

***Francisella tularensis* subsp. *novicida*, “Two-Allele” Transposon Mutant Library, Plate 22 (tnfn1_pw060419p02)**

Catalog No. NR-8056

For research use only. Not for human use.

Contributor:

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Product Description:

A comprehensive 16508-member transposon mutant library¹ of sequence-defined transposon insertion mutants of *Francisella tularensis* subsp. *novicida*, strain U112 was prepared to allow the systematic identification of virulence determinants and other factors associated with *Francisella* pathogenesis. Genes refractory to insertional inactivation helped define the genes essential for viability of the organism.

To facilitate genome-scale screening using the mutant collection, a “two-allele” single-colony purified sublibrary, made up of approximately two purified mutants per gene, was assembled.

NR-8056 represents Plate 22 (tnfn1_pw060419p02) of the “two-allele” 3050-member sublibrary. Detailed information for each mutant is shown in Tables 1-3. Information about specific clones may also be accessed through the [Francisella Tularensis Genome Research](#) homepage.

Francisella tularensis subsp. *novicida*, strain U112 is excluded from Select Agent status. Please see [CDC Select Agent Program, Notification of Exclusion](#).

Material Provided:

Each well of the 96-well plate contains approximately 0.25 mL of bacterial culture in 0.7X Tryptic Soy Broth containing 0.1% L-cysteine and 10 µg/mL kanamycin supplemented with 5% glycerol.

Note: Production in the 96-well format has a potential for cross-contamination. Individual mutants should be checked by the recipient prior to use.

Packaging/Storage:

NR-8056 was packaged aseptically in 96-well plates. The product is provided frozen and should be stored at -60°C or colder immediately upon arrival. For long-term storage, the vapor phase of a liquid nitrogen freezer is recommended. Freeze-thaw cycles should be avoided.

Growth Conditions:

Media:

Tryptic Soy Agar containing 0.1% L-cysteine and 10 µg/mL kanamycin

Incubation:

Temperature: 37°C

Atmosphere: Aerobic with 5% CO₂

Propagation:

1. Scrape top of frozen well with a pipette tip and streak onto agar plate.
2. Incubate the plate at 37°C for 24–48 hours.

Citation:

Acknowledgment for publications should read “The following reagent was obtained through the NIH Biodefense and Emerging Infections Research Resources Repository, NIAID, NIH: *Francisella tularensis* subsp. *novicida*, “Two-Allele” Transposon Mutant Library, Plate 22 (tnfn1_pw060419p02), NR-8056.”

Biosafety Level: 2

Appropriate safety procedures should always be used with this material. Laboratory safety is discussed in the following publication: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, and National Institutes of Health. [Biosafety in Microbiological and Biomedical Laboratories](#). 5th ed. Washington, DC: U.S. Government Printing Office, 2007; see www.cdc.gov/od/ohs/biosfty/bmb15/bmb15toc.htm.

Disclaimers:

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References:

1. Gallagher, L. A., et al. "A Comprehensive Transposon Mutant Library of *Francisella novicida*, A Bioweapon Surrogate." Proc. Natl. Acad. Sci. USA 104 (2007): 1009–1014. PubMed: 17215359.

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Table 1 - Transposon Type and Mutated Gene

| Strain Name | Well | Transposon type | Gene | Description | Function Class |
|-----------------------|------|-----------------|------|------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| tnfn1_pw060419p02q101 | A01 | T20 | - | hypothetical protein | hypothetical - novel |
| tnfn1_pw060419p02q102 | B01 | T20 | - | hypothetical protein | hypothetical - novel |
| tnfn1_pw060419p02q103 | C01 | T18 | - | protein of unknown function with radical SAM domain | unknown function - conserved |
| tnfn1_pw060419p02q104 | D01 | T20 | rpe | D-ribulose-phosphate 3-epimerase | energy metabolism |
| tnfn1_pw060419p02q105 | E01 | T20 | - | hypothetical membrane protein | hypothetical - novel |
| tnfn1_pw060419p02q106 | F01 | T20 | - | acetoacetate decarboxylase | other metabolism - biosynthesis |
| tnfn1_pw060419p02q107 | G01 | T20 | - | ATP-binding Cassette (ABC) superfamily protein | transport |
| tnfn1_pw060419p02q108 | H01 | T20 | - | conserved hypothetical membrane protein | hypothetical - conserved |
| tnfn1_pw060419p02q109 | A02 | <KAN-2> | - | conserved protein of unknown function | unknown function - conserved |
| tnfn1_pw060419p02q110 | B02 | <KAN-2> | - | protein of unknown function | unknown function - novel |
| tnfn1_pw060419p02q111 | C02 | <KAN-2> | - | conserved protein of unknown function | unknown function - conserved |
| tnfn1_pw060419p02q112 | D02 | <KAN-2> | appC | cytochrome bd-II terminal oxidase subunit I | energy metabolism |
| tnfn1_pw060419p02q113 | E02 | <KAN-2> | - | amino acid-polyamine-organocation (APC) superfamily protein | transport - amino-acid |
| tnfn1_pw060419p02q114 | F02 | <KAN-2> | - | hypothetical protein | hypothetical - novel |
| tnfn1_pw060419p02q115 | G02 | <KAN-2> | - | hypothetical membrane protein | hypothetical - novel |
| tnfn1_pw060419p02q116 | H02 | T18 | - | conserved protein of unknown function | unknown function - conserved |
| tnfn1_pw060419p02q117 | A03 | T18 | - | conserved protein of unknown function | unknown function - conserved |
| tnfn1_pw060419p02q118 | B03 | T18 | - | birA-like protein | post-translational modification, protein turnover, chaperones - protein modification |
| tnfn1_pw060419p02q119 | C03 | T18 | - | carbon-nitrogen hydrolase | putative enzymes |
| tnfn1_pw060419p02q120 | D03 | T18 | - | chitin-binding protein | putative enzymes |
| tnfn1_pw060419p02q121 | E03 | T18 | - | protein of unknown function | unknown function - novel |
| tnfn1_pw060419p02q122 | F03 | T18 | - | drug:H+ antiporter-1 (DHA1) family protein | transport - drugs / antibacterial compounds |
| tnfn1_pw060419p02q123 | G03 | T18 | - | monovalent cation:proton antiporter family protein | transport |
| tnfn1_pw060419p02q124 | H03 | T18 | pilN | Type IV pili associated protein | motility, attachment and secretion structure |
| tnfn1_pw060419p02q125 | A04 | T18 | - | protein of unknown function | unknown function - novel |
| tnfn1_pw060419p02q126 | B04 | T18 | - | small conductance mechanosensitive ion channel (MscS) family protein | transport |
| tnfn1_pw060419p02q127 | C04 | T18 | - | hypothetical protein | hypothetical - novel |
| tnfn1_pw060419p02q128 | D04 | T18 | - | protein of unknown function | unknown function - novel |
| tnfn1_pw060419p02q129 | E04 | T18 | - | hypothetical protein | hypothetical - novel |
| tnfn1_pw060419p02q130 | F04 | <KAN-2> | - | hypothetical protein | hypothetical - novel |
| tnfn1_pw060419p02q131 | G04 | T18 | - | hypothetical protein | hypothetical - novel |
| tnfn1_pw060419p02q132 | H04 | T18 | - | conserved protein of unknown function | unknown function - conserved |
| tnfn1_pw060419p02q133 | A05 | T18 | - | | |
| tnfn1_pw060419p02q134 | B05 | T20 | emrE | putative membrane transporter of cations and cationic drugs, multidrug resistance protein | transport - drugs / antibacterial compounds |
| tnfn1_pw060419p02q135 | C05 | T20 | ksgA | dimethyladenosine transferase | transport - amino-acid |
| tnfn1_pw060419p02q136 | D05 | T20 | - | metallopeptidase, M50B family | post-translational modification, protein turnover, chaperones - protein degradation |
| tnfn1_pw060419p02q137 | E05 | T20 | rfbB | iron-sulfur cluster-binding protein | putative enzymes |
| tnfn1_pw060419p02q138 | F05 | T20 | bioF | 8-amino-7-oxononanoate synthase | cofactors, prosthetic groups, electron carriers metabolism |
| tnfn1_pw060419p02q139 | G05 | T20 | - | glycosyl transferase, group 1 | cell wall / LPS / capsule |
| tnfn1_pw060419p02q140 | H05 | T20 | - | proton-dependent oligopeptide transporter (POT) family protein, di- or tripeptide:H+ symporter | transport |
| tnfn1_pw060419p02q141 | A06 | T20 | - | drug:H+ antiporter-1 (DHA2) family protein | transport - drugs / antibacterial compounds |
| tnfn1_pw060419p02q142 | B06 | T20 | - | conserved protein of unknown function | unknown function - conserved |
| tnfn1_pw060419p02q143 | C06 | T20 | - | conserved hypothetical protein | Potentially coding: hypothetical - conserved |
| tnfn1_pw060419p02q144 | D06 | T20 | ribD | pyrimidine reductase/pyrimidine deaminase | cofactors, prosthetic groups, electron carriers metabolism |
| tnfn1_pw060419p02q145 | E06 | T20 | pilQ | Type IV pili secretin component | motility, attachment and secretion structure |
| tnfn1_pw060419p02q146 | F06 | T20 | - | protein of unknown function | unknown function - novel |
| tnfn1_pw060419p02q147 | G06 | T20 | - | protein of unknown function | unknown function - novel |
| tnfn1_pw060419p02q148 | H06 | T20 | - | protein of unknown function | unknown function - novel |

Table 1 - Transposon Type and Mutated Gene

| Strain Name | Well | Transposon type | Gene | Description | Function Class |
|-----------------------|------|-----------------|------|----------------------------------------------------------------------------|------------------------------------------------------------------|
| tnfn1_pw060419p02q149 | A07 | T18 | - | conserved protein of unknown function | unknown function - conserved |
| tnfn1_pw060419p02q150 | B07 | T20 | - | acid phosphatase | fatty acids and lipids metabolism |
| tnfn1_pw060419p02q151 | C07 | T20 | - | transcriptional regulator, LysR family | signal transduction and regulation |
| tnfn1_pw060419p02q152 | D07 | T20 | - | hypothetical membrane protein | hypothetical - novel |
| tnfn1_pw060419p02q153 | E07 | T20 | ribD | pyrimidine reductase/pyrimidine deaminase | cofactors, prosthetic groups, electron carriers metabolism |
| tnfn1_pw060419p02q154 | F07 | T20 | - | hydroxy/aromatic amino acid permease (HAAAP) family protein | transport - amino-acid |
| tnfn1_pw060419p02q155 | G07 | T20 | gph | phosphoglycolate phosphatase | putative enzymes |
| tnfn1_pw060419p02q156 | H07 | T20 | apaH | diadenosine tetraphosphatase | signal transduction and regulation |
| tnfn1_pw060419p02q157 | A08 | T20 | - | aldo/keto reductase family protein | putative enzymes |
| tnfn1_pw060419p02q158 | B08 | T20 | hslR | heat shock protein 15 (HSP15) | translation, ribosomal structure and biogenesis |
| tnfn1_pw060419p02q159 | C08 | T20 | ilvD | dihydroxy-acid dehydratase | amino acid metabolism - biosynthesis |
| tnfn1_pw060419p02q160 | D08 | T20 | - | hypothetical membrane protein | hypothetical - novel |
| tnfn1_pw060419p02q161 | E08 | T20 | - | hypothetical membrane protein | hypothetical - novel |
| tnfn1_pw060419p02q162 | F08 | T20 | glgX | pullulanase | carbohydrate metabolism - degradation, utilization, assimilation |
| tnfn1_pw060419p02q163 | G08 | T20 | - | conserved hypothetical protein | hypothetical - conserved |
| tnfn1_pw060419p02q164 | H08 | T20 | - | protein of unknown function | putative enzymes |
| tnfn1_pw060419p02q165 | A09 | T20 | - | protein of unknown function | unknown function - novel |
| tnfn1_pw060419p02q166 | B09 | T20 | - | conserved hypothetical protein | hypothetical - conserved |
| tnfn1_pw060419p02q167 | C09 | T20 | - | cation diffusion facilitator (CDF) family protein | transport |
| tnfn1_pw060419p02q168 | D09 | T20 | gplX | fructose 1,6-bisphosphatase II | energy metabolism |
| tnfn1_pw060419p02q169 | E09 | T20 | parA | chromosome partition protein A, ATPase | cell cycle |
| tnfn1_pw060419p02q170 | F09 | T20 | - | conserved protein of unknown function | unknown function - conserved |
| tnfn1_pw060419p02q171 | G09 | T20 | - | hypothetical protein | hypothetical - novel |
| tnfn1_pw060419p02q172 | H09 | T20 | pilM | Type IV pili, pilus assembly protein | motility, attachment and secretion structure |
| tnfn1_pw060419p02q173 | A10 | T20 | dnaJ | chaperone, DnaJ family, with C-terminal Zn finger domain | post-translational modification, protein turnover, chaperones |
| tnfn1_pw060419p02q174 | B10 | T20 | bioB | biotin synthase | cofactors, prosthetic groups, electron carriers metabolism |
| tnfn1_pw060419p02q175 | C10 | T20 | - | conserved hypothetical membrane protein | hypothetical - conserved |
| tnfn1_pw060419p02q176 | D10 | <KAN-2> | - | conserved protein of unknown function | unknown function - conserved |
| tnfn1_pw060419p02q177 | E10 | <KAN-2> | crcB | CrcB family protein | cell cycle |
| tnfn1_pw060419p02q178 | F10 | T18 | - | transcriptional regulator | signal transduction and regulation |
| tnfn1_pw060419p02q179 | G10 | T18 | - | ATP-binding Cassette (ABC) superfamily protein | transport |
| tnfn1_pw060419p02q180 | H10 | T18 | - | drug:H+ antiporter-1 (DHA1) family protein | transport - drugs / antibacterial compounds |
| tnfn1_pw060419p02q181 | A11 | T20 | - | thioredoxin | cofactors, prosthetic groups, electron carriers metabolism |
| tnfn1_pw060419p02q182 | B11 | T20 | - | protein of unknown function | unknown function - novel |
| tnfn1_pw060419p02q183 | C11 | T20 | cyoC | cytochrome bo terminal oxidase subunit III | energy metabolism |
| tnfn1_pw060419p02q184 | D11 | T20 | - | membrane protein of unknown function | unknown function - novel |
| tnfn1_pw060419p02q185 | E11 | T20 | - | drug:H+ antiporter-1 (DHA1) family protein | transport - drugs / antibacterial compounds |
| tnfn1_pw060419p02q186 | F11 | T20 | - | conserved protein of unknown function | unknown function - conserved |
| tnfn1_pw060419p02q187 | G11 | T20 | - | transcriptional regulator, AraC family | signal transduction and regulation |
| tnfn1_pw060419p02q188 | H11 | T20 | - | NAD/FAD-binding protein | putative enzymes |
| tnfn1_pw060419p02q189 | A12 | T20 | potI | ATP-binding cassette putrescine uptake system, membrane protein, subunit I | transport |
| tnfn1_pw060419p02q190 | B12 | T20 | - | conserved protein of unknown function | unknown function - conserved |
| tnfn1_pw060419p02q191 | C12 | T20 | - | amino acid-polyamine-organocation family protein | transport - amino-acid |
| tnfn1_pw060419p02q192 | D12 | T20 | blaA | beta-lactamase class A | other metabolism - degradation, utilization, assimilation |
| tnfn1_pw060419p02q193 | E12 | T20 | - | monovalent cation:proton antiporter | transport |
| tnfn1_pw060419p02q194 | F12 | T20 | - | amino acid permease | transport - amino-acid |
| tnfn1_pw060419p02q195 | G12 | T20 | - | drug:H+ antiporter-1 (DHA1) family protein | transport - drugs / antibacterial compounds |
| tnfn1_pw060419p02q196 | H12 | T20 | - | MutT/nudix family protein | putative enzymes |

Table 2 - Sequencing and Insertion Location

| Strain Name | Well | Sequence confirmation (C, Confirmed; U, unconfirmed) | Effective Genome Position of Insertion | Direction of insertion (F, forward relative to genome; R, reverse) | Locus Tag | ORF left end | ORF right end | Direction of ORF (F, forward relative to genome; R, reverse) | Length of ORF (codons) | Effective position of insertion in ORF [nucleotide of insertion/length of ORF in nucleotides] |
|-----------------------|------|------------------------------------------------------|----------------------------------------|--------------------------------------------------------------------|------------|--------------|---------------|--------------------------------------------------------------|------------------------|-----------------------------------------------------------------------------------------------|
| tnfn1_pw060419p02q101 | A01 | C | 503452 | R | FTN_0497 | 503304 | 503723 | R | 140 | 272(420) |
| tnfn1_pw060419p02q102 | B01 | C | 850265 | F | FTN_0792 | 849966 | 850385 | R | 140 | 121(420) |
| tnfn1_pw060419p02q103 | C01 | U | 819267 | R | FTN_0761 | 818940 | 820022 | F | 361 | 328(1083) |
| tnfn1_pw060419p02q104 | D01 | C | 1292461 | R | FTN_1221 | 1292193 | 1292858 | R | 222 | 398(666) |
| tnfn1_pw060419p02q105 | E01 | C | 1330386 | F | FTN_1260 | 1329874 | 1331325 | F | 484 | 513(1452) |
| tnfn1_pw060419p02q106 | F01 | C | 865418 | F | FTN_0808 | 865255 | 865992 | R | 246 | 575(738) |
| tnfn1_pw060419p02q107 | G01 | C | 1339612 | F | FTN_1267 | 1338966 | 1339724 | F | 253 | 647(759) |
| tnfn1_pw060419p02q108 | H01 | C | 1093585 | F | FTN_1038 | 1093310 | 1093993 | F | 228 | 276(684) |
| tnfn1_pw060419p02q109 | A02 | C | 1306837 | R | FTN_1238 | 1306482 | 1307129 | R | 216 | 293(648) |
| tnfn1_pw060419p02q110 | B02 | C | 1540638 | R | FTN_1451 | 1540174 | 1540707 | R | 178 | 70(534) |
| tnfn1_pw060419p02q111 | C02 | C | 829241 | R | FTN_0772 | 829228 | 829515 | R | 96 | 275(288) |
| tnfn1_pw060419p02q112 | D02 | C | 1730310 | F | FTN_1619 | 1728955 | 1730328 | F | 458 | 1356(1374) |
| tnfn1_pw060419p02q113 | E02 | C | 598176 | R | FTN_0571 | 597725 | 599131 | R | 469 | 956(1407) |
| tnfn1_pw060419p02q114 | F02 | C | 151766 | R | FTN_0139 | 151697 | 151867 | R | 57 | 102(171) |
| tnfn1_pw060419p02q115 | G02 | C | 1621602 | R | FTN_1524 | 1621272 | 1621652 | R | 127 | 51(381) |
| tnfn1_pw060419p02q116 | H02 | C | 33174 | R | FTN_0033 | 32974 | 33519 | F | 182 | 201(546) |
| tnfn1_pw060419p02q117 | A03 | C | 494390 | F | FTN_0489 | 494328 | 494654 | R | 109 | 265(327) |
| tnfn1_pw060419p02q118 | B03 | U | 594701 | F | FTN_0568 | 594002 | 594781 | R | 260 | 81(780) |
| tnfn1_pw060419p02q119 | C03 | C | 1463140 | F | FTN_1383 | 1463001 | 1463768 | F | 256 | 140(768) |
| tnfn1_pw060419p02q120 | D03 | C | 1266183 | R | FTN_1192 | 1265920 | 1267707 | F | 596 | 264(1788) |
| tnfn1_pw060419p02q121 | E03 | C | 1616872 | F | FTN_1519 | 1616753 | 1617106 | R | 118 | 235(354) |
| tnfn1_pw060419p02q122 | F03 | C | 554978 | F | FTN_0533 | 554322 | 555512 | R | 397 | 535(1191) |
| tnfn1_pw060419p02q123 | G03 | C | 1073130 | F | FTN_1013 | 1072741 | 1073913 | R | 391 | 784(1173) |
| tnfn1_pw060419p02q124 | H03 | C | 1204642 | R | FTN_1140 | 1204444 | 1205004 | R | 187 | 363(561) |
| tnfn1_pw060419p02q125 | A04 | C | 771836 | F | FTN_0716 | 771325 | 772137 | F | 271 | 512(813) |
| tnfn1_pw060419p02q126 | B04 | C | 1678900 | F | FTN_1581 | 1678701 | 1679195 | R | 165 | 296(495) |
| tnfn1_pw060419p02q127 | C04 | C | 40469 | F | FTN_0038 | 40369 | 40650 | R | 94 | 182(282) |
| tnfn1_pw060419p02q128 | D04 | C | 1582413 | F | FTN_1490 | 1581779 | 1582627 | R | 283 | 215(849) |
| tnfn1_pw060419p02q129 | E04 | C | 785972 | R | FTN_0733 | 785970 | 786260 | R | 97 | 289(291) |
| tnfn1_pw060419p02q130 | F04 | C | 1000083 | R | FTN_0939 | 1000022 | 1000177 | R | 52 | 95(156) |
| tnfn1_pw060419p02q131 | G04 | C | 820795 | F | FTN_0764 | 820728 | 821078 | R | 117 | 284(351) |
| tnfn1_pw060419p02q132 | H04 | C | 1243659 | F | FTN_1172 | 1243043 | 1244494 | R | 484 | 836(1452) |
| tnfn1_pw060419p02q133 | A05 | C | 1454241 | R | intergenic | | | | | |
| tnfn1_pw060419p02q134 | B05 | U | 856623 | R | FTN_0799 | 856317 | 856643 | R | 109 | 21(327) |
| tnfn1_pw060419p02q135 | C05 | C | 587474 | R | FTN_0560 | 587181 | 587966 | F | 262 | 294(786) |
| tnfn1_pw060419p02q136 | D05 | C | 484774 | R | FTN_0479 | 484555 | 485208 | R | 218 | 435(654) |
| tnfn1_pw060419p02q137 | E05 | C | 1090680 | F | FTN_1034 | 1090247 | 1090873 | F | 209 | 434(627) |
| tnfn1_pw060419p02q138 | F05 | C | 871127 | R | FTN_0814 | 870744 | 871868 | R | 375 | 742(1125) |
| tnfn1_pw060419p02q139 | G05 | C | 143210 | F | FTN_0130 | 142461 | 143402 | F | 314 | 750(942) |
| tnfn1_pw060419p02q140 | H05 | C | 560996 | R | FTN_0537 | 560098 | 561507 | F | 470 | 899(1410) |
| tnfn1_pw060419p02q141 | A06 | C | 708852 | R | FTN_0667 | 708399 | 709784 | R | 462 | 933(1386) |
| tnfn1_pw060419p02q142 | B06 | C | 855199 | R | FTN_0798 | 854146 | 856299 | F | 718 | 1054(2154) |
| tnfn1_pw060419p02q143 | C06 | C | 1731709 | R | - | 1731290 | 1731751 | F | 154 | 420(462) |
| tnfn1_pw060419p02q144 | D06 | C | 125168 | R | FTN_0114 | 124591 | 125655 | R | 355 | 488(1065) |
| tnfn1_pw060419p02q145 | E06 | C | 1202168 | R | FTN_1137 | 1201461 | 1203242 | R | 594 | 1075(1782) |
| tnfn1_pw060419p02q146 | F06 | C | 1563369 | R | FTN_1475 | 1563112 | 1563483 | R | 124 | 115(372) |
| tnfn1_pw060419p02q147 | G06 | C | 1303689 | R | FTN_1235 | 1303554 | 1304012 | R | 153 | 324(459) |
| tnfn1_pw060419p02q148 | H06 | C | 1029409 | R | FTN_0975 | 1029173 | 1030660 | F | 496 | 237(1488) |

The Effective Genome Position of Insertion indicates the effective insertion position that is most likely to be functionally relevant in light of the 9-bp Tn5 target-site duplication and the direction of transcription of the predicted gene of insertion. E.g., for genes oriented to the right, the value reported indicates the genomic position of the nucleotide immediately adjacent to the left end of the insertion element when accounting for the 9-bp target site duplication.

Table 2 - Sequencing and Insertion Location

| Strain Name | Well | Sequence confirmation (C, Confirmed; U, unconfirmed) | Effective Genome Position of Insertion | Direction of insertion (F, forward relative to genome; R, reverse) | Locus Tag | ORF left end | ORF right end | Direction of ORF (F, forward relative to genome; R, reverse) | Length of ORF (codons) | Effective position of insertion in ORF [nucleotide of insertion(length of ORF in nucleotides)] |
|-----------------------|------|------------------------------------------------------|----------------------------------------|--------------------------------------------------------------------|-----------|--------------|---------------|--------------------------------------------------------------|------------------------|------------------------------------------------------------------------------------------------|
| tnfn1_pw060419p02q149 | A07 | C | 1640370 | R | FTN_1542 | 1640166 | 1640927 | F | 254 | 205(762) |
| tnfn1_pw060419p02q150 | B07 | C | 102034 | R | FTN_0090 | 101004 | 102545 | R | 514 | 512(1542) |
| tnfn1_pw060419p02q151 | C07 | C | 1740175 | R | FTN_1628 | 1739841 | 1740791 | R | 317 | 617(951) |
| tnfn1_pw060419p02q152 | D07 | C | 945707 | F | FTN_0888 | 945336 | 945869 | F | 178 | 372(534) |
| tnfn1_pw060419p02q153 | E07 | C | 125168 | R | FTN_0114 | 124591 | 125655 | R | 355 | 488(1065) |
| tnfn1_pw060419p02q154 | F07 | C | 1609370 | F | FTN_1512 | 1608678 | 1609847 | F | 390 | 693(1170) |
| tnfn1_pw060419p02q155 | G07 | C | 611341 | F | FTN_0582 | 611071 | 611742 | R | 224 | 402(672) |
| tnfn1_pw060419p02q156 | H07 | C | 588521 | R | FTN_0561 | 587981 | 588805 | F | 275 | 541(825) |
| tnfn1_pw060419p02q157 | A08 | C | 883160 | F | FTN_0825 | 882250 | 883320 | R | 357 | 161(1071) |
| tnfn1_pw060419p02q158 | B08 | C | 757398 | R | FTN_0712 | 757045 | 757410 | R | 122 | 13(366) |
| tnfn1_pw060419p02q159 | C08 | C | 1101498 | R | FTN_1043 | 1100825 | 1102504 | R | 560 | 1007(1680) |
| tnfn1_pw060419p02q160 | D08 | C | 151535 | F | FTN_0138 | 151080 | 151694 | F | 205 | 456(615) |
| tnfn1_pw060419p02q161 | E08 | C | 1080661 | F | FTN_1023 | 1080187 | 1080771 | R | 195 | 111(585) |
| tnfn1_pw060419p02q162 | F08 | C | 526882 | F | FTN_0512 | 524688 | 527897 | R | 1070 | 1016(3210) |
| tnfn1_pw060419p02q163 | G08 | C | 742320 | R | FTN_0699 | 742065 | 743228 | F | 388 | 256(1164) |
| tnfn1_pw060419p02q164 | H08 | C | 56117 | R | FTN_0047 | 53754 | 57527 | F | 1258 | 2364(3774) |
| tnfn1_pw060419p02q165 | A09 | C | 226963 | R | FTN_0206 | 226642 | 227115 | F | 158 | 322(474) |
| tnfn1_pw060419p02q166 | B09 | C | 776453 | F | FTN_0721 | 776068 | 777051 | R | 328 | 599(984) |
| tnfn1_pw060419p02q167 | C09 | C | 409379 | R | FTN_0411 | 409260 | 410144 | F | 295 | 120(885) |
| tnfn1_pw060419p02q168 | D09 | C | 306092 | F | FTN_0298 | 305744 | 306727 | F | 328 | 349(984) |
| tnfn1_pw060419p02q169 | E09 | C | 432337 | R | FTN_0433 | 432195 | 432833 | F | 213 | 143(639) |
| tnfn1_pw060419p02q170 | F09 | C | 1075375 | R | FTN_1016 | 1075256 | 1075756 | R | 167 | 382(501) |
| tnfn1_pw060419p02q171 | G09 | C | 916635 | F | FTN_0862 | 916124 | 917245 | F | 374 | 512(1122) |
| tnfn1_pw060419p02q172 | H09 | C | 1205829 | R | FTN_1141 | 1205009 | 1206010 | R | 334 | 182(1002) |
| tnfn1_pw060419p02q173 | A10 | C | 1355503 | R | FTN_1283 | 1354992 | 1356176 | R | 395 | 674(1185) |
| tnfn1_pw060419p02q174 | B10 | U | 872735 | F | FTN_0815 | 871865 | 872803 | R | 313 | 69(939) |
| tnfn1_pw060419p02q175 | C10 | C | 1483970 | R | FTN_1406 | 1483913 | 1484686 | R | 258 | 717(774) |
| tnfn1_pw060419p02q176 | D10 | C | 1242403 | R | FTN_1171 | 1242057 | 1243040 | R | 328 | 638(984) |
| tnfn1_pw060419p02q177 | E10 | C | 150379 | F | FTN_0136 | 150192 | 150533 | F | 114 | 188(342) |
| tnfn1_pw060419p02q178 | F10 | C | 905906 | F | FTN_0850 | 905800 | 906207 | F | 136 | 107(408) |
| tnfn1_pw060419p02q179 | G10 | C | 1339499 | F | FTN_1267 | 1338966 | 1339724 | F | 253 | 534(759) |
| tnfn1_pw060419p02q180 | H10 | U | 722093 | R | FTN_0678 | 721383 | 722594 | R | 404 | 502(1212) |
| tnfn1_pw060419p02q181 | A11 | C | 911349 | F | FTN_0856 | 911269 | 911592 | F | 108 | 81(324) |
| tnfn1_pw060419p02q182 | B11 | C | 150533 | R | FTN_0137 | 150533 | 150937 | F | 135 | 1(405) |
| tnfn1_pw060419p02q183 | C11 | C | 219946 | F | FTN_0197 | 219561 | 220160 | F | 200 | 386(600) |
| tnfn1_pw060419p02q184 | D11 | C | 812591 | F | FTN_0757 | 810052 | 814938 | F | 1629 | 2540(4887) |
| tnfn1_pw060419p02q185 | E11 | C | 721792 | R | FTN_0678 | 721383 | 722594 | R | 404 | 803(1212) |
| tnfn1_pw060419p02q186 | F11 | C | 620810 | R | FTN_0590 | 620283 | 621500 | F | 406 | 528(1218) |
| tnfn1_pw060419p02q187 | G11 | C | 1346376 | F | FTN_1274 | 1346150 | 1346974 | R | 275 | 599(825) |
| tnfn1_pw060419p02q188 | H11 | C | 1543541 | R | FTN_1454 | 1542637 | 1543887 | F | 417 | 905(1251) |
| tnfn1_pw060419p02q189 | A12 | C | 791119 | R | FTN_0737 | 790573 | 791376 | R | 268 | 258(804) |
| tnfn1_pw060419p02q190 | B12 | C | 1233985 | F | FTN_1162 | 1233942 | 1234244 | R | 101 | 260(303) |
| tnfn1_pw060419p02q191 | C12 | C | 1620586 | R | FTN_1523 | 1620541 | 1621251 | F | 237 | 46(711) |
| tnfn1_pw060419p02q192 | D12 | C | 1062425 | F | FTN_1002 | 1062223 | 1063104 | F | 294 | 203(882) |
| tnfn1_pw060419p02q193 | E12 | U | 157391 | F | FTN_0143 | 156853 | 158736 | F | 628 | 539(1884) |
| tnfn1_pw060419p02q194 | F12 | U | 955149 | R | FTN_0898 | 954503 | 956044 | R | 514 | 896(1542) |
| tnfn1_pw060419p02q195 | G12 | C | 323132 | F | FTN_0312 | 322772 | 323959 | F | 396 | 361(1188) |
| tnfn1_pw060419p02q196 | H12 | C | 241468 | R | FTN_0219 | 241266 | 241640 | F | 125 | 203(375) |

The Effective Genome Position of Insertion indicates the effective insertion position that is most likely to be functionally relevant in light of the 9-bp Tn5 target-site duplication and the direction of transcription of the predicted gene of insertion. E.g., for genes oriented to the right, the value reported indicates the genomic position of the nucleotide immediately adjacent to the left end of the insertion element when accounting for the 9-bp target site duplication.

Table 3 - Sequence Mapping Quality Metrics

| Strain Name | Well | Junction information | Position in sequence read of last vector nucleotide | Length of match to transposon | Transposon match score | Average phred score for transposon match | Genome position information | Length of match to genome | Genome match score | Average phred score for genome match |
|-----------------------|------|----------------------|-----------------------------------------------------|-------------------------------|------------------------|------------------------------------------|-----------------------------|---------------------------|--------------------|--------------------------------------|
| tnfn1_pw060419p02q101 | A01 | EXACT(0) | 156 | 142 | 103 | 26 | EXACT(0) | 200 | 176 | 47 |
| tnfn1_pw060419p02q102 | B01 | EXACT(0) | 156 | 145 | 113 | 30 | EXACT(0) | 200 | 164 | 42 |
| tnfn1_pw060419p02q103 | C01 | EXACT(0) | 125 | 119 | 105 | 37 | EXACT(0) | 158 | 102 | 33 |
| tnfn1_pw060419p02q104 | D01 | EXACT(0) | 156 | 151 | 118 | 37 | EXACT(0) | 200 | 191 | 56 |
| tnfn1_pw060419p02q105 | E01 | EXACT(0) | 155 | 153 | 123 | 37 | EXACT(0) | 200 | 192 | 55 |
| tnfn1_pw060419p02q106 | F01 | EXACT(0) | 156 | 145 | 140 | 44 | EXACT(0) | 200 | 182 | 57 |
| tnfn1_pw060419p02q107 | G01 | EXACT(0) | 161 | 150 | 136 | 34 | EXACT(0) | 200 | 184 | 56 |
| tnfn1_pw060419p02q108 | H01 | EXACT(0) | 156 | 145 | 128 | 47 | EXACT(0) | 200 | 146 | 48 |
| tnfn1_pw060419p02q109 | A02 | EXACT(0) | 117 | 119 | 87 | 38 | EXACT(0) | 200 | 177 | 48 |
| tnfn1_pw060419p02q110 | B02 | EXACT(0) | 118 | 107 | 82 | 23 | EXACT(0) | 200 | 192 | 52 |
| tnfn1_pw060419p02q111 | C02 | EXACT(0) | 117 | 111 | 89 | 33 | EXACT(0) | 200 | 195 | 46 |
| tnfn1_pw060419p02q112 | D02 | EXACT(0) | 119 | 112 | 85 | 32 | EXACT(0) | 200 | 193 | 48 |
| tnfn1_pw060419p02q113 | E02 | EXACT(0) | 121 | 119 | 104 | 38 | EXACT(0) | 200 | 190 | 62 |
| tnfn1_pw060419p02q114 | F02 | EXACT(0) | 116 | 112 | 97 | 37 | EXACT(0) | 200 | 182 | 59 |
| tnfn1_pw060419p02q115 | G02 | EXACT(0) | 117 | 107 | 90 | 36 | EXACT(0) | 200 | 187 | 36 |
| tnfn1_pw060419p02q116 | H02 | EXACT(0) | 123 | 112 | 94 | 27 | EXACT(0) | 200 | 176 | 48 |
| tnfn1_pw060419p02q117 | A03 | EXACT(0) | 123 | 120 | 69 | 23 | EXACT(0) | 200 | 185 | 54 |
| tnfn1_pw060419p02q118 | B03 | EXACT(0) | 122 | 112 | 85 | 22 | EXACT(0) | 200 | 180 | 54 |
| tnfn1_pw060419p02q119 | C03 | EXACT(0) | 124 | 117 | 101 | 28 | EXACT(0) | 200 | 194 | 57 |
| tnfn1_pw060419p02q120 | D03 | EXACT(0) | 125 | 119 | 105 | 28 | EXACT(0) | 200 | 144 | 30 |
| tnfn1_pw060419p02q121 | E03 | EXACT(0) | 123 | 120 | 104 | 35 | EXACT(0) | 200 | 175 | 50 |
| tnfn1_pw060419p02q122 | F03 | EXACT(0) | 125 | 120 | 115 | 37 | EXACT(0) | 200 | 186 | 54 |
| tnfn1_pw060419p02q123 | G03 | EXACT(0) | 125 | 115 | 109 | 31 | EXACT(0) | 200 | 172 | 48 |
| tnfn1_pw060419p02q124 | H03 | EXACT(0) | 122 | 112 | 90 | 26 | EXACT(0) | 200 | 182 | 55 |
| tnfn1_pw060419p02q125 | A04 | EXACT(0) | 124 | 119 | 103 | 34 | EXACT(0) | 200 | 186 | 51 |
| tnfn1_pw060419p02q126 | B04 | EXACT(0) | 125 | 120 | 106 | 39 | EXACT(0) | 84 | 77 | 51 |
| tnfn1_pw060419p02q127 | C04 | EXACT(0) | 121 | 112 | 90 | 29 | EXACT(0) | 200 | 172 | 53 |
| tnfn1_pw060419p02q128 | D04 | EXACT(0) | 122 | 120 | 99 | 38 | EXACT(0) | 199 | 150 | 45 |
| tnfn1_pw060419p02q129 | E04 | EXACT(0) | 122 | 119 | 92 | 29 | EXACT(0) | 200 | 170 | 58 |
| tnfn1_pw060419p02q130 | F04 | ADJUSTED(1) | 122 | 111 | 58 | 21 | ESTIMATE(56) | 143 | 72 | 24 |
| tnfn1_pw060419p02q131 | G04 | EXACT(0) | 125 | 120 | 94 | 23 | EXACT(0) | 200 | 180 | 43 |
| tnfn1_pw060419p02q132 | H04 | EXACT(0) | 124 | 112 | 81 | 22 | EXACT(0) | 200 | 194 | 54 |
| tnfn1_pw060419p02q133 | A05 | EXACT(0) | 121 | 120 | 86 | 25 | EXACT(0) | 200 | 158 | 37 |
| tnfn1_pw060419p02q134 | B05 | EXACT(0) | 156 | 138 | 117 | 26 | EXACT(0) | 200 | 185 | 32 |
| tnfn1_pw060419p02q135 | C05 | EXACT(0) | 156 | 145 | 137 | 41 | EXACT(0) | 170 | 159 | 51 |
| tnfn1_pw060419p02q136 | D05 | EXACT(0) | 156 | 145 | 134 | 41 | EXACT(0) | 200 | 178 | 65 |
| tnfn1_pw060419p02q137 | E05 | EXACT(0) | 158 | 153 | 139 | 40 | EXACT(0) | 200 | 165 | 43 |
| tnfn1_pw060419p02q138 | F05 | EXACT(0) | 158 | 152 | 128 | 36 | EXACT(0) | 200 | 184 | 55 |
| tnfn1_pw060419p02q139 | G05 | EXACT(0) | 159 | 153 | 119 | 30 | EXACT(0) | 200 | 187 | 55 |
| tnfn1_pw060419p02q140 | H05 | EXACT(0) | 155 | 145 | 126 | 38 | EXACT(0) | 200 | 180 | 57 |
| tnfn1_pw060419p02q141 | A06 | EXACT(0) | 158 | 153 | 127 | 30 | EXACT(0) | 200 | 183 | 53 |
| tnfn1_pw060419p02q142 | B06 | EXACT(0) | 157 | 153 | 126 | 31 | EXACT(0) | 200 | 191 | 59 |
| tnfn1_pw060419p02q143 | C06 | EXACT(0) | 157 | 145 | 132 | 34 | EXACT(0) | 200 | 171 | 60 |
| tnfn1_pw060419p02q144 | D06 | EXACT(0) | 157 | 153 | 124 | 25 | EXACT(0) | 200 | 189 | 48 |
| tnfn1_pw060419p02q145 | E06 | EXACT(0) | 156 | 153 | 135 | 40 | EXACT(0) | 200 | 198 | 53 |
| tnfn1_pw060419p02q146 | F06 | EXACT(0) | 157 | 145 | 139 | 44 | ESTIMATE(48) | 152 | 122 | 25 |
| tnfn1_pw060419p02q147 | G06 | EXACT(0) | 156 | 152 | 128 | 34 | EXACT(0) | 200 | 174 | 58 |
| tnfn1_pw060419p02q148 | H06 | EXACT(0) | 158 | 145 | 133 | 48 | EXACT(0) | 200 | 179 | 56 |

Table 3 - Sequence Mapping Quality Metrics

| Strain Name | Well | Junction information | Position in sequence read of last vector nucleotide | Length of match to transposon | Transposon match score | Average phred score for transposon match | Genome position information | Length of match to genome | Genome match score | Average phred score for genome match |
|-----------------------|------|----------------------|-----------------------------------------------------|-------------------------------|------------------------|------------------------------------------|-----------------------------|---------------------------|--------------------|--------------------------------------|
| tnfn1_pw060419p02q149 | A07 | EXACT(0) | 119 | 111 | 84 | 26 | EXACT(0) | 200 | 180 | 52 |
| tnfn1_pw060419p02q150 | B07 | EXACT(0) | 156 | 153 | 130 | 37 | EXACT(0) | 200 | 184 | 45 |
| tnfn1_pw060419p02q151 | C07 | EXACT(0) | 158 | 152 | 138 | 39 | EXACT(0) | 200 | 188 | 58 |
| tnfn1_pw060419p02q152 | D07 | EXACT(0) | 156 | 151 | 130 | 38 | EXACT(0) | 200 | 189 | 55 |
| tnfn1_pw060419p02q153 | E07 | EXACT(0) | 158 | 153 | 123 | 32 | EXACT(0) | 200 | 189 | 54 |
| tnfn1_pw060419p02q154 | F07 | EXACT(0) | 155 | 152 | 131 | 40 | EXACT(0) | 201 | 99 | 23 |
| tnfn1_pw060419p02q155 | G07 | EXACT(0) | 156 | 142 | 70 | 16 | EXACT(0) | 200 | 187 | 50 |
| tnfn1_pw060419p02q156 | H07 | EXACT(0) | 158 | 152 | 125 | 33 | EXACT(0) | 200 | 189 | 53 |
| tnfn1_pw060419p02q157 | A08 | EXACT(0) | 156 | 152 | 121 | 33 | EXACT(0) | 200 | 188 | 58 |
| tnfn1_pw060419p02q158 | B08 | EXACT(0) | 157 | 152 | 133 | 37 | EXACT(0) | 200 | 159 | 39 |
| tnfn1_pw060419p02q159 | C08 | EXACT(0) | 157 | 153 | 127 | 34 | EXACT(0) | 200 | 193 | 54 |
| tnfn1_pw060419p02q160 | D08 | EXACT(0) | 158 | 153 | 134 | 37 | ESTIMATE(2) | 198 | 182 | 60 |
| tnfn1_pw060419p02q161 | E08 | EXACT(0) | 157 | 145 | 129 | 49 | EXACT(0) | 200 | 160 | 27 |
| tnfn1_pw060419p02q162 | F08 | EXACT(0) | 158 | 153 | 132 | 32 | EXACT(0) | 197 | 184 | 52 |
| tnfn1_pw060419p02q163 | G08 | EXACT(0) | 156 | 153 | 132 | 44 | EXACT(0) | 201 | 169 | 39 |
| tnfn1_pw060419p02q164 | H08 | EXACT(0) | 159 | 152 | 146 | 38 | EXACT(0) | 193 | 176 | 55 |
| tnfn1_pw060419p02q165 | A09 | EXACT(0) | 155 | 116 | 57 | 16 | EXACT(0) | 200 | 186 | 51 |
| tnfn1_pw060419p02q166 | B09 | EXACT(0) | 157 | 152 | 130 | 33 | EXACT(0) | 200 | 174 | 47 |
| tnfn1_pw060419p02q167 | C09 | EXACT(0) | 157 | 145 | 83 | 15 | EXACT(0) | 200 | 175 | 50 |
| tnfn1_pw060419p02q168 | D09 | EXACT(0) | 158 | 153 | 141 | 38 | EXACT(0) | 200 | 194 | 53 |
| tnfn1_pw060419p02q169 | E09 | EXACT(0) | 156 | 145 | 112 | 28 | EXACT(0) | 200 | 186 | 49 |
| tnfn1_pw060419p02q170 | F09 | EXACT(0) | 155 | 150 | 126 | 38 | EXACT(0) | 99 | 97 | 36 |
| tnfn1_pw060419p02q171 | G09 | EXACT(0) | 157 | 145 | 136 | 40 | EXACT(0) | 200 | 182 | 55 |
| tnfn1_pw060419p02q172 | H09 | EXACT(0) | 162 | 152 | 125 | 38 | EXACT(0) | 200 | 187 | 47 |
| tnfn1_pw060419p02q173 | A10 | EXACT(0) | 159 | 151 | 138 | 32 | EXACT(0) | 200 | 188 | 50 |
| tnfn1_pw060419p02q174 | B10 | EXACT(0) | 158 | 153 | 142 | 40 | EXACT(0) | 200 | 175 | 35 |
| tnfn1_pw060419p02q175 | C10 | EXACT(0) | 156 | 144 | 107 | 26 | EXACT(0) | 200 | 177 | 56 |
| tnfn1_pw060419p02q176 | D10 | EXACT(0) | 121 | 120 | 75 | 23 | EXACT(0) | 200 | 189 | 49 |
| tnfn1_pw060419p02q177 | E10 | EXACT(0) | 116 | 112 | 92 | 31 | EXACT(0) | 196 | 161 | 24 |
| tnfn1_pw060419p02q178 | F10 | EXACT(0) | 121 | 106 | 88 | 31 | EXACT(0) | 199 | 143 | 35 |
| tnfn1_pw060419p02q179 | G10 | EXACT(0) | 123 | 106 | 92 | 27 | EXACT(0) | 200 | 190 | 48 |
| tnfn1_pw060419p02q180 | H10 | NONE | 0 | 0 | 0 | 18 | ESTIMATE(146) | 216 | 135 | 21 |
| tnfn1_pw060419p02q181 | A11 | EXACT(0) | 155 | 114 | 96 | 30 | EXACT(0) | 200 | 190 | 43 |
| tnfn1_pw060419p02q182 | B11 | EXACT(0) | 158 | 145 | 131 | 36 | EXACT(0) | 200 | 184 | 49 |
| tnfn1_pw060419p02q183 | C11 | EXACT(0) | 159 | 145 | 132 | 39 | EXACT(0) | 200 | 190 | 53 |
| tnfn1_pw060419p02q184 | D11 | EXACT(0) | 158 | 144 | 131 | 39 | EXACT(0) | 200 | 192 | 56 |
| tnfn1_pw060419p02q185 | E11 | EXACT(0) | 157 | 152 | 123 | 31 | EXACT(0) | 200 | 187 | 57 |
| tnfn1_pw060419p02q186 | F11 | EXACT(0) | 156 | 145 | 134 | 49 | EXACT(0) | 200 | 161 | 51 |
| tnfn1_pw060419p02q187 | G11 | EXACT(0) | 157 | 152 | 144 | 50 | EXACT(0) | 200 | 198 | 58 |
| tnfn1_pw060419p02q188 | H11 | EXACT(0) | 156 | 153 | 121 | 35 | EXACT(0) | 200 | 189 | 60 |
| tnfn1_pw060419p02q189 | A12 | EXACT(0) | 155 | 145 | 95 | 29 | EXACT(0) | 200 | 193 | 55 |
| tnfn1_pw060419p02q190 | B12 | EXACT(0) | 158 | 145 | 135 | 52 | EXACT(0) | 197 | 175 | 52 |
| tnfn1_pw060419p02q191 | C12 | EXACT(0) | 159 | 153 | 134 | 32 | EXACT(0) | 200 | 180 | 56 |
| tnfn1_pw060419p02q192 | D12 | EXACT(0) | 157 | 145 | 82 | 18 | EXACT(0) | 200 | 186 | 53 |
| tnfn1_pw060419p02q193 | E12 | EXACT(0) | 156 | 145 | 131 | 44 | EXACT(0) | 200 | 180 | 51 |
| tnfn1_pw060419p02q194 | F12 | EXACT(0) | 157 | 145 | 133 | 44 | EXACT(0) | 200 | 186 | 65 |
| tnfn1_pw060419p02q195 | G12 | EXACT(0) | 155 | 114 | 85 | 22 | EXACT(0) | 200 | 193 | 48 |
| tnfn1_pw060419p02q196 | H12 | EXACT(0) | 157 | 145 | 136 | 43 | EXACT(0) | 200 | 187 | 39 |