

“Where did photoactivated adenylyl cyclase (PAC), the *Euglena* blue-light receptor, come from?: phylogenetic analysis of orthologues of PAC subunits from several euglenoids and trypanosome-type adenylyl cyclases from *Euglena gracilis*”

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Figure S1 Multiple alignment of deduced amino acid sequences of the cDNAs similar to that of PAC subunits. The sequences were aligned using Clustal X. Fully conserved amino acid residues are shown in red. Possible flavin binding domains are indicated by a blue background, while possible catalytic domains of adenylyl cyclase by a yellow background.

PAC α	-MYILVWKEGQQIRTFQDLEECGQFQTASNI	TD--GQIFSVINVTPTMSKGGETG---	ETQ	54	
AlPAC α	-MYILVWKEGQQIKTFQDLEECGQFQIASNI	TD--GQIFSVSVTPTMSKGGETG---	ETQ	54	
KqPAC1	-MYILVWKDGGQVKNFQDLEECGAFQTAANI	VD--GQIFNVGVTSAMNKGDDTG---	EVQ	54	
EsPAC1	-MYILVWKEGQQIKTFQDLEECGQFQTACNI	SD--GQIFSVNVAPTMSKGGESG---	EQL	54	
CsPAC1	-MYILVWKEGQQIKTFQDLEECGQFQTASNI	SD--GQTFSINVSPVMSKGGETG---	ETQ	54	
EtgPAC1	-MYVLVWKNNGQQVKT	FETLDGANSYKTGSNIADDDSNIFHIDVIPAQSAGSAGGGNVDPK		59	
EtvPAC1	-MYVLIWKS	GQQIQTFPDLEAASQFKAASNI	IED--SFIFSVSVTPTMLAGGAAG---	ESG	
EsPAC2	-MYILVWKKGQQIKS	FHTLDEAAEFKAASNI	IDE--AQMFSITVAPAISASGGTNE--	ATN	
PAC β	-MYILVWKKGQQIKT	FHTLDEAAQFKAASNI	IDE--AQMFSVTVAPAISASGGSNE--	ATN	
AlPAC β	-MYILVWKR	GQQIKTFHTLDEAANFKAASNI	IDE--AQMFSITVAPAISASGGSNE--	ATN	
CsPAC2	-MYILVWKKGQQIKT	FHTLDEAAQFKAASNI	IDD--AQMFSINVAPAVSASGGSNE--	ATN	
KqPAC2	-MHVLIWKKGQQIKT	FHTLDEAAQFKAASNI	IDD--AQIFNVSVTPAISASGGSNE--	ATN	
EtgPAC2	-MFLLVWKKGQQMAT	FHTLEESNEFKAASNI	IED--SHVFHLKLTPTTSGAGGANN--	ATG	
EtvPAC2	MVFLLVWKNGTQLKS	FLTLDDATQYKTASSI	IDD--AQIYNVAFTPAVSGDGGSNE--	ATN	
PAC α	LRRLMYLSASTEPEKCN	AEYLA	DMAHVATLRNKQIGVSGFLLYSS	PPFFQVIEGTDEDL	114
AlPAC α	LRRLMYLSASTEPEKCN	AEYLA	DMAHVATLRNKQIGVSGFLLYSS	PPFFQVIEGTDEDL	114
KqPAC1	LRRLMYLSASTEPEECT	TEYLAELARASSLRNKEIGVSGFLLYS	APFFQVIEGTDEDL		114
EsPAC1	LRRLMYLSKSTEPEACN	AEYLAQMAFVATCVNSTIGVSGFLLYS	APFFQVIEGTDDDL		114
CsPAC1	LRRLMYLSASTEPE	RCDEYLAEMAHVATLRNSEIGVSGFLLYS	APFFQVIEGTDEDL		114
EtgPAC1	LRRLMYLSKTTEAEL	CTPEYLA	DMAHVATLRNMEIGVSGFLLYS	APFFQVIEGTDEDL	119
EtvPAC1	LRRLMYLSKATEP	DECTPEFLAELAHVATLRNQEIGVSGFLLYS	APFFQVIEGTDEDL		114
EsPAC2	LRRLMYLSKSTNPEE	CDPAFLAEMAGIATIRNKEIGVSGFLMYSS	PPFFQVIEGTDEDL		115
PAC β	LRRLMYLSKSTNPEE	CNPQFLAEMARVATIRNREIGVSGFLMYSS	PPFFQVIEGTDEDL		115
AlPAC β	LRRLMYLSKSTNPEE	CNPQFLAEMARVATLRNREIGVSGFLMYSS	PPFFQVIEGTDEDL		115
CsPAC2	LRRLMYLSKSTEPEK	CDVPYLAEMAGIATLRNREIGVSGFLMYSS	PPFFQVIEGTDEDL		115
KqPAC2	LRRLMYLSKSTNPEE	CTPQFLAELGR	ISSIRNKEIGVSGFLMYS	APFFQVIEGTDEDL	115
EtgPAC2	FRRLMYLSKSTEAE	EVNSTYLAEMAGIATIRNQEIGVSGFLMYSD	PPFFQVIEGTDEDL		115
EtvPAC2	LRRLMYLSKSTEPEL	VNTQYLAEMAHVATLRNQCIGVSGFLMYSH	PPFFQVIEGTDEDL		116

PAC α	FLFAKISADPRHERCIVLANGPCTGRMYGEWHMKDSHIDNITKHPAIKTILFQIARSFSS	174
AlPAC α	FLFAKISSDPRHERCIVLANGPCTGRMYGEWHMKDSHIDNITKHPAIKTILFQIARSFSS	174
KqPAC1	FLFAKISSDPRHEKCIVLANGPCTGRLYGEWHMKDSHIDNITKHPAIKTILFQIAKSFSS	174
EsPAC1	WLYAKISRDPHERCIVLANGPCTGRMYGEWHMKDSHIDNITKHPAIKTILFQIARSFSS	174
CsPAC1	FLFAKIGADPRHERCIVLANGPCTGRLYGEWHMKDSHIDNITKHPAIKTILYQIARSFSS	174
EtgPAC1	FLFAKIGADPRHERCIVLANGPCTGRLYGDWHMKDSHIENITSHPAIKTILYQIARSFSS	179
EtvPAC1	FLFGKIGLDTRHEACIVLANGPCSGRMYGEWHMKDSHIDNITKHPAIKTILYQIARSFSS	174
EsPAC2	FLFAKISADPRHEKCIVLANGPCTGRMYGDWHMKDSHIDSITTHPAMKTILYQIARSFSS	175
PAC β	FLFAKISADPRHERCIVLANGPCTGRMYGDWHMKDSHMDSITTHPAMKTILYQIARSFSS	175
AlPAC β	FLFAKISADPRHERCIVLANGPCTGRMYGDWHMKDSHIDSITTHPAMKTILYQIARSFSS	175
CsPAC2	FLFAKIGADPRHERCIVLANGPCTGRMYGDWHMKDSHIDSITTHPAMKTILYQIARSFSS	175
KqPAC2	FLFSKISMDDRHDRCIVLANGPCTGRMYGDWHMKDSHIDSITTHPAMKTILYQIARSFSS	175
EtgPAC2	FLFAKIGADPRHERCIVLANGPCTGRLYGDWHMKDSHIDSITSHPAMKTILYQIARSFSS	175
EtvPAC2	FLFAKIGIDPRHERCIVLANGPCTGRLYGDWHMKDSHIDSITSHPAMKTILYQIARSFSS	176
PAC α	MWSYLPKNAANMLLLGKNPNKQAPEPMSVVVTFIYLVFESSILAHPLTEQCADILAAFV	234
AlPAC α	MWSYLPKNAANMLLLGKNPNKQAPEPMSVVVTFIYLVFESSILAHPLTEQCADILAAFV	234
KqPAC1	MWSYLSKNTANMLLLGKQPNKQAPEPMSVVVISFIYLVFESSILAHPLTEQCADVLAFAFV	234
EsPAC1	MWSYLPKNAANMLLLGKEPNKQAPEPMSVVITFIYLVFESSILAHPLTEQCADILEAFV	234
CsPAC1	MWSYLPKNAANMLLLGKNPNKQAPEPMSVVVTFIYLVFESSILAHPLTEQCADVLAFAFV	234
EtgPAC1	MWSYLPKNAANMLLLGKNPNKQTPPEPMSVVVTFIYLVFESSILAHPLTEQVADVLSHFV	239
EtvPAC1	MWAYLPKQAGNMLLLGKEPNKQPEPMSAVVSFIYLVFESTILANPNLTEQVADILIAFV	234
EsPAC2	MWSYLPKSAGNMLLLGKDPAAQPEPMSVIVTFIYLVFESSILSNPDLTEQAAEVLSTFV	235
PAC β	MWSYLPKSAGNMLLLGKDPAAQPEPMSVVVTFIYLVFESSILSNPNLTEQAAEVLSTFV	235
AlPAC β	MWSYLPKSAGNMLLLGKDPAAQPEPMSVVVTFIYLVFESSILSNPNLTEQAAEVLSTFV	235
CsPAC2	MWSYLPKSAGNMLLLGKDPASQPEPMSVVVTFIYLVFESSILSNPNLTEQAAEVLSTFV	235
KqPAC2	MWSYLPKSTGNMLLLGKDPAAQPPVPMVVVTFIYLVFESSILSKPNLTEQAAEVLSTFV	235
EtgPAC2	MWSYLPKSAGHMLLLGKDPNKQPEPMSVVVTFIYLVFESSILSHPLTEQCAEVLSTFV	235
EtvPAC2	MWSYLPKSAGNTLLGKDPAAQPEPMSVVVTFIYLVFESSILSHPLTEQCAEVLSTFV	236
PAC α	DACVRNVEGTGGQVAKFITGICMAYWPINRAEDALVGLQQLSEDLAELRSQQPPGSALSLSL	294
AlPAC α	DACVRNVEGTGGQVAKFITGICMAYWPINRAEDALVGLQQLSEDLAELRSQQPPGSALSLSL	294
KqPAC1	DVCVRNIEGTGGHVAKFITGICMAYWPSNRAEDALVGLQQLSDDLAEELRSQQPPGSALSLSL	294
EsPAC1	DACVRNIEGTGGQVAKFITGICMAYWPINRAEDAIVGLQQLSEDLAELRSQQPPGSALSLSL	294
CsPAC1	DACVRNVEGTGGQIAKFITGICMAYWPINRAEDALVGLQQLSEDLAELRSQQPPGSALSLSL	294
EtgPAC1	DICVRNIEGSGGAIKFITGITMAYWPINRAEDALLALQQLINEDLAQLRSQQPPGSALSLSL	299
EtvPAC1	DSCVKNVEGSGGSVAKFITGICMAYWPINRAEDALLGLQAISSDLAEELRAHQPPGSALSLSL	294
EsPAC2	DVCVKNVEGSGGNIKFITGICMAYWPINRAEDALTSIQQISEDLAQLRSQQAPGSAITL	295
PAC β	DVCVKNVEGSGGNIKFITGICMAYWPINRTEALTAIQQISEDLAQLRSQQAPGSAVSL	295
AlPAC β	DVCVKNVEGSGGNIKFITGICMAYWPINRTEALNAIQQISEDLAQLRSQQAPGSAISL	295
CsPAC2	DVCVKNVEGSGGNIKFITGICMAYWPINRAEDALTSIQQISEDLAQLRSQQAPGSAVSL	295
KqPAC2	DVCVKNVEGSGGNIKFITGICMAYWPINRAEDAIQAIQQISDDLAEELRSQQPPGSAISL	295
EtgPAC2	DVCVRNVEGSGGNIKFITGICMAYWPINRAEDALTALQQLINEDLAQLRGAQAPGSAISL	295
EtvPAC2	DVCVKNVEGSGGNIKFITGICMAYWPINRAEDALTSIAQISEDLGQLRGQQPPGSALSLSL	296
PAC α	IYSRCGVHYGRALLCNAGFRKADFTLLGDCINTASRITSLSVKLKVPLLLSFEVRCLLGD	354
AlPAC α	IYSRCGVHYGRALLCNAGFRKADFTLLGDCINTASRITSLSVKLKVPLLLSFEVRCLLGD	354
KqPAC1	VYSRCGVHYGRALLCNAGIKKADFTLLGDCINTASRITSLAGLKVPLLLSFEVRCLLGA	354
EsPAC1	VYSRCGVHYGRALLCNAGFRKADFTLLGDCINTASRITSLSVKLKVPLLLSFEVRCLLGD	354
CsPAC1	VYSRCGVHYGRALLCNAGTRKSDFTLLGDCINTASRITSLSVKLKNVPLLLSFEVRCLLGD	354
EtgPAC1	MYGRAGVHYGRALLCNAGVRKSDFTLLGDCINTASRVTSLATQLKSPLLFSEVRCLLGD	359
EtvPAC1	VYSRAGVHYGRALLCNAGMQKSDFTLLGDCINTASRVTSLSVQLKVPLLFSEVRCLLGD	354
EsPAC2	MYSQAGVHYGRAMLCNAGTRKSDFTLLGDCINTTSRVATLAKKLTPLLFSEVRCLLGD	355
PAC β	MYSQAGVHYGRAMLCNAGSRKSDFTLLGDCINTTSRIATLAKKLTPLLFSEVRCLLGD	355
AlPAC β	MYSQAGVHYGRAMLCNAGSRKSDFTLLGDCINTTSRIATLAKKLTPLLFSEVRCLLGD	355
CsPAC2	MYSQAGVHYGRAMLCNAGTRKSDFTLLGDCINTTSRVATLAKKLTPLLFSEVRCLLGD	355
KqPAC2	MYSQAGVHYGRALLCNAGTRKSDFTLLGDCINTTSRIATLAKKLTPLLFSEVRCLLGD	355
EtgPAC2	MYSRSGVHYGRAMLCNAGTRKSDFTLLGDCINTASRVASLAVTLKSPLLFSEVRCLLGD	355

PAC α	EMREELLESSGLHKVKGRDKPVQVYQFN-APELDSAMVRAKIEQFNPGRYRALCPVKPYES	413
AlPAC α	EMREELLESAGLHKVKGRDKPVQVYQFN-APELDSAVVRTKIEQFNPGRYRALCPVKPYDS	413
KqPAC1	EMREELLESAGMHKVKGREQPVQVFYFN-AAEVDSTAVRAKIEQFNPGRYRALCPVKPYDS	413
EsPAC1	EMREELENSGLHKVKGRDKPVQVYQFN-APELDSAMVRAKIEQFNPGRYRALCPVKPYDS	413
CsPAC1	EMREELLESAGLHKVKGRDKPVQVYQFN-APELDSAQVRAKIESFNPGRFRCMPVKPYDS	413
EtgPAC1	DMRDELESAGMHKVKGRDKPVAVYQFP-CEPLDNDMVRAKIEAFNPGRYRAQFPVVPYDS	418
EtvPAC1	DMREELLESGLGMHKVKGRDKPVAVYQFAGAPELDSAMVKAKEQFNPGRYRAQCPVRELES	414
EsPAC2	EMREEIEGAGMHQVKGRVQVYQFP-GPELDEVEMVRQKIDQFNPGRFRCQMPVVDYDS	414
PAC β	EMREEIEGAGMHQVKGRDKPVVYQFP-GPELDEVEMVRQKIEQFTPGRFRCQMPVVEYEA	414
AlPAC β	EMREEVEGAGMHQVKGRDKPVVYQFP-GPELDEVEMVRQKIEHFTPGRFRCQMPVVEYES	414
CsPAC2	EMREEIEGAGMHQVKGRDKPVVYQFP-GEELDVDEVVRHKIETFNAGRFRQMPVVEYDT	414
KqPAC2	EMREEIESAGMHQVKGRDKPVVYQFP-GATLDVEVVQKIEQFNPGRFRCQMPVVDYDT	414
EtgPAC2	EMRDEIESAGMHQVKGRDKPVVYQFP-SPIILSDVVVRQKIEQFNPGRYRCSMPVLDYET	414
EtvPAC2	EMRDEIEGAGMHSVKGKDKPVVYQFP-GPELDSGMVRQKIEEFNPGRYRCGMPVMEYES	415
PAC α	LHPAQRPPIFDDTPRE-NQPK---LSQVQRDSLVDRLSLIAKLAFPS-SMMAGGEGQLI	468
AlPAC α	LHPAQRPPIFDDTPRD-SQPK---VNQMQRDSLVDRLSMIAKLAFPS-SMMVGGESQLI	468
KqPAC1	LHPSQKPPIFDDTPRD-SMPR---SGHLQRQDSLVDRLSMIAKLAFPP-SMAAGGESQLI	468
EsPAC1	LSATQKPPIFDDTMRD-GHNK---LSAAQRDSLVDRLSLIAKLAFPP-SMLAGGDGQLI	468
CsPAC1	LHPSQRPPIFDDTPRE-SMPK---LSVVQRDSLVDRLSLIAKLAFPP-NMMNGGDNQLI	468
EtgPAC1	LHGVHKPPIFDDSPKD-PLATRIAQAAGERKDSLIDRLIMISNLAIPA-SMAGGNNQLI	476
EtvPAC1	LHPDVRPPIFDDTPRE-ASMP--KAGAGERRDSLADRLTMIAKLAFP--TIGGTNSQMI	469
EsPAC2	LPVSQRPPIFDDTPKGNPRPRTPGYGGTQRSDSLVDRLIMIAKLAGPS--ASAGDTSLT	472
PAC β	LPISQRPPIFDDTPKGNPRPRTPGYGGQRQSDSLVDRLIMIAKLAGPS--VSATGDTTTLT	472
AlPAC β	LPISQRPPIFDDTPKGGKPRPRTPGYGGQRQSDSLVDRLIMIAKLAGPS--ISATGDSLT	472
CsPAC2	LHPSQRPPIFDETPKGNPRPRTPGYGGTQRRDSLVDRLIMIAKLAGTT--ASTTGDTTLI	472
KqPAC2	LLPSQRPPIFDETQRDVIKPRVP--GMQRDSLADRLAMIAKLAGTTGGAAGAGDSTLV	471
EtgPAC2	MNPAKRPPIFDNAPKGNPKIG-KKYNAAAHRDSLVDRLTEIARLAFPG--SQAGDSTLI	471
EtvPAC2	LHVSEQPPIFDDTPKGTGTPGTRAWGGTNRKDSLADKLALISQLAGP---LQTSGDTTTLT	472
PAC α	TLTYISQAHPMSRLDLASIQRIAFARNNESSNITGSLLYVSGLFVQTEGPKGAVVSLYL	528
AlPAC α	TLTYISQAHPMSRLDLSSIQRVSFSRNESSNITGSLLYVNGLFVQTEGPKSAVVSLYL	528
KqPAC1	GLTYISQASHAMSRLDLSDIQRVAHRNEQVNIACLLYINGLFVQTEGPKSAVVSLYL	528
EsPAC1	TLTYISQASRPMSRLDLSAIHRVAMRRNESSNISGCLLYVNGLFVQTEGPKSAVVSLYL	528
CsPAC1	TLTYISQASYPMSRLDLAAIQRVGCRRNESAIITGSLIYVNGLFVQTEGPKSAVITLYL	528
EtgPAC1	TLTYISHAVKPMMSRLDLAAINRNAVRRNAASKITGTLLYVNGLFVQTEGPKDAVLTLYN	536
EtvPAC1	TLTYVSFSSRPMSRLDLAAIQRVGLRRNSQVDITGSLLYVAPLFVQTEGPKDAVLSVYM	529
EsPAC2	TLTYISLATRPMSRLDLSAIMRTATRNRSSQGITGTLLYINGLFVQTEGPKDAVNLYL	532
PAC β	TLTYISQATRPMSRLDLSAIMRTATRNRQAQSGITGTLHVNGLFVQTEGPKDAVNLYL	532
AlPAC β	TLTYISQATRPMSRLDLSAIMRTATRNRQAQSLITGTLLYVNGLFVQTEGPKDAMVNLYL	532
CsPAC2	TLTYISQASRPMSRLDLSAIMRASTRNTQQNITGTLHVNGLFVQTEGPRDAVMNLYL	532
KqPAC2	TLTYISQTVRPMSRLDLAAIMRVATRNRQAQGITGTLHVSGLFVQTEGPRSAVGLYLM	531
EtgPAC2	SLTYLSNSVRPMSRLDLAAIQRALTARNASQGITGCLLYVNGLFVQTEGPRDNVINLYL	531
EtvPAC2	TLTYISHSTRPITRMDLASIQRCALRRNAQHNIITGCLLYVTGLFVQTEGPKDAVINLYH	532
PAC α	KIRQDKRHKDVVAVFMAPIDERVYGSPLDMTSATEEMLATFPPLQDVLSQLAKSFISLET	588
AlPAC α	KIRQDKRHKDVVAVFMAPIEERVYGSPLDMTAATEEMLATFPPLQDVLSQLAKSFISLET	588
KqPAC1	KIRQDPRHKDVVVVHMAPLEERMYRGPLDTTCATDEMLATFPPLQDVLSQLAKSFISLET	588
EsPAC1	KIRQDGRHKDVVTVYMAPLEERVYATALDMTAATEDMLSTFPPLQDVLSQLARSFISLET	588
CsPAC1	KIRQDSRHKDVVIIVFMAPIEERVYSTALDMTSATEEMLATFPPLQDVLSQLAKSFISLET	588
EtgPAC1	KVRRDARHEDVVTVHLAPLDERVYDVPFSVTAATDSMLSKFPPLQDVLSQLAKSFISLET	596
EtvPAC1	KIRADPRHRDVVAVYMAPQEERVYNSAFELTTATEEMLSAFPPLQDVLSQLAKSFISLET	589
EsPAC2	RIRQDPRHTAVVTVHQAALQERVYPPPEWTMTSATEEMLATFPPLQDVLSQLAKSFTSLET	592
PAC β	RIRQDPRHTDVTTVHMAPLQERVYPPSEWTLTSATEEMLATFPPLQDVLSQLAKSFTSLET	592
AlPAC β	KIRQDPRHTDVTTVHMAPIQERAYPAEWTLTSATEEMLATFPPLQDVLSQLAKSFTSLET	592
CsPAC2	RIRQDPRHTDVTTVHMANLQERVYPPPEWTLTSASEDMLAAFPPLQDVMSQLAKSFTSLET	592
KqPAC2	RIRQDPRHKDVVTVHLAPISERVYPPDWTLTTATEQMLSTFPPLQDVLSQLAKSFTSLET	591

Supplementary Material (ESI) for Photochemical & Photobiological Sciences

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EtgPAC2	KIREDP RRHKD VVTVYMPVIQDRVYQEAWTMTTASEDMLATFPPLQDVLSQLAKSFTSLET	591
EtvPAC2	KIRADARHTD VVT VHQGP IQDRVYASAWAL TNT SEEMLSAFPPLQDVLSQLAKSFTSLET	592
PAC α	YVPSTV V RYLTAGNNPRNLQPVSV EV VMLATDICSFTPLSEKCSL TE VWTICNTFIDACT	648
AlPAC α	YVPSTV V RYLTAGNNPRNLQPVSV EV VMLATDICSFTPLSERCSL TE VWTICNTFIDACT	648
KqPAC1	YVPSTIV R YLTSGNNPRNLQPVSV EV VMLATDICSFTPLSEHC SL TEIWTICNTFIDACT	648
EsPAC1	YVPSTIV R F L TAGNNPRNLQPVSV D VVMLATDICSFTPLSERCSL TE VWTICNTFIDACT	648
CsPAC1	YVPSTV V RYLTAGNNPRSLQPVSV EV VMLATDICSFTPLSENC SL TEVWTICNTFIDACT	648
EtgPAC1	YVPSTV V R W L T AGNNPRGLHAV S TEVVMFATDICSFTPLSENC SL VEVW L ICNTFIDACT	656
EtvPAC1	YVPSTV V RYLTAGNNPRSLQAI S TGVVMFATDICSFTPLSEKCSL TE VW L ICNTFIDACT	649
EsPAC2	YVPSTV V RYLTAGNNPRNLM P VSCSVMLATDICSFTSLTEK S SL TE VW M ICNTFIDACT	652
PAC β	YVPSTV V RYLTAGNNPRNLM P VSCGVMLATDICSFTSLTEK S SL TE VW M ICNTFIDACT	652
AlPAC β	YVPSTV V RYLTAGNNPRNLM P VSCGVMLATDICSFTSLTEK S SL TE VW M ICNTFIDACT	652
CsPAC2	YVPSTV V RYLTAGNNPRNLM P ISCGVMLATDICSFTSLTEK S SL TE VW M ICNTFIDACT	652
KqPAC2	YVPSTV V RYLTAGNNPRNLV P VSCGVMLATDICSFTSLTEK S SL TE VW L ICNTFIDACT	651
EtgPAC2	YVPSTV V RYLTAGNNPRDL M PVSV E CVMFATDICSFTMLTEK S SL TE VW M ICNTFIDACT	651
EtvPAC2	YVPSTIV R YLTAGNNPRNLR P VSVGVMLATDICSFTMLTEK S SL TE VW M ICNTFIDACT	652
PAC α	SAICNEGGEVIK L IGDCVTAYFPPTGADNAVHACQEIVS F CAQLRDAFHDVLD C RSVVAC	708
AlPAC α	SAICNEGGEVIK L IGDCVTAYFPPTAADNAVHACQEIVS F CAQLRDAFRDVL C RSVVAC	708
KqPAC1	SAICSQGGEVIK L IGDCVTAYFPPTSADNAVYACQDIVAF C ANLREAFRDVL C RSVVAC	708
EsPAC1	SAICNEGGEVIK L IGDCVTAYFPPHAADNAV S ACQEIVTF C THLREAFKDVLD C RSVIAC	708
CsPAC1	SAICSEGGGEVIK L IGDCVTAYFPPTSADNAVAACQEIVTF C TQLREAFSDVL C RSVIAC	708
EtgPAC1	HSICNKGGEVIK L IGDCVTAYFPDPGADA A VLACQEVVTF C AQLREAFEEVLD C RSVVAC	716
EtvPAC1	AAIVQERGEVIK L IGDCVTAYFPPTNADGAVMACQEIVAF C TGLRAAFSDVL D VRQVVAC	709
EsPAC2	SAICQEGGEVIK L IGDCVTAYFPGNAADAAIAAAQELFM F CTTLRQAFVDVL D VRGCVAC	712
PAC β	SAICQEGGEVIK L IGDCVTAYFPGNNADSAVAAAQELFT F CRQLREAFVDVL D VRGCVSC	712
AlPAC β	SAICQEGGEVIK L IGDCVTAYFPGNGADSAVAAAQELFT F CRQLREAFVDVL D VRGCVSC	712
CsPAC2	SAICQEGGEVIK L IGDCVTAYFPGSAADA A VAAAQELYL F CTQLREAFVDVL D VRGCVSC	712
KqPAC2	NAICQAGGEVIK L IGDCVTAYFPGTAADNAV S AAQELIT F CRELREAFVDVL D VRGCIYC	711
EtgPAC2	SAICAEGGEVIK L IGDCVTAYFPPSERADNAVAASQELYM F CVHMR E AFQEILD V RACIAC	711
EtvPAC2	NAVITNGGEVIK L IGDCVTAYFPGHGADGAVAAAQEIF S CTQLREAFADAL D VRSAISA	712
PAC α	GVGLDFGQV I MAQC S LSGMTEFV V VAGEVSARVMEVEAL T REAGRAIV I TEPVADRLSPKL	768
AlPAC α	GVGLDFGQV I MAQC S LSGMTEFV V VAGEVSARVMEVEAL T REAGRAIV I TEPVADRLSPKL	768
KqPAC1	GVGLDFGQV I MAQC S SSGLTEFAV V VAGEVSARVMEVEAL T REAGRAIV L TEPVADHLSPKL	768
EsPAC1	GVGLDFGQV I MAQC S LSGMTEFV V VAGEVSARVMEVEAL T REAGRAIV V TEPVADRLSSRL	768
CsPAC1	GVGLDYGQV V MAQC S LSGMTEFV V VAGEVSARVMEVEAL T REAGFTIV V TEPVADRLSPKL	768
EtgPAC1	GVGLDYGQV V MAQC S SEG M TEYV V VAGEVSARVMEVEAL T RDVARAIV V TEPVADRLSPAM	776
EtvPAC1	GVGLDYG D VVMAQC S SMG M TEFV V VAGEVSARVMEVEAL T REVGRAIV I TEPVADRLSPKM	769
EsPAC2	GVGLDYGQV V MGQCGT M GLTEFV V VAGAVSARVMEVEAL T REVGRAIV V TEPVADRLSPQM	772
PAC β	GVGLDYGQV V MAQC S LSGLTEYV V VAGAVSARVMEVEAI T REVGYAIV V TEPVADRLSPQL	772
AlPAC β	GVGLDYGQV V MAQC S LSGLTEYV V VAGAVSARVMEVESI T REVGYAIV I TEPVADRLSPQL	772
CsPAC2	GVGLDYGQV V MAQC S GLTEYV V VAGAVSARVMEVEAL T REVGHAI V TEPVADRLSPQL	772
KqPAC2	GVGLDFGQV V MAQC S GLTEY V VAGAVSARVMEVEAL T REVGRAIV L TEPLADRLCPQM	771
EtgPAC2	GVGLDYGQV V MAQAG S LSGLTEY V VAGAVSARVMEVEALS R DVGRAIV C TEPV V DRLSPHL	771
EtvPAC2	GIGLDFGQV V MAQAG S LVTEFAV V VAGSVSARVMEVEAL T RDVGRAIV V TEPVADRLSPQL	772
PAC α	RDTGIVPCQEGVDG V PCYGI L GPEWELDVATI K KN I YGFHDARALAAMKKVDD-----	821
AlPAC α	RDTGIVPCQEGVDG V PCYGI L GVEWELDVAII K KN I YGFHEARQAALKKVDD-----	821
KqPAC1	RDNGLVPCQEGVDG V PCYGI L GAEWELDVVTI K RNI Q NFHAA R AVA A VQKVDD-----	821
EsPAC1	RDSGIVPCQEGVDG V PCYGI L GPEYE L DIVTVKAN I YGFHDARQAALRKADD-----	821
CsPAC1	RDTGII P CH E GVDG V PCYGI A GDEWVLDIKTI K ANI Y GFHEARQAALRKVDD-----	821
EtgPAC1	RDNGII P CSQGV D IPCYGI L GEEWELDIPTI K ANI K RFHAT R AEIARQKEE-----	829
EtvPAC1	RDTGII P CPQAEGL P CYGI A GDDWLDIVTI K KN I YSFHDRDAVAHAKAAA-----	822
EsPAC2	RDTGII P CPQAEGL P CYGI A GDDYELDIDEIKRS I KHLHAARS G EKM-----	820
PAC β	RDHGIVPTPQAEGL P CYGI A GEEFELDVDSIKRGI K ALHAARS G EKP-----	820
AlPAC β	RDHGII P TPQAEGL P CYGI A GEEFELDVDSIKRGI K ALHAARS G EKP-----	820
CsPAC2	RDSGII P CPQAEGL P CYGI A GEEFELDIDSIKRGI K ALHAARS G EKV-----	820

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KqPAC2	QEMGIVPSPQAIDGLPCYGVAGDEFVLDVDTIKRSIKNFHAARS	SGEKLNVSGLANGDLEE	831
EtgPAC2	RDSGVI PCPQAIEGIPCYGIAGEDYELDIRSIKAGIKQLHAARS	SLEDQA-----	820
EtvPAC2	RDRGLI PCPQAIEGIPCYGLAGDDFELD IASIKGRIRNLHAMR	RAGEKPN-----LPDD	825
PAC α	GTNAPGR----	GAPAGGIPSSPKVRPPGRTNSVSSYTPDPNEALDPRMAESVFLDMCHQR	877
AlPAC α	GTNAPGR----	GAPAAGVPSSPKARALGRTSSVSSYTPDLNETLDPRMAESVFNDLCNQR	877
KqPAC1	GMNAPGRALPVASMPAISSPSPKVVRTAGRAASVASYPDLNDLLDPRMAE	VVFQELCQQR	881
EsPAC1	GTNAPG-----	KSGPAVPSSPKVHHAQGRAGSVASYTPDPNEVLDPRMAEMVFDQMCQHR	876
CsPAC1	GTRAPGH----	AAPAS----PKAQKGAGRANSVASYPDVNELLDPRMAESVVFQELCQQR	873
EtgPAC1	AAAAEAG-----	KPKAKARADSRFGPRGSVNSYCPDPNEVLDPRMAEDVFVEACAAR	881
EtvPAC1	AQEALDA-----	AAPSPKKGGRGSGRSSVSSYAADPNEVLDPRMAEAAAYTQGCQQR	874
EsPAC2	-----	-----	-----
PAC β	-----	-----	-----
AlPAC β	-----	-----	-----
CsPAC2	-----	-----	-----
KqPAC2	-----	-----	-----
EtgPAC2	-----	-----	-----
EtvPAC2	-----	-----	-----
PAC α	GDTANNSIAVKLRQAANDDRLDLGRMLQGPHELMPVMQAIKHLTNLRMLNMSDNFVDDNN		937
AlPAC α	GDAPNNSIAAKLRQAANDDRLDLGRMLQGPHELMPVLQAIKQLTNLRMLNMSDNFVDDNN		937
KqPAC1	GEIPNNAVLLRLRQAHEERADLGRSLQGPHELPPLTQALKQLTNVRALNMSDNFVDDTS		941
EsPAC1	GDQPSNAIILMKLRNAAQDDRLDLGRTLQGPHELGPLTQAIKQLTNLKMVNMSDNFIDNDT		936
CsPAC1	GDVPNVGISAKLRQAQDDRLDLGRTLQGPHELGPVVQAVKQLTNLKTLLNLSDNFVDDGS		933
EtgPAC1	GDAPNLALAKMRQAANDDRLDLARALQGPHELSPLTALKQLCHLRSLNMSDNFIDDDN		941
EtvPAC1	GEQPTMAIVNKLRGAGNDTRMDLGRALQGPHELMALCTALKHLTHLRLLNMSDNFVDDNS		934
EsPAC2	-----PSADHEENKGNDFRVSPGRVRRSDSGRRSNSAQGKRSTPVR	-----	861
PAC β	-----LTEPEEAKP--DFRVSPGRVRRHSDSGRRSNSAQGKRSTQVR	-----	859
AlPAC β	-----LALPEEAKQDYRVSPGRMRHSDSGRRSNSAQGKRSTQVR	-----	860
CsPAC2	-----AVAEPEEKGGDFRVSPGRVRRSDSGRRSNSAQGKRSTPVR	-----	860
KqPAC2	-----SMTGSPLRATINDFRVSPGRVRRSDSVRRSPSIAGRYGVATR	-----	873
EtgPAC2	-----AAAAEEEAQAQQQFRVSPGRVRRSDAGRRSNSAQGRRMAPVR	-----	862
EtvPAC2	-----HEQEDNYKQAQQDFRVSPGRVRRADSGRRSNSAQGRRSAPVR	-----	867
PAC α	VGELVESCIPMRSLQVLDLSNPNGLTKVIALKRLIKHNTQVREILLNGTRIPAPTEQRKLQ		997
AlPAC α	VGELAESCIPMRSLQVLDLSNPNGLTKVIALKRLIKHNTQIREILLNGTRIPAPTEQRKLQ		997
KqPAC1	IGDLIESCLAMRSLQMLDLSNPNGLTKVIALKRLIKHNPQLREIHLNGTRIPAPTEQRKLQ		1001
EsPAC1	IGDLVEACLMSRSLQVLDLSNPNGLTKTIALKRLIKHNPVREVLLNGTRIPAPTEQRKLQ		996
CsPAC1	VGEIVEACLPMRNLQVLDLSNPNGLTKI IALKRLIKHNPAVREILLNGTRVAPTEQRKLQ		993
EtgPAC1	VVDLVEACLPMENLQVLDLSNPNGITKI IALKRLVKHNQVIREINLNGTRVAPTEQRKLQ		1001
EtvPAC1	IAEIVEACLPMKSLAVLDLSNPNGLTKI IALKRLVKHNPGIKEI ILQGTRIPAPTEQRKLQ		994
EsPAC2	-----	-----	-----
PAC β	-----	-----	-----
AlPAC β	-----	-----	-----
CsPAC2	-----	-----	-----
KqPAC2	-----	-----	-----
EtgPAC2	-----	-----	-----
EtvPAC2	-----	-----	-----
PAC α	SSMNVNRLCAS----	TDLKGSWKYEH-----	1019
AlPAC α	SSMNVNRMCAS---	TDSKS-SHKYDH-----	1019
KqPAC1	SSLNVNRLCAS---	AESKLGSHKYEGAAH----	1027
EsPAC1	SSMNVNRLTAS---	DKG--GSHKYDH-----	1017
CsPAC1	SSINVNRLCSS---	TDKGGSHKYESH-----	1017
EtgPAC1	SSINVNRLCAS---	EKR-----	1015
EtvPAC1	SSINVNRLCASSPNGAESKAGHKYDQSMSSSHH		1027
EsPAC2	-----	-----	-----
PAC β	-----	-----	-----
AlPAC β	-----	-----	-----

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CsPAC2 -----

KqPAC2 -----

EtgPAC2 -----

EtvPAC2 -----