

# Supporting Information for

## Design of Controllable Bio-Inspired Chiroptic Self-Assemblies

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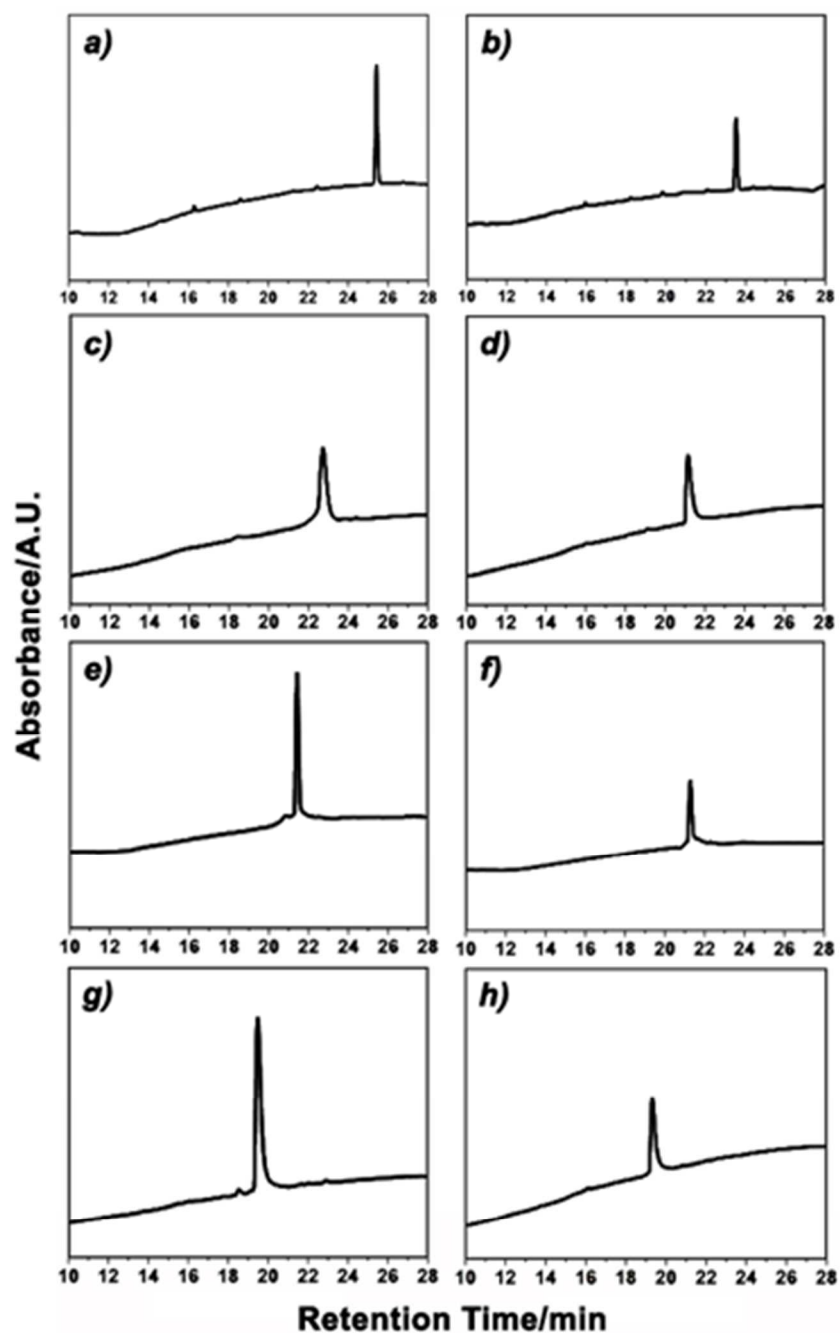


Figure S1. Reversed phase HPLC profiles of the synthesized lipopeptides: (a) C<sub>14</sub>-L-FFK, (b) C<sub>14</sub>-L-FK, (c) C<sub>14</sub>-D-FFK, (d) C<sub>14</sub>-D-FK, (e) C<sub>14</sub>-L-YYK, (f) C<sub>14</sub>-L-YK, (g) C<sub>14</sub>-D-YYK, (h) C<sub>14</sub>-D-YK. Note that a gradient elution mode was employed, as shown in Table S1. The monitoring wavelength was set at 214 nm, and the flow rate was 1 mL min<sup>-1</sup>.

**Table S1.** HPLC gradient elution conditions

Time/min	A%	B%
	0.1% (v/v) TFA in water	0.1% (v/v) TFA in acetonitrile
0	90	10
4	90	10
25	10	90
32	90	10

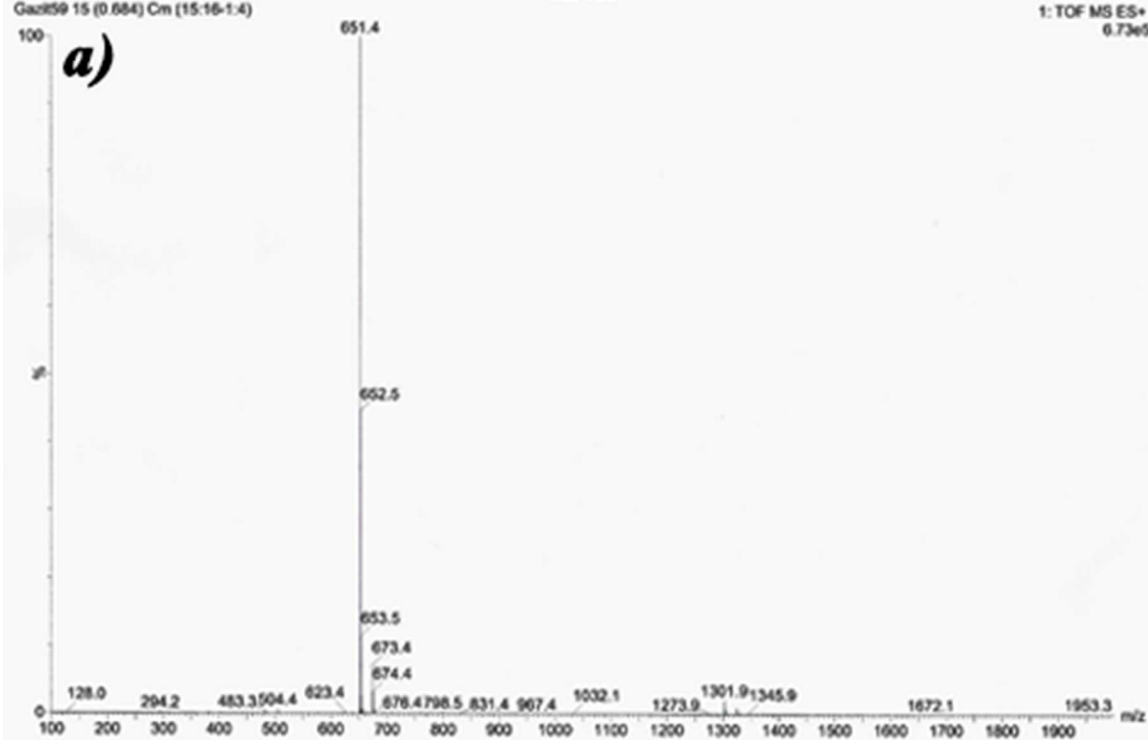
It is evident that the lipopeptide peaks highly dominate the profiles and their relative area is more than 95%, indicating the high purities of the synthesized compounds.

C14-FFK-OH #2

GasID59 15 (0.684) Cm (15:16:1:4)

Kai Tao

1: TOF MS ES+  
6.73e5

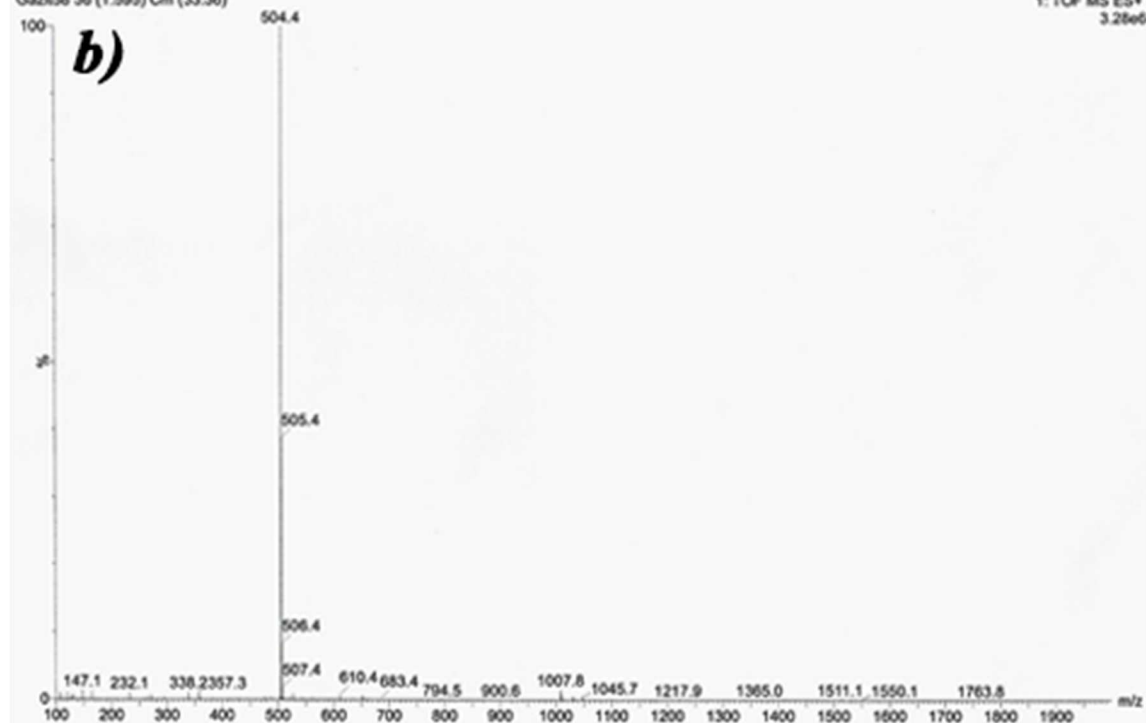


C14-FK-OH #1

GasID58 36 (1.595) Cm (33:36)

Kai Tao

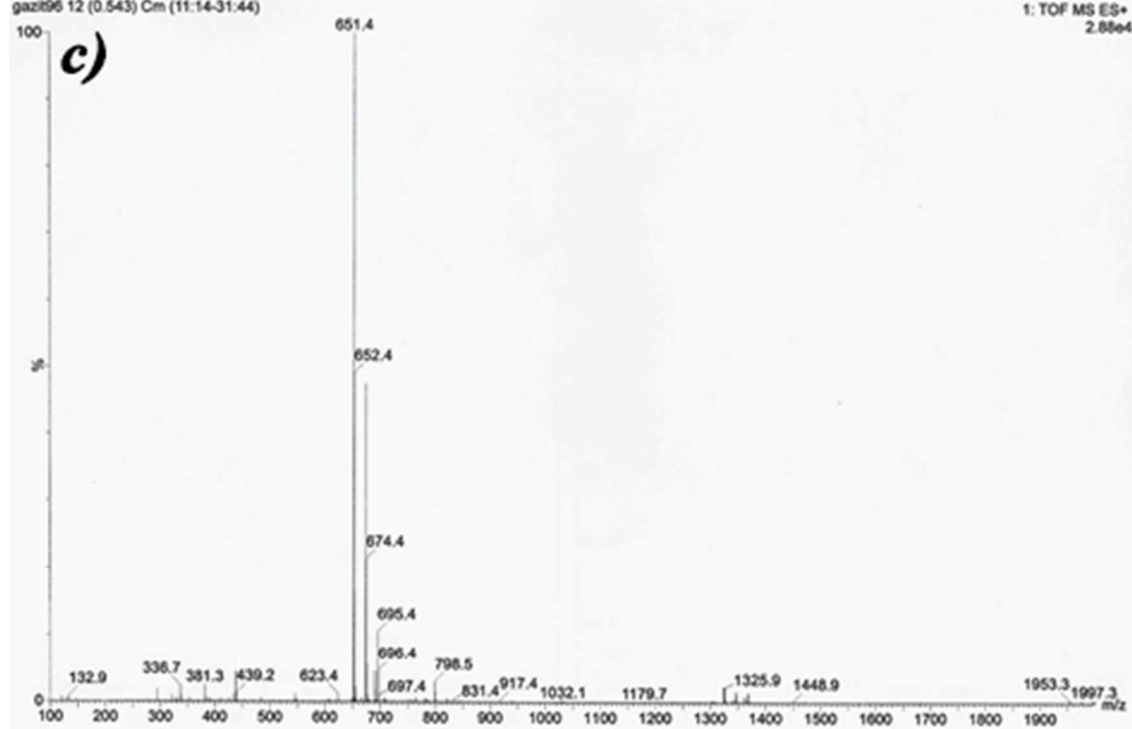
1: TOF MS ES+  
3.28e6



C14-FFK-OH No 1  
gas096 12 (0.543) Cm (11:14-31:44)

kai Tao

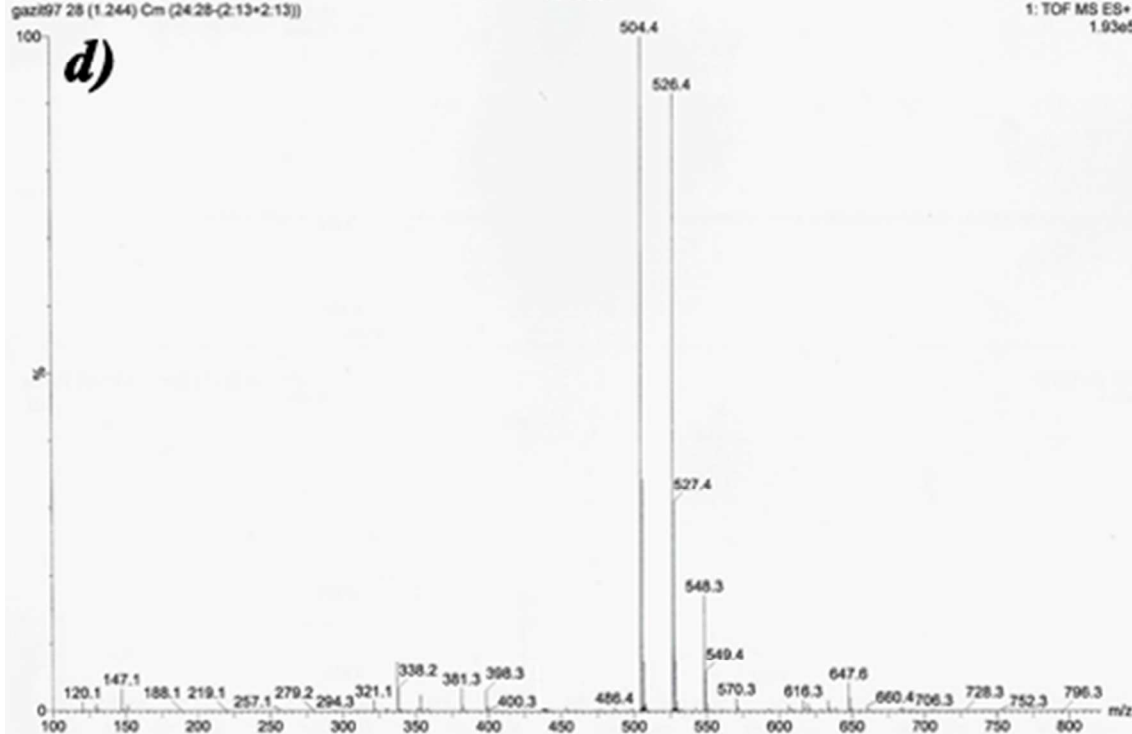
1: TOF MS ES+  
2.88e4



C14-FK-OH No 2  
gas097 28 (1.244) Cm (24:28-(2:13+2:13))

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1: TOF MS ES+  
1.93e5

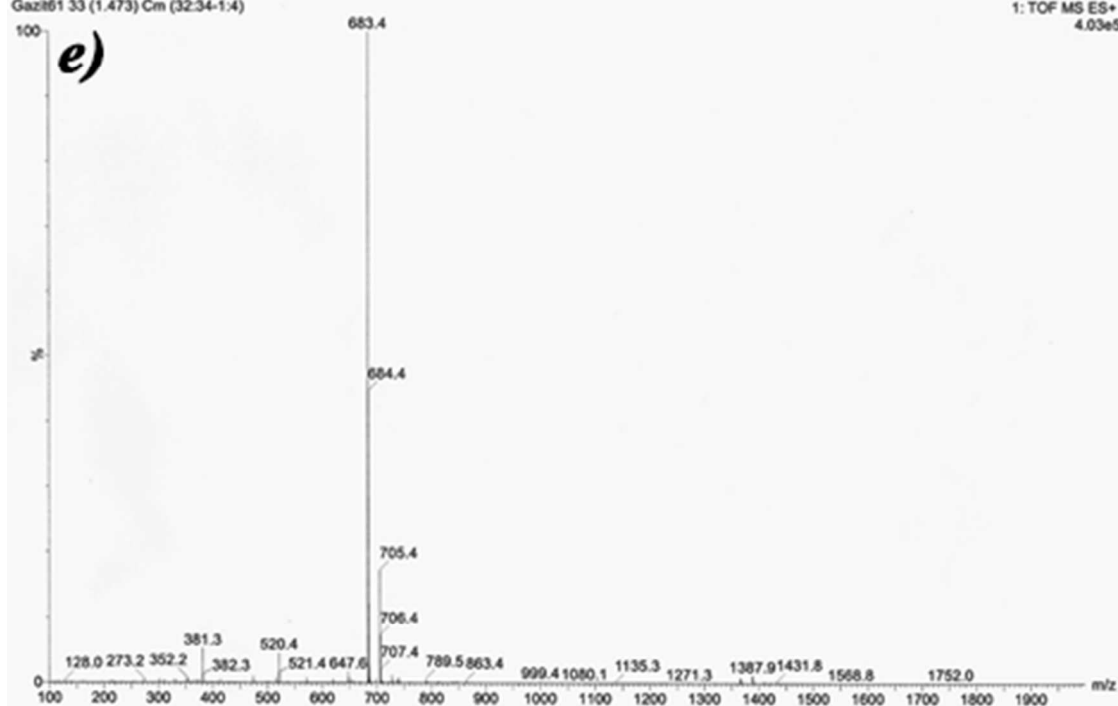


C14-YYK-OH #4

Gaz181 33 (1.473) Cm (32:34-1:4)

Kai Tao

1: TOF MS ES+  
4.03e5

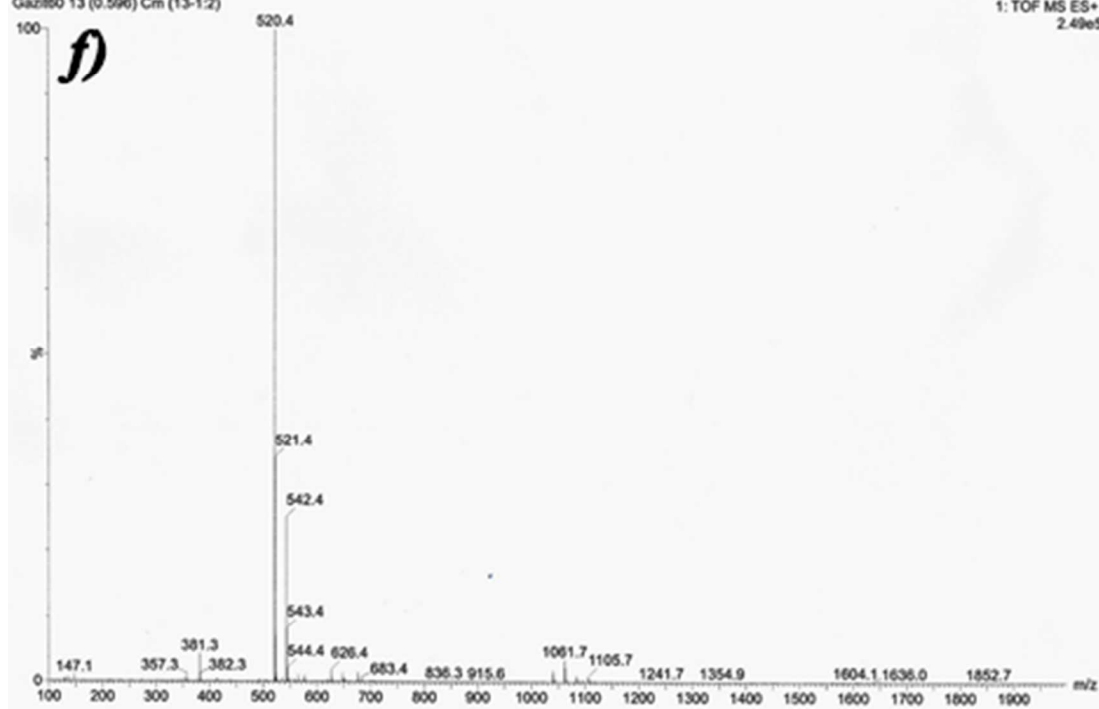


C14-YYK-OH #5

Gaz180 13 (0.596) Cm (13-1:2)

Kai Tao

1: TOF MS ES+  
2.49e5



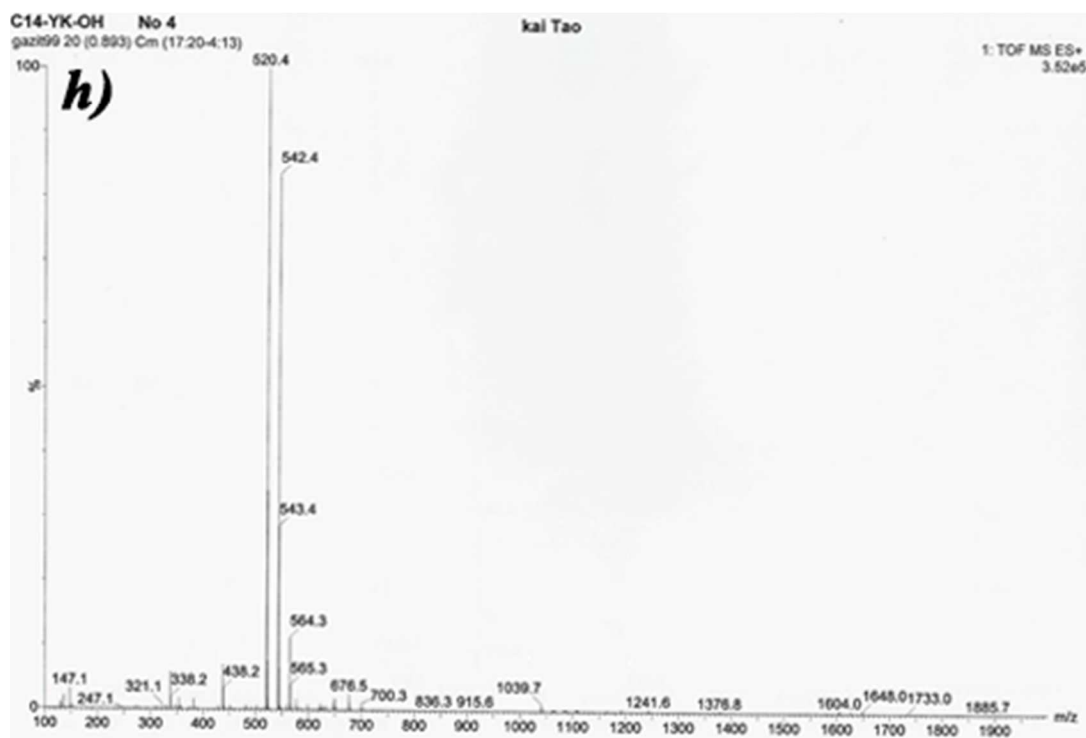
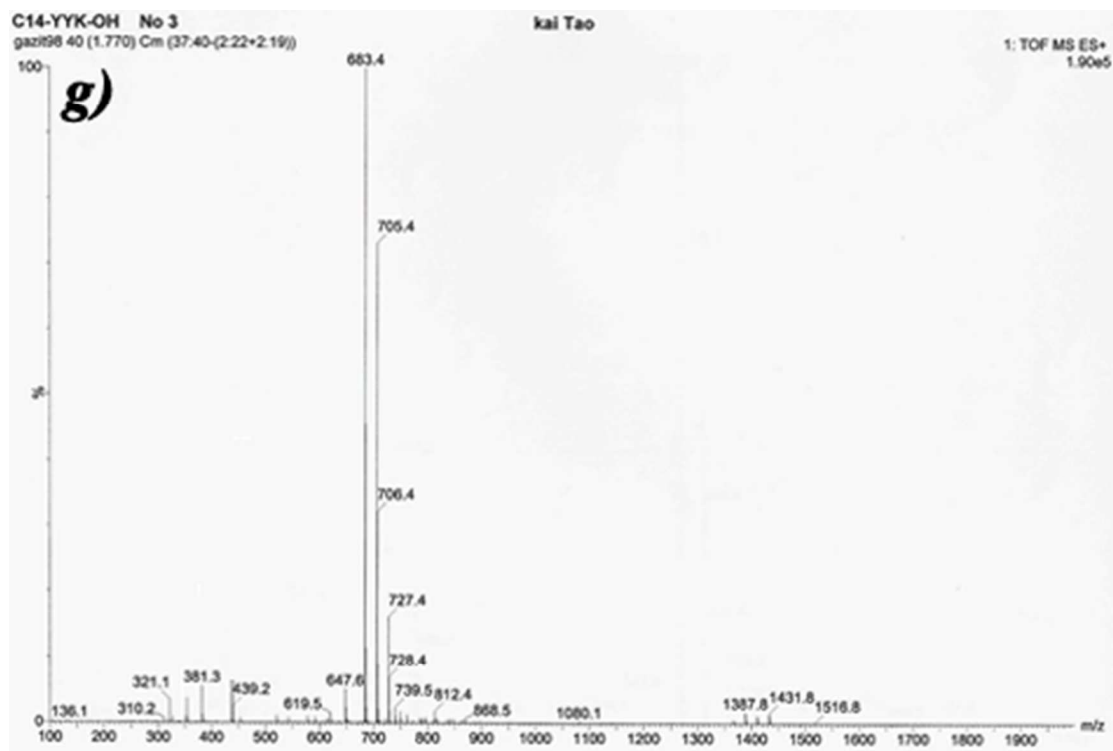


Figure S2. MS spectra of the synthesized lipopeptides: (a) C<sub>14</sub>-L-FFK, (b) C<sub>14</sub>-L-FK, (c) C<sub>14</sub>-D-FFK, (d) C<sub>14</sub>-D-FK, (e) C<sub>14</sub>-L-YYK, (f) C<sub>14</sub>-L-YK, (g) C<sub>14</sub>-D-YYK, (h) C<sub>14</sub>-D-YK.

The observed molecular masses are consistent with the calculated ones, demonstrating the high purities of the lipopeptide samples, which are well in accordance with the HPLC analysis described above:

(a) C<sub>14</sub>-L-FFK:

Expected masses  $[M+H]^+ = 651.9$ ,  $[M+Na]^+ = 673.9$ ;

Observed masses  $[M+H]^+ = 651.4$ ,  $[M+Na]^+ = 673.4$ .

(b) C<sub>14</sub>-L-FK:

Expected masses  $[M+H]^+ = 504.7$ ;

Observed masses  $[M+H]^+ = 504.4$ .

(c) C<sub>14</sub>-D-FFK:

Expected masses  $[M+H]^+ = 651.9$ ,  $[M+Na]^+ = 654.9$ ;

Observed masses  $[M+H]^+ = 651.4$ ,  $[M+Na]^+ = 674.4$ .

(d) C<sub>14</sub>-D-FK:

Expected masses  $[M+H]^+ = 504.7$ ,  $[M+Na]^+ = 526.7$ ;

Observed masses  $[M+H]^+ = 504.4$ ,  $[M+Na]^+ = 526.4$ .

(e) C<sub>14</sub>-L-YYK:

Expected masses  $[M+H]^+ = 683.9$ ,  $[M+Na]^+ = 705.9$ ;

Observed masses  $[M+H]^+=683.4$ ,  $[M+Na]^+=705.4$ .

(f)  $C_{14}\text{-}L\text{-}YK$ :

Expected masses  $[M+H]^+=520.7$ ,  $[M+Na]^+=542.7$ ;

Observed masses  $[M+H]^+=520.4$ ,  $[M+Na]^+=542.4$ .

(g)  $C_{14}\text{-}D\text{-}YYK$ :

Expected masses  $[M+H]^+=683.9$ ,  $[M+Na]^+=705.9$ ;

Observed masses  $[M+H]^+=683.4$ ,  $[M+Na]^+=705.4$ .

(h)  $C_{14}\text{-}D\text{-}YK$ :

Expected masses  $[M+H]^+=520.7$ ,  $[M+Na]^+=542.7$ ;

Observed masses  $[M+H]^+=520.4$ ,  $[M+Na]^+=542.4$ .

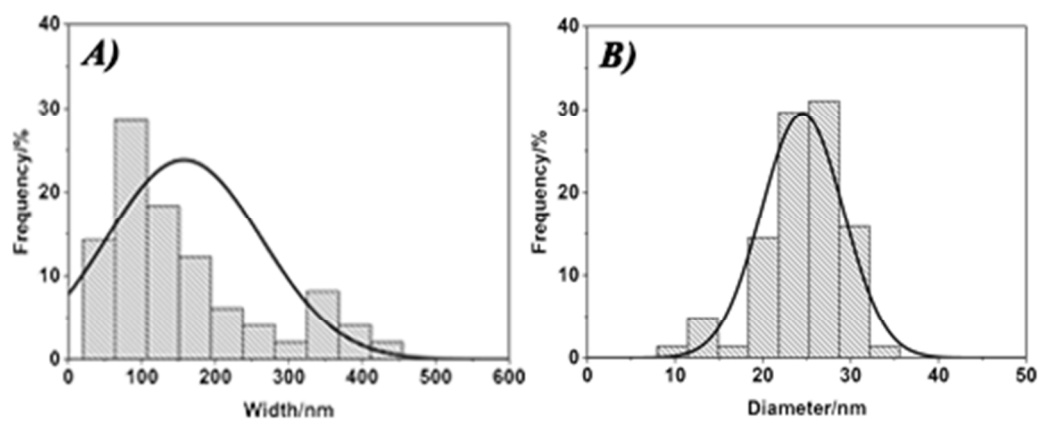


Figure S3. Statistical width distribution of nanoribbons self-assembled by  $C_{14}$ -FFK (A) and diameter distribution of nanofibers self-assembled by  $C_{14}$ -FK (B).

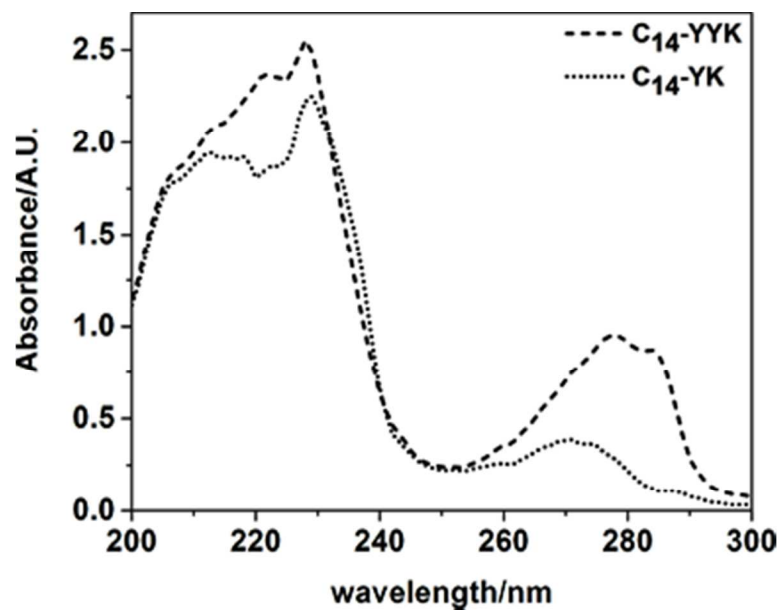


Figure S4. UV-Vis absorption spectra of 1.0 mg mL<sup>-1</sup> C<sub>14</sub>-YYK (dashed lines) and C<sub>14</sub>-YK (dotted lines) in HFIP/water (1/49, v/v) at pH 7.0. It can be clearly seen that the phenolic groups present an intensive absorption at around 280 nm.

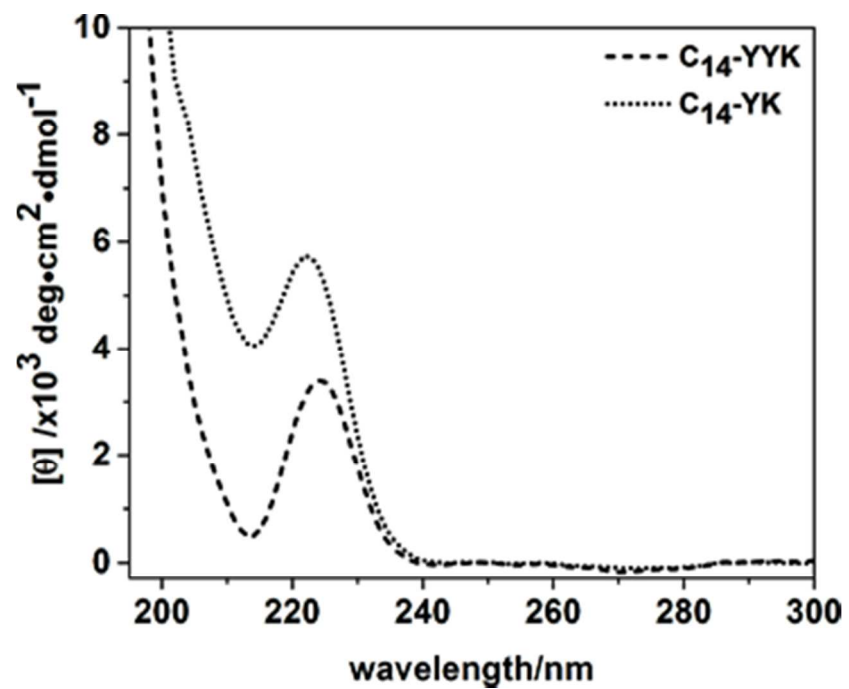


Figure S5. CD spectra of  $1.0 \text{ mg mL}^{-1}$  C<sub>14</sub>-YYK (dashed lines) and C<sub>14</sub>-YK (dotted lines) in HFIP. Note that there is no obvious CD signal for free phenolic moieties.

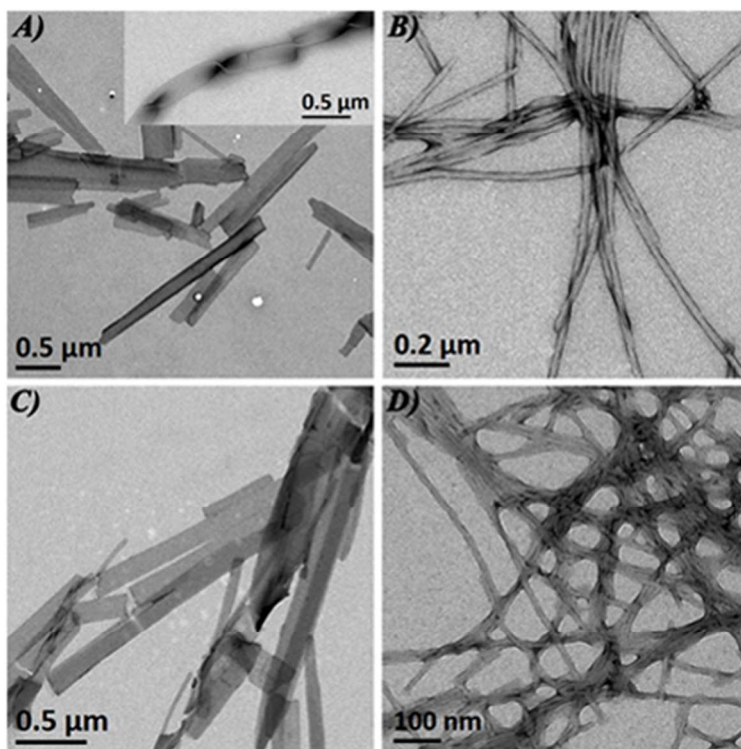


Figure S6. TEM micrographs representing the nanoribbons self-assembled by  $C_{14}$ -D-FFK (A) and  $C_{14}$ -D-YYK (C), and the nanofibers self-assembled by  $C_{14}$ -D-FK (B) and  $C_{14}$ -D-YK (D). The inset in (A) shows the right-handed twisting of the nanoribbons.