```
CLUSTAL 2.0.12 multiple sequence alignment

S.mutans_NP721861                --------------------------------------------------
S.mutans_YP003484506             --------------------------------------------------
S.gallolyticus_YP003430968       --------------------------------------------------
S.bovis_ZP07467090               --------------------------------------------------
S.infantarius_ZP02921024         --------------------------------------------------
S.dysgalactiae_YP002996286       --------------------------------------------------
S.pyogenes_NP268803              --------------------------------------------------
S.equi_YP002744127               --------------------------------------------------
S.equi_YP002123744               --------------------------------------------------
S.uberis_YP002561898             --------------------------------------------------
S.agalactiae_NP687735            --------------------------------------------------
S.thermophilus_YP139610          --------------------------------------------------
S.salivariu_ZP04062119           --------------------------------------------------
S.sanguinis_YP001035504          --------------------------------------------------
S.gordonii_YP001450079           --------------------------------------------------
S.parasanguinis_ZP06900160       --------------------------------------------------
S.oralis_ZP06612220              --------------------------------------------------
S.mitis_ZP07462753               --------------------------------------------------
S.oralis_ZP07458504              --------------------------------------------------
S.mitis_YP003446287              --------------------------------------------------
S.pneumoniae_NP358699            --------------------------------------------------
S.suis_ZP03624685                --------------------------------------------------
S.suis_YP001198724               --------------------------------------------------
L.reuteri_YP001270633            ---------------MNSKLK-----FYQSIRFKIALVFVLILMLTLECV 30
L.vaginalis_ZP03959893           ---------------MNSKLK-----FYQSIKFKIALVFALMLMLTLECV 30
L.antri_ZP05745002               ---------------MNSKLK-----FYQSIRVKIALVFALMLMLTLECV 30
L.fermentum_ADJ40691             ---------------MNSKIK-----FYQSIHFKIALVFALMLMLTLEVV 30
P.acidilactici_ZP06196171        ---------------MNKRTN-----FFRSINFKIALVFAMLLVVTLEVV 30
P.pentosaceus_YP805259           ---------------MNKRTN-----FFKSINFKIALVFAMLLVVTLEVV 30
L.plantarum_NP783897             -------------MLRFKRKN-----FFKTINFKIALVFALLLLITLEIV 32
L.brevisgi_YP794237              ---------------MNSKIR-----WFQSIHFKIALVFALLLLLTLEIV 30
L.salivarius_ZP04009519          ---------MIEAENMNKKVR-----FFHSIHFKIALVFALLLLITFQIV 36
L.ruminis_ZP03957718             -----------MEKQTNKKLH-----FFQSIHFKIALVFALLLLITFQIV 34
L.casei_YP807963                 ---------------MNKKIR-----FFQSIHFKIAIVFILLLVVTLELI 30
L.rhamnosus_ZP04439975           ---------------MNKKIR-----FFQSIHFKIAIVFILLLVVTLEMI 30
L.sakei_YP394689                 ---------------MNKKIR-----LFQSIHFKIAIVFVLLLLVTLEVI 30
L.acidophilus_ZP04020787         ---------------MKKLRIKLN-TTFNSINTKLAIVFMLMLLATIEVI 34
L.ultunensis_ZP04012109          ------------MRTMKRLKKKLS-TTFNSINIKLAIVFMLMLLATIEVI 37
L.crispatus_ZP03996903           ---------------MKKFKARLN-STFNSINTKIAIVFMLMLLATIEVI 34
L.helveticus_YP001576656         ---------------MKKLREKLN-ATFNSINTKLAVVFMLMLLATIEVI 34
L.jensenii_ZP06338918            -------------MVKMKKIKS-----ILNSLNTKIAVVFMLMILATIEII 33
L.jensenii_ZP04646123            -------------MVKMKKIKS-----ILNSLNTKIAVVFMLMILATIEII 33
L.delbrueckii_ZP07092088         MDGLMKKDKKARKEKVKKEKTNLLKRAVSSIQTKIALIFMLLLLATIEII 50
L.gasseri_YP813915               ----------MQLGQMKKIKS-----VLNSINFKIAVIFMLLLLATIEVV 35
L.johnsonii_NP964082             ---------------MKKIKS-----VLNSINFKIAIIFMLLLLATIEVV 30
L.iners_ZP05743701               ---------------MKKIRK-----PFTSINAKIAIIFMLLLLATIEIV 30
E.casseliflavus_ZP05644942       ---------------MKNKVR-----FFQSVNFKIALTFILILLIAIQII 30
E.gallinarum_ZP05649732          ---------------MKNKVR-----FFRSVNFKIALTFILILLISIQII 30
E.faecium_ZP03982596             ---------------MKRKVR-----FFRSVNFKIAITFILILLISIEII 30
E.faecalis_NP814923              ---------------MKKKVH-----FFQSVNFKIALSFILLLLIAIQII 30
Lc.lactis_YP808469               --------------------------------------------------
Lc.lactis_YP001031763            --------------------------------------------------
Lc.lactis_NP266552               --------------------------------------------------


S.mutans_NP721861                --------------------------------------------------
S.mutans_YP003484506             --------------------------------------------------
S.gallolyticus_YP003430968       --------------------------------------------------
S.bovis_ZP07467090               --------------------------------------------------
S.infantarius_ZP02921024         --------------------------------------------------
S.dysgalactiae_YP002996286       --------------------------------------------------
S.pyogenes_NP268803              --------------------------------------------------
S.equi_YP002744127               --------------------------------------------------
S.equi_YP002123744               --------------------------------------------------
S.uberis_YP002561898             --------------------------------------------------
S.agalactiae_NP687735            --------------------------------------------------
S.thermophilus_YP139610          --------------------------------------------------
S.salivariu_ZP04062119           --------------------------------------------------
S.sanguinis_YP001035504          --------------------------------------------------
S.gordonii_YP001450079           --------------------------------------------------
S.parasanguinis_ZP06900160       --------------------------------------------------
S.oralis_ZP06612220              --------------------------------------------------
S.mitis_ZP07462753               --------------------------------------------------
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S.oralis_ZP07458504              --------------------------------------------------
S.mitis_YP003446287              --------------------------------------------------
S.pneumoniae_NP358699            --------------------------------------------------
S.suis_ZP03624685                --------------------------------------------------
S.suis_YP001198724               --------------------------------------------------
L.reuteri_YP001270633            GAVFVRQLEHQNLNTFKQTIELPS-YVDNSLAEQLSRSNT------KKAN 73
L.vaginalis_ZP03959893           GAVFVRQLEHQNLNTFKQTIELPS-YVDNSLSEQLVNTNH------KKAN 73
L.antri_ZP05745002               GAVFVRQLEHQNLNTFKQTIELPS-YVDNSLSEQLSRSNT------KKAD 73
L.fermentum_ADJ40691             GAVFVRQLEHQELANFKQQIELPS-YIDNSLATQLTSTDT------KTAN 73
P.acidilactici_ZP06196171        GVIFVRQLETQNLSQFKSQVQLQP-YVENEISAQLERSNT------KKAN 73
P.pentosaceus_YP805259           GVIFVRQLETQNLNQFKTQVQLQP-YVENEISTQLERANT------KSAN 73
L.plantarum_NP783897             GAIFVKQLESKNIQDFKQSVQIPT-YIDNSLSEQLTVSST------RKAN 75
L.brevisgi_YP794237              GAVFVRQLERQNLNTFKAQQVVQT-HIVNRLSDELSMSGM------TKSN 73
L.salivarius_ZP04009519          GAIFVRQLKNDNLKSFKQRVELST-YVENSLIVALSRTDT------EGAN 79
L.ruminis_ZP03957718             GAVFVQRLKSENIKSFKQRVELST-YVDNSLIKQLTSTNT------TKAN 77
L.casei_YP807963                 GAYFVKTLEQQNIEQFKTSVNVDS-YIQDKLAADLLRTDT------EGAN 73
L.rhamnosus_ZP04439975           GAYFVKTLEQQNIEQFKTSVNVDS-YIQDKLAADLLRTDT------DNAN 73
L.sakei_YP394689                 GASFVKQLEYQNVKDFKQSLQVTP-YVQNQLSNELMS-NS------GNAN 72
L.acidophilus_ZP04020787         GAYFTRQLEQTSIENFQSSIQIQT-IVSNQLANQLAS-DN------KNAN 76
L.ultunensis_ZP04012109          GAYFTRQLEQSSIENFQSSIQIQT-IVSNQLANQLAS-DN------KNAN 79
L.crispatus_ZP03996903           GAYFTRQLEQNSIENFQSSIQIQT-IVSNQLANQLTS-DN------KNTN 76
L.helveticus_YP001576656         GAYFTRQLEQNSIENFQSSIQIQT-IVSNQLANQLAS-DS------KNAN 76
L.jensenii_ZP06338918            GAYFTRQLEQSTIESFQTSIQIPT-IITNSLATQLSK-NT------KKAD 75
L.jensenii_ZP04646123            GAYFTRQLEQSTIESFQTSIQIPT-IITNSLATQLSK-NT------KKAD 75
L.delbrueckii_ZP07092088         GAYFTRQMEQTSINNFQTTIQLQS-IVTDQLTAQLVK-NG------KSAD 92
L.gasseri_YP813915               GASFTRQLEQNSIQNFESSIQVPN-IITNQISSQLSRANS------KKAN 78
L.johnsonii_NP964082             GASFTRQLEQNSIQNFESSIQVPN-IITNQIASQLSRANS------KSAN 73
L.iners_ZP05743701               GAYFTRQLEQNSIESFETSIQIPN-LISNQIATQLNKNNA------KKAN 73
E.casseliflavus_ZP05644942       GAYFIRELERTTVDAFKRDMEARASTLVVTLGSELSRMDNDDGLDWDSMN 80
E.gallinarum_ZP05649732          GAYFIRELEKTTIDAFKRDMEARASTLVVTLGSELSRMDAEDSLDWDAMN 80
E.faecium_ZP03982596             GAYFIRGLERSTINTFIKDMNQTVESLATTISPELNRKDN---ADDEEVN 77
E.faecalis_NP814923              GGYFIRELEATTISDFKKNMDSQVVQLSNTLSTQMSNKD----LERSDVD 76
Lc.lactis_YP808469               ------------MIKFFNSMIFKG--------------------------- 12
Lc.lactis_YP001031763            ------------MIKFFNSMIFKG--------------------------- 12
Lc.lactis_NP266552               ------------MIKFFNSMIFKG--------------------------- 12


S.mutans_NP721861                --------------------------------------------------
S.mutans_YP003484506             --------------------------------------------------
S.gallolyticus_YP003430968       --------------------------------------------------
S.bovis_ZP07467090               --------------------------------------------------
S.infantarius_ZP02921024         --------------------------------------------------
S.dysgalactiae_YP002996286       --------------------------------------------------
S.pyogenes_NP268803              --------------------------------------------------
S.equi_YP002744127               --------------------------------------------------
S.equi_YP002123744               --------------------------------------------------
S.uberis_YP002561898             --------------------------------------------------
S.agalactiae_NP687735            --------------------------------------------------
S.thermophilus_YP139610          --------------------------------------------------
S.salivariu_ZP04062119           --------------------------------------------------
S.sanguinis_YP001035504          --------------------------------------------------
S.gordonii_YP001450079           --------------------------------------------------
S.parasanguinis_ZP06900160       --------------------------------------------------
S.oralis_ZP06612220              --------------------------------------------------
S.mitis_ZP07462753               --------------------------------------------------
S.oralis_ZP07458504              --------------------------------------------------
S.mitis_YP003446287              --------------------------------------------------
S.pneumoniae_NP358699            --------------------------------------------------
S.suis_ZP03624685                --------------------------------------------------
S.suis_YP001198724               --------------------------------------------------
L.reuteri_YP001270633            KQINQILSEVNNNNISEIRVVDSKSIVRGTSNADNRSAIGQKTTDQAIKA 123
L.vaginalis_ZP03959893           QKIRKILAEVNNNNISEIRVIDSQGVVRGTSNFDNRNMIGQKTTEQMVKA 123
L.antri_ZP05745002               QEIRQILSEVNNNNISEIRVVDSKGVFRGTSTADNRNIVGQKTTDAMVKA 123
L.fermentum_ADJ40691             KEIKTILARVNNTSITEIRVVDAKGIIRGTSSSGNQGIVGQKTTDTVIKN 123
P.acidilactici_ZP06196171        DQIADIIGNINNQNITEIRVIDAKGVIRGTSNNADRSMVGQKTTDRNVKD 123
P.pentosaceus_YP805259           SQISDIIGNINNQNITEIRVIDAKGVIRGTSNSTNQNIVGQKTTDRNVKD 123
L.plantarum_NP783897             GQIKTILSNYNNTNVDEIQVVDSKGTIRGTSDVNDQSVVGQKTTDRNVKN 125
L.brevisgi_YP794237              KQIKSTLSEINNTNNAQIRVIDNKGIIRGTNEVDNQGIVGQKTTDNNIKN 123
L.salivarius_ZP04009519          TKIKNILDDINNANIQEVQVIDAKGTIRGDSDVNSRSLIGQKTTNSAVKG 129
L.ruminis_ZP03957718             KSINTILEDINNENISTIQVIDSKGTIRGENDVNGRSVVGQKTTNTNIKR 127
L.casei_YP807963                 DDIKSTLSQADIANSADLQVVDAKGTIRGDSDINAQTNVGQKSANSSIKN 123
L.rhamnosus_ZP04439975           DDIKSTLSQADIANSADLQVIDAKGTIRGDSDINAQTNVGQKSANSNIKN 123
L.sakei_YP394689                 KNIKDIIG--DMGNSAEIQVVDNKGTIRGVTNLNTQSTVGQKTRNPRVKQ 120
L.acidophilus_ZP04020787         DRLNQIVNDYNNDAISEIIVVDNKDTIRAVSNLNDKSKIGQRINNTDVKQ 126
L.ultunensis_ZP04012109          DRLNQIVNDYNNDLISEIIVVDNKDTIRAVSNLNDKSKIGQRINNTDVKQ 129
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L.crispatus_ZP03996903          DRLNQIVNDYNNDAISEIIVVDNKDTIRAVSNLNDKSKIGQRINNTDVKQ 126
L.helveticus_YP001576656        DRLNQIVNDYNNDSISEIIVVDNKDTIRAVSNLNDKSKVGQRMNNTDVKQ 126
L.jensenii_ZP06338918           EQLSQIVSNYNNSAISEIIVVDNKDVIRAVSNLNDKSRVGQRATNVGIKQ 125
L.jensenii_ZP04646123           EQLSQIVSNYNNSAISEIIVVDNKDVIRAVSNLNDKSRVGQRATNVGIKQ 125
L.delbrueckii_ZP07092088        RKMNQIITDYSNDAISEIQVVDSKNVIRAVSNLNDKNRVGQLSNNGDIRE 142
L.gasseri_YP813915              QQLSQIISNYNLGDISQLMVVDNKGVIRAVSNVNDQNRIGQRTSNVDIKS 128
L.johnsonii_NP964082            QQLSQIISNYNLGDISQLMVVDNKGVIRAVSNVNDQNRIGQRTSNADIKS 123
L.iners_ZP05743701              KQLNRIVSNYSNDAINDITVVDSKSVIRSVSNVNDQGTIGQRATNSDIKK 123
E.casseliflavus_ZP05644942      ASLNRILTSTNSSEILEMRVVDEQGIIRATTNINDRGSVGEKNDYRDYDT 130
E.gallinarum_ZP05649732         SSLNRILSSTNSSEILEMRVVDEQGIIRATTNINDRGSVGEKNDYRDYDT 130
E.faecium_ZP03982596            ANIKRFIENSATSDIIEIRVVDEKGIIRGTTDVNEQSAVGKKNDYVDIND 127
E.faecalis_NP814923             ANLKKALSDFSNADISEARIVDDKGIIRATNDLNQQNIIGKKNDYRDLND 126
Lc.lactis_YP808469              --------------------------------------------------
Lc.lactis_YP001031763           --------------------------------------------------
Lc.lactis_NP266552              --------------------------------------------------


S.mutans_NP721861               --------------------------------------------------M 1
S.mutans_YP003484506            --------------------------------------------------M 1
S.gallolyticus_YP003430968      --------------------------------------------------M 1
S.bovis_ZP07467090              --------------------------------------------------M 1
S.infantarius_ZP02921024        --------------------------------------------------M 1
S.dysgalactiae_YP002996286      --------------------------------------------------M 1
S.pyogenes_NP268803             --------------------------------------------------M 1
S.equi_YP002744127              --------------------------------------------------M 1
S.equi_YP002123744              --------------------------------------------------M 1
S.uberis_YP002561898            --------------------------------------------------M 1
S.agalactiae_NP687735           --------------------------------------------------
S.thermophilus_YP139610         --------------------------------------------------
S.salivariu_ZP04062119          --------------------------------------------------
S.sanguinis_YP001035504         --------------------------------------------------M 1
S.gordonii_YP001450079          --------------------------------------------------M 1
S.parasanguinis_ZP06900160      --------------------------------------------------M 1
S.oralis_ZP06612220             --------------------------------------------------M 1
S.mitis_ZP07462753              --------------------------------------------------M 1
S.oralis_ZP07458504             --------------------------------------------------M 1
S.mitis_YP003446287             --------------------------------------------------M 1
S.pneumoniae_NP358699           --------------------------------------------------M 1
S.suis_ZP03624685               --------------------------------------------------M 1
S.suis_YP001198724              --------------------------------------------------M 1
L.reuteri_YP001270633           TLLNNRSHTENLYDNSNHTRYYVNVIPLVDN----SNNNVVGAVYLRASL 169
L.vaginalis_ZP03959893          TLVNNRSHTENVYDNSNHTRYYVNIIPLVDN----SNNNVVGVVYLRASL 169
L.antri_ZP05745002              TLLNNRSHSENVYDGANHNRYYVNVIPLND-----SNNNVVGAVLLRASL 168
L.fermentum_ADJ40691            TLVNNRSHTENLYDSANHNRYYVSVVPLLASG---NANNVVGVVYMRANL 170
P.acidilactici_ZP06196171       VIYNTRSYQQISYNKTNNTRYFISVVPLINTS--GATNNLTGVVYIRANL 171
P.pentosaceus_YP805259          VIYNTRTYQQVSYNKTTNTRYFVSIVPLINTA--GATNNLTGVVYIRANL 171
L.plantarum_NP783897            AIYNNRTYTKSTYDTQNNGRYYVSIVPLYSSNSAGNSSQLVGVLYVRANM 175
L.brevisgi_YP794237             AIYNNRDVVRTTYSSQSNSRYYTTITRLIRTQ--GNNSELVGVIYMRSSL 171
L.salivarius_ZP04009519         VLYTGRTYTETTYNRNDNKQYYISITPLLNVS--SNNNAVVGAIYTRADM 177
L.ruminis_ZP03957718            VLYSGRTFTTMTYDKSSNRRSYVSITPLFSAS--GNTNTVVGAVYLRANL 175
L.casei_YP807963                TLYSGQQYEGYEYRDRTGS-TYYKVIPIKNPNATGDNNSVIGAIAISASM 172
L.rhamnosus_ZP04439975          TLYSGQQYEGYEYRERTGS-TYYKVVPIKNPNATGDNNSVIGAIAISASM 172
L.sakei_YP394689                AIYSGHTEQEVAYSESQGS-YYTAIQPLTDPN--GDSNTVVGAVYIRASM 167
L.acidophilus_ZP04020787        VISTGHQINKVI--DDH-GNYMIQISPLTSGNG---SNNNVGAIYVKASM 170
L.ultunensis_ZP04012109         VISTGHQINKVV--DDH-GNYMIQISPLTSGNG---SNNNVGAIYVKASM 173
L.crispatus_ZP03996903          VISTGHQINKVV--DDH-GNYMIQISPLTSGNG---SNNTVGAVYVKASM 170
L.helveticus_YP001576656        VISTGHQINKVV--NDH-GNYMIQISPLTSGNG---SNNNVGALYVKASM 170
L.jensenii_ZP06338918           VTSTGRQITWID--SNNNGSNMVQITPLTIGTG---TNSTLGAIYVRANM 170
L.jensenii_ZP04646123           VTSTGRQVTWID--SNNTGSNMVQITPLTVGTG---ANSTLGAIYVRANM 170
L.delbrueckii_ZP07092088        VINSGQQKTQVA--SDQKGSFMVQIVPLTSGT------NIVGAVYVRASM 184
L.gasseri_YP813915              VLSNGKQVSKVI--NDN-GNYMVQISPLTSANG---TNTPVGAIYVRASL 172
L.johnsonii_NP964082            VLSNGKQVSKVI--NDN-GNYMVQISPLTSANG---TNTPVGAIYVRASL 167
L.iners_ZP05743701              VLTSGRQISKII--NDN-GKYMIQISPLNVGNG---PNTIVGVIVVKAGM 167
E.casseliflavus_ZP05644942      NRS-----EVLYDESSG-QRVFNIVQSIQSPTG----DTVLGTLYLRSNL 170
E.gallinarum_ZP05649732         NRS-----EVLYDESTG-QRVYNIVQSIQSPTG----DTVLGTLYLRSNL 170
E.faecium_ZP03982596            FTT-----KRYVALDNDDKRVNINVQPILSPTG----DAVIGALYVKSNI 168
E.faecalis_NP814923             FTS-----KKYQALDND-KRVYVNVQPIQSPTG----ETVIGVLYVKSNL 166
Lc.lactis_YP808469              ------------------------------------------VVAHLLLF 20
Lc.lactis_YP001031763           ------------------------------------------VVAHLLLF 20
Lc.lactis_NP266552              ------------------------------------------VVAHLLLF 20

S.mutans_NP721861               TNVFESSPLFLRILLAVLIILLFFYFIFLNYREYKNNNQVKQLNAKVRSL 51
S.mutans_YP003484506            TNVFESSPLFLRILLAVLIILLFFYFIFLNYREYKNNNQVKQLNAKVRSL 51
S.gallolyticus_YP003430968      NDTMLQNLTYFEQAILFLLAFVAVYFVYLAIRDYRTSVNIRRLSGKVREL 51
S.bovis_ZP07467090              NDTMLQNLTYFEQAILFLLAFVAVYFVYLAIRDYRTSVNIRRLSGKVREL 51
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S.infantarius_ZP02921024          NDTMVQNQYLFEQAILFLLAFVAIYFIHLAIRDYRTSVNIRRLSGKVREL 51
S.dysgalactiae_YP002996286        TRDIIGNLSAFELAILLLLVFVAFYFIHLAVRDYRNARIIRMMSHKIRDL 51
S.pyogenes_NP268803               TRDIIGNLSTFELAILILLVFVAFYFIHLAVRDYRNARIIRMMSHKIRDL 51
S.equi_YP002744127                TKDIIGNLSAFELAILLLLVFVAFYFIHLAIRDYRNARIIRLMSHKIRDL 51
S.equi_YP002123744                TKDIIGNLSAFELAILLLLVFVAFYFIHLAIRDYRNARIIRLMSHKIRDL 51
S.uberis_YP002561898              TENLIGNLSLFELSILLLLIFVAAYFIYLAVRDYRNAKIIRQMSHKIRDL 51
S.agalactiae_NP687735             MNNSAANIRSFELALLFLLVFVAVYFVYLAVRDFKMSKNIRLLNWKVRDL 50
S.thermophilus_YP139610           MTSIGLNITSFELALLFMLLFVAFYFIFLAYRDYQQVKNIRKLTKRVKSL 50
S.salivariu_ZP04062119            MTSIGLNITSFELALLFTLLFVAFYFIFLAYRDYRRVKNIRKLTKRVKSL 50
S.sanguinis_YP001035504           IEAIKQFVISADFVFAIIIIGFIVVVALLLLENRRDNQKLVQLNQKVKDL 51
S.gordonii_YP001450079            IENIRQFVFSVDFVFVLIVLGFILVVALLFLENRRDNRQLRLLNQKIKDL 51
S.parasanguinis_ZP06900160        IDQLKQFVMSSNFVFVLITVGFIIVVALLLLENRRDNIKLRQLNSKIKDL 51
S.oralis_ZP06612220               IEDIRQTILTSDFIFILILLGFILVVTLLLLENRRDNIRLKEINQKVKDL 51
S.mitis_ZP07462753                IEDIRQTILTSDFIFILILLGFILVVTLLLLENRRDNIRLKEINQKVKDL 51
S.oralis_ZP07458504               IEDIRQTILTSDFIFILILLGFILVVTLLLLENRRDNIRLKEINQKVKDL 51
S.mitis_YP003446287               IKLIKDTVLTSDSIFILILLGFILVVTLLLLENRRDNIRLKQINQKVKDL 51
S.pneumoniae_NP358699             LDLLKQTIFTRDFIFILILLGFILVVTLLLLENRRDNIQLKQINQKVKDL 51
S.suis_ZP03624685                 INQLRYLMTTAEFWFVVILIGFLIALTVLLIENYRDNKQIKQLNQKVNAL 51
S.suis_YP001198724                INQLRYLMTTAEFWFVVILIGFLIALTVLLIENYWDNKQIKQLNQKVNAL 51
L.reuteri_YP001270633             ESVYSNINNITLVYLSAAMITIVLSLILAIIISQEITRPIEEMRKQTLRI 219
L.vaginalis_ZP03959893            ESVYSNINSITLIYLSAALITIVIGLLLAIIISQEITRPIEEMRKQTLRI 219
L.antri_ZP05745002                EGVYSNINNITLIYFSAALVTIILSLFLAVLISQEITRPIEEMRKQTLRI 218
L.fermentum_ADJ40691              EGVYSTINSISLIYLSAALITIVLGLGLAVLISREITRPIEEMRKQTLRI 220
P.acidilactici_ZP06196171         ESVYQNVNNITLIFVVAALIAITIGLFLAVLIARAITRPIEEMRQRTMQI 221
P.pentosaceus_YP805259            ESVYQNVNNITLIFVVAALIAITIGLILAVLISRAITRPIEEMRQRTIQI 221
L.plantarum_NP783897              KSVYSTINNIMGIFVIASLAAMVLGLGIAIIIARAITRPIEEMKQQTQRI 225
L.brevisgi_YP794237               DSVYQNINQITLIYVSATFVAIILGLVMAIIISRAITRPIDEMKKQTLRI 221
L.salivarius_ZP04009519           ASVYDSVNNVVVIFASASLIAIVIGMFLAIIVSSSITKPIEEMKRQTARI 227
L.ruminis_ZP03957718              ESVYDSVNSVTLIFATASLIATAIGMALAITVSSAITRPIDEMKKQTMQI 225
L.casei_YP807963                  EQAYDSINKIVGIFLISSLVAGLLGTLLSIVISRAITRPIDEMKKQAIRM 222
L.rhamnosus_ZP04439975            EQAYDSINKIVGIFLISSLVAGLLGTLLSIVISRTITRPIDEMKKQAIRM 222
L.sakei_YP394689                  EEVYKGISSITVIFLTSSLVAGLLGMALSIVISRAITRPIDEMKKQAIQM 217
L.acidophilus_ZP04020787          QDVFNNLRQISLTFLIASLIAALLGAFLALVISRAITQPIEEMQKQALHI 220
L.ultunensis_ZP04012109           QDVFNNLRQISLTFLIASLIAALLGAFLALVISRAITQPIEEMQKQALHI 223
L.crispatus_ZP03996903            QDVFNNLRQISLTFLIASLIAALLGAFLSLVISRAITQPIEEMQKQALHI 220
L.helveticus_YP001576656          QDVFDNLRQISLTFLIASLIAALLGAFLALVISRAITQPIEEMQKQALHI 220
L.jensenii_ZP06338918             QGVFDNLRNISYMFLTASFAASILSAILALFISRAITKPIEEMRMQALQV 220
L.jensenii_ZP04646123             QGVFDNLRNISYMFLTASFAASILSAILALFISRAITKPIEEMRMQALQV 220
L.delbrueckii_ZP07092088          ADVFNNLRNISMMFLTASLLAVVVAAIASMFISRAITRPIEELRQQAIQV 234
L.gasseri_YP813915                QGVFNNLRQVSIYFLIASLIAAVLGAIVALVISRAITRPIEEMRKQALRV 222
L.johnsonii_NP964082              QGVFNNLRQVSIYFLIASLIAAVLGAVVALVISRAITRPIEEMRKQALRV 217
L.iners_ZP05743701                QSVFNNIHRVSFLFLTASLVAATLGAGVALVIARAITKPIEEMKDQALRI 217
E.casseliflavus_ZP05644942        ESKYNEVSTTAVIFVTASLIAAVISIIVALLVSRSITQPIGEMREQAIRI 220
E.gallinarum_ZP05649732           EQKYSEVSDTAVIFVTASLIAAAISIVVALLVSRSITQPIGEMREQAIRI 220
E.faecium_ZP03982596              EQKYSEINNTAVIFFTASLIAAFISMIVSVLVARSITQPIGEMREQAIRI 218
E.faecalis_NP814923               ENKYQEITNTASIFFTASIIAAAISIIVTLLIARSITKPIGEMREQAIRI 216
Lc.lactis_YP808469                VILFMSNFDYNLIHLSTFIGYYLFSLVFVLVFLNQQHRMIVNVSKQMNDI 70
Lc.lactis_YP001031763             VILFMSNFDYNLIHLSTFIGYYLFSLVFVLVFLNQQHRMIVNVSKQMNDI 70
Lc.lactis_NP266552                VILFMSSFDYNFAHLSTFIGYYLFSLVFVLVFLNQQHRMIVNVSKQMNDI 70


S.mutans_NP721861                 ITGHYTDKLKVEDNSDLSELVNNVNDLSEVFRLTHENLAQEKNRLTSILS 101
S.mutans_YP003484506              ITGHYTDKLKVEDNSDLSELVNNVNDLSEVFRLTHENLAQEKNRLTSILS 101
S.gallolyticus_YP003430968        ITGKYTEDIIIEKDRDLAELADQLNDLSTVFRLAQENLAQEKNRLASILS 101
S.bovis_ZP07467090                ITGKYTEDIIIEKDRDLAELADQLNDLSTVFRLAQENLAQEKNRLASILS 101
S.infantarius_ZP02921024          ITGKYTEDIIIEKDRDLAELAGQLNDLSTVFRLAQENLAQEKNRLASILS 101
S.dysgalactiae_YP002996286        INGRYTDMINEKADIELMELADQLNDLSDVFRLTHENLAQEKNRLASILA 101
S.pyogenes_NP268803               INGRYTDIIDEKADIELMELSDQLNDLSDVFRLTHENLAQEKNRLASILA 101
S.equi_YP002744127                INGRYTDTINEKADIELMELSEQLNDLSDVFRLTHENLAQEKNRLASILA 101
S.equi_YP002123744                INGRYTDTINEKADIELMELSEQLNDLSDVFRLTHENLAQEKNRLASILA 101
S.uberis_YP002561898              INGRYTDEINEKADIELIELSEQLNDLSDVFRLTHENLAQEKNRLASILA 101
S.agalactiae_NP687735             IAGNYSDSILIQGDADLVELGESLNDLSDVFRMAHDNLEQEKNRLASILT 100
S.thermophilus_YP139610           MAGNYNEKLCIKGDSELLELANSLNDLSDVFRLTHENLIQEKNRLSSVLS 100
S.salivariu_ZP04062119            MAGNYNEELRLKGDPELLELADSLNDLSDVFRLTHENLAQEKNRLSSVLS 100
S.sanguinis_YP001035504           IAGDYSEVLDMQGSPEITDMTNSINDLSEVIRLTHENLEQETKRLSSILS 101
S.gordonii_YP001450079            IAGDYSEVLDMQGSPEITDMTNSINDLSEVTRLTQENLEQETKRLTSILS 101
S.parasanguinis_ZP06900160        IAGDYSEVVDMQGSPELTDMTNSINDLSEVIRLTHENLEQETKRLTSILS 101
S.oralis_ZP06612220               IAGDYSQVLDLQGSTEITNITNNLNDLSEVIRLTQENLEQESKRLNSILS 101
S.mitis_ZP07462753                IAGDYSQVLDLQGSTEITNISNNLNDLSEVIRLTQENLEQESKRLHSILS 101
S.oralis_ZP07458504               IAGDYSQVLDLQGSTEITNITNNLNDLSEVIRLTQENLEQESKRLHSILS 101
S.mitis_YP003446287               ITGDYSQVLDMQGSSEITNITNNLNDLSEVIRLTQENLEQESKRLNSILS 101
S.pneumoniae_NP358699             IAGDYSKVLDMQGGSEITNITNNLNDLSEVIRLTQENLEQESKRLNSILF 101
S.suis_ZP03624685                 IEGNYADVLDMRGSPEITDMANSLNDLSEVIRLTHDNLEQEKTRLTSILS 101
S.suis_YP001198724                IEGNYADLLDMRGSPEITDMANSLNDLSEVIRLTHDNLEQEKTRLTSILS 101
L.reuteri_YP001270633             ARGDYSGQVKVLGNDELGQLAGAVNNLSVRVEEAQESSDSERRRLDSILS 269
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L.vaginalis_ZP03959893          ARGDFSGQVRVMGNDELGQLAGAVNNLSVRVEEAQESSDSERRRLDSVLS 269
L.antri_ZP05745002              ARGDFSGQVRVMGNDELGQLAGAVNNLSVRVEEAQESSDSERRRLDSVLS 268
L.fermentum_ADJ40691            ARGDFSGQVKVMGNDELGQLAGAVNNLSVRVEESQESSDAERRRLDSVLS 270
P.acidilactici_ZP06196171       ARGDYSGQVQIYGDDELGQLAAAVNDLSVRVEESQELTESERRRLDSVLG 271
P.pentosaceus_YP805259          ARGDYSGQVQIYGDDELGQLAEAVNELSVRVEESQESTESERRRLDSVLG 271
L.plantarum_NP783897            ARGDYAGQVRVYSDDELGQLAKAINNLSIRVEESQESTEAERRRLDSVLS 275
L.brevisgi_YP794237             ARGDYSGHVHVYGNDELGQLASAVNNLSVRVEEAQESTESERRRLDSVMA 271
L.salivarius_ZP04009519         ARGDYSGHVHQYGNDELGQLAQAVNNLSIRVEETQELSESERRRLDSVLS 277
L.ruminis_ZP03957718            ADGDYSGKVHVYGTDELGQLAQAVNNLSVRVEEAQESSDSERRRLDSVLS 275
L.casei_YP807963                ARGDYSGQVRIYGQDELGQLAVAVNNLSVRVEEAQEASEAERRRLDSVLA 272
L.rhamnosus_ZP04439975          ARGDYSGQVRIYGQDELGQLAVAVNNLSVRVEEAQEASEAERRRLDSVLA 272
L.sakei_YP394689                ARGDYSGQVRIYGQDELGQLAIAVNNLSVRVEEAQEASESERRRLDSVMS 267
L.acidophilus_ZP04020787        ADGDYSSQVKIYSNDELGQLGKALNTLSVRIERSQEESDSERRRLDSVLS 270
L.ultunensis_ZP04012109         ADGDYSSQVKIYSNDELGQLGHAFNTLSVRIERSQEESDSERRRLDSVLS 273
L.crispatus_ZP03996903          ADGDYSSQVKIYSNDELGQLAKAFNTLSVRIERSQEESDSERRRLDSVLS 270
L.helveticus_YP001576656        ANGDYSSQVKIYSNDELGQLAKAFNTLSVRIEQSQEESDSERRRLDSVLS 270
L.jensenii_ZP06338918           ADGDYSGQVKIYSNDELGQLAEAFNTLSIRVERSQEQSESERRRLDSVLS 270
L.jensenii_ZP04646123           ADGDYSGQVKIYSNDELGQLAEAFNTLSIRVERSQEQSESERRRLDSVLS 270
L.delbrueckii_ZP07092088        ADGDYSTQVKIYSNDELGQLGAAFNTLSVKIERSNEQSESERRRLDSVLS 284
L.gasseri_YP813915              ANGDYSGHVRVYAQDELGQLAEAFNTLSVRIERTQEISDSERRRLDNVLT 272
L.johnsonii_NP964082            ANGDYSGHVRVYAQDELGQLAEAFNTLSVRIERTQEISDSERRRLDNVLT 267
L.iners_ZP05743701              SNGDYSGHVKVYANDEMGELARAFNILSVRIERSQEVSDSERRRLDNVLM 267
E.casseliflavus_ZP05644942      AKGDYSRKVAIHGKDELGQLAETFNQLGERIEETQEAMESERNRLDSVLS 270
E.gallinarum_ZP05649732         AKGDYSRKVAVHGQDELGQLAETFNQLGERIEETQEAMESERNRLDSVLS 270
E.faecium_ZP03982596            ARGDYSRKVKVHGQDELGQLADTFNQLAERIEEAQDTMEAERNRLDSVLS 268
E.faecalis_NP814923             ARGDYAGKVEVHGKDELGQLAETFNQLSERIEEAQETMEAERNRLDSVLT 266
Lc.lactis_YP808469              KNGYLNRDKIPKGTSEINELYEEILKLGEDIVRTQNNLENQRNQLDSILA 120
Lc.lactis_YP001031763           KNGYLNRDKIPKGTSKINELYEEILKLGEDIVRTQNNLENQRNQLDSILA 120
Lc.lactis_NP266552              KNGYLNRDKIPKGTSEINELYDEILKLGEDIVRTQNNLENQRNQLDSILA 120
                                  * :           :  .   .  *.  :  :::    :  :* .::

S.mutans_NP721861               YMTDGVLATDRSGKITVINDMAQKQLNVTR-EQALECNILDILDDDS-YT 149
S.mutans_YP003484506            YMTDGVLATDRRGKITVINDMAQKQLNVTR-EQALECNILDILDDDS-YT 149
S.gallolyticus_YP003430968      YMTDGVLATDRAGNITMINQTAQQQLNLER-EEALQMNIVDILGSDSTYS 150
S.bovis_ZP07467090              YMTDGVLATDRAGNITMINQTALQQLNLEH-EEALQMNIVDILGADSTYS 150
S.infantarius_ZP02921024        YMTDGVLATDRSGNITMINQTAQKQLNLER-EEALGMNIVDILGDDSDYS 150
S.dysgalactiae_YP002996286      YMSDGVLATDRSGKIIMINETARKQLNLTK-EKALEKNITDLLEGDTPYT 150
S.pyogenes_NP268803             YMSDGVLATDRSGKIIMINETARKQLNLSK-EEALKKNITDLLEGDTSYT 150
S.equi_YP002744127              YMTDGVLATNRSGKIIMINETAQKQLNLNR-EQALEKNITDLLDSDSPYT 150
S.equi_YP002123744              YMTDGVLATNRSGKIIMINETAQKQLNLNR-EQALEKNITDLLDSDSPYT 150
S.uberis_YP002561898            YMSDGVLATDRTGQIMMINETAQKQLNISK-EEALLMNITDLLGQDTPYT 150
S.agalactiae_NP687735           YMTDGVLATDRSGKIVMINETAQQQFNLAY-DEALSMNIVDMLGSGSPYS 149
S.thermophilus_YP139610         YMSDGVIATNRLGQITMINSTAQRLLNLDR-ETATQMSILDILDGENPYT 149
S.salivariu_ZP04062119          YMSDGVIATNRRGQITMINSTAQRLLNLDY-ETATQMSILDLLDGENPYT 149
S.sanguinis_YP001035504         YMTDGVLATNRRGQIITINDMATKQLGVKR-DEVQNMSILDLLSISDEYD 150
S.gordonii_YP001450079          YMTDGVLATNRRGQIIMINDMASKQLGVDP-EEVQNTSILDLLDIADEYD 150
S.parasanguinis_ZP06900160      YMTDGVLATNRRGQIIMVNEMAAKQLNVNP-DEVLNTSILDLLSLGDDYD 150
S.oralis_ZP06612220             YMTDGVLATNRRGQITMINDMAKKQLGVQK-EDVLNKSILELLKIEDEYE 150
S.mitis_ZP07462753              YMTDGVLATNRRGQITMINDMAKKQLGVQK-EDVLNKSILELLKIEDEYE 150
S.oralis_ZP07458504             YMTDGVLATNRRGQITMINDMAKKQLGVQK-EEVLNKSILELLKIEDEYE 150
S.mitis_YP003446287             YMTDGVLATNRRGQITMINDMAKKQLGVQK-EDVLNKSILELLEIVDEYE 150
S.pneumoniae_NP358699           YMTDGVLATNRRGQIIMINDTAKKQLGLVK-EDVLNRSILELLKIEENYE 150
S.suis_ZP03624685               YMSDGVIATDRIGRIIMINDMAQKQLGLSS-QKQEQYHLLEVLDLSDRYT 150
S.suis_YP001198724              YMSDGVIATDRIGRIIMINDMAQKQLGLSN-PKQEQYHLLEVLDLSDRYT 150
L.reuteri_YP001270633           HMSDGVLATDRRGNVTIVNNMALQLLGVENEDDLIGKSIIDVLDIRHDYT 319
L.vaginalis_ZP03959893          HMSDGVLATDRRGNVTIVNNMALQLLGVEHDDELIGKSIIDVLDIRHDYT 319
L.antri_ZP05745002              HMSDGVLATDRRGNITIVNNMALQLLGVDHEDDLIGKSIIDALDIRHDYT 318
L.fermentum_ADJ40691            HMSDGVLATDRRGNLTIVNNTALQFLNIADEEQVLGKSILDVLKIRRQFS 320
P.acidilactici_ZP06196171       YMTDGVLATDRRGRITIVNEMATDFLNLEN-DQIVGKSILDILDLRGSVT 320
P.pentosaceus_YP805259          YMTDGVLATDRRGRITIVNEMATDFLNLEN-DQIVGKSILDILDLRGTFT 320
L.plantarum_NP783897            HMSDGVIATDRRGNITIINETASDFMDVTA-EKAIGNSILDILKIRDDYS 324
L.brevisgi_YP794237             HMTDGVIATDRRGNVTIINETASSFLDHEP-DDAVGKSILDLLDIRDDYT 320
L.salivarius_ZP04009519         HMSDGVIATDRRGGITIVNDMAMNYLDISE-GEVLGKSILDILDIRNQYT 326
L.ruminis_ZP03957718            HMSDGVIATDRRGNISIINDMACEYLDVES-KDVIGTSILDVLKIREMQT 324
L.casei_YP807963                HMTDGVIATDRRGNVIIINQTALNFLNTKN-EDVIGVSILKLLNIAKDYT 321
L.rhamnosus_ZP04439975          HMTDGVIATDRRGNVIIINQTALSFLNTKN-EDVIGVSILKLLNIAKDYT 321
L.sakei_YP394689                HMTDGVIATDRRGNITIINETGQDFLNVTS-DGVLGQSLLKVLKISEEYT 316
L.acidophilus_ZP04020787        HMSDGVLATDRHGNVSVVNHMALTFLNAKE-EDVINKPIAEVLGLK-DTS 318
L.ultunensis_ZP04012109         HMSDGVLATDRHGNVSVVNHTALSYLNVKE-KDVINKPIAEVLGLK-DRS 321
L.crispatus_ZP03996903          HMSDGVLATDRHGNVSVVNHMALNFLNKKE-DEVINKPIAEVLGLE-DTS 318
L.helveticus_YP001576656        HMSDGVLATDRHGNVSVVNHMALSYLNADE-DEIINRPIAEVLGLK-DTS 318
L.jensenii_ZP06338918           HMTDGVIATDRHGNVIILNQMALSFLDIKE-KDAVSKPITKILGLDDDVS 319
L.jensenii_ZP04646123           HMTDGVIATDRHGNVIILNQMALSFLDIKE-KEAVNKPITKILGLADDVS 319
L.delbrueckii_ZP07092088        HMTDGVIATDRHGNVSIMNQMAQDFLDVKA-EDAIKKPISQVLGLGEDYT 333
L.gasseri_YP813915              HMTDGVIATDRHGNITIINETALDFLGKTE-KDVIGKPITNLLGLK-DVT 320
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L.johnsonii_NP964082            HMTDGVIATDRHGNITIINETALDFLGKTE-KDVIGKPITNLLGLK-DVT 315
L.iners_ZP05743701              HMTDGVIATDRHGNITIINETALNFLDKTE-NEVKGEPITQLLGLK-EVT 315
E.casseliflavus_ZP05644942      HMTDGVVATDRRGKVITINEMAMSLLNVSN-EEAIGQSILTLLEIDEEYT 319
E.gallinarum_ZP05649732         HMTDGVVATDRRGKVITINEMAMSLLNVTS-EEAVGQSILTLLQIDEEYT 319
E.faecium_ZP03982596            HMTDGVIATDRRGKVITINDMAVSLLDVKN-EEAIGQSILTLLDIEEEYT 317
E.faecalis_NP814923             HMTDGVIATDRRGKVITINEMALSLLNVKN-ENVIGTSLLELLDIEEDYT 315
Lc.lactis_YP808469              YMVDGVIATDRRGNIIMANKSALHYLNTSN-ELLMEKNIVDVLKIADQYN 169
Lc.lactis_YP001031763           YMVDGVIATDRRGNIIMANKSALHYLNTSN-ELLMEKNIVDVLKIADQYN 169
Lc.lactis_NP266552              YMVDGVIATDRRGNIIMANKSALHYLNTDN-DLLMQKNIVEVLKITDQYN 169
                                :* ***:**:* * :   *  .   :.           :   *

S.mutans_NP721861               YNDLIT-KTPEIVLTRRDEY--DEFITLRIRFALNRRESGFISGLIAVLH 196
S.mutans_YP003484506            YNDLIT-KTPEIVLTRRDEY--DEFITLRIRFALNRRESGFISGLIAVLH 196
S.gallolyticus_YP003430968      YHDLVS-KTPEIVLNRRDET--GEFITLRIRFALNRRDSGFISGLIAVLH 197
S.bovis_ZP07467090              YHDLVS-KTPEIVLNRRDGT--GEFITLRIRFALNRRDSGFISGLIAVLH 197
S.infantarius_ZP02921024        YHDLVS-KTPEIVLNRRDET--GEFITLRIRFALNRRDSGFISGLIAVLH 197
S.dysgalactiae_YP002996286      YRELVS-KTPVVTVNSRNDM--GEFVTLRLRFALNRRESGFISGLVVVLH 197
S.pyogenes_NP268803             YRDLVS-KTPVVTVNSRNDM--GEFVSLRLRFALNRRESGFISGLVVVLH 197
S.equi_YP002744127              YRELVS-KTPIVTLNRRNDT--GEFVSLRLRFALNRRESGFISGLVVVLH 197
S.equi_YP002123744              YRELVS-KTPIVTLNRRNDT--GEFVSLRLRFALNRRESGFISGLVVVLH 197
S.uberis_YP002561898            YRELVS-KTPIVTLNRRDET--GEFITLRLRFALNRRESGFISGLVVVLH 197
S.agalactiae_NP687735           FQDLVS-KTPEVVLNRRDEN--GEFVTLRIRFALNRRESGFISGLVAVSH 196
S.thermophilus_YP139610         YSELLS-KTPEIHLSRRDAN--DEFVTLRVNFALIRKESGFISGLVAVLH 196
S.salivariu_ZP04062119          YSELLS-KTPEIHLSRRDAN--DEFVTLRVNFALIRKESGFISGLVAVLH 196
S.sanguinis_YP001035504         LRDLIT-NVPELTIDSQDEN--GEYLSLRVRFALVRRESGFISGLVAVLH 197
S.gordonii_YP001450079          LRDLIT-KMPELTIDSQDEN--GEYLSLRVRFALVRRESGFISGLVAVLH 197
S.parasanguinis_ZP06900160      LRSLIT-EVPELTIDSQDEN--GEYISLRVRFALIRRESGFISGLVAVLH 197
S.oralis_ZP06612220             LRDLIT-QIPELTIDSQDVN--GEYLSLRVRFALVRRESGFISGLVAVLH 197
S.mitis_ZP07462753              LRDLIT-QIPELTIDSQDVN--GEYLSLRVRFALVRRESGFISGLVAVLH 197
S.oralis_ZP07458504             LRDLIT-QIPELTIDSQDAN--GEYLSLRVRFALVRRESGFISGLVAVLH 197
S.mitis_YP003446287             LRDLIT-QIPELMIDSQDAN--GEYLSLRVRFALVRRESGFISGLVAVLH 197
S.pneumoniae_NP358699           LRDLIT-QSPELLLDSQDIN--GEYLNLRVRFALIRRESGFISGLVAVLH 197
S.suis_ZP03624685               LRDLLA-QTPEIVIDHTNEN--EEFLTLRANFATIRSESGLISGLVVVLH 197
S.suis_YP001198724              LRDLLA-QTPEIVIDHTNEN--EEFLTLRANFATIRSESGLISGLVVVLH 197
L.reuteri_YP001270633           VRQLVNGEQREMIIDMSNS---GNNLILNAYFSPIQRESGFVSGLVCVLH 366
L.vaginalis_ZP03959893          VRQLVNSEQKEMILDMSNS---GSNLILNAYFSPIQRESGFVSGLVCVLH 366
L.antri_ZP05745002              VRELINSNQKEMIIDMSAG---GNDLILNAYFSPIQRESGFISGLVCVLH 365
L.fermentum_ADJ40691            IRHLVDEDQDQVILDDLN-----EDLILSAYFSPIKRESGFVSGLVCVLH 365
P.acidilactici_ZP06196171       LRDLLE-NQDPEVLDLSND---EQDLILHASFALIQRESGFISGLVCVLH 366
P.pentosaceus_YP805259          LRDLLE-NQEQVVLDLSDD---DQDLILHASFALIQRESGFISGLVCVLH 366
L.plantarum_NP783897            LRDLIE-NQDELMLDFSSN---ERDLILNAYFSLIQRESGFISGLVCVLH 370
L.brevisgi_YP794237             LRELLE-DPDDLVLDFSTK---EHDLILQAYFSLIQRESGFISGLVCVLH 366
L.salivarius_ZP04009519         LRDLLE-KQDEVVLDMSGE----KDLILNAYFSVIQRESGFISGIVCVLH 371
L.ruminis_ZP03957718            MRELIE-NQDGIIVDMSDA---GHDQILNAYFSTIQRESGFISGLVCVLH 370
L.casei_YP807963                LRDLLE-HQTELLLDFSEQL--DHELILRVDFSLIQRETGFISGLVAVLH 368
L.rhamnosus_ZP04439975          LRDLLE-HQTELLLDFSEQL--DHDLILRVDFSLIQRETGFISGLVAVLH 368
L.sakei_YP394689                LRDLLE-TQQVMVLDFSDQQ--DHDLILHVDFSLIQRETGYITGLVCVLH 363
L.acidophilus_ZP04020787        SQDLIS-SQKEIVITLDEGT--RDEMILHASFSLIKRVTGFVSGSVCVLH 365
L.ultunensis_ZP04012109         SQDLIS-SQKEIVITIDEGT--RDEMILHASFSLIKRVTGFVSGSVCVLH 368
L.crispatus_ZP03996903          SQDLIS-SQKEIVITLDPGT--RDEIILHASFSLIKRVTGFVSGSVCVLH 365
L.helveticus_YP001576656        SQDLIS-SQKEIVVTVKPGT--RDEIILHASFSLIKRVTGFVSGSVCVLH 365
L.jensenii_ZP06338918           AQELIG-NQQEMMITVNEGT--PDEMILHANFSLIRRVTGFVSGAVCVLH 366
L.jensenii_ZP04646123           AQELIG-NQQEMMITVNEGT--PDEMILHASFSLIRRVTGFVSGAVCVLH 366
L.delbrueckii_ZP07092088        SQDLIS-NQSDMQVTVNAGT--DDEIILHASFTLIKRVTGFVSGAVCVLH 380
L.gasseri_YP813915              IQDLLS-TQQELVVRVNDNT--RDEMILHANFSLIQRVTGFVSGLVCVLH 367
L.johnsonii_NP964082            IQDLLS-TQQELVVRVNDNT--RDEMILHANFSLIQRVTGFVSGLVCVLH 362
L.iners_ZP05743701              IQDLMS-TQQELIVTANVNT--HDELILHADFSLIQRVTGFVSGLICVLH 362
E.casseliflavus_ZP05644942      LRKLLE-NPEDMLLERPSNDLTGTNMILRIDFSMIRRESGFISGLVAVMH 368
E.gallinarum_ZP05649732         LRKLLE-SPDEMLIERPNNDIVGTNLILRIDFSMIRRESGFISGLVAVMH 368
E.faecium_ZP03982596            LRKLLE-DPNEMVLDRSTSTLESDQMILRVDFSMIRRESGFISGLVAVLH 366
E.faecalis_NP814923             LRKLLE-EPDELLIDRSTSDREEDQMIIRVDFTMIRRESGFITGLVCVLH 364
Lc.lactis_YP808469              FYDLLE-KEPEITIETHDAG--NKSISLHIKFALFRRESGFISGIIAVLH 216
Lc.lactis_YP001031763           FYDLLE-KEPEITIETHDAG--NESISLHIKFALFRRESGFISGIIAVLH 216
Lc.lactis_NP266552              FYDLLE-KEPEITIETHDSG--NESISLHIKFALFRRESGFISGIIAVLH 216
                                   *:        :             :   *:  :  :*::*:  * :*

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S.mutans_NP721861               DATEQEKEERERRLFVSNVSHELRTPLTSVKSYLEALDDGALTES-VAPS 245
S.mutans_YP003484506            DATEQEKEERERRLFVSNVSHELRTPLTSVKSYLEALDDGALTES-VAPS 245
S.gallolyticus_YP003430968      DTTEQEKEDRERRLFVSNVSHELRTPLTSVKSYLEALDEGALKED-IAPS 246
S.bovis_ZP07467090              DTTEQEKEDRERRLFVSNVSHELRTPLTSVKSYLEALDEGALKED-IAPS 246
S.infantarius_ZP02921024        DTTEQEKEDCERRLFVSNVSHELRTPLTSVKSYLEALDEGALKED-IAPS 246
S.dysgalactiae_YP002996286      DTTEQEKEERERRLFVSNVSHELRTPLTSVKSYLEALDEGAIKED-IAPS 246
S.pyogenes_NP268803             DTTEQEKEERERRLFVSNVSHELRTPLTSVKSYLEALDEGALKED-IAPS 246
S.equi_YP002744127              DTTEQEKEERERRLFVSNVSHELRTPLTSVKSYLEALDEGALKED-IAPS 246
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S.equi_YP002123744              DTTEQEKEERERRLFVSNVSHELRTPLTSVKSYLEALDEGALKED-IAPS 246
S.uberis_YP002561898            DTTEQEKEERERRLFVSNVSHELRTPLTSVKSYLEALDEGALKED-IAPS 246
S.agalactiae_NP687735           DATEQEKEERERRLFVSNVSHELRTPLTSVKSYLEALDEGALNEE-VAPS 245
S.thermophilus_YP139610         DATEQEKEERERRLFVSNVSHELRTPLTSVKSYLEALDDGALNEE-IAPN 245
S.salivariu_ZP04062119          DATEQEKEERERRLFVSNVSHELRTPLTSVKSYLEALDDGALDEE-IAPN 245
S.sanguinis_YP001035504         DTTEQDKEERERRLFVSNVSHELRTPLTSVKSYLEALDEGALSEP-VAPD 246
S.gordonii_YP001450079          DTTEQEKEERERRLFVSNVSHELRTPLTSVKSYLEALDEGALSEP-VAPE 246
S.parasanguinis_ZP06900160      DTTEQDKEERERRLFVSNVSHELRTPLTSVKSYLEALDDGALSEP-VAPD 246
S.oralis_ZP06612220             DTTEQEKEERERRLFVSNVSHELRTPLTSVKSYLEALDEGALYDP-VAPD 246
S.mitis_ZP07462753              DTTEQEKEERERRLFVSNVSHELRTPLTSVKSYLEALDEGALYDP-VAPD 246
S.oralis_ZP07458504             DTTEQEKEERERRLFVSNVSHELRTPLTSVKSYLEALDEGALYDP-VAPD 246
S.mitis_YP003446287             DTTEQEKEERERRLFVSNVSHELRTPLTSVKSYLEALDEGALSEP-VAPD 246
S.pneumoniae_NP358699           DTTEQEKEERERRLFVSNVSHELRTPLTSVKSYLEALDEGALCET-VAPD 246
S.suis_ZP03624685               DMTEQAKEERERRLFVSNVSHELRTPLTSVKSYLEALDEGALTES-VAPS 246
S.suis_YP001198724              DMTEQAKEERERRLFVSNVSHELRTPLTSVKSYLEALDEGALTES-VAPS 246
L.reuteri_YP001270633           DVTSQQKEERERKQFVSNVSHELRTPLTSVRSYVEALSDGAWQDKEIAPQ 416
L.vaginalis_ZP03959893          DVTSQQKEEQERKEFVSNVSHELRTPLTSVKSYVEALSDGAWQDKEIAPQ 416
L.antri_ZP05745002              DVTSQQKEERERKQFVSNVSHELRTPLTSVHSYVEALSDGAWKDQDIAPQ 415
L.fermentum_ADJ40691            DVTSQQKEERERKEFVSNVSHELRTPLTSVKSYVEALSDGAINDPELAPR 415
P.acidilactici_ZP06196171       DVTEQQKIDQDRKRFVSNVSHELRTPLTSMKSYIEALVDGAWKDPNVAPN 416
P.pentosaceus_YP805259          DVTEQQKIDQDRKRFVSNVSHELRTPLTSMKSYIEALVEGAWKDPEVAPN 416
L.plantarum_NP783897            DVTEQQKIDNDRKQFVSNVSHELRTPLTSLRSYIEALSDGAWKDPEVAPG 420
L.brevisgi_YP794237             DVTEQQKIDQARREFVSNVSHELRTPLTSVRSYIEALSEGAWKDPKVAPD 416
L.salivarius_ZP04009519         DVTEQQKIDRERKQFVSNVSHELRTPLTSMRSYIEALNDGAWRDEKVAPE 421
L.ruminis_ZP03957718            DVTEQQKIDRERRQFVSNVSHELRTPLTSMRSYIEALNDGAWKDPEVAPS 420
L.casei_YP807963                DVTEQQKIDRDRKEFVSNVSHELRTPLTSVRSYIEALSDGAWKDPKLAPR 418
L.rhamnosus_ZP04439975          DVTEQQKIDRDRKEFVSNVSHELRTPLTSVRSYIEALSDGAWKDPKLAPQ 418
L.sakei_YP394689                DVTEQQKNEREQREFVSNVSHELRTPLTSVRSYIEALNDGAWQDPEVAPN 413
L.acidophilus_ZP04020787        DVTEQQKNENSQRQFVSNVSHELRTPLTSLQAYIEALNEGAWKDPEIAPK 415
L.ultunensis_ZP04012109         DVTEQQKNEDSQRQFVSNVSHELRTPLTSLQAYIEALNEGAWKDPKIAPK 418
L.crispatus_ZP03996903          DVTEQQKNEDSQRQFVSNVSHELRTPLTSLQAYIEALNEGAWKNPEIAPK 415
L.helveticus_YP001576656        DVTEQQKNENSQRQFVSNVSHELRTPLTSLQAYIEALNEGAWKDPEIAPK 415
L.jensenii_ZP06338918           DVTEQQKNENEQRQFVSNVSHELRTPLTSLRAYIEALNDGAWKDPEIAPQ 416
L.jensenii_ZP04646123           DVTEQQKNENEQRQFVSNVSHELRTPLTSLRAYIEALNDGAWKDPEIAPQ 416
L.delbrueckii_ZP07092088        DVTEQIKNEDEQRQFVSNVSHELRTPLTSVRAYIEALNEGAWKDPEIAPQ 430
L.gasseri_YP813915              DITQQQKNEREQQQFVSNVSHELRTPLTSLRAYVEALNDGAWKDPNIAPQ 417
L.johnsonii_NP964082            DITQQQKNEREQQQFVSNVSHELRTPLTSLRAYVEALNDGAWKDPNIAPQ 412
L.iners_ZP05743701              DITEQQKNENEQRQFVSNVSHELRTPLTSLRAYVEALNDGAWKNENIAPQ 412
E.casseliflavus_ZP05644942      DVTEQEKNEQERREFVSNVSHELRTPLTSMRSYIEALSEGAWKDPEIAPN 418
E.gallinarum_ZP05649732         DVTEQEKNEQERREFVSNVSHELRTPLTSMRSYIEALSEGAWQDPEIAPN 418
E.faecium_ZP03982596            DVTEQEKTERERREFVSNVSHELRTPLTSMRSYIEALSEGAWKDEEVAPN 416
E.faecalis_NP814923             DVTEQEKNERERREFVSNVSHELRTPLTSMRSYIEALSEGAWENPEIAPN 414
Lc.lactis_YP808469              DMTEQDKAERERRLFVSNVSHELRTPLTSVKAYLEALEDGAIDDKETASS 266
Lc.lactis_YP001031763           DMTKQDKAERERRLFVSNVSHELRTPLTSVKAYLEALEDGAIDDKETASS 266
Lc.lactis_NP266552              DMTEQDKAERERRLFVSNVSHELRTPLTSVKAYLEALEDGAIEDKETASS 266
                                * *.* * :  :: ***************:::*:*** :**  :   *.

S.mutans_NP721861               FIKVSLDETNRMMRMITDLLSLSRIDNQTSHLDVELTNFTAFMNYILDRF 295
S.mutans_YP003484506            FIKVSLDETNRMMRMITDLLSLSRIDNQTSHLDVELTNFTAFMNYILDRF 295
S.gallolyticus_YP003430968      FIKVSLDETNRMIRMISDLLNLSRIDNQTVQLEVEMTNFTAFMTSILNRF 296
S.bovis_ZP07467090              FIKVSLDETNRMIRMISDLLNLSRIDNQTVQLEVEMTNFTAFMTSILNRF 296
S.infantarius_ZP02921024        FIKVSLDETNRIIRMISDLLNLSRIDNQTVQLEVEMTNFTAFMTSILNRF 296
S.dysgalactiae_YP002996286      FIKVSLDETNRMMRMISDLLNLSRIDNQVTQLSVEMTNFTAFMTSILNRF 296
S.pyogenes_NP268803             FIKVSLDETNRMMRMISDLLNLSRIDNQVTQLAVEMTNFTAFITSILNRF 296
S.equi_YP002744127              FIKVSLDETNRMMRMISDLLNLSRIDNHVTQLSVEMTNFTAFMTSILNRF 296
S.equi_YP002123744              FIKVSLDETNRMMRMISDLLNLSRIDNHVTQLSVEMTNFTAFMTSILNRF 296
S.uberis_YP002561898            FIKVSLDETNRMMRMISDLLNLSRIDNQVTALAVEMTNFTAFMTSILNRF 296
S.agalactiae_NP687735           FIKVSLDETNRMMRMISDLLSLSRIDNEVTHLDVEMTNFTAFMTSILNRF 295
S.thermophilus_YP139610         FIKVSLDETNRMMRMITDLLALSRIDNKSTQLNVEMTNFTAFMTYILNRF 295
S.salivariu_ZP04062119          FIKVSLDETNRMMRMISDLLALSRIDNKSTQLDVEMTNFTAFMTYILNRF 295
S.sanguinis_YP001035504         FVKVSLNETNRMMRMVTDLLSLSRIDNETSHLEVELTNFTAFITFILNRF 296
S.gordonii_YP001450079          FVKVSLTETNRMMRMVSDLLSLSRIDNDSSHLDVELTNFTAFITFILNRF 296
S.parasanguinis_ZP06900160      FVKVSLNETNRMMRMVTDLLSLSRIDNETSQLDIELTNFTAFITFILNRF 296
S.oralis_ZP06612220             FIKVSLDETNRMMRMVTDLLHLSRIDNTTSQLDVELINFTAFITFILNRF 296
S.mitis_ZP07462753              FIKVSLDETNRMMRMVTDLLHLSRIDNATTQLDVELINFTAFITFILNRF 296
S.oralis_ZP07458504             FIKVSLDETNRMMRMVTDLLHLSRIDNATTKLDIELINFTAFITFILNRF 296
S.mitis_YP003446287             FIKVSLDETNRMMRMVTDLLHLSRIDNATSHLDVELINFTAFITFILNRF 296
S.pneumoniae_NP358699           FIKVSLDETNRMMRMVTDLLHLSRIDNATSHLDVELINFTAFITFILNRF 296
S.suis_ZP03624685               FVKVSLDETNRMMRMITDLLSLSRIDNQVGQIDVELINFTAFVTFILNRF 296
S.suis_YP001198724              FVKVSLDETNRMMRMITDLLSLSRIDNQVGQIDVELINFTAFVTFILNRF 296
L.reuteri_YP001270633           FLKVVQDETDRMIRMINDLLSLSRMDAGTTKLNLEYVNINELFNYILDRF 466
L.vaginalis_ZP03959893          FLKVVQDETERMIRMINDLLSLSRMDAGTTKLNLEYVNINELFNYILNRF 466
L.antri_ZP05745002              FLTVIQNETNRMIRMINDLLSLSRMDSGTTKLNLEYVNIKELFNYILNRF 465
L.fermentum_ADJ40691            FLGVVSDETERMIRMINDLLSLSRMDSGTAKLNLEYVNINELFNYILNRF 465
P.acidilactici_ZP06196171       FLKVTQEETDRMMRMINDLLNLSRMDLGTARLDKEYVNLNELFNHILDRF 466
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P.pentosaceus_YP805259          FLKVTQEETDRMMRMINDLLNLSRMDLGTARLEREYVNLNELFNHILDRF 466
L.plantarum_NP783897            FLKVTQEETDRMIRMINELLSLSRMDSGTTRVDMELVNINEMFNYVLDRF 470
L.brevisgi_YP794237             FLKVTQEETDRMIRMINDLLTLSRMDSGTQKVDLEMVNLNELFNYVLDRF 466
L.salivarius_ZP04009519         FLKVTQDETDRMIRMINDLLSLSRMDSGTVKLDLELVNINGLVNYILDRF 471
L.ruminis_ZP03957718            FLKVTQDETDRMIRMINDLLSLSRMDSGTVKLDFELVNLNELFNYILNRF 470
L.casei_YP807963                FLNVTQEETDRMIRMINDLLSLSRLDSGTSKFNLETVNLNEFFNYVLDRF 468
L.rhamnosus_ZP04439975          FLNVTQEETDRMIRMINDLLSLSRLDSGTSKFNLETVNLNEFFNYVLDRF 468
L.sakei_YP394689                FLKVTQEETDRMIRMINDLLSLSRMDQGTAKMNLEFVNLNEFFGYVLDRF 463
L.acidophilus_ZP04020787        FLEVTQQETGRMIRMINDLLSLSRMDRGVSKMDLEFVNLNDFVNHILNRF 465
L.ultunensis_ZP04012109         FLEVTQQETSRMIRMINDLLSLSRMDRGVSKMDLEFVNLNDFVNHILNRF 468
L.crispatus_ZP03996903          FLEVTQQETSRMIRMINDLLSLSRMDRGVSKMDLEFVNLNDFVNHILNRF 465
L.helveticus_YP001576656        FLEVTQQETSRMIRMINDLLSLSRMDRGVSKMDLEFVNFNDFVSHILNRF 465
L.jensenii_ZP06338918           FLEVTQEETERMIRMINDLLSLSRMDRGVVKMDLEWVNFNDFLSHVLNRF 466
L.jensenii_ZP04646123           FLEVTQEETERMIRMINDLLSLSRMDRGVAKMDLEWVNFNDFLSHVLNRF 466
L.delbrueckii_ZP07092088        FLDVTQKETERMIRMVNDLLVLSRMDRGATKLEPEWVNFTDFVSHLLNRF 480
L.gasseri_YP813915              FLHVIQDETERMIRMINDLLSLSRMDRGVARMDLEWVNLNDFVNHVLNRF 467
L.johnsonii_NP964082            FLHVIQDETERMIRMINDLLSLSRMDRGVAKMDLEWVNLNDFVNHVLNRF 462
L.iners_ZP05743701              FLGVIQNETERMIRMINDLLNLSRMDRGVVKMDLEWVNLNDFLSHILNRF 462
E.casseliflavus_ZP05644942      FLKVTLDETDRMIRMINDLLSLSRMDSGNSQLQLEYINFNEMVNFVLDRF 468
E.gallinarum_ZP05649732         FLKVTLDETDRMIRMINDLLSLSRMDSGNAQLQLEYINFNELVSFVLDRF 468
E.faecium_ZP03982596            FLKVTLDETDRMIRMINDLLNLSRMDTGNTQLQLEYVNFNELVNFVLDRF 466
E.faecalis_NP814923             FLKVTLEETDRMIRMINDLLNLSRMDSGNTHLQLEYVNFNELINFVLDRF 464
Lc.lactis_YP808469              FIGVSLTETNRMIRMISDLLTLSRMDQDRIVLNKEIINLIAFLDYQINRL 316
Lc.lactis_YP001031763           FIGVSLTETNRMIRMISDLLTLSRMDQDRIVLNKEIINLIAFLDYQINRL 316
Lc.lactis_NP266552              FINVSLTETNRMIRMISDLLTLSRMDQDRIVLNKEMINLIAFLDYQINRL 316
                                *: *   ** *::**:.:** ***:*     .  *  *:  :.   ::*:

S.mutans_NP721861               DQIQSQQS------------------TNKVYEIIRDYPDKSVWIEIDTDK 327
S.mutans_YP003484506            DQIQSQQS------------------TNKVYEIIRDYPDKSVWIEIDTDK 327
S.gallolyticus_YP003430968      DQIKSQHT-----------------ISGKQYEIVRDYPIKSIWLEIDPDK 329
S.bovis_ZP07467090              DQIKSQHT-----------------ISGKQYEIVRDYPIKSIWLEIDPDK 329
S.infantarius_ZP02921024        DQIKSQHT-----------------VAGKQYEIVRDYPIKSIWVEIDPDK 329
S.dysgalactiae_YP002996286      DLVKNQQT-----------------GTGKVYEIVRDYPITSVWLEIDNDK 329
S.pyogenes_NP268803             DLVKNQHT-----------------GTGKVYEIVRDYPITSVWIEIDNDK 329
S.equi_YP002744127              DLVKNQHT-----------------STGKSYEIVRDYPITSIWLEIDNDK 329
S.equi_YP002123744              DLVKNQHT-----------------STGKSYEIVRDYPITSIWLEIDDDK 329
S.uberis_YP002561898            DLVRNQNT-----------------VSGKSYEIIRDYPITSVWLEIDNDK 329
S.agalactiae_NP687735           DQIRNQKT-----------------VTGKVYEIVRDYPLKSIWVEIDTDK 328
S.thermophilus_YP139610         GQIKSQET-----------------NPGKSYEIIRDYPVNSIWVEIDTDK 328
S.salivariu_ZP04062119          DQIKSQET-----------------NTGKTYEIIRDYPVNSIWVEIDTDK 328
S.sanguinis_YP001035504         DKIKNQ-------------------DETKKYEIIRDYPITPIWVEIDTDK 327
S.gordonii_YP001450079          DKIKSQ-------------------DETKKYEIVRDYPITPIWVEIDTDK 327
S.parasanguinis_ZP06900160      DKIKSQSQ-----------------EDTKKYELIREYPITPIWVEIDTDK 329
S.oralis_ZP06612220             DKMRSQ-------------------DDEKKYELVRDYPINSVWIEIDTDK 327
S.mitis_ZP07462753              DKMRSQ-------------------DDEKKYELVRDYPINSVWIEIDTDK 327
S.oralis_ZP07458504             DKMRNQ-------------------DEEKKYELVRDYPITSVWIEIDTDK 327
S.mitis_YP003446287             DQIRGQ-------------------DEEKKYELVRDYPITSVWIEIDTDK 327
S.pneumoniae_NP358699           DKMKGQ-------------------EKEKKYELVRDYPINSIWMEIDTDK 327
S.suis_ZP03624685               DQMKNA-------------------DSDKVYTIVRDYQISPIWVEIDTDK 327
S.suis_YP001198724              DQMKNA-------------------DSDKVYTIVRDYQISPIWVEIDTDK 327
L.reuteri_YP001270633           DMIIKKEE---DPK-------------KKKYTIERYFTKKDLWVEIDTDK 500
L.vaginalis_ZP03959893          DMIIKKEE---DPK-------------KKKYTIERFFTKKDLWVEIDTDK 500
L.antri_ZP05745002              DMIIKKNE---NNKD------------SKKYTIERYFTDKDLWVEIDTDK 500
L.fermentum_ADJ40691            DMIIKNEA---ADPS------------KKKYTIVRYFTKKDLWVEIDTDK 500
P.acidilactici_ZP06196171       DMILKNGE---KSE--------------KNYTIKRDFTRRDIWVEVDTDK 499
P.pentosaceus_YP805259          DMILKNSD---KPD--------------KNYSIKRDFTRRDIWVEVDTDK 499
L.plantarum_NP783897            DMILKKDD---NPA--------------KYYTIKREFTKRDLWVEIDTDK 503
L.brevisgi_YP794237             DMMLKQDD---QPE--------------KTYTIKRDFTKRDLWVEIDTDR 499
L.salivarius_ZP04009519         DMMLKKDKIDTRDIK------------TKNYTIKRDFTKRDLWVELDTDK 509
L.ruminis_ZP03957718            DMMLKKDNNDTRETK------------SKNYTIKRDFTKRDLWVEIDTDK 508
L.casei_YP807963                DMMLKTDNEHTGEAKTAQPLPQP-DGQKKRYSIKREITDQDLWVEIDTDK 517
L.rhamnosus_ZP04439975          DMMLKTDNEHTGEARTAQPLPQP-DGQKKRYSIKREITHEDLWVEIDTDK 517
L.sakei_YP394689                DMMIKRDQEHDNNASPRGTGKLPTDDPNKKYSITRDFTKRDLWVEIDTDK 513
L.acidophilus_ZP04020787        DMIVKTD----KNKD-----------HKKKYTIKRELGNQALWVEIDTDK 500
L.ultunensis_ZP04012109         DMIVKTD----KNKS-----------HKKKYTINRELGSQALWVEIDTDK 503
L.crispatus_ZP03996903          DMIVKTD----KNK------------EKKKYTIKRELGSQALWVEIDTDK 499
L.helveticus_YP001576656        DMIVKTD----KNKG-----------HKKKYTIKRELGNQALWVEIDTDK 500
L.jensenii_ZP06338918           DMIVKND---EKDQT-----------GQKKYSIKRKITNQDLWVEIDTDQ 502
L.jensenii_ZP04646123           DMIVKKDA--EKGQE-----------GEKKYSIKRKITNQDLWVEIDTDQ 503
L.delbrueckii_ZP07092088        DMIVEHDQ--GEAQS-----------DTKEYVIKRDLGNQALWVEIDTDQ 517
L.gasseri_YP813915              DMMLKSD----SDKM-----------HKKKYTIKREFPHQALWVEIDTDK 502
L.johnsonii_NP964082            DMMLKSD----TDKT-----------HKKKYSIKREFPHQALWVEIDTDK 497
L.iners_ZP05743701              DMMLKND----G---------------VKKYKIRRIFPHQALWVEIDTDK 493
E.casseliflavus_ZP05644942      DMMVTNES--------------------KKYLIRREFTKRELWVEVDTDK 498
E.gallinarum_ZP05649732         DMMVTNEN--------------------KKYVIRREFTKRELWVEVDTDK 498
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E.faecium_ZP03982596          DMMVGNQE--------------------KNYKIRREFTQRDLWVEVDTDK 496
E.faecalis_NP814923           DMMIENEQ--------------------KNYKICREFTKRDLWVELDTDK 494
Lc.lactis_YP808469            DQILETESN---------------DLISSNFTLVRKYSDKPIWVEIDTDK 351
Lc.lactis_YP001031763         DQILETESN---------------DLISSNFTLVRKYSDKPIWVEIDTDK 351
Lc.lactis_NP266552            DQILETESN---------------DLISSNFTLVRKYSEQPIWVEIDTDK 351
                              . :                         . : : *      :*:*:* *:

                                    N box                          G1 box
S.mutans_NP721861             MTQVIDNILNNAIKYSPDGGKVTITMQTTDTQLILSISDQGLGIPKKDLP 377
S.mutans_YP003484506          MTQVIDNILNNAIKYSPDGGKVTVTMQTTDTQLILSISDQGLGIPKKDLP 377
S.gallolyticus_YP003430968    MTQVLDNILNNAIKYSPDGGKITVSMKTTETQLIISISDEGLGIPKKDLP 379
S.bovis_ZP07467090            MTQVLDNILNNAIKYSPDGGKITVSMKTTETQLIISISDEGLGIPKKDLP 379
S.infantarius_ZP02921024      MTQVLDNILNNAIKYSPDGGKITVSMKTTETQLIISISDEGLGIPKKDLP 379
S.dysgalactiae_YP002996286    MTQVIENILNNAIKYSPDGGKITVRMKTTDTQLIISISDQGLGIPKKDLP 379
S.pyogenes_NP268803           MTQVIENILNNAIKYSPDGGKITVRMKTTDTQLIISISDQGLGIPKTDLP 379
S.equi_YP002744127            MTQVIENILNNAIKYSPDGGKIIVNMKTTDTQLIISISDEGLGIPKKDLP 379
S.equi_YP002123744            MTQVIENILNNAIKYSPDGGKIVVNMKTTDTQLIISISDEGLGIPKKDLP 379
S.uberis_YP002561898          MTQVIENILNNAIKYSPDGGKIRVKMKTTDSQLIISISDQGLGIPKKDLP 379
S.agalactiae_NP687735         MTQVIDNILNNAVKYSPDGGKITVNLRTTKTQMILSISDQGLGIPKKDLP 378
S.thermophilus_YP139610       MTQVIDNILNNAIKYSPDGGKITVSMKTTDTQLIVSISDQGLGIPKKDLP 378
S.salivariu_ZP04062119        MTQVVDNILNNAIKYSPDGGKITVSMKTTDSQLIVSISDQGLGIPKKDLP 378
S.sanguinis_YP001035504       LTQVIDNIMNNAIKYSPDGGTITVSIKTTDEQLILSIADEGLGIPKQDLP 377
S.gordonii_YP001450079        MTQVIDNIMNNAIKYSPDGGKITVGMKTTEDQLIISISDEGLGIPKKDLP 377
S.parasanguinis_ZP06900160    MTQVIDNILNNAIKYSPDGGKIKVGMRTTDAQLIISISDEGLGIPKKDLP 379
S.oralis_ZP06612220           MTQVIDNILNNAIKYSPDGGKITVSMKTTDDQMILSIKDQGLGIPKQDLP 377
S.mitis_ZP07462753            MTQVIDNILNNAIKYSPDGGKITVSMKTTDDQMILSIKDQGLGIPKQDLP 377
S.oralis_ZP07458504           MTQVIDNILNNAIKYSPDGGKITVSMKTTDDQMILSISDQGLGIPKQDLP 377
S.mitis_YP003446287           MTQVIDNILNNAIKYSPDGGKITVTMKTTDDQMILSISDQGLGIPKQDLP 377
S.pneumoniae_NP358699         MTQVVDNILNNAIKYSPDGGKITVRMKTTEDQMILSISDHGLGIPKQDLP 377
S.suis_ZP03624685             MTQVLDNILNNAIKYSPDGGTITFSMKTTDSQLIVSVSDEGLGIPKADLP 377
S.suis_YP001198724            MTQVLDNILNNAIKYSPDGGTITFSMKTTDSQLIVSVSDEGLGIPKADLP 377
L.reuteri_YP001270633         FTQVIDNIMNNAIKYSPDGGVITTRLLETHNHVILSISDQGLGIPRKDLG 550
L.vaginalis_ZP03959893        FTQVIDNIMNNAIKYSPDGGVITARLLETHNHVIMSISDQGLGIPRKDLS 550
L.antri_ZP05745002            FTQVIDNIMNNAIKYSPDGGVITTRLLETHNHVILSISDQGLGIPRKDLG 550
L.fermentum_ADJ40691          FTQVVDNIMNNAVKYSPDGGVITARLLETHNHVILSISDQGLGIPRKDLG 550
P.acidilactici_ZP06196171     IQQVLDNIMNNAIKYSPDGGVITCRLVETHNHVIMSITDQGLGIPKEAIS 549
P.pentosaceus_YP805259        IQQVLDNIMNNAIKYSPDGGIITCRLLETHNHVIMSITDQGLGIPKDSIS 549
L.plantarum_NP783897          FTQVLDNIMNNAIKYSPDGGVVTCRLLETHNQVIISISDQGLGIPRADLG 553
L.brevisgi_YP794237           FTQVLDNLMNNAIKYSPDGGVVTARLLETHNNVILSVSDQGLGIPRADIP 549
L.salivarius_ZP04009519       FIQVVDNIMNNAIKYSPDGGVITCRLLETHNNVILSISDQGLGIPKKDLG 559
L.ruminis_ZP03957718          FIQVVDNIMNNAIKYSPDGGVITCRLLETHNHVILSITDQGLGIPRKDLG 558
L.casei_YP807963              FMQVIDNIMNNAIKYSPDGGTITARLFQTHDHVILSISDQGLGIPRQDLG 567
L.rhamnosus_ZP04439975        FMQVIDNIMNNAIKYSPDGGVITARLFQTHDHVILSISDQGLGIPRQDLG 567
L.sakei_YP394689              FMQVVDNIMNNAIKYSPDGGVITCRLLETHRHVILSISDQGLGIPRKDLG 563
L.acidophilus_ZP04020787      MMQVIDNIMNNAIKYSPDGGVITVRLTQNQNHVILSISDQGLGIPRKDLA 550
L.ultunensis_ZP04012109       MMQVIDNIMNNAIKYSPDGGVITVRLTQNQNHVILSISDQGLGIPRKDLG 553
L.crispatus_ZP03996903        MMQVIDNIMNNAIKYSPDGGVITVRMTQNQNHVILSISDQGLGIPRKDLG 549
L.helveticus_YP001576656      MMQVIDNIMNNAIKYSPDGGVITVRLTHSQGHVILSISDQGLGIPRKDLG 550
L.jensenii_ZP06338918         MMQVIDNIMNNAIKYSPDGGVITVGLTQSQNQIILSISDQGLGIPKKDLN 552
L.jensenii_ZP04646123         MMQVIDNIMNNAIKYSPDGGVITVGLSQSQNQIILSISDQGLGIPKKDLN 553
L.delbrueckii_ZP07092088      MMRVIDNIMNNAIKYSPDGGTITVRLTQNQNQILLSISDQGLGIPRKDLG 567
L.gasseri_YP813915            MMQVIDNIMNNAIKYSPDGGVITVRLLQAQKHVILSISDQGLGIPRKDLN 552
L.johnsonii_NP964082          MMQVIDNIMNNAIKYSPDGGVITVRLLQAQKHVILSISDQGLGIPRKDLN 547
L.iners_ZP05743701            MMQVIDNIMNNAIKYSPDGGLITIRLLQTHKHVILSVSDQGLGIPRKDLS 543
E.casseliflavus_ZP05644942    MIQVIDNIMNNAIKYSPDGGIITVKLMETHNNIVLSINDQGLGIPKKDLT 548
E.gallinarum_ZP05649732       MIQVIDNIMNNAIKYSPDGGVITVKLMETHNNIVLSINDQGLGIPKKDLT 548
E.faecium_ZP03982596          IIQVVDNIMNNAIKYSPDGGTITCRLLETHNNVILSITDQGLGIPKKDLN 546
E.faecalis_NP814923           VIQVLDNILNNAIKYSPDGGVITCRLVETHNNVVFSISDQGLGIPKKDLG 544
Lc.lactis_YP808469            IAQVIDNIIGNAIKYSPKGGTITISIETRERDVLISIKDEGMGIPKSDLL 401
Lc.lactis_YP001031763         IAQVIDNIIGNAIKYSPKGGTITIYVETRERDVLISIKDEGMGIPKSDLL 401
Lc.lactis_NP266552            IAQVIDNIIGNAIKYSPKGGTITISVEKRESDVLISISDQGMGIPKSDLL 401
                              . :*::*::.**:****.** :   :   . .::.*: *.*:***:  :

                                  F box        G2 box                    G3 box
S.mutans_NP721861             LIFDRFYRVDKA-RSRAQGGTGLGLAIAKEIVKQHKGFIWANSE-EGEGS 425
S.mutans_YP003484506          LIFDRFYRVDKA-RSRAQGGTGLGLAIAKEIVKQHKGFIWANSE-EGEGS 425
S.gallolyticus_YP003430968    LIFDRFYRVDKA-RSRAQGGSGLGLAIAKEIVKQHKGFIWAQST-YGKGS 427
S.bovis_ZP07467090            LIFDRFYRVDKA-RSRAQGGSGLGLAIAKEIVKQHKGFIWAQST-YGKGS 427
S.infantarius_ZP02921024      LIFDRFYRVDKA-RSRAQGGSGLGLAIAKEIVKQHKGFIWAQST-YGKGS 427
S.dysgalactiae_YP002996286    LIFDRFYRVDKA-RSRAQGGTGLGLAIAKEIIKQHHGFIWAKSD-YGKGS 427
S.pyogenes_NP268803           LIFDRFYRVDKA-RSRAQGGTGLGLAIAKEIIKQHHGFIWAKSD-YGKGS 427
S.equi_YP002744127            LIFDRFYRVDKA-RSRAQGGTGLGLAIAKEIIKQHRGFIWAKSD-YGKGS 427
S.equi_YP002123744            LIFDRFYRVDKA-RSRAQGGTGLGLAIAKEIIKQHRGFIWAKSD-YGKGS 427
S.uberis_YP002561898          LIFDRFYRVDKA-RSRAQGGTGLGLAIAKEIVKQHNGFIWAKSD-YGKGS 427
S.agalactiae_NP687735         LIFDRFYRVDKA-RSRKQGGTGLGLSIAKEIVKQHKGFIWAKSE-YGKGS 426
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S.thermophilus_YP139610          LIFDRFYRVDKA-RSRAQGGTGLGLSIAKEIVKQHNGFIWAKSE-YGKGS 426
S.salivariu_ZP04062119           LIFDRFYRVDKA-RSRAQGGTGLGLSIAKEIIKQHKGFIWAKSE-YGKGS 426
S.sanguinis_YP001035504          KIFDRFYRVDKA-RSRAQGGTGLGLAIAKEIIKQHQGFIWAKSE-YGVGS 425
S.gordonii_YP001450079           KIFDRFYRVDKA-RSRAQGGTGLGLAIAKEIIKQHHGFIWAKSE-YEVGS 425
S.parasanguinis_ZP06900160       RIFDRFYRVDKA-RSRAQGGTGLGLAIAKEIIKQHKGFIWAKSE-YGKGS 427
S.oralis_ZP06612220              KIFDRFYRVDRA-RSRAQGGTGLGLAIAKEIIKQHNGFIWAKSE-YGKGS 425
S.mitis_ZP07462753               KIFDRFYRVDRA-RSRAQGGTGLGLAIAKEIIKQHNGFIWAKSE-YGKGS 425
S.oralis_ZP07458504              RIFDRFYRVDRA-RSRAQGGTGLGLAIAKEIIKQHNGFIWAKSE-YGKGS 425
S.mitis_YP003446287              RIFDRFYRVDRA-RSRAQGGTGLGLAIAKEIIKQHNGFIWAKSE-YGKGS 425
S.pneumoniae_NP358699            RIFDRFYRVDRA-RSRAQGGTGLGLSIAKEIIKQHKGFIWAKSE-YGKGS 425
S.suis_ZP03624685                RIFDRFYRVDKA-RSRAQGGTGLGLAIAKEIVKQHKGFIWAKSE-YGHGS 425
S.suis_YP001198724               RIFDRFYRVDKA-RSRAQGGTGLGLAIAKEIVKQHKGFIWAKSE-YGHGS 425
L.reuteri_YP001270633            RIFDRFFRVDKA-RSRKQGGTGLGLAISKEVINMLGGQIWVDSV-EGKGS 598
L.vaginalis_ZP03959893           HIFDRFFRVDKA-RSRKQGGTGLGLAISKEVVNMLGGQIWVDSV-EGKGS 598
L.antri_ZP05745002               RIFDRFFRVDKA-RSRKQGGTGLGLAISKEVVNLLGGQIWVDSV-EGQGS 598
L.fermentum_ADJ40691             HIFDRFFRVDKA-RSRKQGGTGLGLAISKEVVNLLGGQIWVDSV-EGKGS 598
P.acidilactici_ZP06196171        HVFDRFYRVDKA-RSRAQGGTGLGLAISKEVVQMHGGRIWVESR-EGEGS 597
P.pentosaceus_YP805259           HIFDRFYRVDKA-RSRAQGGTGLGLAISKEVIQLHGGRIWVESR-EGEGS 597
L.plantarum_NP783897             HVFDRFFRVDKA-RSRAQGGTGLGLAISKEVVQMLGGRIWVDSV-EGKGS 601
L.brevisgi_YP794237              RIFDRFYRVDKA-RSRAQGGTGLGLAISREVVQMLGGRIWVDSR-EGRGS 597
L.salivarius_ZP04009519          HVFDRFFRVDKA-RSRAQGGTGLGLAISKEVIELHHGRIWVDSV-EGKGS 607
L.ruminis_ZP03957718             HIFDRFFRVDKA-RSRAQGGTGLGLAISKEVIEMHHGKIWVDSI-EGKGS 606
L.casei_YP807963                 KIFDRFYRVDKA-RSRKQGGTGLGLAISKEVVEALHGRIWVDSQ-EGRGS 615
L.rhamnosus_ZP04439975           KIFDRFYRVDKA-RSRKQGGTGLGLAISKEVVEALHGRIWVDSQ-EGRGS 615
L.sakei_YP394689                 KIFDRFYRVDKA-RSRKQGGTGLGLAISKEVIEAHNGRVWVDSQ-EGKGS 611
L.acidophilus_ZP04020787         KIFDRFYRVDKA-RSRAQGGTGLGLAIAKEIVEAHHGRIWADSS-EGKGS 598
L.ultunensis_ZP04012109          KIFDRFYRVDKA-RSRAQGGTGLGLAIAKEIVEAHHGRIWADSS-EGRGS 601
L.crispatus_ZP03996903           KIFDRFYRVDKA-RSRAQGGTGLGLAIAKEIVEAHHGKIWADSS-EGKGS 597
L.helveticus_YP001576656         KIFDRFYRVDKA-RSRAQGGTGLGLAIAKEIVEAHHGRVWADSS-EGKGS 598
L.jensenii_ZP06338918            KIFDRFYRVDKA-RSREQGGTGLGLAIAKEIVEAHKGKIWADSQ-EGKGS 600
L.jensenii_ZP04646123            KIFDRFYRVDKA-RSREQGGTGLGLAIAKEIVEAHKGRIWADSQ-EGKGS 601
L.delbrueckii_ZP07092088         KIFDRFYRADKA-RSRAQGGTGLGLAIAKEIVTAHGGRIWADSR-EGHGS 615
L.gasseri_YP813915               KIFDRFYRVDKA-RSRKQGGTGLGLAISKEIVEAHHGRIWADSA-EGAGS 600
L.johnsonii_NP964082             KIFDRFYRVDKA-RSRKQGGTGLGLAISKEIVEAHHGRIWADSA-EGSGS 595
L.iners_ZP05743701               RIFDRFYRVDKA-RSRKQGGTGLGLAISKEIVEAHHGKIWADSS-EGNGS 591
E.casseliflavus_ZP05644942       KIFDRFYRVDKA-RARQQGGTGLGLAISREVIKAHGGAIWAESR-ENRGS 596
E.gallinarum_ZP05649732          KIFDRFYRVDKA-RARQQGGTGLGLAISREVIKSHGGAIWAESR-ENRGS 596
E.faecium_ZP03982596             RVFERFYRVDKA-RARAQGGTGLGLAISREVIKAHRGAIWAESK-EGKGS 594
E.faecalis_NP814923              KVFERFYRVDKA-RARAQGGTGLGLAISKEVIRAHNGSIWVEST-EGEGS 592
Lc.lactis_YP808469               KIFDRFYRVDNASRNSKVGGTGLGLSIVHDIVKIHGGTIFASSEGEGKGT 451
Lc.lactis_YP001031763            KIFDRFYRVDNASRNSKVGGTGLGLSIVHDIVKIHGGTIFASSEGEGKGT 451
Lc.lactis_NP266552               KIFDRFYRVDNASRNSKVGGTGLGLSIVHDIVKIHGGTIFASSEGEGKGT 451
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S.mutans_NP721861                TFTIVLPYEND--NDAIDEWEEDE----DES 450
S.mutans_YP003484506             TFTIVLPYEND--NDAIDEWEEGE----DES 450
S.gallolyticus_YP003430968       TFTIVLPYEKD--SEIYDEWEDEE----E-- 450
S.bovis_ZP07467090               TFTIVLPYEKD--SEIYDEWEDEE----E-- 450
S.infantarius_ZP02921024         TFTIVLPYEKD--SDIYDEWEDDE----D-- 450
S.dysgalactiae_YP002996286       TFTIVLPYEKD--AAIYEEWEDDI----D-- 450
S.pyogenes_NP268803              TFTIVLPYEKD--AAIYEEWEEDV----D-- 450
S.equi_YP002744127               TFTIVLPYEKD--AAIYDEWEDDI----D-- 450
S.equi_YP002123744               TFTIVLPYEKD--AAIYDEWEDDI----D-- 450
S.uberis_YP002561898             TFTIVLPYEKDVVAGTDDEWEDDI----D-- 452
S.agalactiae_NP687735            TFTIVLPYDKD--AVTYEEWEDVE----D-- 449
S.thermophilus_YP139610          TFTIVLPYDQD--AMMVDEWEM--------- 446
S.salivariu_ZP04062119           TFTIVLPYDKD--AMMVDEWEM--------- 446
S.sanguinis_YP001035504          TFTIVLPYEND--GVRDDDWDNE-----DDI 449
S.gordonii_YP001450079           TFTIVLPYDKD--AVLDDGWESEEVESKDD- 453
S.parasanguinis_ZP06900160       TFTIVLPYDKD--AIKDD-WDTEE----EE- 450
S.oralis_ZP06612220              TFTIVLPYDKD--AVKEEIWEDEI----ED- 449
S.mitis_ZP07462753               TFTIVLPYDKD--AVKEEIWEDEI----ED- 449
S.oralis_ZP07458504              TFTIVLPYDKD--AVKEEIWEDEI----ED- 449
S.mitis_YP003446287              TFTIVLPYDKD--AVKEEVWEDEV----ED- 449
S.pneumoniae_NP358699            TFTIVLPYDKD--AVKEEVWEDEV----ED- 449
S.suis_ZP03624685                TFTIVLPYSKD--IALDEWDDSDE----EE- 449
S.suis_YP001198724               TFTIVLPYSKD--IALDEWDDSDE----EE- 449
L.reuteri_YP001270633            TFYISLPYVPYE--E--EDWDDEEAEK---- 621
L.vaginalis_ZP03959893           TFYISLPYVPYE--EG-DEWDDQKDQN---- 622
L.antri_ZP05745002               TFYISLPYVPYE--EE-DDWDD--------- 617
L.fermentum_ADJ40691             TFYISLPYVPYE--E--EEWDDQAD------ 619
P.acidilactici_ZP06196171        TFYISLPYEPFE--EG-DAWE---------- 615
P.pentosaceus_YP805259           TFYISLPYEPFE--EG-DTWE---------- 615
L.plantarum_NP783897             TFYISLPYEPYE--EE-DLWDDDSQA----- 624
L.brevisgi_YP794237              TFYISLPYKPYD--EE-DLWDEDN------- 618
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L.salivarius_ZP04009519          TFYISLPYEEYS--EE-DLWDEN-------- 627
L.ruminis_ZP03957718             TFYISLPYEEYE--GD-DLWDEE-------- 626
L.casei_YP807963                 TFYISLPYEPIT--DGGDDWDEA-------- 636
L.rhamnosus_ZP04439975           TFYISLPYEPIT--DGGDDWDEA-------- 636
L.sakei_YP394689                 TFYISLPYEPID--SDGGDWDEI-------- 632
L.acidophilus_ZP04020787         TFYISLPYEPMT--EEDD-WDEI-------- 618
L.ultunensis_ZP04012109          TFYISLPYEPMT--EEDD-WDEV-------- 621
L.crispatus_ZP03996903           TFYISLPYEPMT--EEDD-WDEV-------- 617
L.helveticus_YP001576656         TFYISLPYETMT--EEDD-WDEV-------- 618
L.jensenii_ZP06338918            TFYISLPFEPMS--EEDD-WDEV-------- 620
L.jensenii_ZP04646123            TFYISLPFEPMS--EEDD-WDEV-------- 621
L.delbrueckii_ZP07092088         TFYIALPYEPMD--EEDE-WDEV-------- 635
L.gasseri_YP813915               TFYISLPYEAIS--EEGENWDEV-------- 621
L.johnsonii_NP964082             TFYISLPYEAIS--EEGENWDEV-------- 616
L.iners_ZP05743701               TFYISIPYEKMS--EEGDMWDEV-------- 612
E.casseliflavus_ZP05644942       TFYIMLPYEPYE--ED--WWV---------- 613
E.gallinarum_ZP05649732          TFYIMLPYEPYE--ED--WWE---------- 613
E.faecium_ZP03982596             TFYISLPYEPYE--EE--WWE---------- 611
E.faecalis_NP814923              TFYISLPYEPYE--ED--WWE---------- 609
Lc.lactis_YP808469               TFSFTLPYSSETAEYWDDAADDFE------- 475
Lc.lactis_YP001031763            TFSFTLPYSSETSEYWDDAADDFE------- 475
Lc.lactis_NP266552               TFSFTLPYSLEAADDWDDGTDEFEFEDNE-- 480
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