Supplementary Material

Table S1 Primers used in this study

|  |  |  |  |
| --- | --- | --- | --- |
| Primer name |  | Primer sequence (5’ – 3’) | Function |
| trkA\_Up794 | F | AAGGGTTGATTCCGTTTTGC | Generation of Δ*trkA* |
| R | AGCTATCGCTTGCTACATTAAGGTTTGTAAGATC |
| trkA\_Down800 | F | CGATGGAGCCCTCTCTTTTCGGACGGC |
| R | GATGCTGAGACTGCCGTA |
| trkA\_promoter\_BamHⅠ | F | GCATCGGGATCCGAGAGAGGTCGATAGGAAAA | Cloning of *trkA* and into pT-COW |
| trkA\_ORF\_salI | R | CGTAGCGTCGACTTAGCCGAAGAAGTCTTTCAGG |
| cdhR | F | CCACGCCACAGTAGAGGAAT | qPCR |
| R | TCTCTTTCTCCCGATTGGTG |
| sigCH | F | TACTGGAGCAATCCGAGACC | qPCR |
| R | GCTTCGACTTTCACGCCTAC |
| frdA | F | TTGCCGTATTCCTCGACTTC | qPCR |
| R | CGGATTCTCATCTGCGATCT |
| frdB | F | AGAGACCTCATGGTGGATCG | qPCR |
| R | CGCATTCTTCTTGGAAATGG |
| sdhC | F | TCCGCTACACATTCAACCAA | qPCR |
| R | TTGTTCCATCCCAAGGTCTG |
| hagA | F | GGGTGTCTCCAAAGGTAACGA | qPCR |
| R | CACTACAACGGACGCAGCA |
| kgp | F | AGGAACGACAAACGCCTCTAT | qPCR |
| R | CACCAACCAAAGCCAAGAAG |
| rgpA | F | GACAAGGACCGACGAAAGAA | qPCR |
| R | TAATCGCTTCCACCACCTTC |
| hbp35 | F | GGATCAAACATTGGGCATTC | qPCR |
| R | GGGCTGTACCATCACCAAAA |
| hmuY | F | TACGAAATGGGACCTGATGG | qPCR |
| R | CCAACCACCTGAAGCAAATC |
| hmuR | F | GCGACGGACAGAAATACGAT | qPCR |
| R | GCCTGCAACATTCAGTTCCT |
| ihtA | F | ATCTCCAGACGGATGAGTGG | qPCR |
| R | AAAGGCTCACGCCAAGTCTA |
| ihtB | F | CGAGTCCGATCCCTCTATCA | qPCR |
| R | ACGTCTTCCGACTATCGTCCT |
| husA | F | AGCCTGTTTGCGTAGCATG | qPCR |
| R | GATTAGCAGGGTTGGCTTCA |
| husB | F | CAGAACAAGACGGTGCTCAA | qPCR |
| R | CTCACGATCTCCCACATCCT |

Table S2 Upregulated genes in *P. gingivalis* W83 Δ*trkA* strain

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Gene ID | Gene name | Log2FC | P value | Regulate |
| CF003\_2219 | trkH | 3.222420502 | 4.52E-184 | Up |
| CF003\_1237 | cdhR | 4.704806767 | 6.19E-125 | Up |
| CF003\_1236 | scdA | 3.612042835 | 1.89E-124 | Up |
| CF003\_0865 | CF003\_0865 | 2.566188145 | 2.61E-91 | Up |
| CF003\_1746 | CF003\_1746 | 3.038825394 | 8.52E-80 | Up |
| CF003\_1870 | ycgJ | 2.569545952 | 1.46E-77 | Up |
| CF003\_1350 | CF003\_1350 | 2.005236303 | 1.62E-44 | Up |
| CF003\_1181 | betI\_1 | 2.152584602 | 4.84E-43 | Up |
| CF003\_2101 | CF003\_2101 | 1.613505102 | 1.12E-42 | Up |
| CF003\_0778 | tsaB | 2.373950043 | 5.28E-40 | Up |
| CF003\_1335 | CF003\_1335 | 1.523431581 | 4.65E-36 | Up |
| CF003\_1682 | yqgM | 1.766611143 | 7.01E-36 | Up |
| CF003\_1240 | kstR2 | 1.853912935 | 1.65E-33 | Up |
| CF003\_1175 | ndvA\_1 | 1.855186871 | 2.37E-33 | Up |
| CF003\_1829 | fadD15 | 2.236583914 | 1.31E-27 | Up |
| CF003\_1180 | ydfJ\_1 | 1.768153233 | 2.21E-27 | Up |
| CF003\_1178 | CF003\_1178 | 2.097569696 | 3.45E-27 | Up |
| CF003\_1019 | CF003\_1019 | 1.552588575 | 8.00E-26 | Up |
| CF003\_1055 | tpr\_7 | 1.660578208 | 3.57E-24 | Up |
| CF003\_1176 | irtA\_1 | 1.489987444 | 4.43E-24 | Up |
| CF003\_1681 | glgX | 1.103962959 | 7.04E-24 | Up |
| CF003\_1000 | alkD | 1.741048622 | 7.04E-24 | Up |
| CF003\_2061 | dfrA | 1.379963438 | 9.62E-24 | Up |
| CF003\_0856 | CF003\_0856 | 1.737661605 | 1.02E-23 | Up |
| CF003\_2102 | tapA | 1.484417344 | 2.12E-23 | Up |
| CF003\_n10 | CF003\_n10 | 2.032664306 | 2.35E-22 | Up |
| CF003\_1602 | CF003\_1602 | 1.595423108 | 3.64E-22 | Up |
| CF003\_0798 | CF003\_0798 | 1.810638756 | 5.93E-22 | Up |
| CF003\_0418 | clpP | 1.35785192 | 2.83E-21 | Up |
| CF003\_0573 | rsmH | 1.060008412 | 5.05E-21 | Up |
| CF003\_1179 | CF003\_1179 | 1.642534973 | 5.18E-21 | Up |
| CF003\_0029 | spoU | 1.510616444 | 3.66E-20 | Up |
| CF003\_n28 | CF003\_n28 | 1.373550954 | 3.80E-20 | Up |
| CF003\_1326 | kgp\_2 | 1.289261786 | 6.42E-20 | Up |
| CF003\_1211 | dapH | 1.395310032 | 3.07E-19 | Up |
| CF003\_1764 | fabF | 1.110221549 | 7.16E-19 | Up |
| CF003\_1212 | bepA\_2 | 1.281467927 | 2.69E-17 | Up |
| CF003\_1189 | CF003\_1189 | 1.003697356 | 9.49E-17 | Up |
| CF003\_1001 | CF003\_1001 | 1.692560377 | 1.33E-16 | Up |
| CF003\_0997 | hipB\_1 | 1.437474331 | 2.78E-16 | Up |
| CF003\_1775 | grpE | 1.318153238 | 4.26E-16 | Up |
| CF003\_1927 | rplX | 1.145327585 | 4.98E-16 | Up |
| CF003\_1469 | hsdM | 1.153151932 | 6.67E-16 | Up |
| CF003\_1308 | CF003\_1308 | 1.318103695 | 1.43E-15 | Up |
| CF003\_1032 | CF003\_1032 | 1.697527711 | 2.21E-15 | Up |
| CF003\_0963 | CF003\_0963 | 1.519504621 | 3.18E-15 | Up |
| CF003\_0849 | CF003\_0849 | 1.545655668 | 3.81E-15 | Up |
| CF003\_n25 | CF003\_n25 | 1.599022443 | 4.29E-15 | Up |
| CF003\_1765 | acpP | 1.0693935 | 6.98E-15 | Up |
| CF003\_0860 | CF003\_0860 | 1.58238124 | 1.53E-14 | Up |
| CF003\_1880 | mftF | 1.042018479 | 2.52E-14 | Up |
| CF003\_1465 | CF003\_1465 | 2.27669102 | 3.60E-14 | Up |
| CF003\_2048 | CF003\_2048 | 1.172506727 | 4.33E-14 | Up |
| CF003\_1696 | llaBIIM | 1.148406864 | 5.47E-14 | Up |
| CF003\_0389 | nusG | 1.065929296 | 6.90E-14 | Up |
| CF003\_1745 | thrS\_1 | 1.076689806 | 1.17E-13 | Up |
| CF003\_0999 | CF003\_0999 | 1.417605316 | 2.77E-13 | Up |
| CF003\_1213 | rnhA | 1.429469099 | 3.12E-13 | Up |
| CF003\_2030 | CF003\_2030 | 1.09103007 | 4.75E-13 | Up |
| CF003\_0968 | mrr | 1.315957978 | 1.03E-12 | Up |
| CF003\_1857 | CF003\_1857 | 1.191123084 | 1.08E-12 | Up |
| CF003\_1879 | yqhO | 1.010948752 | 1.11E-12 | Up |
| CF003\_2169 | CF003\_2169 | 1.093057482 | 1.48E-12 | Up |
| CF003\_0574 | ftsL | 1.085950867 | 3.18E-12 | Up |
| CF003\_1020 | tonB\_4 | 1.174185875 | 4.77E-12 | Up |
| CF003\_n40 | CF003\_n40 | 1.175817363 | 6.34E-12 | Up |
| CF003\_2176 | CF003\_2176 | 13.80241236 | 1.17E-11 | Up |
| CF003\_0565 | asxL | 1.392920981 | 1.53E-11 | Up |
| CF003\_1142 | epsG | 1.032930158 | 2.68E-11 | Up |
| CF003\_0918 | CF003\_0918 | 1.352565239 | 7.92E-11 | Up |
| CF003\_1493 | cnaB\_3 | 1.078453984 | 1.04E-10 | Up |
| CF003\_0847 | CF003\_0847 | 2.101433902 | 1.46E-10 | Up |
| CF003\_0346 | engB | 1.275005505 | 1.80E-10 | Up |
| CF003\_0719 | haeS | 1.247595736 | 1.96E-10 | Up |
| CF003\_0423 | CF003\_0423 | 1.06829307 | 2.07E-10 | Up |
| CF003\_0271 | ssb | 1.107873651 | 2.50E-10 | Up |
| CF003\_0521 | groS | 1.13418393 | 3.06E-10 | Up |
| CF003\_1499 | CF003\_1499 | 1.045749511 | 3.13E-10 | Up |
| CF003\_0261 | CF003\_0261 | 1.46840367 | 3.66E-10 | Up |
| CF003\_1683 | amyA\_1 | 1.179871016 | 5.37E-10 | Up |
| CF003\_1026 | CF003\_1026 | 1.387286208 | 8.59E-10 | Up |
| CF003\_n26 | pssA | 1.372857569 | 1.15E-09 | Up |
| CF003\_0181 | mfa4 | 1.204015463 | 2.34E-09 | Up |
| CF003\_1118 | clpB | 1.225147954 | 2.77E-09 | Up |
| CF003\_1262 | CF003\_1262 | 1.093065593 | 3.30E-09 | Up |
| CF003\_0834 | CF003\_0834 | 1.072662602 | 4.56E-09 | Up |
| CF003\_2092 | CF003\_2092 | 1.012555915 | 5.32E-09 | Up |
| CF003\_1238 | truC | 1.394739102 | 6.45E-09 | Up |
| CF003\_0866 | CF003\_0866 | 1.080749109 | 7.11E-09 | Up |
| CF003\_0480 | cobI | 1.06575466 | 7.95E-09 | Up |
| CF003\_1512 | CF003\_1512 | 2.976201681 | 2.00E-08 | Up |
| CF003\_1601 | birA | 1.036149585 | 4.34E-08 | Up |
| CF003\_1466 | icmt | 2.060297277 | 7.12E-08 | Up |
| CF003\_0930 | vgrG | 1.212926285 | 8.59E-08 | Up |
| CF003\_1003 | acg | 1.129530125 | 9.20E-08 | Up |
| CF003\_1447 | btr\_1 | 2.087974649 | 1.22E-07 | Up |
| CF003\_0826 | btr\_2 | 2.087974649 | 1.22E-07 | Up |
| CF003\_0214 | sigCH | 1.166149512 | 1.28E-07 | Up |
| CF003\_0682 | macB\_3 | 1.073090406 | 3.87E-07 | Up |
| CF003\_0848 | CF003\_0848 | 1.246557665 | 5.71E-07 | Up |
| CF003\_1467 | ubiE\_2 | 1.827467763 | 6.46E-07 | Up |
| CF003\_1318 | sigW\_3 | 1.013842058 | 1.59E-06 | Up |
| CF003\_0680 | bepF | 1.070151596 | 8.47E-06 | Up |
| CF003\_1503 | lytB | 2.08929736 | 1.48E-05 | Up |
| CF003\_0871 | CF003\_0871 | 2.06105192 | 2.30E-05 | Up |
| CF003\_1534 | CF003\_1534 | 3.672084103 | 3.63E-05 | Up |
| CF003\_1505 | rSAM | 2.673541266 | 7.24E-05 | Up |
| CF003\_1617 | CF003\_1617 | 2.718767716 | 0.000215599 | Up |
| CF003\_0846 | CF003\_0846 | 1.083289228 | 0.000276896 | Up |
| CF003\_1489 | mobB | 1.492572964 | 0.000299273 | Up |
| CF003\_1165 | CF003\_1165 | 1.374512026 | 0.000383411 | Up |
| CF003\_1359 | CF003\_1359 | 1.032160669 | 0.000424808 | Up |
| CF003\_1929 | rpsQ | 1.30889447 | 0.000557266 | Up |
| CF003\_0917 | gtrA | 1.231181273 | 0.000657501 | Up |
| CF003\_1461 | CF003\_1461 | 4.130896011 | 0.000858625 | Up |
| CF003\_0870 | CF003\_0870 | 1.9403381 | 0.00087059 | Up |
| CF003\_0216 | CF003\_0216 | 1.191587938 | 0.000996558 | Up |
| CF003\_1470 | CF003\_1470 | 1.379089879 | 0.002459673 | Up |
| CF003\_0875 | CF003\_0875 | 2.183582795 | 0.00261471 | Up |
| CF003\_2194 | CF003\_2194 | 1.367999705 | 0.007252537 | Up |
| CF003\_0868 | bmgA | 1.4316771 | 0.011992058 | Up |
| CF003\_1479 | traJ | 1.349081176 | 0.012173743 | Up |
| CF003\_1199 | CF003\_1199 | 2.811036824 | 0.014654938 | Up |
| CF003\_1460 | CF003\_1460 | 5.371049567 | 0.016317934 | Up |
| CF003\_n06 | CF003\_n06 | 1.350257963 | 0.027141994 | Up |
| CF003\_0003 | wecH | 1.73661899 | 0.039014991 | Up |
| CF003\_0874 | CF003\_0874 | 1.309713516 | 0.039014991 | Up |
| CF003\_1522 | menC | 1.56644774 | 0.042101453 | Up |
| CF003\_n31 | hdoG | 1.061716866 | 0.04502463 | Up |

Table S3 Downregulated genes in *P. gingivalis* W83 Δ*trkA* strain

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Gene ID | Gene name | Log2FC | P value | Regulate |
| CF003\_1421 | fdx | -2.287215016 | 2.25E-61 | Down |
| CF003\_1715 | cnaB | -1.661926995 | 8.91E-48 | Down |
| CF003\_0306 | rnfG | -2.014827093 | 1.55E-41 | Down |
| CF003\_1615 | frdA | -1.908875997 | 5.28E-40 | Down |
| CF003\_1614 | frdB | -2.487360163 | 1.42E-36 | Down |
| CF003\_1108 | terB | -1.737793625 | 3.01E-35 | Down |
| CF003\_1547 | CF003\_1547 | -2.278448974 | 1.70E-32 | Down |
| CF003\_0307 | rnfE | -1.83463962 | 2.39E-31 | Down |
| CF003\_1616 | sdhC | -1.62221776 | 3.08E-31 | Down |
| CF003\_0303 | rsxB | -1.578325491 | 7.52E-31 | Down |
| CF003\_0548 | nifJ | -1.455569434 | 9.65E-29 | Down |
| CF003\_2117 | rpsP | -1.537817004 | 1.27E-24 | Down |
| CF003\_1121 | asnS | -1.279130915 | 1.85E-24 | Down |
| CF003\_1543 | yneP | -1.5310879 | 1.33E-23 | Down |
| CF003\_1844 | kgp\_4 | -1.238185403 | 7.48E-23 | Down |
| CF003\_1545 | sodB | -1.667412696 | 1.34E-22 | Down |
| CF003\_0547 | bioM | -1.468051783 | 4.15E-22 | Down |
| CF003\_1144 | prfB | -1.232258922 | 5.45E-22 | Down |
| CF003\_1089 | srrA | -1.206347363 | 7.47E-22 | Down |
| CF003\_0195 | rbr | -1.670599092 | 1.12E-21 | Down |
| CF003\_0144 | CF003\_0144 | -1.628407778 | 1.14E-20 | Down |
| CF003\_2034 | pyrK\_2 | -1.462766806 | 6.42E-20 | Down |
| CF003\_0304 | rnfC | -1.206449126 | 4.63E-19 | Down |
| CF003\_0592 | rpmE | -1.363612717 | 5.91E-19 | Down |
| CF003\_0332 | rho | -1.285500701 | 1.17E-18 | Down |
| CF003\_0046 | cdsA | -1.077816322 | 2.25E-18 | Down |
| CF003\_2216 | CF003\_2216 | -1.301176079 | 2.82E-18 | Down |
| CF003\_0377 | rpsB | -1.00374776 | 2.88E-18 | Down |
| CF003\_0429 | korA\_1 | -1.21685819 | 1.43E-17 | Down |
| CF003\_0627 | rbp | -1.305245041 | 1.18E-16 | Down |
| CF003\_1812 | korA\_2 | -1.001081566 | 1.33E-16 | Down |
| CF003\_1069 | kdd | -1.038683335 | 1.67E-16 | Down |
| CF003\_2182 | nqrA | -1.103678101 | 4.48E-16 | Down |
| CF003\_1117 | mdtK | -1.392307828 | 6.81E-16 | Down |
| CF003\_1786 | CF003\_1786 | -1.396244103 | 7.58E-16 | Down |
| CF003\_1758 | rpsO | -1.575100792 | 7.59E-16 | Down |
| CF003\_1122 | rluB | -1.046680649 | 1.23E-15 | Down |
| CF003\_0302 | fis | -1.175745368 | 2.38E-15 | Down |
| CF003\_0167 | rplY | -1.112395256 | 3.37E-15 | Down |
| CF003\_0308 | rsxA | -1.542701726 | 4.66E-15 | Down |
| CF003\_0006 | mepA\_1 | -1.152095514 | 4.83E-15 | Down |
| CF003\_2140 | rpmF | -1.771981525 | 5.48E-15 | Down |
| CF003\_1013 | scpC | -1.069224207 | 5.52E-15 | Down |
| CF003\_2177 | nqrF | -1.346198867 | 2.30E-14 | Down |
| CF003\_1964 | wbaP\_1 | -1.103389984 | 1.23E-13 | Down |
| CF003\_0430 | korB\_1 | -1.164311321 | 1.65E-13 | Down |
| CF003\_2179 | nqrD | -1.601098077 | 2.61E-13 | Down |
| CF003\_2033 | gltD | -1.029286269 | 6.58E-13 | Down |
| CF003\_0435 | ptpZ | -1.127081262 | 6.91E-13 | Down |
| CF003\_1640 | dinF | -1.233600108 | 8.00E-13 | Down |
| CF003\_1540 | queA\_1 | -1.092145471 | 1.11E-12 | Down |
| CF003\_2213 | nasD | -1.225428218 | 2.36E-12 | Down |
| CF003\_0712 | CF003\_0712 | -1.201303828 | 2.39E-12 | Down |
| CF003\_0375 | rplM | -1.019615757 | 2.94E-12 | Down |
| CF003\_0745 | gloA | -1.056664245 | 7.66E-12 | Down |
| CF003\_0141 | parB | -1.010148512 | 8.02E-12 | Down |
| CF003\_1828 | pg-lp | -1.455514716 | 1.34E-11 | Down |
| CF003\_0143 | ybeM | -1.133596909 | 3.17E-11 | Down |
| CF003\_1960 | rpmB | -1.155661641 | 4.30E-11 | Down |
| CF003\_2180 | nqrC | -1.21914184 | 6.48E-11 | Down |
| CF003\_1393 | mrdA | -1.051144595 | 1.33E-10 | Down |
| CF003\_0315 | rpmA | -1.115192425 | 1.35E-10 | Down |
| CF003\_2178 | nqrE | -1.208897991 | 1.45E-10 | Down |
| CF003\_0305 | rsxD | -1.024405374 | 2.83E-10 | Down |
| CF003\_0286 | CF003\_0286 | -1.34620683 | 3.13E-10 | Down |
| CF003\_2139 | CF003\_2139 | -1.044495896 | 3.53E-10 | Down |
| CF003\_2126 | yggS | -1.047552419 | 7.20E-10 | Down |
| CF003\_1959 | rpmG | -1.225307856 | 7.20E-10 | Down |
| CF003\_0475 | hemN | -1.192458333 | 1.13E-09 | Down |
| CF003\_1548 | prtT | -1.140872388 | 1.73E-09 | Down |
| CF003\_0108 | epsD | -1.016566527 | 1.73E-09 | Down |
| CF003\_1427 | speB | -1.040793511 | 1.76E-09 | Down |
| CF003\_0018 | CF003\_0018 | -1.211963683 | 3.00E-09 | Down |
| CF003\_1723 | rpsT | -1.332135697 | 8.72E-09 | Down |
| CF003\_0587 | yadS | -1.052452733 | 8.49E-08 | Down |
| CF003\_0082 | ygjK\_2 | -1.00056663 | 1.41E-07 | Down |
| CF003\_1813 | psaC | -1.006714604 | 2.24E-07 | Down |
| CF003\_0083 | CF003\_0083 | -1.011923832 | 2.27E-07 | Down |
| CF003\_2006 | CF003\_2006 | -1.111534024 | 4.30E-07 | Down |
| CF003\_0989 | rplT | -1.159762874 | 4.57E-07 | Down |
| CF003\_1259 | nrdG | -1.018430726 | 5.23E-07 | Down |
| CF003\_1098 | CF003\_1098 | -1.01328164 | 1.54E-06 | Down |
| CF003\_0385 | rpsU | -1.073137057 | 4.68E-06 | Down |
| CF003\_n15 | pntA | -1.011141387 | 5.32E-06 | Down |
| CF003\_1495 | topB\_3 | -1.136609694 | 0.000283672 | Down |
| CF003\_0656 | rpmH | -1.1252642 | 0.000555811 | Down |



**Supplementary Figure 1.** Bone volume and density analysis of murine alveolar bone. (A) bone volume fraction, (B) trabecular separation, (C) trabecular thickness and (D) trabecular number of the three-dimensional micro-CT reconstruction were analyzed. All data are in means ± SD form. \*p < 0.05, \*\*p < 0.01.