

Figure S1. The molecular mass (kDa) and isoelectric point of plots of TaACO genes.

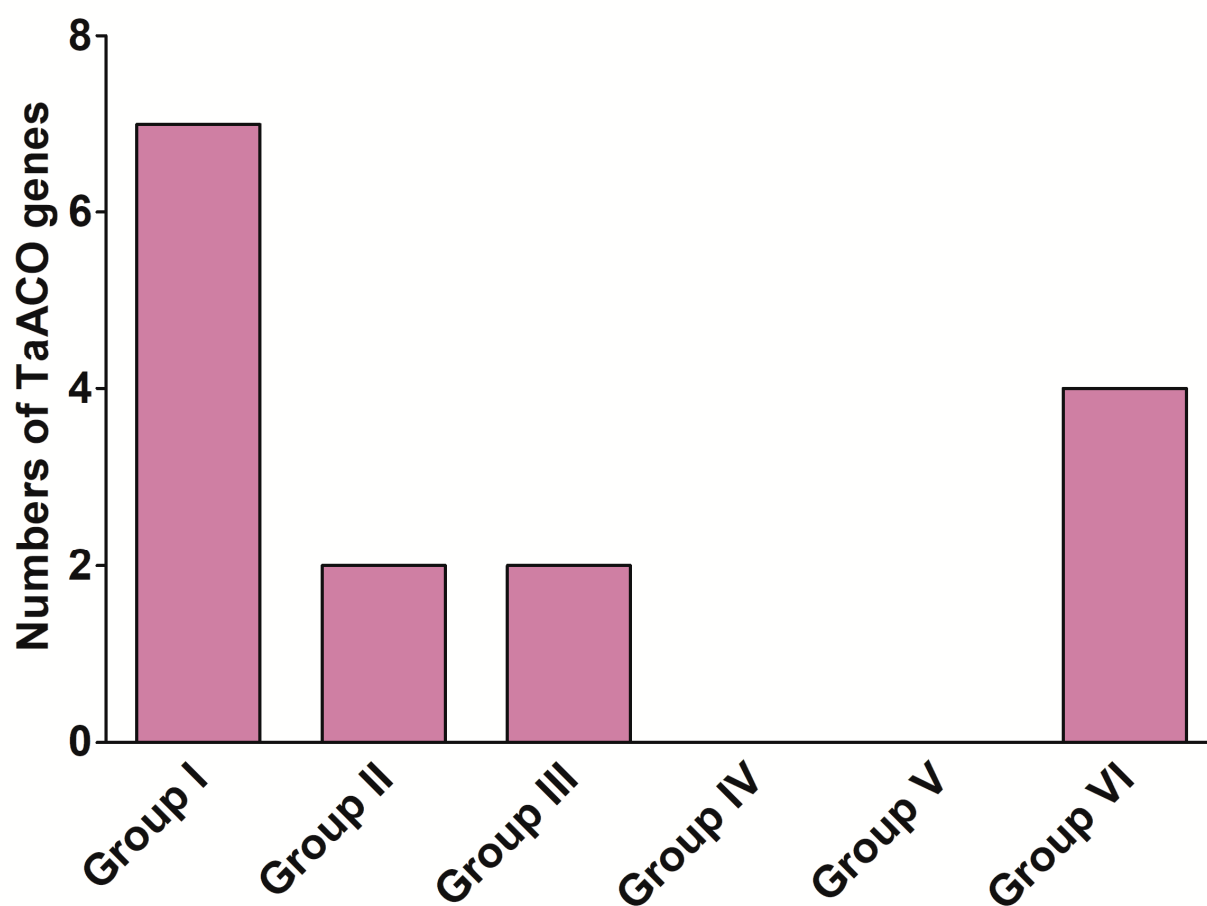


Figure S2. Dispersal of TaACOs in a different group of the phylogenetic tree.

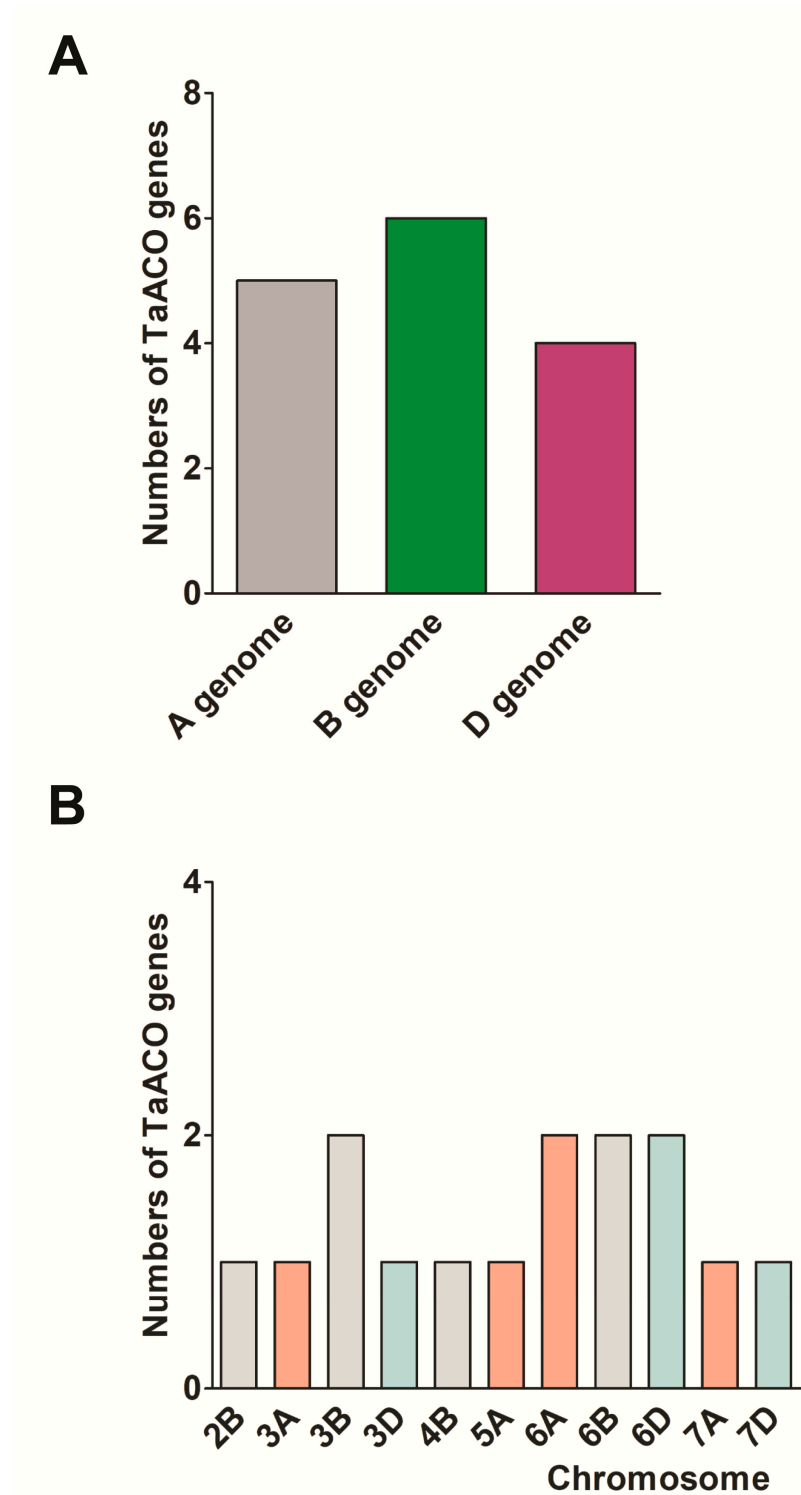


Figure S3. Chromosomal locations of identified ACO genes and on the three sub-genomes of (A) Dispersal of ACO genes in the A, B and D sub-genomes. (B) Dispersal of ACO genes on wheat chromosomes.

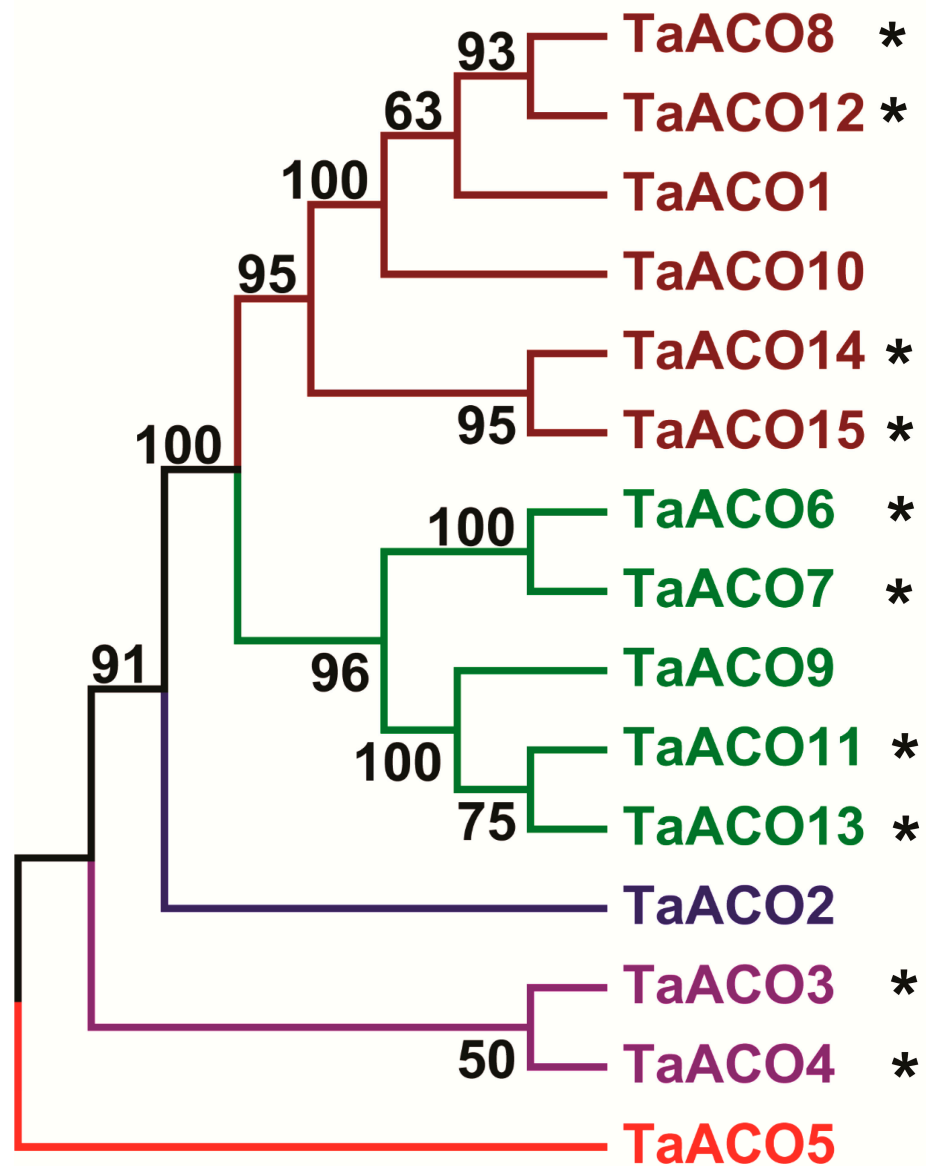


Figure S4. Evolutionary analysis of TaACO genes. A phylogenetic tree was produced using MEGA7 with the NJ method and 1000 bootstrap replications. A black asterisk denotes the duplicated gene pairs.

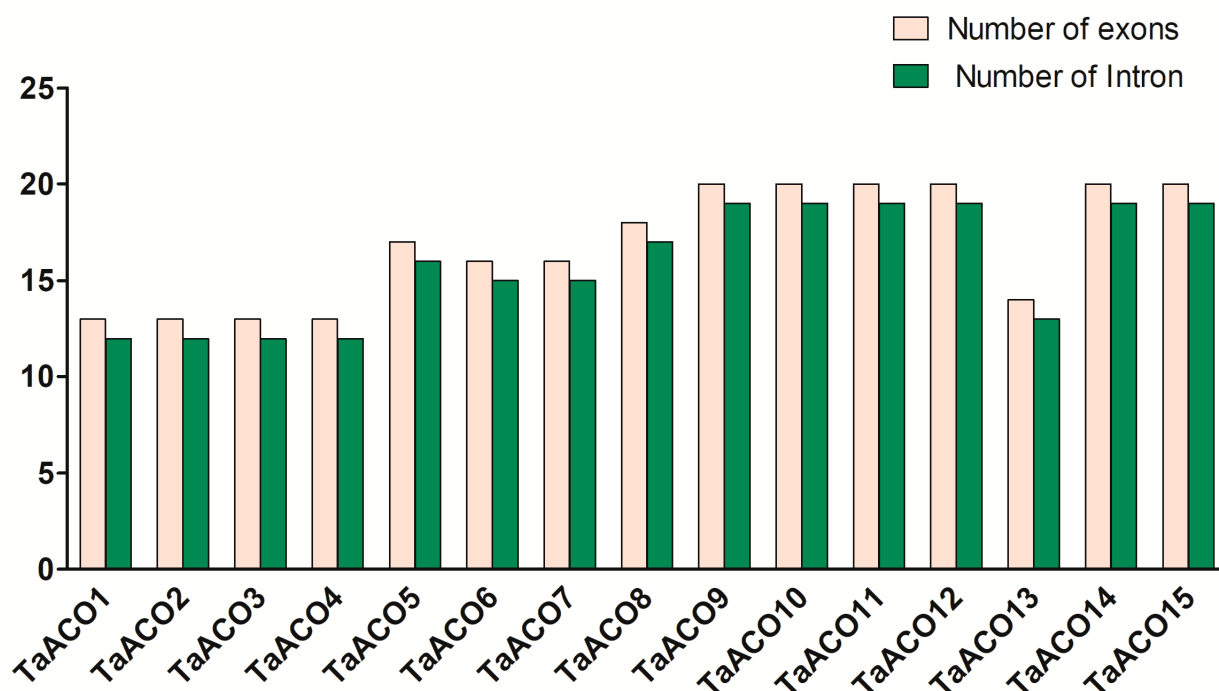


Figure S5. The different number of exons and introns in found in the TaACOs gene family.

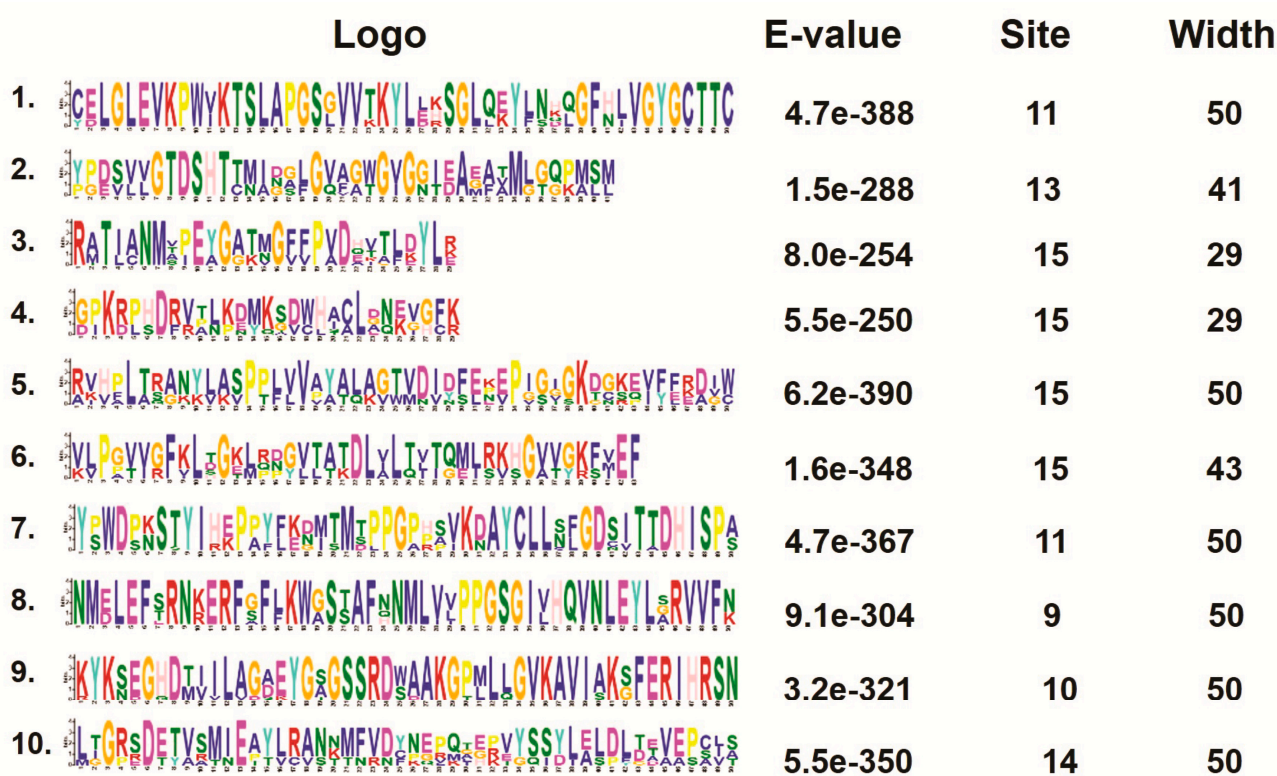


Figure S6. Sequence logo of TaACO motif and height of each mountain indicate the conservation at this position, whereas the height of the different letters represent the frequency of the corresponding amino acids.


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      *      200      *      220      *      240
TaAC01 : -----MNYSCIIREASMRMINPFVMSRLE----- :
TaAC02 : WEKISPKLAIEIPFKEARLVIMNTGGIAVVDLAAIRVIAEIDSPKKINPLVFVDLVID :
TaAC03 : ----- :
TaAC04 : WEKISPKLAIEIPFKEARLVIMNTGGIAVVDLAAIRVIAEESIPKKINPLVFVDLVID :
TaAC05 : WEKISPKLAIEIPFKEARLVIMNTGGIAVVDLAAIRVIAEESIPKKINPLVFVDVVID :
TaAC06 : -----MTVLCLCLCAIAYIAACIFFQVFVDLVVD :
TaAC07 : WENIATKQVEIPFKEARVLIQDFTGVIAVVDLACMRDAMSKIGSPNKINPLVFVDLVVD :
TaAC08 : -----MASISAAAKATSAAFAHKKEIAAAAPQQRLS :
TaAC09 : WENISPKLAIEIPFKEARVLIQDFTGVIAVVDLAAMRDALAKIGSLANKINPLVFVDLVID :
TaAC10 : -----MASISAAAKATSAAFAHKKEIAAAVFPQQ--- :
TaAC11 : WENISPKLAIEIPFKEARVLIQDFTGVIAVVDLAAMRDALAKIGSLANKINPLVFVDLVID :
TaAC12 : -----MASISAAAKATSAAFAHKKEIAAAAPQQRLS :
TaAC13 : WENISPKLAIEIPFKEARVLIQDFTGVIAVVDLAAMRDALAKIGSLANKINPLVFVDLVID :
TaAC14 : WEKISLEQVEIPFKEARVLIQDFTGVIAVVDLAFSMRDAMLEGGNPDKINPMVFADLVID :
TaAC15 : WEKISLEQVEIPFKEARVLIQDFTGVIAVVDLASMRDAMSEGGNPDKINPMVFADLVID :

      *      260      *      280      *      300
TaAC01 : -DFWSRRTIAGRVHAVATSTGLPRA-----EASTGSVKS----- :
TaAC02 : HSVRVQVAKCADALKQNDLEFSRNKERISIFKWASSAFNNMLVLPFGSGILHQNLEYL :
TaAC03 : ----- :
TaAC04 : HSVRVQVAKCADALKQNDLEFSRNKERISIFKWASSAFNNMLVLPFGSGILHQNLEYL :
TaAC05 : HSVRVQVAKCADALKQNDLEFSRNKERISIFKWASSAFNNMLVLPFGSGILHQNLEYL :
TaAC06 : HSVQVQVARSENNAVQANNELEFSRNKERIGILKWGSTAFNNMLVLPFGSGIVHQNLEYL :
TaAC07 : HSVQVQVARSENNAVQANNELEFSRNKERIGILKWGSTAFNNMLVLPFGSGIVHQNLEYL :
TaAC08 : AGASSRRFARAGRVRAVATPTRAPRS-----EASTGSVKS----- :
TaAC09 : HSVQVQVARSSNALQSNNELEFTRNRERIGILKWGSTAFNNMLVLPFGSGIVHQNLEYL :
TaAC10 : -LASSRRFARAGRVRAVATPTRAPRS-----EASTGSVKS----- :
TaAC11 : HSVQVQVARSTNALQSNNELEFTRNRERIGILKWGSTAFNNMLVLPFGSGIVHQNLEYL :
TaAC12 : AGASSRRFARAGRVRAVATPTRAPRS-----EASTGSVKS----- :
TaAC13 : HSVQVQVARSSNALQSNNELEFTRNRERIGILKWGSTAFNNMLVLPFGSGIVHQNLEYL :
TaAC14 : HSVTANVVRSQNALQANNELEEFERNKERIALILKWSSAFNNMLIIPFGSGIVHQNLEYL :
TaAC15 : HSVTANVVRSQNALQANNELEEFERNKERIALILKWSSAFNNMLIIPFGSGIVHQNLEYL :

      *      320      *      340      *      360
TaAC01 : -----PMTTTEKILARK :
TaAC02 : SRVVIKADGVLYPDSVVGTDSTHTTMINSLGVAGWGVGGIEEMAMLGQPMSMVLPGVVGF :
TaAC03 : -----MVLPGVVGF :
TaAC04 : SRVVIKADGVLYPDSVVGTDSTHTTMINSLGVAGWGVGGIEEMAMLGQPMSMVLPGVVGF :
TaAC05 : SRVVIKADGVLYPDSVVGTDSTHTTMINSLGVAGWGVGGIEEMAMLGQPMSMVLPGVVGF :
TaAC06 : ARVVINNGGILYPDSVVGTDSTHTTMIDGLGVAGWGVGGIEEATMLGQPMSMVLPAVVGF :
TaAC07 : ARVVINNGGILYPDSVVGTDSTHTTMIDGLGVAGWGVGGIEEATMLGQPMSMVLPAVVGF :
TaAC08 : -----PMTTTEKILARA :
TaAC09 : GRVVINTDGIMYPDSVVGTDSTHTTMIDGLGVAGWGVGGIEEATMLGQPMSMVLPGVVGF :
TaAC10 : -----PMTTTEKILARA :
TaAC11 : GRVVINTDGIMYPDSVVGTDSTHTTMIDGLGVAGWGVGGIEEATMLGQPMSMVLPGVVGF :
TaAC12 : -----PMTTTEKILARA :
TaAC13 : GRVVINTDGIMYPDSVVGTDSTHTTMIDGLGVAGWGVGGIEEATMLGQPMSMVLPGVVGF :
TaAC14 : ARVVINRDGLLYPDSVLGTDSTHTTMINGLGVAGWGVGGIDEEAMLGQPMSMVLPGVVGF :
TaAC15 : -----QPMSTMVLPGVVGF :

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		*	380	*	400	*	420	
TaACO1	:	SERAS	EPGENVWVVDVLMTHD	CGP	TIGIKKE	----	GEDAKWDRKVI	PDHY :
TaACO2	:	KLTGKIQDG-V	TTDIALTLTQMLRKHG	VVGKFI	EFY	GEGVGS	IP	PARATIANMTPEY :
TaACO3	:	KLTGKIQDG-V	TTDIALTLTQMLRKHG	VVGKFI	EFH	GEGVGS	IP	PARATIANMTPEY :
TaACO4	:	KLTGKIQDG-V	TTDIALTLTQMLRKHG	VVGKFI	EFH	GEGVGS	IP	PARATIANMTPEY :
TaACO5	:	KLTGKIQDG-V	TTDIALTLTQMLRKHG	VVGKFI	EFH	GEGVGS	IP	PARATIANMTPEY :
TaACO6	:	KLSGKIRNG-V	ATDIVLTVTQMLRKHG	VVGKFE	VEFY	GGMGKE	IS	ADRATTIANMAPEY :
TaACO7	:	KLSGKIRNG-V	ATDIVLTVTQMLRKHG	VVGKFE	VEFY	GGMGKE	IS	ADRATTIANMAPEY :
TaACO8	:	SERAS	EPGENVWVVDVLMTHD	CGP	TIGIKKE	----	GEDAKWDRKVI	PDHY :
TaACO9	:	KLSGKIRNG-V	ATDIVLTVTQMLRKHG	VVGKFE	VEFY	GEGMK	IS	ADRATTIANMSPEY :
TaACO10	:	SERAS	EPGENVWVVDVLMTHD	CGP	TIGIKKE	----	GEDAKWDRKVI	PDHY :
TaACO11	:	KLTGKIRNG-V	ATDIVLTVTQMLRKHG	VVGKFE	VEFY	GEGMK	IS	ADRATTIANMSPEY :
TaACO12	:	SERAS	EPGENVWVVDVLMTHD	CGP	TIGIKKE	----	GEDAKWDRKVI	PDHY :
TaACO13	:	KLTGKIRNG-V	ATDIVLTVTQMLRKHG	VVGKFE	VEFY	GEGMK	IS	ADRATTIANMSPEY :
TaACO14	:	KLHCTIRDG-V	ATDIVLTVTQMLRKHG	VVGKFE	VEFY	GRGME	EA	ADRATTIANMAPEY :
TaACO15	:	KLHCTIRDG-V	ATDIVLTVTQMLRKHG	VVGKFE	VEFY	GRGME	EA	ADRATTIANMAPEY :

		*	440	*	460	*	480		
TaACO1	:	-----	ITGDE-----	-----	AARNVDILRD	CAEQ	KIKYFY	YDIKDLSDFRANPDYKGV :	
TaACO2	:	GATMGFF	FVDQALDYLRLIGRSD	ETVSMIEAYLRANK	MFVDCN	LP	TGPFVYSSD	IELDL :	
TaACO3	:	GATMGFF	FVDQALDYLRLIGRSD	ETVSMIEAYLRANK	MFVDCN	LP	TGPFVYSSD	IELDL :	
TaACO4	:	GATMGFF	FVDQALDYLRLIGRSD	ETVSMIEAYLRANK	MFVDCN	LP	TGPFVYSSD	IELDL :	
TaACO5	:	GATMGFF	FVDQALDYLRLIGRSD	ETVSMIEAYLRANK	MFVDCN	LP	TGPFVYSSD	IELDL :	
TaACO6	:	GATMGFF	FVDAKTLDYLKL	TGRSD	ETVAMIEAYLRANK	MFVDYK	VCAERVYSSY	IELDL :	
TaACO7	:	GATMGFF	FVDAKTLDYLKL	TGRSD	ETVAMIEAYLRANK	MFVDYK	VCAERVYSSY	IELDL :	
TaACO8	:	-----	ITSDE-----	-----	AARNVDILRD	CEEQ	KIKYFY	YDIKDLSDFRANPDYKGV :	
TaACO9	:	GATMGFF	FVDHVTLDYLRL	TGRSD	ETVSMIEAYLRANK	MFVDYNE	LP	LERVYSSY	IALDL :
TaACO10	:	-----	ITSDE-----	-----	AARNVDILRD	CEEQ	KIKYFY	YDIKDLSDFRANPDYKGV :	
TaACO11	:	GATMGFF	FVDHVTLDYLRL	TGRSD	ETVSMIEAYLRANK	MFVDYNE	LP	AERVYSSY	IALDL :
TaACO12	:	-----	ITSDE-----	-----	AARNVDILRD	CEEQ	KIKYFY	YDIKDLSDFRANPDYKGV :	
TaACO13	:	GATMGFF	FVDHVTLDYLRL	TGRSD	ETVSMIEAYLRANK	MFVDYNE	LP	LERVYSSY	IALDL :
TaACO14	:	GATVGF	FVDHVTLEYLKMTG	REDET	VSTIEAYLRANK	MFVDYNE	PKIEPT	YSSY	IELDL :
TaACO15	:	GATVGF	FVDHVTLEYLKMTG	REDET	VSTIEAYLRANK	MFVDYNE	PKIEPT	YSSY	IELDL :

		*	500	*	520	*	540		
TaACO1	:	CH	ALAQEGHCR	GE----	VLGTLSHT	CNAGAF	QFATG	IGNTDAG----	VMGTGKAL :
TaACO2	:	TT	VEESVAGPKRPHDRV	PLKEMKSD	WHACLGNE	VGFKGAVPKI	EH	NKIVKEDI	HQPAE :
TaACO3	:	TT	VEESVAGPKRPHDRV	PLKEMKSD	WHACLGNE	VGFKGAVPKI	QH	NKIVKEDI	HQPAE :
TaACO4	:	TT	VEESVAGPKRPHDRV	PLKEMKSD	WHACLGNE	VGFKGAVPKI	QH	NKIVKEDI	HQPAE :
TaACO5	:	TT	VEESVAGPKRPHDRV	PLKEMKSD	WHACLGNE	VGFKGAVPKI	QH	NKIVKEDI	HQPAE :
TaACO6	:	DE	VEECISGPKRPHDRV	TLKNQSD	WLSCLDNK	VGFKGAVPKI	SQAKVAE	SSTR	TPAK :
TaACO7	:	DE	VEECISGPKRPHDRV	TLKNQSD	WLSCLDNK	VGFKGAVPKI	SQAKVAE	SSTR	TPAK :
TaACO8	:	CH	ALAQEGHCR	GE----	VLGTLSHT	CNAGAF	QFATG	IGNTDAG----	VMGTGKAL :
TaACO9	:	DE	VEECISGPKRPHDRV	TLKNQSD	WLSCLDNK	VGFKGAVPKI	QQ	DKVVKEDI	NQPAE :
TaACO10	:	CH	ALAQEGHCR	GE----	VLGTLSHT	CNAGAF	QFATG	IGNTDAG----	VMGTGKAL :
TaACO11	:	DE	VEECISGPKRPHDRV	TLKNQSD	WLSCLDNK	VGFKGAVPKI	QQ	DKVVKEDI	NQPAE :
TaACO12	:	CH	ALAQEGHCR	GE----	VLGTLSHT	CNAGAF	QFATG	IGNTDAG----	VMGTGKAL :
TaACO13	:	DE	VEECISGPKRPHDRV	TLKNQSD	WLSCLDNK	VGFKGAVPKI	QQ	DKVVKEDI	NQPAE :
TaACO14	:	GD	VEECISGPKRPHDRV	TLKNQSD	WLSCLDNK	VGFKGAVPKI	IP	DLQNRVVKEDI	HQRTAE :
TaACO15	:	GD	VEECISGPKRPHDRV	TLKNQSD	WLSCLDNK	VGFKGAVPKI	IP	DLQNRVVKEDI	HQRTAE :


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      *          560          *          580          *          600
TaACO1 : LK----VPPTIRFVLGEMPYLLAKDLQLQIIGETISGATKSMETAGS-----IE :
TaACO2 : ITHGSVVLAAVCSSINSSNFSVMIGAGLVAKKACELGLEVKPEWVKTSIAPGSLVVTKYIE :
TaACO3 : ITHGSVVLAAVCSSINSSNFSVMIGAGLVAKKACELGLEVKPEWVKTSIAPGSLVVTKYIE :
TaACO4 : ITHGSVVLAAVCSSINSSNFSVMIGAGLVAKKACELGLEVKPEWVKTSIAPGSLVVTKYIE :
TaACO5 : ITHGSVVLAAVCSSINSSNFSVMIGAGLVAKKACELGLEVKPEWVKTSIAPGSLVVTKYIE :
TaACO6 : IKHGDVVIAAITSCINTSNENVMLGALVAKKACDLGLEVKPEWIKTSIAPGSGVVKKYID :
TaACO7 : IKHGDVVIAAITSCINTSNENVMLGALVAKKACDLGLEVKPEWIKTSIAPGSGVVKKYID :
TaACO8 : LK----VPPTIRFVLGEMPYLLAKDLQLQIIGETISGATRSMEFVGS-----IE :
TaACO9 : LKHGSVVIAAITSCINTSNFSVMLGALVAKKACELGLEVKPEWVKTSIAPGSGVVTKYIL :
TaACO10 : LK----VPPTIRFILGEMPYLLAKDLQLQIIGETISGATRSMEFVGS-----IE :
TaACO11 : LKHGSVVIAAITSCINTSNFSVMLGALVAKKACELGLEVKPEWVKTSIAPGSGVVTKYIL :
TaACO12 : LK----VPPTIRFVLGEMPYLLAKDLQLQIIGETISGATRSMEFVGS-----IE :
TaACO13 : LKHGSVVIAAITSCINTSNFSVMLGALVAKKACELGLEVKPEWVKTSIAPGSGVVTKYIL :
TaACO14 : LKHGTVVIAAITSCINTSNFTVMIASGLVAKKAYELGLEVKPEWIKTSIAPGSGVVTKYIL :
TaACO15 : LKHGTVVIAAITSCINTSNFTVMIASGLVAKKAYELGLEVKPEWIKTSIAPGSGVVTKYIL :

      *          620          *          640          *          660
TaACO1 : SLNMEFRMT-----LNMVTEAGKNGVVPADETFKY-----IEKTSVTEYEP :
TaACO2 : HSGIQEYLNHQGFHLVGYGCTTCIGNSQDIDKSLSDAIVDNDVVVVAVLSGNRNYEGR :
TaACO3 : HSGIQEYLNHQGFHLVGYGCTTCIGNSQDIDKSLSDAIVDNDVVVVAVLSGNRNYEGR :
TaACO4 : HSGIQEYLNHQGFHLVGYGCTTCIGNSQDIDKSLSDAIVDNDVVVVAVLSGNRNYEGR :
TaACO5 : HSGIQEYLNHQGFHLVGYGCTTCIGNSQDIDKSLSDAIVDNDVVVVAVLSGNRNYEGR :
TaACO6 : KSGIQKYLNLQLGHNIVGYGCTTCIGNSQDIDESVAAAITDNDVVAAAVLSGNRNFEGR :
TaACO7 : KSGIQKYLNLQLGHNIVGYGCTTCIGNSQDIDESVAAAITDNDVVAAAVLSGNRNFEGR :
TaACO8 : SLTMEFRMT-----LNMVTEAGKNGVVPADETFKY-----IEKTLVTEYEP :
TaACO9 : KSGIQEYFNKQGFHLVGYGCTTCIGNSQEHESVSAAITENDVVAAAVLSGNRNFEGR :
TaACO10 : SLTMEFRMT-----LNMVTEAGKNGVVPADETFKY-----IEKTSVTEYEP :
TaACO11 : KSGIQEYFNKQGFHLVGYGCTTCIGNSQEHESVSAAITENDVVAAAVLSGNRNFEGR :
TaACO12 : SLTMEFRMT-----LNMVTEAGKNGVVPADETFKY-----IEKTSVTEYEP :
TaACO13 : KSGIQEYFNKQGFHLVGYGCTTCIGNSQEHESVSAAITENDVVAAAVLSGNRNFEGR :
TaACO14 : RSGILKYLSDLGHNIVGYGCTTCIGNSQDIDQIVADEITENDIIAAVAVLSGNRNFEGR :
TaACO15 : RSGILKYLSDLGHNIVGYGCTTCIGNSQDIDQIVADEITENDIIAAVAVLSGNRNFEGR :

      *          680          *          700          *          720
TaACO1 : VYSDAQIRYSDYRFDIS-KIEPVAKPHSPDNRALAECIDVKIDRVYIGCTGGKTED :
TaACO2 : VHPLTRANYLASPPLVVAYALAGTVDIDFNEPIGIGKDGKEVYFKDVWPTNEEIEQVIK :
TaACO3 : VHPLTRANYLASPPFVAVAYALAGTVDIDFNEPIGIGKDGKEVYFKDVWPTNEEIEQVIK :
TaACO4 : VHPLTRANYLASPPLVVAYALAGTVDIDFNEPIGIGKDGKEVYFKDVWPTNEEIEQVIK :
TaACO5 : VHPLTRANYLASPPLVVAYALAGTVDIDFNEPIGIGKDGKEVYFKDVWPTNEEIEQVIK :
TaACO6 : VHPLTRANYLASPPLVVAYALAGTVNIDFKEFVGISKDGKEVFFRDIMPTTEIAEVVK :
TaACO7 : VHPLTRANYLASPPLVVAYALAGTVNIDFKEFVGISKDGKEVFFRDIMPTTEIAEVVK :
TaACO8 : VYSDAQIRYSDYRFDIS-KIEPVAKPHSPDNRALAECIDVKIDRVYIGCTGGKTED :
TaACO9 : VHPLTRANYLASPPLVVAYALAGTVDIDFKEPIGVGKDGKEVFFRDIMPTTEIAEVVQ :
TaACO10 : VYSDAQIRYSDYRFDIS-KIEPVAKPHSPDNRALAECIDVKIDRVYIGCTGGKTED :
TaACO11 : VHPLTRANYLASPPLVVAYALAGTVDIDFKEPIGVGKDGKEVFFRDIMPTTEIAEVVQ :
TaACO12 : VYSDAQIRYSDYRFDIS-KIEPVAKPHSPDNRALAECIDVKIDRVYIGCTGGKTED :
TaACO13 : VHPLTRANYLASPPLVVAYALAGTVDIDFKEPIGVGKDGKEVFFRDIMPTTEIAEVVQ :
TaACO14 : IHPLTRANYLASPPLVVAYALAGTVDINFEEPIGTGNGNIPFLRDIWPSSEVSEIVH :
TaACO15 : IHPLTRANYLASPPLVVAYALAGTVDINFEEPIGTGNGNIPFLRDIWPSSEVSEIVH :

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      *           740           *           760           *           780
TaACO1 : FIAAAKVELASGKKKVP-----TFLVEAT-----QKVMMDVYSIPVPGS-- :
TaACO2 : SNVLEKMEVDTYDSITEGNDANNKLVVPKEFLYPWDPKSTYIHKAYLENIITMTPPGPS :
TaACO3 : SNVLEKMEVDTYGSITEGNDANNLVVPKEFLYPWDPKSTYIHKAYLENIITMTPPGPS :
TaACO4 : SNVLEKMEVDTYGSITEGNDANNLVVPKEFLYPWDPKSTYIHKAYLENIITMTPPGPS :
TaACO5 : SNVLEKMEVDTYGSITEGNDANNLVVPKEFLYPWDPKSTYIHKAYLENIITMTPPGPS :
TaACO6 : ASVLEDMEKGTYEAITKGNPMWNELPVSASTLYPWDPKSTYIHEEPYFKDMTMTPPGARP :
TaACO7 : ASVLEDMEKGTYEAITKGNPMWNELPVSASTLYPWDPKSTYIHEEPYFKDMTMTPPGARP :
TaACO8 : FIAAAKVELASGKKKVP-----TFLVEAT-----QKVMMDVYSIPVPGS-- :
TaACO9 : SSVLEDMEKSTYEAITKGNPMWNQLVPPEASLYSWDSNSTYIHEEPYFKDMTMTSPPGHA :
TaACO10 : FIAAAKVELASGQKVKVP-----TFLVEAT-----QKVMMDVYSIPVPGS-- :
TaACO11 : SSVLEDMEKSTYEAITKGNPMWNQLVPPEASLYSWDSNSTYIHEEPYFKDMTMTSPPGHA :
TaACO12 : FIAAAKVELASGKKKVP-----TFLVEAT-----QKVMMDVYSIPVPGS-- :
TaACO13 : SSVLEDMEKSTYEAITKGNPMWNELPVPPEASLYSWDSNSTYIHEEPYFKDMTMTSPPGHA :
TaACO14 : SNVIVDMEKSTYEAITKGNPMWNQLVVPETTDVYSWDPNSTYIREEPYFKGMSMDLPGEHS :
TaACO15 : SNVIVDMEKSTYEAITKGNPMWNQLVVPETADVYSWDPNSTYIREEPYFKGMSMDLPGEHS :

      *           800           *           820           *           840
TaACO1 : -----GGKTCQIFEEAGCDAIASINCG-----ACLGGPEDTYARN- :
TaACO2 : VKDAYCLISLGDSTITTDHISESGVIKGFPAAYKLLERGVKPENETTYGSRANDIEIVR :
TaACO3 : VKDAYCLISLGDSTITTDHISESGVIKGFPAAYKLLERGVKPENETTYGSRANDIEIVR :
TaACO4 : VKDAYCLISLGDSTITTDHISESGVIKGFPAAYKLLERGVKPENETTYGSRANDIEIVR :
TaACO5 : VKDAYCLISLGDSTITTDHISESGVIKGFPAAYKLLERGVKPENETTYGSRANDIEIVR :
TaACO6 : VKDAYCLINFGDSTITTDHISESGSIHDSFAAYKLLERGVKPENETTYGSRANDIEIVR :
TaACO7 : VKDAYCLINFGDSTITTDHISESGSIHDSFAAYKLLERGVKPENETTYGSRANDIEIVR :
TaACO8 : -----GGKTCQIFEEAGCDTASINCG-----ACLGGPEDTYARN- :
TaACO9 : VKDAYCLINFGDSTITTDHISESGSIHDSFAAYKLLERGVKPENETTYGSRANDIEIVR :
TaACO10 : -----GGKTCQIFEEAGCDTASINCG-----ACLGGPEDTYARN- :
TaACO11 : VKDAYCLINFGDSTITTDHISESGSIHDSFAAYKLLERGVKPENETTYGSRANDIEIVR :
TaACO12 : -----GGKTCQIFEEAGCDTASINCG-----ACLGGPEDTYARN- :
TaACO13 : VKDAYCLINFGDSTITTDHISESGSIHDSFAAYKLLERGVKPENETTYGSRANDIEIVR :
TaACO14 : IKDAYCLISFGDCVTAADHISESGSIHDSFAAYKLLERGVKPENETTYGSRANDIEIVR :
TaACO15 : IKDAYCLISFGDCVTAADHISESGSIHDSFAAYKLLERGVKPENETTYGSRANDIEIVR :

      *           860           *           880           *           900
TaACO1 : EPTVCSTTNRNFPGRMHKEGQIYLASPYTAAASALTGVVDPRDFLL----- :
TaACO2 : GAFANIRIVNKLLEGEVGPKTIVHVPTGEHYVFDAAMK-YKSEGHDMVILAGDEYAGSS :
TaACO3 : GAFANIRIVNKLLEGEVGPKTIVHVPTGEHYVFDAAMK-YKSEGHDMVILAGDEYAGSS :
TaACO4 : GAFANIRIVNKLLEGEVGPKTIVHVPTGEHYVFDAAMK-YKSEGHDMVILAGDEYAGSS :
TaACO5 : GAFANIRIVNKLLEGEVGPKTIVHVPTGEHYVFDAAMK-YKSEGHDMVILAGDEYAGSS :
TaACO6 : GTFANIRIVNKLLEGEVGPKTIVHVPTGEHYVFDAAMK-YKSEGHDMVILAGDEYAGSS :
TaACO7 : GTFANIRIVNKLLEGEVGPKTIVHVPTGEHYVFDAAMK-YKSEGHDMVILAGDEYAGSS :
TaACO8 : EPTVCSTTNRNFPGRMHKEGQIYLASPYTAAASALTGVVDPRDFLS----- :
TaACO9 : GTFANIRIVNKLLEGEVGPKTIVHVPTGEHYVFDAAMK-YKSEGHDMVILAGDEYAGSS :
TaACO10 : EPTVCSTTNRNFPGRMHKEGQIYLASPYTAAASALTGVVDPRDFLS----- :
TaACO11 : GTFANIRIVNKLLEGEVGPKTIVHVPTGEHYVFDAAMK-YKSEGHDMVILAGDEYAGSS :
TaACO12 : EPTVCSTTNRNFPGRMHKEGQIYLASPYTAAASALTGVVDPRDFLS----- :
TaACO13 : GTFANIRIVNKLLEGEVGPKTIVHVPTGEHYVFDAAMK-YKSEGHDMVILAGDEYAGSS :
TaACO14 : GTFANIRIVNKLLEGEVGPKTIVHVPTGEHYVFDAAMK-YKSEGHDMVILAGDEYAGSS :
TaACO15 : GTFANIRIVNKLLEGEVGPKTIVHVPTGEHYVFDAAMK-YKSEGHDMVILAGDEYAGSS :

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		*	920	*	940	*	960																	
TaACO1	:	-----						:																
TaACO2	:	RS	SAAGP	LLGVKAVIA	NG	FERI	HRSNI	VGMGI	IPLRF	AG	EDAD	SI	NLSG	HER	FT	IDL	:							
TaACO3	:	RS	SAAGP	LLGVKAVIA	NG	FERI	HRSNI	VGMGI	IPLRF	V	GEDA	DSI	NLSG	HER	FT	IDL	:							
TaACO4	:	RS	SAAGP	LLGVKAVIA	NG	FERI	HRSNI	VGMGI	IPLRF	V	GEDA	DSI	NLSG	HER	FT	IDL	:							
TaACO5	:	RS	SAAGP	LLGVKAVIA	NG	FERI	HRSNI	VGMGI	IPLRF	AG	EDAD	SI	NLSG	HER	C	FT	IDL	:						
TaACO6	:	RW	AAKG	EMIQ	GVKAVIA	KS	FERI	HRSNI	AG	MGIV	PLCF	AG	EDAD	SI	GLT	GHE	RY	TI	QL	:				
TaACO7	:	RW	AAKG	EMIQ	GVKAVIA	KS	FERI	HRSNI	AG	MGIV	PLCF	AG	EDAD	TL	GLT	GHE	RY	TI	QL	:				
TaACO8	:	-----																		:				
TaACO9	:	RW	AAKG	EMLL	GVKAVI	SS	FERI	HRSNI	VGMGI	IPL	CF	AG	EDAD	SI	GLT	GHE	RY	TI	NI	:				
TaACO10	:	-----																		:				
TaACO11	:	RW	AAKG	EMLL	GVKAVIA	KS	FERI	HRSNI	VGMGI	IPM	CF	AG	EDAD	SI	GLT	GHE	RY	TI	NI	:				
TaACO12	:	-----																		:				
TaACO13	:	RW	AAKG	EMLL	GVKAVI	SS	FERI	HRSNI	VGMGI	IPL	CF	AG	EDAD	SI	GLT	GHE	RY	TI	NI	:				
TaACO14	:	RW	DA	KGT	MLL	GVKAVIA	KS	FERI	HRSNI	VGMG	VIPL	CF	SS	GEI	MDSI	GLT	G	Q	Q	Y	TI	HL	:	
TaACO15	:	RW	DA	KRT	MLL	GVKAVIA	KS	FERI	H	-----											:			
			* <td>980<td>*<td>1000<td>*<td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td></td></td></td>	980 <td>*<td>1000<td>*<td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td></td></td>	* <td>1000<td>*<td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td></td>	1000 <td>*<td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td>	* <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>																	
TaACO1	:	-----																			:			
TaACO2	:	ERK	TEI	RPGQ	DI	VTT	KNG	KSFT	CT	LC	INT	QVE	LEY	FNH	GGIL	PY	LIR	KLA	----		:			
TaACO3	:	EGK	TEI	RAGQ	DI	VTT	QNG	KSFT	CT	LS	INT	QVE	LEY	FNH	GGIL	PY	LIR	KLA	----		:			
TaACO4	:	EGK	TEI	RPGQ	DI	VTT	QNG	KSFT	CT	LC	INT	QVE	LEY	FNH	GGIL	PY	LIR	KLA	----		:			
TaACO5	:	ERK	TEI	RPGQ	DI	VTT	QNG	KSFT	CT	LC	INT	QVE	LEY	FNH	GGIL	PY	LIR	KLA	----		:			
TaACO6	:	FTD	NEI	KPGQ	DI	VTT	DNG	KSFT	CT	LR	FD	TE	VE	LA	YYT	H	GGIL	PY	VIR	KLA	AEQ-	:		
TaACO7	:	FTD	NEI	KPGQ	DI	VTT	DNG	KSFT	CT	LR	FD	TE	VE	LA	YYT	H	GGIL	PY	VIR	KLA	AEQ-	:		
TaACO8	:	-----																			:			
TaACO9	:	FTD	SEI	RPGQ	DI	VTT	DND	KSFT	CT	LR	FD	TE	VE	LA	YYN	H	GGIL	PY	VIR	NMA	GAQN	:		
TaACO10	:	-----																			:			
TaACO11	:	FTD	SK	IRPGQ	DI	VTT	DND	KSFT	CT	LR	FD	TE	VE	LA	YYN	H	GGIL	PY	VIR	NMA	GAQN	:		
TaACO12	:	-----																			:			
TaACO13	:	FTD	SEI	RPGQ	DI	VTT	DND	KSFT	CT	LR	FD	TE	VE	LA	YYN	H	GGIL	PY	VIR	NMA	GAQN	:		
TaACO14	:	ESS	HE	MQPGQ	DI	VTT	STR	KSFT	CT	LR	FD	TE	VE	LA	SY	ED	H	GGIL	QY	V	M	K	INSAC	:
TaACO15	:	-----																			:			

Figure S7. Alignment of the TaACO proteins and preserved aconitase domain is indicated with red color line. Amino acid residues conserved in all proteins were shaded blue and similar amino acids were gray shaded. Dashes denotes gaps led to exploit the alignment of the homologous region.

A

```

          *      20      *      40      *      60      *
AtAC01 : ----- :
AtAC02 : -----MYRRATSGVRSASARLSSSLSRIASSETASVSAPSAS :
AtAC03 : -----MYLTASSSASSSIIRAASSRSSLFSFRSVLSPSV :
AtAC04 : ----- :
OsAC01 : -----MPPLTSALLSRSSSTRIPAAAAAAAISNPAGAAA :
OsAC02 : ----- :
OsAC03 : -----MYKAAYSSAS--ARLSSSLRFRSLPSPAPSSSL :
OsAC04 : ----- :
GmAC01 : -----MYITTASSSASSLLRATRPKLEFFPSPSRNFASFTP :
GmAC02 : -----MASTVSSILRASRSKLSSSSSASLSRTLAR :
GmAC03 : -----MRVLSLTR---FFSSP----- :
GmAC04 : ----- :
GmAC05 : ----- :
GmAC06 : ----- :
GmAC07 : ----- :
GmAC08 : ----- :
TaAC01 : ----- :
TaAC02 : -----MASTAGLQTSHGHWENTTLTSSQSHLGRSSSFPRPPAGDFLERSPPRCR :
TaAC03 : ----- :
TaAC04 : -----MASTAGLQISHGHWENTTLTSSQSHPCSRSSSFPRPPAGDYLERSPPRCR :
TaAC05 : -----MASTAGLQTSHGHWENTTLTSSQSHLCFRYSFPRPPAGDFLECSPPRRS :
TaAC06 : ----- :
TaAC07 : -----MPPLASSLLLSRSAAGPGSARATAAAAAAISRPAA :
TaAC08 : ----- :
TaAC09 : -----MKLLPPPPAAPCCS-SDPSSHRRRLPPPPQL---- :
TaAC010 : ----- :
TaAC011 : -----MKPLPTPPASSCCSSPDYPYSHRRRLPPPPQP---- :
TaAC012 : ----- :
TaAC013 : -----MKLLPTPPAS----SDPYSHHR-LPPPPQL---- :
TaAC014 : ----- :
TaAC015 : ----- :
PpAC01 : ----- :
PpAC02 : -----MQILTYVCRSLQAQRFCPRLPHVHGLRASSTASPVGLTREGNSSFLAPPSQP :
PpAC03 : MRLSRLPLPPRLPDRSFTMPLFMYVCRSLRQHGCSSKFPLSLGHRAASSAASAGSIRSGVPSFRSTPSQP :
PpAC04 : ----- :
PpAC05 : -----MLPLLHSGSHPRRFAPPL-----SSHAPPR-----SLPHFLS--SLK :
SdAC01 : ----- :
SdAC02 : ----- :
SdAC03 : ----- :
SdAC04 : ----- :
SdAC05 : ----- :
SdAC06 : -----MLAAAWNLCLAAPIVRKDSGLSPP :
SdAC07 : -----MLAAAWNLCLAAPIVRKDSGLSPP :

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	80	*	100	*	120	*	140
AtACO1	:	-----	-----	-----	-----	-----	MASENPFERSI :
AtACO2	:	SLRNQTNRSKSFSSALRSFVCSASTRWSHGGSWGPASLRAQARNSTFVMEKFERKYATMASEHSYKDI :					
AtACO3	:	SSTSPSSLLARRSFGTISPAFRRWSHSFHSKPSPFRETSQIRAV---SPVLDRQLQRTFSSMASEHPFKGI :					
AtACO4	:	-----	-----	-----	-----	-----	CKSSSKS :
OsACO1	:	SSSSPSPPPPSSRPR-----PASPFAAGLAGRIFGGRRRAARSSSSAAAVFERREFASAAAKNSYDEI :					
OsACO2	:	-----	-----	-----	-----	-----	-----
OsACO3	:	RLLSLRARAFSRPSRGGWAAAGGWSGRASSSPVVGCGACRAQIGAVAPAVERVHRRMAATAAAEHPPFKNI :					
OsACO4	:	-----	-----	-----	-----	-----	KAAAFHAK :
GmACO1	:	CTS-----SFSATARSLLCSVPRWSHRLHSA-SPLTPRPRISAV---APLVERFHREIATMANENPPFKGN :					
GmACO2	:	SAPRRSPGSSSAATRSFGSAVPRWSHGVDWR-SPLGLRPQIRAA---APLIERFHRRIATSATDNPPFKGN :					
GmACO3	:	-----	-----	-----	-----	-----	-----
GmACO4	:	-----	-----	-----	-----	-----	EIVKIQK :
GmACO5	:	-----	-----	-----	-----	-----	SFPRIKK :
GmACO6	:	-----	-----	-----	-----	-----	-----
GmACO7	:	-----	-----	-----	-----	-----	-----
GmACO8	:	-----	-----	-----	-----	-----	FITCKK :
TaACO1	:	-----	-----	-----	-----	-----	SMRMINP :
TaACO2	:	RRCSHAVAAAIVVEKLGQGRSVGPSLFVPRRSRDGFLARRGRQPPAAAPCGSAVEGAGAAAPATDRFANT :					
TaACO3	:	-----	-----	-----	-----	-----	-----
TaACO4	:	RRCSHAVAAAIVVEKLGQRRSVGPSLFVPRRSRDGFLARRGRQPPAAAPCGSAVEGAG-AAAPATDRFAKT :					
TaACO5	:	RRCSHAVAAAIVVEKLGQGRSLGPSLFVSRRSRDGFLARRGRQQLAAAPCGSAVEGAG-AAAPATDRFAKT :					
TaACO6	:	-----	-----	-----	-----	-----	-----
TaACO7	:	AEPAPCPSAPAPSPLHAARGGQGPRGAFASGLAGRLFGGRRRAARSSSSAAAVFERREFASAATKNSYDEI :					
TaACO8	:	-----	-----	-----	-----	-----	SAAFAHK :
TaACO9	:	RRAAFPP-AASRPFAGLLRAAR---VRCSSS-TSGRGRG-----SVARFQRSSMAASGTEHAYNNI :					
TaACO10	:	-----	-----	-----	-----	-----	SAAFAHK :
TaACO11	:	RRAAFPP-PAPRPFAGLLRAAR---ARCSPSPSATTGPA-----VERSQRSRMAASGTEHAYSNI :					
TaACO12	:	-----	-----	-----	-----	-----	SAAFAHK :
TaACO13	:	RRAAFPP-AASRPFAGLLRAAR---VRCSSSSAAGRGRGVSAP-----AVARFQRR-MAVSGTEHAYSNI :					
TaACO14	:	-MSTSSSNSNPFSFALR-----					
TaACO15	:	-----	-----	-----	-----	-----	-----
PpACO1	:	-----	-----	-----	-----	-----	-----
PpACO2	:	RL-SSPVINSRLFRTLAAASY-PDEHRPADFSVARS-----TKSTVGLRSTIPGARMASQTASENPFSSL :					
PpACO3	:	RL-SPDSAGSRLFRTIVSASYSADCECRAAVASVGRSSPRALSPTMVPTTTTTPVGSRMASQTASENPFSSL :					
PpACO4	:	-----	-----	-----	-----	-----	MATTAVSVAHHPGISSALRDGASLASG :
PpACO5	:	FL-CPASFHSVTILILLSP-----PPSPLPFP-----STMASSPASKNPFSNL :					
SdACO1	:	-----MHSQELKYFSLDSF-----					FAANPYKNL :
SdACO2	:	-----MHSQELKYFSLDSF-----					FAANPYKNL :
SdACO3	:	-----	-----	-----	-----	-----	MEG :
SdACO4	:	-----	-----	-----	-----	-----	-----
SdACO5	:	-----	-----	-----	-----	-----	-----
SdACO6	:	RLSCFHRVRSVHFRASIALRQ-----RQEIAMVSGHPFESI :					
SdACO7	:	RLSCFHRVRSVHFRASIALRQ-----RQEIAMVSGHPFESI :					

	*	160	*	180	*	200	*
AtACO1	:	LKA	LEKPDGG-EFGNYISLPALNDPRIDKLPYSIRILLES	SAIRN	CDEFQVKS	KDV	KIDWENTSPKQVE :
AtACO2	:	LTS	LPKPGGG-EYGKYISLPALNDPRIDKLPFSVRILLES	SAIRN	CNDYQVT	KDDV	KIDWENTSTKQVE :
AtACO3	:	FTT	LPKPGGG-EFGKFYSLPALNDPRVDKLPYSIRILLES	SAIRN	CDFQVTK	EDV	KIDWEKTSKQVE :
AtACO4	:	DLG	ISSFPK--SSQISIHRCQKKSISRKIVSVMAPQKD-RSPGTTG	SVK	TGMTMT		KILARASEKSLVVP :
OsACO1	:	LTG	LAKPGGGAIEFGKYISLPALSDPRIERLPYSIRILLES	SAIRN	CDEFQVT	GKDV	KIDWENSAPKQVE :
OsACO2	:	---	---	---	---	---	---
OsACO3	:	LTT	LPKPGGG-EYGKFYSLPALNDPRIDKLPYSIRILLES	SAIRN	CDFQVNQNDV		KIDWENTSPKLAE :
OsACO4	:	NEL	AAAVAPSQQQLQRRVSGRRARSGRVRAVATPARAPRAP	SSTG	SVKSAMTMT		KILARASERASLEP :
GmACO1	:	LTS	LPKPGGG-EFGKFYSLPSLNDPRIDRLPYSIRILLES	SAIRN	CDFQVK	KEDV	KIDWENNSTKQVE :
GmACO2	:	LTS	LPKPGGG-EFGKFYSLPSLNDPRIDRLPYSIRILLES	SAIRN	CDFQVK	KEDV	KIDWENS SVKQVE :
GmACO3	:	---	---	---	---	---	---
GmACO4	:	FRR	IVSYSG-----FYCFATLISYFYVNNTTTRAGFSRADQFYASYPAGTELLT	DTT			KYKAALGNCFEAE :
GmACO5	:	DVS	ISAFTS-----QRCEKALPRRIIRCAVAAPQ-RQPSTTG	SVRTAMTMT			KILARASEKVQLTP :
GmACO6	:	---	---	---	---	---	---
GmACO7	:	---	---	---	---	---	---
GmACO8	:	DLG	FAFPSP-SSIIGKRQKCKKTSSNKIVSVVSSPKNKRSPSATG	STKIPMTAT			KILARAAEKCEVRP :
TaACO1	:	FVM	VSR-----DFWSRRTRAGRVHAVATSTGLPRAPASTG	SVKSPMTTT			KILARKSERASLEP :
TaACO2	:	LTS	LPKPGGG-EYGKFYSLPALNDPKIDKLPYICIRILLES	SAVRN	YDNFQV	TESDV	NIDWEKTSPKLAE :
TaACO3	:	---	---	---	---	---	---
TaACO4	:	LTN	LPKPGGG-EYGKFYSLPALNDPKIDKLPYICIRILLES	SAVRN	YDNFQV	TESDI	NIDWEKTSPKLAE :
TaACO5	:	LT	LPKPGGG-EYGKFYSLPALNDPKIDKLPYICIRILLES	SAVRN	YDNFQV	TESDV	NIDWEKTSPKLAE :
TaACO6	:	---	---	---	---	---	---
TaACO7	:	LTS	LAKPGGGADFGKYISLPALADPRIDRLPYSIRILLES	SAIRN	CDEFQVT	GKDV	KIDWENSATKQVE :
TaACO8	:	KEL	AAAPQ--QQRLSAGASSRRARAGRVRAVATPTRAPRSPASTG	SVKSPMTTT			KILARASERASLEP :
TaACO9	:	LTS	LPKPEGG-EYGKFYSLPALNDPRIDKLPYSIRILLES	SAIRN	CDGFQVT	KNDV	KIDWENTSPKLAE :
TaACO10	:	KEL	AAVPP--QQ----LARSRRARAGRVRAVATPTRAPRSPASTG	SVKSPMTTT			KILARASERASLEP :
TaACO11	:	LTS	LPKPEGG-EYGKFYSLPALNDPRIDKLPYSIRILLES	SAIRN	CDGFQVT	KNDV	KIDWENTSPKLAE :
TaACO12	:	KEL	AAAPQ--QQRLSAGASSRRARAGRVRAVATPTRAPRSPASTG	SVKSPMTTT			KILARASERASLEP :
TaACO13	:	LTS	LPKPEGG-EYGKFYSLPALNDPRIDKLPYSIRILLES	SAIRN	CDGFQVT	KNDV	KIDWENTSPKLAE :
TaACO14	:	--GL	RDEGG-DCGSYYSIPDLGDQRIDKLPYITIRVLLES	SAVRN	CDEFQIT	KEDV	KMGWEKTSLEQVE :
TaACO15	:	---	---	---	---	---	MGWEKTSLEQVE :
PpACO1	:	---	---	---	---	---	---
PpACO2	:	ITD	LPKPDGG-SYGKFYSLVKLNDPRVDSLPLYSIRYLLEAAIRN	CDFQVT	KEDV		KVDWEKTAPKQVE :
PpACO3	:	ITD	LPKPDGG-SYGKFYSLVKLNDPRVDSLPLYSIRYLLEAAIRN	CDFQVT	KEDV		KVDWEKTAPKQVE :
PpACO4	:	SGF	YGVRS--VAAAPKTSVASAHRDMRVRAVMAVQKQERS	PASTG	AVKQAMTAT		KILANASEKTKLAP :
PpACO5	:	VTD	LPKASGG-SYGQYYSLVKLNDRVDELPLYSIRYLLES	SAIRN	CDFQVLEADV		KLDWKVTAPKQVE :
SdACO1	:	VK	PLEG-----HGKYISLPALNDPRVDKLPYSIKILLES	CIRN	CDFQVT	KEDV	KIDWENTAPQQVE :
SdACO2	:	VK	PLEG-----HGKYISLPALNDPRVEKLPYSIKILLES	CIRN	CDFQVT	KEDV	KIDWENTAPQQVE :
SdACO3	:	AML	HSSYFS--VNAREMS-----RRSSTISAVMAPPQQQRPPASTG	AVKHAMT	LT		KILARASEKTKLVP :
SdACO4	:	---	---	---	---	---	---
SdACO5	:	--ML	HSSYFS--VNAREMS-----RRSSTISAVMAPPQQQRAPASTG	AVKHAMT	LT		KILARASEKTKLVP :
SdACO6	:	LTS	LSKDDGG-EYGKYISLPDLHDPRIEKLPLYSIKILLES	SAIRN	CDFQVT	KDDV	KADWVNTAPKLVE :
SdACO7	:	LTS	LSKDDGG-EYGKYISLPDLHDPRIEKLPLYSIKILLES	SAIRN	CDFQVT	KDDV	KADWVNTAPKLVE :

	220	*	240	*	260	*	280
AtACO1	: IPFKPARVLLQDFTG	PAVVD	LACMRDAMNNLGGDSN	KINPLVPVDLVIDES	QVDVA	SENAVQANMEL	:
AtACO2	: IAFKPARVILQDFTG	PVLVD	LASMRDAVKNLGSDPS	KINPLVPVDLVIDES	QVDFA	SEDAQKNLEL	:
AtACO3	: IPFKPARVLLQDFTG	PAVVD	LACMRDAMNKLGSDSN	KINPLVPVDLVIDES	QVDVA	SENAVQANMEL	:
AtACO4	: GDNIVWNVDLIMTHD	CGPGA	FGIFKREFGEK----	AVWDPEKIVLIPDHY	FTADK	ANRNVDIMREH	:
OsACO1	: IPFKPARVLLQDFTG	PAVVD	LACMRDAMSKLGSDEN	KINPLVPVDLVIDES	QVDVA	SENAVQANMEL	:
OsACO2	:						MEL :
OsACO3	: IPFKPARVLLQDFTG	PAVVD	LAAMRDAMAKLGSDAN	KINPLVPVDLVIDES	QVDVA	SPNAVQSNMEL	:
OsACO4	: GENVVVDVLLIMTHD	CGPGT	IGIFKREFGED----	AVWDREKVVLIIPDHY	FTSDE	ANRNVDILRDF	:
GmACO1	: IPFKPARVLLQDFTG	PAVVD	LACMRDAMNKLGSDSN	KINPLVPVDLVIDES	QVDVT	SDNAVQANMEL	:
GmACO2	: IPFKPARVLLQDFTG	PAVVD	LACMRDAMNKLGSDSN	KINPLVPVDLVIDES	QVDVA	SENAVQANMEL	:
GmACO3	:	-----LDFTG	PAVVD	LACVRDARNKLGSDSN	KINPLVPVDLVIDES	QVDVA	SEN----- :
GmACO4	: EWGPFEFCVAKHFERQ	GKSPY	AYHAKMFRNT----	AVWDCEKIMFIPDHY	FPNA	EAHAHYIVDISRKF	:
GmACO5	: GDNVWNVVDLIMTHD	CGPGS	IGIFKREFGDD----	AVWDREKIVLIIPDHY	FTSDE	ANRNVDILRDF	:
GmACO6	:						:
GmACO7	:						:
GmACO8	: GENAWANVVDLMIND	TCPGIS	GIFKKEFGNT----	AVWDREKIVLIIPDHY	FTNDE	AHRNVDIARDF	:
TaACO1	: GENVVVDVLLIMTHD	CGPGT	IGIFKREFGED----	AVWDREKVVLIIPDHY	FTGDE	ANRNVDILRDF	:
TaACO2	: IPFKPARLVMDNTGG	PAVVD	LAAIRDVIAELSDPK	KINPLVPVDLVIDES	RVDDVA	CADALKQNMDL	:
TaACO3	:						:
TaACO4	: IPFKPARLVMDNTGG	PAVVD	LAAIRDVIAELSDPK	KINPLVPVDLVIDES	RVDDVA	CADALKQNMDL	:
TaACO5	: IPFKPARLVMDNTGG	PAVVD	LAAIRDVIAELSDPK	KINPLVPVDLVIDES	RVDDVA	CADALKQNMDL	:
TaACO6	:	-----MTVLC	CLCLCALAYIAAC	FFQVPVDLVIDES	QVDVA	SENAVQANMEL	:
TaACO7	: IPFKPARVLLQDFTG	PAVVD	LACMRDAMSKLGSDEN	KINPLVPVDLVIDES	QVDVA	SENAVQANMEL	:
TaACO8	: GENVVVDVLLIMTHD	CGPGT	IGIFKREFGED----	AVWDREKVVLIIPDHY	FTSDE	ANRNVDILRDF	:
TaACO9	: IPFKPARVLLQDFTG	PAVVD	LAAMRDALAKLGSDAN	KINPLVPVDLVIDES	QVDVA	SSNAIQSNMEL	:
TaACO10	: GENVVVDVLLIMTHD	CGPGT	IGIFKREFGED----	AVWDREKVVLIIPDHY	FTSDE	ANRNVDILRDF	:
TaACO11	: IPFKPARVLLQDFTG	PAVVD	LAAMRDALAKLGSDAN	KINPLVPVDLVIDES	QVDVA	STNAIQSNMEL	:
TaACO12	: GENVVVDVLLIMTHD	CGPGT	IGIFKREFGED----	AVWDREKVVLIIPDHY	FTSDE	ANRNVDILRDF	:
TaACO13	: IPFKPARVLLQDFTG	PAVVD	LAAMRDALAKLGSDAN	KINPLVPVDLVIDES	QVDVA	SSNAIQSNMEL	:
TaACO14	: IPFKPSRVILQDFTG	PVLVD	LASMRDAMLELGGNPD	KINPMVPADLVIDES	TANVV	SQNAIQANMEL	:
TaACO15	: IPFKPSRVILQDFTG	PVLVD	LASMRDAMSELGGNPD	KINPMVPADLVIDES	TANVV	SQNAIQANMEL	:
PpACO1	: IPFKPARVILQDFTG	PCVVD	LAAMRDAIKRLGGDPS	KINPLVPVDLVIDES	QVDVA	KANAIQVNMKL	:
PpACO2	: IPFKPARVILQDFTG	PAVVD	LAAMRDAITRLGGDPD	RINPLVPVDLVIDES	QVDVA	SANAIQANMEL	:
PpACO3	: IPFKPARVILQDFTG	PAVVD	LAAMRDAITRLGGDPD	RINPLVPVDLVIDES	QVDVA	SANAIQANMEL	:
PpACO4	: GENVWVKADLMTHD	CGPGT	IGIFKKEFGQN----	AVWDREKIVLIIPDHY	FTSDE	ANRNVDILRDF	:
PpACO5	: IPFKPARVILQDFTG	PAVVD	LAAMRDAIERLGGDPD	KINPLVPVDLVIDES	QVDVA	SPNAIQANMEL	:
SdACO1	: IAFKPARVILQDFTG	PAVVD	LAAMRDAMKRLGGDEN	VINPMIPVDLVIDES	QVDVA	AANALEANMKH	:
SdACO2	: IAFKPARVILQDFTG	PAVVD	LAAMRDAMKRLGGDEN	VINPMIPVDLVIDES	QVDVA	AANALEANMKH	:
SdACO3	: GENVWVNADLMTHD	CGPGT	IGIFKKEFGAN----	AVWDREKIVLIIPDHY	FTADE	ANRNVDILRDF	:
SdACO4	:	-----MTHN	CGPGP	IGIFKKEFGANGEMCPQ	WDREKIVLIIPDHY	FTADE	ANRNVDILGDF
SdACO5	: GENVWVNADLMTHD	CGPGT	IGIFKKEFGAN----	AVWDREKIVLIIPDHY	FTADE	ANRNVDILRDF	:
SdACO6	: IPFKPARVILQDFTG	PALVD	LAAMRDAMKRLGGDPT	KINPLIPVDLVIDES	QVDVA	SANAVASNMQF	:
SdACO7	: IPFKPARVILQDFTG	PALVD	LAAMRDAMKRLGGDPT	KINPLIPVDLVIDES	QVDVA	SANAVASNMQF	:

		*	300	*	320	*	340	*								
AtACO1	:	EFQRNKER	AF	LSNAFHN	MLVVEPGSGIVE	QVNLEYLARVVF	NTNGLLYPDSV	VGTDSHITMIDGLG	:							
AtACO2	:	EFKRNKER	TFLK	GSTAFQ	NMLVVEPGSGIVE	QVNLEYLGRVVF	NSKGF	LYPDSVVGTDSHITMIDGLG	:							
AtACO3	:	EFQRNKER	AF	LSNAFHN	MLVVEPGSGIVE	QVNLEYLGRVVF	NTNGLLYPDSV	VGTDSHITMIDGLG	:							
AtACO4	:	CREQNIKY	----	DI	TDLG	NFKAN	LDYK	SVCA	-----	LAQEGHCRPGEV	LG	TD	SHIT	CTAGAFG	:	
OsACO1	:	EFHRNKER	GFLK	GSTAFR	NMLVVEPGSGIVE	QVNLEYLARVVF	NNGG	GILYPDSV	VGTDSHITMIDGLG	:						
OsACO2	:	EFDRNKER	GFLK	ASTAFH	KMQVF	EPGSGIVE	QVNLEYLARVVF	NADG	IMYPDSV	VGTDSHITMIDGLG	:					
OsACO3	:	EFKRNKER	GFLK	GSTAFH	NMLVVEPGSGIVE	QVNLEYLGRVVF	NTDGI	MYPDSV	VGTDSHITMIDGLG	:						
OsACO4	:	CMEQNIKY	----	DI	KDLS	NFKAN	LDYK	SVCA	-----	LAQEGHCRPGEV	LG	TD	SHIT	CNAGAFG	:	
GmACO1	:	EFQRNKER	AF	LSNAFHN	MLVVEPGSGIVE	QVNLEYLGRVVF	NNEGLLYPDSV	VGTDSHITMIDGLG	:							
GmACO2	:	EFQRNKER	AF	LSNAFHN	MLVVEPGSGIVE	QVNLEYLGRVVF	NTEGLLYPDSV	VGTDSHITMIDGLG	:							
GmACO3	:	--VRNNER	AF	LSNAFHN	MLVVEPGSGIVE	QVNLEYLGRVVF	NTEGLLYPDSV	VGTA	SHITMIDRLG	:						
GmACO4	:	CVEQDIKY	----	AI	QDCS	NFRAN	LDCK	-----	-----	-----	-----	-----	-----	-----	:	
GmACO5	:	CHEQNIKY	----	DI	KDLS	NFKAN	LDYK	SVCA	-----	LAQEGHCRPGEV	LG	TD	SHIT	CTAGAFG	:	
GmACO6	:	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	:	
GmACO7	:	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	:	
GmACO8	:	CVEQDIKY	----	DI	QDRS	NFRAN	LDYK	SVCA	-----	LAQEGHCRPGEV	LG	TD	SHIT	SAGAFG	:	
TaACO1	:	CAEQKIKY	----	DI	KDLS	NFRAN	LDYK	SVCA	-----	LAQEGHCRPGEV	LG	TD	SHIT	CNAGAFG	:	
TaACO2	:	EFSRNKER	SFFK	ASSAFN	NMLVLEPGSGILE	QVNLEYLSRVVF	KADGV	LYPDSV	VGTDSHITMIDGLG	:						
TaACO3	:	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	:	
TaACO4	:	EFSRNKER	SFFK	ASSAFN	NMLVLEPGSGILE	QVNLEYLSRVVF	KADGV	LYPDSV	VGTDSHITMIDGLG	:						
TaACO5	:	EFSRNKER	SFFK	ASSAFN	NMLVLEPGSGILE	QVNLEYLSRVVF	KADGV	LYPDSV	VGTDSHITMIDGLG	:						
TaACO6	:	EFSRNKER	GFLK	GSTAFN	NMLVVEPGSGIVE	QVNLEYLARVVF	NNGG	GILYPDSV	VGTDSHITMIDGLG	:						
TaACO7	:	EFSRNKER	GFLK	GSTAFN	NMLVVEPGSGIVE	QVNLEYLARVVF	NNGG	GILYPDSV	VGTDSHITMIDGLG	:						
TaACO8	:	CEEQKIKY	----	DI	KDLS	NFRAN	LDYK	SVCA	-----	LAQEGHCRPGEV	LG	TD	SHIT	CNAGAFG	:	
TaACO9	:	EFTNRNER	GFLK	GSTAFQ	NMLVVEPGSGIVE	QVNLEYLGRVVF	NTDGI	MYPDSV	VGTDSHITMIDGLG	:						
TaACO10	:	CEEQKIKY	----	DI	KDLS	NFRAN	LDYK	SVCA	-----	LAQEGHCRPGEV	LG	TD	SHIT	CNAGAFG	:	
TaACO11	:	EFTNRNER	GFLK	GSTAFH	NMLVVEPGSGIVE	QVNLEYLGRVVF	NTDGI	MYPDSV	VGTDSHITMIDGLG	:						
TaACO12	:	CEEQKIKY	----	DI	KDLS	NFRAN	LDYK	SVCA	-----	LAQEGHCRPGEV	LG	TD	SHIT	CNAGAFG	:	
TaACO13	:	EFTNRNER	GFLK	GSTAFQ	NMLVVEPGSGIVE	QVNLEYLGRVVF	NTDGI	MYPDSV	VGTDSHITMIDGLG	:						
TaACO14	:	EFERNKER	AF	LSNAFHN	NMLIIEPGSGIVE	QVNLEYLARVVF	NRDGLLYPDSV	VGTDSHITMIDGLG	:							
TaACO15	:	EFERNKER	AF	LSNAFHN	NMLIIEPGSGIVE	-----	-----	-----	-----	-----	-----	-----	-----	-----	:	
PpACO1	:	EFQRNKER	AF	LSNAFHN	MLVVEPGSGIVE	QVNLEYLARVVF	NSEGYLYPDSV	VGTDSHITMIDGLG	:							
PpACO2	:	EFSRNKER	GFLK	GATAFK	NMLVVEPGSGIVE	QVNLEYLARVVF	NNSG	GILYPDT	IVGTDSHITMIDGLG	:						
PpACO3	:	EFSRNKER	GFLK	GATAFK	NMLVVEPGSGIVE	QVNLEYLARVVF	NNSG	GILYPDT	IVGTDSHITMIDGLG	:						
PpACO4	:	AREQDIKY	----	DI	TD	DRS	NFRAN	LDYK	SVCA	-----	LAQEGHCRPGEV	LG	TD	SHIT	CNAGAFG	:
PpACO5	:	EFSRNKER	GFLK	GATAFK	NMLVVEPGSGIVE	QVNLEYLARVVF	NNSG	GILYPDT	IVGTDSHITMIDGLG	:						
SdACO1	:	EFDRNKER	GFLK	GATAFK	NMLVVEPGSGIVE	QVNLEYLARVVF	SNDG	FLYPDSV	VGTDSHITMIDGLG	:						
SdACO2	:	EFDRNKER	GFLK	GATAFK	NMLVVEPGSGIVE	QVNLEYLARVVF	SNDG	FLYPDSV	VGTDSHITMIDGLG	:						
SdACO3	:	SKEQSIKY	----	DI	TD	DRG	NFRAN	LDYK	SVCA	-----	LAQEGHCRPGEV	LG	TD	SHIT	CTAGAFG	:
SdACO4	:	SKEQSIKY	----	DI	TD	DRG	NFRAN	LDYK	SVCA	-----	LAQEGHCRPGEV	LG	TD	SHIT	CTAGAFG	:
SdACO5	:	SKEQSIKY	----	DI	TD	DRS	NFRAN	LDYK	SVCA	-----	LAQEGHCRPGEV	LG	TD	SHIT	CTAGAFG	:
SdACO6	:	EFNRNKER	AF	LSNAFHN	MLVVEPGSGIVE	QVNLEYLARVVF	NRDG	FLYPDSV	VGTDSHITMIDGLG	:						
SdACO7	:	EFSRNKER	AF	LSNAFHN	MLVVEPGSGIVE	QVNLEYLARVVF	NRDG	FLYPDSV	VGTDSHITMIDGLG	:						

	360	*	380	*	400	*	420																				
AtACO1	: VAGWGVGGIE	EAT	LGQPM	SNVLE	GVVGE	KLT	KIR	DGNTATD	LVLT	VTQM	IRKH	GVVG	KFVE	YH	-	EG	:										
AtACO2	: VAGWGVGGIE	EAA	LGQPM	SNVLE	GVVGE	KLD	KIK	EGVTATD	LVLT	VTQI	IRKH	GVVG	KFVE	Y-	-	EG	:										
AtACO3	: VAGWGVGGIE	EAT	LGQPM	SNVLE	GVVGE	KIA	KIK	RNGVTATD	LVLT	VTQM	IRKH	GVVG	KFVE	Y-	-	NG	:										
AtACO4	: QFATGIGNTD	GFV	GTGK	ILIK	VEPT	IR	V	D	EP	PSYL	QAKD	LIL	Q	I	GE	SV	AG	ATY	K	T	M	E	S	-	TT	:	
OsACO1	: VAGWGVGGIE	EAT	LGQPM	SNVLE	GVVGE	KLT	KIK	RNGVTATD	LVLT	VTQM	IRKH	GVVG	KFVE	Y-	-	GG	:										
OsACO2	: VAGWGVGGIE	IVA	LGQPM	SNVLE	GVVGE	KLS	M	RDGVTATD	LVLT	VTQM	IRKH	GVVG	KFVE	Y-	-	VG	:										
OsACO3	: VAGWGVGGIE	EAT	LGQPM	SNVLE	GVVGE	KLT	KIK	QNGVTATD	LVLT	VTQM	IRKH	GVVG	KFVE	Y-	-	EG	:										
OsACO4	: QFATGIGNTD	GFV	GTGK	ILIK	VEPT	IR	V	D	EP	PPYL	ILAK	DIL	Q	I	GE	SV	S	ATY	K	S	M	E	S	-	ST	:	
GmACO1	: VAGWGVGGIE	EAA	LGQPM	SNVLE	GVVGE	KLS	KIK	RNGVTATD	LVLT	VTQI	IRKH	GVVG	KFVE	Y-	-	DG	:										
GmACO2	: VAGWGVGGIE	EAA	LGQPM	SNVLE	GVVGE	KLS	KIK	RNGVTATD	LVLT	VTQI	IRKH	GVVG	KFVE	Y-	-	DG	:										
GmACO3	: VAGWGVGGIE	EAT	LGQPM	SNVLE	GVVGE	KLS	KIK	CNGVTATD	LVLT	VTQI	IRKH	GVVG	KFVE	Y-	-	N-	:										
GmACO4	: -----	GTGK	VLIK	VEPT	IR	V	E	EP	PCYL	ILAK	GLIL	H	N	GE	S	M	S	AS	Y	K	G	K	E	-	TT	:	
GmACO5	: QFATGIGNTD	GFV	GTGK	ILIK	VEPT	IR	V	D	EP	PPYL	ILAK	DIL	Q	I	GE	SV	S	ATY	K	S	M	E	S	-	TT	:	
GmACO6	: VAGWGVGGIE	EAA	LGQ	-----	-----	-----	-----	N	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	:
GmACO7	: VAGWGVGGIE	QAA	LGQ	-----	-----	-----	-----	N	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	:
GmACO8	: QFATGIGNTD	AFV	GTGK	ILIK	VEPT	IR	V	D	EP	KPSYL	ILAK	DIL	N	I	GE	SV	S	ATY	K	T	M	E	S	-	TT	:	
TaACO1	: QFATGIGNTD	GFV	GTGK	ILIK	VEPT	IR	V	D	EP	PPYL	ILAK	DIL	Q	I	GE	SV	S	ATY	K	S	M	E	S	-	ST	:	
TaACO2	: VAGWGVGGIE	EAA	LGQPM	SNVLE	GVVGE	KLT	KIK	QDGVTTT	DIAL	TLTQM	IRKH	GVVG	KFIE	F	Y	-	EG	:									
TaACO3	: -----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	:
TaACO4	: VAGWGVGGIE	EAA	LGQPM	SNVLE	GVVGE	KLT	KIK	QDGVTTT	DIAL	TLTQM	IRKH	GVVG	KFIE	F	Y	-	EG	:									
TaACO5	: VAGWGVGGIE	EAA	LGQPM	SNVLE	GVVGE	KLT	KIK	QDGVTTT	DIAL	TLTQM	IRKH	GVVG	KFIE	F	Y	-	EG	:									
TaACO6	: VAGWGVGGIE	EAT	LGQPM	SNVLE	GVVGE	KLS	KIK	RNGVTATD	LVLT	VTQM	IRKH	GVVG	KFVE	Y-	-	GG	:										
TaACO7	: VAGWGVGGIE	EAT	LGQPM	SNVLE	GVVGE	KLS	KIK	RNGVTATD	LVLT	VTQM	IRKH	GVVG	KFVE	Y-	-	GG	:										
TaACO8	: QFATGIGNTD	GFV	GTGK	ILIK	VEPT	IR	V	D	EP	PPYL	ILAK	DIL	Q	I	GE	SV	S	ATY	K	S	M	E	S	-	ST	:	
TaACO9	: VAGWGVGGIE	EAT	LGQPM	SNVLE	GVVGE	KLS	KIK	RNGVTATD	LVLT	VTQM	IRKH	GVVG	KFVE	Y-	-	EG	:										
TaACO10	: QFATGIGNTD	GFV	GTGK	ILIK	VEPT	IR	V	D	EP	PPYL	ILAK	DIL	Q	I	GE	SV	S	ATY	K	S	M	E	S	-	ST	:	
TaACO11	: VAGWGVGGIE	EAT	LGQPM	SNVLE	GVVGE	KLT	KIK	RNGVTATD	LVLT	VTQM	IRKH	GVVG	KFVE	Y-	-	EG	:										
TaACO12	: QFATGIGNTD	GFV	GTGK	ILIK	VEPT	IR	V	D	EP	PPYL	ILAK	DIL	Q	I	GE	SV	S	ATY	K	S	M	E	S	-	ST	:	
TaACO13	: VAGWGVGGIE	EAT	LGQPM	SNVLE	GVVGE	KLT	KIK	RNGVTATD	LVLT	VTQM	IRKH	GVVG	KFVE	Y-	-	EG	:										
TaACO14	: VVGWGVGGID	EAA	LGQPM	SNVLE	GVVGE	KLT	KIK	RDGVTATD	LVLT	VTQM	IRKH	GVVG	KFVE	Y-	-	RG	:										
TaACO15	: -----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	:
PpACO1	: VAGWGVGGIE	EAV	LGQPM	SNVLE	GVVGE	KLS	KIK	KTGVTATD	LVLT	VTQM	IRKH	GVVG	KFVE	Y-	-	KG	:										
PpACO2	: VAGWGVGGIE	EAA	LGQPM	SNVLE	GVVGE	KLN	KIK	RTGVTATD	LVLT	VTQI	IRKH	GVVG	KFVE	Y-	-	KG	:										
PpACO3	: VAGWGVGGIE	EAA	LGQPM	SNVLE	GVVGE	KLN	KIK	RTGVTATD	LVLT	VTQI	IRKH	GVVG	KFVE	Y-	-	KG	:										
PpACO4	: QFATGIGNTD	GFV	GTGK	ILIK	VEPT	IR	V	D	EP	KYL	ILAK	DIL	Q	I	GE	SV	AG	ATY	R	A	M	E	S	-	TA	:	
PpACO5	: VAGWGVGGIE	EAA	LGQPM	SNVLE	GVVGE	KLN	KIK	RTGVTATD	LVLT	VTQM	IRKH	GVVG	KFVE	Y-	-	KG	:										
SdACO1	: VAGWGVGGIE	EAA	LGQPM	SNVLE	GVVGE	KLS	KIK	RTGVTATD	LVLT	VTQM	IRKH	GVVG	KFVE	Y-	-	KG	:										
SdACO2	: VAGWGVGGIE	EAA	LGQPM	SNVLE	GVVGE	KLS	KIK	RTGVTATD	LVLT	VTQM	IRKH	GVVG	KFVE	Y-	-	KG	:										
SdACO3	: QFATGIGNTD	GFV	GTGK	ILIK	VEPT	IR	V	D	EP	PSYL	ILAK	DIL	Q	I	GE	TV	S	ATY	K	S	M	E	S	-	TA	:	
SdACO4	: QFATGIGNTD	GFV	GTGK	ILIK	VEPT	IR	V	D	EP	PSYL	ILAK	DIL	Q	I	GE	TV	S	ATY	K	S	M	E	S	-	TA	:	
SdACO5	: QFATGIGNTD	GFV	GTGK	ILIK	VEPT	IR	V	D	EP	PSYL	ILAK	DIL	Q	I	GE	TV	S	ATY	K	S	M	E	S	-	TA	:	
SdACO6	: VAGWGVGGIE	EAT	LGQPM	SNVLE	GVVGE	KLV	KIK	QAGVTATD	LVLT	VTQM	IRKH	GVVG	KFVE	Y-	-	EG	:										
SdACO7	: VAGWGVGGIE	EAT	LGQPM	SNVLE	GVVGE	KLV	KIK	QAGVTATD	LVLT	VTQM	IRKH	GVVG	KFVE	Y-	-	EG	:										

		*	440	*	460	*	480	*
AtACO1	:	MSRELS	-----	LAD	RATTANN	SPEYGATMGFFFEV	-----	HVTLDYLRRLTGRS
AtACO2	:	MSELS	-----	LAD	RATTANN	SPEYGATMGFFFEV	-----	HVTLEYLKLITGRS
AtACO3	:	MSGLS	-----	LAD	RATTANN	SPEYGATMGFFFEV	-----	HVTLDYLRRLTGRS
AtACO4	:	IESLS	-----	NEE	MTICNN	VVEAGGKNGVVP	-----	
OsACO1	:	MSELS	-----	LAD	RATTANN	SPEYGATMGFFFEV	-----	GKTLDYLRRLTGRS
OsACO2	:	VGEIS	-----	LPA	RATTANN	SPEYGASMGFFFEV	-----	HYNYLKRISSFHTRLIKQH
OsACO3	:	MGKLS	-----	LAD	RATTANN	SPEYGATMGFFFEV	-----	HVTLDYLRRLTGRS
OsACO4	:	VESIN	-----	NEE	MTICNN	VVEAGGKNGVVP	-----	
GmACO1	:	MGEIS	-----	LAD	RATTANN	SPEYGATMGFFFEV	-----	HVTLDYLRRLTGRS
GmACO2	:	MGEIS	-----	LAD	RATTANN	SPEYGATMGFFFEV	-----	HVTLDYLRRLTGRS
GmACO3	:		-----				-----	
GmACO4	:	IENLS	-----	NEE	MAICNN	VVEAVGKNSIVVT	-----	
GmACO5	:	VESLT	-----	NEE	MTICNN	VVEAGGKNGVVP	-----	
GmACO6	:		-----		RTIGGT		-----	LR
GmACO7	:		-----		RTIGGT		-----	LR
GmACO8	:	IESLS	-----	NEE	MTICNN	VVEAGGKNSIVAA	-----	
TaACO1	:	IESIN	-----	NEE	MTICNN	VVEAGGKNGVVP	-----	
TaACO2	:	VGSIP	-----	LPA	RATTANN	TPEYGATMGFFFEV	-----	QVALDYLRRLIGRS
TaACO3	:	VGSIP	-----	LPA	RATTANN	TPEYGATMGFFFEV	-----	QVGLDYLRRLIGRS
TaACO4	:	VGSIP	-----	LPA	RATTANN	TPEYGATMGFFFEV	-----	QVALDYLRRLIGRS
TaACO5	:	VGSIP	-----	LPA	RATTANN	TPEYGATMGFFFEV	-----	QVALDYLRRLIGRS
TaACO6	:	MGEIS	-----	LAD	RATTANN	APEYGATMGFFFEV	-----	AKTLDYLRRLTGRS
TaACO7	:	MGEIS	-----	LAD	RATTANN	APEYGATMGFFFEV	-----	AKTLDYLRRLTGRS
TaACO8	:	IESLT	-----	NEE	MTICNN	VVEAGGKNGVVP	-----	
TaACO9	:	MGKLS	-----	LAD	RATTANN	SPEYGATMGFFFEV	-----	HVTLDYLRRLTGRS
TaACO10	:	IESIT	-----	NEE	MTICNN	VVEAGGKNGVVP	-----	
TaACO11	:	MGKLS	-----	LAD	RATTANN	SPEYGATMGFFFEV	-----	HVTLDYLRRLTGRS
TaACO12	:	IESLT	-----	NEE	MTICNN	VVEAGGKNGVVP	-----	
TaACO13	:	MGKLS	-----	LAD	RATTANN	SPEYGATMGFFFEV	-----	HVTLDYLRRLTGRS
TaACO14	:	NEELA	-----	LAD	RTTANN	APEYGATVGFEEV	-----	HITLEYLMKTGRE
TaACO15	:	NEELA	-----	LAD	RATTANN	APEYGATVGFEEV	-----	HITLEYLMKTGRE
PpACO1	:	MAEIS	-----	LAD	RATTANN	APEYGATMGFFFEV	-----	KITLDYLTLTGRE
PpACO2	:	MSELT	-----	LAD	RATTANN	SPEYGATMGFFFEV	-----	RVSLDYLMKTGRD
PpACO3	:	MSELT	-----	LAD	RATTANN	SPEYGATMGFFFEV	-----	RVSLDYLMKTGRD
PpACO4	:	VDAMT	-----	NEE	MTICNN	VVEAGGKNGVVP	-----	
PpACO5	:	MSELT	-----	LAD	RATTANN	SPEYGATMGFFFEV	-----	RVTLDYLRMTGRD
SdACO1	:	MQEIS	-----	LAD	RATTANN	SPEYGATMGFFFEV	-----	HVSLQYLRMTGRE
SdACO2	:	MQEIS	-----	LAD	RATTANN	SPEYGATMGFFFEV	-----	HVSLQYLRMTGRD
SdACO3	:	VERMT	-----	NEE	MTICNN	AIAGGKNGVVP	-----	
SdACO4	:	VERMT	-----				-----	
SdACO5	:	VERMTVSSFSPLYLIEIVHLISRSELTQ	-----	NEE	MTICNN	AIAGGKNGVVP	-----	
SdACO6	:	VSCIS	-----	LAD	RATTANN	SPEYGATMGFFFEV	-----	QMTINYLSTGRD
SdACO7	:	VSCIS	-----	LAD	RATTANN	SPEYGATMGFFFEV	-----	QMTINYLSTGRD

	500	*	520	*	540	*	560
AtACO1	:	-----DDT	VSMIEAYLRANK	FVD	YSEPEKSTV	SSCIELNLEDVEFC	SGPKRTHDFVP
AtACO2	:	-----DET	VSMIESYLRRAN	FVD	YNPPQGERA	TSYLQLDLGHVEFC	ISGPKRTHDFVP
AtACO3	:	-----DET	VAMIEAYLRANK	FVD	YNPPQDRV	SSYLELNIDDEVEFC	ISGPKRTHDFVT
AtACO4	:	-----ATT	LNIVENRTS	P	FEFVYSDGNAS	VADYRFVSKLEIVAK	HSIDNR--
OsACO1	:	-----DDT	VAMIESYLRRAN	FVD	YNQPEAERV	SSYLELNIEEVEFC	ISGPKRTHDFVT
OsACO2	:	NLAITCTYDITRCMHNNK	VSMIEAYLRANK	FVE	HHHPHTERV	SSYLELNINIDVEFC	ISGPKRTHDFVP
OsACO3	:	-----DET	VAMIEAYLRANK	FVD	YNPPQTERV	SSYLELDINEVEFC	ISGPKRTHDFVL
OsACO4	:	-----Q	TTFNYLEGKTS	E	YEPVYSDAQAR	VSDYRFVSKLEIVAK	HSIDNR--
GmACO1	:	-----DEI	VAMIESYLRENK	FVD	YNPPQDRV	SSYLELNISDVEFC	ISGPKRTHDFVP
GmACO2	:	-----DET	VAMIEAYLRANK	FID	YNPPQDRV	SSYLELNIDEVEFC	ISGPKRTHDFVP
GmACO3	:	-----					
GmACO4	:	-----T	YKYLGDMTLAPYEPVFS	DENAR	LVQYRFVASKMEELVAK	HSIDNR--	
GmACO5	:	-----S	TTFKYLEGKTS	P	YEPVYSDDQAR	LAEYRFVSKLEIVAK	HSIDNR--
GmACO6	:	-----I	LAVAL				
GmACO7	:	-----I	LAVAL				
GmACO8	:	-----R	TTYKYLEDKTSAPYEPVSS	DENAR	LAQYRFVSNMEELVAK	HSIDNR--	
TaACO1	:	-----E	TTFKYLEGKTS	E	YEPVYSDAQAR	YSDYRFVSKLEIVAK	HSIDNR--
TaACO2	:	-----DET	VSMIEAYLRANK	FVD	CNELQTGPV	SSDLELDITTTVEFS	VAGPKRTHDFVP
TaACO3	:	-----DET	VSMIEAYLRANK	FVD	CNEPQTGPV	SSDLELDITTTVEFS	VAGPKRTHDFVP
TaACO4	:	-----DET	VSMIEAYLRANK	FVD	CNEPQTGPV	SSDLELDITTTVEFS	VAGPKRTHDFVP
TaACO5	:	-----DET	VSMIEAYLRANK	FVD	CNEPQTGPV	SSDLELDITTTVEFS	VAGPKRTHDFVP
TaACO6	:	-----DET	VAMIEAYLRANK	FVD	YKQVQAERV	SSYLELDIDEVEFC	ISGPKRTHDFVT
TaACO7	:	-----DET	VAMIEAYLRANK	FVD	YKQVQAERV	SSYLELDIDEVEFC	ISGPKRTHDFVT
TaACO8	:	-----E	TTFKYLEGKTI	E	YEPVYSDAQAR	YSDYRFVSKLEIVAK	HSIDNR--
TaACO9	:	-----DET	VSMIEAYLRANK	FVD	YNPPQLERV	SSYLALDIDEVEFC	ISGPKRTHDFVT
TaACO10	:	-----E	TTFKYLEGKTS	E	YEPVYSDAQAR	YSDYRFVSKLEIVAK	HSIDNR--
TaACO11	:	-----DET	VSMIEAYLRANK	FVD	YNPPQAERV	SSYLALDIDEVEFC	ISGPKRTHDFVT
TaACO12	:	-----E	TTFKYLEGKTS	E	YEPVYSDAQAR	YSDYRFVSKLEIVAK	HSIDNR--
TaACO13	:	-----DET	VSMIEAYLRANK	FVD	YNPPQLERV	SSYLALDIDEVEFC	ISGPKRTHDFVT
TaACO14	:	-----DET	VSTIEAYLRANK	FVD	YNPPKIEPT	SSYLALDIDVEFC	ISGPKRTHDFVT
TaACO15	:	-----DET	VSTIEAYLRANK	FVD	YNPPKIEPT	SSYLALDIDVEFC	ISGPKRTHDFVT
PpACO1	:	-----G	KKVKEIEGYLRANK	FID	HSPKPKDNK	SSHLELDINTVEFC	ISGPKRTHDFVN
PpACO2	:	-----E	KKVEEIEAYLRANK	FID	HEKPRKDNT	SAYLELDIDTVEFC	ISGPKRTHDFVA
PpACO3	:	-----E	KKVEEIEAYLRANK	FID	HEKPRKDNT	SAYLELDIDTVEFC	ISGPKRTHDFVA
PpACO4	:	-----A	TTAKYLEGKTSKPQVFTS	DGNAS	LQYRFVSKLEIVAK	HSIDNR--	
PpACO5	:	-----E	ERVEEIEAYLRANK	FVD	HEK--KDNT	SGHLELDIDTVEFC	ISGPKRTHDFVT
SdACO1	:	-----E	KKVEMIESYLRRAN	FID	YNPPTEKV	SSYLELDIDSVQFC	ISGPKRTHDFVN
SdACO2	:	-----E	KKVEMIESYLRRAN	FID	YDEPTEKV	SSYLELDIDSVQFC	ISGPKRTHDFVN
SdACO3	:	-----E	VTSYLKGKTDKEFESVYS	DAGAT	IQEYRIVSKLEIVAK	HSIDNR--	
SdACO4	:	-----E	YRTIVSKLEIVAK	HSIDNR--			
SdACO5	:	-----E	VTSYLKGKTEKEFESVYS	DAGAT	IQEYRIVSKLEIVAK	HSIDNR--	
SdACO6	:	-----A	EKKVMEAYLRANK	FVD	YSQKQPETV	SAYLELDIGSVEFC	ISGPKRTHDFVS
SdACO7	:	-----A	EKKVMEAYLRANK	FVD	YSQKQPETV	SAYLELDIGSVEFC	ISGPKRTHDFVS

	*	580	*	600	*	620	*		
AtACO1	:	LKEMKADWHS	CLDNFVGFKGF	AVPKEAQSKAVE	FN	NGTTAQLRHGDNVIAA	T	SCTNTSNPSVNLGAGL	
AtACO2	:	LKDMKADWHAC	LDNFVGFKGF	AVPKEKQEEVVKF	SY	NGQPAELKHGSDVIAA	T	SCTNTSNPSVNLGAGL	
AtACO3	:	LKEMKADWHS	CLDSKVGFKGF	AIPKEAQEKVVNF	SE	DGQPAELKHGSDVIAA	T	SCTNTSNPSVNLGAGL	
AtACO4	:	-----	-----	-----	---	ALARECKDVKIDRVY	G	SCTGGKTEDFNAAGKL	
OsACO1	:	LKNMKS	SDWLSCLDND	VGFKGF	AVPKESQGKVAE	FS	HGTPAKLRHGDVIAA	T	SCTNTSNPNVNLGAGL
OsACO2	:	LKEMKSDWHAC	LDNRVGFKGF	AVPREQDKVVKF	ED	QGQPAELKHGSDVIAA	T	SCTNTSNPSVNLGAGL	
OsACO3	:	LKEMKSDWHS	CLDNFVGFKGF	AVPKEQDKVVKF	ED	HGQPAELKHGSDVIAA	T	SCTNTSNPSVNLGAGL	
OsACO4	:	-----	-----	-----	---	ALARECKDVKIDRVY	G	SCTGGKTEDFFAAGKV	
GmACO1	:	LKEMKADWHAC	LDNKVGFKGF	AIPKEAQGKVAE	ED	HGQPAELKHGSDVIAA	T	SCTNTSNPSVNLGAGL	
GmACO2	:	LKEMKADWHAC	LDNNVGFKGF	AIPKDVQGKVAE	ED	HGQPAELKHGSDVIAA	T	SCTNTSNPSVNLGAGL	
GmACO3	:	-----	-----	-----	---	-----	---	-----	
GmACO4	:	-----	-----	-----	---	ALL-----	---	AQLKFLCFSFLLHKRV	
GmACO5	:	-----	-----	-----	---	ALARECKDVKIDRVY	G	SCTGGKTEDFNAAGKV	
GmACO6	:	---	MK-----	-----	---	IKQGSRVVVAQA	---	KLICGSGI	
GmACO7	:	---	MK-----	-----	---	IKQGSRVVVAQA	---	KLICGSGI	
GmACO8	:	-----	-----	-----	---	ALARECNNVKIDRVY	G	SCTGGKTEDFNAAGKV	
TaACO1	:	-----	-----	-----	---	ALARECKDVKIDRVY	G	SCTGGKTEDFIAAGKV	
TaACO2	:	LKEMKSDWHT	CLGNEVGFKGY	AVPKEEHNKIVK	ED	HGQPAELKHGSDVIAA	T	SCTNTSNPSVNLGAGL	
TaACO3	:	LKEMKSDWHAC	CLGNEVGFKGY	AVPKEQHNKIVK	ED	HGQPAELKHGSDVIAA	T	SCTNTSNPSVNLGAGL	
TaACO4	:	LKEMKSDWHAC	CLGNEVGFKGY	AVPKEQHNKIVK	ED	HGQPAELKHGSDVIAA	T	SCTNTSNPSVNLGAGL	
TaACO5	:	LKEMKSDWHAC	CLGNEVGFKGY	AVPKEQHNKIVK	ED	HGQPAELKHGSDVIAA	T	SCTNTSNPSVNLGAGL	
TaACO6	:	LKNMQSDWLS	CLDNKVGFKGF	AVPKESQGKVAE	FS	RGTPAKLRHGDVIAA	T	SCTNTSNPNVNLGAGL	
TaACO7	:	LKNMQSDWLS	CLDNKVGFKGF	AVPKESQAKVAE	FS	RGTPAKLRHGDVIAA	T	SCTNTSNPNVNLGAGL	
TaACO8	:	-----	-----	-----	---	ALARECKDVKIDRVY	G	SCTGGKTEDFIAAGKV	
TaACO9	:	LKDMKSDWHAC	LDNKVGFKGF	AVPKEQDKVVKF	ED	NGQPAELKHGSDVIAA	T	SCTNTSNPSVNLGAGL	
TaACO10	:	-----	-----	-----	---	ALARECKDVKIDRVY	G	SCTGGKTEDFIAAGKV	
TaACO11	:	LKDMKSDWHAC	LDNKVGFKGF	AVPKEQDKVVKF	ED	NGQPAELKHGSDVIAA	T	SCTNTSNPSVNLGAGL	
TaACO12	:	-----	-----	-----	---	ALARECKDVKIDRVY	G	SCTGGKTEDFIAAGKV	
TaACO13	:	LKDMKSDWHAC	LDNKVGFKGF	AVPKEQDKVVKF	ED	NGQPAELKHGSDVIAA	T	SCTNTSNPSVNLGAGL	
TaACO14	:	LKDMKT	DWHACLENKIGFKGY	GIPKDLQNRVVK	ED	HGRTAELKHGTVIAA	T	SCTNTSNPTVNIASGL	
TaACO15	:	LKDMKADWHAC	LENKIGFKGY	GIPKDLQNRVVK	ED	HGQTAELKHGTVIAA	T	SCTNTSNPTVNIASGL	
PpACO1	:	LREMKKDWKDC	LNKVGFKGF	AIPKDKQSKVAK	FS	EGKAAELRHGSDVIAA	T	SCTNTSNPSVNLGAGL	
PpACO2	:	IKDMKQDWQS	CLDNKVGFKGF	AIPKQDQEKVAK	FT	EGKPAELRHGSDVIAA	T	SCTNTSNPSVNLGAGL	
PpACO3	:	IKDMKQDWQS	CLDNKVGFKGF	AIPKQDQEKVAK	FT	EGKPAELRHGSDVIAA	T	SCTNTSNPSVNLGAGL	
PpACO4	:	-----	-----	-----	---	GLARECKDVKIDRVY	G	SCTGGKTEDFIAAGEL	
PpACO5	:	LKDMKQDWQA	CLDNKVGFKGF	AIPKEQDKVVKF	FT	EGKPAELRHGSDVIAA	T	SCTNTSNPSVNLGAGL	
SdACO1	:	LKDMKEDWHN	CLDSKVGFKGF	GVPKDEQSAIAK	KE	EGKPAELRHGSDVIAA	T	SCTNTSNPSVNLGAGL	
SdACO2	:	LKDMKEDWHN	CLDSKVGFKGF	GVPKDEQSAIAK	KE	EGKPAELRHGSDVIAA	T	SCTNTSNPSVNLGAGL	
SdACO3	:	-----	-----	-----	---	ALARDCCKDVKIDRVY	G	SCTGGKTEDFVAAAKL	
SdACO4	:	-----	-----	-----	---	ALARNCCKDVKIDRVY	G	SCTGGKTEDFVVAAGKL	
SdACO5	:	-----	-----	-----	---	VLARDCCKDVKIDRVY	G	SCTGGKTEDFVAAAKL	
SdACO6	:	LKDMKADWQA	CLDNKVGFKGF	NIPKDLQHKTAQ	FT	EGKPAELRHGSDVIAA	T	SCTNTSNPYVNLGAGL	
SdACO7	:	LKDMKADWQA	CLDNKVGFKGF	NIPKDLQHKTAQ	FT	EGKPAELRHGSDVIAA	T	SCTNTSNPYVNLGAGL	

	640	*	660	*	680	*	700
AtACO1	: VAKKACD	IGLE	-----	-----	VKPWIKTSLAPGSGVVTKYIAKSGIQK	ELNQLGFSIVGYG	:
AtACO2	: VAKKASD	IGIK	-----	-----	VKPWVKTSAPGSRVVEKYIDRSGLRES	ITKQGFIVGYG	:
AtACO3	: VAKKACD	IGIQ	-----	-----	VKPWIKTSLAPGSGVVTKYIAKSGIQE	YINEQGFINVGYG	:
AtACO4	: FHAAGRK	VKVP	-----	-----	TEIVPATQKV	RMDEVYALPVPAG	:
OsACO1	: VAKKACE	IGLE	-----	-----	VKPWIKTSLAPGSGVVKKYIDKSGIQK	YLDQLGFHIVGYG	:
OsACO2	: VAKKACE	IGLE	GLPFRFRSKNRSSPVYRKQ	-----	VKPWVKTSFTHGSAVTREYAKHSHLQD	YLNQQGFHLAAFG	:
OsACO3	: VAKKACE	IGLE	-----	-----	VKPWVKTSAPGSGVVTKYILQSGIQE	ELNKQGFHVGYG	:
OsACO4	: FLASGKK	VKVP	-----	-----	TEIVPATQKV	RMDIYSIPVPAG	:
GmACO1	: VAKKAHE	IGIQ	-----	-----	VNPWVKTSAPGSGVVTKYILQSGIQK	YINEQGFIHVGFG	:
GmACO2	: VAKKAHE	IGIQ	-----	-----	VKPWVKTSAPGSGVVTKYIAKSGIQK	YLINEQGFIVGYG	:
GmACO3	:		-----	-----			:
GmACO4	: WMVIHLKTQ	IKG	-----	-----	KEYTPRQGILHPRKHGISLSSP		:
GmACO5	: FLASGKK	VKVP	-----	-----	TEIVPATQKV	RMELYSLPVPAG	:
GmACO6	: VLRNKR		-----	KT			:
GmACO7	: ALQNKG		-----	KT			:
GmACO8	: FLAGGKT	VKVP	-----	-----	TEIVPATQKV	RMELYTLEVPDSG	:
TaACO1	: FLASGKK	VKVP	-----	-----	TEIVPATQKV	RMDEVYSLPVPAG	:
TaACO2	: VAKKACE	IGLE	-----	-----	VKPWVKTSAPGSLVVTKYIEHSGIQE	YLNHQGFHIVGYG	:
TaACO3	: VAKKACE	IGLE	-----	-----	VKPWVKTSAPGSLVVTKYIEHSGIQE	YLNHQGFHIVGYG	:
TaACO4	: VAKKACE	IGLE	-----	-----	VKPWVKTSAPGSLVVTKYIEHSGIQE	YLNHQGFHIVGYG	:
TaACO5	: VAKKACE	IGLE	-----	-----	VKPWVKTSAPGSLVVTKYIEHSGIQE	YLNHQGFHIVGYG	:
TaACO6	: VAKKACD	IGLE	-----	-----	VKPWIKTSLAPGSGVVKKYIDKSGIQK	YLNQLGFIVGYG	:
TaACO7	: VAKKACD	IGLE	-----	-----	VKPWIKTSLAPGSGVVKKYIDKSGIQK	YLNQLGFIVGYG	:
TaACO8	: FLASGKK	VKVP	-----	-----	TEIVPATQKV	RMDEVYSLPVPAG	:
TaACO9	: VAKKACE	IGLE	-----	-----	VKPWVKTSAPGSGVVTKYIAKSGIQE	YLNKQGFHIVGYG	:
TaACO10	: FLASGKK	VKVP	-----	-----	TEIVPATQKV	RMDEVYSLPVPAG	:
TaACO11	: VAKKACE	IGLE	-----	-----	VKPWVKTSAPGSGVVTKYIAKSGIQE	YLNKQGFHIVGYG	:
TaACO12	: FLASGKK	VKVP	-----	-----	TEIVPATQKV	RMDEVYSLPVPAG	:
TaACO13	: VAKKACE	IGLE	-----	-----	VKPWVKTSAPGSGVVTKYIAKSGIQE	YLNKQGFHIVGYG	:
TaACO14	: VAKKAYE	IGLE	-----	-----	VKPWIKTSLAPGSGVVTKYILRSGLLK	YISDLGFIVGYG	:
TaACO15	: VAKKAYE	IGLE	-----	-----	VKPWIKTSLAPGSGVVTKYILRSGLLK	YISDLGFIVGYG	:
PpACO1	: VAKKGTE	IGLE	-----	-----	VKPWVKTSAPGSGVVTKYIAKSGITK	YLNQQGFIVGYG	:
PpACO2	: VAKKATE	IGLE	-----	-----	VKPWVKTSAPGSGVVTKYIEKSGINK	YLDKQGFIVGYG	:
PpACO3	: VAKKATE	IGLE	-----	-----	VKPWVKTSAPGSGVVTKYIEKSGINK	YLDKQGFIVGYG	:
PpACO4	: LAISGQK	VKVP	-----	-----	TEIVPATQKV	RMELYSLPVPAG	:
PpACO5	: VAKKATE	IGLE	-----	-----	VKPWVKTSAPGSGVVTKYIEHSGINK	YLDQQGFIVGYG	:
SdACO1	: VAKKATE	IGIQ	-----	-----	VKPWIKTSLAPGSGVVTKYIAKSGITE	YLDKQGFIVGYG	:
SdACO2	: VAKKATE	IGIQ	-----	-----	VKPWIKTSLAPGSGVVTKYIAKSGITE	YLDKQGFIVGYG	:
SdACO3	: LNKAGQK	VKVP	-----	-----	TEIVPATQKV	RMDEVYAMPPEAD	:
SdACO4	: LNKAGQK	VKVP	-----	-----	TEIVPATQKV	RMDEVYAMPPEAD	:
SdACO5	: LNKAGQK	VKVP	-----	-----	TEIVPATQKV	RMDEVYAMPPEAD	:
SdACO6	: VAKKATE	IGLE	-----	-----	VRPWIKTSLAPGSGVVTKYIAKSGILK	YLDMQGFIVGYG	:
SdACO7	: VAKKATE	IGLE	-----	-----	VRPWIKTSLAPGSGVVTKYIAKSGILK	YLDMQGFIVGYG	:

	*	720	*	740	*	760	*
AtACO1	:	CTTCIGNSGDIHEAVASAI	VDND-IVAS	AVISNNNFEGRVHPLTRAN	-----		:
AtACO2	:	CTTCIGNSGNLDPEVASA	IEGTD-IIPA	AVISNNNFEGRVHPQTRAN	-----		:
AtACO3	:	CTTCIGNSGEINESVGA	AITEND-IVAA	AVISNNNFEGRVHPLTRAN	-----		:
AtACO4	:	GKTCAQIFEEA-----	GCDTPASPCG	ACIGPRTYARINEP	-----		:
OsACO1	:	CTTCIGNSGELDET	VSAISDND-IVAA	AVISNNNFEGRVHALTRAN	-----		:
OsACO2	:	CATCVGNSGDLDES	VSAITEND-IVSV	AVISANNNFEGRVHPLTRAN	-----		:
OsACO3	:	CTTCIGNSGDLDES	VSAISEND-VVAA	AVISNNNFEGRVHPLTRAN	-----		:
OsACO4	:	GKTCSQIFEEA-----	GCDTPASPCG	ACIGPRTYARNNEP	-----		:
GmACO1	:	CTTCIGNSGELLES	VASAISEND-IVAA	AVISNNNFEGRVHALTRAN	-----		:
GmACO2	:	CTTCIGNSGELDQS	VASAISEND-IVAA	AVISNNNFEGRVHPLTRAN	-----		:
GmACO3	:	-----	-----	-----	-----		:
GmACO4	:	---TGDHIFNQHSVEFAVGADNPESA	ICASLAT	QLLETR-----			:
GmACO5	:	GKTCSQIFEEA-----	GCDTPASPCG	ACIGPRTYARNNEPKARIIVDK	EWK	KDVVDVRRVGDR	IIA
GmACO6	:	-----	-----	-----	-----		:
GmACO7	:	-----	-----	-----	-----		:
GmACO8	:	GKTCSMIFEEA-----	GCDPPASPCG	ACIGPRTYGRINEP	-----		:
TaACO1	:	GKTCSQIFEEA-----	GCDAPASPCG	ACIGPRTYARNNEP	-----		:
TaACO2	:	CTTCIGNSGDLDKSL	SDAIVDNDVVVV	AVISNNNFEGRVHPLTRAN	-----		:
TaACO3	:	CTTCIGNSGDLDKSL	SDAIVDND-VAVV	AVISNNNFEGRVHPLTRAN	-----		:
TaACO4	:	CTTCIGNSGDLDKSL	SDAIVDND-VVVV	AVISNNNFEGRVHPLTRAN	-----		:
TaACO5	:	CTTCIGNSGDLDKSL	SDAIVDND-VVVV	AVISNNNFEGRVHPLTRAN	-----		:
TaACO6	:	CTTCIGNSGDLDES	VAAAITDND-VVAA	AVISNNNFEGRVHALTRAN	-----		:
TaACO7	:	CTTCIGNSGDLDES	VAAAITDND-VVAA	AVISNNNFEGRVHALTRAN	-----		:
TaACO8	:	GKTCSQIFEEA-----	GCDTPASPCG	ACIGPRTYARNNEP	-----		:
TaACO9	:	CTTCIGNSGELHES	VSAITEND-VVAA	AVISNNNFEGRVHPLTRAN	-----		:
TaACO10	:	GKTCSQIFEEA-----	GCDTPASPCG	ACIGPRTYARNNEP	-----		:
TaACO11	:	CTTCIGNSGELHES	VSAITEND-VVAA	AVISNNNFEGRVHPLTRAN	-----		:
TaACO12	:	GKTCSQIFEEA-----	GCDTPASPCG	ACIGPRTYARNNEP	-----		:
TaACO13	:	CTTCIGNSGELHES	VSAITEND-VVAA	AVISNNNFEGRVHPLTRAN	-----		:
TaACO14	:	CTTCIGNSGDLDQIV	ADEITEND-IIAV	AVISNNNFEGRIHPLTQAN	-----		:
TaACO15	:	CTTCIGNSGDLDQIV	ADAITEND-IIAA	AVISNNNFEGRIHPLTQAN	-----		:
PpACO1	:	CTTCIGNSGELHED	VSKAITEND-IVAA	AVISNNNFEGRVHPLTRAN	-----		:
PpACO2	:	CTTCIGNSGDVHEA	VAEAIAND-VVAA	AVISNNNFEGRVHPLTRAN	-----		:
PpACO3	:	CTTCIGNSGDVHEA	VAEAIAND-MVAA	AVISNNNFEGRVHPLTRAN	-----		:
PpACO4	:	GKTCAEIFQQA-----	GCDTPASPCG	ACIGPRTYARNNDP	-----		:
PpACO5	:	CTTCIGNSGDLHED	VSEAIAND-VVAA	AVISNNNFEGRVHPLTRAN	-----		:
SdACO1	:	CTTCIGNSGEIHED	VASAIADND-MIAA	AVISNNNFEGRIHPLTRAN	-----		:
SdACO2	:	CTTCIGNSGEIHED	VASAIADND-MIAA	AVISNNNFEGRIHPLTRAN	-----		:
SdACO3	:	GKTCAQIFEEA-----	GCDTPASPCG	ACIGPRTYARNNEP	-----		:
SdACO4	:	GKTCAQIFEEA-----	GCDTPTSPCG	ACIGPKITLEK1	-----		:
SdACO5	:	GKTCAQIFEEA-----	GCDTPASPCG	ACIGPRTYARNNEP	-----		:
SdACO6	:	CTTCIGNSGELHEA	VATAIADND-IVAA	AVISNNNFEGRVHPLTRAN	-----		:
SdACO7	:	CTTCIGNSGELHEA	VATAIADND-IVAA	AVISNNNFEGRVHPLTRAN	-----		:

		*	860	*	880	*	900	*		
AtACO1	:	----	YLASPPLV	AYALAGTVDIDF	ETQPIGTGKDGKQ	IF	FRDIWPSNKE	VAE	VVQSS	:
AtACO2	:	----	YLASPPLV	AYALAGTVDIDF	EKEPIGTRSDGKS	VY	LRDWP	SNEE	VAQ	VVQYS
AtACO3	:	----	YLASPPLV	AYALAGTVNIDF	ETETPIGKGNKGD	VF	LRDIWPTTE	EIAE	VVQSS	:
AtACO4	:	----								
OsACO1	:	----	YLASPPLV	AYALAGTVNIDF	EKEPIGISKDGKE	VY	FRDIWPS	TEE	IAE	VVKSS
OsACO2	:	----	YLASPPLV	AYALAGTVDIDF	EKEPIGHGKDGNE	VY	LRDIWPTNEE	IEE	QV	VVKSS
OsACO3	:	----	YLASPPLV	AYALAGTVDIDF	EKEPIGVGKDGKE	VF	FRDIWPS	TEE	IAE	VVQSS
OsACO4	:	----								
GmACO1	:	----	YLASPPLV	AYALAGTVDIDF	EKEPIGTGKDGKN	VY	LRDIWPS	TEE	IAK	VVQSS
GmACO2	:	----	YLASPPLV	AYALAGTVDIDF	EKEPIGTGKGNN	VY	LRDIWPS	TQ	EIAE	AVQSS
GmACO3	:	----								
GmACO4	:	----								
GmACO5	:		FGLGEMNGEGKSILEFSE	ALDLS	IANTWFKKRE	DHLITYKSG	GTCSQIDFFLI	RKSDRKYCLNCK	VI	PEE
GmACO6	:	----								
GmACO7	:	----								
GmACO8	:	----								
TaACO1	:	----								
TaACO2	:	----	YLASPPLV	AYALAGTVDIDF	ENEPIGIGKDGKE	VY	FKDVWPTNEE	IEE	QVI	KSN
TaACO3	:	----	YLASPPLV	AYALAGTVDIDF	ENEPIGIGKDGKE	VY	FKDVWPTNEE	IEE	QVI	KSN
TaACO4	:	----	YLASPPLV	AYALAGTVDIDF	ENEPIGIGKDGKE	VY	FKDVWPTNEE	IEE	QVI	KSN
TaACO5	:	----	YLASPPLV	AYALAGTVDIDF	ENEPIGIGKDGKE	VY	FKDVWPTNEE	IEE	QVI	KSN
TaACO6	:	----	YLASPPLV	AYALAGTVNIDF	EKEPVGISKDGKE	VF	FRDIWPTTDE	EIAE	VVKAS	:
TaACO7	:	----	YLASPPLV	AYALAGTVNIDF	EKEPVGISKDGKE	VY	FRDIWPTTDE	EIAE	VVKAS	:
TaACO8	:	----								
TaACO9	:	----	YLASPPLV	AYALAGTVDIDF	EKEPIGVGKDGKE	VF	FRDIWPTTE	EIAE	VVQSS	:
TaACO10	:	----								
TaACO11	:	----	YLASPPLV	AYALAGTVDIDF	EKEPIGVGKDGKE	VF	FRDIWPTTE	EIAE	VVQSS	:
TaACO12	:	----								
TaACO13	:	----	YLASPPLV	AYALAGTVDIDF	EKEPIGVGKDGKE	VF	FRDIWPTTE	EIAE	VVQSS	:
TaACO14	:	----	YLASPPLV	VYALAGTVDINF	EEEEPIGTGKGNRP	IF	LRDIWPSSE	EVSE	IVHSN	:
TaACO15	:	----	YLASPPLV	VYALAGTVDINF	EEEEPIGTGKGNRP	IF	LRDIWPS	SKK	VSE	IVHSN
PpACO1	:	----	YLASPPLV	AYAFAGTVDIDF	AKEPIGKSKGGKD	VF	LKDVWPSNEE	IAK	VVQSS	:
PpACO2	:	----	YLASPPLV	AYAFAGTVNIDF	EKDPIGVGKDGKN	VF	LRDIWPSNQ	EVAE	VVATS	:
PpACO3	:	----	YLASPPLV	AYAFAGTVNIDF	EKDPIGVGKDGKN	VF	LRDIWPSNQ	EVAE	VVATS	:
PpACO4	:	----								
PpACO5	:	----	YLASPPLV	AYAFAGTVNIDF	ETETPIGLKDGKN	VF	LRDIWPS	SDEV	AE	VVANA
SdACO1	:	----	YLASPPLV	AYALAGTVDIDF	DTEPIGVGKSGKE	VF	LRDIWPSSE	EVAK	VVEKA	:
SdACO2	:	----	YLASPPLV	AYALAGTVDIDF	DTEPIGVGKSGKE	VF	LRDIWPSSE	EVAK	VVEKA	:
SdACO3	:	----								
SdACO4	:	----								
SdACO5	:	----								
SdACO6	:	----	YLASPPLV	AYALAGTVNIDF	EKEPIGVHSGKQ	VF	LRDIWPTSE	EVAK	VAEAS	:
SdACO7	:	----	YLASPPLV	AYALAGTVNIDF	EKEPIGVHSGKQ	VF	LRDIWPTSE	EVAK	VAEAS	:

	920	*	940	*	960	*	980
AtACO1	: VLPDMFKATYEAITKGN	SMWNQLSVA--SGTL	Y	EWDPKSTYIHEPPYFKG	MTMSPPG	PH-----	:
AtACO2	: VLPSMEKSSYETITEGN	PLWNELSAP--SSTL	Y	SWDPNSTYIHEPPYFKN	MTANPPG	PR-----	:
AtACO3	: VLPDMFRATYESITKGN	PMWNKLSVP--ENTL	Y	SWDPNSTYIHEPPYFKD	MTMDPPG	PH-----	:
AtACO4	:	-----		-----		-----	:
OsACO1	: VLPDMFKSTYEAITKGN	PMWNELSVS--ASTL	Y	PWDPTSTYIHEPPYFKD	MTMSPPG	PR-----	:
OsACO2	: VLPDMFTQTYESIKRCN	RRWNELRVPGEAAL	Y	PWDPSSTYIRKPPYLEG	MAMSPSR	PR-----	:
OsACO3	: VLPDMFKSTYEAITKGN	PMWNQLTVP--EASL	Y	SWDPNSTYIHEPPYFKD	MTMSPPG	PH-----	:
OsACO4	:	-----		-----		-----	:
GmACO1	: VLPDMFRSTYEAITKGN	PMWNQLQVP--ADTL	Y	SWDPSTYIHEPPYFKS	MTMDPPG	PH-----	:
GmACO2	: VLPDMFRSTYEAITKGN	TMWNQLQVP--AETL	Y	SWDPKSTYIHEPPYFKG	MTMDPPG	AH-----	:
GmACO3	:	-----		-----		-----	:
GmACO4	:	-----		-----		-----	:
GmACO5	: SLTTQHRVLVMDVRIR	DRAKRRSPMVAPRIKW	HLKGEKQGIF	QQKIWEGWCGQS	QS	SANDLWNKMSQEI	:
GmACO6	:	-----		-----		-----	:
GmACO7	:	-----		-----		-----	:
GmACO8	:	-----		-----		-----	:
TaACO1	:	-----		-----		-----	:
TaACO2	: VLPKMEVDTYDSITEGN	DAWNKL VVP--KETL	Y	PWDPKSTYIHKPAYLEN	ITMTPPG	PP-----	:
TaACO3	: VLPKMEVDTYGSITEGN	DAWNKL VVP--KETL	Y	PWDPKSTYIHKPAYLEN	ITMTPPG	PP-----	:
TaACO4	: VLPKMEVDTYGSITEGN	DAWNKL VVP--KETL	Y	PWDPKSTYIHKPAYLEN	ITMTPPG	PP-----	:
TaACO5	: VLPKMEVDTYGSITEGN	DAWNKL VVP--KETL	Y	PWDPKSTYIHKPAYLEN	ITMTPPG	PP-----	:
TaACO6	: VLPDMFKGTYEAITKGN	PMWNELFVS--ASTL	Y	PWDPKSTYIHEPPYFKD	MTMTPPG	AR-----	:
TaACO7	: VLPDMFKGTYEAITKGN	PMWNELFVS--ASTL	Y	PWDPKSTYIHEPPYFKD	MTMTPPG	AR-----	:
TaACO8	:	-----		-----		-----	:
TaACO9	: VLPDMFKSTYEAITKGN	PMWNQLFVP--EASL	Y	SWDSNSTYIHEPPYFKD	MTMSPPG	PH-----	:
TaACO10	:	-----		-----		-----	:
TaACO11	: VLPDMFKSTYEAITKGN	PMWNELFVP--EASL	Y	SWDSNSTYIHEPPYFKD	MTMSPPG	PH-----	:
TaACO12	:	-----		-----		-----	:
TaACO13	: VLPDMFKSTYEAITKGN	PMWNELFVP--EASL	Y	SWDSNSTYIHEPPYFKD	MTMSPPG	PH-----	:
TaACO14	: VLVDMFKSTYEVITKGN	PMWNQL VVP--TTDV	Y	SWDPNSTYIREPPFFKG	MSMDLPG	PH-----	:
TaACO15	: VLVDMFKSTYEAITKGN	PMWNQL VVP--TADV	Y	SWDPNSTYIREPPFFKG	MSMDLPG	PH-----	:
PpACO1	: VLPDMFTSTYQAITKGN	QTWNSLPAP--SGSQ	Y	AWDSKSTYVHEPPFFQN	MPKAPP	GK-----	:
PpACO2	: VLPDMFQETYTITQGN	TMWNL DVP--AGAQ	Y	AWDPNSTYVHEPPFFKT	MSKDPPG	GM-----	:
PpACO3	: VLPDMFQETYTITQGN	TMWNL DVP--AGAQ	Y	AWDPNSTYVHEPPFFKT	MSKDPPG	GM-----	:
PpACO4	:	-----		-----		-----	:
PpACO5	: VLPDMFRSTYKAITEGN	TMWNKLEAP--AGSQ	Y	AWDPKSTYVHDPFFFKT	MTKDPPG	GR-----	:
SdACO1	: VVPDMFRSTYKTITKEN	KMWNNLSAP--SGAL	Y	AWDPSTYVHDPFFFKS	MTEPPG	VH-----	:
SdACO2	: VVPDMFRSTYKTITKEN	KMWNNLSAP--SGAL	Y	AWDPSTYVHDPFFFKS	MTEPPG	VH-----	:
SdACO3	:	-----		-----		-----	:
SdACO4	:	-----		-----		-----	:
SdACO5	:	-----		-----		-----	:
SdACO6	: VLPDMFKSTYESITKGN	TMWNL DLPAP--TGD	Y	SWDPKSTYIHEPPFFKT	MTRDPPG	VH-----	:
SdACO7	: VLPDMFKSTYESITKGN	TMWNL DLPAP--TGD	Y	SWDPKSTYIHEPPFFKT	MTRDPPG	VH-----	:

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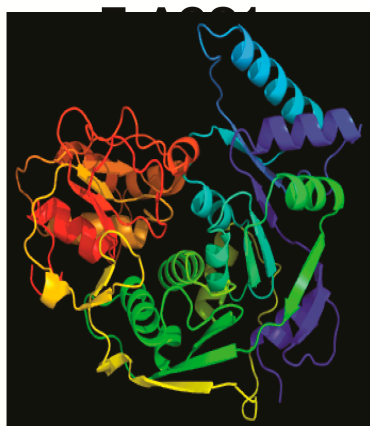
          *      1000      *      1020      *      1040      *
AtACO1 : -----G V K D A Y C L I N F G D S I T T D H I S P A G S I H K D S P A A K Y L M E R G V D R - R D E N S Y G S R R G N D E I M A R :
AtACO2 : -----E V K D A Y C L I N F G D S V T T D H I S P A G N I Q K T S P A A K F L M D R G V I S - E D E N S Y G S R R G N D E V M A R :
AtACO3 : -----N V K D A Y C L I N F G D S I T T D H I S P A G N I Q K D S P A A K F L M E R G V D R - K D E N S Y G S R R G N D E I M A R :
AtACO4 : -----
OsACO1 : -----P V K D A Y C L I N F G D S I T T D H I S P A G S I H P D S P A A R Y L K E R G V E R - K D E N S Y G S R R G N D E I M A R :
OsACO2 : -----S V R D A Y C L I N L G D S V T T D H I S Y S G S I T P G S A A A E Y L R A A G V A D R E R L G S Y G G R R G N D E V V V R :
OsACO3 : -----G V K N A Y C L I N F G D S I T T D H I S P A G S I H K D S P A A K Y L L E R G V D R - K D E N S Y G S R R G N D E V M A R :
OsACO4 : -----
GmACO1 : -----G V K D A Y C L I N F G D S I T T D H I S P A G S I H K D S P A A K Y L V E H G V E R - K D E N S Y G S R R G N D E V M A R :
GmACO2 : -----G V K D A Y C L I N F G D S I T T D H I S P A G N I N K D S P A A K Y L L D R G V E Q - K D E N S Y G S R R G N D E V M A R :
GmACO3 : -----
GmACO4 : -----
GmACO5 : I K V A K E T L G E S R G F G P R G K E S W W W N E S V Q S K V R V K K E C F K E W S R C R N S E T W D K Y K I A R N E T K K A V S E A R A :
GmACO6 : -----
GmACO7 : -----
GmACO8 : -----
TaACO1 : -----
TaACO2 : -----S V K D A Y C L I S L G D S I T T D H I S P S G V I K P G T P A A K Y L L E R G V K P - E N F T T Y G S R R A N D E I V V R :
TaACO3 : -----S V K D A Y C L I S L G D N I T T D H I S P S G V I K P G T P A A K Y L L E R G V K P - E N F T T Y G S R R A N D E I V V R :
TaACO4 : -----S V K D A Y C L I S L G D S I T T D H I S P S G V I K P G T P A A K Y L L E R G V K P - E N F T T Y G S R R A N D E I V V R :
TaACO5 : -----S V K D A Y C L I S L G D S I T T D H I S P S G V I K P G T P A A K Y L L E R G V K P - E N F T T Y G S R R A N D E I V V R :
TaACO6 : -----P V K D A Y C L I N F G D S I T T D H I S P A G S I H P D S P A A K Y L K E R N V E R - K D E N S Y G S R R G N D E I M A R :
TaACO7 : -----P V K D A Y C L I N F G D S I T T D H I S P A G S I H P D S P A A K Y L K E R N V E R - K D E N S Y G S R R G N D E I M A R :
TaACO8 : -----
TaACO9 : -----A V K N A Y C L I N F G D S I T T D H I S P A G S I H R D S P A A K Y L L E R G V D R - K D E N S Y G S R R G N D E V M A R :
TaACO10 : -----
TaACO11 : -----A V K N A Y C L I N F G D S I T T D H I S P A G S I H R D S P A A K Y L L E R G V D R - K D E N S Y G S R R G N D E V M A R :
TaACO12 : -----
TaACO13 : -----A V K N A Y C L I N F G D S I T T D H I S P A G S I H R D S P A A K Y L L E R G V D R - K D E N S Y G S R R G N D E V M A R :
TaACO14 : -----S I K D A Y C L I S F G D C V T A D H I S P A G S I H K D S P A A K Y L V G H S V K H - R D E N S Y G S R R G N Y E V M M R :
TaACO15 : -----S I K D A Y C L I C F G D C V T T D H I S P A G S I H K D S P A A K Y L V D H S V K P - G D E N S Y G S R R G N Y E V M M R :
PpACO1 : -----P V K A A Y C L I N F G D S I T T D H I S P A G N I N K D S P A A K F L M D R G V Q K - K D E N S Y G S R R G N D E I M A R :
PpACO2 : -----S V K D A F C L I N F G D S I T T D H I S P A G N I N K D S P A A K Y L M D R G V E R - K D E N S Y G S R R G N D E I M V R :
PpACO3 : -----S V K D A F C L I N F G D S I T T D H I S P A G N I N K D S P A A K Y L M D R G V E R - K D E N S Y G S R R G N D E I M V R :
PpACO4 : -----
PpACO5 : -----S V K D A Y C L I N F G D S I T T D H I S P A G N I N K D S P A A R Y L M E R G V D R - R D E N S Y G S R R G N D E I M G R :
SdACO1 : -----G V K D A Y C I I N F G D S I T T D H I S P A G N I N K D S P A A R Y L M E R G V E K - K D E N S Y G S R R G N D E I M A R :
SdACO2 : -----G V K D A Y C I I N F G D S I T T D H I S P A G N I N K D S P A A R Y L M E R G V E K - K D E N S Y G S R R G N D E I M A R :
SdACO3 : -----
SdACO4 : -----
SdACO5 : -----
SdACO6 : -----G V H D A V L L I N L G D S I T T D H I S P A G S I H K D S P A A R Y L T E R G V E R - K D E N S Y G S R R G N D E V M V R :
SdACO7 : -----G V H D A V L L I N L G D S I T T D H I S P A G S I H K D S P A A R Y L M E R G V E R - K D E N S Y G S R R G N D E V M V R :

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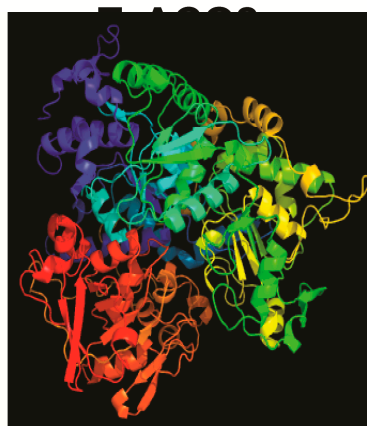
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AtACO2	: GTFANIRIVNKLKGEVGP	NT	VIHIPTGEKLSV	FDAA	SKYKTAEQDTII	-----	LA	:
AtACO3	: GTFANIRIVNKLINNGEVGP	KT	VIHIPS	GEKLSV	FDAA	MRYKSSGEDTII	-----	LA
AtACO4	:							:
OsACO1	: GTFANIRIVNKLFLKGEVGP	KT	IIHIPS	GEKLSV	FDAA	TKYKNEGHD	II	:
OsACO2	: GAFANIRIVNKLINNGKVGP	KT	VIHVPTGEELCV	FDAA	IKYKSEGHNM	VI		:
OsACO3	: GTFANIRIVNKLFLNGEVGP	KT	VIHVPTGEKLYV	FDAA	ALKYKSEGHDT	IV		:
OsACO4	:							:
GmACO1	: GTFANIRIVNKLINNGEVGP	KT	IIHIPTGEKLYV	FDAA	TRFRE	-----		:
GmACO2	: GTFANIRIVNKLINNGEVGP	KT	VIHIPTGEKLYV	FDAA	QRYKAEGQDT	IV		:
GmACO3	:							:
GmACO4	:							:
GmACO5	: QAFDGLYQALGTRD	GER	SIYRLAKGRERKTRD	LD	QVKCVKDEEGKVLV	HEKDIKERWKAYFHNLFNDGYG		:
GmACO6	:							:
GmACO7	:							:
GmACO8	:							:
TaACO1	:							:
TaACO2	: GAFANIRIVNKLLEGEVGP	KT	VIHVPTGEKHYV	FDAA	MKYKSEGHDM	VI		:
TaACO3	: GAFANIRIVNKLLEGEVGP	KT	VIHVPTGEKHYV	FDAA	MKYKSEGHDM	VI		:
TaACO4	: GAFANIRIVNKLLEGEVGP	KT	VIHVPTGEKHYV	FDAA	MKYKSEGHDM	VI		:
TaACO5	: GAFANIRIVNKLLEGEVGP	KT	VIHVPTGEKHYV	FDAA	MKYKSEGHDM	VI		:
TaACO6	: GTFANIRIVNKLFLKGEVGP	KT	VIHVPSGEKLA	V	FDAA	MKYKNEGHD	II	:
TaACO7	: GTFANIRIVNKLFLKGEVGP	QT	IIHVPSGEKLA	V	FDAA	MKYKNEGHD	II	:
TaACO8	:							:
TaACO9	: GTFANIRIVNKLFLGGEVGP	KT	IIHVPTGEKLSV	FDAA	TKYKSEGHDT	II		:
TaACO10	:							:
TaACO11	: GTFANIRIVNKLFLGGEVGP	KT	IIHVPTGEKLSV	FDAA	TKYKSEGHDT	II		:
TaACO12	:							:
TaACO13	: GTFANIRIVNKLFLGGEVGP	KT	IIHVPTGEKLSV	FDAA	TKYKSEGHDT	II		:
TaACO14	: GTFGNIRIVNKLLDGEPGP	KT	IIHIPTREKLYV	YDA	AMRYKNDGQDT	IV		:
TaACO15	: GTFGNIRIVNKLLDGEPGP	KT	IIHVPTREKLYV	YDA	AMRYKNDGQDT	IV		:
PpACO1	: GTFANIRIVNKLFLGGEVGP	KT	IIHVPSKERLF	I	YDA	AKKYKDEGHDT	II	:
PpACO2	: GTFANIRIVNKLFLKGEVGP	KT	VIHVPTQEKMF	I	YDA	AMKYKEEGHDT	II	:
PpACO3	: GTFANIRIVNKLFLKGEVGP	KT	VIHVPTQEKMF	I	YDA	AMKYKEEGHDT	II	:
PpACO4	:							:
PpACO5	: GTFANIRIVNKLFLKGEVGP	KT	IIHVPTQEKMF	I	YDA	QKYKAEGHDT	II	:
SdACO1	: GTFANIRIVNKLFLKGEVGP	KT	IIHIPS	GEKLSV	FDAA	KKYQDEGHDT	II	:
SdACO2	: GTFANIRIVNKLFLKGEVGP	KT	IIHIPS	GEKLSV	FDAA	KKYQDEGHDT	II	:
SdACO3	:							:
SdACO4	:							:
SdACO5	:							:
SdACO6	: GTFANIRIVNKLFLKGEVGP	KT	VIHLPSGECHW	V	YDA	QKYKDEGKEM	VV	:
SdACO7	: GTFANIRIVNKLFLKGEVGP	KT	VIHLPSGECHW	V	YDA	QKYKDEGKEM	VV	:

		*	1140	*	1160	*	1180	*																																																																
AtACO1	:	GA	EY	GS	SS	RD	WA	AK	GP	ML	LG	VK	AV	I	SK	SF	ER	I	HR	SN	LV	GM	GI	IP	LC	FK	AG	ED	AE	T	LG	-----	:																																							
AtACO2	:	GA	EY	GS	SS	RD	WA	AK	GP	LL	LG	VK	AV	I	AK	SF	ER	I	HR	SN	LV	GM	GI	IP	LC	FK	AG	ED	AE	T	LG	-----	:																																							
AtACO3	:	GA	EY	GS	SS	RD	WA	AK	GP	ML	QG	VK	AV	I	AK	SF	ER	I	HR	SN	LV	GM	GI	IP	LC	FK	SG	ED	AD	T	LG	-----	:																																							
AtACO4	:	-----																												:																																										
OsACO1	:	GA	EY	GS	SS	RD	WA	AK	GP	ML	QG	VK	AV	I	AK	SF	ER	I	HR	SN	LV	GM	GI	IP	LC	FK	SG	ED	AD	T	LG	-----	:																																							
OsACO2	:	GA	EY	GS	SS	RD	SA	AK	GP	ML	LI	MI	-----																		:																																									
OsACO3	:	GA	EY	GS	SS	RD	WA	AK	GP	ML	LG	VK	AV	I	AK	SF	ER	I	HR	SN	LV	GM	GI	IP	LC	FK	AG	ED	AD	SL	LG	-----	:																																							
OsACO4	:	-----																												:																																										
GmACO1	:	-	CL	Y	DK	I	SS	K	C	Y	I	C	N	-	-	I	S	V	F	P	L	C	I	N	Y	R	V	L	F	V	Q	I	D	N	T	K	G	M	-----	:																																
GmACO2	:	GA	EY	GS	SS	RD	WA	AK	GP	ML	LG	VK	AV	I	AK	SF	ER	I	HR	SN	LV	GM	GI	V	P	L	C	FK	SG	ED	AD	T	LG	-----	:																																					
GmACO3	:	-----																												:																																										
GmACO4	:	-----																												:																																										
GmACO5	:	Y	D	S	S	S	L	D	T	R	E	E	D	R	N	Y	K	Y	R	R	I	Q	K	Q	E	V	K	E	A	L	K	R	M	S	N	G	K	A	V	G	P	D	N	I	P	I	E	V	W	K	T	L	G	D	R	G	L	E	W	L	T	K	L	F	N	E	I	M	R	S		:
GmACO6	:	-----																												:																																										
GmACO7	:	-----																												:																																										
GmACO8	:	-----																												:																																										
TaACO1	:	-----																												:																																										
TaACO2	:	G	D	E	Y	G	A	G	S	S	R	D	S	A	A	K	G	P	L	L	G	V	K	A	V	I	A	K	G	F	E	R	I	H	R	S	N	L	V	GM	GI	I	P	L	R	F	K	A	G	E	D	A	D	S	I	N	-----	:														
TaACO3	:	D	D	E	Y	G	A	G	S	S	R	D	S	A	A	K	G	P	L	L	G	V	K	A	V	I	A	K	G	F	E	R	I	H	R	S	N	L	V	GM	GI	I	P	L	R	F	K	V	G	E	D	A	D	S	I	N	-----	:														
TaACO4	:	G	D	E	Y	G	A	G	S	S	R	D	S	A	A	K	G	P	L	L	G	V	K	A	V	I	A	K	G	F	E	R	I	H	R	S	N	L	V	GM	GI	I	P	L	R	F	K	V	G	E	D	A	D	S	I	N	-----	:														
TaACO5	:	G	D	E	Y	G	A	G	S	S	R	D	S	A	A	K	G	P	L	L	G	V	K	A	V	I	A	K	G	F	E	R	I	H	R	S	N	L	V	GM	GI	I	P	L	R	F	K	A	G	E	D	A	D	S	I	N	-----	:														
TaACO6	:	GA	EY	GS	SS	RD	WA	AK	GP	ML	QG	VK	AV	I	AK	SF	ER	I	HR	SN	LV	GM	GI	V	P	L	C	FK	AG	ED	AD	SL	LG	-----	:																																					
TaACO7	:	GA	EY	GS	SS	RD	WA	AK	GP	ML	QG	VK	AV	I	AK	SF	ER	I	HR	SN	LV	GM	GI	V	P	L	C	FK	AG	ED	AD	T	LG	-----	:																																					
TaACO8	:	-----																												:																																										
TaACO9	:	GA	EY	GS	SS	RD	WA	AK	GP	ML	LG	VK	AV	I	SK	SF	ER	I	HR	SN	LV	GM	GI	I	P	L	C	FK	AG	ED	AD	SL	LG	-----	:																																					
TaACO10	:	-----																												:																																										
TaACO11	:	GA	EY	GS	SS	RD	WA	AK	GP	ML	LG	VK	AV	I	AK	SF	ER	I	HR	SN	LV	GM	GI	I	P	M	C	F	K	AG	ED	AD	SL	LG	-----	:																																				
TaACO12	:	-----																												:																																										
TaACO13	:	GA	EY	GS	SS	RD	WA	AK	GP	ML	LG	VK	AV	I	SK	SF	ER	I	HR	SN	LV	GM	GI	I	P	L	C	FK	AG	ED	AD	SL	LG	-----	:																																					
TaACO14	:	G	S	K	Y	G	T	G	S	S	R	D	W	A	K	G	T	M	L	L	G	V	K	A	V	I	A	K	S	F	E	R	I	H	R	S	N	L	V	GM	G	V	I	P	L	C	FK	SG	ED	M	D	S	I	G	-----	:																
TaACO15	:	G	S	E	Y	G	T	G	S	S	R	D	W	A	K	R	T	M	L	L	G	V	K	A	V	I	A	K	S	S	E	R	I	H	-----												:																									
PpACO1	:	GA	EY	GS	SS	RD	WA	AK	GP	YL	QG	VK	AV	I	SK	SF	ER	I	HR	SN	LV	GM	G	L	I	P	L	C	FK	Q	G	Q	D	A	D	S	I	G	-----	:																																
PpACO2	:	GA	EY	GS	SS	RD	WA	AK	GP	YL	QG	VK	AV	I	AK	SF	ER	I	HR	SN	LV	GM	G	L	I	P	L	C	F	K	E	G	E	D	A	E	T	L	G	-----	:																															
PpACO3	:	GA	EY	GS	SS	RD	WA	AK	GP	YM	QG	VK	AV	I	AK	SF	ER	I	HR	SN	LV	GM	G	L	I	P	L	C	F	K	E	G	E	D	A	E	T	L	G	-----	:																															
PpACO4	:	-----																												:																																										
PpACO5	:	GA	EY	GS	SS	RD	WA	AK	GP	YL	QG	VK	AV	I	AK	SF	ER	I	HR	SN	LV	GM	G	L	I	P	L	C	F	R	N	G	E	D	A	D	S	I	G	-----	:																															
SdACO1	:	GA	EY	GS	SS	RD	WA	AK	GP	YL	QG	VK	AV	I	AK	SF	ER	I	HR	SN	LV	GM	GI	I	P	L	C	FK	SG	ED	A	E	S	L	G	-----	:																																			
SdACO2	:	GA	EY	GS	SS	RD	WA	AK	GP	YL	QG	VK	AV	I	AK	SF	ER	I	HR	SN	LV	GM	GI	I	P	L	C	FK	SG	ED	A	E	S	L	G	-----	:																																			
SdACO3	:	-----																												:																																										
SdACO4	:	-----																												:																																										
SdACO5	:	-----																												:																																										
SdACO6	:	GA	EY	GS	SS	RD	WA	AK	GP	FL	QG	VK	AV	I	SK	SF	ER	I	HR	SN	LV	GM	S	I	I	P	L	C	Y	K	N	G	E	D	A	E	S	L	G	-----	:																															
SdACO7	:	GA	EY	GS	SS	RD	WA	AK	GP	FL	QG	VK	AV	I	SK	SF	ER	I	HR	SN	LV	GM	S	I	I	P	L	C	Y	K	N	G	E	D	A	E	S	L	G	-----	:																															

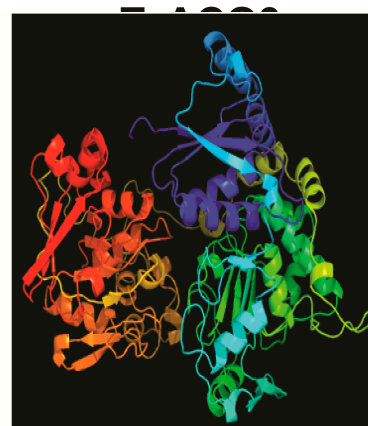
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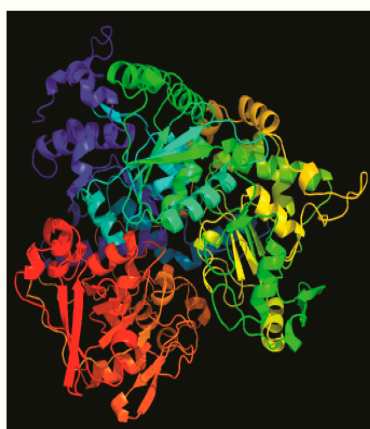
TaACO4



TaACO5



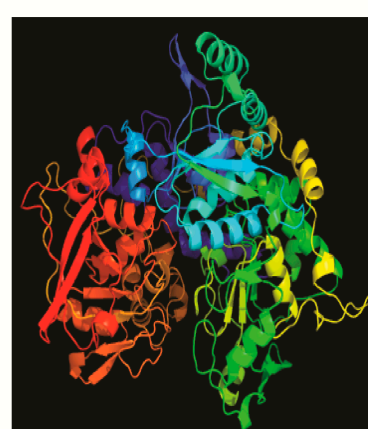
TaACO6



TaACO7



TaACO8



TaACO9

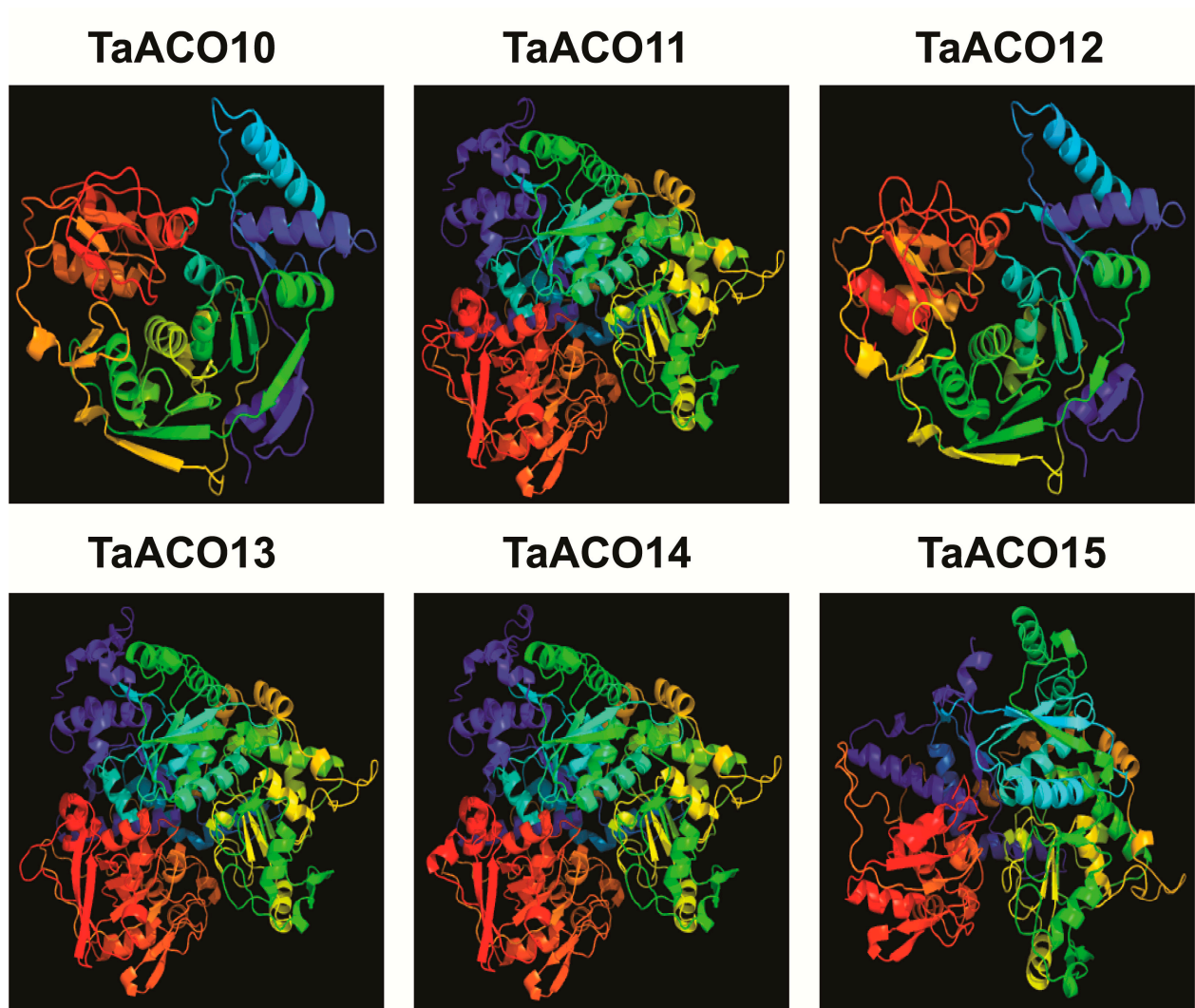
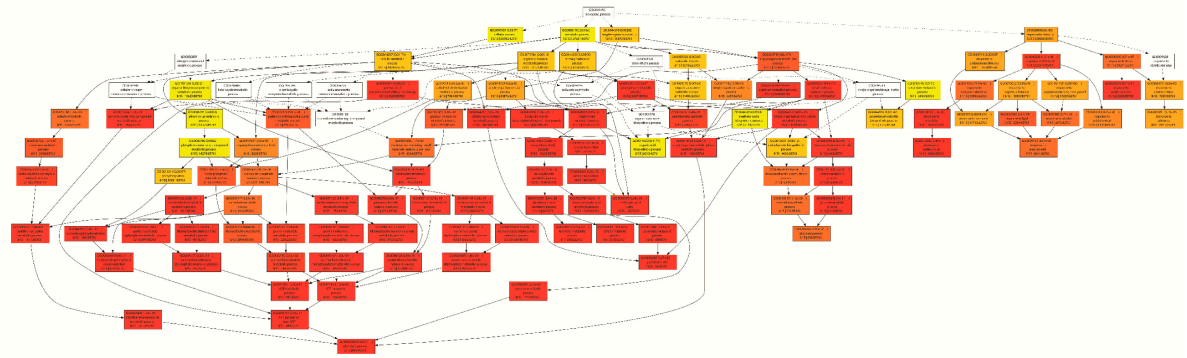
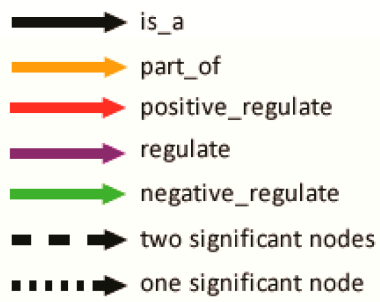


Figure S8. Alignment and 3-dimensional structure of the TaACO protein sequences. **A.** The aconitase domain is underlined with red color. Colored and shaded amino acids are chemically similar residues. Dashes indicate gaps introduced to maximize the alignment of the homologous region. **B.** Predicted 3D structures TaACO proteins.

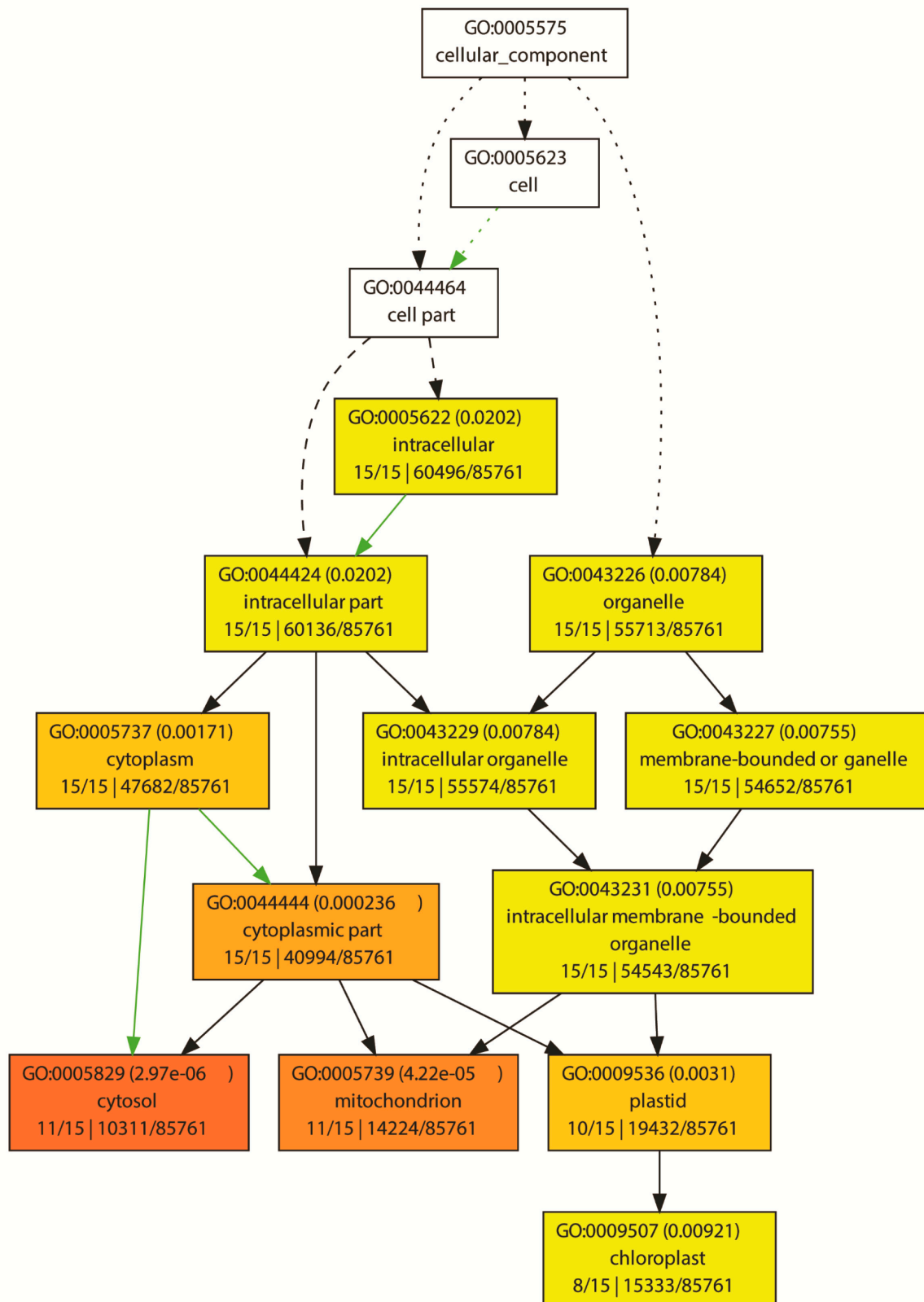
A



Level9
Level8
Level7
Level6
Level5
Level4
Level3
Level2
Level1



B



C

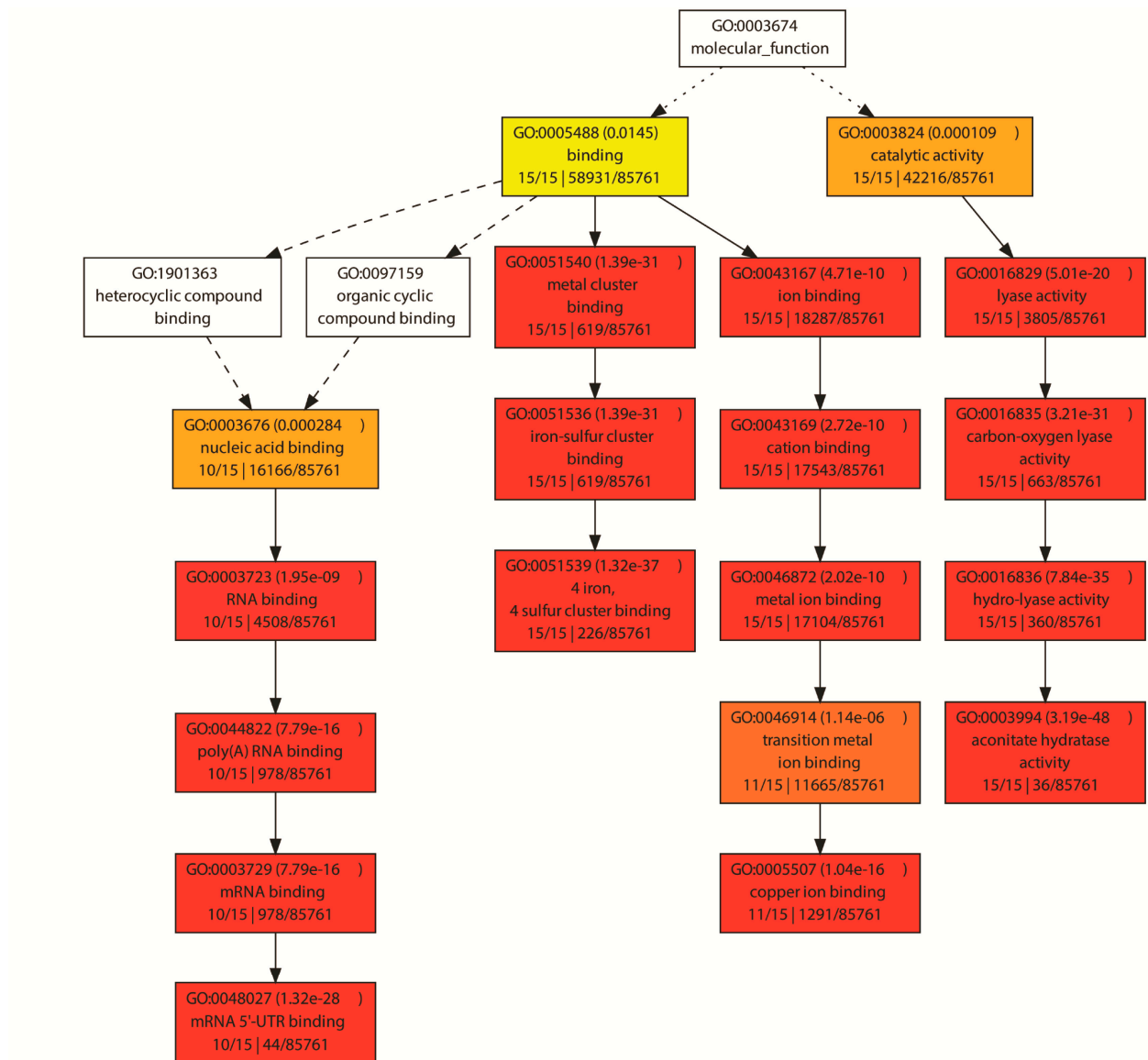


Figure S9. The predicted GO term of TaACO gene family using AgriGO **A.** Biological Process. **B.** Cellular component. **C.** Molecular function.

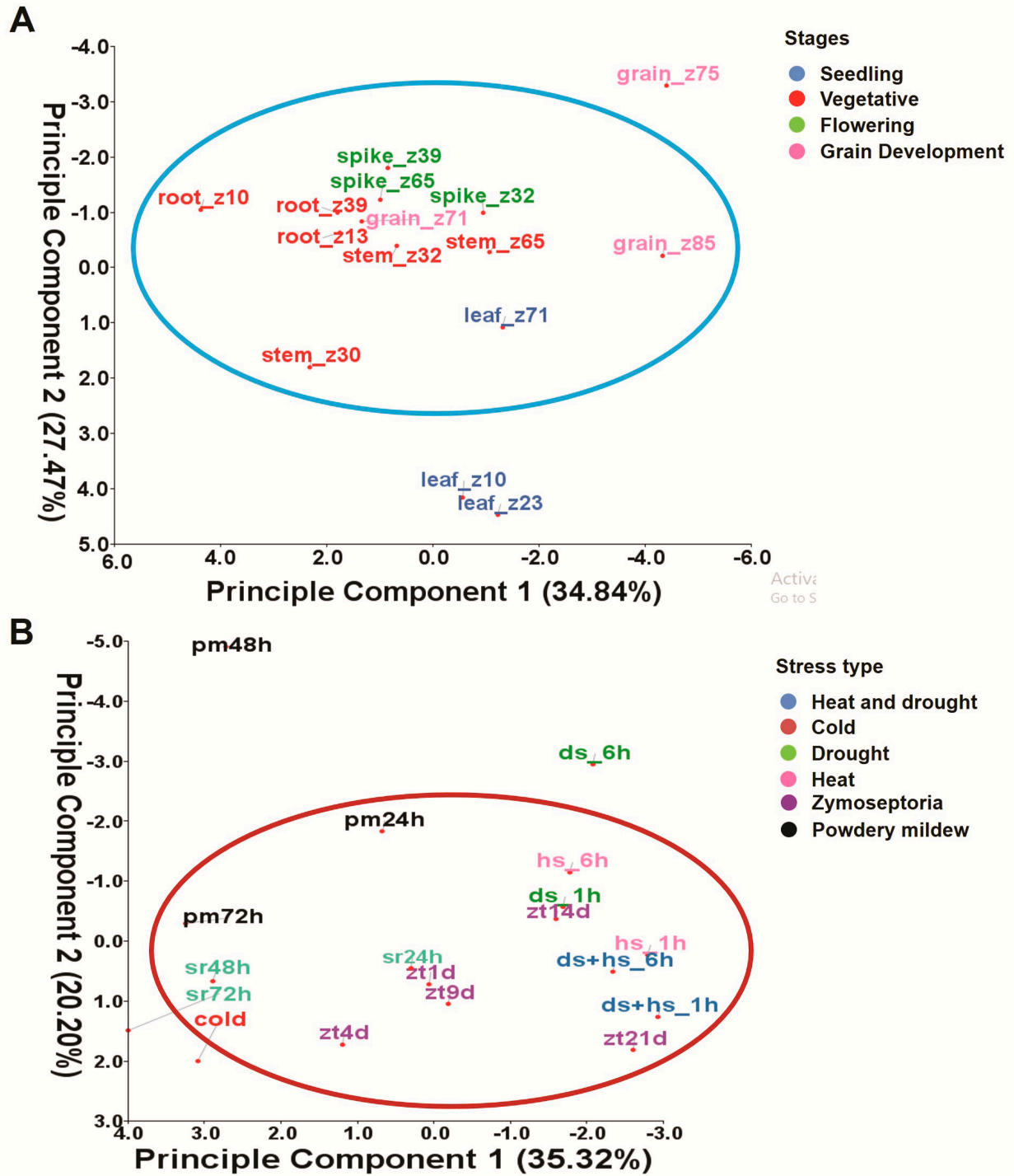


Figure S10. PCA plots displaying grouping of different (A) Different tissues and developmental stages (B) Diverse stress conditions based on the TaACO expression profiles. HS: Heat stress, DS: Drought stress, DS+HS: Combined drought and heat stress; PM: Powdery mildew; SR: Stripe rust, Zt: *Zymoseptoria tritici*, d: days and h: hour.

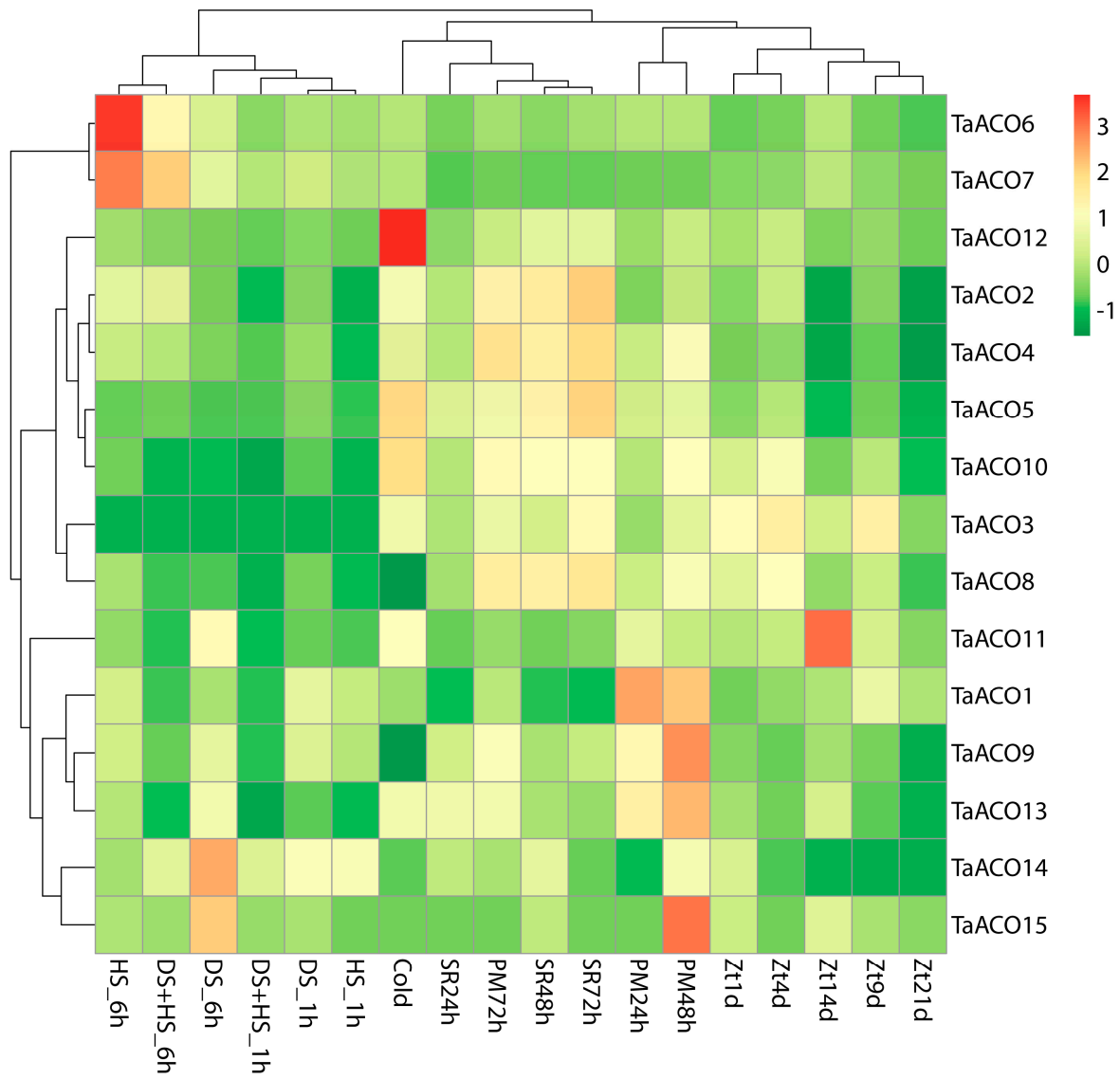


Figure S11. Heatmaps signifying the expression profile of *TaACO* genes in biotic and abiotic stress conditions. TPM values were directly used to produce the heatmaps. HS: Heat stress, DS: Drought stress, DS+HS: Combined drought and heat stress; PM: Powdery mildew; SR: Stripe rust, Zt: *Zymoseptoria tritici*, d: days and h: hour.