

Supplementary Materials

1. Supplementary Figures

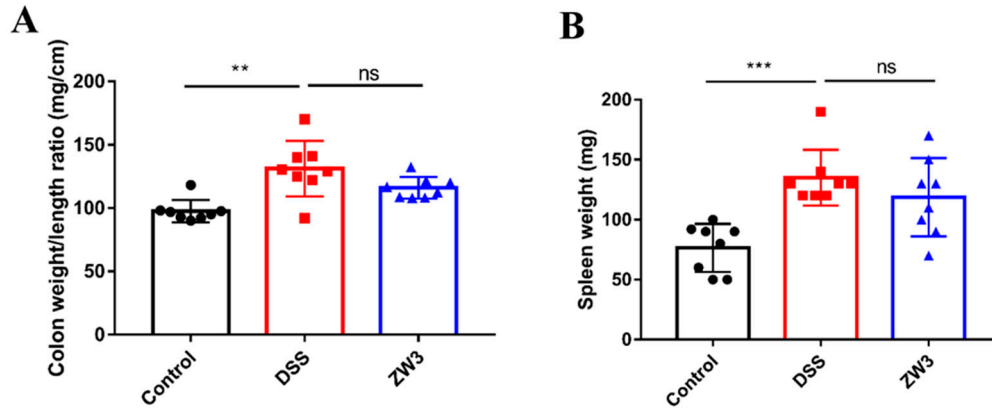


Figure S1. *B. licheniformis* ZW3 attenuates DSS-induced colitis symptoms. (A) Colon weight/length ratio and (B) spleen weight of the mice with free drinking water (Control), DSS (DSS), and ZW3 plus DSS (ZW3). ** $p < 0.01$, *** $p < 0.001$, and ns, not significant.

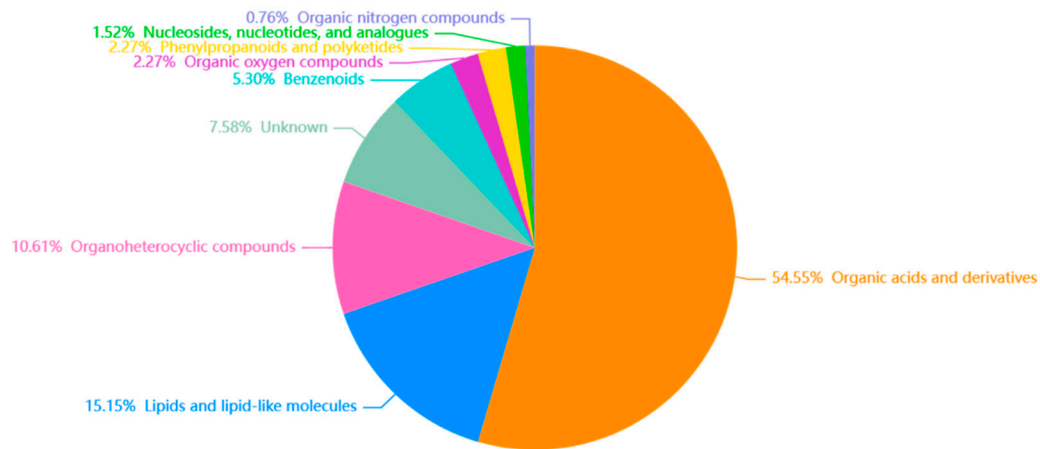


Figure S2. MS2 superclass classification of the differential metabolites between the colitis mice and ZW3-treated colitis mice.

2. Supplementary Tables

Table S1. Metabolomic changes in the colonic contents between mice in the ZW3 group and DSS group

| Metabolites | RT (min) | VIP | Ratio | Regulated | Mode |
|------------------------------------|----------|------|-------|-----------|------|
| Cinobufagin | 4.605 | 3.92 | 11.76 | ↑ | - |
| Arg-Leu | 2.260 | 2.60 | 7.91 | ↑ | + |
| Lys-Leu | 1.990 | 2.36 | 7.57 | ↑ | + |
| Guanosine | 2.801 | 2.30 | 6.41 | ↑ | - |
| Hydroxypropyl-Lysine | 2.249 | 2.42 | 6.31 | ↑ | - |
| Histidiny-Leucine | 1.988 | 2.54 | 6.20 | ↑ | + |
| Deuteroporphyrin IX | 4.614 | 3.30 | 6.18 | ↑ | - |
| Guanosine | 2.796 | 2.30 | 5.97 | ↑ | + |
| Glutamine | 0.940 | 2.24 | 4.00 | ↑ | - |
| Ureidoisobutyric acid | 0.978 | 2.21 | 3.81 | ↑ | + |
| Guanine | 2.804 | 1.84 | 3.49 | ↑ | - |
| Hypoxanthine | 2.797 | 1.38 | 2.19 | ↑ | + |
| Uric acid | 1.080 | 3.64 | 0.015 | ↓ | - |
| 1-(2-Pyrimidinyl)-4-piperidinamine | 8.170 | 2.21 | 0.33 | ↓ | + |
| 2-hydroxyhexanoylglycine | 3.336 | 2.08 | 0.21 | ↓ | - |
| Stearamide | 5.434 | 1.87 | 0.36 | ↓ | + |
| 1,4-Diaminonaphthalene | 3.510 | 1.89 | 0.37 | ↓ | + |
| 3-Oxostearic acid | 5.496 | 1.34 | 0.44 | ↓ | + |

Table S2. Disease activity index (DAI) score of DSS-induced colitis

| Score | Weight loss | Bloody stools | Stool consistency |
|-------|-------------|------------------------|-------------------|
| 0 | None | None | Normal |
| 1 | 1-5% | - | - |
| 2 | 6-10% | Blood visible in stool | Loose stools |
| 3 | 11-15% | - | - |
| 4 | Over 15% | Gross bleeding | Diarrhea |

Table S3. Histological scores of DSS-induced colitis

| Score | Epithelium loss | Crypt loss | Infiltration of inflammatory cells | Depletion of goblet cells |
|-------|-----------------|------------|------------------------------------|---------------------------|
| 0 | None | None | None | None |
| 1 | 0%-5% | 0%-10% | Mild | Mild |
| 2 | 5%-10% | 10%-20% | Medium | Medium |
| 3 | Over 10% | Over 20% | Severe | Severe |

Table S4. Antibodies used in this study

| | Application | Dilution | Manufacturer | Cat. No. | Lot. No. |
|----------------|--------------------|-----------------|---------------------------|-----------------|-----------------|
| MPO | IHC | 1:1000 | Servicebio, Wuhan, China | GB12224 | AC2111015A |
| F4/80 | IHC | 1:300 | Servicebio, Wuhan, China | GB113373 | AC210730003 |
| MUC2 | IF | 1:500 | Servicebio, Wuhan, China | GB11344 | AC211012453 |
| ZO-1 | IF | 1:200 | Servicebio, Wuhan, China | GB111402 | AC211114002 |
| Occludin | IF | 1:1000 | Servicebio, Wuhan, China | GB111401 | AC210814001 |
| MUC2 | WB | 1:8000 | Abcam, Cambridge, MA, USA | Ab272692 | 1009676-7 |
| ZO-1 | WB | 1:5000 | Proteintech, Wuhan, China | 21773-1-AP | 00114347 |
| Occludin | WB | 1:5000 | Proteintech, Wuhan, China | 27260-1-AP | 00114087 |
| β -actin | WB | 1:2000 | Servicebio, Wuhan, China | GB15003 | AC220918001 |