Supporting Information

Structure-mechanical property relationship of a pentapeptide crystal

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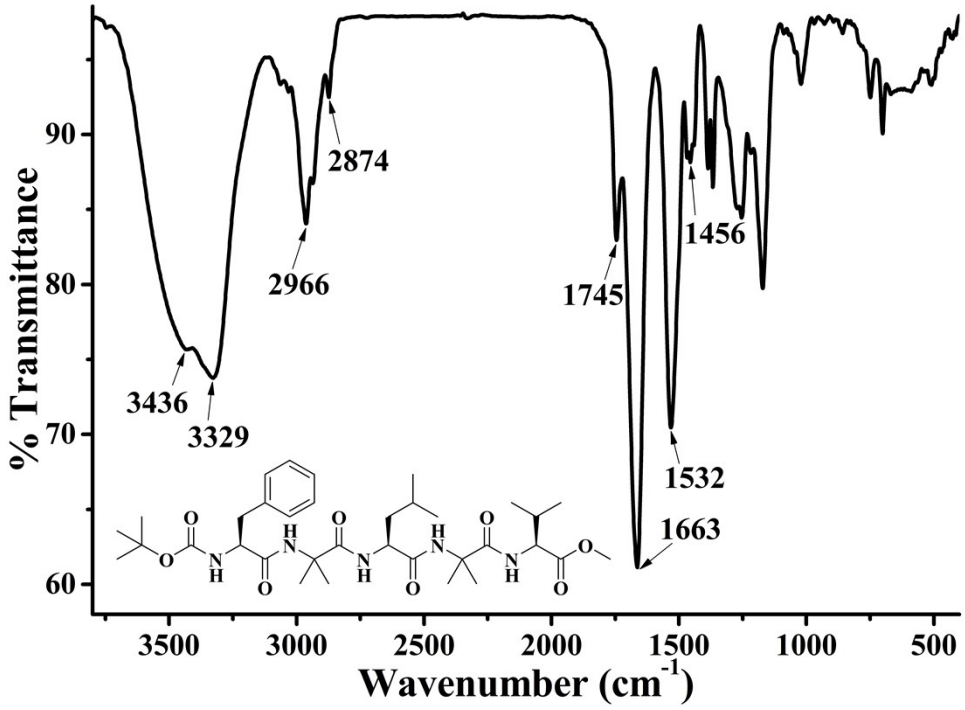
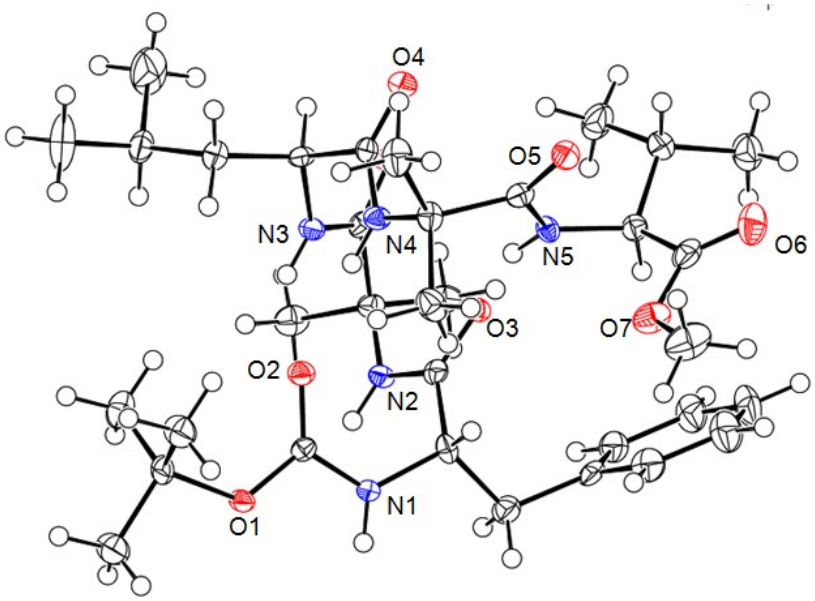
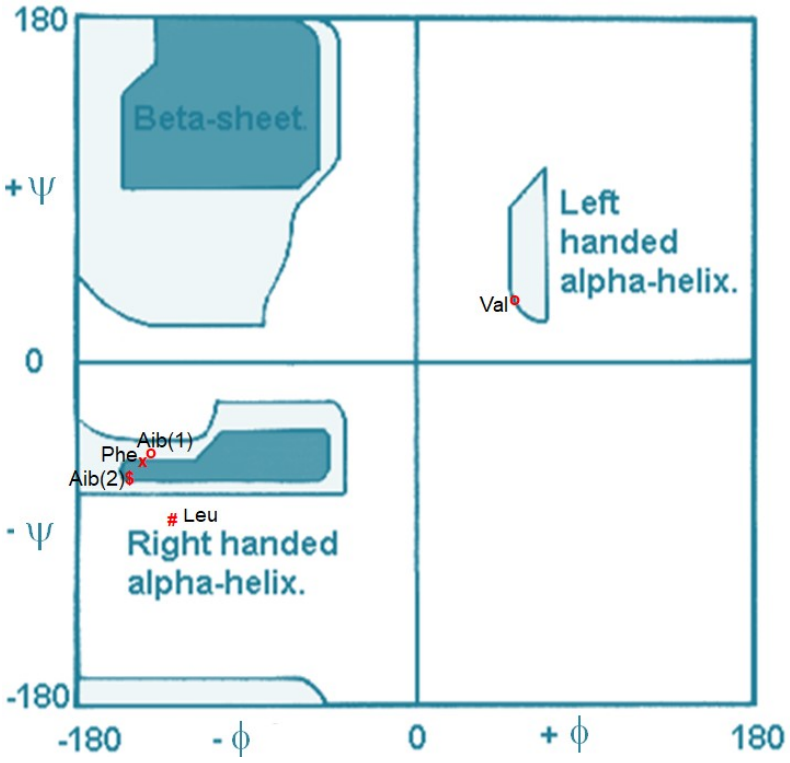


ESI Figure S1: The solid-state FT-IR spectra of pentapeptide 1.



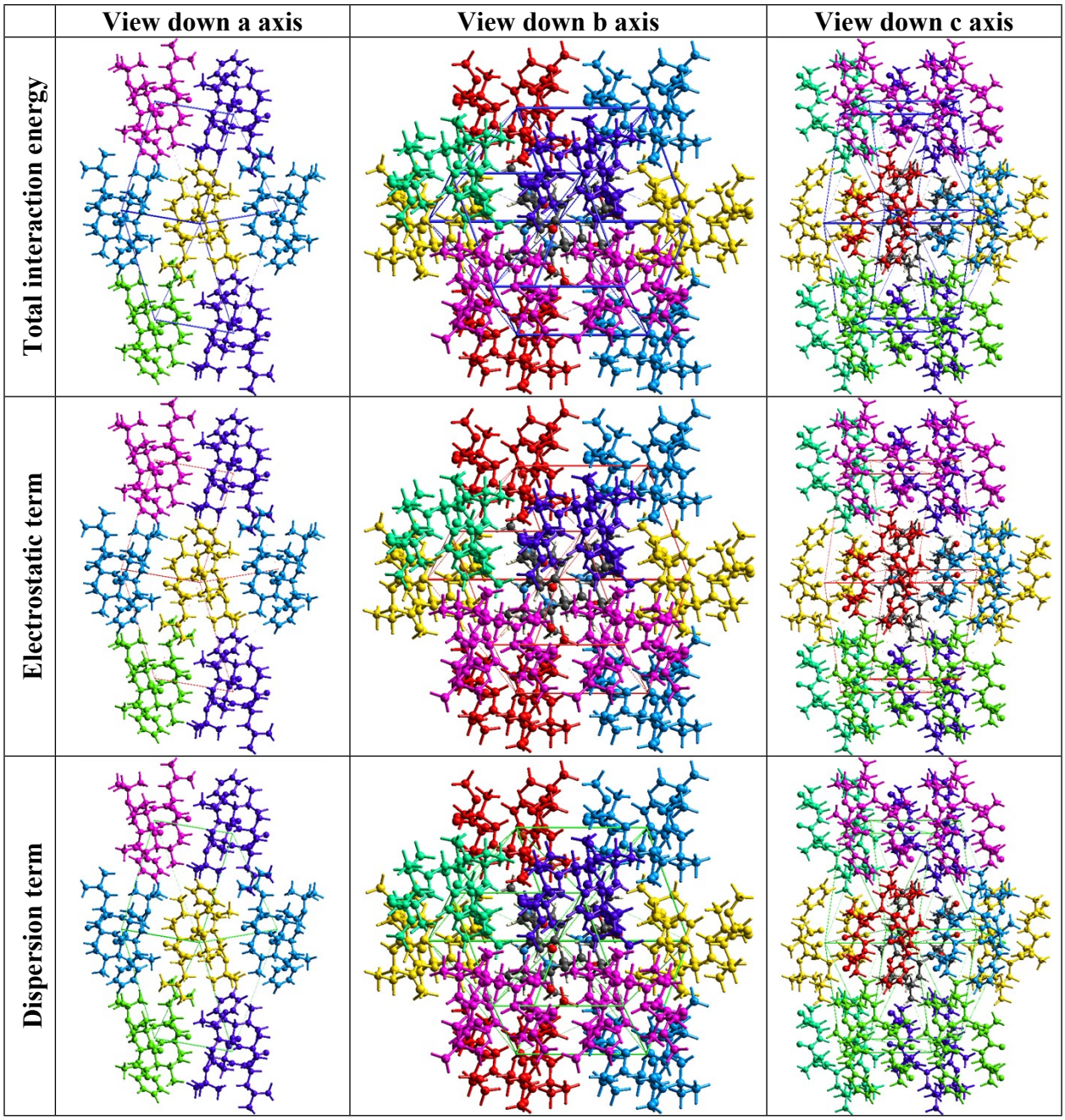
ESI Figure S2: ORTEP diagram of pentapeptide **1**. Probability 50%.



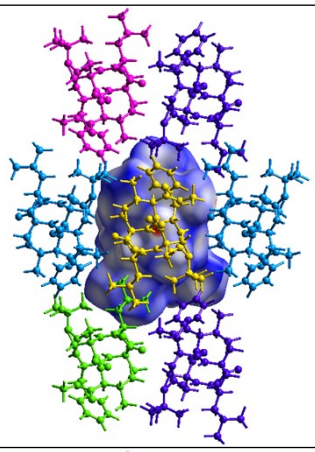
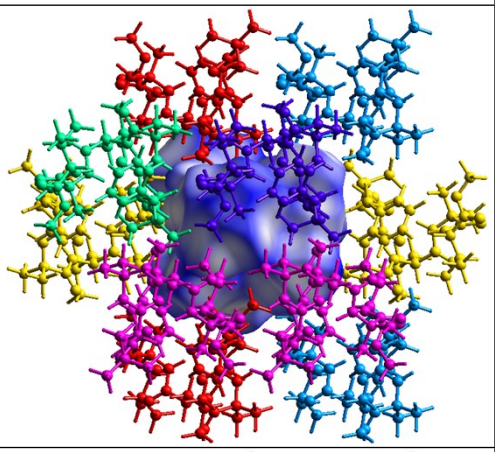
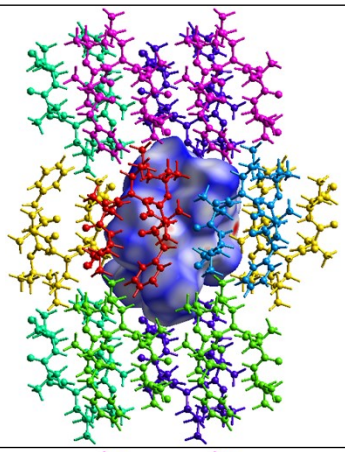
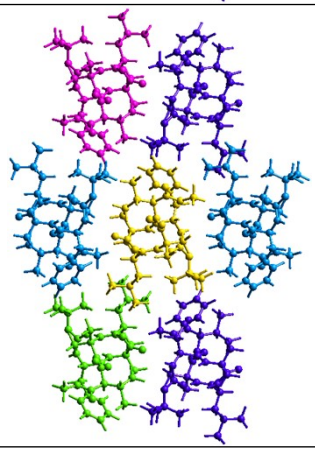
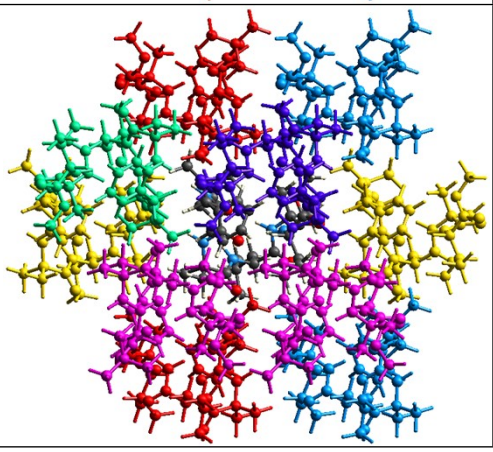
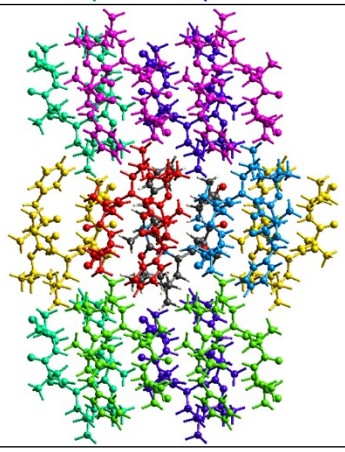
ESI Figure S3: The coordinates of the ϕ and ψ dihedral angles of pentapeptide **1** shown on a Ramachandran plot.

ESI Table S1: Crystal data and structure refinement for pentapeptide 1.

Identification code	BPAIBLAV
Empirical formula	$C_{34}H_{55}N_5O_8$
Formula weight	661.83
Temperature/K	293(2)
Crystal system	orthorhombic
Space group	$P2_12_12_1$
a/Å	9.5985(4)
b/Å	23.0985(11)
c/Å	16.6315(7)
α/°	90
β/°	90
γ/°	90
Volume/Å^3	3687.4(3)
Z	4
ρ_{calc}g/cm^3	1.192
μ/mm^{-1}	0.085
F(000)	1432.0
Crystal size/mm^3	0.2589 × 0.2112 × 0.1987
Radiation	MoKα (λ = 0.71073)
2Θ range for data collection/°	3.526 to 50.048
Index ranges	$-11 \leq h \leq 10$, $-27 \leq k \leq 24$, $-15 \leq l \leq 19$
Reflections collected	9097
Independent reflections	6207 [R_{int} = 0.0341, R_{sigma} = 0.0644]
Data/restraints/parameters	6207/0/436
Goodness-of-fit on F^2	1.070
Final R indexes [I>=2σ (I)]	R_1 = 0.0482, wR_2 = 0.1048
Final R indexes [all data]	R_1 = 0.0562, wR_2 = 0.1119
Largest diff. peak/hole / e Å^{-3}	0.17/-0.27
Flack parameter	0.0002(10)



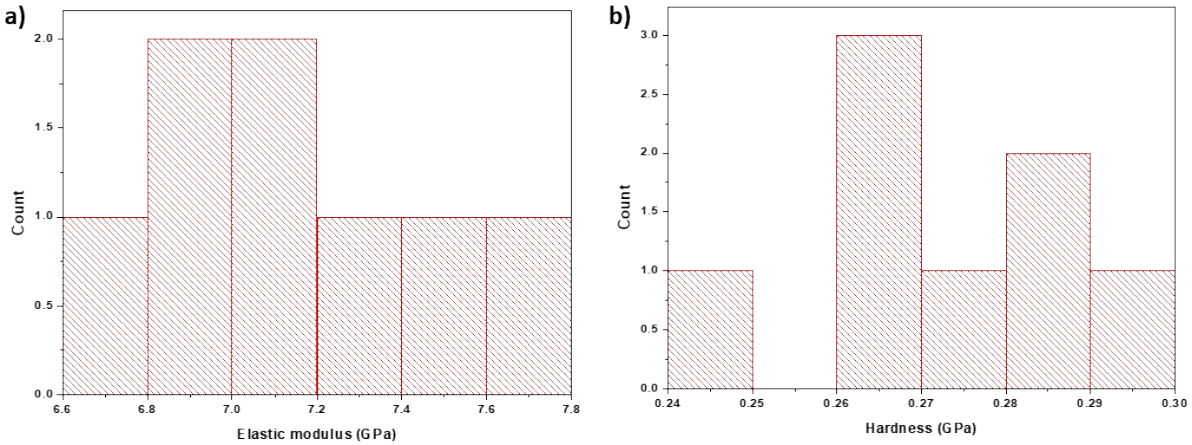
ESI Figure S4: Energy frameworks of pentapeptide viewed along different crystallographic directions.

View down a axis	View down b axis	View down c axis
		
		

ESI Figure S5: Graphical representation of calculated aggregate total interaction energies of molecule within 3.8 Å (first row hirshfeld surface mode and second row normal mode).

ESI Table S2: Intermolecular interaction energies (kJ/mol) for the pentapeptide **1,** calculated using B3LYP/6-31G(d,p) dispersion corrected DFT model, with X–H bond lengths normalized to standard neutron diffraction values. The total energy (E_{tot}), electrostatic (E_{ele}), polarization (E_{pol}), dispersion (E_{dis}), and exchange-repulsion (E_{rep}) components of the energy are listed below. R indicates the distance between molecular centroids (mean atomic position) in Å.

	N	Symop	R	E_ele	E_pol	E_dis	E_rep	E_tot
	2	-x+1/2, -y, z+1/2	9.02	-33.4	-11.7	-64.7	41.7	-74.6
	2	x, y, z	9.60	-53.3	-24.9	-67.0	64.5	-93.3
	2	x+1/2, -y+1/2, -z	12.73	-2.6	-3.6	-30.1	14.6	-22.6
	2	-x, y+1/2, -z+1/2	14.59	0.6	-0.9	-8.9	2.3	-6.3
	2	-x+1/2, -y, z+1/2	10.40	-14.0	-6.8	-27.3	17.9	-32.6
	2	-x, y+1/2, -z+1/2	12.15	-19.3	-5.4	-42.0	26.7	-44.5
	2	x+1/2, -y+1/2, -z	14.09	1.7	-1.0	-10.5	5.6	-4.6



ESI Figure S6: Histogram plots as (a) elastic modulus and (b) hardness obtained from several indentations from multiple crystals.

Experimental

Peptide Synthesis: The reported peptide was synthesized by traditional solution-phase reaction using racemisation free fragment condensation strategy by N,N'-dicyclohexylcarbodiimide /1-hydroxybenzotriazole (DCC/ HOBt) (Figure S2). The C-terminus was protected as a methyl ester and tertiary-butoxycarbonyl group was used for N-terminal protection. The products were purified by column chromatography using silica (100-200-mesh size) gel as stationary phase and n-hexane-ethylacetate 9:1 as eluent. The compounds were characterized by 400 MHz ^{1}H NMR spectroscopy, 100 MHz ^{13}C NMR spectroscopy, solid-state FT-IR Spectroscopy and mass spectrometry.

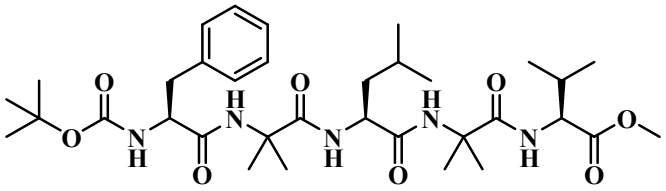


Figure S7: Schematic presentation of pentapeptide 1.

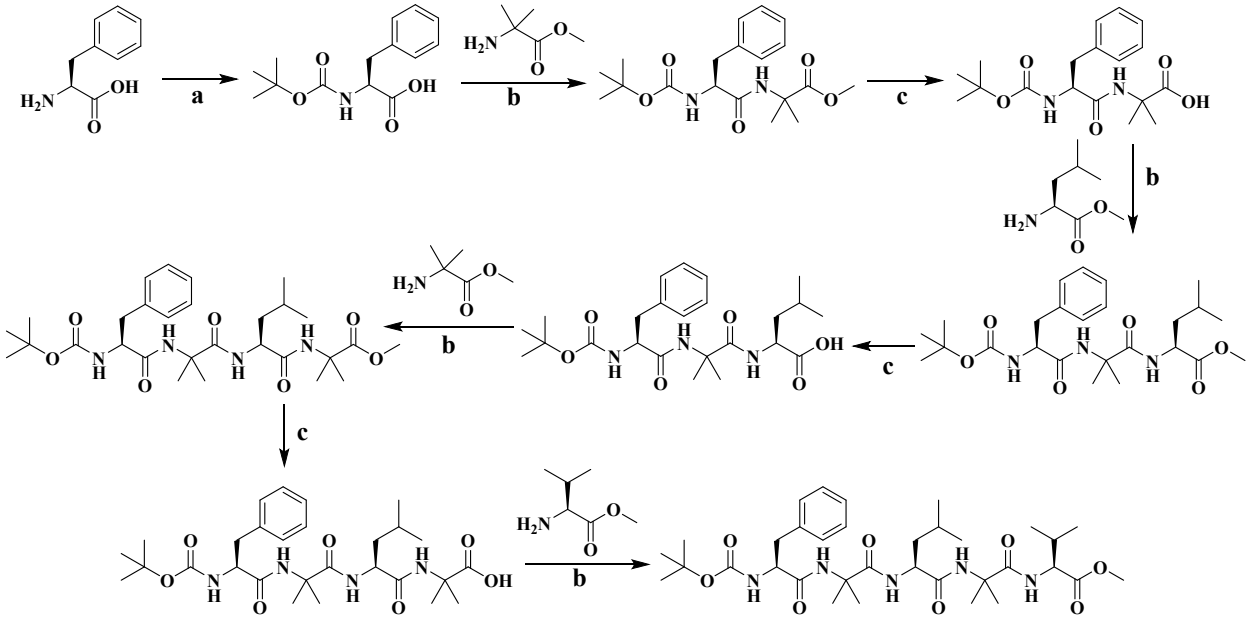


Figure S8: Synthesis of pentapeptide **1.** Reaction conditions: (a) = Di-tert-butyl dicarbonate, Dioxane, 1(M) NaOH, Water, rt (25 ^{0}C) 12h. (b) = Dry DCM, DCC, HOBt, rt (25 ^{0}C), 48 h. (c) = 2(M) NaOH, MeOH, rt (25 ^{0}C) 12 h.

Synthesis

(a) Boc-Phe(1)-OH. A solution of L-Phenylalanine (3.30 g, 20 mmol) in a mixture of dioxane (40 mL), water (20 mL) and 1M NaOH (20 mL) was stirred and cooled in an ice-water bath. Di-tert-butylpyrocarbonate (4.8 g, 22 mmol) was added and stirring was continued at room temperature for 6h. Then the solution was concentrated under vacuum to about 20-30 mL, cooled in an ice-water bath, covered with a layer of ethyl acetate (about 50 mL), and acidified with a dilute solution of $KHSO_4$ to pH 2-3 (Congo red). The aqueous phase was extracted with ethyl acetate and this operation was done repeatedly. The ethyl acetate extracts were pooled, washed with water and dried over anhydrous Na_2SO_4 and evaporated in a vacuum. The pure material was obtained as a waxy solid. Yield: 4.87g, (18.35 mmol, 91.78%).

^{1}H NMR (500 MHz, DMSO-d_6, δ in ppm, 298K): 12.75 (br, 1H, COOH); 7.28- 7.09 (m, 5H, aromatic ring protons); 7.11-7.09 (d, 1H, J = 10Hz, Phe NH); 4.09-4.01 (m, 1H, C$^{\alpha}$H Phe); 3.02-2.87 (m, 2H, C$^{\beta}$H Phe), 1.36 (s, 9H, Boc -CH_3) (Figure S3). ^{13}C NMR (DMSO-d_6, 125 MHz, δ in ppm, 298K): 173.57, 155.41, 138.00, 129.05, 128.09, 126.27, 80.24, 55.10, 36.39, 20.73. (Figure S4)

(b) Boc-Phe(1)-Aib(2)-OMe. 4.2 g (16 mmol) of Boc-Phe-OH was dissolved in 25 mL DCM in an ice-water bath. H-Aib-OMe was isolated from 4.91 g (32 mmol) of the corresponding methyl ester hydrochloride by neutralization and subsequent extraction with ethyl acetate and the ethyl acetate extract was concentrated to 10 mL. It was then added to the reaction mixture, followed immediately by 3.3 g (16 mmol) N,N'-dicyclohexylcarbodiimide (DCC) and 2.2 g (16 mmol) of HOBt. The reaction mixture was allowed to come to room temperature and stirred for 48 h. DCM was evaporated and the residue was dissolved in ethyl acetate (60 mL) and dicyclohexylurea (DCU) was filtered off. The organic layer was washed with 2M HCl (3 X 50 mL), brine (2 X 50 mL), 1M sodium carbonate (3 X 50 mL) and brine (2 X 50 mL) and dried over anhydrous sodium sulfate. It was evaporated in a vacuum to yield Boc-Phe-Aib-OMe as a white solid. Yield: 4.56 g (12 mmol, 75.20%).

^{1}H NMR (400 MHz, $CDCl_3$, δ in ppm, 298K): 7.30-7.27 (m, 2H, aromatic proton), 7.24-7.20 (m, 3H, aromatic proton), 6.27 (s, 1H, Aib NH), 5.06 (s, 1H, Phe NH), 4.27-4.25 (m, 1H, Phe C$^{\alpha}$H), 3.69 (s, 3H,-OCH_3), 3.09-3.04 (m, 1H, Phe C$^{\beta}$H), 2.99-2.94 (m, 1H, Phe

$C^{\beta}H$), 1.42 (s, 3H, Aib $C^{\alpha}H$), 1.40 (s, 12H, BOC -CH_3) (Figure S5). ^{13}C NMR (100 MHz, $CDCl_3$, δ in ppm, 298K): 174.17, 170.44, 156.31, 136.86, 129.54, 128.26, 126.95, 80.20, 56.43, 56.40, 52.65, 38.54, 28.32, 24.76 (Figure S6); ESI-MS (MeOH): m/z (Calc): $C_{19}H_{28}N_2O_5Na$ $[M+Na]^+$ 387.19; found: 387.49 (Figure S7); FTIR spectrum: (in cm^{-1}) 3369, 3312, 1729, 1680, 1540 (Figure S8).

(c) Boc-Phe(1)-Aib(2)-OH. To 4.37 g (12 mmol) of Boc-Phe-Aib-OMe, 25 mL MeOH and 2(M) 15 mL NaOH were added and the progress of saponification was monitored by thin-layer chromatography (TLC). The reaction mixture was stirred. After10 h, methanol was removed under vacuum; the residue was dissolved in 50 mL of water and washed with diethyl ether (2 X 50mL). Then the pH of the aqueous layer was adjusted to 2 using 1M HCl and it was extracted with ethyl acetate (3 X 50 mL). The extracts were pooled, dried over anhydrous sodium sulfate, and evaporated under vacuum to obtained compound as a waxy solid. Yield: 3.8 g (10.38 mmol, 89.60%).

^1H NMR (400 MHz, DMSO-d_6, δ in ppm, 298K): 12.27 (bs, 1H, -COOH), 8.05 (s, 1H, Aib NH), 7.27-7.23 (m, 4H, aromatic proton), 7.19-7.17 (m, 1H, aromatic proton), 6.76 (s, 1H, Phe -NH), 4.20-4.16 (m, 1H, Phe $C^{\alpha}H$), 2.96-2.91 (m, 1H,Phe $C^{\beta}H$), 2.74-2.68 (m, 1H, Phe $C^{\beta}H$), 1.36 (s, 3H, Aib CH_3), 1.36 (s, 3H, Aib CH_3), 1.29 (s, 9H, BOC -CH_3) (Figure S9). ^{13}C NMR (100 MHz, DMSO-d_6, δ in ppm, 298K): 175.48, 170.88, 155.10, 138.10, 129.31, 127.94, 126.13, 77.98, 55.36, 54.92, 37.19, 28.14, 24.77 (Figure S10); ESI-MS (MeOH): m/z (Calc): $C_{18}H_{26}N_2O_5Na$ $[M+Na]^+$ 373.17; found: 373.41 (Figure S11) FTIR spectrum: (in cm^{-1}) 3374, 3297, 1717, 1677, 1638, 1563 (Figure S12).

(d) Boc-Phe(1)-Aib(2)-Leu(3)-OMe. 3.15 g (9 mmol) of Boc-Phe Aib-OH was dissolved in 25 mL DCM in an ice-water bath. H-Leu-OMe was isolated from 1.8 g (10 mmol) of the corresponding methyl ester hydrochloride by neutralization and subsequent extraction with ethyl acetate and the ethyl acetate extract was concentrated to 10 mL. It was then added to the reaction mixture, followed immediately by 2.1 g (10 mmol) N,N'-dicyclohexylcarbodiimide (DCC) and 1.35 g (10 mmol) of HOBt. The reaction mixture was allowed to come to room temperature and stirred for 48 h. DCM was evaporated and the residue was dissolved in ethyl acetate (60 mL) and dicyclohexylurea (DCU) was filtered off. The organic layer was washed with 2M HCl (3 X 50 mL), brine (2 X 50 mL), 1M sodium carbonate (3 X 50 mL) and brine (2 X 50 mL) and dried over anhydrous

sodium sulfate. It was evaporated in a vacuum to yield Boc-Phe-Aib-Leu-OMe as a white solid. Yield: 3.72 g (7.8 mmol, 86 %).

^{1}H NMR (400 MHz, $CDCl_3$, δ in ppm, 298K): 7.33-7.29 [m, 2H, aromatic proton], 7.25-7.20 [m, 3H, aromatic proton], 6.96 [s, 1H, Leu NH], 6.19 [s, 1H, Aib NH], 5.05 [s, 1H, Phe NH], 5.58-5.52 [m, 1H, phe C^{α} H], 4.20-4.15 [m, 1H, Leu C^{α} H], 3.71 [s, 3H, -CH_3], 3.08-3.06 [m, 2H, Phe C^{β} H], 1.7-1.62 [m, 2H, Leu C^{β} H], 1.57-1.55 [m, 1H, Leu C^{λ} H], 1.46 [s, 3H, Aib –CH_3], 1.42 [s, 9H, Boc –CH_3], 1.40 [s, 3H, Aib –CH_3], 0.94-0.92 [m, 6H, Leu CH_3] (Figure S13). ^{13}C NMR (100 MHz, $CDCl_3$, δ in ppm, 298K): 173.92, 173.47, 170.68, 155.71, 136.89, 129.41, 128.86, 127.13, 80.60, 57.34, 56.75, 52.22, 51.06, 41.21, 37.87, 28.34, 25.78, 24.83, 24.56, 22.95, 21.88 (Figure S14). ESI-MS (MeOH): m/z (Calc): $C_{25}H_{39}N_3O_6Na$ $[M+Na]^+$ 500.27; found: 500.30 (Figure S15); FTIR spectrum: (in cm^{-1}) 3263, 2902, 1716, 1671, 1632, 1511, 1488, 1431 (Figure S16).

(e) Boc-Phe(1)-Aib(2)-Leu(3)-OH. To 3.5 g (7.3 mmol) of Boc-Phe-Aib-Leu-OMe, 25 mL MeOH and 2(M) 15 mL NaOH were added and the progress of saponification was monitored by thin-layer chromatography (TLC). The reaction mixture was stirred. After10 h, methanol was removed under vacuum; the residue was dissolved in 50 mL of water and washed with diethyl ether (2 X 50mL). Then the pH of the aqueous layer was adjusted to 2 using 1M HCl and it was extracted with ethyl acetate (3 X 50 mL). The extracts were pooled, dried over anhydrous sodium sulfate, and evaporated under vacuum to obtain the compound as a waxy solid material. Yield: 3.2 g (6.8 mmol, 93 %).

^{1}H NMR (400 MHz, DMSO-d_6, δ in ppm, 298K): 12.34 [bs, 1H, -COOH], 7.89 [s, 1H, Leu NH], 7.43 [s, 1H, Aib NH], 7.31-7.18 [m, 5H, aromatic proton], 6.96 [s, 1H, Phe NH], 4.26-4.20 [m, 1H, phe C^{α} H], 4.13-4.08 [m, 1H, Leu C^{α} H], 2.99-2.94 [m, 1H, Phe C^{β} H], 2.77-2.71 [m, 2H, Phe C^{β} H], 1.63-1.48 [m, 3H, Leu C^{β} H, Leu C^{λ} H], 1.34 [s, 6H, Aib –CH_3], 1.30 [s, 9H, Boc –CH_3], 0.87-0.81 [m, 6H, Leu CH_3] (Figure S17). ^{13}C NMR (100 MHz, DMSO-d_6, δ in ppm, 298K): 173.97, 173.78, 170.89, 155.34, 138.10, 129.29, 128.00, 126.15, 78.19, 56.00, 55.94, 50.29, 37.12, 28.16, 25.71, 24.04, 23.56, 22.91, 21.37, 21.05 (Figure S18). ESI-MS (MeOH): m/z (Calc): $C_{24}H_{37}N_3O_6Na$ $[M+Na]^+$ 486.26; found: 486.27 (Figure S19); FTIR spectrum: (in cm^{-1}) 3245, 2905, 1620, 1507, 1441 (Figure S20).

(f) Boc-Phe(1)-Aib(2)-Leu(3)-Aib(4)-OMe. 3.0 g (6.5 mmol) of Boc-Phe Aib-Leu-OH was dissolved in 25 mL DCM in an ice-water bath. H-Aib-OMe was isolated from 1.5 g (10 mmol) of the corresponding methyl ester hydrochloride by neutralization and subsequent extraction with ethyl acetate and the ethyl acetate extract was concentrated to 10 mL. It was then added to the reaction mixture, followed immediately by 2.1 g (10 mmol) N,N'-dicyclohexylcarbodiimide (DCC) and 1.35 g (10 mmol) of HOBt. The reaction mixture was allowed to come to room temperature and stirred for 48 h. DCM was evaporated and the residue was dissolved in ethyl acetate (60 mL) and dicyclohexylurea (DCU) was filtered off. The organic layer was washed with 2M HCl (3 X 50 mL), brine (2x50 mL), 1M sodium carbonate (3 X 50 mL) and brine (2 X 50 mL) and dried over anhydrous sodium sulfate. It was evaporated in a vacuum to yield Boc-Phe-Aib-Leu-Aib-OMe as a white solid. Yield: 2.7 g (4.8 mmol, 74 %).

^{1}H NMR (400 MHz, $CDCl_3$, δ in ppm, 298K): 7.38-7.30 [m, 3H, aromatic proton, Aib NH], 7.22-7.20 [m, 3H, aromatic proton], 6.85 [s, 1H, Leu NH], 6.23 [s, 1H, Aib NH], 4.93 [s, 1H, Phe NH], 4.44-4.38 [m, 1H, phe C^{α} H], 4.16-4.11 [m, 1H, Leu C^{α} H], 3.70 [s, 3H, $-CH_3$], 3.13-3.08 [m, 1H, Phe C^{β} H], 3.04-2.99 [m, 1H, Phe C^{β} H], 1.65-1.63 [m, 3H, Leu C^{β} H, Leu C^{λ} H], 1.55-1.52 [m, 9H, Aib $-CH_3$], 1.42 [s, 9H, Boc $-CH_3$], 1.35 [s, 3H, Aib $-CH_3$], 0.91-0.86 [m, 6H, Leu CH_3] (Figure S21). ^{13}C NMR (100 MHz, $CDCl_3$, δ in ppm, 298K): 175.23, 173.60, 171.81, 171.53, 156.43, 135.93, 129.40, 129.27, 129.18, 127.62, 81.67, 57.45, 57.20, 56.07, 52.34, 51.86, 39.91, 37.26, 28.25, 27.28, 25.48, 25.00, 24.75, 23.95, 23.41, 21.10 (Figure S22). ESI-MS (MeOH): m/z (Calc): $C_{29}H_{46}N_4O_7Na$ $[M+Na]^+$ 585.33; found: 585.35 (Figure S23); FTIR spectrum: (in cm^{-1}) 3265, 2913, 1712, 1633, 1497, 1435 (Figure S24).

(g) Boc-Phe(1)-Aib(2)-Leu(3)-Aib(4)-OH. To 2.5 g (4.5 mmol) of Boc-Phe-Aib-Leu-Aib-OMe, 25 mL MeOH and 2(M) 15 mL NaOH were added and the progress of saponification was monitored by thin-layer chromatography (TLC). The reaction mixture was stirred. After10 h, methanol was removed under vacuum; the residue was dissolved in 50 mL of water and washed with diethyl ether (2 X 50mL). Then the pH of the aqueous layer was adjusted to 2 using 1M HCl and it was extracted with ethyl acetate (3 X 50 mL). The extracts were pooled, dried over anhydrous sodium sulfate, and evaporated under vacuum to obtain the compound as a waxy solid. Yield: 2.3 g (4.2 mmol, 92 %).

^{1}H NMR (400 MHz, DMSO-d_6, δ in ppm, 298K): 12.06 [bs, 1H, -COOH], 8.06 [s, 1H, Aib NH], 7.67 [s, 1H, Leu NH], 7.34-7.19 [m, 6H, aromatic proton, Aib NH], 7.01 [s, 1H, Phe NH], 4.21-4.11 [m, 2H, phe C^{α} H, Leu C^{α} H], 3.01-2.95 [m, 1H, Phe C^{β} H], 2.81-2.74 [m, 1H, Phe C^{β} H], 1.58-1.46 [m, 3H, Leu C^{β} H, Leu C^{λ} H], 1.36-1.22 [m, 21H, Aib –CH_3, Boc –CH_3], 0.88-0.78 [m, 6H, Leu CH_3] (Figure S25). ^{13}C NMR (100 MHz, DMSO-d_6, δ in ppm, 298K): 175.42, 173.55, 171.59, 171.10, 155.50, 137.91, 129.24, 128.06, 126.23, 78.37, 56.11, 56.00, 54.77, 50.87, 36.96, 28.27, 28.13, 24.84, 24.79, 24.09, 23.20, 21.21 (Figure S26). ESI-MS (MeOH): m/z (Calc): $C_{28}H_{44}N_4O_7Na$ $[M+Na]^+$ 571.31; found: 571.34 (Figure S27); FTIR spectrum: (in cm^{-1}) 3248, 2906, 1630, 1506, 1440 (Figure S28).

(h) Boc-Phe(1)-Aib(2)-Leu(3)-Aib(4)-Val(5)-OMe. 2.2 g (4 mmol) of Boc-Phe Aib-Leu-Aib-OH was dissolved in 25 mL DCM in an ice-water bath. H-Aib-OMe was isolated from 1.3 g (8 mmol) of the corresponding methyl ester hydrochloride by neutralization and subsequent extraction with ethyl acetate and the ethyl acetate extract was concentrated to 10 mL. It was then added to the reaction mixture, followed immediately by 1.65 g (8 mmol) N,N'-dicyclohexylcarbodiimide (DCC) and 1.10 g (8 mmol) of HOBt. The reaction mixture was allowed to come to room temperature and stirred for 48 h. DCM was evaporated and the residue was dissolved in ethyl acetate (60 mL) and dicyclohexylurea (DCU) was filtered off. The organic layer was washed with 2M HCl (3 X 50 mL), brine (2x50 mL), 1M sodium carbonate (3 X 50 mL) and brine (2 X 50 mL) and dried over anhydrous sodium sulfate. It was evaporated in a vacuum to yield Boc-Phe-Aib-Leu-Aib-Val-OMe as a white solid. Yield: 1.9 g (2.9 mmol, 73 %). (White solid, melting point = 155-156 ^{o}C).

^{1}H NMR (400 MHz, $CDCl_3$, δ in ppm, 298K): 7.36 [s, 1H, Val NH], 7.35-7.30 [m, 3H, aromatic proton], 7.23-7.21 [m, 2H, aromatic proton], 7.17-7.15 [m, 2H, Aib NH, Leu NH], 6.37 [s, 1H, Aib NH], 5.07 [s, 1H, Phe NH], 4.48-4.44 [m, 1H, phe C^{α} H], 4.23-4.14 [m, 2H, Leu C^{α} H & Val C^{α} H], 3.69 [s, 3H, -OCH_3], 3.165-3.11 [m, 1H, Phe C^{β} H], 3.01-2.96 [m, 1H, Phe C^{β} H], 2.22-2.16 [m, 1H, Val C^{β} H], 1.88-1.83 [m, 2H, Leu C^{β} H], 1.64-1.61 [m, 1H, Leu C^{λ} H], 1.58 [s, 6H, Aib –CH_3], 1.52 [s, 3H, Aib –CH_3], 1.42 [s, 9H, Boc –CH_3], 1.36 [s, 3H, Aib –CH_3], 0.96-0.87 [m, 12H, Leu -CH_3 & Val -CH_3] (Figure S29). ^{13}C NMR (100 MHz, $CDCl_3$, δ in ppm, 298K): 175.36, 174.43, 172.60, 171.98, 170.86,

156.72, 136.79, 129.41, 129.05, 127.55, 81.34, 58.36, 57.95, 57.40, 57.03, 53.24, 51.88, 39.46, 37.05, 30.96, 28.26, 26.85, 25.70, 25.06, 24.01, 23.33, 20.93, 19.23, 18.29 (Figure S30). ESI-MS (MeOH): m/z (Calc): $C_{34}H_{55}N_5O_8Na$ $[M+Na]^+$ 684.40; found: 684.42 (Figure S31). FTIR spectrum: (in cm^{-1}) 3436, 3329, 2966, 2874, 1745, 1663, 1532, 1456 (Figure S32).

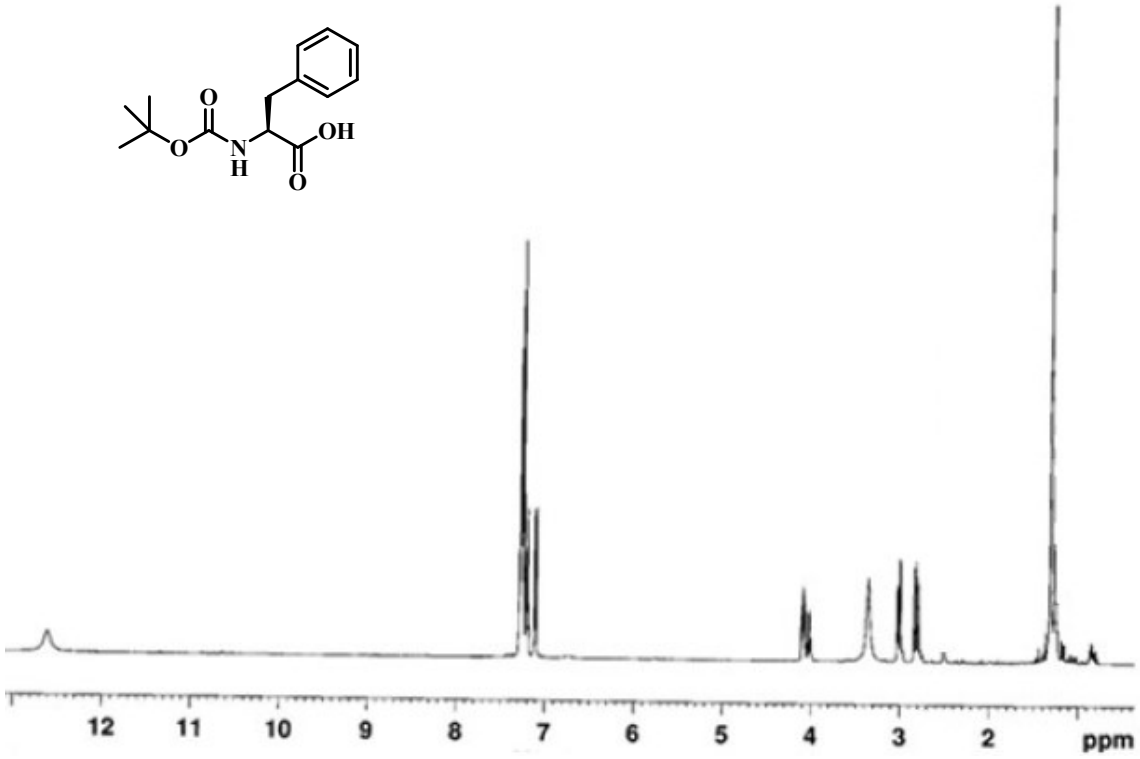
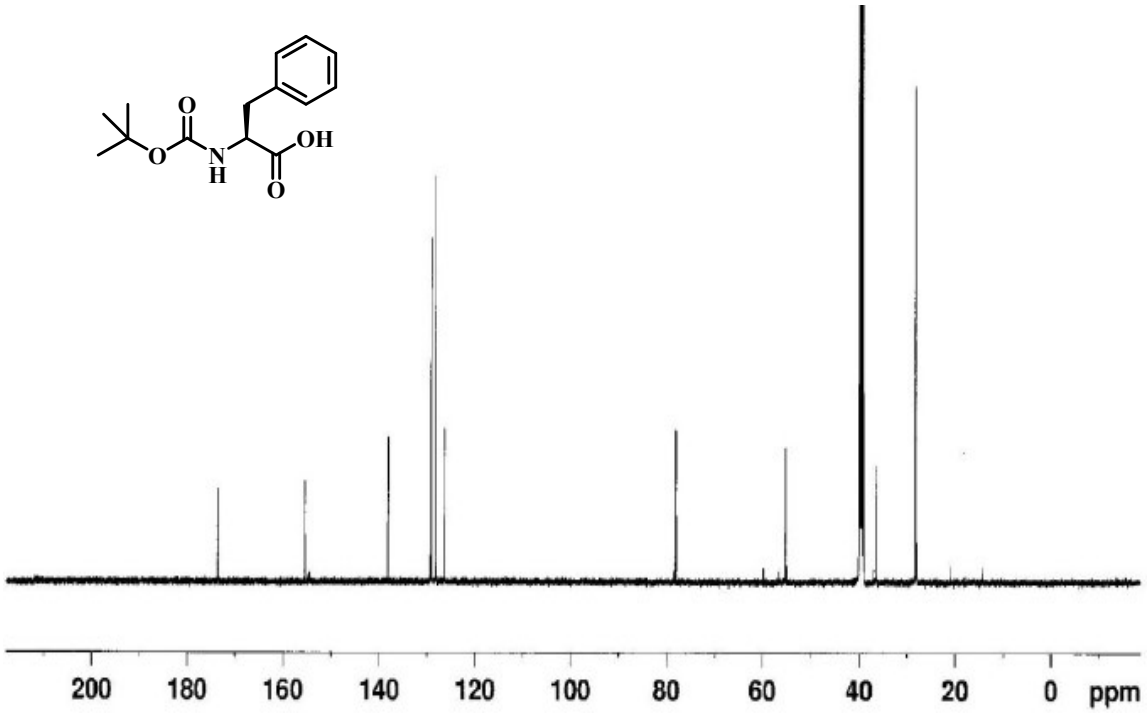


Figure S9: ^{1}H NMR (500 MHz, DMSO-d_6, δ in ppm, 298K) spectrum of Boc-Phe-OH.



igure S10: ^{13}C NMR (125 MHz DMSO-d_6, δ in ppm, 298K) spectrum of Boc-Phe-OH.

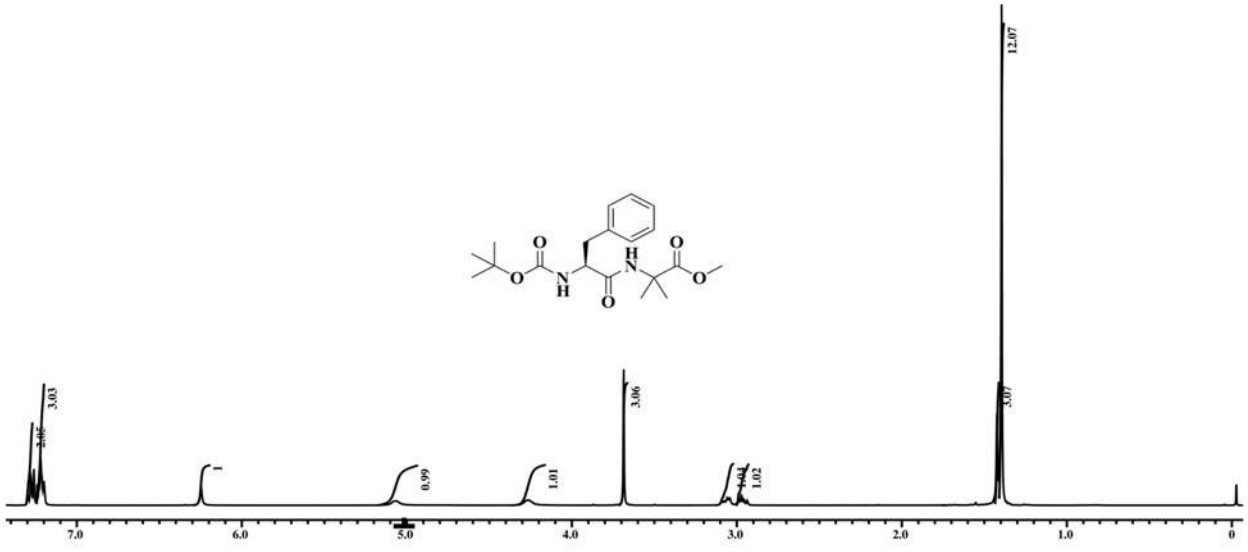


Figure S11. ^{1}H NMR (400 MHz, $CDCl_3$, δ in ppm, 298K) spectrum of Boc-Phe-Aib-OMe.

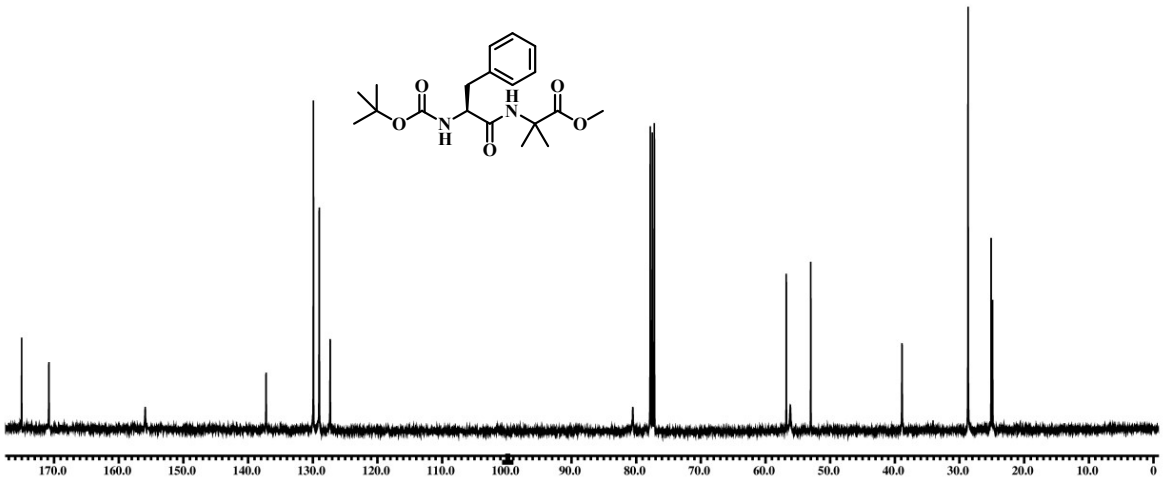


Figure S12. ^{13}C NMR (100 MHz, $CDCl_3$, δ in ppm, 298K) spectrum of Boc-Phe-Aib-OMe.

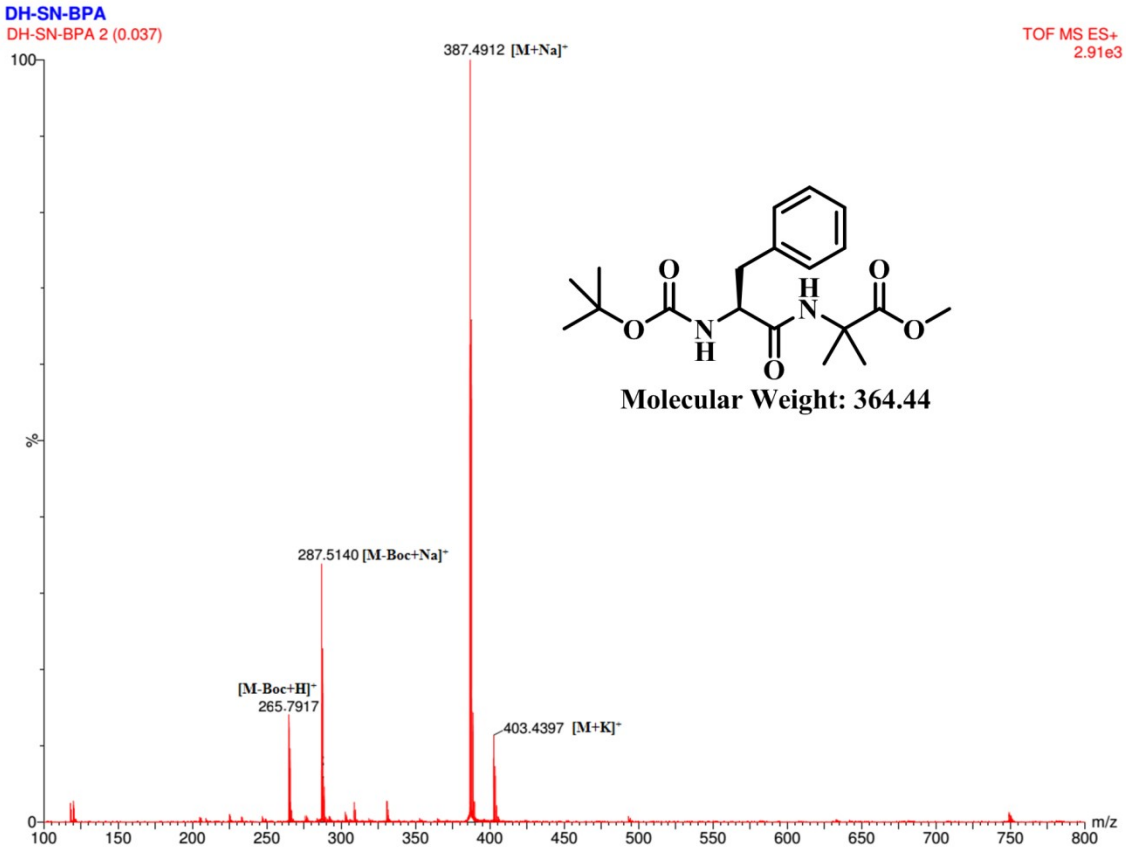


Figure S13. Mass Spectrum of Boc-Phe-Aib-OMe.

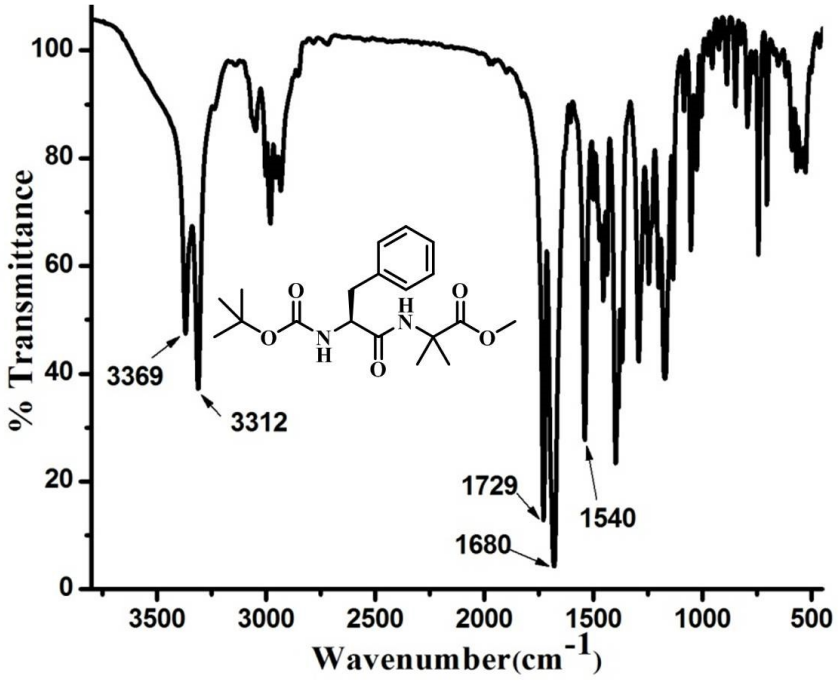


Figure S14. FT-IR Spectrum of Boc-Phe-Aib-OMe.

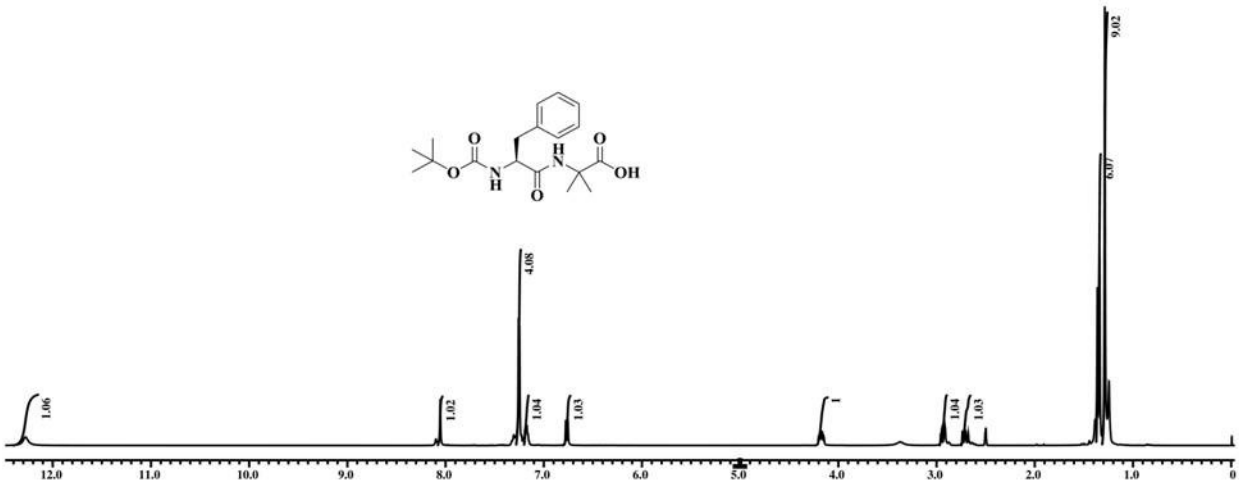


Figure S15. ^{1}H NMR (400 MHz, DMSO-d_6, δ in ppm, 298K) spectrum of Boc-Phe-Aib-OH.

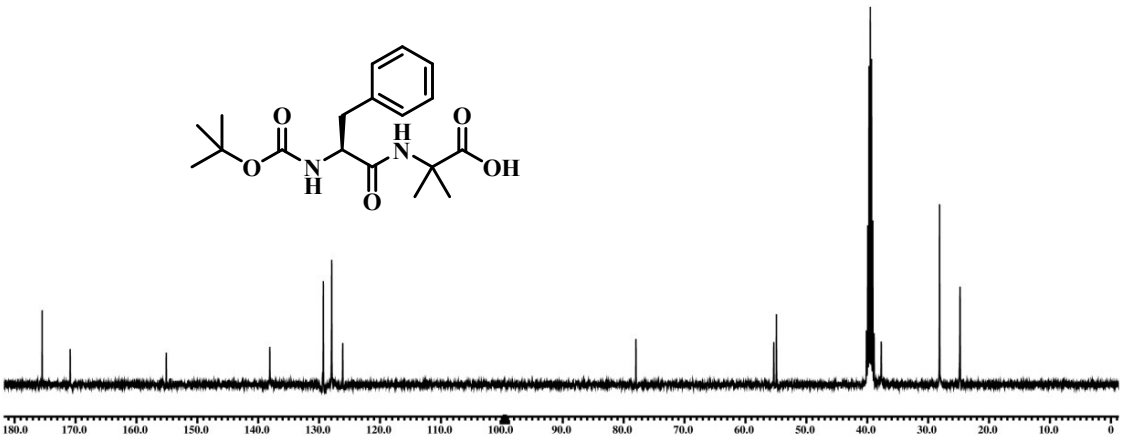


Figure S16. ^{13}C NMR (100 MHz, DMSO-d_6, δ in ppm, 298K) spectrum of Boc-Phe-Aib-OH

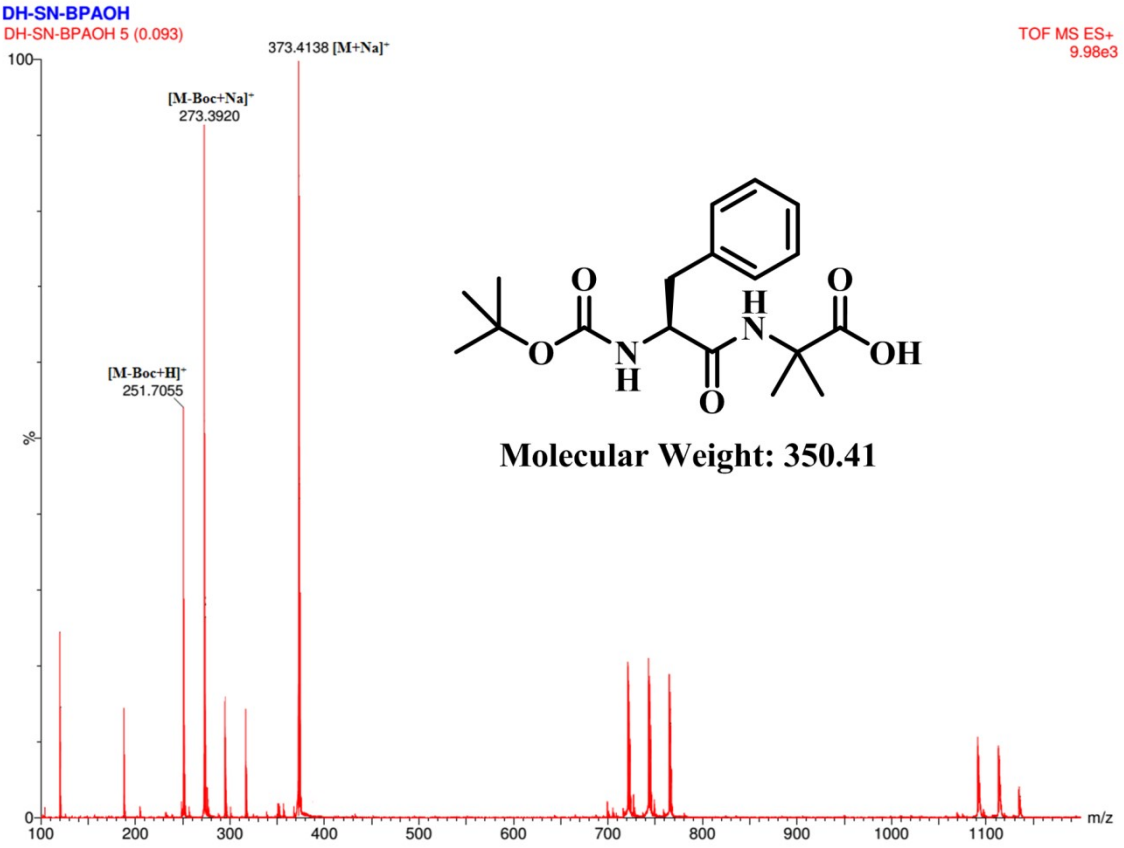


Figure S17. Mass Spectrum of Boc-Phe-Aib-OH.

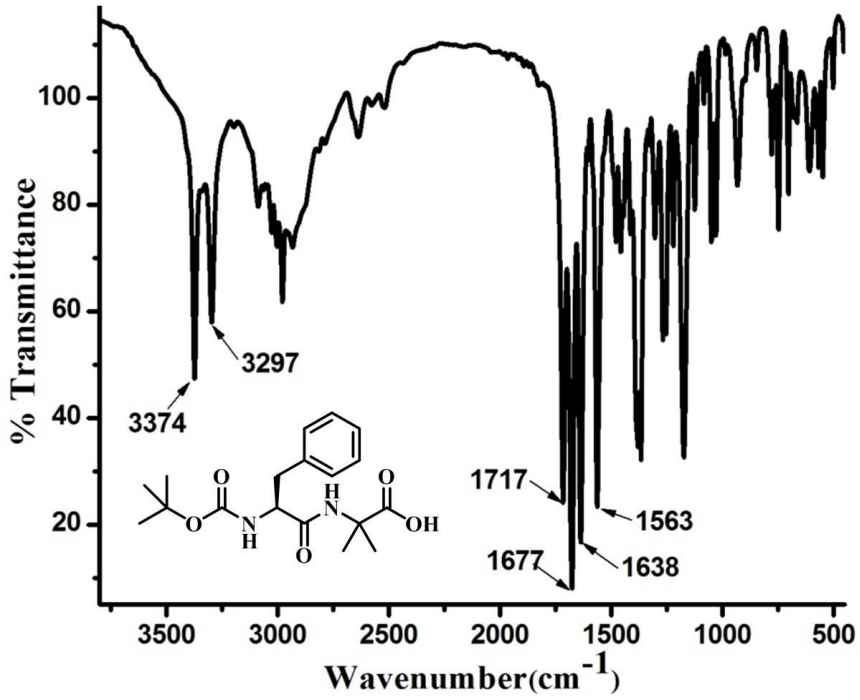


Figure 18. FT-IR Spectrum of Boc-Phe-Aib-OH.

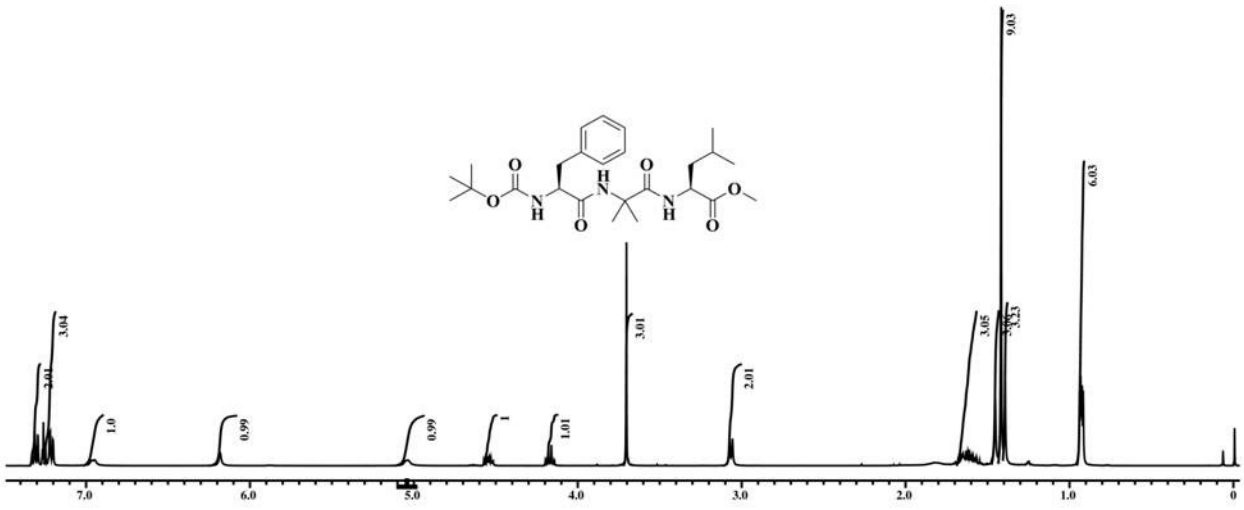


Figure S19. ^{1}H NMR (400 MHz, $CDCl_3$, δ in ppm, 298K) spectrum of Boc-Phe-Aib-Leu-OMe.

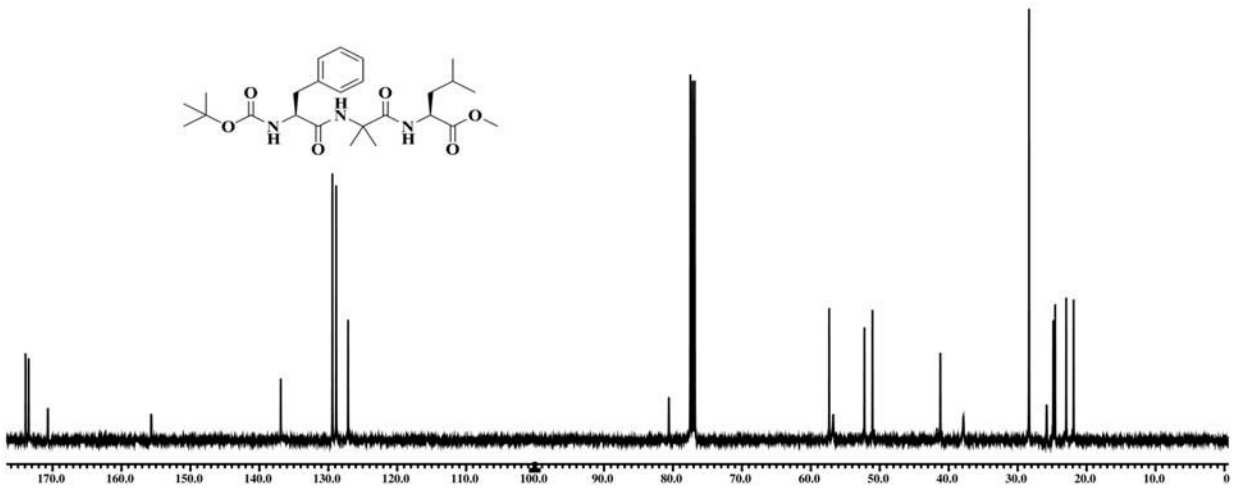


Figure S20. ^{13}C NMR (100 MHz, $CDCl_3$, δ in ppm, 298K) spectrum of Boc-Phe-Aib-Leu-OMe.

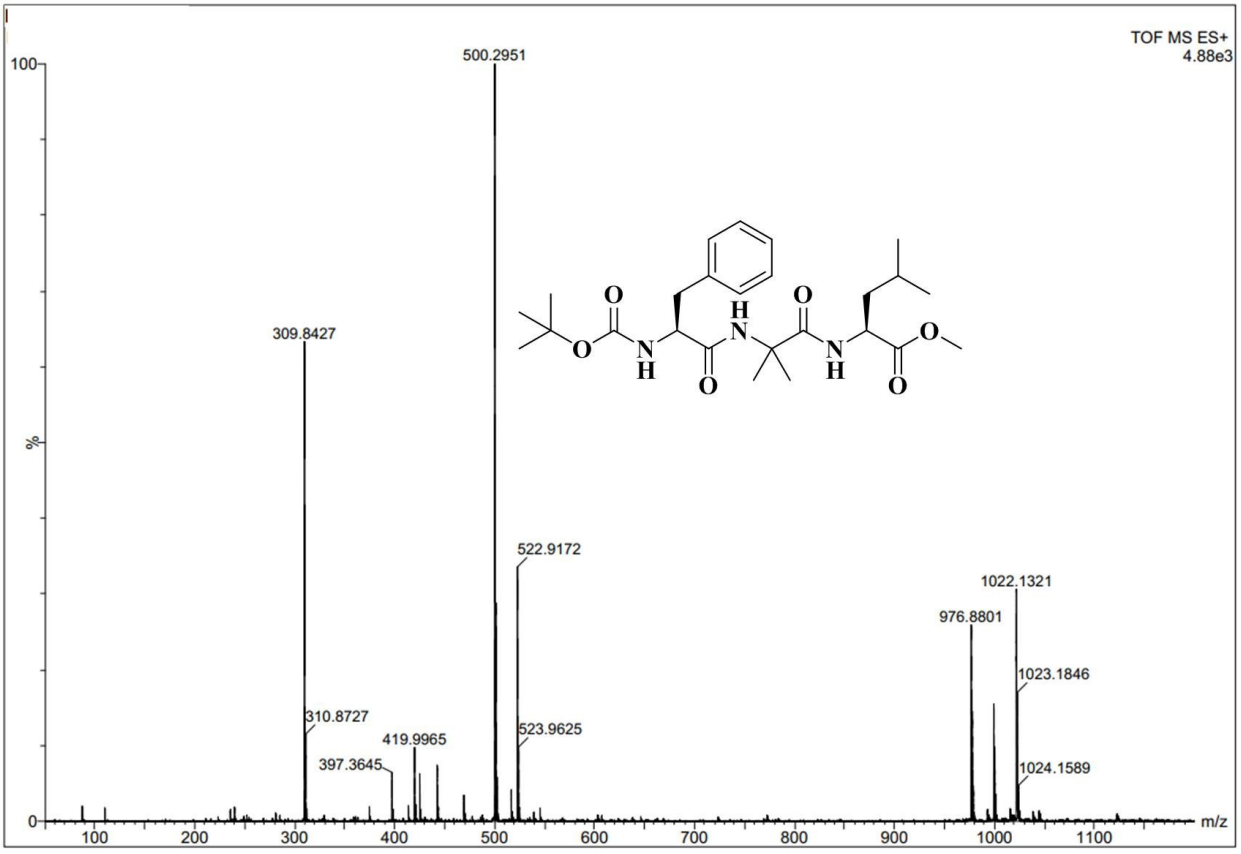


Figure S21. Mass Spectrum of Boc-Phe-Aib-Leu-OMe.

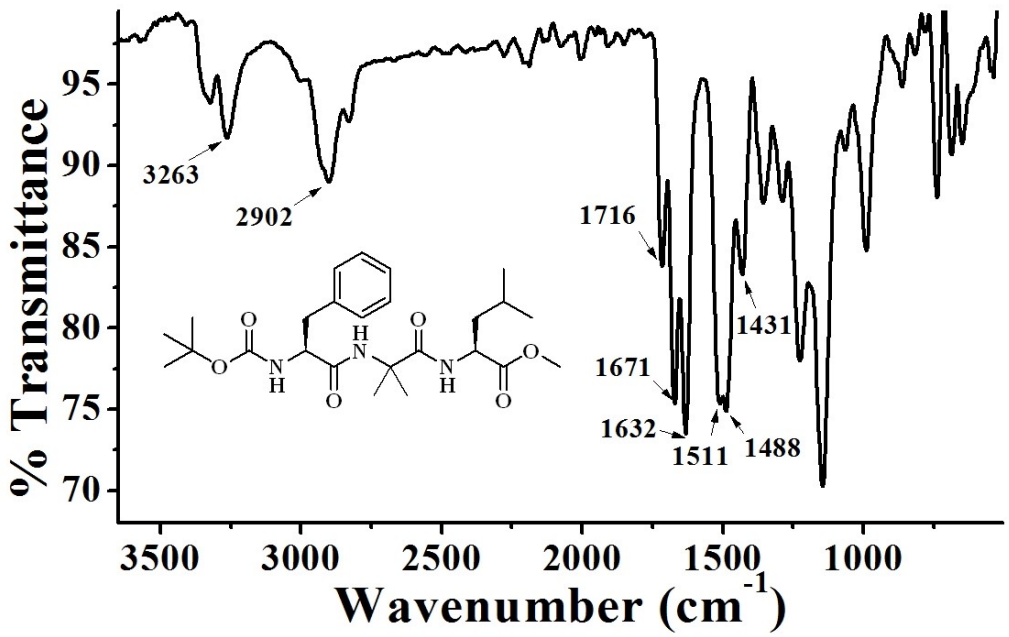


Figure S22. FT-IR Spectrum of Boc-Phe-Aib-Leu-OMe.

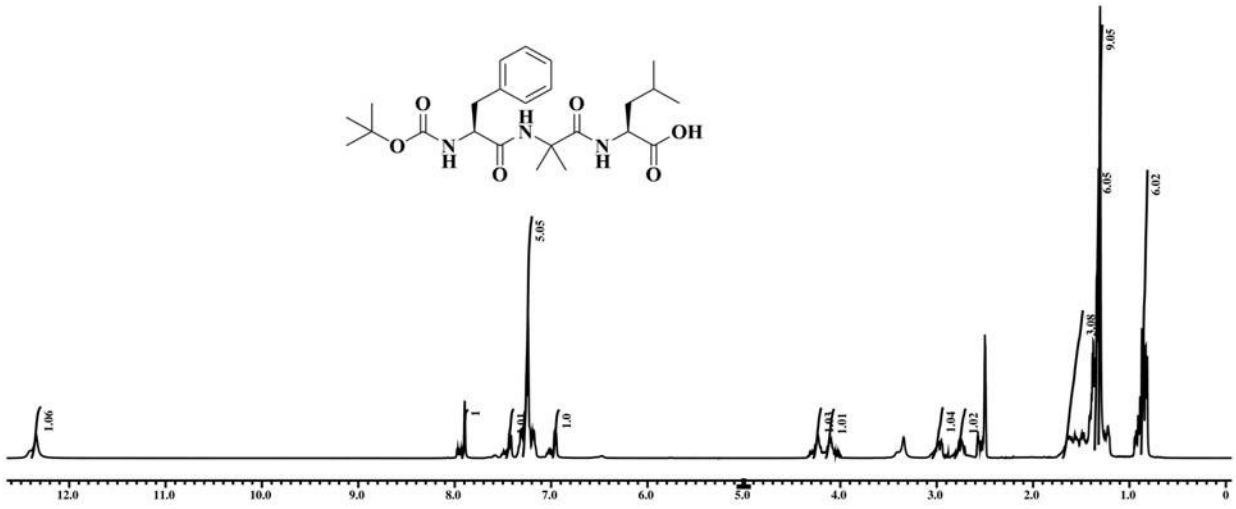


Figure S23. ^{1}H NMR (400 MHz, DMSO-d_6, δ in ppm, 298K) spectrum of Boc-Phe-Aib-Leu-OH.

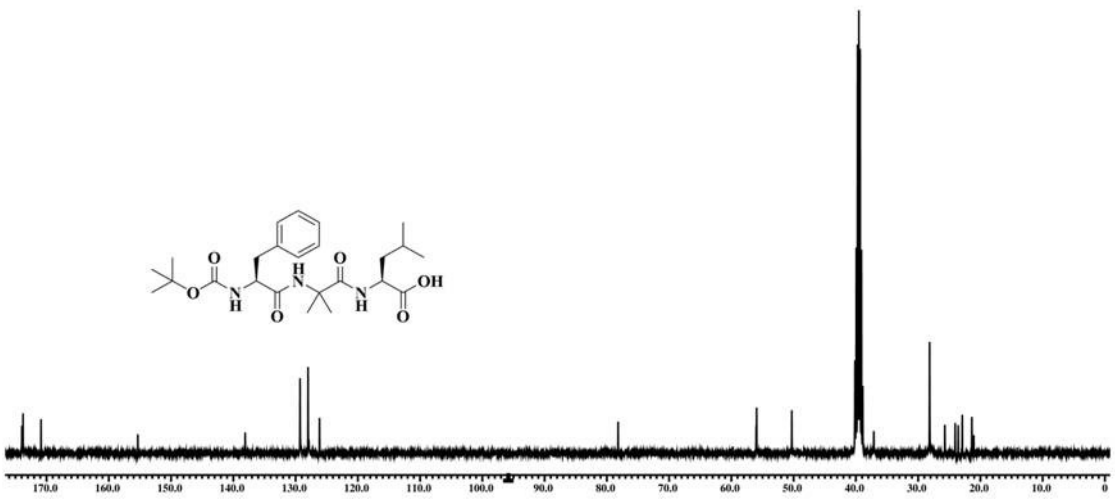


Figure S24. ^{13}C NMR (100 MHz, DMSO-d_6, δ in ppm, 298K) spectrum of Boc-Phe-Aib-Leu-OH.

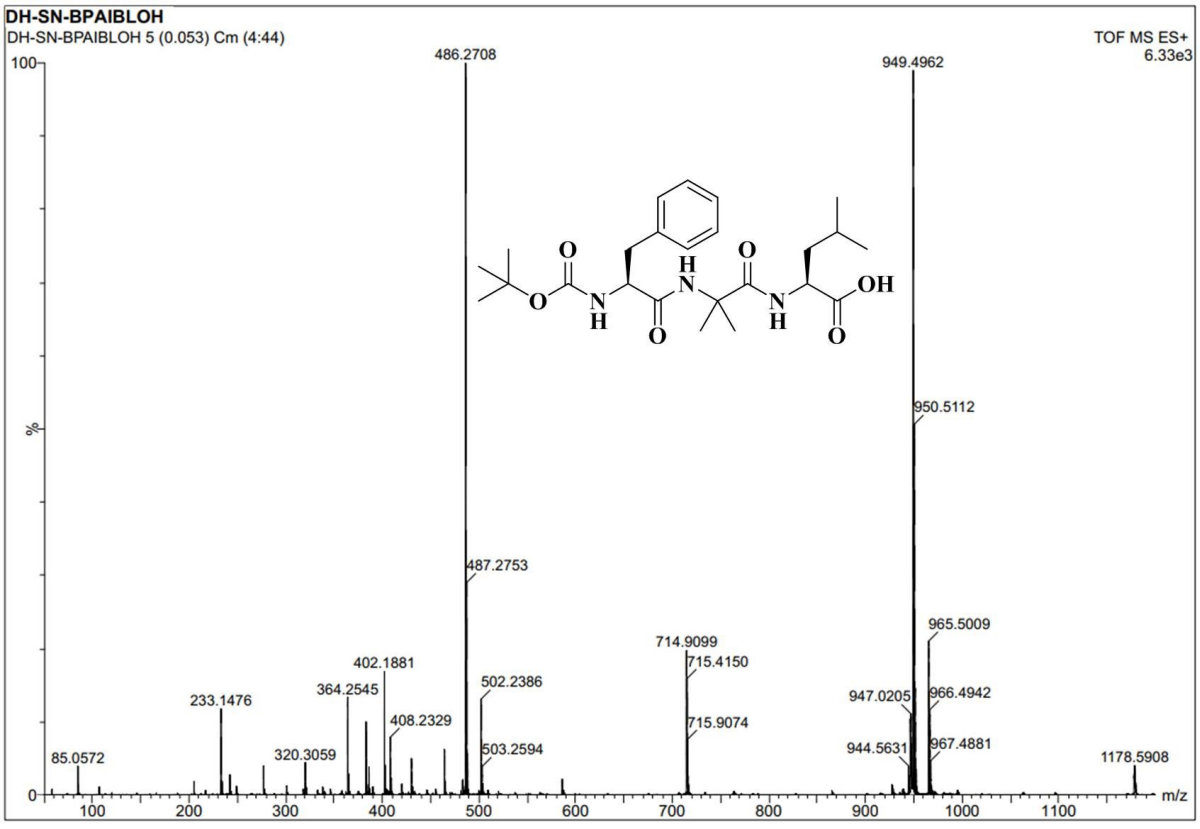


Figure S25. Mass Spectrum of Boc-Phe-Aib-Leu-OH.

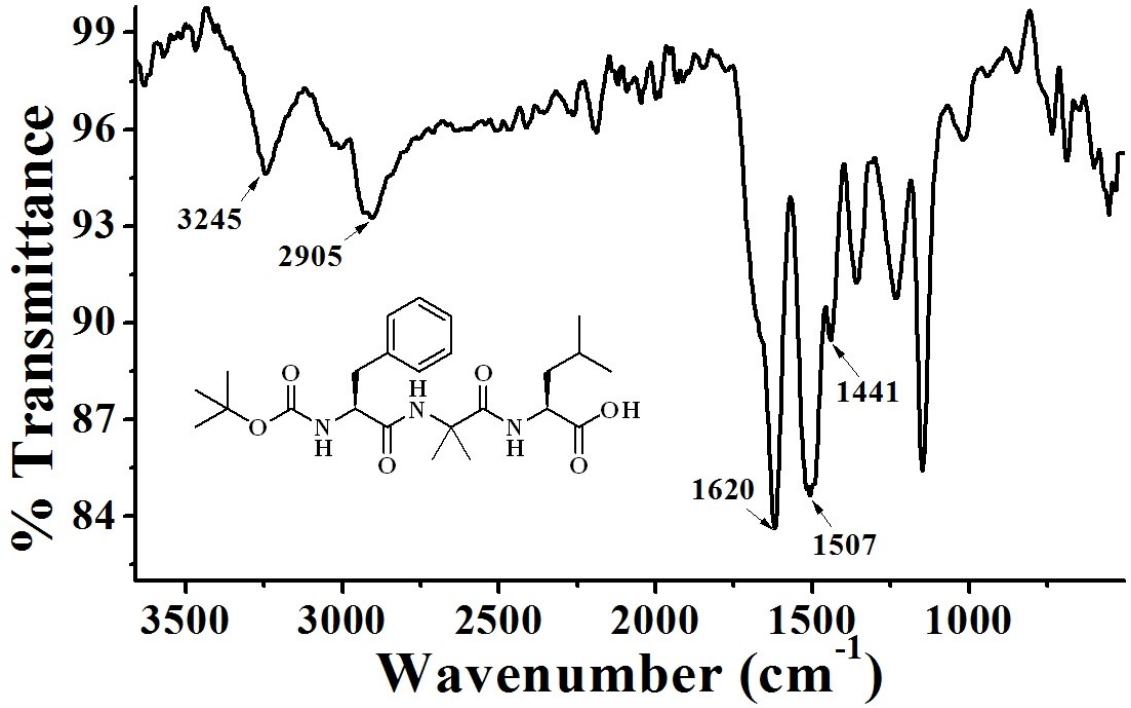


Figure S26. FT-IR Spectrum of Boc-Phe-Aib-Leu-OH.

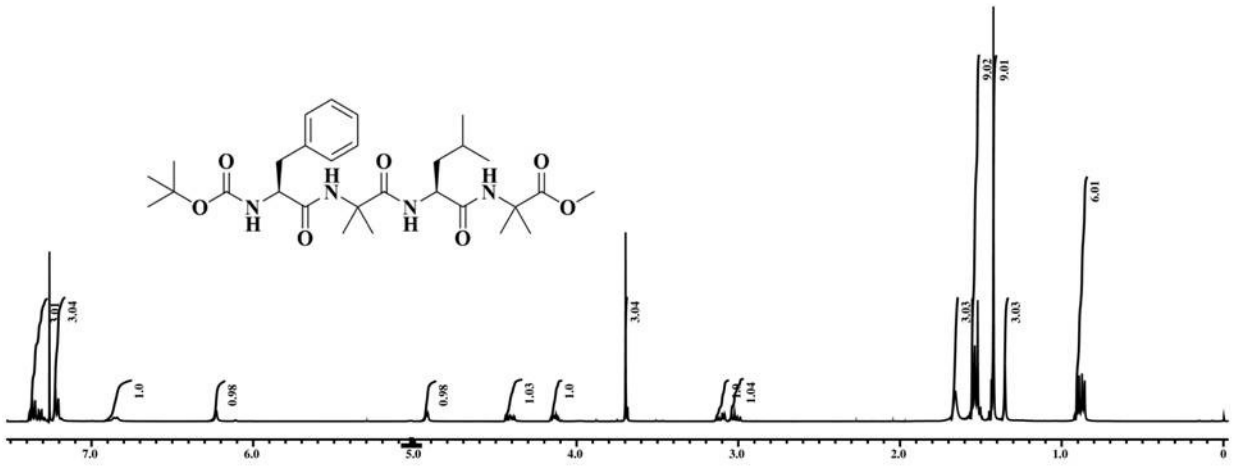


Figure S27. ^{1}H NMR (400 MHz, $CDCl_3$, δ in ppm, 298K) spectrum of Boc-Phe-Aib-Leu-Aib-OMe.

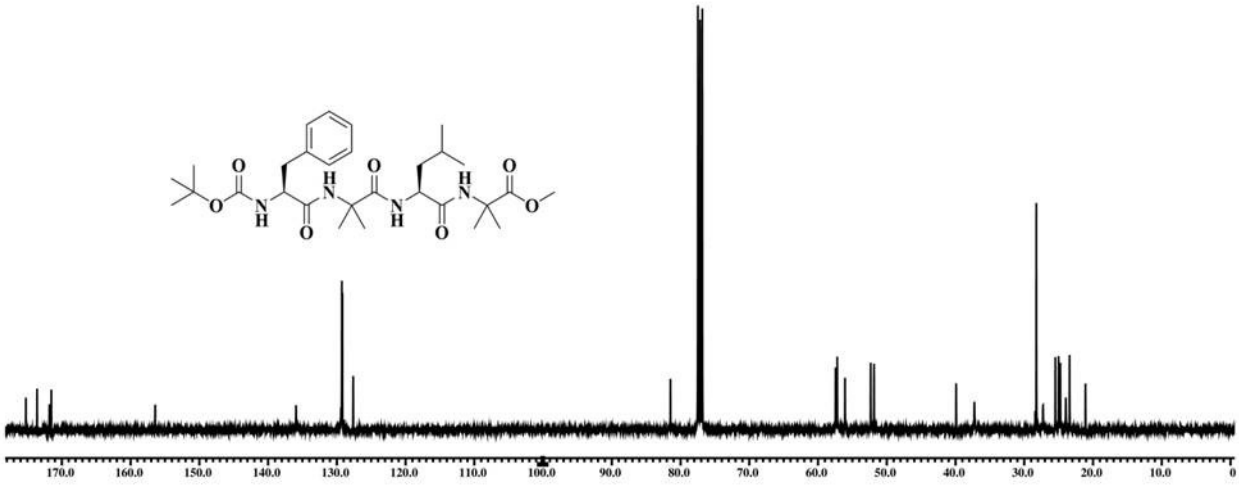


Figure S28. ^{13}C NMR (100 MHz, $CDCl_3$, δ in ppm, 298K) spectrum of Boc-Phe-Aib-Leu-Aib-OMe.

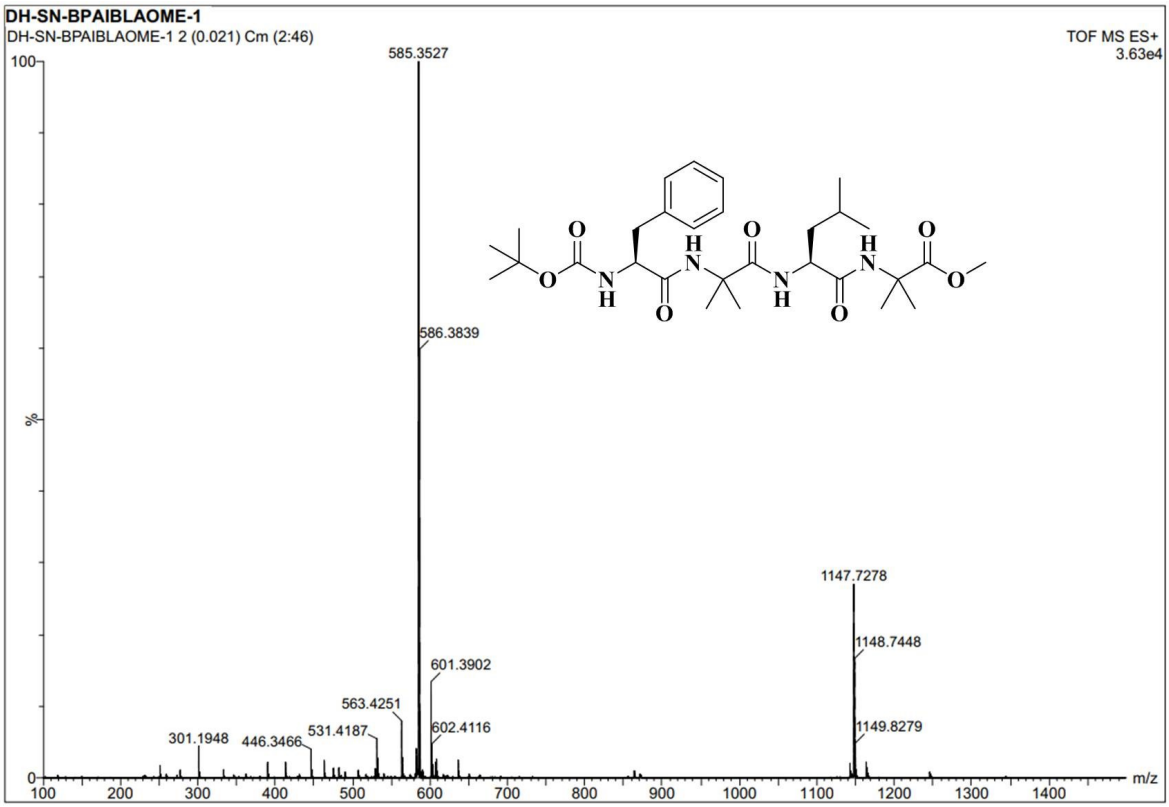


Figure S29. Mass Spectrum of Boc-Phe-Aib-Leu-Aib-OMe.

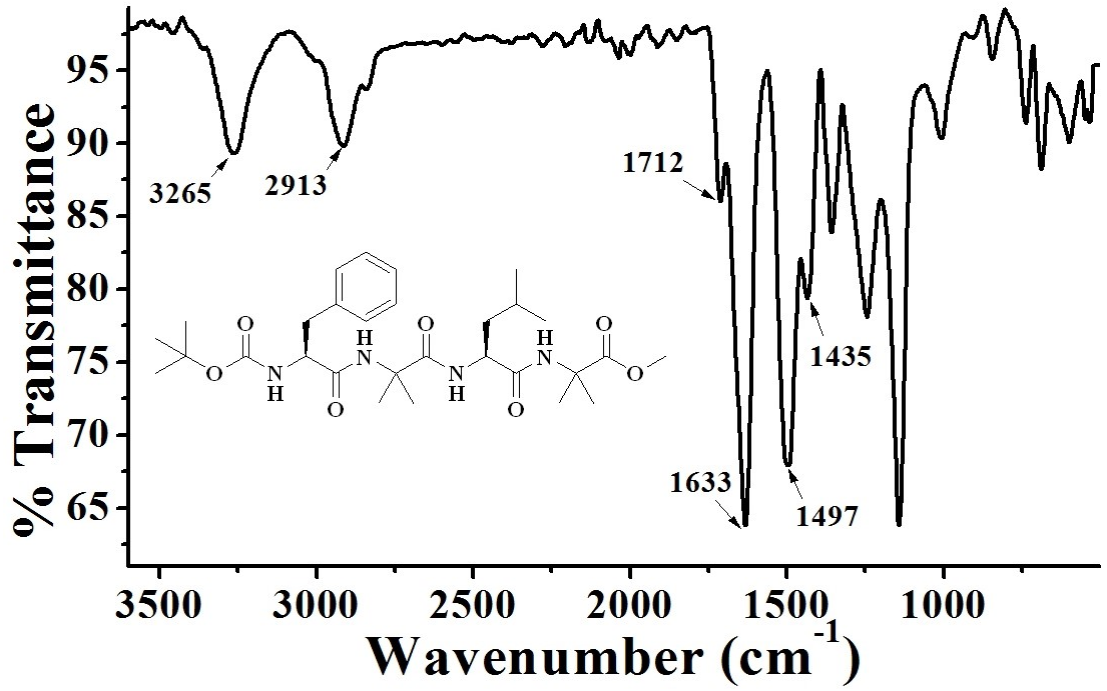


Figure S30. FT-IR Spectrum of Boc-Phe-Aib-Leu-Aib-OMe.

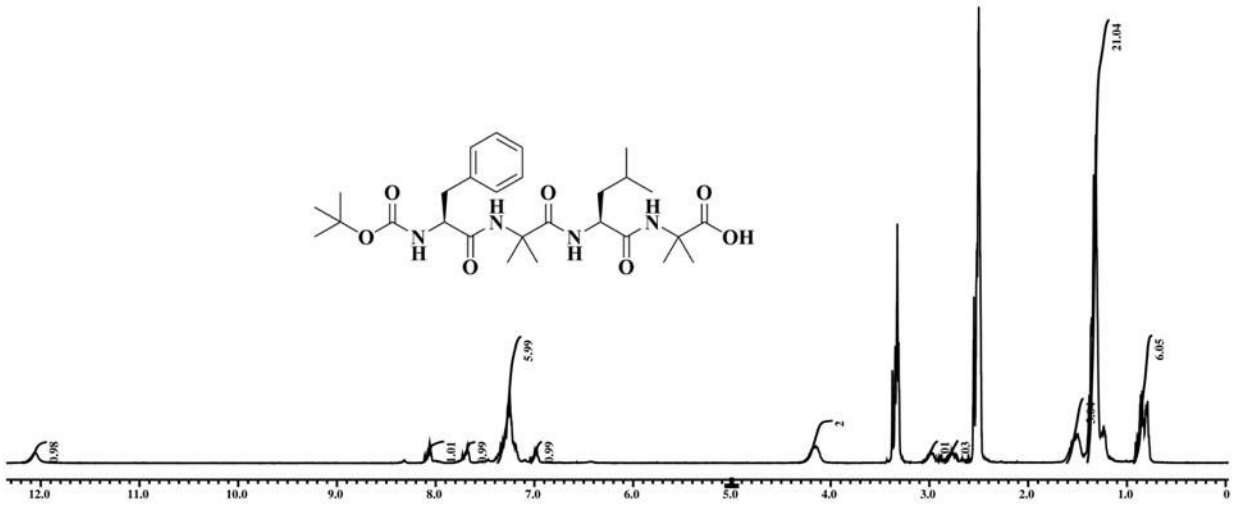


Figure S31. ^{1}H NMR (400 MHz, DMSO-d_6, δ in ppm, 298K) spectrum of Boc-Phe-Aib-Leu-Aib-OH.

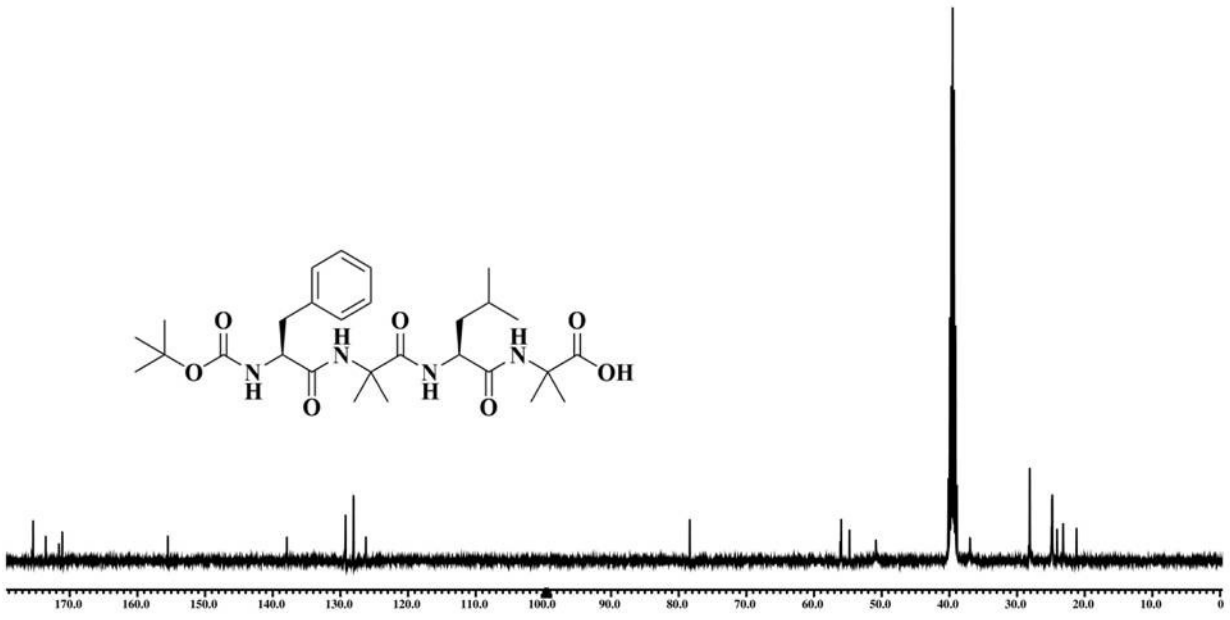


Figure S32. ^{13}C NMR (100 MHz, DMSO-d_6, δ in ppm, 298K) spectrum of Boc-Phe-Aib-Leu-Aib-OH.

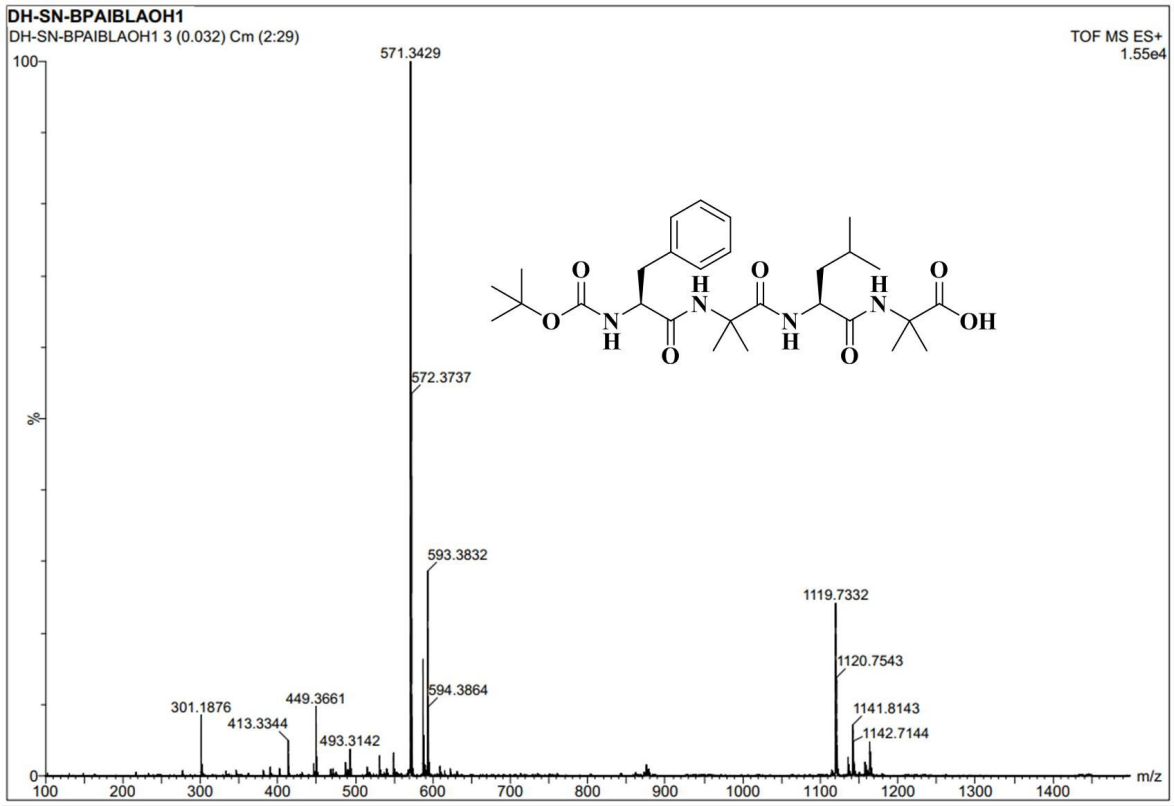


Figure S33. Mass Spectrum of Boc-Phe-Aib-Leu-Aib-OH.

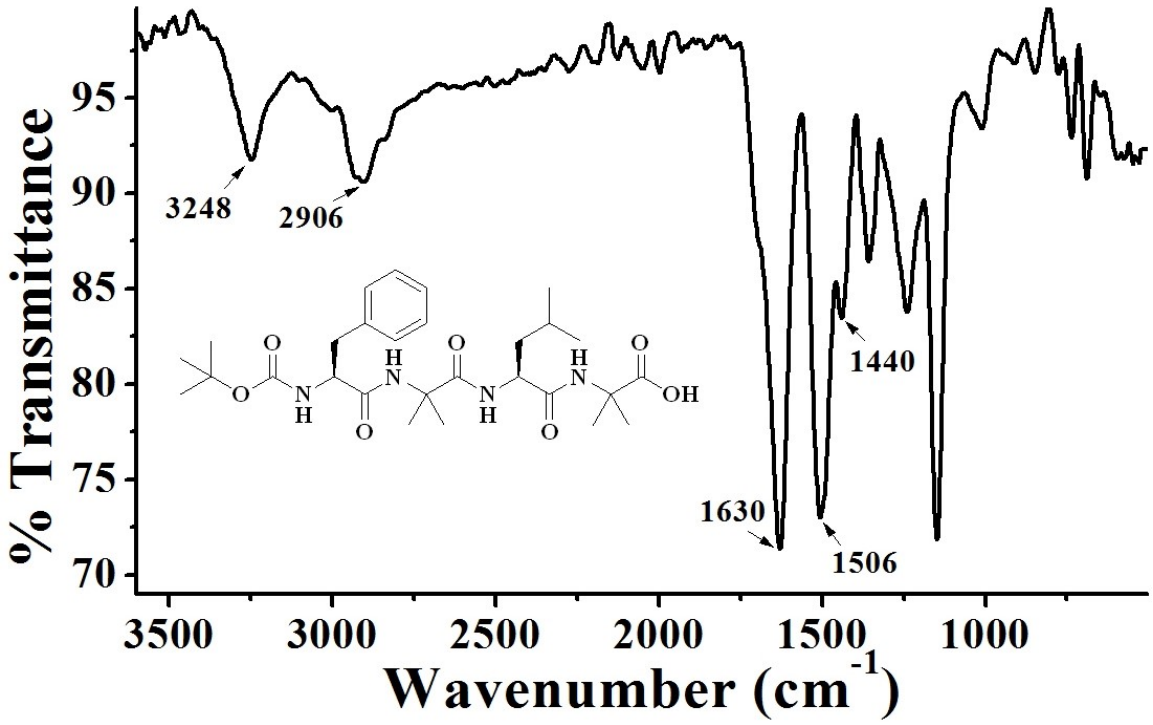


Figure S34. FT-IR Spectrum of Boc-Phe-Aib-Leu-Aib-OH.

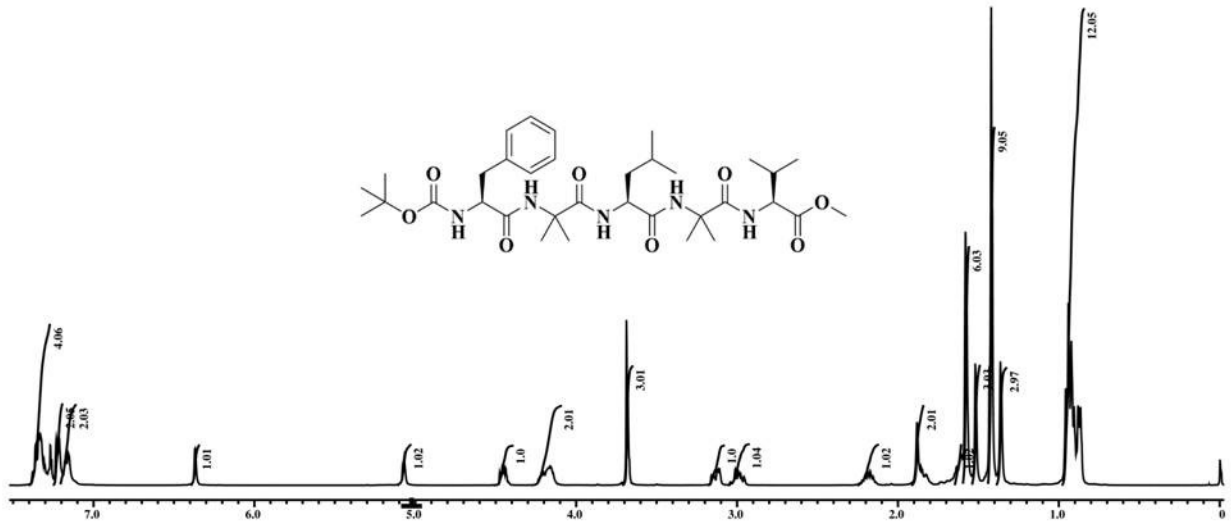


Figure S35. ^{1}H NMR (400 MHz, $CDCl_3$, δ in ppm, 298K) spectrum of Boc-Phe-Aib-Leu-Aib-Val-OMe **1**.

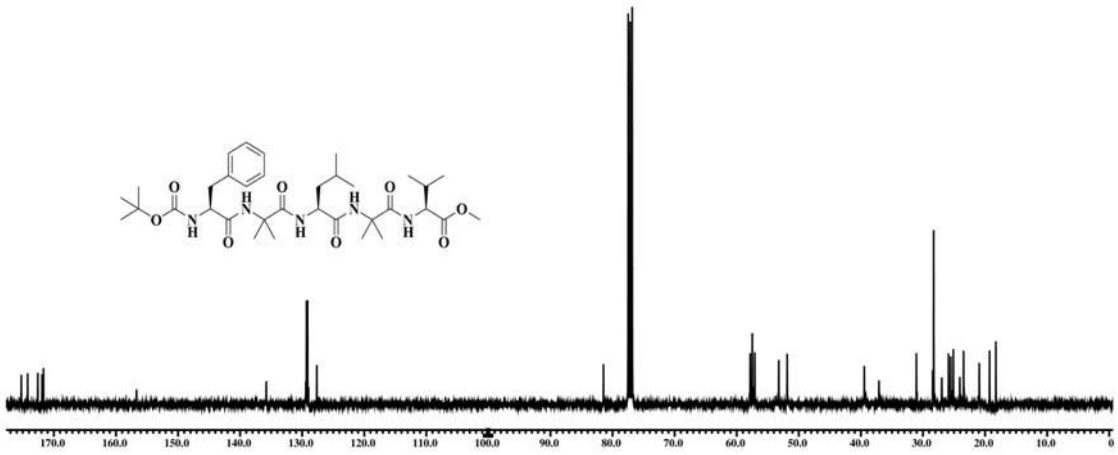


Figure S36. ^{13}C NMR (100 MHz, $CDCl_3$, δ in ppm, 298K) spectrum of Boc-Phe-Aib-Leu-Aib-Val-OMe.

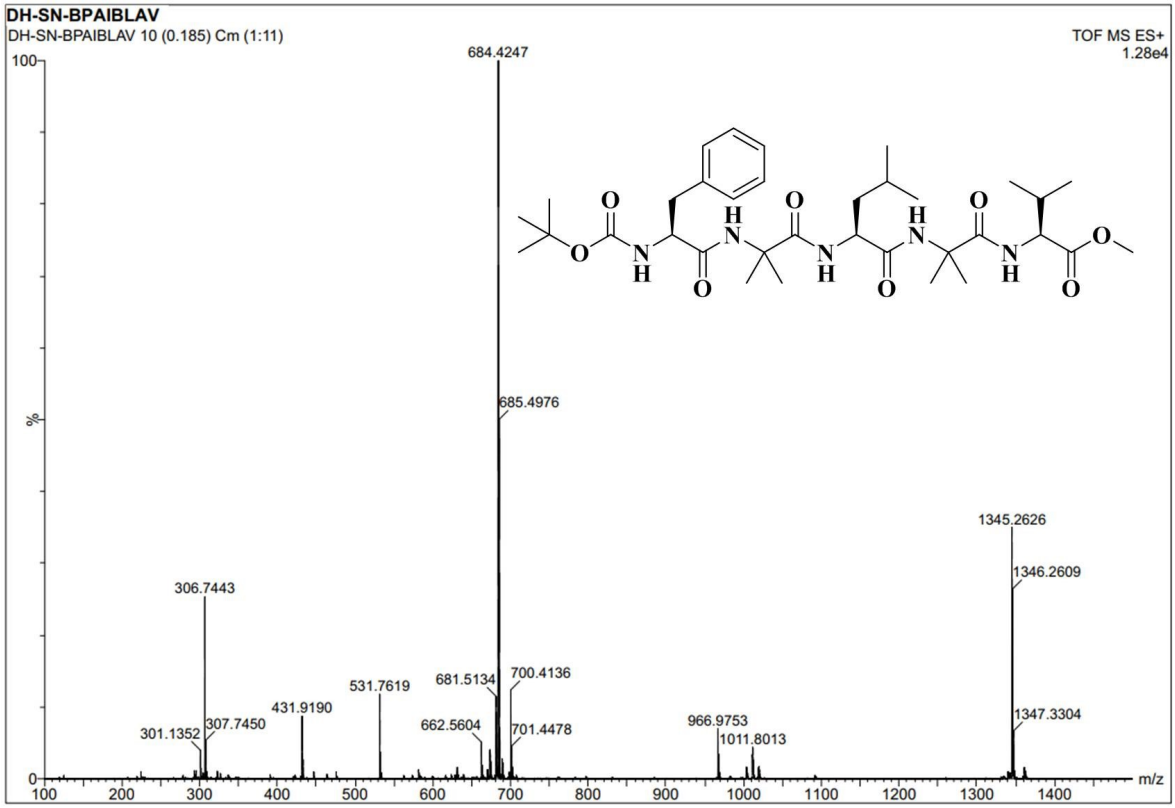


Figure S37. Mass Spectrum of Boc-Phe-Aib-Leu-Aib-Val-OMe **1**.

Figure S38. FT-IR Spectrum of Boc-Phe-Aib-Leu-Aib-Val-OMe **1**.