Furan Conjugated Tripeptides as Potent Antitumor Drugs

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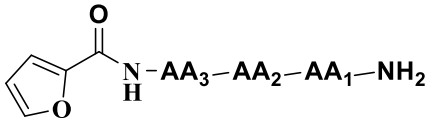
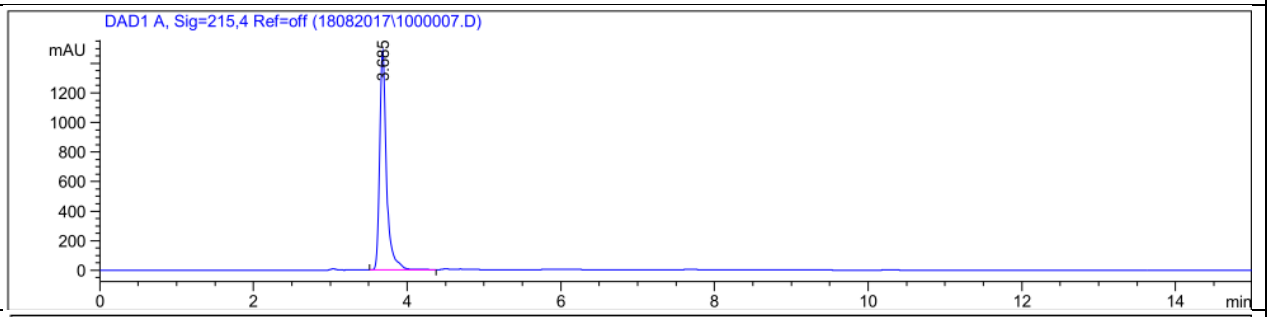
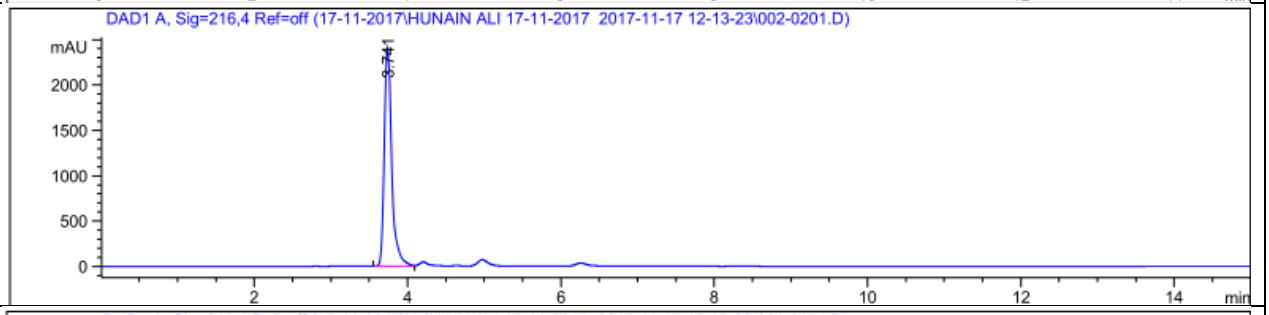
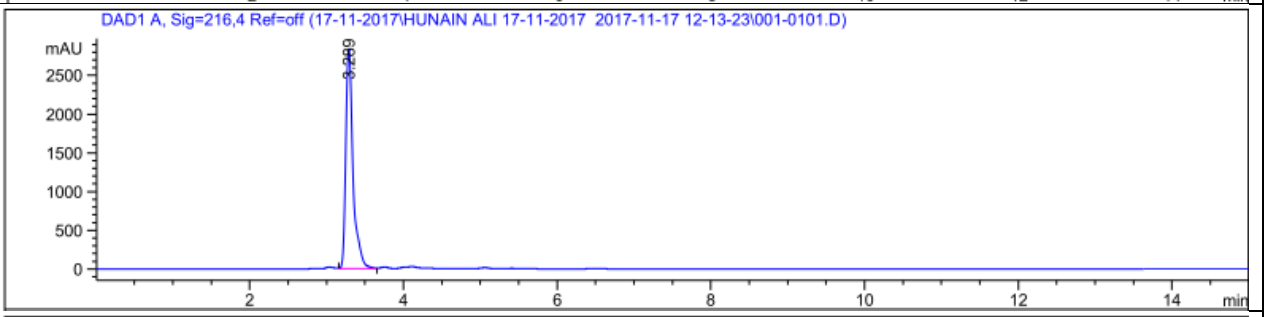
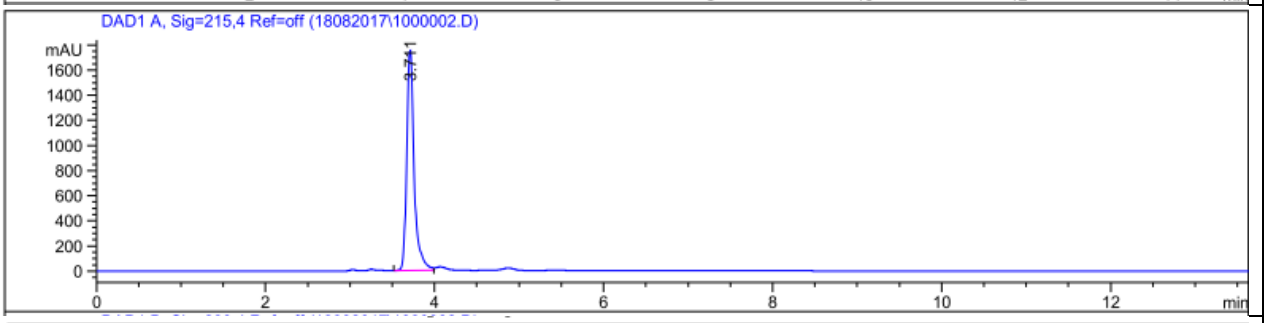
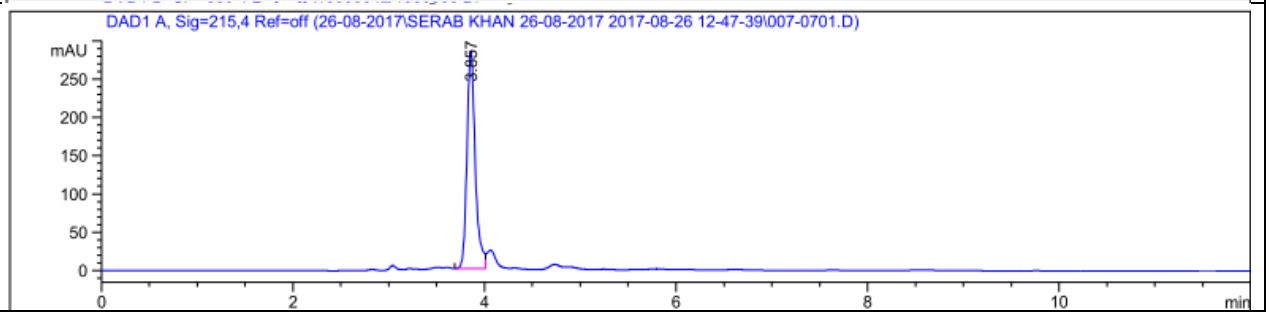


Conjugate No.	AA_3	AA_2	AA_1	Conjugate No.	AA_3	AA_2	AA_1
1	D-2-Nal	D-Phe	D-Ala	**11**	L-Tyr	D-Phe	D-Ala
2	L-2-Nal	L-Phe	L-Ala	**12**	D-Ala	D-Phe	D-Ala
3	L-2-Nal	L-Ala	L-Ala	**13**	D-Ala	D-Phe	Gly
4	L-2-Nal	L-Ala	L-Phe	**14**	D-Ala	D-Phe	L-Lys
5	L-2-Nal	L-2-Nal	L-Ala	**15**	D-Ala	L-2-Nal	D-Ala
6	L-Phe	L-2-Nal	L-Ala	**16**	D-Ala	L-Ile	D-Ala
7	L-Ala	L-2-Nal	L-Phe	**17**	D-Ala	L-Arg	D-Ala
8	L-Ala	L-Phe	L-2-Nal	**18**	D-Ala	D-Phe	-
9	L-2-Nal	L-Tyr	L-Ala	**19**	L-2-Nal	D-Phe	L-*N*-Me-Ala
10	L-2-Nal	L-Phg	L-Ala	**20**	L-2-Nal	D-Phe	L-Ala

Figure S1: Structures of peptide conjugates 1-20

Peptide Conjugate	UPLC Profile of Peptide Conjugates in ACN:H_2O:TFA::60:40:0.08 at 215 nm
1	
2	
3	
4	
5	

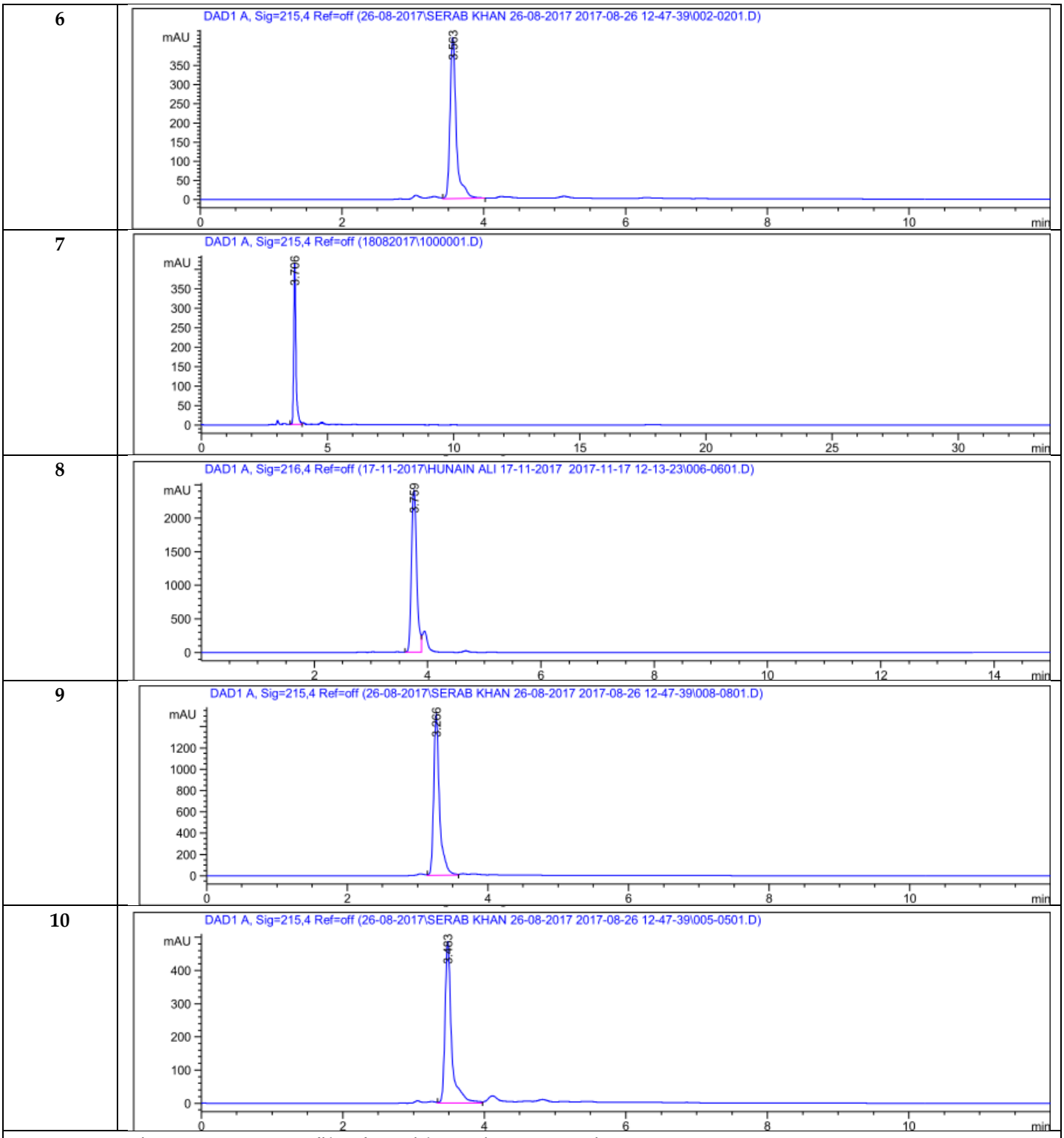
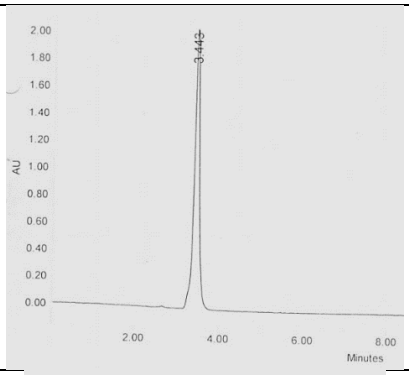
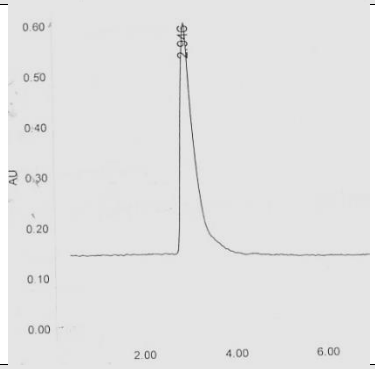
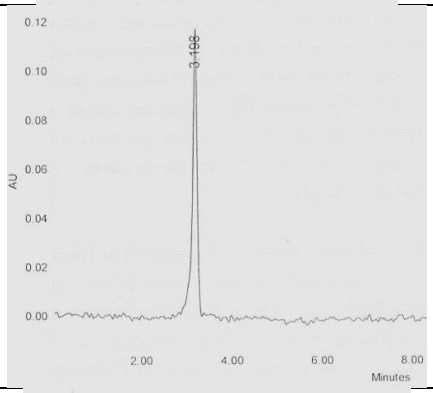
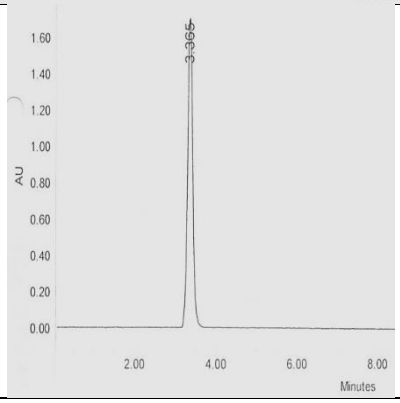
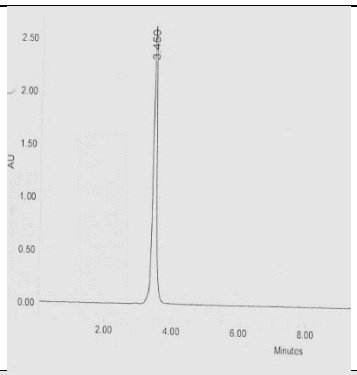
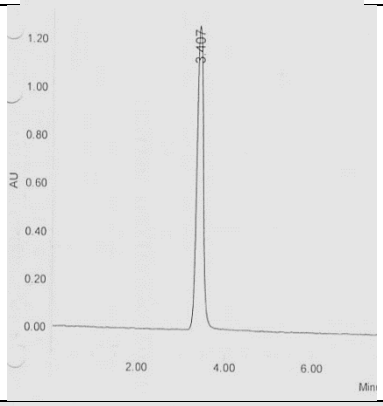
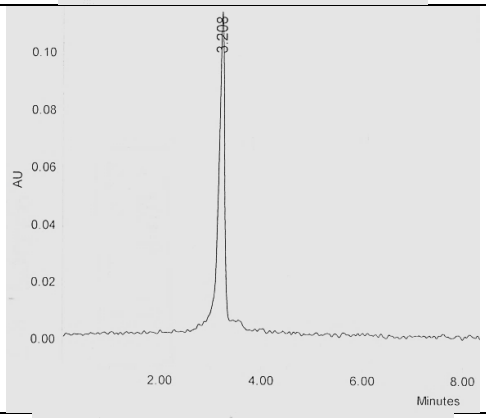
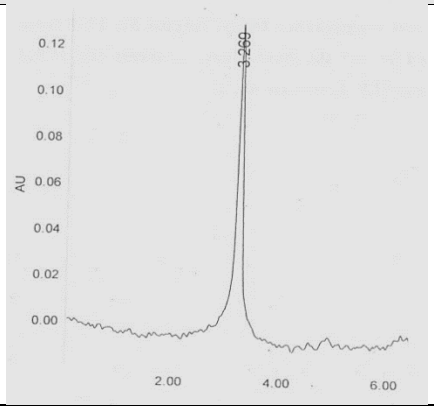


Figure S2: UPLC Profile of Peptide Conjugates 1-10 in ACN:H_2O:TFA::60:40:0.08 at 215 nm

Peptide Conjugate	UPLC Profile of Peptide Conjugates	Wavelength (nm)
11		262.9
12		297.6
13		253.8
14		287.7

15		276.7
16		267.8
17		309.4
18		278.9

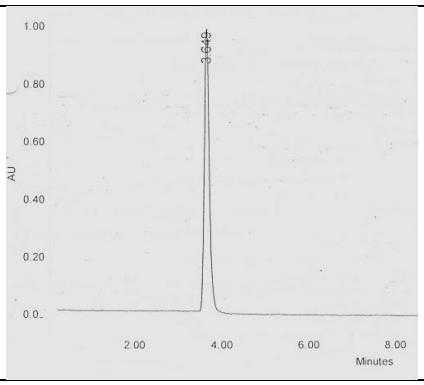
20			236.5

Figure S3: UPLC Profile of Peptide Conjugates 11-18 and 20

Table S1. ^{1}H-NMR (600 MHz) and ^{13}C-NMR (150 MHz) data of conjugate 1-5 in DMSO-d_6

1			2			3			4			5		
Residue	**δ_H**	**δ_C**	**Residue**	**δ_H**	**δ_C**	**Residue**	**δ_H**	**δ_C**	**Residue**	**δ_H**	**δ_C**	**Residue**	**δ_H**	**δ_C**
D-Ala^1			**L-Ala^1**			**L-Ala^1**			**L-Phe^1**			**L-Ala^1**		
α	4.16 p (7.2 Hz)	48.3	*α*	4.16 p (7.2 Hz)	48.3	*α*	4.18 p (7.2 Hz)	48.9	*α*	4.40 td (4.8, 8.4 Hz)	53.7	*α*	4.22 p (7.2 Hz)	48.3
CH_3	1.20 d (7.2 Hz)	18.0	CH_3	1.20 d (7.2 Hz)	18.0	CH_3	1.20 d (6.6 Hz)	18.2	*β, β′*	3.00 dd (4.8, 13.8 Hz). 2.85 dd (8.4, 13.8 Hz)	37.5	CH_3	1.23 d (7.2 Hz)	18.0
NH	8.04 d (7.2 Hz)	-	NH	8.04 d (7.2 Hz)	-	NH	7.84 d (7.8 Hz)	-	1	-	137.7*	NH	7.60 br. s	-
C=O	-	174.3	C=O	-	174.3	C=O	-	175.6	2, 6	7.80 m	127.5	C=O	-	174.3
NH_2	7.71 br. s	-	NH_2	7.71 br. s	-	NH_2	7.80 br. s	-	3, 5	7.45 m	126.1	NH_2	7.0 br. s, 8.1 d (7.8 Hz)	-
D-Phe^2			**L-Phe^2**			**L-Ala^2**			4	7.74 m	127.8	**L-2-Nal^2**		
α	4.53 td (4.2, 8.4 Hz)	54.1	*α*	4.53 td (4.2, 8.4 Hz)	54.1	*α*	4.30 p (7.2 Hz)	49.3	NH	7.83 m	-	*α*	4.65 td (4.2, 8.4 Hz)	63
β, β′	3.1 dd (3, 13.2 Hz), 2.80 dd (9, 13.8 Hz)	37.5	*β, β′*	3.10 dd (3, 13.2 Hz), 2.80 dd (9, 13.8 Hz)	37.5	CH_3	1.26 d (7.2 Hz)	18.5	C=O	-	172.8	*β, β′*	3.13 dd (4.2, 13.8 Hz), 3.07 dd (8.4, 13.8 Hz)	51
1	-	137.7*	1	-	137.7*	NH	8.36 d (7.2 Hz)	-	NH_2	7.35 br. s	-	1	7.75* m	127*
2, 6	7.15 m	126.5	2, 6	7.15 m	126.5	C=O	-	172.8	**L-Ala^2**			2	-	133
3, 5	7.60 m	127.6	3, 5	7.60 m	127.6	**L-2–Nal^3**			*α*	4.25 p (7.2 Hz)	48.7	3	7.75* m	127*
4	7.22 m	127.4	4	7.22 m	127.4	*α*	4.71 td (4.2, 9 Hz)	54.7	CH_3	1.20 d 7.2 Hz)	18.0	4	7.75* m	128*
NH	8.24 d (7.8 Hz)	-	NH	8.24 d (7.8 Hz)	-	*β, β′*	3.13 m, 3.18 m	37.8	NH	8.30 d (7.2 Hz)	-	5, 8	7.71* m	126
C=O	-	171.9	C=O	-	171.9	1	7.38 m	125.5*	C=O	-	171.9	6, 7	7.71* m	128*
D-2–Nal^3			**L-2–Nal^3**			2	-	135.9	**L-2–Nal^3**			9	-	134
α	4.70 td (4.2, 9.6 Hz)	54.1	*α*	4.70 td (4.2, 9.6 Hz)	54.1	3	7.40 m	125.6*	*α*	4.78 td (3.6, 8.4 Hz)	54.0	10	-	133
β, β′	3.10 dd (10.2, 13.2 Hz), 3.20 dd (4.2, 13.8 Hz)	37.3	*β, β′*	3.10 dd (10.2, 13.2 Hz), 3.20 dd (4.2, 13.8 Hz)	37.3	4	7.70 m	127.5	*β, β′*	3.20 dd (3.6, 13.8 Hz), 3.09 dd (10.2, 13.8 Hz)	37.2	NH	8.29 d (7.8 Hz)	-
1	7.38 m	125.5	1	7.38 m	125.5	5, 8	7.19 m	128.1	1, 4	7.19* m	129.2*	C=O	-	170.3
2	-	137.7*	2	-	137.7*	6, 7	7.25 m	129.2	2	-	137.7*	**L-2–Nal^3**		
3	7.40 m	125.6	3	7.40 m	125.6	9	-	133.0	3,5	7.20 m	128.1	*α*	4.73 td (4.2, 9.0 Hz)	54.1
4	7.70 m	127.5	4	7.70 m	127.5	10	-	131.0	6	7.12 m	126.3	*β, β′*	3.01 dd (9.0, 13.8 Hz), 3.25 dd (4.2, 13 Hz)	37.3
5, 8	7.19 m	128.1	5, 8	7.19 m	128.1	NH	8.38 d (8.4 Hz)	-	7, 8	7.19* m	129.2*	1	7.42 m	128*
6, 7	7.25 m	129.2	6, 7	7.25 m	129.2	C=O	-	170.0	9,10	-	131.0*	2	-	134
9	-	133.0	9	-	133.0	**2-Furoyl^4**			NH	8.38 d (8.4 Hz)	-	3	7.40 m	125.6
10	-	131.0	10	-	131.0	C	-	147.3	C=O	-	171.1	4	7.70* m	127.5
NH	8.27 d (8.4 Hz)	-	NH	8.27 d (8.4 Hz)	-	*α*	7.05 d (3.6 Hz)	115.6	**2-Furoyl^4**			5, 8	7.39 m	125.1
C=O	-	170.0	C=O	-	170.0	*β*	6.53 dd (1.8, 3.6 Hz)	112.7	C	-	147.3	6, 7	7.39 m	127.2
2-Furoyl^4			2-**Furoyl^4**			*γ*	7.76 br. s	146.3	*α*	7.05 d (3.6 Hz)	114.6	9	-	133.0
C	-	147.3	C	-	147.3	C=O	-	157.7	*β*	6.54 dd (1.8, 3.6 Hz)	111.9	10	-	132
α	7.05 d (3.6 Hz)	114.6	*α*	7.05 d (3.6 Hz)	114.6				*γ*	7.74 br. s	145.3	NH	8.30 d (8.4 Hz)	-
β	6.53 dd (1.8, 3.6 Hz)	112.1	*β*	6.53 dd (1.8, 3.6 Hz)	112.1				C=O	-	157.7	C=O	-	170.0
γ	7.76 br. s	145.3	*γ*	7.76 br. s	145.3							**2-Furoyl^4**		
C=O	-	157.7	C=O	-	157.7							C	-	147.3
												α	7.05 d (3.0 Hz)	114.6
												β	6.53 dd (1.8, 3.0 Hz)	112.1
												γ	7.76 br. s	145.3
												C=O	-	157.7

Table S2: ^{1}H-NMR (600 MHz) and ^{13}C-NMR (150 MHz) data of conjugate 6-10 in DMSO-d$_6$

6			7			8			9			10		
Residue	**δ_H**	**δ_C**	**Residue**	**δ_H**	**δ_C**	**Residue**	**δ_H**	**δ_C**	**Residue**	**δ_H**	**δ_C**	**Residue**	**^{1}H (δ, ppm)**	**δ_C**
L-Ala[1]			**L-Phe[1]**			**L-2–Nal[1]**			**L-Ala[1]**			**L-Ala[1]**		
α	4.19 p (7.2 Hz)	48.2	*α*	4.44 td (4.8, 8.4 Hz)	54.2	*α*	4.45 td (4.8, 9 Hz)	53.9	*α*	4.18 p (7.2 Hz)	48.2	*α*	4.23 p (7.2 Hz)	48.5
CH_3	1.23 d (7.2 Hz)	18.4	*β, β'*	2.85 dd (9, 13.8 Hz), 3.05 dd (4.8, 13.8 Hz)	37.5	*β, β'*	3.15 dd (4.8, 13.2 Hz), 2.98 dd (9, 13.2 Hz)	37.8	CH_3	1.20 d (7.2 Hz)	18.4	CH_3	1.17 d (7.2 Hz)	18.6
NH	8.22 d (7.2 Hz)	-	1	-	135.4	1	7.42 m	128.3	NH	8.04 d (7.2 Hz)	-	NH	8.37 d (7.2 Hz)	-
NH_2	7.78 br. s	-	2, 6	7.60 m	127.6	2	-	137.9	NH_2	7.80 d (7.2 Hz)	-	NH_2	7.80 br. s	-
C=O	-	174.2	3, 5	7.30 m	126.5	3	7.31 m	128.1	C=O	-	174.3	C=O	-	174.7
L-2–Nal[2]			4	7.10 m	126.0	4	7.77 m	125.6	**L-Tyr[2]**			**L-Phg[2]**		
α	4.65* m	54.0	NH	8.01 d (8.4 Hz)	-	5, 8	7.41 m	125*	*α*	4.47 td (4.2, 8.4 Hz)	54.4	*α*	5.54 d (7.8 Hz)	56.6
β, β'	2.95 m, 2.87 m	36.9	C=O	-	173.0	6, 7	7.78 m	126	*β, β'*	2.70 dd (8.4, 13.8 Hz), 2.92 (4.2, 13.8 Hz)	36.7	1	-	135.9
1	7.38 m	125.5	NH_2	7.80 d (7.8 Hz)	-	9	-	133.1	1	--	130.3	2, 6	7.40* m	127.7
2	-	137.9	**L-2–Nal[2]**			10	-	131.9	2, 6	7.00* m	127.6	3, 5	7.70 m	126.1
3	7.70 m	127.5	*α*	4.55 td (4.8, 8.4 Hz)	54.1	NH	7.99 d (8.4 Hz)	-	3, 5	7.00* m	127.9	4	7.40* m	126.1
4	7.40 m	125.6	*β, β'*	2.96 dd (9, 13.8 Hz), 3.11 dd (4.8, 13.8 Hz)	37.7	NH_2	7.82 br. s	-	4	-	155.9	NH	8.69 d (7.8 Hz)	-
5, 8	7.19 m	128.1	1	7.65* m	128.1*	C=O	-	174.5	NH	8.24 d (7.8 Hz)	-	C=O	-	169.5
6, 7	7.25 m	129.2	2	-	137.9	**L-Phe[2]**			OH	9.13 br. s	-	**L-2–Nal[3]**		
9	-	133.0	3	7.65* m	128.1*	*α*	4.53 td (5.5, 8.4 Hz)	54.2	C=O	-	171.1	*α*	4.92 td (4.2, 10.2 Hz)	54.3
10	-	131.0	4	7.40 m	125.6	*β, β'*	2.73 dd (9, 13.8 Hz), 2.90 dd (4.8, 13.8 Hz)	37.8	**L-2–Nal[3]**			*β, β'*	3.14 m, 3.18 m	37.6
NH	8.09 d (7.2 Hz)	-	5, 8	7.35 m	127.5	1	-	135.4	*α*	4.75 td (4.2, 9.6 Hz)	54.1	1	7.26 m	128.4
C=O		171.1	6, 7	7.72 m	129.3	2, 6	7.07 m	124	*β, β'*	3.06 dd (10.2, 13.8 Hz), 3.15 dd (4.2, 13.8 Hz)	37.3	2	-	138.30
L-Phe[3]			9	-	133.1	3, 5	7.08 m	123	1	7.38 m	125.5	3	7.05 m	127.8
α	4.65* m	54.1	10	-	131.9	4	7.09 m	125*	2	-	135.7	4	7.15 m	127.7
β, β'	3.22 m, 2.97 m	37.6	NH	8.06 d (7.8 Hz)	-	NH	8.03 d (7.8 Hz)	-	3	7.40 m	125.6	5, 8	7.30 m	128.1
1	--	135.4	C=O	-	172.3	C=O	-	171.5	4	7.70 m	127.5	6, 7	7.40* m	128.9
2, 6	7.15 m	126.5	**L-Ala[3]**			**L-Ala[3]**			5, 8	7.19* m	128.1	9	-	133.4
3, 5	7.60 m	127.6	*α*	4.28 p (7.2 Hz)	48.8	*α*	4.31 p (7.2 Hz)	48.3	6, 7	7.25 m	129.2	10	-	132.3
4	7.22 m	127.4	CH_3	1.19 d (7.2 Hz)	17.8	CH_3	1.15 d (7.2 Hz)	17.1	9	-	133.0	NH	8.44 d (8.4 Hz)	-
NH	8.27 d (8.4 Hz)	-	NH	8.21 d (7.2 Hz)	-	NH	8.16 d (7.2 Hz)	-	10	-	131.0	C=O		171.5
C=O	-	170.4	C=O	-	170.7	C=O	-	170.1	NH	8.35 d (8.4 Hz)	-	**2-Furoyl[4]**		
2-Furoyl[4]			**2-Furoyl[4]**			**2-Furoyl[4]**			C=O	-	170.8	C	-	147.5
C	-	147.3	C	-	147.3	C	-	147.1	**2-Furoyl[4]**			*α*	6.94 br. s	114.5
α	7.02 d (3 Hz)	114.1	*α*	7.07 br. s	114.3	*α*	7.12 d (3.6 Hz)	114.1	C	-	147.3	*β*	6.55 dd (1.8, 3.6 Hz)	112.5
β	6.57 dd (1.2, 3 Hz)	112	*β*	6.6 dd (1.8, 3.6 Hz)	112.9	*β*	6.61 dd (1.8, 3.6 Hz)	112	*α*	7.19* br. s	114.1	*γ*	7.70 br. s	145.8
γ	7.77 br. s	145.3	*γ*	7.75 br. s	145.4	*γ*	7.78 br. s	145.3	*β*	6.56 dd (1.8, 3.6 Hz)	112.1	C=O	-	158.4
C=O	-	157.6	C=O	-	157.8	C=O	-	158.4	*γ*	7.74 br. s	145.3			
									C=O	-	157.7			

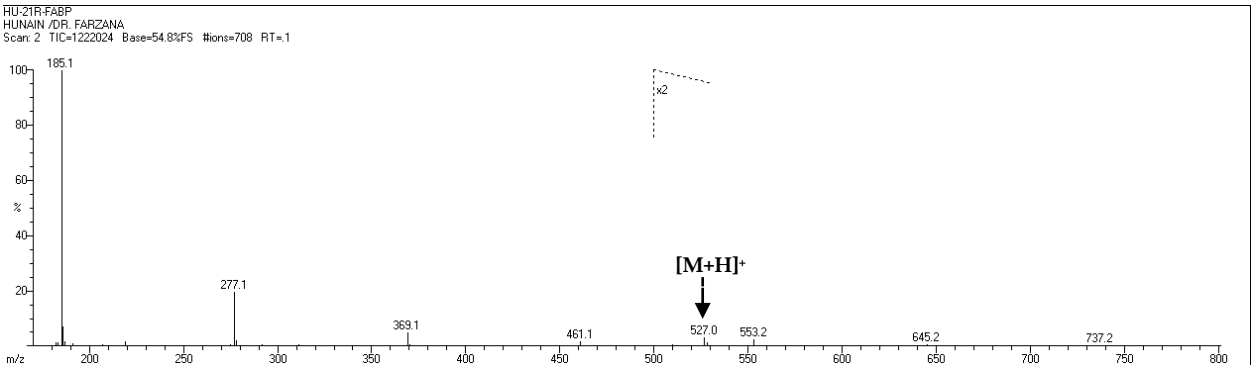


Figure S4: FABMS (Low Resolution Positive Mode) of Conjugate 1

HEJ-MASS LAB -ICCBS				JEOL HX 110 MASS SPECTROMETER (FAB-HR)			
STUDENT NAME		HUNAIN ALI		SAMPLE CODE		DATE	14-11-17
SUPERVISOR NAME		Prof.Dr. Farzana Shaheen		HU-21R		FAB (+VE / -VE)	FAB +VE
Mass	Theoretical Mass	Delta [ppm]	Delta [mmu]	RDB	Composition		
527.2305	527.2308	-0.5	-0.3	17	C32 H33 O6 N1		
	527.2294	2	1.1	17.5	C30 H31 O5 N4		
	527.2326	-4.1	-2.1	4	C20 H37 O13 N3		
	527.2281	4.5	2.4	12.5	C29 H35 O9		
	527.2335	-5.6	-3	21.5	C35 H31 O3 N2		
	527.234	-6.6	-3.5	3.5	C22 H39 O14		
	527.2268	7.1	3.7	13	C27 H33 O8 N3		
	527.2353	-9.1	-4.8	8.5	C23 H35 O10 N4		

Figure S5: FABMS (High Resolution Positive Mode) of Conjugate 1

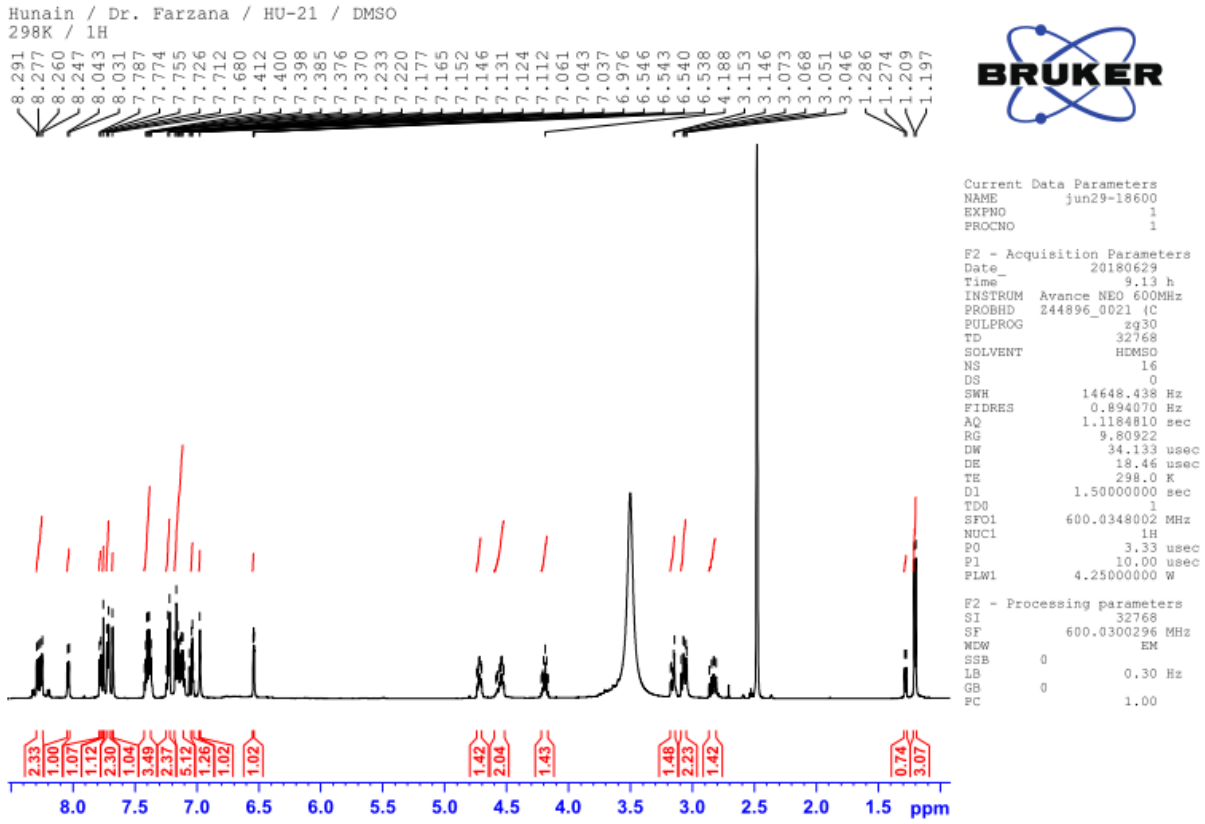


Figure S6: ^{1}H-NMR of Conjugate 1

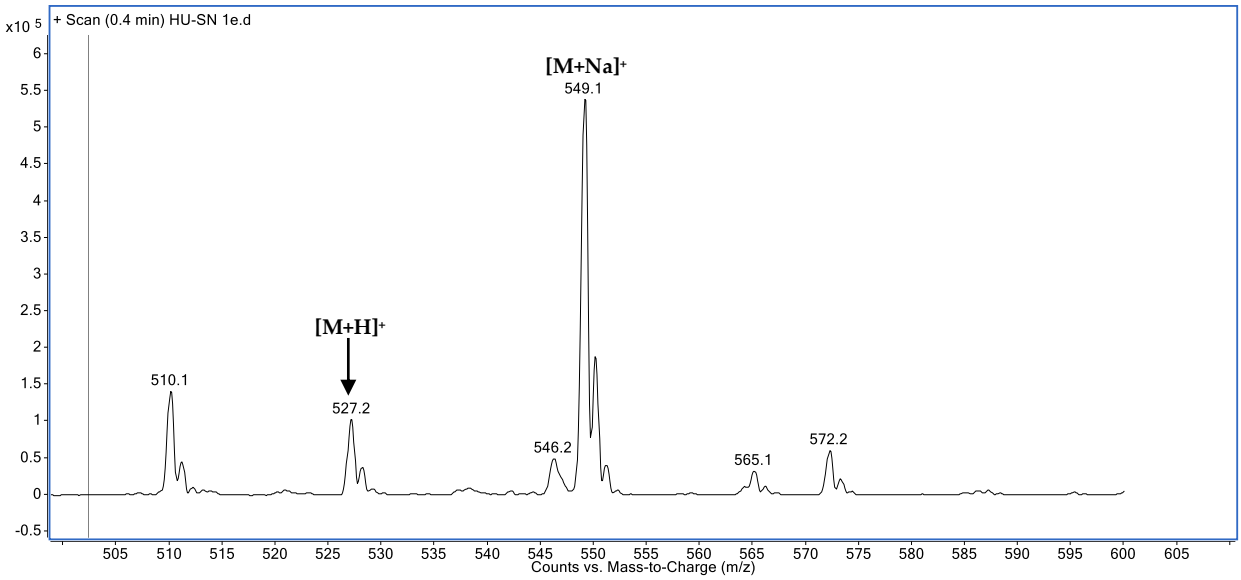


Figure S7: ESIMS (Low Resolution Positive Mode) of Conjugate 2

HEJ-MASS LAB -ICCBS				JEOL HX 110 MASS SPECTROMETER (FAB-HR)			
STUDENT NAME		HUNAIN ALI		SAMPLE CODE		DATE	21-7-17
SUPERVISOR NAME		Prof.Dr. Farzana Shaheen		HU-SN-1e		FAB (+VE / -VE)	FAB +VE
Mass	Theoretical Mass	Delta [ppm]	Delta [mmu]	RDB	Composition		
527.2311	527.2308	0.6	0.3	17	C32 H33 O6 N1		
	527.2294	3.1	1.7	17.5	C30 H31 O5 N4		
	527.2335	-4.5	-2.4	21.5	C35 H31 O3 N2		
	527.2281	5.7	3	12.5	C29 H35 O9		
	527.2353	-8	-4.2	8.5	C23 H35 O10 N4		
	527.2268	8.2	4.3	13	C27 H33 O8 N3		

Figure S8: FABMS (High Resolution Positive Mode) of Conjugate 2

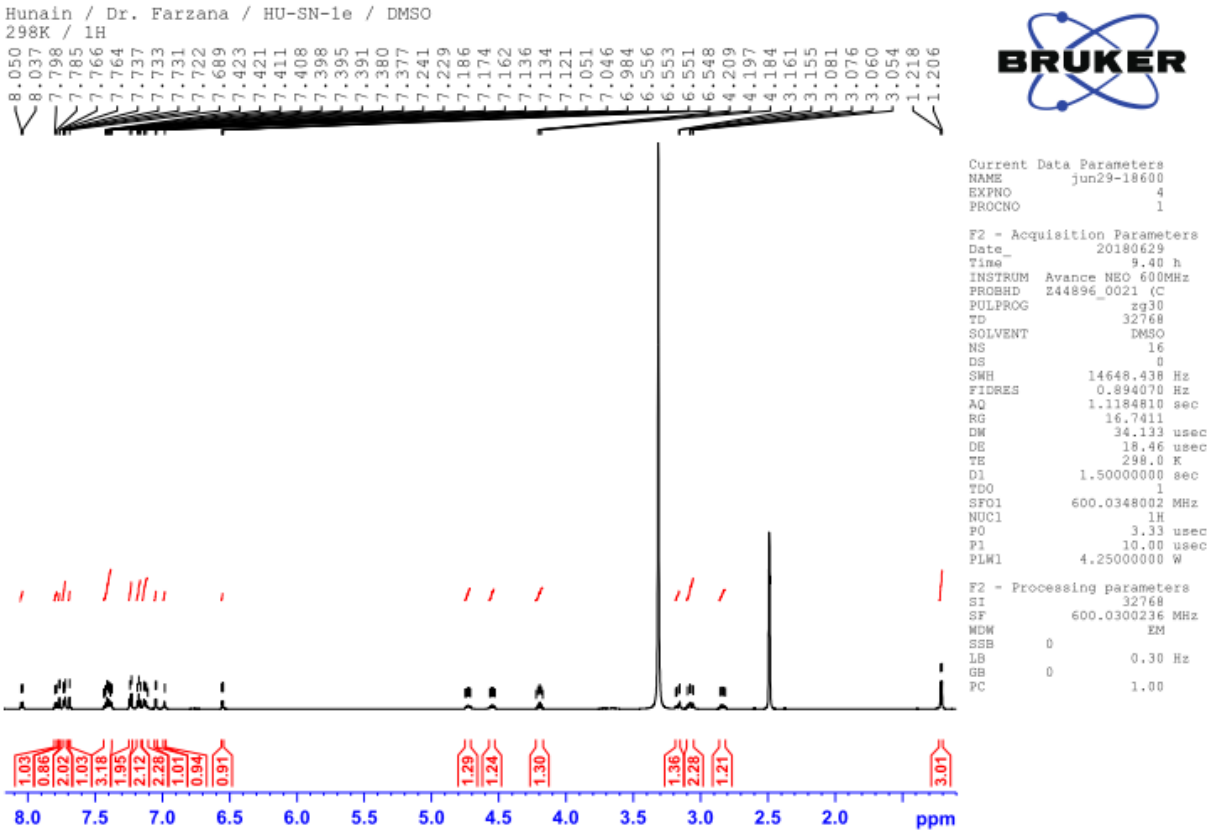


Figure S9: ^{1}H-NMR of Conjugate 2

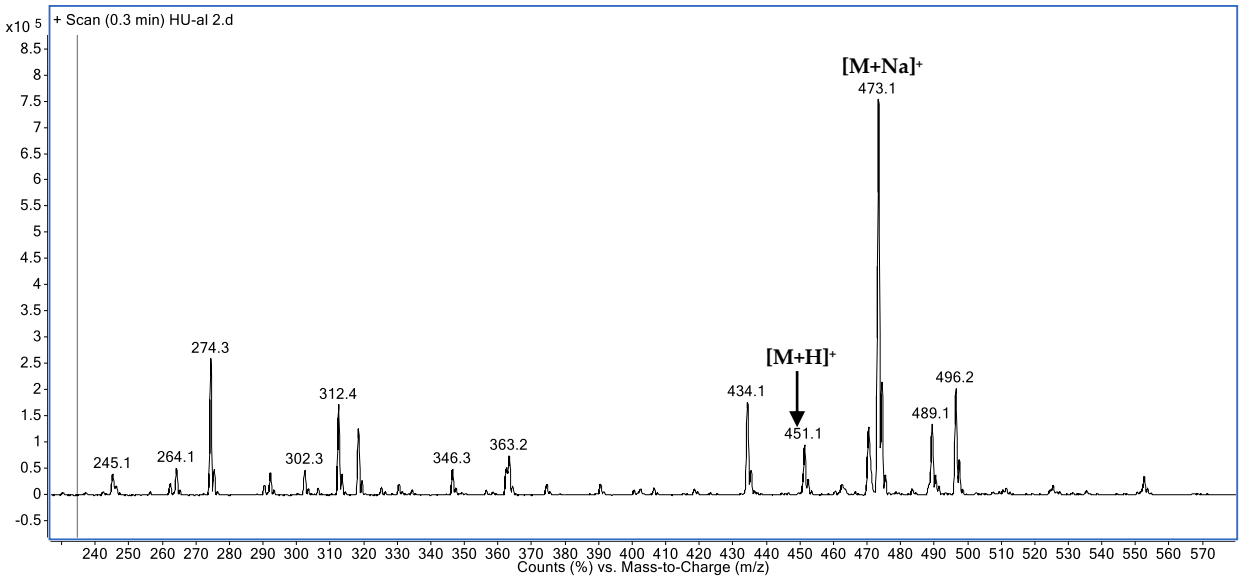


Figure S10: ESIMS (Low Resolution Positive Mode) of Conjugate 3

HEJ-MASS LAB -ICCBS				JEOL HX 110 MASS SPECTROMETER (FAB-HR)			
STUDENT NAME	HUNAIN ALI			SAMPLE CODE		DATE	21-7-17
SUPERVISOR NAME	Prof. Dr. Farzana Shaheen			HU-SAL-2		FAB (+VE / -VE)	FAB +VE
Mass	Theoretical Mass	Delta [ppm]	Delta [mmu]	RDB	Composition		
451.19800	451.1981	-0.3	-0.1	13.5	C24 H27 O5 N4		
	451.1968	2.6	1.2	8.5	C23 H31 O9		
	451.1995	-3.3	-1.5	13	C26 H29 O6 N1		
	451.1955	5.6	2.5	9	C21 H29 O8 N3		
	451.2008	-6.3	-2.8	18	C27 H25 O2 N5		

Figure S11: FABMS (High Resolution Positive Mode) of Conjugate 3

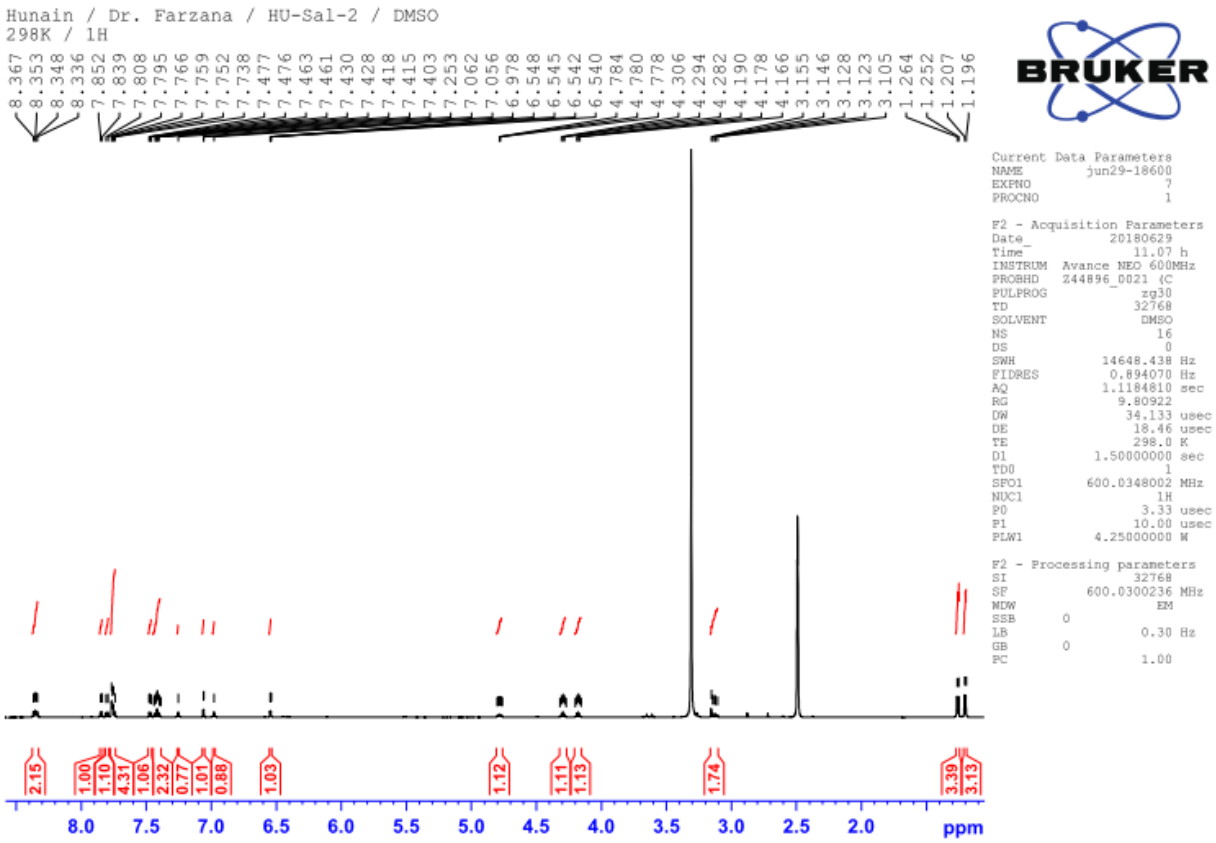


Figure S12: ^{1}H-NMR of Conjugate 3

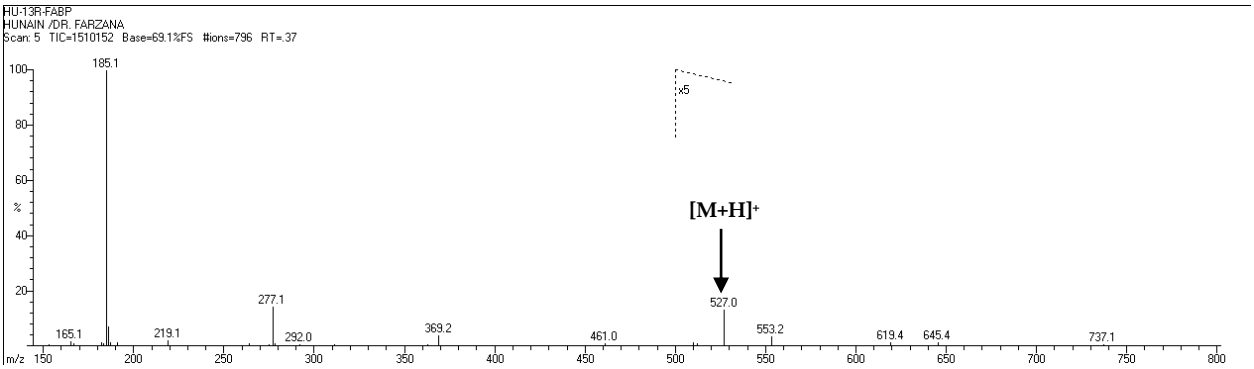


Figure S13: FABMS (Low Resolution Positive Mode) of Conjugate 4

HEJ-MASS LAB -ICCBS				JEOL HX 110 MASS SPECTROMETER (FAB-HR)			
STUDENT NAME		HUNAIN ALI		SAMPLE CODE		DATE	14-11-17
SUPERVISOR NAME		Prof.Dr. Farzana Shaheen		HU-13R		FAB (+VE / -VE)	FAB +VE
Mass	Theoretical Mass	Delta [ppm]	Delta [mmu]	RDB	Composition		
527.2299	527.2294	0.9	0.5	17.5	C30 H31 O5 N4		
	527.2308	-1.7	-0.9	17	C32 H33 O6 N1		
	527.2281	3.4	1.8	12.5	C29 H35 O9		
	527.2326	-5.2	-2.7	4	C20 H37 O13 N3		
	527.2268	5.9	3.1	13	C27 H33 O8 N3		
	527.2335	-6.8	-3.6	21.5	C35 H31 O3 N2		
	527.234	-7.7	-4.1	3.5	C22 H39 O14		
	527.2249	9.5	5	26	C39 H29 O1 N1		

Figure S14: FABMS (High Resolution Positive Mode) of Conjugate 4

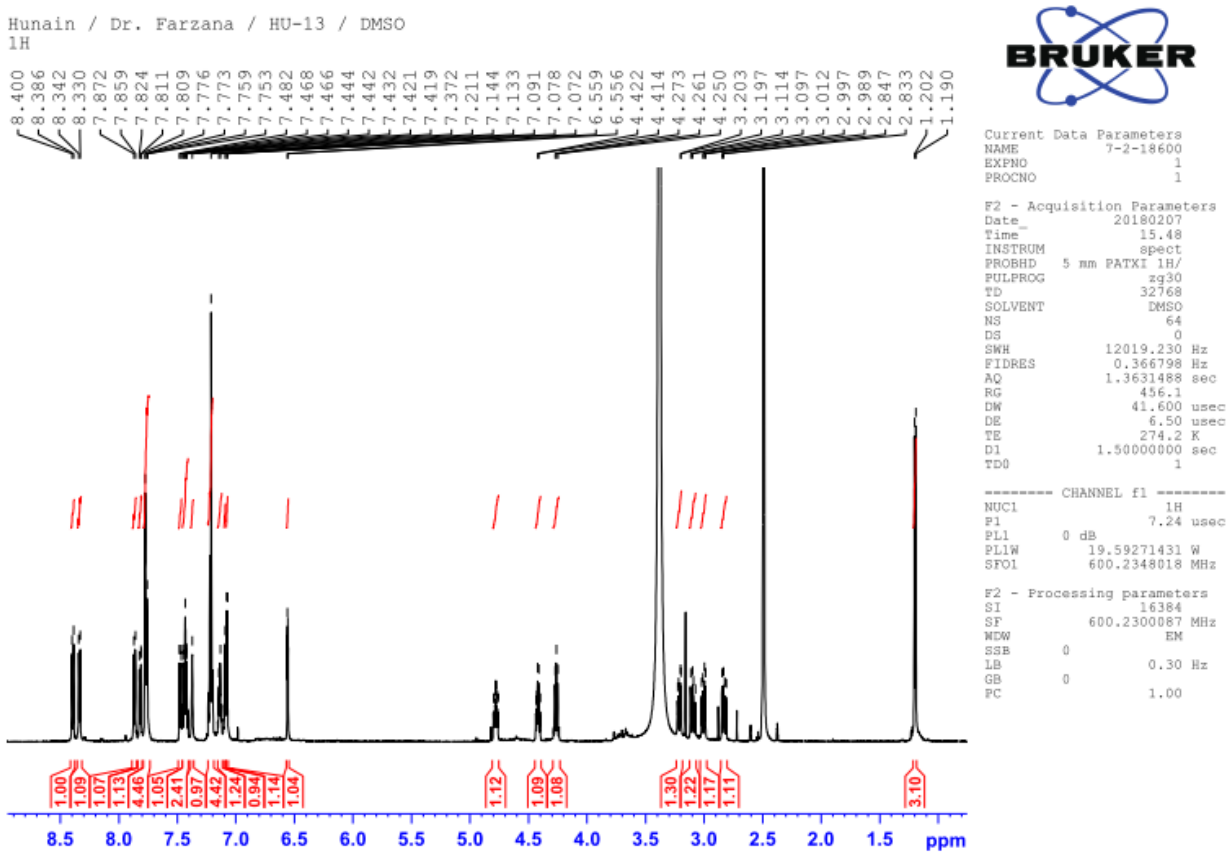


Figure S15: ^{1}H-NMR of Conjugate 4

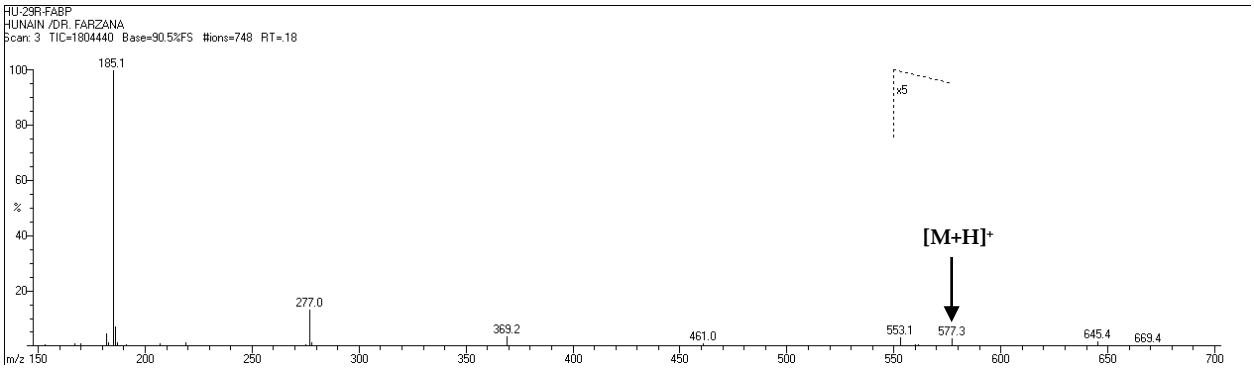


Figure S16: FABMS (Low Resolution Positive Mode) of Conjugate 5

HEJ-MASS LAB -ICCBS				JEOL HX 110 MASS SPECTROMETER (FAB-HR)			
STUDENT NAME		HUNAIN ALI		SAMPLE CODE		DATE	15-11-17
SUPERVISOR NAME		Prof.Dr. Farzana Shaheen		HU-29R		FAB (+VE / -VE)	FAB +VE
Mass	Theoretical Mass	Delta [ppm]	Delta [mmu]	RDB	Composition		
577.2472	577.2464	1.3	0.8	20	C36 H35 O6 N1		
	577.2491	-3.3	-1.9	24.5	C39 H33 O3 N2		
	577.2451	3.6	2.1	20.5	C34 H33 O5 N4		
	577.2438	6	3.4	15.5	C33 H37 O9		
	577.251	-6.5	-3.8	11.5	C27 H37 O10 N4		
	577.2518	-8	-4.6	29	C42 H31 N3		
	577.2424	8.3	4.8	16	C31 H35 O8 N3		
	577.2531	-10.3	-5.9	28.5	C44 H33 O1		
	577.2406	11.5	6.6	29	C43 H31 O1 N1		
	577.255	-13.5	-7.8	15.5	C32 H37 O8 N2		

Figure S17: FABMS (High Resolution Positive Mode) of Conjugate 5

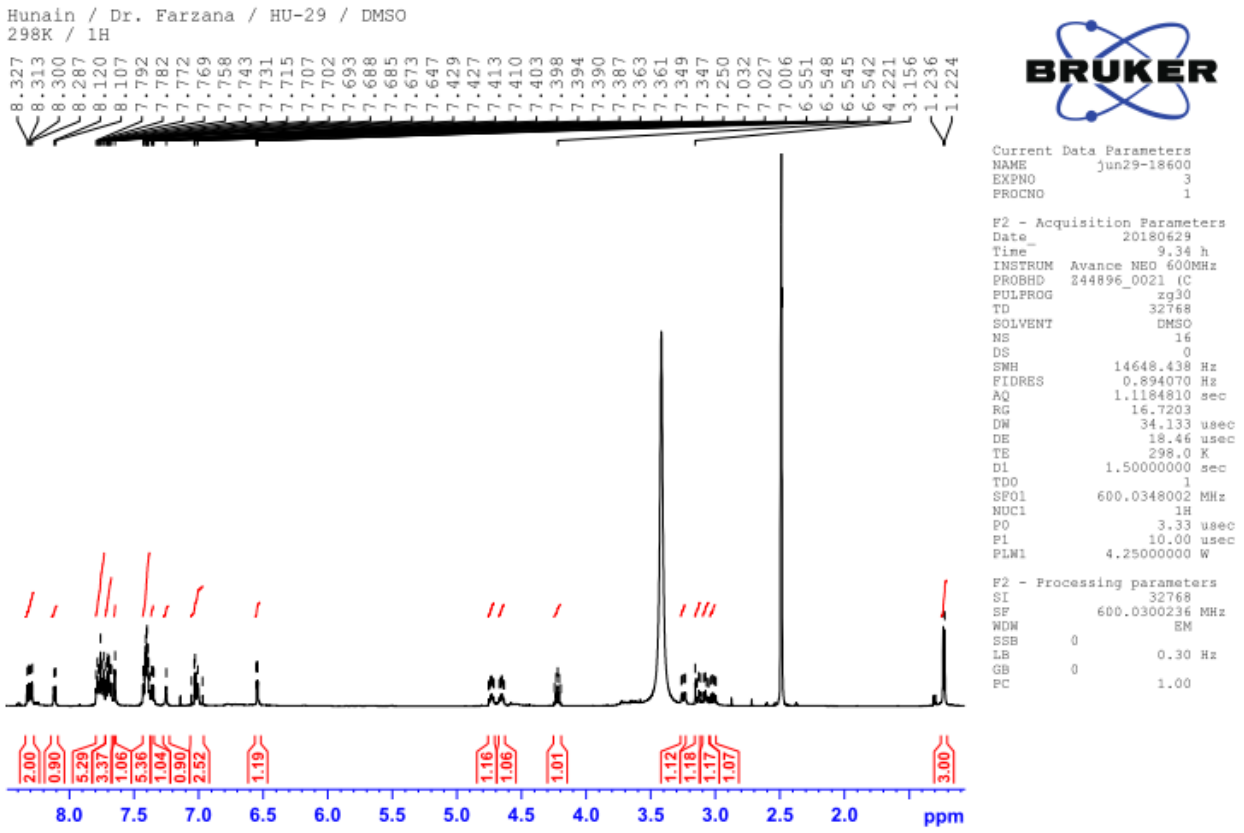


Figure S18: ^{1}H-NMR of Conjugate 5

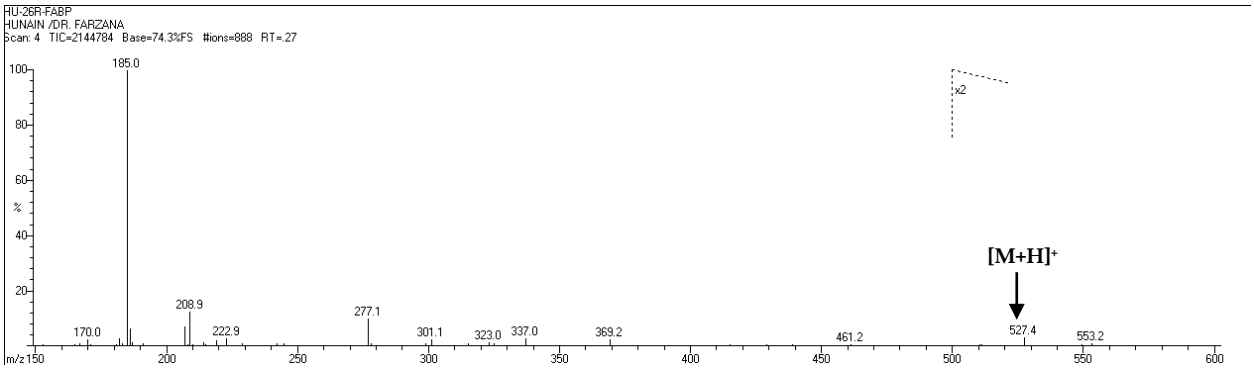


Figure S19: FABMS (Low Resolution Positive Mode) of Conjugate 6

HEJ-MASS LAB -ICCBS				JEOL HX 110 MASS SPECTROMETER (FAB-HR)			
STUDENT NAME		HUNAIN ALI		SAMPLE CODE		DATE	15-11-17
SUPERVISOR NAME		Prof.Dr. Farzana Shaheen		HU-26R		FAB (+VE / -VE)	FAB +VE
Mass	Theoretical Mass	Delta [ppm]	Delta [mmu]	RDB	Composition		
527.2309	527.2308	0.2	0.1	17	C32 H33 O6 N1		
	527.2294	2.8	1.5	17.5	C30 H31 O5 N4		
	527.2335	-4.9	-2.6	21.5	C35 H31 O3 N2		
	527.2281	5.3	2.8	12.5	C29 H35 O9		
	527.2268	7.8	4.1	13	C27 H33 O8 N3		
	527.2353	-8.4	-4.4	8.5	C23 H35 O10 N4		
	527.2361	-10	-5.2	26	C38 H29 N3		
	527.2249	11.4	6	26	C39 H29 O1 N1		
	527.2375	-12.5	-6.6	25.5	C40 H31 O1		
	527.2236	13.9	7.3	26.5	C37 H27 N4		

Figure S20: FABMS (High Resolution Positive Mode) of Conjugate 6

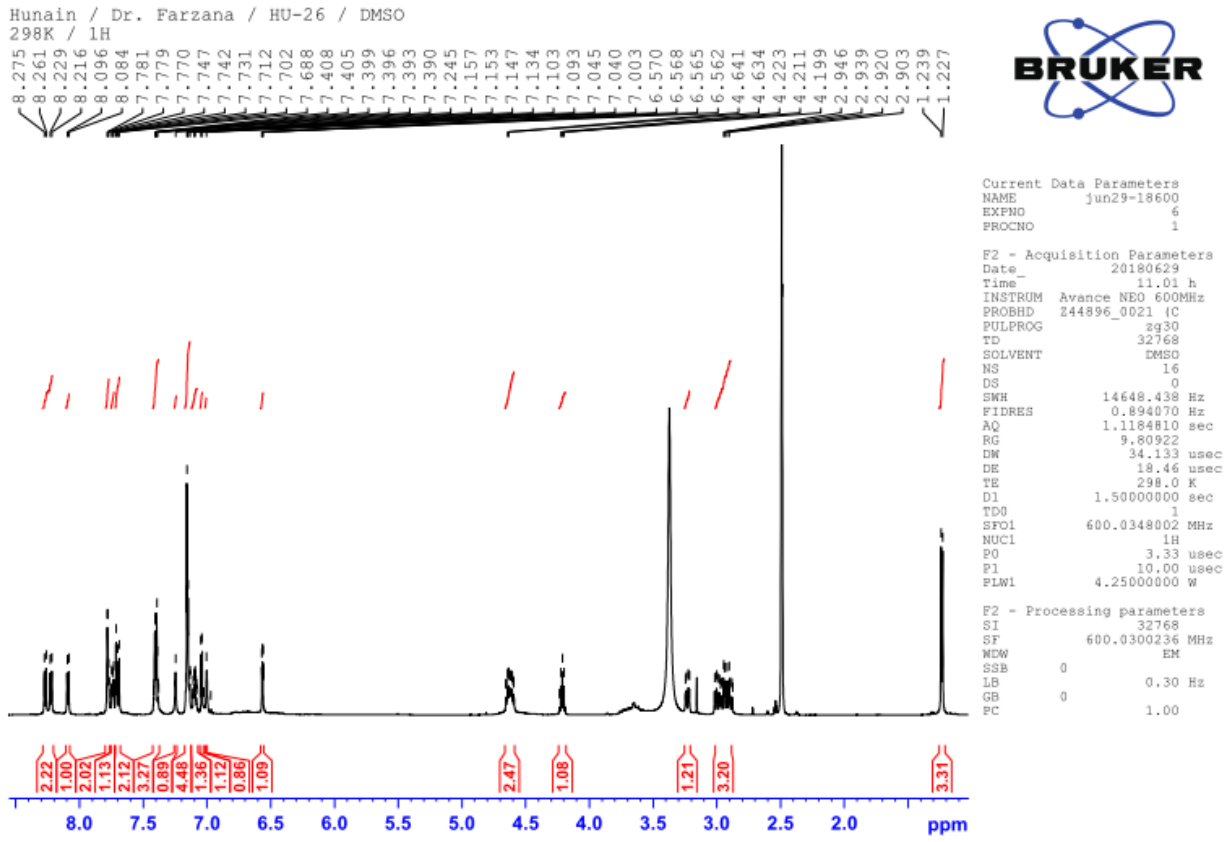


Figure S21: ^{1}H-NMR of Conjugate 6

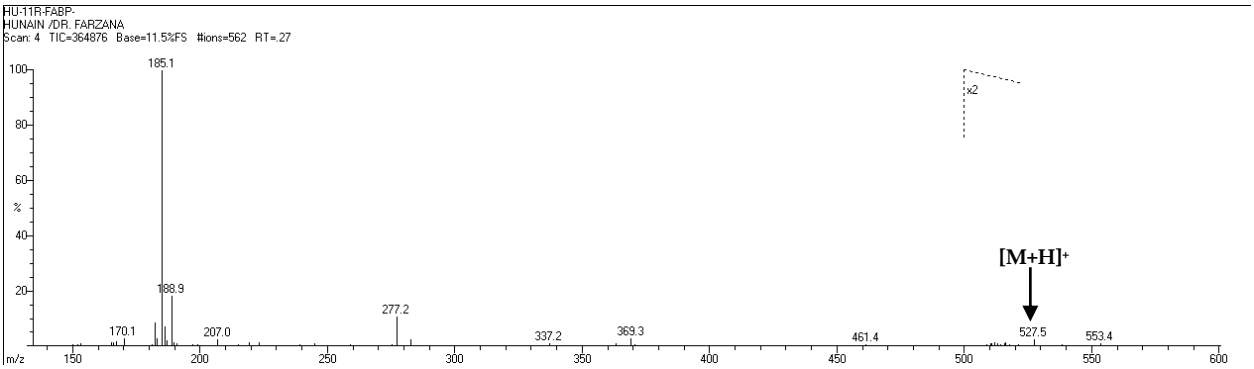


Figure S22: FABMS (Low Resolution Positive Mode) of Conjugate 7

HEJ-MASS LAB -ICCBS				JEOL HX 110 MASS SPECTROMETER (FAB-HR)			
STUDENT NAME		HUNAIN ALI		SAMPLE CODE		DATE	15-11-17
SUPERVISOR NAME		Prof.Dr. Farzana Shaheen		HU-11R		FAB (+VE / -VE)	FAB +VE
Mass	Theoretical Mass	Delta [ppm]	Delta [mmu]	RDB	Composition		
527.2311	527.2308	0.6	0.3	17	C32 H33 O6 N1		
	527.2326	-2.9	-1.5	4	C20 H37 O13 N3		
	527.2294	3.1	1.7	17.5	C30 H31 O5 N4		
	527.2335	-4.5	-2.4	21.5	C35 H31 O3 N2		
	527.234	-5.5	-2.9	3.5	C22 H39 O14		
	527.2281	5.7	3	12.5	C29 H35 O9		
	527.2353	-8	-4.2	8.5	C23 H35 O10 N4		
	527.2268	8.2	4.3	13	C27 H33 O8 N3		

Figure S23: FABMS (High Resolution Positive Mode) of Conjugate 7

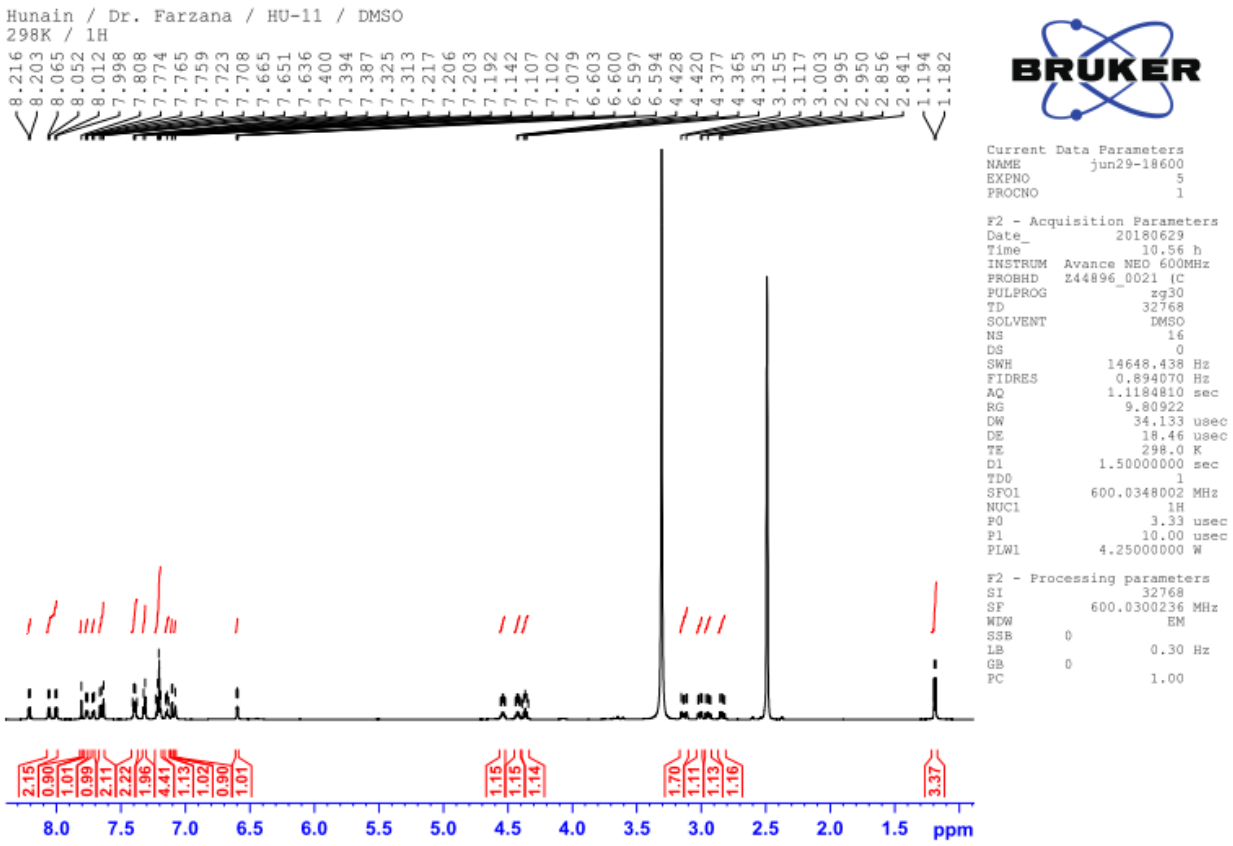


Figure S24: ^{1}H-NMR of Conjugate 7

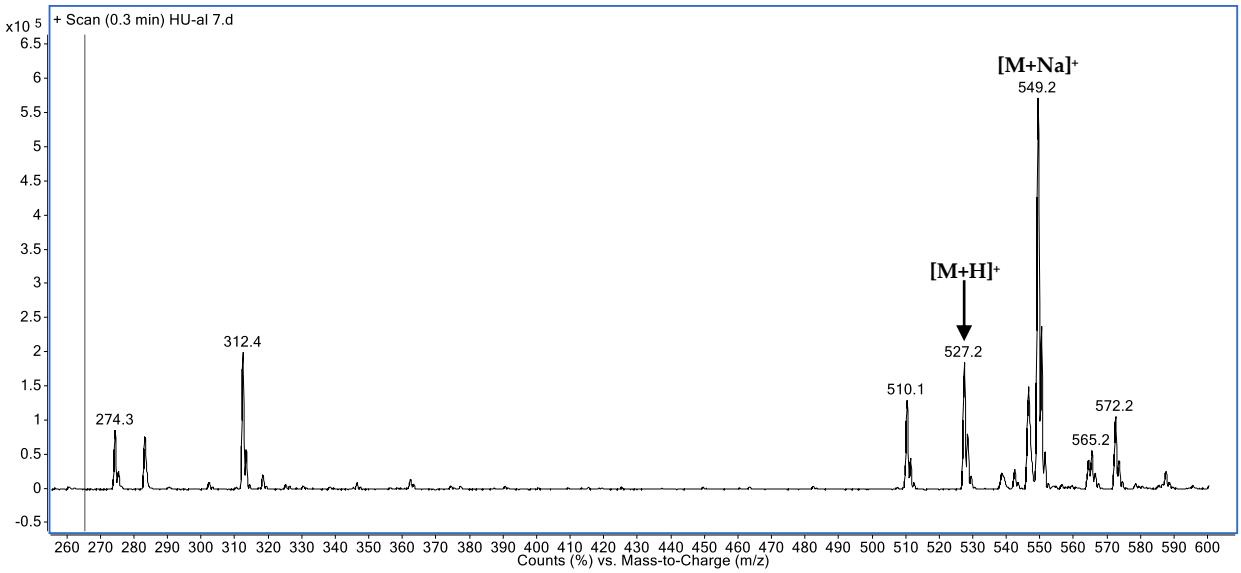


Figure S25: ESIMS (Low Resolution Positive Mode) of Conjugate 8

HEJ-MASS LAB -ICCBS				JEOL HX 110 MASS SPECTROMETER (FAB-HR)			
STUDENT NAME		HUNAIN ALI		SAMPLE CODE		DATE	21-7-17
SUPERVISOR NAME		Prof.Dr. Farzana Shaheen		HU-SAL-7		FAB (+VE / -VE)	FAB +VE
Mass	Theoretical Mass	Delta [ppm]	Delta [mmu]	RDB	Composition		
527.2269	527.2268	0.3	0.1	13	C27 H33 O8 N3		
	527.2281	-2.3	-1.2	12.5	C29 H35 O9		
	527.2249	3.8	2	26	C39 H29 O1 N1		
	527.2294	-4.8	-2.5	17.5	C30 H31 O5 N4		
	527.2236	6.3	3.3	26.5	C37 H27 N4		
	527.2308	-7.4	-3.9	17	C32 H33 O6 N1		
	527.2222	8.8	4.7	21.5	C36 H31 O4		
	527.2209	11.4	6	22	C34 H29 O3 N3		
	527.2335	-12.5	-6.6	21.5	C35 H31 O3 N2		
	527.2353	-16	-8.4	8.5	C23 H35 O10 N4		

Figure S26: FABMS (High Resolution Positive Mode) of Conjugate 8

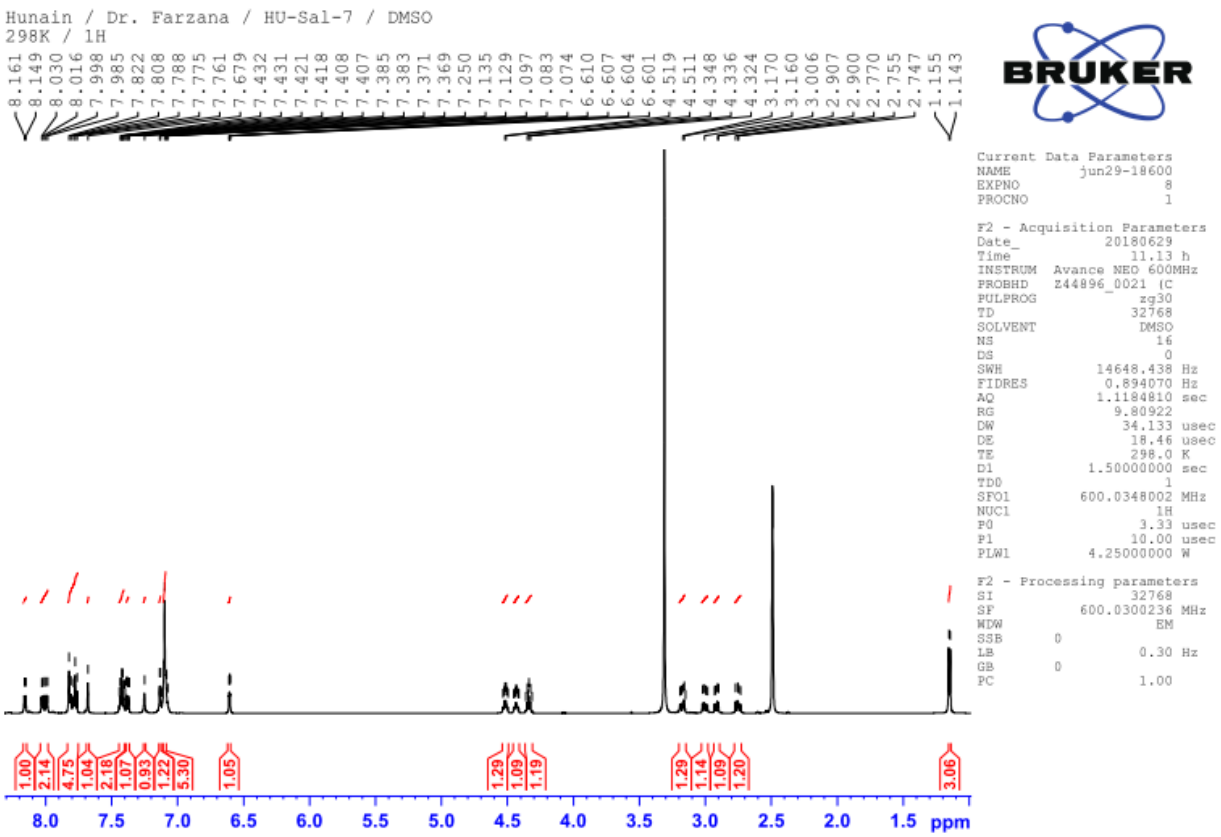


Figure S27: ^{1}H-NMR of Conjugate 8

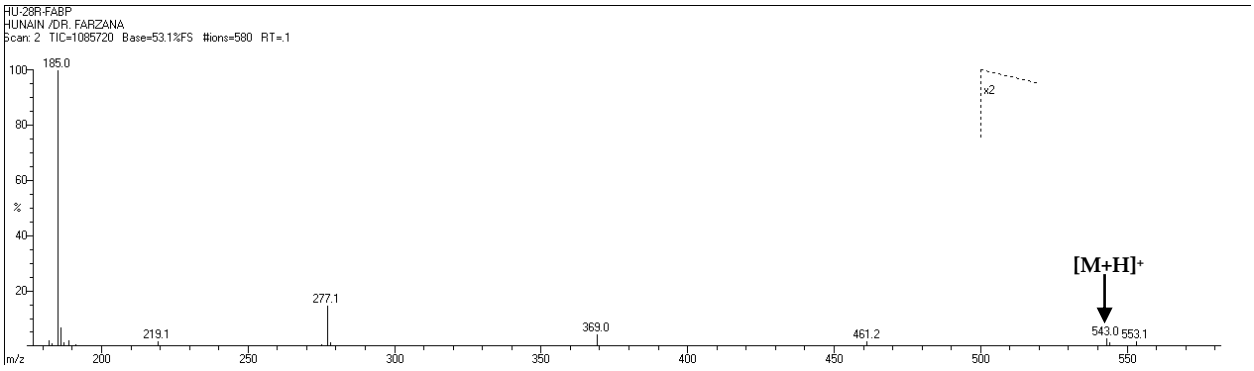


Figure S28: FABMS (Low Resolution Positive Mode) of Conjugate 9

HEJ-MASS LAB -ICCBS				JEOL HX 110 MASS SPECTROMETER (FAB-HR)			
STUDENT NAME		HUNAIN ALI		SAMPLE CODE		DATE	14-11-17
SUPERVISOR NAME		Prof. Dr. Farzana Shaheen		HU-28R		FAB (+VE / -VE)	FAB +VE
Mass	Theoretical Mass	Delta [ppm]	Delta [mmu]	RDB	Composition		
543.2256	543.2257	-0.2	-0.1	17	C32 H33 O7 N1		
	543.2244	2.3	1.2	17.5	C30 H31 O6 N4		
	543.2276	-3.6	-2	4	C20 H37 O14 N3		
	543.223	4.7	2.6	12.5	C29 H35 O10		
	543.2284	-5.1	-2.8	21.5	C35 H31 O4 N2		
	543.2289	-6.1	-3.3	3.5	C22 H39 O15		
	543.2217	7.2	3.9	13	C27 H33 O9 N3		
	543.2302	-8.5	-4.6	8.5	C23 H35 O11 N4		

Figure S29: FABMS (High Resolution Positive Mode) of Conjugate 9

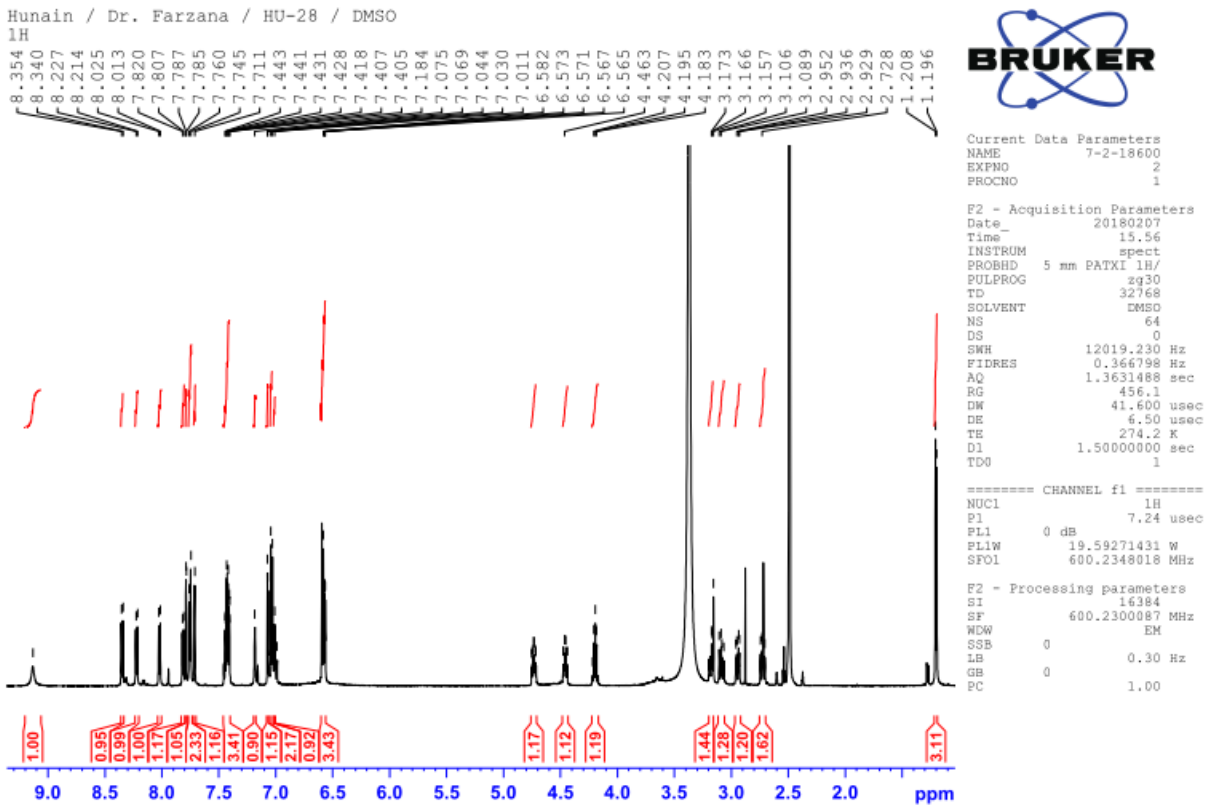


Figure S30: ^{1}H-NMR of Conjugate 9

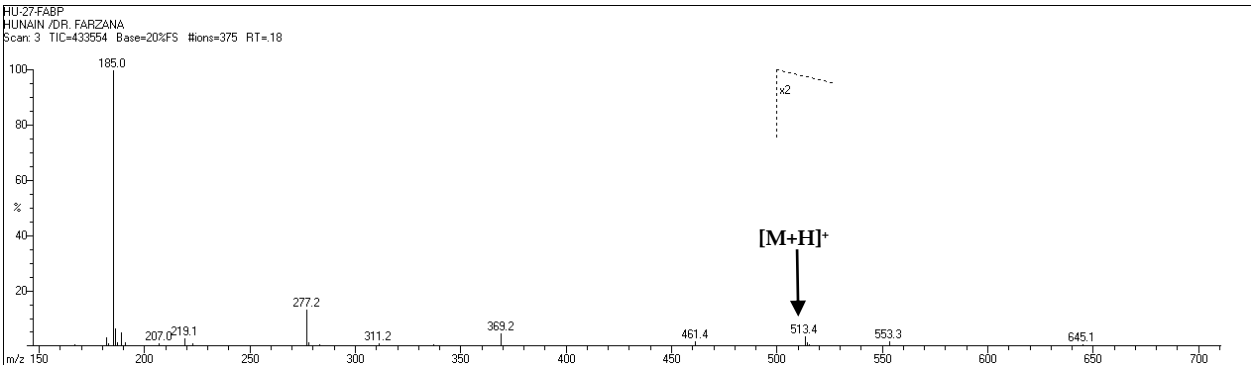


Figure S31: FABMS (Low Resolution Positive Mode) of Conjugate 10

HEJ-MASS LAB -ICCBS				JEOL HX 110 MASS SPECTROMETER (FAB-HR)			
STUDENT NAME		HUNAIN ALI		SAMPLE CODE		DATE	15-11-17
SUPERVISOR NAME		Prof.Dr. Farzana Shaheen		HU-27R		FAB (+VE / -VE)	FAB +VE
Mass	Theoretical Mass	Delta [ppm]	Delta [mmu]	RDB	Composition		
513.2131	513.2125	1.3	0.6	12.5	C28 H33 O9		
	513.2138	-1.4	-0.7	17.5	C29 H29 O5 N4		
	513.2111	3.9	2	13	C26 H31 O8 N3		
	513.2151	-4	-2	17	C31 H31 O6 N1		
	513.2093	7.5	3.8	26	C38 H27 O1 N1		
	513.2178	-9.2	-4.7	21.5	C34 H29 O3 N2		
	513.2079	10.1	5.2	26.5	C36 H25 N4		
	513.2066	12.7	6.5	21.5	C35 H29 O4		
	513.2197	-12.8	-6.6	8.5	C22 H33 O10 N4		
	513.2205	-14.4	-7.4	26	C37 H27 N3		

Figure S32: FABMS (High Resolution Positive Mode) of Conjugate 10

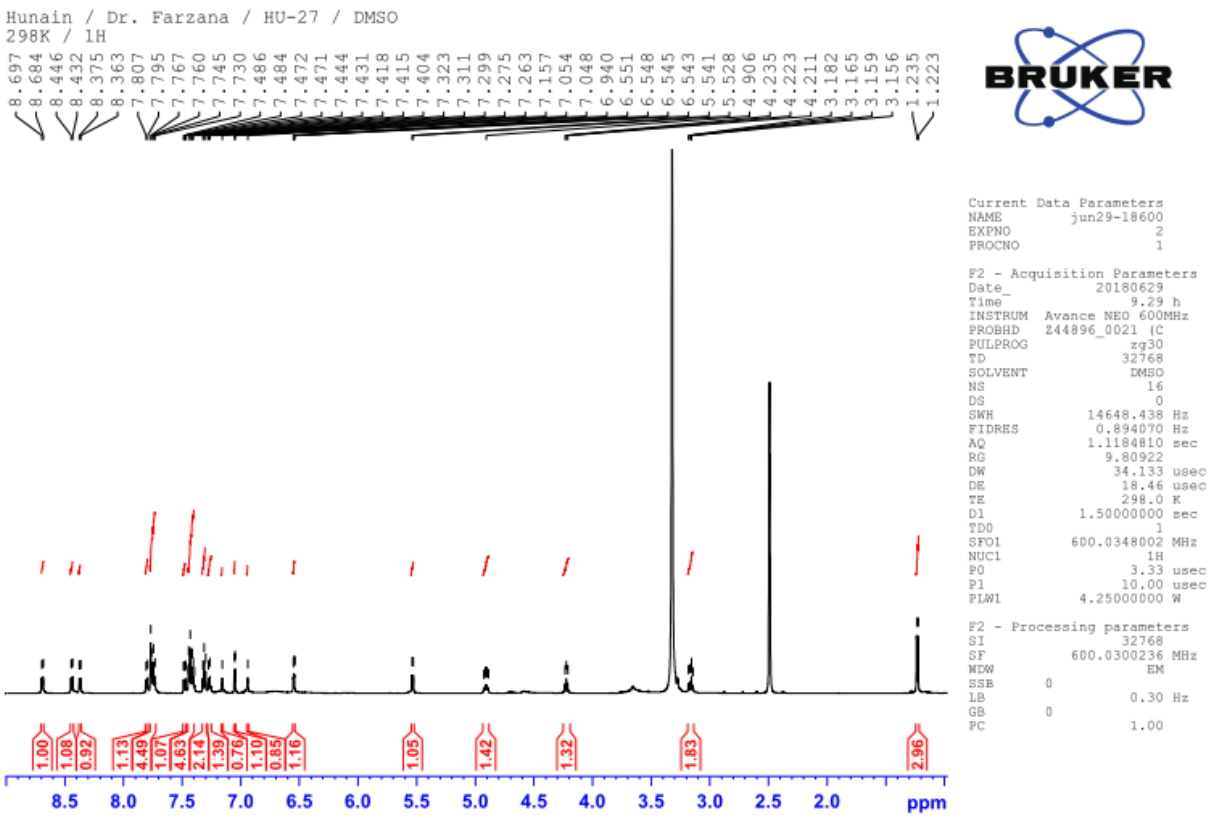


Figure S33: ^{1}H-NMR of Conjugate 10

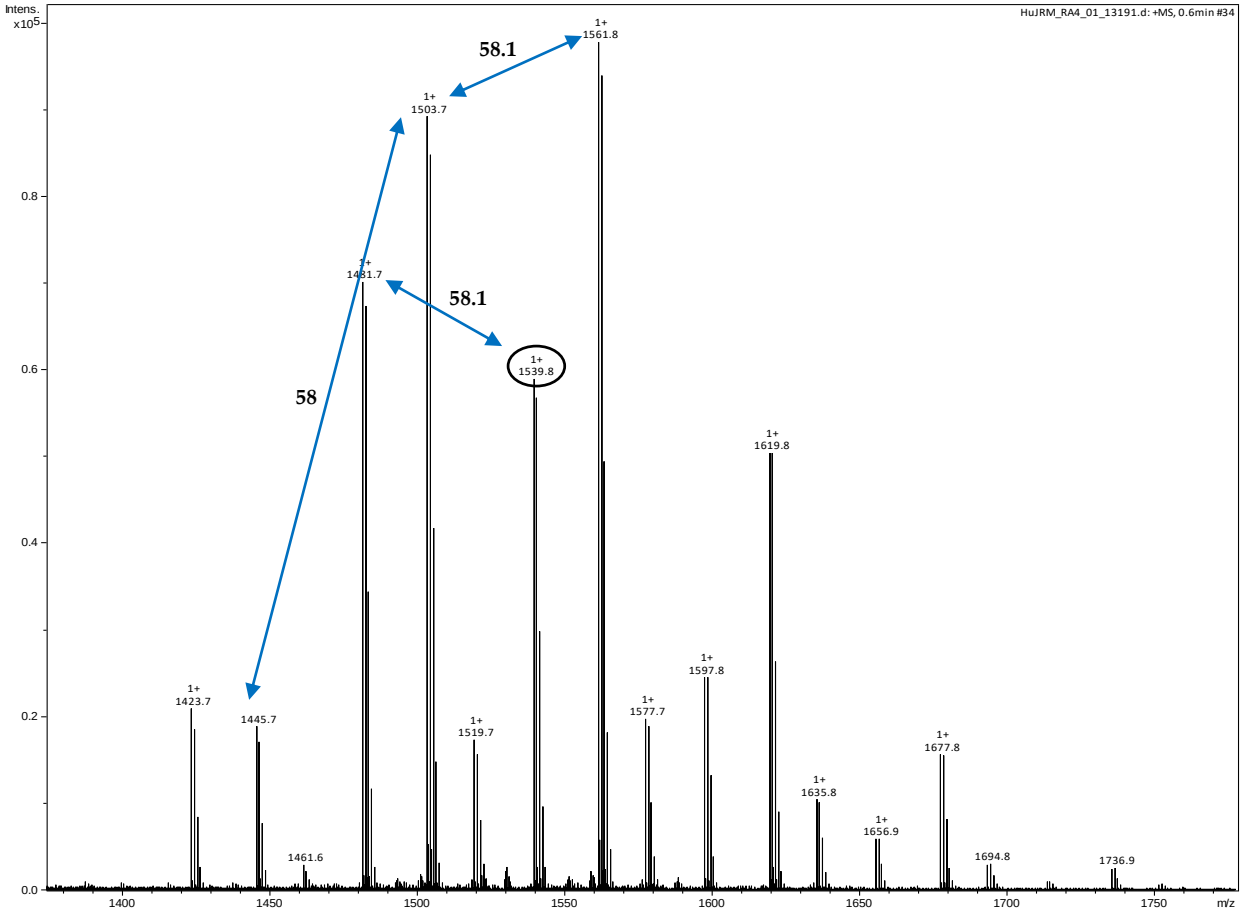


Figure S34: ESI Spectra (Low Resolution) of Conjugate 4a

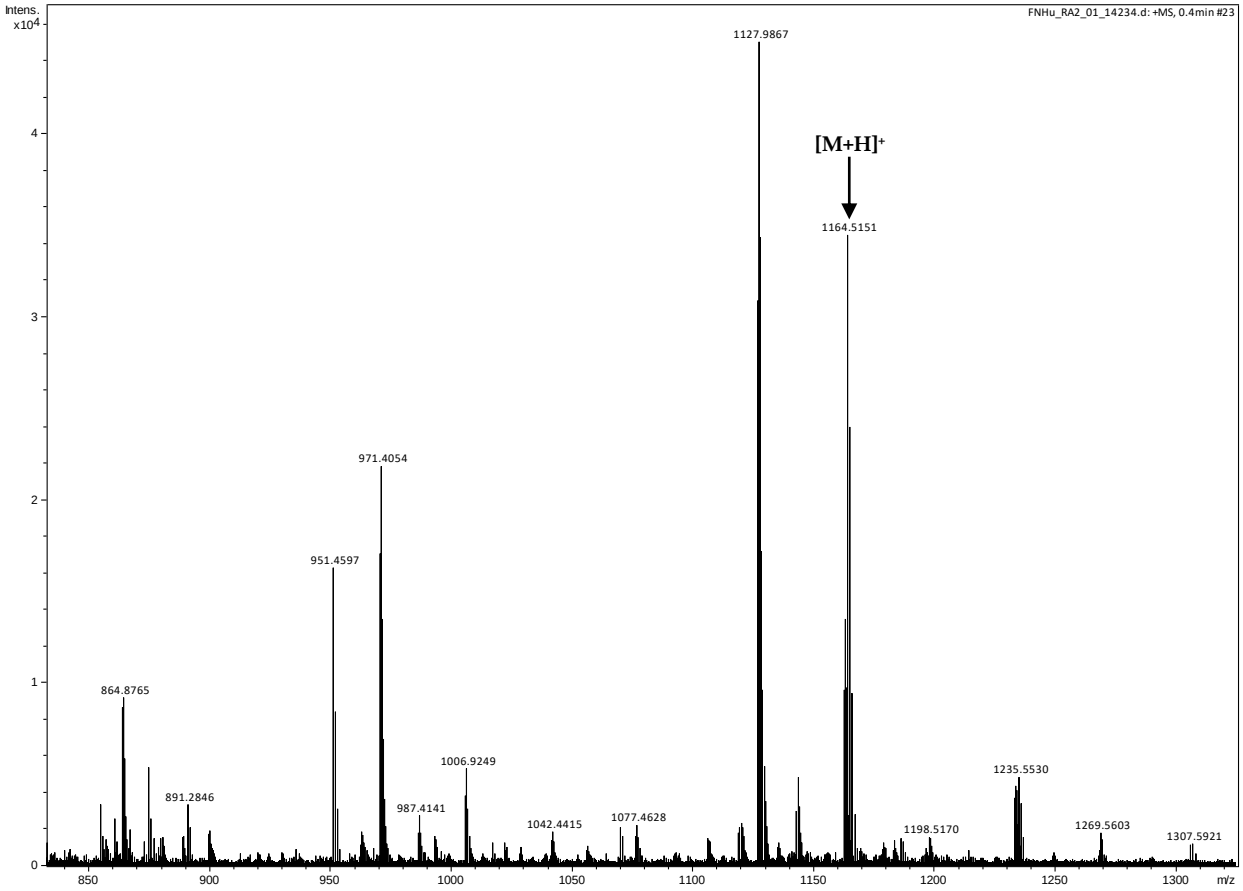


Figure S35: ESI Spectra (Low Resolution) of Conjugate 4b

Table S3: TFA Cocktails for cleavage of peptide conjugates 1-20

S. No.	Protecting groups	TFA cocktail for cleavage	Time given for cleavage
1	-	TFA:H_2O::95:5	2 h
2	-	TFA:H_2O::95:5	2 h
3	-	TFA:H_2O ::95:5	2 h
4	-	TFA H_2O ::95:5	2 h
5	-	TFA:H_2O::95:5	2 h
6	-	TFA:H_2O::95:5	2 h
7	-	TFA:H_2O::95:5	2 h
8	-	TFA:H_2O::95:5	2 h
9	*tBu*	TFA:TIPS:Phenol:H_2O::88:2:5:5	2 h
10	-	TFA:H_2O::95:5	2 h
11	*tBu*	TFA:DCM:TIPS::95:4:1	2 h
12	-	TFA:DCM:TIPS::90: 9:1	2 h
13	-	TFA:DCM:TIPS::90:9:1	2 h
14	-	TFA:DCM:TIPS:90:9:1	2 h
15	-	TFA:DCM:TIPS::95:4:1	2 h
16	-	TFA:DCM:TIPS::95:4:1	2 h
17	*pbf*	TFA:H_2O:TIPS::90:9:1	2 h
18	-	TFA:DCM:TIPS::95:4:1	2 h
19	-	TFA:DCM:TIPS::95:4:1	2 h
20	-	TFA:H_2O:TIPS::90:9:1	2 h

Table S4: HPLC conditions for peptide conjugates 11-20

S. No	Retention time (min)	HPLC eluted system	Wavelength (nm)
11	3.442	ACN: H_2O::85:15	262.9
12	3.649	ACN: H_2O::85:15	297.6
13	3.365	ACN: H_2O::85:15	253.8
14	3.198	ACN: H_2O::85:15	287.7
15	3.450	ACN: H_2O::85:15	276.7
16	3.407	ACN: H_2O::85:15	267.8
17	3.208	ACN: H_2O::85:15	309.4
18	3.269	ACN: H_2O::85:15	278.9
19	3.642	ACN: H_2O:TFA::85:15:0.08	295.6
20	3.415	ACN: H_2O:TFA::85:15:0.08	236.5

Table S5: Sequence and ESIMS (Low Resolution) and FABMS (High Resolution) of peptide conjugates 11-20

S. No.	Sequence	$[MH]^+$, calculated mol. formula	HRMS
11	2-Furoic acid-L-Tyr-L-2 Nal-D-Ala-NH_2	543.22, $C_{30}H_{30}N_4O_6$	543.2278
12	2-Furoic acid-D-Ala-D-Phe-D-Ala-NH_2	401.17, $C_{20}H_{24}N_4O_5$	401.1791
13	2-Furoic acid-D-Ala-D-Phe-Gly-NH_2	387.16, $C_{19}H_{22}N_4O_5$	387.1705
14	2-Furoic acid-D-Ala-D-Phe-L-Lys-NH_2	458.23, $C_{23}H_{31}N_5O_5$	458.2413
15	2-Furoic acid-D-Ala-L-2 Nal-D-Ala-NH_2	451.19, $C_{24}H_{26}N_4O_5$	451.1943
16	2-Furoic acid-D-Ala-L-Ile-D-Ala-NH_2	367.2, $C_{17}H_{28}N_4O_5$	367.2014
17	2-Furoic acid-D-Ala-L-Arg-D-Ala-NH_2	410.21, $C_{17}H_{27}N_7O_5$	410.2143
18	2-Furoic acid- D-Phe-D-Ala-NH_2	329.14, $C_{17}H_{20}N_3O_4$,	329.1414
19	2-Furoic acid-L-2-Nal-D-Phe-L-*N*-Me Ala-NH_2	541.2, $C_{31}H_{33}N_4O_5$	541.2120
20	2-Furoic acid-L-2 Nal-D-Phe-L-Ala-NH_2	527.22, $C_{30}H_{30}N_4O_5$	527.2250

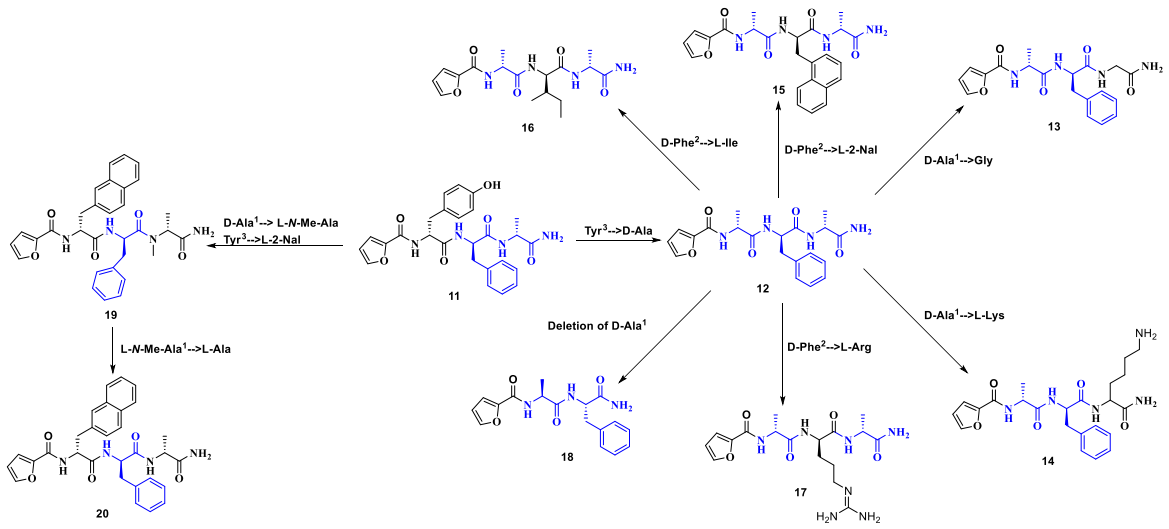
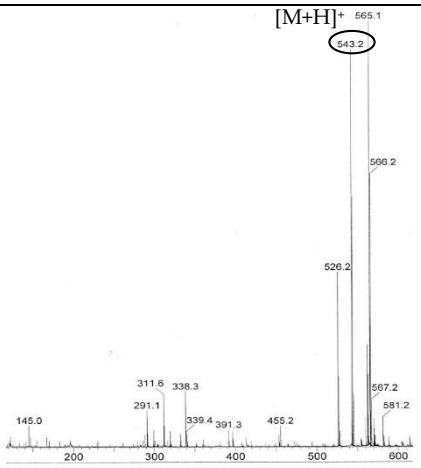
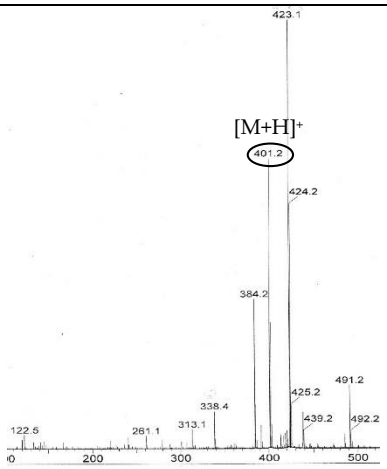
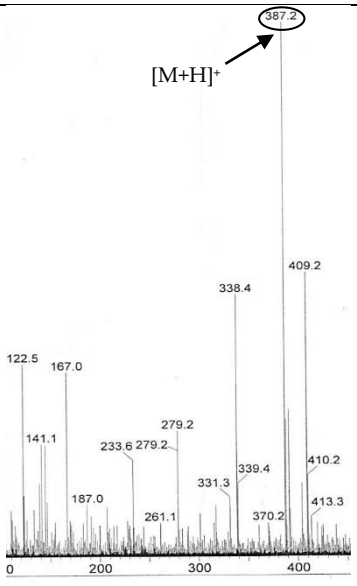
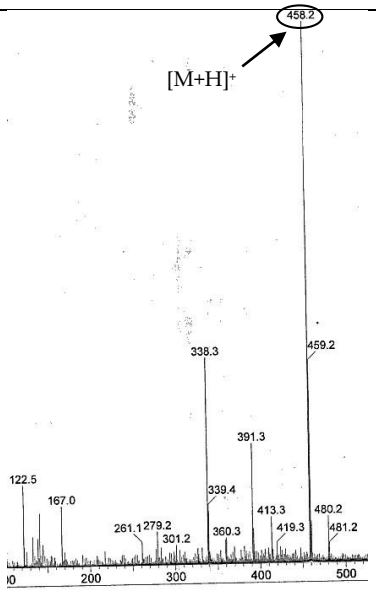
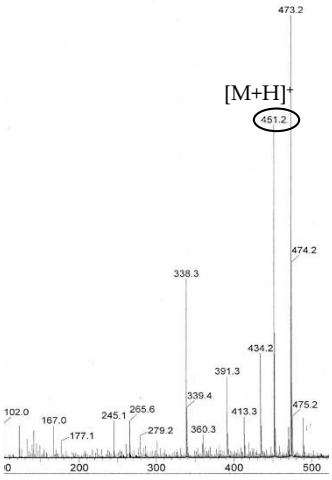
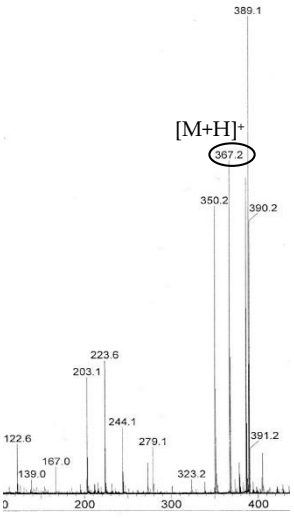
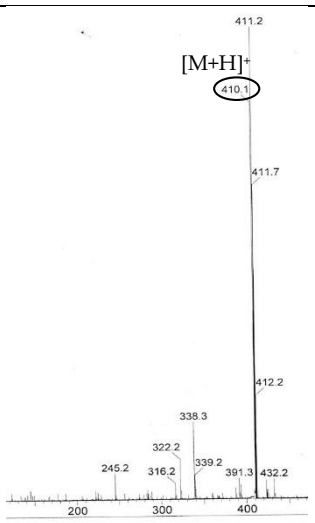
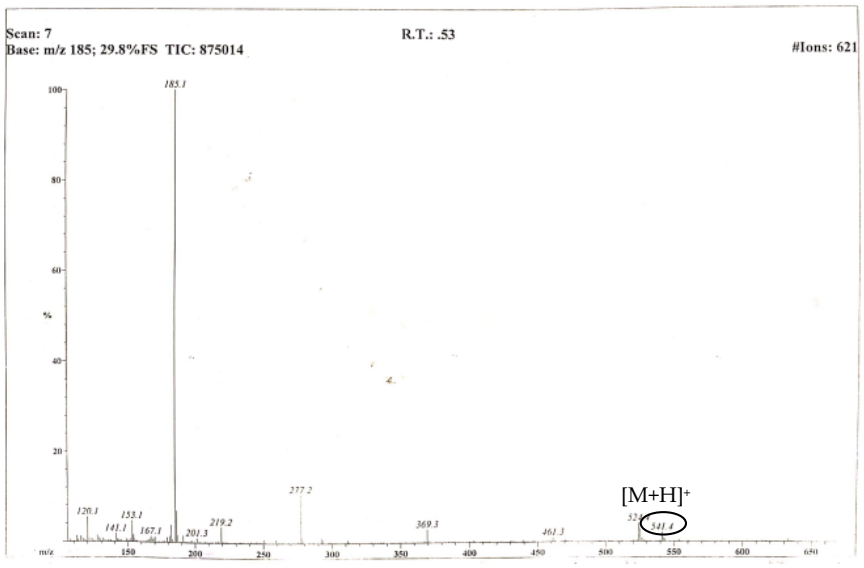


Figure S36: Structural relationship between peptide conjugates 11-20

Conjugate No.	ESI-MS Spectrum
11	
12	
13	

14	 458.2 [M+H]+ 459.2 338.3 391.3 122.5 339.4 167.0 413.3 480.2 261.1 279.2 360.3 419.3 481.2 301.2 200 300 400 500
15	 473.2 [M+H]+ 451.2 474.2 338.3 434.2 391.3 339.4 102.0 265.6 475.2 167.0 245.1 413.3 279.2 360.3 177.1 200 300 400 500
16	 389.1 [M+H]+ 367.2 350.2 390.2 223.6 203.1 244.1 122.6 279.1 391.2 167.0 139.0 323.2 200 300 400

17	 411.2 [M+H]+ 410.1 411.7 412.2 338.3 322.2 339.2 245.2 316.2 391.3 432.2 200 300 400
19	 Scan: 7 Base: m/z 185; 29.8%FS TIC: 875014 R.T.: .53 #Ions: 621 185.1 277.2 [M+H]+ 541.4 120.1 153.1 141.1 167.1 201.3 219.2 369.3 461.3 % m/z

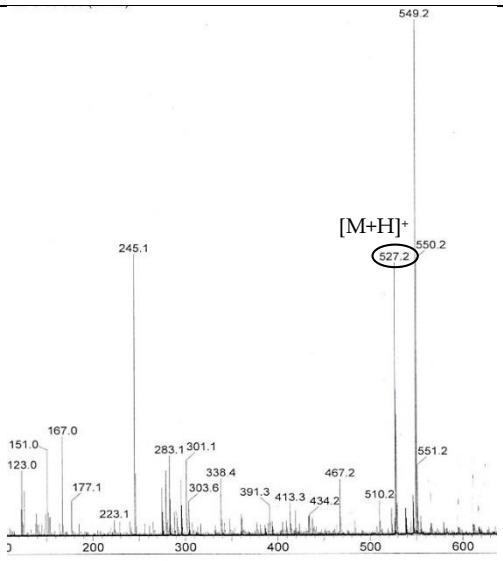
20	

Figure S37: ESI Mass spectrum for peptide conjugates 11-17, 19 (FAB-MS) and 20