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CLUSTAL O(1.2.4) multiple sequence alignment


Dori_Gp41_Singleton          MSARLPLKLGSSD----------------------A-RGDDV---THWQRWA----RAYA  30
Sparky_Gp27_Singleton        MTARLPLKLGSSD----------------------A-RGDDV---THWQRWA----RAYA  30
Adjutor_Gp40_ClusterD        ----MELKVGSSD----------------------ANTDGEV---TRWQNWV----KRYA  27
Predator_Gp40_ClusterH       ------MGLPYKK----------------------GSNGPEI---KVWQDWA----YRYA  25
Nilo_Gp40_ClusterR           ----------------MRVNGVWVGWGV------GDHSAIDDTVRRAKAYMRAMYRSYA  37
Patience_Gp42_ClusterU       ----------------MKGPDGSYIGIGL------GDVSSEV---LKIKQFINRKFSRF-  34
Gaia_Gp34_ClusterX           ------------------------------------------------------------  0
Bricole_Gp38_ClusterM        ------------------MW----IGWQE------GMSGRPV---LAAKGELRAKFSYGK  29
TM4_Gp30_ClusterK            ------------------MAW----VGWQL------GMQGEQV---KVIQQKLIAKYQWVR  30
Courthouse_Gp48_ClusterJ     ----MPLRLGDRNES-VRQWRIKMNAWFGP--LYTRLHGPLP---MDTDEFGPRAKSWQE  50
Kumao_GP39_Singleton         ------------------MAW----DGWKE------GMAGPPV---LAAKRELKRKFSYAK  30
Cosmo_Gp52_ClusterV          ------------------MRVAGQWVGWGL------GDIDPKV---QDMKRFLKRKFSYAR  34
Ms6_LysB_ClusterF            ------------------MRIDGQYVGLGP------GDRSDEI---RKIKAFMRRKFSY-A  33
Corndog_Gp70_ClusterO        ------------------MRIGGEYVGLGL------GDASEEI---GRIRDFMRRKFRSYA  34
Bxz1_Gp238_ClusterC          -------------MR-VPPVTGEYVGLGL------GDSSEEI---RKIKEFMRKKFRSYA  37
MooMoo_Gp29_Singleton        ------------------MRIGGQYVGLGL------GDSSPEI---RNIKTFMRRKFASYA  34
D29_Gp12_ClusterA            ------------------------------------------------------------  0
LeBron-Gp26_ClusterL         --------------M-AKGLNGEWIGYGP------GDSGTQV---LAAREKLKAKFSY-G  35
MosMoris_Gp54_ClusterS       ----------MAKDPLTG-------AWIG---YGPGDVSPEV---QKVERRLLLAYP--K  35
32HC_Gp37_ClusterZ           ------------------M-------AWKQPQLTDPPMVSEEI---GKLNRRLLLAYA--A  31
BPs_Gp28_ClusterG            ------------------M-------AYQ-AP-RNVGDTHPLI---PAAKRKL----A--G  25
Giles_Gp32_ClusterQ          ------------------M-------AWKPTE-YQIGDRHPDI---ADAKERL-RRIA--A  29
Orion_Gp50_ClusterB          -------------MTQPT-------AWQPP--QNVGDVAVTV---AQAKAKL----K--V  29
Babsiella_Gp27_ClusterI      ---MTELRYGGAQPAEAM-------AWQKA--IREFAKSYAL---AADGGPL----K--I  39
Rubeelu_Gp27_ClusterN        ---MTELRIGSSGPL-VA-------AWQRA--MVDRFEAYAL---AADGGPL----R--V  38
Jebeks_Gp27_ClusterP         ---MTELRVGSSGPL-VA-------AWQQA--MVDRFEAYAL---AADGGPL----R--V  38
Cuke_Gp31_ClusterAC          ------------------------------------------------------------  0
Porky_Gp35_ClusterE          ------------------------------------------------------------  0
Bipper_Gp35_ClusterY         ------------------------------------------------------------  0


Dori_Gp41_Singleton          ESYAALMG-PVDGYYGNSDAEFTREMQRRLVAAGHAI------------AITGV-FDEAT  76
Sparky_Gp27_Singleton        ESYAALMG-PVDGYYGNSDAEFTREMQRRLVAAGHAV------------AITGV-FDEAT  76
Adjutor_Gp40_ClusterD        ASYSDIVG-PIDGYYGYSDADFTRELQRRLG-----L------------PITGV-FDDVT  68
Predator_Gp40_ClusterH       KSYADLIG-PKDAYFGNGEELFVKTMQGKLG-----V------------AQTGI-FGALE  66
Nilo_Gp40_ClusterP           GHLA------DTNEFDREMEAAVIEMQQRLVLQGRLE------L--G-TYVTGV-LDLPT  81
Patience_Gp42_ClusterU       -KLL------ETEIYDAAMEAAVRELQTIYKNNGT-L------T--D-PFIPGV-VNLAT  76
Gaia_Gp34_ClusterX           ------------------------------------------MSGLWPEI-R         9
Bricole_Gp38_ClusterM        N-------LDLTEHFGPDLTEALKTFQRN---------------KGG-LRTDGV-LDYAT  65
TM4_Gp30_ClusterK            DRYP---RLTASGVYDVNTQAAIVEFQFRAGLPVT----------------GI-ADYAT  69
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Courthouse_Gp48_ClusterJ      ------------------------EYERR-------T------NQP----VDGEVSDNDL  69
Kumao_GP39_Singleton          H-------LVENTFFDHDLTVALMTYQVAKNIELAKR------GEPL-LRTDGV-LDWYT  75
Cosmo_Gp52_ClusterV           ESLD------DSEVYDETMMRVVMQMQANYGD---------------LDITGV-MNYAT  71
Ms6_LysB_ClusterF             ATLA------DTEFYDEAMTAVVAEMQSRYNTAGQLR------D--G-LYIPGI-INAET  77
Corndog_Gp70_ClusterO         GNLPDTRNALGLPLFDEPMTVAVTEMQGRYLQSGELR------D--G-LFIFGI-INAET  84
Bxz1_Gp238_ClusterC           GHLA------DTPHYDEQMTAVVAEMQGRYNQDGKLA------T--G-KYTPGI-INAET  81
MooMoo_Gp29_Singleton         GHLA------DTELYDEQMVAVVTEMQARYNASGQLA------S--D-KYTPGI-INAET  78
D29_Gp12_ClusterA             ------------------------------------------------------------  0
LeBron-Gp26_ClusterL          KHLK------LTTLYDAELLPVLVEFQLRTNVQRALT------GKQL-LRVDGI-LDYAT  81
MosMoris_Gp54_ClusterS        NSHAVEHGVQIDDVFTNGTAAALRDLTEFMNNDPREHERLAKLNVRLPMRSDGI-ADLNV  94
32HC_37_ClusterZ              NSRAVEAGVQLHDVFDAATDRALRNIQVHLAKTE----------DPKYNREPGV-LTYDC  80
BPs_Gp28_ClusterG             NSYGKAIGDDRSDVYTEAFGAALIQYGKNVHDLVLAG----RRPGPDVNV-EGI-FDWAI  79
Giles_Gp32_ClusterQ           KLVAGRLDNDNTDVFSPVFADVLAEWKTAVHRDVLSG----RRQPPDVDPTSTV-IDWAT  84
Orion_Gp50_ClusterB           FSYGAAFKTETSNVYTAEFGTALRTFQQRRNAEIHEG----KKPGPVMNT-DGV-LDWAT  83
Babsiella_Gp27_ClusterI       DGWI-----------GDDDAKVAAEYRSRR-------------RLPPPPP-GVV-VTHEE  73
Rubeelu_Gp27_ClusterN         DAYF-----------GYDDAAVQREYERRT-------------GQP--Q--DGV-VSEAD  69
Jebeks_Gp27_ClusterP          DAYF-----------GYDDAAVQREYERRT-------------QQW--I--DGV-VSEGD  69
Cuke_31_ClusterAC             ------------------------------------------------------------  0
Porky_Gp35_ClusterE           ----------------------------------------------------M-TTYGE  6
Bipper_Gp35_ClusterY          ----------------------------------------------------M-ATWDS  6


Dori_Gp41_Singleton           AALVGYAGA------PPAEERRPIWIYTAPGSGAPWN------------------VGPSF  112
Sparky_Gp27_Singleton         AAIVGYAGG---AKPPAATERRKIWIYTAPGSGAPWN------------------IGPSF  115
Adjutor_Gp40_ClusterD         ALHPKVNYRWKGQGAGQPAARRKIWFYSNPGSGANEF------------------VGPSF  110
Predator_Gp40_ClusterH        AGLTGFKAGS-VVISPPVIERRKIWFYSNPGSGANEF------------------VGPSF  107
Nilo_Gp40_ClusterP            QIAMG-------FKKAPN--PVRPIIITVEGHLSSMY------------------VGP--  112
Patience_Gp42_ClusterU        KYAIG-------YLKK-D--VILPIHFSVEGHMSDMW------------------IGP--  106
Gaia_Gp34_ClusterX            AMLNG-------EF-----YIPAGTIITANGTGVPDG------------------SGPGF  39
Bricole_Gp38_ClusterM         QKALG-------VLEA-----LKPWVFTVAGTGAGWD------------------AGY--  93
TM4_Gp30_ClusterK             QVRLG-------AVAPAPPPRQRIMVLTFSGTSADMW------------------TGY--  102
Courthouse_Gp48_ClusterJ      RA-------------LNVPVPTKVVIFTVAGTGARWD------------------QTY--  96
Kumao_GP39_Singleton          QK-------------VLGLLDRKVVIFTVSGTGAVWS------------------QGY--  102
Cosmo_Gp52_ClusterV           QVRSG-------YLKVEK--PPLPTLYTVHGTGVSMW------------------DGP--  102
Ms6_LysB_ClusterF             KYVMG-------YLSRPV-IDTRPVLFTVCGTGVPWW------------------VGP--  109
Corndog_Gp70_ClusterO         KYVMG-------YLERPPGPDTRPLFITVCGTGVPWW------------------VGP--  117
Bxz1_Gp238_ClusterC           KYVMN-------YLERPAGPDNRPVLFTVCGTGVPWW------------------VGP--  114
MooMoo_Gp29_Singleton         KYVMG-------YLQRPPGPDTRGVLLTVCGTGVPWW------------------VGP--  111
D29_Gp12_ClusterA             --------------------MSKPWLFTVHGTGQPDP------------------LGPGL  22
LeBron-Gp26_ClusterL          QVALG-------IVAPPA--VVKPLLFTVHGTGQPVP------------------DGPGL  114
MosMoris_Gp54_ClusterS        RRAIG-------AYID----P-----------PAAV--------------------QSKY  112
32HC_37_ClusterZ              KVRLG-------VIVP----A-----------PAAP--------------------DKRF  98
BPs_Gp28_ClusterG             QRQME-------LT------A----------PPAPPAPPRDRALAYVWRGTGGII-GQDL  115
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Giles_Gp32_ClusterQ          KVQLG-------MIAR----A----------TPPAPAPPKARHLGIVFRGTGGII-GQDY  122
Orion_Gp50_ClusterB          KKQLG-------ILPE----Q---------TAPAPPPVPANRAAALVFRGTGGII-GQDY  122
Babsiella_Gp27_ClusterI      YAALV-------K--------------------TAPPPPKPRHLAIVFRGTGGVI-GQDY  105
Rubeelu_Gp27_ClusterN        LRALG-------L--------------------LDTPATKPRHLAIVFRGTGGAI-GQDY  101
Jebeks_Gp27_ClusterP         LRALG-------L--------------------LDTPATRPRHLAIVFRGTGGVI-GQDY  101
Cuke_31_ClusterAC            ---------------M----SDRIFFLWLPGTWEVDSLKAENPSATNFVGLGKWLVDDRF  41
Porky_Gp35_ClusterE          LKALR-------LGVK----YVRHTLFTVAGTWADMW--------------------SGY  35
Bipper_Gp35_ClusterY         ILDYL--------RGD----PCKVGYFGVPGTWSPWD--------------------AGY  34


Dori_Gp41_Singleton          ELGELCRKIL-----KLNHQPVG-YP--IGG----YLGLMGGDPALSYLDVIGAQAAEFA  160
Sparky_Gp27_Singleton        ELGELCRKIL-----KINHQPVG-YP--IGG----YLGLMGGDPALSYLDVIGAQAAEFA  163
Adjutor_Gp40_ClusterD        EVGEFCKNVL-----KINHQPVH-SA--IGG----YLGLMGGDPKFSYNDVIYDQYKSLE  158
Predator_Gp40_ClusterH       EVGEFCKNVL-----KINHQPVH-SA--IGG----YLGALGGDSKLSYNEVIFDQYKSIE  155
Nilo_Gp40_ClusterP           C-AYVASKL--ESEGVCWWQPIG-YD----------------NTSLPFRN--QTGISAVL  150
Patience_Gp42_ClusterU       A-AYVGEVL--RAENRALHFPTG-YD----------------NRALPFNN--KSGVEQLV  144
Gaia_Gp34_ClusterX           S-ADLARELDRRAEGMWVWRWIN-YP----------------AAVFPMRPSIGILRNNLK  81
Bricole_Gp38_ClusterM        P-AEVARAV----LDLYRWQGVN-YP----------------AKPFPMGSSVDAGIAELK  131
TM4_Gp30_ClusterK            P-ADVARALD---PSIFYWQPVC-YGPN--GI----------PAIFPMGSSAKSGEVEGL  145
Courthouse_Gp48_ClusterJ     P-YDLGRWQD---QNRVILQPIG-YP----------------AATFPMGPSVDKGEAELV  135
Kumao_GP39_Singleton         P-FDVAMRQD---QSKVIVQPIG-YP----------------AAVFPMEHSANEGERELV  141
Cosmo_Gp52_ClusterV          P-ADCARRL----LDKYRWQPVGNYP----------------ASAFPMWPSIQAGCLELN  141
Ms6_LysB_ClusterF            D-ADTARAV----EDQYLWQPIG-YP----------------AAPFPMGRSITAGITEAH  147
Corndog_Gp70_ClusterO        D-ADTARAC----EDKLFWQPIG-YP----------------AKNFPMGKSIAAGIDQCH  155
Bxz1_Gp238_ClusterC          D-AETARQV----EDLYRWQPVG-YP----------------AAPFPMGPSIEAGKAELR  152
MooMoo_Gp29_Singleton        D-ADTARAV----ENVYKWRPVG-YR----------------AAPFPMGASIAEGRAEAN  149
D29_Gp12_ClusterA            P-ADTARDV----LDIYRWQPIGNYP----------------AAAFPMWPSVEKGVAELI  61
LeBron-Gp26_ClusterL         P-ADTARNV----LDKWDWQPIGNYP----------------AEPFPMWPSILKGVAELR  153
MosMoris_Gp54_ClusterS       P-I---QGVF--------------HNTN---------AFLNPDPFHNFVQATNEGAAEAL  145
32HC_37_ClusterZ             V-Q---QGVG--------------FSTD---------AFLMGDPTHSYVDAVREGSAELL  131
BPs_Gp28_ClusterG            V-SLVCQGVA----DLVDEVNPP-WAATMGGIPVGV---AGGIGDPSMWSAVQATLAWTQ  166
Giles_Gp32_ClusterQ          V-SRVLQACA----DLVEEVHPA-FAATMGGIPVGT---AGGINDPSMAHAVALAFADAQ  173
Orion_Gp50_ClusterB          V-SQVCQQVG----PMVEEINPE-FPASMGGLPPGA------PNLPSARQAIDIGYRSGA  170
Babsiella_Gp27_ClusterI      V-SRVCQGAA----DLVEERNPE-WAASMGGLPPGA------PNSPSMNKAVQVAVASGA  153
Rubeelu_Gp27_ClusterN        V-SRVCQGAA----DLIEERNPE-FPASVGGLPPGA------PNSPSMNKAVQIGVAAGA  149
Jebeks_Gp27_ClusterP         V-SRVCQGAA----DLVEERNPE-WAASMGGLPPGA------PNSPSMNKAVQVAVASGA  149
Cuke_31_ClusterAC            P-DRLPLNIF---E-PIMLCPPD-YMASFGPIPAAGSSIFSAWNHLSYKESVLDAVEHSV  95
Porky_Gp35_ClusterE          P-ADVARLVD---EDLFRWQPVW-YPASFGPVGNP-------LG-RSYQESVQDGVKELI  82
Bipper_Gp35_ClusterY         Q-ADVGRLIN---SAWFYWQGVG-YVAAFGPVNGP-------ITNPSYAESVQEGVDETV  82
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G-X-S-X-G
Dori_Gp41_Singleton RLLRANPDVIEAMAARRRDRNARVDVEIWVSGYSQSADGFEDALEHLFGDGG-------- 212
Sparky_Gp27_Singleton RLLRINPDVIEAMAARRRDRNARVDVEIWVSGYSQSADGFEDALEHLFGDGG-------- 215
Adjutor_Gp40_ClusterD WLLDNNPDIKD----------PDVEFWFSGYSQKADGLEDALEILFGDGGFTIPKTGE 206
Predator_Gp40_ClusterH WLLDNNPDIND----------PDLELWFSGYSQKADGLEDALEILFGDGGFVIPQTGE 203
Nilo_Gp40_ClusterP NVLRQTVLLNG---NGQPTRPFPLGTPWGIEGFSQGAIIVNRILMLLRDTTD-------- 199
Patience_Gp42_ClusterU QRVGAAEFFI-----DGKVIKFPPGTPWTASAFSQGAMIWCDFYRQYLMPG--------- 190
Gaia_Gp34_ClusterX AMIRAT----------------PGRLVLSAYSQSAIAFAYVWRDDILNPN-------- 115
Bricole_Gp38_ClusterM KLLRERMD----------RYPAARFVLIGYSQGAIVTSMVWQNFI---K-------- 167
TM4_Gp30_ClusterK RLLDEK----------ARDFDYIVLIGYSQGALPASRLMRRIL---S-------- 179
Courthouse_Gp48_ClusterJ NQMRRHLD----------ANPSLNFILVGYSQGAIVTSRVLRRMM---S-------- 171
Kumao_GP39_Singleton AQMRRHLD----------ANPSYVFILIGYSQGAMVVSRVLRRMM---S-------- 177
Cosmo_Gp52_ClusterV RLIEST----------PGKFTFAGYSQGAMVTSIVYKYDLLDPM-------- 175
Ms6_LysB_ClusterF NQANR----------WRERIETHGTALAGYSQGAVVLSELWMNHIAPED-------- 186
Corndog_Gp70_ClusterO VQFNRADP-------GFMHRQRIERNGVVLGGYSQGAVVVSELWENNIKPAN-------- 200
Bxz1_Gp238_ClusterC AQINRMEP-------GFELRKQVERNGMVLAGYSQGAIVTSEVWEDDIRTSG-------- 197
MooMoo_Gp29_Singleton RII----------VEERDRIEKYGLALAGYSQGAIVTSELWEYDIKPTS-------- 188
D29_Gp12_ClusterA LQIELKLD----------ADPYADFAMAGYSQGAIVVGQVLKHHILPPT-------- 100
LeBron-Gp26_ClusterL VQIRKAFA----------ANPNRKIGFAGYSQGAVVVSLVMKYDFMAEG-------- 192
MosMoris_Gp54_ClusterS RLYSTM----------PGRDIVVLGYSMGGVTAQKFLN---------- 173
32HC_37_ClusterZ RLALPM----------VGVPKIGLAYSMGGDVLRAALE---------- 159
BPs_Gp28_ClusterG TDFIARHK----------VNPKIRVVIGGYSAGAIAAAMFRA---------- 198
Giles_Gp32_ClusterQ RIFLERFR----------ANPRIRVVIGGYSAGAVAAAMFRE---------- 205
Orion_Gp50_ClusterB ----AWIK----------ANPSRKFVLGGYSLGEIVVAKLLTALFSPG--------- 204
Babsiella_Gp27_ClusterI ----AEIR----------SGRSFVLGGYSAGAIVASR-LRAMLEPG--------- 184
Rubeelu_Gp27_ClusterN ----AEIR----------SGRSFVLGGYSAGAIVASR-LRAMLEPG--------- 180
Jebeks_Gp27_ClusterP ----AEIR----------SGRSFVLGGYSAGAIVASR-LRAMLEPG--------- 180
Cuke_31_ClusterAC DVILKL----------PTDRPIIIGGYSQGAEVAERL-KAEFLPG--------- 129
Porky_Gp35_ClusterE RLINA----------TPGTFALVGYSQGAEVVSRV-LLEILFG--------- 114
Bipper_Gp35_ClusterY RLILA----------RPGPIVLGGYSQGAEVVYWV-AREFLTG--------- 114
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Dori_Gp41_Singleton -----EFELIRD--RLNGIIQFGNPSKDK----------T------GIAR-KT 241
Sparky_Gp27_Singleton -----EFELIRD--RLNGVIQFGNPSKDK----------T------GIAR-KT 244
Adjutor_Gp40_ClusterD TVGPGKYRHLRP--RINGTIQFGNPSKQPGPTRVG---NR---PPGS------GISR-KK 251
Predator_Gp40_ClusterH KVGPGKYRHLRG--RINGVIQFGNPSKET----------T------GIAR-KQ 237
Nilo_Gp40_ClusterP ----PMLQQRYA--DLTRGLTFGDPYREKDVVAE--WVTDPPKPGTQ------GISD--V 243
Patience_Gp42_ClusterU ----KPLHWRLK--DLRAVICCGNPDREKGVCVD--WIPDKPGPDRQ------GIMDDEN 236
Gaia_Gp34_ClusterX ----GELHHRLD--DIEAIILYGDPVRTPGIAYGNEL-GGVAPPGEVNGHVSGGIAG-PN 167
Bricole_Gp38_ClusterM ----GS--DLEA--RIIGSITYGNPCRELHVANGNVA-EGIPVPEGR------G-IS-DF 210
TM4_Gp30_ClusterK ----GDLQRFKS--KLIAGVTFGNPMREK----GHTF-PGGADPGGH------G-LD-PQ 220

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Courthouse_Gp48_ClusterJ      ----GDLAHYYN--RCIAGVTFGNPMRER----GH-F-VGVNDPGGQ------G-LD-PK  211
Kumao_GP39_Singleton          ----GDLRQYFD--RCIAGVTFGNPLRER----GH-F-TGASDPGGQ------G-LD-PE  217
Cosmo_Gp52_ClusterV           ----GRLHHRLP--DFMGGVTWGNPMREMGKAWTDGV-GAVAGQNNG------G-IA-ED  220
Ms6_LysB_ClusterF             ----SGLRWMKP--HVRKAVTWGNPNRELGHVWADHGGSPMAPSNTQ------G-VS-SN  232
Corndog_Gp70_ClusterO         ----GSLHWAKD--YVVKAVTWGNPNREVGAVWPDYGGSPMASLTSQ------G-VS-ST  246
Bxz1_Gp238_ClusterC           ----PIVGWAKD--HVLKAVAWGNPNREQGKAYPDAG-APLAAADSA------G-IT-GR  242
MooMoo_Gp29_Singleton         ----GPLHWAKP--YVRKAVAWGNPMREIGKAWPDPG-APVSGMGRG------G-IT-QE  233
D29_Gp12_ClusterA             ----GRLHRFLH--RLKKVIFWGNPMRQKGFAHSDEWIHPVAAPDTL------G-IL-ED  146
LeBron-Gp26_ClusterL          ----GEFNALYKAGQVIAVVTWGNPMRERGVQHSDGT-KQVAPADTE------G-IL-ED  239
MosMoris_Gp54_ClusterS        ----RLPVEWRK--YVRALVTFGDPSMPAEGSLLG---ND---PG-E------GISK-AP  213
32HC_37_ClusterZ              ----KWPADRRG--EWSLFGVFGNPSKRPGPTLLG---ND---PGGQ------GISG-VW  200
BPs_Gp28_ClusterG             ----WLLENFPD--NYVCSFSFGDPTRPFGGGFFG---QP--APWGR------GIST-IS  240
Giles_Gp32_ClusterQ           ----WLLTNYPD--NYLCSFSFGDPTRPAGGAYFG---GV--AAPGR------GIST-WR  247
Orion_Gp50_ClusterB           ----GELAAFRD--NYVCSFHIGPPARPLGGAFYG---GT--AAPGV------GIAS-NR  246
Babsiella_Gp27_ClusterI       ----QPLAEYRE--NYVCGFALGNPSRPFGHTYYL---GA--IPNGR------GISD-FQ  226
Rubeelu_Gp27_ClusterN         ----QPLAAYRE--NYVCGFAFGNPCRPFGHTYYL---GA--IPNGR------GISD-FQ  222
Jebeks_Gp27_ClusterP          ----QPLAEYRE--NYVCGFALGNPSRPFGHTYYL---GA--IPNGR------GISD-FQ  222
Cuke_31_ClusterAC             ----GRLSSY----FLLAHYTFGNPGRPQGVTFPN---GN--TLPWG------GISN-LN  169
Porky_Gp35_ClusterE           -----SLRHRLK--DFIGGGCFGNPYRAKGVSYPG---SGLPTSGHG-------IAP-VN  156
Bipper_Gp35_ClusterY          ----GRLAHRRG--DLLLIVTFGNPCRAKGHGVNQ---AT--AHGWG-------ISR-K-  154
                                            * *

                                                        D
Dori_Gp41_Singleton           RPAWLL--------RLITNV----TTRG------DFYAEATD------------TIRPLF  271
Sparky_Gp27_Singleton         RPAWLL--------RLITNV----TTRG------DFYAEATD------------AIRPLF  274
Adjutor_Gp40_ClusterD         RPQWLT--------MMTWDIVTTSPGAP------DFYAACDD------------DIRPLF  285
Predator_Gp40_ClusterH        RPAWLR--------SLIRNV----TTKG------DFYAEAPD------------NIRPIF  267
Nilo_Gp40_ClusterP            RLTNTP--------SWWKVV----SRRG------DLYSENP-DN-------EVGLNRSAI  277
Patience_Gp42_ClusterU        RMVNTP--------WYWLEL----ARKG------DMYTDNESSG-------ERGLNKTAI  271
Gaia_Gp34_ClusterX            CLRPEECLHPVTGRRVILSV----ANPG------DLYASAPVGEVPWVEETEVGALETMI  217
Bricole_Gp38_ClusterM         RLRSTP--------SWWYDF----AHGANSRFGRDIYTDTP--------DDDAGEMMTAI  250
TM4_Gp30_ClusterK             CLVNTP--------DWWHDY----AAKG------DIYTVGSGSN-----DEKANADMTFI  257
Courthouse_Gp48_ClusterJ      PLVDTP--------SWWYDY----AARG------DIYSSGPGNN-----DRQAAEHMTSI  248
Kumao_GP39_Singleton          CLVDTP--------SWWHDY----AIPG------DIYTCGPGNY-----DLAALEHMRAI  254
Cosmo_Gp52_ClusterV           RLVGTP--------WNWRDY----AHKG------DLYTDCEFD------DEGE--YKRSV  254
Ms6_LysB_ClusterF             GMRNTP--------DWWRDY----AHQG------DLYACTEPG------DTQE--VRNAI  266
Corndog_Gp70_ClusterO         GMRDTP--------SWWRNY----AHAG------DLYAAAEPG------DSQQ--DKNAI  280
Bxz1_Gp238_ClusterC           LMTDTP--------DWWRNY----AHQG------DLYTATRPG------ESRE--DKVAI  276
MooMoo_Gp29_Singleton         LMVDTP--------EWWRNY----AHAG------DLYTDVADD------EAAE--NKRAI  267
D29_Gp12_ClusterA             RLENLEQY-----GFEVRDY----AHDG------DMYASIKED------DLHE--YEVAI  183
LeBron-Gp26_ClusterL          RLQGTP--------AMWREY----AHKG------DMYAACELT------GVQRGDNKRAI  275
MosMoris_Gp54_ClusterS        QPTWI--------RDRYWSY----SIDG------DWYPRARG-------------LLFLM  242
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32HC_37_ClusterZ          YPEWT--------TGRLYDF----TLPG------DMYPNSVG-------------LLPQI  229
BPs_Gp28_ClusterG         YGDP--------TDYRHCWL----THEG------DMYAQIPG--------GVVGDIMDDV  274
Giles_Gp32_ClusterQ       YGDI--------RDYRHCWL----AAPG------DMYTSVPD--------NAVGDIMDTA  281
Orion_Gp50_ClusterB       LATDI----YAQLGPRACYL----CDPE------DMYGSIPVPV-----EGGTGDIMETV  287
Babsiella_Gp27_ClusterI   LPRSC----C---TWDWCEL----VHPD------DMYANVPL--------GDAGDIMTAI  261
Rubeelu_Gp27_ClusterN     LPRSC----C---TWDWCEL----VHPD------DMYANVPL--------GDAGDIMTAI  257
Jebeks_Gp27_ClusterP      LPRSC----C---TWDWCEL----VHPD------DMYANVPL--------GDAGDIMTAI  257
Cuke_31_ClusterAC         IP--T----PQG--TFYRSY----AFYD------DMYANANP--------K---SYLFEF  200
Porky_Gp35_ClusterE       LAPDI----LPA--EMWEEW----WNEG------DLYAQNLD--------GKSGEIITSF  192
Bipper_Gp35_ClusterY      -PPLT----ELL--PIWLDY----ALPG------DMYCCADD--------D---TYLAIG  186
                                                           * *

Dori_Gp41_Singleton       YEWFIRAETELPFVVYSAQI-ILPALLNLVAPFLG------------------GGLANPA  312
Sparky_Gp27_Singleton     YEWFIRAETELPFVVYSAQI-ILPALLNLVAPFLA------------------GGLASPL  315
Adjutor_Gp40_ClusterD     YEWFIKADTELPFVVYTAQI-IIPALLNLLAPFL----------------GGFGGVTSPL  328
Predator_Gp40_ClusterH    YQVIVDSESELPFFVRVLRI-AVPILIKWAATILPIFVP----L---AAAGGFGPMVQ-I  318
Nilo_Gp40_ClusterP        YKIAAENSW-----------------------------------------------------  286
Patience_Gp42_ClusterU    AKIITQNKW-----------------------------------------------------  280
Gaia_Gp34_ClusterX        FEAVMD--------------------------------------------------------  223
Bricole_Gp38_ClusterM     YRLVQDLKNI----------------------------------------------------  260
TM4_Gp30_ClusterK         YQLVQGDILGMMFGTGNPLD-----------IL-------------GLLGGLGG-----  287
Courthouse_Gp48_ClusterJ  YLAVMGKFIL----------------------------------------------------  258
Kumao_GP39_Singleton      YLAVQGHFLT----------------------------------------------------  264
Cosmo_Gp52_ClusterV       CKIVMG-HNV----------------------------------------------------  263
Ms6_LysB_ClusterF         WQIVRD-LDL----------------------------------------------------  275
Corndog_Gp70_ClusterO     WQIIRD-LNF----------------------------------------------------  289
Bxz1_Gp238_ClusterC       WQIVRG-TNI----------------------------------------------------  285
MooMoo_Gp29_Singleton     WAIVRG-TKV----------------------------------------------------  276
D29_Gp12_ClusterA         GRIVMKASGF----------------------------------------------------  193
LeBron-Gp26_ClusterL      CKIVMW-HEV----------------------------------------------------  284
MosMoris_Gp54_ClusterS    YDILTRAALTMEFAV--YLFTQLPSRLFQELIGME--------------DSDDP----LA  282
32HC_37_ClusterZ          YQILVRMEASVEFAL--YLFNLLTSSFGPALLGLA--------------AGGLGPATAGF  273
BPs_Gp28_ClusterG         YEEVTRFAFRDILQVATRMVSAIPTI----AGKAGIPLP--------AVF----------  312
Giles_Gp32_ClusterQ       YDIVTQVELSDFLGTAFGVARQIPII----MEEAGIGLP--------SVF----------  319
Orion_Gp50_ClusterB       YDMVTTLALNDFLNTAAAMLPHILEI----AQDAGIFGL--------LGLGGVGPAT---  332
Babsiella_Gp27_ClusterI   YQAVVDVELSDPLGTLRAIIRAIPTV----LAEAGVSVP--------L------------  297
Rubeelu_Gp27_ClusterN     YQAVVEVELSDPLGTLRAIVASIPRV----LAEAGIKLP--------L------------  293
Jebeks_Gp27_ClusterP      YQAVVDVELSDPLGTLRAIIRAIPTV----LAEAGVSVP--------L------------  293
Cuke_31_ClusterAC         YDGLTDLQFHDPFKAVKDVVGVVTKSDLMILAGAQPTNPFWVVTHIPQFIDISTKAVN--  258
Porky_Gp35_ClusterE       YDILTKLQFHDMLGLAVNMFKALSNDKGIIAQVMRVLAV-----PLPGVIDAG-RAAVYA  246
Bipper_Gp35_ClusterY      YAALTKLQLHDPWQLVQAMLALIQSDEF-ADALAELLDP-----LFPGLATTLGELTGMD  240
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Dori_Gp41_Singleton          ALPILAAVTGAGSGLLGSVIGGVL----GAK-------------------------D-  340
Sparky_Gp27_Singleton        AAPVLAGVTGAGGGLLNTVIGGVL----GAK-------------------------D-  343
Adjutor_Gp40_ClusterD        AGGILASATGLPMNLLHGLLSGVA----AAD-------------------------N-  356
Predator_Gp40_ClusterH       ALSTLSGLQGLGSNPLFGSLMGQA----GND-----------------------GNA-  348
Nilo_Gp40_ClusterP           ---------------------------------------------------AGGPA-  291
Patience_Gp42_ClusterU       ---------------------------------------------------SGGPA-  285
Gaia_Gp34_ClusterX           ---------------------------------------------------FNGRDF  229
Bricole_Gp38_ClusterM        ---------------------------------------------------IVGTD-  265
TM4_Gp30_ClusterK            ---------GLLGGLGGGLLGGGKGGLQLPSGLVLPGVQGGAL----------TDHQR-  326
Courthouse_Gp48_ClusterJ     ---------------------------------------------------GND-  261
Kumao_GP39_Singleton         ---------------------------------------------------GRD-  267
Cosmo_Gp52_ClusterV          ---------------------------------------------------FGGPD-  268
Ms6_LysB_ClusterF            ---------------------------------------------------FTGPD-  280
Corndog_Gp70_ClusterO        ---------------------------------------------------FTGTD-  294
Bxz1_Gp238_ClusterC          ---------------------------------------------------LSGPD-  290
MooMoo_Gp29_Singleton        ---------------------------------------------------FSGPD-  281
D29_Gp12_ClusterA            ---------------------------------------------------IGGRD-  198
LeBron-Gp26_ClusterL         ---------------------------------------------------LKGEN-  289
MosMoris_Gp54_ClusterS       GALAPL----------------------GDLL---------MAGRGIL----------  299
32HC_37_ClusterZ             GALSSI-----------------RSMVTIGGLGM------APATSAGDV----------  299
BPs_Gp28_ClusterG            ------------------------------------GALAGGPAGLTTFAIPLLL-----  331
Giles_Gp32_ClusterQ          ------------------------------------KALAGGPAGLAGLGVPLIM-----  338
Orion_Gp50_ClusterB          ----------GGGGLLGGLLGGGLGGLLGGG-MANPAALLANPLAAIPLLLPLFT-----  376
Babsiella_Gp27_ClusterI      --------------------------------LAHAGLSAGNPVEMAGVALPVLT-----  320
Rubeelu_Gp27_ClusterN        --------------------------------FAPPAASA-EPAAAAAMLLPALT-----  315
Jebeks_Gp27_ClusterP         --------------------------------LAHAGLSAGNPVEMAGVALPVLT-----  316
Cuke_31_ClusterAC            ---------------------------------------------------------  258
Porky_Gp35_ClusterE          GTFAVQGTRPHITLAETGRVARAVWHLNRIGAKTLARAS--------------------  285
Bipper_Gp35_ClusterY         GAALLANRKPVGGGVLGGLMSGQLLTTTPAGGNLLGGLIGAGTGVLGGLLDGVIPGGLP-  299

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Dori_Gp41_Singleton          -KPNPELIELLSVR---GVLTNLGELIAL-------LAALP-GLQAHGEYHLP-KPEFNG  387
Sparky_Gp27_Singleton        -KPNPELIELLSVR---GVLTNIPQLVAL-------LAALP-GLQSHGEYHLP-KPEFNG  390
Adjutor_Gp40_ClusterD        -APNPKLIELLSVR---GVLTNIPQLIKL-------LTNIS-GVQTHGEYHLP-KPEFNG  403
Predator_Gp40_ClusterH       -EEDRKMIELLSPT---GVLTNIPGLIQL-------IAALP-GLQAHGEYHLP-KAEFNG  395
Nilo_Gp40_ClusterP           -GLLQRIGDFLMD-----PLDGTIDIGLAIIGGVMF-MGN---MEPHGGYDLN--PC---  336
Patience_Gp42_ClusterU       -GLLARVTDLLVN-----PIDDVIPITLALYDAIRFGAGG---IRAHGGYDME--PA---  331
Gaia_Gp34_ClusterX           LAFAKEIAELFIK-----PLSQVLPLVQAIWNGLTFLGQGS--SAPHWTYNVM--PA---  277
Bricole_Gp38_ClusterM        -SLIEQVGEMFQR-----PITEVGAAMWAIFLGGQFVATRPYPTMPHINYDIN--PAVAI  317
TM4_Gp30_ClusterK            -GLVEAVLALLAN-----PFAEVPAAVKAIVSGVGFIATNP-PTAPHIEYHIR--EAAPG  377
Courthouse_Gp48_ClusterJ     -ALVSQVIELFTN-----PFAEVPAVVKAIASGIGFVTSNP-PTAAHIEYHIR--ECVPG  312
Kumao_GP39_Singleton         -NLGEQVLEVLMN-----PFAEVPAVVKAIVSGLGFVTANP-PTAPHIEYHIR--ECFPG  318
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Cosmo_Gp52_ClusterV          -SILRQVIELGLD-----PFGEAIPMIKAISDAGMFFINR---TTPHINYNVG--PA---  314
Ms6_LysB_ClusterF            -SLLAQVIELAQA-----PLPETIAITRAILDAGMFFAKR---TGPHVDYNPQ--PA---  326
Corndog_Gp70_ClusterO        -SLLAQAIELSQM-----PIPRTIAAFKALIDAGMFFAKG---TGPHVDYGIG--PA---  340
Bxz1_Gp238_ClusterC          -SLLRQFLEIAEA-----PVPNAIAAFQAFMDAGLFFVKG---TRPHTNYHIG--AA---  336
MooMoo_Gp29_Singleton        -SILAQVLEVMGIRQDAGMVMEVMAIFKAIMDAGLFFLKG---TGPHVNYNIQ--PA---  332
D29_Gp12_ClusterA            -SVVAQLIELGQR-----PITEGIALAGAIIDALTFFARSRMGDKWPHLYNRY--PA---  247
LeBron-Gp26_ClusterL         -NILAQIAELLQQ-----PVLHIIPLFQSIVDAGMFFTAG---VDGPHNYAIQ--PA---  335
MosMoris_Gp54_ClusterS       --------------NPAQMFAILPDLFNLLFDAIKFV-----ATNAHGKYGDPGYALWGG  340
32HC_37_ClusterZ             --------------NLMAMITNIPAIIQSIAAALKFV-----QTNAHYHYHDQPQPYWRG  340
BPs_Gp28_ClusterG            -SSIRGFIPG----GNADELTGTAAAAKAATIGLQFLFA---GTAPHIRYHID--EAWPG  381
Giles_Gp32_ClusterQ          -GLLGGLIGG----QK--NPTGVAAAAQAAVIALQFVTSNP-PTAAHIQYEFR--EVWPG  388
Orion_Gp50_ClusterB          -SALPGLIAGVGGPGTGGALTGPAAAAQAAILGMKFLFA---GTRPHIEYHIR--EVWPG  430
Babsiella_Gp27_ClusterI      -STLAGLIGG----AAGGPLTGPAAAVQAAIIAIRFAAS---GTAPHINYHAW--EVWPG  370
Rubeelu_Gp27_ClusterN        -ATLPGLTGA----D-PARPSGPAAAVQAAIIALRFAAS---GTAPHINYHAW--EVWPG  364
Jebeks_Gp27_ClusterP         -STLGGLVGG----AVGGQLTGPAAAVQAAIVALKFAVA---GTAPHINYHAW--EVWPG  366
Cuke_31_ClusterAC            ----------------------------SLDALARFA-----SSGAHGHYGDW--EIIPG  283
Porky_Gp35_ClusterE          ------------------------------------------------------------  285
Bipper_Gp35_ClusterY         -PIVGGLLGGGS--GPGGTPTGMYKLGKTFAALLNFA-----TTNDHGHYHDT--PAFAG  349


Dori_Gp41_Singleton          -RTGIQVAYDVVASFRR---PPIASP-------------------     409
Sparky_Gp27_Singleton        -RTGIQVGYDVVAAFRR---------------------------     406
Adjutor_Gp40_ClusterD        -RSGIQVGCDIVAGFRR---------------------------     419
Predator_Gp40_ClusterH       -RTGIQVGCDIVAAFRR---------------------------     411
Nilo_Gp40_ClusterP           --------VEYMRGVGTRRVA-----------------------     349
Patience_Gp42_ClusterU       --------VQFCRERLAA-------------------------     341
Gaia_Gp34_ClusterX           --------ADYLIELGANIRERGVA--------------------     294
Bricole_Gp38_ClusterM        -LRRIAA-------------------------------------     323
TM4_Gp30_ClusterK            -VTYFQHAIDYLRQVGASVAARAA--------------------     400
Courthouse_Gp48_ClusterJ     -VTYFDHAMGYVRQVISANKRIA----------------------     334
Kumao_GP39_Singleton         -VTHFEHAVDYVRRAVSAGMRIE----------------------     340
Cosmo_Gp52_ClusterV          --------VDFLAGL-----------------------------     321
Ms6_LysB_ClusterF            --------IDYLRT-----------------------------     332
Corndog_Gp70_ClusterO        --------IEYLRS-----------------------------     346
Bxz1_Gp238_ClusterC          --------VDYLRS-----------------------------     342
MooMoo_Gp29_Singleton        --------IEYLRAT----------------------------     339
D29_Gp12_ClusterA            --------VEFLRQI----------------------------     254
LeBron-Gp26_ClusterL         --------IDYLRSVV---------------------------     343
MosMoris_Gp54_ClusterS       -MTAVDHAAATIRERVPNGATLFLLPGTWSMWNQLFPFDTAVRLQ     384
32HC_37_ClusterZ             -LTGVDCAAQVISESVE-RATVFTVPGTVSHWNDGPPAWTAWKLP     383
BPs_Gp28_ClusterG            GPTFLDLARQHVRDWTSR--PAA----------------------     402
Giles_Gp32_ClusterQ          -QTYLGLAIQHVRDWAGR--TPAVTA-------------------     411
Orion_Gp50_ClusterB          -QTYIGLAVQHVRDWVGR--ELPA---------------------     451
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Babsiella_Gp27_ClusterI       -QTYLGLAVQHVRDWAQR--VPVRA--------------------     392
Rubeelu_Gp27_ClusterN         -QTYLGLAIQHVRDWASR--TPVRN--------------------     386
Jebeks_Gp27_ClusterP          -QTYLGLAIQHVRDWASR--TPVRA--------------------     388
Cuke_31_ClusterAC             -FTPIFHCIRSAKYAAKG--IGYAVPGI-----------------     308
Porky_Gp35_ClusterE           ------------------------------------------     285
Bipper_Gp35_ClusterY          -TNAVAHAVGEVNRLAA---------------------------     365
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Figure S2. Alignment of LysB proteins. The conserved pentapeptide (G/A-X-S-X-G) is colored pink. The conserved amino acids candidates to be part of the catalytic triad, Ser, Asp and His are highlighted in pink, light blue or yellow backgrounds respectively. The already identified catalytic triad of LysB D29 Ser82, Asp166 and His240 are colored red. The dashed blue lines represent the absent N-terminus region. Numbers refer to the amino acid positions. A representative of each cluster, for which a *lysB* gene was identified, was selected from the Actinobacteriophage database (www.phagesdb.or). Accession numbers are indicated in Table S1.