

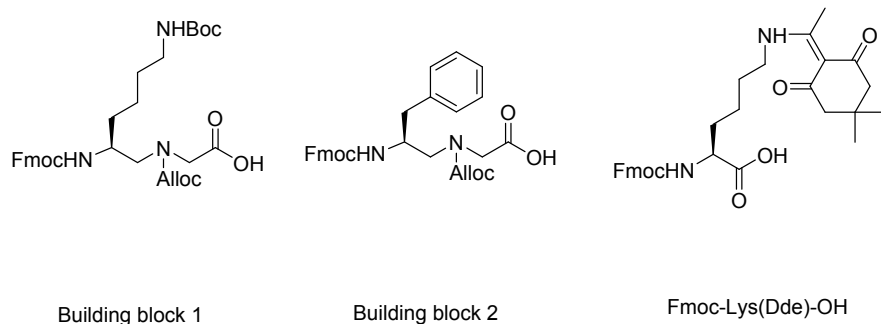
## Supporting information

### **Dimeric lipo- $\alpha$ /sulfono- $\gamma$ -AA hybrid peptides as broad-spectrum antibiotic agents**

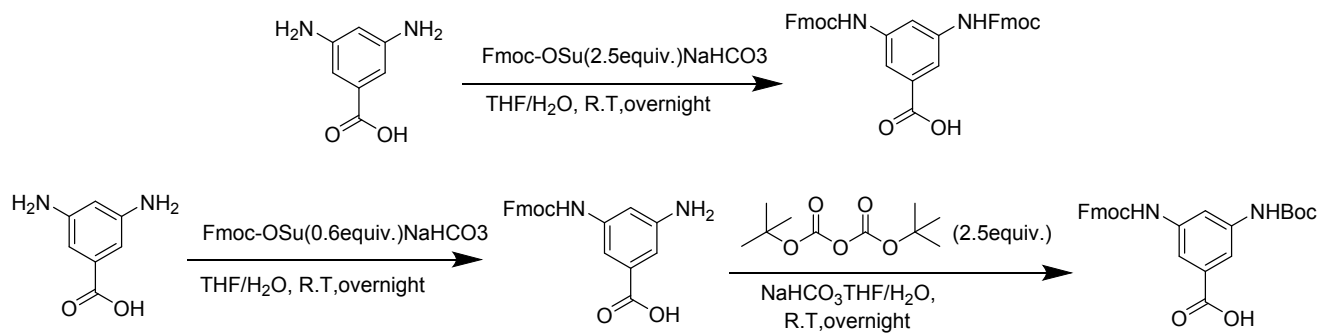
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**Figure S1** Sulfonyl- $\gamma$ -AA peptide building blocks and amino acid used in the study



**Figure S2** Synthetic scheme of linker

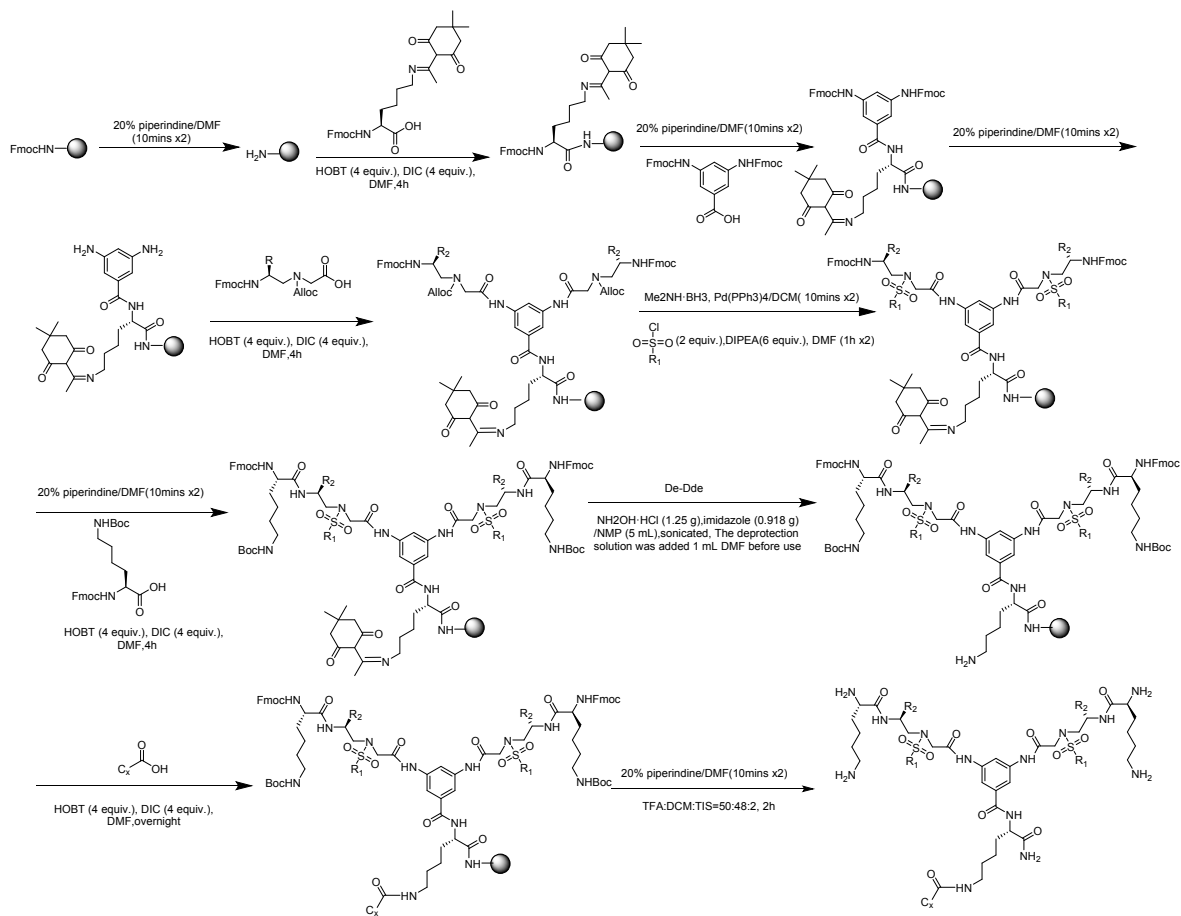


Figure S3 General synthetic scheme of Dimeric lipo- $\alpha$ /sulfono- $\gamma$ -AA peptides

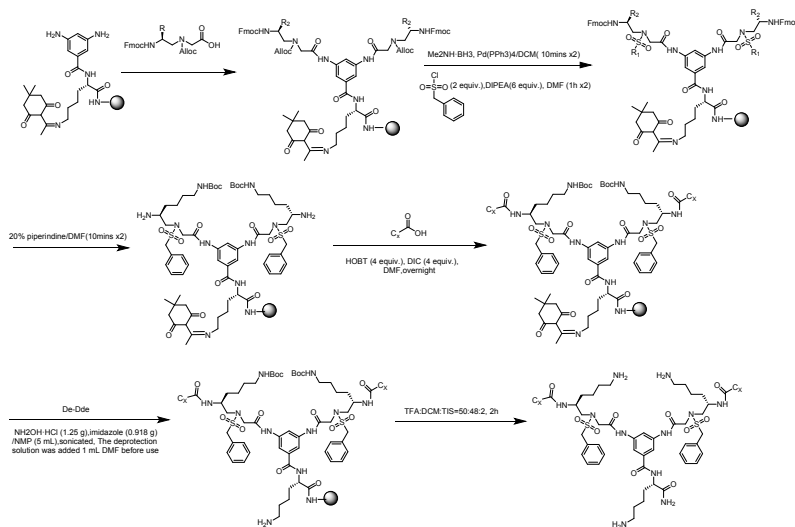
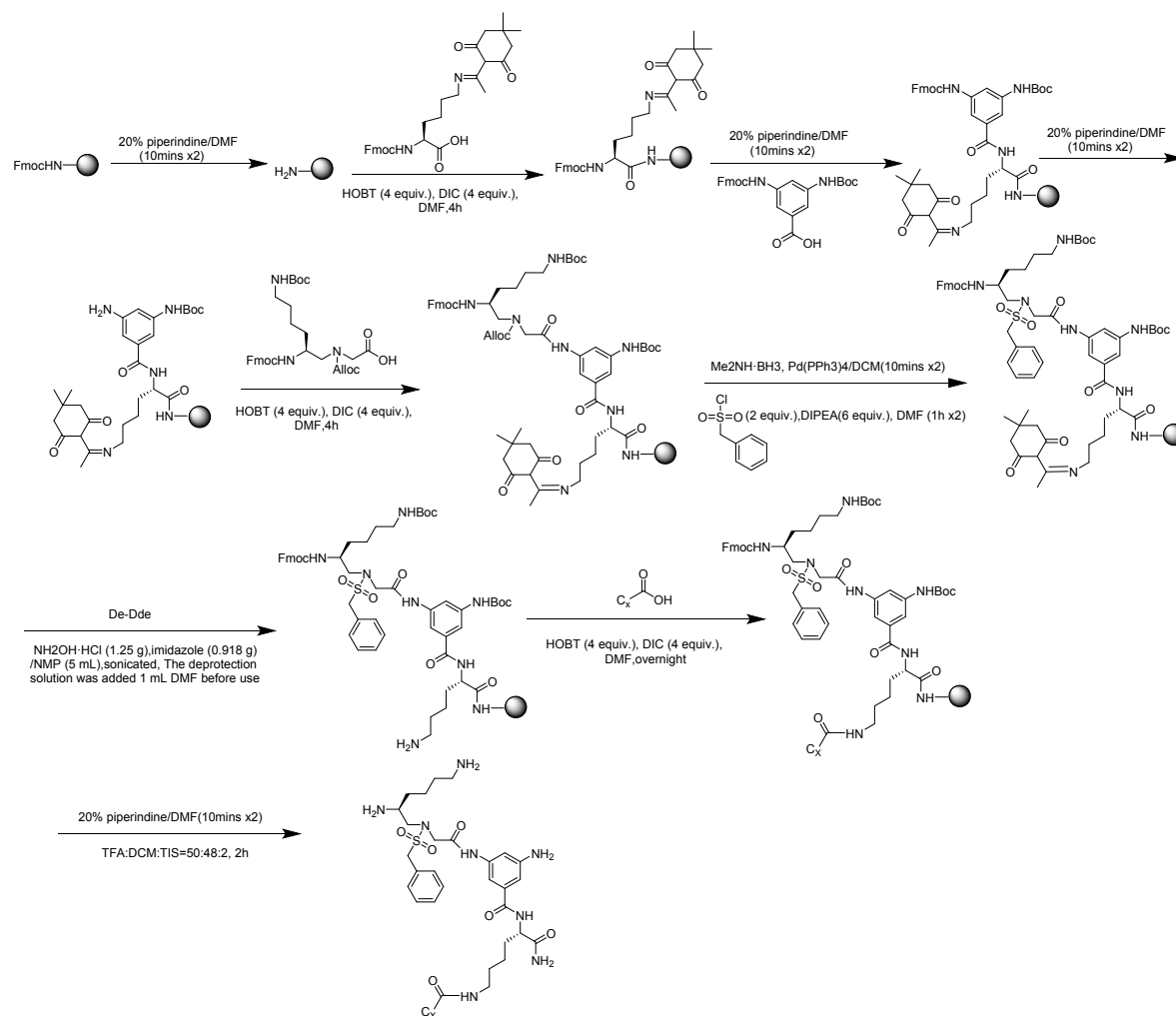


Figure S4 Typical synthetic route for compound 9 and 10



**Figure S5** Typical synthetic route for compound **8**

Dimeric lipo- $\alpha$ /sulfonyl- $\gamma$ -AA peptides	Exact Mass	Observed (MALDI-TOF)
1	1367.82	1368.91
2	1423.88	1424.89
3	1339.79	1340.81
4	1311.76	1312.83
5	1283.72	1285.14

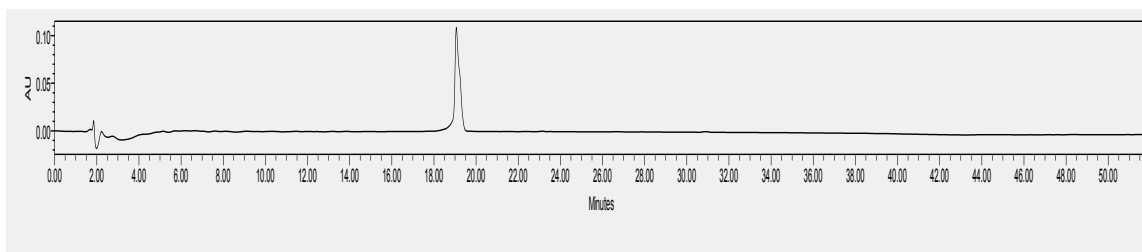
6	1111.63	1112.71
7	1167.69	1169.11
8	842.55	843.91
9	1293.80	1295.33
10	1405.92	1406.93
11	1311.76	1312.85
12	1017.62	1018.71
13	1423.96	1425.19
14	1367.82	1368.97
15	1399.81	1400.95
16	1429.76	1430.87
17	1407.71	1408.74
18	1495.61	1496.71
19	1439.82	1440.85
20	1439.82	1440.85

**Table S1.** MALDI analysis of Dimeric lipo- $\alpha$ /sulfono- $\gamma$ -AA hybrid peptides

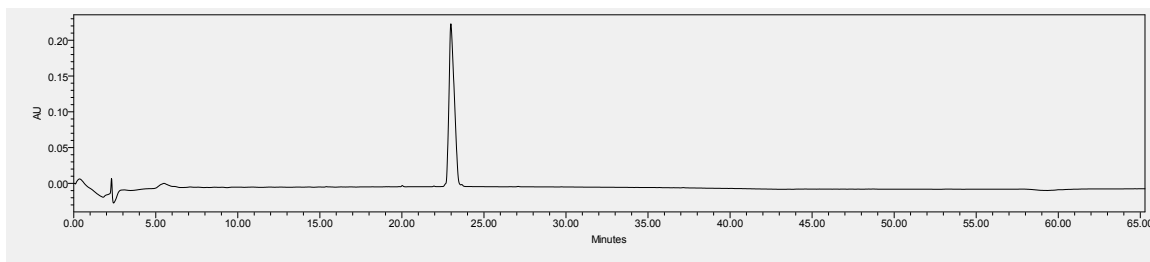
Dimeric lipo- $\alpha$ /sulfono- $\gamma$ -AA peptides	Purity trace after HPLC purification (%)	Retention Time (min)
1	100.00	19.09
2	99.86	22.99
3	100.00	17.70
4	98.98	15.66
5	99.50	13.73

6	99.97	21.73
7	98.59	26.59
8	99.91	22.12
9	99.07	29.53
10	99.84	39.18
11	100.00	18.74
12	100.00	17.39
13	99.99	19.60
14	99.96	18.75
15	99.85	18.52
16	99.92	18.53
17	100.00	19.70
18	99.75	19.55
19	99.90	19.75
20	99.91	19.64

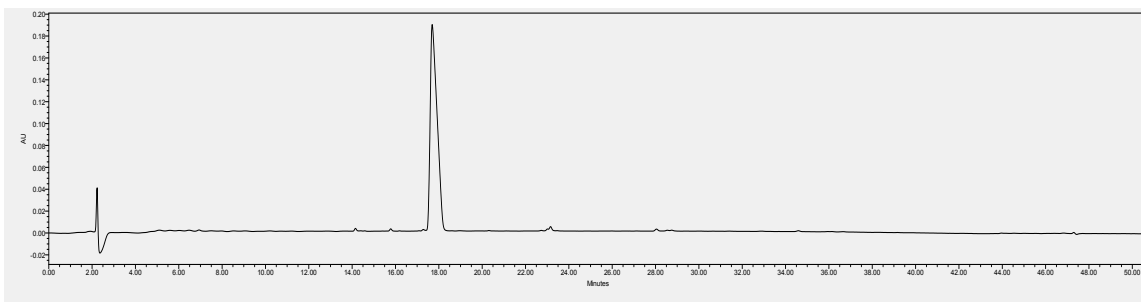
**Table S2.** HPLC purities and retention time of Dimeric lipo- $\alpha$ /sulfonyl- $\gamma$ -AA peptides. The gradient eluting method of 5% to 100% of solvent B (0.1% TFA in acetonitrile) in A (0.1% TFA in water) was performed



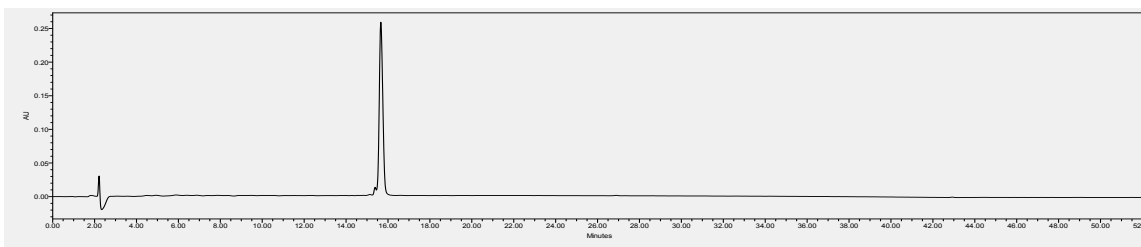
Compound 1



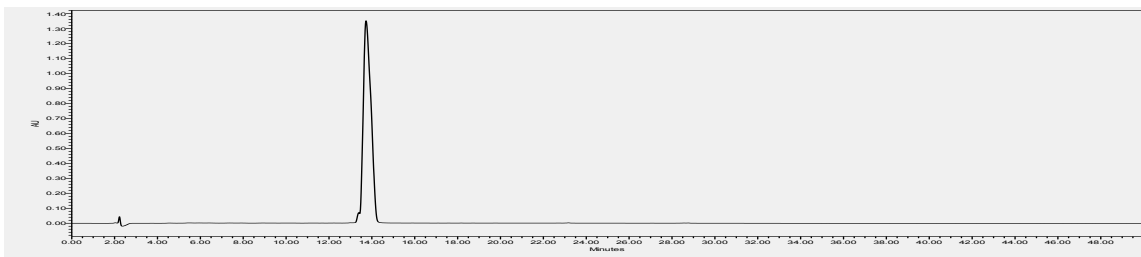
Compound 2



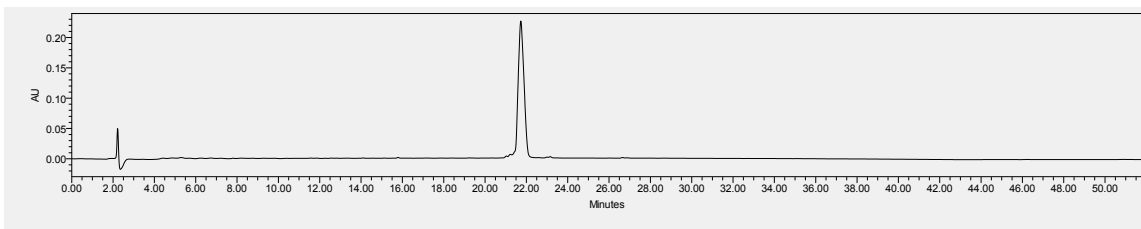
Compound 3



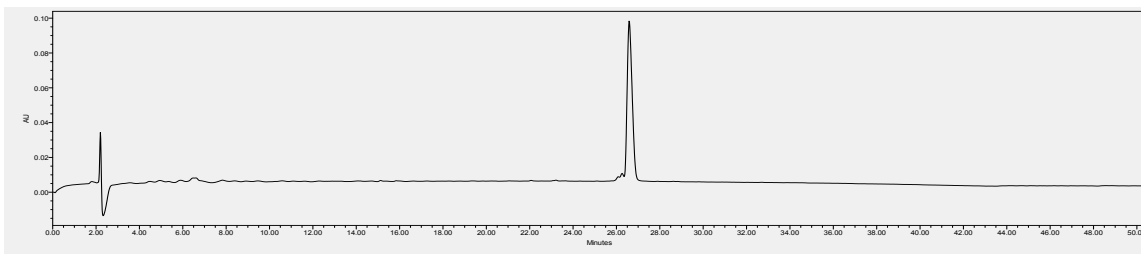
Compound 4



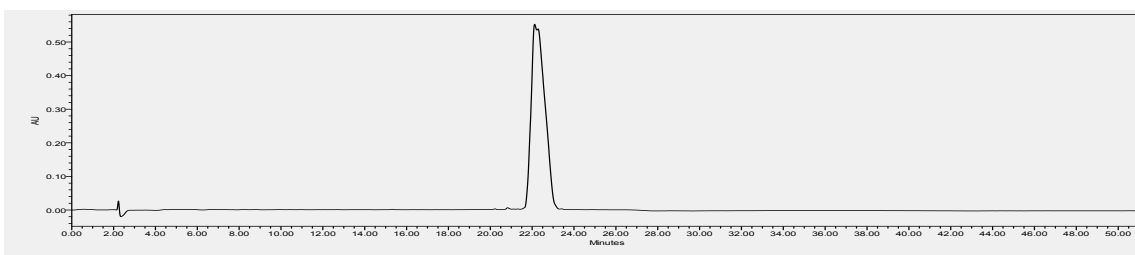
Compound 5



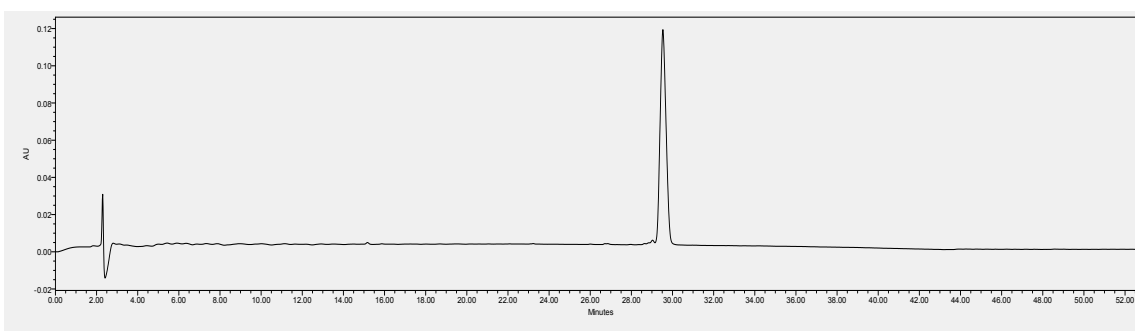
Compound 6



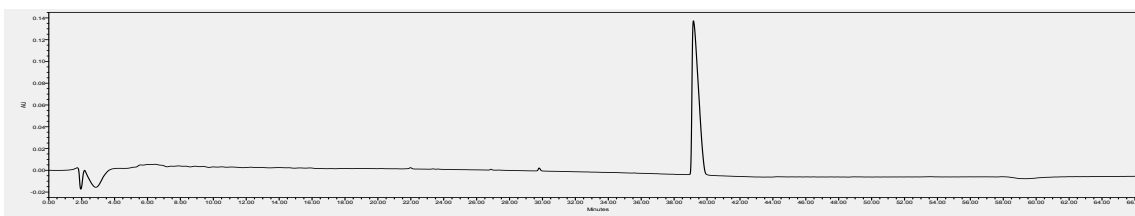
Compound 7



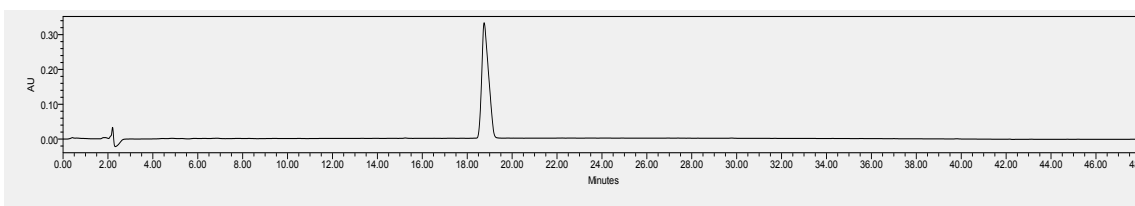
Compound 8



Compound 9

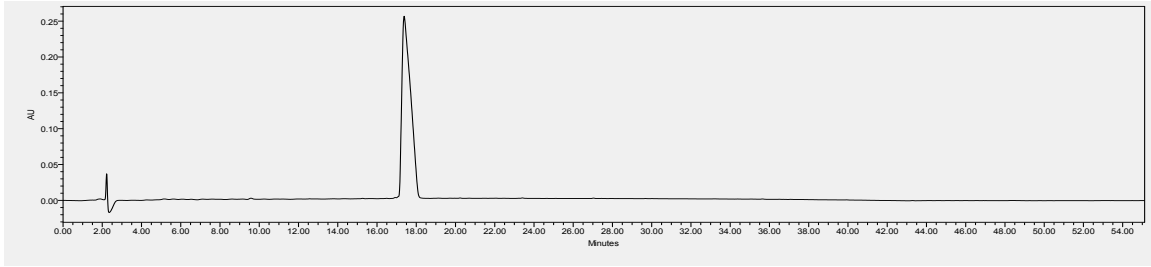


Compound 10

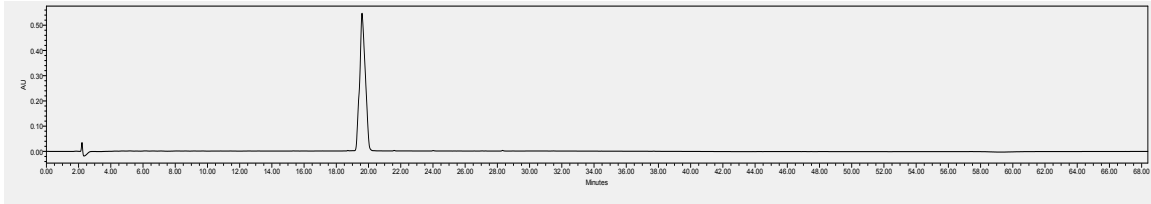


Compound 11

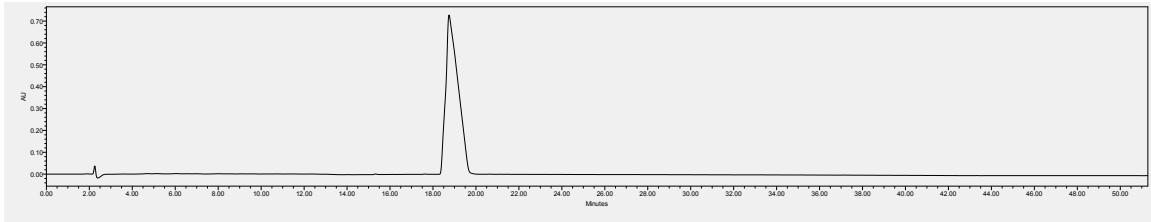




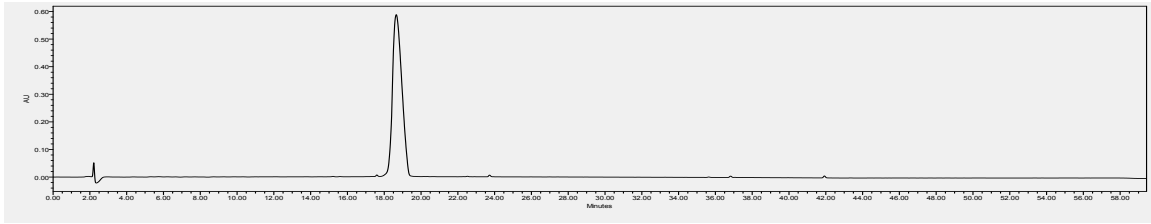
Compound 12



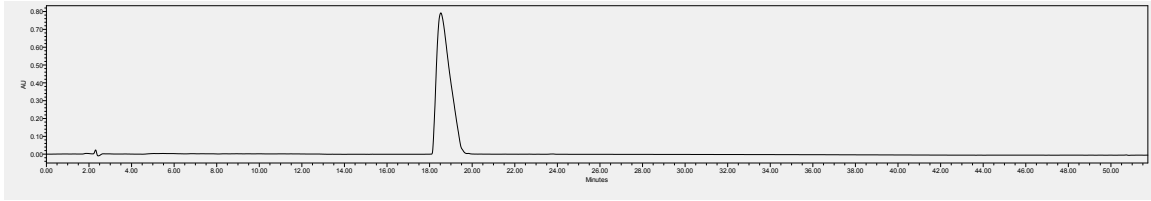
Compound 13



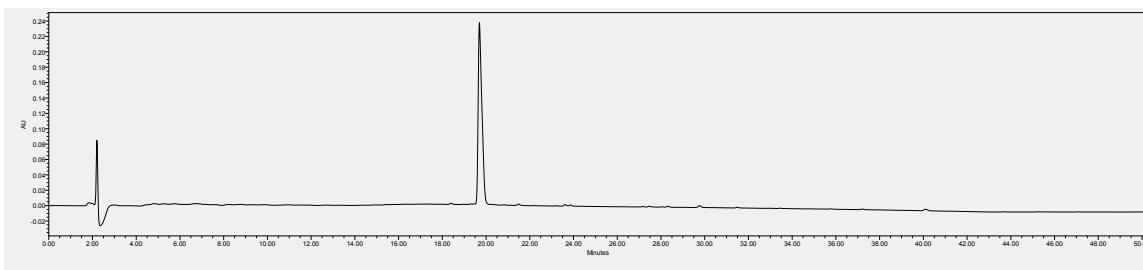
Compound 14



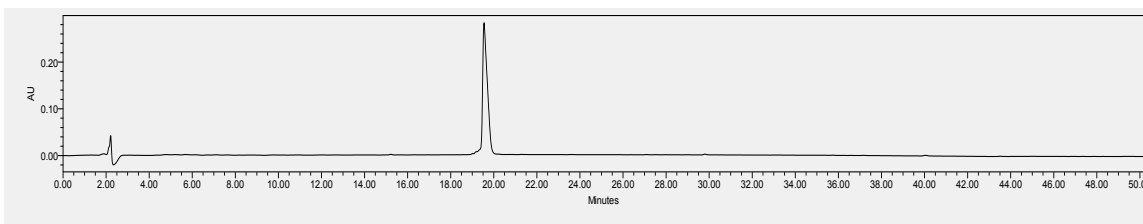
Compound 15



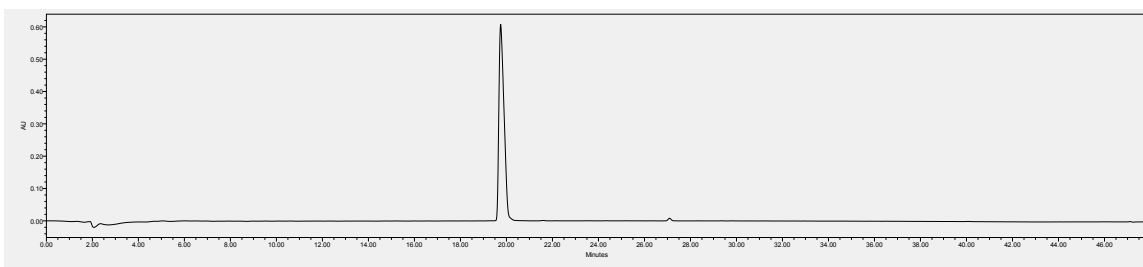
Compound 16



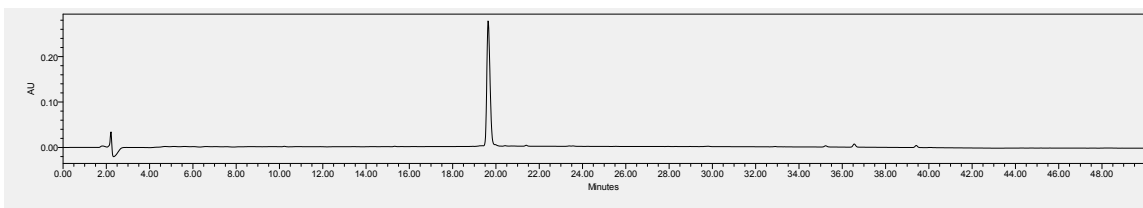
Compound 17



Compound 18



Compound 19



Compound 20

**Figure S6** Analytical HPLC trace of Dimeric lipo- $\alpha$ /sulfo- $\gamma$ -AA peptides

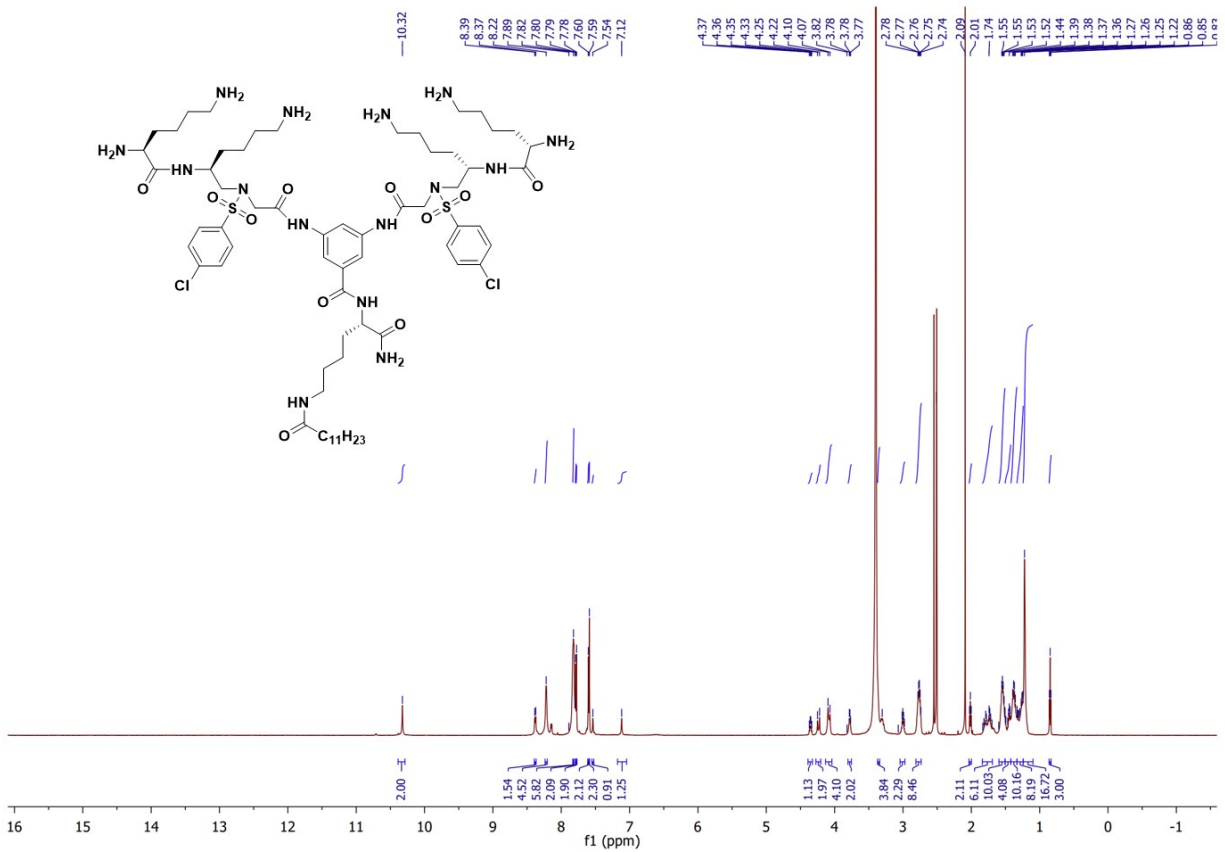
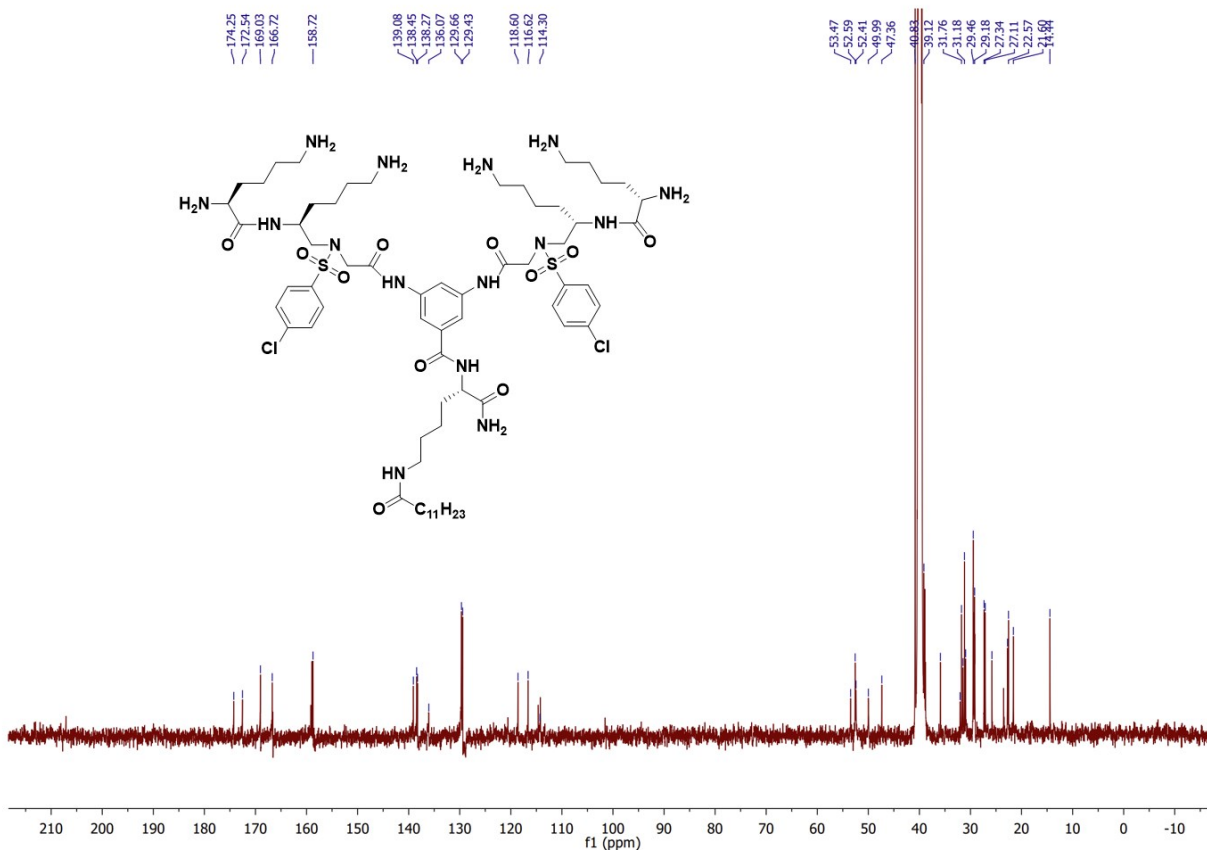
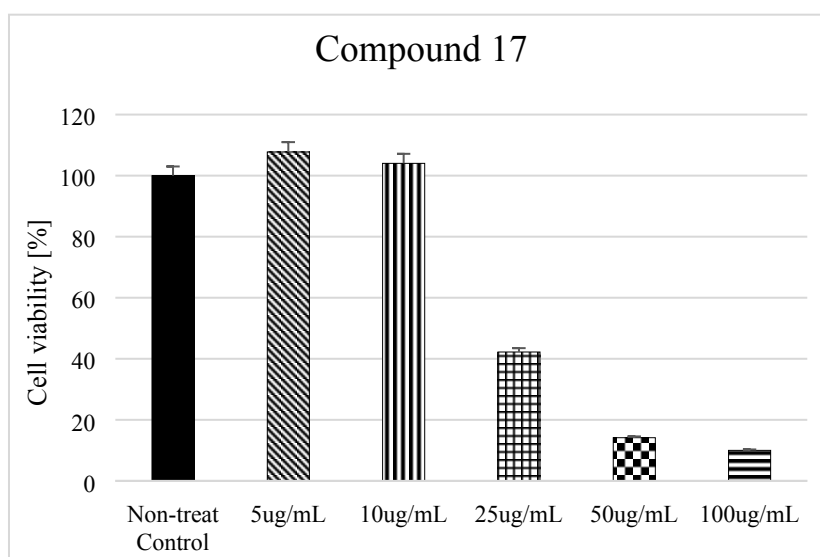


Figure S7 <sup>1</sup>H NMR (DMSO-d<sub>6</sub>) spectra of compounds 17



**Figure S8**  $^{13}\text{C}$  NMR (DMSO- $d_6$ ) spectra of compounds **17**



**Figure S9** Cytotoxicity of the **17** against HeLa cells