SUPPLEMENTARY INFORMATION

A widely conserved bacterial cytoskeletal component influences unique helical shape and motility of the spirochete *Leptospira biflexa*

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Table S1: Oligonucleotides used in this study

Primer Name	Sequence (5' – 3')[1]	Function
Lb1431.KO.MluI.RC	acgcgtTTCCCCTTCTGTGAGAATC	Deletion of *lbbD*
Lb1431.KO.SalI.F	gtcgacGATTCGAAGGACTAACG	Deletion of *lbbD*
Lb1431.Comp.NotI.F	gcggccgcCTTGTCACCTCAGTATGG	Amplification of *lbbD* and 441 basepairs upstream flanking region for deletion vector
Lb1431.Comp.NotI.Rev	gcggccgcCCGACGCGCAATGTCCG	Amplification of *lbbD* and 475 basepairs downstream flanking region for deletion vector
Lb1431-Sal-pflgB.Fuse.F	GATTCTCACAGAAGGGGAATACC CGAGCTTCAAGGAAGAT	Gibson Assembly primer for combining flgKan with inverse PCR product for deletion vector
Lb1431-Sal-Kan-fuse.RC	CGTTAGTCCTTCGAATCTTAGAA AAACTCATCGAGC	Gibson Assembly primer for combining flgKan with inverse PCR product for deletion vector
Lb1431.Expr.NdeI.F	catatgGCAATAGGTAAGGATTCC	Amplification of *lbbD* for over-expression vector
Lb1431.Expr.HindIII.RC	aagtccCGTTAGTCCTTCGAATCTA	Amplification of *lbbD* for over-expression vector
Lb1431.Comp.Bsph.F	tcatgaTAGTTTGCTAATACCCGAGC	Amplification of P_{flgB} from pGSBLe24 for complementation
Lb1431.Comp.Bsph.Rev	tcatgaGCCTAATTGAGAGAAGTTTC	Amplification of the spectinomycin-resistance marker from pGSBLe24 for complementation
Lb1432.Comp.Anchor.F	CATCTCCAAGGAAGCGGC	Determining where complement integration event occured
pGEM.Comp.Anchor.RC	CGGTATTTCACACCGCATCAG	Determining where complement integration event occured
Lb1432.Xho1.T7.Rev	CTCGAGGTCCTTCGAATCTAAAG ATTTG	Amplification of *lbbD* for expression in pET28a vector
Lb1431.pet28.Nco1.F	CCATGGCAATAGGTAAGGATTCC	Amplification of *lbbD* for expression in pET28a vector
Lb117.rtPCR.F	CCTCGAAACCACAGGAAAGG	qPCR Primer
Lb117.rtPCR.Probe	CGATACAGATATCAAAGCGCGTG TGGT[2]	qPCR Probe
Lb117.rtPCR.Rev	TCGAGTCTGCAGCTTGAAAG	qPCR Primer
Lb122.rtPCR.F	ATATCAAGGCTGGGACTGTTG	qPCR Primer
Lb122.rtPCR.Probe	GGAACGTTACCGCAACACAAAG GT[2]	qPCR Probe
Lb122.rtPCR.Rev	TGTTTCCCTGTACCTTTCCAG	qPCR Primer
Lb106.rtPCR.F	ACCTCTCATGGCAAACTCATC	qPCR Primer
Lb106.rtPCR.Probe	CGATGAAACAGGTGATGTGGAA GCAGA[2]	qPCR Probe
Lb106.rtPCR.Rev	ACAACCAAACTCCCCACTTC	qPCR Primer
Lb134.rtPCR.F	AGATGCACTCGTCATTGGAG	qPCR Primer
Lb134.rtPCR.Probe	AGAAGTCATTGTCTCCGGAACCC TCA[2]	qPCR Probe
Lb134.rtPCR.Rev	CCAGTTTCACTTCGTTTTCGG	qPCR Primer
Lb146.rtPCR.F	GGCGAGTGTCATTGTAGAAGG	qPCR Primer
Lb146.rtPCR.Probe	CGTAGGGAACGTGACGGCAAGA A[2]	qPCR Probe

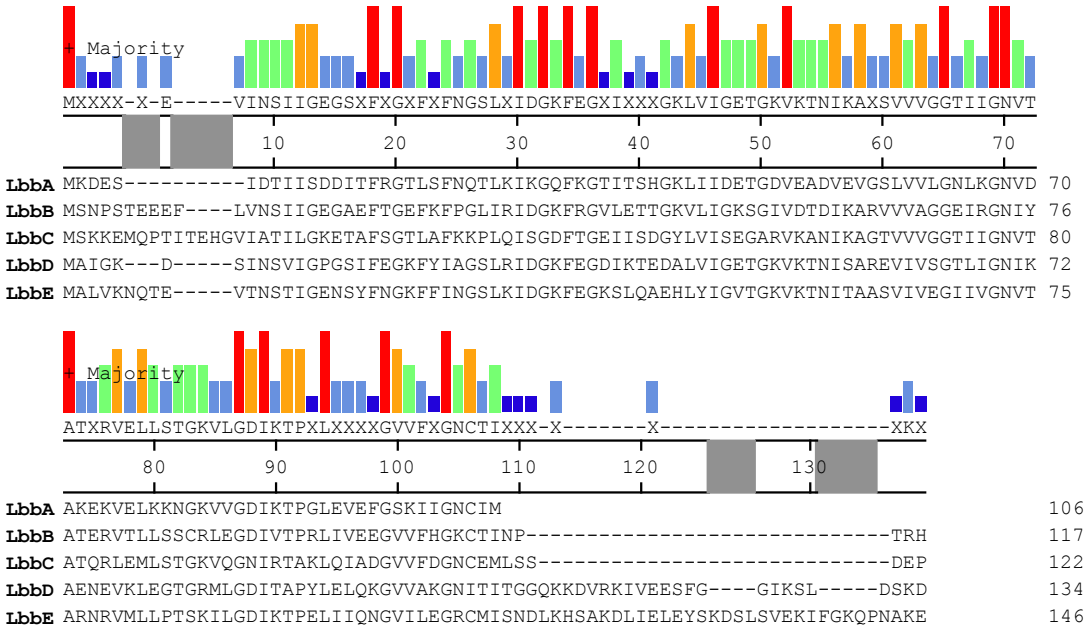
Lb146.rtPCR.Rev	GGATTTTGGAAGTGGGTAGGAG	qPCR Primer
1432.F	TTGTATGGCAGTGGGTATTCC	qPCR Primer
1432.R	TCCCGTCAGTAAGTTTAAGGC	qPCR Primer
1432.Probe	TGGTAGGCGGAAGAAAAGGTTC GTT[2]	qPCR Probe
1430.F	CCCGTTCCTACCCACAATAC	qPCR Primer
1430.R	ATTTCCATAGCCACCCATCC	qPCR Primer
1430.Probe	CCCTTGACCTACGTGCCAATTAC GAA[2]	qPCR Probe
FlaB.Lb.F.qPCR	CTGCTTACAGGAGCGTTTGCT	qPCR Primer [3]
FlaB.Lb.RC.qPCR	TGGTGCATGTTAGCTCCAATATG	qPCR Primer [3]
FlaB.Lb.Probe	ACTCAACCCAACTGCTAGTATGT GGTT[2]	qPCR Probe [3]

[1] Lower-case letters designate restriction enzymes.

[2] TaqMan probes were labeled with FAM (6-carboxyfluorescein) at the 5'-end and with TAMRA (6-carboxytetramethylrhodamine) at the 3'-end.

[3]Previously published in Stewart et al. BMC Microbiology 2012, 12:290.

Supplemental Figure 1



Bactofilin	% Identity to LbbD
LbbA	33
LbbB	39
LbbC	30
LbbE	43

Fig. S1. Amino acid sequence alignment of the 5 bactofilin proteins of *L. biflexa* and their sequence identity compared to LbbD. Colors above the alignment indicate the strength of residue conservation (with red being conserved in all sequences and dark blue being the least conserved).

Supplemental Videos

Fig. S2. Dark field video microscopy of wild type *L. biflexa* translating in 0.5% methyl cellulose. Methyl cellulose was added to a wild type *Leptospira* culture to a final concentration of 0.5% and videos recorded on a Nikon Eclipse 80i using a dark field condenser with Nikon NIS-Elements AR 4.20.02 software at 4 fps.

Fig. S3. Dark field video microscopy of ΔLBBD translating in 0.5% methyl cellulose. Methyl cellulose was added to a culture of the mutant strain ΔLBBD to a final concentration of 0.5% and videos recorded on a Nikon Eclipse 80i using a dark field condenser with Nikon NIS-Elements AR 4.20.02 software at 4 fps.