

## Supplementary File S1: Phylogenetic reconstruction of odorant receptors

We used the alignment of the OR gene family published by [58] (their Figure 3), which is based on the OR gene sequences found in a number of moth species and the butterfly species *Danaus plexippus* and *Heliconius melpomene*. We completed [58]'s OR amino acid fasta file with either all 16 Ban\_OR unigenes identified in the transcriptome, or the 7 Ban\_OR unigenes most expressed in our transcriptome. We aligned the additional OR sequences with Mafft V7 (website: <http://mafft.cbrc.jp/alignment/server/>) using G-INS-i reconstruction method, leave gappy regions, gap opening penalty of 3.0 and offset value of 1.0, which gave the same OR tree as in [58]. Phylogenetic reconstructions were carried using maximum likelihood using the “LG+I+G” substitution model and 100 BT. Rate heterogeneity was set at four categories, and the gamma distribution parameter and the proportion of invariable sites were estimated from the data set. Tree reconstruction was performed using PhyML 3.0 [58], with SPR (Subtree Pruning and Regrafting) method for tree topology improvement. Given that the phylogenetic reconstructions using all 16 Bany-OR unigenes positioned all *B. anynana* OR sequences out of the “pheromone receptor subclade” found for moths [58], and that most weakly expressed OR unigenes displayed long branches in the phylogenetic tree, we finalized the phylogenetic reconstructions using the 7 most expressed OR unigenes only. Images were created using Evolview (website: <http://www.evolgenius.info/evolview/>).

Fasta OR aligned amino acid sequences used for the final phylogenetic reconstruction:

>DpleOR1

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-----MGLLFADAKDLVGIIKKTSDINYMRLVLKLGKLVIFCYPHIEGELQSK--
YVILGKIWVTLLSIATLSGQILYLY--HKTGK-IIFLKLGHYITAMNSVV----
SFRIMRTFLKSYNEIMNDFMIKIHIFNHKD---RSEYALKIQIIHKASH-
FVTVFLNSGMIFAIITFNIAPLYNNYRSGAFNDYKNGNASFEHSVFF-YIPEEY-
ENNIIIYTAIFISNWYVSLMCAMLFIQFDLILCLMIINLWGRFKILHSLETFGESF----
DFETFNNTTQEGFTVNQSTEVNKKLEDIITHHQQVIKFTSKLSSTFGPVLLHYYIFHIVTLCI
LLECSKM--DPDALTRYGILTFLVVEQLIQVSVAFEILETMSSKLEKAVYYLPWE--
CMNVSQRRVVLIMLMQAQRGGTVKALDMVNVGVQTMQLQILRTSFSYFIMLQAL-
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>DpleOR2

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-----MGLLFADAKDLVGIIKKTSDINYMRLVLKLGKLVIFCYPHIEGELQSK--
YVILGKIWVTLLSIATLSGQILYLY--HKTGK-IIFLKLGHYITAMNSVV----
SFRIMRTFLKSYNEIMNDFMIKIHIFNHKD---RSEYALKIQIIHKASH-
FVTVFLNSGMIFAIITFNIAPLYNNYRSGAFNDYKNGNASFEHSVFF-YIPEEY-
ENNIIIYTAIFISNWYVSLMCAMLFIQFDLILCLMIINLWGRFKILHSLETFGESF----
DFETFNNTTQEGFTVNQSTEVNKKLEDIITHHQQVIKFTSKLSSTFGPVLLHYYIFHIVTLCI
LLECSKM--DPDALTRYGILTFLVVEQLIQVSVAFEILETMSSKLEKAVYYLPWE--
CMNVSQRRVVLIMLMQAQRGGTVKALDMVNVGVQTMQLQILRTSFSYFIMLQALE
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>HmelOR1

-----GIEKTQDIKYMRLKRRLQILHAWPSKAIGEE----  
YCLYGRIYVFLVFALSPPGFLYLKNNLFVID---FMELAHTYVTVSMSTMA----  
TFRVMLVFLKIYKNLIADFNCCIHLFNHKD---HSEYAMSTHLLVHKISH-  
FFTVYIDILLVVGLLLLFNFTPLWKNIYSDAFTNYKTGNSSLELSIYY-QLPFDY-  
KHNIYWYLVMFIFDWYMSILCSFCFCYIDLLISLMVFHIWGHMRIIINDMVTFRRPN----  
KVTIDANIQDEFFSDEEGRLVARDIGNIVQQHNKIAEFSARLISTFGPILLIYYLFHFVSGCV  
LLLVCFQK--NAEAIMLYGPLTFVVVFQQIIQISIVFELLATVSDQYSNAVYSLPWE--  
CMKVGDRKKVFIMLINSQRPLPVKAMNIVNVGVQTMAAILKTSVSFYIMLNTFA

>HmelOR9

-----  
MDLQYMKRIKFYLNWLGSWPFEDLYEVYKEELPLRNSKILIIYFICILLGGIMYVK--  
VHKNE-LNFFELGHNYITLLMNVVS--LQRVTMALLNS--YRVMMAHFILNFHLFHHKQ---  
RSKYAMKIYKQIDTLCS-  
WYTIYLYSQMYVGCILFNLGPLINNIMSNAYSANGTTPEFEFSVYL-YLPFTV--  
QNKKQYGLISLLNILLTSDGACIFCTFDVLMSEIIFHVWGHLLKILKYHLESFPPKE----  
REPGNRYTKVVMYTEDELPIIFEKLKENIEHHKLIIEFMNLASNGFGVMICVYFIFHQVIGC  
ILLEISAM--DMESFASYGVLTFFVMFQQLIQISIFELIGSKSETIKHAVYDMPWE--  
CMDIKNKKIFLFFLNNVQKPIALKALGLVSGVQTMASILKTSFSFYIMLRT--

>BmorOR1

-----MLLSFKDDSRSPDIQKPQNFQYMKILRFNLKIICAWPEKQLNEI----  
GHSIHRVILPIQSVVCLACGILYIH--FHFNE-IPFFILASTFITVMMNLAT--CSTALVMLFER-  
-YLVLTGRFITVMHLFNFQK---NSDYAYKLCTFVNRMSh-  
FYTLYVLFSMFMGLGLFNLLPLYNNYVSGAFSDPYGPNVTFFHHSVYF-AFPFDY-  
SHNFRGYIIMALFNSYVSVTCSIGLVMFDLLMCLMVMHVWGHLLKILSHNLINFRPV----  
ITTPNGPTNVETYTEESKEVFARLRECIKHGYGTVDDFANDMSETFGVILLVYYGFHQVS  
LCMLLLECSDL--STKAMLRYGPLTLIMIQQLIQISIFELLGSAVRIPDAVYQLPWE--  
CMDVKNRRVVYGFLLRRTQNPVRFKAMGMLDVGVTMASILKTSISYFVMLRTVA

>SlitOR13

-----MDIKLSSVKIFSDGSDLEGIEKVEDILYLRILKKIMWVIDGWPKEAHKS-----  
QFFRYIICILDMVSLIPGTLYLK--INTGK-IPSFELGHTYITVFMNAIA----  
ALRTVLVLTRNYNEIIFYLKEVHLFNFR---KSKYAYETHILVHKISH-  
FFTMYVFMLMCCGILLFNLTPYNSYAAGMFRDEPPPNATFDHAVYF-ALPFDT-  
STSFKGYAIVSLYNWYICITCSTYFCIIDLTFIMVFHLWGHMRVLSYNLENFPKPA----  
NDAHAYTACENKYNEEELVEVFIRLRDCIQIHSLVINFSMMADSFGWTLLVYLFFHQVS  
GCLLLECSQL--DTAALARYGPLTHIFQQLIQLSVIFELIGSSNDRILDSVYSVPWE--  
YMDTANRKNVFMRLRQSQRSMNLKACSMITVGVQTMIAILKTSFSYFVMLRTVA

>HvirOR13

-----MKILSDGSDLEGVEKVEDIFYINLARKSMWILDSWP-KAFNAS-----  
SKYRYFVLALNVATLIGGAIYLR--NNTGV-LSSFELGHTYITVFMNCIT--CSRCLMILSKD-  
-YNHVMTLFLVQKIHLFHHKH---KSDYAYLTHIFIHKISH-

FYTVYLLGLALNGLFLFNMIPFYNCYSRGMFRDVIPANATYDHAVFY-SVPFDY-  
TTKFKGYLAMTSFNVFISYTCTSYFCVVDLTISLVIFHLWGHMRLLTYHLANFKKPS----  
NDNNKDEIKDHSYTEEELKEVFSKLREYIQHHNLILEFSSEMSNAFGPALLAYMVFHQVS  
GCILLECSQL--DTKTLVRYGPLTIVIFQQLIQISVIFELLGSSNDKLIDGVYLPWE--  
YMDTKNRKL VFTMLRQSHRSINLTMMSMVTVGVQTM TAILKTSFSYFVMLKTVA

>BmorOR4

-----  
FKIIKNIIVENDALKQVEKPQEFQYMKWVQYHLKYIDGWPNNMDMNKKNVSKIRFHKRH  
LLVVEQTITFLSQMFYIV--KNYGK-LSFFEIGHSYITALMTIVI--FSRSVVTALGR--  
YRKIARYFVSSLHLYHYKD---ISEYALQTHLLVHRLSH-  
YYTVYLISLVVTGMLLFNITPLYNNISSGVFNSPRPENMTFQHAVYL-GLPFDY-  
TTDIKGYFVVFILNWHLSHIAASYFCTFDLFLSLLILHLWGHLRIILNNLKTFFKP-----  
YTNSMYTEENQVVLLKLQECIRYHNFIISFTVMMSNVYDVVIIVYYLFHQVTGCLLLL  
QCSTL--DWESLSRYGPLTLIIFQQLIQVSMIFEILGFLSDKLPNAVYSIPWE--  
AMNVTNRKL VQVLLQKSQKPIQFKAMNMMSVGVQTMASIIKTSISYFIMLRTIA

>BmorOR9

-----MVARRPLQFHQGRNVDNVEDFKYVKWLRNHLKTVDAWPVHHSKR----  
K-IQKRYVLPIFSAACFISQTVYLK--NGIGT-LSFVVLVHSYICFLINGSC----  
LCRGILIATERYKRLATCYLKTVHLFHHKN---RSEHAMKIHVIVHRLSH-  
YYTIYLISLVFVGMVLFNFMPYNNINSGAFKSPRPENVTFQHAMYL-ALPFDY-  
TTNIKGYFVVFILNWIYISLVTTSHFCTFDLFLSLLILHLWGHLRIILNNLKTFFKP-----  
VPGSSFKFTIEQNRKIYLLQECIRHHQFTIDFTNEMSSTFGLVILFYFFYQVSGCLLLAC  
SQM--DIESLSRFGPMTFILFQQLIQLSIVFELISSLSENLPNAVYNVPWE--  
FMDKNNRKMIQVLLQSQKLIQFKATSMNMVGVQAMATILKTSVSYFIMLRTMY

>SlitOR6

-----  
MGLKKFLFEDES VQGITA PTDYLYVKLLRMTLRHATWPQTELGEKEPVYLVNVLKYFYLV  
VATIGCQIGSYCYLRTYSDEL---MMEAGHNYIMIMMTFID--ISRITSLTFSTE-  
YRKLCKEFFT KMHLFYFKD---ISEHAMETHKRVHLISH-  
LFTLWLLFQMLFGVPLFNLVPMYYNYAAGRYKPGGTQNSTFEHSMYY-QYPFDT-  
LTEIKGYIVANIINWILSSLCVIWFCMCDLILLMVFNWGHRLMLTYTLNNFPRPI----  
TIDGGLTVTSAIYSDEENVQIFRKLKECVDYHRRIVEFNSKVSDVFGPMLIYYLYHQTS  
CLLLECSQM--TAPVLMRYLPLTIVCTQQLIQLSVIFELIGTQSEKLPSAVYSVPWE--  
CMSISNKKFVIFFLMNVKEPIAVKPLGIANVSVTTMASILRTSLSYFTFLRSI-

>SlitOR16

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MYIKIVRFMLVIVGSWPRREIGEPEPRYQTIMLKLFFFSVVNAALYGSISYVYMHTSELS--  
-FLEIGHMYIVILMTAND--MPRVFTLTLSQK-YRDLAKEFLTKIHLFYFKD---  
HSPYAMLTHKKVHLVCH-  
LVSLCLLSQMLTGLSLFNLPMTNYSSGRYASGGTQNSTFEHSMYF-SYPFNT-

STDFNGYVVACIFHWLLSYFCSTQFVMFDLFLSIMVFHLWGHFKILINSLNNFPKPF----  
ELEGGININAEKYSKEELVKVSEKLKECIDYHREIIQFKKAMSDVFGPMLFCYYVFHQTS  
GCLLLECSQM--TAQALIRFLPLTIILTQQLIQLSIIFELVGSESEKLKDAVYGVPWE--  
CMDVSNRKVVAFFLMNVQEPVHIKALGVANVGVTSMAILKTSLSYFTFLRSM-

>HvirOR16

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MGLRQQLFENEAVEGINTASDYLYIKILRFTLVIVNSWPRKEIGEPESRLSAFAKYFYFLFL  
TVLAAIGSIAYVAVHNRELT---FLETGHMYIVVLMSLVD--VSRVATLTMSTT-  
YREVARDFLTkiHLfyykd---RSKHAMETHRAVHKISH-  
LFTLWLVGQMLSGLSLFLNIPMYSNYAAGRYSGDVSKNSTFEHSLYY-SYPFDT-  
STDIRGYSIACVIHWVLSYLCSTWFCMFDLFLSLMVFHLWGHFKILINTLNDFFPRP-----  
SSKVEGAQFSDEELVDVAARLKDCIVYHREITLFTDRMSNVFGPMLFVYYSFHQASGCL  
LLECSQM--TAQALMRYVPLTIILTQQLIQLSVIFELVGSESDKLKHAVYGLPWE--  
CMDVKNRRVVLIFLANTQEPVHVkamgvANVGVTSMAILKTSMSYFTFLRSM-

>HvirOR6

-----  
MNLrkFLFENEAVEGINSPADYLYTRILRFNLDfirtWPRKELGEPENLAFTVFMQYFYLI  
LNIVTVMGSTSYIVVRGSELS---FIEAGLMYLIFLIGIVD--TLTVVCLTFSEK-  
FRVLAKDFTLTKHlFyykd---RSKHAMEIHKKIHLISH-  
LFSLWILFQMLSGLSLFLNIIPMYSNLAAGKYRKGGQLQNSTFEHSLYY-LYPFNT-  
STDITGYIIACILHWIISYLCSCWFCINLFLSLLVFNLWGHFKILISTLNEFPRPS----  
SKSVDTQESPYKYTEEELIEVAEKLKDCINYHREIKIFTNRMSDVFGPMLFIYYAFHQASG  
CLLLECSQM--TARALMRYLPLTIIMLQQLIQLSVIFELVGTESEKLKDAVYGVPWD--  
CMDTKNRKVVMFFLMNVQEPVHVkamGLANVGVTTMASILKTSLSYFTFLLSQT

>HvirOR14

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MTGIRDFFFNYEAKDGVTPNPTEYPYMIMSRHLLTVITCWPKKPKegLNARAWVIVQKIF  
HMSLCLLTTLGMAMYIG--LHKKS-MSFLELGHLyISLLMTVVI--FSRITTLClnPK-  
YRAVSTeFLTKiHLfyykd---DSEFSMQIHkQVHKISH-  
LFTLYLTGQMIAGLSLFLNLTpMYNNFSAGKYKKGGLKNSTFEHSLYY-SYPFNA-  
SSDVGGYIVSNICDWIISYLCSTWFCTLDLFLSIMVFHVWGHFKILLHDLDHFPRPK----  
LDNSNITLTSEKFSSIELGQVSEKLKKCIEYHRKIVSFTDEMSEVFGPMLFVYYGFHQTSg  
CLLLECSQM--TVAALVCYLPLTIMLFQQLIQLSIIFELVGSVSDKLKDAVYSLPWE--  
AMDIKNKKTVAIFLMNVQEPVHVkaLGLAEVGVTSMTAILKTSMSYFTFLRSK-

>HvirOR15

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MTGFRDFVFNYQPKDGITNPVDYPYLIiARYLLTFISMWPKKSVVYHSARAWLWVQKFY  
HLLLCaVAFFGGVLYITLHKKSMT---FYELGHLyISLLMMACT--FSRITTLCFNDE-  
YRVVAKDFVTkiHLffYkN---RSDYSMQIHKKVHMISH-  
VFTLYLSGQMMLGLFLFNVTpMYNNYSAGKYKSGGLKNSTYEHSLYF-SWPFNA-

STDMRGYIVSNILNWMLSYTCSSWFCVIDFFLSLMVFHIWGHFKILLHDLDFRPS----  
VIEDSITITNEMYSQTELDQVFDRLGKCIDYHREIVSFTDKMSEVFGPMLFAYYGFHQAS  
GCLLLECSQM--TVAALVRYLPLTHLFQQLIQMSIIFELVGSVTDKLRDAVYGLPWE--  
AMDTKNRKTVAFFLMNVQEPVHVKAALGLAEVGVTSMTAILKTSMSYFAFLRSM-

>MsexOR1

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MIFMDDPLSKSIKDPRDYRYMKLFRSTLRLIGSWPGRDLKEEGATKYEIAPLYWVLVIKI  
TCFLLTIIYLI--ENTNK-LGFFEIGHVYITVFMTMIT--LSRSITLSLNPK-  
YRRVMTKYITKMHLFYFKD---MSDIALKTHIRVHKLSH-  
FFTMYLSTQVVLGTVTFNIVPMYNNYKVGRFENNILVNDSYELSIYF-KTPTKF-  
LSTLNGYIAITTFNWWYSSYICSNFFCMFDLALSLIFTVSGHFKILIHNLNNFPLPS----  
KVLKTDEIQAPLYNKTEKKDITLRLKQCIDYHREVLEFTQDISEAFGPMLFVYYLFHQVS  
GCLLLECSQM--  
DAAALMRYGLLTAVLFQQLIQLSVVSVGTVTGYLKDAVYNVPWE--  
YMDTQDRKTVCFILMNVQEPVHINALGLAKVGVQAMAGILKTSFSYFAFLRT--

>BmorOR3

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MIFVDDAVIGIKDPREYRHLRVLRTSLRLLGAWPGHYLGEETGSKYECAPMFLMFIIKIA  
CLYLTIVYLRNNADVLG---FFELGHVYLTIFMTFVT--LSRGFSLTWNPN-  
YHKVVKKFITEMHLLYFKD---NSEYAMKTHRRVHKISH-  
FYTVFLKVQMIAGLTLFNVIPMYNNYRQGNYSRDRPANITYDLSIY--YETFDI-  
LNTPNGYIFICVFNWFASYICCSFFCSFDLILSLMISTVSGHFRILIHNLTLFPLPG---  
NRSEFVLEEAKLYSPAEMWQVTDRLRQCIDYHRKLVFTGDISEAFGPMLFVYYLFHQV  
SGCLLLECSQL--NTAALVRYGVLTVVLYQQLIQLSVIVESVGTVTGRLKDAVYEVNVPWE-  
-YMDTSNRKTVAIFLMNVQEPLHVNALGLAKVGVQSMAILKTSFSYFTFLRTVS

>SlitOR11

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MFNLDTYAGDAVVGISGPM DYKYMKVLRFLVLRISGWPGKALGEKTLKIEGMGHAYYN  
TILSLIYLALGIAYLKKNAHRFG---FLELGQLYIVLLMNMLS--TSRAFTLCLSEK-  
YRTVAKIFIQKVHLFYFKD---KSDYAMSIHVTVHRISY-  
FAAIYVSIMLSIAACFLNIPMYNNYAANFASFDNLQNKTYEQAISC-LYPWNF-  
ETNFKGYLVATLSGWYGTVLCGSSVSMFDLFLCLMIFNLWGHFKILIYNLDHFPRPG----  
EERSGRVIGSEMYSESELEEVAIKLKDCIQYHMLIVNFTNNMSDAFGMALFIYYSFHQITG  
CLLLECSQM--TAAALSRYLPLTIIMFGELVLLSIIFETIGTMSEKLDVYKMPWE--  
YMDTKNRRTVLIFLIKVQEPHVKAGGLVDVGVTTMASILKTSFSYFAFLRTF-

>HvirOR11

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MHLAGNAVGTGITGPM DYKYMKVLRFLVLRISGWPGKALGEKTLRIEGMGHAYYNTILSL  
VYLALGIAYLKKNFHRFD---FLELGQLYIVLLMNMLS--TSRAFTLCLSQK-  
YREVAKIFIQKIHLFYFKE---KSDYAMKIHVIVHKISF-

ISAVYLSVLLFIAAVMFNLP MYNNYSARYSSFDNLENTTYEQ AISC-LYPWNF-  
ETNFNGYL VATLSGWYGTMLCGSSVSMFDLFLCLMIFNLWGHFKILIHNL EHFPRPG----  
AERSGRIIGSEMY SQAELEQVAVLLRECIQYHMLIFDFTNNMSDAFGMALFIYYSFHQITG  
CLLLLECSQM--TAAALTRYLPLTIIMFGELVLLSIIFETIGTMSEKLKDAVYKVPWE--  
YMDTKNRRTLIFL-----

>CpomOR4

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MSLKSRVWEKLKKKFDDGEVDSPLKYTYVKQVSCLMSSVGAWPHRQFGRQKLHTLLSI  
YNLGLHGV CAGMFILGLLYWR--QRRHN-MSFFDSGHIFLCMLFDLLV----  
LLRFMVTQTTKYQETIKAFLLEFHLFYFKD---RSPYAAKVHTQVHTISG-  
MFSFYVICQMAHGMA LFVLMPCYSNLRKGMF GKNR PENSTFENSAYY-YLP-  
DACYTTLRGYWILLAFNAFSSYIITIGLFEFDLMISMMVFQIWGHLKILKNSLLTMPLP-----  
-----  
VNSKDGLYSPEENIKIKALLKEIIEHHTLIKFVDGCSNTFSEYLF TFYLFMQFITCILLLEVS  
SF--TADALGKYGPLTIGMHQQLIQVSILFEVLNTKSNELIDAMTQIPWE--  
HMNTSNRRTVLFLICRIQIPVSLKAGGMVPVGVNTMQAVLKGSVTYYMMLKAFA

>BmorOR7

-----MLLYHPNTQVEEKVNNVEEFTYMKFLKSFCCKIMDFWPEREEKNS----  
KTRIFRLRYILVLQFCFTLVAGVLYLKNNFGK-KTFYDLGHTIITVVMNVVS--  
VSRLILRCFKK--YDVVGQQFINKIHL YHFRN---DSEYSMKTYKAVHKISN-  
NMTYIFSFSIFVCVVTFNLPVFNNIGSGAYKNRPNVTLQQCVYY-ALPFDY-  
TGDFKWYMLVAIFNVQKTFFCTSLFILFDLLSMMIHLWGHIRIFIHNLNHIPAP-----  
RNSLEYTREERQEVDNTLKKCIQHHTLIIGFVRIMSETYGLAVLIYYAFQQVVGCLLLQ  
CSRL--DLKTITRFGFLT TMVNQQLIQISVIFELLGYMNDKLQEAVYCV PWE--  
YMDTSHRKMVYMMFRQSQIPLQLKAMNMLSIGVKTMASILKTSVTYYLMLKTIT

>BmorOR5

-----MLLYYPNTQVKEKVNNVEEFTYMKFLKSFCCKIMDFWPEREEKNS----  
KTRIFRLRYILVLQFCFTLVAGVLYLKNSVGK-QTFYDLGHTIITVLMNVVS----  
SRLILRCFKK-YDVVGQQFINKIHL YHYRN---DSEYAMKIHTVVHKISH-  
NMTYIFSFCIIFGTVTFNLTPIFNNIGSGAYKNRPNVTLQQCVYY-ALPFDY-  
TGNFKWYLLVAIFNVQKTFFCTSLFILFELSLSLMIICLWGHLRIFIHNLNHIPAP-----  
RNSFEYTKEERQEVDLTLKKCIQHHTLIIGFVRIMSETYGLAVLIYYAFQQVVGCLLLQ  
CSQM--ELKTVTRFGFLT VLNQQLIQISVIFELLGYMSDKLQDAVYCV PWE--  
YMDTCHRKMVYMMFRQSQIPLQLKAMNMLSIGVKTMVSILKTSVTYYLILKT--

>MsexOR4

-----MKFFVDGSEIAHITKPQDIQYMQMLKFFTNSLAGWP IEAVEGI---  
KNFYWRNGLVVIAYAYFFGQVFYIY--RYIND-YTFLVMGHSYITVLMTIVT--  
IARHTLPYFKC--YDDTTADFVHNIHLFNRYN---KPGYYKEFHLKIHKISH-  
AFSVYLC TLLVTGPSMFNGIPLYNNYASGAFSFRSPNVTYEQAVSL-LLPFDD-  
TNNFKGYFVVFLANCCVSYISSCCLCIYDLLLSLMVFHLWGHLKILTKTLDNFPKPP----

QAIEADPNKSLKFSDEELKVIHKKLGECVAHHQLISNFSTRMSNTFGLSLFIYYGFHQLSG  
CLLLLECAQL--EAAAIICYGPLTLVVFQQLIQLSFIFELIGTVNEGLTDSVYCLPWE--  
AMDQGNKKIVFTFLRQSQKSMNLKALNMLSIGVQTMAKILKTTMTYFLMLQTIA

>HmelOR10

-----KEISSPMDLRYMKRIKFHLHFMGGWPLNELYDAYREN--  
RHFkFLLVF-WSTIFINSLFYLK--FNLNK-LDFFKLgQVYIVIFMTAVA--LS-----  
LLPVFITILN-----SQVHKEVHKVLE-  
YLTTWILIELYVGTSSFHlPLYNNIRSTVNDRNVNNGTIYEYAMYF-YIPYEQ---  
NNIIFIFIFVISLILIFDIGSAFCTYDLLMSTIIHVWGHlKILIHhLENFPRPE----  
ADKYGNKENDFRYNKKESRVIFDMLKENIEHHKLIMGFMNSVSIAGVMMFVYYIFHQI  
TGCILLLEISAL--NAEAFVTYGLLTAFMYQQLIQTSFIFELIGSKSEVIKEAVYGLPWE--  
CMDVKNKKIVLFFLYNVQAPIRLNAMGLIavgVQTATAV---SIK-----

>HmelOR11

-----MFNSNSIIHFLFRNEEISSPMDIKYMKIIKRHLHIMGGWPFNELYEEPky-  
IPLRNYKFLVVFFTAILLNCLYYLKLHIKRLD---FFKLgQIYIVLFMNVVG----  
LVSFFFSINNEVNKILK-----  
YFTTWILLELFTGIAAFHVIPLYNNIQSSASDHSLENGTLYEHAiYH-YMPFEE---  
NNIYAIIFILNMLTFDGASSFCIYDLLMSIILHVWGHfKILKHhLENLPRPK---  
AERSEGKANGIMYSKKESQKIFNMLKENIEHHKLIMEFMDSVLSAFGIMMCVYYLFHQV  
SGCILLLEMSAL--NTEAFVSYSLMTLVMFQQLIQTSVVFELIGSKSEVLKDAVYGVPWE--  
CMDEKNRKIVLFFLYNVQTPISLRAMGLTVGVQTAAT-----

>MsexOR15

-----MLYIY--TRWNN-  
IAFSTHGtIFTIVPITFLI---LTKVLSAQKESYRRlMKtFLQEIHLCNFG----  
SNSYMKQRAVEVEKYSR-YLATFFFVFLVVYRALWTIVPIVFNLKN--  
SKAIENKEIPLKTCFYM-WLPFDY-  
EHEYKYWVITHIANSTLIALGCIVVTSYDTINYSIVFHLIGHIKSLKHlIKTNISQ-----  
----NLSDDETKRGLVEVIRYHCFVLKIFGEIERAFGINVTGNYLYNLIADSLlYHLMLG--  
DKENKLMyGVMLLVFMGGLIVMTLILEEVRRTFDIPQTVYDMPWE--  
KMSVSNQKIVVIMLARTQPTLEYKSAGGLKAGVNPTIQIiKSTFSYYVMLKSSL

>HmelOR5

-----QPPLNQMFYRIIANMMSISTVGNRTNWGYKtYPK-----  
MYVIMNIVAIIFAPTVIVSqvAYLCVNFTKLD---FEILIIAFSILPSTVLA----  
NVDIFSSKTKTNISLSRNLLSKIHLyNIYKNDTNDEFKLIFVEKSIRISS----  
YYLICFCGTNWLswVTMPVYNnyHD--KEAVLNHTVQLQTCIFL-WLPYDY-  
RYDFNNWIIvHTINSYIIIFAGASAIMTYQVIFYTLTYNLIGHIEILRNKIKTEfKE-----  
----DLTDDQAHSKLVEIKYHDFICQVFEDLQTAfgVNVAANYLENLVSNSILLFQIMYG--  
GKEKIFQYlAMGMAYTGgPIISIVIDELRRRTYNLSELLYSIPWE--  
DMSVPNQKIVLLVLQKMqIVMDFKAFGGISAGVAPMISVSTIKYNESLCLFGMC

>HmelOR7

-----MDLFFLRQPPLNQMFYRVIANMMSISTVGNRTNWDGYKTYPK-----  
IYVLINIVAIIFAPTIVVSQVAYITINFTKLD---FEILIIAFSVLPSTIVA----  
NVDIFCSKTKTYLNLSRDLLSKIHLNYIYKYNKNDEFIKKKLIFTEKSTR-  
ISSYYFIGFCLTNWLSWITMPIFNNYRN--KEAILNHTVQLQTCVYL-WLPCDY-  
RYDFNWNWIIVHTMNSYVIFAGASAIMIYQAIFYTFTYNLIAHIEILKEKINTEFKE-----  
-----  
DLTDHQVHAKLVEIIKYHNFIWQVFEDLQTAFGINVAANYLQSLVSNILLSFQVMYG--  
GKENLVQYITMVMAYAGGPILLSIVIEELRRRTYDLSDLLYAIPWQ--  
NMSVNPQKIVLLVLQKMQIVMDFKAFGGISAGVAPMISVSISIKKYYESLCFSG

>HmelOR6

-----QPPFNQKFYRFIANMMSITTVGNRTNWDGYKTYPK-----  
IYVFINIVAIIFAPAVMVSEIAYLCVNFTKLD---FEILIIAFSIFPYIFSS-----  
KTETYIRLSRSLLSKIHIYNIYKYN-KNEFMKKKLIFVEKSIR-  
ISSYYLICFYTSNWVSWILMPIYNNYKN--KEAVLNHTVQLETCVYL-WLPYDY-  
RYDFNVWIFVHTINTYIIFAGAYAIMIYQIIFYILTYNLIGHIEIFKNKLKTEFNE-----  
----DLTDEQVHFRLVEIIKYHNFTV--FEDLQTTFGLNVAANYLENLVGNGLLLFQLKYG--  
GKDKLLQYIAMGMTYTGGPIIMSIVIEDLRRRTLNLSELLYAIPWE--  
NMSIPNQKIVLLVLQKMQIVMDFKAFGGISAGVAPMISV-SI-----

>BmorOR6

-----MKEEYYLQHPRTQLFYKVLAVSTIESTIDLTWWGYTFPKYVGW--  
FYHLQCNVVRFLFGKCVVVSQILFIILNYQTID---KSVFIITITPLGALV----  
GIKAESAKAECYVNLMMKNFMDKVHIHSIYRKNENNEFVKKKVIQIERVSR-  
FTAYFLVILIAINCLSWMLKPTLHNIKH---FEEIMNSMEFQYYIYF-WTPLDY-  
KYNLRDYIIHITLCIYLGATAVTVIVTFDIFNFIAVFHVVAHIQILKNNVKSNSWD-----  
-----DFNESEKKGYLVSILEYHAYIIRIFGEVQSAFGLNVASNYLQNLIEDGLFLYQIMNG-  
-EKENVLMYGLMIILYLGGLIFLSIVLEEIRRNQYDLCEYVYALPWE--  
GMSLENQKIFVVFLQRTQPDLEFETVCGMKAGVKPAFSIVKSMFSYYVMINSRF

>DpleOR22

-----MPWNVEVLLRTLTISSYRRLNKPISWI-----  
LTTLSGLFYIYSYVISPVWFLMVKS--RETGD---FTAAIVELSLSMCSLTC--  
VPKIFYMKYYSSSTVMDLIDEYLR-----CNELIVKGTRFEKNFLKNMKTVK-  
KQATVTWAVSMLNSATYLTVPLLRPGRH-----FTQDMYV-IYGLEP-  
MLESNPFEIATFMMVLSIIFALKVIVYITLFFVIVIIGFLESQMLALSVELTNIWEDY----  
NYYILQHNESGDEYEVNRNVFVTNRLRDILKFHIMNINLRNKVEKELRFIFVIDFIFMMLGL  
VTELLGLDNT-----LFQFSFT---LGIVFIDCCIGQRLIDASIAFETAVIDYCKWE--  
NFNLSNQKTVLFMLQCSQKTMTLTAAGIAVLNFIFLMSVLKSTYSAYTTLASFT

>DpleOR20



-----MMWNVEVLLRRTL TIRSNRRFDKPIPWIYYVIN-----  
ISTGLCYFYTYMLSTAWFVLVRC--RETGD---FISAMVALSLTMCSITC--  
IPKIFYMKYYQNTVMDLVDNYLH-----CNELIVSGTRFEKNFFANMRTVK-  
KQATIAWVILTLNGVVFVTL PFLRPGRH-----FSQDLFA-LYGLDP-  
MVESPNYEKASILLTLAVYFSLTVMVHITLFIIVIIGFLESQMLALSVELSNIWEDY----  
NYYVLHHNESITKYELRNLFIKNRLRDIVKFQIMIVSLRNKVEKELRFIFVND FIFMIFALV  
SELVGLENT-----MVQMPFT---FGMVFIDCFIQRLIDASKAFERAAYGSKWE--  
NFNLSNQKT VLFMLQCSQKTMTL TAGGIAVLDFIYLM SVLKSTYSAYTTLKSSA

>DpleOR19

-----MFVCEMVARSGLLG--  
LFDED-LVYFDAPHYSPATLFP SQL--EAGMTLKVYRLEAVMDLVDEYLN-----  
CNELIVKGTRFEKNFFT NMRIIK-KQATVSWFVLTLSAIFASLPFMRPGRH-----  
LTQDL-YVMY---  
MMESPNYEIAAILTVSSVYFAVTIIH LTLFIIVIIGFLESQMLALSVELTNIWEDY----  
NYYILQHNE SGDEYEV RN VFVTNRLRDILKFHIMNINLRNKVEKELRFIFVIDFIFMMLGL  
VTELLGLDNT-----LFQFSFT---LGIVFIDCCIGQRLIDASIAFETA VYDCKWE--  
NFNLSNQKT VLFMLQCSQKTMTL TAAGIAVLNFIFLMSVLKSTYSAYTTLAS--

>DpleOR35giEHJ75373.1|

-----MMWNVEVLLRRTL TIRSNRRFDKPIPWIYYVIN-----  
ISTGLCYFYTYMLSTAWFVLVRC--RETGD---FISAMVALSLTMCSITC--  
IPKIFYMKYYQNTVMDLVDNYLH-----CNELIVSGTRFEKNFFANMRTVK-  
KQATIAWVILTLNGVVFVTL PFLRPGRH-----FSQDLFA-LYGLDP-  
MVESPNYEKASILLTLAVYFSLTVMVHITLFIIVIIGFLESQMLALSVELSNIWEDSKKFYN  
YYVLHHNESITKYELRNLFIKNRLRDIVKFQIMIVSLRNKVEKELRFIFVND FIFMIFALVS  
ELVG GLEN-----TMVQMPFT---FGMVFIDCFIQRLIDASKAFERAAYGSKWE--  
NFNLSNQKT VLFMLQCSQKTMTL TAGGIAVLDFIYLM SVLKSTYSAYTTLKSSA

>MsexOR50giAFL70813.1|

WTGIRKFGLEYCDLPTMLWNVAFLLRPLTLNIDSRHKKPIPLL FYVLT-----  
VVITSSYFYVYLISMSWFVFVRS--LETKE---LIPAMVVLSLGISSEIG--  
TLKFFYTFVYIDKVRKIVDEYLE-----CDALVVPFSRFSKNLLTTLR FVK-  
KRAIIYWLVIIGNGFAYWSKPLFMKGRH-----HLEDNLV-IYGLEP-  
MLES PKYEIA YFLMTAGVCFICYPPANVTILLIVVVGYTEAQMLALSEEILNIWDDANDH  
YNNLPSTNQNTN---  
ELKSKIINKYIKDRLKDITKSHARNINLLRQVEFVFRGAIAIGYVFLILGLIAELLG--  
GLENTFLQIPFA---FIQVAIDCFTGQRVMDANIVFETA VYDCKWE--  
NFDKTNMKT VLLLLQNSQKT L TLSAGGXTMLNFKCLMSVIKSIYSAYTTLRT--

>Bany\_OR2\_GZKG99Z02DT2MR

-----AMAAA--  
VSLTSCNVTC--ITKFLFMIIHVTHIRDITEKYVK-----FDSQFEPESRFAVDLRTHLRVVK-  
SRALYIWTVLVVNCIVFVLIPLLRPGRH-----VTEEMYI-LYGLEP-

MLESPNYEVVHTVSAISVGFCVYIMVNVAVYVIVIIGYNESQMYTSLSEVRSLWDDSQN  
FYNNIKHKINNKVYGSYIKDTMVNEYIRIRLKQIVGYHVANIHLFHALNNEFLIILAIEYTL  
LSIAIIGELLG--GLENTYLQVPYT---VVQIYMDCLAGQRLIDACNEFEFAVYDCQWE--  
NFNASNQKTVLLMLVLSQKTLMLSAGGMANLNIECLMKILRSAYSAYTALKSSL

>DpleOR21

-----MTVSKSPVSGY-----LNKMYQYTENIF----  
PETGD---IRRAAVELSLATASGTC--VAQFLYMKLCSNRLMDIVDEYLS-----  
CDKLVSRRGTRFEKNLSWKLREIK-KRALVWVWVLIGNAALYVTVPIFIPGRH-----  
FTEDLFV-LYGLDP-  
MVESPNYEKASILLTLAVYFSLTVMVHITLFIIVIIGFLESQMLALSVELSNIWEDY----  
NYYVLHHNESITKYELRNLFIKNRLRDIVKFQIMIVSLRNKVEKELRFIFVNDFIFMIFALV  
SELVGLENT-----MIQMPFT---FGMVFIDCFIQRLIDASKAFERAAYGSKWE--  
NFNLSNQKTKYEVLGNNTEDLHLVCYRNVQNSRKNSNEDDGE-----

>DpleOR28

-----MNVLRKLRKFGL-----DYYDMQMML-----  
WN-----IEVLFRRAFTINIRKETG-----QRNSIRDLVEKCLQ-----  
CNKLIVKGTRFETNFLASLKDVK-RKAIMLWSGFAINGVVYILAPFLKTGRH-----  
FPQDLIV-IYGLEP-  
MYESSNYEIAMMLFMASSYFSLFIITYVSLLMIVIVGFVESQMLALSEELENLWDDY----  
NDYKFDEESERKENVIRNLFIKMRLSDIVKFHIMNINLRKEIKDKMLFIFFNDFIFMAFAM  
VAELVGLQNT-----AVQIPFT---FGMVCFCDCYVGQRLLDAAATFEEAVYSCQWG--  
NFNVSNRKTVFLMLLCGRAMTSLSAGGMSVLDYSFLMAVLRSTYSAYTTLKSTE

>DpleOR16

-----ISWIFYFLI-----  
FSSCACYTSAYIFNAIWVVFVRC--VETND---FITAMVALSLTTCSASC--  
VIKFFYMKLFKNQLMGLVDEYLY-----SDTLVERSTRFASNRLQNLRLVK-  
RRAIIVWTILISNAIIYVIEPLLRPGRH-----FTADLYV-IYGLEP-  
MFESPNYEIIYVIEAASIYFSVWTTVHLTLLIFVVLGCIEAQLLALSEELNNIWED-----  
SYKYYKQENRNEYFIRNTFLRRRLRDIVRFHIVNIHLRRIVDKVTRFIFGVDCAFMILAIV  
TELVGLENT-----FVQFPFT---IGIVFIECFIQKLIDASIVFEKSVYSCKWQ--  
NFDVSNQKTVFCMLQTSQNTLSLSAGGVAVLNLAFFMFVLRRTTYSAYTTLKSS-

>DpleOR17

-----  
MGASNSAIERRTHGYCCLHAARGAPNLAksYRALTTKPRYFILKSTFTSSCACYTSAYIF  
NAIWVVFVRCVETN--DFITAMVALSLTTCSASC--VIKFFYMKLFKNQLMGLVDEYLY----  
--SDTLVERSTRFANNRLQNLRLVK-RRAIIVWTILISNAIIYVIEPLLRPGRH-----  
FTADLYV-IYM-----  
FESPNYEIIYVIEAASIYFSVWTTVHLTLLIFVVLGCIEAQLLALSEELNNIWED-----  
SYKYYKQENRNERNTFLRRRLRDIVRFHIVNIHLRRIVDKVTRFIFGVDCAFMILAIVTE

LVGLENT-----FVQFPFT---IGIVFIECFIGQKLIDASIVFEKSVYSCKWQ--  
NFDVSNQKTVFCMLQTSQNTLSLSAGGVAVLNLAFFMFVLRTTYSAYTTLKSS-

>DpleOR18

-----NDTQPVSVALYLII-----  
TICSSCYFFAYVVNLVWFVLVRC--VETGD---FITAMVALSLTFCSGTC--  
LAKFLYMKMYTNTVMNLVDEYRL-----CDKLLVSYTRFAMNRMNNLRIIK-  
KRAITVWLVLVTNAVYLLTPLLSPGRH-----FAEDLYV-LYGLEP-  
SFETPNYQIIFAIEAASIFFSISTTVHITVFHIVVGCIEAQLLALSEELENMWED-----  
---SAKFYDRK-----TVMKLID-----DYLHCNLVVRGTRFE-----  
TNTIAIVFIDCFIGQKLIDASDVFEISSYIGCRWE--  
NFDVHNQKTVLFMLKNSQKTLYLSAGGIAVLNMSCLMCIFRTTYSAYTTLQ---

>HmelOR40

-----MGIFGNLGLDHSDLRTLIENTIGILFRGLTINIDQNNIRPIPWIIYI--  
FNVVAGTFYIYVYILSMIWFVLFRC--PECGD---ITICFLEVSLGMCSASA---  
IHKFFYIKLTTVRKLIYEYIK-----YDRLVLPETRFADNIKKHLRIVK-  
RRALIIWITFMVNGTIYIIMPFLMPGRH-----LTEDLYV-IYGLEP-  
MLESPNYEIAATMLMIPAIHGVFSLAVIVAFMVVIVGYIEAQMMLALSEELLNLRQDF----  
CEKVTRQNNSLSTIAIQNFIKRNLRDIIRFHIMNIKLNNVENKFRIIYIEFIFLFFAIVAELL  
GLENT-----YVQLPYT---FDQIFLDCLIGQRLLDASIVFEKALYSCEWE--  
NFNVANQKTVLLMLRNSQKTLTSLAGGIAVLSYPFLMHVIKSTYSAYTTLQSTV

>HmelOR35

-----MDRPALSSRPSVWTVVRKFELDHDDFTTIMENIHFMRLILTINIFNNSNSIPVISY-----  
IFVIIGSFAYFYVYILSIWMAY--FYYGN---WTAMAIVLSLFCSTS--  
FTKLIFMKLNSKNVKNLIERFLQ-----CHAQVVPGTRFCKNLQKRLKIVQ-  
QRAIIWVFGMLNGAIYVLLPFIIPGRH-----FTTDLYV-IYGLVP-  
MFESPNFEIATTLNITSIAFGIYALVSIAAYILIVVGYIESQLHALSEELSTIWEDY----  
NVSKNNCDGIGEREDIINQFIEVRLRDILQLHIANINLLHELDVELRMSLILEFSLITFAITAE  
LLGFKNT-----YLQLSYT---ILQVYMNCLAGQRLIDAGKCFEHSLSYCKWE--  
NFNVKNQKTVLIMLRMAQKTLVLSAGGIAKLDFACLMEILKSTYSAYTTLNS--

>HmelOR36

-----MIKFSFCSH--IWKRLRKFGLDYDDFPVILENVNSLLRNITIDIFKNSKPISFIFY----  
LTVIGSSLYFYVYVFSMVWLVCFNY--GRAGN---WTAVAVVLSLFCSTS--  
FTKLIVFMKINSNDIKEIIAKFLQ-----CHAQVIPGTRFANNIRKRLRIVK-  
RRATNIWLFVINGGIYVIIPFLTGRH-----FTTDIYF-IYGLVP-  
MFESPNFEIATVVNITGIGFGIYTQVTAAYVLVTVGYIESQMHALSEELQVWDDK----  
HNLKRDVNAVDNKRRLMNIFIRVRLRDITKLHIANINLLHELDKELRATLALEFTFIASFIT  
AELLGLENT-----HLQLPYT---VLQIFMDCLAGQRLIDASNNFEISLYNCKWE--  
NFSIKNRKTVLLMLRVSQRTLVLASAGGVAKLGFPCMMILRTAYSAYTTLKS--

>HmelOR38

-----MRNKERGIWGTCLKTFGLRHDDFPTIMNNVAILLRALTINIYASAKPISLILSI---  
LTLIVSFAYIYECVISMVWL VFFYY--GRTGQ---WDGICVALTLFSCVTVC--  
VTKFVYMKIFSKDVQKTVEKFHK-----CDAQVIKNTRFARNLRKRLRTVK-  
KRATLIWITLVVNGGIFMMIPYVTPGRH-----FSLDLYY-MYGLMP-  
VLESPNYEIATFINTLSSIFCSYTMVCVAIYVIVIVGYTEAQMYALGEELINWVNDK----  
HKVQDKIHIDIKDKISNDFIKIRLRDIKFHIIINIKLVQDLEEELRSTFALEFSIVAFSITVELA  
GLEHT-----YLQLPFS---LVQVFMDCLAGQCLIDACNYFEDAVYSCKWE--  
NFNIDNQKTILLMLGTSQRTLMISAGGVSKINFESLMVILKSTYSAYTTLKS--

>HmelOR33

-----IPTLYYI-----  
FTAVVITSYIYVYNISVVWYSFFYC--RTTPT-CYRLSSIIVFSLG VASSIG----  
VCKLFFMYLDKIRDIAAECLL-----CDAKTIPGSRFEINILKTMRFIK-  
KRAMIFWIVIIISNGVYFLKPLLIPGRH-----FSEDDLIVLGKC----LDP-  
VLESPNYEIAFALT TAGIFVTVYLPSNITGFLIIVTGYIEAQILALSEEIIQLWVDP----  
VHNEELPRQEKNEKAINNEFINNRLKDIVKIHIIININIFHQVEDVFRGAIAIEFTLLMISLTA  
VLLGLENT-----YMQIPFG---LMQVAVDCFTGQRVIDACVTFERAISYSCQWE--  
NFDVKNMKIVLLLLQNSMKTLKLSAGGLSTLSFPCFMSVLNSIYSAFTTLHSTL

>HmelOR34

-----  
ILFCITIIYVYMYIFSTVWYTFVYCRRTD--NRLSAIINFSGVVSSTIA--  
FCKFMFMYLFEDKVREIIAGYLV-----CDSLIVPGSQFEKNILKTMRFVK-  
KRAMIFWIVIIISNGAIYMLKPLFTPGRH-----FPEDDFI-LYRLDP-  
MFESPNYEIAIFLFSASIGLTVFLSSNITAFLLIITGYVEAQLLALSQEILQIWDDN----  
VETFEDLKQLEDQNEIDNNLIRDRLKNIVKIHVINMNLIIQQVEAVFRGAIAVEFILLFISITA  
VLLGLENT-----YLELPYS---LMQVAVDCFTGQRLIDACVNFETAVYFCKWE--  
NFDQTQNRQTVLLILHISQKTLTLSAGGLSTLSFPCLSVLNSIYSTFTTLHSAL

>HmelOR37

-----MHVIRKFGLGFTDLP TLIWNVSVLLRVITL NIDGRNRTPIPKAFHA--  
STITLISCYFYVYFVSMIYVFFYC--RRTSD---WISAIIVFSLG VASQIG--  
VCQFDCIFFFRSSVRDVVAEYLT-----CDELLIPASRFESNILKTMRHVK-  
KRALIFWIVIIISNGFVYVTKPLVIPGRH-----LPEDEFI-LLGLNP-  
VHESPNFEIAYLV TIAGVMITVYLPSNITAFLLIITGYTEAQM LALA QEMQLIWDDL----  
RGNYPIDHIKMKKLIINNF IKYRLKDVIKIHTINLKLISKVESVFRGAMAIEFTILIISLTAV  
LLGLEKT-----YLELPFA---LMQVAIDCFIQKVIDACEIFEKSVYASKWE--  
RFDKSNMTTVLVILQTAQKKMTLSAGGMITLSYPSLMAILKSIYSTFTTLRS--

>SlitOR39

-----  
----R-----  
-----  
EIEDVMRGP NAXGFLFLIVGLVAEXLGLNNT-----ILQLPFT---

LSQMGTD CFLGQKIMDANIKFEHAVYDCKWE--  
NFNQVNKKIVLVMLQNSQKTMTLTAGGMATLSFSYFILL-----

>BmorOR38

-----MNLSQSVNEQANEYVKMRLERISKIHSPLPFEDIQDFRELCCIP--  
GSITASYVYAFLISLLWFLFARC--TDPED---FQVAMVVFSLGISSEIG--  
STKFFNSIYIKELRKLFKDYLL-----YDATCPAQGRLRLHLLTTLRYVK-  
RRAIIYWLVIIGNGFIFAIKPLLVEGRH-----LAQDDLVLIGLEP-  
MRQSPNYEIAYAIMTMGVCFICYPPAHVTMFLIIIVGYTEAQMLALSEELKHLWNDK----  
HSRTEREADAAMKSKILNSFVNFRLLVQIIKSHSTNVNLIGRVENVFRGSLAVGYVFLIVGL  
IAELLGLENT-----YLQVPFA---LIQVAIDCFIQQRVNDANIDFEKAVYDCKWE--  
NFDKRNMKIVLLLLQNAQKTVSLSAGGIAKLNFSCFMSVIKSIYSAYTTLRT--

>MsexOR28

-----MAWFGFIHT-----PHTGD---  
LLAAMVVLISLGISVQIG--TLKFFYTFVYINKETNIVKYYLE-----  
CDSLIVPGGRFSGNLLRALRNK-KRAIVYWLVIINGITYVTKPMFMRGRH-----  
HMEDRYV-IYGLEP-  
MFESPNYEFAYFLMTAGLCFICYPPANVTVFLIVVVGYTEAQMLALSKELLHLWTDN----  
QHETTLINAQASKNKIINDYVRYRLKEIIMHAFNIHLVRQVEFVFRGAIAIGYVFLTLGLI  
AELLGLENT-----YLQIPFA---LIQVAVDCYTQKQVTDASLIFERAVYDCKWE--  
NFDKMNMKTVLLLLQNSQKTMTISAGGITMLNFSCLMMSVIKSIYSAYTTLRT--

>BmorOR35

-----MKLWQSIREFGLEYCDLPTTLQNVASLLRAITLNIDSRHT-ARIPFI----  
MTVVITLSYFYVFLVSMWVVFVRS--AETRD---YLAAMVVLISLGISSEIG--  
TLKFFYTFIYIKKVQRIVREYLE-----CDHMOVPESTRFADNVLTMRNVK-  
KRAILYWVVVIGNGVVYVTKPLFMSGRH-----HMEDRYI-VYGLEP-  
MFESPNYEVAYFLMMFGLCFICYPPANVTVFLIVVVGYTEAQMIALGEEMLRIWEDK----  
YHTVGALTNSSEKNKIINQYVKFRLTEIIMHTTNIQLLRQVEFVFRSAIAMGYVFLVLGL  
IAELLGLENT-----YLQIPFA---LIQVLVDCYTQKQVMDASSLFEQAVYDCKWE--  
NFDKSNMKTVLLILQNSQKSMRLSVGGITVLGFSCMMSVMKSIYSAYATLRT--

>BmorOR39

-----MLWSVFSYF-----TRADD---  
VLGIVIFSLGVSSEIG--LVKLCFMYANIDKIQKITEGYLK-----  
SDAASARNRFSKNILHTMQSVK-KRGVIFWLVIISNGVVYLVKPIVTPGRH-----  
FMEDQFI-ILGLEP-  
KYETPNYEIGFFMMAVGVCVTCYLPANITAYLITVAGYSEAQFLALGHELANLWPDA----  
QLHCRAMNLSQSVNEQANEYVKMRLRELVKIHSTNVNLLRDIEGAFRGAIAVEFLLLIGL  
IAELLGGLLENT-----YMQVPFA---LIQVSVDCLTGQRVMDANLALERAVYDCRWE--  
EFDASNRRVLLLLQNAQKVATLSAGGIATLNFSCLMMAVIKSIYSAYTTLRT--

>SlitOR36

-----MLTFHEIIHEIRKFGLEYCDLPTMLENVSILLRVLTVNIDSKYKKGITILS----  
YIVTAVTAACFYVFLFSMTWVFWWRARITGE---LVGAMVVLSLGISSEIG--  
PFKLFYMCYCMDKTHKIADGFLE-----CDANTIKGTRFHSNLMKCLRVK-  
KRAMLYWVVVAGNGVLYVMKPVAMRGRN-----LPENYFL-IYGLEP-  
MLETPNYQIAYFMMIASVFFVCYVPASVTAFLIVITGYAEAQMLALSEEMLELWSDE----  
DTSEELDVYNPKVKVIINQFVERRLREIIGRHANVINLLNQVEIVFRQAIAIGFVLLVGLLS  
ELLGKLENT-----FLQLPFA---LMQVSMDCFAGQRVMDASTMFEASVYDCKWE--  
NFDKSNMKLVLMQNAQKTM TLSAGGVRTLSFSALMSVFRGIYSAYTALRS--

>SlitOR35

-----MWNKIRKFGLEYCDLPTMIWNVAVFLKVLTLNVYGKKKTGIPFI-----  
FYIVVVVAALSYLYVYLICMVWFV--VRSRE---  
TEDLGAAMVILSLGISSEIGTKLLYMFLYIKDIRNLTDAFLD-----  
FDSHMVPGTRMYTNLLRYLRDVK-KRAIFYWAVIMGNGTLYVTMPMLRPGRH-----  
LTEDMLV-IYGLEP-  
MFESPNEYIAWFMMAASVATICYISANVTAYFIVIIGYAESQMRALSDEVTHVWKDD----  
LNYGTDLQDFDRKKMIINEHVFKNLKYIIRHATIKTLINQVEDVCSGPTAVGLTFLGLI  
SELLGGLNT-----FLQMPFV---FMQVGTDCFIGQRIMDAGEVFEWAVYDCQWE--  
NFDHKNMKMILLMLQISQKTSSISAGGMTKMSFRCLMGAMRV TY SAYTAFRSIM

>BmorOR37

-----MELGCSRHLKLPCSLHPIGISKHGNTLSELLIYFPAIPKIT----  
YAILAVLLTVYYYIYLCSITWVFWVRCPQTGD---LAAASIVFSLGVSSEIG---AIKLFIIAK--  
LRDITGEYLQ-----CEADM-APGRLRARVGRSLRTVR-  
RRAFVYWLVLVNAFAYDLMPAFLPGRH-----LSEDV FV-IYGFEP-  
MFESP NFEIASTLMGVSVVFICYTAGSISAF LIVIVGYSEATMLALSDEISCVWDD-----  
--  
ACASECQQPNDFIRARLGKIVAIHTKQIRLIREVEVVFRGALAGGFACVAGLIAALLGGLE  
NT-----FLQLPFC---VIQISVDC FVGQRLRDANVAFETA VYNCKWE--  
YFDKSNMKT VLLILQNSQKTMGLTAGGVAALDFTSLMTIFKSVYSGVSQTDD--

>CpomOR38

-----METLDKFGLAHCDLPTMMWNVAVMLRVVAVKIEGGATSIPIFF-----  
YLLATVAIVLYFFNYASMLVFVLVGCRETGD---ILAGIMVLSISMNSLIG--  
INKLFYIYRHQDKVQSLVADYVA-----YDRIA-PWPGTSALMAELMRSVK-  
KRLILFWTVTMGNAFIFNLQPLVMPSRL-----NLYDKHV-VYGLKF-  
ILGITNYP IAVNIVACTFFICYITSSIGLLIVTTGYSEGRLLALSQEMRDLWSDY----  
SENFEGDSEDKKAAKELNNYVKYRLQVIVKSHAINIDVIKKLEGIFRNAIAVEFILLTAGL  
SIDLLGLEDT-----YIILPFS---LMQVGMDCYLGQKLMDACKVFEDAIYDCKWE--  
NFDVKNRKT VLLMLKISQRTL SLSAGGVATLSFECLMAMYKAVYSAYTALRS--

>DpleOR56

-----MPESGKTKGRRFFV VHYILLRFLGLGWWHSPEENNTNN-----  
FPGIYLYYSILTEVVWVAGFVGLESMDPFIGH-KDLDRLMFSLAFV VTHDLT--

IVKLYIFFFKNQIQDIIRTLEI-----KTVRITR-  
IFTGLFIFFGWM TIGNGNVYGHQDLRWVAQLNDTSLRPFRTLPQPI-YIPWEH--  
QNDLSFIITFLLETVGLLWTGHIVMTIDTFIGSVILHMSTQFSIMQEAISTAYDR-----  
DMIVRTYCTKQEIEIALENTLKSCFRQHQMLISCVDKFASTYSYGFMTQLLSSMAAICSV  
MVQVSRDASSLKSI VTSLAFFGAMIIQLALQCFTSSELTHQAERVSEAVMCCCKWE--  
RMPVRLRRYLVLMIARSQRPLQLTAGGFATMNND CFLAILKAAYSYYAVLSQRQ

>HmelOR60

-----MSNAQSRDGPTRYFAPHYYLLRFLGLGWWHHPDENDTRN-----  
FPGWYLYYAILTQLVWVAGFVGLESIDPFIGE-KDLDRFMFSLSFVITHDLT--  
LTKLYIFYFKNDNIQDIVRTLNI-----RIQDFYQNYEKNRKTTRITKILT-  
ASFVFFGWITIGNTNIYGHQDLRWKAKVAKL NESVSKPPRTLPQPI-FIPWKY--  
ESEESYIFTFLLETVGLLWTGHIVMTIDTFIGSVILHMSSQFVILQEALITAYDRP----  
TRRNERLARAYYTDKDIETALENTLKSCIQQHQMLINC VKKFASTYSYGFMTQLLSSMA  
AICVVMVQVSQDASSFKSIATSLAFFVAMIIQLAIQCFTGSELTYQASLVSDAVMQCKWE  
--RMP PRLRRMLLLTMMRAQKPLHLRAAGYAYMDNSCFLSILKAAYSYYAVLSQKQ

>SlitOR14

-----MTETRPKH YFGFHYRILRFLGLGWWHHP EEGNTSN-----  
FPGWYLYYSIATQLVWVAGFVGLETIDPFVGE-KEMDRFMFSLSFVITHNLT--  
LIKLYIFFFKNADIQEIVHTLEI-----GIYDYYQNDDKNRKT VRVSKIIT-  
AAFIFFGWVTIGNGNVYGTIQDLKWKSLVATLNDS DVPVRTLTPQPI-YIPWDY--  
QKDASYIPTFVLETVGLLWTGHIVMTIDTFIASVILHMGSQFEILHEAITTAYDRE----  
DENNERIVKSFV PKQDIDAALKNTFRNCFRQHQVLINCVEKFSRTYSYGFMTQLLSSMA  
AICVVMVQVSQDSFKSVRLITSVAFFVAMILQLGMQCLTGNETLQAERISDAIMQSKW  
E--RIPPSQRRLLLIMMMRAQRPLRLTAAGFTHMDNACFLAIMKAAYSYYAVLSQ--

>BmorOR60

-----MVRPCRYFAIH FILLRFLGLGWWHHPHENETRN-----  
YPGLYLYYSILTQLVWVVG LVGLETIDPFVGE-KDMDRFMFSLSFVITHDLT--  
LIKLYIFYFRNVEIQDIVRTIEI-----DLY---RYYQNDDKIRATIRISR-  
IFTAAFLFFGWVTIGNANIYGIVQDLRWVKNLNETTSKPLRTLTPQPI-FIPWPY--  
QEDKHYILTFILETMGLLWTGHIVMTIDTFIASVILHMSTQFAILREAIVTAYDRN----  
EENNQIFLESFYSKEHIESVLESTLLSCIRHQQLLIGCVEKFSKTYSYGFMTQLLSSMAGIC  
VVMVQVSQGASSFKSVVTSLAFFFAMVIQLAIQCFTGNELTIQAERIADAVMESKWE--  
KMPVRLRRLLLVTMMRAQRPLHLTAAGFAYIDNTCFLSILKAAYSYYAVLSQKQ

>HmelOR8

-----MSPSTKRLLTFFCKYVYYAGAGDFLCNGVKES-----  
KIYRIYTLISFSVYFIMIFLENLA-ALIGD---  
FPEVEGKS AVMFSAIHDIILIKMFLIFYKSSIIKLNNEMASVM-----  
SDIEEESVIKRQQNKVL-WGIGLYVLT VYLSLISYGVESLRKVIVE-----GTPFYT-  
VVTYFPSYYDNSFMAS TFRVFYMTWLYMMLPMIAADCMPIVHLIIMAYKFVTL CNYYD  
RIRRN-----

FYNNLKVMNNRSAARILKLQCLRGILLHRKLMFLAEEIHRIFGIIMSLQVCESSAVAVLLL  
LRLALS-PHMNLTFMTYTFVGSFLFLLALNLWNAGEITYQASLLSNAMFYCGWH--  
VCHNDIRCILIGCAQAQKPLILKAFGIQDLSYSTFVSV---SICQSLKVAP--

>BmorOR8

-----MSLSTRCLLKDFCKYVYYAGA--GNFWYEDIYKET-----  
VPYKMYVVISFFTYTVMIFLENLA-ALFGK---  
LPEVEKNSAVMFAAIHNIVLTKMFLLLYHKRSISKLNCEMAAVG-----  
ENLEEASIMRRQFRKMR-LGTALYFISVYLSLVAYGVESARRTIVE-----  
GAPFYTVVTY----  
LPDYDNTTVLASFLRIFYITWLYMMLPMMSADCMPIAHLITMTYKFVTLCRHFDQIREK  
-----  
FQINVKIMAKTEATEILKLGFIIEGIMHQKLMYLADEIHRVFGIIMALQVCESSAVAVLLL  
LRLALS-PHLDLTFMTYTFVCSLFLLLALNLWNAGELTYQASLLSNAMFYSGWY--  
FCDFEKIRRVLIGCAQAQKPLILKAFGVLDLSYETFVSVM--TYSVFAVFYKRG

>DpleOR58

-----MAALFAD-----  
FPEDEKRDSVTFSVAHTIVMIKMFIIHNKKNIKKLISDIIAVC-----  
ESHEEESLMNEKYKVMK-INVIAYFFTCYSSAACFVFEGLRKMYEV-----  
-----DGFTMVILIMFKYKLITLRNYFDKLRKD-----  
TEILHQSSDPQLAVNHLVNGLIKGIIMHKELLRILKEIDKAFGTVVALQLCQSSGAVSLL---  
-----LGIAASL-----LSIESIFYCGWH--  
NSGRNIRRIVLHACIQARPLVMKAFKMIELTYGTFLWSVKDQGTFKELLNT--

>HmelOR21

-----MKDYLLKKICKKIFLVGS--GNFWYEESEIGNDD--V-  
ILYKIFNYILFLVYALMTLLEIMA-ALIGD---  
FPEDEKSDSVTFVAVSHTIVMIKIFSIVWNKELVKKLIQDLISVC-----  
EIHHEEYLMKEKYNIMK-INVIAYFITVYGSAACFVFEGLRKMLTG-----SHFVTAVTY-  
YPSYDD--  
NSLLATITRIFMTMALFMMMLTMIVSVDCFAVVILIMYKYKFITLKNYFQNLRL-----  
-  
FEAFDIQENCSGEKLKGLIDGIIMHEKLLRISKDIDKAFGTVMALQLCQSSGSAVSLLLQI  
AVT-----MKILFFVIALFFLLGLFLCNAGEITYQASLLSDSIFYCGWH--  
FPRRNLGRLVLQACAQAQRPLVMKAFKMELTYGTFLLVIRGTYSVFALFYA--

>SlitOR19

-----MKNHYILKTYCKRIFLIGS--GNFWYKESEIGND---  
QSLLYRTYNAVLYFIYGFMILEIMA-ATMGD---  
FPPDEKRDSVSFAVSHTIAMIKIFSIVANKSLIKLNHKMVTVC-----  
ERYEENTLMAEKYKIMK-INVLAYFVTVYASAFFVFEGLRKMLTG-----  
SHFVTVVT-YYP-----



-----KFEDSIGATSARVLATVILYIL-----MIT-----MIMSVDSF-----  
---TM-----IYLIMYKYK-----FITL-KQ---YY-----

>MsexOR29

-----MKNYYILKTYCSKIFLLGSGDFWYENKVIIGDD---  
KRILYRMYSCALFFIYGFMTVLEIMA-ALMGE---  
FPTDEKRDSVTFVSHAIVMFKIISVVFQKELVKTLNRKMVTIC-----  
EHYEEQALMSEKYRIMK-INVIVYFLIVYGSAACFVFEGRLKLFDG-----SHFVTVVT-  
YYP-  
DYEDNSMFANSVRILATVILFLMLNMIVCVDSFTMVYLIMYKYKFITLRHYFENLSVT-  
-----  
IDKLNTPGNEEVVAKMLTDGLVEGVEMHSLRLSKDIDKAFGTVMALQLCQSSGSAV  
SLLLQIALS-DQLTFVLKIVFFVMALFFLLGLFLCNAGEITYQAAQLSDAIFYSGWH--  
VCSRHVVRKIVLLAIMQAQQPLVMKAFKMELTYGTFILVVRATYSVFALFYAQD

>BmorOR22

-----MNKNHYILKTYCDKIFLVGS--GNFWHQKTESRND---  
KTLTYKIYSCVLFFTYGFMTVLEIMA-ATMGD---  
FPEDEKRDSVTFATSHTVVMIKFISIIKNKELLKTLNRKMMMIC-----  
EAHEEQTLMDEMYRTVK-INVVAYCVAVYGSATFYVFEGRLRKFYNG-----  
SHFVTIVT-YYPNSD-  
DDTMLASIVRIATTLVLLMMLLSMIISVDITYTMAYLIMYKYKFITLRHYFKRLREN-----  
-  
VDELVAAGKARLAAEKLAQGLVEGIKMHNELLSLSKDIHKAFTGTVMALQLCQSSGSAV  
SLLLQIALSQLTFTMGMKIFFFLAAMYLLALFLCNAGEITYQASLLSDEIFYCGWH---  
NSPVIRDVLIAILRAQSPLVMKAFKMVELTYATFILVVRSTYSVFALFYA--

>BmorOR21

-----MNKNHYILKTYCDKIFLVGS--GNFWYQKTESRND---  
KTLTYKIYSCVLFFTYGFMTVLEIMA-AMMGD---  
FPEDEKRDSVTFATSHTVVMIKFISIIKNKELLKTLNRKMMMIC-----  
EAHEEQTLMDEMYRTVK-INVVAYCVAVYGSATFYVFEGRLRKFYNG-----  
SHFVTIVT-YYPNSD--  
DDTLAATIVRIATLVLLMMLLTMIIISVDITYTMAYLIMYKYKFITLRHYFKRLREN-----  
VDELVAAGKARLAAEKLAQGLVEGIKMHNELLSLSKDIHKAFTGTVMALQLCQSS-----  
GSA-----VSLLLQIA-----LSDQLFTMGMK-----  
IFFFLAAMYLLALFLCNAGEITYQVCTSIV-----

>CpomOR19

-----MKNYFILKNLCRKIYLVGA--GDFWFEEGEISKG---  
KSLRYQFLCFVLFSIYIFMTVLEIIG-VFFGD---  
MPKDERSDCTTFVASHIVLGKMFVILNRKRVKELNRKLVEIC-----  
ANHEDEHRVAENYRIMK-INIWAFVSVYGSFIFFLFEGIRKMMMSG-----SHFITIVTY-  
WPFYED----NSIIAVSFRFFTLVLAVMMATMICIDSFAMIILIMYKYKFITLRYFEGRLRER-

-----  
FDRNNYTGNEEYATELLHAGFIEGIVMHSNLTRL SKDIDRSVGTVLALQVCLSSGSAVSL  
LLQLALSDLTVA AQLKIIMFVIAVFFLLALFLCNAGEITYQASLLSDSIFYCGWD----  
RRDLRRLVLFSCAAAQRPIVMKAFNMLELTYGTFIQVVVRGTYSVFALISAQN

>HvirOR19

-----MKDRDILFKYCKVMFYIGS--GNCWYKEDEIGND---  
RSILYRVCSASLMLLYSYMAIFELIA-FAFGN---  
FPEEEKRQALIGGAGHTVMLLKALFLTTKKLPIRSLNRKIVSIC-----  
EDYEDSALMARKYKIMK-IN AISYLGLVNGGVLLYHIEGLRNMLNG-----SHFVTVVT-  
YYP--SFEDDSMLATIVRVFNIIFIMIMLTIVISVDTYIVTYFIMYRYKFITLRKYFENLRND--  
-----  
FFT LIERKEVELATEKLANGLVEGIKMHSSLIRLKPEIDKAFATVSAIRVFESSLAVCL-  
LFEISPSDQRIPIEVKTMIFIFALFFAMGLFLCNAGDITYQASQLTDAIFYCGWQ--  
SCPRPIRKMVLLAIMQAQRPPVMKAFKVLELNYATYIQLVRSTYSVFTLLCAQK

>HmelOR20

-----MIYETNETIKFISIANKIWCFCGI--HNLWIENIFDN-----  
KFTKYFNKIITFSLMLFVSMEMGALFTRTD---  
LTEKQCSDLYLFVPTHCILGSYYIGSQYYKKNIKRLLIMLSIDMK-----  
SVYNDSEIEKQMIKRAT-YYSIA YVMSASSALLSY-----EGSFTTVVTA-  
WPDSED-TSVFSSFARLFFYLWWAFMARISIGIVLTHHSVGISHQFKILQKYFYSLNDIFNN-  
-----  
ETIDSHEKQLKYEQSLKVGIKVHSQALWCTSQCQLSCSFVFGGQMMVCVYALSFLMLQ  
MMNSERTLT TAMVIATTSICVLICTGLIMWNAGDI--TAALIPSAIFSSGWH--  
HCGDTLRRVTSIILGIAQ-----GQVNCKRSIMVER---HWVFK-----

>SlitOR37

-----METTTTSYTRSKTTNFFYKINFIVYIFGL--PNFWIQDLKLSKRF--  
SNKFYDKFSMFNNTLIFLLIIFELCSYFTQTQ---  
LTETHQSNRLIYAISHPMLFMRVMMTSIKDR-VKLVMYSLNVGLK-----  
RVHNDPEVEKQMIACTI-MYLSALLLSCLMSMLMYAAEGFGEVIRH-----  
GKTFTTIITA-YPRVED-  
ASDMANVVRAICFIWWIFLTRIFAVYILVISLTTCLSYQYKKPAELFHSLNDIFER-----  
--  
NDLSQIEKEEQYEAGFKVGIKLHADTLRCTLTQSVCRGVFSGQIVFNILLVVLMAQM  
ANSERTLVNLGSAGFTACAVLISTGFYMWNA GDVTVEASHLGTAIYFSGWY--  
HCSVRIKRLVVITMSEAQRPVVLKGLGYIDLSYQSYIRIVKSSYSVFSVLF---

>MsexOR26

-----ITYLYLFGGL--PNFWIEDFKLPK-W--  
FMRSFDIFTKIINNVL YFFILMEMIAFFTQEN---LSERQKSDLLVYGISHP--  
ILSYRVFISYKEDLRAVLDDL VVTLK-----RVYNDVKVERQMIKKSL-  
LYSSALVFSCILAMFFYTFDSILHVIRT-----GATFNVVITT-WPKVED-

RSTLANAGRIVFYIWWFFMSRVSGAYTTVICLTTCLSHQYTNLRSYFENLNNIFET-----  
-----  
NFDQAVKEQKYEDGFKVGIALHLDLTLRCTRECHSICQGVFSGQIILNLLLVLMSQMVN  
SERTLVTAFAFATASSASAVLISTGYFMWNAGDVTVEASRLSSAMYLSGWH--  
RSSITIRKLVVITMFNAQKPVLKGLGIVDLSYQSYLSIVKSSYSVLSLLY---

>BmorOR20

-----MIQASKYPNSKTKELFRKIAHIAIYICGL--PNFWIEELNLPKS---  
FIRVYDKIVRIFNVATYFFLGIEIAAHFTQHH---LTNKQKFDLLLYSISHP--  
ILNGYGVIVSRQVKKVLLDLIVNL-----  
KVKYNDPVIIEAMIKISMTYSVSFITNCVLSMLTYTFDALLMVYKK-----  
GVTFNVIITA-  
WPDVEDTTTEASIGRIGFHIFWWLFVTRPFAVYVLVINLTTCLSHQYMNLSYFFHLEDIF  
KE-----  
NLSQNEKEAKYEA EYKIGVMLHANTLRCRRCHMVWNGVMSGQIIFNISLIVIIM AQMM  
NSDRTL VNTFGTVLTASAILISTGFFMWNAGDVT VQASRLATAMYCSGWQ--  
CRGKSIRNMVMNTIAVAQRPLVLRGLGVIDLSYQSYLSIVKASYTVFSVIY---

>SlitOR21

-----MDNFSGSYRQTKTTEFLINLNKFIFVFGGL--PNCWVDNLDFPDN---  
FMKVLNVLSIYGNWSVIIMNISEYGAIYTQNN---LSERQKSDLMLFLISHT--  
IIGFRIRICHQRDIRNV MYKLGIALK-----AVHNDCEAEQKMITRSK-  
FFSWALIFNCVMSVIMYTIEGVLRVIRT-----GDTFNTVITA-WPDVHD-  
RSVLSNIGRTVIYIWYIYLTRIFS VYSLVICLTIAVSHQFKNLKS YFYSLSKIFEN-----  
DNLSQTEKEQEYEKA FKV GISMHSETLKCTDEIQTICREVFSGQIIFNL TLLIVLMYQMMN  
SPRTFSNVLT LGLTALTILFSTGFFMWNAGDITVEAEGVPVAMFSSGWE--  
NCSVRVRKLIVISMSQAQKAVALTGLGIIALSYQSYVSIVKSSYSVFSVLY---

>HvirOR21

-----MDHFSGYKSSKTTEFLINLNQFVFIFGL--PNFWVQELDISDS---  
FRKIVGYLNKYGNWSIFGLILAEYGAFFTQKN---LNQRQSSDLVLFMISHS--  
IIGFRVRICHQEVIRNV MYKLGIALK-----EVHNDSEAEQMIKRSK-  
FFSWALILNCVISFLMYTIEAVLRVIRA-----GVTFTTVITV-  
YPDVEDRSGLSNGVRVMFYI IWC IYLTRVFAVYTLVICLTIAMSHQFKNLTSYFYSLSSIF  
DD-----  
DQMTQAEKEQEYERAFRVGIKIHS DTLNCTGDIQKICRDVFSGQIIFNITLLIVLMYQMVN  
SARSLTNALTLVMVALSILLSTGFFMWNAGDITVEAKSLPTAMFSSGWE--  
HCRDSVRKLIVIAMMQAQEPVVL TGLGIIALSYQSYVSIVKSSYSVFSVLY---

>CpomOR34

-----MMPIKPFQNNRTSDLFHTICKIIYLSCA--TNFWFEDIDYPA----  
FMKIYNSTSRVLEVTVA VLIISDWG--AFWTQ-  
PNLTEKQSNDRMLFAFSHVVL YSVYCSVIYYKREIRELVMTLTVRLK-----  
EVCYDGSIEKMMLRTTF-RYT TAFVFVCSSTLFSFGIGSGFQALTT-----NATFTTHPI-

WPDVED-RRLVAGAARIILYIVWWIFLV--RFISVYIILLISTIGIAHQFKNLCKYFEDLTDI---  
-----  
FEGSGSQEEKERRYENAFKVGIKMHSITLWCMRQIQLVGGVAFSGQVIINVSVLGLLMIQ  
MMFTERTLIAVMPIIFMVSSVLVGTGVFLWNAGDVTIEASRLPAAMFHSGWH--  
RQSVRVRKLVITIAIAQAQKRVRIKGLGFIELSYESYVTIVKSSYSLFSVIY---

>MsexOR9

-----MTSPDSKIKEFFRKFTLITYLCGL--ADFWIEDLDLPTQ---  
FIKCYDTFCKIFNFLYLYVIAQILSLFTQHN---  
LTEKQRNYQLMFCVAHPFVVTFTLIAKHRKKLQSVLFRLVVSLK-----  
LVYNDLDIEKEMIKRIK-FYLFVAVSAPFWISMISYCVDSYVQVVT-----GTTFNIMILA-  
WPLVDD--HSVIASLARFIYHIIWILFETRVTAAAY-VMVISLTTCISYQYRNLRSYFESIHRV-  
-----  
FEEDLTQKEKEKKYEKLLKIGIQAHSOTLRVTKDGTEACSAVLQAQVLFNTVFLVILMYQ  
AVVVNENRSLVFSTLCTVITLLFSTWFFTCNAGDVTYEASLIGTAMYTSGWQ--  
NCSLSIRKLLVIALARAQEPHILKGFWILTSLHQSFLSIVKFSYSIFSLLY---

>MsexOR5

-----MKVPLKKFRPTETTKLLDELNKLFIYFAF--RGFWVEEVKLPKT---  
FVKIYDAMYPALNVSLVIFCALQIGAHFTQKH----  
LNIQQKININIMGIAQPLTKCCLNCMYKKECKQVLYHLFVAVK-----  
EIYNDEETEKMLVKKLK-FSLWVYMFSSVSTTLLYGMIALIEMVRS-----  
GSTFVGTVTA-WPDTTD-  
TSALAACARVYLYFWIVYTSTGSMVILMVLTFMGLTYQYKNLQKYFENLNSIFED-----  
-----  
KQVTHEELEMNFEKALQKGIIKAHSOTLWCVNQCQTICKRINMAIVLINTILIVLMGFLILK  
V-----GTCLIVLGMCLMILAFFMWNAGDVTVEAQKLSDAIYSSGWY--  
NCSARIRSLVVIAMIAQEPVVFTAFGVIELSYETYVAIIKSAYSVFSVLY---

>MsexOR6

-----MEETKKYAPTDTTKLLDKFNKILYVFGF--RGFWMGDVKLPKT---  
VMKIIDILYPVLIITQGTFTGLQLGAYFTQKH---  
LNSVQKIDALVMGFGQPMMLLYCLNCRYKACREVFYHLFVVVK-----  
TVYNDKETENMVKRLK-LYFGAYLIFSLLVLLYGSYASVETVRK-----  
GATFVTVVTA-WPDVTD-  
TSKLASYARVGIFMWSVYSFTTSVVIIIVLIIFLGLTYQYINLQRYFENLNSIFEN-----  
DRLSHEEMEKNFEKALQNGIKAHSETLWCVKQCRMICSAINAGVILLTTGTLVIL---  
MPAILGSKDDLLEAMMYLIVLMMAFFMCNAGDTTV-EAQKLPNAIYSCGWY--  
NCSARIRSLVVVAMIAQEPVVFTGFGVIELSYENFVTIISAYSLSISVFH---

>BmorOR19

-----MHEFVINVQNETTKLYDQLNIIYILGL--QGIWVDEIKLSRR---  
FHVFFKVVTFILHIMCGMFAQLQFFAIFTQNS---  
LNSQQKSDVIVIGISNPMAYIFCINFIRNRNEIKDLFYHLAVVLK-----

IYYNDVEIEKSMVNKIK-SYLSTYVFASITILVSNGIIAFFQTINS-----DEPFLGIITA-  
WPKDTSKTASYARIGFYLFWCIHFFRISTVFAVIVCILISIKYQYKFLCSYFESLNKIFDD

-----  
ETSSHEVKEAEFENAFENGIKIHTQIIWCVRRCQIMCRTVFSANIMLDTFVLVILMLAMV  
NS--ENDFYCSQMSSVLVTVVLMMAFFMWTAGDINVQASQLPDAIYGSGWY--  
NCGKSIRSLVTISMNKAQQPILMWALGFVELSHKNFVAIIKSAYSVFSVFY---

>SlitOR33

-----MSNQIKMYTPNEMTKLLGKLNVICFIFGL--KNIWVED-VKLTNR--T-  
RSCNRLLLFAEIFYIIFASTILGSLFTQKN---LSEKQKTDQMMFSITLP-  
GNIFHYILLYRRHEIRNLLYHLAVVLK-----EHYNDEDLEREMIKKIK-V-----  
FSISLCGLVGMGLSAFYRVVTA-----GETFVTITSA-WPDIHD--  
RSTAAGLVRVVFYFWWYPFAARIM-VTFLILVTMLVSICYQFKNLQSYFYSLDEI-----  
FSDGTQSQEKE--  
KKYENAFKLGKMHSLTLWCKNQHQHVSKELFATEIFLFFGMLLSQLTA--  
LLDRNMTQLGTMFITSVTTCLALGFFMWNGGDITLEASKLSEAMYCSGWQ--S-  
SVRVRKLVANALRQAQNPVYKTLGIVEFSYESYVRLVKMPYSAVSVFY---

>SlitOR34

-----MNFFRNPEVPTQLYKETDTTKYNKFWFLCCCPDFWVKKVDYPDP---  
FTRVYRPSMLVNHIVMVIFCSSCFLSLWTQHD---  
LSQSQKSDRLAYAASTPIITVYHFVILYYTEDVKQVLYKLAVVLK-----  
VDHNDKNAEDEMİKQSK-LHNGIFFSSVCNMVLVGLYNFYRAVTT-----  
DATFITCISA-WPDIED-  
RSTLAGLTRVVVYFWFSHVTRNMGVFLITHALLLSQQYKNLQSYFEDLNRIFLE-----  
-----  
KELSQEEQELKFEVRFKKGIEQHALTLWCVDETQRIFQITFSSHVLLWCLLISILPDVLNN  
DTHSPTMLVSNAPRVCAALVGLGYFMWPAGDITVEASNVPHAMYGSGWQ--  
CCSPRIRKLVVLAMMQAQRSELKAFGHLTFSYETYVAIVKMSYSLFSVLY---

>DpleORco

-----MITKSENRLVSDLMPNİKLMMQAGHFLFNYHSDNSGMSSL---  
LRKCYSSIIHAFLIVMHYLCMAANMA--KYSEE---VNELTANTITVLFFSHS--  
İİKLTFFAITSKNFYRTLAVWNQSNŞPL-----FTESDARYHQLALTKMR-  
RLLYFICGMSFFSVICWVTITFFGESVVDKETNETITEPAPRLPLKA-WYPFDA--  
MSGTMYIAAFQVYWLLFTIFIANLMDVMFCSWLIFACEQLQHLKAIMKPLMELL----  
QNFGQNNNNPNGLTQKQEMLARSİKYWVERHKHİVRLVSSİGDTYGTALLFHMLVSTİ  
TLTLLAYQATKİNLNVYAFSTVGYLSTLGQVFHFCİFGNRLİESSSVMEAAYSQWY  
--DGSEEAKTFFVQİVCQQCQKAMSİSGAKFFTVSİDLFASVLGAVVTYFMVLVQLK

>HmelORco

-----MMTKİKTQGLVSDLMPNİKLMQAAGHFLFNYHSDNSGMSTL---  
LRKVYSSVHAFLİMİHYLCMAANMA--KYSEE---VNELTANTITVLFFTHS--  
İİKLAFFAITSKNFYRTLAVWNQSNŞPL-----FTESDARYHQLSLNKMR-

RLLYFISGMTIFSVVCWVTITFFGESVRDKETNDTLTEPVPRLPLKA-WYPFDA--  
MGGTMYIIAFAFQIYWLLFSMAMANLLDVMFCSWLIFACEQLQHLKAIMKPLMELL----  
QTFGQQNNNPNGLTQKQEMLARSAIKYWVERHKKHIVRLVSSIGDTYGTALLFHMLVSTI  
TLTLLAYQATKINGLNVYAFSTVGYLSTLAQVFHFCIFGNKLIIESSSVMEAAAYSCQWY  
--DGSEEAKTFVQIVCQQCQKAMSISGAKFFTVSLDLFASVLGAVVTYFMVLVQLK

>Bany\_Orco

-----  
FFAHT--IIKLTFFAITSKNFYRTLAVWNQSNHPL-----FTESDSRYHQLALTKMR-  
RLLYFICGTTIFAVTCWVTITFFGDSVRMLVDKETN-ETLTEPVPRLPL---DA--  
MSGTMYVAAFAFQIYWLLFAMSIANLLDVMFCSWLIYACEQLQHLKAIMKPLM-----  
QN---PNN-  
PNGLTQKQEILARSAIKYWVERHKKHIVRLVSSIGDTYGTALLFHMLVSTITLTLLAYQAT  
KINGLNVYAFSTVGYLGYTLGQVFHFCIFGNKLIIESSSVMEAAAYSCQWY--  
DGSEEAKTFVQIVCQQCQKAMSISGAKFFTVSLDLFASVLGAVVTYFMVLVQLK

>SlitORco

-----MMTKVKAQGLVSDLMPNIKLMQAAGHFLFNYHAENGGMSGL---  
LRKIYASTHAILITIHFACMGINMA--QYSDE---VNELTANTITVLFFHT--  
IIKLGFFALNSKSFYRTLAVWNQSNHPL-----FTESDARYHQIALTKMR-  
RLLYFICGMTVLSVSWVTLTFFGESVRSKETNETLTEVAPRLPLKA-WYPFNA--  
MSGTTYIIAFAFQVYWLLFSMAIANLMDVMFCSWLIFACEQLQHLKAIMKPLMELL----  
QTFGQQNNNPNGLTPKQEMLARSAIKYWVERHKKHVRLVASIGDTYGTALLFHMLVST  
ITLTLLAYQATKINGINVYAFSTIGYLSYTLGQVFHFCIFGNRLIESSSVMEAAAYSCQWY-  
-DGSEEAKTFVQIVCQQCQKAMSISGAKFFTVSLDLFASVLGAVVTYFMVLVQLK

>HvirORco

-----MMTKVKAQGLVSDLMPNIKLMQMAGHFLFNYHSENAGMSNL---  
LRKIYASTHAILIFIHYACMGINMA--KYSDE---VNELTANTITVLFFAHT--  
IIKLAFFALNSKSFYRTLAVWNQSNHPL-----FTESDARYHQIALTKMR-  
RLLYFICGMTVLSVISWVTLTFFGESVRNKETNETLTEVVPRLPLKA-WYPFNA--  
MSGTMYIVAFQVYWLLFSMAIANLMDVMFCSWLIFACEQLQHLKAIMKPLMELL----  
QNFGQQNPNGLTPKQEMLARSAIKYWVERHKKHVRLVASIGDTYGTALLFHMLVSTI  
TLTLLAYQATKINGINVYAFSTIGYLSYTLGQVFHFCIFGNRLIESSSVMEAAAYSCQWY--  
DGSEEAKTFVQIVCQQCQKAMSISGAKFFTVSLDLFASVLGAVVTYFMVLVQLK

>BmorORco

-----MMTKVKTQGLVTDLMPCIRLLQAAGHFLFNYHADTSGMNML---  
LRKIYSSAHAVLIVVHYICMGINMA--QYKDE---VNELTANTITVLFFAHS--  
IIKLAFFAFNSKSFYRTLAVWNQSNHPL-----FTESDARYHQISLSKMR-  
RLLYFICGMTVFSVISWVTLTFFGESVRSKETNETLTEPAPRLPLKA-WYPFKT--  
MSGGGYVFAFIYQIYFLLFSMALANLLDVIFCSWLIFACEQLQHLKAIMKPLMELL----  
QNFNAEN-  
NPNGLTAKQEMLARSAIKYWVERHKKHVRLVASIGDTYGTALLFHMLVSTITLTLLAYQ

ATKINGINVYAFSTIGYLVYTLGQVFHFCIFGNRLIEESSVMEAAAYSCQWY--  
DGSEEAKTFVQIVCQQCQKAMTISGAKFFNVSLDLFASVLGAVVTYFMVLIQLK

>CpomORco

-----MMGKVKSQGLVSDLMPNIKLMQMSGHFLFNYTEETGGMSLL---  
LRKIYAAMHAFLILLNFVCMGINMA--QYSEE---VNELTANTITVLFFAHT--  
IIKLAFFAINSKSFYRTLAVWNQSNHPL-----FTESDARYHQLSLDKSR-  
RLLYFICGTTCLSVVSWVTLTFFGESVRDKESNDLTLEPAPRLPLKA-WYPFDT--  
MSGSMYIMAFVYQIYWLLFSMLIANLLDVMFCSWLIFACEQLQHLKAIMKPLMELL----  
QNFNSTNPNPNGLTQKQEMLARS AIKYWVERHKKHVRLVASIGDTYGTALLFHMLVSTI  
TLTLLAYQATKIDGLNVYAFSTVGYLRYTLGQVFHFCIFGNRLIEESSVMEAAAYSCQWY-  
--DGSEEAKTFVQIVCQQCQKAMSISGAKFFTVSLDLFASVLGAVVTYFMVLVQ--

>MsexORco

-----LSGHFLFNYYADNSGMTMLLR-----  
KMYSTVHAILIFVQFVCMGVNMA--MYADE---VNELTANTITVLFFAHS--  
IIKLGFLAFTSKSFYRTMAVWNQSNHPL-----FTESDARYHQIALTKMR-  
RLTYFICFMTVMSVSWVTITFFGESVRNKETNETLTLEPAPRLPLKA-WYPFDT--  
MSGSMHVVFVVFQIYWLLFSMSMANLLDVLFCAWLIFACEQLQHLKAIMKPLMELL----  
QNFVQNTVNPNGLTQKQEMLARS AIKYWVERHKKHVRLVASIGDTYGTALLFHMLVST  
ITLTLAYQATKINSINVYAFSTIGYLCYTLGQVFHFCIFGNRLIEESSVMEAAAYSCQWY-  
-DGSEEAKTFVQIVCQQCQKALTISGAKFFTVSLDLFASVLGA-----VV-----

>HmelOR65

-----EMTLRCVGCWDWYREPKNEYQIF----  
FNNIYLG FVL FILLNLPISLIVHLY--TVWTD---MMSHLENMADGLPLFAS--  
VFIVAYLSAHKNDLYNLVKYMNENFRWHS-----ARGLTNMTMLKSYQTAK-  
SFAYWYTGCTLFSVTMYVAMPIFAHLWT-----KNPLQP-WIYKDL--  
TSSPAIVLVFMRQCLAQAFVGLAVGQLGVFFACNSILLCGQLDLLCCSLRNARHAD----  
SSYHYDDKV VNIYSLHYDEATSEALRECGRVCQIINEFKVKFEFVSPLLVL RVVQVTLY  
LCTLLYA-----ATLKFDMITVEYLA AVALDIFVYCYFGNQIILQADRVTTAAYQSSWP--  
SMGVRPRRLLLNLLANLRPTVVVRAGRFLPMNLHTFVLIKTSFSYYTLLVNVN

>SlitOR1

-----MASNVDKTTLNSEKPEHYIHYIEMPLKLVGCWDLFPNSVTENRKI----  
FNDIYLGIVL FVLTHIPMVLT VHLY--TEWQD---IMSSLGTIADALPLLVS--  
LVIVAYYAIYRRNLYELLNYLDKNFKYRS-----ARGLTNMTMEQSCMTAR-  
RFGRIYTACTMFSVTMYATLPVIVHLWT-----KEPIQS-WIYMDV--  
TQPPFFEFV FMLSCLAQMYVGLAMGQFGVFFASNSILICGQLDLLCCSLRNARYTT----  
HNYVDAKTNFDIYSPEYDDATMEALRDCASLCQVVN KYKEMFESFVSPLLALRVVQVT  
LYLCTLLYA-----ATLQFDMITVEYLA AVALDIFVYCYGNGQIILQADRVSTAAYQSMWH-  
-TMGIRPRKVLLNILLANRRPVVVRAGKFLPMDLHTFVVII--KTSIF-LLHSSS

>DpleOR44

-----DCIFVFLFIFLYNCLLTINLY--  
FLPSD---LNVIIEDLVLYFTCLSI--MSKVLTYFIRKESIRDILRFLDG-----  
DKFQPKNEKELQIINAAKKFNE-KYWKVVAILSYSSNITHVSTPIHLID-----  
SVPVVPVSG-YFFLSE-  
DRRRENLYYIYLFQAVGIHFNMLYNINIDSFFIGLLILAIQIDILDEKLKNIATN-----  
IWDADGMVNRDIDEICIRKLNDCILHYNNISKFCLLVEEVFSVTLFVQFSMSSFVICVCLY  
RLTQP-APLPYYLFLGSYLFIMIIQIFVPCFFGARIMDKSSQLSHAVYSCDWT--  
PRSRRFKSSMRLFVERSLRPHSITGGKIFPLSLVTFTSIMNAAYSFFTLLTN--

>MsexOR41

-----  
DLIIEELVFYFTELA--ISKVLTFVFFRDKLAKILDALED-----  
PMFQAANGREQKIIDGAKRFNK-RYWKIVATVSLTSHATHILSPIVEHLFL-----  
SVPLQLPTCR-YSFLSE-  
NTIQQFIYPLYLYQTLGMHSHLWFNANIDSFFLGLMILIIAQLQILDRLRRTVTDV-----  
KKNDDIGQANTSEARANYSLTQLNKCIVHFDEVGKFCGLVEDTFSMTLFMQFSMSSCIL  
CVVLFRTLP-APFEYYIFLGTVMCMISFIFVPCWFGTRVMELSVLLCSSVYECDWT--  
AMPKKFKSNLQLFVERAKRPLTITGGKMFMLSLTTFTSIMNSSYSFFTLLRN--

>BmorOR13

-----MAPKQIDCFEINWKFWKFLGI----WSENKPHRY---  
YKYYSKIFITFFVILYDVLTYINFY--FVPRQ---LDLIIGEMLFYLTELSV--  
LSKVFTFIIMRHKLKIIIFEILES-----DAFQTDTEEELKILHRAKVFIK-  
RYWKIVALVSITANLTHISSPLLKNLIF-----KVELVLPVCS-YSFLSE-  
SFLKTFEYPLYFYQIVGIHFHMLYNLNIDTYFLGLMILIIAQLDILNVKFRNLKSG-----  
-----KDHTQLNESIMGLNKNLDHYNEIERFCSLVQNIFSFTLVQFSMASCIICVCLFSFTLS-  
VPVEYYIFLATYMFIMIIQIMVPCWFGSRIMDKSILLSSAIYNCDWT--  
SNSKDFKINMRLFVERANKPLSITGGKMFSLSLATFTSIMNSAYSFFTLLRY--

>SlitOR8

-----MESHQIDSLNINLMYFKFLGV----WPGNNPWRF---  
YNYYSKAFIMVFVIIIFILLFSINFY--FLPRQ---LNIFIEETIIYFTDLAV--  
TSKVLTFVFMHEEIIILDILEC-----DLFQPEDDEEMIILENAKKSSK-  
TYCKIIMIVSYLSSTLLILSPLISHLIL-----GVELLLPICR-YAFISD-  
EYRLMFIYPIYLYQIVSIHFHVLNVNVNVDIFFFGMLMVLAIQILDILDRKLRKVTDG-----  
NKVEDTDGEASRSPIDKNKEDVMKINQCIHFIKVCRFCELIEDAFSATLVQYSAASCIIC  
VCLCRFTMP-AEMGYIVFLASYMSLMISQMMAPCWLGTRLMDKSQLLAFSVYNCDWT--  
SRSRQFKSNMRFFVDRANKPLSITGGKMFNLSLGTFTSIMNSAYSFFTLLQHFAQ

>HvirOR8

-----DSYCKIHNSFAIKIFFIMVFRQIDCFKINMKFLKFLAIWPGKDFTRR---  
YKYYTVAFLTAYFIIFMILFTINLF--FLPKQ---LDIFIENMVFYFTDSAT--  
LSKVMTIGFMRKKILQLFEMLES-----DIFQPDNAEGLAVIEKAKKFNK-  
LYWNIILAVSFASCASNLFPPIIAHFIL-----GTELVLPICN-YGFLSE-



DFRQMFGVPLYLYQGSAMMFDMLYSVNIDTLFAGLMVLAIAQLDILGIKLRRVTDK-----  
EVLEETDSETSRQHNRDNHKEAIKKINHCHIIHYEKIHKYCSLVEDVFSITLFFVQFGMASCHICI  
CLMRFTMP-APLVYYLFLATYMFVMILQILVPCWFGQRIIDKSNLLAFSAYDCEWT--  
SETRQFKSSMRIFIERAHKPLSITGGKMFCLSLVTFTSIMNTAYSFFTLQN--

>SlitOR20

-----MGYNQIDCFKIHLTILRVLGV-----WPEENPSVY----  
YVYFSRIFVFIFTVLYVIIYTMNFY--FLPQQ---LEIFAEELIFYFTNVGA--  
LSKALAFIFLRDKVKKMLYMLES-----EMFQTDNPKEEVKLIEKTKEKSL-  
FYWKITFGLSVSANTVNVFLPFVLHLIF-----SIKLEFPVCR-YSFIPE-  
QYEAIFLYPAYLYQSIGITSHMLYNVNIDTFLLGVMFLAMAQLDILDRKLRKVTDV-----  
CVNVDAFPGSIDKMIDDQNAVLEINKCIKHYDAVCEYCKLIQDAFSEILFVLFSSGSKIC  
MCLFRFTMP-AETQYFVFLTLYIVVMTLQVMVPCWFGSRLMEKSSQITFAVYDCDWT--  
PRCRRFKSNLRLVERANRPIIKGGKMFLSLATFTAIMNSSYSFFALLRN--

>HmelOR13

-----MPLKQSDCFKINKKYWTLIGIYSTIDSKM-----  
YIWYSRIVLFIFIFIYDTLSTLNFY--YVPRD---LDHFIEELIFYFTELSV--  
ISKVLTYILMRESITKILCVLDS-----EKFEPDTEKGIQITTAAMKFNV-  
KYWRIVAFVSYFSLIHLISPLVAHLSL-----SVPLVLPLCS-YSFLTE-  
SFKERFIYPLYTYQCLGMHAHMLCNLNIDTFFLGMLIFTIAQLEILEDKLVTL-----  
-----TNISRLPNSKTGDRNISKNNEFCDLVEDVFSITLFFVQFGIASCHICVCLFRFTLP-  
APIQYYMFLASYMFVMTIQIAVPCWFGTRIIVKSSLLSQAIYNCDWT--  
PRPRRFKSTMRFLVERANRPLSVTGWKMFLSLNTFTSVI--VFLYYVFFVTAC

>DpleOR45

-----MAIFIVNFIIYNSSLILNLV--  
FTPRK---IEYMIREVIFLFTVAV--TGKVLMMFKRKKILSVFDILNC-----  
EVFKGEDDISRRIVESHVSKYK-TYWSLYAILSNAFAYSSQVFVPIIVYFIF-----  
NTNIKLICK-YYFLDE-  
EYVRRYFVFLYLYQSLGIYGHMQYNVNIDALISGLLILAIAQVKVLKYELKNIKPD-----  
----  
SPLKDKRETERSQIFKLHKHLKHYEELNYCSGIQDIVGLSMFVQFGIASIIICVVLSSGLRF  
T-ASVEALMFMVTYLFTMILQIYVPAWLGTQLNYESQELVFAAYSSQWI--  
RRSEKFKRSLKLFMERANTNIVLTGWRIPLSLDTFTSVI--TRNIS-----

>HmelOR61

-----MVENKLSDCFKNFIFLKIFGL-----WPGSRDSGY----  
YKYYSTVFLLIILLVYNILLVFNFL--STPRK---IDLIMNEVMFLFTEVAV--  
FSKVFLMLFMRQKIFDAFDILNC-----EAFKGQDDFSRQIIKNHTRKYQ-  
IYWKSNAILSNFVHFSQIYIPIFQHVVF-----NKDIELPVCK-YYFLDD-  
QIIRNFFVFWFVYQTFGIYAHMNYNVNVDALIAGLLVHIIAQLKVIRHEIENIKVL-----  
-  
KSNKKSQVETDYLQISTLNTYLNKHYEALLKYCSIVQDIIGITMFVQFGVSSVHICVVLVCLL

MP-FTIQGLMFKLAYLFAMMLQIFVPAWLGTQVEYESQKLTFAAYSCEWI--  
PRSEIFKRSLKLFMERGNTSIVLTGWRIFPLSLDTFTSVS--EHSYVTYI----

>SlitOR15

-----MPSDQSKMFDNSFRIAKIFGI-----WPGLKPSRY----  
YKFYSFIYLFATFVCYNLLLTLNLL--YTPRK---IELLLREVIFYFTEITV--  
ATKILTILFMRDKIIQALNFIDC-----DEFVGDYENKKGILYKTNMGFR-  
LGWRSYLVLSNIAYSSQVIVPIFLDILR-----ETKSELPICK-YYFLSD-  
EDRESHFLFWFIYQSFGMYGHMMYNVNIDSIIAGLLLIAIAQLKLLGNLTLNKLKLS-----  
--  
DEESKLPKDSQDKIQIKRFHKLLRHYEVILRYCDTVQDTLNVTLFFQFGVASIICVVMCG  
LLLP-SSTETKVFLVMYLFTMTLQIFVPGFLGTQLTYGSEGLVTAAYNSEWI--  
PRSESFKSSLKLFREARAARPVVISGLKMFPLSLITFTSIMKTAYSFFTLIRNVQ

>MsexOR23

-----MSSFCQTDIFKPNFFFWKCFGI-----WGGRTENKN----  
YKYYSFSYLFVTLFVFNILLTINLI--YTPLK---IESLIREVIFYFTEIAI--  
TVKVLMLVMRSKILDVFNLLDC-----KEFQGDDEESKQIETNHSFYR-  
TCWKLNAVLSNISFASN VFAPLFINLIW-----TAKIEFPVCK-YYFLSD-  
EMRDKYFIFWFIYQSIGIYGHMMYNVNVDSFIAGLLLMAITQLKVLNAKFTKFKLE-----  
-----  
KRHEKHHQNKIQLRLNRYLKHYDCVLRyceiiQDLLSVTMFVQFGMASAIICAIMCGLL  
LP-STTETFMFMVTYLFAMTIQIFVPAWLGTQLSHESCGVFAA-YNCEWI--  
PRSMSFKRSIMIFVERANNPIQLTGLKMFPLSLATFTSIMKTAYSFFTLFRNLQ

>BmorOR15

-----MRTL VYQTDIFKPNVFFWK MFGI-----WADRKSSKT----  
YKYYSFVFLFITLIMYN SLLAINLL--YTPLK---IELLIREVIFCFTEITV--  
TTKVLMLFKRNKILD AFDLLNK-----NEFRGNSEESSAIQKNNSAYK-  
TYWKLYAILS NFAYSSQVLGPLIVKLIW-----KTKLELPICN-YYFLNE-  
ELRHDFFSGWYIYQSFGMYGHMMYNVNIDTFISGLLMMAVTQLKIIQTKLLSLKLN-----  
----  
PRERKMDRGLMNITEVLKLNEILKHYELVLKYCSTVQSILDVAMFVQFGVASAIICVAM  
CGLIMVRSSTETLLFMVTYLFAMTLQIFVPAWMGTQLHFQSQELVFAAYNSEWI--  
PRCQSFKRSIIIFVERAKIPITITGLKMFPLSLATFTSIMKTAYSFFTLIRNMQ

>BmorOR12

-----MTRITDVFSLNFIWKFLGL-----WGKSAPSK-----  
YNMAYTVFYLFSLFVYDIFLTLNLI--HTPRK---LETLVRETMFYFNHLVA--  
VTKILMMFIMRKKILVIFDLLDC-----EEFKPNDENSQEIMKRKTDFFY-  
IYWRIVAVTSNLSCFMLVIGPLIKMLIW-----KIELGLPVCK-FYFMSD-  
ELRNKYFVIWYIYQSFGIYNQMVNNLNLDTFNCGMLWMAVGQLQILKTKFVNLKLN----  
-----  
DFENGLDLKSRDDMQIERLRKYLTHYEILKYCAIVQDILNITIFVQLGMSSIVICVGLCGF

VAMPSNTETAIFMFSYLTMTMQIFVPSWMGTQISFECGELMSAAYSCEWI--  
PRSKLFKRSLILVERAKTPVRITGLKIFTLSLDTFTSIMKTTYSFRTLIRQ--

>BmorOR61

-----MARITDVFRLNFIFWKFLGI-----WGKSAPSKY----  
NMAYTALYLSASLFVYDIFLTLNLI--HTPRK---LETLLRETMFYFNHLVA--  
MTKILKMFIRRKILVIFDLLDC-----EEFKPSDEDSQEIMKRKNEFY-  
IYWRIVAVTSNLSCFMQVVGPLIKMLIW-----KSELGLPVCK-YYFMSD-  
EFRNKYFVIWYIYQSFGIYNQMVNNLNLDTFNCGMLWMAVGQLQILKTKFVNFKLN----  
-----  
DIENSLDLKTRDDMQTERLRKYLTHYEILKYCATVQDILNITIFVQLGMSSIVICVGLCGF  
VAMPSNTETAIFMSSYLITMTMQIFVPSWMGTQISFECGELMSAAYCCEWI--  
PRSKLFKRSLILVERAKTPVRITGLKIFTLSLDTFTSIMKTTYSFRTLIRQLQ

>HmelOR45

-----MVEFSDLPQEYIKLYSICFSLIRFNDNFDDHVPFFK-----  
KYWRFFVKMFLTSIQFVSMIYLKRRIQGD-FKIPELSYVISCYI-----  
VIFQVLYNKTNIQKLI-----LSLGVMWRTDNLTDIQI-----  
-----  
ENKNRFLKTFSFFCISVSGLGMYFGIEFLTITLCAYLSTAFSLLRDDLKRLTPR-----  
NNRGNLNENLRNESPYTIEMIIKQHQLIELTKLMNNSFSVIFFTNLSFATFEICFYAFACI  
VA-HTPMDFSKNILAVLIILPSIFILCYSELLREESGGIADAAYENVWY--  
RGDDGYQKSIRFIIMRAQRPCSLMSLNYTPITLNTFTKVVSTTWSYLSVAIT--

>HmelOR46

-----MVEFSDLPQEYIKPYSICFSLIRFNNFDDHV-PI-----  
FKKYWRVFVRMFLTSIQFVSMIYLIRRIQED-FETTELSYAMSCLMVITQG--  
FLKFYLVLYHKANIQKLILSLGV-----MWKKDNLTDIQIENKNR-----  
LLKTLNMLAGLAY-----  
IYYGVELLPITICGLLSTAFSFLREDLKRLTPR-----  
NNQVNLNENFQNEPTNTIEIIKQHQLIELTKLMMNIFTVIFFTNLAAFAIEICFYIFASIVA  
-PTPMDFAKNILAVIIMLPSIFILCYSELLREESGGIADAAYENIWY--  
RGDVGYQKSICFIIMRAQRPCSLMCLNYIPITLNTFTKIVSTTWSYLSLAMT--

>SlitOR40

-----  
-----  
-----  
IIFVNLSSASISMCFGGF-  
CAKVAHRAALDMANNFVAVLALTLPLFNLCDYAERLREASAGMADSVYNNLWY--  
ISDKHYQKSCGFILRRSQKPCCLTSLKYSEIGLNTFSAVLSTTWSYFSLASS--

>MsexOR40

-----MTYKNRQHQUELEMELSHLPGDYLKPLIACFDLLARCNIGFFHGNSSYFK-----  
KYWRYSYIISCVVAYYSSLTVYALKIFLGQ-MELFELAYVVPVVFVCTQA--  
ILKAHVIIHKGEIRALVLQLG-----ETWRTDNLTTTRQLNKKN-----LLLKKLNF-----  
-----

CYGVFRIVYSYLGTEFLLISLCSHLSTEFCLLREDLLNVKPV-----  
GNRRFRILQDSSNIELHDIVVKHQKLIKFEQLNEIFNKMIFVNLSSVTITVCFFAFATKVA-  
RGPVDMANNFMAVMALILPIFNLCYYAEMLINASAGKQESAYHSLWY--  
VANKQYQMSIWFIIRRSQKPCCLTSLKFSPVALHTFTAVLSTTWSYFSLASSLF

>DpleOR39

-----MDYDRTLTYLTSEAFKFSGIEMGYKRIPG-----  
YLKYLYHFNALWLYADVFGFEFFWLCEGIAMGK--SIDLLSRVAPCSALCILS--  
TAKTLPMTVNNDILKDAVLKLRRLHQGVDL----RNSFECDELMKTSTILK-  
NIITVLVVGFCVVLFSTMPGFLMAYD---FFTTGTYQLQLPFFT-KYFVDV-  
FADARIYTFVYLHQFVSTVLVGLNIFAADTLFFAFCSYVKMHFRILGHYYENIVGQ-----  
-----

SESETRNNLRRCVRTHQVLIKLVNQINILYSKSTLVNIMTSSFIICLCGFNITITSKDMSTYL  
LFIPFLMNSLTEIFLMCFFGDQ MIDSSYNITQAVYSSRWY--  
DAGEDLKRSVLLILFRSQSQCKITAA NFSDLHLRSFTTVC--VYIIL-----

>HmelOR23

-----MSSIKGFVNSLKLTKKTFFISGIEIDKEDDTKTSIFK-----  
WLFHFNMLWLHTDVFGEFSWLIEGINMRKS---LADLSMVAPCTTICLLA--  
TAKSLNIYLF RDVLDSAVAKLRE-----LYPSDVKEGSVESQILERSMKFLN-  
IVVLFLSACCVVTVIFSSMPLILMGYE---YYQLGYTELKLPFLT-EYFFDS-  
YANKMIWSFVYLHQVWSTVIVCLNLFATDTLFYAFC AHLQM HFNFLCHDFENIVRT-----  
-----

TDDETRREL RKCARRHQDLIELVDKMELLYSKSNL FNILSSSLICLSGFNITLLENSKAAS  
LTFIPFLVVSFTQISLMCFFGDMLMASSTKISDAIYNSRWY--  
NAAPDVKRNLLFVLFRARKPCKVTAANFAVINLTAFTTILSRWSYFALLRT--

>HmelOR12

-----MSYFDKSLEIVKFVFTLSGITYKSKKLNTKEKLI-----  
VRSIYYFNFSVNSDVVGAVYCFIDGVQTG-KTFVELTYIAPCITFAILC--  
SLKAFCMFHYKDHVSDLIDQLRDLDN-----KRKDESDIKKRETNFLH-  
AILKASNINLM LLLTFCVSPFILIAYK---YVKTSEVELFLPLLI-KYPFDS--  
YDIKYWPYVYVHQFWSVVLVIVNLSVSDYLLFICCTYLRIQFRFLQKDIREIVTS-----  
--

NRKLTEPELVLLQEKIVNLVKWHQELIRLTGCLELIYAKSTLYNFVSSSVLICFTGFNVVTI  
-DNVAFTTIFVFLSTSLQIFSLCFFGDLLMESSTEVRNAVYESKWY--  
YTNTKAAKSLLIQTRTDNPCKLTAFGFSEVNLKAFMSILSSAWSYFALLKT--

>HmelOR55

-----MSNFDKSLEKIKPIFVLSGITYQSKKLNIKEKIQ----  
IRCVYLFNFICLNSDLLGSIYCFIDGVRTGKT---FVELTYIAPCVTFSFLC--  
NLKGIFLIHYEDRVCELIDNLRNLDNK-----RRKDDTYIKKGEINFLH-  
AILKTSNILNVILVLTfIMSPFILIAIK----YLKTNKVELILPFLI-KYPFDP--  
YDIRYWPFVYIHFQWS-----DYLLYICCTYLRIQFRFLQSDIKNIIRS-----  
NKMLTEPDLAGFQEKIVNLVKWHQEVIRLTSCLELIYSKSTLYNFVSSSILICLTGFNVIAI-  
QNMAFTIVFLVFLTASLLQIYLLCFFGDLLMKSSIEVRDAVYESKWY--YIKARAAKSLII-  
-----QT-----

>SlitOR7

-----MPKPLLFDGSLDKLGVLFYSGMNLEKDIITPMDTIK----  
HRWLYTLNYFS-VLSAEIAGIYYIITGIVQGK--SFIEVTSVAPCLTFSLLA--  
LIKCSYHHMYEKNIKELINLLRHLEKENDRT---ECADKQEIIDEAEAGFLN-  
KVINVLYVLNCCMIVVFDMTMPMVLIAVK----YYKTKQFEMLLPYLD-VFSFIP--  
YELVYWPFAYVHQIWSECMVLLSMAAADYLFFTCCTYIRIQFRLLQYDFERIIPD-----  
-  
RSVSKEERFDEAEFRDKFREL VQWHQDLIRSAIILDIIYSKSTLFNFLSSSLVICLTGFNVTI  
V-DDIVIIVTFLTFLSMALMQVFFLCFFADLMMTASLEVSNAVYNCKWY--  
LGNTQVGKQLLLVQTRAQEPCKLTAAGFADVNLNAFMRLSSAWSYFALLQT--

>HvirOR7

-----IEKLGVLFRFSGMNIKNKIVTPLDTIK----YRWLYTLNFLV-  
VFSAIIGSVYYVILGIKQGK--NFIEVTSVAPCLTFSILS--  
MIKSLYHLMYEEHIQELIELLRELELRENNRE---KCIEKEEIIASETGFLN-  
KVINVLYVLNCSMIVVFDMTMPMIMIAVK----YYKTNEFEMLLPYLD-VFSFIP--  
YELKYWPFAYIHHQIWSECVVLLDMAAADYLFFTCCTYIRVQFKLLQYDFERMIPD-----  
-----  
RGISKGEENELRNKFTELLKWHQDIIYSSTILEIIYSKSTLFNFLSSSLVICLTGFNVTVI-  
DDIVIIITFLTFLSMALMQVFFLCFFADLMMTASLEISNAVYNCRWY--  
SANIKVGKQILFVQTRAQEPCKLTAAGFADVNLNAFMRLSSAWSYFALLQTVY

>SlitOR12

-----MEEEP LLINKTLKKIEIWLRTTGTVNKSTPKTRMDTIK----  
SRAIYIINFFWLNMDLSGAVVWFISGIANKKS---FTELT YVSPCITLSFLA--  
NFKCFFLFLNEDTVDKLLET LRELEMNERSRP---RHKDKDAIMVHEHKFLT-  
NLISFLNVFFCGLIVAFAIGPVTLTIFI----YVTTNEVDLQLPFLI-IYPFDA--  
FQLKIWPWVYLHQIWSEVVVIVGLGAADYLFYIFCSNISVQFQLLKYNENLIPD-----  
-  
DETCGRLVNVEEVRAEFVDLIKWHQDLISSVKLLETIYTRSTLLNFVSSSALICLTGFNVL  
AG-SDFVYVMTFVSFLFLSALQIFFLCFFGDLLLTSGVKVSDAVYNCRWY--  
LAGTSLGKDLLLVQTRSQT PCKLTAWDFSEVNLKSFMTILSTAWSYFALLQT--

>HvirOR12

-----MMEEEPLLDKTVKKVEFLFRWTGINIKSGTKTRMDTIK----  
SRAVYIINFIWLNNDLAGAVVWFFAGIANSIG---FTELTIVAPCITLSFLG--  
DLKSLYLIIREKNVDNLIQMLRDLEINERARP---KSEEKDAIKYEHNFT-  
TVISVLNVFYFVLLVAFALSPVTLVALK----YYTTNELELLLPFLI-VYPFNP--  
YDIRYWPWVYLRQIWSEVVVIDICTADYLFYTFCTYIRMQFRLKHCIERVIPE-----  
--  
DDGSGRLLNIEQVRAEFVQLIKWHQDLISSANMLETVYTRSTLFNFVSSSVLICLTGFNVV  
AI-SDVAFVVTFLSFLFMSLLQIFFLCFFGDLLMTASTEVS DAVYNCRWY--  
LADTSFGKDLLLVQTRAQTPCKLTASDFS DVNLKAFMKILSTAWSYFALLQTLY

>MsexOR10

-----MALHFDDTIKKNDFVFRYAGINIKSGERKKNDAIK----  
SRRMYVFNFFWL NIDVYGSIFWFIDGLRMGKD---FIGLTYIAPCISLSTLS--  
LIKSLFLISSEKHMFKLIDNLRELETRENARP---RSVQKEEIINTEIKFLN-  
YVLKTINILYVVLVMTFALSPLIIIAIK----YMQTGEVELILPFLI-LYPFDP--  
YNIKLWPFVYLHQFWSECVVTLNIC-----CSYIRIQFRLQHDFERIISA-----  
PSGNRRVRENDFKAKFIELVKWHQDAIESVSLETIYSKSILFNFMSSSLIICLTGFNITVV-  
NDAFVVTFLSFLFMGLVQVFFLCFFADLSESSVEVSNAVYNSQWY--  
MADSNIGKQLLLVQTRAQKPCKLTAWGFADVNLNSFMRVLSTAWSYFALLQT--

>BmorOR11

-----MDEHSHFETSLNKKVLFKYSGMNLENTVTNT-----  
YEFLNHRWVYILNHAWTLAAVTFICIGISNGQ--NFIEMTCIAPCVAMTVLA--  
VSKSFFHYINENAVKSLENLIELERTDFERT---KSVQRTEIVATEKQLLN-  
MVINVLYVLNCSMILVFDMTPLIIIAIK----YWTTNKFVRLLPYLD-IFVFVP--  
YKFEYWVMAYILQIWAECIVLLFIGAADCLFFTCCTYIRIHFRLQYDFERLTSS-----  
RRES DGLR DDEDFRETYTNLVKRHQGLIESSILEMIYSKSTLSN FVLSSLVICLSAFNVTV  
V-NDVTIVMTYLIFLAMSLMQVYFLCFF-DMLMSASEEVGNNAVYNCSWY--  
TEKASTGKDLLFTITRAQKPCELTAAHFAYVNLKAFMRV-SFSASITTLPTI--

>MsexOR36

-----MAETLLDKSLSKINILFRCSGTNIAIGKAAPHTHTKR----  
NRCIYSFNFIWQNTDVLGAIYWFISGLKSGKS---FTELTFIAPCIILSFLS--  
VMKSIISIIYEKKVYQLIKNLRMMEAHERNRE---NTTERGKITEKGVNFLN-  
LVINVLYVFNMLVLVCFALNPLILMILN----YMKTNEIDFILPFPI-AYPFDP--  
YNIKVWPMVYLRQIWTEIVVVLNTIAPDFVFCIFCSHITIQFRLQYDIEHVITG-----  
TRKSIYNDEM RGGRIRNKLIEIKWHQELITCVNLENIYSVSALYNFISSSVIICLSGFNVT  
EN-KDIVLVISFIAFLFMGLLQIFFFCFFGDMLIHASIEVS DAVYNSKWY--LVPPKMRKD---  
-----FTSNSNSCPTSL-----

>HmelOR25

-----FNKALKKVQAFLRPIGLQIDENNSNM TIRKW----  
LRFRWAFIVNMWMNMMDITGQSAWLIQSFTGK--SFVELTNLAPCLALCLLG--  
DIEAFFFM RHSNKARELVRSIRFLQSLTAEKD---MDIEDIAFLKGQIKIFY-

IAVNTITVIITVGIMGFGVSPFINMALH----YKKTSEFVLNQPFLLI-LYPFDI--  
NDIRFYFIA YFHVMTAVIAVLTVLAPCFLCYACSTFIIYQFHRLQKDLEQIIPY-----  
TDNLILYEINDDVKKEFMQIIDRHRKLCIECVNLMEFIYTESTLCNVITSSLLICLTGFNVMA  
I-DDIALTLPFLQFLLLGLVQIYILCYYGDMIMIYSAKVGDAAYNCQWY--  
MIIATRAQKPCRMTALRFSDINFKTFTRILSTSWSYFALLSS-----

>BmorOR25

-----MFEKALRSANFYMRVIGIPTDIRDGNRTLNERL--  
RNRWFYCINFLWLNTDVAGEITWFKGLLSGS-STLIENTYLIPCLTLCILG--  
NVKTFFTIKYANHIIDLVAIKDLEIKNNA-----ARKNETEIVKERLKFLT-  
TSNKFLLFVIGTGIIAFGIGPLMLTASI---YFSSGDMKLLPFLI-WYPFDS--  
SDIRYWPFVYVHQVWSACIACCAVYGPDCFYFTSCTFIHIHFIHLQNDITNIVE-----  
-  
SSRARRNGLYRGCHQAFLELTNRHKDLIRCVNLLEIYISKSTLVNVVSSSLICVTGFNVMA  
AI-DFLPLIAPFTSFLALGLVQTYLLCYYGDTIMCSSTEVS DAVYNSTWY--  
GTNISQMRDYL FVMKRAQKPCCLTAYGFSDVNLRTFSRILSTAWSYFALLIT--

>SlitOR9

-----MVEPFQKCLSQVNFFCKLLGMNIDYRGDSETLIQFL---  
RSHKYFIAQFILFNSQNVSQISWVCEAVITGK--SFLDVTYMIPCLIFCILS--  
IFKGVSYLYAKYNYEFIVTMKNLLAGLTPSNEE-HNIFMKTVIDKHVLMMLT-  
IIFKRMVNIVAVCLIMFALGPFIIMLSN----YYKTKEVKLELPFIG-YYPFNE--  
YDLRIYPFMFHLHQWWTSLFATLMVCGTDYFFFTCCTFIQIQFTILNYDMEKL VND-----  
-----SSCDKDKRLKELVLRHIELMRCVDIMEKIFSTSILFNALTSSVIICITGFNVSVV-  
ENVFMVGSFLAFLFSVVEIFLYCYYGDIIMRSSMNVGNAIYN SCWY--  
MTGVADRKLFLIIITRSQTPCELTAHGFAKINLYTFSSILSTAW-----

>HvirOR9

-----MVDQFQKCLKSVNLYLKFIGHLHLESKDTTKTFIERSR--  
SHRLYFAHFFSLNLEVVAQILWVLEAVITRKS---FVEITRLIPCLILTLIS--  
DFKTL SLLYYARHFIVTMKSLLL NQKQLEEK----ETRFREDLIDKHVLMMLT-  
SITKKISY LIGMGLLMFALAPAFIIPH----YFKTNEVKLEMPFIA-YYPFNE--  
FDSRIYPWVYLHQVWTACVAMIMVYGPDCFFFTCCTFIHIQFSLNNDMERIVNE-----  
-----DTPRYDKTKFKELAVRHIELMRCVNLLEKIFSKSILFNALTSSVIICVTGFNVLVV-  
DNIVMMASFTAFLFGLMQIFLYCYYGDTIMRSSMQVSTSIYN SPWY--  
NIRAADRKGFFIVIIRAQKPCELTANGFFKINLSAFTSILSTSWSYFALLKTMY

>HmelOR48

-----MDEATRKA AKMEIDESLMLSTFSMRRIGLSFDKPRNATDYFLQ-----  
KLIFSL SICGICCHVSTEFINIVLTFASSP--RVEDVVPLFHTFGYGALS--  
IAKV FVLWYKNKVFGELIEELTG-----IWPMPLDGDALGIKEKSLTALR-  
ISHRWYFSVNVLGVWFYNLTPIIVYFYR----VWQGQDAQVGFVWVS-WYPFDK--  
HQPFAHVAVYLFEIFAGVTCVWIMVSSDLLFFGMASHIALLMRILQRRLESLAST-----  
-----EQTDEENYEEIRSNIKLHQRLIRQGESVEECLNNGFAIKPILQLRLLEPFMA-----

-ISNKLFLGSALIQVGAMCWYADDIFHANGNIAAAVYSSDWY--  
KMSPRCRRALLFLILRCQKPIAFTAMKFTNISLVITYSSILTRSYSYFALLYT--

>MsexOR12

-----MEQAKREIDESLKLSAFCMRRIGLSFEKHKNASAHLR-----  
QQLMFALSVCISYHVFSEIMYIGLTLANS-PRVEDVVPLFHTFGYGALS--  
IAKVFALWYKKDVFSQLLRELVG-----IWPTPPLEDEAQAIKDKSLDALR-  
ITHKWYFAVNVLGWVWFYNVTPIAVYFYR---LWQGDGAQVGYVWVS-WYPFDK--  
HQTIAHVAVYIFEIFAGQTCVWIMVSTDLLSGMASHISMMLLRMLKRRLESLAST-----  
-----EKTDDEYYHEILENIKLHQRLITYCYDLEDAFSLSNLVNIVLSSLNICCVVFVIVLL-  
-EPFVAVSNKLFLGSALIQIGMLCWYADDIFHANADVAAAAYNNSGWY--  
STNARCRRALLFLMQRAQKPIAFTAMKFTNISLVITYSAILTRSYSYFALLYT--

>CpomOR12

-----MNTNAEARREIGATLTLCTFSMQCIGLSFERPDG-TARLLR-----  
QKLMFVVSVCITIVYHVFSEIVYIGLTLSNS-PRVEDVVPLFHTFGYGALS--  
IAKVFALWSKKNVFTEHLDELSD-----IWPMEPLDEDARNIKEKSLTALR-  
LVHQWYFSINVGGLVLFYNVTPICVYMYQ---LWQGQDAVVGFVWMS-WYPFDK--  
YKPINHVFVYIFEVFAQTCVWIMICTDLLFSGLASHIAMLLRLLHKRLETLAET-----  
-----EKSQEEYYQEIVANIKLHQRLIRYCNDLEEAFTIVNLINVVFSSLNICCVVFVIVLL--  
EPFMAVSNKLFLGSALIQIGMLCWYADDIFHSNADVALAVYNNSGWY--  
RTDPRCRRALIFLIRRAQKPVAFTAMKFTNISLVITYSSILTRSYSYFALLYT--

>HmelOR49

-----MVTQDKIIAKKEINKTLKLCNFCTRIVGFSFIDDLPKSL-----  
YLKIWKYICFLVIIVLKEAGQMNYAITELLTS-TSVADVFAGLHIFGYDCIS--  
LSKLLTIWYKRNIERNLSELS-----LWFLTSSDRNAIEFKKKKLSKLE-  
IVQFWYAFWNVLGVWLYNLTPVVIYLYQ---KIRGEPASLGYIWHL-KYFFDK--  
TQPGYHELAFVFETFSGLFSVWAMLGSDILFMTMASHISMMLLRMLQDKIRRLDMR-----  
-----KNQNCYADITSLIKIHQRLIRYGEDLEDAFCLVNINVLMSVNICCL-----  
LDPVMVMSNKFYLGAVLTQVGILCWYADDISASSSGVATAVYESGWY--  
HCDIRSRKLLLAVIQRSQKPLYFTALKFGPITMSTYSSILATSYSYFALLYT--

>BmorOR51\_BAH66346

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-----MDCTIVAFYSQAKTQIKMLRYDLEQL-GK-----  
FERSSHIWKALKDEKIHSLVFCVEHYRQIVWFVKEVESIFGEAMTVQFFVMAWVICMT  
VYKIVGLSIYSAEFVSMGVYLGCMALQLFICYCYGTQLKVESESVNTSLYCSNWL--  
SSLPKVRRQMLIMMQYCSKPLTPRTAYVIPMSLETYISVLKSSYSYSLFTLLNQKH

>DpOR46\_gi|357617181|gb|EHJ70629.1|



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FCSTHSNGDDVLKMFDSAAAQYQIHNVHLDILSAEFLTMGTYLCCMMTQLYIYCYYGT  
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SLSPAFRRLVMMERCKRSIEPRTAYIIPLSMETYISATSRIFSAPNVVSAI-

>Bany\_OR3\_GZXD38A02GNYNJ

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-----  
-----  
DHYDRVVWFAKEVESIFGEAMIVQFFVMVWVICMTTYKIVGLSLMSAEFVSIVLYLGCM  
LAQLFIYCYYGTHLKVESELVNDVYQSSDWQ--  
SLSPAFRRLVMMERCKRTVEPRTAYIIPMSLDYISVLRSSYALFTILDRK-

>DpleOR62

-----MTFKFLSNLENPDHLLGP---TLWGLQTSGIWQPCKKRVK-----  
IYNTIHHIM-AILFVLSQYVELY--FIRND---LAMALKNLSVTMLSTVC--  
VVKAGTFIHWQKYWKDIFNYVSK---LEKNQLYKPDYLTKNITIRKYTEYSR-  
FVTYFYWTLVTATVFSLLAPLASYLSSQNKLGDGSGASSYPEIMSS-WVPFDK--  
TQGCGLVLTLIHVLICFYGGGIVANYDSNAVVLMSFFAGQLKILKINCERLFGN-----  
-----  
GEEIVSYKEAVERIRICHHHHILLIKYSKVFNLSLLSPVMFLYIIICSLMICASAVQLTTAGTT  
SMQQIWIAEYLIALLVAQLFLYCWHSKVLHMSLQVDSGVYTSAAW--  
SQDVRIRRSVLLLGGQLKKKVMFTAGPFTDLNIATFVAILKGSYSYYTLLSK--

>SlitOR42

-----KWYFKFLTVSEDPDNPIGN-----YYLIASMWWSLGERSFX----  
XKLFSHNLVHFVAFIFVLSQYVELW--VIRND---LEMAMRNLSVTMLSTVC--  
VFKACNLVFWQNTWKELFDYVSE-----LKDDTINKIIFQYVKYAR-  
RVTYLYWSLVTATVLIVSLAPLLIYWSSPTYRHNIRNGTVPYPEIMSSWTPFDR--  
TRGIGFCVATVY-----IMTFFAGQLKVLSANCSRLFGD-----  
GNELINCDETVKRIKECHLHLLYLIKFSAVLNSLLSPVMFLYVIICSLMICASAAQLTTEGT  
TTVHQVWIAEYLMALIAQLFLYCWHSNDVFYLSNQVDDGVYSSAAW--  
SQNVRIRRSLLLGGQLRKPIVFTAGPFTKLNMATFVTILKGSYSYYTLVAKKE

>HmelOR27

-----MVILFPSLEDPECPLLGP---TLWGLQTWGMWQPNKGKAK-----  
IVYNTIHHIF-AIFVMSQYIELW--YIRSN---LEMALRNLSVTMLSTVC--  
VVKATTIFISWQKSWREIFEFVSL---VEKQQLNKQSKKTKRIVNEYTKYSR-  
AVTYFYWCLVTATVFTVILAPLVLYFSSQRREQIRNGTLAYPEIMSS-WTPFDK--  
TRGLGYWTIVVFHSLICFYGGGIVATYDSNAVVLMSFFAGQFEFLREKCADLFGN-----  
-----

GEEFISYNTAVKRIKECHHHHVLLIKYSKILNSLLSPVMFLYVIICSLMICASAVQLTSEGT  
TTMQQVWIAEYLVALVAQLFLYCWHSNKVFLK---VDEGVYTSAWW----  
SSRGPHTQYSAAWRST-----E-----

>MsexOR43

-----MLERLSKYLENPNHPLLGP---TLCGLKCWGMWQPL-GVNR-----  
IYNAIHFF-AILFVISQYVELW--FIRSN---MELAIRNLSVTMLSTVC--  
VIKAGTFVFWQKSWNDVIDYVSG---LENIQLSKRDITNSVISEYTKYSR-  
SITYSYWVLVTATVFTVILAPLVGFLSSSDKDLMLNGTLAYPEIMSS-RLPFNR--  
SRGFGYWVAAIEHSLICFYGGGVVANYDSNAIVLMSFFAGQLKLLSINCARLFND-----  
-----  
NEVLKYSDTMKRIKDCHHHHVEIVKFSMVLNSLLSPVMFLYVIICSLMICASAIQLTAEG  
TSNMQRIWISEYLMALIAQLFIYCWHSNEVLHMSSKVDEGVYPSHWS--  
AQNVRVRRSVAPRRATAQAHRLHSRTLYQAHYIYFCSYSEGIVQLLYAAKQ--

>BmorOR27

-----MPSSFFLPNLENPDYPSLGP---TLKGLKYWGMWQSGGIKR-----  
ILYNSIHAF-ATFFVITQYVELW--IIRNN---VELALRNLSVTMLSTVC--  
VVKAGTFVCWQKYWSGIIGFVSN---LEKEQLSKNDAATQAAIVKYIKYSR-  
RVTYFYWSLVTATVFTVILAPLVGFLSSPERELIANGTLPYPEIMSS-WVPFDR--  
SRGFGYWVTALVHTLICFYGGGVVANYDSNAVVLMSFFAGQMKLLSINC SRLFDD-----  
-----GNEVISNNEAMKRIKECHYHHVFST---  
IFNSLMSPVLFLYVIICSLMLCASAVQLTTDGTSMQRIWISEYLMALIAQLFLYCWHSN  
QVLYMALERLGGLFEACLE--  
RFPSKWKTGRLVLLRKDGRPADSPAGYRPIVLLDEAGKMLERIVAARIVRHL--

>CpomOR28

-----MVSVQKIISLAKRLEDPKHPLLGP---NLKGLYVYGLWQSGSKFRN-----  
TCYNVIHFC-AFLFVISQLIELW--IIRHD---YLEALHNLSLTALGMVC--  
IFKAVSYVMWQSDWKKLVEGISA---EEISQSDSLNDACIELKQKYTNYVR-  
IVTYLYWNVVVSTNITMVSAPFLKYATSEYREQISNGTEPLPQIFSS-WFPFDK--  
TTMPGYSLAIFIHILINIHG GGVIALYDSNAVAVMVFIRGQLGMLREKCKHIFDE-----  
-----  
YELVNQEIILGRIKECHRHHNFIMRHSSLFNSLLSPVMFLYVLVCSGMICCSVIQFTSEEAT  
AAQKVWVLQYTTALVSQFLFLYCWHSNEVVVECQHVDGGVYDSEWW--  
KGDTHVRKQLAMLGGKLTHNIVFSAGPFTTLCVPTFIDVIKGSYSFFTLLTQ--

>DpleOR63

-----MASKIIRIFERLESPKYPLLGP---NLQGLYWFGWLWQCGNRIRD-----  
GLFNILHLA-SVLFLVSEFVELF--AMEID---LMKILFNVSVTALS LVT--  
VCKTVLFIYYLPHWKNLVNSISK---LEQEQLKSNNFKLV AIIKRYTLYSR-  
VITYSFWSVICITSLT VTAPFLKYITSSYRQSIQNGTELYPQILSS-WFPFDK--  
TKMPGYLIAVSIHIIMTTQGAAIVAVYDSTAVAIMSFLKGQQLLRYKCERIFGL-----  
----

NEVIPTEKVLANIEECHRLHCFLLEQHHRFNSITSPVMILYVLVCSVMMCCSVVQLSLGH  
LSTSEKLWVIEFTTALITQLFLYCWHSNEITYESNLVDRGVYASNWW--  
RGDVKVKRQILILAGKLAPSLILKAGPVTTLSMATFISILKGSYSFYTLVTQ--

>HmelOR53

-----MLLQKIIRTLSSLENPEYPLLGP---NITGLYWFGWLWQCGRKYRD-----  
AFFNFVHFC-SLLFVISQFLELY--FMEKD---LLKVLFNVTITALGLVS--  
ISKTLFFILFLKDWKLLIKNISA---EEIHALSVGNKNVVNYMNYQYKYSR-  
NLTYLYWCIMLMTSFVIMLSPYLKLLSNNYLELVKNGTEPYPQMLSS-WFPFDD--  
TKMPGYFISVTVHILIAIQGIGVIAVYDSNAVAIMSFLKGQMQLKYKCENIFGD-----  
---  
DYEVISQAEVISNIKECHRLHNFFIEQHKL FNTILSPVMFIYVLVCSIMICCSVVQLSVEGV  
PISQKFWVIEYTTALIIQLLLYCWHSNEIAYESASVDLGVYTSNWW--  
RGDVRLRRHALLLAGKLSPMFILDAGPFNQFSMTTFINVSHR-----

>BmorOR53

-----MALKKMLALTKGLEDPHPLLGP---TLKALSVFGLWQTGSQKST-----  
VIYNTFHFL-TFLFVITEYIDLY--TVRKE---LSKMLNNSVTVLSTIC--  
MIKTLSYVCRQSHLKVLVREISE---LELELMKTDDKNIVKRLRQYTVYTR-  
AVTYVYWFLVVGINVLTSPLLYASSIYRSEIKNGTEPPPLILCS-WFPFDS--  
ARMPGYFWATMVHIIMSIQGCGVVATYDMNAVAVMSYLKGQTSILKDKCKAIFDE-----  
-----  
TASSRDVLRIRDCHRHNNILLRHYYMFNSLLSPIMFVYMLICSFTICCSIIQLDSSETTISQ  
RIWIIQYSIGQISQLFLYCWHSNEFAA-----KVKKKHFLF-----  
-PINLF-----

>DpleOR61

-----MLKALLSSIEDPTRRLLGPNYWILKNMGL-----VLPQNP----  
IAKVAYIVLHEIVSFFVLTQYMELY--VIRSN---LDLVLTNLKISMLSIVC--  
IVKANTFVIWQVQWKEVIEYVTR---ADQYERDNQSVERRKIIDSYTKYCR-  
GIVYFYCVLVFTTFTITVNTPLMRYLSSQYREALRNGTELFPHIFSS-WMPFDK--  
YNSPGSWITVIWHVCLCAYGAGIMAAAYDTVIMVIMVFFGGKLELLRERCTHIFEN-----  
-----  
TEIASDDNQTNKIRKLHNIHVLLMKHSRLFNLSLLSPVMFLYVVMCSLMLCASAFQLTSA  
-TNTTQKLLMAEYL VFGIAQLFMFCWHSNDVLIKSQKVMFGPYESEWW--  
TVNSKQARSILIT-----

>HmelOR28

-----MIQSFITSIEDPQRPLLGPYWILKKMGLVLSKNL-----  
LNKAFYIIVHEIVTVFVITQYIEAY--VIKSD---LDQVLTNLKISMLSIVC--  
VVKANTFVFWQHSWGEVIEYVTQ---ADKYEREDTNVEKTQILD SYTEYCR-  
RVIRFYWTLVFTFISVISTPLIKYLSS--QEA FNNGTELFPHIFSS-WVPFDK--  
YSFPGNWITVICHVLFCAYGGGIMAAAYDTIIIVIMVFFGGKLQLLRERCKAIFSC-----  
---

NGLTVSDEQAYRTIRELHKTHVLLMKYSRLFNSLLSPVMFLYVVMCSLMLCASAFLTT  
E-TNTTQKVLMAEYLIFGVAQLFMFCWHSNDVLVKNQQVTLGPYESEWW--  
KMDFRQRKNILLAGQLKIVHTYTAGPFTELTLSTFVTVY-----

>SlitOR29

-----MNSFLQSLEDPARPFLGPYWILKKMGL-----LLPKSI----  
LGKVLVYIFLHETVTFVATQYMELY--VIRSD---LDLVLTNMKISMLSVVC--  
IVKVNTFVLWQKHWREVLDYITE---ADNFERQNEDPVKSQIVEAYTKYCR-  
RLTYFYWALVSTTFLTTTCSPLMRYLSSMFRENMRNGTEPFPHIFSS-WMPFDK--  
YHSPGCWITVLWHTVLCAYGAAIMAAAYDTCIVVTMVFFGGKLDLLRERCKHMFSGS-----  
-----  
YGTVTTDKQCEEVVRQLHGIHVMLIKYSRLFNSLLSPVMFFYMVMCSLMLCASAYQLTS  
A-QNAAQKLLMAEYLIFGIAQLFVFCWHSNDVLIKNNMTSGPFESNWWY--  
TANYRQKKDVLVLLSGQLRIKNIFTAGPFANLTLPTFINILKGAYSYYTLLRK--

>MsexOR18

-----MLSFLKNLEDSEERPLLGPYWILKKMGLLLPKNK-----  
ISKIFYILVHEIVTLFVVSQYMELY--VIRSD---LDLVLTNLKISMLSVVC--  
VVKVNTFVFWQSDWKQVLEYVTK---ADMFERQNQDVPKSNINSYTKYCR-  
RLTHFYWGLVFTTFLTTTNTPFMRYLSSNFRNNFANGTEMFPHIFSS-WMPFNK--  
NHSPGCWITILWHVLLCAYGAAIMAAAYDTCVVVIMVFFGGKLYLLRERCSNMFKN-----  
-----  
SDENASEATVKQLHGIHIQLIKYSRLFNSLLSPVMFFYMVMCSLMLCASAYQLTSA-  
TNAAQKLLMAEYLVFGVAQLFLFCWHSNDVLIKNNENVTLGPYESNWW--  
SASLRQKKNVLILSGQLRISNKFSAGPFADLTLATFITIIKGAYSYYTLLRK--

>BmorOR29

-----MFDLQNLLEDSEERPLLGPFWLINKTGL-----LLPKTN----  
FGKLAYILVHEIVTFFVVTQYVELY--VIRSD---LDLVLTNLKISMLSIVC--  
IVKVNTFVFWQTSWREVLEYVNE---ADKFERNQTDETRGMKIETITKYCR-  
RLTYFYWSLVFTTFLTTTNTPLMRYWSSIFRENLRNGTEDFPHFSS-WMPFDK--  
NHSPGSYCTIVWHVLLCAYGAAIMAAAYDTCIVVIMVFFGEKLNLLRERCKKMLAN-----  
-----  
DLYNHAFVIGQLHDIHVQLIKQSRLFNSLLSPVMFLYILMCSLMLCASAYQLTSA-  
TSTAQKLLMAEYLIFGIAQLFVFCWHGNDVLFKNANVSLGPYESNWW--  
SSSPRVRADVLLCGQLRVHRVFTAGPFADLTLSTFIKILKGAYSYYTLLRK--

>BmorOR56

-----MKLLEKLEDPRPLLGP-----NVKALKFWGLLLPESR----  
SKKYFYLFMHFAVTFTATEYIDVW--FVKSD---LALLNNLKITMLATVS--  
VLKVTTFLWQNAWRDLIGYVSR---ADLEQRATSDSRKLALINGFTGYCR-  
KITYYYWFLMYTTVAIVTVQPIKFSSAYRLDVQSGNGTYLQVSS-WIPWDK--  
NTLPGYLLASIYQTYAAIYGGGWITSFDTNAIVIMVFFRAELELLRIDCAALFDD-----  
-----

EKSFGDMAFMRRRLKECHRRHTELVKHSRLFDSCLSPIMLLYMFVCSVMLCVTAYQITIE-  
TNPMERFLMTEYLVFGVAQLFMYCWHSENDVLYASQDL SRGPYESAWW--  
SRDVKYRKNNLYILVAQFNKVIVFSAGPFTKLT VATFIRILKGAYSYYTLLSQSQ

>MsexOR30

-----LENAERPLLGP-----NVKALQFWGLLLPKYR----  
LKRYFYLTMHILVTLFTFTECVDVY--FVKSD---MNLLLNKITMLATVS--  
VCKVNTFLYWQKRWDIIAYVTR---ADLNQRNTKDEKKLALIKKFTLYCR-  
KITLYWFLMYTTVVIVVAQPIFKYAFSNYRDNVRMGTTETYLQVVSS-WVPFDK--  
NTIIGYIAASIYQTYAAKPNS-----ADIHHTGGR-----  
SSMHLEGPPIRPIVSR-----  
ITIHWV--SFNVVTGKT-----LALPNLIALI-----

>DpleOR60

-----MTSTIQRLLQKLEDPKRPLLGPWKLYGLILPRTRKG-----  
KMIYLSILTVMGFLFISEYVDMI--IMRND---VNHLLLNFKYSMLSSVN--  
VIKVITMYAWHKHWMGIFKFTTR---VDIERRNSPDPIYRETVRKYTKYCR-  
IITYIYWFLGYCTVIMIVVQPAKYLLSTYRQNVKDGTEKFLEVNS-WTPFDK-----  
TTMSGVASLYSGGWITSYDTNAFVLMIFFRGELELLRRDCRSFGT-----  
EENPVTKEEAQKRIDHCHQRHNDILKYFRLFDSCLSPIMLLYVIVCSVMLCATTVQLTTE-  
SSAMQKLITFQYLMFGVSQVFIYCWHSENDVLYVSQDLMLGPYESYWW--  
TRTLSEQKNLHLLAGQLNKQIVLTAGPFSYINLATFINILKGAYSYYTLLN---

>HmelOR57

-----MKLFIQKLFNVLEDPNQPFVGRIKLLKIFGLLLPENNNK-----  
LKLIYFIFHAY-VLMFIVTQWMELF--TSRSE---IIMILRNVKYAIFASVN--  
VTKVSTCILWQKDWKFILDFITK---VDEERRTTKDKVSKDILQKYTFQSK-  
IVTYLYFYLTCTIAMMIIQPTVQFSLSSSYREKLKSGKEKPLEVNSWLPVDK--  
RTSSGYIIMIICQMLPLIYSGGWITSYDTNAIAVMTFVCCELELLRRDCQILFGT-----  
--  
IKEPASNEEAKAKLAKCHKRHNDLVICSQFLFDSCLSSVMLVYVVICSCMLCATAYQFMIE  
-NEPLQKIITAVYLIFAVSQLFLYCWHSENDVLYYSKDLMLGPYESIWW--  
MRSLSQQRNIHILTNQLDKIIVFSAGPFSSITVTTFINILKGAYSYYTLLSQSQ

>HmelOR58

-----MASLLTKFHSALEDSNYPLIGR--NVKLLKMSYLLSERPGYRAAV-----  
RVKAGILLSLMVFFALTQATDTF--INISN---IVKFLRNLYVLMSTMI--  
IAKVSSYMLWQKRWETHIQYVNE---VNVDRITDDPISIKIYKKLVKYCK-  
IVTYIYIYLT SATVFLVLIQPIIYCLR--MYSSLEDDLDKYIPITNTWVPFDK--  
DNLIVYLLSLLLQIYATIYSLIYIVAFDANAVSTMVFFRGELELLRRDSQILFGT-----  
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NSPVNEETARVNLSKCQKRHKDLVTYVKLFDSCLSPIMLLYVIVCSVMLCATAYQLTVE-  
TNAMQKFITA EYLIFGVSQFLMFCWHSENDVLY-SKDLTLGPYESMWW--  
TRSVSEQKDISILTDQFNKEIVFSAGPFTSITVATFISVS-----

>SlitOR45

-----  
QFQYFRVYRSFQKCRNTNVRLLGNLLKFLEDPEYPSVGPHLKLQRQTLIGRFKQILFYVTITFF  
FSQYVKCFIKFN-ADSLKLILQYAPFHMGI-----KSCFFQKDYKTWELVIDYMSS----  
VEKKQLDKKDKKHDDIIHEYIKRNR-KVSYFFWALAFFSNFSIFTEPYQKNQVN-----  
VNGTSIYLKIFDG-YTPFDN---  
EPPGYYSMLIQTVLGHIVSAYVVGWDTLVVSIMIFFTGQLKITCMYCRLAIDA-----  
-----  
NSTKSHENIAKCHRFYTTLVEYTHLFNALVSPVMFMYLVVIAINLGVCIVQIVEIHDDITT  
LVSSILFVIACLIQLLLIFYWFANEVTVESTFVSYSTFESDWP--EANKKLQKE-----  
-----V-----ALLG---

>MsexOR35

-----MVVIEKILSFLEDPRYPVSGPIRLLSLTGL-----WH-PDLKSP----K-  
SRFKIIIFLVTVAFFLSQYVKCIKFNTDD---LKLILQYAPSHMGII-----  
KTCLFQKDYKIWEELIDFISS---VELKQISRKDENLDKVMKAYIRNR-  
RVSYFFWALAFFSNFSIFTEPYQKNNFN-----VNGTSTYLYIFDG-YTPFSR---  
EPNGYYFSMCIQTMLGHIVSAYVIAWDTLVVSIMIFFAGQLKITRLYCTRMITA-----  
-----  
NNEESHNRNIAECHRFTSLVKYQKTFNCLISSVMFVYLVVISVNLGVCIKQIAEIEDDLPT  
LVSSCVFLMACLIQLLLIFYWHSNEVTIESDLVSYSTFQSNWA--  
QSNKNIQKEVALLALTTRKKLVFRAGPFNVMSLSTFVSILRASYSFYTLLKG--

>BmorOR36

-----MVFNSKKNIIISLFSLLEDSRHPSVGPHLRLLSLTGIWYPNSKT-----  
NITLLKRACFYVIVLFFVSQYLKCIKFKIDS---LQLILEYAPFHMGI-----  
KTCFFQKDYNVWQDLVSFISK---TERDQIAKKDPKSIKTIQSYISNR-  
KITYSFWALAFIANIGVFSKPYQNNQSD-----VNGTVTYNHLFDG-YTPFSE---  
EPPGYYSMGIEITLGHVVSFYVLGWDTLVVSIMIFFAGQMMSRLQCSRMIING-----  
-----  
SPERTHKNIKCHKFHTDLIKYQKQFNLSISPVMFVYLFVSSINLSVCIVQIAEIEDDFATVL  
SSFIFLLACLIQLLLIFYWHSNEVTVQSELVSYSTFESNWT--  
STQNKLQKEVALLGLTTSKTLVFTAGSFNHMTLATFISIIRASYSFYALLNSTK

>DpleOR48

-----MSLLFTHIKSSLKFTNVIFTVFGVWPPPGLNDLARRVY-----  
SLYSFLLLFMMSVYIIIQTGDLV--QVWGD---LTLMTASVFMLFTNIAY--  
AIKLAYVIQRRELIQKIIFDG-----DNELDGQKTKLAIQTVE-----  
-----RYPFDA--  
TKRPAYQWTYAHQFIALSINAAVNLCDDVLVATLIAQCRCRLRLIAQSLRTLCD--  
VDVDKKGRITADSEKVVSSRVRGIVMRHQLVLAQVEQLQQCFSPILGQFAVASFIICVT  
AYQMAFV-TNLYRLISMASFIEAVTIQVYIYCVAGTNLTIDSDEVSRAAAYECPWY--  
EFPASIRRLLLVIMVRCKRATVITVAGIVEISLDTFMSLTSTCVKTLTDLHSQI

>DpleOR49

-----ISVLMGNVLEEATAKDIKNC-----  
TFIILQMIDLY--LIWGN---LSLMTGTALVLFTNISQ--  
VTKIINLLARRKHIEFLIKDTNDGLEVM-----TSSRARELIKSCDHETR-  
NQQVIFLLVTFVTTVGW---ATITDKNG-----LPLPA-WYPYDT--  
SVSPAYELTYTHQTLSIMIVAVLNISKDSLVTTLAQTRCRLGLVGLALTTVCSE----  
DNTYSGGYSNKLFTAQQEMIKNRLRICVQQHQRALRAAKILQECFSVPTFAQFSVSLIII  
CVTAFQLSVICIDGQQDAWPTPVTFFIIINFSAYSDIGYYHKKTSEELARRAYEMPWY--  
MCSVSVRRSIQIMMIRCHRIVKFTAGGFTTSLATFTAVIKLSYSMLTLLQQ--

>HmelOR62

-----MGILVENSIFSLRSLTALRFTGFWPPEGWSKGKLILY-----  
HCYGFFCFMLLGIFLITEVADLF--LIWGN---LPLMTGTAFLLFTNLAAQ--  
AAKFLNIIIRKSILRIITECEV---  
LKEHKVAKFKGSRNILCIVQSCNRETQQQVFFFILTITVAGW-----  
LGSAEMGKLPLRA-WYPYNT--  
NISPLYEITYIQQGFTILLAALLNVSKDTLATTLIAQCKCRLRLIGLSLRNIGDC-----  
YYGEVNEPLTSSQELKAYQHLRRCVIEHQRTLNTIMLLEKTFSEPTFAQFSVSLVIICATAF  
QLVSQSGNYVRLISMGTYLNNMMFQVFIYCYQGHSLSTESEDLACVYDMPWY--  
NYSVRVRRSLLVIMVRCRRIAKLTAGGFTTSLITSFMAV-----RLML---

>HmelOR63

-----MDILVKNSNFSLSLSLTILRFTGF----WPPETLRKDKMI-  
LYNCYGFIFFVLMVFLISELGDLV--LIWGN---LPLMTGTAFVLFTNLAAH--  
ATKFINIVRRRESVLKIITDSDILKAE-----TSVEGRKIVHSCNRETR-  
WQQLFYFLLTFFTCMGW-----ASSAEKNKLPLRG-WYPYNT--  
NKPIAYEITYFYQVFSMFGAAFLNVSKDTLVTTLIAQCRCRLRLVSLSLRNLTSL-----  
TVSEKTLIFTPTQEAIVYKRLRSCAIKHQKVLETTLLLQNTFSEPIFAQFNVSLSVIICVTAQ  
LVSQTGNVIRLISMSTYLMNMMFQVFLYCYQGDQLSTESEELAKAAVEVPWY--  
ASSVRLRSSLLIMMVRCRRVVKLTAAGFTTSLSLNTFTAV---RFFELVGLFS--

>BmorOR63

-----MKLWIRNANFTISLSLTLLRCLGFWSPDGLAGNKRL-----  
YNCYSFVFFMFLGIIYILQVVDMI--KIWGD---LPLMTGTAFLLFTNFH--  
ATKVINIVIRKNRIQRVIQQANAVLMGV-----QSEEARRIVKSCDFETS-  
IQLCLYFLLTFFVTTVGW-----ATSAEKHQLPLRA-WYPYDT--  
SKSPAYELTYIHQVAALLIAAYINVAKDSLVSLLIAQCRCRLRLVGLALASLGQD-----  
LKIDYQSQLSPAQENILNRLKTCVLEHQTVLAAVTELQACFSKPTFAQFTVSLIIICVTAF  
QLVST-GNLVRLLSMGTYLMNMIFQVFIYCYQGNKLSVESSEIAGSVYFSPWY--  
LGSVKLRRALLIVMVRSRRAKLTAGGFTTSLASFMIIKASYSLFTLLQQVK

>CpomOR16

-----MGIIEKNVNFVSVSITALKLFGFWAPEGLTREQNILY-----  
NCYGFLSFMLLGTYLIIQVVDLF--LIWGD---VALMTGTAFVLFTNLAQ--  
TTKIVAVVARAGTLRPLVSSADT-----LLAAETGPGKEIVDSCNRETW-  
QQQLVYFCLTTVTVAGWAGSAEKNQ-----LPLRA-WYPYDT--  
SVSPAYELTYLHQVGALFAAAYLNVGKDTLVTCLIAQTRCQLQLAALRLASLTDD-----  
-  
LTPTAQGTLTAEQEAEAWSRLEVAARRHQEALHAAAQLQACFSAPVFAQFGVSMIICV  
TAFQLTAQNGNLVRLASMGTYLLNMMFQVFIYCYQGNQLSGESMDIATAAYSCGWT--  
ACGVRLRRGLLLVMVRARRAARLSAGGFATLSLASFMAIVKTSYSLFTVLQQAD

>MsexOR16

-----MGIFVQNVNRSRFLCTMLKLTGFLVPNGVIEFTVFHN-----  
IYWFFWMMFVVGINVTQTGDLI--QVWGN---LSLMTSAAFLLLSDVAM--  
MMKIINVVMRGRVIQTVIDGMDL-----ELRSEARAKGRKIIKECDDQTT-  
RHLYLFLCLSGVTVLGW-----AGSAEH-----NKLPLRA-WYPYDT--  
STSPAYELTYIQQ-----NQLITTGQN-----  
TIDRLRSCVLKHQAALRAASQIQECFSEPILTQFTASTVIICVTAYQLRIEQSNLVRVISM  
MAYLLCMMMLQVFLYCLQGNQLAEESSNIAEAVYECPWY--  
RLPLPLRRSLLLIMVRSRRVAQLTAGGIATLSLACFTSIHKVSYTFFTVLQS--

>MsexOR34

-----MKIFIDNANGTLWLSLNLLRWVGFLVPDNFEGRKKKLL-----  
PFYSFFWFMIVGIYVIVQTGDLI--QVWGD---ITLMTGTSFLLFTNMAF--  
ITKIINVMMVRDAVLAIIDEGDEVLRSE-----RRIEGKAIVKSSNQETS-  
RLLYLYGLLTVVTVFGWAASAEKGS-----LPLRA-WYPYDT--  
SKSPAYELTYLHQSVAVILLAFNLVSLDVLVTSLAAVCRCRFQLLALSRLTLCHD-----  
IPIDEKHLVSPEHKQIVHERLRLCVLQHQSIESAARIKTCFSGHILAQFTVSIVIICVTAYT  
LALERDNPIRLIAMFSYLLGMMMQLVFLYCYQGDYLSEESSDIADAAYECPWY--  
ACPIPLRRSLLVIMARSCRVAILTAGGFSTLSLACFVSIHKASYSFFTVLQTSR

>MsexOR37

-----MKIFIHNANGTLWLSLNLLMWVGFLVPYNFECQKNNL-----  
LPLYSFFWFMFIVGIYGSFRTRNLI--QVWGD---ITLMTGTSFLLVTNMAF--  
ITKIINEMVPRDAGLSIFYEGDEVLRSQ-----RRIEGKAIVKSSNRETS-  
RLLYLYGLLTVVTVFGW-----AAS-----AEKGSPLRA-WYPYDT--  
SKSPAYELTYLHQSVAVILLAFNLVSLDVLVTSLAAVCRCRFQLLALSRLTLCHD-----  
IPIDEKHLVSPEHKQIVHERLRLCVLQHQSIESAARIKTCFSGHILAQFTVSIVIICVTAYT  
LALEHDNPIRLIAMFSYLLGMMMQLVFLYCYQGDYLSEESSDIADAAYECPWY--  
ACPIPLRRSLLVIMARSRVAILTAGGFSTLSLACFVSIHKASYSFFTVLQQVE

>HmelOR64

-----MKLVQNVNFSLIVTQVVFFTFGIWTPKCDG-----  
WKKRLFSFYSFVSFNFILGSYII--IQIGD---LIQVWGNLSLMTGTIFL---  
LLTNFSLSTKCNRETI-----MQLSVFYTL SYMTVFGW-----



AASAEKNELPLRA-WYPYDT--  
SKTPAYQLTYAHQSIASMEATINVCLDTLVTSLICQYRCQLRLLALSLRTLCDG-----  
LEFDNMGRLTEYSNEIVSRRLERCVVVRHQTVLHQVNLLQKYFSIPILAQFTVSMGIICVSA  
YQLAFETTSLVRIISMVAYLMVMMLQVFLYCYQGNQLVMDSTGVSSAGDFDPWY--  
ACSIPIQKSLILMMRTKRVARLTAGGFTELSLATFMAV-STYYILN-----

>BmorOR45

-----MKVLDNVNHAVKVTMNCCRLYGLFVSDDLTKRQLIIM-----  
RAFSLMLYLFFVGFFITTQSALII-TMWGD---LNLMTNVGLVLGTHLTL--  
SAKVFTLHYKEKEITNVIYKNEVRLRAE-----TREQGKYIISEMNRETT-  
LFMRLFIPFGMGTVTAWLLCTPKGELYT-----PA-WYPCNT--  
TKSPAHEIILAHQGIAVILTATLEIAIVLLMTSIVAVCRCLKLVLGSLFETICDD-----  
LPSNIMNKLTADEQVIVAKRVRENVIEHQAVLECINDIQDCFSSAMLVHIAISTMIICATA  
YQLAVESLDLTQRMRTMASFLGGMSTEIFLCYQGGHLSIDSMEVATAVYSCPWY--  
TFPTSLKRSLLVIMIRAQQPALLTAGGFAPLLLDTFVSIMKASYSFFTIVLQN--

>BmorOR47

-----MKLVFDNFIFALKVTLNWCRYFGIFIPDELTGRRQKL-----  
LVQAYSVFMFMLFIGFFIITQIILFI-LVWGD---LSLMTDVGLVLGTNLAL--  
SAKIAVFFFKREELASILKKNDLTLRFE-----TREEGKKIISEIDRETN-  
AFMKVFFFCFGVGTIVIAW---FLSTPKG-----ELHIAT-WYPCDT--KRSPAYEIIMIHQ---  
-----LAITADLLMLSMIAVCRRCRVKLVGLYLQITICDD-----  
LPCNVKNKLTSDDEEVIVAKRIREYVIEHQAILDCISELQNHFSALLVQLLTSVVIICVTAY  
QLAVESSDLLRKFTMASFLFAMSTEMFTFGYQGGHLSHDSMEVATAAYSCPWY--  
TFPTSLKRSLLVIMIRAQQPALLTAGGFTTSLSETFVTIMKASYSFFTIVLQE--

>BmorOR58

-----MKLVFDNFIFALKVTLNWCRYFGIFIPDELTGRRQKL-----  
LVQAYSVFMFMLFIGFFIITQIILFI-LVWGD---LSLMTDVGLVLGTNLAL--  
SAKIAVFFFKREELASILKKND-----TLRFETREEGKKIIS-----  
-----EYPCDT--  
KRSPAYEIIMIHQTIAVAVIASLAITADLLMLSMIAVCRRCRVKLVGLYLQITICDD-----  
LPCNVKNKLTSDDEEVIVAKRIREYVIEHQAVLDCISELQNHFSALLVQLLTSVVIICVTA  
YQLAVESSDMLRKFTMASFLFGMSTEMFMFGYQGGHLSHDSMEVATAAYSCPWY--  
TFPTSLKRSLLVIMIRAQQPALLTAGGFTTSLSETFVTVS-----

>BmorOR46

-----MAFFIRNKMLGLTITLNTLSWAGLIMRDQYTKTQRIIV-----  
RVYGWLVFLLFVAATYVQIADLI--DIWGD---LDLMAETSLLLFMELAV--  
ISKILTLIFKYDKIMEIINGTEDILCSE-----NRLEGQKIIASIDKETT-  
RFFQYYTSSVIFTTFFW---FLGEHSS-----TFFIRA-KYPFNE--  
LKSPGYEFALIHQCMVMVFTGYFEFNINIFFASVVAGCRCLKLVALSLRNICIN-----  
IPVNKKNLITPEEKLITERLHCAISQHKYALDAAEDVKHCLSKVLLVQLTVSIVIICTTAY

QMAVS-TDTIQKLSMAGYLLGASFEVFLFCFQGQSLSNASEDIADAVYECPWY--  
TLTQPLKRTLIIIMMRAQSPAILTAGGGFVTL DITEYMAVLTGHGGFGDFLHR--

>BmorOR57

-----MPSLIKNRIFGLTLTLNTLSWAGLILRDDYT-KTQRII----  
MKVYGGGLVFLYLFVFTAYVQIADLV--VIWGN---IDFMTETSLILFMQLAV--  
SAKVLTLMLKSKKIMEVTNEADA-----ILISEKKVEGQRIIASIDKNTT-  
LFLKYYGFFVAFTIICW---FMGENTS-----TFFIRS-KYPFNE--  
LKSPGREFAFVHQCIVVIFTGSFDFNVDIIISLVAVCRCRLKLVALSLRNLCLD-----  
IPMNKRNLITSDEEKVITERLRNIISQHKRALDAAEAIKHYLSGALLVQLMVSIVVICTTA  
YQLAVK-STTMQSLTMAGYLFGTSLEVFLFCYQGEFLRESSEEIADAAYECPWY--  
TLTRPLKKTLIIIMTRAQRPATLTAGGGFVTL DITEYMAV-----SLISNT-

>SlitOR44

-----  
-----  
-----  
-----YCYQGNQLSEESFEIAGAAYECLWY--  
KFSRLRLRRALLIVMVXHX-PSSTTHCWRIHYTFTCFFHG-NHSFVFISATTS--

>HmelOR47

-----VYTGDVKDYDATYTIPTVILKVVGIRIFLKDTKLKSICW-----  
NFYFWFNFVSILISCMLESINMFMSMASVGT---FVDLFTMMPCVGYLIIG--  
TCKAFKIKRYYYVYKNLVEELRD-----MWPNGPITEEEHKVMNDALRRVR-  
FIIKGNRNSTMALGSIFNGPPLIAWVKN-----RLGFDTELLMPFFF-  
WLPFKTGRFEAIYFTQCFLCKLLTTMRIPGYMMSADLLYCIFLCHITTQFSLLSIRIKKFIY  
VY----  
SKKYLESQSNPIHDEETQEKLAELFSIIQRHRALIRLSSDVESMYTFSLLVNFVNSSVIICF  
CLFCCAFV--EKWNEFIYKMFLITSTLQTWMLCWYGQNLISTSTGVAESLYNCGWY--  
TGSSKIKKSIFIMINRSQKQVHITTGFSIISLASYATILKTSWSYFTLLIN--

>SlitOR28

-----  
MTSLYRKFLFKKKLKQRIDERVYNKRDYDASYAPTKKVLGWVAIRMTHNISEKFYWFE  
MMNLFLVGPSELVSMLTTAYEAKTFRD---SIKVFRTPMPCFGCVVLS--  
MFKSIKMVVHRPVYENLANELRD-----MWPEGEVSEEEHQIISAALKQLN-  
FIVKGYYYWCNNALLISFLSPPYFITLAR-----YFGYDSPMGLHFLY-WLPFDP--  
YQSVYYEITLVLQTWHALVVIWFNVAWDMFLCLFLCHITTQFDLLARRVQRLFYVE----  
FIQTEGERVNSYGAQYWEARHQKEITEIVLRHHSIRLTGDVENMFSLALLINFMNSSIIC  
FCGFCCVLI--EKWNEVAYKSFLVTALSQTWLLCWYGQKLIDSSQRLADALYGCGWY--  
NSSKRARS AVLIMLHRAQKGIYVTTHGFSVISLASYSTIIKTAWSYFTLLLN--

>MsexOR42

-----MASLWRKYFTKEIQVLKRVYEKSDYEDTYETPRKYLKWSGIRMKHNISKSLSICW-  
----LVYYWFCFVNIVFASVAEIIAMCMTASAGT---  
FDDAIAIFQMMPGFCGLSLKSFKMVHRPVFENLITEIGN-----  
MWPQRLVDEEEHKIISALREIK-IFVKGYHWCNNYLMLSFLYPPFWELIKR-----  
LSGEKWEPKLHFIY-WLPFDP--  
LQPVYYECMLALQTWQAMTVIWTNMSGDFMFCLFLSHITTQFNLLSVRIRKLIYVE----  
YLRKNKEPVDSYTPQQWEEKHFKEITEIVLQHQAIRLSRDIENMYSLTLLVNVVNSPLVI  
CFCGF-CSVVKWNE---TAYKSFLVTALSQTWFVCWYGQKLLDSSEGVAEAVYNSGWY--  
RASKKIRRLMIMLHGSQKGVGVTTYGFSIISLASYSTIIKTSWSYFTLLN--

>HmelOR42

-----MDIPNFEEMFKQININFWLVGLNFHQSRV-----  
TLAYFIILFNIVIVLVEETGFFVSKFSVEN---FLELTQLAPCTCIGSLS--  
LLKIIIFIAKKKQNIQDLTQYLRE-----LYNKALIDSSKKELIKQDFIFLK-  
YLVKYFFILNAILICVYNFSSLVLIAYY---YYTKRTIFYILPYAM-LIPFST--  
DHWYSWLIVYLHSIACGFVCVIYFTTVDALYYIMTSHICAQFSLSEEIKGLDAD-----  
-----TSCQLSDIVKRHQYILKLSQNLEEIFRAPNLFNVLVGSLEICALGFNLTMG--  
PWSQVPGVVLFLLSVLVQILMISVFGENLIRESRKVGESAFCKWY--  
DMDQKSKKIILLMLRSNKPQKLTAYKFSVISYESFTKIISTSWSYFTILKT--

>HmelOR43

-----MDIPTFEEIFQQIKINFWLVGL-----PFGKSNV-----  
TKTYIILLFNILAFVEEMGFFVSQFSVEN---FLELTQLAPCTCIGLLS--  
FLKIIIFIAKKKENIYGLTQHLRE-----LYNKALSDSTKKELIKQDFIFLK-  
YLVKYFFILNAILICVYNFSSLVLIAYY---YYTKRTIFYILPYAM-LIPFST--  
NHWYSWLIVYLHSLASGFVCVIYFTTVDALYYIMTSHICAQFSLSEEIKGLDAD-----  
-----TSYKLSDIVKRHQYILKLSQNLEEIFRAPNLFNVLVGSIEICALGFNLTMG--  
PWSQVPGVVLFLLSVLVQILMISVFGHELIRESRKVGESAFCKWY--  
DMDRKSCKKIILLMSN--KPQKLTAYKFSVISYESFTKIISTSWSYFTILKT--

>BmorOR42

-----MDIPKFEELLKQIKMNFWMGI-----P-FDNPKI-----  
QIRYYVLLLPLSLMLIEEIAFFGSRMSEN---FLELTQLAPCICIGVLS--  
VLKILALTAKRQKIYELTQNLEC-----LHKIILNDTRKTELVRKNLVLIK-  
FITKYFFVLNAVLFVYNFSSPVIIAYN---YIVSNEVQFVLPYAV-LLPFKT--  
DSWIPWLIVYVYSIFCGFTCVLYYATVDVLYCVMTSLVCNNFSLISFKLQKVNRN-----  
-----TAHLLKEVVKEQQYVLKLAEDLENIFTAPNLFNVLIGSVEICALGFNLMIG--  
DLTQIPGCILFLSSVLLQILMISVFGENLISESSRIAEAAFLCKWY--  
EMDQKSKKTILTIMIRSHKPKLTAYKFSVISYGSFSKIISTSWSYFTILRT--

>DpleOR53

-----MRRTNGCARTDGFH-----  
SLYRALVLVLTIAVLLQEFVYAY--QERND---MTKLSRVMFLLLCHITS--  
IAKQIVFHYDADRIQEMIEGFDD-----PIYNGESASALSLLRSTTLVAR-

RLERAYAGCAILTCTLWLVPVLHRLSG-----NPVHFAF-WTGIDT--  
DPPAMFVAVLLYSYYVTTLVGIANTTMDAFIATILFQCKTQLTILRLDFQTLTPQR-----  
ALIECQKNDLTYESALIKLFVKCFLHYRRVTETAALLQDIFGTAILVQFGIGGWILCMAA  
YKLVSLNVLSIEFASMTLFILCILTELFLYCYYGNELTVESELIVRSVYSMRWV--  
SSPLRFQRLLLLLMLRVRRTLPAAGRVIPLSLDTFVKILKSSYTFYAVLRQTK

>HmelOR26

-----MRAPGGAGK-----  
GGYRALVLAVTAAYLLQECVYAY--QERSD---MSKLSQVMFLLLCHITS--  
IVKQIVFHIDADRIDLQVLQSLND-----PIYNSTCPRARELLSHTTARAR-  
RLQRAYAGCAALTCTLWGMFAAWRRACG-----GAVEFPF-WTGPRT--  
DSPAVFIVILLYSFYVTTLVGLANTTMDAFIATILYQCKTQFTILRNEFETLPER-----  
AKSLSIKTNEDYERVIMTLFVKCYHHYQKIIETSTVLGHIFGVAILVQFGIGGWILCMAAY  
KLVSLNILSIEFASTALFILCILTELFLYCYYGNELTVESDKLVCSVYCMRWQ--  
RAPLRLRRLVLVMERARRPLCIAARLVPLSLETFLKILKSSYTFYAVLRQ--

>SlitOR17

-----MSVCAGSVAPHVRCLRRVGFCRWGAAAPANPLLAT---  
AARFYHVFALAATSTYVLQQLIYAY--QERSD---MDKLSQVMFVLLCHVTC--  
VAKQVAFHVDADRIDELIARLDE-----PLLNQCAGPRGALLHGTARRAA-  
RLLRVYSGCAVATCVLWIVFPVLYRIRG-----ISFEFPF-WAGVSY--  
DHNVVFGAVLLYSFYTTNLVAIGNTTMDAFMATILDQCKTQLRILRLNFETLPER-----  
ARALQQSGGGVYEASLQRLFVDCLLHYNITETCTVLHDVFAVPLLIQFGVGGWILCMA  
AYKIVSLNVFSIEFASTTLFIICILIELFIFCYYGNEVTVESSRVSESLSMEWA--  
RAGLSFRRLSLVLVMERAKRPLRPAAGRVIPLSLDTYVTILKSSYSFYAVLRQTK

>HvirOR17

-----MSLRSECARSVAPHVRVLRRVGFLRGAALP-ARPRAV---L-  
RGYHALALAATSTYVLQQAVYAY--QERGD---MEKLSQVMFLMLCHVTC--  
VVKQIAFHVDADRIDLRIAGLDE-----PLLNQCEGERGALLRGTARGAA-  
RLLRITYVGCATCVLWIVFPILNRIQG-----ISFEFPF-WTGFSY--  
DHNVVFSVLVLLQSFYCTNLVAIGNTSMDAFMATILDQCKTQLRILRINFESLPER-----  
ASALHMETGENYDTILDELFDCLVHYNKITEMCAELHDVFTAPLLVQFAVGGWILCM  
AAYKIVSLEVLISIEFASTLITLILIELFIFCYYGNEVTVESERSVSQSLYSMEWR--  
RARLAFRRSLVLVMERAKRPLRPAAGRVIPLSLDTFVKILKSSYSFYAVLRQ--

>SlitOR26

-----MSLSSGSVATHLRILRRCGYCRLAGGARVARLGS----  
LHALYRGFTLALTTLYLLQECIYAY--QVRQD---MDKLARVMFLLLCHITS--  
IAKQLVFHLKADRIDEMLGGLNE-----PLYNQSAAVHQRLLRVTAARAA-  
RFVRAYAGCAVVTCTLWITFPVMYHLQG-----QLVEFPF-WINVDY--  
NQSKMFILVLAYSYYVTTLVGIANTTMDAFMATVLNQCKTQLRILRMNFECLPLQ-----  
-  
AVEVLKTSPGQSYDAVLMKLFKECLLHYEKITKTAKMLQDIFGTAILIHFIGIGGWILCRA

AYKIVTLNVMSEFASMTLFISCILTELFLYCYYGNEVTDESSRVSESLYSMEWA--  
RAGLSFRRLVLMERAKRPLRPAAGRVIPLSLDTFVKIIKSSYTFYAVLRQTK

>BmorOR26

-----SLSGSSVFTHLFLLRCCGFCRLSRSSSTARGLSV---  
AHEVYRALTLTLTVVYLLQECVYAY--QERTD---MDKLSRVMFLLLCHITS--  
VAKQLVFYLDADRIDYLIATLDD-----PSY--NEMSHQRLLDASRWAS-  
RFVWAYSGCAVVTCTLWIVFPIIYHVQG-----QTVEFPF-WIQIDY--  
TKSSMFVVVLLYSYYVTTLVGIANTTMDAFMATILGQCKTQFTILRIKFETLPTR-----  
AKQALRCDSEQNYDEVLMLRFDHCLKHYQKIV-----  
SAILIQFGIGAWILCMAAYKIVNLSVLSIEFASMILFISCILTELFLYCYYGNEVSTESERLV  
TSIYSMEWV--  
GARLGFQRGLLVLLERARRPVRPAAGLVIPLSLQTFLKIIKSSYTFYAVLRQTK

>MsexOR3

-----  
MTSAGSSVAPHLRCLRMVGFCLRSAGTAGATGRGRWRRRAHGAYHAFALSATSTYVLQ  
QLIYAY--QERGD---MEKLSRVMFIMLCFVTC--VVKQIVFHVDA TRIDMLVAGLAE-----  
PLFNPAAEWARALLRETARAAR-RQALAYAGCAVATCVLWIVFPVLD RARG-----  
RHVHFSF-WAPIDC--  
THTAKFLTLLLYSFYATSLVGVGNNTMDSFVATVLHQCKTQLTILRINLET LVER-----  
ARAACGDARDQYDRVVYKLLVESLVHYQKITQTCALLQDIFGAALLVQFGVGGWILCM  
AAYQIVSLDVMSIEFASTTLFIVCILTELFLYCYYGNEVAVESDLVLQSMYALEWL--  
AVPRRVRRALLIAMERAQRPMRPAAGAVLPLTLD TYVKILKSSYSFYAVLRQTK

>BmorOR59

-----MDTNPSAAGDSVAPHLRRLRQVGFCQLDPTSQSRRPILAL--  
MHRVYHRLVLAATVLYIFEQLTYAY--QARND---MERLSRVLFLMLCHLTC--  
IAKQFVFHSDADKINQLVVGLDD-----ALCNQPVETHRLLLLLETSRAA-  
RLLMLYSGCAVSTCILWAVFPLLDQLRG-----RTVEFAF-WIPIDY-  
RHNAFQFAVVLAYAFYSTSLVAVANTTMDAFIATVLYQCTTQLRILRMNFESLPER-----  
---  
AYALSRKTRQDYHTVTHELLVDCLLHYKKITETCNLLEQIFGKAILVQFGVGGWILCMA  
AYQIVDMEILSIEFASTALFMGCILTELFLYCYYGNEVTVQSGLVSESVYAMSWL--  
SLCPRERRALVVVLERARRPLRPAAGR VVPLTLNTYKILKSSYSFYAVLRQTK

>SlitOR31

-----MEDNVAYSTFEGFRPHFDALARVGYFKIVLKPISSLKRF----  
FHNVYRIISWSLILTYNLQH VIRVV--KVRHS---FNLIVDTL FILLTTLNT--  
LGKQTAFNLRSRRIDDIISIING-----PTFAASKPYHVEVLKQNALVMS-  
RLLTLYHGAIFTCTGLWTVFPVVRNALG-----KEVQFTG-YFPFET--  
TSTLAFSLALAYMTVLITFQAYGNVTMDCTIVAFYAQAKIQLQMLRYNLEQLVEFN----  
IKKFNSIKTQYRDEGEEKTELQERLKKCVRHYDQIVRYAKEVESIFGEAMVVQFFVMAW

VICMTVYKIVGLSICSAEFVSMVYLGCM LAQLFIYCYFGTQLKVESELVNQSIYCCDWL  
--CLSPQFRRQLLVMMQCCGRPLAPRTAYVIPMSLDTYIHVLRSSYTLFTFLNR--

>CpomOR31

-----MTTTYSTFEAFRPHFNALAYVAYFKIIPKPSSGVKHT----  
LHTVYRAVVWFLVIIYNLQHVIRVI--QARHS---TEQAVNTLFLVLLTTINT--  
LGKQVAFNSRVERVDRLVATIEG-----PLFMARNTYDEKVLRSNAWIMS-  
RLLMYHGSIIYLCGAMWGISPLVSKLSG-----EVELTG-YFPFDT--  
SGWLGFGLIAVAFNTIVITLQGYAHVTMDCTIVSLHAQTKVQLQMLRNSLEHLTDSR----  
EICVQSTVYKDIEDTAFGVVLKKRLTRCVEHYKLIVWFHSEVEAVFSEAMIVQFFVIAWV  
ICMTVYKIAGLSLVSAEFFSMFVYLGCM LGQLFIYCYGTQVKAESEFINYSIYRCDWV--  
SLSPRFRALLLILMSRGMRPVAPRIAYIIPMSIETYISVLRSSYTLLTFLERK-

>HmelOR24

-----MEVKLSYRCVEQHLLRLRVGGYYQIDPHSPTLHKR-----  
LHDIYMRITLVWIIIVYTVQQAIKLY--EVRDD---MDMVMGTLFLFLTHTDS--  
IYKQLVLWIKADKVEELLDIMKGGIYNLLCQLFNQGEDDHMTYLLQAAYTST-  
CLLNTDNCLALATCFLWTLLPFLHLQG-----KSVEFAI-WFPFDV--  
NVDPAFYFLLLYVWFTTSWLAFCNTTMDVMVSFLFGQCKTQLSIMFVILSRKYLP-----  
-----ATERIW----  
MIEDIFSTAIAYQFLISGWIICTSVYRMVDMSPASVQFLSMVLYISCILIQIFMYCYYGNEV  
TIESENLTGSAYSMNWL--  
EINLKLRRHVILFMERIKRPIQPLAGRIIPLSNNTFVSIVKNSYTFYALLKNTN

>DpleOR51

-----MADIKSEDLFLNR-----  
AKFVMKLLGVWIIYIVQVWGD---LEAVSQASYLLFTQASL--  
CFKVTVFQVNVKSLRELLKRMND-----KIFLPQSSKQNRILSLQAKRIK-  
RLLLAFFMISSQTTCGLWALKPLFDDPGS-----RKFPFDM-WMPVTP--  
QSSPHYEFGYAFQLLTICMSAYMYFGVDSVALSMVIFACGQIDIHKDKILKINSI-----  
RKESGDEMSRRIVASDNNKKLIECIRQHQA VVLFKELLENTYHTYLLFQLVGSVGLICMS  
ALRILVVEWRSIQFFSIVTYLSVMISQLFVCCWCGHELTATSEDLHTVFYRSTWY--  
EQDVRFRQCLCFAMMRLGQPLVLRAGHYIPLSRQTFVSILRMSYSYFAVLNQTK

>HmelOR16

-----MKVLKSEDLYLNRAKFMKYLG V-----WV-PAKNET----  
ASKCYRLFMMSLQYLFLLFQIIYII--LVWGD---LEAVSQASYLLFTQACL--  
CFKITVLQINMDMLKDLLRRMND-----KIFFPNSKEHERILKLQAKRIK-  
RLLLAFFMISSQTTCGLWALKPLFDDAGN-----RKFPFDM-WMPVSP--  
EFSPQYELGYVFQLLTICMSAYMYFGVDSVVL SMVIFGCAQLDIHKDKILNIGFV-----  
DIKGQDSMEKKTIIAENNTKLINCIRQHQA VVLFTELIENAYHTFLFQLVGSVGLICMSA  
LRILVVDWRSMQFFSILTYSVMISQLFVCCWCGHELTATSEELHTVLYKCAWY--  
DQDLKFKRRTLLFAMLRMDRPLVLRAGHYISLSRQTFVSVS-----SVL----

>SlitOR32

-----MVSSDLFLNRAKFVMKYLGV-----WVLADNASY----  
FLKAYRGFMITLQYLFLIFQTIYII--QVWGD---LDAVSQASYLLFTQACL--  
CLKVTVFQINMPMLKDLLRLMDS-----KIFRPENDVHEKLLELQAARIK-  
RLLAFMVSSQITCGMWALKPLFDDADR-----KFPFDM-WMPVSP--  
EDAVQYYIGYAFQLGTICISAYMYFGVDSVTFSSVIFGCAQINIIKEKLMSITSI-----  
KEKRGTKAVDEALAENYNKLVDCKHHQAIVTFTTELVENAYHPYLLFQLIGSVGIICMSA  
LRILVVDWRSMQFFSILTYLSVMISQLFVCCWCGHELTATSEDLHRVLYKCYWY--  
EQDVKFKRELCFAMMRISRPLVLRAGHYIILSRQTFVAILRMSYSYFAVLNQTH

>BmorOR16

-----MSFNSEDLYLNRAKFVMKYLGV-----WVPPENENF----  
ARKFYKIFMMSLQHLFLFFQIIYIV--EVWGD---LEAVSQASYLLFTQACL--  
CFKITVFQINMNKLKELLQMNG-----YVFQPKNINQQNIIKVQATRIK-  
RLLAFMISSQLTCGMWALKPLFDDVGS-----RKFPFDM-WMPVSP--  
ERSPHYHLGYSFQLVTICMSAYMYFGVDSVAFSSVIFGCAQIGVIKDKIMSIKPL-----  
GIYRNHKTYYTKISRYNRKTLIECVKHHQAVISFTELVEDTYNSYLLFQLVGSVGIICMSAL  
RILVVDWRSVQFFSILCYLSVMISQLFVCCWCGHELSTSEELHTILYNCAWY--  
DQDVKFKRDLNFMMARARRPILLRAGYYISLSRQSFVSILRMSYSYFAVLNQ--

>MsexOR32

-----MSCIMYLAVSEQLTMTLNSEDLYLNRAKFVMKFLGV-----WVPPNDENI----  
IRKLYRYFMISLQYLFLIFQIIYII--QVWGD---LEVVSQASYLLFTQACL--  
CFKVTVFHVNVDLLKELLQMNG-----ETFRAQSFDEKILESQAARIK-  
RLLAFMISSQLTCGMWAVKPLFDDVGS-----RKFPFDM-WMPVTP--  
ESSPHYHIGYTFQLVTICMSAYMYFGVDSVALSSVIFGCAQIEIHKDKLMSIQPV-----  
DKNANDAINAFSDNYQQLVNCIKHHQAIVRFTDTVENAYHTFLLFQLVGSVGIICMSALR  
ILVVDPRSMQFFSIVSYLSVMISQLFVSCWCGHELTATSEDLHTTLYMCAWK--  
DQNTKFQKELCFAMLRMSRPLVLRARHYIALSRQTFIMILRMSYSYFAVLNQ--

>MsexOR45

-----MDVCIMYLAVSEQLTMTLNSEDLYLNRAKFVMKFLGV-----WV-PPNDEN----  
IRKLYRYFMISLQYLFLIFQIIYII--QVWGD---LEAVSQASYLLFTQACL--  
CFKVTVFHVNVDLLKELLQMNG-----ETFRAQSFDEKILESQAARIK-  
RLLAFMISSQLTCGMWALKPLFDDVGS-----RKFPFDM-WMPVTP--  
ESSPHYHIGYTFQLVTICMSAYMYFGVDSVALSSVIFGCAQIEIHKDKLMSIQPV-----  
DKNANDAINAFSDNYQQLVNCIKHHQAIVRFTDTVENAYHTFLLFQLVGSVGIICTSALR  
-----IL-----VSEDLHTTLYMCAWK--  
DQNTKFQKELCFAMLRMSRPLVLRAGHYIALSRQTFIMILRMSYSYFAVLNQ--

>DpleOR52

-----MGIWLSSNNYVI-----  
LRDLYKSLIMSTQYSFLLFEIFYVF--VWGD---IDEMSEASYLLFTQTSV--

CYKASVFIINKKNLIVLLVSMKA-----KIFEPQSSIHYGILYRNARVVK-  
NLCAVFLMSAITTCSLWTIMPLFDAET-----RFFPFI-WMPVDP--  
RDSPQYELGYIYQVMSIYISALLFVAVDNITLGMIMFGCAQLEIVIDKIKQLKNA-----  
SSKHNKERRKCLICENNKLLDECIKQHQS VIRFIETLENTYHANIFFQLTATVGIICIGLRISI  
VEPRSVQFFSMLNMYMTMLSQLFLYCWCGSHLTTKSEELREWLYQCPWY--  
NQDPRFRKSVFIAMERMKRPIIFKAGHYIPLSRPTFVSVLRLSYSYFAVLNQAK

>SlitOR10

-----MEAEKNTTLFLGRPCKILT AHGV----WPHPNNYII---  
LRKLYMLFVMWTQYSFLLFEIYIV--NVWGE---IDEVSEASYLLFTQASL--  
CYKSTTFMINKKS LLELLDIMDS-----DIFPKSAEHEKILAAQALKIK-  
RLCLFFLTSA TTTCTLWAMIPLFDDASK--RSFPFRICKQETLTLLF-RMPVTP--  
LKSPDYELGYLYQMISYISAF LFISVDS-VAVLIMFGCAQLEIIMDKIKKIQSI-----  
FNTDQSEEGRKLLKMNNELLDEC VKQHQTVERLIQLCEDTYHANIFFQLSGTVAIICNI  
GLRISIVEKNSVQFFSMLNMYMTMLSQLFLYCWCGHELTIRSENLEWLYQCPWY--  
EQDTKFKRSLFIAMGRMKKPIIFKAGHYISLSRPTFVAILRCSYSYFAVLNR--

>HvirOR10

-----  
IDAVSEASYLLFTQASL--CYKSTAFMVNKQSLLELLEIMDC-----  
EIFEPKSAEHEKILAAQARKIK-RLCLFFLTSA TTTCTLWAMIPLFDAASK-----  
RSFPFRI-WMPVTP--  
LKSPDYELGYLYQMVS IYISAF LFISVDSVAVSMIMFGCAQLEIIMDKIQKIKYV-----  
FESADSEEKRREIKINNEFLVECIKQHQTVERFIQLCEDTYHANIFFQLTGTVAIICNIGLRI  
SIVEPNSVQFFSMLNMYMTMLSQLFLYCWCGHELTIRSENLEWLYQCPWY--  
EQDTKFKRALFIAMERMKKPIIFKAGHYISLSRPTFVAILRCSYSYFAVLNR--

>MsexOR31

-----MAQNTFLFLGRPCKILTFFGI----WLPSKQYQD---  
LVKIYMILVMITQYSFVLFEIVYII--NVWGD---IEVVSEASYLLFTQASV--  
CYKT TAFLIKKRKLVLLEHMEQ-----EIFASQSKDHEKILLELSRIK-  
RLCTFFLTSAIT TCTLWAMIPLFDDAGH-----KTFPFRI-WMPVTA--  
DESPGYELGYLYQMVS IYISAF LFIAVDSVALSMIMFGCAQLDIKDKMQKVREV-----  
PICLNVDEKKEKLKSNNDLFTECVRHYQNVISFVELVEETYHANIFFQLSGTVAIICNIGLR  
ISIVDHHSVQFFSMLNMYMTMLSQLFLYCWCGNELTIRSEVLRDWMYQCPWY--  
DQDTKFKRTLWITMERMKKPIIFKAGHYISLSRPTFVAILRCSYSYFAVLNR--

>CpomOR10

-----MTVSTVDNVTFLNRPRNILLYLG I----WLKPANYVS---  
LYVAYAIIVMLTQYSFVFFEFIYIA--LAWGD---MDAVTEASFLFTQASV--  
CYKVTRFMINKDNLVFLLSF MEE-----EVFQAQNERHVRCLLNQSIMIR-  
RLCLFFLGSA LT TCTLWGLMPVVDSTGG-----ERIFPFLI-WMPVGP--  
EKSPQYELGYFYQMVAIYISAF LFIAVDSVALSMIMFGCAQLEIIMDKVQQIKRV-----  
PMSGKVKKQDREQLIQENKVL FVECLKHHQAVIRFIESAEDTYHANIFFQLSGSVAIICIG



LRITATTPGSVQFISMLNYMVTMLSQFLYCWCGNELTIRSEILREVMYLCPPWH--  
EQSNSFRRLWVAMERMKRPIIFKAGHYIPLSRPTFVAILRSSYSYFAVLNQ--

>BmorOR41

-----MMGNSTDLFLDRTKSILNFFAMWRSFEKPIPL-----  
KVYMAFIMTTQYLFLIFEIIV--NVWGD---MAEVSEASILLFTQASV--  
CYKITSFISKTNFVILLGLIES-----EIFSAQTELHEKILILKARKIK-  
RLCMFFLVNAVTTCSLWAVIPLLDISSK-----MLPFI-WMPAST--  
GESPHYELGYLYQMITIYISAFFIGVDSVPLSMIMFGCAQLEIIMDKIGVKSR-----  
PLDQQPMQRQAVLNSNYELLVECVRRYQSVVRFIELTEKTYHANIFFQLSGSVLIICNIGF  
RIAVDSNSLQFYSMILTYLVTMLSQFLQYCWCGHELTIRGEELRETLYQSPWH--  
EQDIRFRKVLITMERMKRPIIFKAGHYIPLSRPTFVAILRCSYSYFAVLNR--

>HmelOR41

-----MNSNIEIFLSTPKIILIWLSI-----WLRIGDHVI----  
LHQLKQAIVLFTQYSFLLFELIYII--VWGD---LDEVSEASYLFFTQASV--  
CYKVAVFVINKNKLKLLLEFMMV-----DIFASQSTVHDGYARTHVSPLI-TVCIQNLAE---  
---NEERSILTLGS-----LTHSHCFRMPVSQ--  
HIFSQYMIGYLYQIISVYISALLFFAVDSTTLSMIIFGCAQIEIIDKIKK-----  
-----  
VKHISKCFRIELLENTYHANIFFQLSGTVAIICIIGLRISITEPDSVQFYSMVNYMVTMMS  
QLLLYCWCGNELTTKSEDLREWIYQCPWY--  
EQDSKFRSSLVIAMDCMKRPIIFRAGHYIPLSRPTFVSV-----

>BmorOR10

-----MRTNAKSFLFVPSKVLTLCGV-----WPVEKTSI-----  
FSLIYRSIMLSSQFCFLVFNGIYIG--LMWGD---LKAUSDALYMFFTQTTTC--  
CSKAIGFYFNFMIKIRIVASMD-----VLFTAMSIEDQATIFSHSRTVN-  
KLYKGVLGFTGFTLVQWTVLSLIGSGRT-----LPFNEMWVPTDI--  
SKSPNYEITFVVELWMMVISAALFMSVDTITVATMMFSCAQLDIIMKKTQQIQEI-----  
PLSPDLSSRNRSELHEKNNGILIDCIKQHQAIVRFSELCEGTFQVHSFFHLGGIVFMICVIGF  
RMAGESPVSAQFWAALSylvILGQLYLYWCANELTTKSEQLRDKLYLTPWY--  
DQDVKFKRNLCIAMECMAKALTFRAGSYIPLSRAMFVSILRSSYSYFAFLNQAN

>BmorOR40

-----MTGAGAGT-----  
FRTGAGPGRGDGVARRGESGE---  
TTTLGRDAFAALGCFGAADGSTARARFFPRVTVLNPSEVPGSGLAADSNSISDSESEPELD  
AAQDAIDAGA-----GVGGDIGESRA-----RTVFG-  
IQGHIDASDSALRMHNNVAIYA--KTTMSGNSQLTFATAATIFLKNASGP-----  
-----NGVAIGTDYAICVVSLSLFFRTELVEDTYNSYLLFQLVGS-  
VIICMSALRILVVDWRSVQFFSILCYLSVMISQLFVCCWCHELSTSEELHTILYNCAWY  
--DKDVKFKRDLIFMMARARRPILLRAGYYIGLSRQSFVSV-SIRIRFNAILVI--

>SlitOR27

MIILNENMKTCLAFSPVVPYGVFESWEDLNPQLYHAVHIYWLFYGM-----WF-  
NDFSPQ---Q-MMYTLIVLWVCFFPGIGEVVYLL--RRREN---IGDVAEGLYLFLSEMYT--  
YFKVVVFWLNRNKVIDLLKYLHC-----EEFKPKEPEHRDIIKSIKSAR-  
FVMTYYSTMCVGAVSVGIIMPLTENFDI-----LPTNV-EYPPFN-  
VYQTPAYEAVYIHHIYKPATCIIDGVMDTILAAFVASAIGQIEILXFNLRNFELL-----  
-----  
EYKPPYYVRSVLKDCIVHHNCIIRYVSMIESAFSLASALQFMLSVMVLCLIGIQFLSIPTSH  
PMQAWMGIYLTCLMLIEVFILCWFGDELIWKSMDLAKAAAFEGPWM--  
NSDRKSNMFIIIFLERCKRPMRLTAGKIFTLSLDTYTVLINWSYKAFAVMRN--

>DpleOR34

-----MSFFKRFTDRVCESDLDFDNLKYLYYVGLWPREDWPKYKQILY-----  
KIYEFKLHLLSITFIVITGIGTY--QQRNN---VIMLMTNLDKTLVGYNF--  
VLKIFFFVIKREKLNVLNIEIKN-----SGDKVSDDRKTLMMA-IHVIFITFISTALVSAF--  
-SLLSQYKA-----EMTVEA-  
WMPFDPFKDRMSLLMAAQILAICFVVPCLYRAFAMQGIVCSIIMYFCDQLHLQGNLKK  
LGNT-----  
KHNEQARKEFKGIVKKHVRLMRYTKTFTEIFKEFFLIQNLAVTIELCLNALMVTVVLD  
EKTLLASFLTFLGLALFNAYIFCYLGDELIILSTGISQAAYESEWT--  
SWPIDMQKDLLIIKVAQRPLKLSAGGMAIMCIQTYSQALYNAYSIFAVLNDVV

>HmelOR18

-----MAVLKAISEQILHRDLDFDNLKYLTFVGL-WPENWNRDKLFLY-----  
KIYEINLHFLSIMFIVLTGIGTY--QYRDD-ITIAMTNLDKCLAAYNFVF---  
KIFFFVLKREKLRLALIVEIRS-----SSDKVNDDRKMMLMG-  
IYVIVITLVATILVGAFTLVAQLK-----MEMTIEA-  
WMPFDQYENRSSLLMATQILAVGFVVPCLFRAYAIQGIVCSIIMYFCDQLEELQDGLSNL  
DYS-----  
EETDRFVREELKNIKKHVRLMGYSKTFTSIFKEFFLIQNLAVTIELCLNALMVTVVLQEKT  
LLASFLVYLGLALVNAYIFCYLGDELISQSTGIANAAAYEIGWT--  
SWPKDLQKDLLILIIAAQRPLTLSAGGMSIMCIQTYSQVLYILATIF-----

>BmorOR18

-----MGDRMVTRGHFFDFNLIKLYFYVGLWPSNEAKRIEKIAY-----  
KIYEYQLHVLSLIFLVTTGIGTY--KNHKD---IIALLTNLDKTLVAYNF--  
VFKVIVFVYKREELRKLIEQIVQ-----SGDQITEDRKALMA-  
KLIVVLTGISTVIITAFSCLALFEGEMT-----IDA-  
WMPFDPMKSKMNLFAASQILAATFVVPFCGYRAFAMLGIVCSLILYLRDQLVDLQNKIRD  
LRFA-----  
TGNVEKLRDDFKLIVKKHVRLLGYSKVIEMIFKEYFFIQNMAVTAELCLNAMMVSVVLE  
QKTLAASFLAFLSVALLNAYIYCYLGNELIVQSEGIAMAAYESSWI--  
LWPVDMQKDLLIVITAAQKPMKLSAGGMAVLSVQTYSQTLYNGYSIFAVLNDIV

>CpomOR21

-----MFGSLELSDDFFAYNLKYFLVGLWPDDAWAKTHPSLY-----  
KIYENITHVLSIIFLITSGIGTY--QIKDD---VVLLMTNLDKCLVAYNF--  
VAKVGIFVWKRRQVEILISEIVN-----SGDQLTEERKKMML-  
MIIIVVTGLSTSIVGAFSALALYHNELS-----VEA-  
WMPFDPMESKMNLLTASQLLAITFVVPVIWRAIAMQGIVCSLIMYLCDQLVELQDRIRSL  
EFT-----  
SMTERVVREEFKNIVNKHVRLMGYTQDMNKIFEEYFLIQNLAVTLELCLNLMATMIGFE  
QKTLATFFAFLCVALMNAYIYCYLGNEMIIQSGNLALAAAYESSWI--  
SWPLDLQKDLVILLRVAQKPLYLSAGGMVAMSIQTYSQTLYNGYSIFAVLNDVV

>SlitOR43

-----NVFILIDDGFFSFNIKYLFFVGL-----WPEKTLTRN----  
QKFLYKIYELFIHAITHIIFLIMAGVGPIKNKDDILIVLSNLDKSLVVYNFFF----  
KTIIFLIKRDQLSDLIDEIEA-----SGDEVTKERKKLMA-  
NYVMAVTGMTAAVVSTFSLALLEGIMS-----IEA-  
WMPFDPVKNSMNLVLSLQII-  
AFCVFPGLCRAFAMQGLVCSMIMYSCDQLIHLQKELRSLDYV-----  
KDTEMITRMKFKMIIKKHIRLMGYSMKMESIFNEYFLVQNLAVTVELCLNAVMVSIVVQ  
QITLLFTFLAYLVLALINAYVYCYLGNELIIQSEGIALAAAYESTWT--  
SWPVDLQKDLLILINASQRPLKLSAGGIALLSIQTFSQALYNGYSIFAVLNDVV

>HvirOR3

-----LIDDGFFSFNLKYLYFVGLWPEKTLTANQKILY-----  
KLYEYFITFLTTFIVLASIGTY--QHKHD---LVVVFCNVDKCLVVYNF--  
FLKTIIFIKRDKLRDLIDEIEM-----SGDKVTEERKKLMA-  
NYVMFITGMTAAVIGAFSLLALLEGTMS-----VEA-WLPFDP-  
MESLMNQILALEVLAFCVFPGLCRAFAMQGLVCSMIMYLCDQLTHLQTELRLDLYV-----  
-----  
KESEMAMRLKFKNAIRKHIRLMGYSGRMESIFKEYFLVQNLAVTVELCLNAVMVTVVV  
HQITLLVSFVAYLLLALVNAYVYCYLGNELIIQSQGIALAAAYESTWT--  
SWPVDLQKDLLIVILAAQRPLKLSAGGMALLCIQTFSQALYNGYSIFAVLNDVAV

>MsexOR20

-----MAVSVLKRLTYGDNIFEFNKYLMVGLWHNENWTRNQKLLY-----  
KIYDNTLDVLGLIYLTLTAGIH--GNMDD-ITAALAGVDKSLVAYNFML----  
KIIVFHFRKHQLRKL VKEIIA-----  
SGDVVPEEHKILVAKLSLATTITTIHVTIFTGISVLA-----GELPAKV-WLPFDT-  
SKNFMNLLAGVQICVTFGVPICYRGLALKCFVSTMIFYLRDQLIDLQVKFKELDNF-----  
-----KDAEEEVRTNFKKIVKKHIRLIRYSKTIDNLLREYFLIQNLAITIEVCMNSVTLT---  
-----LSEGISSAAYNTSWT--  
SWPVDMQKDLLTVIIVAQSHFKLTAGGMVMSLETYAQTLYNGYSIFAVLID--

>MsexOR21

-----MLVGFWHNENWTRNQKLLY-----  
KIYDLTMHVFGITDIALSAVGIIYQTKHDLT---VALAGVDKALVAYNFMF----  
KIIGFHFTKDQFKKLVKEMIA-----  
SGDVVPENHEILMAKLSLATTITSTIIVVIFTGSSMMVG-----DLPARV-WLPFDI-  
SKSFMHLLAGVQFCVIFAIPVCYRGLALQCFVSTLIFYLRDQLIDLQDKFKELENF-----  
-----  
QNVETELRRNFKKIVKKHIRLIRYSKEMDYLLREYFLIQNVAFTTEVCMNAVILTLIGFSQ  
KTLINFIAFLITALIHAFVYCYLGDEIIEQSKA-----YRLLLT--  
IQPSTMQKNLLTVIIAAQSHLKLTAGGMAVMSLETYAQTLYNGYSIFAVLADAV

>HmelOR22

-----MALFDNLRKKILGSDFDYDGFVGDLYEFHPQLKILLVTNGIFFNNRDSYWR-----  
FLWPVISVLLSIITCAFELMFIHHGVDIED---YSFATECFCYFLIIFTI--  
PIVYTSVMLNRNNIIQILDTMNR-----DFLFICNLGSKYRKTFLLQGQMLIK-  
KLCVCWLIFCVSIVLMYIFSTTAILLYQ-SLFATQHENMVRPLIFPF-WLP-  
ADDPYRTPNYEIFFFLQCVEGLIVPQTFMYIYVLFHILLHHYYL-MSMMTFDIEVLFHGL---  
-  
DESVVSLSYTDSRLMEVKVILRNRMRVVKWHNLVLGSDAVSSVYGPPLVYQVTITSL  
VTCLVAYQVADSLDHGKLHVIFTMLFIATCVQLWIPCYLGTILRNKAFAVGEAMWNSG  
WH--TTLGRLLRSIIIFIKRCQKPVSIKFTGLPNLELETFSV-GVSFVYLNINLFL

>SlitOR22

-----MRLQIIKDFLMKASFDFDRPDIDLYNFRIFLAVKGVFFTNRGSR-----  
FRLIWPSICIQLSIIGMTFEEMFIWRGVSLKD---YSFATECFCYWLLLGCI--  
PTVYVSILVHTNKIYDIVVKMNE-----EFIYVCSLGPRYRKPFLEGQLLIW-  
QLCYAWFGFVSFVGGLYVVFPLVGLIYQ-SLFATLNENTTRPLQFPM-WLPHDD-  
PYRTPNYELFLFIQSTLCFCFVQTFCVYIYTLFHILLHYMIMDMIIIDFSVIFDGL----  
EESVALLPRHDSRRMETQRILNARIEKIVKWHLSVFGAVKTVSSIYGPPLVYQVSFTSIAIC  
LIAYQIAEKLDHGSLDILFSLLSICACLQLWIPCHLGTMRNKAFEVGDAGWTCGWH--  
PLGLMIRTDIIIIILRAQQPVTIKYTGLPQIQLETFSMSSSYFNMLRQYS

>MsexOR22

-----MGWIERIKGFILKKSDFDFDRPDICLYNFRILFALKGIFFNKQNSK-----  
LKIILPTYFNLLTILGMVFEGMFAHRGLTIKD---YSFAIESFLYFIILTST--  
PLVYLCLFYHKDKIIQLDDMNE-----EFKFVCSLGPRHRTPLKQGQLLIW-  
KLCYAWYTLSTGTAFMMFPVMALVYQ-TLFVTHTEKTIRPLAFTM-WLPNDD-  
PYRTPNYEIFFEMNYCVIIVQTFGVYIYTLFHLLLHHYFILDMMILDFEAFIDGL----  
DESVAALPSKHPRRREVQLILNARIKRIVTWHNSVIKTINTLSIVYKPALVFQILLSSIMVC  
LIGYQIAESLDNGVIDFLFIMLGVCTCMQVWIPCYLGTLLRNKVFAVREACWNCGWH--  
SLGTILRLDILIIQRTQVPLLIKLSDMSTVELETFSIMSAAYSYFNMLRNSN

>CpomOR24

-----MKAFVSTAKTFLYKNDFEWNKEITLQNFQIFLAINGVFFNNRESK-----  
IRFILPVLSTLITLVAVAFEIFFIWHGISMND---YGFATECFCYFFILGSV--

GIVYSSVLLNRVKVFKLLHNMNN-----DFLFICNLKAEYRDTFLTQGQLLIW-  
RLCWSWIVFISFVSLLYISNTLLYLLYQ-STLATQDEHMIRPLIFPM-WLPEDD-  
PYRTPNYEIFLALEVILIFVVLVTFGLYVYILFHLLHYYNLMDVILIALDDLFDGL----  
DESVVALNRGDPRRQAVQDELNIRMGQIVRWHL SVFDSVDDISSVYGPTLVYQVMFSSI  
VICLMAYQVAEQLSEGKVDYLF GILGIGACLQLWIPCYIGTLLRNKGFFVGDRCFYCGW  
H--PLSRLLRPDLIIFIQRTQRPVAIKFTGLPHLQLETFSSIMSNAYS LFNMLRQYK

>CpomOR22

-----  
PGEYSLCSQSNMTLLTIFRDIKS FVNKDG YDLERPDVTLQNFHPQLEVFFAIKGIKRFIWP  
ALSSFMASVATGFELLFIWRALTIKN---YAMATESFAYLIILGSV--  
ILTYLGVLTNRRTTILTLLSEMSK-----DFRYICNLASNYRKSFLDQGQLLIW-  
KLTMTWGIFVICVAILYVLNTLLLLLYQ-SLFATLDEHYVRPLIFPV-WLPHDD-  
PYRTPNYEMLLVFDIAIILVAMASFGLYVPLSLHLFMHYYKLLDMILIAIDELFEEL----  
DESVVTLPVTDQRRLDVKAELSRRMGRIVRWHSVFDSVGAITSIYGPM LVYQVMFSSV  
IICLMAHQVAIQMADGKFNYL FALLTFGAILQLWIPCCMG TLLQTKALS LGERC FYSGW  
Y--PLTQLVRQDLLIFITRTQVPVEIKFTGLPEMELHTFSSIMSTAYS YFNMLRQYN

>BmorOR66BAH66361.1

-----  
-----MRFGLKVYIYTLFHILLH---FYYILHMIKFDLEAIFDDI----  
DESVALLPHRDTRRIEVQKILNGRMKRIVTWHISVFKAVEAVSSIYGPPLAYQVMFTSIAI  
CLIAIQITQKLENGILDIRFTMLGVAA CLQMWIPCYLGTLLRNKA FG VGEACWNSGWHQ  
TPLGRMIRQDIIIVLLRAQQPVTIKFPGLQSIQLETFSSVIFNLYGYYYYYYCLDG

>BmorOR65NP\_001166622

-----  
---MRLGFEVSISEYLYRNIFYIYTLFHILLHFYIILHMIKLDLEAIFDDI----  
DESVALLPHRDTRRIEVQKILNGRMKRIVTWHISVFKAVEAVSSIYGPPLAYQVMFTSIAI  
ICLIAIQITQKLENGILDIRFTMLGVAA CLQMWIPCYLGTLLRNKA FG VGEACWNSGWHQ  
TPLGRMIRQDIIIVLLRAQQPVTIKFPGLQSIQLETFSSVIFNLYGYYYYFLLLRW

>DpleOR65EHJ63907

-----  
-----MIFHVLLHCFYMLSIIILDCEALFGGL----DES VVKLD RY-----  
-----IQSVSSVFGPVLVYQVSLSSVAICLAAYQVAH-----  
AFTVADAIWESGWNETPLSLLIRTDMMIIILRSHNPITIKFTALPNLELETFSSVSIYMSVK--  
-----

>Bany\_OR4\_GZXD38A02FY60I

-----LLHHYYLMSMINFDCEVLVGL----

DESVVRLPKHDPRRMGVQTLNSRMRRIVKWHNLVFQSIEAVSSIFGPPIVYQVMFSSLLI  
SLTAYQVAESLDHGKLNVMFAMLGIAMCLQLWIPCYLGTLFRNKAFSVGDAMWSSGW  
HETPLGRLLRADITLVIMRSQLPVSIKFTGLPNLELETFSIMSTSYSYFTLLRQYT

>DpleOR29

-----MMWPINFEEYKISTYSLRLNGAHPNIKNKNKFWYLK-----

IYLLRFIELLCGGLLVNSIIFYD--VVSCK---YTEAIKNSLMVIVGITV--  
IFKHSILINCNSDIKQLLKILDE-----DYKAAELYGEREKDILKSAMSGV-  
KICRFWLVSATLTCFMFPAKAIEMGNL-----YMRGEFKLVPMFDF-  
TYPIEVHKESTVAYTVLFLMCLSFDFLSLSIYIGFDPLVPIFMLHTCGQLELISNKLNVNFS  
K-----

DASRQDIVDDLKRINVKLQNIYKFVKMVQNIFIILYEFNMKTTTFLLPFSVFQIMQSLRNR  
EISLEFIFFSGACLFHYMPCYYSNLLMEKSESLRNAIYFSGWE--  
SRDIGIRKTILLMLTRTYVPLGIKTV-FYPICLDTFDEMVRQAYGIYNIMNAAW

>HmelOR29

-----MHKFEDVFKISTLALHFNGSHQPATR-----

FRIIYEHLISFFCFVSLLYSIFYD--MKNEV---YTEVIKNGVMVIVCVTV--  
TFKFKILLQNRDDIQRLLDSINH-----DYDLAKNLSEEEQLIVSKYANMGV-  
IVCKCWVTAALATGFMFPVKAFILMGYK-----  
YSKDEWELIQMFDLHWPLINGIKDNLFIPTFIFVSCFSFDFSVSMYIGFDPLGPIFLHAC  
GQLDLICNRLKNLSE-----  
TTADAKENLKLINLKLIEIYRYVKTIQDIFVVLYEFNMKTTTFLIPSTFQFVHSLREKDISL  
EFAFTICAIFHFYMPCYYGSKLVDMGEKLRQSIYACGWE--  
ERNIEIRKTILFMMTRTTLPLVIKTI-FNSISLDAFGEMARQAYGIYNIMNA--

>HmelOR30

-----KFEDVFKLSTLALHFNGSHQPATRNRFKM-----

FRIVYEHIITFLCFVSLLYSIILYD--VNNKE---YTEVIKNGVMAIVCVTV--  
TFKFTILLRNRDDIQSLIDTINQ-----DYELSEDLSEEEQHIVMKHANMGV-  
DVCKIWLAAASIVTGLLPVKAFVLMAYK-----  
YINGEWELVPMFDLNPWFINGIKKNPIIFTCIFAQCLSFDFFSASMYLGFDPGPIFLVHAC  
GQLDLLSNRFMKLFQ-----  
TTADAKENLKLHLKLLEIYMYVKKIQDIFVVLYEFNMKTTTFLIPSTFQFVESLRKKDIS  
LEFASFAISAVHFYMPCFYGNKLMSEKLRQSIYACGWE--  
MEDIEIRKTILFMLTRTTVPLGIKSI-FYSICLDTFGEM-ASAYGIYNLMNAAW

>BmorOR30

-----MSVSNLKFEVLFKPT-----TMSLHMNRSHPSIKRNKI----

WLLQFISLMTLTAFCATGLITSLLFHDLFKFGK---YMEASKNGTIAMLSFTT--  
TFKYSLLLYLQKSLNRLLIAKIDM-----DYEIAKGLTPQEKVTVLNYAKKGV-

IVSKFWLFTAFAITFCFPLKAFIIMGYRFIIKDEFRLPEPMFDMTYPE---  
PIESYKTSFPVYFILFVVCFLFGCYASSLYVAFDPLVPIFVLHACGQLDLLSVRITKLFSD---

-----  
TKNPRIIAKELKVIIKLQELYSFVNFIKVNFSILYEYNMKITTISMPLSAFQVVESLRRGEF  
NIEFTYFFFGCILHFFMPCYYSNLLMERSENFRFAIYSCGWE--  
NHNDKNIRQLLFMLTRAAEPLGIATV-FTNISLDTFAEVN--TFD--TVLLA--

>CpomOR33

-----LILYSMFFHD-----LKNND---  
FAAACTNGILSVLYIAV--TFKYVVLLVKVEDITFAMNKVKG-----  
DFAAAKHLCSDEQAITEYAYKAC-WVTKVWLLTASSVFCVFPIQVIVLSIYN-----  
YAIGDFQFVHMYQM-  
TFPIETRKYETNMYLFLILQTYFGVYVLLMFAGFTPLGLIFMLHVCGRIEIVKYRISKLFEG-----  
EHYDPREIHQRLKNIVTPLQDALDFVDLIKKTFRLLVYEVYMKFTTIVIPIASYEVLESKE  
GRLSIEFMTFIVAGAVLCFAPCYYSDDLMEKGLSLRMSVYTSGWE--  
AYDSAMRRTLCHIMCRLERDVAIRTL-FQTVNLDAFSELCHQSYALFNVINT--

>DpleOR30

-----MTFALKFNRSHPHSIKRDLKWMFHFG-----MHGTYFAVF---  
VTLVYSSISID--LKNDD---FTQATANGVLCCLIFTVS--TYKYCIIWYYQDLLLDVIKKINM---  
--DYEEAQCFTKEEKQIVHKFINKGR-EVNKYWFILIVTTAFIFLAKSLGLMLYY-  
TIIDEFKLVHLYEMHYPK-FLE-DK-  
KDTLNVFILLYIIFLFYDLYGALTYIGFEPFGPVLMLHSCGQLEIVRGRILKIFQS-----  
----  
NYTDAEIIQLNDIAKYLQKILSFIESIKTSFKILYELTLKATAITIPITYQIIQSLKKGELRIE  
FLTVIIAGVGLSTTPCYyseMLMNAGKDLNQAIYECGWE--  
NFEPKSRKLIFLLLLRTSKSMAVRTI-FVEVCLEALTDVM--AYAISNLLNAK-

>DpleOR31

-----MTFALKFNRSHPHSIKRDLKWMFHFG-----MHGTYFAVF---  
VTLVYSSISID--LKNDD---FTQATANGVLCCLIFTVS--TYKYCIIWYYQDLLLDVIKKINM---  
--DYEEAQCFTKEEKQIVHKFINKGR-EVNKYWFILIVTTAFIFLAKSLGLMLYY-  
TIIDEFKLVHLYEMHYPK-FLE-DK-  
KDTLSVFILLYIIFLFYDLYGALTYIGFEPFGPVLMLHSCGQLEIVRGRILKIFQS-----  
----NYTDAEIIQLNDIAKYLQKILRS---  
IKTSFKILYELTLKATAITIPITYQIIQSLKKGELRIEFLTVIIAGVGLSTTPCYyseMLMN---  
-----AV-----

>HmelOR4

-----LNIKFENSFQFM---LRAMYISQFHPYTKKDIKWA---  
SKLLSMYLTCLAVICIIVYSIIFID--LKVKD---ITQACSNGVICLIFSVI--  
TLHYCIMFYQKLIVNMIEIMNN-----HYEKAEYTVEEKHVILEYVEKGK-  
FIVIIWRRISLFGGGLFITRPIFVMVYY-AIFSEFKPVHLYEMVYPS---

PIEELKDTFSVYCFLYITFIIFTCCAMFTLHGFQPLGPIFMVHACGQLEVARTRIMKIFHD---  
-----  
DNSVEEHVCLKHVAVSLKNIYSFIDKIQTCKFIFYELILKTTILVLPVIFQILGSFSKGELKI  
EFLSIVVGAITLSSVPCYYSGMLMESGENLRLAIYSCSWE--  
RWDRTSRTLILLLLLRTTPPV TIRTM-FCRLSLDALADVFRQAYTIFNLLNA--

>SlitOR5

-----MTNQKDLDFENIFKIT-----TTALHISGSHPSVPKDLK----  
WALKFTILHGT FALGFVTVIYSIIYHDLKEQN---FVQICKDCVVFVLCVT--  
SLQYCVLLIHQDNLVLLIKNINS-----DYEQMQNLSDKEKQLMDKYMNLGA-  
KVCRHWFVLVLTCLIFLIKSVGFMCYY-----  
YLINDIKYIPYYDIKYPEERKNENFSVFLITYCLMFYFALYSVLIYVAYVPLGPVFM LHAS  
GLLEVVKNRIDDLFSD-----  
SNPEKIREKLKD VVMKLQYIYSIVDDMKTIFRFGYEVSLKGTAVLLPVTFYAVLEAAKN  
GEISMEFISFIAGGIVISAVPCYYSDLLMEKGEAVRLSLYMCGWE--  
QHDRRTRTTLQLMLLRALRPIAIQTL-FRTLCLDALTDLFQQSYGIFNLMNAMW

>SlitOR30

-----MDATCLNFEELFKIRTVFMRLNRS-----YPSIARDRP----  
WKFQFSIIMMIIFSHFFFLSYSVFYHDIRSGN---FAVACLNASVAIICITI--  
TLKYIILLYHQESIKQLKIAMER-----DYAAAEFCNEDKEIVVQYAKRGV-  
TVCKFWLVFGFGTSTIFPIKALVLTGYN-----YWKGEFVYVHVFDL-  
IYPIEDYKNVTICFWLLFIFNNSFGLLASSMFVGFDPMPVIFMLHTCGQLDLLS-----  
-----RHIS-----TLF-----  
VDANI-----

>BmorOR33

-----MIYYRKCKMELNFDKI-FKIAIISQKFSGTYPYTKRDKK----  
WATHFILMHGELTHICMLFIYNIIFFDLKAAD---YSQMCRNMCLSFVY MVI--  
TLLYINMLYYQSKLKMLIETMKA-----EYELAKTMSEEEQNVILEYAKKGR-  
WLCRAWAILTTCGMAQFFLKSIVCTIYS-----  
AIQGNFRIVQYYEVICPIERHRNPNVIFITLYFCTFFYSLYTSALYTSVLPLGPIFLLHGCAK  
LEIVRLNIKNLFDN-----  
DDYVVQERLKKTVLQMQDIYCYSHEINECFQILYEFLKATSLVLPITIFAVIQALGRGQFI  
PEFFAFIFGAFMVGTTPCYYSNMLMEKSEDVRMTLYSCGWE--  
RFDLNRKCIILMLCRA LRPVSIRTI-FRSVSLTTLTDVFQQAYALFNLLNAVW

>BmorOR34

-----MIYYRKSKMELNFDKI-FRIAIISQKFSGTYPYTKRDKK----  
WATHFILMHGELTHICMLFIYNIIFFDLKAAD---YSQMCRNMCLSFVYLV I--  
TLLYINMLYYQSKLKMLIETMKA-----EYEIAKTMSEEEQNVILEYAKKGR-  
WLCRAWAILTTCGMAQFFLKSIIVCTIY-----  
SAIQGNFRIVQYYEVIYPIERHRNPNVIFITMYFCTFFYSLYTSALYTSVLPLGPIFLLHGCA  
KLEIVRLNIKNLFDN-----



DDYVVQERLKKTVLQMQEIYCYSNEINECFQVIYEFLKSSSLVLPITIFAVIQALGRGQFI  
PEFFAFIFGAFVVGTTPCYYSNMLMEKSEDCMTLYSCGWE--  
TRDLNTRKCIHMLCRLRPVSIRTI-FRSVSLTTLTGVFQQAYALFNLLNAVW

>MsexOR38

-----LSLPLQSSHVTMDLNFDKM-YILTVFAMRINRSHPSIAKDTK----  
WFLQLLPMYGIFSIMFALLINCIIHYDLKAKD---FSSTCRNGCLCVLYFIS--  
TLSYYVMLVHQTTLKTIIINTMNE-----DYAQUALKFKADEQKVLDYAKKGL-  
YVCRQWLAMSIMGVGLFFVKNVLLYAYN-----  
YYVDDMKLVPLHDMTYPIEEKRDDIIVYASLYALTVMYGVFAAIMYMSFVPLGPVFML  
HCCGQLELIVMRLLENLFIK-----  
THEEANCLKDIIRHLQNIYGFVNIEKCFMGFYELTLKATTITLPIAVYEIIESCHRRELRM  
EFLVFIFGAMIISNSPCYYSHLLMENGEQVRLAVYCSGWE---VVPIPRRLALL-----  
-----SW-----

>SlitOR38

-----MADQFEKTLKFLRLTLTSPEIPITFKW-----  
LIRYLLGFLTLTALAIVITYNTY--ISITN-RVFFEACRNITLSLTYYGC--  
CMNNILSFWHRSSLRALLETIRH-----DYKMAAQLPREEQLIFEDYDRKKC-  
LMCKIWFHLFTVSLFLFVAKAVVLMIIY-----YFIGEFRLVHLYEL-  
TYPIEKRRKGELVIYLFIFCIVFLYGLLSGLGFASFVPYGTICMLHACGHLEIARKRIDSFLTG  
-----  
DRRYVNEKLKNIAQLLQYTYKFMENTNGCFRLFYDATLKLSAIAIPFTLYALLEG-----  
LRHGEFSMFVLNAIXQYTLLPKXXIIKGEEVRLALYSCGWE--  
CEYNRRVRIILLLLTCCSRPIAMQTM-FTTLCLYAVTDMFQQAYTILNLMNA--

>DpleOR13

-----MRNPETYRSL-----  
IAPFWILHFSLLVYVYGAGSVMYQL--RVASS---TRDFLKSYPVNITLIILI--  
VNNSYWFIKERPLLRTVLNQVIR-----NDILSMETELLQDKHEKLLSVIK-  
KIILIFYGFNLFDFAFF-IYIPHRSDVNN-----DHYSMTSCVGGLEP---  
LTATPNRQICRLILGLQEVTIMTAVLNYQTLLLFLIAHTeamYRLLSEEMLNFNQY-----  
-----ASTPESNIFVKNRLPLLVSRLSLTLDIKNLALYSMPMGVNFGSNAVVICLFFYL----  
--PLREWITFSPVLIYCFLVFFLYCYLCQRLINASEVFENAVYSCGWE--  
KFNLNEQKTIYVMLLQAQKPVTLAADIIPVNISTFATTIQAMFKFVTVVKL--

>HmelOR54

-----MKFIDNIKDYFIETRFQLRENIIWLVNLVPSKAGFSILKDKI----  
SAPFWILHLSLLFYVYGVGSVVYQI--KFAQG---ASDFIKSYVNISILIT--  
ANNSYWFLMKRPLLKVIEQVTR-----NDSLKSTVFLKDKHKGKLLSVIK-  
KILFIFYGFNLDDALF-IYIPHRVDVSN-----DYYSMTPCVGGLEP---  
LTMSPNREICHVILFSQEISIMTVVLNYQALLFLIAHTAAMYQMLAAEMLAFEEY-----  
-----  
ENSDINIVVKEHLPSLIERHALTSLIIDNLKALYSMPMGVNFGSNAVVICLFLYLSLHEW-----

--ITFAPVLIYCFLVFFLYCFLCQRLINASEVFENAVYSCGWE--  
KFNMKKKTIYVMLLQAQKPITLLAADIPVNIYTFASTLRAMYQFITVVKL--

>BmorOR54

-----MGLNTIKEFFVNVKRRFQDVSIDSLLWIVNIVPSLAGFSI--  
PFWIVHWSLLVYVYAVGNAVYQW--KFANE---AIDYITSFINVSLILI--  
GNNSWWFLANRRLLKSVLHKIEV-----NDELSRRSEQSRLKHKKLLKIIK-  
RIVLVFYMSNYVNASFIYLPNRVDVLNN-----YAMTPCVGMEP----  
LTVSPNRELCLTILCMQEFSIMTVVLNFQALLCFIAHTAVMFQILADEIMALNNY-----  
-----ENLEEHAQYVKEMLPIFVKRHSLLSAVDNYKSLYSVPLGVNFGSNALTILLILYL--  
----PVLEWFKFIPIFVFCFMLFFLYCFLCQKLVNASEAFETAICYCCGWE--  
NFALREMKMIYVMLHQAQKPVELLAADIVPVNMNTFATTLQAMYKFVTVVKF--

>DpleOR12

-----MSLIDRFKTKLV DYKETFMDYSIILLNFIPSMAGFSILNKKN-----  
SVIFWIVHFFLVLYVYVLGSIMYQV--NVADG---PIDLIKSYVNLTLVILI--  
INNSYWFIVKRATLTKLMENVIE-----NDTQSHQLDFLKP KHTKLLRTIK-  
IIVYIFYAFNILDVIF-VYIPRRIDVTN-----EYYSNVACVGMKP----  
LTHFPKKQLCQLVLFATEISICTVVLNYQALIFFLISHTAAMYRLLCEEIFALDDD-----  
-----NMDTATVKKRLVVLIGRHTLTLTITKTIKDLYSMPIGINFGSNA--ICIISFA----  
LPWEEWVNLSPVYIYCFLVFFLYCHLCQMLINASEQFEYAVYSCGWE--  
KFDLKEQKTAYVMLLQAQKPVTLAADIVPVNIYTFATTMQAMFKFITVFKF--

>CpomOR36

-----MECFSRAQDGFHRLKKRLRENLVCLVMVMPSLVGFEITRKKI-----  
FVPFWIIHLSLLTYVYGVGSLVYQAKHARVAS-----DFIKSFVNVSILVLT--  
VNNSYWWLTHRDLLRNVLKANA-----SDKMTIQAGLFVDKHQHSLSIK-  
RILIIIFYFINLTNEFT-SYLPKRAELNE-----KTFSMTPCVGIKP----  
LTSSPQREVCIVLTSQELTIVIVVLNFQTMMLLLIAHTSTMYQLLSDEIMTFNTI-----  
----LTNPSNYDLLKERLGVIIKRHILTLDIIKDIRVLYSIPMGINFGSNAVCMCFFFFL-----  
EPEEYFNFMPISMYCFIVFFLYCFLGQRLTNAAEVFSRAVYSCGWE--  
LMDIKEQRAISIMLLQSQKEVDLLAADLIPVNMLTFAST-SQIYKFVTVFKL--

>BmorOR55

-----MCFLKIKQQIIDIQKHFKDYSLWIVNLLPRLMGFNLRADKVG-----  
FFWTIYILLVYVFGIGIFVYLW--KHVD---MSGLMKSYLNLSLILVI--  
VNNSCWFLSKRSLLNKVLKKIHL-----  
IEDLSCSEHALAKYRRVFKIVTHLLASYVLFYFTEIYFMFLFRNYDLLED-----  
YSLAPCVGLEP----  
LSSSPNSEICLIIVLIHEFISTTVMMMSFAALFLVLIAHTAVMFLVLAEDMTKLTDL-----  
----INLADHRKMIRESLRSLIHRHSLLLQIVYELRLLYSVPLGINFISNASILVLLCLPIHEW--  
----PSFLHIIIGYCFFAFFLYCFLGQNVINASEKFIDAIYCCGWE--  
HFGVAEKKLVHVMLRQAQKPVEIHALGMISVNMNTYVEALQLIYKFVTVLKI--

>SlitOR4

-----MVNTFRGRLLNIRDRLKQNNLVWLINFLPNLAGFPLLSQKF-----  
KFFFWIVHTVLLFYVYLLGTAMYQT--YFAED---FVDSINSFFNISVFILI--  
GNDSWWLISKRNDLNDLLKMVKK-----  
NDDLIIESGRFQDVHQKLMKSIKIIIVIMCYMFHFVNDVMIF--IPSRTIGMD-----  
DFSTVSCVGMPE-----  
LTSSPNRQACMVVLALQELTAIVAVCSYDVALLFLFSHTTAVFQILYQDMTEFANI-----  
-----  
SKSHETYYVVKDRLKNIVFRHVLALHTVRKLEDIYSVAIGIGFGLDAISMCLFVLPLDVC-  
-----LNFAPLIYHSLFIFFLYCFQGQRLTTASEKFEMAVYCCGWE--  
NLRVKERRQVLLMLKQAQKPVIVYAARVIPRIHTFASTMQSIYKFVTIFKV--

>DpleOR33

-----MYPNPVYDE-----  
KRKKLIVMAILSVLPAFTLAGNDIRLRILNND---MANVVRQSILVSITFV--  
IIFFIISIARKDEFRLLEEIDA----DYERFNGMSEQYQDLVEDTIRKTR-  
KVEKSWCFVLLVTTASYPVLGACTIYS--QLFSDYPRRYMVHELKA-  
ILISEEQKYQSPYFEIVSLYTMIVIFLFIGFTGFDGMFSVCLLHVSLKLIYQENLRNLFNE  
-----  
KDIQKIKYNIGLFVKNHCGVLRLIAKIQTCEVWLVGIFINAVVQIGMAFTQITNQ-  
TESDINQMYLYALATVVHIIYLPCYFASDVTYNAAEIANVAYSSSWE--  
RVDSKIRSSICFIIAKCQTPVRLTALDMLTFNMELFVSV---GHQM-----

>HmelOR14

-----YTTFVETYKIISFIMGVGMIIYPNPKTEKRK-----  
IVLLMLISIGPISMMILNDMFNC--LAMRD---YVNVIRHSTVVGPFLLGG--  
FFKILIQFYKRKPAKEIVDEINR-----  
DYASYNDMTVTYKKMINASIENLIFYSEKCAWAITVVTCVSAFPIMAVLSNLHSTLFAAE  
PKRYMVHDIILPY-AEPEKR--  
FESPIFEIMFAYMLYASVLYIINFIGYDGGFFGLCINHACLKMEIYCRSFEDALRE-----  
-----DNESCVHLKIVNIIVEQNKLRKRFVDLIQDTFNIWLGLILVATMIQIGTCMYLISEG---  
YALDLRYLIFIIGTVVHIIYLPCRYAAKLKHMSMETATLIYSSGWE--  
RLSIRIRKMVLFMIARAQIPIEITAFNLMIFDMDLFVTV---SFMFIPLL----

>SlitOR41

-----EMWR-----  
LASIPFLIATITPLATMIFIDMYKCWMAKD---IVNIIRHSTVVGPFLLGG--  
FFKMILMYHKRIQAKQILDEIDR-----  
DYENINNYSEIYKDIARASVKNCQIYSERGWAITVVTCVMTFPVMAISLNLVQSCFKSEP  
VKYMIHDLEKPFSEDPEDR--  
FESPYFEIIFVYMFYCSILYVVNFTGYDGGFFGLAINXACLKMDLYCKALEEASKL-----  
-----DAHEVCGRVIGVIKEQCRMVQFVDLIQDTFNIWLGIIFLATMIQICTCLYHINEG---  
YGFDLRYMIFVTGAVIHIYLPCRYAAKLKAMSLETANRFXSSGWE--  
QVDQVRKMILFMVARAQVPNEIVALNMLAFNMELFVSILQTSYSMTLLRS--

>HvirOR20

-----EFKPFHETYKVI-----TFTLCIAMIFPNPRTEK-----  
WRLISIPLLIATVAPVASMIFLDMYKCWTNND---IVNIIRHSTVVGPFLLGG--  
FFKMILMYHKRKEAKQILDEFDR-----  
DHFMFNDFSETYKDIARASIRNCQIYSERLWALLVTTCVMTFPVMAIVLNIYNFLFKSEPT  
KYMIHDLEKPFSESPEER--  
FESPYFELLFAYMFYAAILYVVNFTGYDGFFGLCINHACLKMELYCKALEEAMVA-----  
-----  
DREEVYGRVVAVIREQCRMFRYVDLVQETFNIWLGIIFIATMIQICTCLYHITEG---  
YGFDIRYMIFVYGAVVHIYLPCTRYAAKLKAMSMETS NR FYCCGWE--  
KVDERVRKMVLFMIARAQVPNEITAFNMLAFDMELFSLILQTSYSMFTLLRS--

>DpOR20\_zhan2011

MMWNVEVLLRTL TIRSNRRFDKPIPWIIYVINISTGLCYFYTYMLSTAWFVLVRCRETG  
DFISAMVALSLTMC SITCIPKIFYMKYYQNTVMDLVDNYLHCNELIVSGTRFEKNFFANM  
RTVKKQATIAWVILTLNGVVFTLPFLRPGRHFSQDLFALYGLDPMVESPNYEKASILLT  
LAVYFSLTVMVHITLFIIVIIIGFLESQMLALSVELSNIWEDSKKFYNYVVLHHNESITKYEL  
RNLFIKNRLRDIVKFQIMIVSLRNKVEKELRFIFVND FIFMIFALVSELVGGLENTMVQMP  
FTFGMV FIDCFIQRLIDASKAFERAA YGSKWENFNLSNQKT VLFMLQCSQKTM TLTAG  
GIAVLDFIYLSVLKSTYSAYTTLKSSA-----  
-----

>MsexOR7

-----MDEPEFKPFHKTYQIITFALSVGMIYPNPATDKMR-----  
LASIPISILTILPLACMIFLEMYQC--WTQGD---IVNIIRHTTVLGPFLGG--  
LFKMFLMYHKRQAKQILDEFER-----  
DYHLYNSFTGDYLN IARDGIRNSLIYSERG WAITVTTCVMTFPVMAILLNMYNYTFKFQ  
ATKYMIHDLNKPG-ASPEAR--  
FDSPYYEIMFFYMMYCSLLYVINFIGYDGFFGLSINHACMKTNLYCKMLED A WKA-----  
-----EPNER YRRVVAVIDEQCRMFEFVNLIQDTFNIWLGII FLATMIQICTCLYHITEG-  
--YGFDLRYMIFVSGATIHIYLPCTRYAAKLKAMAAETATHFYSSGWE--  
RVNDRRLRNLLFMVARAQTP LQITAFNMITFDMELFVSIMQSSYSMFTLLRS--

>BmorOR14

-----MSNYIFKPFHETYRIITFTMIAAMIYPNPATEKRR-----  
LIYIGLMLLSVIPLAFMIVTEMYEFFMASD---LNNTIRHSTVIGPFIGG--  
FVKVALMYKRRQANELVSEINR-----  
DHLAYNGLKGEDREIAASSIRNCQIYCELGWTLIVMSCGLSFPVIAILLKIHSFTFKLDSTK  
HMIHDINNPFDDPEDR--  
FESPFFEIMFVYTFSSFIYIINYVGYDGFFGLCINHACLKMKLYCRALEDAMRS-----  
-----DSRRHEKIVAVIEEQRRTYEYIALIQDTFNIWLGIIYVATMIQMCTCMYHIVQS---  
FNIDVRYIIFV-ISIIHIYLPCTRYAANLKCAAETPTLIYCCGWE--  
SVDLRIKRMMPFMVARSQVIVEITAFNMFAFDMELFVWIMKTSYSMFTLMRS--

>CpomOR20

-----MKSFRRKESSTLPLVPVTEEELEFKTYKIITFTMIVGMLYPTPNTEV-----  
CRVVGILTILVTMSPVCIVALLDMWNSWFRGD---IINIIRHTTVIGPFLGA--  
IFKMMLFFYSRKEAWSIIKKMDS-----  
DHARYNTLPEQHKIARRHIQNTQYYSEKCWSITVATCVLTFPLTAVVLTFFYN--  
YTFKENPVKYMIHDIDKPFSPRED-  
RFTSPYFEIMFFYMGYCSLFYIISFTGFDAFFGITINHACMKMELACKTMEDAMLE-----  
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RDRDSRHRMLDVISEQNDLFRMVELIQETFAIWLGIIVATMLQICNCMYQIIEG---  
YGIDPRYLVFIVGTIAHIYLPCTRYAAKLQVSALEVATHLYCCGWE--  
RVDERARKMIVFMIARAQIPMKITAFNMFDMDMELFVSILQTSYSMFTLLRS--

>Bany\_OR6\_GZXD38A01B02O1

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EVWLVGIFFNA--VVQIGMALCQITSN--  
AEADINAMYFAVATAVHIYVPCHLASDVTYHAAEVATVAYSSSWE-  
SVQDAGVKRSIAIIARAQIPINFQALGMLTFNMEMFVSILQTSYSMYTLLRTNI

>BmorOR14\_ABK27845

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-----MKLYCRALEDAMRS-----  
ESRRHEKIVAVIEEQRRTYE--YIALIQDTFNIWLGLIYVATMIQMCTCMYHIVQSF---  
NIDVRYIIFVI-SIIHIYLPCTRYAANLKCMAAETPTLIYCCGWE-  
SVSDLRIKRMMPFMVARSQVIVEITAFNMFAFDMELFVWIMKTSYSMFTLMRS--

>CpomOR14

-----MDATKAFRTSDSSAVLAPVFEDMEFKPFRETYKIITFNMIVGMLYPTPETAVC-----  
-RLLGIVLVLSISPAALIALLDVWHSWQRGD---IINIVRHITVLGPCLAA--  
IFKMMLFYFTRDEAWRIIRKIDA-----  
DHARYNILSESHKEIARRHIQNTQYYSEKCWAITVAVTVLTFPLTAVVLNFYNFVFKEEP  
VKYMIHDLEKPF-SPPEDR--  
FASPYFEIMFGYMAFYCSLWYIISFIGFDAFFGVTINHACMKLELACKIMEDAMLE-----  
-----EDRDSRQSRMKEVISEQNDFFSMVELIQETFNFWLGLIIVATMCQICNCMYQIIEG-  
--YGIDPKYIIFILGTIAHIYLPCTRYAAKLQVTALDVATHLYCCGWE--  
HVDERARKMVAFMIARAQVPLKITAFNMFYFDMDLFLVSILQTSYSLFTLLRS--

>DpleOR32\_EHJ72221

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MLYWFLLYLWKCICNHD---MYNVSRLNTIGILVTLF--FFKSFYVTNKTHRFAQLLEKISN-  
---DLLKGNDMDDSYQEIYEKYIKLGK-LGQTCWIFIPILLTSQFPIYAGVSTIYE--

SLKTDGTGQKYMIHEMDL-KY-  
LEDKQYDSPIYELTFAYHLITCLTLSPNFAGFDGSFCIATNHLRLKLKLLAHKVERAFKD--

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AKNKWELHTMIKETIRDHQEALSFYEDLQEVYGSWLFTVFAVTSLLISLNIYQIYLS---  
ERVDPKYAIFAISGIIHMFAPCYFASNLMKTSEELSLDLYSVEWE--  
VWYPAVTKQLIFMIAKSQQTLLTGNGIVYFNMQLFISLLRSAWGVPGFIYK--

>Bany\_OR7\_GZXD38A02GO9NU

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-IAMNLYQL-YLSDHIDMKYTIFAVSATSHVRAVLFTCNLIKVSEDLSWDIYDVPWE-  
TWADPSVTKLLIFMIAKSQQTLLSGNGIVYFNMQLFISVLQTAYSFFTLISR--

>HmelOR66

-----MDKSEKKFKCFNETFPRCTFALAFSLTYPNPTNIK-----  
KRLIIFSIAIFVNSGMLIWFILYLFKCIQTRD---IYNLARNITIGVLVLLF--  
FSKMYYTTRNAKKFARLLEKITI----DLLLGNDMAEEYQMIYEYIKIGK-  
HGETIWIIIPILLSSQFPYAGMCNMYEKSVDGKKYMI---HEMEL-KYIEDI-  
QYETPYEYELLFAYNIINVILLSPNFAGFDGSFCIATNHLRLKLKVLAKHVCEAFRQ-----  
-----AKS-  
KAELKEKLKGAIKDHQEALDFYDDLQEVYGGWLLVVFLTSFLISLNIYQIYLS---  
QQIDTKYSMFAISGIIHMFPCYFSSNLIKTSSEELSWDLYNAAWE--  
DWDPAVRKLLIFMITKSQQTLLVLTGQGIVYFNMQLFISVLQTSYSVFTLITS--

>SlitOR18

-----MEMKSDILTQKKYKTFNDTFKLCAFSLAFAFL-----YPNRNTALK-----  
RCITITLIVFCGGQLFWFITYTFKCLYTLD---LYNFARNMTLAVVLILF--  
FIKTYAIYATQKFATLLDKISE----DLLEANNLGERQQKLYDEHITIAK-  
FGEISWLLVPVLSALFPIYAGTLMSESQTDYQRRMVHDMELLY---  
VEDIQSETPFFQCMFAYNCVQCQVVLVPNYCAFDGSFCIATTHIQLKLKLMVLKVHDAFK  
Y-----  
SKTKYELRMKMNEAIRDHQEALDFYVQSQNVFGPWLFVFMVLTSMISFNLYQIYLL---  
QRIDPKYTSFGLVGVLHIYLPQYASSLTKVSEEIPNDLYLVDWE--  
AWDPKVTKQLIFMITKAQKEMILTMGMGIVVFNMELFKSIMQTSYSFFTLITA--

>HvirOR18

-----MEMKVDVLPEKKYKGFNETFKLCAFSLAFAFLYPNRRTA----  
LRCITITLIVFCGGQLFWFITYTFKCLYTLD---IYNFARNMTLAVVLVLF--  
FIKTYVVIYATSKFAPLLDKISE----DLLEANNLEEEFQVLYDDHIKIAK-  
VGEISWLLIPTIMSALFPIYAGALMTIE----  
SIQTDYERRMVHDMELLFVEDIQSETPFFQCMFAYNCVQCQVVLVPNYCGFDGSFCIAT  
THRLRLKLKLMTLKVYKAFKY-----  
SKSRQELRVRLYESIKDHQDALDFYVQLQNVYGPWLFVFLTSFMISFNLYQIYLL---

QRIDPKYTSFGVVGVLHIYLP CRYASDLTRVSEEIPDDLYLAWE--  
AWDPSITKMLMFMITRAQKEMIVTGMGLVVFNMEMFKSILQTSYSFFTLITA--

>CpomOR18

-----MNQSNCLKYKSFNETFKFC-----SFALALGLIYPNRKNVC-----  
LRTTIFFVLLFNFGTLFWFIWYTVKCLWELD---IYNSTRNITVGVIILLF--  
VFKTIYVNLKTD MFASLLEQITK-----DLLKGNNMDEDYQEIYDYYIKQGL-  
FGQKCYVWIPLILTSIFPTYAGISMTYGSLRSDDFKKVMLHEMDLKY----  
IEDKQYDFPYFELVFAYYFLGIYILIPNFAFGDGSFCIATSHLRMKIKLMTHGVQRAFTD---  
-----  
SKDILELKARLKTCVKDHQEALFYTLIQRLYGGWLFVAVLLTSFLISCNLYQIYLT----  
GIDPRYTMFAATGVFHMYTPCYFASCLIELGEQTCTDIYCAKWE--  
SWDPTVTKFLIFIMARAQKRLLLNLGLGIVFFNMESFVSLMQTSYSFFTLITSK-

>SlitOR25

-----MGLIKNLCLKLSYTKAIDRSSGRLETIFFENYYRIAYMAGMSTADDNIGY-----  
LVYSNTVKLMIVLLVFGVVWYGF--METTS---FDEFAGNLNVSLLQFIT--  
FYRYRNMLAHEKFYKELASSMES-----PYFDI--STEQRKKLVEFWSRNTV-  
KYLKLLMGLGNCTLVAFWIFPLDDIEY-----NLIVGL-YLPFFY--  
KSPSIYPLAYMLS VIFFFYISHFVMVTDLKMQTHLIHLLCQFSVLADCFENMIPDV----  
TGFEQVPRNHLMYNNHFAAKYTERLGNLVKQHKALLGHAMNLRDTLSGPLLGLAAS  
GVLICFIGYQATAT-  
IGQSVVMTSFLFLAYNLDFYMICRWCQEITNQSANVGEAIYCSGWE--  
CGKLPGVRSIMFVIARANKPLVLTAGGMYDLSLTSYTSLVKTSYSALTVLLRFR

>MsexOR25

-----MELCKTIWRIITPTKALQQSSGHLETIFYRVSYLMGLSTSDHDM-----  
FYLLYSTTVKFMITLLVCGELWYIF--TETSS---LDGIASSINVTLIQFIT--  
IYRYKNMMDHKDIYKKLATSMES-----PYFDTSNEKRKQLVFWWAKRNE-  
KYLKLLLFLGNCTLA AWYLYPLVDDIEY-----NLIIGF-HTPFSF--  
KTPLRYPVVYL VVVIAFTYISHFVMVTDLIMQAHLIHLCCQFTVLADCFENLLDDQ----  
HGFEDVPRNMLVNNKQFAAKYIRRLGHLVEQHKKILKHTVNLNRNTLSRPMLGQLAASG  
TLICCIGYQATTT-MTESIVLMSLFYLGYNSELYIICLWCEEITTQSMNIGDAIYCSGWE--  
GVKLPGVRSIMLV LARANKPLVLTAGGMYNLSLTAYTTLVKTSYSALTVLLRFR

>BmorOR64

-----MGVSNGRGTVPFLYPLDYNLIVGVHLPFEYKTPSRYP-----  
LAYITVVI AFIYVSYFVMVTD---LIMQAH-----LLHLLCQFNV-----  
LADCFENMLNDCVKGFE-----GPLVSLHEY-IHPLIDEFEY-----NLMVGL-  
RLPFSF--  
DTPLRYLFTYVIVLIAFN YTAHYVMVTDLIMQSYLIPLICQYAVLADCFENILID-----  
-----CSNDYGDHARRNDIVYSRSMELRAILSRPMLGQLASSGLLICFVG YQATTS--  
ISVIVLMSLFYLGYNMFTLFVVCRWCEEITNKSLNIGNAVYCSGWE--  
GMTVVVRSTILLVILRANKPIVFTAGGMYNLSLTSYTSLVKGSYSALTFLLRIQ

>DpleOR54\_64

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NLIIVISLPFDYRTPALYPVTYMSTFIVFMYIAYFVMLHDLVIQVYLVHLI---  
CQFAILNDCFENILID---  
CKKGFSKEQLDSIYFNEEFIQKYIKRLGRLVDQHTFIINNTLKLRLDILSTPMLLQVAVSTTL  
ICSIGFQIATTSVNVSKMLMSLLYLGYNMLSFFIMCKRCEDLKIQSTKVGEAVYFSSWEV  
VVTIPRVRTTVLLILLRAHKPIGLTGGGMYEELSLEAYGNMIKTSYSALTVLLRLR

>Bany\_nBa.0.1-g11159genome

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MDVVYNNLPFQSEGIGEAIVYCSGWEGIVMVPGVRTSILLILARANKPVRLSAGGMYDLS  
LEAYATCDLRGPESKLVSDLAP

>SlitOR24

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LLYTMYSSFIRIISALVWFEIWSVLGNTD-VSLDQIISVNVIFIHLVT--  
FWKLVTVVKNKRIFKKLAKALES-----SSFDMSTERRKGIVNDWILINN-  
KYLKVVLTLGCLTLIVWESYPMIDELKF-----NLMVDV-KLPFEY--  
QSLLTVMVITYTAVAIMFAYASLMVIISELMMQAHLIRLICQFDVLADCFENIFEEA----  
EEFPDLKKHELVKDKTFVDKYVKRLGDLVAQHREILDQTNDLRTILSAPLLGQLACSGL  
LICFVGQYQATATAENLGKFVMSLLYLGYNMFTWYLMCRWCEEITIKSQRIGQSAYFSGW  
E--SLAPGARATIVLVIARANKPLVFVAGGMYTSLSSYTTLVKASYNALNILLTMS

>BmorOR50

-----MEGTSEGDEPFIYR-----LNDNGTGPNLVVKIL----  
YCPCWYTAHLMPPFKLHYCFATAEIVR--LMIVP---  
LVDSQDVLPPVITQIVISIFIRCYSFIVEVNRHLLMQETLL-----  
KPARRDPKIANYNMVRNDRLSARGGGTVIYYRRALHCVPLDPPALA-----  
NIEASVCRPI---FAAKTLKDKQHLLIQNKKE-----VTRFARLLLTYVTVGGFIEWP----  
MSFCFRRIKDP-----NTVVPFYVPFTPDNWTCLI---  
NEVTDIFNPCLTFQFFTSSVAICMVYKLSDT-  
YIVLEFVLLNFIFVLLTQMFIYCYGNNVSVYESKYINTSLYLSDDS--  
SASPGVRKMFLIVMPRWTRPLVVRIARVVPLSLDSFVSVYKCSIEHFIYSHVK-

>DpleOR59

-----MGSLLKWLFNPRTAYIKKSKASVKDIIDNLFQDSGVLLGKEQT-----  
TVPWKVKISIFCFLVCNLLQLIALI--LALGD---LDELLACSGRLTFLTMS--  
VPKLFSIFLSKKLKRDLAYEYESEDE-----EDDYLTEHIDSYTKQFQ-



GFAKILSSIFYAANVYVLSPIEYGYH---VYKGNDRMYPHILPG-WSPQDA---  
NVISYSVLIVAEEVIAAEYCVKLHTVYDVTAVGLMIFIRGQFLLLHQFSEHIGGR-----  
GNDLSLSRRRDDRAHCRIKKCHYIHVSLLKSISDLDLIRNVLGIYFCIAAMTLCSAAVQL  
LKW-NSLDAMVSLQFPATLIQLYLFCLYGDGMFNESAVMSGEGFRAARW--  
CLSKHIIQEIAILCVSMSQSRRINAGPFVTVDLPTFVMIVRGTYSVYTVLTQE-

>BmorOR32

QERGRPPGLEGEYVANRPFRKSLRGSQEEPRANGKSENVNSHILHCGLRFNETNC-----  
-HTHYIAKVAIFCFIVTYMLQVMELY--WSKGD---QEKLFECFSILSFCGMG--  
VMKLVLIRVYHQRWRFLNQVSILENRHLDPGPLSDDNEIVTFITKYTDKFK-  
RTSSILIKMYASTLVIYVLSPFVEYIFR-----QFLNIAYPHILPA-WTPLDE--  
FSVTGYLIMVSFETVACIYCVFVHVAFDLTCVGLMIFACGQFYLLRYRSERIGGK-----  
-  
GRICRLKSTEVRAHYRIVFCHGIHVLLVQLIEELDRLIKHLGVYFFLATLTLCSVAVRLK  
TEDMSITQLVNLLQYMCGLTLQLFLYCKYGDVSYNEAYGLPDACLESGRF--  
QWKTGYRPI--VLLDEAGKLLERVVAARIVQHLTGVGPDLQAQFGFRSTIDA--

>SlitOR23

-----MWQKLKEFYNKTHTDFSKGYIDPYEFHKTFYQIMVNFKVADLSNENPPSY-----  
FNQNAIIFMTGFVAKLLCISSFYHGLMTFN---LRLATEAGTYIIVMAYA--  
LLISSCTRRNVPQYHNFLRAMKEDFQFICTSG---  
EKYRVVPYFSNQLLTWKICIFACIFTASIAVGMVVSFAFLSLFYFLAT----  
YKEEIGGSRPLLFPF-WLPNVDF-  
GETPVYEIAFMFSNICALLYAYNYIFMIQTQIVWIRQITSKVDIVIWSISDLLVD-----  
IHPAGSEESVYFSYLIKARMRDILLHHQSMYSLMEDYAVVYKKMLMFQKCCGSVVC  
LTAYCIAEAFDAGEFQAILLLLCIGTTVLHFVPCYFCTFLAVKVSSVCDACWNIPFW----  
AGPLIRPMVLIMQRSRLPLQAAGFEDISIETFSKKMTNAYSLSFNMLRQAN

>DpleOR37

-----MDETFQVFDRVLSFAGISLFAKRNWNSKKW-----  
LFFQCFNVIIGFITFIFTAFVF--TNISN---LLLCIQGGCVWTTGVIM--  
FISLCVCLIFRTKFRTFLEEMVFEDRVFDIPLVKSELEKLVVNSQEKLFLTRVLLKTYVG  
SVWLCVTLYLCGPIYQMCVT-----KDKSLRLLAFDM-WFPYGL--EDFRVYVATFIFH-----  
AYAAYPGLQSTIILFVGQIIRQLQILTFILNNLDEI-----  
AKELVGKRGELWQETCIQIFSQCVDHYIQTKRFSNKLNVICQPFYALIVVATMLVCVCS  
VKIAISDKLSPDTMKYYVHELCLVFLVLMFCYLGQQVDNECEKLEAAV-TEKWY--  
LFNSSHKTNIRIFMMAMCQKMPIYIYGSITLSLQTFTWFIRTGMSFFTFLMS--

>HmelOR3

-----MMYEYDTFVTFD-RILSFAGIPIFAKHKCNSKKW-----  
LLFQIFNFFLAFLTFVFTSGFVL--SNLSN---LELCIQGACVWTTGVIM--  
FISLGVCLVFLRQFRSFLEEIIFNDSLLEMPFINGELRKSVINSRETLFRLTRVLLKTYIASLG  
VCATLYLCGPIYLMCIR-----NDKSLRLLAFDM-WFPWGL--  
ENFAVYVASFVFHAYVGYLCS--FAGLQSTLVLLVGQIIRQLKILTFILSNMDDL-----

IKELVGERGDKWQRECTTLLTQCVDHFVKTKRFANRLNAICQPFYLSVILVAMMLMAV  
CSVKIAISDKLSPDTVKYIHEICNILIVLMLCSLGQQVENECEQLEMAV-TDKWY--  
IYNSKHRVCVRIFKMALSQRMPYIFGSITLSLPTFTWFIRTGMSFFTLVMS--

>SlitOR3

-----MDEAFLAFHRVLSFAGISIFAKQNWNSHRW-----  
LAHQTFNFIIGVLCFIFTTGFFV--TNVSD---FLLCIQGACIWTTGVIM--  
TITLGVCLIFRKEFRSFLEEMVFRDHMLEMPLIDHELRLNLTGSQEKLFKYTTLLLSYVA  
NVFLCATLYLCSPVYGMLVR-----EDKSLRLLAFDM-WFPWSL--  
EDYTVYIISFIFHAYAGYLCCIAYPGLQSTIILLGQLIRQTRILTFILLHMNEL-----  
ALEVTGVQDERWQDICTLILSQCVDHYVKIKRFSNRLNLICRPFYLTLLVAILVCMCS  
VKIAVSNKLSLDTFKYIHEFCFILVVLMFCLIGQQVENECEALERAV-TEKWY--  
IFNHIHKSNNRIFKWALGQRMPIYIFGTITLSLPTFTWFIKTGMSFFTLVMSVL

>BmorOR17

-----MREDKMEINNSQKFYTKM-IFRYLYSVGLGDWWYQHEDRSDS---  
HRKLYCLWAVI-SNAYIFLNICNELLANFRKD---  
LTDVEKNDAIQFSFAHPLIFAKIASFFFNRKKIREVFGRLLLEENR-----  
SVYSCGELEKESMKQIK-RYSLAFIGVSYMTLVMSTIDGLRAHFKE-----  
GIPIRTEVTYYP-SPSNSGVIVNIRFLVE-  
FHWYIVSVMVAIDSLAVASFVFTFKFKLLQRYFKDMGLT-----  
VRRDQSNMTDEALADKFRDFIVGVKLHENALWCAENVQKAFGWVYSVQVFETVALL  
VMCLVKLVTTNHNMIFFLLANFAFMLCVIILNGSYMMPAGDVTSE---VPTSIFLCGWE--  
LVQTDLRFLVVVAIQRSQVPVIMKAFGIMTLSYSNFIAVS--LFKFYNLF----

>HmelOR68

-----LNLPNFSAYLKKSDVNMSILQV-----  
TSIFKRLLVPYKRLLTYYNKSLDEIGFTISKE-GFFYLQINATDYVILGLYS----  
RAKILALSSHTFTKNFQWLGP-----  
LLLCCSSKCLTYLFFFLIHFILHLVCRVTKILLNFVY-----IKLFN-YFIIDY-  
VYLLPFYTISINFNLISKIFCFFLAINMILRSESEPIHVHGASWSSKKFSTENFD-----  
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TKNPVSSTKTITMLKSIMKYANYILKIYIQKEFFSYIIGCKFYCIVFFLWNKDNEQIQKNFL  
TTVLL-KILRKMVWLNFFVENLKQ---IYKIISSISKYM---  
KSKSKANLYLLYINYFLSYTFCTFRYSFKNKYLLEISIIQNHIFTLINP--

>HmelOR69

-----IFFYFYTIHLWLNKKKISLKKQKNVLARKIT----  
KFSIYRYFLINACTLRMINIFLII---GMQDN---FIQVGPYYNIYLLNPQL-----  
AFTLVTHMCS-----CATTGLRFAGSNLATFT--  
IYTFSKLSTTNYLLMALNKLYRIIMY-----  
NRLSTFKTYLLYLCKIICFLCSMRGLWENYIGIIISILPARGFVCLNLLLCYKQ-----  
-----NRYINIITVTFIQIHSVVG-TYLRHTNKKI-

KIVYLCFTRSTLTSTKGNQIANSTFPC-----  
KCNTNGSNCLFFIFLNTRFPLPFLLCAGYSVKLNLRMKLK--KWNIFYLYFCENN

>SlitOR47

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-----KLLNTSATY-----  
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QVHQRFGGCFSVVNLINVLLSSVNICCVMTIVFL--  
DSWMEMSNKFYLGAALTQIFVCWYADDIYRASVGVADAVYESGWY--  
KSNTENVQARARNFKRSQRPLYFTALKFRAITMITYSSILTTAYSFTLLYTRD

>SlitOR46

-----GKQWYHAEDIESIVPKISGFSYRKDKV-----  
SAWFWYIHMFLLFYVYAVGNFWYQW--KFAHG---AGDFIKSYVNISIIVII--  
GNNSVWFVKQRPLLRTVLKKIEQSDLSR-----RSSFLMRKHEKLMKIVK-  
RIVLIFYGFNYIDAFF-IYFPHRVDLRN-----NYSMTPCVGLQP----  
LTASPNREICMTILTLQEFTINIVALNYQALLFLIAHTAAMYQMMAYEMMALNDY-----  
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KKENLRQVKKKLSSLIERHCLTLDVVDNLRSLYSVPLGVNFGSNAVCISLFYLPLREC-----  
--LQFMPVFVYCSLVFFLYCFLCQRLINSAEVFARAVYCCGWE--  
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>Dp0R36\_EHJ75140

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FNAILILLCVGAITLIFPCYLCTFLCVKINSICYACWNIPFWN--  
AGPVIRPYLLIMQRSLQPLPIKSPGFEEVSLQTFSNKMASAYSFFNMLRQANI

>Bmor\_XP004924066

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LMEDYSQVYKKLLLFEQKCCGPVVCLTAYCATEKLAEGELNVVLILLCVGTIVMHIYPS  
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>Bany\_OR5\_GZXD38A01A8I9X

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MHSNFPVVCILELHITCLQTVKQKHREETCIPGNFLNSLRVSLKIRIGSAWWYFWPNPSHS  
MRRLELSIVGFYYLIKIMIFFVVTSAFACWNIPFWD--  
ASTVIRPYLVLIMQKSLQPLPLKVPGLEEF SMLTFSNV SFL-----