

Supplemental Legends

FIG S1 Nucleotide sequence alignment of the *iglA-D* containing region of *F.n.n.* FSC769 and other selected *Francisella* sp.: *F.n.o.* LADL--07-285A (GI: 564747871), *F. philomiragia* ATCC 25017 (GI: 167596226), *F. novicida* U112 (GI: 754269614), *F. holarctica* LVS (GI: 754265763) and *F.t.t.* Schu S4 (GI: 754282044). Pink background indicates nucleotide differences and dots represent identical residues between strains. Genes are labeled with yellow arrows behind the nucleotide sequence pointing in the coding direction and the gene order is *iglA*, *iglB*, *iglC* and *iglD*. *F.n.o.* has a premature stop codon 21 bp before the end of *iglA* compared to the other *Francisella* sp. analyzed.

FIG S2 Representative dotplots of *Dictyostelium* wt cells infected with *F.n.n.* wt and Δ *iglC* (upper and middle panel) and *Dictyostelium* Δ *atg1* cells infected with *F.n.n.* wt (lower panel) at 1, 4, 24 and 48 hpi. Displayed is the sideward scatter (SSC) plotted as a function of green fluorescence (FL-1). After enhancement of the endogenous *F.n.n.* GFP signal with an AlexaFluor488-coupled antibody we observe two separate populations of weakly (non-infected) and strongly fluorescent (infected) cells.

FIG S3 Replication of *F.n.n.* in zebrafish is dependent on *IglC*

(A) Site of microinjection (white circle) and observation area of bacterial growth using fluorescence microscopy (black rectangle). (B-G) Representative micrographs show the fluorescent signal of *F.n.n.* wt (B, C), *F.n.n.* Δ *iglC* (D, E) and PBS as a negative control (F, G) at 6 dpi. Displayed are the green channel (GFP) and an overlay with the corresponding bright field image of the zebrafish tail region. (H) Bacterial

replication of *F.n.n.* wt (black), *F.n.n. ΔiglC* (white) and *F.n.n. iglC+* (grey) measured by qPCR at 3 and 7 dpi (n=3). In the *F.n.n. ΔiglC* infected group (6 dpi), a few of the embryos displayed a substantial amount of green fluorescent granulas in parts of the yolk sac. This could suggest that the *F.n.n. ΔiglC* mutant succeeds in some individuals, however selected individual responses of zebrafish embryos to bacterial infections were observed before (91). This different degree of success is reflected in the gDNA samples, where one *ΔiglC* sample (consisting of 3 embryos each) contained a much higher quantity of *F.n.n.* genomes than the others 7 dpi.

FIG S4 Additional ultrastructural analysis of intracellular *F.n.n.* wt samples processed by chemical fixation and room temperature dehydration (A, B) or HPF and freeze substitution (C, D). (A, B) Ultrastructural analysis of phagosomal (A) and cytosolic (B) *F.n.n.* after chemical fixation at 2 and 4 hpi, respectively. Cytosolic as well as phagosomal bacteria are surrounded with the electron-translucent area, which indicates fixation artefacts. (C, D) Overview (C) and high magnification (D) showing formerly cytosolic *F.n.n.* wt at 1 hpi possibly contained within an autophagosome as indicated by the limiting autophagic-like membrane and the ribosomes in the lumen. Bacteria are surrounded with an electron pale area indicating the presence of weakly contrasted material, which was a characteristic appearance of cytosolic bacteria after HPF and freeze substitution. No binding of various lectins (wheat germ agglutinin, concanavalin A, ricinus agglutinin I, *Erythrina cristagalli* lectin, *Maackia amurensis* Lectin I or *Maclura pomifera* lectin) was observed indicating no enrichment in mannose, glucose, N-acetylglucosamine, galactose, N-acetylgalactoseamine or sialic acid components. Asterisks: *F.n.n.*, arrows: *F.n.n.*-enclosing membrane, white arrowheads: electron-translucent area characteristic of chemically fixed bacteria,

black arrowheads: electron-pale area characteristic for HPF. Scale bars: 500 nm (A, B, D), 2 μ m (C).

Fig S5 Visualization of the rupture of the phagosomal membrane by electron and fluorescence microscopy. (A, B) Electron microscopy following HPF and freeze substitution reveals rupturing phagosomal membrane in *Dictyostelium* cells infected with *F.n.n.* wt at 1 hpi. Asterisks: *F.n.n.*, arrowheads: broken membrane. (C, D) Confocal fluorescence microscopy shows the broken p80-positive compartment (green) and escaping *F.n.n.* wt (red) at 4 hpi. The inset displays the green channel (p80) of the region of interest (white square). Scale bars: 500nm (A, B), 5 μ m (C, D).

FIG S6 Phagosomal maturation and ubiquitination in *Dictyostelium* Δ *atg1* cells (A-C) Association rates of *F.n.n.* wt with p80 (A), VatA (B) and ubiquitin (C) in *Dictyostelium* Δ *atg1* cells over 48 hpi. Data of 3 independent experiments (mean \pm SEM) was collected for each association study and a minimum of 100 bacteria was counted at each timepoint. (D) Representative micrographs of accumulated, ubiquitinated (green) *F.n.n.* wt (red) in *Dictyostelium* Δ *atg1* cells at 48 hpi. The margin of the cell is marked with a dashed line and the inset shows only ubiquitin in the green channel. Scale bar: 5 μ m.

Movie S1 Live cell microscopy of *Dictyostelium* Lifeact-RFP (red) infected with *F.n.n.* wt expressing GFP (green) at 19 hpi. The inset displays the red channel (actin) of the region of interest (white square). Scale bar: 5 μ m.

Movie S2 Live cell microscopy of *Dictyostelium* Lifeact-RFP (red) infected with *F.n.n.* $\Delta ig1C$ expressing GFP (green) at 2 hpi. The inset displays the red channel (actin) of the region of interest (white square). Scale bar: 5 μ m.

Cryofixation, chemical fixation and Transmission Electron Microscopy

Cellulose capillary tubes (a kind gift by Heinz Schwarz) with an inner diameter of 200 µm were filled with a concentrated suspension of infected cells by capillary action (Hohenberg *et al.*, 1994), cut into short segments and transferred into aluminium planchettes (with a 6 mm diameter and a 150 µm recess), filled with 1-hexadecene (Merck Millipore, Darmstadt, Germany). Samples were cryofixed in an EM HPM100 high-pressure freezing machine (Leica Microsystems, Vienna, Austria) (Kaech *et al.*, 2014). Freeze substitution (Balzers FSU 010; Bal-Tec, Balzers, Liechtenstein) was performed as described (Leonidova *et al.*, 2014) in acetone containing 1% osmium tetroxide for 8 h at -90°C, 6 h at -60°C and 4 h at -40°C. Afterwards samples were incubated for 1 h on ice, washed with acetone and incubated with 1% uranyl acetate in acetone for 1 h on ice. After washing samples were then progressively infiltrated with epon resin (Fluka, St. Louis, Missouri, USA) (15, 33, 50, 80, 100%) over two days at room temperature or they were first incubated with 0.5% glutaraldehyde (GA) for 30 min at 4°C, washed and then infiltrated with LR White resin (Electron Microscopic Sciences, Hatfield, PA, USA) (50, 100%) over 10 hours. Eventually samples were polymerized overnight at 70°C. Around 70 nm sections were cut using an ultra 45° diamond knife (Diatome, Biel, Switzerland). Sections were examined without additional contrasting using a CM100 transmission electron microscope (Philips, Eindhoven, Netherlands). The images were recorded digitally with a Quemesa TEM CCD camera and iTEM software v 5.1 (both Olympus Soft Imaging Solutions, Münster, Germany).

The embedding of chemically fixed samples was performed by the EM facility at the department of Biosciences, University of Oslo. Infected, attached cells were fixed in a solution of 2% GA and 1% PFA in HL5c for 2 h at RT and washed with sterile PBS. Subsequently, 2% GA/sodium cacodylate (0.1 M) was added before the fixed cells

were scraped off the well bottom with a cell scraper and stored at 4°C. The cell pellets were subsequently washed 2 x 10 min with 0.1 M sodium cacodylate buffer, then incubated for 1 h in darkness with the aqueous solution of 2% OsO₄ and 1.5% K₃Fe(CN)₆, washed 2 x 10 min in dH₂O and stained with 1.5% uranylacetate for 30 min. Samples were dehydrated in 70, 80, 90, 96% EtOH for 10 min in each concentration before 4 x 15 min in absolute EtOH. The pellets were resuspended in 1:1 epon/propylene oxide and rotated O/N with open lids before Epon polymerization at 60°C for 3 days. Sections were prepared and examined as described above for cryofixed samples.

- Hohenberg, H., Mannweiler, K. and Muller, M. (1994). High-pressure freezing of cell suspensions in cellulose capillary tubes. *Journal of microscopy* **175**, 34-43.
- Kaech, A. and Ziegler, U. (2014). High-pressure freezing: current state and future prospects. *Methods in molecular biology* **1117**, 151-171.
- Leonidova, A., Pierroz, V., Rubbiani, R., Lan, Y.J., Schmitz, A.G., Kaech, A., *et al.* (2014). Photo-induced uncaging of a specific Re(I) organometallic complex in living cells. *Chem Sci* **5**, 4044-4056.

F.n.n. FSC769 **ATGGCGAAAAATAAGATTCCAAATTC AAGGTTGATGATAAATTATGAAACTAAAGTGGAT** 60
 F.n.o. LADL-07-285A **A** **A** **T** 60
 F. philomiragia ATCC 25017 **A** **C** **G** 60
 F. novicida U112 **A** **A** **C** **T** **T** 60
 F.t. holarctica LVS **A** **A** **C** **T** **T** 60
 F.t.t. Schu S4 **A** **A** **C** **T** **T** 60
 Consensus **ATGGCAAAAAATAANATNCCAAATTC AAGGTTGATGATAAATTATGAAACTAATGTNGAT**

F.n.n. FSC769 **GGGGTTCTAAAGAAAAAGAATTGCCTTACAGAGTTTTAGTTGTTGGTGATTTGTGCGAAA** 120
 F.n.o. LADL-07-285A **A** **A** **C** **A** 120
 F. philomiragia ATCC 25017 **A** **A** **G** **A** **A** **A** **G** 120
 F. novicida U112 **T** **CT** **GC** **A** **CC** **C** **A** **A** 120
 F.t. holarctica LVS **T** **CT** **GC** **A** **CC** **C** **A** **A** 120
 F.t.t. Schu S4 **T** **CT** **GC** **A** **CC** **C** **A** **A** 120
 Consensus **GGTGTNNNTAAAGAAAAAGANNACCTTACAGAGTNNNTAGTTGTTGGNGATTTNTCAAAA**

F.n.n. FSC769 **GGAAGATCCGTAGATGCTAAAAAAGAGTTTATTGATAGAGCTGTAGACGAGTAAATAAT** 180
 F.n.o. LADL-07-285A **G** **C** 180
 F. philomiragia ATCC 25017 **G** **C** **G** 180
 F. novicida U112 **T** **G** **A** **CGCA** **AG** **C** **A** 180
 F.t. holarctica LVS **T** **G** **A** **CGCAT** **AG** **C** **A** 180
 F.t.t. Schu S4 **T** **G** **A** **CGCA** **AG** **C** **A** 180
 Consensus **GGAAGATCTGTNGATGCAAAAAAAGAGTTNNCNGATAGAGNGGTNAGANGAGTAAATAAT**

F.n.n. FSC769 **GGTGTGATAGAGCCTTAGAAGATATGAATATATCTTTTGACTTTGAAGTCCGAACTTT** 240
 F.n.o. LADL-07-285A **G** **T** **A** **A** **T** **C** 240
 F. philomiragia ATCC 25017 **G** **T** **A** 240
 F. novicida U112 **G** **TT** **G** **T** **G** **A** **A** 240
 F.t. holarctica LVS **G** **TT** **G** **T** **G** **A** **A** 240
 F.t.t. Schu S4 **G** **TT** **G** **T** **G** **A** **A** 240
 Consensus **GGTGTGATAGNGNNTTAGAAGANATGAATATATCTTTTGATTTTGANGCACCAAACTTT**

F.n.n. FSC769 **GTTTCAAAGGATCCTAGTAATCTAAAAGTTAATTATAGAATCCAAAGTGTAAAAGATTTT** 300
 F.n.o. LADL-07-285A **C** **T** **A** **C** **G** **C** **T** 300
 F. philomiragia ATCC 25017 **A** **T** 300
 F. novicida U112 **T** **A** **T** **TG** **C** 300
 F.t. holarctica LVS **T** **A** **T** **TG** **C** 300
 F.t.t. Schu S4 **T** **A** **G** **T** **TG** **C** 300
 Consensus **GTTTCAAAGATCCTAGTAATTTAAAAGTTAATTATAGAATNAAAGTGTNAAAGATTTT**

F.n.n. FSC769 **AAACCTGATGCTGTTGCTAAAAAAGTTCCAGAAATCGGAGCACTACTCGAAATGAAAGAG** 360
 F.n.o. LADL-07-285A **GG** **G** **T** **G** **TA** **CT** **G** **T** **A** 360
 F. philomiragia ATCC 25017 **G** **A** 360
 F. novicida U112 **G** **T** **A** **G** **G** **T** 360
 F.t. holarctica LVS **G** **T** **A** **G** **G** **T** 360
 F.t.t. Schu S4 **G** **T** **A** **G** **G** **T** 360
 Consensus **AGACCTGATGCTGTTGCTAAAAAAGTTCCAGAAATCAGAGCGCTGCTTGAATGAAAGAG**

F.n.n. FSC769 **ATATTAGCATCTTTTGCTAAGAATATTGAAAATAATCGCAATCTTAAAAGACTATAGAT** 420
 F.n.o. LADL-07-285A **G** **T** **C** **C** 420
 F. philomiragia ATCC 25017 **G** 420
 F. novicida U112 **G** **G** **C** **T** **C** **G** **A** **C** 420
 F.t. holarctica LVS **C** **G** **C** **T** **C** **G** **A** **C** 420
 F.t.t. Schu S4 **C** **G** **C** **T** **C** **G** **A** **C** 420
 Consensus **ATATTAGCATCTTTTGCTAAGGANATTGAAAATAATCGTAATCTNAANAANACNATAGAT**

F.n.n. FSC769 **ATGATTTTTTCAGATAATAATGAGCTAGAAGCTTTAAAGAGTAAGATTCCTACTTTAACA** 480
 F.n.o. LADL-07-285A **G** 480
 F. philomiragia ATCC 25017 **G** 480
 F. novicida U112 **G** **C** **AT** **T** **A** **G** **G** 480
 F.t. holarctica LVS **G** **C** **AT** **T** **A** **G** **G** 480
 F.t.t. Schu S4 **G** **C** **AT** **T** **A** **G** **G** 480
 Consensus **ATGATTTTTTCAGATANTAANGANNTAGAANCNTTAAAGAGTAAGATTCCTGCTTTNACA**

F.n.n. FSC769 **AACTATACGATTAAGAAT TCTGATGATGCAGAAGCTGTAGAATCTCAAGAGTCAAGCAAT** 540
 F.n.o. LADL-07-285A **A** **T** **C** **G** **G** **A** **T** 540
 F. philomiragia ATCC 25017 **A** **T** **C** **G** **G** **A** **T** 540
 F. novicida U112 **C** **TG** **CT** **G** **C** **T** **T** 534
 F.t. holarctica LVS **C** **TG** **CT** **GG** **C** **T** **T** 534
 F.t.t. Schu S4 **C** **TG** **CT** **G** **C** **T** **T** 534
 Consensus **AACTATACGATTAAGAANTCTNNTGATGCAGAAG-TGCNGAGTCTCAAGANTNAAGTAAT**

F.n.n. FSC769 **CAAAGACAATAGAGGATAAATAG-GAGAAATTTTGAATGACAGAAAATAGTTTAAGTCT** 599
 F.n.o. LADL-07-285A **T** **A** **G** **G** **TT** **AT** 599
 F. philomiragia ATCC 25017 **A** **G** **G** **TT** **AT** 599
 F. novicida U112 **C** **G** **T** **G** **A** **GTT** **AT** **AA** 591
 F.t. holarctica LVS **C** **G** **T** **G** **G** **TT** **AT** **AA** 591
 F.t.t. Schu S4 **C** **G** **T** **G** **G** **TT** **AT** **AA** 591
 Consensus **CAANAGACANTAGATGNTAANTAG-GAGGATTTTANNAATGACANNAATANNTTAAGTCT**

F.n.n. FSC769 **TACAGATGAACCTTTAAACAATTTTGGTGGTTCAGCTGAGATTGATAGCGTACTTAAAAA** 659
 F.n.o. LADL-07-285A **T** **C** **G** 659
 F. philomiragia ATCC 25017 **T** **C** **G** 659
 F. novicida U112 **C** **T** **T** **G** **A** **TA** **A** **AG** **T** **C** 651
 F.t. holarctica LVS **C** **T** **T** **G** **A** **TA** **A** **AG** **T** **C** 651
 F.t.t. Schu S4 **C** **T** **T** **G** **A** **TA** **A** **AG** **T** **C** 651
 Consensus **NACNGATGAACCTTTAAATAATTTTGGNGGNTCNCNGANGTTGATAGNGTACTNAAAAA**

F.n.n. FSC769 **TATAGATTTTGATGTTTCAGGTGATGCATCTAAAGTCTTCTTTATCTTCAGATTATAA** 719
 F.n.o. LADL-07-285A **G** **C** 719
 F. philomiragia ATCC 25017 719
 F. novicida U112 **A** **T** **T** **A** **A** **T** **C** **C** 711
 F.t. holarctica LVS **A** **T** **T** **A** **A** **T** **C** **C** 711
 F.t.t. Schu S4 **A** **T** **T** **A** **A** **T** **C** **C** 711
 Consensus **TATAGATTTTGATGTTTCAGNTGATGCNTCTAAAGTTNTNTCTTTATCTNCGANTANAA**

F.n.n. FSC769 **TGCTAGAAACCTTATGGCATTATCTCTTGTGTTAGCAAATAATGAAAGTATAAATAATTA** 779
 F.n.o. LADL-07-285A 779
 F. philomiragia ATCC 25017 **C** 779
 F. novicida U112 **GC** **T** **G** **A** **T** **A** 771
 F.t. holarctica LVS **GC** **T** **G** **A** **T** **A** 771
 F.t.t. Schu S4 **GC** **T** **G** **A** **T** **A** 771
 Consensus **TGCTAGAAACCTTATGGCNTATCTNNTAGCAAATAATGANANTATAAATAATTA**

F.n.n. FSC769 **TAACCAAAAGTATATCCAGAAAGTTATTACGGTAATTGATAGACTCATTGATTTACAAGT** 839
 F.n.o. LADL-07-285A **T** **A** **T** 839
 F. philomiragia ATCC 25017 **T** **T** 839
 F. novicida U112 **C** **T** **A** **T** **A** **A** **T** **AG** **G** 831
 F.t. holarctica LVS **T** **A** **A** **T** **G** **T** 831
 F.t.t. Schu S4 **T** **A** **A** **T** **AG** **T** 831
 Consensus **TAANCAAAANTATATCCAGAAAGTTATTACAGTATTGATANNCTTATTGATTTACAAGT**

F.n.n. FSC769 **TAATGCTATTATATCAAATGATGAGTTTAGATCTCTTGAGCAAGAGTGGTTGAAGGTACA** 899
 F.n.o. LADL-07-285A **C** **A** **A** **A** **A** **A** 899
 F. philomiragia ATCC 25017 **C** **T** **A** **T** 899
 F. novicida U112 **CT** **T** **G** **A** **A** **C** **A** **G** 891
 F.t. holarctica LVS **T** **T** **G** **A** **A** **C** **A** **G** 891
 F.t.t. Schu S4 **T** **T** **G** **A** **A** **C** **A** **G** 891
 Consensus **TAATNCTATTATATCNAATGATGAGTTTAGANCNCTTGAGCAAGAATGGCTAAAGGTGCA**

F.n.n. FSC769 **AGAGGTTTGTCAAGATGATTTGTGATAATGTAGAAGTAAGTATATTAGACGTTAAGAAAGA** 959
 F.n.o. LADL-07-285A **A** 959
 F. philomiragia ATCC 25017 **G** **A** **C** **AC** **T** **C** 959
 F. novicida U112 **A** **C** **A** **T** **T** **A** **A** 951
 F.t. holarctica LVS **A** **C** **A** **T** **T** **A** **A** 951
 F.t.t. Schu S4 **A** **C** **A** **T** **T** **A** **A** 951
 Consensus **AGAGGTTTGTCAAGANGACTATGATAATGTNGAAGTAAGTATATTAGATGTAANAAAGA**

F.n.n. FSC769	AGAATTACAGTATGACTTTGAGAGAAATCTATATGACATATCTAGTAGCGATTTCCTTTAA	1019
F.n.o. LADL-07-285A	. . . . . G	1019
F. philomiragia ATCC 25017	. . . . . T C	1019
F. novicida U112	. . . . . GC A T C T C	1011
F.t. holarctica LVS	. . . . . GC A T C T T T C T C	1011
F.t.t. Schu S4	. . . . . GC A T C T T T T C T C	1011
Consensus	AGAGNTACANTATGATTTNGAGAGAAATNTATATGANATATCTAGTAGNGACTTNTTAA	
F.n.n. FSC769	GAAAGTGATGTTGCAGAATTTGATCAATATGGTGGTGAACCATATGGCGCAATACCTCGG	1079
F.n.o. LADL-07-285A	. . . . . A CT T A	1079
F. philomiragia ATCC 25017	. . . . . T T G	1079
F. novicida U112	. . . . . A A T C T T A	1071
F.t. holarctica LVS	. . . . . A T C T A T T A	1071
F.t.t. Schu S4	. . . . . A T C T C T T A	1071
Consensus	NAAAGTNTATGTTTCAGAATTTGATCAATATGGTGGTGAACCNATGGCGCAATANTAGG	
F.n.n. FSC769	CTTGATAATTTTGAAAACACTACAAATGATATAAATTTGGTTGACAGGGATGGGCATGGT	1139
F.n.o. LADL-07-285A	AC G G A C	1139
F. philomiragia ATCC 25017	. . . . . T T T	1139
F. novicida U112	. . . . . A T C T A T	1131
F.t. holarctica LVS	. . . . . A T C T T A T	1131
F.t.t. Schu S4	. . . . . A T C T T A T	1131
Consensus	ATTGTATAATTTTGAAAANACNACAAATGATATAAATTTGGTTGACTGGNATGGGNATGGT	
F.n.n. FSC769	GGCAAAGAATTCATGCCCATTTATAGCATCAATAGACAAGTCATTTTGGTGTTAA	1199
F.n.o. LADL-07-285A	. . . . . A C AT T T	1199
F. philomiragia ATCC 25017	. . . . . T T T	1199
F. novicida U112	. . . . . A T T T C	1191
F.t. holarctica LVS	. . . . . A T T T C	1191
F.t.t. Schu S4	. . . . . A T T T C	1191
Consensus	GGCAAAGAATTCATGCACCATTATNGCATCAATTGANAAGTCATNTTTGGTGTTAA	
F.n.n. FSC769	AGATCTATCAGAAATAACTCACATAAAGAGTTTGAATCCTTGTAGAACATCCTAGATA	1259
F.n.o. LADL-07-285A	. . . . . T T T C G T A C	1259
F. philomiragia ATCC 25017	. . . . . T T T	1259
F. novicida U112	. . . . . G T C T A G T C T G	1251
F.t. holarctica LVS	. . . . . G T C T A G T C T G	1251
F.t.t. Schu S4	. . . . . G T C T A G T C T G	1251
Consensus	NGATTTATCAGAAATNACTCATATAAANAGTTTGAANCCTTGTGNTNGANCATCCTAGATA	
F.n.n. FSC769	TAAAGAGTGGAATGACTTTAGAAACCTAGATGTAGCTGCATATATCGGTTTGACTATCGG	1319
F.n.o. LADL-07-285A	. . . . . A T G T T C G	1319
F. philomiragia ATCC 25017	. . . . . T G T T C G	1319
F. novicida U112	. . . . . T T T A CG A	1311
F.t. holarctica LVS	. . . . . T T T A CG A	1311
F.t.t. Schu S4	. . . . . T T T A CG A	1311
Consensus	TAAAGAGTGGAATGATTTAGAAACCTTGATGTTGCTGCATATATNGGTTTGACNNGTGG	
F.n.n. FSC769	AGATTTTATGTTACGTCAGCCATATAATCCTGAGAATAACCCAGTTCAGTATAAGCTTAT	1379
F.n.o. LADL-07-285A	. . . . . T T T A T C	1379
F. philomiragia ATCC 25017	. . . . . T T A T C	1379
F. novicida U112	. . . . . T G G A T A	1371
F.t. holarctica LVS	. . . . . T G G A T A	1371
F.t.t. Schu S4	. . . . . T G G A T A	1371
Consensus	NGATTTTATGTTNCGNCANCCATATAATCCTGAGAATAATCCAGTTCAGTATAANCTTAT	
F.n.n. FSC769	GGAAGGCTTTAACGAGTTTGTGGATCATAAGAATAATGATAGCTACTTATGGGGACCCTC	1439
F.n.o. LADL-07-285A	. . . . . T A T T G G T T G C T	1439
F. philomiragia ATCC 25017	. . . . . C T A T T G G T T G T	1439
F. novicida U112	. . . . . T T T G T G A T TC TG	1431
F.t. holarctica LVS	. . . . . T T T G T G A T TC TG	1431
F.t.t. Schu S4	. . . . . T T T G T G A T TC TG	1431
Consensus	GGAAGGCTTTAATGAGTTTGTGGATGATAAGAATAATGATAGCTACTTATGGGGACCTNC	

1 460 1 480 1 500

F.n.n. FSC769 **ATCTATTCAAGTTAGTTAAAAATATGGTGAGATCATATGATAAAAAC TAGATGGTTTCAATA** 1499

F.n.o. LADL-07-285A C A G 1499

F. philomiragia ATCC 25017 A G 1499

F. novicida U112 **T . A TC G A T C** 1491

F.t. holarctica LVS **T . A TC G A T C** 1491

F.t.t. Schu S4 **T . A TC G A T C** 1491

Consensus **NTCNATTCANCTAGTTAANAATATGATGAGATCTTATGATAAAAAC TAGATGGTTNCAATA**

1 520 1 540 1 560

F.n.n. FSC769 **CATAAGAGGTGTTGAAAGTGGTGGTTATGTAAGAACTTAGTGTCATGTGTTTATGATAA** 1559

F.n.o. LADL-07-285A A G T C A 1559

F. philomiragia ATCC 25017 **T A G T A G A G** 1559

F. novicida U112 **T A G A G AG T C A** 1551

F.t. holarctica LVS **T A G AG G AG T C A** 1551

F.t.t. Schu S4 **T A G AG G AG T C A** 1551

Consensus **TATAAGAGGNGTTGANAGTGGTGGTTATGTAANAACCTTNGTANCTTGNGTNTATGATAA**

1 580 1 600 1 620

F.n.n. FSC769 **TAAAGGTGCTTAGAAACAAAGCCGCCACTGAATGCTTTATTTGCAGATTATATGGAGCT** 1619

F.n.o. LADL-07-285A T T 1619

F. philomiragia ATCC 25017 T A T 1619

F. novicida U112 **..... CA . TC T T . A T . A TA T T** 1611

F.t. holarctica LVS **..... CA . TC T T . A TT . A TA T T** 1611

F.t.t. Schu S4 **..... CA . TC T T . A TT . A TA C T T** 1611

Consensus **TAAAGNNTNNTAGAAACNAAGTCNCCNCTAAATGTNTTATTTGCNGATTATATGGAGNT**

1 640 1 660 1 680

F.n.n. FSC769 **ATCACTTCAAATATTGGTTTAAATACCATTGTGAAGTGA AAAAGGTACAAGTAATGCTTG** 1679

F.n.o. LADL-07-285A G G 1679

F. philomiragia ATCC 25017 G C 1679

F. novicida U112 G T C 1671

F.t. holarctica LVS G T 1671

F.t.t. Schu S4 G T C 1671

Consensus **ATCACTTGCAAATATTGGTTTAAATACCATTGTGAAGTGA AAAAGGTACNAGTAATGCTTG**

1 700 1 720 1 740

F.n.n. FSC769 **TTTTTTTAGTGTGAAGCTCAGCTAAGAAAGTTGAAGAGTTTGTAGATAGTTTTGATTCTGC** 1739

F.n.o. LADL-07-285A C C A 1739

F. philomiragia ATCC 25017 C A 1739

F. novicida U112 **..... C A T T A C A G A C A** 1731

F.t. holarctica LVS **..... C A T T A C A G A C A** 1731

F.t.t. Schu S4 **..... C A T T A C A G A C A** 1731

Consensus **TTTCTTTAGTGTNAANTCNGCTAANAAGTCGAAGANTTTGTAGATNGNTTTGANTCNGC**

1 760 1 780 1 800

F.n.n. FSC769 **TAATTCAATGTTGATTGCTAATCTTTCTTATACTATGTGTATATCCAGAATTTACATTA** 1799

F.n.o. LADL-07-285A C C . A 1799

F. philomiragia ATCC 25017 C A 1799

F. novicida U112 **A . C GA . A C C G A T** 1791

F.t. holarctica LVS **A . C GA . A C C G A T** 1791

F.t.t. Schu S4 **A . C GA . A C C G A T** 1791

Consensus **NAACTCAANNTTAATGTCTAANCTTTCTTANACTATGTGTATATCNAGAAATNTCNCATTA**

1 820 1 840 1 860

F.n.n. FSC769 **TATTAAGTGTGTTATCAGAGATAAGATAGGAAGTGTGTTAGGTGCTGAGCAAATTCAAAA** 1859

F.n.o. LADL-07-285A A A T C 1859

F. philomiragia ATCC 25017 A A T C 1859

F. novicida U112 **..... A A T T T A G A TC TCG** 1851

F.t. holarctica LVS **..... A A T T T A G A TC TCG** 1851

F.t.t. Schu S4 **..... A A T T T A G A TC TCG** 1851

Consensus **TATTAANTGTGTNATNAGAGATAAGATNGGNAGTNTTGTGGNTGNNAGNNTTCAAAA**

1 880 1 900 1 920

F.n.n. FSC769 **TATTTCTTTCAGATTGGATATCAGAGTTTGTACTACTGTATATCAACCAACGCCCTTTAGA** 1919

F.n.o. LADL-07-285A G A . C 1919

F. philomiragia ATCC 25017 C C 1919

F. novicida U112 **A T A C C A C** 1911

F.t. holarctica LVS **A T A C C A C** 1911

F.t.t. Schu S4 **A T A C C A C** 1911

Consensus **NATTTCTTTCAGATTGGATATCAGANTTTGTNACNACAGTNTATCAACCAACCCCTTTAGA**

		1 940		1 960		1 980	
F.n.n. FSC769		GATGGCAAGATATCCTTTTAGGAATGTTTCTATTGATGTTAAACCTATACCGGGTAAACC					1979
F.n.o. LADL-07-285A		. . . . . G C T T A					1979
F. philomiragia ATCC 25017		. . . . . G C T T A					1979
F. novicida U112		A G C . A . C C . G C G					1971
F.t. holarctica LVS		A G C . A . C C . G C G					1971
F.t.t. Schu S4		A G C . A . C C . G C G					1971
Consensus		NATGGCGAGATATCCTTTNAGNAANGTTTCTATNGANGTTAAACNATACCGGGTAANCC					
		2 000		2 020		2 040	
F.n.n. FSC769		AGGGTGGTATTCATGTAAAAATAATGTGATTCCACATTCAATTTGAAGGTATGGATAC					2039
F.n.o. LADL-07-285A		. . . . . C C G					2039
F. philomiragia ATCC 25017		. . . . . C					2039
F. novicida U112		T C C A C A A					2031
F.t. holarctica LVS		T C C A C A A					2031
F.t.t. Schu S4		T C C A C A A					2031
Consensus		NGGNTGGTATTCATGCAAAATAATGTNATTCNCACATTCAATTTGAAGGNATGNATAC					
		2 060		2 080		2 100	
F.n.n. FSC769		TACAATGACTATTGATACTAGGTTAGAACCAGAATTATTTGGCGCGAATAATAACTAAAA					2099
F.n.o. LADL-07-285A		. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .					2099
F. philomiragia ATCC 25017		. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .					2099
F. novicida U112		. . . . . A C . T C . T A . A					2091
F.t. holarctica LVS		. . . . . A C . T C . T A . A					2091
F.t.t. Schu S4		. . . . . A C . T C . T A . A					2091
Consensus		TACAATGACTATNGATACTAGGNTNGAACCAGAATTATTCGGTNCNAATAATAACTAAAA					
		2 120		2 140		2 160	
F.n.n. FSC769		ACAAGGAGAATGATTATGAACGAGATGATAACAAGACAGCAAGTTACAAGTGGTGAATTT					2159
F.n.o. LADL-07-285A		. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .					2159
F. philomiragia ATCC 25017		. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .					2159
F. novicida U112		. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .					2150
F.t. holarctica LVS		. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .					2150
F.t.t. Schu S4		. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .					2150
Consensus		ACAAGGAGAATGATTATGAGTGAGATGATAACAAGACANANGTAACAAGTGGCGANACN					
		2 180		2 200		2 220	
F.n.n. FSC769		ATTTATGTTGGACTGATCCTACAGCGTGATAGGATCTCATCCAATCGTAGATTATTT					2219
F.n.o. LADL-07-285A		. . . . . A A A C					2219
F. philomiragia ATCC 25017		. . . . . C A A					2219
F. novicida U112		. . . . . C GA . A T . A T T					2210
F.t. holarctica LVS		. . . . . C GA . A T . A T T					2210
F.t.t. Schu S4		. . . . . C GA . A T . A T T					2210
Consensus		ATTCATGTNAGNACTGATCCTACNGCATGTATAGGATCTCATCCNAATNGTAGATTATTT					
		2 240		2 260		2 280	
F.n.n. FSC769		ATAGACTCATTACTATGGCAGGAATTGATCTTGATAAGAATATTGTTGCTATAGAAGGC					2279
F.n.o. LADL-07-285A		G G A . G G A A					2279
F. philomiragia ATCC 25017		. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .					2279
F. novicida U112		. . . . . T T A A . T . GGAGA . A A C G T					2270
F.t. holarctica LVS		. . . . . T T A A . T . GGAGA . A A C G T					2270
F.t.t. Schu S4		. . . . . T T A A . T . GGAGA . A A C T					2270
Consensus		ATNGANTCTTTNACTATAGCNGGNGNNAANCTTGATAAAAATATNGTTGCTATAGAAGGT					
		2 300		2 320		2 340	
F.n.n. FSC769		GGAGAGGATGTTACAAAAGCAGATTCTGCAACTGCTGCAGCCAGTGTATACGCCATCT					2339
F.n.o. LADL-07-285A		. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .					2339
F. philomiragia ATCC 25017		. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .					2339
F. novicida U112		. . . . . . . . . . . C . G T G . T . A T A TT					2330
F.t. holarctica LVS		. . . . . . . . . . . C . G T G . T . A T A TT					2330
F.t.t. Schu S4		. . . . . . . . . . . C . G T G . T . A T A TT					2330
Consensus		GGAGAGGATGTNACNAAAGCTGATTTCNGCTACAGCTGCTGCTAGTGTAAATACGTTTATCT					
		2 360		2 380		2 400	
F.n.n. FSC769		ATAACTCCAGGCTCTATAAATCCAACAATAAGTATTACACTTGGAGCTTTGATTAATCA					2399
F.n.o. LADL-07-285A		. . . . . . . . . . . T					2399
F. philomiragia ATCC 25017		. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .					2399
F. novicida U112		. . . . . G T T . T . C . A					2390
F.t. holarctica LVS		. . . . . G T T . T . C . A					2390
F.t.t. Schu S4		. . . . . G T T . T . C . A					2390
Consensus		ATAACNCCAGGCTCTATAAATCCAACAATAAGTATTACNCTTGGNGNTNTAATTAATCA					

F.n.n. FSC769 AATACTAGGACTCTACTTGAAGTGTGTATCAAGTATATTACAAGCAGGGGCAACTGAT 2459
 F.n.o. LADL-07-285A G.GT...CT.G...G.A...T.T.A...G.T...A... 2459
 F. philomiragia ATCC 25017 ...G...G...G...G... 2459
 F. novicida U112 GTC.A...AA.A...GAGAAA.T.G.C...A.T.T.A... 2450
 F.t. holarctica LVS ...GT...A...AA.A...GAGAAA.T.G...A.T.T.A... 2450
 F.t.t. Schu S4 ...GT...A...AA.A...GAGAAA.T.G...A.T.T.A... 2450
 Consensus AATGTTAGNACTANANTTGAAGNGNNNGTTTCGAGTATATTACAAGCANGTGCNACAGAT

F.n.n. FSC769 ATGAAAATAAAATTTGGGTAACCTCGAACAAAAACAAGAGTACAAAACAGATGATGCTTGG 2519
 F.n.o. LADL-07-285A ...T.GC.T.G...T.T...G...T...T...A... 2519
 F. philomiragia ATCC 25017 ...T...T...T...T... 2519
 F. novicida U112 ...T.G.A...T.T.T...T...T...A.A... 2510
 F.t. holarctica LVS ...T.G.A...T.T.T...T...T...A.A... 2510
 F.t.t. Schu S4 ...T.G.A...T.T.T...T...T...A.A... 2510
 Consensus ATGAAAATTAAGTTAGGTAANTCTAATAAAAAACAAGAGTANAAAACAGATGAAGCNTGG

F.n.n. FSC769 GGCATTATGATTGATATATCTAATTTAGAATTATATCCTATTAGTGCAGAAGCATTTAGT 2579
 F.n.o. LADL-07-285A ...T.C...C.G...C.T.T.C... 2579
 F. philomiragia ATCC 25017 ...T...T...T...T... 2579
 F. novicida U112 ...T...A.C...G...A.A...TA.G.T... 2570
 F.t. holarctica LVS ...T...A.C...G...A.A...TA.G.T... 2570
 F.t.t. Schu S4 ...T...A.C...G...A.A...TA.G.T... 2570
 Consensus GGTATTATGATNGATNNTACTAATTTAGAGTTATATCCNATAAGTGCNAGGCNNTTAGT

F.n.n. FSC769 ATAAAAATAGAACCAACTGAACCTTATGGGGTTGCGAAAGATGGTATGAGATATCATGTA 2639
 F.n.o. LADL-07-285A ...A.G...C.AT.T.G...A... 2639
 F. philomiragia ATCC 25017 ...T.GT...G.A...T.T.A...A...T...A.T... 2639
 F. novicida U112 ...T.GT...G.A...T.T.A...A...T...A.T... 2639
 F.t. holarctica LVS ...T.GT...G.A...T.T.A...A...T...A.T... 2639
 F.t.t. Schu S4 ...T.GT...G.A...T.T.A...A...T...A.T... 2639
 Consensus ATNANNATAGANCCAACAGAACCTTATGGGTGTTTCAAAGATGGNATGAGATATCATATN

F.n.n. FSC769 GTATCTATTGATGGACTTACAACCTCACAAGGTAGCTTGCCGTGTATGCTGTGCTGCAAGT 2699
 F.n.o. LADL-07-285A A...G.C...T...T... 2699
 F. philomiragia ATCC 25017 A...C...G... 2699
 F. novicida U112 A...A...T...A...A...T...C...A...T...C... 2690
 F.t. holarctica LVS A...A...T...A...A...T...C...A...T...C... 2690
 F.t.t. Schu S4 A...A...T...A...A...T...C...A...T...C... 2690
 Consensus ATATCTATNGATGGCTTACAACNTCNCAAGGNAGCTTGCCNGTATGNTGNGCNGCNAGN

F.n.n. FSC769 ACTGATAAAGGAGTTGCTAGAATAGGGTACATAGCAGCTGTATAGTAA-ATAGGAGTTAT 2758
 F.n.o. LADL-07-285A ...A...T.C...A... 2758
 F. philomiragia ATCC 25017 ...A...C...G... 2758
 F. novicida U112 ...A...A...A...T...T...C...G...C...G... 2749
 F.t. holarctica LVS ...A...A...A...T...T...C...G...C...G... 2749
 F.t.t. Schu S4 ...A...A...A...T...T...C...G...C...G... 2749
 Consensus ACNGATAAAGGAGTTGCTAAAATAGGNTANATNGCAGCTGCATAGTAAGATNGGAGTTNT

F.n.n. FSC769 ATTATTAAAATGTTTCTCGAAAGGATATGTTGGGAAGATGGTCTAAGATTAGACAAGGT 2818
 F.n.o. LADL-07-285A ...A...A... 2818
 F. philomiragia ATCC 25017 ...A...G...A... 2818
 F. novicida U112 ...CT...A...T...A...T...T...GC.A... 2806
 F.t. holarctica LVS ...CT...A...T...A...T...T...GC.A... 2806
 F.t.t. Schu S4 ...CT...A...T...A...T...T...GC.A... 2806
 Consensus ATTATTNNAATGTTTCTNGAAAGGATNTATTGGGAAGATGGTNTAAGATTAGANAGNGAT

F.n.n. FSC769 ATCTTAGACAAATCAAATTTGTCTATTTTAGAAAGGTCAAAGTCTGCAAATTTATTTGCCA 2878
 F.n.o. LADL-07-285A ...T...TC...G... 2878
 F. philomiragia ATCC 25017 ...TC...G... 2878
 F. novicida U112 ...T...T.G...C.A.G...T.GCA.C...GC... 2866
 F.t. holarctica LVS ...T...T.G...C.A.G...T.GCA.C...GC... 2866
 F.t.t. Schu S4 ...T...T.G...C.A.G...T.GCA.C...GC... 2866
 Consensus ATTTTAGATAANTCAAATNTNTCTNTTTAGAAAGGTNAANNNGCAAGNTATTTGCCA

		2 900		2 920		2 940	
F.n.n. FSC769	GCTAATCTTAATAAAGG	TATCGTTAGTTT	CGATTTAGATAT	GGAGAGTTTGCAGACGGGA			2938
F.n.o. LADL-07-285A	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	2938
F. philomiragia ATCC 25017	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	2938
F. novicida U112	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	2926
F.t. holarctica LVS	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	2926
F.t.t. Schu S4	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	2926
Consensus	GCTAATCTTAATAAANGGNATCGTTAGNNTNGATTAGATNTTGANAGTTTGCAGACAGGN						
		2 960		2 980		3 000	
F.n.n. FSC769	CTTATTCTAATAAAGATCTTGTATTGTACTTAGATGAAAAACATTTATTTTTTATGAT						2998
F.n.o. LADL-07-285A	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	2998
F. philomiragia ATCC 25017	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	2998
F. novicida U112	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	2986
F.t. holarctica LVS	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	2986
F.t.t. Schu S4	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	2986
Consensus	CTTATNCTNATAAAGAATCTTANATTGTACTTAGATGAAAAANNNTTNTTTTTTATGAT						
		3 020		3 040		3 060	
F.n.n. FSC769	AAATGCTATCCTCTGTCTTTGCAGGTAATGACAGATGAGTTAACTAATGATATCCCTCTA						3058
F.n.o. LADL-07-285A	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	3058
F. philomiragia ATCC 25017	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	3058
F. novicida U112	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	3046
F.t. holarctica LVS	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	3046
F.t.t. Schu S4	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	3046
Consensus	AANTNNTATCCNNTATCTTNCANATAATGACNGATNAGTTAANTNATGANATCCNNTA						
		3 080		3 100		3 120	
F.n.n. FSC769	TTCTTGAATGTTAAGGAGAAGATAGTTGAAAAAGAGGTGTTAAGTACATATATAATCAA						3118
F.n.o. LADL-07-285A	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	3118
F. philomiragia ATCC 25017	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	3118
F. novicida U112	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	3106
F.t. holarctica LVS	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	3106
F.t.t. Schu S4	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	3106
Consensus	TTNNTGAATNTNANAGAGAANNANTTGAAAAANANGNGTTAANTANATNTATAATCAA						
		3 140		3 160		3 180	
F.n.n. FSC769	CTATCACTTTCATTAGAGTATGATTATAGTGTTAAGTATAGTACGCAAATTCATTATTT						3178
F.n.o. LADL-07-285A	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	3178
F. philomiragia ATCC 25017	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	3178
F. novicida U112	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	3166
F.t. holarctica LVS	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	3166
F.t.t. Schu S4	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	3166
Consensus	NTNTCANTNTCATTAGAGCATNNTATNGTNTTAANNATAGNANNCAAATTCATTATTT						
		3 200		3 220		3 240	
F.n.n. FSC769	AAGTTAGATAGAGGCAAGTTAGTATCAGATACATATGATTTTCCCTTACTAAGCTTTAAT						3238
F.n.o. LADL-07-285A	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	3238
F. philomiragia ATCC 25017	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	3238
F. novicida U112	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	3226
F.t. holarctica LVS	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	3226
F.t.t. Schu S4	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	3226
Consensus	ANGTTAGATAGAGGNNNTTAGTANCAGANATNTATGANTTCCNNTANTAAGCTTTAAT						
		3 260		3 280		3 300	
F.n.n. FSC769	CACTATTGATGCATGATACCTTTTATAAAGCTCAATAGAAATGGTTTCTGAATTAATCT						3298
F.n.o. LADL-07-285A	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	3298
F. philomiragia ATCC 25017	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	3298
F. novicida U112	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	3286
F.t. holarctica LVS	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	3286
F.t.t. Schu S4	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	3286
Consensus	CANTATTANNNGTNGATATTTTTNTAAANCTNAATAGNANTGTTTCTGAANTAAANTCT						
		3 320		3 340		3 360	
F.n.n. FSC769	TTCAATCGTTTTGTTTTCTCAACCTCAAGATCATATGCTGCAATTTACTTGTATTCTTA						3358
F.n.o. LADL-07-285A	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	3358
F. philomiragia ATCC 25017	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	3358
F. novicida U112	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	3346
F.t. holarctica LVS	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	3346
F.t.t. Schu S4	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	3346
Consensus	TTNAATCGNTTTTGTTTTNNTCANCTCAAGATCNTATGCNCAATNTTACTTGTATNTTN						

3 380 3 400 3 420
 F.n.n. FSC769 **ATTAATAAATTAGAAAGAGA****CTTAAATTTGCTGAATCTAATAAGTTAAATAGTTCCTT** 3418
 F.n.o. LADL-07-285AG..... 3418
 F. philomiragia ATCC 25017 3418
 F. novicida U112T.G.G.G.....G.GC.....C.G 3406
 F.t. holarctica LVST.G.G.C.A.....G.GC.....C.G 3406
 F.t.t. Schu S4T.G.G.C.A.....G.GC.....AC.G 3406
 Consensus **ATTAATAAATTAGAAAGAGAANTNAANTTTGCTGAATCTAATANGNNAATAGTTCNCCN**

3 440 3 460 3 480
 F.n.n. FSC769 **AAGCAAATATTTGATCTAATTCATGATATTTATAGTTTAAATCCAGCTTAACTTAGATAAG** 3478
 F.n.o. LADL-07-285A ..A.....G..... 3478
 F. philomiragia ATCC 25017A..... 3478
 F. novicida U112A.....T.....G.....C.C.....T.A.....C.....A 3466
 F.t. holarctica LVSA.....T.....G.....C.C.....T.A.....C.....A 3466
 F.t.t. Schu S4A.....T.....G.....C.C.....T.A.....C.....A 3466
 Consensus **AAACAAATATTTGATNTAATTNATGATATTTANAGNTTAATNCAACTTAACTTAGATAAN**

3 500 3 520 3 540
 F.n.n. FSC769 **GTTGGGGATGTTGATAATTTGAGTTTGATTTTTATAAATCTATAAGGAAGATAAACTTA** 3538
 F.n.o. LADL-07-285AA.....C..... 3538
 F. philomiragia ATCC 25017A.....G.....TA..... 3538
 F. novicida U112AA.GC.....GC.....A.....CC.A.GC.T.G.CT.AT.TC 3526
 F.t. holarctica LVSAA.GC.....GC.....A.....CC.A.GC.T.G.CT.AT.TC 3526
 F.t.t. Schu S4AA.GC.....GC.....A.....CC.A.GC.T.G.CT.AT.TC 3526
 Consensus **GTTGANGANNTTGATAGNATTGANTTTGATTTNANAANCCTTNACTAANNATAANNTA**

3 560 3 580 3 600
 F.n.n. FSC769 **TTGGCTGATAGATTATTGACTCTTTGTGAATATAGAAAAATTAATAACTTTATTAATTT** 3598
 F.n.o. LADL-07-285A ..C..... 3598
 F. philomiragia ATCC 25017 3598
 F. novicida U112C.T.....G.A.....G.....G.....C.G..... 3586
 F.t. holarctica LVSC.T.....A.....G.....G.....C.G..... 3586
 F.t.t. Schu S4C.T.....G.A.....G.....C.G..... 3586
 Consensus **NTNGCTGATAGATTATTNACTCTTTGTGANTATAGAAAANATTAATAACTTTATNANATTT**

3 620 3 640 3 660
 F.n.n. FSC769 **GAACTGCAAGGAAAAAATATTTATGTGAAACTTCCCGAAGAGTTTTTCGTTGCTACT** 3658
 F.n.o. LADL-07-285AA..... 3658
 F. philomiragia ATCC 25017 3658
 F. novicida U112T.....T.....A.....G.T.T.....T..... 3646
 F.t. holarctica LVST.....T.....A.....G.T.T.....T..... 3646
 F.t.t. Schu S4T.....T.....A.....G.T.T.....T..... 3646
 Consensus **GAANTGCANGGAAAAAATATNTATGTGAAANCCTNCCNGAAGAGTTTTTNGTTGCTACT**

3 680 3 700 3 720
 F.n.n. FSC769 **AGGTATTATCTTTTCATCAAAGAAAGGCAATAGCTCCAGCTAATGTAAATTTGAAAAAT** 3718
 F.n.o. LADL-07-285A ..A.....A.....T.....C.T..... 3718
 F. philomiragia ATCC 25017A.....A.....C..... 3718
 F. novicida U112A.C.....C.T.....G.A.C.....C.....GG 3706
 F.t. holarctica LVSA.C.....C.T.....G.A.C.....C.....GG 3706
 F.t.t. Schu S4A.C.....C.T.....G.A.C.....C.....GG 3706
 Consensus **AGATANTATCTTTTCNTTAAAAGNAANGCAACAGCTCCAGCNAATGTAANNTTGAAAAAT**

3 740 3 760 3 780
 F.n.n. FSC769 **AAAAAAGCTATGAGAATAACAAGTATAAGTAGAAATAAAAACGTTGTAACCTCTCTCTT** 3778
 F.n.o. LADL-07-285A 3778
 F. philomiragia ATCC 25017 3778
 F. novicida U112G.T.C.....T.T.....G.TA.....T.G..... 3766
 F.t. holarctica LVSG.T.C.....T.T.....G.TA.....G.....G..... 3766
 F.t.t. Schu S4G.T.C.....T.T.....G.TA.....G.....G..... 3766
 Consensus **AANAANGCNTNGAGAATNACNAGTATAAGTAGAAATAANAANNTTGTAACTCTNTCTCTT**

3 800 3 820 3 840
 F.n.n. FSC769 **TCTGGAGTGAAACTCGTTGAAGTTGAGTATTTCTATGATGAATTTTACAACACGGGTTGAT** 3838
 F.n.o. LADL-07-285AC.C..... 3838
 F. philomiragia ATCC 25017T.....T.....C.C..... 3838
 F. novicida U112A.....A.....G.....C.....A.G.....T.....TA.AT 3826
 F.t. holarctica LVSA.....A.....G.....C.....A.G.....T.....TA.AT 3826
 F.t.t. Schu S4A.....A.....G.....C.....A.G.....T.....TA.AT 3826
 Consensus **TCNGGAGTAAAAC TGTTGANGTTGANTTTCTATGATNAATTTTACAACNNGNNTTGAT**

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                                  3 860                3 880                3 900
F.n.n. FSC769 AATATTGATGCAATATATGAAATTCAAAAAGGCTCGGAATGGGACTTTATACTTGC GGAT 3898
F.n.o. LADL-07-285A ..... A ..... A ..... A ..... A ..... A ..... A ..... A ..... 3898
F. philomiragia ATCC 25017 ..... A ..... A ..... A ..... A ..... A ..... A ..... A ..... 3898
F. novicida U112 ..... C ..... T T G ..... T ..... T A ..... 3886
F.t. holarctica LVS ..... T T G ..... T ..... T A ..... 3886
F.t.t. Schu S4 ..... C ..... T T G ..... T ..... T A ..... 3886
Consensus AATATTGATGCAATATATGAAATTCAAAAAGGNTCNGANTGGGANTTTATANTNGCGGAT

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                                  3 920                3 940                3 960
F.n.n. FSC769 AGTAGTGCGGTTTTTACAGCCTTTGAAGGTAGTGAAAACTTTGATTTCTTTATAGCATT 3958
F.n.o. LADL-07-285A ..... T ..... A ..... G ..... A ..... 3958
F. philomiragia ATCC 25017 ..... T ..... A ..... G ..... 3958
F. novicida U112 ..... G T ..... G T ..... C ..... 3946
F.t. holarctica LVS ..... G T ..... G T ..... C ..... 3946
F.t.t. Schu S4 ..... G T ..... G T ..... C ..... 3946
Consensus AGTAGTGCGGTTTTTACNGCTTTGAAGGTAGTGANAANTTTGATTTCTTTATAGCN TTT

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F.n.n. FSC769 ACCTAA 3964
F.n.o. LADL-07-285A ..... 3964
F. philomiragia ATCC 25017 ..... 3964
F. novicida U112 T T ..... 3952
F.t. holarctica LVS T T ..... 3952
F.t.t. Schu S4 T T ..... 3952
Consensus NCNTAA

```

FIG S2

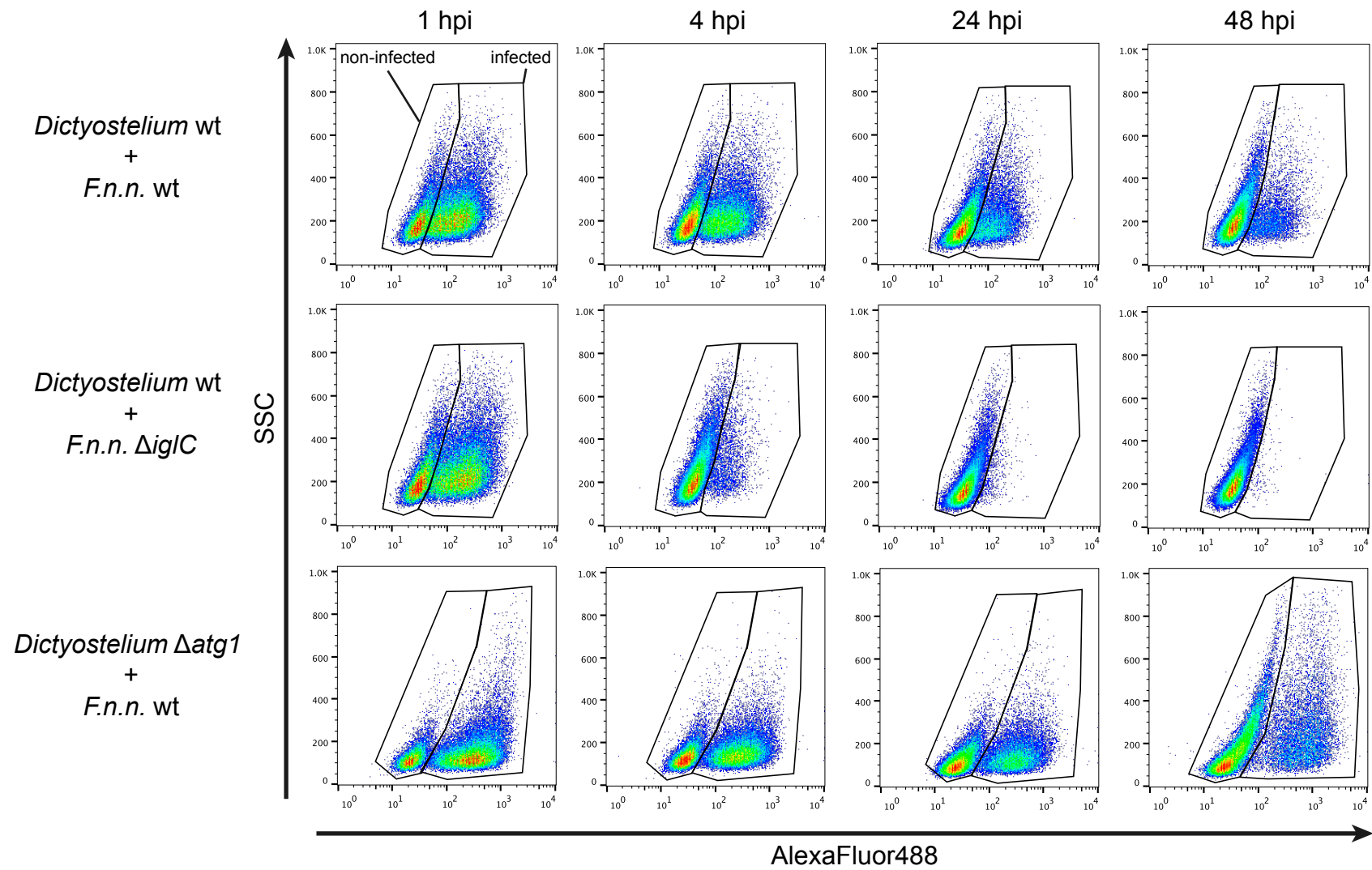


FIG S3

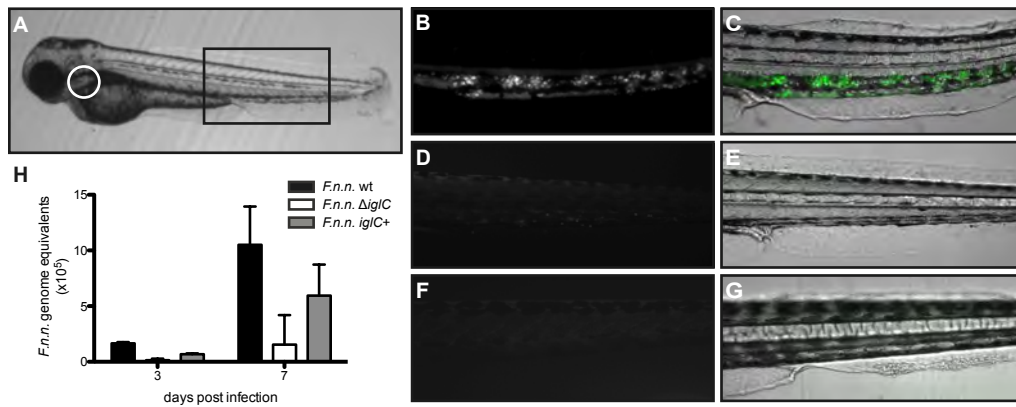


FIG S4

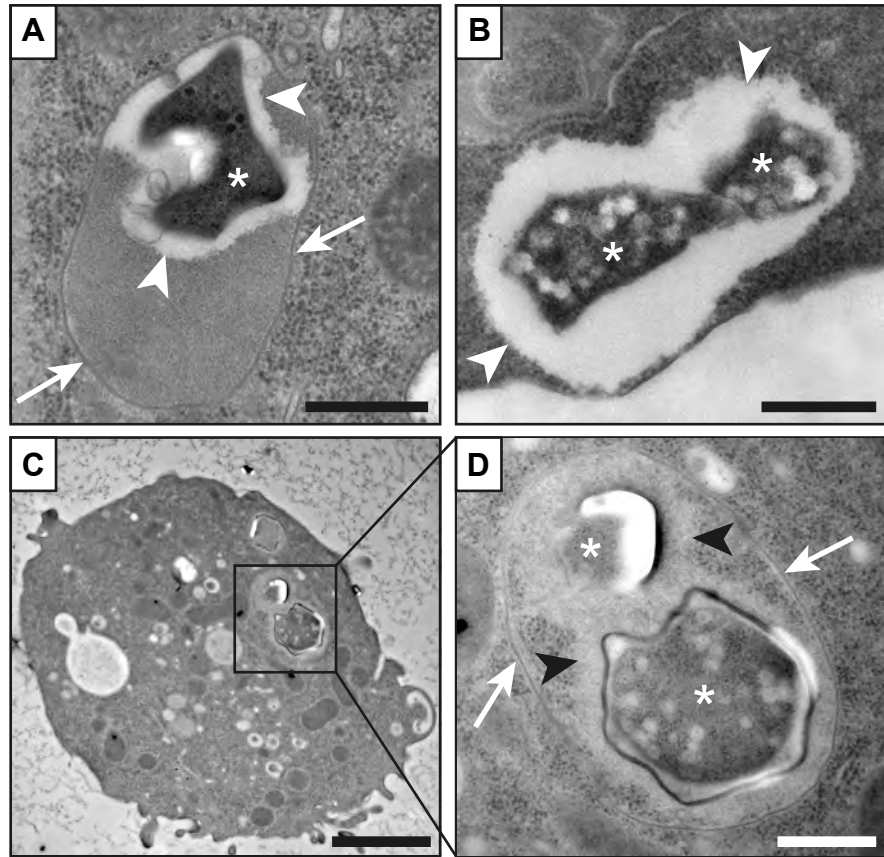


FIG S5

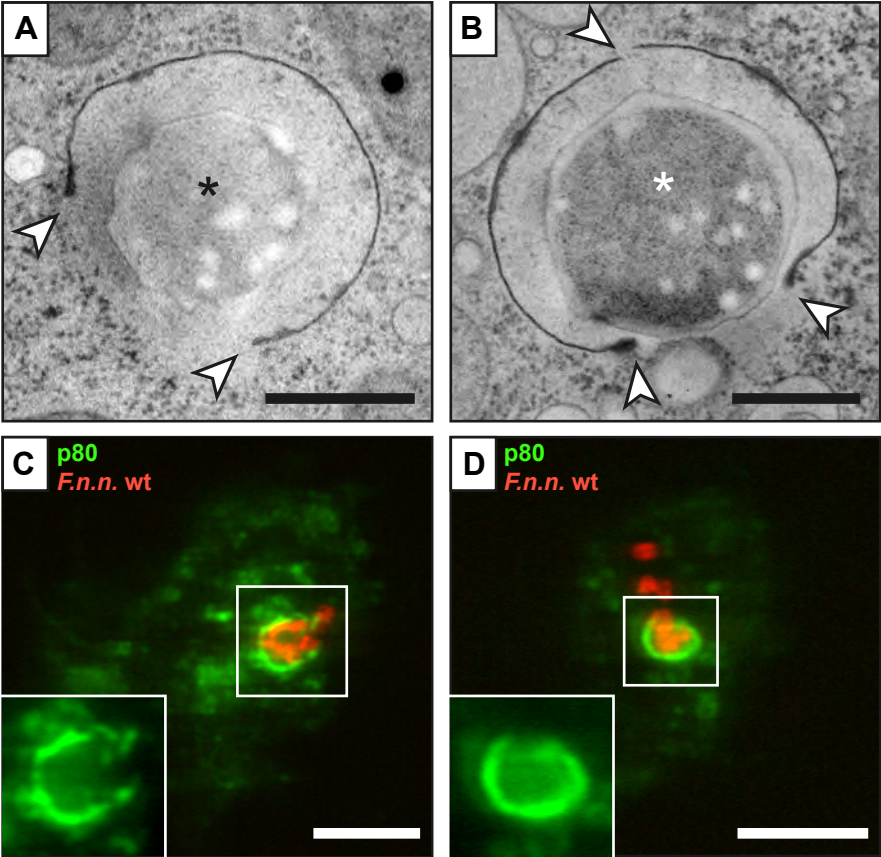
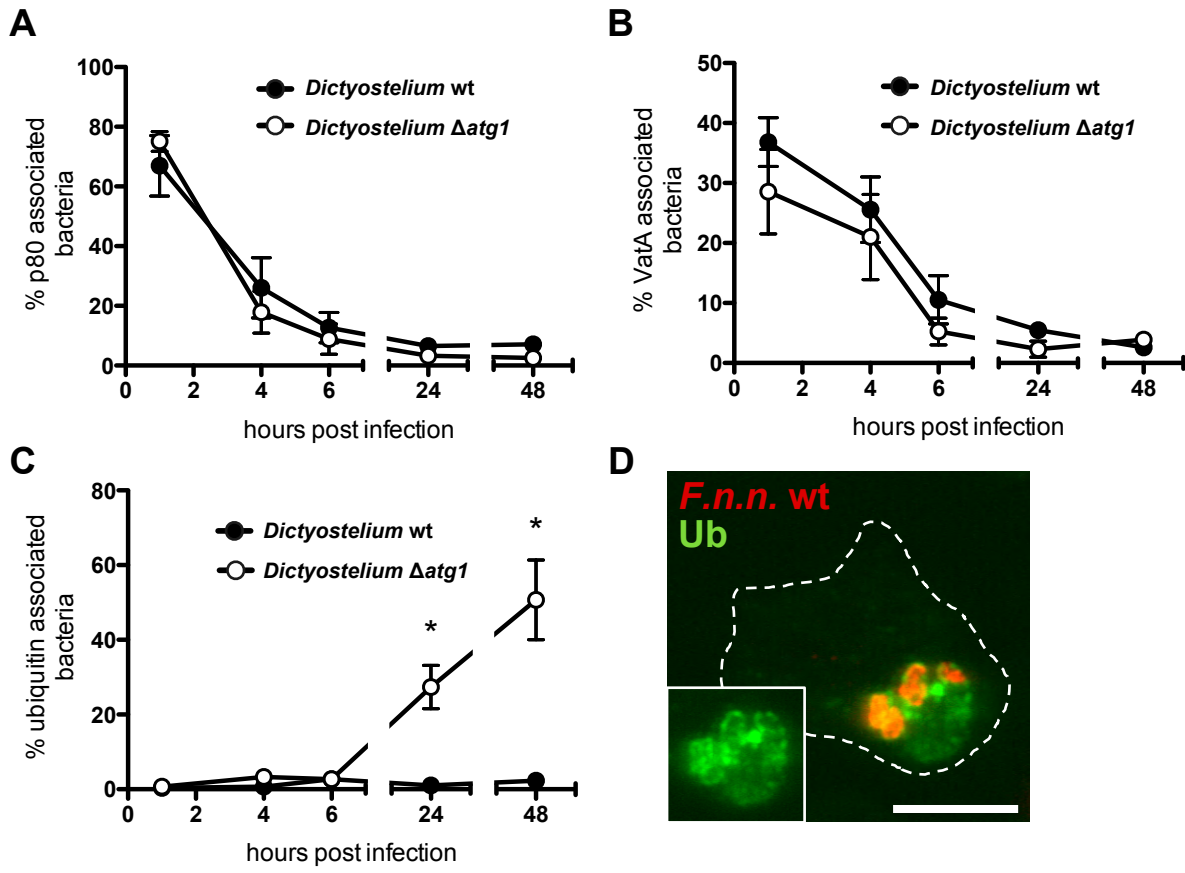


FIG S6



Primers used for cloning				
	Name	5'-3' sequence	Product size	Source
P1	Fnn_iglC_OF	GGTGGTGAACCATATGGCGC	P1+2: 2271 bp in mutant, 2837 bp in wt <i>F.n.n.</i>	This study
P2	Fnn_iglC_OR	TAAAGTCCCATTCCGAGCCTT		
P3	Fnn_iglC_IF	CACAGCAAGTTGCTAGAATAGGGTACATAGCAGCT	P1+4: 1184 bp	This study
P4	Fnn_iglC_IR	GCTATTCTAGCAACTTGCTGTCTTGTTATCATCTC	P2+3: 1105 bp	This study
P5	Fnn_iglC_C1F	GTGTATGTTGCAGAAATTTGATCA	P2+5: 2298 bp in mutant, 2864 bp in wt <i>F.n.n.</i>	This study
P6	Fnn_iglC_C2R	AACCGCACTACTATCCGCAAG	P1+6: 2294 bp in mutant, 2860 bp in wt <i>F.n.n.</i>	This study
P7	Fnn_iglD_IR	TC AAA GGC TGT TCT TAG ACC ATC TTC CCA ACA	P5+7: 1228 bp in mutant, 1794 in wt <i>F.n.n.</i>	This study
P8	Fn_groEL F	CATAAGACCAGCGATTGATGC	367 bp	This study
P9	Fn_groEL R	AAAAGATCGTGTGGATGATGC		
P10	Fnn_compl_tr_iglC_F(NdeI)	TCT GCA CAT ATG ATT ATG AAC GAG ATG ATA ACA AGA CAG	635 bp	This study
P11	Fnn_compl_tr_iglC_R(EcoRI)	CTGA GAA TTC CTA TAC AGC TGC TAT GTA CCC TAT TCT		
Primers used for qPCR				
	Name	5'-3' sequence	Product size	Source
Q1	Dd_rnlA_F	GGCGCTGGTCAAATAGTAAGTATATTAGA	85 bp	(1)
Q2	Dd_rnlA_R	GGTTACCGCCCCAGTCAAA		
Q3	Dd_gapdh_F	GGTTGTCCCAATTGGTATTAATGG	247 bp with gDNA, 156 bp with cDNA	(2)
Q4	Dd_gapdh_R	CCGTGGGTTGAATCATATTTGAAC		
Q5	Dd_atg8_F	CTCCAAGATCAGATGCACCA	163 bp	Frauke Bach (GI: 8625555)
Q6	Dd_atg8_R	GCAGCAGTTGGTGGGATAGT		
Q7	Dd_p62_F	TTGAAAATCGCACAACCAAC	172 bp	Frauke Bach (GI: 8617503)
Q8	Dd_p62_R	AGGAACCCTTTGGAATGACA		
Q9	Fnn_spec_F	TGAGTTGGTAACCATTGATTGTACATAGT	97 bp	(3)
Q10	Fnn_spec_R	CGAGTACCTGGTGGGAGAAAGA		
Q11	Fnn_iglB_F	GGTGCTGAGCAAATTCAAAA	85 bp	This study (GI:169589433)
Q12	Fnn_iglB_R	CCATCTCTAAAGGCGTTGGT		
Q13	Fnn_iglC_F	TAGGCGTATAACACTGGCTGC	70 bp	(4)
Q14	Fnn_iglC_R	TGCTATAGAAGGCGGAGAGG		
Q15	Fnn_iglD_F	TGTGAAAACCTCCCCGAAGA	77 bp	This study (GI:169589431)
Q16	Fnn_iglD_R	GCTGGAGCTATTGCCTTTCT		

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