

Table S1. Primers used in this study

Primer	Sequence (5' to 3')
catF	CCGGCAATAGTTACCCTTATTATCA
catpt1F	CACTTTAGATAAAAATTTAGGAGGC
catpt1R	TTATAAAAGCCAGTCATTAGGCCTA
rplAuF	CACATCACGGACTTAAGGAG
rplAuR	GCCTCCTAAATTTTTATCTAAAGTGGTGGTTATAGCGGATAACCTC
rplAdF	TAGGCCTAATGACTGGCTTTTATAAGTGCTTCCAAACGGAACCTGG
rplAdR	CAGAATGTTGATGTCATGTC
rplBuF	GGCAATCAAATCAGTATTGTC
rplBuR	GCCTCCTAAATTTTTATCTAAAGTGCCTTCTTTTTACAGATAATTAAG
rplBdF	TAGGCCTAATGACTGGCTTTTATAATAACGGGGTGTCTACGGTTC
rplBdR	CCTTCGTCAACGAATGCTTG
rplCuF	CCATCATTATTCGCGAACAC
rplCuR	GCCTCCTAAATTTTTATCTAAAGTGGAAATTAAGTTTAATTTTCGATATC
rplCdF	TAGGCCTAATGACTGGCTTTTATAACTCTTAGGAAAGGAGGAAATTG
rplCdR	CAGAACGTTTCAGTAATGACGG
rplDuF	GATATCGAAATTAAACTTTAATTC
rplDuR	GCCTCCTAAATTTTTATCTAAAGTGCATTTTCCTCCTTTTCCTAAGAG
rplDdF	TAGGCCTAATGACTGGCTTTTATAACCACGAGAAGCTTCTGATTAC
rplDdR	CAGCTTCAGGACCTGACATG
rplEuF	GATTCAACAAGAGACTCGTTTA
rplEuR	GCCTCCTAAATTTTTATCTAAAGTGCCTTAGTCATTAAAGCAGGTGC
rplEdF	TAGGCCTAATGACTGGCTTTTATAAGCGGAATGGACATCGTTATC
rplEdR	CGTATGCTAGAACTTCTCCACC
rplFuF	GAGTACACACGCTGTGAACG
rplFuR	GCCTCCTAAATTTTTATCTAAAGTGGCTTCTTACCTACACGAGAC
rplFdF	TAGGCCTAATGACTGGCTTTTATAACGTTGGATACTCTCATCCTG
rplFdR	ACGCGTCGACCGTCCATGGTATAAGTATCCGC
rplIuF	GGAGTTTATCAGAGATCCGC
rplIuR	TGATAATAAGGGTAACTATTGCCGGCCTTCATCTCTGTACGCCT
rplIdF	TAGGCCTAATGACTGGCTTTTATAAGATATACAAACGTGCCTGTG
rplIdR	CTGACCATCATCAGCTTGTG
rplJuF	GAAAGAAGCTGAAGCTGCTG
rplJuR	GCCTCCTAAATTTTTATCTAAAGTGCCTGTAGATTCTTGTGTAACAC
rplJdF	TAGGCCTAATGACTGGCTTTTATAACTCTTGCTGCAAAGCTGTG
rplJdR	CTTTTTTCCGGCTCGGATTG
rplLuF	GAAAGAAGCTGAAGCTGCTG

rpILuR TGATAATAAGGGTAACTATTGCCGGGATTAAGCGCCTTGTTCTTCC  
rpILdF TAGGCCTAATGACTGGCTTTTATAAGTTGTACGTGAAATCACTGG  
rpILdR CTTTTTTTCCGGCTCGGATTG  
rpIMuF CCCGGACGTATTTAAACGGC  
rpIMuR GCCTCCTAAATTTTTATCTAAAGTGCCCCCTCCTAAATGATCTGTC  
rpIMdF TAGGCCTAATGACTGGCTTTTATAACCACACGAAGCACAAAAACC  
rpIMdR GCAACAGTCCATTCATTGCC  
rpINuF CGCGTTAAATATCGCAGAGAGC  
rpINuR GCCTCCTAAATTTTTATCTAAAGTGTAACGAGTCTCTTGTTGAATC  
rpINdF TAGGCCTAATGACTGGCTTTTATAACAGTTGCTCGTGAATTGCGTG  
rpINdR CTTTCGCACCGATAGGCATT  
rpIOuF CCGGAATTCGAATTAGTTGCAAAACGCGC  
rpIOuR GCCTCCTAAATTTTTATCTAAAGTGGGACACCTCCTTATCCGATC  
rpIOdF TAGGCCTAATGACTGGCTTTTATAAGGTCAAAACGCTCGTTCTGG  
rpIOdR GATCGTTGCTGCCGACAAATTG  
rpIPuF GGAATCTAAGTGGTACGCTG  
rpIPuR GCCTCCTAAATTTTTATCTAAAGTGGCTCTCTGCGATATTTAACGCG  
rpIPdF TAGGCCTAATGACTGGCTTTTATAACGCCTTGCATCTCACAAATTG  
rpIPdR TAAACGAGTCTCTTGTTGAATC  
rpIQuF CTTACTGCTCAAAGAGGACG  
rpIQuR TGATAATAAGGGTAACTATTGCCGGCTGTATGACATGTGATGTCC  
rpIQdF TAGGCCTAATGACTGGCTTTTATAAGAGCACCAATGGCAATTATC  
rpIQdR CGCAACTCTCTGCTTTTGGC  
rpIRuF CCGGAATTCCTTAACGGTCTTGGAATCGCG  
rpIRuR GCCTCCTAAATTTTTATCTAAAGTGCTCCTTTCTTCACTTTAAGCG  
rpIRdF TAGGCCTAATGACTGGCTTTTATAAGCGGATACTTATACCATGGACG  
rpIRdR ACGCGTCGACCCAGAACGAGCGTTTTGACC  
rpISuF CCGCGTATTATCCTCGTATG  
rpISuR TGATAATAAGGGTAACTATTGCCGGCCTCGTTTTCAACTCCTTCC  
rpISdF TAGGCCTAATGACTGGCTTTTATAAGTGAACCTTCGCGGAAAAGCG  
rpISdR CCAACTTTGACCCACTGTTG  
rpITuF GTTGTTCGGATAAGTCGTC  
rpITuR TGATAATAAGGGTAACTATTGCCGGCCCTCCTAATTGTTCTTATC  
rpITdF TAGGCCTAATGACTGGCTTTTATAACAGCTTGCTGATGCTGCTAA  
rpITdR GGACAGAATCTCCTGAGAAG  
rpIUuF GATGCTTGCAGAAGTCTCAG  
rpIUuR GCCTCCTAAATTTTTATCTAAAGTGGACTAAGACTCGCCAGATAC  
rpIUdF TAGGCCTAATGACTGGCTTTTATAACGTCAGCCTTACACTAAAGTG

rplUdR GCGGTGTTTTTCAGGTTTGAG  
rplVuF CTGGTGAAGTTCGCATGATC  
rplVuR GCCTCCTAAATTTTTATCTAAAGTGCCTCCTCTCTTAGCGTCTTG  
rplVdF TAGGCCTAATGACTGGCTTTTATAACAAGCATTTCGTTGACGAAGG  
rplVdR CACACCTTGTGCTCCAGCAC  
rplWuF CTCTTAGGAAAGGAGGAAATTG  
rplWuR GCCTCCTAAATTTTTATCTAAAGTGG AACATCACGAGGATCTTTC  
rplWdF TAGGCCTAATGACTGGCTTTTATAACGCAGAAAAGCGATCGTAAAAC  
rplWdR GATCATGCGAACTTCACCAG  
rplXuF CGGTGACATCGTTAAGATCATGG  
rplXuR GCCTCCTAAATTTTTATCTAAAGTGGAGATAACCATAACTTTATCGCC  
rplXdF TAGGCCTAATGACTGGCTTTTATAACA ACTCAAGCTAACCCCTCAAG  
rplXdR CGCCTCCCTTTCATTGATTA  
rpmAuF GATGCTTGCAGAAGTCTCAG  
rpmAuR TGATAATAAGGGTAACTATTGCCGGGCTCACCTCCTATATTATGTT  
rpmAdF TAGGCCTAATGACTGGCTTTTATAAGTGAGCGTATATCCTGTAGC  
rpmAdR GCGGTGTTTTTCAGGTTTGAG  
rpmBuF GACATTATGTGCCACTTCAG  
rpmBuR TGATAATAAGGGTAACTATTGCCGGCCATTTGTTTCCCTCCTCAC  
rpmBdF TAGGCCTAATGACTGGCTTTTATAAGTGGCAGGCGTTTTTATGTG  
rpmBdR GCCAATAGAAAAAGCCGCTC  
rpmCuF GTTGCTGACAACATCGCTCG  
rpmCuR GCCTCCTAAATTTTTATCTAAAGTGCAGCAGTGGTAAGGTCACGA  
rpmCdF TAGGCCTAATGACTGGCTTTTATAACGTGAAGTGCGCAAAGCTATC  
rpmCdR CACGCAATTCACGAGCAACTG  
rpmDuF CCGGAATTCGAATTAGTTGCAAAAACGCGC  
rpmDuR GCCTCCTAAATTTTTATCTAAAGTGGTTCCTCCTTATCCTAACAG  
rpmDdF TAGGCCTAATGACTGGCTTTTATAAGATCGGATAAGGAGGTGTCC  
rpmDdR GATCGTTGCTGCCGACAAATTG  
rpmFuF GCATAGCATATTCCGCTGTC  
rpmFuR TCTTGATAATAAGGGTAACTATTGCCGGCCACCTCCTTAAAGAGTTAA  
rpmFdF TAGGCCTAATGACTGGCTTTTATAACTCTTCCTGTCAGCTTGCGG  
rpmFdR CCATGATATCGATCAGTGCC  
rpmGAuF AATCCCGAGAAGCATGAATA  
rpmGAuR ATCTTGATAATAAGGGTAACTATTGCCGGTATTTTTCCCTCCAAACTAAA  
rpmGAdF TAGGCCTAATGACTGGCTTTTATAACAGCTTTGCTGTTTGAGGTG  
rpmGAdR TCTCGAATAAGGGACAGGAA  
rpmGBuF GGGACAGTGATGCGTTAGAT

rpmGBuR TTGATAATAAGGGTAACTATTGCCGGGTCATTACACCTTTTTCTAAATA  
 rpmGBdF TAGGCCTAATGACTGGCTTTTATAATTTTGCCTTTTAAATGTGGAG  
 rpmGBdR ACTTTCTTTTTACGACTTT  
 rpmHuF GCAAATGGCGCTTACCATTC  
 rpmHuR GCCTCCTAAATTTTTATCTAAAGTGCGAGGAATAGCTGTAAAGAC  
 rpmHdF TAGGCCTAATGACTGGCTTTTATAAGCCACTGAATAATGTCAGTG  
 rpmHdR GTTGTAAGAAAGCAGTGGTG  
 rpmIuF GTTGTTCGGGATAAGTCGTC  
 rpmIuR GCCTCCTAAATTTTTATCTAAAGTGCGGTGAGTTTTTCATTTTTGGC  
 rpmIdF TAGGCCTAATGACTGGCTTTTATAAGATAAGGAACAATTAGGAGGG  
 rpmIdR GGACAGAATCTCCTGAGAAG  
 rpmJuF GGCTGATAACTGGACGGTTG  
 rpmJuR GCCTCCTAAATTTTTATCTAAAGTGCTTCAGTTTCCGGAGTGCTT  
 rpmJdF TAGGCCTAATGACTGGCTTTTATAATTTATAAGGAGGTGCCAGAG  
 rpmJdR GCAACGAGTCGGTGCAATTCG  
 rpsBuF CTCGCTGCAGTGAAAGAAAC  
 rpsBuR TGATAATAAGGGTAACTATTGCCGGCCGAAGTGAACACCAGCTTC  
 rpsBdF TAGGCCTAATGACTGGCTTTTATAACTGCTGAAGGCGGAAAAATC  
 rpsBdR GGTTACGCAGTTGTTGTTTCTG  
 rpsCuF GTAGTGCAATCACGAAGGGAG  
 rpsCuR GCCTCCTAAATTTTTATCTAAAGTGACGCGTACCCTTAGATTCC  
 rpsCdF TAGGCCTAATGACTGGCTTTTATAAGTCTGGATCTATCGTGGAGAG  
 rpsCdR GATAGCTTTGCGCACTTCACG  
 rpsDuF GCTTCAGCACATCTGTCTGATC  
 rpsDuR TGATAATAAGGGTAACTATTGCCGGCAAGATGGACCTGTATAGCG  
 rpsDdF TAGGCCTAATGACTGGCTTTTATAACAATCGCAGTCTATGACGGAC  
 rpsDdR GCCAAGTGCTTCGACTTCAG  
 rpsEuF CGTTGGATACTCTCATCCTG  
 rpsEuR GCCTCCTAAATTTTTATCTAAAGTGATGTGTCCCTCCTTCTTTT  
 rpsEdF TAGGCCTAATGACTGGCTTTTATAAGGTAAGTGGAGTTATCGCTGG  
 rpsEdR ACGCGTCGACCCAGAACGAGCGTTTTGACC  
 rpsFuF CGTGGCCAACGTAAGTGAAG  
 rpsFuR GCCTCCTAAATTTTTATCTAAAGTGCTCCTTTTGGACTAAGCGGC  
 rpsFdF TAGGCCTAATGACTGGCTTTTATAAGTGACGATATCATTGCCAC  
 rpsFdR GAATAAGCGCCTTCAAGATC  
 rpsGuF GACTGCAAAAACAGTCTTGC  
 rpsGuR GCCTCCTAAATTTTTATCTAAAGTGCTCCTTTTGGACTAAGCGGC  
 rpsGdF TAGGCCTAATGACTGGCTTTTATAACATTTGCTCACTATCGCTGG

rpsGdR	CCGATCGGCAATTGAATTGC
rpsHuF	GTGCTGTTGAGGAATTAACG
rpsHuR	GCCTCCTAAATTTTTATCTAAAGTGTTACCAGCTGGCTTTTTTCACG
rpsHdF	TAGGCCTAATGACTGGCTTTTATAACTTAACGGTCTTGAATCGCG
rpsHdR	CTCCTTTCTTCACTTTAAGCG
rpsIuF	CCCGGACGTATTTAAACGGC
rpsIuR	TGATAATAAGGGTAACTATTGCCGGCGTAATATTGAACCTGCGCC
rpsIdF	TAGGCCTAATGACTGGCTTTTATAAGCACCTCAGTTCTCAAAACG
rpsIdR	GCAACAGTCCATTCATTGCC
rpsJuF	GGGAGGATTCACTCACCGTC
rpsJuR	GCCTCCTAAATTTTTATCTAAAGTGCCCTCTTTTCGCCTACATC
rpsJdF	TAGGCCTAATGACTGGCTTTTATAACTCGTGAGCAATTTGAAATGCG
rpsJdR	GACATAGGTCCGCGAGATTG
rpsKuF	GGCTGATAACTGGACGGTTG
rpsKuR	GCCTCCTAAATTTTTATCTAAAGTGAAGTAAGGGAGGTTCTTAAAC
rpsKdF	TAGGCCTAATGACTGGCTTTTATAACAAGCTGCTGGACTAGAAGTC
rpsKdR	CAGGATTTAAGATCTCTACATC
rpsLuF	GACTGCAAAAACAGTCTTGC
rpsLuR	GCCTCCTAAATTTTTATCTAAAGTGTCTACTTTACTCACGCGTCC
rpsLdF	TAGGCCTAATGACTGGCTTTTATAAGTTCGTGGTGCGCTTGATAC
rpsLdR	CCGATCGGCAATTGAATTGC
rpsMuF	GGCTGATAACTGGACGGTTG
rpsMuR	GCCTCCTAAATTTTTATCTAAAGTGCTCTGGGCACCTCCTTATAAA
rpsMdF	TAGGCCTAATGACTGGCTTTTATAAGTCGTACTGTAGCTAACAAG
rpsMdR	CAGGATTTAAGATCTCTACATC
rpsOuF	GGCGAATGTCTTGCTTGGAC
rpsOuR	TGATAATAAGGGTAACTATTGCCGGCGCTTTGAGTAATTGCCATC
rpsOdF	TAGGCCTAATGACTGGCTTTTATAAACGTAACCTCGTTACCGTGAG
rpsOdR	CAGCCATTTCTGAAGAGCAG
rpsPuF	CGACGTGCTGACATTGATTG
rpsPuR	GCCTCCTAAATTTTTATCTAAAGTGCCATTTTACTAGCACCTCCG
rpsPdF	TAGGCCTAATGACTGGCTTTTATAACTCTAGCCAAGGAATCATGG
rpsPdR	CTTTCAACTCACTGCCAAGC
rpsQuF	GTTGCTGACAACATCGCTCG
rpsQuR	GCCTCCTAAATTTTTATCTAAAGTGGCCTTGGTAACTTTGCGTTG
rpsQdF	TAGGCCTAATGACTGGCTTTTATAACGGTGACATCGTTAAGATCATGG
rpsQdR	CTTGAGGGTTAGCTTGAGTTG
rpsRuF	CGTGGCCAACGTAAGTGAAG

rpsRuR	TGATAATAAGGGTAACTATTGCCGGCTCCTGCCATTGTCATTTCC
rpsRdF	TAGGCCTAATGACTGGCTTTTATAACGTCAAATGGCTTTACTTCC
rpsRdR	GAATAAGCGCCTTCAAGATC
rpsSuF	CATGTCAGGTCCTGAAGCTG
rpsSuR	GCCTCCTAAATTTTATCTAAAGTGCTCCCTTCGTGATTGCACTAC
rpsSdF	TAGGCCTAATGACTGGCTTTTATAACAATCGCAGTCTATGACGGAC
rpsSdR	GCGAAGTGCTTCGACTTCAG
rpsTuF	CCAACAGATTTTCTACTGCC
rpsTuR	TGATAATAAGGGTAACTATTGCCGGCAACCTGTAGCACAGTGTCT
rpsTdF	TAGGCCTAATGACTGGCTTTTATAACTAGCGAAAAAAGTGAACGGAC
rpsTdR	CGTTTATGATGGAGGCGAAG
rpsUuF	GTTTTCAGCTTTGTCAGCGG
rpsUuR	GCCTCCTAAATTTTATCTAAAGTGCTCCGAATACACCAATCGAC
rpsUdF	TAGGCCTAATGACTGGCTTTTATAACGCAAGAAAAAAGTCTGAAGC
rpsUdR	CATCTCTCTTAGAAAAGATGTCC
fliEuF	CTAGTTGCAAAATAGATAATTGTGAGGAC
fliEuRkmF	GACGTTTCCCGTTGAATATGGCTCATTTCATTCACCTACTTTCCG
fliEdFKmR	ATTTGATGCTCGATGAGTTTTTCTAAGGGGTCTGACGATTTAGA
fliEdR	CAGTTCCGCCGTTGGCTGCACCG

---

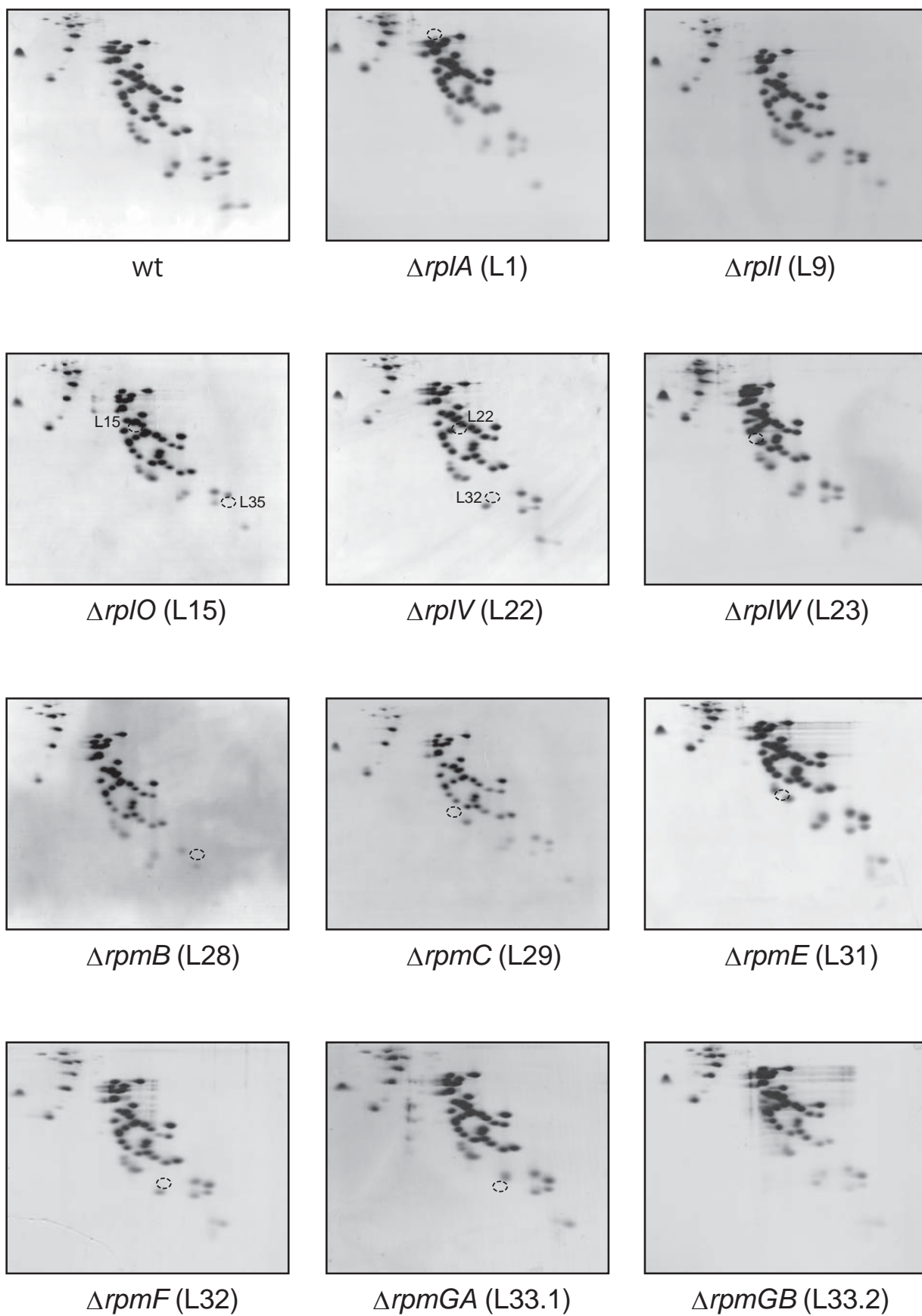


Fig. S1. Akanuma *et al.*

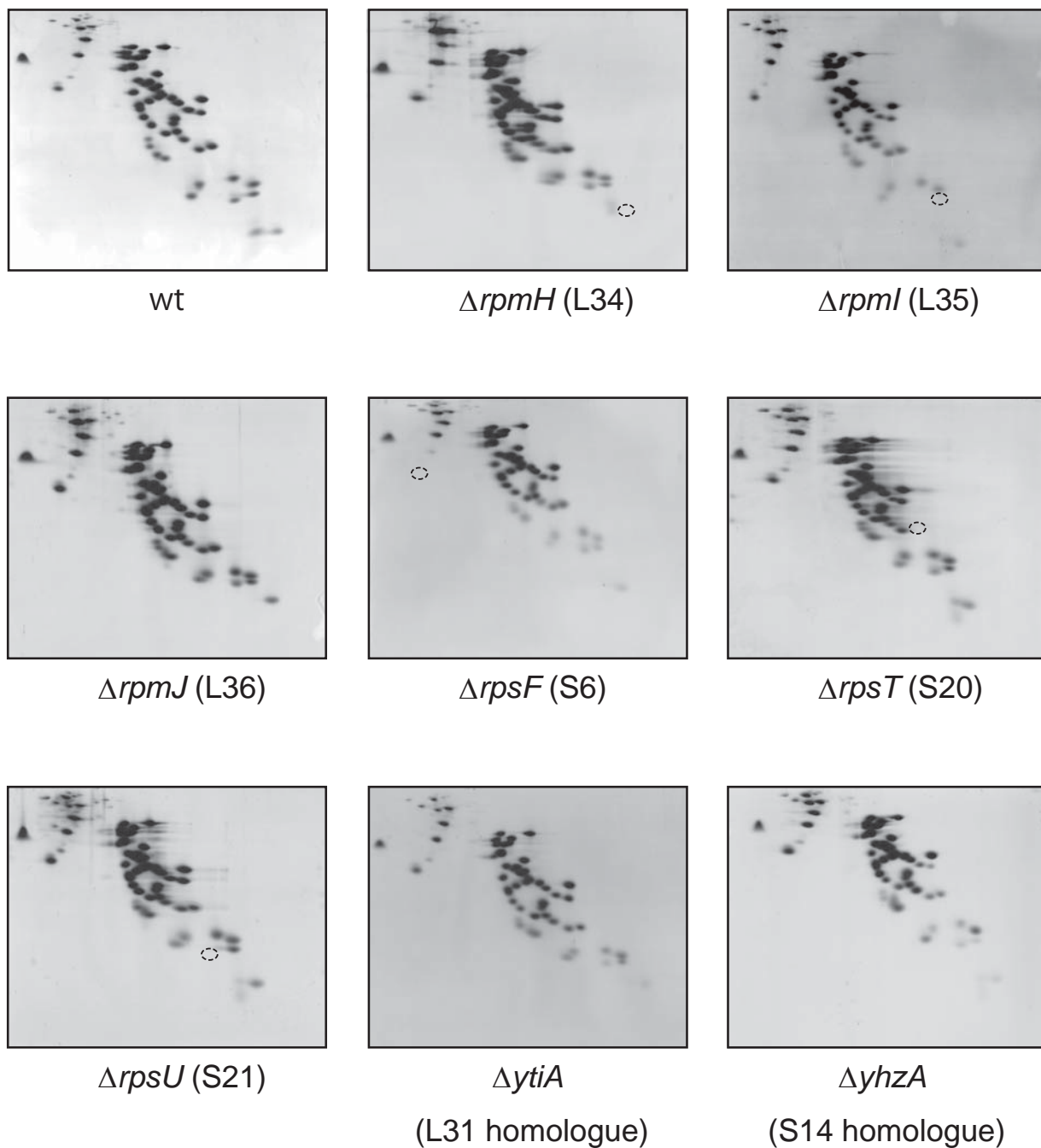


Fig. S1. RFHR 2D gel electrophoresis of ribosomal proteins prepared from individual deletion mutants of the ribosomal proteins. Ribosomal proteins (750  $\mu\text{g}$ ) were prepared from cells in early exponential phase (OD600  $\sim$ 0.2), grown in LB medium at 37°C, and were used for RFHR two-dimensional gel electrophoresis as described in the Materials and Methods. Circles with dotted lines indicate the protein spots that have disappeared. Gene deletion in individual mutants is confirmed by the disappearance of the relevant spot. Gene deletion of *rplI* (L9), *rpmGB* (L33.2) and *rpmJ* (L36), for which protein spots were not detected in wild-type ribosomes, was confirmed by PCR (data not shown). A significant reduction in the amount of L35 and L32 proteins was observed in ribosomes prepared from the mutant  $\Delta rplO$  (L15) and the mutant  $\Delta rplV$  (L22), respectively (See Fig. 1 in detail).



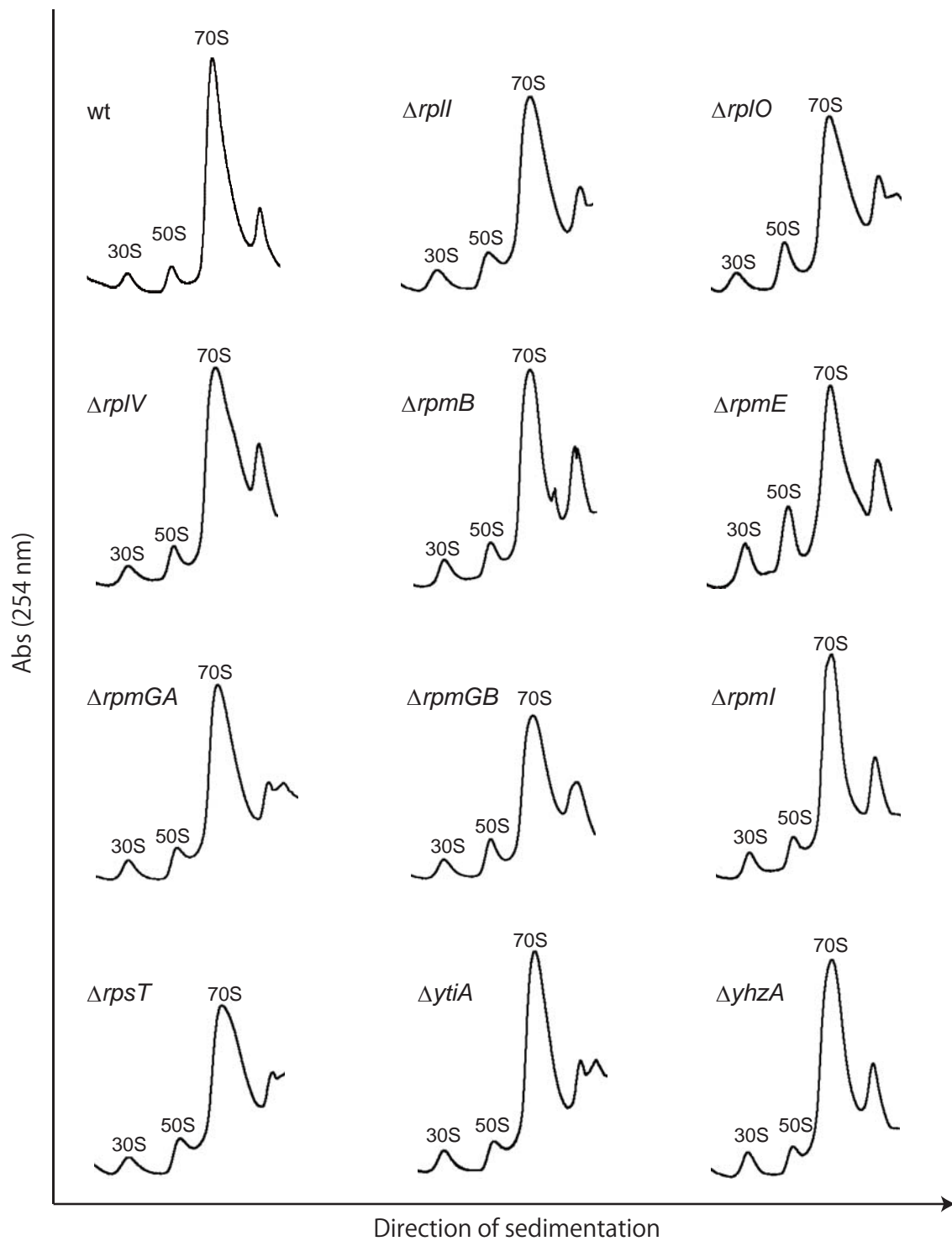


Fig. S2. Ribosome sedimentation profiles from the deletion strains. Crude cell extracts were sedimented through a 10–40% sucrose gradient as described in the Materials and Methods. The 30S, 50S, and 70S peaks are each indicated in each individual profile.

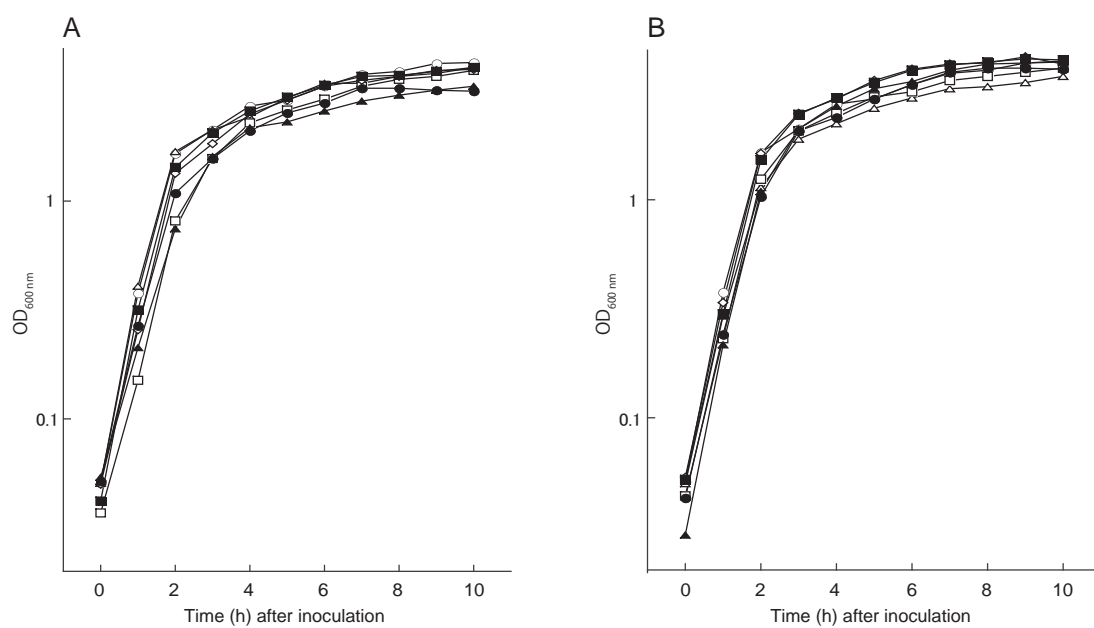


Fig. S3. Growth characteristics of the deletion mutants. Cells were grown in LB at 37°C, and the optical density at 600 nm was measured. Symbols (A); open circle, wild-type; open triangle,  $\Delta rplI$  (L9); open square,  $\Delta rplO$  (L15); open diamond,  $\Delta rpmB$  (L28); closed circle,  $\Delta rpmC$  (L29); closed triangle,  $\Delta rpmE$  (L31); closed square,  $\Delta ytiA$ . Symbols (B); open circle, wild-type; open triangle,  $\Delta rpmF$  (L32); open square,  $\Delta rpmGA$  (L33.1); open diamond,  $\Delta rpmGB$  (L33.2); closed circle,  $\Delta rpmI$  (L35); closed triangle,  $\Delta yhzA$ ; closed square,  $\Delta rpsT$  (S20).

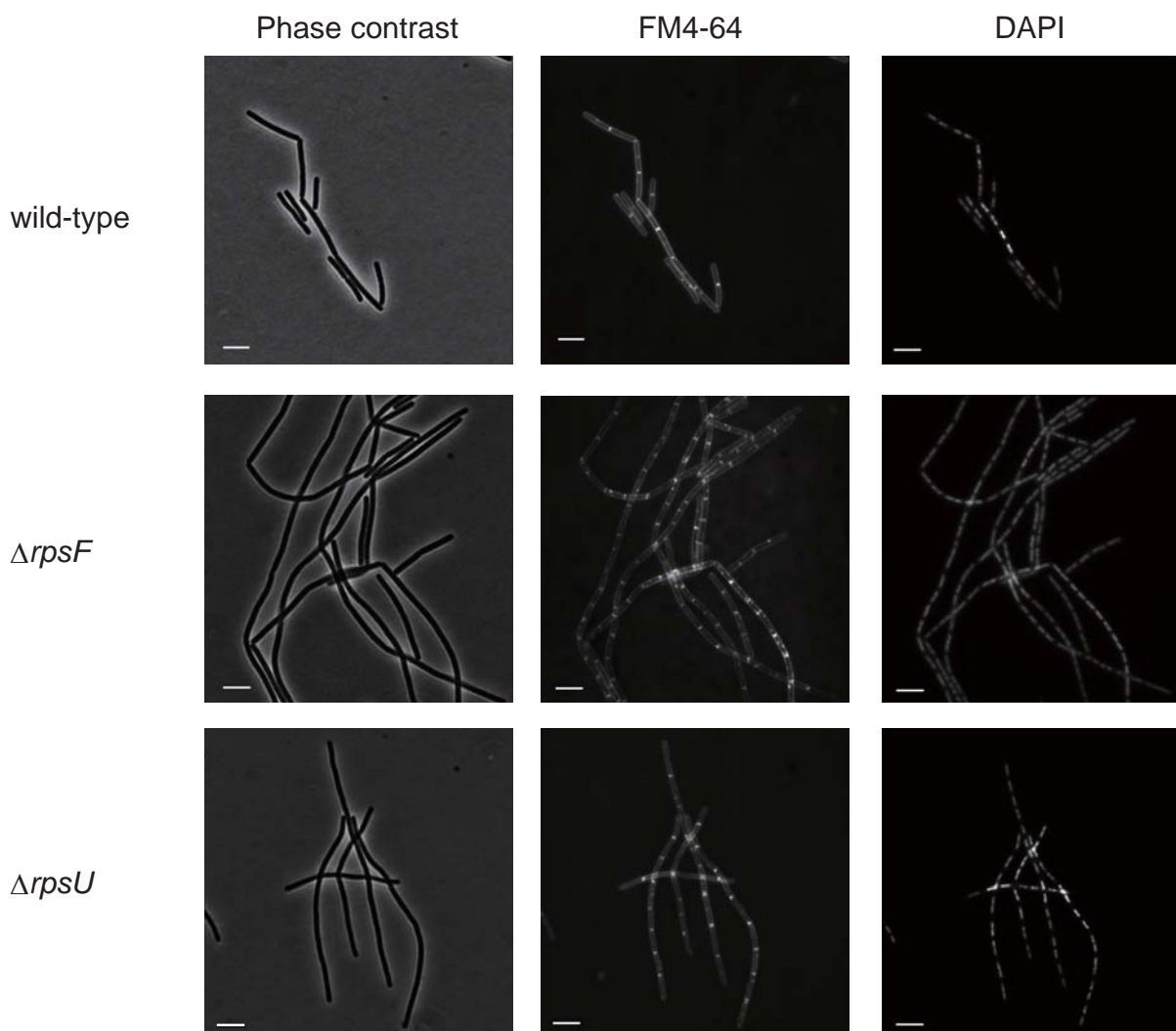


Fig. S4. Microscopic observation of cells of wild-type and  $\Delta rpsF$  (S6) and  $\Delta rpsU$  (S21) mutants. Phase contrast and fluorescence images were obtained of cells grown in LB at 37°C to exponential phase. Cells were labeled with DAPI (chromosomal DNA) and FM4-64 (membrane). Upper panels: wild-type; Middle panels:  $\Delta rpsF$  (S6); Lower panels:  $\Delta rpsU$  (S21). Bars, 5  $\mu\text{m}$ .