# SUPPLEMENTARY INFORMATION

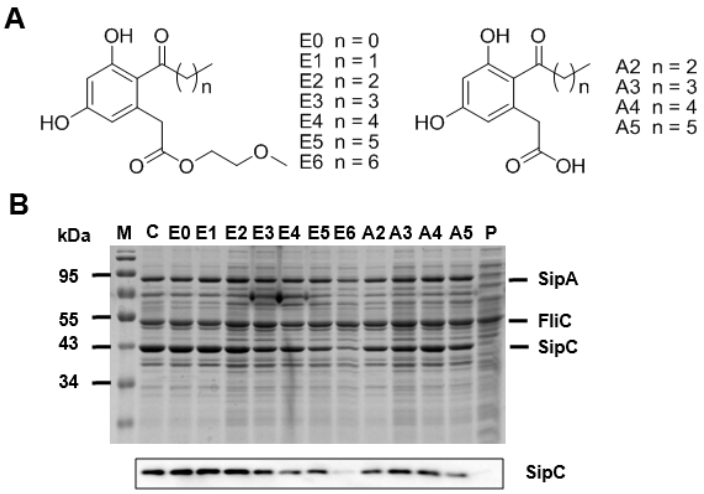



**Fig. S1. Effects of Csn-B derivatives on the secretion of SPI-1 effectors. (A).** Chemical structures of Csn-B derivatives. **(B).** Effects of Csn-B derivatives on secretion of SPI-1 effector proteins. The proteins were treated and analyzed by the same protocols as Fig. 1B. M: Marker; C: DMSO control; P: positive control, INP0403.

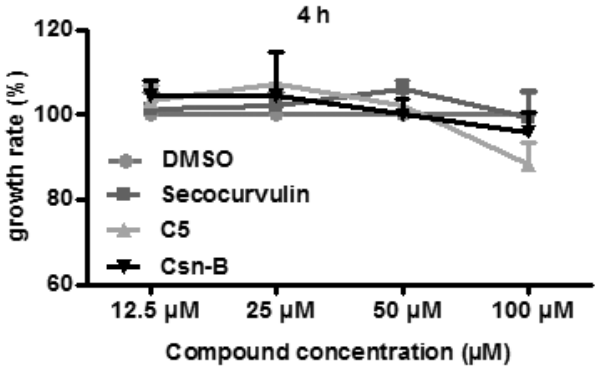



**Fig. S2. Effects of compounds secocurvulin, C5 and Csn-B on viability of HeLa cells.** Secocurvulin, C5 or Csn-B was added to HeLa cells at concentrations ranging from 12.5 to 100 μM and incubated for 4 h. The cell growth rate was determined using MTT assay. Values represent the means of percent viability compared to DMSO control in three independent experiments performed with triplicate samples. Error bars indicate standard deviations from the means.

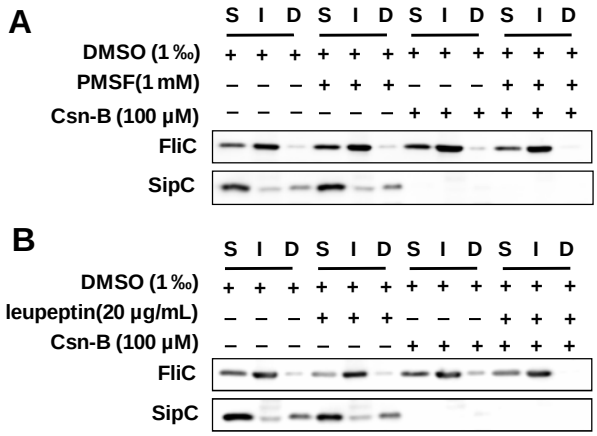
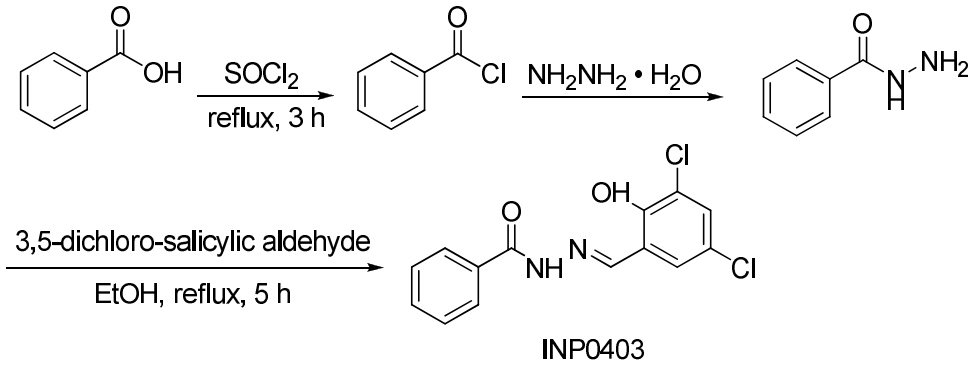



**Fig. S3 Inhibition of Csn-B on SPI-1 was not due to protein degradation.** The cells of *S. enterica* serovar Typhimurium χ8956 were cultured in the absence or presence of 100 μM of Csn-B under SPI-1 induced condition. The culture supernatants were collected by centrifugation. The pellets were resuspended by the same volume of PBS. **(A).** PMSF at a final concentration of 1 mM was added to the resuspended solutions. **(B). L**eupeptin at a final concentration of 20 μg/mL was added to the resuspended solutions. Proteins from different fractions were analyzed by Western blots. S: supernatant of culture; I: intracellular fraction; D: cell debris.




INP0403

**Scheme S1. Synthetic scheme for INP0403.**

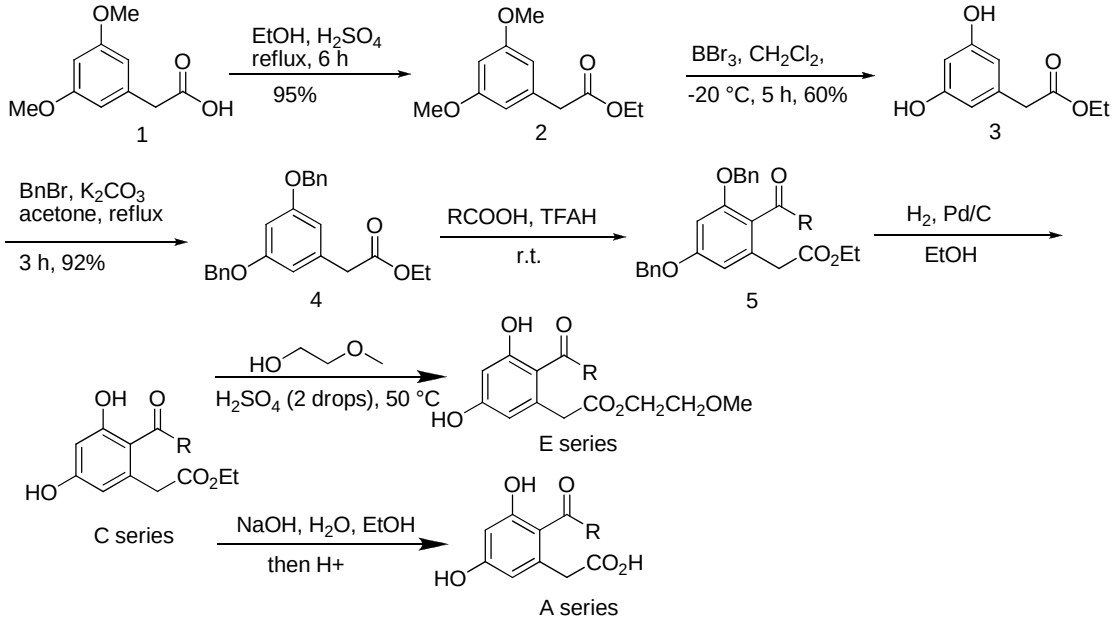
**Chemical Synthesis of INP0403 (Scheme S1):**

INP0403 was synthesized according to a procedure published previously [1]. Benzoic acid (8.2mmol) in anhydrous $SOCl_2$ (4.0 mL) was refluxed at 95°Cfor 3 h. After the excess $SOCl_2$ was removed by a rotary evaporator, the residue was dissolved in THF and transferred to constant pressure drop funnel completely. The reaction mixture was added to 80% hydrazine hydrate (10 mL) in THF (16 mL) dropwise and stirred at 0°C for 2.5 h. The resulting mixture was extracted with EtOAc (3×50 mL). The combined EtOAc extracts were washed with saturated $NaHCO_3$ (50 mL) and brine (3×50 mL), and then dried over anhydrous $Na_2SO_4$. The solvent was evaporated to dryness, and the crude products were purified by flash silica gel chromatography (eluted by 10-60% petroleum ether in acetone) to afford benzoyl hydrazine.

3,5-Dichloro-salicylic aldehyde (1 mmol) and benzoyl hydrazine (1 mmol) were dissolved in absolute ethanol (10 mL) and refluxed for 5 h at 80 °C. The remaining solid was purified by flash silica gel chromatography (eluting with 5-15% petroleum ether in EtOAc) to afford INP0403.

**INP0403:** 22% yield; Gray white solid;$^1$H-NMR (600 MHz, DMSO-$d_6$): δ12.56 (s, 2H), 8.60 (s, 1H), 7.98 (d, $J$ = 7.0 Hz, 2H), 7.71 (s, 1H), 7.67 (s, 2H), 7.60 (d, $J$ = 7.2

Hz, 2H); $^{13}$C-NMR (150 MHz, DMSO-$d_6$): δ163.53, 152.76, 147.47, 132.86, 132.66, 130.78, 129.16, 128.94, 128.27, 123.41, 121.96, 121.24; MS (ESI): *m/z* 309.4 $[M+H]^+$.




**Scheme S2. Synthetic scheme for Csn-B and its derivatives.**

**Chemical Synthesis of the C series compounds (Scheme S2):**

The C series compounds were synthesized according to a published procedure [2-4]. 2- (3,5-Dimethoxyphenyl) acetic acid **(1)** was stirred and refluxed for 6 h in anhydrous ethanol (50 mL) and concentrated sulfuric acid (1.0 mL). The reaction mixture was subsequently quenched with saturated sodium bicarbonate solution to room temperature, extracted with ethyl acetate (3×50 mL), dried by anhydrous sodium sulfate and then concentrated under reduced pressure. The crude material was purified by silica gel chromatography using a gradient of 5% ethyl acetate in hexanes to afford the product in 95% yield as colorless oil**(2)**. MS (ESI): *m/z* 225 $[M+H]^+$.

A mixture of ethyl 2- (3,5-dimethoxyphenyl) acetate **(2)**and $BBr_3$ in anhydrous $CH_2Cl_2$was stirred for 5 h at -20 ºC, and the reaction was quenched with a aq. saturated $NaHCO_3$ solution at -20 ºC. The reaction mixture was extracted with ethyl acetate, dried by anhydrous sodium sulfate and concentrated under reduced pressure.

The crude material was purified by silica gel chromatography using a gradient of 25% ethyl acetate in hexanes to give the product in 60% yield as a white solid**(3)**. MS (ESI): *m/z* 197 $[M+H]^+$.

Benzyl bromide was added to a solution of ethyl 2-(3,5-dihydroxyphenyl)acetate **(3)**in acetone, and the mixture was refluxed for 3 h. After the mixture was cooled to room temperature, the solvent was removed under reduced pressure. The residue was extracted by ethyl acetate, dried by anhydrous sodium sulfate and concentrated under reduced pressure. The crude material was purified by silica gel chromatography using a gradient of 5% ethyl acetate in hexanes to give the product in 92% yield as colorless oil **(4)**.

**Ethyl 2-(3,5-bis (benzyloxy) phenyl) acetate(4):**

$^1$H-NMR (600 MHz, $CDCl_3$): δ 7.43-7.37 (m, 8H), 7.33 (t, J=7.2 Hz, 2H), 6.55 (d, J=9.0 Hz, 2H), 5.02 (s, 4H), 4.15 (q, J=7.2 Hz, 2H), 3.55 (s, 2H), 1.25(t, J=7.2 Hz, 3H) ; $^{13}$C-NMR (150 MHz, $CD_3Cl_3$): δ 171.40, 160.00, 136.77, 136.11, 128.61, 127.87, 127.46, 108.45, 100.79, 70.06, 60.96, 41.70, 14.41; MS (ESI): *m/z* 377 $[M+H]^+$.

A solution of ethyl 2-(3,5-bis (benzyloxy) phenyl)acetate**(4)** and appropriate aliphatic acid in 2,2,2-trifluoroacetic anhydride was stirred at 40 ºC for 12h and then treated carefully with an aq. saturated $NaHCO_3$ solution at 0 ºC. The reaction mixture was extracted with ethyl acetate, dried by anhydrous sodium sulfate and concentrated under reduced pressure. The crude material was purified by silica gel chromatography using a gradient of 8% ethyl acetate in hexanes to give different ketone in 92% yield

as colorless oil (5).

Pd/C was added to the solution of the appropriate ketone in ethanol, and the mixture was stirred under $H_2$ at room temperature for 12 h. The reaction mixture was filtered and concentrated under reduced pressure. The crude material was purified by silica gel chromatography using a gradient of 20% ethyl acetate in hexanes to give **C** series products in 92% yield as white solid.

**Curvulin:**

$^{1}$H-NMR (600 MHz, $CDCl_3$): δ 12.14 (s, 1H), 9.57 (s, 1H), 6.35 (s, 1H), 6.26 (s, 1H), 4.16(q, J=7.2 Hz 2H), 3.81(s, 2H), 2.58(s, 3H), 1.25(t, J=7.2 Hz, 3H); $^{13}$C-NMR (150 MHz, $CD_3Cl_3$): δ 203.15, 171.03, 164.42, 162.15, 136.96, 116.02, 112.70, 102.84, 61.03, 41.45, 30.91, 14.13; MS (ESI): *m/z* 239 $[M+H]^+$.

**C1:**

$^{1}$H-NMR (600 MHz, $CDCl_3$): δ 10.99 (s, 1H), 9.23 (s, 1H), 6.27 (d, t, J=1.9 Hz, 1H), 6.17 (s, 1H), 4.05(q, J=7.2 Hz 2H), 3.65(s, 2H), 2.82(q, J=7.2 Hz, 2H), 1.17(t, J=7.2 Hz, 3H), 1.06(t, J=7.2 Hz, 3H); $^{13}$C-NMR (150 MHz, $CD_3Cl_3$): δ 206.93, 171.23, 160.90, 135.95, 111.82, 102.64, 60.84, 36.66, 14.16, 14.13, 8.74; MS (ESI): *m/z* 253 $[M+H]^+$.

**C2:**

$^{1}$H-NMR (600 MHz, $CDCl_3$): δ 10.99 (s, 1H), 9.23 (s, 1H), 6.27 (d, t, J=1.9 Hz, 1H), 6.17 (s, 1H), 4.05(q, J=7.2 Hz, 2H), 3.65(s, 2H), 2.82(q, J=7.2 Hz, 2H), 1.17(t, J=7.2 Hz, 3H), 1.06(t, J=7.2 Hz, 3H); $^{13}$C-NMR (150 MHz, $CDCl_3$): δ 206.93, 171.23, 160.90, 135.95, 111.82, 102.64, 60.84, 36.66, 14.16, 14.13, 8.74; MS (ESI): *m/z* 267

$[M+H]^+$.

**C3:**

$^1$H-NMR (600 MHz, $CDCl_3$): δ 10.99 (s, 1H), 9.23 (s, 1H), 6.27 (d, J=1.9 Hz, 1H), 6.17 (s, 1H), 4.05(q, J=7.2 Hz, 2H), 3.65(s, 2H), 2.82(q, J=7.2 Hz, 2H), 1.17(t, J=7.2 Hz, 3H), 1.06(t, J=7.2 Hz, 3H); $^{13}$C-NMR (150 MHz, $CDCl_3$): δ 206.93, 171.23, 160.90, 135.95, 111.82, 102.64, 60.84, 36.66, 14.16, 14.13, 8.74; MS (ESI): *m/z* 253 $[M+H]^+$.

**Secocurvularin:**

$^1$H-NMR (600 MHz, $CDCl_3$): δ 11.97 (s, 1H), 6.32 (s, 1H), 6.26 (d, J=2.5 Hz, 1H), 6.24 (d, J=2.5 Hz, 1H), 4.21(q, J=7.1 Hz 2H), 3.82(s, 2H), 2.82(t, J=7.4 Hz, 2H), 1.71-1.67(m,2H), 1.31-1.27(m, 7H), 0.89(t, J=6.9 Hz, 2H); $^{13}$C-NMR (150 MHz, $CDCl_3$): δ 206.74, 171.73, 164.20, 160.28, 136.54, 116.62, 112.72, 103.28, 61.73, 43.38, 41.78, 31.41, 24.64, 22.47, 14.14, 13.97; MS (ESI): *m/z* 295 $[M+H]^+$.

**C5:**

$^1$H-NMR (600 MHz, $CDCl_3$): δ 11.97 (s, 1H), 6.40 (s, 1H), 6.28 (s, 1H), 6.27 (s, 1H), 4.23(q, J=7.0 Hz, 2H), 3.84(s, 2H), 2.84(t, J=7.0 Hz, 2H), 1.72-1.68(m, 2H), 1.31-1.29(m, 9H), 0.89(t, J=6.1 Hz, 3H); $^{13}$C-NMR (150 MHz, $CDCl_3$): δ 206.76, 171.76, 164.15, 160.29, 136.52, 116.63, 112.72, 103.28, 61.73, 43.44, 41.77, 31.59, 28.93, 24.92, 22.52, 14.16, 14.13, 14.05; MS (ESI): *m/z* 309 $[M+H]^+$.

**Csn-B:**

$^1$H-NMR (600 MHz, $CDCl_3$): δ 12.13 (s, 1H), 6.30 (d, J=2.4 Hz, 1H), 6.28 (d, J=2.4 Hz, 1H), 5.85(s, 1H), 4.21(q, J=7.1 Hz, 2H), 3.86(s, 2H), 2.84(t, J=7.4 Hz, 2H),

1.74-1.69(m, 2H), 1.32-1.6(m, 11H), 0.90(t, J=6.9 Hz, 3H); $^{13}$C-NMR (150 MHz, $CDCl_3$): δ 206.70, 171.33, 164.47, 160.13, 136.67, 116.60, 112.54, 103.27, 61.63, 43.38, 41.80, 31.68, 29.20, 29.08, 24.98, 22.60, 14.14, 14.07; MS (ESI): *m/z* 323 $[M+H]^+$.

**C7:**

$^1$H-NMR (600 MHz, $CDCl_3$): δ 6.27 (s, 2H), 4.21 (s, 2H), 3.81 (s, 2H), 2.84 (s, 2H), 1.69 (s, 2H), 1.29 (dd, *J* = 15.6, 8.3 Hz, 15H), 0.89 (t, *J* = 7.0 Hz, 3H); $^{13}$C-NMR (150 MHz, $CDCl_3$): δ 206.88, 171.94, 160.43, 136.41, 116.75, 112.72, 103.23, 61.71, 43.51, 41.66, 31.88, 29.47, 29.29, 24.96, 22.69, 14.14; MS (ESI): *m/z* 351 $[M+H]^+$.

**Chemical synthesis of the E series compounds (Scheme S2):**

The appropriate C series compound was dissolved in 1 mL 2-methoxyethanol and two drops of concentrated sulfuric acid was added to the solution. The mixture was stirred at 50ºC for 12–16 h, extracted by ethyl acetate and then eluted by saturated sodium bicarbonate solution and brine. The organic phase was dried by anhydrous sodium sulfate and concentrated under reduced pressure. The crude material was purified by silica gel chromatography using a gradient of 23% ethyl acetate in hexanes to give E series products in 60-80% yield as colorless oil.

**E0:**

$^1$H-NMR (600 MHz, $CDCl_3$): δ 11.64 (s, 1H), 9.51(s, 1H), 6.26 (d, J=2.4 Hz, 1H), 6.15 (d, J=2.4 Hz, 1H), 4.15(s, 1H), 4.21(q, J=7.1 Hz, 2H), 3.73(d, J=12.2 Hz, 2H), 3.48(t, J=4.4 Hz, 2H), 3.26(d, J=12.7 Hz, 2H), 2.46(d, J=12.5 Hz, 3H); $^{13}$C-NMR (150 MHz, $CDCl_3$): δ 203.12, 171.13, 163.54, 161.79, 136.58, 116.56, 112.47, 102.74,

70.19, 63.84, 43.48, 41.01, 40.40, 40.25, 40.12, 39.98, 39.84, 39.70, 31.96; MS (ESI): *m/z* 269 $[M+H]^+$.

**E1:**

$^1$H-NMR (600 MHz, $CDCl_3$): δ 11.68 (s, 1H), 6.33 (d, J=6.5 Hz, 1H), 6.24 (d, J=6.5 Hz, 1H), 4.23-4.21(m, 2H), 3.81(d, J=8.6 Hz, 2H), 3.55(m, 3H), 3.34(d, J=8.8 Hz, 2H), 2.87(m, 2H), 1.13(m, 3H); $^{13}$C-NMR (150 MHz, $CDCl_3$): δ 206.72, 171.13, 163.28, 161.46, 136.06, 112.48, 102.92, 70.27, 63.94, 58.93, 41.19, 40.33, 40.20, 40.06, , 36.49, 8.86; MS (ESI): *m/z* 282 $[M+H]^+$.

**E2:**

$^1$H-NMR (600 MHz, $CDCl_3$): δ 11.67 (s, 1H), 7.28 (s, 1H), 7.12 (s, 1H), 6.26 (d, J = 6.8 Hz, 1H), 6.22 (s, 1H), 4.39 -4.28 (m, 2H), 3.85 (s, 2H), 3.66 (d, J = 3.4 Hz, 2H), 3.42 (s, 3H), 2.83 (t, J = 7.2 Hz, 2H), 1.78 -1.67 (m, 2H), 0.94 (dd, J = 18.2, 10.8 Hz, 3H);$^{13}$C-NMR (150 MHz, $CDCl_3$):δ 206.69, 171.81, 163.68, 160.51, 136.27, 116.77, 112.62, 103.13, 70.28, 64.23, 58.92, 45.37, 41.43, 18.35, 13.78; MS (ESI): *m/z* 297 $[M+H]^+$.

**E3:**

$^1$H-NMR (600 MHz, $CDCl_3$): δ 12.21 (s, 1H), 6.32 (d, J = 2.4 Hz, 1H), 6.28 (d, J = 2.3 Hz, 1H), 6.02 (s, 1H), 4.32 -4.27 (m, 2H), 3.91 (s, 2H), 3.40 (s, 2H), 2.86 (t, J = 7.4 Hz, 2H), 1.74 – 1.67 (m, 2H), 1.37 (dd, J = 15.0, 7.5 Hz, 2H), 0.94 (t, J = 7.4 Hz, 3H); $^{13}$C-NMR (150 MHz, $CDCl_3$): δ 112.39, 103.21, 43.06, 41.63, 27.06, 22.33, 13.90; MS (ESI): *m/z* 311 $[M+H]^+$.

**E4:**

$^{1}$H-NMR (600 MHz, $CDCl_3$): δ 11.83 (s, 1H), 6.93 (s, 1H), 6.27 (s, 1H), 6.22 (s, 1H), 4.32 (s, 2H), 3.86 (s, 2H), 3.66 (d, J = 3.9 Hz, 2H), 3.42 (s, 3H), 2.84 (t, J = 7.4 Hz, 2H), 1.70 (dd, J = 14.1, 7.0 Hz, 2H), 1.32 (t, J = 13.4 Hz, 4H), 0.90 (t, J = 6.7 Hz, 3H); $^{13}$C-NMR (150 MHz, $CDCl_3$): δ 206.77, 171.69, 163.93, 160.49, 136.31, 116.65, 112.63, 103.15, 70.27, 64.25, 58.94, 43.40, 41.50, 31.41, 24.62, 22.51, 13.98; MS (ESI): *m/z* 325 $[M+H]^+$.

**E5:**

$^{1}$H-NMR (600 MHz, $CDCl_3$): δ 11.68 (s, 1H), 7.15 (s, 1H), 6.26 (s, 1H), 6.21 (s, 1H), 4.32 (s, 2H), 3.84 (s, 2H), 3.66 (d, J = 4.2 Hz, 2H), 3.42 (s, 3H), 2.84 (t, J = 7.4 Hz, 2H), 1.68 (dd, J = 14.1, 7.0 Hz, 2H), 1.30 (d, J = 9.6 Hz, 7H), 0.89 (t, J = 6.6 Hz, 3H); $^{13}$C-NMR (150 MHz, $CDCl_3$): δ 206.83, 171.81, 163.68, 160.52, 136.25, 116.75, 112.64, 103.12, 70.27, 64.24, 58.93, 43.50, 41.44, 31.64, 28.94, 24.90, 22.53, 14.06; MS (ESI): *m/z* 339 $[M+H]^+$.

**E6:**

$^{1}$H-NMR (600 MHz, $CDCl_3$): δ 12.10 (s, 1H), 6.29 (d, J = 2.4 Hz, 1H), 6.24 (d, J = 2.4 Hz, 1H), 4.34 – 4.31 (m, 2H), 3.89 (s, 2H), 3.67 -3.63 (m, 2H), 3.42 (s, 2H), 2.84 (t, J = 7.4 Hz, 2H), 1.70 (dd, J = 14.2, 7.2 Hz, 2H), 1.34 -1.26 (m, 7H), 0.89 (t, J = 6.9 Hz, 3H);$^{13}$C-NMR (150 MHz, $CDCl_3$): δ 206.76, 171.74, 171.59, 163.82, 160.52, 136.28, 116.69, 112.62, 103.15, 70.27, 64.24, 58.94, 43.48, 41.48, 31.70, 29.23, 29.15, 24.97, 22.64, 14.11. MS (ESI): *m/z* 353 $[M+H]^+$.

**Chemical synthesis of theA series compounds (Scheme S2):**

The reaction mixture of the appropriate C series compound in ethanol and a.q.

NaOH was stirred for 3-4 h at room temperature, and then adjusted to pH 2-3 by HCl (6 M).The mixture was extracted with ethyl acetate, and the organic layer was washed with saturated brine, dried by anhydrous sodium sulfate and concentrated under reduced pressure. The crude material was purified by silica gel chromatography using a gradient of 10% chloroform in methanol to give the product in 80-90% yield as dark brown solid.

**A2:**

$^{1}$H-NMR (600 MHz, DMSO-*d6*): δ 12.09 (s, 1H), 9.90 (s, 1H), 9.69 (s, 1H), 6.27 (d, *J* = 2.0 Hz, 1H), 6.14 (d, *J* = 1.9 Hz, 1H), 3.45 (d, *J* = 15.6 Hz, 2H), 2.77 (t, *J* = 7.3 Hz, 2H), 1.55 (m, 2H), 0.87 (t, *J* = 7.4 Hz, 3H); $^{13}$C-NMR (150 MHz, DMSO-*d6*): δ 205.90, 172.82, 159.55, 157.73, 136.05, 120.70, 110.61, 101.75, 45.94, 39.20, 17.70, 14.28; MS (ESI): *m/z* 239 $[M+H]^{+}$.

**A3:**

$^{1}$H-NMR (600 MHz, DMSO-*d6*): δ 12.11 (s, 1H), 9.92 (s, 1H), 9.70 (s, 1H), 6.27 (s, 1H), 6.14 (s, 1H), 3.44 (s, 2H), 2.79 (t, *J* = 6.7 Hz, 2H), 1.55 (m, 2H), 1.28 (m, 4H), 0.88 (t, *J* = 7.0 Hz, 3H); $^{13}$C-NMR (150 MHz, DMSO-*d6*): δ 206.01, 172.83, 159.53, 157.69, 136.02, 120.72, 110.60, 101.75, 43.66, 39.19, 26.46, 22.42, 14.45; MS (ESI): *m/z* 275 $[M+H]^{+}$.

**A4:**

$^{1}$H-NMR (600 MHz, DMSO-*d6*): δ 12.11 (s, 1H), 9.88 (d, *J* = 41.3 Hz, 1H), 9.67 (d, *J* = 41.5 Hz, 1H), 6.27 (s, 1H), 6.14 (s, 1H), 3.44 (s, 2H), 2.78 (s, 2H), 1.53 (s, 2H), 1.26 (s, 4H), 0.88 (s, 3H); $^{13}$C-NMR (150 MHz, DMSO-*d6*): δ 206.03, 172.82, 159.53,

157.69, 136.02, 120.72, 110.59, 101.75, 43.89, 39.18, 31.49, 23.95, 22.52, 14.41; MS (ESI): *m/z* 267 $[M+H]^+$.

**A5:**

$^1$H-NMR (600 MHz, DMSO-*d6*): δ 12.10 (s, 1H), 9.91 (s, 1H), 9.70 (s, 1H), 6.27 (s, 1H), 6.14 (s, 1H), 3.43 (s, 2H), 2.78 (s, 2H), 1.52 (s, 2H), 1.27 (s, 6H), 0.87 (s, 3H); $^{13}$C-NMR (150 MHz, DMSO-*d6*): δ 206.03, 172.82, 159.53, 157.69, 136.02, 120.72, 110.59, 101.75, 43.94, 39.18, 31.69, 28.93, 24.25, 22.49, 14.41; MS (ESI): *m/z* 281 $[M+H]^+$.

**Chemicals and experimental instruments used in syntheses:**

All chemicals were purchased from commercial sources and used as received. All dry solvents were of anhydrous quality purchased from Sigma-Aldrich. Commercial grade solvents were used for routine purposes with further purification by distillation. Reactions were stirred magnetically using Teflon-coated magnetic stirring bars.

NMR ($^1$H and $^{13}$C) spectra were measured on a Brucker AV-600 spectrometerusing TMS as the internal standard. Electrospray ionization mass spectrometry (ESI-MS) was performed on a LTQ-Orbitrap XL instrument. Silica gel (200–300 mesh) was used for column chromatography (CC).

**TABLE S1** Sequence of primers used in this study

| Gene | Function | Sequence(5'-3') |
|---|---|---|
| ***rrsH*** | 16S ribosomal RNA. | F: GTGGCGGACGGGTGAGTA<br>R: GGGCACATCTGATGGCAAG |
| ***hns*** | global DNA-binding transcriptional dualregulator H-NS. | F: GCGTCGTGAAGAAGAAAGCG<br>R: CAGCAGTTCATTCGGGTCAA |
| ***hha*** | with H-NS involved in transcript-tional regulation of hemolysin; non-specific DNA-binding protein which affectsthe production of multiple proteins. | F: GATTATTTGATGCGTTTACGGC<br>R: GTCAATTCTGCAAGACGGTGAT |
| ***phoP*** | response regulator in two-component regulatory system with PhoQ; involved in magnesium starvation and stress. | F: TGCGGGAAAGTCATACCATTG<br>R: TGACATCGTGCGGATACTGG |
| ***phoQ*** | virulence sensor protein PhoQ; in two-component regulatory system with PhoP; ligand is magnesium ion. | F:<br>CTTCCATGAAATTGAAACCAACG<br>R: TCATCTCGGCATCATCGTCA |
| ***hilD*** | AraC family activator for invasion genes; derepressshilA expression. | F:CAGTTTCACTTTAGTTTGCTTTCG<br>R: AACATCCCAGGTTCGTCACAG |
| ***hilC*** | AraC family activator for invasion genes; derepresseshilA expression. | F:GCTGAGGTGGCAGGAAAGC<br>R: CCTCTTCAGCGGCCAGTTT |
| ***rtsA*** | T3SS and flagellar regulator. | F: GCGCAAAACTGGCAGAGG<br>R:CCGTGGTGAGCTTGATGAGTAC |
| ***hilA*** | Activates the expression of invasion genes and SPI-1 apparatus genes prgH/I/J/K. | F:CATACATTGGCGATACTTCCTTT<br>R: GCATACTGCGATAATCCCTTCA |
| ***invF*** | SPI-1 transcription factor; activated by HilA; requires SicA as a co-factor; controls sigD, sopB/E, sicA, and sipB/C/D/A genes. | F: GGCGCAGGATTAGTGGACAC<br>R: ACGATCTTGCCAAATAGCGC |
| ***sicA*** | partitioning factor for SipB/C; prevents premature association of SipB/C; regulates several promo-ters with InvF. | F:GGCAGCAAAAGCCAGACAGT<br>R: CGCCTCCAGATAGACCAACG |
| ***sipC*** | translocation machinery compo-nent. | F: GTGACCTGGGGTTGAGTCCTAC<br>R: AAGGACGTGATCGTTCCGG |
| ***prgH*** | needle complex inner membrane protein. | F: GTTGTGGGCTCGTCAGGTTT<br>R: CGCTTATTTTCTTCGTTTTCGT |

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