

Figure S1. Multiple sequence alignment of QAPRTase residues from 230 organisms. Residue numbering at top is from the mature *S. typhimurium* protein sequence. Alignment was obtained as described in *Materials and Methods*. Fully conserved residues are denoted with an asterisk: (1) *Salmonella typhimurium* LT2, (2) *Escherichia coli* K-12, (3) *Mycobacterium tuberculosis* H37Rv, (4) *Mycobacterium leprae*, (5) *Mycobacterium avium paratuberculosis*, (6) *Mycobacterium* sp. MCS, (7) *Mycobacterium smegmatis*, (8) *Mycobacterium vanbaalenii*, (9) *Homo sapiens*, (10) *Yersinia pestis*, (11) *Mus musculus*, (12) *Canis familiaris*, (13) *Xenopus laevis*, (14) *Arabidopsis thaliana*, (15) *Oryza sativa japonica*, (16) *Cyanidioschyzon merolae*, (17) *Saccharomyces cerevisiae*, (18) *Ashbya gossypii*, (19) *Candida albicans*, (20) *Cryptococcus neoformans*, (21) *Dictyostelium discoideum*, (22) *Shigella flexneri*, (23) *Erwinia carotovora*, (24) *Photobacterium luminescens*, (25) *Wigglesworthia glossinidia*, (26) *Sodalis glossinidius*, (27) *Xylella fastidiosa*, (28) *Xanthomonas campestris* pv. *Campestris*, (29) *Xanthomonas oryzae*, (30) *Vibrio cholerae*, (31) *Vibrio vulnificus* CMCP6, (32) *Pseudomonas aeruginosa*, (33) *Pseudomonas putida*, (34) *Pseudomonas syringae* pv. *Tomato*, (35) *Psychrobacter arcticum*, (36) *Acinetobacter* sp. ADP1, (37) *Shewanella denitrificans*, (38) *Shewanella frigidimarina*, (39) *Shewanella amazonensis*, (40) *Shewanella baltica*, (41) *Shewanella loihica*, (42) *Idiomarina loihiensis*, (43) *Colwellia psychrerythraea*, (44) *Pseudoalteromonas haloplanktis*, (45) *Pseudoalteromonas atlantica*, (46) *Saccharophagus degradans*, (47) *Psychromonas ingrahamii*, (48) *Marinobacter aquaeolei*, (49) *Coxiella burnetii*, (50) *Legionella pneumophila*, (51) *Methylococcus capsulatus*, (52) *Francisella tularensis*, (53) *Nitrosococcus oceani*, (54) *Alkalilimnicola ehrlichei*, (55) *Halorhodospira halophila*, (56) *Hahella chejuensis*, (57) *Chromohalobacter salexigenus*, (58) *Alcanivorax borkumensis*, (59) *Aeromonas hydrophila*, (60) *Baumannia cicadellinicola*, (61) *Neisseria meningitidis*, (62) *Chromobacterium violaceum*, (63) *Ralstonia solanacearum*, (64) *Ralstonia eutropha* JMP134 : Reut_A2736, (65) *Ralstonia eutropha* JMP134 : Reut_B3748, (66) *Burkholderia mallei*, (67) *Burkholderia xenovorans*, (68) *Burkholderia* sp. 383, (69) *Bordetella pertussis*, (70) *Rhodospirillum rubrum*, (71) *Polaromonas* sp. JS666, (72) *Polaromonas naphthalenivorans*: Pnap_0937 (73) *Polaromonas naphthalenivorans*: Pnap_4632, (74) *Acidovorax avenae*, (75) *Acidovorax* sp. JS42, (76) *Methylobium petroleiphilum*, (77) *Nitrosomonas europaea*, (78) *Nitrospira multififormis*, (79) *Azoarcus* sp. BH72, (80) *Dechloromonas aromatica*, (81) *Thiobacillus denitrificans*, (82) *Methylobacillus flagellatus*, (83) *Helicobacter pylori*, (84) *Helicobacter hepaticus*, (85) *Wolinella succinogenes*, (86) *Thiomicrospira denitrificans*, (87) *Thiomicrospira crunogena*, (88) *Campylobacter fetus*, (89) *Geobacter sulfurreducens*, (90) *Geobacter metallireducens*, (91) *Pelobacter carbinolicus*, (92) *Pelobacter propionicus*, (93) *Desulfovibrio vulgaris*, (94) *Desulfovibrio desulfuricans*, (95) *Bdellovibrio bacteriovorus*, (96) *Desulfotalea psychrophila*, (97) *Anaeromyxobacter dehalogenans*, (98) *Myxococcus xanthus*, (99) *Syntrophus aciditrophicus*, (100) *Syntrophobacter fumaroxidans*, (101) *Anaplasma marginale*, (102) *Anaplasma phagocytophilum*, (103) *Ehrlichia ruminantium* Welgevonden, (104) *Ehrlichia canis*, (105) *Neorickettsia sennetsu*, (106) *Candidatus Pelagibacter ubique*, (107) *Candidatus Ruthia magnifica*, (108) *Mesorhizobium loti*: mll5833, (109) *Mesorhizobium loti*: mll6272, (110) *Mesorhizobium loti*: mll9102, (111) *Mesorhizobium* sp. BNC1, (112) *Sinorhizobium meliloti*, (113) *Agrobacterium tumefaciens*, (114) *Rhizobium etli*, (115) *Bradyrhizobium japonicum*, (116) *Rhodopseudomonas palustris* CGA009, (117) *Rhodopseudomonas palustris* BisB18, (118) *Rhodopseudomonas palustris* BisB5, (119) *Rhodopseudomonas palustris* BisA53, (120) *Rhodopseudomonas palustris* BisA53, (121) *Nitrobacter hamburgensis*, (122) *Silicibacter pomeroyi*, (123) *Silicibacter* sp. TM1040, (124) *Rhodobacter sphaeroides* ATCC 17029, (125) *Roseobacter denitrificans* (126) *Paracoccus denitrificans*, (127) *Maricaulis maris*, (128) *Hyphomonas neptunium*, (129) *Zymomonas mobilis*, (130) *Novosphingobium aromaticivorans*, (131) *Sphingopyxis alaskensis*, (132) *Erythrobacter litoralis*, (133) *Granulobacter bethesdensis*, (134) *Rhodospirillum rubrum*, (135) *Magnetospirillum magneticum*: amb2953, (136) *Magnetospirillum magneticum*: amb3885, (137) *Magnetococcus* sp. MC-1, (138) *Acidobacteria bacterium*, (139) *Solibacter usitatus*, (140) *Bacillus subtilis*, (141) *Bacillus halodurans*, (142) *Bacillus anthracis* Ames, (143) *Bacillus licheniformis* ATCC 14580, (144) *Bacillus clausii*, (145) *Geobacillus kaustophilus*, (146) *Listeria monocytogenes*, (147) *Streptococcus pneumoniae*, (148) *Clostridium acetobutylicum*, (149) *Clostridium perfringens* 13, (150)

Clostridium novyi, (151) *Clostridium thermocellum*, (152) *Carboxydotherrmus hydrogenoformans*, (153) *Syntrophomonas wolfei*, (154) *Corynebacterium glutamicum*, (155) *Corynebacterium efficiens*, (156) *Corynebacterium diphtheriae*, (157) *Corynebacterium jeikeium*, (158) *Nocardia farcinica*, (159) *Rhodococcus* sp. RHA1, (160) *Streptomyces avermitilis*, (161) *Leifsonia xyli xyli* CTCB07, (162) *Arthrobacter* sp. FB24, (163) *Arthrobacter aurescens*, (164) *Nocardioides* sp. JS614, (165) *Thermobifida fusca*, (166) *Frankia* sp. CcI3, (167) *Frankia alni*, (168) *Acidothermus cellulolyticus*, (169) *Bifidobacterium longum*, (170) *Rubrobacter xylanophilus*, (171) *Fusobacterium nucleatum*, (172) *Rhodopirellula baltica*, (173) *Leptospira interrogans serovar lai*, (174) *Synechocystis* sp. PCC6803, (175) *Synechococcus* sp. WH8102, (176) *Synechococcus elongatus* PCC6301, (177) *Synechococcus* sp. CC9902, (178) *Synechococcus* sp. CC9311, (179) *Cyanobacteria* Yellowstone A-Prime, (180) *Cyanobacteria* Yellowstone B-Prime, (181) *Thermosynechococcus elongates*, (182) *Gloeobacter violaceus*, (183) *Anabaena variabilis*, (184) *Prochlorococcus marinus* SS120, (185) *Prochlorococcus marinus* MED4, (186) *Prochlorococcus marinus* MIT9313, (187) *Prochlorococcus marinus* NATL2A, (188) *Prochlorococcus marinus* MIT9312, (189) *Prochlorococcus marinus* MIT 9515, (190) *Trichodesmium erythraeum*, (191) *Bacteroides fragilis*, (192) *Porphyromonas gingivalis*, (193) *Salinibacter rubber*, (194) *Cytophaga hutchinsonii*, (195) *Gramella forsetii*, (196) *Chlorobium tepidum*, (197) *Chlorobium chlorochromatii*, (198) *Chlorobium phaeobacteroides*: Cpha266_0455, (199) *Chlorobium phaeobacteroides*: Cpha266_2293, (200) *Pelodictyon luteolum*, (201) *Dehalococcoides ethenogenes*, (202) *Deinococcus geothermalis*, (203) *Thermus thermophilus* HB27, (204) *Aquifex aeolicus*, (205) *Thermotoga maritime*, (206) *Methanococcus maripaludis*, (207) *Methanosarcina acetivorans*, (208) *Methanosarcina barkeri*: Mbar_A1304, (209) *Methanosarcina barkeri*: Mbar_A1867, (210) *Methanosarcina mazei*, (211) *Methanococcoides burtonii*: Mbur_0259, (212) *Methanococcoides burtonii*: Mbur_1682, (213) *Methanosaeta thermophila*, (214) *Methanospirillum hungatei*, (215) *Methanoculleus marisnigri*, (216) *Methanosphaera stadtmanae*, (217) *Methanopyrus kandleri*, (218) *Halobacterium* sp. NRC-1, (219) *Haloarcula marismortui*, (220) *Natronomonas pharaonis*, (221) *Pyrococcus horikoshii*, (222) *Pyrococcus abyssi*, (223) *Pyrococcus furiosus*, (224) *Thermococcus kodakaraensis*, (225) *Hyperthermus butylicus*, (226) *Sulfolobus solfataricus*, (227) *Sulfolobus tokodaii*, (228) *Sulfolobus acidocaldarius*, (229) *Pyrobaculum aerophilum*, (230) *Pyrobaculum islandicum*

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1 -----PP RRYNPDDRRD
2 -----MPP RRYNPDIRRD
3 -----M
4 -----MI
5 -----
6 -----MLLS
7 -----MLMM
8 -----M
9 -----MDA EGL
10 -----MPP RCYNSNSRRA
11 -----MDPEGL
12 -----MDPKGL
13 -----MGC RDF
14 MISVSRFLSP -----QFYA IPRSFVKMSA S-----AT QTAGEVSMGI
15 MPAAAAAAP PNPVNLQLAP RLRGLVSFPS SYSSSPFSN RLRRLRPRAA SMSAEARVPV
16 -----MNSKEKQLER
17 -----MP--VY
18 -----MP--EF
19 -----MAP--EY
20 -----MS ETDLKPQNL
21 -----MEI
22 -----MPP RRYNPDIRD
23 -----MST RRYSQEQRQK
24 -----MTK QNCNTDQRR
25 -----MINFSKK
26 -----MST RRYNVERRRA
27 -----M
28 -----MTTT
29 -----MSLPVHTD
30 -----MK ETHNSQDRLA
31 -----MK NTHNSQERLD
32 -----MPN
33 -----MPN
34 -----MPN
35 -----MTVKKR
36 -----MDYILDVIMS
37 -----
38 -----
39 -----
40 -----
41 -----
42 -----
43 -----MLS
44 -----
45 -----
46 -----MRPSAK FILVISKPMN
47 -----
48 -----MIS
49 -----
50 -----
51 -----
52 -----MADVMLNTD
53 -----
54 -----MCPTNV
55 -----M
56 -----
57 -----MHY
58 -----MTIAN---
59 -----
60 -----MLP NNQN-NVHRQ
61 -----MPSEN
62 -----M
63 -----MTATQMTTSA AQATFDS---
64 -----MS VNSVFDS---
65 -----
66 -----MTIDA VSPLFADISR
67 -----M GAVERSQVEA VSPLFAEIQ
68 -----MTNSA VSPLFSSVRE
69 -----M SINIGQAAPL AIDAAPTLRT
70 -----MLSAMTSY FD-----
71 -----MKKS FD-----
72 -----MKKS FV-----
73 -----
74 -----MTNL FQPAAVP---
75 -----M QKCGESMRCG YARPMTRDL
76 -----MLTFET---
77 -----
78 -----MFY
79 -----M
80 -----MTIEFDY---
81 -----
82 -----MNPISQQT

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166 -----MSG S-----APGSVC GPGSAGVPGG RLSPATRSAL
167 -----MSE TDGHGWTGDH GWTGDHGWTD GHGWIEVHSG RLSPATRSAL
168 -----MPA P-----V-----RLPADIVQRL
169 -----
170 -----MQORA
171 -----MNLR
172 -----M KPAMDYRPVQ
173 -----MWLSKDKTFF CSQMKRAYTH
174 -----MMRILVTNP APMTICLPPWI
175 -----MSGMDWQSSA
176 -----MFAIVP----MLPPWI
177 -----MDWQAPA
178 -----MARADLSITP
179 -----
180 -----
181 -----MNPRVSA--YLPPWS
182 -----MLTNRYA--LPHPL
183 -----MSKAG--VLPPWL
184 -----MNIITPN
185 -----MDLYSPN
186 -----MFSMSVSSPS
187 -----MDLRSPK
188 -----MDLNTPI
189 -----MDFYSPN
190 -----MKG--VIPPKI
191 -----
192 -----
193 -----MLSL
194 -----M ITEYLFYII HY-----FCLM
195 -----M AVMAEKRTNH
196 -----MNHK
197 -----MNK
198 -----MKMKNQ
199 -----
200 -----
201 -----
202 -----
203 -----MGGV
204 -----MNEI
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13      23      33      45      52
1 ALLERINLDI PAAVAQALRE DLG-----GEVDAGNDI TA---QLLPA DTQAHATVIT
2 ELLERINLDI PGAVAQALRE DLG-----GTVDANNDI TA---KLLPE NSRSHATVIT
3 GLSDWELAAA RAAIARGLDE DLRYGP----DV-----TTL--ATVPA SATTASLVT
4 MLSDCEFDAE RDTIRRALHE DLRYGL----DI-----TTQ--ATVPA GTVVIGSMVP
5 MISDCELTAA REIIRRLVE DLRYGP----DV-----TTL--ATVPA EAVATASMVP
6 QLSETEIAEA RAVVARGLEE DLRYGP----DV-----TTQ--ATVPA DAATTASMRT
7 KLSDAELTAA KAAVARAVEE DLAYGP----DV-----TTM--ATVDA AATTTASVVS
8 TLTEDELGEA RAVIARALDE DLRYGP----DV-----TTL--ATVAA DAHTTAAVVS
9 ALLLPPVT-L AALVDSWLRE DCPG-----LNY AALVSG----AGPSQAALWA
10 ELLERIQSDI PATVAQALSE DLG-----GEVNADRDL TA---QLLPA DKQATATIT
11 QLLLPPPT-L AALANSWLQE DCPG-----LNF ASLVTG----SAPSQAVLWA
12 ELLLPPPT-L AALADSWLRE DCPG-----LNH AALVSG----AAPSQAVLWA
13 TLLPRPR-L QQFARDWLAE DAPW-----LDI AGWAASRRNP GGQEEAVLLC
14 KPPSHPTYDL KAVIKLALAE DAGHT-----GDV TCM--ATIPF DMEVEAYFLA

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15	APPAHPTYDL	KAVINLALSE	DAGDR-----	-----GDV	SCL--ATIPS	DVKAEATFIA
16	ARVAPLPLLL	NAHIERWLE	DAPS-----	-----FDF	SGSLVD----	LRPASGTLWQ
17	EHLLEPVNGAW	RQDVTNWLSE	DVPS-----	-----FDF	GGYVVG----	SDLKEANLYC
18	KNLLPANGAW	KHDITNWLQE	DVPA-----	-----FDY	GGYVVG----	SATKTATLLC
19	ANLLPVSGNW	KQKITDYLTE	DVPS-----	-----FDF	GGFVVG----	NTPETGSLYM
20	AHLLPPS--W	SAEVQRWFAE	DTPS-----	-----FDW	AGFVVG----	EEEQEAILWG
21	SQLLPKFK-I	EKIIKEWLEE	DIPS-----	-----FDY	GGCVVG----	SDEKVAHLLG
22	ELLERINLDI	PGAVAQALRE	DLG-----	-GTVDANNDI	TA---KLLPE	NSRSBATVIT
23	TLARIAQDI	PTSVDLALRE	DLG-----	-GIVDANQDI	TA---LLPD	NEIVSARIIT
24	VLMEHLQNDI	PASVTLALKE	DLG-----	-GNTNFTADI	TG---QLIPA	DKQATAVIT
25	KIIKQIKKDI	NNIVKSSLEE	DLGKSIN---	-----INFDI	TSK--IFKEN	KLIK-SNIYT
26	ELLARIQQDI	PPSVSAALKE	DLG-----	-GGTDAQADI	TA---LLLPV	DSQASAVIIT
27	NLISLPRIII	EPMVRHALAE	DLGLAG----	-----DI	TSA--AVIPE	KHRSTVIVVA
28	APVAPADALV	EADVARALAE	DIG-----	-----SGDV	TA---ALLP-	DAPDTAYLLC
29	VPVTPPAESI	DADVARALAE	DIG-----	-----SGDV	TA---ALLP-	DRADSAYLLC
30	YLKQQLPADI	TRSVITDLKE	DLG-----	-GTLDPAAID	TA---SLIPA	DRISTATIIT
31	YLKQQLPIEI	TRAVTDTLKE	DLG-----	-GSLNADNDV	TA---ALIPA	EAINATATIIT
32	LTLADLQGEI	QANVRTALAE	DVG-----	-----GGDL	TA---QLIDP	QREAEARVIT
33	LRLADLTAEI	EANVRRALLE	DIG-----	-----SGDI	TA---QLIPA	ERLAKATIIT
34	LRIADLSAEI	EANVRRALLE	DVG-----	-----SGDI	TA---QLIPA	ERLAKATIIS
35	EP-ALAEVLL	KPLVESALME	DLGRRG----	-----DV	TSQ--ATIPA	DMQAQLQIKA
36	IPQSILLEQSI	QINIQQALQE	DIG-----	-----DGD	TA---MLTPE	DEQATATIIT
37	----MLENDI	RHSVKTALNE	DLG--HNEHQ	SVEAMLNADI	TA---MLIPA	EKQVRGTLIT
38	----MLENDI	RHAVQTALDE	DLG--HTAHN	TIHDMLNADI	TA---QLIPA	DKHVS GALIT
39	----MLENDI	RLSVKAALDE	DLG-----	--HGASADI	TA---QLIPE	DRIAEATLIT
40	----MLENDI	RQSVKSALSE	DLGG-TEIND	QTKAIAYGDI	TA---MLIPA	DKYAEATLIT
41	----MLENDI	RLAVKVALEE	DLGFQADSNL	TAEKLSLDI	TA---QLIPS	DKYAQASLIT
42	MSQPELQLAI	QDGVRAALKE	DLF-----	-GEDARL-DI	TA---QLIPE	QSQSRASIIT
43	SQLEKLQDDI	SKTISWALCE	DLGA----VD	NAMPQASQDI	TA---MLIPE	NEQAVATVIT
44	--MPIPHTLV	QSLVTLALGE	DL-----	NYQSAENGDI	TA---QLIPV	NEQANAKVIT
45	----MLQHAI	QEAVKAAALLE	DLG-----	-GPDCTMGDI	TA---NLIPE	PQQIVVNIIT
46	IQLDSIRADI	TRAVREALAE	DIG-----	-----DGD	TA---MLIPG	DQINTAEIIT
47	----MVAQEI	IRSVKIALDE	DLN-----	-GLSPLEGDI	SA---NLIPE	GRQAKAIVIT
48	AELLR-QARI	ES-VAQSLRE	DIG-----	-----DGD	TA---QLIPA	EKLATARVIT
49	----MNKKAI	RTAVHAALVE	DIG-----	-----SGDI	TA---ELISA	ETVARASIIS
50	-MNNVLSQVT	FD-VKRALQE	DVG-----	-----NGDV	TA---ALLPQ	QLIVEAEIIS
51	-MSQTPVELN	LDDIDRYIAE	DLG-----	-----SGDL	TA---DVVPA	SVSARAEEVIT
52	QINKVPNDIV	TRLVRESLAE	DIA-----	-----TGDI	TA---QLA-E	DIDTTAFKIT
53	----MSPVSI	KEEVRRALAE	DIG-----	-----TGDI	TT---TLIPA	TTKITATIIC
54	RPQPPAAEQI	QADVTRALEE	DLG-----	-----TGDI	TA---ELVPR	NAWAQGVIC
55	TISLPPRETI	RDDVARALAE	DVG-----	-----GGDL	TA---GLVPA	SGVAEQVVA
56	MLEQLIQPAI	QDDVEKALAE	DIG-----	-----SGDI	TA---MLIPA	EQHAEARVIT
57	R--EALAEDI	RTSARLLAE	DVG-----	-----PGDI	TA---QLIPA	KQWAWARVVS
58	-LPDYVRDDI	TRNVTFALAE	DIR-----	-----DGD	TA---QLIDA	DSTSSATIIT
59	----MLQQDI	RRAVRAALLE	DLG--DALTP	LDQPDASADI	TA---QLIPA	DRLASARVIT
60	YLLTRIKEDI	SYIVNFALKE	DLG-----	-GLINADIDI	TA---QLIPK	ISKSNATIIT
61	TLFPLPDTLL	RPMVEQALSE	DLGRRG----	-----DI	TSA--AVIAP	DKTAKLFLVS
62	PLPAPH--LI	AQQVALALAE	DIG-----	-----PCDR	TA---QLIAA	DKAGSARVIA
63	-FGSALREAL	AANVAAAIRE	DVG-----	-----TGDR	TG---LLIPA	DRHARARVIV
64	-YGPALKSAL	EANVSAAIAE	DVG-----	-----SGDL	TG---LLVPA	DKQAHARVIV
65	--MYDIFST	DKLIDLWLTE	DIGICD----	-----L	TVQ--TMIEP	GETGTFCMNA
66	EYGAAFDAAI	ARNVADALAE	DVG-----	-----SGDQ	TG---RLVPD	GAPRRARVIV
67	QYGAAFEAAI	ARNVADALAE	DVG-----	-----TGDI	TG---RLVPA	DDVRGARIIV
68	QYGAAFDDAI	ARNVADAI AE	DVG-----	-----AGDQ	TG---RLVPA	GGRRRARIIV
69	APAPLPQVML	EPLVRAALLE	DLGRAG----	-----DI	TTD--AIVPA	QARAQTRLVA
70	FSDLVAELA	RVDARALEE	DVG-----	-----SGDL	TA---GLIDP	ACHARAHVLA
71	FSAEATIVEVA	KADAILALAE	DVG-----	-----AGDL	TA---GLIDP	ARSARAQVLA
72	FNVDGVAALA	RADVARALAE	DLG-----	-----AGDL	TA---ALIDP	AAQAHAHVLA
73	MKNEKFNQTV	HADVARALQE	DVG-----	-----TGDL	TA---ALVPQ	EAFARATIIC
74	AGDAQWQATV	QADVRALEE	DVG-----	-----AGDL	TA---ALIDP	ARRARARVLA
75	FGADALAALA	RADVDRALQE	DVG-----	-----SGDL	TA---GLIDP	ARRVRARILA
76	--NETLDEAR	ARNVRDALFE	DIG-----	-----RTDW	TG---RLVPE	GHRVRARVLV
77	--MLQSEAI	SNQVRLALSE	DIG-----	-----TGDL	TA---SLIPP	GKCLSAQVIV
78	DHFTYLETEV	KNNVSQALLE	DVG-----	-----AGDL	TA---SLVPC	DETATATVIS
79	TISEQLRVEI	QRNVSASLAE	DIG-----	-----TGDL	TA---RLIAA	ETEARGRVIT
80	----PLAAEI	SRNVDAALSE	DVG-----	-----AGDL	TA---TLVPA	ERQVRATVIS
81	-MSELLASAV	ETDVARALAE	DVG-----	-----SGDL	TA---RLIPA	AQTGTARLIT
82	PPFNALQKVI	EANILHALEE	DVG-----	-----AGDI	TA---QLVPA	QLATATI IA
83	IRT-----	--FLERALKE	DLG-----	-----HGD-	LFER--VLEK	DFKATAFVRA
84	IKD-----	--FIKKALDE	DLG-----	-----RGD-	LYA---LFAT	DKEVQAYIIA
85	LRP-----	--FLEAALAE	DIG-----	-----RGD-	LFA---LMDI	KMRVQAEIIA
86	IED-----	--FVKETLAQ	DVG-----	-----RGD-	LYA---LVEP	SVEASAKIVA
87	MTKINYFKDL	ENNIKNALAE	DVG-----	-----PGDL	TA---GLIPD	TRQATAQVIA
88	----MNTYI	NELINLGFKE	DLSSG----	-----DI	TSL--AIFND	EKDS-FYLIC
89	----MTGL	DPIIDNALQE	DIHTGD----	-----I	TTL--SVVPE	PRPARARLIA
90	----MTGI	DKIIEALME	DIHTGD----	-----I	TTL--AVVPG	SRPARARLIA
91	----MFEI	DRIIRTALQE	DIGLGD----	-----I	TTQ--ATIAT	GTTARAEVLA
92	----MLTL	DRFIDAALAE	DIHTGD----	-----I	TTR--ALLPK	KRPATARLVA
93	FFSGTALDRL	TAAIDLALVE	DGPD-----	-----L	TSD--AVFSP	EDRLEAVVVA
94	FFAGEALRHT	VAAIDLALVE	DGPD-----	-----L	TSN--AVFAP	SHQLAAQIIA
95	---MT---L	LELIRAAIKE	DMPH-----	-----GDV	TTE--SLALK	PRMGRARLKA
96	---MDKNTL	RSTLLNFLAE	DIGRGD----	-----I	TSE--SIFPA	KQQGKAHLVA
97	--MPRLSAHA	ERLLDLALAE	DLLL-----	-----GDA	TSE--ATIDA	SATGEGRFLA

98	---	MQQDYL	DRLIALALDE	DLGAA----	-----	GDV	TSQ--ALIPP	DYEGSAELVA
99	LPKHMLD---	ALILSALEE	DVGS-----	-----	GDV	TTA--AVLSG	EENGYARVVA	
100	-----	MDQL	DVLLRMALVE	DVGH-----	-----	GDV	TTE--GTIDA	GLTGRAVVFV
101	-----	MF	EIIIRSAIME	DLGEQG----	-----	DI	TTN--CIFEK	EEVN-FSIIS
102	-----	MF	EYIIRQALEE	DLGTIG----	-----	DI	TTD--CIIGD	QRIK-FEVNA
103	-----	MNGLF	SEIHNALKE	DLKIG-----	-----	DI	TTN--NTLTN	EQVD-FTISA
104	-----	MKVSF	SEIINNALKE	DLGENG----	-----	DI	TTN--SILLD	EKIN-FSINA
105	TVISM DYEA	EKIITLALNE	DLGLGC----	-----	DI	TTE--NTLPC	DLVTSFVDNA	
106	PKIKLSNYYI	KNKVKLALNE	DLYPNG----	-----	DI	TSS--LVKNS	KVIK-IKLIS	
107	MNLSTSKYI	LDSVALALAE	DFG-----	-----	TGDV	SA---DLFLN	KTIISAEIIS	
108	SLAPLPQIIM	EPIVRSALLE	DLGRAG----	-----	DI	TSD--AIIPA	DCKATLALNA	
109	NLSPLPVIML	EPLVRAALLE	DLGRAG----	-----	DV	TTE--AIVTP	FHYARTVLAA	
110	NLAPLPAIML	EPLVRAALLE	DLGRAG----	-----	DL	TTD--AIVPK	DLRATVLSA	
111	NIPPLPTVMF	EPLVRSTLLE	DLGRAG----	-----	DL	TTD--AVVPA	GLHAELTLTA	
112	LRPELPALMV	EEQVKAALLE	DLGRAG----	-----	DI	TTL--STIGP	DRTAANMSV	
113	ILSPLPRLII	EPPVRNALLE	DLGLAG----	-----	DI	TST--AVIPA	DHRSVVVMAA	
114	SLAPLPRLLI	EPLVRAALLE	DLGLAG----	-----	DI	TSA--SVIPS	DHRSTVVMMA	
115	PDAFLSPLAI	DESVHRALDE	DLGRAG----	-----	DI	TSL--ATIPE	ATKAKAILVA	
116	PDAFLSPLAI	TDAVRRALDE	DLGRAG----	-----	DV	TSV--ATIPE	ATQAHAILVA	
117	TDFAFLSPFAI	AEAVRRALAE	DLGRAG----	-----	DI	TSN--ATIPA	EAHAQATMVA	
118	LKDVRMPAAT	TTELERLLDD	DVP-----	-----	HGDL	TTE--ALGIG	GQAGVMEFTA	
119	MSSFATTCAS	RTELESLLLD	DAP-----	-----	HGDL	TTE--ALGIG	SQPATMQFVA	
120	PDAFLSPFAI	DEAVRRALDE	DLGRAG----	-----	DV	TSI--ATIPA	EAQAHAVLVA	
121	PLPALPRVMI	EPLVRMALLE	DIGRAG----	-----	DL	TTD--AIVPA	GHRATVLLVA	
122	THAPLPDLIL	EPLVRAALME	DLGTYG----	-----	DI	TTR--TVIAP	GTRYCARLNA	
123	SFATLPDLIL	EPLVKSALME	DLGSYG----	-----	DV	TTR--AVIPD	DVTYSARLRA	
124	-----	MFLLD	DRALLALLQE	DLP-----	-----	HGDL	TSR--ALGIG	PAPGLLRMAA
125	-----	M	NQLIDLWLDE	DVNYDD----	-----	L	TAK--IMVDD	DAVAKFGMNA
126	EMPPLEPIL	EPLLRAALTE	DLGTYG----	-----	DI	TTR--TVIPA	GTRYRARIVA	
127	PIMPLPRHV	NDAVARAIAE	DQGGRG----	-----	DV	TSL--ACIPA	KAEAKFYVNA	
128	-IPPLSPIIL	DPIVRLALAE	DLGRAG----	-----	DL	TTD--ATIPP	ETQLSVVIAA	
129	SVLDDDGFDA	EAFIRSTLAE	DLGEAG----	-----	DI	TAM--AVIPE	EAVFSGVMAS	
130	SSFSIPGFDL	EAFVAATLAE	DLGQGLP----	-----	GGHDV	TSE--SVIPA	DARFTGMTDS	
131	TQFPMGFDL	EAFVRATLAE	DLGAG-----	-----	DI	TSL--ATIPA	DARFDGVMDS	
132	STFDLPGFDL	DRFVRDTLAE	DLGEGLP----	-----	GGRDV	TSE--SVIPA	EARFAGVMDS	
133	-MTPLPDLIL	EPLVRAALLE	DLGRAG----	-----	DI	TTD--AVIPA	TQTARVALQA	
134	PVAALSPFAI	DEAVRRALAE	DLGRAG----	-----	DI	TST--ATIPA	ATRAHARFVA	
135	-----	MIRIT	DEELDRFFHD	DVP-----	-----	HGDL	TTR--SLGLA	EAPAAMAFRA
136	PEAELDWDDA	RRVILAALAE	DTGADKG----	-----	GEDDI	TSA--SVIPA	DLRFTGIMAA	
137	-----	MTPIW	SDIVRSALAE	DIG-----	-----	RGDI	TTN--TLIPA	GKEAEAVLIA
138	NSRRVTAVLE	N-----	ALTE	DRAT-----	-----	RDA	TTY--ACIDP	NQRATGLTIA
139	-----	M	NPIVRLALEE	DIGT-----	-----	GDV	TSR--ACISE	SQMAAGRFLA
140	Q-----	L	KKLLNHFFLE	DIG-----	-----	TGDL	TSQS--IFGE	-QSCAEIVA
141	A-----	V	KRALDRFFLE	DGF-----	-----	NGDI	TTA--IFPP	SEKCVAVHKA
142	K-----	V	KEALNRFFLE	DIG-----	-----	ERDV	TSQL--IFPD	NLLSKGTFLA
143	I-----	L	RNMLKEFFKE	DIG-----	-----	RGDL	TSEA--VFDD	NHQCEAVITA
144	K-----	L	DQQLRGFLAE	DIG-----	-----	YGDR	TAEA--LFTV	-ERAEAVIVA
145	K-----	L	EQLLRQFFLE	DIG-----	-----	DGDV	TSET--IFPA	HERASGMFMA
146	L-----	M	NQAIQAFLE	DIG-----	-----	QYDL	SAGT--VFPR	DTMGEVFLA
147	STDLTFFQ-I	DDTLKAALRE	DVH-----	-----	SEDY	STNA--IFDH	HGQAKVSLFA	
148	T-----	F	DDFKKELID	DGA-----	-----	YNDI	TTNA--IIEE	SSKSTADIIA
149	L-----	V	EENVKRALNE	DLQ-----	-----	YGDI	TTES--VVLD	HKIAKVDIIA
150	I-----	I	DKFLIEALKE	DNF-----	-----	YEDI	TTEA--IVGK	SSIASVDLIA
151	S-----	DI	DRIIINALRE	DIP-----	-----	SGDI	TTDN--IIDE	TSQSEAVLIS
152	Y-----	V	REHIRLALAE	DIG-----	-----	MGDI	TTEA--IAVG	DEHTVGFVKV
153	M-----	V	KEIKRALAE	DLG-----	-----	NGDI	TTRN--LIAE	TQEQQLFLA
154	---MTH--	I	DRIVGAALSE	DAP-WG----	-----	DI	TSD--TFIPG	SAQLSAKVVA
155	---MLDQRIT	DRIVAAALDE	DAP-WG----	-----	DL	TSE--TLVPE	SAIVRAHLVA	
156	-----	MDVINNALNE	DLCYGP----	-----	DV	TTE--AIFGL	EK-AEVQFAA	
157	TDPTRIRAAY	LRMAKVALEE	DFGDGA----	-----	DV	STL--ATVPA	DATGTKVMRA	
158	LDAALDRDEV	LALIRTALDE	DLRYGP----	-----	DV	TTE--ATVPA	DAVVKASVVS	
159	LPDGLDADKV	RALVRLALDE	DLRYGP----	-----	DV	TSS--STVPA	DAVAKASVVS	
160	ADAGLDPLEV	EDIANVAIQE	DLD-----	-----	HGVDV	TTV--ATISE	DAVATADFTA	
161	---MLTRPII	DAAVSAAALAE	DAP-WG----	-----	DL	TSE--LLIPT	SAYASARLAA	
162	LTGSLPETAV	QEVLRRAALAE	DAP-YG----	-----	DI	TSQ--VLIPA	EARATAVLNA	
163	LT--LPAAPV	REILERAFAE	DAP-SG----	-----	DI	TSQ--LLIPA	EARATAVLNA	
164	RAAGLDPEAI	RAQVARALAE	DLPGGLA----	-----	RGDV	TSV--ATIAA	DARGTGVFVA	
165	-----	EELIRTALAE	DCSG-----	-----	HQVDV	TTV--ATIPP	AQIRTADVVA	
166	ASAGLDPDGV	VALVGRALVE	DLPVWEENE-	VTGQIGAVDA	TSE--ATVDP	ALVGHGAIVS		
167	VAAGLDPEGV	VTVIGRAVAE	DLPSGEPDG-	PGGRAGAVDA	TSA--ATVDA	ALVGHGALVS		
168	VDAGLDADHV	HAVIHAALQE	D-----	-----	RGGVDV	TSV--AVVPA	DQRAVADVVA	
169	---MLTSHII	RVAVEAALAE	DAP-YG----	-----	DI	TCE--TTIPA	DETGSAHLTA	
170	ATLRRPPGAL	LELARLALRE	DLGR-----	-----	GDV	TSE--ATVPP	GLRARGRFVA	
171	--KIDKFQ-M	DDSRMVLKE	DIT-----	-----	SEDI	STNA--IYKK	DRLAETISLVS	
172	LDDALEN-DL	RQLVRLSIAE	DLDTAV----	-----	DW	TTV--AMIAF	ERRGACQIVP	
173	PISSVNFQDY	ELLAKLAWEE	DCPE-----	-----	EDI	TSVS--LFSI	DQNATANLNS	
174	IIDP-----	--WLQQWLAE	DIG-----	-----	RGDW	STQG--LGLQ	-HRGQARVVA	
175	LTR-----	--ALDRWLEE	DIG-----	-----	RGD	LTA---SALQ	RKHGYAHWIA	
176	LLDP-----	--ILSDWSRE	DLG-----	-----	RGDH	SAQG--LGLQ	GTTGKATWVA	
177	ISR-----	--ALDRWLDE	DIG-----	-----	RGD	LTA---IALQ	GQHAAHWLVA	
178	RLR-----	--QLAEWLQE	DLG-----	-----	RGD	LTT---PALR	GREGEAHWRA	
179	MTQALYIP--	EETLCAWLQE	DLGH-----	-----	GDL	TSE--LTLPP	SVEGEAVILA	
180	-MEEVYLP--	EETLCAWLWE	DLGH-----	-----	GDL	TTE--LTLPP	GLEGEAVILA	

181	VLDP-----	--LLDQWLQE	DIG-----	-----RGDR	TTQALHLQDR	Q--GKAHRL
182	LLDP-----	--LLSSWLAE	DWG-----	-----RGDR	TSEA-LFAEE	SPDGHGKILL
183	VLDP-----	--LLRGWLLE	DVG-----	-----RGDR	TTNG-LLAAD	VLGSAKWIA
184	IHH-----	--LLDTWLNE	DLG-----	-----RGD-	LSQ---SAVE	NYRAHAHWVS
185	ISR-----	--IIDGWIEE	DIG-----	-----KGD-	LTA---SAIT	KKIGKAHWIA
186	LTLTPELR--	--SRLESWLAE	DLG-----	-----RGD-	LTA---PALR	GCHGRACWRA
187	LHK-----	--ILDTWIEE	DLG-----	-----DGD-	LTR---FVLN	DRSASAHWVA
188	ISK-----	--IIDNWIDE	DIG-----	-----RGD-	LTR---PSIT	EENGNAWVIA
189	ISR-----	--IIDYWIEE	DIG-----	-----KGD-	LTS---SAIT	ENIGKAHWLA
190	ILDN-----	--LLKDWLLE	DIG-----	-----RGDR	TTSGLLLEDE	VIVGTGHWLI
191	-----MNELI	DRLIDLAFAE	DIGD-----	-----GDH	TTL--SCIPA	TAMGKSKLLI
192	-----MLL	EKLIDLAIAE	DIAD-----	-----GDI	SSN--AIIPQ	SEGAATMVM
193	LRLSIAEDVD	PNGEWFEGE	APSR-----	-----RDV	TST--AALAA	DTPLDGRIVA
194	HYTYLTTDAL	LAFIDLALKE	DVGD-----	-----GDH	TSL--ASIPA	GTEGKAQLIL
195	ISPEQFEKEI	DLIKNAIRE	DIGD-----	-----GDH	SSL--ACIPK	SAIGKAKLLV
196	AFREFFETCR	LKAMQLALEE	DRFQ-----	-----GDI	TTE--ATVDQ	NQLGLGYIEV
197	AMNDFYEGCR	ARAIMLALEE	DRYT-----	-----GDI	TTL--ATVPP	EQAGRAVIKA
198	---MLYQLP	DTDIERFIEE	DMP-----	-----YGD	TTS--LLGIG	NAQGSITFTS
199	AQQDFYEGCR	SRAVMLALEE	DRYI-----	-----GDI	TTL--STIDD	NRVGRAEVRA
200	DCHDFYEGCR	SRAVMLALEE	DRYT-----	-----GDV	TTM--ATIDP	QQQGSVVRA
201	---MSQSQI	EKIIDNACDE	DFAR-----	-----GDI	TTE--TLIPS	SLAGRAIIVA
202	---MLSLDD	R--LRAALAE	DIGR-----	-----GDA	TTL--ATIPP	EQTARAEFLL
203	VGEALWQGG	EEALRAWLRE	DLGQ-----	-----GDL	TSL--LVVPE	DIEGEAVILA
204	LVKE-----	--KLKEFLE	DIG-----	-----TGD	TTEG---IYR	GEKAKAVIKT
205	-----MEKI	LDLLMSFVKE	DEGK-----	-----LDL	ASFPLRN---	TTAGAHLLLK
206	---MLKNHA	LRILEESLDY	DVG-----	-----FGDL	TTEL--MIPK	NQSEAVFIA
207	-----ML	IREVESFIEE	DLG-----	-----YDDV	SCT--IVPDR	--PAEAIIFT
208	-----M	IDLFELYFYE	DCP-----	-----YQDE	SAE--LLRLE	G-RGKMRIVS
209	-----ML	IKEVESFIEE	DLG-----	-----YDDV	SCT--IVPDK	--PAEAIIFT
210	-----MF	IREIESFIEE	DLG-----	-----YDDV	SCT--IVPDR	--PAEAIIFT
211	-----M	IEEFHYLLE	DCP-----	-----YGDE	TTE--LLGIE	G-EGSLTIRS
212	-----MIL	TSEIERFIEE	DLG-----	-----ANDI	SCT--LVPEK	--EIKAIIVFV
213	-----ML	RSHIERFLEE	DLG-----	-----EWDD	STS--IVPDL	--NVDAAIIS
214	--MNTLPDIP	LTRLLEYVEE	DCP-----	-----FGDI	TSE--VVIDP	QICS-AVISA
215	---MRMIP	IEDLLRFVRE	DAP-----	-----WGDV	TSE--TVVP-	DVACRAVIRA
216	---MSIFS	DNRIIENVYD	DIG-----	-----FEDI	TTN--SLVTE	DKWAQAEILC
217	--MLLNEVKV	RKIVELALTE	DVG-----	-----RADL	TSS--IVEGE	--RAEAEIVA
218	---MPVT	DADVERWLRE	DLG-----	-----HHDV	TN--DVPG-	--ETTGRIVA
219	---MLT	DSDIERWLRE	DVG-----	-----HHDV	TN--DVPG-	--TTEGRLVA
220	---MRIE	QSQVERWLRE	DLG-----	-----HHDV	TN--EVPG-	--QTTGRLVA
221	---MITVIP	LEYLLRFVYE	DSP-----	-----YGDV	TSE--AIPE	DMNAEAVIIA
222	---MIP	LNILLKFIEE	DAP-----	-----YGDV	TSE--AIPE	DMEAEAVIIA
223	---MEIP	ISYLLKFVEE	DAP-----	-----YGDI	TSE--AVIPR	EMSAGVIIA
224	---MVP	LEYLLRFIEE	DAP-----	-----FGDV	TSE--AVIPE	DMKARAVIIA
225	--MFLDPYTV	AEKLEWVEE	DAP-----	-----FGDL	TTG--YTVP-	GLWARAVVVL
226	---MIDWIY	VKRLLDYLEE	DVM-----	-----PEDI	TTK--FLEG-	--IRARGIVRC
227	---MIKQIM	INKLLSLEE	DTY-----	-----PEDV	TSK--IVSG-	--IKCKAIIIS
228	---MIEKLV	INRLLQLEE	DLY-----	-----PEDI	TSR--VIRG-	--VKVKGIIIS
229	---MIEARLF	AFELDELKR	DLP-----	-----FIDW	ASA--ALPGK	TIEA--CVVA
230	-----M	RSRLEAWLLE	DLG-----	-----SYDL	TTE--VLGIG	GLRGVAQLFA

	62	71	78	86	87	97
1	RED-GVFCGK	RWVE---EVF	IQLAG--DDV	R-----	LTWHVDDGDA	IHANQ----
2	REN-GVFCGK	RWVE---EVF	IQLAG--DDV	T-----	IIWHVDDGDV	INANQ----
3	REA-GVVAGL	DVALLTLNEV	LGTINGYRVL	R-----	---VEDGAR	VPPGE----
4	REP-GVIAGV	DVALLVLDEV	FGVDGYRVLY	R-----	---VEDGAR	LQSQG----
5	RQP-GVIAGV	DVALLVLDEV	LGARGYQVLD	R-----	---VEDGAH	LQPGQ----
6	REP-GVAAGV	DVALLVLDEV	IGPDGYRVVD	R-----	---VEDGTR	LEAGA----
7	REP-GVIAGV	DVALLVLDEM	IGADRYRVLH	R-----	---VDDGAQ	LDAKQ----
8	REP-GVVAGL	DVALLVLDEV	LGADGYRVGH	R-----	---VADGTR	LEAGG----
9	KSP-GVLAGQ	PFFDAIFTQL	NCQVSWFLP-	-----	-----EGSK	LVPV-----
10	RED-GIFCGQ	RWLN---EVF	IQLG---AQI	S-----	IQWLVTGDGK	LTANQ----
11	KSP-GVLAGR	PFFDAIFTQL	NCQVSWFLP-	-----	-----EGSK	LVPV-----
12	KSP-GVLAGR	PFFDAIFARV	NCQVSWFLP-	-----	-----EGSK	LVPV-----
13	KSA-GMLAGS	PFQAVCEEA	GCTVQWDHS-	-----	-----DGEW	LEPV-----
14	KED-GIVAGV	ALADMIFE--	-HVPD-----	-----SLK	VEWMRKGDY	VHKGL-----
15	KED-GVVAGI	SLADMIFK--	-QVDP-----	-----SLK	VEWFESDGN	VHKGL-----
16	KSA-GVVAGR	PFQAVFTEL	GCSVTWRDEG	TTSTT-----	---SLEGQY	WDGAEGSSSA
17	KQD-GMLCGV	PFAQEVFNQC	ELQVEWLFK-	-----	-----EGSF	LEPSKN--DS
18	KQK-GVLAGV	PFADVFRQC	NLECQWLFV-	-----	-----EGDE	LDPS----AT
19	KQS-GVICGI	PFVNEVFHQC	NLQHKWIFS-	-----	-----EGQF	VSDKEIASAG
20	KSG-GVLAGV	PFEEVFKQV	DCAVEWLMP-	-----	-----EGSV	VPPD-----
21	KQN-GVFSGS	IFFQEIFNQL	GCKVWFK-	-----	-----DGES	FSMTHGPEKN
22	REN-GVFCGK	RWVE---EVF	IQLAG--DDV	T-----	IIWHVDDGDV	INANQ----
23	REA-GIFCGT	RWLE---EVF	SQLG---NTT	T-----	IVWHVADGET	ITPNQ----
24	RED-GIFCGQ	QWLN---EVF	TQLG---DQI	S-----	IEWLVKSDSA	ITANQ----
25	KEN-GVFCGK	MWLEEVFY-Q	IDNNINIWK	V-----	---SDGE	LKKDQ----
26	REN-GVFCGQ	CWLE---EVF	NQLG---GGV	A-----	IEWLVADGDD	ILANQ----
27	RQS-GVIAGL	DTAELAFKVI	NAELVMMRHV	H-----	-----DGMK	VKPGD----
28	KQD-AVIAGR	PWFD---ATH	RALDPQVQ--	-----	IAWRIQEGDR	VGAGT----
29	KQD-AVITGR	PWFD---ATH	RALDPQVR--	-----	IDWLVEHQH	VAAGT----

30	REA-GVFCGQ	LWAD---EVF	KQLG---GQV	S-----	IEWHVQDGD	LTPNQ----
31	REH-GVFCGQ	AWAD---EVF	KQLG---GKV	T-----	IEWHVKDGD	VEPNQ----
32	REH-ATIAGR	AWVD---EVF	RQVD---PRV	L-----	VTWQVEDGQ	VEPNQ----
33	REN-CVVAGT	AWVD---AVF	RQLD---PRV	A-----	VHWQVADGEQ	ASANQ----
34	RDA-AVIAGT	AWVD---TVF	RQLD---PRV	A-----	VHWQVVDGER	VSPDQ----
35	RQA-GVICGM	DLARLSFALI	DEKIEFVAYI	N-----	-----DGET	VEAGA----
36	REN-MILAGR	PWVD---ALI	TRYD---ASV	Q-----	IEWLKQEGEQ	VAAGE----
37	RED-GVFCGK	AWAE---QVF	NQLG---GQV	A-----	LHWHVDDGDL	VVANQ----
38	RED-GVFCGK	AWAE---QVF	NQLG---SEV	V-----	LHWHVDDGDL	IVANQ----
39	REE-GIFCGK	AWAE---QVF	NQLG---GTV	A-----	LHWHVDDGDW	VVPNQ----
40	REE-GVFCGK	AWAE---QVF	NQLG---GEV	A-----	LHWHVDDGDL	VLPNQ----
41	REE-GVFCGK	AWAE---QVF	NQLG---GEV	A-----	LHWHVDDGDL	VLPNQ----
42	RED-AVICGC	AWVD---QVF	RQMG---NQV	E-----	IEWLVKDGDN	VKANT----
43	RED-CIVCGV	AWVN---EVF	KQLD---ASL	NRTVE-QATK	ITWVNDGES	VAANS----
44	RED-CIFCGK	DLII---EVF	KQVD---PSV	-----V	VNVLVNDGDA	VKANS----
45	RED-CVLAGK	EWVN---ATF	MQLD---DNI	D-----	INWHVEDAQH	VKADT----
46	RED-CTLCGQ	AWLE---ETF	AQLG---GL	DS-----	IEWHAQDGDQ	VTAGS----
47	RED-AVFCGQ	AWTE---EIF	RQLG---NQV	K-----	ITWVFKEGDF	VKANS----
48	RED-ARLAGS	AWVE---EVF	RQVD---PSV	R-----	LQWQFHDGDD	VPANA----
49	REN-AIICGI	PWVD---EVY	QAVD---SSI	K-----	IQWKVKDGD	VSSNQ----
50	REP-MLVCGQ	PWVN---EVF	KQVD---NTV	E-----	MEWRVSEGDF	LSTPA----
51	RES-MVLCCG	AWFE---AVF	RRLDPAVR--	-----	VIWLAEEGAE	VSAAD----
52	REE-MILCGQ	DFAN---EVI	NQLD---KNI	Q-----	ITWLYSDAQK	VPANA----
53	RET-AILCGT	SWFN---EVF	HQLD---ADI	A-----	IDWAKADGDL	VPANQ----
54	REQ-AVLCGH	HWFD---EVF	RQLDDRVE--	-----	IHWAAEGEQR	LTPDQ----
55	REA-AVLCGT	AWFD---EVF	RQLDRGVG--	-----	VRWLCSDGEA	VEPGA----
56	RED-AIVCGV	EWVN---AVF	AKVD---PDC	K-----	VEWKFKDGDQ	AHAND----
57	RED-AVLCGV	AWVD---ELY	RRLD---PSV	R-----	LTWHAADGDA	LAPDQ----
58	RED-TTMCGI	PWAD---EVF	KQLG---EV	D-----	VEWHVVDGDR	LSAES----
59	REA-GVFCGQ	PWVD---EVF	VQLG---GEV	R-----	VEWLVDQGEV	LSPNQ----
60	HEQ-GIFCGK	KWFI---EVF	KQLS---DDI	I-----	INWKVDDGDY	IQANQ----
61	RED-GVIAGM	DLARIAFQTM	DPSVRFQAEI	H-----	-----DGQA	VRAGQ----
62	RED-AVICGQ	AWFD---ECF	RQVDARCR--	-----	VEWLAEEGK	VAAGR----
63	REA-AVLCGA	PWFD---ACM	PAVDPALR--	-----	VTWLQHEGDR	MAPDS----
64	REQ-AVLCGQ	PWFS---ACM	KAVDERLT--	-----	VTWKQEEGAR	MAPDS----
65	REP-MIAGI	DVAARIFARY	DPSSIDVRA	A-----	-----DGDK	VEKGA----
66	RED-AVLCGV	PWFD---AVV	RAVDPSIE--	-----	VDWRHREGDR	MSADS----
67	RED-AVLCGV	PWFN---AVM	RQVDPRIE--	-----	VQWRYREGDR	MKADT----
68	REE-AVLCGV	PWFE---AVI	ARIDPEIV--	-----	VQWHYREGDR	MTPDS----
69	RQA-GVLAGL	DLARLAFRLV	DPEIEFHALL	P-----	-----DGAQ	LQPGA----
70	REA-AVICGA	PWAQ---AAL	QQVDPAIR--	-----	LQWLVLLEGQR	CEIDQ----
71	RES-AVICGS	AWVE---ATI	LQLDPQAR--	-----	LTWHVVDGDR	CAANQ----
72	RES-AVLCGT	AWFE---AAL	RQMDPEAT--	-----	LVWHVQEGER	CAPNQ----
73	RQE-AVICGQ	PWVM---EIL	KQIAPTAK--	-----	TAWSVQDQGH	CEPGQ----
74	REE-AVICGA	PWAE---AAL	RALDPDVR--	-----	LTWRVAEQQR	CTADQ----
75	REA-AVICGA	PWVE---AAL	RALDPGVT--	-----	LNWHVAEGAR	CATDQ----
76	REA-AVLCGR	HWFF---DCV	VALDPQAD--	-----	VQWHYAEGAR	MSDSD----
77	REA-IVICGI	PWFD---ESF	RQLSPSVR--	-----	IDWHVSEGGQ	TSAGQ----
78	RKE-AVMCGS	RWFE---ECF	RQLEPHVE--	-----	VRWHTRDGET	VGAGQ----
79	RED-AVVCGT	AWFD---ATF	AALSPTTS--	-----	VLWHVVDGDR	VEAGQ----
80	REA-GVLCGT	AWFA---ECV	ARLDPTAR--	-----	ITWHGADGDR	IAPNQ----
81	REA-AVIAGR	PWFD---ACF	KALDLACS--	-----	IDWQVKEGDG	VAAGT----
82	RED-AVVCGI	PWAN---EAF	RQVSREIA--	-----	AEWLVEGDDH	VSAGA----
83	KQE-GVFSGE	KYALELLEMT	G-----IEC	VQTIK-----	-----DKER	FKPKD----
84	KQE-GVFSGE	IYLKAMLEHF	Q-----LAL	VSSYS-----	-----DGES	FAKGA----
85	KSE-GIFSGE	LYARELCEMR	G-----IEA	LFGIK-----	-----DGEV	FEPSK----
86	KSD-GVMAGV	TYCNVLAKLE	N-----FRV	VWNKN-----	-----DSES	FVKGD----
87	KEA-AVICGR	PWFD---KVI	QQVN---PNI	E-----	IEWFCKEGQS	VPVNT----
88	KSD-GVLCGI	DIFKKVFK-F	IDENISVELY	F-----	-----KGDG	IKYAD----
89	KEP-LVLAGI	G-VAARVFRH	LDPA-IRFDA	RF-----	-----PDGAR	VETGT----
90	KEP-LVLAGI	D-VAARVFTF	LDAS-VCFEA	RH-----	-----GDGAR	LAAGD----
91	KQD-FVLAGI	D-VACQVFHV	LDPS-IAFEK	LR-----	-----EDGVH	VQRGD----
92	KED-FVLAGI	S-VAERVFDR	LGGSVDFFAA	RA-----	-----VDGEL	IASGS----
93	KQH-TLVAGL	PIAPIILDRC	PEVHP-----	-----YT	LEMPVRDGD	LAPGD----
94	KED-SLVCLG	AYIPYIMDRV	IACDPQPQGW	D-----DYT	VDTPTYADGAH	VTAGT----
95	KED-IVLSGA	MAFEQSMQ--	-ALEP-----	-----TCR	IKWHFEEGDE	ILKNQ----
96	RQP-MVVAGA	DAVAGEVFRV	QNDS-ILVEN	AI-----	-----ADGTH	IEKGD----
97	KED-LVLAGT	AVAV---RVF	ERLG-----	-----AS	CTFDRADGAR	AARGE----
98	KEQ-LVLAGL	DAFV---RVF	KTVDP-----	-----NVE	VELLRRDQGE	IKPKM----
99	KSE-LVVAGI	DIFR---QVF	FAVD-----	-----DRIA	IAVCQDSDQ	ARKGQ----
100	REP-LVLSGS	DPFR---RTF	RLVDP-----	-----QVR	VESLFDSDGEE	VPADV----
101	KEP-MMVSGI	VAVKEIFEIF	SKK-INFIL	E-----	-----CDGNN	IQSGT----
102	REE-LIVSGM	LFISDLANVL	HKEDISFYPM	E-----	-----VDGTP	VKSGT----
103	RED-LVVCGM	PILEEIFG-M	NKGSICYETH	R-----	-----SDGEF	IGENS----
104	RED-LVVCGI	PILEEIFN-T	KKEYIKYKVH	K-----	-----NDGNI	AGKNS----
105	RKE-TVVCVE	FLAKVIFG--	-QSGIEYFLN	K-----	-----QGDGR	VLPGE----
106	NQQ-AVIAGL	EFVKQTFK-L	IDNKIKFIK	K-----	-----EEGSI	VKKND----
107	REF-SVICGI	EYAQ---STF	LLLD---DKI	K-----	LDWKIKDGE	ISSGQ----
108	RQA-GVVAGL	DLVMFAFLV	DPGISQLRC	P-----	-----EGGK	VSAGQ----
109	RQR-GIVAGL	DLAMLAFRLI	SPDVEILVER	P-----	-----DGCS	VVEGE----
110	RQT-GVVAGL	DLAIALAFRLI	DERIETTPVC	P-----	-----DGSE	VTPGQ----
111	RQP-GVVAGL	DVAALAFRLI	DPAISVKIER	P-----	-----DGSA	IAPGD----
112	REA-GVVAGL	ELARTAFRLI	DPSIRFEALA	A-----	-----DGDR	VAPGT----

113	REQ-GVIAGL	DAAELAFQLV	DPAIRMNRHI	A-----	-----DGAA	VAAGD-----
114	RQP-GVIAGL	DAADLAFTLV	DPEIVMRRHI	E-----	-----DGDA	VKSGD-----
115	RQS-GVIAGL	PLALATLQEL	SSDIEVRAHV	R-----	-----DAAR	MARGQ-----
116	RQA-GVIAGL	PLAIETFRQL	STDVAITAHA	R-----	-----DGDT	VAAGI-----
117	RQA-GTIAGL	PLAVAAFQAL	SPDIFIQPHV	H-----	-----DGDP	VARGI-----
118	RDP-MVLALV	DDAAAILGLC	GC-EVERMAM	S-----	-----GSR	LAPGA-----
119	RDT-MVVALV	KDAAAIIELC	GG-QVELAAC	C-----	-----GST	LTPGE-----
120	RQA-GVIAGL	PLAVATFKML	SPDIVIHPHA	H-----	-----DGAA	VAAGI-----
121	RQQ-GIVAGL	DLARLAFQLI	DPATEMQVAH	D-----	-----DGAV	VEPGD-----
122	RAA-ATVSGM	QIAALAFRLV	DPALRVETLV	A-----	-----DGQT	CAAGD-----
123	REE-AVVSGM	QVAALAFRLV	DATLEVKTRV	A-----	-----DGAV	CQPGD-----
124	RDP-MVLAGV	EEAARIFALL	GA-RAEIAAP	S-----	-----GAE	RAPGA-----
125	REP-ITLSGL	KLAEMVFRKM	DPECTFETSR	K-----	-----DGER	VETGE-----
126	REA-GVASGM	QLAGIAFRLI	DPGLAWRPLH	P-----	-----DGSR	FQPGD-----
127	REA-GVVCGF	QPALAAIWQC	DPKALVSPQM	D-----	-----DGDT	VKPGD-----
128	RKP-GVIAGL	DVAAYSASLV	DPALKLEIEK	P-----	-----DGSA	LTPGD-----
129	REP-MVIAGL	PLAAAFFKAL	DPLAEIEILA	K-----	-----DGTY	LPAGQ-----
130	RDA-ITVCGL	PIAAAFFRAL	DPQMKIEILV	E-----	-----EGAR	VAPGS-----
131	RDA-ITVAGL	PIAERFFRAL	DPAMEIEILA	E-----	-----EGAE	VPAGS-----
132	RNP-IVVAGL	PVAAAFFRAL	DPAMAIDILV	E-----	-----EGAA	VEPGA-----
133	RQP-GVIAGL	DLARLAFHLV	EPRIHFSIHV	P-----	-----DGGR	VMPGD-----
134	RQP-GILAGL	GCAFSAFALL	DDTVFTTPL	E-----	-----DGAE	IAAGQ-----
135	GAA-MVASST	EEAARLLTRL	GC-AVTASVA	S-----	-----GTR	ATTGD-----
136	RHT-MVVAGM	PVAQEVFRLV	VPEARFTARV	A-----	-----DGDT	VEAGT-----
137	REE-LVVCGL	PVVS---EVF	KQVDSRIG--	-----	ILPEASDGAG	VMAGN-----
138	KED-CILAGI	GAVQRIFEVY	AMLDGA----	-VVSH-PEVT	THPEIFDGVV	LRKGQ-----
139	REP-LVVIAGL	DLLA---EY	TQRGG----	-----VSD	LQILKRDGDA	CVDGE-----
140	KSE-GIFAGA	AIIEGFSLL	DEN---VQS	ILHKK-----	-----DGDM	LHKGE-----
141	KAR-GIVSGL	SLLEIGYSL	DDH---IHV	EERVK-----	-----DGQE	VRPGD-----
142	KDT-GVFTGR	LVIEEGFNLI	DER---IKV	ELHKK-----	-----DGDL	VEKGE-----
143	KDD-GLFAGE	LVIIEGFRL	DET---IAV	HMLKT-----	-----DGEA	VRKGE-----
144	KGE-GIFAGT	QVVNQLYALL	DSD---IEV	ELFVR-----	-----DGEQ	VKRGQ-----
145	KAD-GVVAGV	GIIAAGYQLL	DPR---VEV	TIMKQ-----	-----DGER	VQAGE-----
146	KET-GILCGI	SIPPKVYELL	GGN---IQF	EAYKK-----	-----DGDW	VQKGD-----
147	KEA-GVLAGL	TVFQRFVTLF	DAE---VTF	QNPHQF-----	-----KGDGR	LTSGD-----
148	KED-GIIAGI	GIFKRVFEIF	KG----AEA	EFTIS-----	-----DGSK	VKKGE-----
149	KEK-GVIAGT	EVFKMVFKIL	GD----VEV	DFSVN-----	-----DSEE	VEKGO-----
150	KEE-GIIAGL	NVFERVFTLL	GN----VEV	KALVK-----	-----DGDE	VSSSQ-----
151	KDE-GVIAGL	DVAKKVFLLM	DDQ---VVF	EKMVE-----	-----DGQT	VKRGD-----
152	KEP-GVVAGL	VLEEEIYRVL	SGN---VRV	EYMKV-----	-----DGEE	VASGO-----
153	KAS-GIVAGL	EVSATVFSCL	EPA---VQF	TAFIH-----	-----DGDE	IKPGD-----
154	REP-GVFSGO	ALFDASFRLV	DPRINASLKV	A-----	-----DGDS	FETGD-----
155	REP-GVFSGT	CLLEAAFRVL	DPEIRIELQI	T-----	-----DGEA	FEP-K-----
156	RAH-GVLAGS	RIAEEVFRTY	ATQLKMRIDT	EVL-----	-----IEDGEV	VAPGD-----
157	RQA-GVISGL	D-ALAIVAEV	ADERHVELVP	L-----	-----VADGDR	VEAGD-----
158	RQP-GTVAGI	DVGLLVLDEV	LGAGEYEITG	R-----	-----VADGAR	VEPGQ-----
159	RAH-GTVAGL	DVGLLVLDEV	IGAGRYQVLD	R-----	-----VADGTR	VAPGQ-----
160	REA-GVVAGL	RVAAEIVSVV	CT-DEFEVER	H-----	-----VDDGDR	VEEQG-----
161	REP-GTFAGG	EVFAAAMRLT	DPGIQVILAV	A-----	-----DGDA	FEAGD-----
162	RVP-GVLSGG	AVFAAAMKLT	DPDAVVELLV	A-----	-----DGER	FGAGA-----
163	RVP-GVFSGG	TVFRDAMKLV	DPDTEVEILL	A-----	-----DGEA	FDAGT-----
164	REA-GVVAGL	GVAALVFHEV	LG-DAVEVTD	R-----	-----VPDGR	VAPGD-----
165	RRD-GVVAGL	PLAELVFRVL	CE-GVVEVIR	H-----	-----ARDGDS	VKRGD-----
166	RAA-GVVAGL	PVAAAVFESL	LG-PAATVTL	T-----	-----ARDGDP	VPPGT-----
167	RAA-GTVAGL	PVAAAVFESL	LG-RSVTVTL	T-----	-----AADGDA	VSPGT-----
168	RAA-GVIAGL	PIAAATFVVA	GD-DQVEVEF	L-----	-----AADGEQ	VPAGA-----
169	REN-GVMSGI	DVFAAAFAAQ	NPAVTVTAAI	K-----	-----DGER	FQRGQ-----
170	RRE-LVVSGL	GAAA---AVF	YEAGGG----	-----EVE	FVPLAGEGEL	AGGGA-----
171	KEE-GILAGL	DVFKRVFELL	DNS---VEF	TEYK-----	-----KGDGK	ILNKD-----
172	RCS-GIAAGI	ALAPWIVDEF	DADLEVEVLI	D-----	-----EGTP	LVPGE-----
173	REP-GILCGT	GVLEVLNTLS	GNKIRSELFK	K-----	-----DSES	FQAGE-----
174	KEN-GVIAGL	PMAARIFQLL	DP----SMEF	QVLG-----	-----EGQA	VTAST-----
175	KQP-GCFCGG	PLVQQLFQRL	D---PEVSV	HLLRD-----	-----DGAA	VEVGD-----
176	KSE-GIAGL	PIAFRMLQLL	DP---QVKC	TAKLA-----	-----EGFA	CGSGQ-----
177	KQS-GRFCGG	PLVQTLFERL	D---PACKV	QLLVA-----	-----DGEP	VQSGQ-----
178	KAN-GVFCGG	ALLEPLLKEL	VGSSPPGLEL	HLLVR-----	-----DGTP	IEAGQ-----
179	KEP-GILAGL	EIAR---RVF	RLVD-----	-----PQLA	FASQVEEGAS	VVAGQ-----
180	KET-GILAGL	EIAK---RVF	RLAD-----	-----PQVE	FIPGVEEGAR	VAVRQ-----
181	KSQ-GVIAGL	PIVERVFQRL	TT---AVVF	TYEQA-----	-----EGAI	CEEPT-----
182	KEA-GVVAGL	PLVERLFAIV	DP---AVRF	APMCE-----	-----EGTA	AEART-----
183	KAP-GVIAGL	PVAARVFQLL	NE---KVSF	VTTID-----	-----EGAF	CKPGQ-----
184	KQE-GIFCGG	EIVKCLFQRL	D---PSIEI	TLQKG-----	-----EGAK	LMVGE-----
185	KEE-GIFCGV	GIIKEILKKI	D---EKIEY	NFFIN-----	-----DGEK	FLKYQ-----
186	KAD-GLFCGG	VFVEPLLHAL	D---PKARV	QLLVS-----	-----EGAS	VSVGQ-----
187	KED-GTFCGG	DLVKLIFRKI	D---PKVDI	QLLIE-----	-----DGQK	FEKNQ-----
188	KEG-GIFCGV	EIIKEIFKKI	D---LNISS	KFNIS-----	-----DGNQ	FFKDQ-----
189	KEK-GIFCGV	EIIKTILNKI	D---ENIDC	RFFIK-----	-----DGET	FLKDQ-----
190	KEP-GVIAGL	PIAARVFELL	DQ---QVNF	LPTVA-----	-----EGEW	CEKGT-----
191	KEA-GVLAGI	EIAKEIFH--	-RFDP-----	-----TMK	VEVFINDEGAS	VKPGD-----
192	KAD-GIISGM	EVARRVFE--	-RFE-----	-----AVT	WTPYVSDGGS	VKRGQ-----
193	KED-GVIAGL	PLAD---ALC	RLVD-----	-----PALQ	FVPSVDEGER	VEAGQ-----
194	KDT-GILAGI	ELAEMIFK--	-RVDP-----	-----ALE	LDIKMHDDGT	FKPGQ-----
195	KDQ-GVLAGI	EFAKKVFFQ--	-YVDP-----	-----DLK	INLKMKGDDL	IRKGD-----

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196 KSE-GIAGV EVAR---QVF QSLD----- -----AALE FTAYVKDGKR VYPGE-----
197 KEQ-GIVAGV DVAL---QVF KACD----- -----PALQ VQCHAEDGAV VQRGD-----
198 RHL-TVLSCT EEACRVLERC GA-RVTSSMP S-----GTS VEAGV-----
199 KED-GILAGA EVAR---QVF AACD----- -----GAVS VVCHHSDGDQ LMVGD-----
200 KED-GVIAGV DVAA---QVF AACN----- -----PSLK LEVHRNDGER VVQGE-----
201 QOD-GIMAGA EVAKIVFM-- -KHPD----- -----NME IDILIEDGKK IKAGD-----
202 KEP-GILSGL AVVR---RVF ALLDP----- -----DLQ VTWTAREGEW RERG-----
203 KEG-GVLAGL WVAE---RVF ALAD----- -----PRTA FAPLVAEGAR VAEGT-----
204 KEE-GVLAGA PFVEMVFEIL G-----GVSV EFKKR----- -----EGEV FEKGE-----
205 TEN-VVASGI EVSRMFLEKM GLLSKFNVE- -----DGEY LEGTG-----
206 KEK-AIICGI DVFIEFMEKN GLTCTSLVN- -----EGDN VIG-----
207 KED-CTVAGI SEAASIFIYF GIQAET----- -----DFKGDGR LSKGD-----
208 REN-GVCACA SDLAEYYERK NM-KTLNYLR D-----GET FKPGD-----
209 KED-CTVAGI KEAESIFCYL GIQVET----- -----TLKGDGC LKEGE-----
210 KED-CTVAGI DEAVSIFYF GIQAET----- -----DFKGDGQ LKKGD-----
211 RDP-GIASCA DDLAEFYEKK GL-KVNMHLE N-----GKE FTENA-----
212 QOD-CIIAGI PIAKRIFDYF GLDSSA----- -----KYKGDGQ LGSGD-----
213 KED-CILAGL EEVSELFEYL DVNSEP----- -----LFDDGEY ATAGA-----
214 RES-LVLAGL TEVIRLSEWY GLAASS----- -----ACSDGLY RQAGD-----
215 KDA-GVIAGL EEARALFEHY GVAVRQ----- -----RIPDGRP VAPGA-----
216 KDE-GILAGM DVAHYIINEF NLNISS----- -----SFLDGE IHKGD-----
217 KEE-GVVSgt LPARLTFELL DCEVDV----- -----LVEDGER IQPGD-----
218 QQA-GVAAGL DA AVR VF EYL GCEADA----- -----PAAAGDR IDAGD-----
219 KAS-GVVAGL DAATAVF EYL DCAVET----- -----SVDSGSA IDAGD-----
220 TEP-GVLAGL EAAA AVFEYL GVDIES----- -----RRSAGDA VEAGE-----
221 QOD-GVIAGV EEARVLF EHF GVKVNV----- -----LKKDGEY VKKGE-----
222 QOD-GVIAGV EEAKVLF EHF GVSVS----- -----KKRDGEE VRAGE-----
223 QOE-GIAGV DEARKLFEYF GVEVNV----- -----KKQDGEF VKKGD-----
224 KQN-GVIAGV EEAKALFEHF GVKVEV----- -----KKRDGEL VGKRD-----
225 KSR-AVPA CL EPVVEALRIL GFNAKP----- -----LVEEAAW VEP PR-----
226 KDS-GILAGN RFIVPF LKYL GFSNIN----- -----GEKDGRE VKKGD-----
227 KDE-GILAGQ KFIIPFLEYL GIKIEN----- -----YMKDGTQ IKKKD-----
228 KENKSILAGN KFIIPFLEYL GLKVDY----- -----YRKDGEL FSKGE-----
229 KAE-GVAAGV DEAAEFLKLL GFQITL----- -----RLPEGAE IKPGV-----
230 REE-AVVAGS EEAAEVYRLA GCGEVEVVKR S-----GQL ARRGD-----

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109 119 129 139
1 ---TVFELNG PARVLLTGER TALNFVQTLS GVASEVRRYV GLLA-----
2 ---SLFELEG PSRVLLTGER TALNFVQTLS GVASKVRHYV ELLE-----
3 ---ALMTLEA QTRGLLTAER TMLNLVGHLS GIATATAAWV DAVRG-----
4 ---PLLTVQA AARGLLTAER TMLNLVCHMS GIATVTVAWV DAVRG-----
5 ---SLLTVRA ETRGLLTAER TMLNLICHL S GIATTTAHWV AAVQG-----
6 ---ALLTLDA PTRGLLTAER TMLNLVSHLS GIATSTAMWV DAVAG-----
7 ---TVLTVEA PTRELLTAER TMLNLLCHLS GVATATAAWV DAVAG-----
8 ---VALTVEG PTRGLLTAER TLLNLVCHLS GIATATAAWV DAVSG-----
9 ---ARVAEVRG PAHCLLLGER VALNTLARCS GIASAAAAAV EAARGAG---
10 ---TLCHLTG PARILLTGER TALNFLQTLS GVATEVSRYV VQLA-----
11 ---VKVAEVKG PAHLLLLGER VALNTLARCS GIASAAATAV EVARSTG---
12 ---AKVAEVRG PAHCLLLGER VALNTLARCS GVASAAAAAV EAAKGTG---
13 ---TRVATVKG RVNDLLLAER PALNALSRSIS GVATVAREAA QKAKAVG---
14 ---KFGKVS G NAHKIVVAER VLLNFMQRMS GIATLTKLMA D--AA-----
15 ---QFGRVYG CARNIIVAER VVLFNFMQRMS GIATMTKAMA D--AA-----
16 GKRPLATVRG PARLLQGER TALNLLSRCS GVATRARQFK QLCRVRQ---
17 GKIVVAKITG PAKNILLAER TALNILSRSS GIATASHKII SLARSTG---
18 GKIPVAKVTG EARNILLAER TALNILSRCS GIASASRNII ASARAAG---
19 GKIVVCTVKG SASNILLAER TALNLLSRAS GVATQSYKTK KLADESG---
20 TKTKVAIVRG KARQLLLGER VALNTLARCS GIATVSRFR DLARAEG---
21 KPQVLAVHIG PVRNIIIGER LSLNILSRSC GITTQGYNVK KLVGDGNEQ-
22 ---PLFELEG PSRVLLTGER TALNFVQTLS GVASKVRHYV ELLE-----
23 ---TLCDITG PAKQLLTGER TALNFLQTLS GVATETSRYV AVLQ-----
24 ---KLCLLRG PAQILLTGER TALNFIQTLS GVATEVSHYV HCLT-----
25 ---LICIIQG PIKCLLAGER TALNFIQTLS GVSSKVKKYI EIKN-----
26 ---PLCRLSG PARLLLTGER TTLNFVQTL C GVASEVKRYV AALA-----
27 ---VIATITG CSRALLTAER TALNFLSHLS GIATATASIV TAIAGT---
28 ---VLATLHG RSRSLVSAER TSLNFLQTLS ATATTTAA YV AAVA-----
29 ---VLALLQG RSRSLLSAER TSLNFMQTLS ATATTTAA YV AAVA-----
30 ---TLCTLTG PARILLTGER NAMNFIQTLS GCATATARYV QELK-----
31 ---TLCTLIG PARDLLTGER NAMNFIQTLS GCATITAQYA AKIA-----
32 ---MLFQLKG PARALLTGER SALNFLQLLS GTATRSQHYA DLVA-----
33 ---PLFHLEG PARSLLSGER SALNFLQLLS GVATRARFLA DLVA-----
34 ---ALFHLEG PARSLLTGER SALNFLQMLS GVATRAKYFA DIVA-----
35 ---VLATVRG NARNLLTAER TALNFMTHLS GIATDTKKIV DSVADY---
36 ---AFLKLAG SARSLTVER PALNFVQTLS AVATKAAFYV QQLE-----
37 ---VLCESG SARVILTGER TAMNFIQTLS GVASLTKRYV DKLA-----
38 ---LVCESG PARAILTGER TAMNFIQTLS GVASLTKLYV NKLA-----
39 ---VLCESG PARAILTGER TAMNFIQTLS GVASLTRVYV DKLA-----
40 ---LVCESG PARTILTGER TAMNFIQTLS GVATLTKHYV DKLV-----
41 ---VLCESG SARAILTGER TAMNFIQTLS GVATLTKLYV DRLA-----
42 ---ELCRLKG PSRILLTGER TALNFLQTLS ATATTTYHYS KLLD-----
43 ---TLFELEG DARTLLTGER VALNFLQTLS GTATLTSHYV KELA-----
44 ---TLFTATG SARAILTAER TALNFVQTLS GTATTTAHYV KELA-----

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45	---	VLCQISG	NARVILTGER	TALNFLQTLS	GTATVVADYV	QALG-----	-----
46	---	KLVTLRG	NARRLLTGER	TALNFIQLLS	GTATKAHQFA	QLLP-----	-----
47	---	QLFSLEG	AARTLLTGER	TALNFIQTLS	GIATTVKQYT	DLIK-----	-----
48	---	VIFRMQG	PARSLLTAER	AALNWLQTLS	GVATACAHYA	RRVS-----	-----
49	---	ALALLTG	KARSLVTGER	TALNWLQTLS	GTATTVSRVY	EKLK-----	-----
50	---	TLCIIHG	TASSILTAER	TALNFLQTLS	ATATQTYHYV	QKLK-----	-----
51	---	RVCEVEG	NARALLSGER	TALNLLQTLS	GTATTIARRYA	QAVA-----	-----
52	---	RIFELKG	NVRSILTAER	TIILNFIQMLS	GTATVTNKLIV	KLIS-----	-----
53	---	IICTLYG	LARPLLSGER	TALNFLQTLS	GTATTIAHRYA	SAVK-----	-----
54	---	PVCTFAG	PARALLSGER	TALNFLQTLS	ATATQARHFV	DLVA-----	-----
55	---	VVCRIQG	PSRAVLTGER	TALNFLQFLS	GTATTARRYA	DAVA-----	-----
56	---	VLFTVSG	RARSLLTAER	TALNFLQTLS	GVATQARQYA	NMVS-----	-----
57	---	VFLELEG	PARSLMTGER	AALNLLQTLS	GTATRTRDYA	ARVA-----	-----
58	---	TLCTLRG	NTRKILTGER	TALNFLQTLM	GTATTARRYA	DAVA-----	-----
59	---	ELFRLHG	PARVLLTGER	NALNFVQTLS	GVASLTARYV	AELA-----	-----
60	---	LLCEIHG	PTRIILLTGER	TALNFIQTMS	GIASKVKLYV	EALK-----	-----
61	---	TAAVEG	NARALLAAER	TALNYLTHLS	GIATATARAV	AEVAKY----	-----
62	---	ELCRISG	PARALLTAER	SALNFLQLLS	GVASETRRYV	DAVA-----	-----
63	---	VVCEIEG	PARSLLTAER	ASLNFLQLLS	GVATATSRYA	EAIA-----	-----
64	---	VVCEITG	PARALLTAER	PALNFLQLLS	GVATVTRRYA	DLIA-----	-----
65	---	VLLNVSG	NARSVLTAER	TALNIMQRLC	GIANLTARYA	DEIAHT----	-----
66	---	TVCELRG	PARALLTAER	NALNFLQLLS	GVASATROQV	DRIA-----	-----
67	---	TVCELRG	PVRALLTAER	NALNFLQLLS	GVASATRHYV	DAVA-----	-----
68	---	TVCELEG	PARALLTAER	NGLNFLQLLS	GVATATRRYV	DRVE-----	-----
69	---	ETALIRG	PARGMLTAER	TALNFLCHLS	GVASATASIV	AAIGAG----	-----
70	---	VVLELQG	PARALLTAER	TVLNFLQLLS	AVASKTAEYV	AAVQSV-P--	-----
71	---	VVLEIQG	RAQALLTAER	TALNFLQLLS	AVASKTAGYV	AAVQ-----	-----
72	---	VVVMERS	QARALLSAER	TALNFLQLLS	AVATKTATYV	ALVE-----	-----
73	---	VIVEITG	PARDLLTAER	TCLNFLQTLS	AVATKTARYV	NEVK-----	-----
74	---	VVLEIEG	QARALLSAER	TALNFLQMLS	AVATKTRRYV	DAVA-----	-----
75	---	VVLEIEG	QARALLSAER	TALNFLQLLS	AVATKTRTYV	DAVA-----	-----
76	---	LVCEIEA	DARALLAAER	PALNFLQLLS	ATATLTRRHV	DAIA-----	-----
77	---	TLCVLDG	DARALLTGER	TALNFLQMLS	AVATRTRKFV	EAIE-----	-----
78	---	KLCAVKG	TARALLTGER	TALNFLQLLS	AVSTQTRSYV	NAIS-----	-----
79	---	LCEVDA	SARVLLTAER	TALNFLQLLS	GTATVTRRFV	DAVA-----	-----
80	---	LCEIDG	NGRALLTAER	SALNFLQLLS	AVASKARVYA	DAIT-----	-----
81	---	ALVEIRG	NARALLTAER	PALNFLQTLS	GVATVTRAYV	DAVR-----	-----
82	---	TLCSLSG	PARALLTAER	CALNFLQTLS	GTATATRQYV	NAIT-----	-----
83	---	ALMEIRG	DFSMLLKVER	TLLNLLQHSS	GIATLTSRFV	EALNS-----	-----
84	---	ILCNIKG	SHIHILQLER	VLLNILAHSS	GIATLTASYV	RLIKD-----	-----
85	---	RLVALEG	DYVSLQIER	TLLNLLQHSS	GIATQTRRLV	NLIPSG----	-----
86	---	VLATLSA	TSHVLLRVER	TFLNMLLHAS	SIATLTKKYA	DIIEP-----	-----
87	---	LVCELRG	QANSILTAER	SALNFLQTLS	ATATITRQYI	EKLQ-----	-----
88	---	MVAKVSG	SVINILQAER	VALNFISYLS	GIATKTSIFV	KESK-----	-----
89	---	LLAEMAG	DSAMLLQGER	VALNLLQRCM	GIATLTARYV	EAVAGT----	-----
90	---	LIAELTG	DSALLQGER	VALNLLQRCM	GTATLTARYV	EAVAGT----	-----
91	---	VLAWIKG	EAATLLQGER	VALNLMQRMS	GVATHAAAFV	KELEGT----	-----
92	---	VFATLEG	DAADLLMGER	VALNLLQRCM	GVATITSHFV	QAVRGT----	-----
93	---	TALRVAG	SARHILKAER	VILNFMTHLS	GIANLTHDYV	TALEG-----	-----
94	---	TVVRLRA	SARLLKAER	IILNFMTHLS	GIANLTARYV	DALSG-----	-----
95	---	IICTIEG	DLVQILKAER	VALNFLGHLS	GIATHTRRFV	KKIAG-----	-----
96	---	IILTVSG	PVVDLLKAER	VALNLLQRLS	AIATMTSLFV	QAVEGT----	-----
97	---	LVGTARG	TVRALLAAER	TALNFLQRLS	GVATATRRCV	DALAAGG----	-----
98	---	VAARCHG	RMRSLLAAER	TALNIVQRAA	GIATLAQQAV	TSVRGS----	-----
99	---	VVAEITG	SLAGILIAER	VALNFFQRCM	GIATATRQYV	EAVAGT----	-----
100	---	PFFRMEG	SVRSLTAER	TALNLLQRLS	GVATLTRRMV	NALAGT----	-----
101	---	VIVKGYG	PASEILSIER	VLLNFLQRAS	SISSRTRDFV	SKVAG-----	-----
102	---	CLLRGEG	SASKILSVER	VLLNFQRAS	GISSLTRQFV	EIHG-----	-----
103	---	ILVSGKG	LAKCLLPIER	VMLNLIQHAS	GIASITKQFV	DEITG-----	-----
104	---	TLVSGEA	LAIHLMPIER	VILNFIQHAS	GIASITRQFV	NEVSG-----	-----
105	---	CIIRGCG	SAHVLLRIER	VFLNFIQRSC	AVAAATRRFV	DAVSH-----	-----
106	---	VVATIEG	RAENILIGER	VALNFLSHIS	GIATKTNQFV	KLAN-----	-----
107	---	ILCILIG	SSKAIISAER	VALNFLQMLS	SVATKTHDLV	SKIN-----	-----
108	---	TIAIVNG	PARSLLTAER	TALNFLCKLS	GIATATATLV	NAVRGH----	-----
109	---	VIASVVG	PARAILTAER	TALNFLCHLS	GIATATASIV	NAIRDH----	-----
110	---	TIALVSG	PARAILTAER	TALNFLSHLS	GIATATASIV	NAIRDH----	-----
111	---	VIASVSG	PARGLLIAER	TALNFLCHLC	GIATATAGIV	EVVRGH----	-----
112	---	TVARISG	RARGLLSAER	VALNFLMHLS	GIATYTATFA	DEIAHT----	-----
113	---	IATIEG	PSRGLLTGER	TALNFLGHLS	GIASVTAKIV	AAIAGT----	-----
114	---	VATIEG	PSRLLTGER	TALNFLGHLS	GIATVTAGIA	AAISGT----	-----
115	---	HVLTISG	PARAILTAER	TALNFVGRLS	GVATLTADYV	ARTEGS----	-----
116	---	QVLTISG	PARAVLTGER	TALNFVGRLS	GIATLTADYV	RHTAGT----	-----
117	---	PVLTISG	PARAVLAGER	TALNFVGRLS	GIATLTADYV	RHAAGS----	-----
118	---	PILTARG	GAGLLRGWK	VAQTLVEIWS	GVATATREIV	DAARAVSP--	-----
119	---	LILTARG	PAGALLKSWK	VAQTLIEIWS	GVASGAREIV	AAAQAVAP--	-----
120	---	NLLTISG	PARAVLSGER	TALNFVGRLS	GVATLTANYV	RHTAGT----	-----
121	---	VIATLSG	PVRGILTAER	VALNFLCLRLS	GIATATASVV	AAVRDY----	-----
122	---	TLMVIEG	EAAAILSAER	VALNFVGRLC	GIATLTAALV	AETHGT----	-----
123	---	VLMIEG	KAASILMGER	VALNFAGRLT	GIATLTAAMV	AETRGT----	-----
124	---	PILAVEG	PAEALFAGWK	VAQTLMEWAS	GLATSAGALV	RAAAGAP--	-----
125	---	TFAVITG	NAQALLTAER	VALNLVQRMC	GIAGLTAQYV	KEIEGT----	-----
126	---	TIAEIEG	EAASILSAER	VALNFAGRLS	GIATQTAAFV	AETAGT----	-----
127	---	VLISVTC	RARGLLAAER	IILNFMGRMS	GIATFTRAYV	DAVEGT----	-----

128	---	VVARLSG	SARSILTAER	TMLNFLGRLS	GVASLTRQYV	DAVAHT----	-----
129	---	TLLKIKG	KARALLECEC	SALNLCQHLS	GIATMTRDYV	EAIKGT----	-----
130	---	DLMRLEG	NARAMLTAER	SALNTVQHLS	GVATLTRQYV	DAMGET----	-----
131	---	DVMRLSG	NARAMLTAER	SALNTVQHLS	GIATMTRQYV	DAIAGT----	-----
132	---	DLMRLEG	NARAMLTAER	SALNTVQHLS	GIATMVREYV	DAMDNP----	-----
133	---	AIATIDG	PARGLLTGER	VALNFLGHLS	GIATATAGIA	DAIAHT----	-----
134	---	TVAEVAG	AARTILAAER	TALNFLGHLS	GIATRTRRFV	DAIAHT----	-----
135	---	LLL VATG	PAEAVLAGWK	VAQTLMEYAS	GIASATARIV	DAARAANP--	-----
136	---	VLAEMEG	PARGLLTAER	TALNLLQLLS	GIATLTSQYA	KRIQGT----	-----
137	---	TIFTLRG	PARGILTGER	VALNFFQNL	AVASLTSQFV	EKVA-----	-----
138	---	TVAVIRH	NARVLLSCER	VILNVIQRMS	GIATATRRFV	DAIAGT----	-----
139	---	IFATVRG	RARTLLECEC	VALNFLQRLS	GVATLARRYA	DAVAGT----	-----
140	---	VIAELHG	PAAALLSGER	VVLNLIQRLS	GIATMTREAV	RCLDD-----	-----
141	---	VIATIQG	PVHHVLFGER	VLLNLIQRMS	GIATVTRKAI	DTLND-----	-----
142	---	IATVQGG	PIASLLTAER	VILNVIQRMS	GIATMTRKAV	LALDS-----	-----
143	---	TIARLKG	RAASLMTGER	VVLNLIQRMS	GIATLTKQSI	IRLND-----	-----
144	---	QLARFTG	PVKSLLSGER	VLLNLLQRCM	GIATLTAKAV	EELGD-----	-----
145	---	TIAVASG	PVGPLLSGER	VILNLLQRLS	GIATVTRQAV	DLLGN-----	-----
146	---	IIAAVKA	PVRTLLSGER	VILNLMQRMS	GIASQTNFAI	KQLDD-----	-----
147	---	LVLEIIG	SVRSLLTCEC	VALNFLQHL	GIASMTAAYV	EALGD-----	-----
148	---	IIGRVFG	STHSILSGER	TALNLMQILS	GIATTTSNLN	KRLEG-----	-----
149	---	HFGQVSG	DAKKILMGER	VALNYMQRCM	GIATLTREFV	ERLEG-----	-----
150	---	LIAKIKG	NTRSILTGER	VALNMLQKIS	GIATITNKFV	KEIKG-----	-----
151	---	IIAKIKG	NTRALLKGER	TALNLLQRLS	GIATKTRQLA	DKIKD-----	-----
152	---	VIAKIYG	PAAVILMGER	VALNYLQFLS	GIATKTRRII	NKVKD-----	-----
153	---	RIARVEG	KMSTLLSGER	VALNFLQRLS	GIASKTRNMA	ESIKY-----	-----
154	---	ILGTITG	SARSILRSE	IALNFIQRTS	GIATLTSQYV	AEVKGT----	-----
155	---	SLGAIITG	SARAILRAER	IALNFTQRMS	GIATQTARYV	EAVAGT----	-----
156	---	VILRISG	PLRVLLTAER	VALNIVSHLS	GIATHTSKWV	KQVAG-----	-----
157	---	EVARVEG	KIQHILMLER	TLNLSHAS	GIATQTRAWV	DAVEAAATS-	-----
158	---	AVLGVVA	PTRGLLTAER	TLNLSHAS	GIATATAAWV	DAVEG-----	-----
159	---	AVLTVTA	PTQGLLTAER	TMLNLVCHLS	GIATATSAAV	DAVEG-----	-----
160	---	KLLTVTT	RTRDLLTAER	SALNLLCRLS	GIATATRAWA	DALAA-----	-----
161	---	TIATVSG	PAGSVLTAER	VALNFAQRMS	GIATLTSQYV	RAVAHT----	-----
162	---	TLARVTG	NARAVLLAER	VALNLVQRLS	AIATRTAEFV	DLVQGT----	-----
163	---	HLARVSG	SARSVLLAER	VGLNLVQRMS	AIATKTAEFV	RLVEGT----	-----
164	---	VVMRVAG	PTRGLLTAER	TALNYASHLS	GVATATAHWV	DALAG-----	-----
165	---	ILMTVTA	RTRDLLTAER	TALNFLTMLS	GIATATRAWV	DAVAG-----	-----
166	---	TVAYVNG	PVRGLLTAER	TALNLLCHLS	GIATLTRAUV	DAVAG-----	-----
167	---	TVARVNG	PVRGLLTAER	TALNLLCHLS	GIATLTRSUV	DAVAG-----	-----
168	---	RLLTVSG	PARSLLTAER	TALNLAHLS	GIATATARUV	AEIAG-----	-----
169	---	ILATVEG	PVRDLLTAER	IALNFTQRMS	GIATMTAAUV	DAVNAIYGDD	YDGPVTRPRR
170	---	VIAEVAG	PARPVLLAER	VALNLLMLRC	GVATLTRRYA	AAVEGT----	-----
171	---	LILKIKG	NVKTILSAER	TALNYLQRLS	GIATYQKQMV	EALDD-----	-----
172	---	PIVRLSG	SARDLLTSE	VLLNLSRLC	GVATLTGRYV	EAIGE-----	-----
173	---	TLLKIEG	SLVQILRIER	ILLNFIQYLS	GISTTTGEVV	KKYGQK----	-----
174	---	VVATMAG	NLGSLLTGER	VALNLVMGLS	GIATMTRQYV	QAIAD-----	-----
175	---	RLLDLEG	PATALVAGER	TALNLAHLS	GIATATAELV	AQLQG-----	-----
176	---	VIAELEG	PLASLLSGER	AALNVAMRLS	GVATATRRFV	DQLAD-----	-----
177	---	RLELEGG	PATALVAGER	TALNLAHLS	GIATATGELV	AQLDG-----	-----
178	---	RLELRGG	PAEQLVAMER	TALNLAHLS	GIATATAVLV	AQLEG-----	-----
179	---	EVVQIKG	SLRGILAAER	LALNLLQRLS	GIATLTRTYV	EALRGT----	-----
180	---	EVAHLKG	SLKGILAGER	LALNLLQRLS	GIATLTRTYV	EALRGT----	-----
181	---	IVARIAA	PLETLLGGER	LALNCLMRLS	GIATLTHTYV	QAIAD-----	-----
182	---	VIAVVEG	PVRSLMGER	VALNLLQRLS	GIATITRRYV	ERLAG-----	-----
183	---	VVAEIHG	SLDALLMGER	VALNLAHLS	GIATLTNTYV	EKIAD-----	-----
184	---	KIMDLNG	PVASLLAGER	TALNLAHLS	GVATATKRLV	SKLQG-----	-----
185	---	KLLELNG	PSRSLASER	ISLNSMHL	GISTYTKNIV	DVLKG-----	-----
186	---	DLRLEG	QASALAAVER	TALNLAHLS	GVATATAALV	DQLRG-----	-----
187	---	RLELKG	SSSVLVAER	VSLNVAMHL	GIATSTALLV	TKLSG-----	-----
188	---	KLEIYG	PSKSLASER	IGLNIAHLS	GISTYTKNIV	NKLEG-----	-----
189	---	KLELGG	PSRSLASER	ISLNSMHL	GISTYTKNIV	DVLKG-----	-----
190	---	VVAKLDG	SLDSSLTGER	VALNLGMRLS	GIATMTRKYV	EKIAG-----	-----
191	---	VAMIVEG	KIQSLLQTER	LMLNVMQRMS	GIATMTRKYV	KQLEG-----	-----
192	---	VILRVEG	SYRALLQAE	LALNFLQRLS	GIATMTARYA	EALKG-----	-----
193	---	LLATVEG	PGRALLTAER	PAINFVGRS	GIATRTRRFV	DAVSHT----	-----
194	---	IALTVNG	SVHSILIAER	LVLNTMQRMS	GIATYTHSLQ	ELIAH-----	-----
195	---	IAFYVEG	SSQSILKSER	LVLNAMQRMS	AIATKTAEFV	QKLEG-----	-----
196	---	RVLEVKG	RIASILGGER	TALNFMQRMS	GIATRTNMYV	ERVSHT----	-----
197	---	VVLEVQGG	LLAPLLVAER	TALNFMQRMS	GIATRARAYV	DAIAHT----	-----
198	---	MFLSAEG	SAASLHAGWK	VALNLLEYAS	GIATRTAAIV	NSARAVNP--	-----
199	---	LVLEVSG	KLAPLLVGER	TALNFMQRMS	GIATKTKLFV	EKVSHT----	-----
200	---	RVFVDHG	LLAPILLGER	TALNFMQRMS	GIATKTRAFV	DLVSHT----	-----
201	---	VVMVLNG	RVINILKCE	TALNFLTMLS	GIASLTAKYI	SKVEG-----	-----
202	---	VIGSVTG	PARPILLSGER	VALNLLQRLS	GIATLTRRYV	DALKGG-----	-----
203	---	EVARVRG	PLRGILAGER	LALNLLQRLS	GIATLTRAUV	EALAGT----	-----
204	---	ILAILGG	DAKSLIGER	LSLNILQRLS	GIATATRRFV	EKLKG-----	-----
205	---	VIGEIEG	NTYKLLVAER	TLNVLVSMF	SVATTTTRFV	EKLKHK----	-----
206	---	PFLKVKG	NTKTIITLER	TALNFMHL	GISTKTNRII	NEVRKIN----	-----
207	---	TIFRLRG	GAISILRAER	LSNFLGHLS	GIATLTRNCV	DAVRKHSES-	-----
208	---	AIFEAEG	DLKLLFRYWR	VSQFTLIMC	AIATKTASLV	SAGRKANP--	-----
209	---	IIFRLKG	GAVSILRAER	LALNFLGHLS	GIATLTRACV	DTVROYSVT-	-----
210	---	IIFRLKG	GAVSILRAER	ISNFLGHLS	GIATLTRKCM	DIARKHSET-	-----

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211 ---ILFEAEG DLRKLFKLWR ISQTFLSMTC AIATKTRKMV DKAREVNP-- -----
212 ---TILEISG NAVSVLRAER IVLNFLGHLS GIATNTREYV ETVRQYSD-- -----
213 ---EVMSIQG SARNILRGER VALNILGRMS GIATLTRECV LRA----QK- -----
214 ---VIVTLTG QAHTILLLER TLLNILGRMS GIATRARKMQ DLVSAINPG- -----
215 ---VLELEEG RARAILLLER TALNIGRMS GIATRTRESV DAVRAVSPA- -----
216 ---VILEFEG KAKDILMVER TILNYLMHLS GIATLVSNTC KKVHEINPK- -----
217 ---IVLKAYG EATALLAAER VALNFLMRLS GIATATRQVV ERVREVPD- -----
218 ---TVLRVSG AAQSVLRAER VAVNVAGHAS GVATKTRRAV AAAREASDD- -----
219 ---VVLRVGD PAQSVLRGER VAVNITGHAS GVATKTRAAV DAAESVATDS G-----
220 ---TVLRVSG AASDVLRGER VAVNIAGHAS GVATKTRTAV ERARAVAPD- -----
221 ---VIAEVKG NARAILLVER TALNIGRMS GIATETRKLV EKVRKVNPR- -----
222 ---VILELKG NARAILLVER TALNIMGRMS GIATETRKLV EKVKRVNPN- -----
223 ---VIMEVKG NARAILLVER TALNIGRMS GIATETRRLV DIVREVPNK- -----
224 ---VILELEG NARAILLVER TALNVMGRMS GIATEVRKLV EKVKSVNPK- -----
225 ---GVLEVAG EARRILLFER TLLNLLIYTF SVATTTRMMV EAAHRINPR- -----
226 ---IVLNFEQ DAD-ILTVER LILNFLGKLS GIATITNLMV KKAKEVNPY- -----
227 ---IVLEIEG DAETILGVER LVLNLLGKLS GISTVTHMT RLAKSVNPN- -----
228 ---NILIFQG DAEAVLGVER LVLNMLSRLS AIATETRKMV NIAREINPK- -----
229 ---KILCFRG EASEALKVER VLLNLLMHAS GIATYTRKLV AKAKSANPR- -----
230 ---VVLRAVG EARCLHAAWR TAQEVVAWAS GVATKTRRLV ELARRVNP-- -----

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156 166 176 186
1 --GTQIQ--- --LLDTRKTL PGLRTALKYA VLCGGGANHR LGLTDAFLIK ENHI-----
2 --GTNTQ--- --LLDTRKTL PGLRSALKYA VLCGGGANHR LGLSDAFLIK ENHI-----
3 --TKAKIR--- ---DTRKTL PGLRALQKYA VRVGGGVNHR LGLGDAALIK DNHV-----
4 --TKAKIR--- ---DTRKTL PGLRALQKYA VRVGGGVNHR LGLGDTALIK DNHV-----
5 --TKAQR--- ---DTRKTL PGLRALQKYA VRVGGGVNHR LGLGDAALIK DNHV-----
6 --TNAKIR--- ---DTRKTL PGLRALQKYA VRVGGGVNHR MGLGDAALIK DNHV-----
7 --TKAKIR--- ---DTRKTL PGLRLLQKYA VRVGGGVNHR MGLGDAALIK DNHV-----
8 --TGAQIR--- ---DTRKTL PGLRALQKYA VRVGGGTNHR MGLGDAALIK DNHV-----
9 -----WT GHVAGTRKTT PGFRLVEKYG LLVGGAAASHR YDLGGLVMVK DNHV-----
10 ---GLKTQ--- --LLDTRKTL PGLRTALKYA VLCGGGNHR LGLSDAFLIK ENHI-----
11 -----WT GHVAGTRKTT PGFRLVEKYG LQVGGAAACHR YDLGGMVMVK DNHV-----
12 -----WT GHVAGTRKTT PGFRLVEKFG LLVGGAAASHR YDLGGLVMVK DNHV-----
13 -----WP GQVIGTRKTT PGFRLPEKYG LLVGGAGTHR YGTTDLVMLK DNHV-----
14 ---SPAC--- --ILETRKTA PGLRLVDKWA VLI GGGRNHR MGLFDMVMIK DNHI-----
15 ---HPAC--- --ILETRKTA PGLRLVDKWA VLI GGGRNHR IGLFDMVMIK DNHI-----
16 -----WH GVIAGTRKTT PGFRLVEKYG MHIGGADMHR VDLSGMIMLK DNHL-----
17 -----YK GTIAGTRKTT PGLRRLEKYS MLVGGCDTHR YDLSSMVMLK DNHI-----
18 -----YR GTVAGTRKTT PGLRRLEKYA MLVGGCDTHR YDLSSMVMLK DNHI-----
19 -----YT GIIAGTRKTT PGLRQLEKYA MLI GGVDTHR YDLSSMVMLK DNHI-----
20 -----WK GVVAGTRKTT PGFRLVEKYG MMVGGVDPHR HDLSSMVMLK DNHI-----
21 ---QQQPWK GKIAGTRKTT PGFRLVEKLA LLTAGLDTHR MDLSSMIMLK DNHI-----
22 --GTNTQ--- --LLDTRKTL PGLRSALKYA VLCGGGANHR LGLSDAFLIK ENHI-----
23 --GTRTR--- --LLDTRKTL PGLRTALKYA VSCGGGDNHR LGLSDAFLIK ENHI-----
24 --GLKTQ--- --LLDTRKTL PGLRTALKYA VLCGGGNHR LGLFDAFLIK ENHI-----
25 --TKTKLR--- ---DTRKTI PGLRSSLKYA VLCGGAENHR FGLFDGILIK DNHI-----
26 --GTGTT--- --LLDTRKTV PGLRTALKYA VLCGGGSNHR LGLADAFLIK ENHI-----
27 --KTVVV--- ---CTRKTL PGIRTLQKYA VRAGGGMNHR FALYDAMLIK DNHI-----
28 --GTGAR--- --ILDTRKTL PGLRAAQKYA VRCGGGDNHR IGLFDTVMLK ENHI-----
29 --GTRAR--- --ILDTRKTL PGLRAAQKYA VRCGGGNHR IGLFDTVMLK ENHI-----
30 --GTQCR--- --LLDTRKTI PGLRSALKYA VACGGGYNHR IGVFDAYLIK ENHI-----
31 --HTECR--- --LLDTRKTI PGLRSALKYA VACGGGYNHR IGVFDAYLIK ENHI-----
32 --GTAVK--- --LLDTRKTL PGLRLAQKYA VTCGGCHNHR IGLYDAFLIK ENHI-----
33 --GTQVR--- --LLDTRKTL PGLRLAQKYA VTCGGCDNHR IGLYDAFLIK ENHI-----
34 --GTQVK--- --LLDTRKTL PGLRMAQKYA VTCGGCHNHR IGLYDAFLIK ENHI-----
35 --PAQIT--- ---CTRKTI PGLRIVQKYA VRCGGGRNHR LGLDDAILIK DNHI-----
36 --GLHTK--- --LLDTRKTL PGLRIAQKYA VALGGGNHR LGLFDAFLIK ENHI-----
37 --GTQTR--- --LLDTRKTI PGLRTAQKYA VTCGGGKNHR IGLFDAFLIK ENHI-----
38 --GHTQ--- --LLDTRKTI PGLRTAQKYA VTCGGGKNHR IGLFDAFLIK ENHI-----
39 --GTDRC--- --LLDTRKTI PGLRTAQKYA VSCGGGKNHR IGLYDAFLIK ENHI-----
40 --GTHTR--- --LLDTRKTI PGLRTAQKYA VTCGGGKNHR IGLYDAFLIK ENHI-----
41 --GTHCK--- --LLDTRKTI PGLRTAQKYA VTCGGGKNHR IGLFDAFLIK ENHI-----
42 --GYKTQ--- --LLDTRKTL PGMRLAQKYA VRCGGGVNHR IGLFDAYLIK ENHI-----
43 --GSETK--- --LLDTRKTL PGLRSAQKYA VLCGGGVNHR IGLFDAFLIK ENHI-----
44 --GTRKQ--- --LLDTRKTI PGLRILQKYA VKCGGANHR IGLYDAFLIK ENHI-----
45 --DSNTK--- --LLDTRKTL PGMRLAQKYA VTCGGGKNHR IGLFDAYLIK ENHI-----
46 --NSNCK--- --ILDTRKTI PGLRTAQKYA ITCGGCHNHR IGLYDMFLIK ENHI-----
47 --DTDCK--- --LLDTRKTL PGLRHASKYA VLCGGGLNHR IGLYDAYLIK ENHI-----
48 --HTNVR--- --LLDTRKTL PGLRLAQKYA VTCGGCDNHR LGLWDAFLIK ENHI-----
49 --GTPAH--- --LLDTRKTL PGLRYAQKYA VRCGGGKNHR MGLYDAFLIK ENHI-----
50 --GTRAK--- --LLDTRKTI PGLRLAQKYA VYCGGGLNHR MGLYDAFLIK ENHI-----
51 --GTGVK--- --VLDTRKTL PGLRLAQKYA VRCGGCHNHR AGLYDAVLIK ENHI-----
52 --QYKTK--- --LLDTRKTI PGFRLAQKYA VRCGGGFNHR IGLFDAYLIK ENHI-----
53 --GLPVR--- --ILDTRKTL PGLRQAQKYA VRCGGGNHR HGLYDGILIK ENHI-----
54 --GTHAR--- --ILDTRKTL PGLRAAQKYA TRCGGALNHR QGLYDAILIK ENHI-----
55 --GTGVQ--- --LLDTRKTV PGLRAAQKYA VRAGGGSNHR FGLFDAYLIK ENHI-----
56 --HTKAK--- --VLDTRKTL PGLRVAQKYA ASCGGCRNHR IGLWDAFLIK ENHI-----
57 --DTGVA--- --LLDTRKTL PGLRLAQKYA VTCGGGKNHR LGLHDAFLIK ENHI-----
58 --GSQVT--- --ILDTRKTL PGLRAGQKYA VLCGGCQNH IGLYDAFLIK ENHV-----
59 --DTDCR--- --LLDTRKTL PGLRSAQKYA VTCGGGKNHR IGLFDAYLIK ENHI-----

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60 --DTKIK--- --LLDTRKTL PGLRTASKYA VLCGGGNHR IGLTDAFLIK ENHI-----
61 --GTDIV--- ---CSRKTI PLLRVLQKYA VRAGGGVNRH MGLDDAVLIK DNHL-----
62 --GHRAR--- ---ILDTRKTL PGLRLAQKYA VTAGGGDNQR IGLFDGILIK ENHI-----
63 --GTRAR--- --VLDTRKTL PGLRLAQKYA VRIGGGENQR LALYDGILIK ENHI-----
64 --GTNAR--- --VLDTRKTL PGLRLAQKYA VRIGGGENQR LALYDGILIK ENHI-----
65 --KARLI--- ---DSRKT PGLRALEKHA VTCGGGLNHR LSLDNGVMIK DNHI-----
66 --DTRAR--- --ILDTRKTL PGLRLAQKYA VRVGGGANQR LALYAGILIK ENHI-----
67 --HTRTR--- --ILDTRKTL PGLRLAQKYA VRVGGGANQR LALYDGILIK ENHI-----
68 --GTRAK--- --ILDTRKTL PGLRLAQKYA VRVGGGENQR LALYDGILIK ENHI-----
69 --HTKVT--- ---CTRKT PGLRAVQKYA VRVGGGSNHR YGLDDAVLIK DNHV-----
70 --GSRAQ--- --IVDTRKTL PGLRLAQKYA VRAGGGSNHR LGLYDALLIK ENHI-----
71 --GTRAQ--- --IVDTRKTL PGLRLAQKYA VRTGGGTNHR IGLYDAVLIK ENHI-----
72 --GTKAR--- --IVDTRKTL PGLRLAQKYA VLTGGGTNHR VGLYDAVLIK ENHI-----
73 --GTRAV--- --ILDTRKTI PGLRVAEKYA VRCGGGKNRH MGLFDAMLIK ENHI-----
74 --GTRAQ--- --IVDTRKTL PGLRLAQKYA VRMGGGTNHR IGLHDAVLIK ENHI-----
75 --GTRAH--- --IVDTRKTL PGLRLAQKYA VRTGGGTNHR IGLHDAVLIK ENHI-----
76 --GASPNPRG CAILDTRKTL PGLRQAQKYA VRTGGGQNRH LALWHGILIK ENHI-----
77 --GTGQ--- --IVDTRKTL PGLRLAQKYA VRCGGGVNHR TGLYDGILIK ENHI-----
78 --GTGAV--- --IVDTRKTL PGLRLAQKYA VKCGGVTNHR IGLYDGILIK ENHI-----
79 --GTRAK--- --IVDTRKTL PGLRLAQKYA VSVGGGTNHR VGLYDGILIK ENHI-----
80 --GTAKQ--- --VVDTRKTL PGLRIAQKYA VRAGGGGNHR LALWDAILIK ENHI-----
81 --GTGAA--- --IVDTRKTL PGLRLAQKYA VRTGGGQNRH IGLYDGILIK ENHI-----
82 --GTRAR--- --ILDTRKTL PGLRIAQKYA VRIGGGLNQR IGLYDGILIK ENHI-----
83 --HKVRL--- ---DTRKTR PLLRIFEKYS VLNNGASNHR LGLDDALMLK DTHL-----
84 --MHVKLL--- ---DTRKTR PLLRQLEKYS IVNGGGNHR FGLDSMLMLK DTHL-----
85 --SNLKIL--- ---DTRKTR PLLRAFEKYS VRNNGGINHR LGLDDCLMLK DTHL-----
86 --YGVKLL--- ---DTRKTR PMLRVFEKYA TRCGGAVNHR MGLDDSLMIK DTHL-----
87 --GSHTQ--- --LLDTRKTM PGLRLAQKYA VHCGGGTNHR IGLYDAILIK ENHI-----
88 --GNVKIL--- ---DTRKTL PAYRMLAKYA VKCGGGENHR IGLYDMILIK DNHI-----
89 --GARIV--- ---DTRKTM PGLRVLDKHA VRLGGGINHR TGLYDGVLIK ENHI-----
90 --RARIV--- ---DTRKTT PGLRVLEKYA VRVGGGINHR TGLYDGVLIK ENHI-----
91 --GAAVV--- ---DTRKTT PGLRVLEKYA VRVGGGNHR TSLYDGVLIK ENHV-----
92 --RTRIV--- ---DTRKTT PGLRELEKYA VRVGGGFNHR TGLYDGVLIK ENHI-----
93 ---THTR--- --LLDTRKTL PGLRHVEKYA VLVGGGLNHR IDLAEMMLK DNHI-----
94 ---TGTR--- --LLDTRKTL PGLRYPEKYA VVIGGGLNHR RNLQEMMLK DNHI-----
95 ---TKTK--- --ILDTRKTT PAFRDLEKRA VVHGGGVNHR MNLSDAILIK DNHI-----
96 --GVRIT--- ---DTRKTT PGLRMLEKYA VLAGGGSNHR FNLADGVMIK DNHI-----
97 ---GRTR--- --LLDTRKTT PGWRMLEKAA VRAGGKGNHR FSLGDGVLIK DNHV-----
98 ---NLR--- --VLDTRKTP PGMRTVAKEA VRMGGASNHR FGLFDGVLIK DNHI-----
99 ---KAK--- --ILDTRKTA PGLRILDKYA VRIGGGANHR FGLSNAVLIK DNHI-----
100 ---SCR--- --LLDTRKTT PLWRVLEKAA VRHGGGSNHR FGLFDGVLIK DNHV-----
101 --TKAKIR--- ---STRKTS PGLRNFPLYA VRVGGGESYR DGLYNGIMVK DNHI-----
102 --TNAIR--- ---STRKTC PGLRKFPLYA VHVGGGESFR TGLFDGVLIK DNHI-----
103 --TKAKIR--- ---STRKTT PGLRILDKYS VHIGGGENYR NSLYDGILIK DNHI-----
104 --TKAKIR--- ---STRKTT PGLRMLDKYS VCVGGGENYR NSLYDGVLIK DNHI-----
105 --TKAKIR--- ---DTRKTT PGMRCVEKYA VKVGGGSYR NSLNDRVLLK DNHI-----
106 --KTKIC--- ---CTRKTI PTLRVIQKYA VTLGGGTNHR FNLSDEFLIK DNHI-----
107 --HTNAQ--- --LIDTRKTI PGLRLAQKYA VKCGGGVNRH MGLYDCVMLK ENHI-----
108 --NAKIV--- ---CTRKTT PGLRVLEKYA VRAGGGANHR FALDDAVLIK DNHI-----
109 --PVKIT--- ---CTRKTT PGLRAVEKYA VRAGGGANHR FGLDDAILIK DNHI-----
110 --KAKIV--- ---CTRKTT PGLRAVEKYA VRAGGGGNHR FGLDDAILIK DNHI-----
111 --KAQIV--- ---CTRKTT PGLRALEKYA VRAGGGSNHR FGLDDAILIK DNHI-----
112 --GAKVC--- ---CTRKTI PGLRALEKYA VRLGGGSNHR YGLDDAVLIK DNHI-----
113 --KASVA--- ---CTRKTT PGLRALEKYA VRAGGGMNHR FALYDAVLIK DNHI-----
114 --KASVA--- ---CTRKTT PGLRALEKYA VRAGGGMNHR FALYDAVLIK DNHV-----
115 --RMRIC--- ---CTRKTT PGLRALEKYA VRCGGGFNHR FGLDDAILIK DNHI-----
116 --KMRIC--- ---CTRKTT PGLRALEKYA VRCGGGFNHR FGLDDAILIK DNHI-----
117 --KLRIC--- ---CTRKTT PGLRALEKYA VRCGGGFNHR FGLDDAILIK DNHI-----
118 --HIAVA--- ---CTRKNT PGTKRFAVAA VKSGGAVMHR LGLSETILVF GEHR-----
119 --EVVVA--- ---CTRKNT PGTKRYAAAA VKAGGAVMHR LGLSESIILF PEHR-----
120 --KLRIC--- ---CTRKTT PGLRALEKYA VRCGGGFNHR FGLDDAVLIK DNHI-----
121 --KAKIV--- ---CTRKTT PGLRAIEKYA VRVGGGSNHR FGLDDAVLIK DNHV-----
122 --NARIT--- ---CTRKTT PGLRLVEKQA VLGGGGFNHR YLSDAILIK DNHI-----
123 --QARIT--- ---CTRKTT PGLRMVEKLA VLGGGGFNHR YLSDAILIK DNHI-----
124 --GTVVA--- ---CTRKT PGTALAFKA VTAGGATLHR TGLSDTVLLF PEHR-----
125 --GAILL--- ---DSRKT PGLRMIEKYA VVCGGGRSHR LGLDSGIMLK DNHI-----
126 --KARIT--- ---CTRKTT PGLRLVEKQA VLGGGGFNHR FGLSDAILVK DNHI-----
127 --GARIA--- ---HTRKTT PGFRAFELQA VQAGGGALHR FGLDDAILIK DNHV-----
128 --KTRIV--- ---CTRKTT PGHRALEKRA VRCGGGTSHR YGLDDAILIK DNHI-----
129 --GTILL--- ---DTRKTI PGLRLLEKYA TRMGGQNRH MGLDDGAMIK DNHI-----
130 --QARLL--- ---DTRKTI PGLRHLEKYA VRTGGGTNHR MGLWDAAMIK DNHV-----
131 --GATLL--- ---DTRKTI PGLRVLEKYA TRMGGAKNHR MGLWDAAMIK DNHV-----
132 --DCTLL--- ---DTRKTI PGLRHLEKYA TRMGGASNHR MGLWDAAMIK DNHV-----
133 --KARIC--- ---CTRKTT PGLRAVEKYA VRAGGGSNHR FGLDDAVLIK DNHI-----
134 --RARLT--- ---CTRKTT PGLRLEKYA VRCGGGSNHR FGLDDAVLIK DNHI-----
135 --GVVVA--- ---CTRKTF PGTKAVAIKA VIAGGGVPHR LGLSDSVLLF PEHR-----
136 --GCTLL--- ---DTRKTI PGLRRLSKYA TRCGGAKNHR MGLYDGVLIK DNHI-----
137 --GTGCR--- --IVDTRKTV PGMRLVQKYA VRVGGGNHR MGLDDGVLIK ENHI-----
138 ---HAK--- --ILDTRKTV PGLRVLDKYA VRCGGGTNHR LDLSDGVLIK NNHI-----
139 ---GCR--- --VIDTRKTT PGLRALEKAA ARTGGITNHR AGLYDAILIK NNHI-----
140 --EQIKIC--- ---DTRKTT PGLRMLLEKYA VRAGGGYNHR FGLYDGMIMK DNHI-----
141 --PSIRIC--- ---DTRKTT PGLKLFKYEYA VRSGGGVNHR LNLSDMVLIK DNHI-----
142 --SHTRIC--- ---DTRKTM PGLRMFDKYA VVCGGGFNHR FGLYDGMIMK DNHI-----

143	-PNIAIC---	----DTRKTT	PGLRILEKYA	VKTGGGSNHR	FGLDGGIMIK	DNHI-----
144	-PSIRVC---	----DTRKTA	PGLRMFDKFA	VRIGGGANHR	FGLDDALMLK	ENHI-----
145	-SSTRIC---	----DTRKTT	PGLRMLEKYA	VTGGGGYNHR	FGLYDGVMIK	DNHI-----
146	-SAIRIC---	----DTRKTA	PGLRAFDKYA	VQTGGGFNHR	NGLYDGVMLK	DNHI-----
147	-DCIKVF---	----DTRKTT	PNLRLFKEYA	VRVGGGYNHR	FNLSDAILLK	DNHI-----
148	-TGVKLL---	----DTRKTT	PGMRLLKEYA	VKIGGGYNHR	FGLSDGILLIK	DNHI-----
149	-TKVKLL---	----DTRKTT	PNMRIFEKYA	VKVGGGTNHR	FGLNDGVMIK	DNHI-----
150	-TKAKLL---	----DTRKTT	PNLRFVEKYA	VKVGGGYNHR	FSLSDGVLIK	DNHI-----
151	-LPAKLV---	----DTRKTT	PGLRVLEKYA	VRVGGGYNHR	FCLSDGVLIK	DNHI-----
152	-YPPRVV---	----DTRKTV	PGLRWLSKYA	VRVGGGHNHR	FNLSDGILLK	DNHI-----
153	-QHAVLV---	----DTRKTT	PGLRLLEKYA	VRVGGAKNHR	FGLYDGVMIK	DNHI-----
154	--KARIV---	----DTRKTT	PGLRIIERQA	VRDGGGFNHR	ATLSDAVMVK	DNHL-----
155	--GARIV---	----DTRKTT	PGLRIIERQA	VRDGGGHNHR	TSLSDAVMVK	DNHL-----
156	-TETRIR---	----DTRKTL	PGLRQLQKYA	VVCGGGINHR	MGLGDAALIK	DNHI-----
157	PQGCKVR---	----DSRCTL	PGMRMLEKRA	IVHGGGYPHR	YNLGDQVMVK	DNHV-----
158	-TDCKIR---	----DSRCTL	PGLRALQKYA	VRVGGGVNHR	MGLGDAALIK	DNHV-----
159	-TGAKIR---	----DSRCTL	PGLRGLQKYA	VRVGGGVNHR	MGLGDAALIK	DNHV-----
160	-TDTKVR---	----DTRKTT	PGLRSLEKFA	VRCGGGVNHR	MSLSDAALVK	DNHV-----
161	--SARIV---	----DTRKTT	PGLRAFERHA	VRCGGGGNHR	FSLSDAVMAK	DNHL-----
162	--KARIT---	----DTRKTT	PGLRVLEKYA	VRCGGGANHR	FSLSDAVLAK	DNHL-----
163	--RARIT---	----DTRKTT	PGLRVLEKYA	VRCGGGANHR	YLSDAVLAK	DNHL-----
164	-TRARVL---	----DTRKTL	PTFRALQKYA	VRCGGGVNHR	FSLGDRAMVK	DNHV-----
165	-TKAAIR---	----DSRKTH	PGLRVLEKYA	VRCGGGVNHR	FGLADAALIK	DNHI-----
166	-TGAMIR---	----DTRKTL	PGLRALEKYA	VRCGGGVNHR	MSLTDAALIK	DNHV-----
167	-TGAAIR---	----DTRKTL	PGLRALEKYA	VRCGGGSNHR	MSLTDAALIK	DNHV-----
168	-TGAVIR---	----DTRKTT	PGLRMLEKYA	VRCGGGENHR	MSLADAALIK	DNHI-----
169	YERTRIV---	----DTRKTT	PGLRPFKEYG	VVCGGGHNHR	YGLSDAVMMK	DNHL-----
170	----GAR---	--IADTRKTT	PGLRALEKAA	VRAGGGVNHR	SGLDDGVLIK	DNHL-----
171	-KNILLL---	----DTRKTT	PNMRIFEKYS	VRVGGGYNHR	YNLSDAIMLK	DNHI-----
172	-HDARLV---	----DTRKTT	PGWRRLEKYA	VRCGGGHNHR	TGLYDGFLLIK	DNHL-----
173	--GLMIL---	----DTRKTL	PGYRKLAKYA	VYCGGGSNHR	LNLSEMAMIK	DNHL-----
174	-YPTRFV---	----DTRKTT	PGLRVLEKYA	SRLGGAMNHR	LGLDDAVMVK	DNHI-----
175	-TGVRLA---	----DTRKTT	PGLRLLEKYA	VRCGGGINHR	MGLDDAAMLK	ENHI-----
176	-LPTQFV---	----DTRKTT	PGLRLLEKYA	TRVGGGTNHR	LGLDDAVMVK	DNHI-----
177	-TGVRLA---	----DTRKTT	PGLRLFKEYA	VRCGGGINHR	MGLDDAAMLK	ENHL-----
178	-TGVVALA---	----DTRKTT	PGLRGLEKYA	VRCGGGINHR	MGLDDAAMLK	ENHL-----
179	----STQ---	--LLDTRKTT	PGLRALEKYA	VRVGGGKNHR	FGLFDGILLIK	ENHI-----
180	----STQ---	--LLDTRKTT	PGLRALEKYA	VRVGGGKNHR	FGLFDGILLIK	ENHI IATQRC
181	-LPTQLV---	----DTRKTT	PGLRLLEKYA	VAVGGGVNHR	FGLDDAILIK	DNHI-----
182	-HHARLV---	----DTRKTT	PGLRLIEKYA	VRVGGALNHR	FGLDDAAMIK	DNHI-----
183	-LPARLV---	----DTRKTT	PGLRLLEKYA	TAVGGATNHR	MGLDDAVMIK	DNHI-----
184	-TGILLA---	----DTRKTT	PGLRQLEKYA	VRCGGGINHR	LGLDDAAMLK	ENHI-----
185	-TNINLA---	----DTRKTT	PGLRIFEKYA	FKCGGGINHR	MGLYDAAMIK	ENHI-----
186	-SSVRLA---	----DTRKTT	PGLRVLEKYA	VRCGGGVNHR	CGLDDAAMLK	ENHL-----
187	-SKVKLA---	----DTRKTT	PGIRVFEKYA	FHCGGGINHR	LGLDDAAMLK	ENHI-----
188	-TNIKLA---	----DTRKTT	PGLRIFEKYA	FKCGGGVNHR	MGLYDAAMIK	ENHI-----
189	-TNIKLA---	----DTRKTT	PGLRIFEKYA	FKCGGGINHR	MGLYDAAMIK	ENHI-----
190	-LNVQLV---	----DTRKTT	PGLRILEKYA	TQVGGAKNHR	MGLDDGVMIK	DNHI-----
191	---TKTR---	--VLDTRKTT	PGLRMLEKAA	VKIGGGVNHR	IGLFDMILLK	DNHV-----
192	---TAVR---	--LLDTRKTA	PGMRITDKMA	VRHGGGHNHR	MGLYDMIMLK	DNHI-----
193	---EAD---	--ILDTRKTL	PGHRRPDKYA	VRHGGGRNHR	MGLYDMVLIK	DNHI-----
194	---TKAK---	--VLDTRKTT	PNFRMLEKWA	VKIGGGVNHR	YGLFDMILLK	DNHV-----
195	---TKTK---	--ILDTRKTT	PGIRAIEKWA	VKIGGGENHR	FALYDMIMLK	DNHI-----
196	----NAS---	--ILDTRKTA	PALRYDKEA	VRIGGGTNHR	FGLFDMILLIK	DNHI-----
197	----NAR---	--ILDTRKTV	PGMRSFDKEA	VRIGGGYNHR	TGLFDMMLIK	DNHI-----
198	--AVSVV---	----TRKSF	PGTKKVAIKA	IMAGGAMPHR	LGLSESLVF	RHHT-----
199	----KAS---	--ILDTRKTA	PGLRYFDKEA	VRIGGGRNHR	FGLFDMMLIK	DNHI-----
200	----EAR---	--ILDTRKTA	PGLRYFDKEA	VRIGGGRNHR	FGLFDLILIK	DNHI-----
201	---LNVS---	--LADTRKTI	PGMRMLEKYA	VYAAGGKSNR	PDLACGVLIK	DNHL-----
202	---HAR---	--LLDTRKTT	PLWRDLEKEA	VRQGGGTNHR	AGLDDGILLIK	DNHV-----
203	----KAQ---	--ILDTRKTT	PGLRALEKYA	VRVGGGRNHR	YGLFDGILLIK	ENHV-----
204	-TNVKIL---	----DTRKTT	PGFRYFEKYA	VRIGGGTNHR	FGLYDMVLIK	DNHK-----
205	-----IAATRIL	-----	PGLGVLQKIA	VHGGGDPHR	LDLSGCVMIK	DNHL-----
206	-KTVKIA---	----ATRKTH	PLLSMIEKYA	VFVGGGDTHR	FRLDDMVMIK	DNHI-----
207	---TRVAC---	----TRKTT	PGIRKFEKLA	VAAGGGDTHR	FNLSDAVMIK	DNHI-----
208	--DIIIA---	----TSRKTH	PGSRIFEIKA	VRAGGGDIHR	NSLSDSIQFS	QNHL-----
209	---TRVAC---	----TRKTT	PGIRKFEKLA	VAAGGGDTHR	FNLSDSVMIK	DNHL-----
210	---VRVAC---	----TRKTT	PGIRKFEKLA	VAAGGGDTHR	FNLSDAVMIK	DNHV-----
211	--DIMIA---	----TSRKTH	PGFRKYELRS	VHAGGGDHR	NSLSDSILIT	QNHF-----
212	---VKVAG---	----TRKTT	PGIRKFEKLA	IIAGGGDPHR	FDLSDTIMIK	DNHV-----
213	---VRVAC---	----TRKTT	PGFRYFEKKA	VLIAGGGDTHR	FNLSGAVMIK	DNHI-----
214	---CRIAA---	----TRKTA	PGLRLMDKKA	AMIGGADPHR	FSLSDAVLIK	DNHR-----
215	---VRVAA---	----TRKTA	PGLRMLDKKA	VVLGGGDPHR	YCLSDMVLIK	DNHL-----
216	---IRVAC---	----TRKTT	PGLQKLEKKA	VEIAGGGDTHR	FKLDDCVLIK	DNHI-----
217	---VIVAA---	----TRKVH	PITGFLEKKA	VSDGGGLDHR	FGLDDAVLIK	DNHL-----
218	---VAIAG---	----TRKTT	PGLRGVEKRA	VVAGGGDTHR	LDLSHMVMVK	DNHV-----
219	---SRIAG---	----TRKTT	PGLRGVEKRA	VAAGGGDTHR	LNLSHMVMVK	DNHI-----
220	---VAIAG---	----TRKTT	PGLRGVEKRA	IAAGGGDTHR	LDLSHMVMVK	DNHI-----
221	---VKVAG---	----TRKSL	--LRLIDKRA	IMIGGEPHR	FSLSDAILIK	DNHL-----
222	---VKVAG---	----TRKSL	--LRLIDKKA	IMIGGEPHR	FSLSDAILIK	DNHL-----
223	---VKIAG---	----TRKSL	--LRLLDKKA	IMIGGEPHR	FSLSDAILIK	DNHL-----
224	---VRVAG---	----TRKTL	--LKPDKRA	LLIGGGETHR	FSLSDAILIK	DNHL-----
225	---VRIAA---	----TRKTP	PGLRYFAKCA	VAVGGGDTHR	LSLSDAVLVK	DNHV-----


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226 ---VRIAG-- ----TRKTT PGFRLFKEYA IEVGGGDPHR YNLSDAVLIK DNHI-----
227 ---VRIAG-- ----TRKTT PGLRVFEKYA IEVGGGDPHR YNLSDAVLIK DNHI-----
228 ---VIAG-- ----TRKTT PGLRIFEKYA IEIGGGDPHR YSLYDMVLIK DNHI-----
229 ---VIVAA-- ----TRKTL PFLRYIEKKA VWIGGGDPHR FSLSDSTLFK DNHR-----
230 ---RVVVA-- ----ATKTP PGLRALYHKA VLAGGGMVHR CCLSDGVLVF RNHL-----
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1  --IASGS--- ----- VRQAVEKAFW LHPDV----- PVEVEVEN-- LDELDDALKA
2  --IASGS--- ----- VRQAVEKASW LHPDA----- PVEVEVEN-- LEELDEALKA
3  --AAG---- -S----- VVDALRAVRN AAPDLP----- -CEVEVDS-- LEQLDAVLPE
4  --AAG---- -S----- VVDALRAVRA AAPELP----- -CEVEVDS-- LEQLDAMLAE
5  --VAAG---- -S----- VVDALRAVRD AAPELP----- -CEVEVDS-- LEQLDEVLPE
6  --AAAG---- -S----- VVAALRAVRA AAPGLP----- -CEVEVDS-- LEQLDEVLAE
7  --AAAG---- -S----- VVAALKAVRE EAPGLP----- -CEVEVDS-- LEQLDEVLAL
8  --AAAG---- -S----- VVAALRQVRS AAPDLP----- -CEVEVDS-- LEQLDEVLAE
9  --VAAG---- -G----- VEKAVRAARQ AADFALK--- -VEVECSS-- LQEAQVAAEA
10 --IAAGS--- -S----- IKEAVAKAFW IHADV----- PIEVEVES-- LDELQQALEA
11 --VAAG---- -S----- MERAVLKARQ AAGFSLK--- -VEVECSS-- LEEAFRAAEA
12 --LAAG---- -G----- VEKAVQAARQ VADFTLK--- -VEVECSS-- LQEAVEAAKA
13 --WAMG---- -G----- VKEALDGVRA LAGKTLK--- -VEVECRS-- LEEALDAAAA
14 --SAAG---- -G----- IVNAVKSUDE YLKQKNL-EM DVEVETRT-- LEEVKEVLEY
15 --SVAG---- -G----- ITNAMKFVDR FLAKEKL-AL PVEVETRT-- LQEVKDLLEY
16 --ACIGLELQ RAPDD--PIV IQEAVRRARN CAGFSVS--- -VEVECGS-- EASALAAITA
17 --WATG---- -S----- ITNAVKNARA VCGFAVK--- -IEVECLS-- EDEATEAIEA
18 --WATG---- -S----- ITRAVQDARA ACCFTIK--- -IEVECS-- EAKADKAIAA
19 --TSTG---- -S----- ITKAVKKAKS VCGFAVK--- -VEVEVSN-- EKDAEEAIEA
20 --WATG---- -S----- ITSAIQTVRR VAGFSL--- -VNVECON-- FKEADEAVTA
21 --WACG---- -N----- ITNTVKNARS VGGFSLK--- -IEVECRN-- QNEAIEAIEA
22 --IASGS--- -S----- VRQAVEKASW LHPDA----- PVEVEVEN-- LEELDEALKA
23 --IAAGS--- -S----- IKNAVEKAQS LRGDV----- PVEVEVES-- LDELQQALEA
24 --IANGS--- -S----- IKQAVDKARY SHPDV----- PVEVEVET-- LDELILALKA
25 --EYIGS--- -S----- IKKIINMTRL YFPKS----- KLEIEVRN-- IKELKEAITS
26 --IAAGS--- -S----- IANAVTNAVA LRADV----- PVEVEVES-- LDELHQALDA
27 --AIAGS--- -S----- VREALRHAKA MAGHLVN--- -IEIEVDT-- LEQLHEAMEI
28 --RAAGS--- -S----- LSAAVHAARV QQPQ-----L PLVVEVET-- LEQLREALQV
29 --RAAGS--- -S----- LSAAVHAARA QQPQ-----L PLVVEVET-- LEQLHEALQV
30 --IACGG--- -S----- IRQAI STAKQ LNPBK----- PVEVETET-- LAELEEAISA
31 --IACGG--- -S----- ITQAVTKAKE LQPGK----- PVEVETEN-- LDELREAINA
32 --AACGG--- -S----- IDRAIAEARR IAPGK----- PVEVEVEN-- LDELQQALEA
33 --AASGG--- -S----- VAEAVAAAHR IAPGK----- PVEIEVES-- LDELQQAALAA
34 --AACGG--- -S----- IAQAVTAHR IAPGK----- PVEVEVES-- LGELKQALDA
35 --AIAGD--- -S----- IKTAIEQAQQ FAGHLIP--- -IEIEVDT-- LAQLEQALDA
36 --MAAGG--- -S----- IAQAI EKAHQ IAPGK----- PVEVEVET-- WDELQQAALQ
37 --MACGG--- -S----- IAEAIQAARA LHNDK----- PVEVEVES-- LDELKAALDG
38 --MACGG--- -S----- ISKAITAARA LDSNK----- PVEVEVES-- LEELTQALDG
39 --MACGG--- -S----- IKAIDKART LHPDK----- PVEVEVES-- LAELTEALQA
40 --MACGG--- -S----- IRQAVDTARS LYPNK----- PVEVEVES-- LEELALALDS
41 --MASGS--- -S----- IASAINAARQ LASDK----- LVEVEVES-- IDELQQAALDA
42 --FACGG--- -S----- ITQAVATAKR LNPBK----- TVEVEVEN-- LDEFQQAALKA
43 --AACGG--- -S----- ISQAVATAKS NHSDK----- TVEVEVES-- LDELEQALNA
44 --AACGG--- -S----- INKAVQAQKQ NQPNK----- PIEVEVES-- LVDLKQALDA
45 --LACGS--- -S----- IANAIGKARE MHPDI----- PVEVEVEN-- LEELKQALDA
46 --AACGG--- -S----- ITAAVEKARE IAPDK----- RVEVEVET-- REELLEAIAA
47 --MACGG--- -S----- IEASVKMAKK QHPER----- LVEVEVES-- IAELKEALNA
48 --AACGS--- -S----- IANAVAEHR IAPGK----- PVEVETES-- LAELDQALEA
49 --LSCGS--- -S----- LTQAIQKARA SHPEK----- TLEIEVEN-- LNELQEALAA
50 --KACGS--- -S----- VAHAISLARK TDKHL----- LVEIEVET-- LEELQEALDA
51 --AAAGS--- -S----- IGEAVATARR LHPG-----V LVEVEVEN-- FPELEQALAA
52 --RSAGG--- -S----- IAKAVTKAKK LDSNK----- VVEVEVTN-- LDELNQAIAA
53 --LAAGS--- -S----- ITAAIARARI ANSNL----- PVEIEVEN-- LNELQQAALAA
54 --LACGS--- -S----- IAAVAAAARE RAPE-----L PVEVEVET-- LQLEQQAALAA
55 --AACGG--- -S----- LTPAVEVARL RAAG-----T PITVEIED-- LVQLDEAIAA
56 --MACGS--- -S----- IHNAVEEAHR IAPGK----- PVEVEVET-- MEQLQEALSA
57 --AACGG--- -S----- IAEAVTAARR IASDL----- PVEVEVES-- LDELDAALEA
58 --AACGG--- -S----- ITAAIKRARA LAPEK----- KIVEVET-- LAELEEAACL
59 --LACGG--- -S----- IAEAI SEARR LNPBK----- PVEVEVES-- LVELEQALAA
60 --LAAGS--- -S----- IANAVSNALI LRKDL----- IVEVEVEN-- LQELKQALKA
61 --AYCGS--- -S----- IAQAVRQAKQ AVGPLTC--- -VEIEVDT-- LAQLDEAIAA
62 --MAAGG--- -S----- VAQAMEQALA DLPPG-----V TLQIEVEN-- LAQLEEALNH
63 --AAAGG--- -S----- VTAALRAAQA LNAG-----V PIQVEVET-- LAELEEALAA
64 --AAAGS--- -S----- ITAAMQAALA LGAN-----A SIQIEVES-- LAELEEALAA
65 --AVCGS--- -S----- IAAAVARVRR KLPVLT--- -LEVECDR-- LDQVREALDA
66 --AAAGG--- -S----- VGEALDAAFA LNAD-----V PVQIEVET-- LDQLRTALAH
67 --AAAGG--- -S----- VGEALDAAFA LNAG-----V PIQVEVET-- LEELEIALAH
68 --AAAGG--- -S----- VGEALDAAFA LESG-----V PVQVEVET-- LAQLDTALAH
69 --AIAGG--- -S----- IDAAVQRARA AIGHMVK--- -IEVEVDT-- LEQLRVLRRL
70 --AAAGG--- -S----- VAKVLRRAAV LAPEA---K FVEIEVET-- LAQLKEALDA
71 --AAAGG--- -S----- IAQVLAARAAA VAAQA---D FVQIEVED-- LAELQQAALNA
72 --AAAGG--- -S----- IRQVLAQAAK IAAEA---D FVEIEVET-- LEQLHEALDA
73 --AAAGG--- -S----- LTIAFRAAQK MVDQV---D FIQVEVET-- LDQLEEALEA

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74 --AAAGG--- ----- VTAVLHAARA AAAQA---K FIEIECET-- LEQLDEALSA
75 --AAAGG--- ----- VTAVLRAAQA VAAQA---A FIEIEVET-- LAQLQEALDA
76 --AAAGG--- ----- IAQVLAARE LDAG----V DIQIEVET-- LAQLREALDH
77 --IAAGS--- ----- IEAALRKAIE IAPP----EV FIQIEVET-- QGELMQALSA
78 --MAAGG--- ----- IEPALRAARR IAAR----GI FIQIEVET-- LQDLRTALDA
79 --IAAGG--- ----- IROVVEQARA IAFSN---V FIEVEVEN-- LDELREALDA
80 --HAAGG--- ----- IAQAMAAAKQ VAEQAKGRCK FIQIEVES-- IDELNQALTA
81 --LAAGG--- ----- IKAVLDAAFR LAEDQ---V SVQIEVET-- LDELQOALDA
82 --AAAGS--- ----- IEAVLHHARA LNP----DV SIQIEVET-- LEQLQALNA
83 --RHVK---- -----D LKSFLTHARK NLPFTAK--- -IEIECES-- FEEAKNAMNA
84 --AYAG---- -----N LKELISTARE RLPFMCP--- -IEIECEN-- YKQAKEAIQA
85 --RHID---- -----D LYAFIKEART RIPWTSR--- -IEVEVES-- VQRMIEACEA
86 --KTIK---- -----D LKSYIQKARQ KIPFTAK--- -IEVEAET-- LEIAKEAFKA
87 --MAAGS--- ----- ISQAVALARQ LHPNK---- TVEVETET-- LDEVKQAVDA
88 --DAAGG--- ----- ITNAVTKIRQ KYGN----K FKQIEVETRS LNEVKEALNL
89 --AAAGG--- ----- ITEAVRRARA YIPHTMK--- -IEVETEC-- LEEVAEALEA
90 --AAAGG--- ----- ISRAVSRARS YIPHTLK--- -IEVETES-- IAEVTEALEA
91 --AAAGG--- ----- IAVAVARARE TAPHTLR--- -IEVETRN-- LEEVKEALVA
92 --AAAGG--- ----- IGEAISRARA YIPHTLK--- -IEIETET-- LAQVEEALTA
93 --DAAG---- -----S ITAAVTRLRT AYAP----CP PIEVECRT-- MEEVVAEAVAC
94 --DLAG---- -----S ITAAVQRLRD TYSP----CP PVEVECRT-- PDDVCEAVAC
95 --SVMG---- -----G ITNAINRVR- EHSN----L PIEVEAGT-- VEDVKEAVAM
96 --AACGS--- ----- LTAAYERARL AIPHTIK--- -IEVETDT-- LPQVEECVAC
97 --AACGG--- ----- VAEAVRRARA S---AGA-ML RVEVEVED-- LPGLDEAIAA
98 --AAVGG--- ----- IAEALRRAKL N---GPR-LT KVEIEVIN-- LKQLEAIEH
99 --EAAG--- ----- IGTAVARVR- --QRASH-TL KIEVEVKN-- FQELNEAIOA
100 --AAVGG--- ----- VREAVRRARR S---APH-GL KIEVEVET-- LEQLEALQA
101 --VCGGS--- ----- ITECVSRIRR KLGDV---- FITVECDN-- KLQVEESIKS
102 --ASCSG--- ----- ISECVKHVAR KLGNV---- VILVECDT-- TEQVEESILN
103 --ASCSG--- ----- ITLAIQRIKE NLKDE---- YIAVECDN-- ISQVEESILN
104 --ASCSG--- ----- ITLAIQRLRM NLKNA---- YVAIECDN-- ISQIEESLSN
105 --AICGG--- ----- ITAAVHKLKK SFEGI---- YITVECDT-- FDQVKESLSV
106 --ASSDI--- ----- KTLVSLAIKN KKGR---- KITVEVDN-- LNQLKKIMGL
107 --IALGS--- ----- ITLAVKLAIE QYPNL---- PLIVEVED-- LSQLEEVLLI
108 --AIAGD--- ----- IRTAIERARR AIGHMVK--- -IEVEVDR-- LDQLEIALTA
109 --AIAGG--- ----- IRAAIKRARA SAGHLVK--- -IEVEVDT-- LTQLEEALTL
110 --AMAGG--- ----- IRPAIERTRA SVGHLIK--- -IEVEVDT-- LAQLEEALAL
111 --AIAGG--- ----- IRPAIERARA HAGHMVK--- -IEVEVDT-- LAQLEEVLAR
112 --AVSGG--- ----- VAGAVRAARA YCGHLVK--- -VEVEVDG-- LAQLEALTA
113 --AVAGG--- ----- VREAIRRARH GVGHLVK--- -IEVEVDT-- LVQLHEAMEE
114 --AISGG--- ----- VAEAIRRARH GVGHLVK--- -IEVEVDR-- LDQLQEAAMV
115 --AVAGG--- ----- IRPVLERARA HAGHLIK--- -IEIEVDT-- LAQLREVLDL
116 --AVAGG--- ----- IRPVLEAARA KIGHLVK--- -IEIEVDT-- IDQLREVLDL
117 --AVAGG--- ----- VRPVLERARA RIGHLVK--- -VEIEVDT-- LDQLKEVLAS
118 --GFL---- -----DEP LAATVERLRR AAPEKK--- -LVTEVSS-- IEAALAAAAE
119 --GFLA---- -----DQA LPQIVERMRR GAPEKK--- -LVIEVTS-- VEAALAAAAE
120 --AVAGG--- ----- VRPVLERARE RIGHLVK--- -IEIEVDT-- LDQLREVLDL
121 --AIAGG--- ----- VTEALQRAK GVGHLVK--- -IELEVDT-- LDQLHEALDQ
122 --AAAGG--- ----- IRPVLEATRA RASHMVK--- -VEIEVDR-- LDQLEEVLA
123 --AAAGG--- ----- IRAVLDATKA HASHMMA--- -VEIEVDT-- LDQLREVLEV
124 --PFA---- -----AGD LRAQLARLRA ACPEKH--- -LVVEVTS-- LAAAEAAAEAG
125 --AVAGS--- ----- IAAAVQRAKA KAPMLTK--- -IEVEADR-- LDQVREALDA
126 --AAAGG--- ----- IRPVLQAIKA RASHMMR--- -VEIEVDR-- LDQLAEVLEE
127 --AVCGGV-- ----- -REAVEAARK SAGHMTR--- -IAVEVDR-- LSQLDAAIDA
128 --AACGGS-- ----- IEATLERAKA YAGHLRM--- -IEIEVDT-- LAQLEEALKY
129 --AVAGS--- ----- VALAVRRAVE AA--IPY--- -IIVEIDT-- LEQIPEALAE
130 --LVAGG--- ----- VAEAVRRALS AG--VRD--- -VICEVDH-- IDQIEPALAA
131 --AVAGS--- ----- VEAVRRAVE AG--IAD--- -IIVEVDR-- VAQVEPALVA
132 --LVAGN--- ----- VGEAVRRAVA AG--VEE--- -ICEVDR-- LDQIEPALRA
133 --AIAGG--- ----- VATAIKRARS SIGHLVK--- -IEVEVDT-- LTQLHQVLEY
134 --AVAGG--- ----- VSAALSRARA GVGHMVR--- -IEIEVDT-- LEQLAEVLAV
135 --ALLD---- -----DGS MADSVRRLKQ SCPEKK--- -IVVEVTS-- AEEAEAAALA
136 --AVCGG--- ----- VGEAVRRAKA EG--RPN--- -IEAECDT-- LEQVAEAVEA
137 --AMAGS--- ----- IREAVAAMHS SLTHLH--- -RIEVECT-- LDQVVEALEA
138 --ALAGS--- ----- AVEALDRAT --RNRG-EQ PIEIEVRS-- LEELEQVLEK
139 --SAAGG--- ----- VRPALERAAQ S---G---L PVEIEVRT-- RAELGEALSS
140 --AACG--- -----S ILEACKKARQ AAGHMVN--- -IEVEIET-- EEQLREAIATA
141 --AQAK---- -----G IRQAVTQARS VIGHSLK--- -IEVEVEN-- REQLEEAVDA
142 --AFAG---- -----S ITKAVTSVKE KLGHMVK--- -VEVETET-- EEQVREAVAA
143 --AACG---- -----S ISKAVEKARS ACGHMVK--- -IEVEIES-- EQELHEAIEA
144 --AAST---- -----S IAAAIEKARA YAGPMAK--- -IEVETTT-- LDEVKEAVAA
145 --AFCG---- -----S IARAVKTVRE RLGHMVK--- -IEVETET-- EDEVLEAVEA
146 --AFSG---- -----G ITSAVSTVRG KLGHMVK--- -IEVETET-- AEQVKEAVQA
147 --AAVG---- -----S VQKAIQAQARA YAPFVKM--- -VEVEVES-- LAAAEAAALAA
148 --DAAY---- -----G ITNAVNLARN NSSFVRK--- -IEVETET-- LDEVSEALNA
149 --EAAG---- -----G IKNVAVSLARK NSPFVRK--- -IEVEVES-- IEQLKEALET
150 --DAAG---- -----G IKKAIELVRN SVSFVRK--- -IEVEVEN-- LTGVQKALEA
151 --KAAG---- -----G IKQAVQLVRE KIPHTMK--- -IEVETET-- IEQVLEALEA
152 --KAAG---- -----G IEAAIKRARK YAPHTLK--- -IEIEVES-- LEGLKEAIAA
153 --QAVG---- -----G IQKAVSTLRQ KVPHTLK--- -IEVEVEN-- LQQLQEALEA
154 --AATASQ-- -----GLS ITEALSNMKA KLPHTTH--- -VEVEVDH-- IEQIEPVLAA
155 --ASVLAS-- -----GMT ITEALLQMKR RLPHTTH--- -VEVEVDR-- LDQIEPVLAA
156 --AYR---- -----G IKDCVSIIRK AHPHIS--- -IEVECDT-- LTQVAEALDS

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157 --ELS-----N AAEAYARVRE FLGEDAT-- WVEVEVDT-- LDQLSDLLAE
158 --AAAG-----S VVEALRAVRA LAPDIA---- -CEVEVDS-- LEQLDAVLAE
159 --AAAG-----S VVAALRAVRA AAPDIE---- -CEVEVDS-- LEQLDEVLAE
160 --MAAG-----G VAQAFRAVGE MFPDVP---- -IEVEVDT-- LHQLREVVDVA
161 --AVLTAQS-----GLS VTAALKKVRRL ELSHHTH--- -LEVEVDR-- LDQIEPVLAA
162 --AVITGGD-----PAK LTAVLKKAARA RLGHHTH--- -FEVEVDR-- MEQVEPVLAA
163 --AVMTGGD-----SSK LTELLIAAKA QLGHTTH--- -FEVEVDR-- AEQIEPVLAA
164 --VAAG-----G VVPAYDAVRR AYPDLR---- -VEVEVTG-- LDELRELLDA
165 --AAAG-----G VAEAVRAVRE RFPDIP---- -LEVEVDR-- IDQIEPALAA
166 --VAAG-----G VAAFAAVRA RFPGLP---- -VEVECDT-- VDQVAEAVDA
167 --VAAG-----G VAAFAAVRD RFPGLP---- -VEVECDT-- VDQVAEAVAA
168 --MAAG-----G ISEAFARVRA MFPFVP---- -VEVECDT-- LPQVAEAVRA
169 --AALAAR-----GID LAGAIRHVRE QVGHTTH--- -IEVEVDR-- LDQIPAVIAG
170 --ALAGG-----S VAEAVRRARA A---APH-LL RVEVEVES-- ERELREALAA
171 --DAAG-----S ITEAIKLAKA YSPFIKK--- -IEIEVED-- LKGVEEAVKA
172 --ALGRSEHD PSSKLTAGEA ATRAVAMRGA SVNQLVAP-P MVEIEVDT-- LEQFEQVATT
173 --AMYSS-----S AREPVEKIKL SFPNK----- LVEVEIDS-- ILQLEDIAISS
174 --QAAG-----S ITKAVQTLRQ NLPYPLA--- -IEVETSN-- LEEVQEAIAI
175 --AWAG-----G ITMAIAAVRE QAPWPTA--- -VIVEAET-- EAQALEAVRA
176 --AAAGG-----S IAAAIKKLRS QLPFPLI--- -IEVETET-- LGQVMEAIISA
177 --AWAG-----G ITAAIDVVRH QAPWPCR--- -VIVEAET-- GDQACEAVQA
178 --AWAG-----G VTAIAAVRA DAPWPAR--- -VIVEAET-- SEEAQAAVAA
179 --RGAGG-----S ILAAVQRAK --AGAPH-HL KVEVEVRN-- LQEELEALAA
180 CDRGAGG-----S VLAAVKRAK --EGAPH-HL KVEVEVRD-- LQEELEALAA
181 --VAAG-----G ITAAVEKVRQ ASFFPLA--- -IEVETET-- LEQVREALFL
182 --EAAG-----G IRPAVERLRG RIPFLMP--- -IEVETES-- LEQVQEAALGC
183 --AAAG-----G IGEAITRIRA QIPYTLT--- -IEVETET-- IEQVKEALEY
184 --AWSH-----G IKQSIHTLRS NIPWTTK--- -IIVEAET-- TQEAKEAVSA
185 --AWTD-----N LKNAVEKIRL NTPFTTH--- -IIIEAED-- MKQAKDAVLA
186 --AWAG-----S MAAAVAVRT SAPWPAQ--- -VIVEAET-- ADQAAEAIRA
187 --EWSQ-----G ISESIKILKN TIPWTKK--- -IIVEAET-- PSQAKEAVKA
188 --AWTD-----N LNNAVKKIRL NSPFTTH--- -IIIEAEN-- IEQAKEAVLA
189 --AWTD-----N LNNAVKKIRL NTPFTTH--- -IIIEAEN-- MKQAKDAVLA
190 --AAAG-----G IGEAIAKVRE RIPYPLT--- -IEVETET-- LVEVERALEH
191 --DFAG-----G IDKAINRAKE YCKEKGK-DL KIEIEVRN-- FDELQRVLSI
192 --KVAG-----G IPQAI EAARR ALP---L-SI KLEVETSN-- LAEVEEAVRY
193 --DGAGG-----S IPEAVRRAR --DAHGD-DY PIEVEVKT-- LDELDEALAL
194 --DFSG-----G VAQALKNSKA YVAKTGR-DL KIEIETRN-- LSEVKEALRE
195 --DFAG-----G ITKAIDTKT YLKEKNL-DL KIIIVEARN-- IQEIKEILRS
196 --DAAGS-----S VEEAIRRAKA YCQEQGV-SA KIETEVRN-- ISELVRACAS
197 --DAAGG-----S VVEALERAKR YRQEQQL-EV LIETEVRN-- LAELQEVLPV
198 --AFQGG-----LES FLETLSLQKQ RAPENR---- -VIVEADT-- AKEALQIAAA
199 --DASGG-----S VANALRKARQ YRKKHGL-AV KIETEVRN-- IDELREALSC
200 --DAAGG-----S VGPALNRARM YREKHGL-DV KIEAEVRS-- LDELSAALAC
201 --MALSAGI-----G IKEAIEKAKT NKSK-----L PVIVEVNT-- LEQVAQAI EA
202 --AAAGS-----S IGAAIERARN ---ASY-LL KVECEVPD-- LTGLEEALRA
203 --RAAGG-----S VGEAVRRAK --ARAPH-YL KVEVEVRD-- LAELEEALEA
204 --RVAG-----S IKEAVKRVRE RISPVYK--- -IEVEVEN-- LEEVEEALSA
205 --KMYG-----S AERAVQEVVK IIPFTTK--- -IEVEVEN-- LEDALRAVEA
206 --QAVG-----S IEECFKRAEK LSFSSK--- -IEVEVDT-- LDQLKEVIEY
207 -----K LMG-IETAIK AARKSS-FTR KIEVEVES-- AEDAVLAACKL
208 -----S ELGK LRAIKK---- -IEIEPRT-- REEAFKYAGM
209 -----K LMG-IEAAIK AAKKTS-FTR KIEVEIES-- VEYAVLAAEL
210 -----K LMG-IEAAIK EARKTS-FTR KIEVEVES-- AEDAVFAAEL
211 -----S SFDK LRAMRK---- -IEIEPRT-- KEEVFQYAPI
212 -----N MMG-LENAIN SAKELAGFTQ KIDVEVES-- VENAIIAAKM
213 -----A IMG-LEDAIK EARKRASFTK MIEVEVED-- LDTMIRAAEL
214 -----V LT-VVDEAVR RAKA-FSAYH RVEAEADT-- IDEALRIAQA
215 -----A LV-PLPEAIR KAKE-RSRYR AVEVEVET-- ARDAVTAAVA
216 -----Q VVGGVIEAID RAKENVSTFK KIEIEVEN-- LDDAIRASMF
217 -----A LVGSVRDAVR RARERVGFTK VIGVEVES-- IEDAVEAAGA
218 -----A ELG-LEGAIE RFRAAKSFAT KLDVEVET-- PEDAPRAADA
219 -----A EMG-LVDAIE HFHERVSFAT KLDVEVEA-- PEDAPRAAEA
220 -----A EMG-VETAIE RFREQASFAT QIEAEAET-- AEMAVAAAAEA
221 -----A LV-PLEEAIK RAKE-FSVYK VVEVEVEN-- LEDAVKAAGA
222 -----A LV-PLEEAIK RAKE-FSMYK VVEVEVES-- LEDAIKAAGA
223 -----A LV-PLEEAIK RAKE-FSVYK VVEVEVES-- LEDAIKAAGA
224 -----A LV-PLEEAIK RAKE-FSVYK VVEVEVES-- LEDALKAARA
225 -----R IAGSVAEAVR RAKARTSFAT RVEVEVSS-- LEEAVEAIEA
226 -----T LYGNLEELIK RVKFSVSFTK IIEVEVSS-- YEDAIRAFKA
227 -----A LIGSVKEAIR RAKEITSFTK KIEVEVSS-- LKDALEAYQA
228 -----S IIGNVKDAIK QAKEITSFSK KIEVEVSN-- INDAIEAYKA
229 -----K FI-PLHMAS SKRP---FVH KAEVEVNT-- AEDAVRAAEM
230 --VFLG-----S -EGALQKAAK AAAYRP---- -AGVEVST-- VEEAVEAAGA

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228 232 243 249
1 G-----ADI IMLDNFNNTD-----QM REAVKR----- VNGQARLEVS
2 G-----ADI IMLDNFETE-----QM REAVKR----- TNGKALLEVS
3 KPE-----L ILLDNFAVW-----QT QTAVQRRD-----S RAPVMLESS
4 EPE-----L ILLDNFPVW-----QT QVAVQRRD-----I RAPVLLLESS
5 KPE-----L VLLDNFPVW-----QT QMAVQRRD-----A RAPAVLLLESS

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6	DIE-----L	VLLDNFPVW-----	QT	QIAVQRRD--	-----S	RSPATKLESS
7	GVE-----L	VLLDNFPVW-----	QT	QMAVQRRD--	-----A	RAPETLLESS
8	DVE-----L	VLLDNFPVW-----	QT	QIAVQRRD--	-----A	RSPKTKLESS
9	G-----ADL	VLLDNFKPE-----	EL	HPTATVLKAQ	FPSVA-----	-----VEAS
10	G-----ADI	VMLDNFTIP-----	MM	RDAVKMRDDH	AK-----	TQGSQAQLEVS
11	G-----ADL	VMLDNFKPE-----	EL	HPTAATLKAR	FPSVS-----	-----VEAS
12	G-----ADL	VLLDNFRPE-----	EL	HPTAAALKAQ	FPGVG-----	-----VEAS
13	G-----ADI	VMLDNLTP-----	SL	HAVALAVKSS	YPSV-----	-----IEAS
14	ASGSETRLTR	IMLDNMVVPL	ENGDVDVTML	KDAVELING-	-----	---RFETEAS
15	AAENNTSLTR	IMLDNMVVPL	GNGDIDVSML	KDAVELING-	-----	---RFETEAS
16	G-----ADV	IMLDNMDPE-----	TF	CETAKRLREK	TATMPH-----	---CRYLIEAS
17	G-----ADV	IMLDNFKGD-----	GL	KMCAQSLKNK	WNGK-----	---KHFLLLECS
18	G-----ADV	IMLDNFAGT-----	SL	RATAQRLKER	WAGK-----	---KNFLLLECS
19	G-----ADV	IMLDNFKGE-----	EL	RQVAQSLKKK	FAGTN-----	---KSFLLLECS
20	G-----ANI	VMLDNMVG-----	DL	HSAARLKEK	WQQG-----	---REFLIETS
21	G-----ADI	VMLDNFNPO-----	DL	QTVSTYLKQH	YPHIT-----	-----LEAS
22	G-----ADI	IMLDNFETE-----	QM	REAVKR-----	-----	TNGKALLEVS
23	G-----ADI	IMLDNFSLD-----	NI	REAVSL-----	-----	TQGHALLEIS
24	N-----VDI	IMLDNFTIP-----	MM	KEAVAI-----	-----	TSQKVALEVS
25	K-----ADL	IMLDNFKYE-----	DV	IKAVIINK--	-----	---NQSILEAS
26	G-----ADI	IMLDNFSRE-----	DM	VQAVAV-----	-----	TRQRAALEVS
27	G-----VDA	VLLDNMQPS-----	EL	REAVNIVAG-	-----	---RAITEAS
28	G-----CTR	ILIDDFDPA-----	MR	RAAVQIVAAL	P-----	PAQRIPLEVS
29	G-----CTR	ILIDDFDQA-----	MR	REAVRIVAAL	P-----	LERRIPLEVS
30	G-----ADI	IMLDNFSLE-----	MM	REAVKINAGR	-----	---AALENS
31	G-----ADI	IMLDNFTTE-----	MM	RQAVEINAGR	-----	---AALENS
32	G-----ADI	VMLDELSLD-----	DM	RTAVALTAGR	-----	---AKLEAS
33	G-----ADI	IMLDELSLD-----	EM	REAVRITAGK	-----	---AKLEAS
34	G-----ADI	VMLDELSLD-----	DM	REAVRLTAGR	-----	---ALLEAS
35	G-----VSL	VLLDNMAPE-----	VL	LQAVAMCQGR	AKT-----	-----EAS
36	G-----ADI	VMLDNFSQQ-----	QM	IEAVKYVAGR	-----	---CKLEAS
37	G-----CDI	IMLDNFDIT-----	MM	LEAVAINNAY	KE-----	GGRGAKLEVS
38	G-----ADI	IMLDNFDVT-----	MM	VDAVSLNRY	KD-----	QDKGAKLEVS
39	G-----SDI	IMLDNFDVT-----	MM	IEAVAINDAF	KV-----	QGGGAKLEVS
40	G-----TDI	IMLDNFDIT-----	KM	VEAVEMNNQY	KA-----	KGASAKLEVS
41	G-----ADI	VMLDNFDVT-----	MM	IEAVELNNSY	NE-----	NQR-VKLEVS
42	E-----ADV	IMLDNFSIE-----	DI	KQAVQQNRDN	-----	AGHSAQLEVS
43	G-----ADI	IMLDNFTPE-----	MI	EQAVTATRG-	-----	---KAKLEVS
44	G-----ADI	IMLDNFNVE-----	QI	KQAVVVTNK-	-----	---RAKLEVS
45	K-----ADI	IMLDNFSLO-----	DT	RQAVALTQG-	-----	---ASKLEVS
46	R-----ADV	VMLDNFDAD-----	SL	QYAMNLDKHN	T-----	---QYELS
47	G-----AER	IMLDNFSIA-----	MM	LEAVALNSEN	-----	PNSTAKLEVS
48	G-----ADI	IMLDEFSLA-----	DM	AEAVKRNAGK	-----	---ARLEAS
49	K-----ADI	ILLDNFDID-----	TI	KKAVKINNSQ	-----	---AKLEIS
50	H-----PDR	ILLDNFTQD-----	ML	EQAVKMNHPK	Y-----	---CELEAS
51	G-----ADR	IMLDDFERD-----	AL	SKAVAVAAG-	-----	---RAELEVS
52	K-----ADI	VMLDNFSGE-----	DI	DIAVSIARGK	-----	---VALEVS
53	G-----ADI	LLLDNFDTP-----	SL	REAVRISQQR	-----	---AKLEAS
54	E-----ADT	IMLDNFSLA-----	DV	ERAVALTAR-	-----	---RSKLEAS
55	G-----ADV	VMLDNFDAD-----	GI	RQAVDRAAG-	-----	---RVALEVS
56	G-----ADI	VMLDNFSIE-----	QM	AHAVVVNQGR	-----	---AKLEAS
57	G-----ADT	IMLDNFALE-----	TL	REAVARNAGR	-----	---SRLEAS
58	M-----PDQ	IMLDNFSVE-----	ML	AEAAGMAVES	-----	---VLEVS
59	G-----ADI	VMLDNFDIP-----	MM	REAVALNQSR	-----	---AKLEVS
60	K-----ANI	IMLDNFNK-----	NI	LQAVNI-----	-----	TSKQAALVEVS
61	G-----AKR	ILLDNMDDE-----	TL	KEAANRCHTQ	TSHP-----	---HTVYCEAS
62	G-----ARL	VLLDNMSLD-----	DM	RRAVEICA--	-----	---GRAELEAS
63	G-----ATS	VLLDNFDEP-----	AM	HEAVRVTA--	-----	---GRALLEVS
64	G-----ATS	ILIDNFTVP-----	MM	HDAVRINA--	-----	---GRALLEVS
65	G-----VDV	IMLDNMSLP-----	DM	KEAVQIVNG-	-----	---RTKVEAS
66	G-----ARS	VLLDNFTLD-----	MM	RDAVRVTE--	-----	---GRAVLEVS
67	R-----AQS	VLLDNFSFE-----	AM	REAVRITA--	-----	---GRAVLEVS
68	R-----AQS	VLLDNFTLD-----	MM	REAVRVAA--	-----	---DKAVLEVS
69	G-----VDV	VLLDNMDLD-----	TL	REAVALVDG-	-----	---RAVTEAS
70	G-----AGM	VLLDNMTLA-----	QL	QEAVQLNA--	-----	---GRAVLEVS
71	G-----ARM	VLLDNMTLD-----	QL	REAVRINE--	-----	---GRASLEIS
72	G-----ARM	VLLDNMDLP-----	TL	HEAVRINA--	-----	---GRAVLEIS
73	G-----VTM	VLLDNMPLG-----	RV	RQAVEMAQ--	-----	---GCCSLEMS
74	G-----ARM	VLLDNMPLP-----	ML	HDAVRLNAAH	P-----	---AGPAILEIS
75	G-----ATM	VLLDNMPLA-----	QL	REAVRINAAH	A-----	---GGGAILLEIS
76	G-----AVS	VLLDNFDLP-----	QM	REAVAVNA--	-----	---GRALLEVS
77	G-----ARM	VLLDNFDLP-----	AL	RDAVAFNRQF	P-----	---GGPAVLEAS
78	G-----ATL	ILLDNFDLE-----	EL	REAVVLNARL	T-----	---NKGAVLEAS
79	G-----VTM	VLLDNMSLE-----	EM	REAVRITA--	-----	---GRAELEAS
80	G-----ATM	ILLDNFSLD-----	MM	REAAQINA--	-----	---GRAILEAS
81	Q-----APS	ILLDNFELA-----	AM	RRAVELTA--	-----	---GRALLEAS
82	G-----ATL	VLLDNFAPP-----	ML	VEAVRINQ--	-----	---GRAILEAS
83	G-----ADI	VMCDNLSVL-----	ET	KEIAAYRDAH	-----	---YPFVLEAS
84	K-----ADV	IMCDNMSIE-----	EI	KEVVAYRAN	-----	---APYICIEAS
85	G-----ADI	VMCDNMSLH-----	DI	EECVKYRARF	-----	---APGVKLEVS
86	G-----ADI	VMCDNMTPS-----	QV	QETVKYRDAN	-----	---FSHVLEAS
87	S-----ADI	IMLDNFSLH-----	QL	KEAVQQVNKK	-----	---CKLEAS
88	G-----IDM	IMFDNMSLE-----	MM	REAVKIVS--	-----	---QKVFIEAS

89	G-----ADI	IMLDNMDLD-	-----AM	RRAVGLIAG-	-----	---RALVEAS
90	G-----ADI	IMLDNMDLP-	-----TM	TEAVALIGG-	-----	---RALVEAS
91	G-----ADV	IMLDNMDLE-	-----TL	AEAVALVDG-	-----	---NAVTEAS
92	G-----ADV	IMLDNMTLD-	-----DM	RAAVSLVSG-	-----	---RVPLEAS
93	HV-----DR	IMLDNMTF-	-----EAM	RAALGIIPR-	-----	---TIETETS
94	NV-----DR	IMLDNMDA--	-----DGL	AALPLIPD-	-----	---HIETEAS
95	KA-----HR	ILLDNMDN--	-----DTL	KKALEIIPA-	-----	---EVETEAS
96	G-----ADI	IMLDNMSLA-	-----DM	KTAVAMIDG-	-----	---RALVEAS
97	G-----ADL	VLLDNMDD--	-----AA	MAEAVR---R	A-----	-AGRVLLEAS
98	G-----ADV	VMLDNMDD--	-----AQ	IREAVKLA--	-----	-AGRPLEVS
99	G-----VDI	IMLDNMSVP-	-----DM	REAVLHVNGR	-----	---IPLEAS
100	G-----ADI	ILLDNFTL--	-----DL	LQRAVAIN--	-----	-AGRALLEAS
101	S-----VNL	IMLDNMGVS-	-----DI	KDSIKMIE--	-----	---NSAMVEVS
102	N-----VDT	VMLDNMSLD-	-----NI	KKSVSIVN--	-----	---SRAKIEVS
103	N-----VNM	ILLDNMSIT-	-----EI	EQAVSIVN--	-----	---GKSILEAS
104	N-----VDM	ILLDNMSIG-	-----EI	KQAVEIVN--	-----	---GKSVLEVS
105	D-----VDS	VLLDNMSVR-	-----EI	IDCVTYIRNA	S-----	---SRVKIDAS
106	K-----FNT	VLFDNMNNK-	-----TL	KAGVKMAK--	-----	---KHYTEAS
107	SG-----VAR	VLCDFNSIS-	-----DL	IQAVGLAKGK	-----	---LPLEAS
108	G-----VDA	VLLDNMSVE-	-----DL	AQAVAMVGG-	-----	---RAITEAS
109	T-----PDA	VLLDNMSVD-	-----DL	RQAVAMVAG-	-----	---RAITEAS
110	A-----PDA	VLLDNMSLD-	-----EL	RHAVSMVAG-	-----	---RCITEAS
111	K-----VDA	VLLDNMSPE-	-----QL	ARAVELTAG-	-----	---RAITEAS
112	S-----PDV	VLLDNMGPE-	-----LL	SEAVAINAAH	WGLSVASYPG	DLRRTRLEAS
113	G-----VDA	VLLDNMTPE-	-----QL	REAVEIVAG-	-----	---RAITEAS
114	G-----VDA	VLLDNMTPD-	-----QL	REAVIVAG-	-----	---RAITEAS
115	GM-----ADA	VLLDNMDLA-	-----TL	REAVRMSEG-	-----	---RLKLEAS
116	NL-----ADV	VLLDNMDLD-	-----TL	KKAVAMSAG-	-----	---RVVLEAS
117	GL-----ADV	VLLDNMDIA-	-----TL	QEAVRLADG-	-----	---RVVLEVS
118	G-----FDV	VQLEKFAPA-	-----DV	ATLAQRLATG	-----	-PHRPVIAAA
119	G-----FDV	VQLEKFTPA-	-----DV	AALTQQLTED	-----	-RRRPVVAVA
120	GM-----ADA	VLLDNMDIA-	-----TL	KEAVKMADG-	-----	---RVALEAS
121	G-----IDA	VLLDNMSPD-	-----ML	REAVAMVAG-	-----	---RAVTEAS
122	GG-----ADA	VLLDNMDTE-	-----TL	ARAVRMAKG-	-----	---RLITEAS
123	GG-----ASV	VLLDNMTPA-	-----EL	REAVEINAG-	-----	---RLALEAS
124	G-----ADV	IQLEKFPE-	-----AV	AEAVRALE--	-----	-GRPVRIAAA
125	G-----VDV	IMLDNMSND-	-----DM	RKAVKIVDK-	-----	---RIPLECS
126	GG-----ADV	VLLDNMQTA-	-----EL	REAVAMTAG-	-----	---RVVLEAS
127	G-----AES	VLLDNFPLD-	-----DL	RAAVASAKG-	-----	---KVTLEAS
128	G-----PHA	ILLDNMSLE-	-----QL	REAVTITGG-	-----	---RVPLEAS
129	G-----ATH	LLLDNMNPE-	-----TL	EKAVSLVQG-	-----	---RIPESS
130	G-----ATR	LLLDNMGPD-	-----LL	RQAVALVAG-	-----	---RVPCEAS
131	G-----ATH	LLLDNMGGLD-	-----DL	RTSVAIVDG-	-----	---RVPTEAS
132	G-----ATR	LLLDNMGPD-	-----TL	REAVSIVAG-	-----	---RVPTEAS
133	D-----IDA	VLLDNMDPA-	-----TL	RQAVGIING-	-----	---RAIAEAS
134	GG-----AEV	VLLDNMDAP-	-----TL	TRAVDMVAG-	-----	---RLVTEAS
135	G-----ADV	IQLEKFTPA-	-----ET	AETVGRMG--	-----	-HYGILVAAA
136	G-----ADI	VLLDNMGPD-	-----VL	RRAVAIVAG-	-----	---RAKTEAS
137	G-----AHI	LLLDNMTLE-	-----QM	REAVKINAG-	-----	---RTMLEAS
138	G-----AES	VLLDNMTAE-	-----DV	RTAVERVKKL	-----	-DRSVPLEAS
139	G-----ATH	LLLDNLTPA-	-----EA	VEWIAEIAGR	A-----	-K---VELS
140	G-----ADV	IMFDNCPPD-	-----TV	RHFAKLTPAN	-----	---IKTEAS
141	G-----VDI	IMFDNMPPH-	-----II	KEYVALVPDG	-----	---IVTEAS
142	G-----ADI	IMFDNRTPD-	-----EI	REFSKI VPSA	-----	---IVTEAS
143	G-----ADI	IMFDNCPPE-	-----TV	KAF AEMTPAG	-----	---IITEAS
144	Q-----ADV	IMFDNATPE-	-----AI	RTYLAYVPAG	-----	---IKTEAS
145	G-----VDV	IMFDNRTPD-	-----EV	RAFVRLVPKP	-----	---IITEAS
146	G-----ADI	IMFDNRTPE-	-----EI	KQLVKLVPPH	-----	---ITTEIS
147	G-----ADI	IMLDNMSLE-	-----QI	EQAITLIAGR	-----	---SRIECS
148	K-----ADI	IMLDNMDVE-	-----TI	KKAVKLINKR	-----	---ALIEVS
149	K-----ADI	IMLDNMDIK-	-----TL	KEAVKLIDNR	-----	---AEVEAS
150	K-----ADI	IMLDNMDID-	-----AM	KKAVKMINGK	-----	---AIVEAS
151	K-----ADI	IMLDNMSLD-	-----EM	KKAVKIIDGR	-----	---AVTEAS
152	G-----ADI	VMLDNMSPO-	-----RV	KEARKIAGDK	-----	---VLEAS
153	R-----ADI	ILLDNMDSE-	-----SM	RKAVEIVNGQ	-----	---ALLEAS
154	G-----VDT	IMLDNFTID-	-----QL	IEGVDLIGG-	-----	---RALVEAS
155	G-----VDT	IMLDNFTNE-	-----EL	REGIKMVAG-	-----	---RAIVEAS
156	GVR-----L	ILLDNMSVD-	-----QV	KIAVDMCR--	-----K	APHPVEIEAS
157	GKAR---PPQ	VLLDNFTVE-	-----DT	RKAVELRD--	-----Q	LAPQVLESS
158	DVE-----L	VLLDNFPLW-	-----QT	QAAVQRRN--	-----A	TAPTCKLESS
159	NVE-----L	VLLDNFPLW-	-----QT	QIAVQRRD--	-----A	NAPGCKLESS
160	GAD-----L	ILLDNFTPT-	-----EC	EEAVAVIN--	-----	---GRALLEAS
161	G-----VDT	IMLDNFTLE-	-----QL	REGVAIVDG-	-----	---RAIVEAS
162	G-----VDT	IMLDNFTLE-	-----EL	AAGVALVDG-	-----	---RARVEAS
163	G-----VDT	IMLDNFSLE-	-----EL	RAGVKQVDG-	-----	---RAIVEAS
164	GCT-----E	ILLDNMDTA-	-----TM	AEAVRLTA--	-----G	RAT---LEAS
165	GAE-----E	ILLDNFTVP-	-----EL	REAVALVA--	-----	---GRARLEAS
166	GCD-----L	ILCDNMSLA-	-----DL	RAAVQLAR--	-----	PAG--VRLEAS
167	GAD-----L	ILCDNMTPR-	-----DL	RASVALAR--	-----	PAG--VRLEAS
168	GAQ-----L	VLLDNMPPA-	-----MV	RQAVAMVRDL	-----G	AAGRCRLEVS
169	G-----ADT	IMLDNFSLD-	-----DT	RRGVELIDG-	-----	---KAIVEAS
170	G-----ADA	VLLDNMSP--	-----EE	VRRCVRVARR	E-----	-RPGVVVEVS
171	G-----ADI	IMLDNMDIE-	-----TT	KKAIKIINKK	-----	---AIECS

172	GID-----I	VLLDNFSLD-	-----DL	RRAVARRD--	-----E	LGVTLDEAS
173	G-----AEV	ILLDNFSLE-	-----DS	KTAYSILKQK	AP-----	---NVLIEFS
174	Q-----VEI	IMLDNMGTD-	-----TM	ATAVKLIRQA	-----	-NPLIRIEAS
175	G-----ANG	VLLDEFSPK-	-----QL	TQLVPRLR--	-----AS	STGVVLEAS
176	G-----VGW	IMLDNMNLA-	-----QV	QAAVQVIRDR	-----	-APRTKIEVS
177	G-----ADG	VLLDEFSPK-	-----QL	QALVPRLR--	-----QL	APGGVLEAS
178	G-----ADA	LLLDEFSPQ-	-----AL	TTLVPMRAQ	---AEA--RP	ARASIVLEAS
179	G-----ADL	ILLDNFPLE-	-----QI	RAAVQRVGGK	-----	---VPLEAS
180	G-----ADL	ILLDNFTLE-	-----ET	QAAVQRVGGR	-----	---VPLEAS
181	G-----VDV	IMLDNMPIP-	-----EM	TQAVAMIRAE	-----	-APHIKIEAS
182	G-----VQV	IMLDNMPVE-	-----RM	REAVQLIAG-	-----	---RVLTEAS
183	K-----ADI	IMLDNMPVD-	-----LM	RQAVQLIRQQ	-----	-DNGVKIEAS
184	G-----ADG	ILLDEMSPN-	-----EI	TNLIPQLREL	AKQN-----	-SKELIEAS
185	G-----ADS	ILLDEFNPE-	-----LL	KEGIKELRQL	STNNSI--RT	IRNDLIEVS
186	G-----ANG	VLLDEFSPK-	-----QL	QDLVPRLRLL	---AE---QR	AEGPVVLEAS
187	G-----ADG	VLLDEMSIQ-	-----AI	EKLVPRLRQL	SKNSKS--KY	VSQNVIEVS
188	G-----ADS	VLLDELSPE-	-----II	QKNVQELRDL	SMNSLK--KE	VNKNLIEVS
189	G-----ADS	ILLDEFNPE-	-----LL	EKCIKELREL	SINSSK--RT	KRNNLIEVS
190	Q-----ADI	IMLDNMSVE-	-----VM	EQAVKMIRQN	-----	-NSRIKIEAS
191	GG-----VDR	IMLDNFTF--	-----ENT	KKAVEMIGG-	-----	---KYETESS
192	GA-----DI	IMLDNMMDN--	-----DTM	CEAVRLIAG-	-----	---RARTEAS
193	A-----PDF	ILLDNMPPE-	-----TL	RQAVART---	-----	-DGRVPLEAS
194	GG-----AFR	IMLDNMSP--	-----ALM	KEAVALING-	-----	---NAEVEAS
195	DG-----IYR	ILLDNFN--	-----EET	RQAVDLING-	-----	---KCFTESS
196	R-----PDM	ILLDNFMVD-	-----DL	AEAVRWIKAN	G-----	-FGNILLEAS
197	A-----PDR	ILLDNFTCA-	-----QL	CEAVQLVRES	-----	-GSKVELEAS
198	G-----ADV	VQVDMKMPSE-	-----EL	AILVAGIHRQ	-----	-FPGVKVSAA
199	K-----PDI	VLLDNFGID-	-----LL	SDAVAFSKEN	-----	-YPMVILEAS
200	R-----PDI	ILLDNFTID-	-----LM	HEAVEYVRSM	-----	-PSGVLEAS
201	GP-----SS	ILLDNMSV--	-----EDM	KKAVDI IPE-	-----	---TIKIEAS
202	G-----VDR	VLLDNMSD--	-----DL	LAEAVRVRDR	L-----	-APHTLEAS
203	G-----ADL	ILLDNFPLE-	-----AL	REAVRRVGGR	-----	---VPLEAS
204	G-----VDV	IMLDNFTPE-	-----EV	KRAVEI IKG-	-----	---RALVEVS
205	G-----ADI	VMLDNLSPE-	-----EV	KDISRRIKDI	NPNVI-----	---VEVS
206	K-----PDI	ILLDNFEFK-	-----NI	ETALNIVSEF	EKKTG-----	---FKPKIELS
207	G-----ADI	VMLDNMQPE-	-----VI	RETLALLEEK	G-----	LRKSVLVEAS
208	-----SDI	MLLDHISPE-	-----EL	RELGPPELKKL	-----	-NPKLELAVG
209	G-----ADI	IMLDNMQPE-	-----AI	QKTLKTLGSK	G-----	LRNSVIVEAS
210	G-----ADI	IMLDNMQPD-	-----GV	KETISILNGK	G-----	LRESVLEAS
211	-----ADI	LLLDHYTPE-	-----EL	KEVAPKLRQI	-----	-NPKLELAVG
212	G-----VDI	IMFDNMSPG-	-----QV	IKVVEALKNE	D-----	LRNSAILEVS
213	G-----ADI	IMFDNMNPE-	-----EI	KRGVAMLEEM	G-----	VRSGVILEAS
214	G-----ADI	ILLDNMTPE-	-----QV	SQVISLISEN	G-----	LREKVLIEVS
215	G-----ADI	ILLDNMAPD-	-----AV	RETVGTLAAR	G-----	LREQVTLEVS
216	G-----ADI	VMLDNMNPD-	-----EI	EEVLVTLKQR	H-----	LRDDVIEVS
217	G-----ADH	VLLDNMKPA-	-----EI	RRAVNEVRK-	-----	VREDVILEAS
218	G-----ADI	VLLDNMTPA-	-----ET	ERAVDLLDG-	-----	---AALAEAS
219	G-----ADI	VLLDNMSPA-	-----ET	ERAVDLVAAS	D-----	A--DALTEAS
220	G-----ADI	VLLDNMSPS-	-----ET	ADAAAAPVD-	-----	---GTLTEAS
221	G-----ADV	IMLDNMKPK-	-----EI	KEVIEKLRRL	G-----	LRDGVKIEVS
222	G-----ADI	IMLDNMKPK-	-----EI	VRVIEELKRL	G-----	LRENKIEVS
223	G-----ADV	IMLDNMTPK-	-----EI	ERVIEELKRL	G-----	LREKVKIEIS
224	G-----ADV	VMLDNMKPA-	-----EI	AEVIEALKRE	G-----	LREKVKIEVS
225	G-----ADI	VMIDNQPPE-	-----VV	AEIVGELGRR	G-----	LRDRVLEAS
226	G-----ADV	ILLDNMKPY-	-----EI	LPIVNEELKS-	-----	---KVLLEAS
227	G-----ADA	ILLDNMKPE-	-----EI	IPVVNELKG-	-----	---KVIVEAS
228	G-----ADI	IMLDNFSPQ-	-----EV	KEVVKMLKG-	-----	---KVLLEAS
229	G-----FDI	IMLDNMTPK-	-----EV	ERAAKLLAER	G-----	LRGRVILEAS
230	G-----FSY	IQLERMTPE-	-----EV	AEAAARVRSV	-----	-NPRVVVGAS

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1	GNVTAETLRE	FAETG---VD	FISVGALTKH	VRALDLSMRF	C-----	-----
2	GNVTDKTLRE	FAETG---VD	FISVGALTKH	VQALDLSMRF	R-----	-----
3	GGLSLQTAAT	YAETG---VD	YLAVGALTHS	VRVLDIGLDM	-----	-----
4	GGLSLENAAI	YAGTG---VD	YLAVGALTHS	VRILDIGLDM	-----	-----
5	GGLSLENAAD	YAATG---VD	YLAVGALTHS	VRVLDIGLDM	-----	-----
6	GGLSLETAAE	YAGTG---VD	YLAVGALTHS	VRVLDIGLDV	-----	-----
7	GGLTLDTAAD	YAGTG---VD	YLAVGALTHS	VRVLDIGLDF	-----	-----
8	GGLALENAAD	YAGTG---VD	YLAVGALTHS	VRVLDIGLDM	-----	-----
9	GGITLDNLPQ	FCCGPH---ID	VISMGLTQA	APALDFSLKL	FAKEVAPVPK	IH-----
10	GNVTLETLR	YAETG---ID	FISVGALTKH	ITALDLSMRF	Q-----	-----
11	GGVTLNLTQ	FCCGTH---ID	VISLGLTQA	APALDFSLKL	FAEGDTPVPH	ARRF-----
12	GGITLANLPQ	FCCGPH---ID	VLSLGLTQA	APALDFSLKL	FPEGATPMYN	AHRS-----
13	GGVTLTNLHQ	FLGAH---VD	MVSMGCLTQG	SPSIDFSLKL	SHGLCRRDTD	SSL-----
14	GNVTLETVHK	IGQSG---VT	FISSGALTHS	VKALDISLKI	DTELALQVGR	RTKRA-----
15	GNVTIDTVKK	IGETG---VT	YISSGALTHS	VKALDISLKI	DTELALQVGR	RTNRA-----
16	GGITLETAPR	YMCAA---AD	IISVS-LSQG	YECVDYSLKV	SFTNREA---	-----
17	GGLNLDNLEE	YLCDD---ID	IYSTSSIHQG	TPVIDFSLKL	AH-----	-----
18	AGLRIDNLS	YLCQD---ID	IYSTSSIHQG	TPVVDVSLKI	DH-----	-----
19	GGLTLQNLSS	YLSND---ID	IYSTSSIHQG	VSTIDFSLKI	DAK-----	-----
20	GGIIEGSLTG	RVGPD---ID	ILSTSAVHQS	CPHVDFSLKI	QPRKSS----	-----

21	GGITSATIOQ	YAIPT---ID	IISMGNLTQG	VPHIDISLKI	QKQ-----	-----
22	GNVTDKTLRE	FAETG---VD	FISVGALTKH	VQALDLSMRF	R-----	-----
23	GNVTLDTLRG	YAETG---VD	YISVGALTKH	VQAMDLSMRF	I-----	-----
24	GNITLDTLRS	YAETG---ID	FISVGALTKH	IRALDLSMRF	N-----	-----
25	GNINKNLLK	FASTG---VD	YISLGELTKN	IKSLDLTMNI	DS-----	-----
26	GNVTLATLRD	CALTG---VD	YISVGALTKH	LRALDLSMRF	H-----	-----
27	GRITPETAIN	IAASG---VD	LISVGWITHS	APILDIGLDF	KSAASSDR--	-----
28	GSVDLAGIRA	IAQDG---VD	CISIGGLTKH	VQAVDLSLKL	GPAPY-----	-----
29	GSVDLAGIRA	VAEDG---VD	CISIGGLTKH	VQAVDLSLKL	GPPPTR----	-----
30	GNITLDNLKE	CAETG---VD	YISVGALTKH	LKALDLSMRF	KS-----	-----
31	GNVTLETIAE	YAETG---VD	YISVGALTKH	VKAMDLSMRF	K-----	-----
32	GGINEGTLRN	IAETG---VD	YISIGTLTKD	VRAVDLSMRL	TL-----	-----
33	GGVNETTLRV	IAETG---VD	YISIGAMTKD	VKAVDLSMRL	SL-----	-----
34	GGINDDTLRV	IADTG---VD	YISIGAMTKD	VKAVDLSMRL	SI-----	-----
35	GGITPETVQA	VAKTG---VD	FIAMGYLTHS	TTALDIGLDF	SA-----	-----
36	GNITLDNLRE	VASTG---VD	YISMGVLT KD	VTAIDLMSRF	NA-----	-----
37	GNVTLDTLAD	FAKTG---VD	YISVGALTKH	VRALDLSLRL	K-----	-----
38	GNVTLDTLAT	FAQTG---VD	YISVGALTKH	VKALDLSLRL	KA-----	-----
39	GNVTLDTLGE	FAKTG---VD	FISVGALTKH	VRAMDLSLRL	KH-----	-----
40	GNVTLDTLAE	FAKTG---VD	YISVGALTKH	VRALDLSLRL	KA-----	-----
41	GNVTLDTISD	YAKTG---ID	YISVGALTKH	VKALDLSLRL	KD-----	-----
42	GNITDERLPE	LAATG---VD	FISSGALTKN	VQAI DLSMRI	SEDN-----	-----
43	GNMTIEILQK	YAKAG---VD	YISSGALTKH	VNAIDLMSRF	K-----	-----
44	GNMTLQTLKT	YSQAG---VD	FISSGALTKN	LQSIDLSMRF	D-----	-----
45	GNITERITE	LAQVG---VD	YISSGALTKH	VQAI DLSLRV	VG-----	-----
46	GNLDLENLKT	IASLN---ID	FCSFGALTKH	VSAVDLSLRV	HS-----	-----
47	GNVNSDTILP	YAKTG---VD	YISVGALTKH	VRAIDLMSRF	IA-----	-----
48	GGINARTLVP	VAETG---VD	YISIGALTKD	VRAIDLMSRL	E-----	-----
49	GNVNLETIHE	IAKTG---VD	YISVGALTKH	LRAIDLMSRI	Y-----	-----
50	GGININNIAD	IAQTG---VD	FISVGSITKS	IQAI DLSLLI	RETL-----	-----
51	GSIDLDSIRA	VAETG---VD	FISVGGTLTKH	LRAIDLMSRI	ALLG-----	-----
52	GNIDRNSIVA	IAKTG---VD	FISVGAITKH	IKAI DLSLQV	QL-----	-----
53	GGITLKNIRQ	VAETG---VD	YISVGALTKD	IRAVDLSIRF	TPEAF-----	-----
54	GNLGEQGLRE	LAGTG---VD	YISIGAITKH	VRAVDYSLRL	RL-----	-----
55	GGLDLDAVRA	LAATG---VD	RISVGALTKH	VHALDLSLRL	TIPSG-----	-----
56	GGVTSETLAA	IAETG---VD	FISIGGVTKH	CRAIDLMSRL	I-----	-----
57	GNVSEATLRE	IAETG---VD	CISIGALTKD	VKAIDLMSRV	VRTETR-----	-----
58	GNLTVGNAAE	LPKSR---HW	FLSSGALTKH	VRAIDLSLRI	R-----	-----
59	GNVTLDTLAD	YAATG---VD	FISVGALTKH	VRALDLSMRF	I-----	-----
60	GNITLSNIKN	YACTG---ID	YISVGALTKN	VRALDLTMRL	I-----	-----
61	GGIGDRLKR	VAQTG---VD	GIALGYLTHS	SRSLDIGLDF	VA-----	-----
62	GGVDLDSVRA	IAATG---VD	RISVGKLT KD	VRALDLSMRF	TL-----	-----
63	GGVSMATIRA	FAQTG---VD	RISVGALTKD	VRATDYSLRV	VE-----	-----
64	GGVNADTIRT	FAETG---VD	RISVGALTKD	VRATDYSLRI	IG-----	-----
65	GGIRLETIRA	VAETG---VD	YISTSKITQS	APAVDIGLDD	A-----	-----
66	GGVNFDTVRA	IAETG---VD	RISIGALTKD	VRATDYSMRI	VE-----	-----
67	GGVNFDTVRT	IAETG---VD	RVSIGALTKD	VRATDYSMRI	V-----	-----
68	GGVNFDTVRA	FAETG---VD	RISIGALTKD	VRATDYSMRI	VD-----	-----
69	GRITPETAPA	VAATG---VD	LMAIGWLTHS	ARVLDIGLDS	-----	-----
70	GGVNMS TVRA	IASTG---VD	RISIGALTKD	VKAIDFSMRF	ASSPL-----	-----
71	GGVTQESLRS	LAETG---VD	RISIGLTKD	VKAIDFSMRF	HEL-----	-----
72	GGVTLAGLRA	LAETG---VD	RISIGTLTKD	VQAI DYSMRF	EAPKGAN---	-----
73	GGVTFDNLRA	CAETG---VD	RISVGALIKD	ITAVDFSMRF	QDRPVER---	-----
74	GGVTLEGLRA	LAETG---VD	RISIGTLTKD	VKATDFSMRM	QDPA-----	-----
75	GGVTLEGLRA	LAETG---VD	RISIGTLTKD	VKATDFSMRL	QELA-----	-----
76	GGVALDQVRD	IAATG---VD	RISIGRLTKD	VTATDYSMRV	LGDA-----	-----
77	GNVTLDTVRA	IAETG---VD	RISIGSLTKD	IRAVDLSMRF	YEA VL-----	-----
78	GGITLDNVRA	VARTG---VD	RISIGLTKD	IKAI DLSMRF	SSRS-----	-----
79	GGVNLERVRA	IAETG---VD	RISIGSLTKD	VRALDLSLRH	VEE-----	-----
80	GNVTLETIRG	IAETG---VD	RISVGALTKD	VKALDLSMRF	VG-----	-----
81	GNITLANVRA	VAETG---VD	RISIGSLTKH	VRAIDLMSRA	LARA-----	-----
82	GGIDHNVRE	IALTG---VD	RISIGSLTKH	LQAI DLSMRF	QPQE-----	-----
83	GNISLESINA	YAKSG---VD	AISVGALIHQ	ATFIDMHMKM	A-----	-----
84	GNINLKNIVQ	YASSG---VD	AISVGS LIHQ	AQWL DLSLKI	EG-----	-----
85	GNITENLLV	YARLG---VD	AISSGSLIHQ	ARWLDMSLKM	R-----	-----
86	GNISLQTIEN	YAKVG---VD	AISSGSLIHQ	ANWIDLMSKV	D-----	-----
87	GNVELPHLSE	LAETG---VD	YISTGAITKN	VQAI DFSMRF	TLEDTQ-----	-----
88	GNMSLDKIKK	LADCG---VD	AISFGELTHS	VKAFDFSLKK	ELI-----	-----
89	GGVNLETVRG	IAETG---VD	IISVGALTHS	ARAMDISMLL	EAE-----	-----
90	GGVNLETVRG	IAEAG---VD	IISVGALTHS	ARAMDISMLL	EAE-----	-----
91	GGVTLETVRG	IAETG---VD	LISVGALTHS	SPAVDISMLF	Q-----	-----
92	GGVSLDTVRA	IAETG---VD	IISVGALTHS	ARAMDISMLL	E-----	-----
93	GGVTLETIRS	LALVGDRGPD	FISVGR LTHS	APAADF SMRI	SKEHP-----	-----
94	GGVTLETIRV	LAQASSRRLD	FISVGR LTHS	APSADF SMRI	SE-----	-----
95	GNMNLDRVAS	VAALG---VN	YISVGALTHS	APCADVSLVF	QWED-----	-----
96	GGVTLKTVD	IATTG---VD	IISSGALTHS	VISCDIGMDW	SMENL-----	-----
97	GNMTLERLPR	VAATG---VD	FVSMGAVTHS	ARAVDLAFDL	A-----	-----
98	GGVTLDRLPR	LAKLG---ID	FVSMGALTHS	ARAMDLSLEI	TAAAKRPARS	KQPKPA----
99	GNVTLATVRQ	IAETG---VD	FISVGALTHS	VKAADLSLLV	MNRE-----	-----
100	GGVTLERVRV	IAETG---VD	FVSCGALTHS	APAVDITMEY	SS-----	-----
101	GGVNIENIRE	IASLG---AD	YISIGSITNS	F7CKDISLEV	FK-----	-----
102	GGINLNNVRP	IAECG---VD	YISVGCITNA	VKCKDIGL DV	IEQI-----	-----
103	GCIDIRNVRS	IAMTG---VD	YISIGCITHS	FKNKDIGLDI	VHNV-----	-----

104	GCVNIRNVRS	IALTG---VD	YISIGCITNS	FKNKDIGLDI	EY-----	-----
105	GGITLATVKE	IAETG---VD	FISVGMGLTHS	IVSADIGIDV	RTKL-----	-----
106	GNVNLKSICK	IAATG---VD	RVSIGSITHS	VPAIDFKFEI	-----	-----
107	GNINENNIVE	VANTG---VD	FISTGSITKN	IQAIDLSLRF	I-----	-----
108	GRVTRASAPA	IAATG---VD	LISVGLWTHS	APILDIGLDM	PADRNCNRHL	N-----
109	GRITAAATAPA	IAATR---VD	LISIGWLTHS	APILDIGLDF	RASLSPASKP	A-----
110	GRITSTVPA	VAATG---VD	LISIGWLTHS	APILDIGLDY	RDT-----	-----
111	GRVTRETAPA	IAASG---VD	LISVGLWTHS	APVLDIGLDY	RA-----	-----
112	GNVQIETIRA	IAETG---VD	YISTSKITMA	APTLDIGLDV	SI-----	-----
113	GRINPQTAAA	IAATG---VD	LISIGWTHS	APVLDIGLDF	ESQS-----	-----
114	GRVTPATAAA	IAASG---VD	LISVGLWTHS	APVLDIGLDF	VEAAGAA---	-----
115	GGVTLDSIAA	IAATG---VD	YASSGALTHS	APNFDICALDI	EA-----	-----
116	GGVTRESISR	IAATG---VD	YASSGALTHS	APNFDVALDI	DA-----	-----
117	GGVTQDTVAA	IAATG---VD	YASAGALTHS	APNFDVALDI	DA-----	-----
118	GGVNASNAAA	YAQAG----A	QVLVTSSPYM	AKPRDVQVKI	RREQQTN---	-----
119	GGVNAGNAAA	YAGAG----A	DVLVTSAPYL	AKPRDVQVHI	LPDPR-----	-----
120	GGVTEATIAA	IASTG---VD	YASSGALTHS	APNFDVALDI	DA-----	-----
121	GRITPATAPS	VAATG---VD	LISIGWLTHS	VGILDIGLDF	KDQAAA-----	-----
122	GNVTLDTVAA	IAATG---VD	YISSGALTHS	YRTVDLGLDF	-----	-----
123	GNVKRDTVAE	IAATG---VD	FISSGALTHS	ARTVDLGLDF	-----	-----
124	GGIHPGNAAA	YAAAG----A	QVLVTSAPYQ	APPRDVAVTL	EPA-----	-----
125	GGVRLDTIRA	KAETG---VD	FVSVGRITQS	ATCVDIGLDD	L-----	-----
126	GNMRLARVAE	VAATG---VD	YISVGALTHS	ARTLDLGLDF	-----	-----
127	GGVNLDTVRG	IAETG---VD	VISVGALTHS	APNFDIGLDE	N-----	-----
128	GGVTLTSVAA	IAETG---VD	FISSGALTHS	APNLDLGLDV	V-----	-----
129	GGVNLDNIRS	RAETG---VT	YISVGRLTQS	APAVDIGLDF	SLLPSA-----	-----
130	GGVRLDTIGA	IAASG---VD	YVSVGRLTQS	APAADIGLDF	TPLG-----	-----
131	GGVRLDTIRA	IAETG---VT	YVSVGRLTQS	APAADIGLDF	ALA-----	-----
132	GGITLDTIKA	KAATG---VD	YVSVGRLTQS	APAADIGLDF	TPL-----	-----
133	GRITPQTAPA	IAESG---VD	LISAGWLTHS	SAVLDIGLDF	LD-----	-----
134	GGVSLDTIAA	LAESG---VD	YISVGALTHS	VTTLDIGLDI	VVAPPKAERA	-----
135	GGINATNAAA	YAQAG----A	AVLVTSAPYC	AQPVDVKVAI	TRQ-----	-----
136	GGVTLDTIRA	IAETG---VD	FVSVGRITQS	APAVDIGLDW	S-----	-----
137	GNVTLDTVRD	IAETG---VD	MISSGALTHS	AGNKDVSLLV	RF-----	-----
138	GGIVLENVRS	YAETG---VN	FISVGALTHS	ARAVDLSLRI	MPA-----	-----
139	GGITLDNVRA	YAGTG---AD	FVSSGAIHNS	ARAVDISFRL	ELI-----	-----
140	GGITLESPLA	FKGTG---VN	YISLGLFTHS	VKSLDISMD-	-VTLNESVE	ECCYVNS---
141	GGISLQTIAS	YRGC---VD	YLSLGFITHS	APILDFTLLI	DEEGEQ-----	-----
142	GGITIEDLSK	YGKTG---VD	YISLGLTHS	VKALDISFN-	---IEA-----	-----
143	GGISFENLPA	YRGTG---VH	CISLGLYTHS	AKSLDISMN-	-VDLKK---	-----
144	GGITMANLRQ	FANTG---VD	FLSLGFLTHS	VVALDLSMLI	QKGEQCK--	-----
145	GGITLANVAA	YGATG---VD	YISLGLCLTHS	APALDMSFN-	---LR-----	-----
146	GNVTLNIHR	YKGS---AN	YISLGLSLTHS	VRAFDISFNS	KGGIKA-----	-----
147	GNIDMTTISR	FRGLA---ID	YVSSGSLTHS	AKSLDFSMKG	LTYLDV-----	-----
148	GNITFENIRE	KAVPG---VD	YISSGMLTHS	FNVLDISMKN	LRNEK-----	-----
149	GNVTLDNIRE	IAETG---VD	FISTGAVTHS	FKVLDISMKN	FRYID-----	-----
150	GNVNLKTIRD	IANTG---VD	YISCGIITHS	AKALDISMKN	LVLMDK---	-----
151	GNVNADTIYD	IACGT---VD	IISVGGLTHS	VKAFDISMKF	S-----	-----
152	GGINEENILE	YARAG---ID	VISLGLTLTHS	VKALDISLDL	KSLKETGQ--	-----
153	GGVNEENIVE	IAKTG---VD	FISCGALTHS	APSLDISFKI	L-----	-----
154	GGVNLNTAGK	IASTG---VD	VISVGALTHS	VHALDLGLDI	F-----	-----
155	GGVNLDTVAD	IARTG---VD	VISVGALTHS	VRALDLGLDF	E-----	-----
156	GGLTLDVALS	YAQTG---VN	YLAVGELTHS	VRALDIGCDV	N-----	-----
157	GGLTLDVAGD	YAAAG---VE	SVAVGGLTHS	VRALDIGLD-	-----	-----
158	GGLTLDVAAAD	YARTG---VD	YLAVGALTHS	VTVLDLGLDF	-----	-----
159	GGLTLDVAAE	YAGTG---VD	YLAVGALTHS	VTVLDLGLDM	-----	-----
160	GRTLGNAEA	YAKTG---VD	FLAVGALTHS	SPILDIGLD-	---LRAAE-	-----
161	GTVSLSTVRA	IAETG---VD	IISAGALTHS	VRSIDLGLDV	VVETP-----	-----
162	GNVSLGTVAE	IAATG---VD	VISIGGLTHS	VIALDLGLDV	ELTVG-----	-----
163	GNVNINTVTE	IASAG---VD	VISVGGGLTHS	VSALDLGLDI	ELKPTQN---	-----
164	GGLTIERARE	VAETG---VD	FISVGALTHS	VQVFDLGLDL	SSGSEG-----	-----
165	GGLTLDRAAD	VAATG---VD	YLAVGALTHS	SPALDIALD-	---LRENF-	-----
166	GGLTLRTAAA	VAAVG---VD	YLAVGALTHS	APALDLGLDL	ALDPDHRPGS	ATAGPPIEDL
167	GGLSLRVAAD	VAATG---VD	YLAVGALTHS	APALDLGLD-	-LDPGRPSGP	DCAGPSSAGP
168	GGLTLAQARA	VAETG---VQ	YLAVGSITHS	APVLDVGLD-	---FRAVGS	---GPPAVG-
169	GNMSLERVPA	VAATG---VD	VISVGALTHS	VRSIDLGLDW	N-----	-----
170	GGVDLGTVRA	YAEAG---AD	LVSVGALTHS	APAADISLEV	EPC-----	-----
171	GNIDITNINR	FKGLE---ID	YVSSGAIHNS	AKILDLSLKN	LRVDD-----	-----
172	GNVTIDTIGN	VAATG---VD	RISSGALTHQ	ATWLDLGMW	LDGFAS----	-----
173	GGITPEKLEA	LSEFSG---A	GVSMGYLTH	TRFLDLGLDI	ERH-----	-----
174	GNVTLANLTA	IASTG---VD	FISSAPITR	SPWLDLSMQI	VRN-----	-----
175	G-VQPEQLQA	YAATG---ID	LISTSAPVTR	SRWLDLSMRF	T-----	-----
176	SNISLENIRA	IAETG---VD	YISSAPITR	SPWLDISMRL	Q-----	-----
177	G-VQPEQLSA	YATTG---ID	LISTSAPMTR	SRWLDLSMRF	S-----	-----
178	G-VNPADLKL	YATTG---VD	LISTSAPMTR	SSWLDLSMRF	TPPG-----	-----
179	GNMNLERARK	AAEAG---VD	YISVGALTHS	AKALDLSLLV	VRP-----	-----
180	GNMTPERARQ	VAEAG---VN	YVSVGALTHS	AKALDLSLLV	V-----	-----
181	GNITLETLRP	VALTG---VD	YISTSAMITR	SPWLDLSLTI	L-----	-----
182	GNITLDTLGD	VAATG---VD	YISTSATITR	APWLDLISLDL	RRVPTDTLP	LD-----
183	GNVTLETIRA	VAETG---VD	YISSAPITQ	SKWLDLSMKI	E-----	-----
184	G-IDPNKILD	FASTG---VD	IISTSSPITQ	STWIDFSMRF	NKQEVN----	-----
185	G-INPINISN	YLIDG---ID	LISTSSSITK	SNWIDFSMRY	IN-----	-----
186	G-VDPGQLHA	YAATG---ID	LISTSAPVTR	SPWLDISMRF	ESTAV-----	-----

187	G-INPNVSD	YIFTG---ID	LISTSAPITK	SKWIDFSMRF	D-----	-----
188	G-INPKEISK	YLIKG---ID	LISTSSSITK	SNWIDLSMRY	IN-----	-----
189	G-INPRDISN	YLIDG---VD	FISTSSSITK	SNWIDFSMRY	IN-----	-----
190	GNITLETIRN	VAETG---VD	YISTSAPITR	STWLDLSMKI	TKAVS-----	-----
191	GGITFDTLRD	YAECG---VD	FISVGALTHS	VKGLDMSFKA	C-----	-----
192	GNMTLERLQS	VAETG---VD	YISVGALTHS	VTAMDISMNF	LLTQ-----	-----
193	GGVTLDTVPT	IAETG---VD	AISVGALTHS	PETLDLSMRI	H-----	-----
194	GGINESTIVA	VAESG---VD	YISVGSLSHS	YKSKDMSLKA	F-----	-----
195	GGITLETAKN	YAECG---VD	FISSGALTHS	VYNLDLSLKA	V-----	-----
196	GNIGLHNVSE	VAMTG---VD	FISIGELTHS	VKALDMSMKI	ERA-----	-----
197	GNIGMHNVOQ	VAESG---VD	FISLGELTHS	VRALDLSMTI	QLA-----	-----
198	GGINADNAAI	YASTG----V	DILVLSSVYF	GKPSDIAALI	NP-----	-----
199	GNVGLHNVAQ	IAETG---VD	YISIGELTHS	VKALDLSMTI	SLD-----	-----
200	GNMSLYNVKA	VAETG---VD	FISVGELTHS	VRALDLSMTI	TLG-----	-----
201	GNINLNDNIRE	VAMTG---VD	VISVGALTHS	APSLDFSLEF	PVQQETE---	-----
202	GNMTLERLPR	VAASG---VD	FVSVGALTHS	APALDISLNL	ILEN-----	-----
203	GNMTLERAKA	AAEAG---VD	YVSVGALTHS	AKALDLSLLV	VRP-----	-----
204	GNITLNDVLD	YAVEG---VD	FISSGAIVHS	SRWLDISLKF	L-----	-----
205	GGITEENVSL	YDFET---VD	VISSRRLTQ	EVFVDSLSEI	QR-----	-----
206	GGINENNVEN	YAKYN---VD	VISMGSLIHS	ATSVDIGLDD	L-----	-----
207	GGISPANLEG	YAKTG---VD	VISMGSLIHK	SRWIDISLEV	IRSEN-----	-----
208	G-IKGPMIPE	YAPF-----V	DIIVISAPYY	ANPLDFTTKM	ERI-----	-----
209	GGISQENLEG	YAKTG---VD	VISMGSLIHK	SRWIDMSLEI	VKQ-----	-----
210	GGISLENLEA	YAKTG---VD	VISMGLLIHR	SRWIDVSLEI	VRPES-----	-----
211	G-ISFENIPK	YAAS-----V	DFVVTAPFY	AEPFDLTNI	ERL-----	-----
212	GGIDISNISE	YAKTG---VD	VISVGSLVHK	SQWIDVSLEF	V-----	-----
213	GGINPGNLEA	YASTG---VD	VISMGALTRG	ARWMDFSMEV	RNR-----	-----
214	GGITEDTLAS	YAALN---ID	RISLGMMLTHT	VINADFSLDI	MKES-----	-----
215	GGVAGDLAG	YAAAG---ID	IISMGALHT	VRNFDVSLDI	LKGAGTVRLS	-----
216	GGITPATITK	YATLD---VD	VISSGFITNS	AQTLDLSLNI	L-----	-----
217	GGITPENAPE	YAETG---VD	VISLGWLTHS	APALDLSMRV	RRMT-----	-----
218	GGITVDDVPA	YAATG---VD	VISMGALTHS	APTLDFSFR	-----	-----
219	GGITVADVPA	YAETG---VD	IISMGSLLTHS	APTLDFSFR	G-----	-----
220	GGITLNDVVD	YAGTG---VD	IISLGSLLTHS	AGALDFSFR	GGDR-----	-----
221	GGITPENIEE	YAKLD---VD	VISLGYLTHS	VRNFDVSLEI	VKPRVSS---	-----
222	GGITPNIEE	YAKLD---VD	VISLGYLTHS	VKNFDVSLEI	KRGSSS----	-----
223	GGITPENIRE	YARLD---VD	VISLGYLTHS	VKNFDVSLEI	VG-----	-----
224	GGITPENITE	YAKLD---VD	VISLGYLTHS	VKNFDVSLEI	IGRL-----	-----
225	GGIDLSNVAD	YAATG---VD	IISSSMLTMS	PVRVDSLRLV	VEVRELRSA-	-----
226	GGITPDNVID	YAKTG---VD	VISSGYITHS	YRSLDFSLEDV	EKI-----	-----
227	GGINPDNVIE	YAKTG---VD	IISSGYITHS	SRSLDFSLEDV	YKS-----	-----
228	GRITPENVKE	YAETG---VD	IISSGYLTHS	VRSLDLSMDV	EKLT-----	-----
229	GNITEDNIHL	YAPY-----V	VISVGRLLTHS	APALDMSLEV	YDDK-----	-----
230	GGIDEHNIAS	YAPH-----V	DVVVTSAPYR	APPIDLGTEM	TPL-----	-----

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