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| --- | --- | --- | --- |
| Active site residues B10-CD1-E7-E11-G8 |  |  | Specie (uniprotID) |
| YHTLW | 3,52E-03 | 3,04E-05 | O: Polaromonas naphthalenivorans CJ2(A1VPS5\_POLNA), Marinomonas sp MWYL1(A6VRD1\_MARMS), Xanthobacter autotrophicus Py2(A7IBJ8\_XANP2), mine drainage metagenome(E6PT94\_9ZZZZ), Methylosinus trichosporium OB3b(D5QKG5\_METTR), Nitrospirillum amazonense Y2(G1XWD4\_9PROT), Thiomonas intermedia K12(D5X1M5\_THIK1), Burkholderiales bacterium JOSHI\_001(H5WW47\_9BURK), Azorhizobium caulinodans ORS 571(A8IIN8\_AZOC5), Beggiatoa sp PS(A7BTI1\_9GAMM), marine gamma proteobacterium HTCC2143(A0YE49\_9GAMM), Burkholderia xenovorans LB400(Q13N39\_BURXL), Methylocella silvestris BL2(B8EJ43\_METSB,B8ELT2\_METSB) |
| YFMKW | 4,47E-04 | 3,04E-05 | P: Rhizobium leguminosarum bv trifolii(B5ZXR3\_RHILW), Agrobacterium sp ATCC 31749(F5J5A9\_9RHIZ), Agrobacterium tumefaciens F2(F7U441\_RHIRD), Sinorhizobium medicae WSM419(A6ULS3\_SINMW), Agrobacterium tumefaciens CCNWGS0286(G6XXM2\_RHIRD), Sinorhizobium fredii NGR234(C3KMT5\_RHISN), Rhizobium sp PDO1-076(H4F0B9\_9RHIZ), Rhizobium etli CFN 42(Q2KDK7\_RHIEC), Agrobacterium tumefaciens 5A(H0HAA1\_RHIRD), Rhizobium etli CIAT 652(B3PYD4\_RHIE6), Rhizobium leguminosarum bv viciae(Q1MMQ0\_RHIL3), Sinorhizobium meliloti CCNWSX0020(H0FT84\_RHIML) |
| YFQVW | 1,05E+01 | 9,85E-05 | P: Lysobacter sp ATCC 53042(F8TUD7\_9GAMM), Roseobacter sp AzwK-3b(A6FK96\_9RHOB) |
| VFLLL | 2,69E+04 | 1,87E-01 | N: Acidithiobacillus caldus SM-1(F9ZLS8\_ACICS,F9ZPY0\_ACICS), Limnobacter sp MED105(A6GNQ3\_9BURK), Halothiobacillus neapolitanus c2(D0L0N5\_HALNC), Hyphomonas neptunium ATCC 15444(Q0BZ22\_HYPNA), Oxalobacteraceae bacterium IMCC9480(F1VZN5\_9BURK), Acidiphilium cryptum JF-5(A5G112\_ACICJ), Burkholderiales bacterium JOSHI\_001(H5WPM9\_9BURK), Brevundimonas subvibrioides ATCC 15264(D9QNS8\_BRESC), Cupriavidus necator N-1(F8GPA5\_CUPNN), Ramlibacter tataouinensis TTB310(F5Y5W2\_RAMTT), Methylibium petroleiphilum PM1(A2SF55\_METPP), Curvibacter putative symbiont of(C9Y9G0\_9BURK), Candidatus Nitrospira defluvii(D8PAF5\_9BACT,D8P7L8\_9BACT), Acidovorax sp NO-1(H0C3W6\_9BURK) |
| YHMLW | 2,35E+01 | 3,04E-05 | O: Novosphingobium aromaticivorans DSM 12444(Q2GCA5\_NOVAD), Novosphingobium pentaromativorans US6-1(G6EBK2\_9SPHN), Sphingobium sp SYK-6(G2ISN4\_9SPHN), Caulobacter segnis ATCC 21756(D5VQ98\_CAUST), Novosphingobium sp PP1Y(F6IFD3\_9SPHN), Caulobacter sp K31(B0T7B3\_CAUSK), Novosphingobium nitrogenifigens DSM 19370(F1Z5X0\_9SPHN), Sphingobium chlorophenolicum L-1(F6ESW7\_SPHCR), Sphingomonas wittichii RW1(A5V5K0\_SPHWW), marine gamma proteobacterium HTCC2148(B7RWE6\_9GAMM) |
| YHSFW | 3,70E-03 | 3,04E-05 | O: Rhizobium leguminosarum bv trifolii(B5ZZM9\_RHILW), Agrobacterium sp ATCC 31749(F5J978\_9RHIZ), Agrobacterium tumefaciens F2(F7U5G1\_RHIRD), Sinorhizobium medicae WSM419(A6UBY2\_SINMW), Limnobacter sp MED105(A6GP10\_9BURK), Agrobacterium vitis S4(B9JR55\_AGRVS), Asticcacaulis excentricus CB 48(E8RL60\_ASTEC), Sinorhizobium fredii NGR234(C3MGD5\_RHISN), Rhizobium sp PDO1-076(H4FB18\_9RHIZ), Rhizobium etli CFN 42(Q2K563\_RHIEC), Collimonas fungivorans Ter331(G0ACD4\_COLFT), Agrobacterium tumefaciens 5A(H0H881\_RHIRD), Rhizobium etli CIAT 652(B3PX70\_RHIE6), Rhizobium leguminosarum bv viciae(Q1MD01\_RHIL3), Agrobacterium radiobacter K84(B9J857\_AGRRK), Burkholderia xenovorans LB400(Q142K1\_BURXL), Sinorhizobium meliloti CCNWSX0020(H0GA12\_RHIML) |
| YFLYW | 5,25E+01 | 3,04E-05 | P: Flavobacteriaceae bacterium 3519-10(C6WZG4\_FLAB3), Gramella forsetii KT0803(A0M173\_GRAFK), Muricauda ruestringensis DSM 13258(G2PIT9\_MURRD), Bdellovibrio bacteriovorus HD100(Q6MK94\_BDEBA), Pedobacter heparinus DSM 2366(C6XVI0\_PEDHD), Haliscomenobacter hydrossis DSM 1100(F4L2U7\_HALH1), Spirosoma linguale DSM 74(D2QM53\_SPILD), Niabella soli DSM 19437(H1NKD8\_9SPHI,H1NM30\_9SPHI), Elizabethkingia anophelis Ag1(H0KQP6\_9FLAO), Riemerella anatipestifer RA-GD(F0TNT5\_RIEAR), Flavobacterium johnsoniae UW101(A5FIM9\_FLAJ1,A5FCK0\_FLAJ1), Pedobacter saltans DSM 12145(F0SCW7\_PEDSD), Fluviicola taffensis DSM 16823(F2I9I0\_FLUTR), Meiothermus ruber DSM 1279(D3PTQ1\_MEIRD), Chthoniobacter flavus Ellin428(B4D1F1\_9BACT), Sphingobacterium spiritivorum ATCC 33861(D7VPR8\_9SPHI), Leadbetterella byssophila DSM 17132(E4RVD1\_LEAB4), Runella slithyformis DSM 19594(F8EAH9\_RUNSL), Owenweeksia hongkongensis DSM 17368(G8R6F6\_OWEHD), Myroides odoratimimus CIP 101113(H1H5B0\_9FLAO), Marivirga tractuosa DSM 4126(E4TR24\_MARTH), Dysgonomonas mossii DSM 22836(F8X358\_9PORP), Flavobacterium frigoris PS1(H7FR52\_9FLAO), unidentified eubacterium SCB49(A6ENP0\_9BACT), Ktedonobacter racemifer DSM 44963(D6TP19\_9CHLR), Zobellia galactanivorans(G0L0F4\_ZOBGA), Chryseobacterium gleum ATCC 35910(D7VV61\_9FLAO), Nitrobacter winogradskyi Nb-255(Q3SUN3\_NITWN), Niastella koreensis GR20-10(G8TDR8\_NIAKG), Nitrobacter hamburgensis X14(Q1QHS5\_NITHX), Flavobacterium columnare ATCC 49512(G8X694\_FLACA), Myroides odoratus DSM 2801(H1ZC40\_9FLAO), Nitrobacter sp Nb-311A(A3WUX8\_9BRAD), Weeksella virosa DSM 16922(F0P268\_WEEVC), Cyclobacterium marinum DSM 745(G0J1W9\_CYCMS), Gallibacterium anatis UMN179(F4H9I5\_GALAU), Solitalea canadensis DSM 3403(H8KRX3\_FLECA), Pedobacter sp BAL39(A6EG59\_9SPHI) |
| LFFFV | 1,08E+02 | 1,87E-01 | N: Halomonas sp TD01(F7SSB5\_9GAMM), Congregibacter litoralis KT71(A4ACE9\_9GAMM) |
| YFKVW | 2,93E+00 | 5,27E-04 | P: mine drainage metagenome(E6Q9Q5\_9ZZZZ), Leadbetterella byssophila DSM 17132(E4RWM0\_LEAB4) |
| YYALW | 6,65E-03 | 3,04E-05 | O: Mycobacterium tuberculosis NCGM2209(G2UUQ6\_MYCTU), Clavibacter michiganensis subsp sepedonicus(B0RAR2\_CLAMS), Micrococcus luteus SK58(D3LL05\_MICLU), Corynebacterium efficiens YS-314(Q8FN04\_COREF), Streptomyces sviceus ATCC 29083(D6XBM2\_9ACTO), Microbacterium laevaniformans OR221(H8E4L0\_9MICO), Mycobacterium rhodesiae NBB3(G8RIA5\_MYCRN), Leifsonia xyli subsp xyli(Q6AFT0\_LEIXX), Tsukamurella paurometabola DSM 20162(D5UWZ7\_TSUPD), Actinoplanes sp SE50110(G8S1V0\_ACTS5), Mycobacterium intracellulare MOTT-64(H8JRE9\_MYCIT), Cellulomonas flavigena DSM 20109(D5UCE3\_CELFN), Corynebacterium glutamicum ATCC 14067(G6WV80\_CORGT), Streptomyces venezuelae ATCC 10712(F2R2J2\_STRVP), Blastococcus saxobsidens DD2(H6RIR9\_BLASD), Xylanimonas cellulosilytica DSM 15894(D1BZH5\_XYLCX), Intrasporangium calvum DSM 43043(E6S6Y0\_INTC7), Nocardioidaceae bacterium Broad-1(E9V271\_9ACTO), Gordonia effusa NBRC 100432(H0QZ84\_9ACTO), Janibacter sp HTCC2649(A3TFS8\_9MICO), Streptomyces zinciresistens K42(G2GKZ3\_9ACTO), Beutenbergia cavernae DSM 12333(C5BXJ9\_BEUC1), Frankia alni ACN14a(Q0RPN6\_FRAAA), Segniliparus rotundus DSM 44985(D6Z7C0\_SEGRD), Mycobacterium tusciae JS617(H1JSN5\_9MYCO), Corynebacterium amycolatum SK46(E2MXD8\_9CORY), Corynebacterium variabile DSM 44702(G0HB35\_CORVD), Corynebacterium accolens ATCC 49725(C0WJJ8\_9CORY), Arthrobacter arilaitensis Re117(E1VWS4\_ARTAR), Saccharomonospora marina XMU15(H5X3G1\_9PSEU), Mycobacterium parascrofulaceum ATCC BAA-614(D5PH46\_9MYCO), Mycobacterium avium 104(A0QDE2\_MYCA1), Streptomyces ghanaensis ATCC 14672(D6A297\_9ACTO), Mycobacterium vanbaalenii PYR-1(A1TCE3\_MYCVP), Nocardia farcinica IFM 10152(Q5Z082\_NOCFA), Corynebacterium diphtheriae NCTC 13129(Q6NFT6\_CORDI), Saccharomonospora cyanea NA-134(H5XE69\_9PSEU), Brachybacterium faecium DSM 4810(C7MBP3\_BRAFD), Mycobacterium colombiense CECT 3035(F9QGJ2\_9MYCO), Corynebacterium lipophiloflavum DSM 44291(C0XRD8\_9CORY), Corynebacterium resistens DSM 45100(F8DZ36\_CORRG), Frankia sp CN3(G6HKE2\_9ACTO), Streptomyces griseoaurantiacus M045(F3NCP4\_9ACTO), Mycobacterium abscessus subsp bolletii(H0IML9\_MYCAB), Nakamurella multipartita DSM 44233(C8XGN0\_NAKMY), marine actinobacterium PHSC20C1(A4AGR0\_9ACTN), Isoptericola variabilis 225(F6FQG9\_ISOV2), Jonesia denitrificans DSM 20603(C7R2X0\_JONDD), Frankia sp EAN1pec(A8L215\_FRASN), Thermobifida fusca(2BMM), Corynebacterium ammoniagenes DSM 20306(D5NXP9\_CORAM), Pseudomonas stutzeri A1501(A4VJW3\_PSEU5), Dietzia cinnamea P4(E6J538\_9ACTO), Algoriphagus machipongonensis(A3I308\_9BACT), Corynebacterium casei UCMA 3821(G7HW23\_9CORY), Mycobacterium gilvum PYR-GCK(A4T2Q7\_MYCGI), Streptomyces cattleya NRRL 8057(F8JS37\_STREN), Gordonia araii NBRC 100433(G7H143\_9ACTO), Saccharomonospora paurometabolica YIM 90007(G4J0W0\_9PSEU), Streptomyces griseoflavus Tu4000(D9Y0C3\_9ACTO), Streptomyces viridochromogenes DSM 40736(D9X9K7\_STRVR), Corynebacterium pseudogenitalium ATCC 33035(E2S653\_9CORY), Micromonospora sp ATCC 39149(C4RPG9\_9ACTO), Corynebacterium glutamicum ATCC 13032(Q8NMW6\_CORGL), Stackebrandtia nassauensis DSM 44728(D3Q6N6\_STANL), Saccharomonospora glauca K62(H1JG78\_9PSEU), Frankia sp CcI3(Q2JDW4\_FRASC), Mycobacterium rhodesiae JS60(G4I1H8\_MYCRH), Streptomyces hygroscopicus subsp jinggangensis(H2K910\_STRHJ), Thermobispora bispora DSM 43833(D6Y4S6\_THEBD), Mycobacterium thermoresistibile ATCC 19527(G7CJC9\_MYCTH), Gordonia sputi NBRC 100414(H5U4M1\_9ACTO), Mycobacterium leprae(Q9X7B3\_MYCLE), Gordonia otitidis NBRC 100426(H5TSE0\_9ACTO), Nocardia brasiliensis ATCC 700358(H5RS95\_9NOCA), Mycobacterium sp MCS(Q1B5W7\_MYCSS), Kocuria rhizophila DC2201(B2GG22\_KOCRD), Corynebacterium striatum ATCC 6940(C2CLE9\_CORST), Corynebacterium jeikeium K411(Q4JWW0\_CORJK), Corynebacterium glucuronolyticum ATCC 51866(C2GJU6\_9CORY), Micromonospora aurantiaca ATCC 27029(D9TAK4\_MICAI), Streptomyces violaceusniger Tu 4113(G2NX27\_STRVO), Microbacterium testaceum StLB037(E8NDL4\_MICTS), Streptomyces sp SPB78(D9UM81\_9ACTO), Mycobacterium marinum M(B2HNH8\_MYCMM), Frankia sp EuI1c(E3J5P0\_FRASU), Saccharopolyspora erythraea NRRL 2338(A4F9C9\_SACEN), Saccharomonospora viridis DSM 43017(C7MZW7\_SACVD), Streptomyces himastatinicus ATCC 53653(D9WQC1\_9ACTO), Gordonia alkanivorans NBRC 16433(F9VZA5\_9ACTO), Corynebacterium aurimucosum ATCC 700975(C3PII6\_CORA7), Salinispora tropica CNB-440(A4XAM0\_SALTO), Mycobacterium smegmatis str MC2(A0R1B8\_MYCS2), Pseudomonas stutzeri ATCC 14405(H7EU46\_PSEST), Planctomyces maris DSM 8797(A6CB44\_9PLAN), Streptomyces bingchenggensis BCW-1(D7C3F4\_STRBB), Saccharomonospora azurea NA-128(H8GDG3\_9PSEU), Mycobacterium sp JDM601(F5YY56\_MYCSD), Streptomyces sp e14(D6K0W4\_9ACTO), Frankia sp EUN1f(D3D1B2\_9ACTO), Gordonia neofelifaecis NRRL B-59395(F1YI30\_9ACTO), Kytococcus sedentarius DSM 20547(C7NFL3\_KYTSD), Gordonia bronchialis DSM 43247(D0LAH0\_GORB4), Corynebacterium ulcerans 809(G0CMU9\_CORUL), Salinispora arenicola CNS-205(A8M1P3\_SALAI), Cellulomonas fimi ATCC 484(F4H5S7\_CELFA), Nocardiopsis dassonvillei subsp dassonvillei(D7B3R3\_NOCDD), Gordonia amarae NBRC 15530(G7GMX0\_9ACTO), Catenulispora acidiphila DSM 44928(C7Q9L1\_CATAD), Nocardia cyriacigeorgica GUH-2(H6R5I9\_NOCCG), Gordonia polyisoprenivorans VH2(H6MX45\_GORPV), Thermomonospora curvata DSM 43183(D1A9X9\_THECD), Geodermatophilus obscurus DSM 43160(D2SCM4\_GEOOG), Mobilicoccus pelagius NBRC 104925(H5UVC5\_9MICO), Corynebacterium pseudotuberculosis 106-A(G7U1I8\_CORPS), Planctomyces limnophilus DSM 3776(D5SYN7\_PLAL2), Frankia symbiont of Datisca(D3M5P7\_9ACTO), Corynebacterium genitalium ATCC 33030(D7WC24\_9CORY), Brevibacterium mcbrellneri ATCC 49030(D4YQV3\_9MICO), Streptomyces scabiei 8722(C9Z5X1\_STRSW), Acidothermus cellulolyticus 11B(A0LVC1\_ACIC1) |
| YFLTW | 1,06E-02 | 5,27E-04 | P: Kordia algicida OT-1(A9E7W3\_9FLAO), Mesorhizobium alhagi CCNWXJ12-2(H0HZ33\_9RHIZ), Gramella forsetii KT0803(A0M1A1\_GRAFK), Streptomyces venezuelae ATCC 10712(F2R152\_STRVP), Psychroflexus torquis ATCC 700755(Q1VP43\_9FLAO), Acidobacterium capsulatum ATCC 51196(C1F2U7\_ACIC5), Mesorhizobium amorphae CCNWGS0123(G6YLR0\_9RHIZ), Mesorhizobium australicum WSM2073(G4K804\_9RHIZ), Capnocytophaga canimorsus Cc5(F9YVW9\_CAPCC), Sulfurimonas denitrificans DSM 1251(Q30PW1\_SULDN), Kitasatospora setae KM-6054(E4N1M3\_KITSK), Flavobacterium johnsoniae UW101(A5FJK5\_FLAJ1), Citreicella sp SE45(D0DE45\_9RHOB), Pelagibacterium halotolerans B2(G4RBW3\_PELHB), Gillisia limnaea DSM 15749(H2BYC9\_9FLAO), Phenylobacterium zucineum HLK1(B4RHN0\_PHEZH), Bizionia argentinensis JUB59(G2ECI5\_9FLAO), Zobellia galactanivorans(G0LBS1\_ZOBGA), Rhodopseudomonas palustris CGA009(Q6N698\_RHOPA), Cellulophaga lytica DSM 7489(F0RE10\_CELLC), Flavobacteria bacterium BBFL7(Q26HY6\_FLABB), Alkalilimnicola ehrlichii MLHE-1(Q0A5B2\_ALHEH), Acetobacter pasteurianus IFO 3283-12(C7L997\_ACEPA), Sphingomonas wittichii RW1(A5VB57\_SPHWW), Sulfurimonas gotlandica GD1(B6BLP9\_9PROT), Burkholderia sp YI23(G8M460\_9BURK), Cyclobacterium marinum DSM 745(G0IZJ2\_CYCMS), Flavobacteriales bacterium ALC-1(A8ULC5\_9FLAO), Cellulophaga algicola DSM 14237(E6XF16\_CELAD,E6XCC0\_CELAD) |
| YHALW | 4,92E-03 | 3,04E-05 | O: Methylotenera versatilis 301(D7DIW7\_METS0), Comamonas testosteroni ATCC 11996(H1RK32\_COMTE), Bordetella petrii DSM 12804(A9IJT5\_BORPD), Methylobacter tundripaludum SV96(G3IT70\_9GAMM), Variovorax paradoxus EPS(E6UXE4\_VARPE), Alicycliphilus denitrificans K601(F4GAB4\_ALIDK), Variovorax paradoxus S110(C5CWP3\_VARPS), Methylomonas methanica MC09(G0A2B2\_METMM), Methylomicrobium alcaliphilum 20Z(G4T327\_META2), Polaromonas sp JS666(Q12EZ1\_POLSJ), Novosphingobium aromaticivorans DSM 12444(Q2G523\_NOVAD), Acidovorax avenae subsp avenae(F0Q0V5\_ACIAP), Marinomonas mediterranea MMB-1(F2JVC2\_MARM1), Neisseria wadsworthii 9715(G4CMK5\_9NEIS), Polaromonas naphthalenivorans CJ2(A1VKI6\_POLNA), Rhodoferax ferrireducens T118(Q21TE0\_RHOFD), Methylovorus sp MP688(E4QIY5\_METS6), Methylobacillus flagellatus KT(Q1H1W3\_METFK), Methylococcus capsulatus str Bath(Q606Y3\_METCA), Gallionella capsiferriformans ES-2(D9SK81\_GALCS), Achromobacter arsenitoxydans SY8(H0F9F5\_9BURK), Achromobacter xylosoxidans C54(E5U1W4\_ALCXX), Beijerinckia indica subsp indica(B2IE39\_BEII9), Azotobacter vinelandii DJ(C1DDP7\_AZOVD), Achromobacter xylosoxidans A8(E3HFM9\_ACHXA), Acidovorax ebreus TPSY(B9MEH6\_ACIET), Bradyrhizobium sp STM 3843(H0TRL7\_9BRAD), Sphingomonas sp SKA58(Q1NF48\_9SPHN), Bordetella avium 197N(Q2KYN5\_BORA1), Novosphingobium nitrogenifigens DSM 19370(F1ZB73\_9SPHN), Mariprofundus ferrooxydans PV-1(Q0F2H6\_9PROT), Achromobacter piechaudii ATCC 43553(D4XAA8\_9BURK), Azoarcus sp BH72(A1K669\_AZOSB), Acidovorax delafieldii 2AN(C5TD07\_ACIDE), Leptothrix cholodnii SP-6(B1Y0J1\_LEPCP), Azoarcus sp KH32C(H0PVQ4\_9RHOO), Burkholderia vietnamiensis G4(A4JRN5\_BURVG), Methylomicrobium album BG8(H8GH79\_METAL), Ramlibacter tataouinensis TTB310(F5XW43\_RAMTT), Methylotenera mobilis JLW8(C6WW87\_METML), Sphingobium chlorophenolicum L-1(F6F2Z0\_SPHCR), Herbaspirillum seropedicae SmR1(D8IZK7\_HERSS), Curvibacter putative symbiont of(C9Y8P3\_9BURK), Sphingobium japonicum UT26S(D4Z631\_SPHJU), Bacteriovorax marinus SJ(E1WZL7\_BACMS), Achromobacter xylosoxidans AXX-A(F7T4L5\_ALCXX), Acidovorax sp NO-1(H0BTR3\_9BURK), Bordetella pertussis Tohama I(Q7VWB0\_BORPE), Methylomonas sp 16a(A3QVH5\_9GAMM), Delftia acidovorans SPH-1(A9BT93\_DELAS), Hylemonella gracilis ATCC 19624(F3KVD3\_9BURK) |
| YFQTV | 2,06E+00 | 9,85E-05 | N: Paramecium multimicronucleatum(Q27213\_9CILI), Paramecium triaurelia(Q7JQC9\_9CILI), Paramecium tetraurelia(Q3SEA1\_PARTE), Paramecium caudatum(TRHBN\_PARCA) |
| YYAFW | 9,49E+00 | 3,04E-05 | O: Arthrobacter aurescens TC1(A1R7B2\_ARTAT), Streptomyces sp AA4(D9VAR2\_9ACTO), Arthrobacter sp FB24(A0JXM3\_ARTS2), Streptomyces clavuligerus ATCC 27064(B5GVB3\_STRCL), Arthrobacter chlorophenolicus A6(B8HA44\_ARTCA), Kribbella flavida DSM 17836(D2PTJ8\_KRIFD), Streptomyces sp Mg1(B4V9I1\_9ACTO), Dermacoccus sp Ellin185(E3BBA3\_9MICO), Streptomyces albus J1074(D6B196\_9ACTO), Kitasatospora setae KM-6054(E4NIA7\_KITSK), Streptomyces sp SirexAA-E(G2NKL6\_9ACTO), Streptomyces griseus XylebKG-1(G0PQ09\_STRGR), Streptosporangium roseum DSM 43021(D2BDZ5\_STRRD), Amycolicicoccus subflavus DQS3-9A1(F6EQ94\_AMYSD), Streptomyces avermitilis MA-4680 =(Q82CH9\_STRAW), Actinosynnema mirum DSM 43827(C6WQ34\_ACTMD), Arthrobacter phenanthrenivorans Sphe3(F0M4E0\_ARTPP), Streptomyces sp SPB74(B5G7N3\_9ACTO), Microlunatus phosphovorus NM-1(F5XP72\_MICPN), Aeromicrobium marinum DSM 15272(E2SBB9\_9ACTO), Streptomyces pratensis ATCC 33331(E8W9Z7\_STRFA), Nocardioides sp JS614(A1SGF5\_NOCSJ), Pseudonocardia dioxanivorans CB1190(F4D1N5\_PSEUX), Arthrobacter globiformis NBRC 12137(H0QPD5\_ARTGO), Streptomyces coelicolor A3(2)(Q9L250\_STRCO), Streptomyces sp C(D9VWG0\_9ACTO), Amycolatopsis mediterranei S699(G0G0V5\_AMYMD) |
| YFTQW | 2,29E-04 | 5,27E-04 | O: Bacillus pumilus SAFR-032(A8FC02\_BACP2), Deinococcus radiodurans R1(Q9RVM5\_DEIRA), Macrococcus caseolyticus JCSC5402(B9EAR3\_MACCJ), Staphylococcus pettenkoferi VCU012(H0DI57\_9STAP), Bacillus subtilis subsp subtilis(), Oceanobacillus iheyensis HTE831(Q8ERT2\_OCEIH), Bacillus halodurans C-125(Q9K8Z8\_BACHD), Staphylococcus hominis subsp hominis(E5CNM8\_STAHO), Bacillus sp NRRL B-14911(Q2B8X7\_9BACI), Deinococcus geothermalis DSM 11300(Q1IY16\_DEIGD), Staphylococcus lugdunensis N920143(F8KNU5\_STALN), Staphylococcus aureus subsp aureus(G7ZMA6\_STAAU), Bacillus sp 2\_A\_57\_CT2(E5WE36\_9BACI), Bacillus clausii KSM-K16(Q5WF01\_BACSK), Planococcus donghaensis MPA1U2(E7RF73\_9BACL), Geobacillus stearothermophilus(2BKM), Staphylococcus pseudintermedius ED99(F0P8H6\_STAPE), Staphylococcus carnosus subsp carnosus(B9DIR9\_STACT), Bacillus atrophaeus 1942(E3DVK0\_BACA1), Bacillus sp BT1B\_CT2(E5W4T9\_9BACI), Anoxybacillus flavithermus WK1(B7GLK9\_ANOFW), Bacillus sp SG-1(A6CQW7\_9BACI), Prevotella dentalis DSM 3688(H1M638\_9BACT), Solibacillus silvestris StLB046(F2F888\_SOLSS), Bacillus selenitireducens MLS10(D6XTC7\_BACIE), Sporosarcina newyorkensis 2681(F9DPW8\_9BACL), Caldalkalibacillus thermarum TA2A1(F5L510\_9BACI), Deinococcus maricopensis DSM 21211(E8U893\_DEIML), Geobacillus thermoglucosidasius C56-YS93(F8CZM8\_BACTR), Bacillus megaterium QM B1551(D5E038\_BACMQ), Staphylococcus caprae M23864:W1(C5QQU4\_STAEP), Staphylococcus capitis VCU116(F9L8I2\_STACP), Bacillus smithii 7\_3\_47FAA(G9QK17\_9BACI), Bacillus cytotoxicus NVH 391-98(A7GM87\_BACCN), Bacillus pseudofirmus OF4(D3FV17\_BACPE), Staphylococcus epidermidis RP62A(Q5HQG7\_STAEQ), Bacillus cereus Rock3-44(C2W574\_BACCE), Deinococcus deserti VCD115(C1D0M8\_DEIDV), Staphylococcus haemolyticus JCSC1435(Q4L511\_STAHJ), Staphylococcus saprophyticus subsp saprophyticus(Q49WD2\_STAS1), Geobacillus sp WCH70(C5D799\_GEOSW), Bacillus thuringiensis serovar huazhongensis(C3GXW6\_BACTU), Bacillus sp B14905(A3IFZ5\_9BACI), Bacillus amyloliquefaciens subsp plantarum(H8XIT3\_BACAM), Bacillus cellulosilyticus DSM 2522(E6TX59\_BACCJ) |
| YFHVW | 4,49E-05 | 3,04E-05 | Q: Streptomyces clavuligerus ATCC 27064(B5GVJ7\_STRCL), Streptomyces venezuelae ATCC 10712(F2RB89\_STRVP), Nocardioidaceae bacterium Broad-1(E9UUY1\_9ACTO), Yersinia ruckeri ATCC 29473(C4ULC2\_YERRU), Kribbella flavida DSM 17836(D2PQN0\_KRIFD), Photorhabdus asymbiotica subsp asymbiotica(B6VNR2\_PHOAA), Streptomyces sp Mg1(B4V629\_9ACTO), Mesorhizobium amorphae CCNWGS0123(G6Y9K6\_9RHIZ), Spirosoma linguale DSM 74(D2QK90\_SPILD), Campylobacter jejuni(A0A0E2UWT7\_CAMJU), Mesorhizobium australicum WSM2073(G4K8I2\_9RHIZ), Fluviicola taffensis DSM 16823(F2IK57\_FLUTR), Frankia sp CN3(G6H1I3\_9ACTO), Nocardia brasiliensis ATCC 700358(), Frankia sp EuI1c(E3J683\_FRASU), Ktedonobacter racemifer DSM 44963(D6U4L4\_9CHLR), Pseudoalteromonas sp SANK 73390(F8J3E6\_9GAMM), Streptomyces himastatinicus ATCC 53653(D9WP19\_9ACTO), Brevundimonas subvibrioides ATCC 15264(D9QFN8\_BRESC), Niastella koreensis GR20-10(G8TQW4\_NIAKG), Streptomyces bingchenggensis BCW-1(D7CHT6\_STRBB), Mesorhizobium opportunistum WSM2075(F7YDW2\_MESOW), Mesorhizobium ciceri biovar biserrulae(E8TLH5\_MESCW), Frankia sp EUN1f(D3D2S0\_9ACTO), Streptomyces sp C(D9VK26\_9ACTO), Mesorhizobium loti MAFF303099(Q98N74\_RHILO), Hylemonella gracilis ATCC 19624(F3KNL2\_9BURK), Amycolatopsis mediterranei S699(G0G7F8\_AMYMD), Xenorhabdus bovienii SS-2004(D3V2A9\_XENBS), Solitalea canadensis DSM 3403(H8KRM2\_FLECA) |
| YFQQV | 6,91E-04 | 2,28E-04 | N: Synechocystis sp PCC 6803(H0PMQ1\_9SYNC), Methylobacter tundripaludum SV96(G3IQT3\_9GAMM,G3IQS9\_9GAMM), Sideroxydans lithotrophicus ES-1(D5CMC9\_SIDLE,D5CR69\_SIDLE), Methylomonas methanica MC09(G0A4H3\_METMM,F9ZWQ0\_METMM), Methylomicrobium alcaliphilum 20Z(G4SUM0\_META2), Tetrahymena pyriformis (TRHBN\_TETPY), Corallococcus coralloides DSM 2259(H8N066\_MYXCO), Plesiocystis pacifica SIR-1(A6G520\_9DELT), Chlamydomonas moewusii(TRHN2\_CHLMO,TRHN1\_CHLMO), Methylococcus capsulatus str Bath(Q604N2\_METCA), Arthrospira sp PCC 8005(H1WKW8\_9CYAN), Cyanothece sp PCC 8802(C7QR53\_CYAP0), Batrachochytrium dendrobatidis JAM81(F4P5H7\_BATDJ), Legionella pneumophila subsp pneumophila(Q5ZSI2\_LEGPH), Myxococcus xanthus DK 1622(Q1CX39\_MYXXD), mine drainage metagenome(E6QPM5\_9ZZZZ,E6QSU8\_9ZZZZ), Legionella longbeachae NSW150(D3HLV8\_LEGLN), Ichthyophthirius multifiliis strain G5(G0QQ62\_ICHMG), Bermanella marisrubri(Q1N6W8\_9GAMM), Volvox carteri(D8THA8\_VOLCA), Methylocystis sp ATCC 49242(E8L3Y3\_9RHIZ), Acaryochloris marina MBIC11017(B0CBZ4\_ACAM1), Myxococcus fulvus HW-1(F8C695\_MYXFH), Methylomicrobium album BG8(H8GM14\_METAL), Chlamydomonas eugametos(TRHN1\_CHLMO), Chlamydomonas reinhardtii(A8JAR3\_CHLRE,A8JAR4\_CHLRE), Coraliomargarita akajimensis DSM 45221(D5EIY8\_CORAD), Methylomonas sp 16a(A3QVH3\_9GAMM) |
| YFLKW | 4,62E+00 | 3,04E-05 | P: Oceanicaulis sp HTCC2633(A3UC56\_9RHOB), Pseudovibrio sp JE062(B6R8B7\_9RHOB), Novosphingobium aromaticivorans DSM 12444(Q2G809\_NOVAD), Caulobacter segnis ATCC 21756(D5VN99\_CAUST), Hyphomonas neptunium ATCC 15444(Q0C302\_HYPNA), gamma proteobacterium NOR5-3(B8KFJ6\_9GAMM), Xanthobacter autotrophicus Py2(A7IJS8\_XANP2), Polymorphum gilvum SL003B-26A1(F2J051\_POLGS), Maricaulis maris MCS10(Q0ARP0\_MARMM), Hirschia baltica ATCC 49814(C6XNL3\_HIRBI), Novosphingobium sp PP1Y(F6IGG4\_9SPHN), Brevundimonas sp BAL3(B4WCH2\_9CAUL), Congregibacter litoralis KT71(A4A461\_9GAMM), Sphingomonas wittichii RW1(A5VGI9\_SPHWW), Afipia sp 1NLS2(D6V129\_9BRAD), marine gamma proteobacterium HTCC2148(B7RT24\_9GAMM) |
|  |  |  |  |
| E7G key residues B10-CD1-E7-E11 | **[]** | | **Specie (uniprotID)** |
| YFTQ | 1,22E-03 | | O: Bacillus pumilus SAFR-032(A8FC02\_BACP2), Deinococcus radiodurans R1(Q9RVM5\_DEIRA), Macrococcus caseolyticus JCSC5402(B9EAR3\_MACCJ), Staphylococcus pettenkoferi VCU012(H0DI57\_9STAP), Oceanobacillus iheyensis HTE831(Q8ERT2\_OCEIH), Bacillus halodurans C-125(Q9K8Z8\_BACHD), Staphylococcus hominis subsp hominis(E5CNM8\_STAHO), Bacillus sp NRRL B-14911(Q2B8X7\_9BACI), Deinococcus geothermalis DSM 11300(Q1IY16\_DEIGD), Staphylococcus lugdunensis N920143(F8KNU5\_STALN), Staphylococcus aureus subsp aureus(G7ZMA6\_STAAU), Bacillus sp 2\_A\_57\_CT2(E5WE36\_9BACI), Bacillus clausii KSM-K16(Q5WF01\_BACSK), Planococcus donghaensis MPA1U2(E7RF73\_9BACL), Staphylococcus pseudintermedius ED99(F0P8H6\_STAPE), Staphylococcus carnosus subsp carnosus(B9DIR9\_STACT), Bacillus atrophaeus 1942(E3DVK0\_BACA1), Bacillus sp BT1B\_CT2(E5W4T9\_9BACI), Anoxybacillus flavithermus WK1(B7GLK9\_ANOFW), Bacillus sp SG-1(A6CQW7\_9BACI), Prevotella dentalis DSM 3688(H1M638\_9BACT), Solibacillus silvestris StLB046(F2F888\_SOLSS), Bacillus selenitireducens MLS10(D6XTC7\_BACIE), Sporosarcina newyorkensis 2681(F9DPW8\_9BACL), Caldalkalibacillus thermarum TA2A1(F5L510\_9BACI), Deinococcus maricopensis DSM 21211(E8U893\_DEIML), Geobacillus thermoglucosidasius C56-YS93(F8CZM8\_BACTR), Bacillus megaterium QM B1551(D5E038\_BACMQ), Staphylococcus caprae M23864:W1(C5QQU4\_STAEP), Staphylococcus capitis VCU116(F9L8I2\_STACP), Bacillus smithii 7\_3\_47FAA(G9QK17\_9BACI), Bacillus cytotoxicus NVH 391-98(A7GM87\_BACCN), Bacillus pseudofirmus OF4(D3FV17\_BACPE), Staphylococcus epidermidis RP62A(Q5HQG7\_STAEQ), Bacillus cereus Rock3-44(C2W574\_BACCE), Deinococcus deserti VCD115(C1D0M8\_DEIDV), Staphylococcus haemolyticus JCSC1435(Q4L511\_STAHJ), Staphylococcus saprophyticus subsp saprophyticus(Q49WD2\_STAS1), Geobacillus sp WCH70(C5D799\_GEOSW), Bacillus thuringiensis serovar huazhongensis(C3GXW6\_BACTU), Bacillus sp B14905(A3IFZ5\_9BACI), Bacillus amyloliquefaciens subsp plantarum(H8XIT3\_BACAM), Bacillus cellulosilyticus DSM 2522(E6TX59\_BACCJ) |
| YFLK | 1,18E-11 | | P: Oceanicaulis sp HTCC2633(A3UC56\_9RHOB), Pseudovibrio sp JE062(B6R8B7\_9RHOB), Novosphingobium aromaticivorans DSM 12444(Q2G809\_NOVAD), Caulobacter segnis ATCC 21756(D5VN99\_CAUST), Hyphomonas neptunium ATCC 15444(Q0C302\_HYPNA), gamma proteobacterium NOR5-3(B8KFJ6\_9GAMM), Xanthobacter autotrophicus Py2(A7IJS8\_XANP2), Polymorphum gilvum SL003B-26A1(F2J051\_POLGS), Maricaulis maris MCS10(Q0ARP0\_MARMM), Hirschia baltica ATCC 49814(C6XNL3\_HIRBI), Novosphingobium sp PP1Y(F6IGG4\_9SPHN), Brevundimonas sp BAL3(B4WCH2\_9CAUL), Congregibacter litoralis KT71(A4A461\_9GAMM), Sphingomonas wittichii RW1(A5VGI9\_SPHWW), Afipia sp 1NLS2(D6V129\_9BRAD), marine gamma proteobacterium HTCC2148(B7RT24\_9GAMM) |
| YFLT | 1,18E-11 | | P: Kordia algicida OT-1(A9E7W3\_9FLAO), Mesorhizobium alhagi CCNWXJ12-2(H0HZ33\_9RHIZ), Gramella forsetii KT0803(A0M1A1\_GRAFK), Streptomyces venezuelae ATCC 10712(F2R152\_STRVP), Psychroflexus torquis ATCC 700755(Q1VP43\_9FLAO), Acidobacterium capsulatum ATCC 51196(C1F2U7\_ACIC5), Mesorhizobium amorphae CCNWGS0123(G6YLR0\_9RHIZ), Mesorhizobium australicum WSM2073(G4K804\_9RHIZ), Capnocytophaga canimorsus Cc5(F9YVW9\_CAPCC), Sulfurimonas denitrificans DSM 1251(Q30PW1\_SULDN), Kitasatospora setae KM-6054(E4N1M3\_KITSK), Flavobacterium johnsoniae UW101(A5FJK5\_FLAJ1), Citreicella sp SE45(D0DE45\_9RHOB), Pelagibacterium halotolerans B2(G4RBW3\_PELHB), Gillisia limnaea DSM 15749(H2BYC9\_9FLAO), Phenylobacterium zucineum HLK1(B4RHN0\_PHEZH), Bizionia argentinensis JUB59(G2ECI5\_9FLAO), Zobellia galactanivorans(G0LBS1\_ZOBGA), Rhodopseudomonas palustris CGA009(Q6N698\_RHOPA), Cellulophaga lytica DSM 7489(F0RE10\_CELLC), Flavobacteria bacterium BBFL7(Q26HY6\_FLABB), Alkalilimnicola ehrlichii MLHE-1(Q0A5B2\_ALHEH), Acetobacter pasteurianus IFO 3283-12(C7L997\_ACEPA), Sphingomonas wittichii RW1(A5VB57\_SPHWW), Sulfurimonas gotlandica GD1(B6BLP9\_9PROT), Burkholderia sp YI23(G8M460\_9BURK), Cyclobacterium marinum DSM 745(G0IZJ2\_CYCMS), Flavobacteriales bacterium ALC-1(A8ULC5\_9FLAO), Cellulophaga algicola DSM 14237(E6XF16\_CELAD,E6XCC0\_CELAD) |
| YFLV | 1,18E-11 | | P: Alicycliphilus denitrificans K601(F4GC46\_ALIDK), Stenotrophomonas sp SKA14(B8L2E0\_9GAMM), Acidovorax avenae subsp avenae(F0Q4M9\_ACIAP), Polaromonas naphthalenivorans CJ2(A1VL14\_POLNA), Herminiimonas arsenicoxydans(A4G4V5\_HERAR), Hyphomonas neptunium ATCC 15444(Q0C1Z2\_HYPNA), Burkholderia cenocepacia PC184(A2VXT3\_9BURK), Lautropia mirabilis ATCC 51599(E7RZ21\_9BURK), Roseibium sp TrichSKD4(E2CBJ4\_9RHOB), Burkholderia gladioli BSR3(F2LCR3\_BURGS), Comamonas testosteroni S44(D8D7D0\_COMTE), Fluviicola taffensis DSM 16823(F2IAE8\_FLUTR), Oceanicola batsensis HTCC2597(A3TSM3\_9RHOB), Burkholderia ambifaria MEX-5(B1T3N9\_9BURK), Mucilaginibacter paludis DSM 18603(H1Y0Q4\_9SPHI), Burkholderia multivorans ATCC 17616(A9AG64\_BURM1), Sphingobacterium sp 21(F4CFE1\_SPHS2), Bordetella bronchiseptica RB50(Q7WJJ5\_BORBR), Nitrosomonas eutropha C91(Q0AIE0\_NITEC), Novosphingobium nitrogenifigens DSM 19370(F1Z895\_9SPHN), Acidovorax citrulli AAC00-1(A1TMH1\_ACIAC), Hahella chejuensis KCTC 2396(Q2SEJ4\_HAHCH), Azoarcus sp BH72(A1K1I2\_AZOSB), Acidovorax delafieldii 2AN(C5T6F2\_ACIDE), Burkholderia glumae BGR1(C5AFG3\_BURGB), Burkholderia vietnamiensis G4(A4JES7\_BURVG), Janthinobacterium sp Marseille(A6SZL3\_JANMA), Flavobacterium branchiophilum FL-15(G2Z6S2\_FLABF), Burkholderia sp(Q39FM2\_BURS3), Stenotrophomonas maltophilia K279a(B2FK64\_STRMK), Acidovorax sp NO-1(H0C1D4\_9BURK), Flavobacterium psychrophilum JIP0286(A6GZD3\_FLAPJ), Roseovarius sp 217(A3W3T5\_9RHOB), Stenotrophomonas maltophilia R551-3(B4SR62\_STRM5) |
| YFLQ | 4,00E-21 | | N: Mycobacterium rhodesiae NBB3(G8RKF8\_MYCRN,G8RPN1\_MYCRN), Micromonas pusilla CCMP1545(C1N9B0\_MICPC), Mycobacterium intracellulare MOTT-64(H8JFC0\_MYCIT), Kribbella flavida DSM 17836(D2Q0K6\_KRIFD), Frankia alni ACN14a(Q0RMX2\_FRAAA), Mycobacterium tusciae JS617(H1JWA3\_9MYCO), Haloarcula marismortui ATCC 43049(Q5UZ01\_HALMA), Saccharomonospora marina XMU15(H5X4Y0\_9PSEU), Mycobacterium parascrofulaceum ATCC BAA-614(D5P2P0\_9MYCO), SAR116 cluster alpha proteobacterium(G5ZYB7\_9PROT), Mycobacterium avium 104(A0QHM2\_MYCA1), Mycobacterium bovis BCG str(G7QTX2\_MYCBO), Mycobacterium vanbaalenii PYR-1(A1T9D6\_MYCVP), Mycobacterium colombiense CECT 3035(F9QQ45\_9MYCO), Haladaptatus paucihalophilus DX253(E7QW03\_9EURY), Frankia sp EAN1pec(A8L0I3\_FRASN), Mycobacterium gilvum PYR-GCK(A4TAL9\_MYCGI), Perkinsus marinus ATCC 50983(C5KNH0\_PERM5), Candidatus Pelagibacter ubique HTCC1062(Q4FLB5\_PELUB), Desmospora sp 8437(F5SKL4\_9BACL), Frankia sp CcI3(Q2J9U9\_FRASC), Patulibacter medicamentivorans(H0EBK8\_9ACTN), Mycobacterium sp MCS(Q1B3C2\_MYCSS), Frankia sp EuI1c(E3IVK7\_FRASU), halophilic archaeon DL31(G2MLY7\_9ARCH), Mycobacterium smegmatis str MC2(A0R4A6\_MYCS2), Frankia sp EUN1f(D3CSZ7\_9ACTO), Haloarcula hispanica ATCC 33960(G0HPU0\_HALHT), Halorubrum lacusprofundi ATCC 49239(B9LP51\_HALLT), Thermomonospora curvata DSM 43183(D1A239\_THECD), Mycobacterium ulcerans Agy99(A0PNY4\_MYCUA) |
| YFLY | 1,18E-11 | | P: Flavobacteriaceae bacterium 3519-10(C6WZG4\_FLAB3), Gramella forsetii KT0803(A0M173\_GRAFK), Muricauda ruestringensis DSM 13258(G2PIT9\_MURRD), Bdellovibrio bacteriovorus HD100(Q6MK94\_BDEBA), Pedobacter heparinus DSM 2366(C6XVI0\_PEDHD), Haliscomenobacter hydrossis DSM 1100(F4L2U7\_HALH1), Spirosoma linguale DSM 74(D2QM53\_SPILD), Niabella soli DSM 19437(H1NKD8\_9SPHI,H1NM30\_9SPHI), Elizabethkingia anophelis Ag1(H0KQP6\_9FLAO), Riemerella anatipestifer RA-GD(F0TNT5\_RIEAR), Flavobacterium johnsoniae UW101(A5FIM9\_FLAJ1,A5FCK0\_FLAJ1), Pedobacter saltans DSM 12145(F0SCW7\_PEDSD), Fluviicola taffensis DSM 16823(F2I9I0\_FLUTR), Meiothermus ruber DSM 1279(D3PTQ1\_MEIRD), Chthoniobacter flavus Ellin428(B4D1F1\_9BACT), Sphingobacterium spiritivorum ATCC 33861(D7VPR8\_9SPHI), Leadbetterella byssophila DSM 17132(E4RVD1\_LEAB4), Runella slithyformis DSM 19594(F8EAH9\_RUNSL), Owenweeksia hongkongensis DSM 17368(G8R6F6\_OWEHD), Myroides odoratimimus CIP 101113(H1H5B0\_9FLAO), Marivirga tractuosa DSM 4126(E4TR24\_MARTH), Dysgonomonas mossii DSM 22836(F8X358\_9PORP), Flavobacterium frigoris PS1(H7FR52\_9FLAO), unidentified eubacterium SCB49(A6ENP0\_9BACT), Ktedonobacter racemifer DSM 44963(D6TP19\_9CHLR), Zobellia galactanivorans(G0L0F4\_ZOBGA), Chryseobacterium gleum ATCC 35910(D7VV61\_9FLAO), Nitrobacter winogradskyi Nb-255(Q3SUN3\_NITWN), Niastella koreensis GR20-10(G8TDR8\_NIAKG), Nitrobacter hamburgensis X14(Q1QHS5\_NITHX), Flavobacterium columnare ATCC 49512(G8X694\_FLACA), Myroides odoratus DSM 2801(H1ZC40\_9FLAO), Nitrobacter sp Nb-311A(A3WUX8\_9BRAD), Weeksella virosa DSM 16922(F0P268\_WEEVC), Cyclobacterium marinum DSM 745(G0J1W9\_CYCMS), Gallibacterium anatis UMN179(F4H9I5\_GALAU), Solitalea canadensis DSM 3403(H8KRX3\_FLECA), Pedobacter sp BAL39(A6EG59\_9SPHI) |
| YFHV | 6,48E-03 | | Q: Streptomyces clavuligerus ATCC 27064(B5GVJ7\_STRCL), Streptomyces venezuelae ATCC 10712(F2RB89\_STRVP), Nocardioidaceae bacterium Broad-1(E9UUY1\_9ACTO), Yersinia ruckeri ATCC 29473(C4ULC2\_YERRU), Kribbella flavida DSM 17836(D2PQN0\_KRIFD), Photorhabdus asymbiotica subsp asymbiotica(B6VNR2\_PHOAA), Streptomyces sp Mg1(B4V629\_9ACTO), Mesorhizobium amorphae CCNWGS0123(G6Y9K6\_9RHIZ), Spirosoma linguale DSM 74(D2QK90\_SPILD), Mesorhizobium australicum WSM2073(G4K8I2\_9RHIZ), Fluviicola taffensis DSM 16823(F2IK57\_FLUTR), Frankia sp CN3(G6H1I3\_9ACTO), Frankia sp EuI1c(E3J683\_FRASU), Campylobacter jejuni(A0A0E2UWT7\_CAMJU), Ktedonobacter racemifer DSM 44963(D6U4L4\_9CHLR), Pseudoalteromonas sp SANK 73390(F8J3E6\_9GAMM), Streptomyces himastatinicus ATCC 53653(D9WP19\_9ACTO), Brevundimonas subvibrioides ATCC 15264(D9QFN8\_BRESC), Niastella koreensis GR20-10(G8TQW4\_NIAKG), Streptomyces bingchenggensis BCW-1(D7CHT6\_STRBB), Mesorhizobium opportunistum WSM2075(F7YDW2\_MESOW), Mesorhizobium ciceri biovar biserrulae(E8TLH5\_MESCW), Frankia sp EUN1f(D3D2S0\_9ACTO), Streptomyces sp C(D9VK26\_9ACTO), Mesorhizobium loti MAFF303099(Q98N74\_RHILO), Hylemonella gracilis ATCC 19624(F3KNL2\_9BURK), Amycolatopsis mediterranei S699(G0G7F8\_AMYMD), Xenorhabdus bovienii SS-2004(D3V2A9\_XENBS), Solitalea canadensis DSM 3403(H8KRM2\_FLECA) |
| LFFF | 2,69E-15 | | N: Halomonas sp TD01(F7SSB5\_9GAMM), Congregibacter litoralis KT71(A4ACE9\_9GAMM) |
| YHSL | 6,48E-03 | | O: Burkholderia pseudomallei(Q93SP0\_BURPE), Cupriavidus basilensis OR16(H1S0E9\_9BURK), Laribacter hongkongensis HLHK9(C1DCX8\_LARHH), Acidithiobacillus ferrivorans SS3(G0JTF5\_9GAMM), gamma proteobacterium HTCC5015(B5JSW2\_9GAMM), Candidatus Accumulibacter phosphatis clade(C7RM33\_ACCPU), Burkholderia dolosa AUO158(A2W8M7\_9BURK), Cupriavidus metallidurans CH34(Q1LPZ1\_RALME), Photobacterium profundum(Q6LPM9\_PHOPR), Pseudoalteromonas haloplanktis TAC125(Q3IHN5\_PSEHT), Shewanella pealeana ATCC 700345(A8GYI1\_SHEPA), Sideroxydans lithotrophicus ES-1(D5CRB2\_SIDLE), Rubrivivax benzoatilyticus JA2 =(F3LVH4\_9BURK), Bdellovibrio bacteriovorus HD100(Q6MJX8\_BDEBA), Photobacterium angustum S14(Q1ZQL4\_PHOAS), Shewanella woodyi ATCC 51908(B1KCX2\_SHEWM,B1KFI9\_SHEWM), Pseudomonas mendocina NK-01(F4DUZ2\_PSEMN), Herminiimonas arsenicoxydans(A4G6U6\_HERAR), Shewanella loihica PV-4(A3QJE6\_SHELP), Methylophaga thiooxydans DMS010(C0N247\_9GAMM), Thiobacillus denitrificans ATCC 25259(Q3SKQ0\_THIDA), Shewanella violacea DSS12(D4ZC95\_SHEVD), Shewanella denitrificans OS217(Q12T98\_SHEDO), Shewanella frigidimarina NCIMB 400(Q08A21\_SHEFN), Gemmatimonas aurantiaca T-27(C1ACG4\_GEMAT), Oxalobacteraceae bacterium IMCC9480(F1VZU8\_9BURK), Dechloromonas aromatica RCB(Q47EI8\_DECAR), Pseudogulbenkiania ferrooxidans 2002(B9Z208\_9NEIS), Photobacterium leiognathi subsp mandapamensis(F2P7E9\_PHOMO), Shewanella sp MR-7(Q0I0R5\_SHESR), gamma proteobacterium IMCC2047(F3KDR8\_9GAMM), Pseudoalteromonas sp BSi20429(G7F0K5\_9GAMM), Ralstonia eutropha JMP134(Q473W9\_CUPPJ), Nitrosospira multiformis ATCC 25196(Q2Y824\_NITMU), Burkholderia thailandensis E264(Q2SZR5\_BURTA), Shewanella oneidensis MR-1(Q8EKQ1\_SHEON), Chromohalobacter salexigens DSM 3043(Q1QXX7\_CHRSD), Ferrimonas balearica DSM 9799(E1SV92\_FERBD), Burkholderia phymatum STM815(B2JE19\_BURP8), Methylophaga aminisulfidivorans MP(F5SXI9\_9GAMM), Shewanella amazonensis SB2B(A1S1K7\_SHEAM), Burkholderiales bacterium JOSHI\_001(H5WMW6\_9BURK), Planctomyces brasiliensis DSM 5305(F0SGZ6\_PLABD), Bermanella marisrubri(Q1N0I3\_9GAMM), Ralstonia solanacearum(D8NAF7\_RALSL), Lentisphaera araneosa HTCC2155(A6DTE6\_9BACT), Shewanella sp HN-41(F7RUT6\_9GAMM), Pseudomonas mendocina ymp(A4XYA7\_PSEMY), Methyloversatilis universalis FAM5(F5RA92\_9RHOO), Burkholderia vietnamiensis G4(A4JGG0\_BURVG), Janthinobacterium sp Marseille(A6SXN6\_JANMA), Thauera sp MZ1T(C4K927\_THASP), Methylibium petroleiphilum PM1(A2SJB2\_METPP), Neptuniibacter caesariensis(Q2BPK7\_9GAMM), Thioalkalivibrio sulfidiphilus HL-EbGr7(B8GQJ2\_THISH), Pseudomonas entomophila L48(Q1I987\_PSEE4), Burkholderia sp CCGE1001(E8YI33\_9BURK), Burkholderia sp CCGE1002(D5W5I0\_BURSC), Photobacterium profundum 3TCK(Q1YXI7\_PHOPR), Chromobacterium violaceum ATCC 12472(Q7NRT9\_CHRVO), Polynucleobacter necessarius subsp asymbioticus(A4SYK5\_POLSQ), Ralstonia syzygii R24(G2ZZY7\_9RALS), Acidovorax sp NO-1(H0BSH7\_9BURK), Saccharophagus degradans 2-40(Q21KH6\_SACD2), Acidithiobacillus ferrooxidans ATCC 23270(B7JAC4\_ACIF2), Marinomonas posidonica IVIA-Po-181(F6CYZ3\_MARPP), Shewanella piezotolerans WP3(B8CHC0\_SHEPW), Psychromonas ingrahamii 37(A1SZ58\_PSYIN), Ralstonia pickettii 12D(C6BJV3\_RALP1), Shewanella baltica OS625(G6DWT5\_9GAMM), Cupriavidus taiwanensis(B3R3U0\_CUPTR) |
| YFLC | 1,18E-11 | | P: Rhodococcus opacus B4(C1B1A1\_RHOOB), Mycobacterium rhodesiae NBB3(G8RRI1\_MYCRN), Frankia alni ACN14a(Q0RAX4\_FRAAA), Mycobacterium tusciae JS617(H1K554\_9MYCO), Chitinophaga pinensis DSM 2588(C7PCY5\_CHIPD), Alcanivorax sp DG881(B4WYJ5\_9GAMM), Xanthobacter autotrophicus Py2(A7IN60\_XANP2,A7IQD1\_XANP2), Legionella longbeachae NSW150(D3HKQ0\_LEGLN), Legionella drancourtii LLAP12(G9EQ43\_9GAMM), Burkholderia phymatum STM815(B2JG43\_BURP8), Mycobacterium thermoresistibile ATCC 19527(G7CCQ9\_MYCTH), Mycobacterium sp MCS(Q1B142\_MYCSS), Acidiphilium multivorum AIU301(F0J070\_ACIMA), Burkholderia sp H160(B5WNG3\_9BURK), Frankia sp EuI1c(E3IW89\_FRASU), Alcanivorax borkumensis SK2(Q0VRD9\_ALCBS), Burkholderia sp CCGE1001(E8YPR1\_9BURK), Burkholderia sp CCGE1002(D5W7R5\_BURSC), Burkholderia sp CCGE1003(E1T6S0\_BURSG), Rhodococcus jostii RHA1(Q0S323\_RHOSR), Flavobacterium columnare ATCC 49512(G8X6A5\_FLACA), Burkholderia rhizoxinica HKI 454(E5AQQ1\_BURRH), Burkholderia xenovorans LB400(Q13Z95\_BURXL), Mycobacterium ulcerans Agy99(A0PR02\_MYCUA) |
| YFAQ | 9,04E-03 | | O: Vitis vinifera(D7SUH5\_VITVI), Brevibacillus brevis NBRC 100599(C0ZIH8\_BREBN), Thermobacillus composti KWC4(G4EHA5\_9BACL), Paenibacillus mucilaginosus KNP414(F8FDK4\_PAEMK), Paenibacillus dendritiformis C454(H3SCH5\_9BACL), Paenibacillus terrae HPL-003(G7VWP9\_PAETH), Brevibacillus laterosporus GI-9(H0UG21\_BRELA), Carica papaya(C4PB37\_CARPA), Arabidopsis thaliana(Q946U7\_ARATH), Zea mays(B6SXE2\_MAIZE), Medicago truncatula(G7J2X4\_MEDTR), Leptospira biflexa serovar Patoc(B0SLD6\_LEPBP), Paenibacillus polymyxa E681(E0RCP4\_PAEP6), Wolffia australiana(H6U807\_9ARAE), Physcomitrella patens(A9S385\_PHYPA,A9TSV7\_PHYPA), Arabidopsis lyrata subsp lyrata(D7M9Q6\_ARALL), Paenibacillus sp HGF5(F3M7Q5\_9BACL), Paenibacillus sp HGF7(F5LGN1\_9BACL), Desmospora sp 8437(F5SFV7\_9BACL), Paenibacillus curdlanolyticus YK9(E0I6V1\_9BACL), Selaginella moellendorffii(D8S6W9\_SELML), Paenibacillus sp JDR-2(C6CW20\_PAESJ), Picea sitchensis(A9NND9\_PICSI), Triticum aestivum(B5TQZ2\_WHEAT), Paenibacillus sp oral taxon(C6J171\_9BACL), Datisca glomerata(Q7Y079\_DATGL), Populus trichocarpa(B9H9D4\_POPTR), Bacillus sp 1NLA3E(H1I1M8\_9BACI), Eutrema halophilum(E4MXS1\_THEHA), Thalassiosira pseudonana(B8C835\_THAPS), Oryza sativa Japonica Group(Q69XE4\_ORYSJ), Glycine max(Q6QDC2\_SOYBN,C6T2S6\_SOYBN), Paenibacillus larvae subsp larvae(E7MC96\_9BACL), Paenibacillus sp Aloe-11(H6CNJ3\_9BACL), Ricinus communis(B9RS68\_RICCO), Bacillus coagulans 36D1(G2TMS0\_BACCO), Phaeodactylum tricornutum CCAP 10551(B7G0D0\_PHATC), Kyrpidia tusciae DSM 2912(D5WU47\_BACT2), Paenibacillus lactis 154(G4HLD4\_9BACL) |
| LFFL | 2,69E-15 | | N: Shewanella denitrificans OS217(Q12SA8\_SHEDO), Marinobacter manganoxydans MnI7-9(G6YYX6\_9ALTE), Shewanella sp MR-4(Q0HLA8\_SHESM), Marinobacter adhaerens HP15(E4PI43\_MARAH), Shewanella amazonensis SB2B(A1SAB3\_SHEAM), Reinekea blandensis MED297(A4BB88\_9GAMM), Marinobacter sp ELB17(A3JBC8\_9ALTE), Marinobacter algicola DG893(A6EY49\_9ALTE), Rheinheimera sp A13L(F7NXD1\_9GAMM), Saccharophagus degradans 2-40(Q21LC5\_SACD2), Halomonas sp HAL1(G4F309\_9GAMM) |
| YFMK | 2,69E-15 | | P: Rhizobium leguminosarum bv trifolii(B5ZXR3\_RHILW), Agrobacterium sp ATCC 31749(F5J5A9\_9RHIZ), Agrobacterium tumefaciens F2(F7U441\_RHIRD), Sinorhizobium medicae WSM419(A6ULS3\_SINMW), Agrobacterium tumefaciens CCNWGS0286(G6XXM2\_RHIRD), Sinorhizobium fredii NGR234(C3KMT5\_RHISN), Rhizobium sp PDO1-076(H4F0B9\_9RHIZ), Rhizobium etli CFN 42(Q2KDK7\_RHIEC), Agrobacterium tumefaciens 5A(H0HAA1\_RHIRD), Rhizobium etli CIAT 652(B3PYD4\_RHIE6), Rhizobium leguminosarum bv viciae(Q1MMQ0\_RHIL3), Sinorhizobium meliloti CCNWSX0020(H0FT84\_RHIML) |
| LFLL | 2,78E-07 | | N: Pseudomonas psychrotolerans L19(H0JJY3\_9PSED), Haliscomenobacter hydrossis DSM 1100(F4L646\_HALH1), Pseudomonas syringae Cit 7(F3GTA3\_PSESX), Pseudomonas syringae pv oryzae(F2ZGU5\_9PSED), Pseudomonas syringae pv maculicola(F3HFH5\_PSEYM), Idiomarina sp A28L(F7RV81\_9GAMM), Parvularcula bermudensis HTCC2503(E0TBW6\_PARBH), Pseudomonas fulva 12-X(F6AA16\_PSEF1), mine drainage metagenome(E6PUT6\_9ZZZZ), Pseudomonas savastanoi pv savastanoi(D7I4P2\_PSESS), Pseudomonas fluorescens SBW25(C3K7I0\_PSEFS), Xanthomonas oryzae pv oryzae(Q5GXS7\_XANOR), Xanthomonas albilineans GPE PC73(D2UCQ4\_XANAP), Pseudomonas mendocina ymp(A4XRM8\_PSEMY), Salinisphaera shabanensis E1L3A(F7QD61\_9GAMM), Xanthomonas gardneri ATCC 19865(F0C5U4\_9XANT), Xanthomonas campestris pv campestris(B0RR93\_XANCB), Pseudomonas syringae pv aptata(F3J5N9\_PSEAP), Pseudomonas syringae pv morsprunorum(F3DZ23\_9PSED), Pseudomonas syringae pv tomato(E2MJY0\_PSEUB), Xanthomonas vesicatoria ATCC 35937(F0BCB2\_9XANT), Ricinus communis(B9TG83\_RICCO), Xanthomonas citri pv mangiferaeindicae(H8FET1\_XANCI) |
| YHML | 2,28E-04 | | O: Novosphingobium aromaticivorans DSM 12444(Q2GCA5\_NOVAD), Novosphingobium pentaromativorans US6-1(G6EBK2\_9SPHN), Sphingobium sp SYK-6(G2ISN4\_9SPHN), Caulobacter segnis ATCC 21756(D5VQ98\_CAUST), Novosphingobium sp PP1Y(F6IFD3\_9SPHN), Caulobacter sp K31(B0T7B3\_CAUSK), Novosphingobium nitrogenifigens DSM 19370(F1Z5X0\_9SPHN), Sphingobium chlorophenolicum L-1(F6ESW7\_SPHCR), Sphingomonas wittichii RW1(A5V5K0\_SPHWW), marine gamma proteobacterium HTCC2148(B7RWE6\_9GAMM) |
| VFLL | 1,18E-11 | | N: Acidithiobacillus caldus SM-1(F9ZLS8\_ACICS,F9ZPY0\_ACICS), Limnobacter sp MED105(A6GNQ3\_9BURK), Halothiobacillus neapolitanus c2(D0L0N5\_HALNC), Hyphomonas neptunium ATCC 15444(Q0BZ22\_HYPNA), Oxalobacteraceae bacterium IMCC9480(F1VZN5\_9BURK), Acidiphilium cryptum JF-5(A5G112\_ACICJ), Burkholderiales bacterium JOSHI\_001(H5WPM9\_9BURK), Brevundimonas subvibrioides ATCC 15264(D9QNS8\_BRESC), Cupriavidus necator N-1(F8GPA5\_CUPNN), Ramlibacter tataouinensis TTB310(F5Y5W2\_RAMTT), Methylibium petroleiphilum PM1(A2SF55\_METPP), Curvibacter putative symbiont of(C9Y9G0\_9BURK), Candidatus Nitrospira defluvii(D8PAF5\_9BACT,D8P7L8\_9BACT), Acidovorax sp NO-1(H0C3W6\_9BURK) |
| YHSF | 6,48E-03 | | O: Rhizobium leguminosarum bv trifolii(B5ZZM9\_RHILW), Agrobacterium sp ATCC 31749(F5J978\_9RHIZ), Agrobacterium tumefaciens F2(F7U5G1\_RHIRD), Sinorhizobium medicae WSM419(A6UBY2\_SINMW), Limnobacter sp MED105(A6GP10\_9BURK), Agrobacterium vitis S4(B9JR55\_AGRVS), Asticcacaulis excentricus CB 48(E8RL60\_ASTEC), Sinorhizobium fredii NGR234(C3MGD5\_RHISN), Rhizobium sp PDO1-076(H4FB18\_9RHIZ), Rhizobium etli CFN 42(Q2K563\_RHIEC), Collimonas fungivorans Ter331(G0ACD4\_COLFT), Agrobacterium tumefaciens 5A(H0H881\_RHIRD), Rhizobium etli CIAT 652(B3PX70\_RHIE6), Rhizobium leguminosarum bv viciae(Q1MD01\_RHIL3), Agrobacterium radiobacter K84(B9J857\_AGRRK), Burkholderia xenovorans LB400(Q142K1\_BURXL), Sinorhizobium meliloti CCNWSX0020(H0GA12\_RHIML) |
| YHAL | 6,48E-03 | | O: Methylotenera versatilis 301(D7DIW7\_METS0), Comamonas testosteroni ATCC 11996(H1RK32\_COMTE), Bordetella petrii DSM 12804(A9IJT5\_BORPD), Methylobacter tundripaludum SV96(G3IT70\_9GAMM), Variovorax paradoxus EPS(E6UXE4\_VARPE), Alicycliphilus denitrificans K601(F4GAB4\_ALIDK), Variovorax paradoxus S110(C5CWP3\_VARPS), Methylomonas methanica MC09(G0A2B2\_METMM), Methylomicrobium alcaliphilum 20Z(G4T327\_META2), Polaromonas sp JS666(Q12EZ1\_POLSJ), Novosphingobium aromaticivorans DSM 12444(Q2G523\_NOVAD), Acidovorax avenae subsp avenae(F0Q0V5\_ACIAP), Marinomonas mediterranea MMB-1(F2JVC2\_MARM1), Neisseria wadsworthii 9715(G4CMK5\_9NEIS), Polaromonas naphthalenivorans CJ2(A1VKI6\_POLNA), Rhodoferax ferrireducens T118(Q21TE0\_RHOFD), Methylovorus sp MP688(E4QIY5\_METS6), Methylobacillus flagellatus KT(Q1H1W3\_METFK), Methylococcus capsulatus str Bath(Q606Y3\_METCA), Gallionella capsiferriformans ES-2(D9SK81\_GALCS), Achromobacter arsenitoxydans SY8(H0F9F5\_9BURK), Achromobacter xylosoxidans C54(E5U1W4\_ALCXX), Beijerinckia indica subsp indica(B2IE39\_BEII9), Azotobacter vinelandii DJ(C1DDP7\_AZOVD), Achromobacter xylosoxidans A8(E3HFM9\_ACHXA), Acidovorax ebreus TPSY(B9MEH6\_ACIET), Bradyrhizobium sp STM 3843(H0TRL7\_9BRAD), Sphingomonas sp SKA58(Q1NF48\_9SPHN), Bordetella avium 197N(Q2KYN5\_BORA1), Novosphingobium nitrogenifigens DSM 19370(F1ZB73\_9SPHN), Mariprofundus ferrooxydans PV-1(Q0F2H6\_9PROT), Achromobacter piechaudii ATCC 43553(D4XAA8\_9BURK), Azoarcus sp BH72(A1K669\_AZOSB), Acidovorax delafieldii 2AN(C5TD07\_ACIDE), Leptothrix cholodnii SP-6(B1Y0J1\_LEPCP), Azoarcus sp KH32C(H0PVQ4\_9RHOO), Burkholderia vietnamiensis G4(A4JRN5\_BURVG), Methylomicrobium album BG8(H8GH79\_METAL), Ramlibacter tataouinensis TTB310(F5XW43\_RAMTT), Methylotenera mobilis JLW8(C6WW87\_METML), Sphingobium chlorophenolicum L-1(F6F2Z0\_SPHCR), Herbaspirillum seropedicae SmR1(D8IZK7\_HERSS), Curvibacter putative symbiont of(C9Y8P3\_9BURK), Sphingobium japonicum UT26S(D4Z631\_SPHJU), Bacteriovorax marinus SJ(E1WZL7\_BACMS), Achromobacter xylosoxidans AXX-A(F7T4L5\_ALCXX), Acidovorax sp NO-1(H0BTR3\_9BURK), Bordetella pertussis Tohama I(Q7VWB0\_BORPE), Methylomonas sp 16a(A3QVH5\_9GAMM), Delftia acidovorans SPH-1(A9BT93\_DELAS), Hylemonella gracilis ATCC 19624(F3KVD3\_9BURK) |
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| STG8 key residues H9-G8-G9 | **[]** | | **Specie (uniprotID)** |
| FWL | 2,69E-15 | | O: Burkholderia pseudomallei(Q93SP0\_BURPE), Vitis vinifera(D7SUH5\_VITVI), Cupriavidus basilensis OR16(H1S0E9\_9BURK), Acidithiobacillus ferrivorans SS3(G0JTF5\_9GAMM), Variovorax paradoxus EPS(E6UXE4\_VARPE), Burkholderia dolosa AUO158(A2W8M7\_9BURK), Limnobacter sp MED105(A6GP10\_9BURK), Sideroxydans lithotrophicus ES-1(D5CRB2\_SIDLE), Variovorax paradoxus S110(C5CWP3\_VARPS), Polaromonas sp JS666(Q12EZ1\_POLSJ), Janibacter sp HTCC2649(A3TFS8\_9MICO), Polaromonas naphthalenivorans CJ2(A1VKI6\_POLNA,A1VPS5\_POLNA), Herminiimonas arsenicoxydans(A4G6U6\_HERAR), Methylophaga thiooxydans DMS010(C0N247\_9GAMM), Arthrobacter arilaitensis Re117(E1VWS4\_ARTAR), Rhodoferax ferrireducens T118(Q21TE0\_RHOFD), Oxalobacteraceae bacterium IMCC9480(F1VZU8\_9BURK), Carica papaya(C4PB37\_CARPA), Arabidopsis thaliana(Q946U7\_ARATH), Gallionella capsiferriformans ES-2(D9SK81\_GALCS), Pseudogulbenkiania ferrooxidans 2002(B9Z208\_9NEIS), Ralstonia eutropha JMP134(Q473W9\_CUPPJ), mine drainage metagenome(E6PT94\_9ZZZZ), Nitrosospira multiformis ATCC 25196(Q2Y824\_NITMU), Burkholderia thailandensis E264(Q2SZR5\_BURTA), Methylosinus trichosporium OB3b(D5QKG5\_METTR), Algoriphagus machipongonensis(A3I308\_9BACT), Zea mays(B6SXE2\_MAIZE), Medicago truncatula(G7J2X4\_MEDTR), Wolffia australiana(H6U807\_9ARAE), Beijerinckia indica subsp indica(B2IE39\_BEII9), Physcomitrella patens(A9S385\_PHYPA,A9TSV7\_PHYPA), Arabidopsis lyrata subsp lyrata(D7M9Q6\_ARALL), Burkholderia phymatum STM815(B2JE19\_BURP8), Methylophaga aminisulfidivorans MP(F5SXI9\_9GAMM), Thiomonas intermedia K12(D5X1M5\_THIK1), Burkholderiales bacterium JOSHI\_001(H5WW47\_9BURK), Selaginella moellendorffii(D8S6W9\_SELML), Planctomyces brasiliensis DSM 5305(F0SGZ6\_PLABD), Picea sitchensis(A9NND9\_PICSI), Triticum aestivum(B5TQZ2\_WHEAT), Kocuria rhizophila DC2201(B2GG22\_KOCRD), Beggiatoa sp PS(A7BTI1\_9GAMM), Corynebacterium glucuronolyticum ATCC 51866(C2GJU6\_9CORY), Collimonas fungivorans Ter331(G0ACD4\_COLFT), Caldalkalibacillus thermarum TA2A1(F5L510\_9BACI), Saccharopolyspora erythraea NRRL 2338(A4F9C9\_SACEN), Azoarcus sp BH72(A1K669\_AZOSB), Datisca glomerata(Q7Y079\_DATGL), Populus trichocarpa(B9H9D4\_POPTR), Eutrema halophilum(E4MXS1\_THEHA), Leptothrix cholodnii SP-6(B1Y0J1\_LEPCP), Azoarcus sp KH32C(H0PVQ4\_9RHOO), Oryza sativa Japonica Group(Q69XE4\_ORYSJ), Burkholderia vietnamiensis G4(A4JGG0\_BURVG), Planctomyces maris DSM 8797(A6CB44\_9PLAN), Glycine max(Q6QDC2\_SOYBN,C6T2S6\_SOYBN), Janthinobacterium sp Marseille(A6SXN6\_JANMA), Ramlibacter tataouinensis TTB310(F5XW43\_RAMTT), Methylibium petroleiphilum PM1(A2SJB2\_METPP), Kytococcus sedentarius DSM 20547(C7NFL3\_KYTSD), Thioalkalivibrio sulfidiphilus HL-EbGr7(B8GQJ2\_THISH), Burkholderia sp CCGE1001(E8YI33\_9BURK), Burkholderia sp CCGE1002(D5W5I0\_BURSC), Herbaspirillum seropedicae SmR1(D8IZK7\_HERSS), Chromobacterium violaceum ATCC 12472(Q7NRT9\_CHRVO), Polynucleobacter necessarius subsp asymbioticus(A4SYK5\_POLSQ), Curvibacter putative symbiont of(C9Y8P3\_9BURK), Bacteriovorax marinus SJ(E1WZL7\_BACMS), Burkholderia xenovorans LB400(Q142K1\_BURXL,Q13N39\_BURXL), Acidovorax sp NO-1(H0BSH7\_9BURK), Acidithiobacillus ferrooxidans ATCC 23270(B7JAC4\_ACIF2), Ricinus communis(B9RS68\_RICCO), Methylocella silvestris BL2(B8EJ43\_METSB), Ralstonia pickettii 12D(C6BJV3\_RALP1), Brevibacterium mcbrellneri ATCC 49030(D4YQV3\_9MICO), Cupriavidus taiwanensis(B3R3U0\_CUPTR), Acidothermus cellulolyticus 11B(A0LVC1\_ACIC1) |
| FWL | 2,69E-15 | | Q: Streptomyces venezuelae ATCC 10712(F2RB89\_STRVP), Nocardioidaceae bacterium Broad-1(E9UUY1\_9ACTO), Frankia sp CN3(G6H1I3\_9ACTO), Frankia sp EuI1c(E3J683\_FRASU), Streptomyces himastatinicus ATCC 53653(D9WP19\_9ACTO), Streptomyces bingchenggensis BCW-1(D7CHT6\_STRBB), Frankia sp EUN1f(D3D2S0\_9ACTO) |
| LVV | 1,22E-03 | | N: Mycobacterium rhodesiae NBB3(G8RPN1\_MYCRN), Mycobacterium intracellulare MOTT-64(H8JFC0\_MYCIT), Kribbella flavida DSM 17836(D2Q0K6\_KRIFD), Frankia alni ACN14a(Q0RMX2\_FRAAA), Mycobacterium tusciae JS617(H1JWA3\_9MYCO), Mycobacterium parascrofulaceum ATCC BAA-614(D5P2P0\_9MYCO), SAR116 cluster alpha proteobacterium(G5ZYB7\_9PROT), Mycobacterium avium 104(A0QHM2\_MYCA1), Mycobacterium bovis BCG str(G7QTX2\_MYCBO), Mycobacterium vanbaalenii PYR-1(A1T9D6\_MYCVP), Mycobacterium colombiense CECT 3035(F9QQ45\_9MYCO), Frankia sp EAN1pec(A8L0I3\_FRASN), Mycobacterium gilvum PYR-GCK(A4TAL9\_MYCGI), Halomonas sp TD01(F7SSB5\_9GAMM), Frankia sp CcI3(Q2J9U9\_FRASC), Patulibacter medicamentivorans(H0EBK8\_9ACTN), Congregibacter litoralis KT71(A4ACE9\_9GAMM), Frankia sp EuI1c(E3IVK7\_FRASU), Mycobacterium smegmatis str MC2(A0R4A6\_MYCS2), Frankia sp EUN1f(D3CSZ7\_9ACTO) |
| AWV | 2,69E-15 | | O: Novosphingobium aromaticivorans DSM 12444(Q2GCA5\_NOVAD), Novosphingobium pentaromativorans US6-1(G6EBK2\_9SPHN), Novosphingobium sp PP1Y(F6IFD3\_9SPHN), Novosphingobium nitrogenifigens DSM 19370(F1Z5X0\_9SPHN) |
| AWV | 2,69E-15 | | P: Rhodococcus opacus B4(C1B1A1\_RHOOB), Streptomyces venezuelae ATCC 10712(F2R152\_STRVP), Acidovorax avenae subsp avenae(F0Q4M9\_ACIAP), Kitasatospora setae KM-6054(E4N1M3\_KITSK), Flavobacterium johnsoniae UW101(A5FCK0\_FLAJ1), Acidovorax citrulli AAC00-1(A1TMH1\_ACIAC), Acidovorax delafieldii 2AN(C5T6F2\_ACIDE), Rhodococcus jostii RHA1(Q0S323\_RHOSR), Acidovorax sp NO-1(H0C1D4\_9BURK) |
| AWV | 2,69E-15 | | Q: Streptomyces clavuligerus ATCC 27064(B5GVJ7\_STRCL), Yersinia ruckeri ATCC 29473(C4ULC2\_YERRU), Kribbella flavida DSM 17836(D2PQN0\_KRIFD), Photorhabdus asymbiotica subsp asymbiotica(B6VNR2\_PHOAA), Fluviicola taffensis DSM 16823(F2IK57\_FLUTR), Ktedonobacter racemifer DSM 44963(D6U4L4\_9CHLR), Pseudoalteromonas sp SANK 73390(F8J3E6\_9GAMM), Niastella koreensis GR20-10(G8TQW4\_NIAKG), Amycolatopsis mediterranei S699(G0G7F8\_AMYMD), Xenorhabdus bovienii SS-2004(D3V2A9\_XENBS) |
| LWV | 2,69E-15 | | O: Sphingomonas sp SKA58(Q1NF48\_9SPHN), Sphingobium chlorophenolicum L-1(F6F2Z0\_SPHCR), Sphingomonas wittichii RW1(A5V5K0\_SPHWW), Sphingobium japonicum UT26S(D4Z631\_SPHJU) |
| RWL | 2,69E-15 | | P: Oceanicaulis sp HTCC2633(A3UC56\_9RHOB), Hyphomonas neptunium ATCC 15444(Q0C302\_HYPNA), Maricaulis maris MCS10(Q0ARP0\_MARMM), Hirschia baltica ATCC 49814(C6XNL3\_HIRBI), Alkalilimnicola ehrlichii MLHE-1(Q0A5B2\_ALHEH) |
| LLV | 2,28E-04 | | N: Acidithiobacillus caldus SM-1(F9ZLS8\_ACICS,F9ZPY0\_ACICS), Limnobacter sp MED105(A6GNQ3\_9BURK), Halothiobacillus neapolitanus c2(D0L0N5\_HALNC), Pseudomonas psychrotolerans L19(H0JJY3\_9PSED), Haliscomenobacter hydrossis DSM 1100(F4L646\_HALH1), Hyphomonas neptunium ATCC 15444(Q0BZ22\_HYPNA), Pseudomonas syringae Cit 7(F3GTA3\_PSESX), Shewanella denitrificans OS217(Q12SA8\_SHEDO), Pseudomonas syringae pv oryzae(F2ZGU5\_9PSED), Oxalobacteraceae bacterium IMCC9480(F1VZN5\_9BURK), Marinobacter manganoxydans MnI7-9(G6YYX6\_9ALTE), Pseudomonas syringae pv maculicola(F3HFH5\_PSEYM), Acidiphilium cryptum JF-5(A5G112\_ACICJ), Idiomarina sp A28L(F7RV81\_9GAMM), Parvularcula bermudensis HTCC2503(E0TBW6\_PARBH), Shewanella sp MR-4(Q0HLA8\_SHESM), Pseudomonas fulva 12-X(F6AA16\_PSEF1), Marinobacter adhaerens HP15(E4PI43\_MARAH), Pseudomonas savastanoi pv savastanoi(D7I4P2\_PSESS), Shewanella amazonensis SB2B(A1SAB3\_SHEAM), Burkholderiales bacterium JOSHI\_001(H5WPM9\_9BURK), Reinekea blandensis MED297(A4BB88\_9GAMM), Pseudomonas fluorescens SBW25(C3K7I0\_PSEFS), Xanthomonas oryzae pv oryzae(Q5GXS7\_XANOR), Xanthomonas albilineans GPE PC73(D2UCQ4\_XANAP), Pseudomonas mendocina ymp(A4XRM8\_PSEMY), Brevundimonas subvibrioides ATCC 15264(D9QNS8\_BRESC), Salinisphaera shabanensis E1L3A(F7QD61\_9GAMM), Cupriavidus necator N-1(F8GPA5\_CUPNN), Marinobacter sp ELB17(A3JBC8\_9ALTE), Ramlibacter tataouinensis TTB310(F5Y5W2\_RAMTT), Methylibium petroleiphilum PM1(A2SF55\_METPP), Marinobacter algicola DG893(A6EY49\_9ALTE), Rheinheimera sp A13L(F7NXD1\_9GAMM), Curvibacter putative symbiont of(C9Y9G0\_9BURK), Xanthomonas gardneri ATCC 19865(F0C5U4\_9XANT), Xanthomonas campestris pv campestris(B0RR93\_XANCB), Candidatus Nitrospira defluvii(D8PAF5\_9BACT,D8P7L8\_9BACT), Pseudomonas syringae pv aptata(F3J5N9\_PSEAP), Pseudomonas syringae pv morsprunorum(F3DZ23\_9PSED), Pseudomonas syringae pv tomato(E2MJY0\_PSEUB), Acidovorax sp NO-1(H0C3W6\_9BURK), Xanthomonas vesicatoria ATCC 35937(F0BCB2\_9XANT), Saccharophagus degradans 2-40(Q21LC5\_SACD2), Ricinus communis(B9TG83\_RICCO), Halomonas sp HAL1(G4F309\_9GAMM), Xanthomonas citri pv mangiferaeindicae(H8FET1\_XANCI) |
|  |  |  |  |
| LT key residues H5-B2-H9-E15-E11-G8 | **[]** | | **Specie (uniprotID)** |
| LFFLLW | 2,21E-12 | | O: Janibacter sp HTCC2649(A3TFS8\_9MICO), Arthrobacter arilaitensis Re117(E1VWS4\_ARTAR), Kocuria rhizophila DC2201(B2GG22\_KOCRD), Corynebacterium glucuronolyticum ATCC 51866(C2GJU6\_9CORY), Saccharopolyspora erythraea NRRL 2338(A4F9C9\_SACEN), Kytococcus sedentarius DSM 20547(C7NFL3\_KYTSD), Brevibacterium mcbrellneri ATCC 49030(D4YQV3\_9MICO), Acidothermus cellulolyticus 11B(A0LVC1\_ACIC1) |
| FILLQW | 4,26E-05 | | O: Leptospira biflexa serovar Patoc(B0SLD6\_LEPBP) |
| LILLQW | 6,48E-03 | | O: Paenibacillus mucilaginosus KNP414(F8FDK4\_PAEMK), Paenibacillus dendritiformis C454(H3SCH5\_9BACL), Bacillus clausii KSM-K16(Q5WF01\_BACSK), Desmospora sp 8437(F5SFV7\_9BACL), Paenibacillus sp oral taxon(C6J171\_9BACL), Bacillus megaterium QM B1551(D5E038\_BACMQ), Bacillus cytotoxicus NVH 391-98(A7GM87\_BACCN), Bacillus cereus Rock3-44(C2W574\_BACCE), Paenibacillus larvae subsp larvae(E7MC96\_9BACL), Paenibacillus sp Aloe-11(H6CNJ3\_9BACL), Geobacillus sp WCH70(C5D799\_GEOSW), Bacillus thuringiensis serovar huazhongensis(C3GXW6\_BACTU), Paenibacillus lactis 154(G4HLD4\_9BACL) |
| LFFLQW | 4,26E-05 | | O: Zea mays(B6SXE2\_MAIZE), Medicago truncatula(G7J2X4\_MEDTR), Triticum aestivum(B5TQZ2\_WHEAT), Thalassiosira pseudonana(B8C835\_THAPS), Oryza sativa Japonica Group(Q69XE4\_ORYSJ) |
| LIAFQV | 3,37E-02 | | N: Mycobacterium ulcerans Agy99(A0PNY4\_MYCUA) |
| LFLLFW | 6,33E-11 | | O: Arthrobacter aurescens TC1(A1R7B2\_ARTAT), Streptomyces sp AA4(D9VAR2\_9ACTO), Arthrobacter sp FB24(A0JXM3\_ARTS2), Streptomyces clavuligerus ATCC 27064(B5GVB3\_STRCL), Arthrobacter chlorophenolicus A6(B8HA44\_ARTCA), Kribbella flavida DSM 17836(D2PTJ8\_KRIFD), Streptomyces sp Mg1(B4V9I1\_9ACTO), Dermacoccus sp Ellin185(E3BBA3\_9MICO), Streptomyces albus J1074(D6B196\_9ACTO), Kitasatospora setae KM-6054(E4NIA7\_KITSK), Streptomyces sp SirexAA-E(G2NKL6\_9ACTO), Streptomyces griseus XylebKG-1(G0PQ09\_STRGR), Streptosporangium roseum DSM 43021(D2BDZ5\_STRRD), Amycolicicoccus subflavus DQS3-9A1(F6EQ94\_AMYSD), Streptomyces avermitilis MA-4680 =(Q82CH9\_STRAW), Actinosynnema mirum DSM 43827(C6WQ34\_ACTMD), Arthrobacter phenanthrenivorans Sphe3(F0M4E0\_ARTPP), Streptomyces sp SPB74(B5G7N3\_9ACTO), Microlunatus phosphovorus NM-1(F5XP72\_MICPN), Streptomyces pratensis ATCC 33331(E8W9Z7\_STRFA), Arthrobacter globiformis NBRC 12137(H0QPD5\_ARTGO), Streptomyces coelicolor A3(2)(Q9L250\_STRCO), Streptomyces sp C(D9VWG0\_9ACTO), Amycolatopsis mediterranei S699(G0G0V5\_AMYMD) |
| LIAEVW | 1,22E-03 | | P: Roseibium sp TrichSKD4(E2CBJ4\_9RHOB), Mucilaginibacter paludis DSM 18603(H1Y0Q4\_9SPHI), Sphingobacterium sp 21(F4CFE1\_SPHS2), Leadbetterella byssophila DSM 17132(E4RWM0\_LEAB4), Hahella chejuensis KCTC 2396(Q2SEJ4\_HAHCH) |
| LILLLL | 1,22E-03 | | N: Haliscomenobacter hydrossis DSM 1100(F4L646\_HALH1), Pseudomonas syringae Cit 7(F3GTA3\_PSESX), Shewanella denitrificans OS217(Q12SA8\_SHEDO), Pseudomonas syringae pv oryzae(F2ZGU5\_9PSED), Marinobacter manganoxydans MnI7-9(G6YYX6\_9ALTE), Pseudomonas syringae pv maculicola(F3HFH5\_PSEYM), Idiomarina sp A28L(F7RV81\_9GAMM), Parvularcula bermudensis HTCC2503(E0TBW6\_PARBH), Marinobacter adhaerens HP15(E4PI43\_MARAH), Pseudomonas savastanoi pv savastanoi(D7I4P2\_PSESS), Pseudomonas mendocina ymp(A4XRM8\_PSEMY), Salinisphaera shabanensis E1L3A(F7QD61\_9GAMM), Cupriavidus necator N-1(F8GPA5\_CUPNN), Marinobacter sp ELB17(A3JBC8\_9ALTE), Marinobacter algicola DG893(A6EY49\_9ALTE), Candidatus Nitrospira defluvii(D8P7L8\_9BACT), Pseudomonas syringae pv aptata(F3J5N9\_PSEAP), Pseudomonas syringae pv morsprunorum(F3DZ23\_9PSED), Pseudomonas syringae pv tomato(E2MJY0\_PSEUB), Acidovorax sp NO-1(H0C3W6\_9BURK), Halomonas sp HAL1(G4F309\_9GAMM) |
| LILLLW | 1,49E-06 | | O: Methylotenera versatilis 301(D7DIW7\_METS0), gamma proteobacterium HTCC5015(B5JSW2\_9GAMM), Methylobacter tundripaludum SV96(G3IT70\_9GAMM), Pseudoalteromonas haloplanktis TAC125(Q3IHN5\_PSEHT), Shewanella pealeana ATCC 700345(A8GYI1\_SHEPA), Methylomonas methanica MC09(G0A2B2\_METMM), Marinomonas mediterranea MMB-1(F2JVC2\_MARM1), Shewanella woodyi ATCC 51908(B1KCX2\_SHEWM), Shewanella loihica PV-4(A3QJE6\_SHELP), Thiobacillus denitrificans ATCC 25259(Q3SKQ0\_THIDA), Methylovorus sp MP688(E4QIY5\_METS6), Shewanella denitrificans OS217(Q12T98\_SHEDO), Shewanella frigidimarina NCIMB 400(Q08A21\_SHEFN), Gemmatimonas aurantiaca T-27(C1ACG4\_GEMAT), Xanthobacter autotrophicus Py2(A7IBJ8\_XANP2), Shewanella sp MR-7(Q0I0R5\_SHESR), gamma proteobacterium IMCC2047(F3KDR8\_9GAMM), Pseudoalteromonas sp BSi20429(G7F0K5\_9GAMM), Shewanella oneidensis MR-1(Q8EKQ1\_SHEON), Shewanella amazonensis SB2B(A1S1K7\_SHEAM), Bermanella marisrubri(Q1N0I3\_9GAMM), Shewanella sp HN-41(F7RUT6\_9GAMM), Methylotenera mobilis JLW8(C6WW87\_METML), marine gamma proteobacterium HTCC2148(B7RWE6\_9GAMM), marine gamma proteobacterium HTCC2143(A0YE49\_9GAMM), Saccharophagus degradans 2-40(Q21KH6\_SACD2), Shewanella piezotolerans WP3(B8CHC0\_SHEPW), Methylomonas sp 16a(A3QVH5\_9GAMM), Planctomyces limnophilus DSM 3776(D5SYN7\_PLAL2), Psychromonas ingrahamii 37(A1SZ58\_PSYIN), Shewanella baltica OS625(G6DWT5\_9GAMM) |
| LILSLL | 1,49E-06 | | N: Acidithiobacillus caldus SM-1(F9ZPY0\_ACICS), Limnobacter sp MED105(A6GNQ3\_9BURK), Halothiobacillus neapolitanus c2(D0L0N5\_HALNC), Burkholderiales bacterium JOSHI\_001(H5WPM9\_9BURK), Candidatus Nitrospira defluvii(D8PAF5\_9BACT) |
| LIALLW | 4,26E-05 | | O: Novosphingobium aromaticivorans DSM 12444(Q2G523\_NOVAD), Sphingobium sp SYK-6(G2ISN4\_9SPHN), Novosphingobium nitrogenifigens DSM 19370(F1ZB73\_9SPHN) |
| LFLLLW | 1,49E-06 | | O: Mycobacterium tuberculosis NCGM2209(G2UUQ6\_MYCTU), Clavibacter michiganensis subsp sepedonicus(B0RAR2\_CLAMS), Micrococcus luteus SK58(D3LL05\_MICLU), Corynebacterium efficiens YS-314(Q8FN04\_COREF), Streptomyces sviceus ATCC 29083(D6XBM2\_9ACTO), Microbacterium laevaniformans OR221(H8E4L0\_9MICO), Mycobacterium rhodesiae NBB3(G8RIA5\_MYCRN), Leifsonia xyli subsp xyli(Q6AFT0\_LEIXX), Actinoplanes sp SE50110(G8S1V0\_ACTS5), Mycobacterium intracellulare MOTT-64(H8JRE9\_MYCIT), Cellulomonas flavigena DSM 20109(D5UCE3\_CELFN), Corynebacterium glutamicum ATCC 14067(G6WV80\_CORGT), Streptomyces venezuelae ATCC 10712(F2R2J2\_STRVP), Blastococcus saxobsidens DD2(H6RIR9\_BLASD), Xylanimonas cellulosilytica DSM 15894(D1BZH5\_XYLCX), Gordonia effusa NBRC 100432(H0QZ84\_9ACTO), Streptomyces zinciresistens K42(G2GKZ3\_9ACTO), Beutenbergia cavernae DSM 12333(C5BXJ9\_BEUC1), Frankia alni ACN14a(Q0RPN6\_FRAAA), Segniliparus rotundus DSM 44985(D6Z7C0\_SEGRD), Mycobacterium tusciae JS617(H1JSN5\_9MYCO), Corynebacterium amycolatum SK46(E2MXD8\_9CORY), Corynebacterium variabile DSM 44702(G0HB35\_CORVD), Corynebacterium accolens ATCC 49725(C0WJJ8\_9CORY), Saccharomonospora marina XMU15(H5X3G1\_9PSEU), Mycobacterium parascrofulaceum ATCC BAA-614(D5PH46\_9MYCO), Mycobacterium avium 104(A0QDE2\_MYCA1), Streptomyces ghanaensis ATCC 14672(D6A297\_9ACTO), Mycobacterium vanbaalenii PYR-1(A1TCE3\_MYCVP), Nocardia farcinica IFM 10152(Q5Z082\_NOCFA), Corynebacterium diphtheriae NCTC 13129(Q6NFT6\_CORDI), Saccharomonospora cyanea NA-134(H5XE69\_9PSEU), Brachybacterium faecium DSM 4810(C7MBP3\_BRAFD), Mycobacterium colombiense CECT 3035(F9QGJ2\_9MYCO), Corynebacterium lipophiloflavum DSM 44291(C0XRD8\_9CORY), Corynebacterium resistens DSM 45100(F8DZ36\_CORRG), Frankia sp CN3(G6HKE2\_9ACTO), Streptomyces griseoaurantiacus M045(F3NCP4\_9ACTO), Mycobacterium abscessus subsp bolletii(H0IML9\_MYCAB), Nakamurella multipartita DSM 44233(C8XGN0\_NAKMY), marine actinobacterium PHSC20C1(A4AGR0\_9ACTN), Isoptericola variabilis 225(F6FQG9\_ISOV2), Jonesia denitrificans DSM 20603(C7R2X0\_JONDD), Frankia sp EAN1pec(A8L215\_FRASN), Thermobifida fusca(2BMM), Corynebacterium ammoniagenes DSM 20306(D5NXP9\_CORAM), Dietzia cinnamea P4(E6J538\_9ACTO), Corynebacterium casei UCMA 3821(G7HW23\_9CORY), Mycobacterium gilvum PYR-GCK(A4T2Q7\_MYCGI), Streptomyces cattleya NRRL 8057(F8JS37\_STREN), Gordonia araii NBRC 100433(G7H143\_9ACTO), Saccharomonospora paurometabolica YIM 90007(G4J0W0\_9PSEU), Streptomyces griseoflavus Tu4000(D9Y0C3\_9ACTO), Streptomyces viridochromogenes DSM 40736(D9X9K7\_STRVR), Corynebacterium pseudogenitalium ATCC 33035(E2S653\_9CORY), Micromonospora sp ATCC 39149(C4RPG9\_9ACTO), Corynebacterium glutamicum ATCC 13032(Q8NMW6\_CORGL), Stackebrandtia nassauensis DSM 44728(D3Q6N6\_STANL), Saccharomonospora glauca K62(H1JG78\_9PSEU), Frankia sp CcI3(Q2JDW4\_FRASC), Mycobacterium rhodesiae JS60(G4I1H8\_MYCRH), Streptomyces hygroscopicus subsp jinggangensis(H2K910\_STRHJ), Mycobacterium thermoresistibile ATCC 19527(G7CJC9\_MYCTH), Gordonia sputi NBRC 100414(H5U4M1\_9ACTO), Mycobacterium leprae(Q9X7B3\_MYCLE), Gordonia otitidis NBRC 100426(H5TSE0\_9ACTO), Nocardia brasiliensis ATCC 700358(H5RS95\_9NOCA), Mycobacterium sp MCS(Q1B5W7\_MYCSS), Corynebacterium striatum ATCC 6940(C2CLE9\_CORST), Corynebacterium jeikeium K411(Q4JWW0\_CORJK), Micromonospora aurantiaca ATCC 27029(D9TAK4\_MICAI), Streptomyces violaceusniger Tu 4113(G2NX27\_STRVO), Microbacterium testaceum StLB037(E8NDL4\_MICTS), Streptomyces sp SPB78(D9UM81\_9ACTO), Mycobacterium marinum M(B2HNH8\_MYCMM), Frankia sp EuI1c(E3J5P0\_FRASU), Saccharomonospora viridis DSM 43017(C7MZW7\_SACVD), Streptomyces himastatinicus ATCC 53653(D9WQC1\_9ACTO), Gordonia alkanivorans NBRC 16433(F9VZA5\_9ACTO), Corynebacterium aurimucosum ATCC 700975(C3PII6\_CORA7), Salinispora tropica CNB-440(A4XAM0\_SALTO), Mycobacterium smegmatis str MC2(A0R1B8\_MYCS2), Streptomyces bingchenggensis BCW-1(D7C3F4\_STRBB), Saccharomonospora azurea NA-128(H8GDG3\_9PSEU), Mycobacterium sp JDM601(F5YY56\_MYCSD), Streptomyces sp e14(D6K0W4\_9ACTO), Frankia sp EUN1f(D3D1B2\_9ACTO), Gordonia neofelifaecis NRRL B-59395(F1YI30\_9ACTO), Gordonia bronchialis DSM 43247(D0LAH0\_GORB4), Corynebacterium ulcerans 809(G0CMU9\_CORUL), Salinispora arenicola CNS-205(A8M1P3\_SALAI), Cellulomonas fimi ATCC 484(F4H5S7\_CELFA), Nocardiopsis dassonvillei subsp dassonvillei(D7B3R3\_NOCDD), Catenulispora acidiphila DSM 44928(C7Q9L1\_CATAD), Nocardia cyriacigeorgica GUH-2(H6R5I9\_NOCCG), Gordonia polyisoprenivorans VH2(H6MX45\_GORPV), Thermomonospora curvata DSM 43183(D1A9X9\_THECD), Geodermatophilus obscurus DSM 43160(D2SCM4\_GEOOG), Mobilicoccus pelagius NBRC 104925(H5UVC5\_9MICO), Corynebacterium pseudotuberculosis 106-A(G7U1I8\_CORPS), Frankia symbiont of Datisca(D3M5P7\_9ACTO), Corynebacterium genitalium ATCC 33030(D7WC24\_9CORY), Streptomyces scabiei 8722(C9Z5X1\_STRSW) |
| LILFLL | 3,37E-02 | | N: Pseudomonas psychrotolerans L19(H0JJY3\_9PSED), Oxalobacteraceae bacterium IMCC9480(F1VZN5\_9BURK), Pseudomonas fulva 12-X(F6AA16\_PSEF1), Pseudomonas fluorescens SBW25(C3K7I0\_PSEFS), Xanthomonas oryzae pv oryzae(Q5GXS7\_XANOR), Xanthomonas albilineans GPE PC73(D2UCQ4\_XANAP), Xanthomonas gardneri ATCC 19865(F0C5U4\_9XANT), Xanthomonas campestris pv campestris(B0RR93\_XANCB), Xanthomonas vesicatoria ATCC 35937(F0BCB2\_9XANT), Ricinus communis(B9TG83\_RICCO), Xanthomonas citri pv mangiferaeindicae(H8FET1\_XANCI) |
| FIASVW | 1,22E-03 | | P: Burkholderia cenocepacia PC184(A2VXT3\_9BURK), Burkholderia gladioli BSR3(F2LCR3\_BURGS), Burkholderia ambifaria MEX-5(B1T3N9\_9BURK), Burkholderia multivorans ATCC 17616(A9AG64\_BURM1), Burkholderia glumae BGR1(C5AFG3\_BURGB), Burkholderia vietnamiensis G4(A4JES7\_BURVG), Roseobacter sp AzwK-3b(A6FK96\_9RHOB), Burkholderia sp(Q39FM2\_BURS3) |
| LIASVW | 6,48E-03 | | P: Alicycliphilus denitrificans K601(F4GC46\_ALIDK), Acidovorax avenae subsp avenae(F0Q4M9\_ACIAP), Polaromonas naphthalenivorans CJ2(A1VL14\_POLNA), Lautropia mirabilis ATCC 51599(E7RZ21\_9BURK), Bordetella bronchiseptica RB50(Q7WJJ5\_BORBR), Nitrosomonas eutropha C91(Q0AIE0\_NITEC), Acidovorax citrulli AAC00-1(A1TMH1\_ACIAC), Azoarcus sp BH72(A1K1I2\_AZOSB), Acidovorax sp NO-1(H0C1D4\_9BURK) |
| LIALQV | 6,48E-03 | | N: Plesiocystis pacifica SIR-1(A6G520\_9DELT), Cyanothece sp PCC 8802(C7QR53\_CYAP0) |
| LIFLLW | 7,95E-06 | | O: Bordetella petrii DSM 12804(A9IJT5\_BORPD), Alicycliphilus denitrificans K601(F4GAB4\_ALIDK), Nitrosospira multiformis ATCC 25196(Q2Y824\_NITMU), Algoriphagus machipongonensis(A3I308\_9BACT), Beijerinckia indica subsp indica(B2IE39\_BEII9), Acidovorax ebreus TPSY(B9MEH6\_ACIET), Acidovorax delafieldii 2AN(C5TD07\_ACIDE), Curvibacter putative symbiont of(C9Y8P3\_9BURK), Bacteriovorax marinus SJ(E1WZL7\_BACMS), Acidovorax sp NO-1(H0BSH7\_9BURK) |
| LILLFV | 1,81E-09 | | N: Halomonas sp TD01(F7SSB5\_9GAMM), Congregibacter litoralis KT71(A4ACE9\_9GAMM) |
| FIASKW | 6,48E-03 | | P: Rhizobium leguminosarum bv trifolii(B5ZXR3\_RHILW), Agrobacterium sp ATCC 31749(F5J5A9\_9RHIZ), Agrobacterium tumefaciens F2(F7U441\_RHIRD), Sinorhizobium medicae WSM419(A6ULS3\_SINMW), Agrobacterium tumefaciens CCNWGS0286(G6XXM2\_RHIRD), Novosphingobium aromaticivorans DSM 12444(Q2G809\_NOVAD), Sinorhizobium fredii NGR234(C3KMT5\_RHISN), Rhizobium sp PDO1-076(H4F0B9\_9RHIZ), Brevundimonas sp BAL3(B4WCH2\_9CAUL), Rhizobium etli CFN 42(Q2KDK7\_RHIEC), Rhizobium etli CIAT 652(B3PYD4\_RHIE6), Sphingomonas wittichii RW1(A5VGI9\_SPHWW), Afipia sp 1NLS2(D6V129\_9BRAD), Rhizobium leguminosarum bv viciae(Q1MMQ0\_RHIL3), Sinorhizobium meliloti CCNWSX0020(H0FT84\_RHIML) |
| LFFFQW | 6,48E-03 | | O: Vitis vinifera(D7SUH5\_VITVI), Carica papaya(C4PB37\_CARPA), Arabidopsis thaliana(Q946U7\_ARATH), Wolffia australiana(H6U807\_9ARAE), Physcomitrella patens(A9S385\_PHYPA,A9TSV7\_PHYPA), Arabidopsis lyrata subsp lyrata(D7M9Q6\_ARALL), Selaginella moellendorffii(D8S6W9\_SELML), Picea sitchensis(A9NND9\_PICSI), Datisca glomerata(Q7Y079\_DATGL), Populus trichocarpa(B9H9D4\_POPTR), Eutrema halophilum(E4MXS1\_THEHA), Glycine max(C6T2S6\_SOYBN), Ricinus communis(B9RS68\_RICCO), Phaeodactylum tricornutum CCAP 10551(B7G0D0\_PHATC) |