

1 **Appendix A: supplementary data**

2 **Supplementary table 1:** Primers and DNA templates used for gene amplification

3 **Supplementary table 2:** Primers used for qRT-PCR experiments

4 **Supplementary Figure 1:** Time-lapse images of colony morphology of four *Bacillus subtilis*
5 mutants on MSgg medium.

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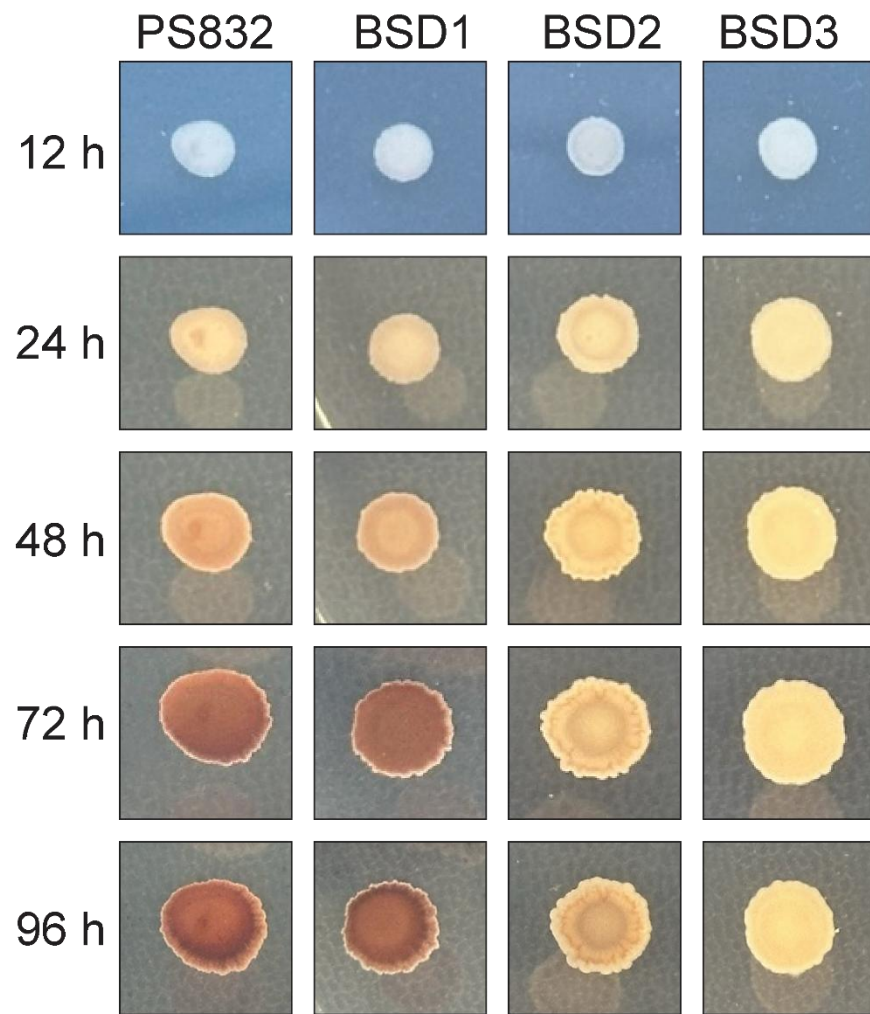
Supplementary Table 1 Primers and DNA templates for gene amplification in this study

Primers	Sequences (5'-3')
koalsD.1F	GTGAATGAAGTCACAAATACGAAAAACGTG
koalsD.1R	TCTCCTTTCTCGCCTGCATTTCCCTTCACTCCTTTATTTAGTGCTG
koalsD.2F	AGGGAAATGCAGGCGAGAAAGGAGAGAGAA
koalsD.2R	TTTTTCTTCGAGGCTCCTGTCACTGCAGCGTCT
koalsD.3F	AGTGACAGGAGCCTCGAAGAAAAAAGAAAGCCCCTTTTAGCAGG
koalsD.3R	GTCGTATGCTGTGTGCGAAACCTTACATG
vegilvB.1F	TAATATCTAAAGCCTCCGTGTACGCCT
vegilvB.1R	TTCTCGCCTGCTTTAGTTCCTCCTTTTGGATTTTCATCCTT
vegilvB.2F	AAGGAGGAACTAAAGCAGGCGAGAAAGGAGAGAGAA
vegilvB.2R	GTCCCCATTTTTATCACCTCCTTTCACTACATTTATTGTACAACAC
vegilvB.3F	GAAAGGAGGTGATAAAAAATGGGGACTAATGTACAGGTGGAT
vegilvB.3R	GAGCGGATACTCTTCTTTCCATTCTGC
vegleuS.1F	GAATTCTACAGTAACCGTAGCACAAACACA
vegleuS.1R	TCTCGCCTGCAGTAAAAACCTCCTTCTGATTGAATACGG
vegleuS.2F	AAGGAGGTTTTTACTGCAGGCGAGAAAGGAGAGAGAA
vegleuS.2R	AAACTCATTTTTATCACCTCCTTTCACTACATTTATTGTACAACAC
vegleuS.3F	GAAAGGAGGTGATAAAAAATGAGTTTTTCAGCACAAAGAGATAGAAAAG
vegleuS.3R	CCTTTTACGACTTCCTTCACCGGAAG
kobcd.1F	GCTGTCTGTCGCAGTAGAAAAATTTGA
kobcd.1R	TGCCATGTTCTGTTCCCTCCTAATGTGTGTATTTC
kobcd.2F	CACATTAGGAGGAACGAACATGGCAGGCGAGAAAGGAGAGAGAA
kobcd.2R	CCAGATCAATTTCTTACGAGGCTCCTGTCACTGCAGCGTCT
kobcd.3F	GGAGCCTCGTAAGAAATTGATCTGGAGGTTATGAAAGTGCT
kobcd.3R	TGCAATACTCTTAGCGCCCCTTG
koyvmA.1F	ACCTGCTGTTAAATGGGCTGATCC
koyvmA.1R	TCTCCTTTCTCGCCTGCCAAAGTGTACACCGCCTTTTTGTTTAC
koyvmA.2F	ACACTTTGGCAGGCGAGAAAGGAGAGAGAA
koyvmA.2R	CCGCAAAGGCAGCTTTTTTACGAGGCTCCTGTCACTGCAGCGTCT
koyvmA.3F	CTCGTAAAAAAGCTGCCTTTGCGGGCAG
koyvmA.3R	CGTGCTGTCGTTCTCGTATTTAACAG
vegyvmA.1F	TGTTAAATGGGCTGATCCCCACC
vegyvmA.1R	TTCTCGCCTGCAGTGTACACCGCCTTTTTGTTTACTTTACA
vegyvmA.2F	AGGCGGTGTACACTGCAGGCGAGAAAGGAGAGAGAA
vegyvmA.2R	TGAGCCATTTTTATCACCTCCTTTCACTACATTTATTGTACAACAC
vegyvmA.3F	GAAAGGAGGTGATAAAAAATGGCTCATACAAAATCAAAGGCAGT
vegyvmA.3R	CTAGGAGGCTAAAGGACATGGCAGA
vegpchR.1F	CACGGACGATGATAAGCAAGGAGTG
vegpchR.1R	CGCCTGCAGGCTACCTTCTTTCTTAGGAATAATAGTTTACG
vegpchR.2F	TAAGAAAGAAGGTAGCCTGCAGGCGAGAAAGGAGAGAGAA
vegpchR.2R	TCAGACATTTTTATCACCTCCTTTCACTACATTTATTGTACAACAC
vegpchR.3F	GAAAGGAGGTGATAAAAAATGTCTGATTTGACAAAACAGATGATATACG

vegpchR.3R	GATGCTGTTTGTCAACCAGCAAAACG
koscoC.1F	CTTGTTTCAGAAAGAGCCGGAAAACA
koscoC.1R	CTGCCATTACGTACCTGCTTCTCTTTTCTT
koscoC.2F	AGAGAAGCAGGTGACGTAATGGCAGGCGAGAAAGGAGAGAGAA
koscoC.2R	GAAGCATTTTGATTAACGAGGCTCCTGTCACTGCAGCGT
koscoC.3F	GGAGCCTCGTTAATCAAAATGCTTCATGATGTCGATAAAGAC
koscoC.3R	GAATGCAAATTGAAAAATCGCCACCAG
koabrB.1F	CTTCATAGTATTTTCAGAAGACGATCCGCGT
koabrB.1R	TTTCTCGCCTGCCCAGTAGATTTTCATAAACATTCTCCTCCCAA
koabrB.2F	TGAAATCTACTGGGCAGGCGAGAAAGGAGAGAGAA
koabrB.2R	CATAACAAGAACGTTCGAGGCTCCTGTCACTGCAGCGTCT
koabrB.3F	CAGGAGCCTCGACGTTCTTGTTATGACACAAGAACGTTT
koabrB.3R	GGAAGCTATGCAGGCGGAATATTATTTTC
kopchR.2F	GAAGGTAGCCTATGGCAGGCGAGAAAGGAGAGAGAA
kopchR.2R	GTGTACACCGCCTTTTTGTCGAGGCTCCTGTCACTGCAGCGTCT
kopchR.3F	CCTCGACAAAAAGGCGGTGTACACTTTGG
kopchR.3R	GACGGCATCATTGTGAGCAAGTAGG
vegyvmC.1F	TCACCATAGCTGTGGAAACATGGAATG
vegyvmC.1R	CCTGCCTCATTACCCCTAAACTTATCCCGC
vegyvmC.2F	AAGTTTTAGGGGTGAATGAGGCAGGCGAGAAAGGAGAGAGAA
vegyvmC.2R	CCGGTCATTTTTATCACCTCCTTTCACTACATTTATTGTACAACAC
vegyvmC.3F	GAAAGGAGGTGATAAAAATGACCGGAATGGTAACGGAAAGA
vegyvmC.3R	AGACAGATGATCCAGTGCGTAC

Supplementary Table 2 Primers and DNA templates for qRT-PCR experiments in this study

Primers	Sequences (5'-3')
qRT-hbsU.F	CAATTATTTTCCGGCAACTGCGTC
qRT-hbsU.R	GACGCTACAAAAGCAGTTGACTCTG
qRT-pchR.F	CGACATATACGTGAGACTGCTGCAC
qRT-pchR.R	CTTCCTTGATCAGTTTTGTGCTGAT
qRT-leuS.F	CGTATTGATTTGCGGATCCCAGTC
qRT-leuS.R	CCATCCTGAAGGATACACAGCTACG
qRT-ilvB.F	GGTTTTCCGGAGACCCTTGC
qRT-ilvB.R	GGATTCAGCATCTGCCGAATGTAC
qRT-leuA.F	GTCCGATGTCGCGATAAATACATG
qRT-leuA.R	GGAGAAACTTGCCATAGCTAAGCAG
qRT-yvmA.F	GTTTCCACAGCTATGGTGAACCTG
qRT-yvmA.R	GGAACCGGCTGCCTGTATCATTC
qRT-yvmC.F	GCTAATCTTCTAGAAGCGCTTGGAAC
qRT-yvmC.R	TGAGCAGCCTCATTTTCGACATGC
qRT-cypX.F	GCTATCATGATGTCCGCTATATCCTTC
qRT-cypX.R	CTCTTTCAAGATAAGGCGCTAACAAGT



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12 Supplementary Figure 1: Time-lapse images of colony morphology of four *Bacillus subtilis*
 13 mutants on MSgg medium