

SUPPLEMENTARY MATERIAL

Putative function of *L.lactis* phage bIL285, bIL286, bIL309, bIL310, bIL311 and bIL312 proteins, deduced from amino acid sequence homology to known proteins. Organisms possessing homologous proteins are indicated. For phages, the bacterial host is indicated in parentheses by the following three-letter acronyms: *Bsu*, *B.subtilis*; *Eco*, *E.coli*; *Hin*, *Haemophilus influenzae*; *Lca*, *Lactobacillus casei*; *Lde*, *L.delbrueckii*; *Lga*, *Lactobacillus gasseri*; *Lla*, *L.lactis*; *Lmo*, *Listeria monocytogenes*; *Lpl*, *Lactobacillus plantarum*; *Mav*, *Mycobacterium avium*; *Msm*, *Mycobacterium smegmatis*; *Pae*, *Pseudomonas aeruginosa*; *Sau*, *S.aureus*; *Spn*, *Streptococcus pneumoniae*; *Spy*, *Streptococcus pyogenes*; *Sth*, *Streptococcus thermophilus*; *Vch*, *Vibrio cholerae*. Accession numbers are as follows: 105 (*Bsu*), AB016282; 186 (*Eco*), U32222; 29 (*Bsu*), M14782; 80 (*Eco*), A57258; 82 (*Eco*), X92588; A118 (*Lmo*), AJ242593; A2 (*Lca*), X97563; *adh* (*Lga*), Z97974; APSE-1 (endosymbiont), AF157835; B103 (*Bsu*), X99260; bIL170 (*Lla*), AF009630; bIL67 (*Lla*), L33769; BK5-T (*Lla*), L44593; *B.subtilis* ClpP, P80244; *B.subtilis* DnaI, P06567; *B.subtilis* SSB, P37455; c2 (*Lla*), L48605; C31 (*Streptomyces*), AJ006589;

Cp-1 (*Spn*), Z47794; CTX (*Vch*), AF055890; CTX (*Pae*), AB008550; D3 (*Pae*), AF147978; Dp-1 (*Spn*), Z93946; DT1 (*Sth*), AF085222; *E.coli* ClpP, J05534; *E.coli* DnaC, J04030; *E.coli* RusA, X92587; *flu* (*Hin*), L42023; *gle* (*Lpl*), X98106; HK022 (*Eco*), AF069308; HK97 (*Eco*), U18319; ICeSt1 (*Sth*), AJ243106; L5 (*Msm*), Z18946; LC3 (*Lla*), L10286; LL-H (*Lde*), L29568, L02496, L42315; *L.lactis* CspD, Y17217; O1205 (*Sth*), U88974; P1 (*Eco*), AF125376; P2 (*Eco*), AF063097; P22 (*Eco*), M12584; P4 (*Eco*), X51522; PBSX (*Bsu*), P23789; PVL (*Sau*), AB09866; PZA (*Bsu*), M11813; r1t (*Lla*), U38906; Rac (*Eco*), L23927; SalP1 (*Sau*), U93688; SF6 (*Bsu*), 67297X; Sfi11 (*Sth*), AF158600; Sfi19 (*Sth*), AF115102; Sfi21 (*Sth*), AF115103; sk1 (*Lla*), AF011378; SPBc2 (*Bsu*), AF020713; SPP1 (*Bsu*), X97918; T5 (*Eco*), AJ001191; T12 (*Spy*), U40453; T270 (*Spy*), U22342; TM4 (*Mav*), AF068845; Tn5252 (*Spn*), L29324; Tn5276 (*Lla*), L27649; TP901-1 (*Lla*), Y14232; TPJ-34 (*Sth*), AF020798; TPW22 (*Lla*), AF066865; Tuc2009 (*Lla*), AF109874, L26219, L31348, L31364, L31365, L31366.

Functional assignment	bIL285	bIL286	bIL309	bIL310	bIL311	bIL312
Integrase	BK5-T, LC3, r1t, Tuc2009 (Lla), many λ-like integrases	O1205, Sfi21 (Sth), T12, T270 (Spp), many λ-like integrases	BK5-T, LC3, r1t, Tuc2009, TPW22 (Lla) adh (Lga), many λ-like integrases	T12, T270, (Spp), Tn5276 (Lla), T12, T270, (Spp), Tn5276 (Lla), many λ-like integrases		PVL (Sau), Tn5276 (Lla), adh (Lga)
Immunity repressor	TP901-1 (Lla) O1205, Sfi21 (Sth) PVL (Sau)	TP901-1, TPW22 (Lla) Sfi21, O1205 (Sth) PVL (Sau)	r1t, Tuc2009, BK5-T (Lla)	TPW22, adh (Lga), gle (Lpl), PBSSX (Bsu), A118 (Lmo)	Tuc2009, r1t (Lla), P22 (Eco)	TPW22, adh (Lga), gle (Lpl), PBSSX (Bsu), A118 (Lmo)
Repressor	TP901-1 (Lla), Sfi19, Sfi21, I205 (Sth), PVL (Sau), P22 (Eco)	A2 (Lca), Sfi21, TPI-34 (Sth)	r1t, TP901-1, BK5-T (Lla)	TPW22 (Lla), TPI34 (Sth), PBSSX (Bsu), gle (Lpl), adh (Lga), CTX (Vch), A118 (Lmo)		
Anti-repressor	TP901-1 (Lla), adh (Lga), TPI34, Sfi21 (Sth), PVL (Sau), A118 (Lmo)	TP901-1, TPW22 (Lla), TPI34, Sfi21 (Sth), PVL (Sau), A118 (Lmo)	TPI34, Sfi21 (Sth), PVL (Sau), flu (Him), A118 (Lmo), A2 (Lca), LLH (Lde), BK5-T, r1t (Lla)	SPBc2 (Bsu), 80 (Eco)		Tn5252 (Spp), Tn5276 (Lla), ICeS11 (Sth)
Excisionase						
RecT			Rac (Eco), SPP1 (Bsu), A118 (Lmo)			
SSB	Tuc2009 (Lla), B.subtilis SSB, SPP1 (Bsu), PVL (Sau), P1 (Eco) PVL (Sau), SPP1 (Bsu), P1 (Eco)	Tuc2009 (Lla), B.subtilis SSB, SPP1 (Bsu), P1 (Eco) PVL (Sau), SPP1 (Bsu), P1 (Eco)				
Replisome organizer	Tuc2009, r1t (Lla), PVL (Sau), A118 (Lmo)	Tuc2009, r1t (Lla), PVL (Sau), A118 (Lmo)	Tuc2009, r1t (Lla), PVL (Sau), A118 (Lmo)	O1205, Sfi19, Sfi21, DT1 (Sth), C31 (Streptomyces), P4 (Eco)		SalP1 (Sau), APSE-1 (endosymbiont)
Helicase						
DnaC		E.coli DnaC, r1t (Lla), O1205 (Sth), gle (Lpl), B.subtilis DnaI	E.coli DnaC, r1t (Lla), gle (Lpl)			
RusA	r1t, Tuc2009 (Lla) E.coli RusA, 82 (Eco), TM4 (Mar)					
dUTPase	r1t (Lla), SPBc2 (Bsu), PVL (Sau), T5 (Eco)	r1t (Lla), SPBc2 (Bsu), PVL (Sau), T5 (Eco)	r1t (Lla), SPBc2 (Bsu), PVL (Sau), T5 (Eco)			
Terminase small subunit						
Terminase large subunit	D3 (Pae), PVL (Sau), 105 (Bsu), A2 (Lca), Sfi19, Sfi21, DT1 (Sth), adh (Lga), HK97, HK022 (Eco), bIL170 (Lla)	A2 (Lca), PVL (Sau), 105 (Bsu), C31 (Streptomyces), bIL67, c2, sk1, bIL170 (Lla)	A2 (Lca), PVL (Sau), 105 (Bsu), C31 (Streptomyces), bIL67, c2, sk1, bIL170 (Lla)	gle (Lpl), A118 (Lmo), LL-H (Lde), O1205, Sfi11 (Sth), SPP1, SFi6 (Bsu)		
Portal protein	HK97 (Eco)	Sfi21 (Sth), PVL (Sau), 105 (Bsu)	Sfi21 (Sth), PVL (Sau), 105 (Bsu), C31 (Streptomyces), HK97 (Eco)			
Protease	HK97 (Eco), C31 (Him), PVL (Sau), 105 (Bsu), A2 (Lca)	B.subtilis ClpP, E.coli ClpP, DT1, Sfi21 (Sth), D3 (Pae)	B.subtilis ClpP, E.coli ClpP, DT1, HK97 (Eco), C31 (Him), PVL (Sau), 105 (Bsu), A2 (Lca)			A2 (Lca), C31 (Him), 105 (Bsu), PVL (Sau), HK97 (Eco)
Capsid protein	PVL (Sau), 105 (Bsu), BK5-T (Lla), Sfi21 (Sth)	BK5-T (Lla), Sfi21 (Sth), PVL (Sau), 105 (Bsu)	PVL (Sau), 105 (Bsu), Sfi21 (Sth), BK5-T (Lla)			
Tail protein	sk1, bIL170 (Lla), PVL (Sau), 105, SPP1 (Bsu)	gle (Lpl), A2 (Lca) Sfi19, Sfi21, DT1 (Sth), LL-H (Lde), adh (Lga), gle (Lpl), sk1, bIL170 (Lla), PVL (Sau), A2 (Lca), CTX (Pae), 186, P2 (Eco)	Sfi19, Sfi21, DT1 (Sth), LL-H (Lde), adh (Lga), gle (Lpl), sk1, bIL170 (Lla), PVL (Sau), A2 (Lca), PBSSX, SPP1, SPBc2 (Bsu)			
Endopeptidase	29, PZA, B103, SPBc2 (Bsu), gle (Lpl), PVL (Sau)					
Tail host-specificity		BK5-T (Lla), O1205, Sfi21 (Sth), bIL170, c2, bIL67 (Lla)	BK5-T (Lla), DT1, Sfi21, Sfi19, O1205, Sfi11 (Sth), c2, bIL170, r1t (Lla), A2 (Lca)			
Holin	BK5-T (Lla), PVL (Sau), SPP1, SPBc2 (Bsu)	BK5-T (Lla), PVL (Sau), SPP1, SPBc2 (Bsu)	BK5-T (Lla), PVL (Sau), SPP1, SPBc2 (Bsu)			
Lysin	BK5-T (Lla), Dp-1 (Spm), 29, B103, PZA, PBSSX (Bsu)	BK5-T (Lla), Dp-1 (Spm), 29, B103, PZA, PBSSX (Bsu)	BK5-T (Lla), Dp-1 (Spm), 29, B103, PZA, PBSSX (Bsu)			
Cold-shock protein						
tRNA					tRNA ^{Lau}	L.lactis CspD, many bacterial Csp proteins tRNA ^{Met}