

[illegible]

RpCht1	713	LMLSVSISGYSEITDASDYDLPAISKAVDEMTFMSYDYHGAWEGV	TGHVSPLRGKSSDKFALYTTSAAETYLISKADKKKIILGIPFYQGTFTLTKSPKEN	812
MaCht1	879	LVLAASISGYKEVIDVAIDLTLTGQTLDFTSMVTYDYHGAWEHQ	TGHVSPLYQRPSDKYPQYNSTMEYLVSARGAPREKLLMGVPFYQSFTLTKTDTNY	978
TcCht6	795	LILAAAISGYKEVIDVAIDLPALGTVLDFMSVMTYDYHGAWERQ	TGHVSPLFHPRPGDKYPQYNTNFTMEYLVSARGAPRGLLVGVPFYQSFTLTKGNNH	894
TcCht10	720	LILAAAISGYKEVIDVAIDLPALGTVLDFMSVMTYDYHGAWERQ	TGHN-----FTMEYLVSARGAPRGLLVGVPFYQSFTLTKGNNH	802
TmCht1	825	MILAAASISGYKEVIDVAIDLQLSGALDFMSVMTYDYHGAWERQ	TGHVSPLYHRQGDYPQYNTNYTMEYLVAAGAPREKLLVGIPFYQSFTLSKTNNH	924
MaCht2	879	LVLAASISGYKEVIDVAIDLTLTGQTLDFTSMVTYDYHGAWEHQ	TGHVSPLYQRPSDKYPQYNSTMEYLVSARGAPREKLLMGVPFYQSFTLTKTDTNY	978
Clustal		::*:::***:*::**::**::**::**::**::**::**::**::*	:*****::**::**::**::**::**::**::**::**:::	

RpCht1 910 LLFAINSALGRDVKQIVSG-CNKPPPEVTPPPVITTLAPDSGPTT--TEHEHVHWTEPTTLKTTTRRPTTTT----- 979

MaCht1 10778 LLRSLNRYELGLITDKPTKGDC TKPPAPSTPAPPETTTGVDSGAASSTEHIHGWEWTSSTSCKPPTSAAWWTTKKPTSSKPSTSPWWTNKPSSSSSSSKPST 1177

TcCht6 995 LLRSLNRGLGLIPDNPSREDCTKPPPEVTPAPPQVTGVDTGASS-TEHMHDPWT---TKPST-WWSSTTT----- 1060

TcCht10 903 LLRSLNRGLGLIPDNPSREDCTKPPPEVTPAPPQVTGVDTGASS-TEHMHDPWT---TKPST-WWSSTTT----- 968

TmCht1 1025 LLRSLNRGLGLIPTPSREDCTKPPPEVTPAPPQTITGVDTGASS-TEHMHPEWKPT-TKPTTSSWWSTTT----- 1094

MaCht2 1077 LLRSLNRYELGLITDKPTKGDC TKPPAPSTPAPPETTTGVDSGAASSTEHIHGWEWTSSTSCKPPTSAAWWTTKKPTSSKPSTSPWWTNKPSSSSSSSKPST 1177

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RpCht1	980	-----TTTTRRPT-----TTTTRRPTTRKP-----TTTTEQSNVG-----ETDLPSTCQTGEYRFPVKGNCAAY	1042
MaCht1	1178	TWSPWWSSTSSSKPTTKPSTPVVWVTEKPSTIPTTRPTTTTVAWWATKPSTTAKPTTETTPDGSTIVPPPAVVMPEVDTPSKPCEPGQHLPDATNCNAY	1277
TcCht6	1061	--SPWWTTTTTRRTT-----TTRPTTTS---TTTRP-----TTTNWPTQGTI PPPAVVMPEVDKPSQPCPEPGQYVPDPHNCNAY	1134
TcCht10	969	--SPWWTTTTTRRTT-----TTRPTTTS---TTTRP-----TTTNWPTQGTI PPPAVVMPEVDKPSQPCPEPGQYVPDPHNCNAY	1039
TmCht1	1095	--SPWWTTTTTRRTT-----TTRRTTTTRRTTTRPST---TTTSWPTHATTI PPPAVVMPEVDKPPQPCPEPGQYLPDPQNCNAY	1170
MaCht2	1178	TWSPWWSSTSSSKPTTKPSTPVVWVTEKPSTIPTTRPTTTTVAWWATKPSTTAKPTTETTPDGSTIVPPPAVVMPEVDTPSKPCEPGQHLPDATNCNAY	1277
Clustal		*::: :*	** ***: : ** *::: *::: *

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RpCht1 1043 RCILGEYHKQNCAGGLHWNENKICDWPNEAKCSSEPTTLKTTT--RRPTTTT-----TTTTTTTRPT 1105
MaCht1 1278 RCILGELKKQYCAGGLHWNKRKNICDWPKEAKCREEKPYLATTT---RKPVRK-----PQTTVLWQTRT 1338
TcCht6 1135 RCVLGELRKQYCAGGLHWNKERKICDWPKSAKCEKKPGHKPSTSSWQKPTKPSYRP-----PSTTNHWQTKT 1202
TcCht10 1040 RCVLGELRKQYCAGGLHWNKERKICDWPKSAKCEKKPGHKPSTSSWQKPTKPSYRP-----PSTTNHWQTKT 1107
TmCht1 1171 RCVLGELRKQYCAGGLHWNKERKVC DWPKEAKQEHKPGHKPTTPSWQKPTTTSWQKPTTTSWQRPPTTTSWQKPTTTSWQRPPTTRPPYRPTTTSWQTKT 1270
MaCht2 1278 RCILGELKKQYCAGGLHWNKRKNICDWPKEAKCREEKPYLATTT---RKPVRK-----PQTTVLWQTRT 1331
Clustal **:*** :* *****:..::***:.*. . . :* :*: . ** :
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RpCht1 1106 TTTTTTTTRRPTTTRKPTTTTTGN---CTEGTYYPVPGKCSSFYICANGMLVEQQCAPGLNWNVESGFCDWAFSVKCKSEYNLNLRTETIRQYVG---T 1197
MaCht1 1339 TPAKVTRTTQAPQTTTRPTSPETTTSKKDCVTGTYYPHE-SCSQFYVCVNGHLVEQSCAPGLSWNAQDGMCDWNFKVKCLPGNKIAQKFNLLNNQYIGDRP 1437
TcCht6 1203 TTS--TTTRPTTTVSQ LIDDKCDSE-----GQYYPHE-SCSSFYVCVNGHLVPQNCAPGLHYNPEEHMCDWKYKVKCVGRKQLAQKYQLPKMG----GP 1288
TcCht10 1108 TTS--TTTRPTTTVSQ LIDDKCDSE-----GQYYPHE-SCSSFYVCVNGHLVPQNCAPGLHYNPEEHMCDWKYKVKCVGRKQLAQKYQLPKMG----GP 1193
TmCht1 1271 TSTPRPTTSGTTSQ LVDNKCSP-----GQYYPHE-SCSSFYVCVNGHLVPQNCAPGLHYNTQEHMCDWKYKVKCVGRKELAQMYQLPKMSF--DHP 1360
MaCht2 1332 TPAKVTRTTQAPQTTTRPTSPETTT-----RP 1357
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RpCht1 1198 RTQDSCN-KGAFAAHPNSCSKYLQCLWDKYEVTHTCAPGLHWNQQQKICDWPKSAGCSKGDGETDVTIVP---VDTDVTIG-----TIKPPPTS 1280
MaCht1 1438 QPYSACT-ENTFAPLAGDCTQYLHCLWGKYEVFQCAPGLHWNQKKICDWPRGAHCSQDTDNSIIDLDT---TAKPAVITPSRPSSKKPTTPSQWKPTT 1533
TcCht6 1289 QPYSACS-ENAFAYPGDCTRYLHCLWGKYEVFNCAPGLHWDNNKNICDWPEKATCDGTSNVNVVDIVT---TAKPAQSTTS--VSTT---TSWNP GST 1378
TcCht10 1194 QPYSACS-ENAFAYPGDCTRYLHCLWGKYEVFNCAPGLHWDNNKNICDWPEKATCDGTSNVNVVDIVT---TAKPAQSTTS--VSTT---TSWNP GST 1293
TmCht1 1361 QPYSACGGENAFAYPKDCTRYLHCLWGKYEVFNCAPGLHWSNERQICDWBEKAKCDGTSSISVAEIIATMKPTEAPVHSSTE--SGSTPPSSTS RKPPTS 1458
MaCht2 1258 QPYSACT-ENTFAPLAGDCTQYLHCLWGKYEVFQCAPGLHWNQKKICDWPRGAHCSQDTDNSIIDLDT---TAKPAVITPSRPSSKKPTTPSQWKPTT 1453
Clustal :. :.* :*:.. . :*:***:***:****. *****:..::*****. * * . . : . . : :* ::
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RpCht1 1281 TTQWTWKPEN-----EWSWTSTTTTEEPWPETPYKHPLSGYFKVVCYFTNNAWYRQGGKGYLPEDIDSDLC THIIYGFVLD ESNLIIKAHDSW 1369
MaCht1 1534 TPS-QWKPPSTTTTESSGNEW EWHPPPIPTSEKPPLSEPLK-PFSGYKIVCYFTNNAWYRKSGKGYLPEDIDENLCHTIVYGFVLDYSNHI IKAHDSW 1631
TcCht6 1379 TNYPEWQPT-----EWHPPPIPTSEKPPLPEELK-PQSGYEKIVCYFTNNAWYRKGLGKGYLPEDIDPDLCHTIVYGFVLD EENLIVKAHDSW 1465
TcCht10 1294 TNYPEWQPT-----EWHPPPIPTSEKPPLPEELK-PQSGYEKIVCYFTNNAWYRKGLGKGYLPEDIDPDLCHTIVYGFVLD EENLIVKAHDSW 1380
TmCht1 1459 TSYPEWQPT-----EWHPPPIPTSEKPPLPEELK-PQSGYEKIVCYFTNNAWYRKGI GRYLPEDIDPDLCHTIVYGFVLD FEKLIVKAHDSW 1545
MaCht2 1454 TPS-QWKPPSTTTTESSGNEW EWHPPPIPTSEKPPLSEPLK-PFSGYKIVCYFTNNAWYRKSGKGYLPEDIDENLCHTIVYGFVLD YSNHI IKAHDSW 1551
Clustal * *:* ** . . :*:** * * ***:*.*****:* * :***** :*****:*****:..: * :*****
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RpCht1 1370 ADFDNRYQIRVVKFRRKGVKVLLALGGWNDSAGDKYSRLVNNPSARRKFIEHAVPFLK YKFDGILDWEYPCWQVTNCNQKDSDK EAFGQWVTEIKQ 1469
MaCht1 1632 ADFDNQFYKR-VTAYKEKGKVSIAIGGWNDSLGDKYSRLVNNPAARRRFIEHILKFLEKYNFDGILDWEYPCWQVDCCKGPDSDKEAFAAFVTEIKQ 1730
TcCht6 1466 ADFDNQFYKR-VTGYKAKGKVSIALGGWNDSQGDKYSRLVNNPAARARFIKHVLQFLEKWNFDGILDWEYPCWQVDCCKGPDSDKQAF AAWVTEIKQ 1564
TcCht10 1381 ADFDNQFYKR-VTGYKAKGKVSIALGGWNDSQGDKYSRLVNNPAARARFIKHVLQFLEKWNFDGILDWEYPCWQVDCCKGPDSDKQAF AAWVTEIKQ 1479
TmCht1 1546 ADFDNQFYKR-VTGYKAKGKVSIALGGWNDSQGDKYSRLVNNPAARARFIKHVLEFLEKWNFDGILDWEYPCWQVDCCKGPDSDKQAFADWVTEIKA 1644
MaCht2 1552 ADFDNQFYKR-VTAYKEKGKVSIAIGGWNDSLGDKYSRLVNNPAARRRFIEHILKFLEKYNFDGILDWEYPCWQVDCCKGPDSDKEAFAAFVTEIKQ 1650
Clustal *****:*. * . :*:** :*:***** *****:*****:*** :*: * : * * :*****:*****:..: * :*****
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RpCht1 1470 EFRKHNLLLSAAVTPSKTVIDAGYDIKALT DNLDWISVMTYDYHGQWDKGTGHVAPMFEHPDDDDYYFNMNYSINYWIDGGVPRRKIVLGMPLYGQSFTL 1569
MaCht1 1731 AFKPKGYLLSAAVSPSKTVIDAGYNVPVLAENLDWVAVMTYDFHGQWDKGTGHVAPLFYHP EDEVAFYNSNFSNLNYWIS EGVPRRKIVMGMPLYGQSFTL 1830
TcCht6 1565 AFKPKGYLLSAAVSPSKTVIDAGYDVPVLAQNLDWVAVMTYDFHGQWDKGTGHVAPLYYHPEDEVVFYNAFNSINYWIS EGVPRRKIVMGMPLYGQSFTL 1664
TcCht10 1480 AFKPKGYLLSAAVSPSKTVIDAGYDVPVLAQNLDWVAVMTYDFHGQWDKGTGHVAPLYYHPEDEVVFYNAFNSINYWIS EGVPRRKIVMGMPLYGQSFTL 1579
TmCht1 1645 AFKPKGYLLSAAVSPSKTVIDAGYDVPVLAQNLDWVAVMTYDFHGQWDKGTGHVAPLYYHPEDEVAFYNAFNSINYWIS EGVPRRKIVMGMPLYGQSFTL 1744
MaCht2 1651 AFKPKGYLLSAAVSPSKTVIDAGYNVPVLAENLDWVAVMTYDFHGQWDKGTGHVAPLFYHP EDEVAFYNSNFSNLNYWIS EGVPRRKIVMGMPLYGQSFTL 1750
Clustal *: .: *****:***:*****: .:*****:*****:*****:*****: :*: *: :*: *****. *****:*.***:***. * *
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RpCht1 1570 ADPKNHGLNAPAPRPAQAGEFTRAAGFLAYYEICDKIQNRGWTVVKDEEGRMGPYAYHDDQWVGFDDEETIKRKSQYIRDMDLGGGMIWALDLDDDFRNTC 1669
MaCht1 1831 EKESRHGLNAPAGPGGAGPYTRAAGFLAYYEICDNIQNRGWTVVQDPKRRMGPYAYKGNQWVSFDDREMIKSEYIRKMDIGGGMIWALDLDDDFKNKC 1930
TcCht6 1665 EKPENHGLNAPAGPGGAGPYTRAAGFLAYYEICHNIKTQGWTVVQDPNRRMGPYAYKGDQWVSFDDREMIKSEYIRKMDIGGGMIWALDLDDDFKNRC 1764
TcCht10 1580 EKPENHGLNAPAGPGGAGPYTRAAGFLAYYEICHNIKTQGWTVVQDPNRRMGPYAYKGDQWVSFDDREMIKSEYIRKMDIGGGMIWALDLDDDFKNRC 1679
TmCht1 1745 EKESNHGLNAPAGPGGAGPYTRAAGFLAYYEICHNIKSQGWTVVQDPKRRMGPYAYRGDQWVSFDDREMIKSEYIRKMDIGGGMIWALDLDDDFKNRC 1844
MaCht2 1751 EKESRHGLNAPAGPGGAGPYTRAAGFLAYYEICDNIQNRGWTVVQDPKRRMGPYAYKGNQWVSFDDREMIKSEYIRKMDIGGGMIWALDLDDDFKNKC 1850
Clustal . :.:***** ** .:.* .:*****.:.:.*: : *****.:.:***.***.* : :.:.*.***:***** *****.* *

RpCht1 1670 GQGRHPLLTSTIARTLADPRYGD-DSVTTMKPRPFKPPSTKPTPSRPTKPPSKPETTSQTMAPDKPSTTTESSMKPMGPDGEFKVVCYFTNWAWYRQGT 1768
MaCht1 1931 GQGRHPLLTSTIRNVLADPGNGEQEPIPPPIEEERPAVG--EPEPVETEEELPRLRID-QTAP---PPSQTTTTQALVDVNSEFKVVCYFTNWAWYRQGVG 2024
TcCht6 1765 GQGRHPLLTSTIRNVLADAGTGQQETIPPIDEEPS-----VEAVEEEREEAPPSVHSSSTVVP---PPQH-STTQSLVDPKSEFKVVCYFTNWAWYRQGVG 1855
TcCht10 1680 GQGRHPLLTSTIRNVLADAGTGQQETIPPIDEEPS-----VEAVEEEREEAPPSVHSSSTVVP---PPQH-STTQSLVDPKSEFKVVCYFTNWAWYRQGVG 1770
TmCht1 1845 GQGRHPLLTSTIRNVLADAGTGQQETIPPIDEEPSKPPYKPEPVEAEHTPEPPSVHSSSTLEP---SPTHGTTQALVNPNSEFKVVCYFTNWAWYRQGP 1941
MaCht2 1851 GQGRHPLLTSTIRNVLADPGNGEQEPIPPPIEEERPAVG--EPEPVETEEELPRLRID-QTAP---PPSQTTTTQALVDVNSEFKVVCYFTNWAWYRQGVG 1944
Clustal *:.:*****.* ..***. *: :.:..:..* . . . * .*:.* .. :.: :.: . .:*****.*****

RpCht1 1769 KYLPSDIDPDLCTHIVYGFAVLNGDQLIKPHDTSWADFNKFYEKVTSEKKEGKVVTVAIGGWNSAGDKYSRLVNDPGARARFTTHVVEFILKYNFDGL 1868
MaCht1 2025 KYLPSDIDPDLCTHIVYGFAVLNGDQLIKPHDTSWADFNKFYEKVTSLKAKGIKVLTAIGGWNSAGDKYSKLNNPSARRRFVSHVVDFFIENNFDGL 2124
TcCht6 1856 KYLPSDIDPDLCTHIVYGFAVLNGDQLIKPHDTSWADFNKFYEKVTAYKSKGIKVLTAIGGWNSAGDKYSRLVNNPSARRRFIAHVVDFFIETNNFDGL 1955
TcCht10 1771 KYLPSDIDPDLCTHIVYGFAVLNGDQLIKPHDTSWADFNKFYEKVTAYKSKGIKVLTAIGGWNSAGDKYSRLVNNPSARRRFIAHVVDFFIETNNFDGL 1870
TmCht1 1942 KYLPSDIDPDLCTHIVYGFAVLNGDQLIKPHDTSWADFNKFYEKVTAFKAKGIKVLTAIGGWNSAGDKYSRLVNNPSARRRFIAHVVDFFIENNFDGL 2041
MaCht2 1945 KYLPSDIDPDLCTHIVYGFAVLNGDQLIKPHDTSWADFNKFYEKVTSLKAKGIKVLTAIGGWNSAGDKYSKLNNPSARRRFVSHVVDFFIENNFDGL 2044
Clustal *****.:*****.***:.*:*****.***:*****.* **:*.* :*****.***:***.*:* ** :***:** *****

RpCht1 1869 DLDWEYPCWQVDCNKGPSDKRAFAFWSELKEAFTPHGLLSAAVSPSKTVIDHGYDVKVLSEKLDWIAVMTYDYGQWDKRTGHVAPMYEHEEDLDA 1968
MaCht1 2125 DLDWEYPCWQVDCNKGPSDKPAFAELVKELHDAFQPKGWLLSSAVSPSKRVIDAGYDVPALSKYLDWIAVMCYDYGQWDKVTGHVAPMYAHPEDIDD 2224
TcCht6 1956 DLDWEYPCWQVDCNKGPSDKSAFADFVKELHEAFKPKGWLLSSAAVSPSRVVDAAGYDVPTLSKYLDWIAVMCYDYGQWDKITGHVAPMYAHPEDADA 2055
TcCht10 1871 DLDWEYPCWQVDCNKGPSDKSAFADFVKELHEAFKPKGWLLSSAAVSPSRVVDAAGYDVPTLSKYLDWIAVMCYDYGQWDKITGHVAPMYAHPEDADA 1970
TmCht1 2042 DLDWEYPCWQVDCNKGPSDKSSFAEFVKELHEAFTPKGWLLSSAVSPSRVVDAAGYDVPTLSRYLDWIAVMCYDYGQWDKITGHVAPMYAHPDDVDA 2141
MaCht2 2045 DLDWEYPCWQVDCNKGPSDKPAFAELVKELHDAFQPKGWLLSSAVSPSKRVIDAGYDVPALSKYLDWIAVMCYDYGQWDKVTGHVAPMYAHPEDIDD 2144
Clustal *****.***** ** :.*:.*.***:***.* **:*:*****.*:* *****.***.***** ***** * :.* *

RpCht1 1969 TFNANFSLFYWQNGADPKKIVMGMPMYGQSFSLADNSNDGLNAPTYGGGEAGEETRARGFLAYHEICDRVLKKGWTLVTDSESGAMGPHAINKDQWVGFD 2068
MaCht1 2225 TFNTNFTIHYWIEKGADRRLVMGMPMYGQSFSLADNSNGLNVATYGGGEAGEETRARGFLAYYEICTNIMKKGWQVIRDRKGRIGPMAYLRDQWVSFD 2324
TcCht6 2056 TFNTNFTIHYWIEKGADRRLVMGMPMYGQSFSLADNNQGLNAAATYGGGEAGEETRARGFLAYYEICTNVIKKGWQVIRDRGRIGPMAYLRDQWVSFD 2155
TcCht10 1971 TFNTNFTIHYWIEKGADRRLVMGMPMYGQSFSLADNNQGLNAAATYGGGEAGEETRARGFLAYYEICTNVIKKGWQVIRDRGRIGPMAYLRDQWVSFD 2070
TmCht1 2142 TFNTNFTIHYWIEKGADRRLVMGMPMYGQSFSLADNNQGVNAPTYGGGEAGEETRARGFLSYYEICTNVINKGWTVVRDRGRIGPMAYLRDQWVSFD 2241
MaCht2 2145 TFNTNFTIHYWIEKGADRRLVMGMPMYGQSFSLADNSNGLNVATYGGGEAGEETRARGFLAYYEICTNIMKKGWQVIRDRKGRIGPMAYLRDQWVSFD 2244
Clustal ***:***:.* :.:*** :*:*****.:.:.*.***** *****:***:***. :.:*** :.: * :.*:* :****.*

RpCht1 2069 DAAMIKHKSEFVKKHGFGGAMIWALDLDDFRNVCGCEEYPLLRTINRVLRSYP-SGPTLCSLSKELKHAITTES-----SESDLRSE 2148
MaCht1 2325 DIGMIRHKSEYIKAMGLGGGMIWALDLDDFKNICDCEEYPLLRTINRVLRLNYAKPAPKCIILGKPQ-KPTLKPT-----TKKPTTPSTIQTQKPS 2412
TcCht6 2156 DIGMIRHKSEFIKAMGLGGGMIWALDLDDFKNLGCEEYPLLRTINRVLRLGYAKPDPKCIILGRDNDKTKPKPT-----TMKPT---TTIGYEPQ 2241
TcCht10 2071 DIGMIRHKSEFIKAMGLGGGMIWALDLDDFKNLGCEEYPLLRTINRVLRLGYAKPDPKCIILGRDNDKTKPKPT-----TMKPT---TTIGYEPQ 2156
TmCht1 2242 DIGMIRHKSEFIRAMGLGGGMIWALDLDDFKNLGCEEYPLLRTINRVLRLDYAKPDPKCIILGKASSPTQKPTPKPTQKPTPKPTPKPTTPPYEPQ 2341
MaCht2 2245 DIGMIRHKSEYIKAMGLGGGMIWALDLDDFKNICDCEEYPLLRTINRVLRLNYAKPAPKCIILGKPQ-KPTLKPT-----TKKPTTPSTIQTQKPS 2332
Clustal * .**:*:***:.. :.*:*****.:.*.*****.*****.*. . * *.: :. . : : ..

RpCht1	2149	-----EITPCPQITGLLNLIIEWRDKSDCTKFYTCQFGVLIQACPLGLYFNQKALMCDWPENAGCKTDQNEIPDDNDESTPSS-----	2226
MaCht1	2413	-----HPVQTQPPPKSCDGRLFVSHDTNCNQYYLGNQGQLQLQCSPSGLFWWNND--HCDWPENTQCHPDGSTTAPIDEVTDSENPASEGT	2495
TcCht6	2242	-----EPVLP-AEVVPCQGRLFVADDTNCAQQYLGNQGQLQLQVCNGLFWNKD--HCDWPENTECHPDASSTMAPSTTMPVPD----	2317
TcCht10	2157	-----EPVLP-AEVVPCQGRLFVADDTNCAQQYLGNQGQLQLQVCNGLFWNKD--HCDWPENTECHPDASSTMAPSTTMPVPD----	2232
TmCht1	2342	KPSTQKPSTGYTTESPEPVMP-QDSVPCRGRFLVADEKNCNQYYLGNQGQLQLQVCNGLFWNRND-HCDWPENTTECHPDGTTTAAPSTTTQTLEVEVP--	2436
MaCht2	2333	-----HPVQTQPPPKSCDGRLFVSHDTNCNQYYLGNQGQLQLQCSPSGLFWWNND--HCDWPENTQCHPDGSTTAPIDEVTDSENPASEGT	2415
Clustal		. . . : * : * * * ** *: *	

RpCht1	2323	IKVL	LG	GGW	ND	SLG	DKYS	SRLV	NSKE	ARKR	FVRQ	AVNF	IEKY	KFGI	DLDWEYP	KCWQ	VDCN	KGPD	SDKE	GFSS	ILVK	ELSA	AMFK	PKGW	LLSA	AAVSP	SKVV	2422
MaCht1	2595	IKVL	LIAT	GGW	ND	SLG	NKYS	SRLV	NDPQ	ARAR	FITN	VIQF	IEKW	DFGI	DLDWEYP	KCWQ	VDCN	KGPD	SDKQ	NTAAL	VRELS	AAFK	PKGL	LLSA	AAVSP	SKAV	2694	
TcCht6	2407	VKVL	LIAT	GGW	ND	SAG	NKYS	SRLV	NDPQ	ARAA	FIAH	VLAF	IEEW	NFDGI	DLDWEYP	KCWQ	VDCN	KGPD	SDKEA	FAAF	VRELS	AAFK	PKNL	LLSA	AAVSP	SKAV	2506	
TcCht10	2323	VKVL	LIAT	GGW	ND	SAG	NKYS	SRLV	NDPQ	ARAA	FIAH	VLAF	IEEW	NFDGI	DLDWEYP	KCWQ	VDCN	KGPD	SDKEA	FAAF	VRELS	AAFK	PKNL	LLSA	AAVSP	SKAV	2422	
TmCht1	2533	IKVL	LIAT	GGW	ND	SAG	SKY	SRLV	NDPQ	ARAR	FVAH	ALEF	IEKW	DFGI	DLDWEYP	KCWQ	VDCN	KGPD	SDKQ	NTAAL	VRELS	LAFK	PKGL	LLSA	AAVSP	SKAV	2631	
MaCht2	2515	IKVL	LIAT	GGW	ND	SLG	NKYS	SRLV	NDPQ	ARAR	FITN	VIQF	IEKW	DFGI	DLDWEYP	KCWQ	VDCN	KGPD	SDKQ	NTAAL	VRELS	AAFK	PKGL	LLSA	AAVSP	SKAV	2614	
Clustal		:***	:	:	*****	:	**	****	:	**	:	:	*****	:	:	*****	*****	*****	*****	:	:	:	*****	*****	*****	*****	*	

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Accession	Length	Sequence	Score
RpCht2	1	-----MRFHQTLLFLALLCPSKERKFLVSSQLLRDASQAEQKRVVCYYTNWSVYRPGTAKFNPQININPYLCTHLIYAFGGGLDRENGLRPYDKYQDIEQG	95
AcypiCht1	1	-----MQFLPWLLIFGSIITSD--AEHDIQKRES--SNQKKVVCYYTNWSVYRPGTAKFNPQININPYLCTHLIYAFGGGLDRENGLRPYDKYQDIEQG	88
DpCht1	1	-----MLTKLISDSKEMRIVCYTNWSVYRPGSAKFSNPQININPYLCTHLIYAFGGFTKENTLKPFDDKYQDIEQG	69
TcCht1	1	-----MNVSQKDSKEIRVVCYYTNWSVYRPGTAKFNPQININPYLCTHLIYAFGGFTKENTLKPFDDKYQDIEQG	68
DgCht1	1	MFWPFKKNFHFANLILRPGAAQTFLFLCALAYCINVASSEGRVVCYYTNWSVYRPGTAKFNPQININPYLCTHLVYAFGGFTKDNQMKPFDDKYQDIEQG	100
DaCht1	1	-----MLFLLCALAYCINEASSEGRVVCYYTNWSVYRPGTAKFNPQININPYLCTHLVYAFGGFTKDNQMKPFDDKYQDIEQG	76
Clustal			

RpCht2	95	RGYAKFTGLKTYNKALKTMIAIGGWNEGSRFSP	PLVADEDRRREFVKNVVKFLRVNHFDGL	DLDWEYPAFRDGGKTHDKENYAQLVQVYHRCGGAVITML	195
AcypiCht	189	-GYAKFNGLKTYNKNLKTLLAIGGWNEGSRF	SKLVDDDKRKEFVKNVTKFLRQNNFDGL	DLDWEYPAAYRDGSKPSDKENYASLVK-----	171
DpCht1	70	-GYAKFTGLKTYNKDLKTLIAIGGWNEGSTR	FSSMVASSERRKELVKNTIKFLRQNHFDGL	DLDWEYPAFRDGGKPRDRDNYAQLVK-----	155
TcCht1	69	-GYAKFTGLKTYNKNLKTMLAIGGWNEGSSR	FSPMVANPERRKELIKNAIKFLRQNHFDGL	DLDWEYPSFRDGGKSRDKDNYAQLVQ-----	154
DgCht1	101	-GYAKFTGLKTYNKQLKTMIAIGGWNEASSR	FSPLVASSDRRHFIKNILKFLRQNHFDGT	DLDWEYPAHREGGKSRDRDNYAQFVQ-----	186
DaCht1	77	-GYAKFTGLKTYNKQLKTMIAIGGWNEASSR	FSPLVASPDRRQFIKNILKFLRQNHFDGT	DLDWEYPAHREGGKSRDRDNYAQFVQ-----	162
Clustal		*****	*****	*****	*****

[illegible][illegible]

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RpCht2      394 VNEKHLGGIMLWSIDNDDFRGNCHQRAYPLIEAAKEAMLGKAATKQVPSAVRSK-----TSSSKSKLKQNQRSS 463
AcypiCht    365 VNENDLGGIMFWSIDNDDFRGSCHSRPYPLIEAGKEALIG--DSKVAPSQGKETK-----TTLSKSRPKPRPVAR 432
DpCht1      348 VAENSLGGIMFWAIDNDDFRGNCHGKPYPLIEAGKEALINAYGLTEDNLISPPAKPTKLPKKQRPRTSRTTTERSEE-IVEETTRRRRIKPKIRNDNQ 446
TcCht1      347 VAEKGLGGIMFWSIDNDDFRGNCHGKPYPLIEAAKEALISAYGLTDENLVSPPTKPIKTTRNRTQSSSKSTDENSEKKKSTSSIVSRRRNRITKTSEEL 446
DgCht1      380 VVAHGLGGIMFWAIDNDDFRGTCSGKPYPLIEAAKEAMLDAYGLG-INEVAKPSAPQKP-SRSTRSDNEGNSNRNRVSSKPE--ASPRRPSAGRPPSSS 475
DaCht1      356 VVAOGLGGIMFWAIDNDDFRGTNGKPYPLIEAAKEAMVEALGLG-INEVAKPSGPQKP-SRSTRSDN--GSTRNRLNGKPENTSTSVPANGARRPAVS 451
Clustal
*: *****:*****:* *: **.***.***.:
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RpCht2	464	TTTTSPPVSS-----TV	TTPEPPTPD	PGSDFVCKDEGFF	PHPRDCKKYFWCLDS	GPSNLGIVAHQFTCP	SGTKLVDVSDSCDFA	543	
AcypiCht	433	TTTTSAPQEKSD-----VST	TTPEPPTPD	TGDFTKCKDEGFF	PHPRECKKYFWCLDS	GPSNLGIVAHQFTCP	SGLVFNKISDSCDYT	515	
DpCht1	447	LATPAKKRRNESGRKAAETSTYSSLKIVTPAY	TTPEPPATPD	MGGAFKCEDEGFF	PHPKDCKKYFWCLG	-GPGDTGIVAHQFTCP	AGLHFNKAADSCDYS	545	
TcCht1	447	SNSQSKSHRKES-RRTTEGVPYSSLELVTPSY	TTPAPPSTPD	LGGGFKCEDEGFY	PHPKDCKKYWCLS-	-GPGELGIVAHQFTCP	AGLYFNKAADSCDYT	544	
DgCht1	476	STTTAG-PSTTIRLTEVEG---QSLYIGGRGS	TTTPPPPTPD	PGSDFKCEEGFFQ	HPHRDCKKYWCLDS	GPSGLGIVAHQFTCP	SGLYFNPAADSCDFA	571	
DaCht1	452	RTTQSPPPSTTFKLDAEG---SSLYIGGRAS	TTTPPPPTPD	PGSDFKCEEGFFQ	HPHRDCKKYWCLDS	GPSGLGIVAHQFTCP	SGLYFNPAADSCDFA	548	
Clustal		:	:	*** ** *	* * *:***:	**::***::***:	**::****:****:	:	:****:

RpCht2 544 RNVICKKKSTTTTSTSTTPRTITTRATT-----TLRSSLSRVASTTTPFPPLQDYED-----DSEEDPQTIKQL 609

AcypiCht 516 RNVVCKDKKTSDDTTTTTTTTTPKPIKS-----GIKTTTTTTTTSTTQTPEVEDDSEDEF-----EEEDPKIKQL 583

DpCht1 546 ONVFCNKKSKPSTTTTAKAGASTSTEASSAKPTVNSVSTTRAPSKITAATSKTTINFRTTTTTTEAYEDEEYEDDEEEE-EPNKR---EESSEEDPQVIKEL 641

TcCht1 545 RNVLCNKKLSKATTTTT--TTTTEASTLKT-----STARVPPKITAATSRTTV-FRTSTTTEAYDD-EYEDDDV-EENK----NSEEDPKVIKEL 628
DgCht1 572 RNVPCCKTKKSTTTPVVSSTSTTTTARPTSSYNRVTAAPVARPVYPRFTSTTSTTTTARTTTPAEEVLEYEEDGND-SPNLGKLGSDAEEDPQVIKEL 670
DaCht1 549 RNVPCCKTKKSTTVAPLSTTTTTTTTARS---NRVTAAPTARPVYPRTSSTSTSTTTT--TTPEPVEDLEYEEDTDEQSPNK---SHDGEEDPQVIKEL 640
Clustal : ** * : * : . : . : : : . : *

RpCht2 610 IHLIKKLGGVDELEKOLEGTTG-----SDVTTP-SISKSLIFERILHR-----NGPSGPQNEGLTRETVRAP----YRRDKPQYVTIRRE 683
AcypiCht 584 ITLTKKLGGVAELEKQLNIKDGS-----TEVTTP-AISKSLYNKVLKLPNRFQSSYINGP-GPQSEGLDKKDDSID----YKKDKPQYVTIRRQ 667
DpCht1 642 IDLIRKAGGIEELEKQLKFGKDFSPSTS---SSDATTPSAISKSLYERVLKTSKSN-----TLSALKKT 702
TcCht1 629 LDLIKKAGGIEELEKQLKIHDGSASVS---NSDTTTPSSISKSLVERVLGKGAKVGGKKNSRGP--QNEGLNTHEDKETT---QDKGRPKYTTITRQ 718
DgCht1 671 IDLIRKVGGEQLEKHLLRNKDGITITLKENSASGVQTTTPSTISKSLYDRVLSRPGTLGTFTNRNFNTFKIQSSGTAESGSTTDESSSQINSSKYSSVLRG 770
DaCht1 641 IDLIRKVGGEQLEKHLLRNKDGSI TLKENSANGAVTTTPSTISKSLYDRVLSRPGTLSSLTRNRLK--IAEASGTEATTSTS--VSAGNTYSKYSSVLRG 736
Clustal : **:* **: :***:* . *** :***** :*:*

RpCht2 684 RPS-----TTTEGLN-----LAEYADVDDVVEPDDRDLEEIPKYKGLHYS-SRESDAE---NSDPPAKSERHFRPKYQSA--- 750
AcypiCht 668 RPSKDVVDNIKESEEDIPTDATERFKPTYKYTVDRTRFRDLGEVAD-ENSESDSLPKYTTISRKSSSENPEE---TTS PKYVTLRRQRPTNKED--- 759
DpCht1 703 NRNSGGR---QNGEEASRGKQSDTRGRPQYKTLTRQRLVRSFF--IPRKILNFI FCVNKVFN-----RRT----- 763
TcCht1 719 RSTNNKN---EDEEEESSDEASKSTKKQPEYVNIARRAVSTTTE--EPEENSKSQLNRNKILGEEDETEDEQPSRKKTSG-PQYVNIRRRQRPSTTEETST 812
DgCht1 771 NSRQGP---QNEGLEQLAEFDGFLKERKQYVTINRNRGTATRDDKATDNNSDDDIDEREEPSQPKQQAETTRRPFSSATPSYTSLLRRSRPTTSP--- 863
DaCht1 737 NSRQGP---QNEGIDKLAEFDGFLKERKQYVTINRQR-----SPNQDAEEHSQHEEDEENEQVETTRRALSSVTPSYTSLLRTRPTTMAP--- 821
Clustal *

RpCht2 751 -----EQFR-PKHPSTEDQEASTKKYSSLVRSRPSTFR----- 782
AcypiCht 760 -----EISDEEITPVAVSSTSQAPRYVSLLRQRSTTTTTTPDDRLEIETTKDNVEEPRENKNTKVSQMTLTTESSIISTILFNTE 839
DpCht1 764 ----- 763
TcCht1 813 SKYTVIRRGTTTEPAEPEEDETTSKNVSTSTEKIDLKSRYSILRRGSTTEATTTESGSISSTSSPKRRGTTLPSPVPERKRTRGTLAPGTTTPSSEDTTTT 912
DgCht1 864 -----VPIES-VTELEEEQVAPVAIKEQTQTKHYATLSR--TRGRITTERPESTASDTAGVLVSSTTNR----- 923
DaCht1 822 -----LVGESSKQEEEEEVVEKNSRSQQQVKSyatLNR--ARERTTGP GTTTTEATEAVPSSTTTRYKYFERTRPTKAA-TLEASKDSEEP 906
Clustal

RpCht2 783 -----DHTSSTSNTPRILTSTR-----VVTQIVEGSTQRQ-----R 813
AcypiCht 840 PFTETIATTVYVPTFTTAKNSETSKILTLETEKMSDTSSTAKAPVSIDSTINNSISTTKAPTSTVTNVVTSIYEAATERQ-----R 920
DpCht1 764 ----- 763
TcCht1 913 RYKSIKRGSTSEAPTDDKTLPEDSTLKYSTFTRTPASTQAAPAATEPETAVTVNVQLLTTPESLTVKTTSLSTKQSEQSNIESIGERVYQTQTPLLLEP 1012
DgCht1 924 ----- 923
DaCht1 907 ADQEDEEEYEEENITVQRKQSTNTRKYASIGRRSTTTTAT-----PETTTTSGTETAKANNNNIHYNSNNKNKSQAKQNNI IPT-----T 987
Clustal

RpCht2 814 VPLHRLHELLPD-----TDNLIKSSSTKSELSTQTSKK 881
AcypiCht 921 VRVKNIQNFLLEHKKTEPVTSVTHTTTTPLTTTLSTTMENIAPVEEPTQKSILKGRFGGPVHFRPTLRKLIGIPENNGTTTEKFIEATTEKIVESTTEKK 1020
DpCht1 764 ----- 763
TcCht1 1013 RPFskTSTRSPTPVVTESSRITKVSDSNYLRKPKLSQTQTEIISTTTLTTEKTPPFRTRAPSRFKLTASyDQqATKQANRARKRFSTTTELYSDNY 1112
DgCht1 924 ----- 923
DaCht1 988 VTEESSTTALPTPTSTNQEPETTTETNTNETTEPNDRSSTTTTTNNPSTTFTSTPTPSLATTTTP-----TTTIPGVDSE 1061
Clustal

RpCht2	882	----RISNRLIRKRP-----SQLDTFAISASATT--EFPLNK-----RNQQIRPPLKERSESQNVT-----	931
AcypiCht	1021	NRLNKYTNRFIRPASNFSTENISTTSKIFVTSSTESTSESSTRQINRFRQTTSSATDKQLPLTRKFVARYRQRTTELPVINNTEVQEVQRSRFFRSRRPI	1120
DpCht1	764	-----	763
TcCht1	1113	EEFDLSRTYRPSEIADLSSLTAVDFVALKELTRNSNSLRQRRRPESTTPRTSSFKSRRLISNK-----NEQNVEDQVNSSSDKTHRIRGFTRSPPVV	1205
DgCht1	924	-----	923
DaCht1	1062	SSADGSPNPLIPESPD LAPPTTTTEPELATTTTTT-----PKTTTPVTTTSTGIHSELNNDI-----DNDNDSDDSEVTKPKTQYKYATTNRRRIT	1147
Clustal			
RpCht2	932	-----TLTKKRTQSLVSTAESSNTFIRNR	955
AcypiCht	1121	SSTTTTTEETITELLNVEENADNVRYETTPYTPPTTMHVPTTNVEEISTNDEEIKKTTIDSFEPISKYSTTEITTTIIQPITNKITKSFRGSVRANDGFQDSN	1220
DpCht1	764	-----	763
TcCht1	1206	STTTEGTTRHSLRNRKVVRRRLRPTSSSKLLSQNSDNKENVVPFKRLVRPNTETENLIENSSLNSLFNRRLTRPTEAPNEEQSDDVSAEEGENIKLSESN	1305
DgCht1	924	-----	923
DaCht1	1148	NTTATRTTNTTANNNNSEAAN-DASPRNGLSSFNKIRASINTNPGRRPPQTQPEHTTIEPNSSASLSSVSSPRPFGYPRRRTRPSSSIPTTTTNQSDNNN	1246
Clustal			
RpCht2	956	FMKTRNPTDDRE-----DGKDP-----LLSREFSRE---SSIIRKPLFRYRSGTTSS-----	1000
AcypiCht	1221	IDKSRSPSLGRQNSRFLKEEQKILFIRVMPSPDGRSQNEFTSNPVKNITRNRGRVRAYDSLELNTLTDELTNEDRPNELFRGSETKFRPTTTSTTTES--	1318
DpCht1	764	-----	763
TcCht1	1306	IRENSNVNNNNNNILSPDDGQKVRKVLKRIKPKVDDEKIVTEPNIVIRTRKIVRKLTPTESTITSTTETTVPGRKRKIIRRLRPTTELKENSTQKTLXI	1405
DgCht1	924	-----	923
DaCht1	1247	STDNDNTNETD-----AVASVVKKTRPSPGDRPKVSAS-LQTATRSTLHNLHHQD---QQESQVEVAGNGGNSLRHEVVSSSLSQTP-----	1324
Clustal			
RpCht2	1001	-----QISKEDSTLSHTTPVSTMNTKNYSEFPRDPNSFILS-EESEKDRYTDEVEDQVTDAE-----IYGQLEEQVSG	1069
AcypiCht	1319	-----TEEIQKDRIRQRITRPVQRSTTTTTTTEESPSSSATESYSSKVNRRRKFRPEYTTTSTSSYEEEITTQKTRNPERFRSRTPLLKNTITTTSTTP	1413
DpCht1	764	-----	763
TcCht1	1406	RGRPFLAHFNNEESGVDASTIKPDSSKYSTPNRGTTTEESEVTEQFIANSENTDSYKGTTEEAQAKQLISNSENSSQRTTDSYKGTTEEADSSTERTIDR	1505
DgCht1	924	-----	923
DaCht1	1325	-----NHIDDADNGGITQTKTKY-TWRAVRKPTARPRNSLARDDKDSRRFAGQLNDISLDQDLSSSTTKFRSRRLNSAEDESEVAHAAAESDQKA	1413
Clustal			
RpCht2	1070	DSKEQSSR-----LPDLANVAVAAIQSLATSAPS-----TQSTEKYKST	1108
AcypiCht	1414	ETLEDSDREFFSTSSQPYFDDSSLFAKTRDDRKIGGSTEDLANTAVVAIHTLATAPPSDYE-----FRPSTHSPQQSVFRETTONREYFEPQ	1500
DpCht1	764	-----	763
TcCht1	1506	SKYSTLNRGTIDSTREESFDKEIITDRGPSRFRSTTEGTIDRTKYSTLNLKGTTEEPEVREHFISNDSSTERTIDRSKYSTLNRGTTESTKEEKIDEET	1605
DgCht1	924	-----	923
DaCht1	1414	RSYQSINHQSGKKI-----	1427
Clustal			
RpCht2	1109	PHAAVG-----KSVLSGTVRPSSRPSRPFPRPTTRAGVTRVRTSSPRPFSSKP---TAQP-----	1158
AcypiCht	1501	APHSIDSFQVQPARLPEQSLRQSAQPQLPPPPPPSIKLPVVSFQAPFQPSPFQAGPFQVPYPGLPFQANNAFAPVARQSPPTALPPATSRQTFILR-	1599
DpCht1	764	-----	763
TcCht1	1606	ITTNRGPSRFRNSNTSTEGTIDRSKYSTLNRGTTEEAQVKEQHISSSDASTEGTIDRSKYSTLNRGTTEEAQVKEQHISNSDASTEGTIDRSKYSTLNRG	1705
DgCht1	924	-----	923

DaCht1	1428	-----	1427
Clustal			
RpCht2	1159	-----TTPARGATSPHRTSLIYEDYDADY--YVEP-----VDLPLSGKVRIHADGYIECLDIGNFPHPFSCRKFISCAKMENGRL	1231
AcypiCht	1600	-----RGPSRTTPLGTAATSAPPQYLNDNTQEQYADYSEPEQASDSSEQRVALKGKVRIHGDGYIECLDMGSFPHPFSCQKFISCAKTEYGAL	1687
DpCht1	764	-----	763
TcCht1	1706	TTESAKEEEKIDEEIISTNRGPSRFRIYRPTVFHDDDEEEEDDSLKTRIVEPLFTEEITESNKLSNNATNKTDDLNKEEAEENSTIETNEENSTEEHKD	1805
DgCht1	924	-----	923
DaCht1	1428	-----	1427
Clustal			
RpCht2	1232	LGWEYTCPKGLSFDPIGGICNWNAGLGCKE-----	1301
AcypiCht	1688	FGWEYTCPKGLSFDQVGGICNWSSGPVCNN-----	1717
DpCht1	764	-----	763
TcCht1	1806	EEDNEDIPVTTVKPYINPILNRQKNRPAFQRPKLTTQKPLSSSTTSRNRKYKTfGRSTTAPSKETNEEITQEKfVpKNLDRNRKVSTSTTTTEVAPEIEQT	1905
DgCht1	924	-----	923
DaCht1	1428	-----	1427
Clustal			
RpCht2	1302	-----	1301
AcypiCht	1718	-----	1717
DpCht1	764	-----	763
TcCht1	1906	TDSVQINDTESDKTTLESIEVTTLKETEEVNVNATTESRTILVETTTTLRTTETTPSHLPRSTSRTRPKFNVpKRLTTPESRfSPKLRTQSTTPKAPTSLLK	2005
DgCht1	924	-----	923
DaCht1	1428	-----	1427
Clustal			
RpCht2	1302	-----	1301
AcypiCht	1718	-----	1717
DpCht1	764	-----	763
TcCht1	1906	DKFTRKYTTTTERNDFVEEEDIPEEDEVENQSSTQRTTRPKARPSNRPDfRKSTEAPKPTEDLGIDTDaVKNRNKNLfSKKRKMNTPFAGHPLNQSILT	2105
DgCht1	924	-----	923
DaCht1	1428	-----	1427
Clustal			
RpCht2	1302	-----	1301
AcypiCht	1718	-----	1717
DpCht1	764	-----	763
TcCht1	2106	TPTISESVTKPSTEPFETTEYLTLHHIFAETERVTENSLPTTSSKIEKLIEVNRIVEVHEMNNTTEERDNKVVdKVGVINRVTVVKVVDGNfNPEDNEI	2205
DgCht1	924	-----	923
DaCht1	1428	-----	1427
Clustal			
RpCht2	1302	-----	1301
AcypiCht	1718	-----	1717

DpCht1	764	-----	763
TcCht1	2206	TKSPKLDDFEIATVREIPNREDRRYEQVAESAEIIDGRSNINIITPRPYSTEASTISLEGLFQTDTPQKLSDKFNLNQLKQGTNDEELLE	2305
DgCht1	924	-----	923
DaCht1	1428	-----	1427
Clustal			

RpCht2	1302	-----	1301
AcypiCht1	1718	-----	1717
DpCht1	764	-----	763
TcCht1	2306	RVLKEDDYITMKAEVVEVTPKISKDIKIVPIQVEMSRKLIAPSDFVTKVEQGVPKVTLQILKPQN	2370
DgCht1	924	-----	923
DaCht1	1428	-----	1427
Clustal			

RpCht3	435		IMKLVTYNNLFSVFLFTTAQNEQEKKSEKRIVCYTINWSPYRP-VAKFPTASIDPNVC <th>H</th> LIIYAFAATFSSNFGVLPTDEYOITNNFNSLKEKNVNLLKTL	H	533									
BmCht3	519	-----AALSDKNKREPQVLCYLTSWSAKRPSAGRFTPENVDPKLCTHIIYAFAATLKDHKLAEADDDKDADMYDKVVALLREKNPNLKIL		600										
BmCht1	547	-----AALSDKNKREPQVLCYLTSWSAKRPSAGRFTPENVDPKLCTHIIYAFAATLKDHKLAEADDDKDADMYDKVVALLREKNPNLKIL		628										
DpCht1	455	-----NNAAPVNGSNAKTICYTISWSANRPLGRFSPEEVNTCLTHLVYAFGALKDYRLSLVGSGDELVDHARIQTIREKNPDLKII		536										
CcCht1	546	-----LVAKEQNTRPAOVFCYLTSWSAKRPGAGKFLPSNIDPKLCTHVVIYAFAATLKDHKLSEATDDDPENYEQVIALREENPDLOIL		627										
AqCht1	551	-----LATVEKNSRPAOVFCYLTSWSVKRPGAGKFEPKDVDSLCTHIVYAFAATLKDHKLTEANDNDPMYDEVIALEEKNPDLQIL		632										
Clustal		:	: ** *.* ** *	.	*	* .. :	**::**:	:::	:	:	. . :	. :.	*.:*	:::

RpCht3	634	QGYDL-NLQNVVDFFNILTYDYHRSNEGVS	SHHAPLYPLQQEISANINTNLNADSTIOHLLKKGLKSDKLN	LIPTYGRNYKLDNVDKHDIGAPSKGNQG	732
BmCht3	696	AGYDVPEISKYLD	FINVMTYDFHGWQERQVGHNSPLFPLESATSY--	QKKLTVDYSAREWVRQGAPKEKLMIGMPYGRSFTLINETQYD	GAPASEGGE 793
BmCht1	724	AGYDVPEISKYLD	FINVMTYDFHGWQERQVGHNSPLFPLESATSY--	QKKLTVDYSAREWVRQGAPKEKLMIGMPYGRSFTLINETQYD	GAPASEGGE 821
DpCht1	632	AGYDVPEVVKYVDF	LNVMTYDFHGHWEGQVGHNSPLFPLETAASH--	QRKLTVDYGAREWVKLGAPAEKIMIGMPTFGRFTTLADLSKFD	IGSPASGGGI 729
CcCht1	723	AGYDVPEISKYLD	FINVMTYDFHGWQERTVGHNSPLFPLEATTGY--	QKKLTVDYSAREWVKQGAPKEKLLIGMPTYGRSFELVNETQFD	GAPASGGGK 820
AgCht1	728	AGYDVPEISKYLD	FINVMTYDFHGWQERQVGHNSPLFPLDSASNY--	QKKLTVDYSAREWVKQGAPKEKLLIGMPTYGRSFTLVNQTFD	GAPASGGGL 825
Clustal		***: : : * : * : * : * : * : *	* * * : * : * : * : *	: : * : * : * : * : *	: : * : * : * : * : *

RpCht3	826	-----	825
BmCht3	892	--DYKVKLEYDGPYETVLT---SGQYTTKDPTEVTCCEEDGHISYHKDQADCTMYMCEGERKHHMPCPSNLVFNPNENVCWDPENVEGCAHHTQAPPAR	986
BmCht1	920	--DYKVKLEYDGPYETVLT---SGQYTTKDPTEVTCCEEDGHISYHKDQADCTMYMCEGERKHHMPCPSNLVFNPNENVCWDPENVEGCAHHTQAPPAR	1014
DpCht1	828	ADNYQVQFVYDGPYERSASSLITGKPAPKDPNVVTCDEEEGHISYHPDKANCAMYYMCEGERKHHMPCPVQLVFNPSQNVCDWDPENVPGCETHFTAGTGR	927
CcCht1	919	--DYKVELEYEGPYESHGP--RGAYTTKDPHDVTCCEEDGHISYHKDWNDCTHYMCCEGERKHHMPCPANLVFNPNQENVCWDPENVEGCHEPTEAPA--	1011
AgCht1	924	--DYKVALEYDGPYESFGP--RGAYTTKDPNEVTCCEEDGHISYHPDKADCTHYFMCCEGERKHHMPCPANLVFNPNENVCWDPENVEGCQHHTQAPAA--	1017
Clustal			

RpCht3	826	-	825
BmCht3	987	R	987
BmCht1	1015	R	1015
DpCht1	928	R	928
CcCht1	1012	-	1011
AgCht1	1018	-	1017
Clustal			

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RpCht4      1  -----MLPSKLWCLLLFVFVLAANYITG[SNKKTVLCYISSWAVYRRSOGQFTISDVDVNLCTHLVYAFLGINETTNTVVSRSWADYVTNNGRFGGQLKDL  94
TcCht3      1  MVSLKNFCAVFVIVFVAFMDEVKALTGPSHGKVVVYCLGTWSVYRPGRGSFTIEHLDPALCTHIVYSTAGLDEKTDTSIKSLDPFQD-LADDYGKGEYQKL  99
PhCht1      1  -----MKKKTRLKPIHDKHVVCYIGTWSVYRPGKGSFKIENIDGNLCTHIVYAFVCLNATTNTLRSIDPYD-LEENYGKGSFKKM  80
DpCht3      1  -----MAFLASPSHGKVVVYCYIGTWAVYRPARGSFTVENLEPSLCTHVIYAFAGLN PQEDSIKSLDPWQD-LTEHYGKGGYQRI  78
DpCht4      1  --MLSIWSGLCVIVIVCGCCIEAQNTPSGHKVVVYCYGTWAAAYRPARGSFTVENLEPSLCTHVIYAFAGLN PQEDSIQSLDPWQD-LTEHYGKGGYQRI  97
MrCht2      1  -----MSISLIRSTRDKVVTCYVASWAIYRPGNKFGIDDLNPNLCTHLVYAFLAGLNDTTWTLRSLDPYMD-IEN--GIGNYKKM  78
Clustal
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[illegible]

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RpCht4      195  RYIVDPGYDVRTISQSDYINVMSYDFNGFWERKTGVNAPLISENEFNV-----EFSIDYLIKKGATPSKILVGIPTFGHSFTMKN 275
TcCht3      200  KDTIDAAVDVKGLSLYLDFIHMMCYYHGAWDQKTGANAPLQSSDVLNV-----EFSINYMLKLGAPAKKLVLGVPLYGRTFLLPE 280
PhCht1      181  INTINTAYDVPEISKHLLHFMICYDHGCPWDKTVGANAPLTSKDSLDL-----ESSITHLLQLGAPPHKLVVGIPAYGHTFLTTKN 261
DpCht3      179  KDTIDVAYDVEGLGVYLDFIHMMCYYDHGAWDQKTGANAPLRSSDVLNVVCTGFPQSAEFPRNGVSLQEYTINYMIKLGAPMHKLVLGVPLYGRTYVLPE 278
DpCht4      198  KDTIDVAYDVEGLGVYLDFIHMMCYYDHGAWDQKTGANAPLRSSDVLNVVCTGFPQSAEFPRNGVSPQEYTINYMIKLGAPMHKLVLGVPLYGRTYVLPE 297
MrCht2      178  KGTIDTAYNIPELSLYLDHIHVMAYDYGCTWDNKNVLPNSPLDS-----VKDTMNYLLNKGAPANKLVLGLPMYGRTFLILAS 254
Clustal
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RpCht4 276 VPD-----NGNYLKVPSPDNGYLSQWTRKGIIGYNEVCYEELST-TSGWKEMWDASSTPYAVNHKKFVSYDNQRSILEKVKLVLNKLGLGGAMVYTDDTD 370

TcCht3 281 PYDPESGRPKPLGAVARNIGFGPFRTRENGFMGYNEICLEVKNKSNQNAKFWDSESKTPYAVSGNKVLTYDDVQSIEBKVKFAIEKDLGGIMVWSIDTDD 380

PhCht1 262 VTN-----PKMGTPITGFGEPEGVFTQQQGFGQGYNEICTELLKDDEKWSKHWDDESSTPYAVGNHVIADFDEKSIETGKVNLGLKYKVGGMFIWSIDTDD 355

DpCht3 279 ALHASSKRKPPLGIVSTSVMFGQGPITREPFGFMGYNEICLELKNKTTEPMMKWFDSESATPPFAIRNTQVITYDDDKSITYEKVKVFAMEKKLAGIMVWSVDTDD 378

DpCht4 298 ALHASSKRKPPLGIVSTSVMFGQGPITREPFGFMGYNEICLELKNKTTEPMMKWFDSESATPPFAIRNSQVITYDDDKSITYEKVKVFAMEKKLAGIMVWSVDTDD 397

MrCht2 255 KLN-SSDESP-IGQRSLSEGFNGSYTGQNGFMGYNEICEELVT-SNNWRIGWDSSNTPTPAIKDDYVIVYDNPRLAKVEYAKSLNLAGMVWSIDTDD 351

Clustal
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RpCht4	371	FRGLCQG-----DR-----YPLVTAVRDHLNK-----DRPITISNVSIVSHNYG-----	409
TcCht3	381	FHGDCAD----VGEDGHFEN--EPLMRAINKAIPK-----SIEDRRNSVQ---WTG-VNTSGAGSSSSLLFLVAMAIALFIKF-----	448
PhCht1	356	FHGDCDKERLKVKES-AQDKYTFPLLRVHTATQYKLQDDDNNDIPEVGTNDIDDPKENNVVPSFQSSITANFVVIFTSGAFLLIILNYIVK	446
DpCht3	379	FQGDCA-----ADDD-SPQN--EPLMRAIDKSIET-----SLEEIKNSIIKGKFTPRRNSSCRLSTSSNMLVFITALFVLGRYSL--	451
DpCht4	398	FQGDCA-----ADDD-SPQN--EPLMRAIDKSIET-----SLEEIKNSIIKGKFTPRRNSSCRLSTSSNMLVFITALFVLGRYSL--	470
MnCht2	352	EKGKCAS----LKDSLEQENPTFPLMRSINVAIYS-----DSNKSCLPTP---SPTPSTAEIRYSSANFRENSGQGEGI-----	418
Clustal		*:* *: : **: :: : : :	

RpCht6
PcCht1
TcCht2
TcCht5
NvCht1
DpCht2
Clustal

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MSPRLVDLVMWARNMEARLPKGS-FLDGARVVCYFSNWA
MGSWNFWLCGSAVVLLFVATVSSQPTDDGRVVCYFSNWA
-----MKLLLAVATIITLLQPYDAT--PARIVCYFSNWA
-----MKLLLAVATIITLLQPYDAT--PARIVCYFSNWA
MNPQAGKLLLSL GALVALFACTATGEQPGRVVCYFSNWA
-----MNVWVAILSATLLQLCTEA----AKVVCYWG
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100
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93
100
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YRPGLGRYTIDIPADMCTHVIYSFVGVS
YRPGLGRYTIDIPGEYCTHIYSFIGVSNVTWEVLVLDPEVDVEQNGFKNFTLLKQKYS
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RpCht6
PcCht1
TcCht2
TcCht5
NvCht1
DpCht2
Clustal

100
101
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94
101
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HLKTSIAVGGWGE
GIKTSIAVGGWGE
KVKLQVAVGWAEGGSKYSAMVAEKSRRDAFIRSVISF
KVKLQVAVGWAEGGSKYSAMVAEKSRRDAFIRSVISF
NLKTEVAVGGWGE
QVKFQVAVGWAEGGEKYSAMVADKSRRDTFIRSVVDF
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YRPGLGRYTIDIPADMCTHVIYSFVGVS
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RpCht6
PcCht1
TcCht2
TcCht5
NvCht1
DpCht2
Clustal

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NEGYPVPELCEN
NEGYPVPELCEN
QEGYPVPELCEN
QEGYPVPELCEN
QEGYPVPELCEN
DEGYPVPELCEN
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YRPGIGRYAIDVDPADLCTHIVYSFIGVNDKSWELIIDPEFDIEQTGFRNFTDLKKTHP

RpCht6
PcCht1
TcCht2
TcCht5
NvCht1
DpCht2
Clustal

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GGAPAKYTNAKGFWAYYE-----EKDSQVQKWD
GGAPGNYTKAKGFISYYEICSEIQEEDSGWTIKWDEAG
GSPGPYTNATGFLAYYEICPEILNKDSGWTKKWDEH
GSPGPYTNATGFLAYYEICPEILNKDSGWTKKWDEH
GGAPGKYTGAKGFISYYEICPEVNDPESGWTKKWDEH
GSPGPYTNATGFLAYYEICPEVNDPESGWTKKWDEH
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RpCht6
PcCht1
TcCht2
TcCht5
NvCht1
DpCht2
Clustal

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MNNYDVMPPTVT
MKDYKVPAPVT
MNSYSVPEPTIS
MNSYSVPEPTIS
MKNYIVPKPEYNT
MKGYTVDPPTIT
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460
487
446
446
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467

YRPGLGRYTIDIPADMCTHVIYSFVGVS
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YRPGIGRYAIDVDPADLCTHIVYSFIGVNDKSWELIIDPEFDIEQTGFRNFTDLKKTHP

RpCht6
PcCht1
TcCht2
TcCht5
NvCht1
DpCht2
Clustal

461
488
447
447
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468

-----QEAP-----KTSEIPDTITEVVEEITEG
ESGGCGCDEESPSKPSATTIKPIRTTTPKRKTTTTEE
-----TVSTTEAPPAPAVSNPQNEVDGSVA-PKECKQ
-----TVSTTEAPPAPAVSNPQNEVDGSVA-PKECKQ
-----TQQTTPKPKPTVPPQPPEIDESHNEIKCEQ
-----EATSRPQSTSSEAPTRRTTKAPPAEGISPGSGG

547
586
513
513
525
549

YRPGLGRYTIDIPADMCTHVIYSFVGVS
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YRPGIGRYAIDVDPADLCTHIVYSFIGVNDKSWELIIDPEFDIEQTGFRNFTDLKKTHP

RpCht6
PcCht1
TcCht2
TcCht5
NvCht1
DpCht2
Clustal

548
587
514
514
526
550
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CDWPQNVKREECKQ--- 561
CDWPENSRRPQCKNFKA 603
CDWPEHADREKCKKIEQ 530
CDWPEHADREKCKKIEQ 530
CDWPQNVDRPECKQ--- 538
CNWPNANADRECKRKE-- 564
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561
603
530
530
538
564

YRPGLGRYTIDIPADMCTHVIYSFVGVS
YRPGLGRYTIDIPGEYCTHIYSFIGVSNVTWEVLVLDPEVDVEQNGFKNFTLLKQKYS
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YRPGIGRYAIDVDPADLCTHIVYSFIGVNDKSWELIIDPEFDIEQTGFRNFTDLKKTHP
YRPGIGRYAIDVDPADLCTHIVYSFIGVNDKSWELIIDPEFDIEQTGFRNFTDLKKTHP

RpCht9 572 LTSWSSKRPGAGRFSPS~~DLQPTLCTHIIYAFATLT~~DHKLASASG-TE~~DQYHKIVSLREKNPNLKI~~LLAIGGWAFGSTPFKELTSNVFRMNQFVYEAEFL 670
PxCht1 536 LTSWSSKRPS~~SSGRFTPENVD~~PMLCTHIIYAFATLK~~DHKLTEGDEKDADMYDKVVALREKNPNLKI~~LLAIGGWAFGSTPFKELTSNVFRMNQFVYEAEFL 635
AcypiCht2 545 MTSWSIKRPGAGKFTPDNID~~PSLCTHVIYAFGSLKDFKLT~~FVDEKDT~~EQYKEMMALREKNANLKVLLAIGGWAFGSTPFKELTGNVFRMNQFVYEAEFL~~ 644
OfCht1 535 LTSWSSKRPSAGRFMPENVD~~PTLCTHVIYAFATLK~~DHKLTEADEKDADMYDKVVALREKNPNLKI~~LLAIGGWAFGSTPFKELTSNVFRMNQFVYEAEFL~~ 634
BmCht1 563 LTSWSAKRPSAGRFTPENVD~~PKLCTHIIYAFATLK~~DHKLAEADDKDADMYDKVVALREKNPNLKI~~LLAIGGWAFGSTPFKELTSNVFRMNQFVYEAEFL~~ 662
BmCht2 535 LTSWSAKRPSAGRFTPENVD~~PKLCTHIIYAFATLK~~DHKLAEADDKDADMYDKVVALREKNPNLKI~~LLAIGGWAFGSTPFKELTSNVFRMNQFVYEAEFL~~ 634
Clustal :**** *:*.:::* *:::* *****:*****:*.*.**.: . :*.:::*****.***:*****.*****.*****.*****

RpCht9 671 REYQFNGLDVDWEYPRGID~~DRASYVNL~~RELRTAFEGEAKSSGQPRLLMTAAVPASFEAIAAGYDVPEI~~AKYLD~~FINVMTYDFHGQWERQVGHNSPL~~YPL~~ 770
PxCht1 636 RDYQFNGLDVDWEYPRGAD~~DRAAFVNLL~~KELRLAFEGEAKSSGQPRLLMTAAVPASFEAIAAGYDVPEI~~SKYLD~~FINVMTYDFHGQWERQVGHNSPL~~EPL~~ 735
AcypiCht2 645 REHKFNGLDVDWEYPRGLDD~~KAAYVNL~~KELRLAFEGESKSSGLPRLLMTAAVPASFEAIAAGYDVVEI~~SKYLD~~FINVMTYDFHGQWERQVGHNSPL~~YPL~~ 744
OfCht1 635 RDYQFNGLDVDWEYPRGAD~~DRAAFVSL~~KELRLAFEGEAKTSGQPRLLMTAAVPASFEAIAAGYDVPEI~~SKYLD~~FINVMTYDFHGQWERQVGHNSPL~~EPL~~ 734
BmCht1 662 RDYQFNGLDVDWEYPRGAD~~DRAAFVSL~~KELRLAFEGEAKTSGQPRLLMTAAVPASFEAIAAGYDVPEI~~SKYLD~~FINVMTYDFHGQWERQVGHNSPL~~EPL~~ 762
BmCht2 635 RDYQFNGLDVDWEYPRGAD~~DRAAFVSL~~KELRLAFEGEAKTSGQPRLLMTAAVPASFEAIAAGYDVPEI~~SKYLD~~FINVMTYDFHGQWERQVGHNSPL~~EPL~~ 734
Clustal *:***** **::*.*.** *****:*.** ***:*****.***** **::*****.*****.*****.*****

RpCht9 771 ESATS~~YQKKLTVD~~FSAREWVRQ~~GAPKEKLMIGMPTYGRSFTL~~VDEAKFDIGAPASGGGKPGN~~YTAESGF~~MAYYEICD~~FLHED~~NTTLVWDNEQQVPFAYRG 870
PxCht1 736 ESATS~~YQKKLTVD~~YSAREWVRQ~~GAPKEKLMIGMPTYGRSFTL~~INETQFDIGAPASGGGQAGRYTNEAGFMSY~~YEICE~~FLREDNTTLVWDNEQMVPFAYRD 835
AcypiCht2 745 ESATS~~YQKKLTVD~~YSAREWVRQ~~GAPKEKLMIGMPTYGRSFTL~~VDPAKFDIGAPASGGGTAGKYTSEAGF~~MAYYEVCD~~FLHVENTTLVWDNEQQVPFAYRK 844
OfCht1 735 ESATS~~YQKKLTVD~~YSAREWVRQ~~GAPKEKLMIGMPTYGRSFTL~~INDTQFDIGAPASGGGQAGRFTNEAGFMSY~~YEICE~~FLREDNTTLVWDNEQMVPFAYRE 834
BmCht1 763 ESATS~~YQKKLTVD~~YSAREWVRQ~~GAPKEKLMIGMPTYGRSFTL~~INETQYDIGAPASEGGEAGRFTNEAGFMSY~~YEICE~~FLREDNTTLVWDNEQMVPFAYRG 862
BmCht2 735 ESATS~~YQKKLTVD~~YSAREWVRQ~~GAPKEKLMIGMPTYGRSFTL~~INETQYDIGAPASEGGEAGRFTNEAGFMSY~~YEICE~~FLREDNTTLVWDNEQMVPFAYRG 834
Clustal *****:*****:*****.*****:*.::***** ** *.::.* *:***:***:*.**.: ***** *****

RpCht9 871 NQWVG~~FDDERSL~~KT~~KMWLKEEG~~FGGIMV~~WSID~~MDDFRG~~VCNGK~~FPLV~~NAMQ~~LE~~EDYTIK~~LEYQGPYEGTGGGGAY~~TTKDP~~NAV~~TCEEED~~DGHISYH~~FD~~ 970
PxCht1 836 DQWVG~~FDDERSL~~KT~~KMWLKEEG~~FGGIMV~~WSID~~MDDFRG~~SCGTGKY~~PLIT~~TAMQ~~ELSGYK~~VKLE~~FDGPYESSNPNGOY~~TTKDP~~NEVTCEEEDGHISYH~~FD~~ 935
AcypiCht2 845 DQWIG~~FDDERSL~~KT~~KMSWLKEEG~~FGGIMV~~SVDMDD~~YRGVCGT~~GKYPLIT~~TAMQELAGY~~TVKLE~~YDGPYBATGRNTVY~~TTKDP~~TSVTCEEEDGHISYH~~FD~~ 944
OfCht1 835 DQWVG~~FDDERSL~~KT~~KMWLKEEG~~FGGIMV~~SVDMDD~~FRGSCGT~~GKYPLIT~~TAMQELSGYK~~VKLE~~YDGPYESSSPTGOY~~TTKDP~~HEVTCEEEDGHISYH~~KD~~ 934
BmCht1 863 DQWVG~~FDDERSL~~KT~~KMWLKEEG~~FGGIMV~~SVDMDD~~FRGSCGT~~GKFLIT~~TMQELSDYK~~VKLE~~YDGPYETVLTSGOY~~TTKDP~~TEVTCEEEDGHISYH~~KD~~ 962
BmCht2 835 DQWVG~~FDDERSL~~KT~~KMWLKEEG~~FGGIMV~~SVDMDD~~FRGSCGT~~GKFLIT~~TMQELSDYK~~VKLE~~YDGPYETVLTSGOY~~TTKDP~~TEVTCEEEDGHISYH~~KD~~ 934
Clustal **:*****.*****:*.**:***:*** ** ***:**::***** *.::***:*** ***** ***** *

RpCht9 971 KADCTMY~~YMC~~EGERKHHMPCPSNLVFNPNENVCDWPENVEGC~~SOHTQ~~APPS--- 1021
PxCht1 936 KADCTMY~~YMC~~EGERKHHMPCPSNLVFNPNENVCDWPENVEGC~~QHHTQ~~APPAKR- 988
AcypiCht2 945 KADCTMY~~YMC~~EGERKHHMPCPSNLVFNPNENVCDWPENVEGC~~MQHTP~~APPTSRR 998
OfCht1 935 HADCTMY~~YMC~~EGERKHHMPCPSNLVFNPNENVCDWPENVEGC~~QOHTQ~~APPAKR- 987
BmCht1 963 QADCTMY~~YMC~~EGERKHHMPCPSNLVFNPNENVCDWPENVEGC~~AHHTQ~~APPARR- 1015
BmCht2 935 QADCTMY~~YMC~~EGERKHHMPCPSNLVFNPNENVCDWPENVEGC~~AHHTQ~~APPARR- 987
Clustal :*****.*****:*** **.: