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## Supplementary material

### 2 **Multi-omics reveals the mechanism of *B. longum* in promoting the** 3 **formation of mixed-species biofilms**

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**Table S1.** Detail of 2216E medium/L

compound	content	compound	content
peptone	5 g	potassium bromide	0.08 g
yeast	1 g	strontium chloride	0.034 g
ferric citrate	0.1 g	boric acid	0.022 g
sodium chloride	19.45 g	sodium silicate	0.004 g
magnesium chloride	5.98 g	Sodium fluoride	0.0024 g
sodium sulphate	3.24 g	ammonium nitrate	0.0016 g
calcium chloride	1.8 g	disodium hydrogen phosphate	0.008 g
potassium chloride	0.55 g	sodium carbonate	0.16 g
pH 7.6 ± 0.2			

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**Table S2.** Detail of AB medium/L

compound	content
sodium chloride	17.5 g
magnesium sulphate	12.3 g
acid-hydrolyzed casein	2 g
pH 7.5 ± 0.2	

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**Table S3.** Additive of AB medium/L

compound	content
1 M potassium phosphate buffer	10 mL
0.1 M arginine solution	10 mL
50% glycerol	20 mL
pH 7.5 ± 0.2	

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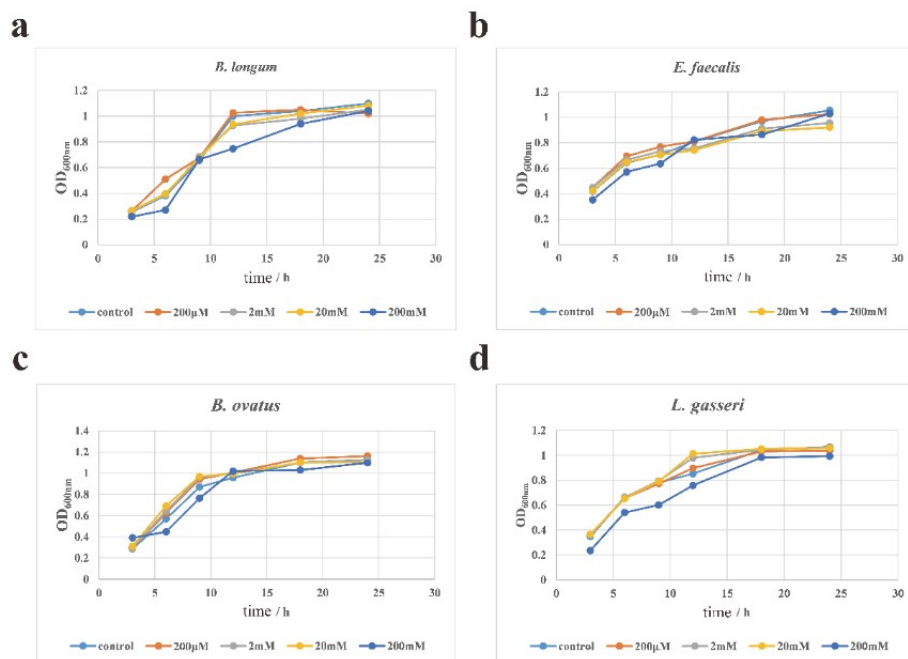
Tip: AB medium needs to be mixed with additives

**Table S4:** VIP value of differential metabolites between biofilm groups

Compound	VIP_score
Acetophenone	7.3333
L-Tyrosine	6.2038
3-(3,4-dihydroxyphenyl) propanoic acid	5.7281
2,6-Xylidine	4.2349
Isoleucine	3.118
Succinic acid	2.9781
Tyramine	2.958
Methylmalonic acid	2.8992
N-Benzylformamide	2.5283
DL-Arginine	2.3854
Adenine	2.2785
L-Glutamic acid	2.1248
L-Pyroglutamic acid	2.113
D-(+)-Tryptophan	1.9657

Compound	VIP_score
trans-3-Indoleacrylic acid	1.6582
Leucylproline	1.6441
5,6-diphenyl-2,3-dihydropyrazine	1.6287
carbamate	1.5963
4-Hydroxybenzaldehyde	1.594
Hypoxanthine	1.5057
Guanine	1.4819
$\gamma$ -Aminobutyric acid (GABA)	1.3981
L-Phenylalanine	1.3482
Dipropylene glycol dimethyl ether	1.3299
Palmitic Acid	1.1818
Valylproline	1.115
Betaine	1.1127
D-(+)-Proline	1.0941
N'-hydroxy-2,5-dimethoxybenzenecarboximidamide	1.0887
Carnosine	1.0344
Cordycepin	1.0216
L-(-)-Methionine	1.0154

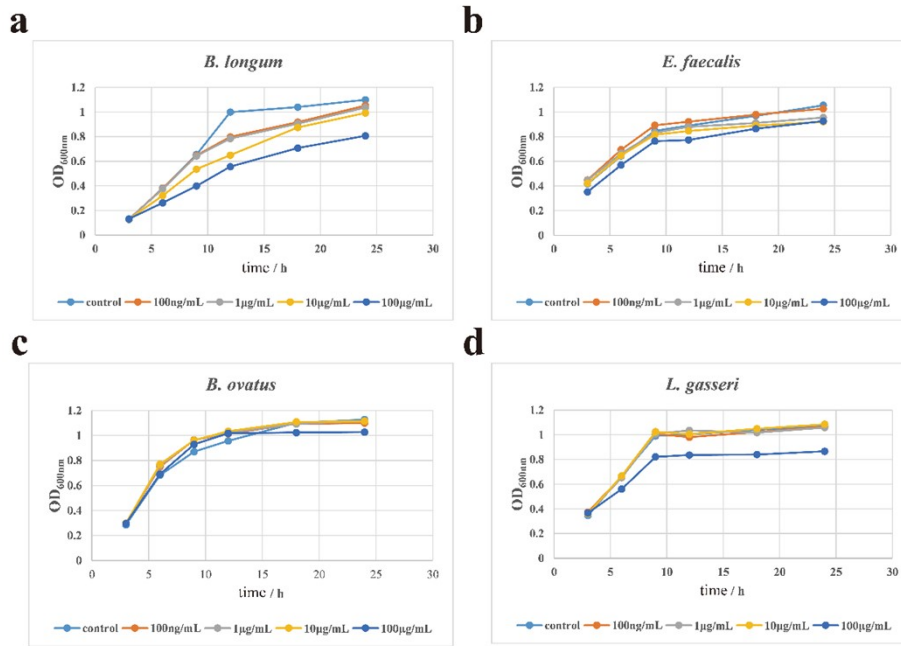
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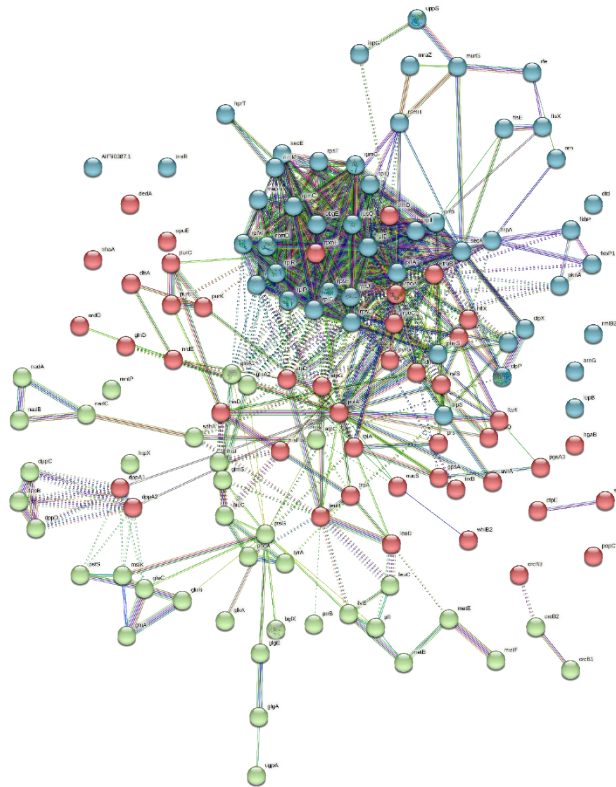
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29 **Fig S1.** Effect of AI-2 inhibitor on the growth of each strain. (a) *B. longum*, (b) *E. faecalis*, (c) *B.*  
30 *ovatus*, and (d) *L. gasseri*.

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 33 **Fig S2.** Effect of AHLs inhibitor on the growth of each strain. (a) *B. longum*, (b) *E. faecalis*, (c) *B.*  
 34 *ovatus*, and (d) *L. gasseri*.  
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 37 **Fig S3.** Protein-protein interaction (PPI) network of DEGs.