Supplementary Information

Bacterial chemotaxis towards polysaccharide pectin by pectin-binding protein

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Table S1. Mutations in the genome of strain A1-M5.

An excel file for Table S1 was separately uploaded.

Table S2. Primers used in this study.

Primer	Sequence (5'-3')
pKS_F1	AAAAATGGCAGCGCTGGCAGTCCTT
pKS_R2	GGCGGTGCTACAGAGTTCTTGAAGT
r-3kbp→6kbp f	TGATCGACCTGCAAGAGCGCATCCA
r-3kbp→6kbp r	TGTTCAAGCGCTCGACGCGAGTGCT
f→3.2kbp	GGGTCGTCGTCAAAGCGTCCTGTCA
r-6kbp→9kbp f	ACACACCCAAAGCGCCGCTTGACTG
r-6kbp→9kbp r	GCTCAGGTCAACATGAGCAACCTGC
f-3.2kbp→6.2kbp f	TGCTCAAGCCACGTTTGGCCGCGTT
f-3.2kbp→6.2kbp r	CACGACGCGCCCAATGTTCACCTCA
r-9kbp→12kbp f	GGTCGTAGCTGTCGTCTCAGTCATT
r-9kbp→12kbp r	TTTCACGCAAGCGCCGATGCTGGAA
f-6.2kbp→9.2kbp f	ATGAGGTGAACATTGGGCGCGTCGT
f-6.2kbp→9.2kbp r	ATGGCGATGTCCAGCCCCACGGTAT
r-12kbp→ f	TTGCGTGAAAGCAGCAGCGATCGCC
f-9.2kbp→12kbp f	ATACCGTGGGGCTGGACATCGCCAT
f-9.2kbp→12kbp f	GACCAACCACGTCAGCGGTGCGATA
f-12kbp→f	TATCGCACCGCTGACGTGGTTGGTC
r-1289838~	TAGACCAGCGTCTGCAATTCCAGGC
f-3135268~	TACGCTGTGGGAGACCGACGAGGTT
sph2942 BamHI infusion f	TCGCGCGACCGGATCAATGCAAGGCCGTTCAACGC
sph2942 BamHI infusion r	AACGTTGCCCGGATCCGACAAGGGCAGATACACGT
sph1119 BamHI infusion f	TCGCGCGACCGGATCGCGGGAACATTTCCTTGTTC
sph1119 BamHI infusion r	AACGTTGCCCGGATCGTCGATTACGCAACCAGCCG
sph1117 BamHI infusion f	TCGCGCGACCGGATCCCGTCGTACCACCGTTAACC
sph1117 BamHI infusion r	AACGTTGCCCGGATCGTATCGGAGAAGTTCGCCCG
sph1118 BamHI infusion f	TCGCGCGACCGGATCACGAACTTGCCGATCGACCA
sph1118 BamHI infusion r	AACGTTGCCCGGATCATTGGCGCCCATACCTCCAG
sph2733 BamHI infusion f	TCGCGCGACCGGATCTTCAAGCTGGGCTACCTCGC
sph2733 BamHI infusion r	AACGTTGCCCGGATCGGACGTACGGATGATGTCGA
sph1118 BamHI infusion f new	TCGCGCGACCGGATCTGATGATCACGGGGATCACC
sph1118 BamHI infusion r new	AACGTTGCCCGGATCTTAAAACGGCCGCGCAACCA
sph1117 f	AAGCGATACCACATCAGCGTCCACT
sph1117 r	AGAAGCGTATGGCGCTGTACGACCA
sph1118 f	TACGCTTCTTCATGCTTTCGTTCGG
sph1118 r	TCGTAGTTCATCCCTAGGAGGACAA
sph1119 f	ATGAGTCGACCCCTTCATTTTCTGC
sph1119 r	TCAGGCGTTTGAACTACCTGATGTC
sph1117 f inverse	AAGTCATCGGCACGGTTCGTCCGGC
sph1117 r inverse	TGAGTCTTGGCGGCGACGAACTGGT
sph1118 f inverse	GACGGTGTAATCGTCAACCTTCGAA
sph1118 r inverse	TGGCTATGGACCGTGACGAGATCAA
sph1119 f inverse	GGGCGACCTCCAGTGCCTCGGTATT
sph1119 r inverse	AATGACCGCGCACGCCATGCACGGA
SPH1118 NdeI（S）	GGCATATGGCTGCTTTCACGCAAGCGCCGA
SPH1118 NdeI（L）	GGCATATGATGAGGTTTTACTCTCGCAAGTTTGCG
Km-F	GGGGGCGCTGAGGTCTGCCTCGTGAAG
Km-R	GGGGGAAAGCCACGTTGTGTCTCAAAA
sph1118-NdeI in fusion	AAGGAGATATACATATGGCTGCTTTCACGCAAGCGCCGA
sph1118-XhoI in fusion	GGTGGTGGTGCTCGAGCTTGGAGAAGTACCACTGCT

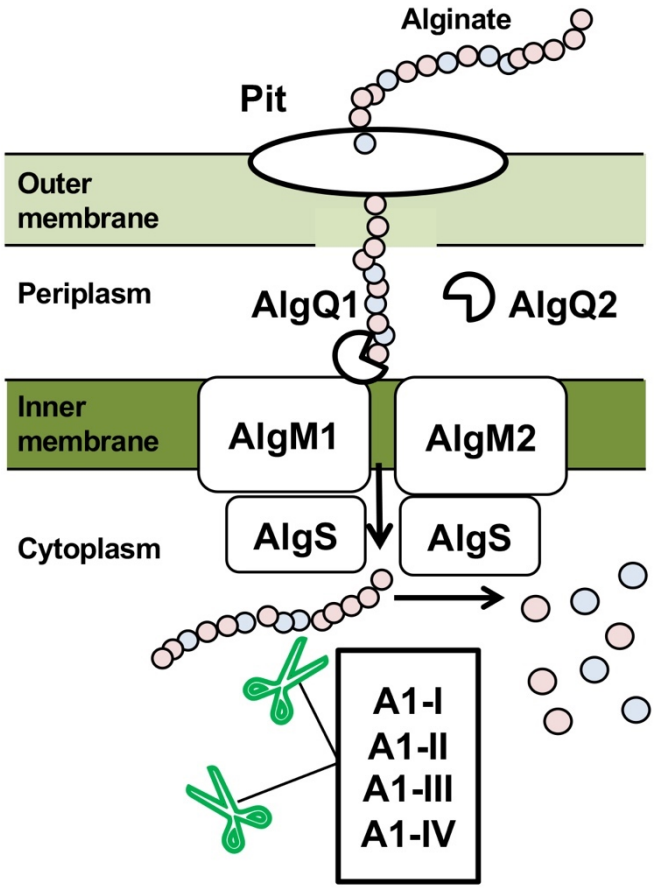

Figure S1. Import and degradation of alginate polysaccharide by strain A1 cells. Extracellular alginate is incorporated to the periplasm through the cell-surface pit and bound to the periplasmic binding protein (AlgQ1 or AlgQ2). The binding protein delivers the polysaccharide to the ABC transporter (AlgM1-AlgM2/AlgS-AlgS), which imports alginate to the cytoplasm with an energy from ATP hydrolysis by AlgS-AlgS. Alginate is degraded to constituent monosaccharides by three endotype (A1-I, II, and III) and a exotype (A1-IV) alginate lyases.

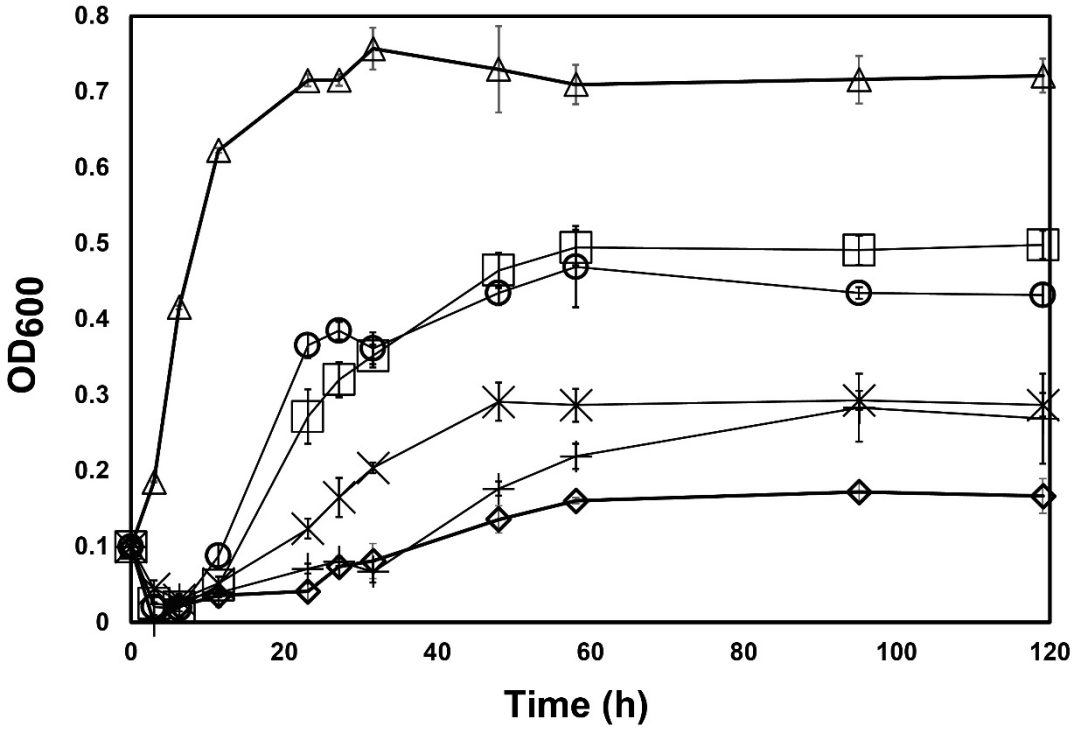

Figure S2. Assimilation of pectin by strain A1 cells. Bacterial cells were cultured in test tubes ($n = 3$). Values indicate the average optical density at 600 nm (OD_{600}) as follows: triangle, non-motile wild-type strain A1 cells; circle, strain A1-MP cells; rhombus, strain A1-M5 cells ; square, *sph1118*-complemented strain *Δsph1118* cells derived from strain A1-MP; cross, strain *Δsph1118* cells derived from strain A1-MP; plus, *sph1117*-*sph1118*-complemented A1-M5 cells. Error bars indicate standard deviations.

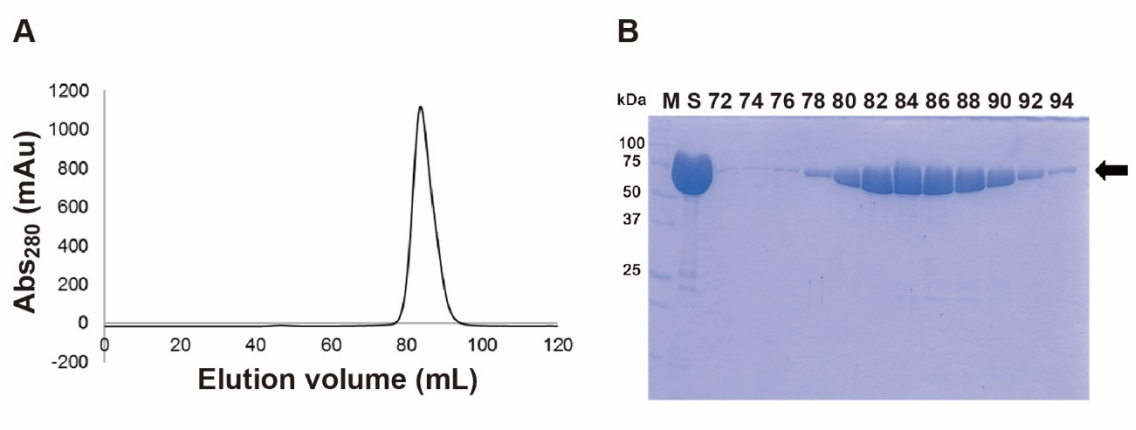

Figure S3. Purification of SPH1118. (**A**) Elution profile of the recombinant SPH1118 from gel filtration column chromatography. (**B**) SDS-PAGE profile of the recombinant SPH1118. Lane S, proteins before subjected to the gel filtration column chromatography; lanes 72-94, fractions cotaining the eluted protein from the chromatography. This electrophoretic profile is not an image cropped from different parts of the same gel or from different gels.