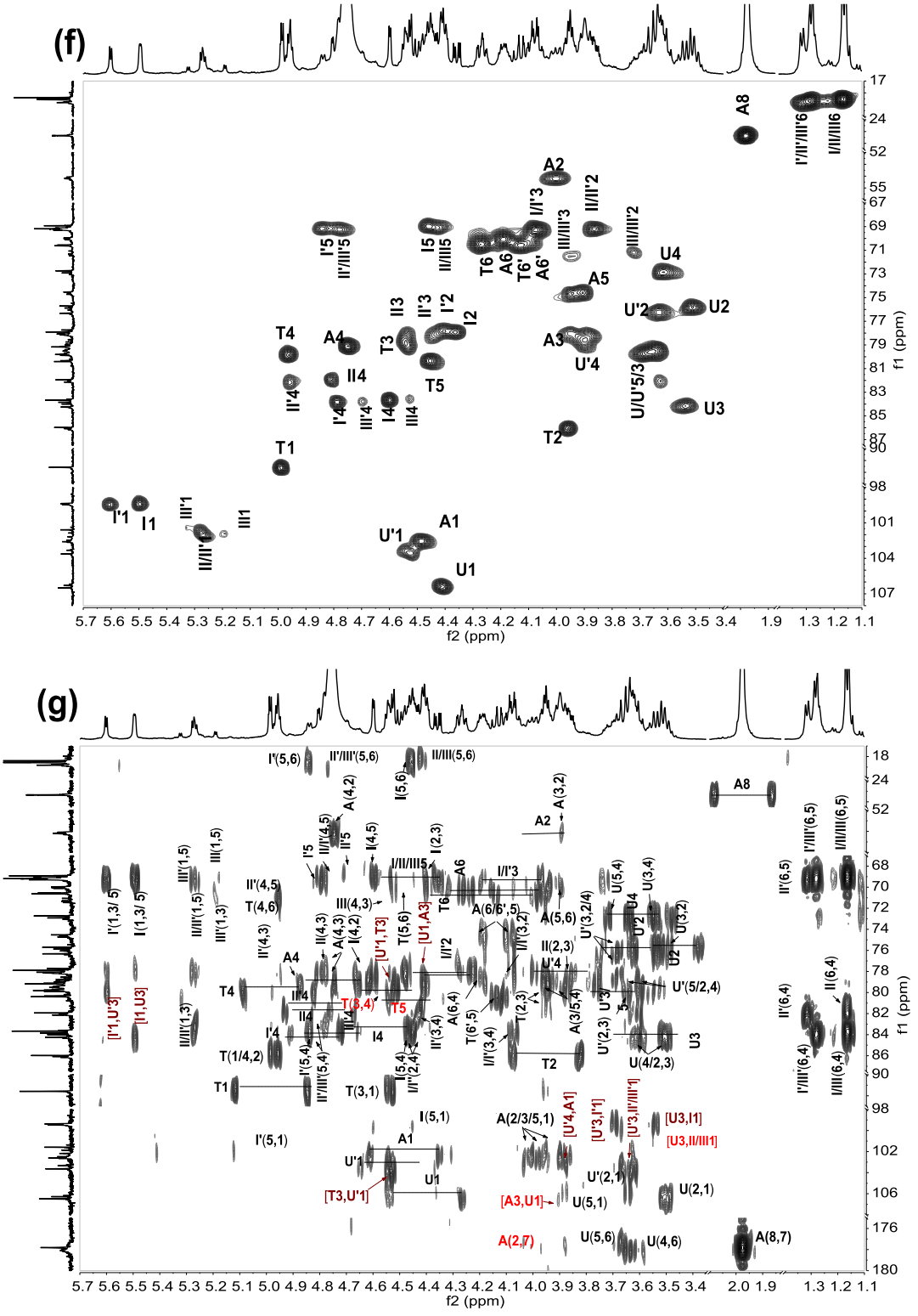


Figure S4. ^{1}H (**a**), ^{13}C (**b**), ^{1}H-^{1}H COSY (**c**), TOCSY (**d**), ROESY (**e**), ^{1}H-^{13}C HSQC (**f**) and HMBC (**g**) spectra of Fr-1

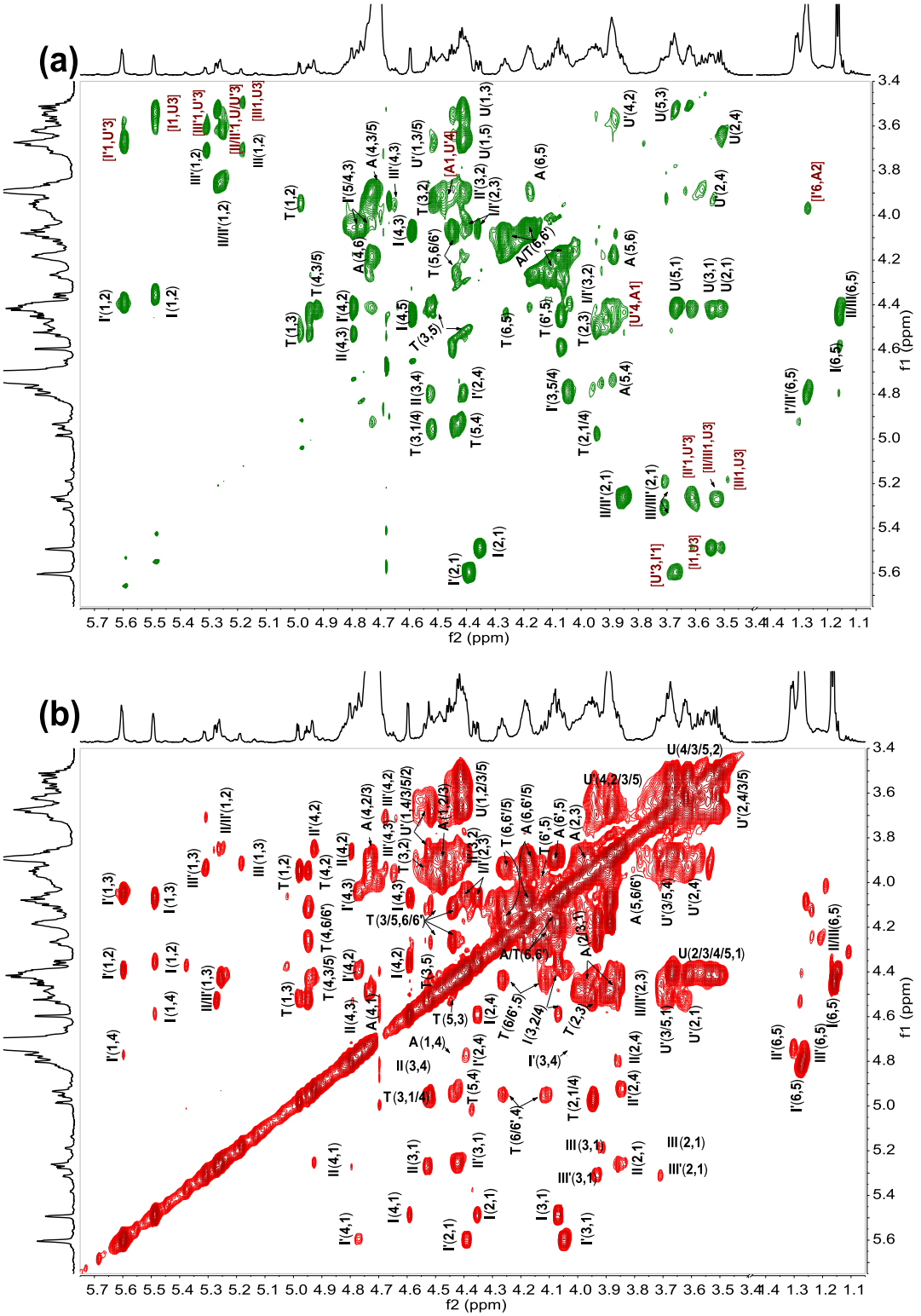


Figure S5. ^{1}H-^{1}H ROESY (**a**) and TOCSY (**b**) spectra of Fr-2

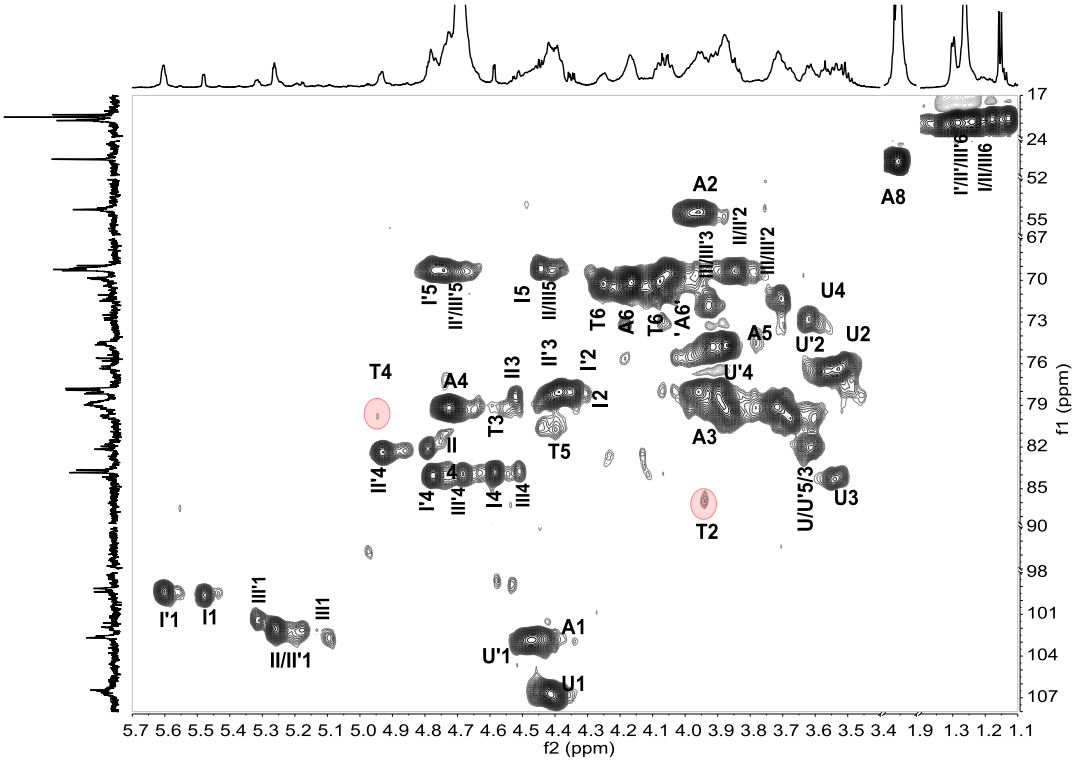


Figure S6. ^{1}H-^{13}C HSQC spectrum of Fr-3

Table S1. $^{1}H/^{13}C$ NMR chemical shift assignments of Fr-1 (800 MHz, D_2O)

Residue		Chemical shift (ppm)								
		H/C	1	2	3	4	5	6	7	8
T	→3)-β-D-anTal$_{4S6S}$-diol	H	4.985	3.954	4.526	4.96	4.455	4.267/4.130		
		C	91.59	85.98	79.14	79.7	80.4	70.63		
U′	→4)-β-D-GlcA-(1→	H	4.533	3.631	3.67	3.9	3.673			
		C	103.64	76.33	79.85	78.15	79.32	177.34		
A	→3)-β-D-GalNAc$_{4S6S}$-(1→	H	4.487	4.003	3.95	4.75	3.906	4.105/4.190		
		C	102.6	54.14	78.9	79.05	74.53	69.97	177.82	25.35
F′ (I′)	α-L-Fuc$_{2S4S}$-(1→	H	5.605	4.404	4.073	4.788	4.842	1.276		
		C	99.48	77.91	69.3	83.67	69.06	18.82		
F′ (II′)	α-L-Fuc$_{3S4S}$-(1→	H	5.267	3.864	4.44	4.951	4.782	1.317		
		C	101.86	69.2	77.74	81.95	68.93	18.76		
F′(III′)	α-L-Fuc$_{4S}$-(1→	H	5.317	3.72	3.943	4.698	4.753	1.269		
		C	101.92	71.29	71.47	84	68.98	18.53		
U	D-GlcA-(1→	H	4.414	3.511	3.544	3.612	3.671			
		C	106.49	75.72	84.25	72.73	79.32	177.82		
F (I)	α-L-Fuc$_{2S4S}$-(1→	H	5.497	4.36	4.083	4.602	4.458	1.167		
		C	99.37	77.91	69.2	83.85	68.93	18.4		
F (II)	α-L-Fuc$_{3S4S}$-(1→	H	5.271	3.86	4.537	4.807	4.407	1.167		
		C	101.6	69.12	78.09	82.14	69.12	18.55		
F (III)	α-L-Fuc$_{4S}$-(1→	H	5.191	3.716	3.943	4.529	4.407	1.143		
		C	101.36	71.29	71.47	83.59	68.98	18.4		