

Table S5. *Bacillus subtilis* strains used in this study

Number	Genotype	Note or Reference
HB16780	$\Delta P_M\text{-}murG$	Mutated <i>sigM</i> promoter inside <i>murG</i> gene using vector pMutin4
HB16812	$\Delta P_M\text{-}murG \Delta P_M\text{-}maf$	
HB17934	$\Delta P_M\text{-}maf$	Mutated <i>sigM</i> promoter inside <i>maf</i> gene using vector pMutin4
HB18905	<i>spx</i> :: $P_{spx}(P_{M1}^*)\text{-}spx$ (<i>kan</i>)	From (1)
HB20830	<i>yhdK</i> :: <i>erm</i>	All <i>gene</i> :: <i>erm</i> and <i>gene</i> :: <i>kan</i> strains were constructed as using genomic DNA of BKE or BKK strains into recipient strains (2)
HB20922	<i>spx</i> :: $P_{spx}(P_{M1}^*)\text{-}spx$ (<i>kan</i>) <i>yhdK</i> :: <i>erm</i>	
HB21099	$\Delta P_M\text{-}rodA$	P_M promoter of <i>rodA</i> removed using CRISPR
HB21117	$\Delta P_M\text{-}rodA \Delta P_M\text{-}murG$	$\Delta P_M\text{-}murG$ transformed with CRISPR plasmid to remove P_M of <i>rodA</i>
HB21118	$\Delta P_M\text{-}rodA \Delta P_M\text{-}maf$	$\Delta P_M\text{-}maf$ transformed with CRISPR plasmid to remove P_M of <i>rodA</i>
HB21266	$\Delta P_M\text{-}maf \Delta P_M\text{-}murG \Delta P_M\text{-}rodA$	P_M promoter of <i>rodA</i> removed using CRISPR from $\Delta P_M\text{-}maf \Delta P_M\text{-}murG$ background
HB25433	$\Delta P_M\text{-}maf yhdK::erm$	
HB25434	$\Delta P_M\text{-}murG yhdK::erm$	
HB25435	$\Delta P_M\text{-}rodA yhdK::erm$	
HB25436	$\Delta P_M\text{-}murG \Delta P_M\text{-}maf yhdK::erm$	
HB25437	$\Delta P_M\text{-}rodA \Delta P_M\text{-}maf yhdK::erm$	
HB25438	$\Delta P_M\text{-}rodA \Delta P_M\text{-}murG yhdK::erm$	
HB25439	$\Delta P_M\text{-}maf \Delta P_M\text{-}murG \Delta P_M\text{-}rodA yhdK::erm$	
HB21248	PY79 $P_M\text{-}lacZ yhdL::kan$	PY79 background, <i>yhdL</i> is not essential in PY79 background
HB21258	168 $P_M\text{-}lacZ yhdL::kan congression from PY79-1$	
HB21259	168 $P_M\text{-}lacZ yhdL::kan congression from PY79-2$	
HB21260	168 $P_M\text{-}lacZ yhdL::kan congression from PY79-3$	
HB21261	168 $P_M\text{-}lacZ yhdL::kan congression from PY79-4$	
HB21262	168 $P_M\text{-}lacZ yhdL::kan congression from PY79-5$	
HB21263	168 $P_M\text{-}lacZ yhdL::kan congression from PY79-6$	
HB21264	168 $P_M\text{-}lacZ yhdL::kan congression from PY79-7$	
HB21265	168 $P_M\text{-}lacZ yhdL::kan congression from PY79-8$	Not included in Figure S1, as this strain contains too many SNPs from PY79, possible endospore contamination from PY79 genomic DNA prep
HB21250	168 $P_M\text{-}lacZ yhdL::kan congression from PY79-9$	
HB21251	168 $P_M\text{-}lacZ yhdL::kan congression from PY79-10$	

HB21252 168 P_M-lacZ yhdL::kan congression from PY79-11
 HB21253 168 P_M-lacZ yhdL::kan congression from PY79-12
 HB21254 168 P_M-lacZ yhdL::kan congression from PY79-13
 HB21255 168 P_M-lacZ yhdL::kan congression from PY79-14
 HB21256 168 P_M-lacZ yhdL::kan congression from PY79-15
 HB21257 168 P_M-lacZ yhdL::kan congression from PY79-16
 HB22728 yidC1
 HB22789 P_M-lacZ yidC1^{Q140K} yhdL::kan
 HB22848 yidC1^{Q140K} yhdK::erm
 HB22849 PY79 P_M-lacZ yidC1^{K140Q} yhdK::erm
 HB22850 PY79 P_M-lacZ yidC1 yhdK::erm
 HB22883 PY79 yhdK::erm
 HB22925 PY79 P_M-lacZ yidC1^{K140Q}
 HB22926 PY79 P_M-lacZ yidC1
 HB22966 yidC1^{Q140K}
 HB23553 amyE::P_{spac(hy)}-yidC1
 HB23556 amyE::P_{spac(hy)}-yidC2
 HB23558 amyE::P_{spac(hy)}-E. coli-yidC
 HB23595 amyE::P_{spac(hy)}-E. coli-yidC^{Q429K}
 HB25405 amyE::P_{spac(hy)}-yidC1 yhdK::erm
 HB25406 amyE::P_{spac(hy)}-yidC2 yhdK::erm
 HB25407 amyE::P_{spac(hy)}-E.coli-yidC yhdK::erm
 HB25408 amyE::P_{spac(hy)}-E.coli-yidC^{Q429K} yhdK::erm

 HB23605 thrC::P_M-spoVG-lacZ-spec ganA::P_{xyIA}-yhdL amyE::yidC1 yhdL::kan
 HB23606 thrC::P_M-spoVG-lacZ-spec ganA::P_{xyIA}-yhdL amyE::yidC1-jag yhdL::kan
 HB23607 thrC::P_M-spoVG-lacZ-spec ganA::P_{xyIA}-yhdL amyE::yidC2 yhdL::kan
 HB23608 thrC::P_M-spoVG-lacZ-spec ganA::P_{xyIA}-yhdL amyE::E. coli-yidC yhdL::kan
 HB23609 thrC::P_M-spoVG-lacZ-spec ganA::P_{xyIA}-yhdL amyE::E. coli-yidC^{Q429K} yhdL::kan
 HB23610 yidC1^{R73A} ganA::P_{xyIA}-yidC2 yidC2::kan
 HB23611 yidC1^{R73AQ140K} ganA::P_{xyIA}-yidC2 yidC2::kan
 HB23698 yidC1^{R73AQ140K} ganA::P_{xyIA}-yhdL-cat yhdL::kan

yidC1 was mutated at its native locus using CRISPR
 amyE::P_{spac(hy)} constructs were made using plasmid pPL82

ganA::P_{xyIA}-yhdL was constructed using pAX01, thrC::P_M-spoVG-lacZ reporter was constructed using pDG1663, with the Erm^R cassette replaced by a Spec^R cassette using LFH PCR

ganA::P_{xyIA}-yidC2 was constructed using pAX01

ganA::P_{xyIA}-yhdL-cat was constructed using pAX01, and the original Erm^R cassette in pAX01 was replaced by a CM^R cassette using LFH PCR

HB23719 *yidC1*^{Q140K} *ganA*::P_{xyIA}-*yhdL*-cat *yhdL*::*Kan*
 HB23902 *amyE*::P_{spac(hy)}-*yidC2*^{Q148K}
 HB25409 *amyE*::P_{spac(hy)}- *yidC2*^{Q148K} *yhdK*::*erm*
 HB23917 *yidC2*'-lacZ
 HB23918 *yidC2*'-lacZ *yidC1*
 HB23935 *yidC2*'-lacZ *yidC1 thrC*::*yidC1*-spec
 HB23953 *ganA*::P_{xyIA}-*yhdL* P_M-lacZ *yhdL*::*kan*
 HB23955 *yidC2 ganA*::P_{xyIA}-*yidC2 yidC1*::*kan*
 HB23965 *thrC*::*yidC1*-spec
 HB23966 P_M-lacZ *thrC*::*yidC1*-spec
 HB23967 *yidC1 P_M-lacZ thrC*::*yidC1*-spec
 HB23968 *yidC2 P_{xyIA}-yidC2 yidC1*::*kan thrC*::*yidC1*-spec
 HB23969 *thrC*::*yidC1*^{Q140K}-spec ΔP_M-*maf*
 HB23970 *thrC*::*yidC1*^{Q140K}-spec ΔP_M-*murG*
 HB23971 *thrC*::*yidC1*^{Q140K}-spec ΔP_M-*rodA*
 HB23972 *thrC*::*yidC1*^{Q140K}-spec ΔP_M-*maf* ΔP_M-*murG*
 HB23973 *thrC*::*yidC1*^{Q140K}-spec ΔP_M-*maf* ΔP_M-*rodA*
 HB23974 *thrC*::*yidC1*^{Q140K}-spec ΔP_M-*murG* ΔP_M-*rodA*
 HB23975 *thrC*::*yidC1*^{Q140K}-spec ΔP_M-*maf* ΔP_M-*murG* ΔP_M-*rodA*
 HB25440 *thrC*::*yidC1*^{Q140K}-spec ΔP_M-*maf yhdK*::*erm*
 HB25441 *thrC*::*yidC1*^{Q140K}-spec ΔP_M-*murG yhdK*::*erm*
 HB25442 *thrC*::*yidC1*^{Q140K}-spec ΔP_M-*rodA yhdK*::*erm*
 HB25443 *thrC*::*yidC1*^{Q140K}-spec ΔP_M-*maf* ΔP_M-*murG yhdK*::*erm*
 HB25444 *thrC*::*yidC1*^{Q140K}-spec ΔP_M-*maf* ΔP_M-*rodA yhdK*::*erm*
 HB25445 *thrC*::*yidC1*^{Q140K}-spec ΔP_M-*murG* ΔP_M-*rodA yhdK*::*erm*
 HB25446 *t thrC*::*yidC1*^{Q140K}-spec ΔP_M-*maf* ΔP_M-*murG* ΔP_M-*rodA yhdK*::*erm*
 HB23976 *thrC*::*yidC1*-spec WT (R73)
 HB23977 P_M-lacZ *thrC*::*yidC1*-spec WT (R73)
 HB23978 *yidC1 P_M-lacZ thrC*::*yidC1*-spec WT (R73)
 HB25354 *yidC1 P_M-lacZ thrC*::*yidC1*-spec sup (R144R231)
 HB25355 *yidC1 P_M-lacZ thrC*::*yidC1*-spec sup (R72K140)
 HB25356 *yidC1 P_M-lacZ thrC*::*yidC1*-spec sup (R73R228)

Genomic DNA of SCB751 (3) transformed into 168

Genomic DNA of SCB751 (3) transformed into HB22728

thrC::*yidC1*-spec WT allele was constructed using LFH PCR

thrC::*yidC1*-spec allele variants were constructed using degenerative primers and LFH PCR

HB25357 *yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (K140R231)
HB25358 *yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (R76R144)
HB25359 *yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (R73R144)
HB25360 *yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (R73R231)
HB25361 *yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (K140R228)
HB25362 *yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (R228R231)
HB25363 *yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (R72R144)
HB25364 *yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (K140R144R231)
HB25366 *yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (R73K140R144)
HB25376 *yhdK::erm yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (R144R231)
HB25377 *yhdK::erm yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (R72K140)
HB25378 *yhdK::erm yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (R73R228)
HB25379 *yhdK::erm yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (K140R231)
HB25380 *yhdK::erm yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (R76R144)
HB25381 *yhdK::erm yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (R73R144)
HB25382 *yhdK::erm yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (R73R231)
HB25383 *yhdK::erm yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (K140R228)
HB25384 *yhdK::erm yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (R228R231)
HB25385 *yhdK::erm yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (R72R144)
HB25386 *yhdK::erm yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (K140R144R231)
HB25387 *yhdK::erm yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (R73K140R144)
HB23987 *yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (R73K140)
HB23988 *yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (R76R228)
HB23989 *yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (K140R144)
HB23990 *yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (R72K140R144)
HB23991 *yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (R76K140R228)
HB25388 *yhdK::erm yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (R73K140)
HB25389 *yhdK::erm yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (R76R228)
HB25390 *yhdK::erm yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (K140R144)
HB25391 *yhdK::erm yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (R72K140R144)
HB25392 *yhdK::erm yidC1 P_{M-lacZ} thrC::yidC1-spec sup* (R76K140R228)
HB25404 *yhdK::erm yidC1 P_{M-lacZ} thrC::yidC1-spec WT* (R73)

HB25107 *P_M-lacZ gana::P_{xyIA}-yhdL yhdL::kan yidC1 thrC::yidC1 sup* (R144R231)
HB25108 *P_M-lacZ gana::P_{xyIA}-yhdL yhdL::kan yidC1 thrC::yidC1 sup* (R72K140)
HB25109 *P_M-lacZ gana::P_{xyIA}-yhdL yhdL::kan yidC1 thrC::yidC1 sup* (R73K140)
HB25110 *P_M-lacZ gana::P_{xyIA}-yhdL yhdL::kan yidC1 thrC::yidC1 sup* (R73R228)
HB25111 *P_M-lacZ gana::P_{xyIA}-yhdL yhdL::kan yidC1 thrC::yidC1 sup* (R76R228)
HB25112 *P_M-lacZ gana::P_{xyIA}-yhdL yhdL::kan yidC1 thrC::yidC1 sup* (K140R231)
HB25113 *P_M-lacZ gana::P_{xyIA}-yhdL yhdL::kan yidC1 thrC::yidC1 sup* (R76R144)
HB25114 *P_M-lacZ gana::P_{xyIA}-yhdL yhdL::kan yidC1 thrC::yidC1 sup* (K140R144)
HB25115 *P_M-lacZ gana::P_{xyIA}-yhdL yhdL::kan yidC1 thrC::yidC1 sup* (R73R144)
HB25116 *P_M-lacZ gana::P_{xyIA}-yhdL yhdL::kan yidC1 thrC::yidC1 sup* (R73R231)
HB25117 *P_M-lacZ gana::P_{xyIA}-yhdL yhdL::kan yidC1 thrC::yidC1 sup* (K140R228)
HB25118 *P_M-lacZ gana::P_{xyIA}-yhdL yhdL::kan yidC1 thrC::yidC1 sup* (R228R231)
HB25119 *P_M-lacZ gana::P_{xyIA}-yhdL yhdL::kan yidC1 thrC::yidC1 sup* (R72R144)
HB25120 *P_M-lacZ gana::P_{xyIA}-yhdL yhdL::kan yidC1 thrC::yidC1 sup* (R72K140R144)
HB25121 *P_M-lacZ gana::P_{xyIA}-yhdL yhdL::kan yidC1 thrC::yidC1 sup* (R76K140R228)
HB25122 *P_M-lacZ gana::P_{xyIA}-yhdL yhdL::kan yidC1 thrC::yidC1 sup* (K140R144R231)
HB25123 *P_M-lacZ gana::P_{xyIA}-yhdL yhdL::kan yidC1 thrC::yidC1 sup* (R73K140R228)
HB25124 *P_M-lacZ gana::P_{xyIA}-yhdL yhdL::kan yidC1 thrC::yidC1 sup* (R73K140R144)
HB25227 *yidC2'-lacZ yidC1 thrC::yidC1 sup* (R144R231)
HB25228 *yidC2'-lacZ yidC1 thrC::yidC1 sup* (R72K140)
HB25229 *yidC2'-lacZ yidC1 thrC::yidC1 sup* (R73K140)
HB25230 *yidC2'-lacZ yidC1 thrC::yidC1 sup* (R73R228)
HB25231 *yidC2'-lacZ yidC1 thrC::yidC1 sup* (R76R228)
HB25232 *yidC2'-lacZ yidC1 thrC::yidC1 sup* (K140R231)
HB25233 *yidC2'-lacZ yidC1 thrC::yidC1 sup* (R76R144)
HB25234 *yidC2'-lacZ yidC1 thrC::yidC1 sup* (K140R144)
HB25235 *yidC2'-lacZ yidC1 thrC::yidC1 sup* (R73R144)
HB25236 *yidC2'-lacZ yidC1 thrC::yidC1 sup* (R73R231)
HB25237 *yidC2'-lacZ yidC1 thrC::yidC1 sup* (K140R228)
HB25238 *yidC2'-lacZ yidC1 thrC::yidC1 sup* (R228R231)
HB25239 *yidC2'-lacZ yidC1 thrC::yidC1 sup* (R72R144)
HB25240 *yidC2'-lacZ yidC1 thrC::yidC1 sup* (R72K140R144)

HB25241 *yidC2'-lacZ yidC1 thrC::yidC1 sup* (R76K140R228)
 HB25242 *yidC2'-lacZ yidC1 thrC::yidC1 sup* (K140R144R231)
 HB25243 *yidC2'-lacZ yidC1 thrC::yidC1 sup* (R73K140R228)
 HB25244 *yidC2'-lacZ yidC1 thrC::yidC1 sup* (R73K140R144)
 HB25287 *yidC2 ganA::P_{xyIA}-yidC2 yidC1::kan thrC::yidC1 sup* (R144R231)
 HB25288 *yidC2 ganA::P_{xyIA}-yidC2 yidC1::kan thrC::yidC1 sup* (R72K140)
 HB25289 *yidC2 ganA::P_{xyIA}-yidC2 yidC1::kan thrC::yidC1 sup* (R73K140)
 HB25290 *yidC2 ganA::P_{xyIA}-yidC2 yidC1::kan thrC::yidC1 sup* (R73R228)
 HB25291 *yidC2 ganA::P_{xyIA}-yidC2 yidC1::kan thrC::yidC1 sup* (R76R228)
 HB25292 *yidC2 ganA::P_{xyIA}-yidC2 yidC1::kan thrC::yidC1 sup* (K140R231)
 HB25293 *yidC2 ganA::P_{xyIA}-yidC2 yidC1::kan thrC::yidC1 sup* (R76R144)
 HB25294 *yidC2 ganA::P_{xyIA}-yidC2 yidC1::kan thrC::yidC1 sup* (K140R144)
 HB25295 *yidC2 ganA::P_{xyIA}-yidC2 yidC1::kan thrC::yidC1 sup* (R73R144)
 HB25296 *yidC2 ganA::P_{xyIA}-yidC2 yidC1::kan thrC::yidC1 sup* (R73R231)
 HB25297 *yidC2 ganA::P_{xyIA}-yidC2 yidC1::kan thrC::yidC1 sup* (K140R228)
 HB25298 *yidC2 ganA::P_{xyIA}-yidC2 yidC1::kan thrC::yidC1 sup* (R228R231)
 HB25299 *yidC2 ganA::P_{xyIA}-yidC2 yidC1::kan thrC::yidC1 sup* (R72R144)
 HB25300 *yidC2 ganA::P_{xyIA}-yidC2 yidC1::kan thrC::yidC1 sup* (R72K140R144)
 HB25301 *yidC2 ganA::P_{xyIA}-yidC2 yidC1::kan thrC::yidC1 sup* (R76K140R228)
 HB25302 *yidC2 ganA::P_{xyIA}-yidC2 yidC1::kan thrC::yidC1 sup* (K140R144R231)
 HB25303 *yidC2 ganA::P_{xyIA}-yidC2 yidC1::kan thrC::yidC1 sup* (R73K140R228)
 HB25304 *yidC2 ganA::P_{xyIA}-yidC2 yidC1::kan thrC::yidC1 sup* (R73K140R144)
 HB23636 *htrA::kan*
 HB23637 *htrB::kan*
 HB23638 *glpG::kan*
 HB23639 *sipS::kan*
 HB23640 *sipT::kan*
 HB23641 *htpX::kan*
 HB23648 *htrAB*
 HB23650 *sacA::P_{htrA}-lux-cat*
 HB25678 *sacA::P_{htrA}-lux-erm*
 HB23651 *cssR*

Chloramphenicol^R provided by plasmid pBs3Clux

Cam^R cassette replaced by Erm^R cassette using LFH PCR, Primers 6878-6881

HB23653	<i>cssS</i>	
HB23657	<i>sacA::P_{htrA}-lux yidCJ^{Q140K}</i>	
HB23660	<i>amyE::P_{spac(hy)}-none</i>	pPL82 empty vector
HB23663	<i>amyE::P_{spac(hy)}-htrA</i>	constructed using pPL82
HB23664	<i>amyE::P_{spac(hy)}-htrB</i>	constructed using pPL82
HB25679	<i>sacA::P_{htrA}-lux-erm cssR</i>	
HB25680	<i>sacA::P_{htrA}-lux-erm cssS</i>	
HB25681	<i>sacA::P_{htrA}-lux-erm cssRS</i>	
HB25682	<i>amyE::P_{spac(hy)}-cssS cssS sacA::P_{htrA}-lux-erm</i>	
HB23682	<i>prsW::kan</i>	
HB23690	<i>cssS htrB</i>	
HB23910	<i>secDF</i>	
HB23926	<i>sasA</i>	
HB23806	<i>bshC</i>	
HB23807	<i>msrA</i>	
HB23808	<i>nfrA</i>	
HB23809	<i>tpx</i>	
HB23811	<i>bshA</i>	
HB25410	<i>htrA::kan yhdK::erm</i>	
HB25411	<i>htrB::kan yhdK::erm</i>	
HB25412	<i>glpG::kan yhdK::erm</i>	
HB25413	<i>sipS::kan yhdK::erm</i>	
HB25414	<i>sipT::kan yhdK::erm</i>	
HB25415	<i>htpX::kan yhdK::erm</i>	
HB25416	<i>htrAB yhdK::erm</i>	
HB25417	<i>cssR yhdK::erm</i>	
HB25418	<i>cssS yhdK::erm</i>	
HB25419	<i>prsW::kan yhdK::erm</i>	
HB25420	<i>cssS htrB yhdK::erm</i>	
HB25421	<i>secDF yhdK::erm</i>	
HB25422	<i>sasA yhdK::erm</i>	
HB25423	<i>bshC yhdK::erm</i>	

HB25424	<i>msrA yhdK::erm</i>
HB25425	<i>nfrA yhdK::erm</i>
HB25426	<i>tpx yhdK::erm</i>
HB25427	<i>bshA yhdK::erm</i>
HB25428	<i>amyE::P_{spac(hy)}-none yhdK::erm</i>
HB25429	<i>amyE::P_{spac(hy)}-htrA yhdK::erm</i>
HB25430	<i>amyE::P_{spac(hy)}-htrB yhdK::erm</i>
HB25431	<i>sacA::P_{htrA}-lux yhdK::erm</i>
HB25432	<i>sacA::P_{htrA}-lux yidC^{Q140K} yhdK::erm</i>

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1. Rojas-Tapias DF & Helmann JD (2018) Induction of the Spx regulon by cell wall stress reveals novel regulatory mechanisms in *Bacillus subtilis*. *Mol Microbiol* 107(5):659-674.
 2. Koo BM, *et al.* (2017) Construction and Analysis of Two Genome-Scale Deletion Libraries for *Bacillus subtilis*. *Cell Syst* 4(3):291-305 e297.
 3. Chiba S, Lamsa A, & Pogliano K (2009) A ribosome-nascent chain sensor of membrane protein biogenesis in *Bacillus subtilis*. *EMBO J* 28(22):3461-3475.