

Figure S2. Amino acid sequences used as BLAST queries to identify putative *M. sexta* OR, GR, OBP and CSP sequences. OR queries are listed on p. 1-18; GR queries on p. 18-38; OBP queries on p. 39-42; CSP queries on p. 43-44.

I. Predicted amino acid sequences of Odorant Receptor queries

>DmOR83bIa

MTTSMQPSKYTGVLADLMPNIRAMKYSGLFMHNFTGGSAFMKKVYSSVHLVFLLMQFTFILVNMAEAE
VNELSGNTITTLFFTHCITKFIYLAVNQKNFYRTLNIWNQVNTHTPLFAESDARYHSIALAKMRKLFLLVM
LTTVASATAWTTITFFGDSVKMVVDHETNSSIPVEIPRLPIKSFYPWNASHGMFYMISFAFQIYYVLFMS
IHSNLCDFMFCSWLIFACEQLQHLKGIKPLMELSASLDTYRPNNSAALFRSLSANSKSELIHNEEKDPGT
DMDMSGIYSSKADWGAQFRAPSTLQSFGGNGGGGGLVNGANPNGLTKKQEMMVRS AIKYWVERHKHVVR
LVAAIGDITYGAALLLHMLTSTIKLTLAYQATKINGVNVYAFTVVGYLGYALAQVFHFCIFGNRLIEESS
SVMEEAAYSCHWYDGSSEAKTFVQIVCQOCQKAMSISGAKFFT VSLDLFASVLGAVVTYFMVLVQLK

>DmOR83bIb

MTTSMQPSKYTGVLADLMPNIRAMKYSGLFMHNFTGGSAFMKKVYSSVHLVFLLMQFTFILVNMAEAE
VNELSGNTITTLFFTHCITKFIYLAVNQKNFYRTLNIWNQVNTHTPLFAESDARYHSIALAKMRKLFLLVM
LTTVASATAWTTITFFGDSVKMVVDHETNSSIPVEIPRLPIKSFYPWNASHGMFYMISFAFQIYYVLFMS
IHSNLCDFMFCSWLIFACEQLQHLKGIKPLMELSASLDTYRPNNSAALFRSLSANSKSELIHNEEKDPGT
DMDMSGIYSSKADWGAQFRAPSTLQSFGGNGGGGGLVNGANPNGLTKKQEMMVRS AIKYWVERHKHVVR
LVAAIGDITYGAALLLHMLTSTIKLTLAYQATKINGVNVYAFTVVGYLGYALAQVFHFCIFGNRLIEESS
SVMEEAAYSCHWYDGSSEAKTFVQIVCQOCQKAMSISGAKFFT VSLDLFASVLGAVVTYFMVLVQLK

>DmOR69aIa

MQLHDHMKYIDLGCKMACIPRYQWKGRPTERQFYASEQRIVFLLGTICQIFQITGVLIYWCNGLRATET
GTFVAQLSEMCSFCLTFVGFVNYAISTNRNQIETLLEELHQIYPRYRKNHYRCQHYFDMAMTIMRIEF
LFYMIYVYNSAPLWVLLWEHLHEEYDLSFKTQTNTWFPWKVHGSALGFGMAVLSITVGSFVGVGFSIV
TQNLICLLTFQLKHYDGISSQLVSLDCRRPGAHKELSILIAHHSRILQLGDQVNDIMNFVFGSSLVGAT
IAICMSSVSIMLLDLASAFKYASGLVAFVLYNFVICYMGTEVTLASGKVLPAAFYNNWYEGDLVYRRMLL
ILMMRATKPYMWKTYKLAPVSITTYMATLKFSYQMFTCVRSLK

>DmOR69aIb

MQLEDFMRYPDLCVQAAQLPRYTWNRRSLEVKNRLAKRIIFWLGA VNLVYHNI GCVMYGYFGDGRTKDP
IAYLAELASVMSLGFTIVGTLNLWKMLSLKTHFENLLNEFEELFQLIKHRAYRIHHYQEKYTRHIRNTF
IFHTSAVVYNSLPILLMIREHFSNSQQLGYRIQSNTWYWPQVQGSIPGFFAAVACQIFSCQTNMCMVNF
IQFLINFFGIQLEIHFDGLARQLETIDARNPHAKDQKYLIVYHTKLLNLADRVRNSFNFTFLISLSVSM
ISNCFLAFSMTMDFGTSLKHLGLLLFITYNFSMCRSGTHLILTSGKVLPAAFYNNWYEGDLVYRRMLL
ILMMRATKPYMWKTYKLAPVSITTYMATLKFSYQMFTCVRSLK

>DmOR46aIa

MSKGVEIFYKQKAFLNILSLWPQIERRWRIHQVNYVHVIVFWVLLFDLLLVLHVMANLSYMSEVVKAI
FILATSAGHTTKLLSIKANNVQMEELFRRLDNEEFRPRGANEELIFAAACERSRKLDRDFYGAALSFAALSM
ILIPQFALDWSHLPLKTYNPLGENTGSPAYWLLYCYQCLALSVCITNIGFDSLCSLFI FLKQLDILA
VRLDKIGRLITTSGGTVEQQLKENIRYHMTIVELSKTVERLLCKPISVQIFCSVLVLTANFYAIAVLSDE
RLELFKYVTYQACMLIQIFILCYAYAGEVTQRSLDLPHELYKTSWVDWDYRSRIALLFMQRLHSTLRIRT
LNPSLGFDLMLFSSIVNCSYSYFALLKRVNS

>DmOR46aIb

MVTEDFYKYQVWYFQILGVWQLPTWAADHQRRFQSMRFGFILVILFIMLLLSFEMLNNISQVREILKVF
FMFATEISCMAKLLHLKLSRKLGLVDAMLSPEFGVKSEQEMQMLELDRVAVVRMRNSY GIMSLGAASL
ILIVPCFDNFGELPLAMLEVCSIEGWICYWSQYLFHSICLLPTCVLNITYDSVAYSLLCFLKVQLQMLVL
RLEKLGPIEPQDNEKIAMELRECAAYNRIVRFKDLVELFIKGPQSVQLMCSVLVLSNLYDMSTMSIA
NGDAIFMLKTCIYQLVMLWQIFIIICYASNEVTVQSSRLCHSIYSSQWTGWNRRANRRIVLLMMQRFNSPML
LSTFNPTFAFSLEAFGSIVNCSYSYFALLKRVNS

>DmOR63aIa

MYSPEEAAELKRRNYRSIREMIRLSYTVGFNLLDPSRCGQVLRITIVLSVSSLASLYGHWQMLARYIHD
IPRIGETAGTALQFLTSIAKMWYFLFAHRQIYELLRKARCHELLQKCELFERMSDLPVIKEIRQOVESTM
NRYWASTRRQILIIYLYSCICITTNFYINSFVINLYRYFTKPKGSYDIMLPLPSLYPAWEHKGLEFPYYHI
QMYLETCSLYICGMCAVSFDGVFIVLCLHSVGLMRSLNQMVEQATSELVPPDRRVEYLRCCIIYQYQRVAN
FATEVNNCFRHITFTQFLLSLFNWGLALFQMSVGLGNSSITMIRMTMYLVAAGYQIVVYCYNGQRFATA
SEEIANAFYQVRWYGESREFRHLIRMMLMRTNRGFRLDVSWFMQMSLPTLMAMVRTSGOYFLLQLQNVNQK

>DmOR63aIb

MYSPEEAAELKRRNYRSIREMIRLSYTVGFNLLDPSRCGQVLRITIVLSVSSLASLYGHWQMLARYIHD
IPRIGETAGTALQFLTSIAKMWYFLFAHRQIYELLRKARCHELLQKCELFERMSDLPVIKEIRQOVESTM
NRYWASTRRQILIIYLYSCICITTNFYINSFVINLYRYFTKPKGSYDIMLRK

>DmOR43b

MFGHFKLVPAPISEPIQSRDSNAYMMETLRNSGLNLKNDFGIGRKIWRVFSFTYNNMVLVPSFPIYVI
HLAEFPPELLQLSLQCLNTWCFALKFFTLIVYTHRLELANKHFDELDKYCVKPAEKRVDRMVAITIRL
YLTFVVVYVLYATSTLLDGLLHHRVPYNTYYPFINWRVDRTOQMYIQSFLEYFTVGAIYVATATDSYPVI
YVAALRTHILLKDRIIYLGDPSENEGSSDPSYMFKSLVDCIKAHRTMLNFCDAIQPIISGTIFAQFIICG
SILGIIMINMVLVADQSTRFGIVIVMAVLLQTFPLCFYCNAIVDDCKELAHALFHSAAWVVDKRYQRTV
IQFLQKLOQPMTFTAMNIFNINLATNINVAKFAFTVYAIASGMNLDQKLSIKE

>DmOR23a

MKLSETLKDIDYFRVQLNAWRICGALDLSEGRYWSWSMLLCLIVYLPMPMLLRGVYSFEDPVENNFSLSLT
VTSLSNLMKFCMYVAQLTKMVEVQSLIGQLDARVSGESQSERHRNMTEHLLRMSKLFQITYAVVFIIAAV
PFVFEDELSPMPMWFDFWKNMVAIYIGALVFOEIGYVFOIMQCFADSFPLVLYLISEQCQLLILRI
SEIGYGYKTEENEQDLVNCIRDQNALYRLLDVTKSLVSYPMVQFMVIGINIAITLFLVIFYVETLYDR
IYYLCFLGIVTQTYPLCYGTMVQESFAELHYAVFCSNWVDQSASVYRGHMLILAERTKRMQLLLAGNLV
PIHLSTYVACWKGAYSFFTLMDARDGLGS

>DmOR22b

MLSQFFPHIKEKPLSERVKS RDAFVYLDRVMWSFGWTPENKRWDLHYKLWSTFVTLIFILLPISVSVE
YIQRFKTF SAGEFLSSIQIGVNMYGSSFKSYLTMMGYKKRQEA KMSLDELDKRCVCDEERTIVHRHVALG
NFCYIFYHIAYTSFLISNLSFIMKRIHAWRMYPYVDPEKQFYISSIAEVLIRGWAVFMDLCTDVCPLI
SMVIAARCHITLLKQRLRNLRSKPGRTEDEYELKELADCVDRHRLILDYVDALRVSFGTIFVQFLLIGIVL
GLSMINIMFFSTLSTGVAVVLFMNSVSMQTFPFYLCNMIMDDCQEMADSLFQSDWTSADRRYKSTLVYF
LHNLQOPIILT AGGVFPI SMQTNLMV KLAFTVVTIVKQFNLA EKFO

>DmOR22a

MLSKFFPHIKEKPLSERVKS RDAFIYLD RVMWSFGWTEPENKRWILPYKLWLA FVNIVMLILLPISISIE
YLHRFKTF SAGEFLSSLEIGVNMYGSSFKCAFTLIGFKKRQEA KVLLDQLDKRCLSDKERSTVHRVAMG
NFFDILYHIFYSTFVVMNFPYFLLERRHAWRMYPYIDSDEQFYISSIAECFLMTEAIYMDLCTDVCPLI
SMLMARCHISLLKQRLRNLRSKPGRTEDEYLEELTECIRDHRLLLDYVDALRPVFSGTIFVQFLLIGTVL
GLSMINLMFFSTFWTGVATCLFMFDVSMETFPFCYLCNMIIDDCQEMSNCLFQSDWTSADRRYKSTLVYF
LHNLQOPIITL TAGGVFPI SMQTNLAMV KLAFSVVTIVKQFNLAERFO

>DmOR82a

MGRLFQLQEYCLRAMGHKDDMDSTDSTALSLKHISLIFVISAQYPLISYVAYNRNDMEKVTACL SVVFT
NMLTVIKISTFLANRKDFWEMIHRFRKMHEQSASHIPRYREGLDYVAEANKLASFLGRAYCVSCGLTGLY
FMLGPVIVKIGVCRWHGTTCDKELPMPMKFPFNDLESPGYEVCFLYTVLVTVVVVAYASAVDGLFISFAIN
LRAHFQTLQROIQENWEFSPSEPDQIRLKSIVEYHVLLLSLSRKLRSIYTPTVMGQFVITSLOVGVIIYQ
LVTNMDSVMDLLLYASFFGSIMLQLFICYGGEIIKAESLQVDTAVRLSNWHLASPKTRTSLSLIILQSQ
KEVLIRAGFFVASLANFVVICRTALSLITLKSIE

>DmOR43a

MTIEDIGLVGINVRMWRHLAVLYPTPGSSWRKFAFVLPVTAMNLMQFVYLLRMWGDLPAFILNMFFFSAI
FNALMRTWLVIKRRQFEFLGQLATLFHSILDSTDEWGRGILRRAEREARNLAAILNLSASFLDIVGALV
SPLFREERAHFPLGALPGVSMTSSPVYEVIIYLAQLPTPLLSMMPFVSLFAGLAIFGKAMLOILVHRL
GOIGGEEQSEERFORLASCIAHYHTQVMRYVWQLNKLVANIVAVEAIIFGSIIICSLFLCLNIITSPTQVI

SIVMYILTMLYVLFYYNRANEICLENRRVAEAVYNVPWYEAGTRFRKTLILFLMOTQHPMEIRVGNVYP
MTLAMFQSLNASYSYFTMLRGVTG

>DmOR2a

MEKQEDFKLNTHSAVYYHWRVWELTGLMRPPGVSSLLYVVYSITVNLVVTVLFPLSLLARLLFTTNMAGL
CENLTITITDIVANLKFANVYMVRKQLHEIRSLRLMDARARLVGDPEEISALRKEVNIAOQTFRTFASI
FVFGTTLSCVRVVVRPDRELLYPAWFGVDWMHSTRNYVLINIYQLFGLIVQAIQNCASDSYPPAFLCLLT
GHMRAELRVRRIIGCRTEKSNKGQTYEAWREEVYQELIECIRDLARVHRLREIIQRVLSVPCMAQFVCSA
AVQCTVAMHFLYVADDHDHTAMIIISIVFFSAVTLEVFVICYFGDRMRTQSEALCDAFYDCNWIEQLPKFK
RELLFTLARTQRPSTLIYAGNYIALSLETFEQVMRFTYSVFTLLLRK

>DmOR67d

MLKMAKVEPVERYCKVIRMIRFCVGFCDNDVADPNFRMWLTYAVMAAIAFFFACTGYTIYVGVVINGDL
TIILOALAMVGSVQGLTKLLVTANNASHMREVQNTYEDIYREYSGKGEYAKCLEKRIRITWTLLIGFM
LVYIILLGLVITFPIFYLLILHQQVLMQFLIPFLDHTTDDGGHLILTAHVILITFGGFGNYGGDMYLFL
FVTHVPLIKDIFCVKLTTEFNELVMKRNDPKVRAMLCDLLVWHQLYTRMLQTTKKIYSIVLQVSTTCV
GLLCTISCFMKAWPAAPLYLLYAAITLYTFCGLGTLVENSNEFLSVIYTNCLWYELPVKEEKLIIMML
AKAQNEVVLTAADMAPLSMNTALQLTKGIYSFSMMLMNYLG

>DmOR59c

MTKFFFKRLQAPLDQEVSSLDASDYYRIAFFLWTPPKGALLRWIYSLWTLTMMWLGIVYLPGLSLT
YVKHFDRFTPEFLTSLQVDINCIGNVIKSCVTYSQMWRFRMNELISSLDKRCVTTTQRRIFHKMVARV
NLIVILFLSTYLGFCLTFTSVFAGKAPWQLYNPLVDWRKQHWQLWIASILEYCVVSIQTMQELMSDTY
AIVFISLFRCHLAILRDRIANLRQDPKLEMEHYEQMVACIQDHRITIIQCSQIIRPILSITIFAQFMLVG
IDLGLAAISILFFPNTIWTIMANVSFIVAICTESFPCMLCEHLIEDSVHVSNALFHSNWITADRSYKSA
VLYFLHRAQQPIQFTAGSIFPISVQSNIAVAKFAFTIITIVNQMNLGKFFSDRSNGDINP

>DmOR59b

MAVFKLKIPAPLTKVQSRQGNIIYLRAMWLIWIPPKGEVLRVYVLFWTCVPPAFAGVFYLPVGFIIISYV
QEFKNFTPGFELTSLQVCINVIYASVKSTITYLFLWRLRKEIILLDSLDRKLANDSDRERIHNMVARCNY
AFLIYSFIYCGYAGSTFLSYALSGRPPWSVYNPFIIDWRDGMGSLWIAIFEYITMSFAVLQDQLSDTYPL
MFTIMFRAHMEVLKDHVRSRMDPERSEADNYQDLVNCVLDHKTILKCCDMIRPMISRTIFVQFALIGSV
LGLTLVNVFFFNFVWKGVASLLFVITILLQTFPFCYTCNMLIDDAQDLSNEIFQSNWVDAEPYKATLVL
FMHHVQOPIIFIAGGIFPISMNSNITVAKFAFSIITIVRQMNLAEQFQ

>DmOR59a

MAEVRVDSLEFFKSHWTAWRYLGVVAHFRVENWKNLYVFYSIVSNLLVTLCPVHLGISLFRNRTITEDIL
NLTTFATCTACSVKCLLYAYNIKDVLEMERLLRLLDERVVGPEQRSIYGQVRVQLRNVLVYVFIGIYMPCA
LFAELSFLFKEERGLMPAWFPFDWLHSTRNYIIANAYQIVGISFOLLQNYVSDCFPAVVLCLISSHIKM
LYNRFEEVGLDPARDAEKDLEACITDHKHILELFRRIEAFISLPLMIQFTVTALNVCIGLAALVFFVSEP
MARMYFIFYSLAMPLQIFPSCFFGTDNEYWFGRLHYAAFSCNWHTQNRSFKRKMMLFVEQSLKSTAVAG
GMMRIHLDFTFFSTLKGAYSFLTIIIRMRK

>DmOR88a

MKPTEIKKPYRMEEFRLPQMFQEVQMVHFQWRRNVPDMSMVNASMVPFCLSAFLNVLFVFCNGWDIIGH
FWLGHANQNPPVLSITIIYFSIRGLMLYLKRKEIVEFVNDLDRECPDLVSQLDQMDETYRNFVQRYRF
IRIYSHLGGPMFCVVPLALFLLTHEGKDPVAQHEQLLGGWPCGVRKDPNFYLLVWSFDLMCTTCGVSF
FVTFDNLFNVMQGHLMHLGHLARQFSAIDPRQSLTDEKRFFVDLRLLVQRQQLLNGLCRKYNDIFKQVAF
LVSNFVAGSLCFYLFMLSETSDVLIIAQYILPTLVLVGFTFEICLRGTQLEKASEGLESSLRSQEWYLG
SRRYRKFYLLWTOYQORTQOLGAFGLIQVNMVHFTEIMQLAYRLFTFLKSH

>DmOR22c

MTDSGQPAIADHFYRIPRISGLIVGLWPQRIRGGGGRPWHAHLLFVFAFAMVVVGAVGEVSYGCVHLDNL
VVALEAFCPGTTKAVCVLKLWVFFRSNRRWAELVQRLRAILWESRRQEAQRMLVGLATTANRLSLLLLSS
GTATNAAFTLQPLIMGLYRWIVQLPGQTELPFNIILPSFAVQPGVFPITYVLLTASGACTVFAFSFVDFG
FICSCLYICGAFRLVQODIRRIFADLHGDSVDVFTEEMNAEVRHRLAQVVERHNAIIDFCTDLTROFTVI
VLMHFLSAAFVLCSTILDIMLNTSSLSGLTYICYIIAALTQLFLYCFGGNHVSESSAAVADVLYDMEWYK
CDARTRKIVILMILRRSQRAKTIIVPFFTPSLPALRSILSTAGSYITLLKFTL

>DmOR56a

MFKDLLLSPTTFEDPIFGTHLRYFQWYGYVASKDQNRPLLSLIRCTILTASIWLSCALMLLARVFRGYE
NLNDGATSYATAVQYFAVSIAMFNAYVQRDKVISLLRVAHSDIQNLMHEADNREMELLVATQAYTRTITL
LIWIPSVIAGLMAYSDCIYRSLFLPKSVFNPAVRRGEEHPILLFQLFPFGELCDNFVVGYLGPWYALGL
GITAIPLWHTFITCLMKYVNLKLOILNKRVEEMDITRLNSKLVIGRLTASELTFWQMQLFKEFVKEQLRI
RKFVQELQYLICVPVMADFIIFSVLICFLFFALTVGVPSKMDYFFMFIYLFVMAGILWIYHWHATLIVEC
HDELSLAYFSCGWYNFEMPLQKMLVFMMHAQRPMKMRALLVDLNLRTFIDIGRGAYSYFNLLRSSHLY

>DmOR85f

MEPVQYSYEDFARLPPTVFWIMGYDMLGVPKTRSRRIYWIYRFLCLASHGVCVGMVFRMVEAKTIDNV
SLIMRYATLVTYIINSDTKFATVLRSAIQSLNSKLAELYPKTTLDRIYHRVNDHYWTKSFVYLVIIYIG
SSIMVVIGPIITSIIAYFTHNVFTYMHCPYFLYDPEKDPVWIYISIIYALEWLHSTQMVISNIGADIWLL
YFQVQINLHFRGIIRSLADHKPSVKHDOEDRKFIAKIVDKQVHLVSLQNDLNGIFGKSLLSLLTTAAVI
CTVAVYTLIQGPTLEGFTYVIFIGTSVMQVYLVCCYGGQVLDLSGEVAHAVYNHDFHDASIAKRYLLII
IIRAQQPVELNAMGYLSISLDTFKQLMSVSYRVITMLMQMIQ

>DmOR85d

MLTKKDTQSAKEQEKLKAIPLHSFLKYANVFYLSIGMMAYDHKYSQKWKEVLLHWTFFIAQMVNLNTVLIS
ELIYVFLAIGKGSNFLEATMNLISFIGFVIVGDFKIWNISRQRKRLTQVVSRLLEELHPOGLAQOEPYNIGH
HLSGYSRYSKIFYFGMHMVLWITYNLYWAVYYLVCFDGLGMRQFERMLPYCWPVPDWDSTGYSYFMYISQ
NIGGQACLSQLAADMLMCALVTLVVMHFIRLSAHIESHVAGIGSFQHDLEFLQATVAYHQSLIHLCDI
NEIFGVSLLSNFVSSSFIICFVGFQMTIGSKIDNLVMLVFLFCAMVQVFMIAATHAQRQLVDASEQIGQAV
YNHDWFRADLRKMLILIIKRAQQPSRLKATMFLNISLVTVSDLLQLSYKFFALLRTMYVN

>DmOR85c

MKFMKYAVFFYTSVGIIEPYTIDSRSKKASLWSHLLFWANVINLSVIVFGEIILYLGVAISDGKFI DAVTVL
SYIGFVIVGMSKMFIIWKKTDLSDLVKELEHIYPNGKAEEMRYLDRYLRSRISITYALLYSVLIWT
FNLFSIMQFLVYEKLLKIRVVGQTLPYLMYFPWNWHENWTTYVLLFCQNFAGHTSASGQISTDLLLCAVA
TQVVMHFDYLARVVEKQVLDLDRDSENSRFLAKTVQYHQRILRLMDVLNDFIGIPLLLNFMVSTFVICFVG
FQMTVGVPPDIMIKLFLFLVSSLSQVYLICHYGQLIADASSLSISAYKQWQADIRYRRALVFFIARP
QRTTYLKATIFMNI TRATMTDLLQVSYKFFALLRTMYIK

>DmOR85b

MEKLMKYASFFYTAVGIRPYTNGEESKMKNKLIHFIVFWSNVINLSFVGLFESIYVYSAFMDNKFLEAVTA
LSYIGFVTVGMSKMFIRWKKTAITELINELKEIYPNGLIREERYNLPMYLGTCSRISLIYSLLYSVLIW
TFNLFVMEYWVYDKWLNIRVVGKQLPYLMYIPWKQDNWSYYPPLFSQNFAGYTSAGQISTDVLLCAV
ATQLVMHFDLNSMERHELSDGWKDSRFLVDIVRYHERILRLSDAVNDFIGIPLLLNFMVSSSFFVICFV
GFQMTVGVPPDIVVKLFLFLVSSMSQVYLICHYGQLVADASYGFSVATYNQWKYKADVRYKRALV I I IAR
SQKVTFLKATIFLDITRSTMTDLLQISYKFFALLRTMYTQ

>DmOR85a

MIFKYIQEPVLGSLFRSRDSLIIYLNRSIDQMGWRLPPRTKPYWWLYYIWTLVVIVLVFIFIPYGLIMTGI
KEFKNFTTTDLFTYVQVPVNTNASIMKGIIVLFMRRRFSRAQKMDAMDIRECTKMEEKVQVHRAAALCNR
VVVIYHCIIYFGYLSMALTGALVIGKTPFCLYNPLVNPDDHFFYLATAIESVTMAGIILANLILDVYPIIYV
VVLRIHMELLSERIKTLRTDVEKGDQHYAELVECVKDHKLIVEYGNLTPMISATMFIQLLSVGLLLGL
AAVSMQFYNTVMERVVSGVYTIAILSQTFPFVCEQLSSDCESLTNTLTFHSHKWI GAERRYRTTMLYFIH
NVQOSILFTAGGIFPICLNTNIKMAKFAFSVVTIVNEMDLAEKLRRE

>DmOR13a

MFYSYPYKALSFPICVWLKLNKSWPLTESSRPWRSQSLLATAYIVWAWYVIASVGITISYQTAFLNNL
SDIIITTENCCTTFMGVLFVRLIHLRLNQRKFRQLIENFSYEIWIIPNSSKNNVAECRRRMVTF S IMTS
LLACLIIIMYCVLPLVEIFFGPAFDAQNKPFYKMIFFPYDAQSSWIRYVMTYIFTSYAGICVVTTLFAEDT
ILGFFITYTCGQFHLLHQRIAGLFAGSNAELAESIQLERLKRIVEKHNNIISFAKRLDFFNPILLANLM
ISSVLICMVGFIQVTKGNMFIGDYVKFIIYISSALSQLYVLCENGDALIKQSTLTAQILYECQWEGSDRI
EIQSFTPTTKRIRNQIWFMI LCSQPVRITAFKFTLSLQSF TAILSTSI SYFTLLRSVYFDDEKKLD

>DmOR65c

MDIRGNVHRFVKFYIDGWKHFRDPTMESSYSAVYYWREQMKAMFLYTTSKERQMPYRSSHWTLVIIQATV
CFLTMICYGVTESLGDQVQGRDIAFIIIGFFYIAFKIYYFQWYGDDELDEVVEALETTFHPWAQKGPQAVDYR
TAKRWYFTLAFFLASSWLVFLCIFIILLITSPWVHQOILPLHAAFPFQWHEKSIHPISHAFIYLFQTNW
VMYFLTWLVCIEGLSVSIYVEITFAIEVLCELRHLHQRCHEGQYQLRLETNRLVQFHQKIVHILDHTNKV
FHGTLIMQMGVNFVLSVLEAMEARKDPKVVAAQFAVLMLLALGHLMSWSYFGDLSQKSLTISEAAAYE

AYDPIKGSKDVYRDLCLIIRRGOEPLIMRASPFPSFNFINYSAILNQCYGILTFLLKTLTD

>DmOR65b

MDIQRFLKFYKVGWKTARDPLMEASHSSIIYWREQMKAMALFTTTEERLLPYRSKWHTLVYIQMVIFAS
MSFGLTESMGDQVQGRDLAFILGAFFIIFKTYFQWYGDDELQVSDLDALHPWAQKGNPVEYQTKGR
WYFVMAFFLATSWSFFLCILLITSPMWWHQONLPFHAAFPFQWHEKSLHPISHAIYLFQSYFAVYC
LTWLLCIEGLSICIYAEITFGIEVLCELRQIHRHNYGLQELRMETNRLVKLHQKIVEILDRTNDVHGT
LIMQMGVNFVLSVLEAVEARKDPKVVAAQFAVLMLLALGHLMSWSYCGDLSQKSLQISEAAAYEAYDP
TKGSKDVYRDLCVIIIRGQDPLIMRASPFPSFNINYSAILNQCYGILTFLLKTLTD

>DmOR65a

MTELRSERKNGNWRDLFGPFESWAVFKAPQAKSRHIIAYWTRDQLKALGFYMNSEQRRLPRIVAWQYFV
SIQALATALASLFYGISSEIGDIVNLGRDLVFIITIIIFICFRLVFFAQYAGELDVIIIDALEDIYHWSIKGP
ATKEVQETKRLHFLFLMALIITWFSFLILFMLIKISTPFWIESQTLPHVSWPFQLHDPSKHPIAYIIIF
VSQSTTMLYFLIWLGVVENMGVSLFFELTSALRVLCIELRNLQELCLGDEDMLYRELCRMTKHFHQIILL
TDRCNHIFNGAFIMQMLINFLVLSLFEVLAACKNPQVAVEYMIIMLMTLGHLSFWSKFGDMFSKESEQ
VALAVYEAYDPNVGSKSIHRQFCFFIQRAQKPLIMKASPPFPFNLENYMFILKQCYSILTILANTLE

>DmOR83c

MSTSESPSSRFRELSKYINSLTNLLGVDFLSPKLFKNYRTWTTIFAIANYTGFTVFTILNNGGDWRVGLK
ASLMTGGLFHGLGKFLTCLLKHQDMRRLVLYSOSIYDEYETRGDSYHRTLNSNIDRLLGIMKIIIRNGYVF
AFCLMELLPLAMLMYDGTAVTAMQYLIPLGLENNYCYVVTYMIQTVTMLVQGVGFYSGDLFVFLGLTQI
LTFADMLQVKVKNDALEQKAEYRALVRVGASIDGAENRQRLLDVIRWHQLFTDYCRAINALYELIA
TQVLSMALAMMLSFCINLSSFHMPSAIFFVVSAYSMSIYICILGTILEFAYDQVYESICNVTWYELSGEQR
KLFGLLRESQYPHNIQILGVMSLSVRTALQIVKLIYSVSMNNRA

>DmOR83a

MKSTFKEERIKDDSKRRDLFVFRQTMCIAMYPFGYVNGSGVLAVLVRFCDLTYELFNYFVSVHIAGL
YICTIYINYQGDLDFVNCLIQTIIYLWTIAMKLYFRFRPGLLNTILSNINDEYETRSAVGFVFTMA
GSYRMSKLWIKTYVYCCYIGTIFWLALPIAYRDRSLPLACWYFPDYTPGVYEVVFLQAMQIQVAASF
ASSSGLHMVLCVLSIGQYDVLFCSLKNVLASSYVLMGANMTELNLQAEQSAADVEPGQYAYSVEEETPL
QELLKVGSSMDFSSAFRLSFVRCIQHRYIVAALKKIESFYSPIWVFKIGEVTFMLCLVAFVSTKSTAN
SFMRMVSLGQYLLLVLYELFIIICYFADIVFQNSQRCGEALWRSPWQRHLKDVRSYDMFFMLNSRRQFOLT
AGKISNLNVDRFRGTITTAFFSFLTLQKMDARE

>DmOR49b

MFEDIQLIYMNIKILRFWALLYDKNLRRYVCIGLASFHIFTQIVYMMSTNEGLTGIIIRNSYMLVLWINTV
LRAYLLLADHLDYALIQKLEAYYDNLNLSYISEILDQVNVKGLMARGNLFGLTSMGFGLYPLS
SSERVLPFGSKIPGLNEYESPYYEMWYIFQMLITPMGCCMYIPYTSIVGLIMFGIVRCKALQHRRLQVA
LKHPYGDRDPRELREEIIACIRYQOSIIIEYMDHINELTTMMFLFELMAFSALLCALLFMLIIVSGTSQLI
IVCMYINMILAQILALYWYANELREONLAVATAAYETEWFTFDVPLRKNILFMMRAQRPAAILLGNIRP
ITLELFQNLNTTYTFFTVLKRVIY

>DmOR49a

MEKLRSYEDFIFMANMMFKTLGYDLFHTPKPWRYLLVRGYFVLCIISNFYEASMTTTRIEWESLAGSP
SKIMRQGLHFFYMLSSQLKFIITFMINRKRLLQLSHRLKELYPHKEQNQRKYEVNKYYLSCSTRNVLYVY
FVMVMALEPLVQSCIMYLIIGFGKADFTYKRIFPTRLTFDSEKPLGYVLAYVIDFTYSQFIVNVSLGTDL
WMMCVSSQISMHLGYLANMLASIRPSPETEQQDCDFLASIIKRHQLMIRLQKDVNYVFGLLASNLFTTS
CLLCCMAYYTVVEGFNWEGISYMMFLFASVAAQFYVVS SHGOMLIDLSTNLAKAAFESKWEGLSRYKKEI
LILMAQAQRPLEISARGVIIISLDTFKILMTITYRFFAVIROQTVK

>DmOR47b

MNDSGYQSNLSLLRVFLDEFRSVLRQESPLIPRLAFYVYVRAFLSLLCQYPNKKLASPLRYWINLFI
MCNVMTIFWTFMFVALPESKNVIEMGDDLWVWISGMALVFTKIFYMHLRCDEIDELISDFEYNNRELRPHNIDE
EVLGWQRLCYVIESGLYINCFCLVNFSSAAIFLQPLLGEKLPFHSVYPFQWHRLDLHPYTFWFLYIWQS
LTSQHNLMSILMVDVGIISTFLQATLNLKLLCIEIRKLGDMVSDKRFHEEFQVVRVRFHQHIIKLVGKAN
RAFNGAFNAQLMASFSLISISTFETMAAAVDPKMAAKFVLLMLVAFIQLSLWCVSGTLVYTSVEVAQA
AFDINDWHTKSPGIQRDISFVILRAQKPLMYVAEPFLPFTLGTMYMLVLKNCYRLLALMQESM

>DmOR10a

MSEWLRFLKRDQQLDVYFFAVPRLSLDIMGYWPGKTGDTWPWRSLIHFAILAIGVATELHAGMCFDRQO
ITLALETLCAGTSAVTLTKMFLMLRFRQDLSIMWNRLRGLLFDPNWERPEQRDIRLKHSAMAARINFWP
LSAGFFTCTTYNLKPIILIAMILYLQNRVEDFVWFTPFNMTPKVLNYPFFPLTYIFIAYTGVTIFMFG
GCDGFYFEFCAHLSALFEVLQAEIESMFRPYTDHLELSPVQLYILEQKMRSVIIRHNAIDLTRFFRDY
TIIITLAHFVSAAMVIGFSMVNLLTLGNNGLGAMLYVAYTVAALSQLLVYCYGGTLVAESSTGLCRAMFSC
PWQLFKPKQRRLVQLLILRSQRPVSMVPPFFSPSLATFAAILQTSGSIIALVKSFO

>DmOR47a

MDSFLQVQKSTIALLGFDLFSENREMWKRPYRAMNVFSIAAIFPFILAAVLHNWKNVLLADAMVALLIT
ILGLFKFSMILYLRDRFKRLIDKFRLLMSNEAEOGEEYAEILNAANKQDQRMCTLFRCTFLAWALNSVL
PLVRMGLSYWLAGHAPELPPCLFPWNIHIIIRNYVLSFIWSAFASSTGVVLPVSLDTIFCSFTSNLCAF
FKIAQYKVVRFKGGSLKESQATLNKVFALYQTSLDMCNDLNQCYQPIICAQFFISSLQCLMLGYLFSITF
AQTEGVYASFIATIIIQAYIYCYGENLKTESASFWEAIYDSPWHESLGAGGASTSICRSLIISMMRAH
RGRFITGYFFEANMEAFSSIVRTAMSIIITMLRSFS

>DmOR9a

MSDKVKGKKQEEKDQSLRVQILVYRCMGIDLWSPTMANDRPWLTFTVTMGPLFLFMVPMFLAAHEYITQVS
LLSDTLGSTFASMLTLVKFLLFCYHRKEFVGLIYHIRAILAKEIEVWPDAREIEVENQSDQMLSLTYTR
CFGLAGIFAALKPFVGIILSSIRGDEIHLELPHNGVYPYDLQVVMFYVPTYLWNVMASYSAVTMALCVDS
LLFFFFTYNCAIFKIAKHRMIHLPAVGGKEELEGLVQVLLHQLKGLQIADHIADKYRPLIFLQFFLSALQ
ICFIGFQVADLFPNPQSLYFIAFVGSLLIALFIYSKCGENIKSASLDFGNGLYETNWTDFSPPTKRALLI
AAMRAQRPCQMKGYFFEASMATFSTIVRSVSYIMMLRSFNA

>DmOR45b

MYPRFLSRNYPLAKHLFFVTRYFGLLGLRFGKEQSWLHLLWLVFNFNLAHCCQAEFVFGWSHLRTSPV
DAMD AFCPLACSFTTLFKLGMWWRQEVADLMDRIRLLIGEQEKRDSRRKVAQRSYYLMVTRCGMLVF
TLGSITTGAFVLRSLWEMWVRHQEFKFDMPFRMLFHDFHRMPWFPVFYLYSTWSGQVTVYAFAGTDGF
FFGFTLYMAFLQALRYDIQDALKPIRDPSSLRESKICQRLADIVDRHNEIEKIVKEFGSIIAAPTFFVHF
VSASLVIATSVIDILLYSGYNIIRYVVYTFVSSAIFLYCYGGTEMSTESLSLGEAAYS SAWYTWDRER
RRVFLIILRAQRPIITVRVPPFAPSPLPVFTSVIKFTGSIVALAKTIL

>DmOR45a

MDASYFAVQRRALEIVGFDPSTPQLSLKHPIWAGILILSLISHNWPVVYALQDLSDLTRLTDNFAVFMQ
GSQSTFKFLVMMAKRRRIGSLIHLRHLKLNQAASATPNHLEKIERENQLDRYVARFRNAAYGVICASAIA
PMLLGLWGYVETGVFTPTTPEFNFVLDERKPHFYWPIYVWVGLGVAAAALAIATDTLFSWLTHNVVIQ
FQLELVLEEKDLNGGDSRLTGFVSRHRIALDLAKELSSIFGEIVFVKYMLSYLQCLMAFRFRSRGWSA
QVPFRATFLVAIIQLSSYCYGGEYIKQSLAIAQAVYGOINWPEMTPKKRRLWQMVIMRAQRPAKIFGF
MFVVDLPLLLWVIRTAGSFLAMLRTFER

>DmOR7a

MAVSTRVATKQEVPESTRRAFRNFLFCFYALGMQAPDGSRPTTSSTWQRIYACFSVVMYVWQLLVPTFFV
ISYRYMGGMEITQVLTSAQVAIDAVILPAKIVALAWNPLLRRAEHHLAALDARCREQEEFQILIDAVRF
CNYLVWFYQICYAIYSSSTFVCAFLGQPPYALYLPGLDWQRSQMQFCIQAWIEFLIMNWTCLHQASDDV
YAVIYLYVVRIQVQLLARRVEKLGTDSDGQVEIYPDERRQEEHCAELQRCIVDHQTMQLLDCISPVISR
TIFVQFLITAAIMGTTMINIFIFANTNTKIASIIYLLAVTLQATPCCYQATSLMLDNERLALAIQOCQWL
GQSARFRKMLLYLHRAQQPITLTAMKLFPINLATYFSIAKFSFSLYTLIKGMNLGERFNRTN

>DmOR74a

MSFHRYRPRPLPGGELAPMPWPVSLYRVLNHVAWPLEAESGRWTVFLDRLMIFLGLVFCHEHNEVDFHYLI

ANRQMDMNLMTGLPTYLILVEMQIRCFQLAWHKDRFRALLQRFYAEIYVSEEMEPHLFASIQRQMLATRV
NSTVYLLALLNFFLVPVTNVIYHRREMLYKQVYFPDNTQLHFFIPLLVLFVWVGFIIITSMLFGELNVMGE
LMMHLNARYIQLGQDLRRSAQMLLKKSSSLNVAIAYRLNLTHILRRNAALRDFGQORVEKEFTLRIFVMFA
FSAGLLCALFFKAFTNPWGNVAYIVWFLAKFMELLALGMLGSILLKTTDELGMMYYTADWEQVIHQSDNV
GENVKMLKLVTLAIQLNRPFFITGLNYFRVSLTAVLKIIQGAFSYFTFLNSMR

>DmOR42b

MVFELIRPAPLTEQKRSDGCIYLYRAMKFIWGLPPKQGVLRVYVLTWTLMTFVWCTTYLPLGFLGSYMT
QIKSFSPGEFLTSLQVCINAYGSSVKVAITYSMLWRLIKAKNILDQLDLRCTAMEEREKIHLVVARSNHA
FLIFTFVYCGYAGSTYLSSVLSGRPPWQLYNPFIWHDGTLKLWVASTLEYMVMMSGAVLQDQLSDSYPLI
YTLILRAHLDMRLRERIRRLRSDENLSEAESYEELVKCVM DHKLILRYCAI IKPVIQGTIFTQFLLIGLVL
GFTLINVFFFSDIWTGIASFMFVITILLQTFPFCYTCNLIMEDCESLTHAIFQSNWVDASRRYKTTLLYF
LQNVQOPIVFIAGGIFQISMSSNISVAKFAFSVITITKQMNIA DKFKTD

>DmOR42a

MDLRRWFPTLYTQSKDSPVRSRDTLYLLRCVFLMGVRKPPAKFFVAYVLWSFALNFCSTFYQPIGFLTG
YIISHLSEFSPGEFLTSLQVAFNAWSCSTKVLIVWALVKRFDEANNLLDEMRRITDPGERLQIHRVLSLS
NRIFFFFMVAVMYATNTFLSAIFIGRPPYQNYYPFLDWRSSSTLHLALQAGLEYFAMAGACFQDVCVDCY
PVNFVVLVRAHMSIFAERLRLRGTYPYESQEOKYERLVQCIQDHKVLRFVDCLRPVISGTFVQFLVVG
LVLGFTLINIVL FANLGSIAAALS FMAAVLLETPFCILCNYLTEDCYKLADALFQSNWIDEEKRYQKTL
MYFLQKLOQPITFMAMNVFPI SVGTNISVTKFSFSVFTLVKQMNISEKLAKSEMEE

>DmOR71a

MDYDRIRPVRFLTGV LKWWRLWPRKESVSTPDWTNWQAYALHVPFTFLFVLLLWLEAIKSRDIOHTADV L
LICLT TTTALGGKVINIWKYAHVAQILSEWSTWDLFELRSKQEVDMWRFEHRRFN RVFMFYCLCSAGVIP
FIVIQPLFDIPNRLPFWMWTPFDWQOPVLFWYAFIYQATTIPIACACNV TMDAVNWYMLHLSLCLRMLG
QRLSKLQHDDKDLREKFL ELIHLHQRLKQOALSIEIFISKSTFTQILVSSLIICFTIYSMQMSPVLQDLP
GFAAMMQYL VAMIMQVMLPTIYGNVIDSANMLTDSMYSNDWPD MNCRMRLVLMFMVYLNRPVTLKAGG
FFHIGLPLFTKTMNQAYSLLALLLNMQ

>DmOR1a

MSKLI EVFLGNLWTRQFTFARMGLDLOPKKGNVLRSP LLYCIMCLTTSFELCTVCAF MVQNRNQIVLCS
EALMHGLQMVSSLLKMAIFLAKSHDLVDLIQOIQSPFTEEDLVGTEWRSQNRGQLMAAIYFMMCAGTSV
SFLMLPVALTMLKYHSTGEFAPVSSFRVLLPYDVTQPHVYAMDCCLMVFVLSFFCCSTTGVD TLYGWCAL
GVSLQYRRLGQQLKRIPSCFNPSRSDFGLSGIFVEHARLLKIVQHFNYSFMEIAFVEVVIICGLYCSVIC
QYIMPHTNQNFALGFFSLVTTQLCIIYLFGAEQVRLEAERFSRLLYEVIPWQNLPPKHKRKLFLFPIERA
QRETVLGAYFFELGRPLLWVIFRTAGSF T TLMNALYAKYETH

>DmOR98b

MLTDKFLRLQSALFRLLGLELLHEQDVGHRYPWRSIC CILSVASFMP LTI AFGLQNVQVNEQLTDSLCSV
LVDLLALCKI GLFLWLYKDFKFLIGQFYCVLQ TETH TAVAEMIVTRESRRDQFISAMYAYCFITAGLSAC
LMSPLSMLISYQRTGELQPKFPFSPVYPWDNMKLSNYIIISYFWNVCAALGVALPTVCVDTLFCSLSHNLC
ALFQIARHKMMHFEGRN TKETHENLKHVFQLYALCLNLGHFLNEYFRPLICQFVAASHLCLVLCYQLSAN
ILQPALLFYAAFTA AVVGVQVSIYCFGSSIHSECQ LFGQAIYESSWPHLLQENLQLVSSLKIAMMRSSLG
CPIDGYFFEANRETLITVSKAFIKVSKKTPQVND

>DmOR98a

MLFNLYLRKPNPTNLLTSPDSFRYFEYGMFCMGWHTPATHKIIYYITSCLIFAWCAVYLP IGI IISFKTDI
NTFTPNELLTVMQLFFNSVGMPPKVLFFNLYISGFYKAKKLLSEMDKRC TTLKERVEVHQGVVRCNKAYL
IYQFIY TAYTISTFLSAALSGKLPWRIYNPFDVDFRESRSSFWKAALNETALMLFAVTQTLMSDIYPLLYG
LILRVHLKLLRLRVE SLCTDSGKSDAENEQDLIKC IKDHNLIIDYAAAIRPAVTRTIFVQFLLIGICLGL
SMINLLFFADIW TGLATVAYINGLMVQTFPFCFVCDLLKKDCELLVSAIFHSNWINSSRSYKSSRLRYFLK
NAQKSIAFTAGSIFPISTGSNIKVAKLAFSVVTFVNQLNIADRLTKN

>DmOR67c

METAKDN TARTFMELMRVPVQFYRTIGEDIY AHRSTNPLKSLLFKIYLYAGFINFNLLVIGELVFFYNSI
QDFETIRLAI AVAPCIGFSLVADFKQAAMIRGKKT LIMLLDLENMHPKTLAKQMEYKLPDFEKTMKRVI
NIFTFLCLAYTTTTFSYPAIKASVKFNFLGYDTFDRNFGFLIWF PFDATRNNLIYWIMYWDIAHGAYLAG

IAFLCADLLLVVITQICMHFNYSMRLEDHPCNSNEDKENIEFLIGIIRYHDKCLKCEHVNDLYSFSLLNFLMASMQICFIAFQVTESTVEVIIICYIFLMTSMVQVFMVCYYGDTLIAASLKVGDAAYNQKWFQCSKSXYCTMLKLLIMRSQKPA SIRPPTFPPIISLVTYMKVISMSYQFFALLRTTYSN

>DmOR67b

MQDQLDHELERIDKLPKLGLLWVEYSAYALGVNIAPRKRSSKYCRLTRILVLIVNLSIIYSLVAFIMENY MISFETYVEAVLLTFQLSVGVVMMFHFQNKVESCQLVFSSTETGEVLKSLGLFQLDLPRKKELSSVSLI LLNNWMIIDRQVMFFFKIVCMPVLYYCVRPFYQYIFDCYIKDKDTCENTLTYPVPAIVPYLQGNVEFPSYV IRFFLLQSGPLWCFFAVFGFNSLVVLTTRYESGLIKVLRFLVQNSTSDILVPKDQRVKYLQCCVRLFARI SSHHNQIENLFKYIILVQCSVSSILICMLLYKISTVLEVGWVMMGMIMVYFVTIALEITLYNVSAQKVES QSELLFHDWYNCSWYNESREFKFMKMLLLFSRRTFVLSVGGFTSLSHKFLVQVFRLSANFFLLLRNMN K

>DmOR67a

MDNVAEMPEEKYVEVDDFLRLAVKFYNTLGIDPYETGRKRTIWFQIYFALNMFNMVFSFYAEVATLVDRL RDNENFLESCILLSYVSFVVMGLSKIGAVMKKKPKMTALVRQLETCFPSPAKVVQEEYAVKSWLKRCHIIY TKGFGGLFMIMYFAHALIPLFIYFIQRVLLHYDPAKQIMPFIYQLEPWEFRDSWLFYPSYFHQSSAGYTAT CGSIAGDLMIFAVVLQVIMHYERLAKVLRREFKIQAHNAPNGAKEDIRKQLQSLVANHIDILRLTDLMNEVF GIPLLLNFIA SALLVCLVGVQLTIALSPEYFCKQMLFLISVLLLEVYLLCSFSQRLIDASENVGHAAYDMD WLGSDKRFFKILIFISMRSQKPVCLKATVVLDLSMPTMSIFLGMYSYKFFCAVRTMYQ

>DmOR35a

MVRYVPRFADGQVKLAWPLAVFRLNHFVPLDPSTGKWGRYLDKVLAVAMSLVFMQHND AELRYLRFEA SNRNLDAFLTGMPTYLILVEAQFRSLHILLHFEKLOKFLIEFYANIYIDPRKEPEMFRKVDGKMIINRLV SAMYGAVISLYLIAPVFSIINQSKDFLYSMIFPFDSPLYIFVPLLLTNVWVGIVIDTMMFGETNLLCEL IVHLNGSYMLLKRDLQLAIEKILVARDRPHMAKQLKVLITKTLRKNVALNQFGQOLEAQYTVRVFIMFAF AAGLLCALSFKAYTNPMANYIYAIWFGAKTVELLSLQIGSDLAFTTDSLSTMYLTHWEQILOYSTNPS ENLRLKLLINLAIEMNSKPFYVTGLKYFRVSLQAGLKILQASFSYFTFLTSMQRRQMSN

>DmOR33c

MVIDSLSFYRPFWICMRLLVPTFFKDSRPVQLYVLLHILVTLWFPLHLLLHLLLPSTAEFFKNLTM SLTCVACSLKHVAHLYHLPQIVEIESLIEQLDTFIASEQEHRYRDHVHCHARRFTRCLYISFGMIYALF LFGVVFQVIGSNWELLYPAYFPFDLESNRFLGAVALGYQVFSMLVEGFQGLGNDTYTPTLCLLAGHVHL WSRMQGLGYFDDETVVNHQRLLDYIEQHKLVRFHNLVSRITISEVQLVQLGGCGATLCIIVSYMLFFVG DTISLVYYLVFFGVVCVQLFPSCYFASEVAEELERLPYAISSRWYDQSRDHRFDLLIFTQLTLGNRGWI IKAGGLIELNLNAFFATLKMAYSLFAVVVRAGKI

>DmOR33b

MDLKPRVIRSEDIYRTRYWLYWHLLGLESNFFLNRLDLVITIFVTIWIPIHLILGLFMERSLGDVCKGLP ITAACFFASFKFICFRFKLSEIKEIEILFKELDQRALSREECEFFNQNTREANFIWKSFI VAYGLSNIS AIASVLFGGGHKLLYPWFYDVQATELIFWLSVTYQIAGVSLAILQNLANDSYPPMTFCVVAGHVRLLA MRLSRIGQGPEETIYLTGKQLIESIEDHRKLMKIVELLRSTMNISQLGQFISSGVNISITLVNILFFADN NFAITYYGVYFLSMVLELFPCCYYGTLISVEMNQLTYAIYSSNWMMSMNRYSRILLIFMQLTLAEVQIKA GGMIGIGMNAFFATVRLAYSFFTLAMSLR

>DmOR33a

MDSRRKVRSENLKYTYWLYWRLLGVEGDYPFRRLVDFTTITSFITILFPVHLILGMYKKPQIQVFRSLHFT SECLFCSYKFFCFRWKLKEIKTIEGLLQDLDSRVESEERNYFNQNP SRVARMLSKSYLVAAISAITAT VAGLFSTGRNLMYLGWFPYDFQATAAIYWISFSYQAIGSSLLILENLANDSYPPITFCVVSGHVRLIMR LSRIGHDKVLSSENTRKLEIGIQDHRKLMKIIRLLRSTLHLSQLGQFLSSGINISITLINILFFAENNF AMLYYAVFFAAMLIELFPSCYYGILMTMEFDKLPYAISSNWLKMDKRYNRSLIILMQLTLVPVNIKAGG IVGIDMSAFFATVVMAYSFYTLALSFRV

>DmOR94b

MESTNRLSAIQTLVIRWIGLLKWENEGEGVLTWLKRIYPFVHLPLTFTYIALMWYEAITSSDFEEA GOVLYMSITELALVTKLLNIWYRRHEAASLIHELQHPAFNLRNSEEIKFWOQNQRNFKRIFYWYIWGSL FVAVMGYISVFFQEDYELPFGYYVPFEWRTREYFYAWGYNVAVMTLCCLSNILLDTLGCYFMFHIALSLF RLLGMRLEALKNAEEKARPELRRIQHLTKVRRLTRECEVLVSPYVLSQVVFSAFIIICFSAYRLVHMGF

KQRPGLFVTTVQFVAVMIVQIFLPCYYGNELTFHANALTNSVFGTNWLEYSVGTRKLLNCYMEFLKRPVK
VRAGVFFEIGLPIFVKTIINNAYSFFALLLKISK

>DmOR94a

MDKHKDRIESMRLILQVMQLFGLWPWSLKSEEEWTFGTGFVKRNYRFLHLHPITFTFIFGLMWLEAFISSNL
EQAGQVLYMSITEMALVVKILSIWHYRTEAWRLMYELOHAPDYQLHNQEEVDFWRREQRFFKWFYIYIL
ISLGVVYSGCTGVLFLLEGYELPFAYYVPEFWQNERRYWFAYGYDMAGMTLTCISNITLDTLGCYFLFHIS
LLYRLLGLRLRETKNMKNDTIFGQQLRAIFIMHQRIRSLTLCQRIVSPYILSQIILSALIIICFSGYRLO
HVGIRDNPGQFISMLQFVSMILQIYLPYCYGNEITVYANQLTNEVYHTNWLECRPPIRKLLNAYMEHLK
KPVITIRAGNFFAVGLPIFVKTIINNAYSFLALLLNVS

>DmOR30a

MELKSMDPVEMPIFGSTLKLKMFWSYLFVHNWRRYVAMTPYIIINCTQYVDIYLSTESLDFIIRNVYLAV
LFTNTVVRGVLQVQRFYSYERFINILKSFYIELLQSDDPINILVKETTRLSVLISRINLLMGCCTCIGF
VTYPIFGSERVLPYGMYLPTIDEYKYASPYEIFFVIQAIMAPMGCCMYIPYTNMVVTFTLFAILMCRVL
QHKLRSLEKLNQVQVGEI IWCIKYQLKLSGFVDSMNALNTHLHLVEFLCFGAMLCVLLFSLIIAQITIAQ
TVIVIAVMVMIFANSVVLVYVANELYFQSFDAIAAAYESNWMDFDVTQKTLKFLIMRSQKPLAILVGGT
YPMNLKMLQSLNIAIYSFFTLRRVYG

>DmOR19a

MDISKVDSTRALVNHWRIFRIMGIHPPGKRTFWGRHYTAYSMVWNVTFHICIWVSFSVNLLQSNLETFC
ESLCVTMPHTLYMLKLINVRMRGQMISSHWLLRLLDKRLGCDDERQIIMAGIERAEFIFRTIFRGLACT
VVLGIIYISASSEPTLMYPTWIPWNWRDSTASAYLATAMLHTTALMANATLVLNLSSYPGTYLILVSVHTK
ALALRVSKLGYGAPLPAVRMQAILVGYIHDHQIILRLFKSLERSLSMTCFLOFFSTACAQCTICYFLLFG
NVGIMRFMMLFLLVILTETLLLCYTAELPCKEGESLLTAVYSCNWLSQLSVNFRLLLLMLARCQIPMI
LVSGVIVPISMKTFTVMIKGAYTMLTLLNEIRKTSLE

>DmOR92a

MLFRKRKPKSDDEVITFDELTRFPMTFYKTI GEDLYSDRDPNVIRRYLLRFYLVLGFLNFNAYVVGEIAY
FIVHIMSTTTLLEATAVAPCIGFSFMADFKQFGLTVNRKRLVRLDDLKEIFPLDLEAQRKYNVSFYRKH
MNRVMTLFTILCMTYTSSFSFYPAIKSTIKYLLMGSEIFERNYGFHILFPYDAETDLTVYWFYSWGLAHC
AYVAGVSYVCVLDLLIATITQLTMHFNF IANDLEAYEGGDHTDEENIKYLHNLVYHARALDLSEEVNNI
FSFLILWNFIAASLVICFAGFQITASNVEDIVLYFIFFSASLVQVVFVVCYYGDEMISSSSRIGHSAFNQ
WLP CSTKYKRILQFIIARSQKPAIRPPTFPPI SFNTFMKVISMSYQFFALLRRTYYG

>DmOR19b

MDISKVDSTRALVNHWRIFRIMGIHPPGKRTFWGRHYTAYSMVWNVTFHICIWVSFSVNLLQSNLETFC
ESLCVTMPHTLYMLKLINVRMRGEMISSHWLLRLLDKRLGCADERQIIMAGIERAEFIFRTIFRGLACT
VVLGIIYISASSEPTLMYPTWIPWNWKDSTASAYLATAMLHTTALMANATLVLNLSSYPGTYLILVSVHTK
ALALRVSKLGYGAPLPAVRMQAILVGYIHDHQIILRLFKSLERSLSMTCFLOFFSTACAQCTICYFLLFG
NVGIMRFMMLFLLVILTETLLLCYTAELPCKEGESLLTAVYSCNWLSQLSVNFRLLLLMLARCQIPMI
LVSGVIVPISMKTFTVMIKGAYTMLTLLNEIRKTSLE

>DmOR24a

MLPRFLTASYPMERHYFMVPKFALSIGFYPEQKRTVLVKLWSFFNFFILTYGKYAEAYYGIHYIPINIA
TALDALCPVASSILSLVKMVAIWYQDELRS LIERVRFLTEQQSKRKLGYKKRFYTLATQLTFLLLCCG
FCTSTYSVRHLIDNILRRTHGKDWIYETPFKMMFPDLLLLRPLYPITYILVHWHGYITVVCVFGADGFF
LGFCLYFTVLLCLQDDVCDLLEVENIEKSPSEAEARIVREMEKLVDRHNEVAELTERLSGMVEITLA
HFVTSSLIIGTSVVDILLFSGLGIIYVVYTCVAVGEIFLYCLGGSHIMEACSNLARSTFSSHWHYGSVR
VQKMTLLMVARAQRVLTIKIPFFSPSLETLSILRFTGSLIALAKSVI

>BmOR1

MLLSFKDDSRSPDIQKPQNFQYMKILRFNLKIIICAWPEKQLNEIRSLGHSIHRVILPIQSVVCLACGILY
IHFHFNEIPFFILASTFITVMMNLVTCRSRTALVMLFERYLVL TGRFITVMHLFNFQKNSDYAYKLCTFVN
RMSHFYTLVYVLFMSFMGLGLFNLLPLYNNYVSGAFSDPYGPNVTFHFSVYFAFPFDYSHNFRGYIIMALF
NSYVSVTCSIGLVMFDLLMCLMVMHVWGHKLKILSHNLINFPKASHVITTPNGPTNVETYTEESKEVF
ARLRECIKHGTVDDFANDMSETFGVILLVYGFHQVSLCMLLLECSDLSTKAMLRYGPLTLIMIQLIQ
ISIIIFELLSVADRI PDVAVYQLPWECEMDVKNRRVVYGFLLRRTQNPVRFKAMGMLDVGVTMASILKTSIS

YFVMLRTVAT

>BmOR2

MMTKVKTOGLVTDLMPCIRLLQAAGHFLFNYHADTSGMNMLLRKIYSSAHAVLIVVHYICMGINMAQYKD
EVNELTANTITVLFFAHSIIKLAFFAFNSKSFYRTLAVWNQSNHPLFTESDARYHQISLSKMRRLLYFI
CGMTVFSVISWVTLTFFGESVRMIASKETNETLTPAPRLPLKAWYPFKTMSGGGYVFAFIYQIYFLLFS
MALANLLDVIFCSWLIFACEQLOHLKAIMKPLMELSAALDTPRNTAELFRVSSTDKTEKVPDAVMDIR
GIYSTQDFGMLTRGAGGKLNFNNAENPNGLTAKQEMLARS AIKYWVERHKHVRLVASIGD TYGTALL
FHMLVSTITLTLAYQATKINGINVYAFSTIGYLVYTLGQVFHFCIFGNRLIEESSVMEAAVSCQWYDG
SEEAKTFVQIVCQOCQKAMTISGAKFFNVSLDLFASVLGAVVTFMVLIQLK

>BmOR3

MIFVDDAVIGIKDPREYRHLRVLRTSLRLLGAWPGHYLGEETGSKYECAPMFLMFIKIACLYLTIVYLR
NNADVLGFFELGHVYLTIFMTFVTLSRGFSLTWNPNYHKVVKKFIEMHLLYFKDNSEYAMKTHRRVHKI
SHFYTVFLKQMIAGLTLFNVIPMYNNYRQGNYSRDRPANITYDLSIYYETFDILNTPNGYIFICVFNWF
ASYICCSFFCSFDLILSLMISTVSGHFRILIHNLTLFPLPEAITASKKFVVDKHCNNGRSEFVLEEAKLY
SPAEMQVTDRLRQCIDYHRKLVFEFTGDISEAFGPMLFVYYLFHQVSGCLLLLLLECSQLNTAALVRYGVLT
VVLYQQLIQLSVIVESVGTVTGRLKDAVYEVWPWEYMDTSNRKTVAFILMNVOEPLHVNALGLAKVGVQSM
AAILKTSFSYFTFLRTVSE

>BmOR4

MFKIIKNIIVENDALKQVEKPOEFQYMKWVQYHLKYIDGWPNDMNKKNVSKIRFHKRHLVVEQTITFL
SQMFYIVKNYGKLSFFEIGHSYITALMTIVIFSRSVVTALGRYKRIARYFVSSHLHYHYKDISSEYALQTH
LLVHRLSHYYTVYLISLVVTGMLLFNITPLYNNISSGVFNSPRPENMTFQHAVYLGLPFDYTTDIKGYFV
VFILNWHLSHIAASYFCTFDLFLSLLILHLWGLRILNLLKTFPKPYTNNSMYTEEENQVLLKLOECI
RYHNFIIISFTVMSNVYDVVIVVYLFHQVTGCLLLLQCSLTDWESLSRYGPLTLIIFOQLIQVSMIFEI
LGFLSDKLPNAVYSIPWEAMNVTNRKLVQVLLQKSQKPIQFKAMNMSVGVQTMASIIKTSISYFIMLRT
IARD

>BmOR5

MLLYYPNTQVKEKVNVEEFTYIKFLKSFCKIMDFWPEREEKNSKTRIFRLRYILVLQFCFTLVAGVLYL
TNSVGKQTFYDLGHTIITVLMNVVLSRLILRCFKKYDVVGQOFINKIHLYHYRNDSEYAMKIHTVVHKI
SHNMTYIFSFCIIFGTVTFNLTPIFNINIGSDAYKNRPNVTLQOCVYYALPFDYTGNFKWYLLVAIFNV
QKTFCTSLFILFELSLSLMIIICLWGHRLRIFIHNLNHIAPRNSFEYTKKEERQEVDDTLKCKIQHHTLII
GFVRIMSETYGLAVLIYYAFQVVGCLLLLQCSQMEKLTVTRFGFLTVLNQQLIQISVIFELLGYMSDK
LQDAVYCVWPWEYMDTSHRKMVYMMFRQSQIPLQLKAMNLSIGVKTMSVILKTSVTTYLILKTVTTD

>BmOR6

MKEEYLLQHPRTQLFYKVLAVHSTIESTIDLTTWGYTFPKYVGVFHYLQCNVRLFGKCVVVSQILFIIL
NYQTIDKSVFIIAITITPLGALVGIIKAESAECYVNLKMFMDKVIHHSIYRKNENNEFVKKKVIQIER
VSRFTAYFLVILIAINCLSWMLKPTLHNIKHFEEIMNKSMEFQYYIYFWTPLDYKYNLRDYIIHTLCIY
LGATAVTVIVTFDIFNFIAVFHVVAHIQILKNNVKSNSWDDFNESEKKGYSILEYHAYIIRIFGEVQS
AFGLNVASNYLQNLIEDGLFLYQIMNGEKENVLMYGLMIILYLGGLIFLSIVLEEIRRQNYDLCEVYVAL
PWEGMSLENQKIFVVFLQRTQPDLEFETVCGMKAGVKPAFSIVKSMFSYYVMINSRF

>BmOR8

MSLSTRCLLKDFCKYVYAGAGNFWYEDIYKETVPYKMYVVISFFTYTVMIFLENLAALFGKLPEVEKNS
AVMFAAIHNIVLTKMFLLLYHKRSISKLNCEMAAVGENLEEASIMRRQFRKMRLGTALYFISVYLSLVAY
GVESARRTIVEGAPFYTVVYLPDYDNTTVLASFLRIFFYITWLYMMLPMMSADCMPIAHLITMTYKFVT
LCRHFQDIREKQINVKIMAKTEATEILKLGFIIEGKMHQKLMYLADEIHRVFGIIMALQVCESSAVAVL
LLLRLALSPHLDLTNAFMTYTFVCSLFLLLALNLWNAGELTYQASLLSNAMFYSGWYFCDFEKDWCRRDIR
RLVLIGCAQAQKPLILKAFGVLDLSYETFVSVARMTYSVFAVFYKRGD

>BmOR9

MLALDDPLQNVNDVEDFKYVWLRNHLKTVDAWPVYSKSKRKIQKRYVLPIFSAACFISQTVYLKNGIGT
LSFVVLVHSYICFLINGSCLCRGILIAATERCKRLATCYLKTVHLFHHKRNSEHAMKIHVIVHRLSHYYTI
YLISLVFVGMVLFNFMPIYNNINSGAFKSPRPESVTFQHAMYALALPFDYTTNIKGYFVVFILNWIISLVT
TSHFCTFDLFIISLMIHLWGHKILMCSLEDIEGFVLGGSFKFTIEQNRKINSILOECIRHHQFTIDFTN

EMSSTFGLVILFYFFYQVSGCLLLLACSQMDIESLSRFGPMTFILFQQLIQLSIVFELISSLSENLPNA
VYNVPWESMDKNNRKMIVLQLLQSQKLRFRKATSMNMGVQAMATILKTSVSYFIMLRMTMYQEH

>BmOR10

MRTNAKSFLFVPSKVLTLGCVWPVEKTSIFSLIYRSIMLSSQFCFLVFNIGIYIGLMWGDALKAVSDALYMF
FTQTTCCSKAIGFYFNFMKIKRIVASMDVLFAMTAMSIEDQATIFSHSRTVNKLYKGVLGFTGFTLVQWTV
LSLIGSGRTLFPNEMWVPTDISKSPNYEITFVVELWMMVISAALFMSVDTITVATMMFSCAQLDIIMKKT
QQIQEIPLSPDLSSRNRSSELHEKNNGILIDCIKQHQAIVRFSELCEGTFQVHSFFHLGGIVFMICVIGFR
MAGESPVSQAQFWAALSYLVIILGQLYLYCWCANELTTKSEQLRDKLYLTPWYDQDVKFKRNLCIAMECMA
KALTFRAGSYIPLSRAMFVSIILRSSYSYFAFLNQANEQ

>BmOR11

MDEHSHFETSLNKIKVLFKYSGMNLENTVTNTYEFNLNRWVYILNHAWTLAAVTFICIGISNGQNFIEMT
CIAPCVAMTVLAVSKSFFHYINENAVKSLENLIELERTDFERTKSVORTEIVATEKQLLNMVINLVYL
NCSMILVFDMTPLIIIAIKYWTTNKFVRLLPYLDIFVFPVKFEYVWMAYILQIWAECIVLLFIGAADCL
FFTCTYIRIHFRLLQYDFERLTSSRRESDGLRDEDFRETYTNLVKRHQGLIESSSILEMIYSKSTLSN
FVLSLVLICLSAFNVTVVNDVTIVMTYLIFLAMSLMQVYFLCFFDMLMSASEEVGNAVYNCOSWYTEKAST
GKDLLFTITRAQKPCELTAAHFAYVNLKAFMRVSFTSASITTLPTI

>BmOR12

MTRITDVFSLNFIFWKFLGLWGKSAPSKYNNMAYTVFYLFASLVFYDIFLTLNLIHTPRKLETLVRETMYF
FNHLVAVTKILMMFIMRKKILVIFDLDCEEFKPNDENSQEIMKRKTDYFYIYWRIVAVTSNLSCFMLVI
GPLIKMLIWKIELGLPVCKFYFMSDELNRKYFVIWYIYQSFGIYNQMVNNLNLDTFNCGMLWMAVGQLQI
LKTGFVNLKLNDFENGLDLKSRDDMQIERLRKYLTHYEIILKYCATVQDILNITIFVQLGMSSIVICVGL
CGFVAMPNTETAIFMSSYLITMTMQIFVPSWMTQISFECGELMSAAYCCEWIPRSKLFKRSILFVER
AKTPVRITGLKIFTLSLDTFTSIMKTTYSFFTLIRQLQVDEVN

>BmOR13

MAPKQIDCFEINWKFWKFLGIWSENKPHRYKYYSKIFITFFVILYDVLTYTINFYFVPRQLDLIIGEMLF
YLTELSVLSKVFTFIIMRHKLKIIIFEILESDAFQDTEEELKILHRAKVFIKRYWKIVALVSITANLTHI
SSPLLKNLIFKVELVLPVCSYSFLSEFSLKTFEYPLYFYQIVGIFHMLYNLNIDTYFLGLMILIIAQDL
ILNVKFRNLKSGKDHTQLNESIMGLNKNLDHYNEIERFCSLVQNIQSFTLQVQFSMASCIIICVCLFSFTL
SVPVEYIIFLATYMFIMI IQIMVPCWFGSRIMDKSILLSSAIYNCDDWTSNSKDFKINMRLFVERANKPLS
ITGGKMFSLSLATFTSIMNSAYSFFTLRLRYIQTRE

>BmOR14

MSNYIFKPFHETYRIITFTMIAAMIYPNPATEKRRLIYIGLMLLSVIPLAFMIVTEMYEFFMASDLNNTI
RHSTVIGPFIGGFVKVALMYKRRQANELVSEINRDHLAYNGLKGEDREIAASSIRNCQIYCELGWTLIV
MSCGLSFPVIAILLKIHSTFKLDSTKHMIHDINNPTDDPEDRFESPFFEIMFVYTFSSFIYIINYVG
YDGFGLCINHACLKMKLYCRALEDAMRSDSRHEKIVAVIEEQRRTYEYIALIQDTFNIWGLIYVATM
IQMCTCMYHIVQSFNIDVRYIIFVISIIHIYLPCRYAANLKCMAAETPTLIYCCGWESVSDLRIKRMMPF
MVARSQVIVEITAFNMFAFDMELFVWIMKTSYSMFTLMRS

>BmOR15

MMTLVYQTDIFKPNVFFWKMGFIWADRKSSKTYKYYSFVFLFITLIMYNSLLAINLLYTPLKIELLIREV
IFCFTEITVSTKVLMLIFKRNKILDAFDLLNKNEFRGNSEESSAI IQKNNSAYKTYWKLYAILSNAFAYSS
QVLGPIVKKLIWTKLELPICNYYFLNEELRHDFSGWYIYQSFGMYGHMMYNVNIDTFISGLLMMAVTQ
LKI IQTKLLSLKLNPRERKMDRGLMNITEVLKLEILKHYELVLKYCSTVQSILDVAMFVQFGVASAIIIC
VAMCGLIMVRSSTETLLFMVTYLFAMTLQIFVPAWMTQLHFQSQELVFAAYNSEWIPRCQSFKRSIIF
VERAKIPITITGLKMFPLSLATFTSIMKTAYSFFTLIRNQALQEE

>BmOR16

MSFNSEDLYLNRAKFVMKYLGVWVPPENENFARKFYKIFMMSLQHLFLFFQIIYIVEVWGDLEAVSQASY
LLFTQACLCKFITVQINMNKLELLKQMNGYVFPKNINQQNI IKVQATRIKRLLFAMISSQLTCGMW
ALKPLFDDVGSRKFPFDMWMPVSPERSPHYHLGYSFQLVTICMSAYMYFGVDSVAFSSVIFGCAQIGVIK
DKIMSIPKPLGIYRNHKTYYTKISRYNRKTLIECVKHHQAVISFTELVEDTYNSYLLFQLVGSVGIICMSAL
RILVVDWRSVQFFSILCYLSVMISQLFVCCWCGHELSTATSEELHTILYNCAWYDQDVKFKRDLNFMARA
RRPILLRAGYIISLRQSFVSIILRMSYSYFAVLDTQTNK

>BmOR17

MREDKMEINNSQKFYTKMIFRYLYSVGLGDWWYQHEDRSDSHRKLCLWAVISNAYIFLNICNELLANFR
KDLTDVEKNDAIQFSFAHPLIFAKIASFFFNRKKIREVFGRLLEENRSVYSCGELEKESMKQIKRYSLAF
IGVSYMTLVMSTIDGLRAHFKEGIPIRTEVTTYPPSPNSGVIVNLRFLVEFHWWYIVSVMVAIDSLAVA
SFVVFVTFKFKLLQRYFKDMGLTVRRDQSNMTDEALADKFRDFIVGVKLHENALWCAENVQKAFGWVYSV
QVFETVALLVMCLVCLVTTNHNMIFFLLANFAFMLCVIILNGSYMPAGDVTYEASEVPTSIFLCGWELVR
QTDLRFLVVVAIQRSQVPVIMKAFGIMTLSYSNFIASVSLFKFYVQFQINLF

>BmOR18

MGDRMVTRGHFFDFNIKYLFFYVGLWPSNEAKRIEKIAYKIYEYQLHVLSLIFLVTGIGTYKNHKDIIAL
LTNLDKTLVAYNFVFKVIVFVYKREELRKLIEQIVQSGDQITEDRKALMAKLVIVLTGISTVITAFSCL
ALFEGEMTIDAWMPFDPMSKMNLFASQILAATFVVPFCYRAFAMLGIVCSLILYLRDQLVDLQNKIRD
LRFATGNVEKLRDDFKLIVKHHVRLGYSKVIEMIFKEYFFIQNMAVTAELCLNAMMVSUVGLEQKTLAA
SFLAFLSVALLNAYIICYLGNELIVQSEGIAMAAYESSWILWPVDMQKDLLIVITAAQKPMKLSAGGMV
LSVQTYSTLYNGYSIFAVLNDIVN

>BmOR19

MHEFVINVONETTKLYDQLNIIILYILGLOGIWDVEIKLSRRFHVFFKVVTFILHIMCGMFAGLQFFAIFT
QNSLANSQKSDVIVIGISNPMAYIFCINFIIRNRNEIKDLFYHLAVVLKIYYNDVEIEKSMVNKIKSYLST
YVFNASITILVSNGLIAFFQTINSDEPFLGIIITAWPDKTDTSKTASYARIGFYLFWCIHFFRISTVFAVIV
CILISIKYQYKILCSYFESLNKIFDDETSSEHVKEAFENAFNGIKIHTQIICVRRQCIMCRTVFSAN
IMLDTFVLVILMLAMVNSEDFYGLCSQMSSVLVTVVLMFAFFMWTAGDINVQASQLPDAIYSGGWYNCRG
KSSARIRSLVTISMNKAQOPILMWALGFVELSHKNFVAIIKSAYSVFSVY

>BmOR20

MIQASKYPNSKTKELFRKIAHAIYICGLPNFWIEELNLPKSFIRVYDKIVRIFNVATYFFFLGIEIAAHFT
QHHLTNKQKFDLLLYSISHPILNGYGVIVSRQVGNVKKVLLDLIVNLKVYNDPVEEAMIKISMTYSVS
FITNCVLSMLTYTFDALLMVYKKGVTFNVIITAWPDVEDTTTEASIGRIGFHFVWVTRPFVAVYVLI
NLTTCLSHQYMNLOSYYFHLEDIFKENLSQNEKEAKYEAAYKIGVMLHANTLRCTRCHMVWNGVMSGQI
IFNISLIVIIAQMMSNDRTLVTNFTGTVLTAASAILISTGFFMWNAGDVTVQASRLATAMYCSGWQNCRGK
SSVSIRNMVMNTIAVAQRPLVLRGLGVIDLSYQSYLSIVKASYTVFSVIY

>BmOR21

MNKNMKNHYILKTYCDKIFLVGSGNFWYQKTESRNDKTLKYIYSCVLFFFTYGFMTVLEIMAAMMGDFP
EDEKRDSVTFATSHTVVMIKFISIIKNKELLKTLNRKMMMICEAHEEQTLMDEMYRTVKINVVAYCVAVY
GSATFYVFEGLRKFYNGSHFVTIVTYPPSNDTDLAATIVRIATTLVLLMMLLTMIIISVDTYTMAYLIMY
KYKFITLRHYFKRLRENVDELVAAGKARLAAEKLAQGLVEGIKMHNELLSLSDIDKAFGTVMALQLCQS
SGSAVSLLLQIAVTMYLLLLALFLCNAGEITYQASLLSDEIFYCGWHKCNSPVLSTQRNIRDIVLIAILRA
QSPLVMKAFKMVVRSTYSVFALFYAQNK

>BmOR22

MNKNHYILKTYCDKIFLVGSGNFWHQKTESRNDKTLKYIYSCVLFFFTYGFMTVLEIMAATMGDFPEDEK
RDSVTFATSHTVVMIKFISIIKNKELLKTLNRKMMMICEAHEEQTLMDEMYRTVKINVVAYCVAVYGSAT
FYVFEGLRKFYNGSHFVTIVTYPPSNDTDLASIVRIATTLVLLMMLLSMIIISVDTYTMAYLIMYKYKF
ITLRHYFKRLRENVDELVAAGKARLAAEKLAQGLVEGIKMHNELLSLSDIDKAFGTVMALQLCQSSGSA
VSLLLQIALSDQLTFTMGMKIFFFLAAMYLLLLALFLCNAGEITYQASLLSDEIFYCGWHKCNSPVLSTQR
NIRDIVLIAILRAQSPLVMKAFKMVELTYATFILVVRSTYSVFALFYAQNK

>BmOR23

MRAKTEFEKTIKLTKTALFLSGINIFLGEWNHWTRTFVDSIAYYLNIVGLYFVFLIGEMYWLDGTITGKS
FVELSLIVPCLTISVLATAKVHYLYHNKESLLDVVDKLEIYPDEIEETANDNDQCLNDKKETVYDNDVT
EVGIVNEANELLKFNFLSTVSVFVVTMTFCTMPLFGMAGEFMETGKFVVLVYPFAVKYFPDVYNTSFVVI
VYVNFQWATIIVCTNIFGVDTLFYALCSYIGMNFRLLSYKFEHLEIKRNDRIINEIIVLIKRHQELIELV
NKTQSLYSLSTLFNIVTSSLLICLSGFNITILSRWSYFALLKTIYS

>BmOR24

MPEELFLDRSIKKIESYFRWGINIRSGDNNKDVFKIRCIYFINFVLLNTDVLGAIWFWRSGLEQGKT

FTEVTYNAPCLTFSFLANFKMLSLIFYEKTVHELIAALQKLEIKHFLRQNC AEELKMLKDEKNFLHAVFK
GSKI VNYASILTFCGSPVLVIASNYKYTG RMDYLLPLIVLYPFDVDNITVWP I IYVRQIWSVITAVIGVC
ATDYLFYTFVCYIISTQFRLLGHSIERVVPNGLSVRTRLNGLNLRMKFVENLKW HQELIRAASLLEQIYTK
STLYNFVTS SVIICLTGFNVAVVEDFAVILSFLFFLFMSLLQIILL CFFGDKLMKSSTNISDAVYNSKWY
LTEKNVGKVLMLMVQIRSQRACRLTAYGFAEVNLR AFMKILSTAWSYFALLQSLYSSHE

>BmOR25

MFEKALRSANFYMRVIGIPTDIRDGNRTL MERLRNRWFY CINF LWLNTD VAGEITW FVKGLLNGSSTLIE
NTYLIPCLTLCILGNVKTFFTIKYANHIIDLVA I LK DLEIKNNAARKNETEIVKERL KFLTTSNKFLLFV
IGTGIIA FGI GPLMLTASIYFSSGDMK LKLPFLI WYPFDSSDIRYWP FVYVHQVWSACIACCAVYGPDCF
YFTSCTFIHIHF IHLQNDITNVIVESSRARKNGLYRGCHQAFLELTNRHKDLIRCVNLEIIYSKSTLVN
VVSSLLICVTGFNVMTFCWFAAPFASFLALGLVQTYLLCYGDTIMCSSTEVS DAVYNSTWYGTNISQ
MRDYLFVMKRAQKPKCLTAYGFS DVNLR TFSRILSTAWSYFALLIT IYRGN GQO

>BmOR27

MPSSFFLPNLENPDYPSLGPTL KGLKYWGMWQSGGIKRILYNSIHAFATFFVITQYVELWIIRNNVELAL
RNLSVTMLSTV CVVKAGTFVCWQKYWSGII GFVSNLEKEQLSKNDAATQAAIVKYIKYSRRVTYFYWSLV
TATVFTVILAPLVGFLSSPERELIANGTLPYPEIMSSWVPFDRSRGFGYVWTALVHTLICYGGGVVANY
DSNAVVLMSFFAGQMKLLSINCSRLFDDGNEVISNNEAMKRIKECHYHHVFSTIFNSLMSPVLFLYVIIC
SLMLCASAVQLTTDGTSNMQRIW ISEYLMALIAQLFLYCWHSNQVLYMALEDRLGGLFEACLESGRFP SK
WKTGRVLVLRKDG R PADSPAGYRPIVLLDEAGKMLERIVAARI VRHLTETAPDLSAE

>BmOR29

MFDLQNL EDSERPLLGPNFWL INKTGLLLPKTNFGK LAYILVHEIVTFFVVTQYVELYVIRSDLDLVL T
NLKISMLSIVCIVKVNTFVFWQTSWREVLEYVNEADKFERNQTDETR GKMIETYTKYCRRLTYFYWSLVF
TTFLT TTTNTPLMRYWSSPIFRENLRNGTEDPHIFSSWMPFDKNHSPGSYCTIVWHVLLCAYGAAIMAA Y
DTCIVVIMVFFGEKLNLLRERCKKMLANDLYNHAFVIGQLHDIHVQLIKQSRLFN SLLSPVMFLYIILMCS
LMLCASAYQLTSATSTAQKLLMAEYLIFGIAQLFVFCWHGNDVLFKNANVSLGPYESNWWSSSPVRADV
LLLCGQLRVRHVFTAGPFADLTLSTFIKILKGAYSYYTLLRK

>BmOR30

MSVSNLKF EALFKPTTMSLHMNRSHPSIKRNKIWLLQFISLMTLTAFCATGLITSLLFHDLKFGKYMEAS
KNGTIAMLSFTTTTFKYSLLLYLQKSLNRLIAKIDMDYEIAKGLPPQEKATVLNYAKKGVIVSKFWLFTAF
AITFCFPLKAFIIMGYRFFIKNEFRLEPMFDMTYPEPIESYKTSFPVYFILFVFFLFGCYASSL FVAFD
PLVPIFVLHACGQLDLLSLRITKLFSDTKNPRIIAKELKVIISKLQELYGFVNFIVNFSILYEYNMKIT
TISMPLSAFQVVESLRRGEFNIEFTYFFFGC I LHFVMPCYYSNLLMERSENFRFAIYSCGWENHHDKNIR
QMLLFMLTRATEPLGIATVFTNNSLDTFAEMCRQSYTIFNLMNAAWA

>BmOR33

MIYYRKCKMELNFDKIFKIAIISQKFSGTYPYTKRDKKWATHFILMHGELTIIICMLFIYNIIEFDLKAAD
YSQMCRNMCLSFVYVITLLYINMLYYQSKL KMLIETMKA EYELAKTMSEEEQNVILEYAKKGRWLCRAW
AILTTGMAQFFLKSIVCTIYSAIQGNFRIVQYYEVICPEVIERHRNPNVIFITLYFCTFFYSLYTSALY
TSVLPLGPIFLLHGCAKLEIVRLNIK NLF DNDYV VQERL KKTVLQMQDIYCYSHEINECFQI ILYEFLK
ATSLVLPITIFAVIQALGRGQFIPEFFAFIFGAFVVGTTPCYYSNMLMEKSE DV RMTLYSCGWETRFDLN
TRKCIILMLCRALRPVSIRTIFRSVSLTTLTDV FQOAYALFNLLNAVWN

>BmOR34

MIYYRKS KMELNFDKIFRIAIISQKFSGTYPYTKRDKKWATHFILMHGELTIIICMLFIYNIIEFDLKAAD
YSQMCRNMCLSFVYLVITLLYINMLYYQSKL KMLIETMKA EYEIAKTMSEEEQNVILEYAKKGRWLCRAW
AILTTGMAQFFLKSIIVCTIYSAIQGNFRIVQYYEVIYPEVIERHRNPNVIFITMYFCTFFYSLYTSAL
YTSVLPLGPIFLLHGCAKLEIVRLNIK NLF DNDYV VQERL KKTVLQMQE IYCYSNEINECFQVIYEFLL
KSSSLVLPITIFAVIQALGRGQFIPEFFAFIFGAFVVGTTPCYYSNMLMEKSE DVCM TLYSCGWETRFDL
NTRKCIILMLCRALRPVSIRTIFRSVSLTTLTG V FQOAYALFNLLNAVWN

>BmOR35

MKLWQSIREFGLEYCDLPTTLQNVASLLRAITL NIDSRHTARIPFICYVMTVVITLSYFYVFLVSM AWFV
FVRS AETR DYLAAMVVL SLGISSEIGTLKFFYTFIYIKKVQIRIVREYLECDHMVVPESRFADNVLKTMRN

VKKRAILYWVVVIGNGVVYVTKPLFMSGRHHMEDRYIVYGLEPMFESPNEYEVAYFLMMFGLCFICYPPAN
VTVFLIVVVGYTEAQMIALGEEMLRIWEDAVAHYNNKYHTVGALTNSSSEKNKIINQYVKFRLTEI IKMHT
TNIQLLRQVEFVFRSAIAMGYVFLVLGLIAELLGGLENTYLQIPFALIQVLVDCYTGQKVM DASSLFEQA
VYDCKWENFDKSNMKTVLLILQNSQKSMRLSVGGITVLGFSCMMSVMKSIYSAYATLRTTMS

>BmOR37

MELGCSRHLKLPICSLHPIGISKHGNTLSELLIYFPAIPKITYAILAVLLTVYYYIYLCISITWVVFVRCPO
TGDAAAASIVFSLGVSSEIGAIKLFIIAKLRDITGEYLQCEADMAPGRLRVRARVGRSLRTRRRRAFVYWL
LVVNAFAYDLMPAFLPGRHLSDFVFIYGFEPMFESPNEFIASITLMGVSVVFCYTAGSISAFILVIVGY
SEATMLALSDEISCVWDDACASECQQPNDFIRARLGKIVAIHTKQIRLIREVEVFRGALAGGFACVAFG
LIAALLGGLENTFLQLPFCVIQISVDCVFGQRLRDANVAFETAVYNCKWEYFDKSNMKTVLLILQNSQKT
MGLTAGGVAALDFTSLMTIFKSVYSGVHHSQTDD

>BmOR38

MNLSQSVNEQANEYVKMRLERISKIHSPLPFEDIQDFRELCCIPLAVYAVTGSITASYVYAFILISLLWF
LFARCTDPEDFQVAMVVFSLGISSEIGSTKFFNSIIYIKELRKLKFDYLLYDATCPAQGRLRLHLLTTLR
YVKRAIIYWLVIIGNGFIFAIKPLLEVEGRHLAQDDLVLIGLEPMRQSPNYEIAAYAIMTMGVCFICYPPA
HVTMFLIIIVGYTEAQMIALSEELKHLWDAIEHYEKHSRTEREADAAMKSKILNSFVNFRLVQIIKSHS
TNVNLIGRVENVFRGSLAVGYVFLIVGLIAELLGGLENTYLQVPPFALIQVAIDCFIQORVNDANIDFEKA
VYDCKWENFDKRNMKIVLLLLQNAQKTVLSL SAGGI AKLNFS CFMSVIKSIYSAYTTLRRTTMK

>BmOR39

MLWSVFSYFTRADDVLGIVIFSLGVSSEIGLVKLCFMYANIDKIQKITEGYLKSDAASARNRFRSKNIL
HTMQSVKRGVIFWLVIISNGVVYLKPIVTPGRHFMEDQFIILGLEPKYETPNYEIGFFMMAVGVCVTC
YLPANITAYLITVAGYSEAQFLALGHELANLWPDAQLHCRAMNLSQSVNEQANEYVKMRLRELVKIHSTN
VNLLRDIEGAFRGAIAVEFLLLVGLIAELLGGLENTYMQVPPFALIQVSDCLTGQRVMDANLALERAVY
DCRWEEDASNRRVLLLLQNAQKVATLSAGGIATLNF SCLMAVIKSIYSAYTTLRRTTMK

>BmOR40

MTGAGAGTFRTGAGPGRGDGVARRGESGETTTLGRDAFAALGCFGAADGSTARARFFPRVTVLNPSEVPG
SGLAADSNSISDSESEPELDAQAIDAAGVGGDIGESRARTVFGIQGHDA SDSALRMHNNVAIYAKTT
MSGNSQLTFATAATIFLKNASGPNQVAIGTDYAICVVSLSLFFCYRFTELVEDTYSYLLFQLVGSVGI
CMSALRILVVDWRSVQFFSILCYLSVMISQLFVCCWCGHEL SATSEELHTILYNCAWYDKDVKFKRDLIF
MMARARRPILLRAGYYIGLSRQSFVSVSIPRIRFNAILVI

>BmOR41

MMGNSTDLFLDRTRKILNFFAMWRSFEKPIPLKVYMAFIMTQYLFLLIFEIIYIVNVWGDMAEVSEASIL
LFTQASVCYKMTAFISKTNFVILLGLIESEIFSAQTELHEKILILKARKIKRLCMFFLVNAVTTCSLWA
VIPLLDISSKMLPFKIWMPVSTGESPHYELGYLQMITIYISAXLFISVDSVPLSMIMFGCAOLEIIMDK
IGKVKSWSLDQOPMQQEVLSNSYELLVECVRRYQSVVRFIELTEKTYHANIFFQLSGSVFIIICNIGFRI
AIVDSNSLQFY SMLTYLVTMLSQLFQYCWCGHELTIRGEELRETLYQSPWHEQDIRFKVLIITMERMKR
PIIFKAGHYIPLSRPTFVAILRCSYSYFAVLNRVRNE

>BmOR42/43?

MDIPKFEELLKQIKMNFWMGIPFDNPKIQIRYYVLLPLSLMLIEEIAFFGSRMSENFELETLQAPCI
CIGVLSVLKILALTAKRQKIYELTONLECLHKIILNDRKTELVRKNLVLIKFITKYFFV LNAVLI FVYN
FSSPVIIAYNYIVSNEVQFVLPYAVLLPFKTD SWIPWLIVYVYSIFCGFTCVLYYATVDVLYCVMTSLVC
NNFSLISFKLQKVN RNTAHL LKEVVKEQYVLKLAEDLENIFTAPNLFNVLIGSVEICALGFNLMIGDLT
QIPGCILFLSSVLLQILIMSVFGENLISESSRIEAAFLCKWYEMDQKSKKTILTIMIRSHKPKKLTAYK
FSVISYGSFSKIIISTWSYFTILRTMYTPPGTKFQDDL

>BmOR44

MYTYFKVLVFWLNKDKVISLQKILHCKEFKPEPEHKEIIRKSIRKARFVMTSYATMCVGAVSVGIILPL
TENFDILPTNVEYPPFDVYKNPTYAYLYLHHIYKPATCIIDGVMDTILAAFVASAIGQIEILAFNLRNF
DVLAERRRKRAISGNKYIGKYTNLYFTKRILKECILLHNSIIRYVSVIESAFSLASALQFMLSVMVLCI
GIQFLSIENPTSHPMQMVMAIYLTCLMIEVFILCWFGNELIWKSNDLRQA AFDGPWRNLNRKTCMFIII
FMERCKRPMRLSAGKIFTLSLDTYTVLINWAYKAFV MRNMKK

>BmOR45

MKVLDNVNHAVKVTMNCCLRYGLFVSDDLTKRQLIIMRAFSLMLYLFFVGGFFITTSALIIITMWGDLNLM
TNVGLVLGTHLTLAKVFTLHYKEKEITNVIYKNEVRLRAETREQGYIIISEMNRETTFLMRLFIPFGMG
TVTAWLLCTPKGELYTPAWYPCNTTKSPAHEIILAHQGIIVILTATLEIAIVLLMTSIVAVCRCLKLVG
LSFETICDDLPSNIMNKLTADEQVIVAKRVRENVIEHQAVLECINDIQDCFSSAMLVHIAISTMIIICATA
YQLAVEKSLDLTQRMTMASFLGGMSTEIFLFCYQGGHLSIDSMEVATAVYSCPWYTFPTSLKRSLLVIMI
RAQQPALLTAGGFAPLLLDTFVSIKASYSFFTVLQNASE

>BmOR46

MAFFIRNKMLGLTITLNTLSWAGLIMRDQYTKTQRIIVRVYGWLVLFLYLFVAATYVQIADLIDIWGDLDL
MAETSLLLFMELAVISKILTILFKYDKIMEIINGTEDILCSENRLGQKIIASIDKETTRFFQYYTSSVI
FTTFFWFLGHSSTFFIRAKYPFNELKSPGYEFALIHQCMVMVFTGYFEFNINIFFASVAVGCRCLKLV
ALSLRNICINIPVNKKNLITPEEEKLITERLHCAISQHKYALDAAEDVKHCLSKVLLVQLTVSIVIICTT
AYQMAVNKSTDTIQKLSMAGYLLGASFEVFLFCFQGGSLNASEDIADAVYECPWYTLTQPLKRTLLIIM
MRAQSPAILTAGGFVTLDITEYMAVLTGHGGFGDFLHRTGAEPMAECHHCGCDLDTVQHTLLVCPAWKGV
RRDLVVKIGNDLSSVLWHRCSAATSRRRCLTSASAPSRRRRGA

>BmOR47

MKLVDNFIFALKVTLNWCYRFGIFIPDELGTGRQKLLVQAYSVMFMLFIGFFIITQIILFILVWGDLS
LMTDVGLVLGTNLALSIAVFFFKREELASILKKNDDTLRFETREEGKIIISEIDRETNAFMKVFFCFG
VGTVIAWFLSTPKGELHIATWYPCDTKRSPAYEIIIMIHQLAITADLLMLSMIAVCRVCLVGLYLQITC
DDLPCNVKNKLTSDDEEVIVAKRIREYVIEHQAILDCISELQNHFSBALLVQLLTSVVIICVTAYQLAVEK
SSDLLRKFTMASFLFAMSTEMFTFGYQGGHLSHDSMEVATAAYSSCPWYTFPTSLKRSLLVIMIRAOQPAL
LTAGGFTTLSLETFTVIMKASYSFFTVLQEATD

>gi|152963629|tpg|DAA06004.1| TPA_exp: odorant receptor 48 [Bombyx mori]

AAACVQIADIIDIWGDINLMAETALLLFMEFAVISKILTLLLRDRIMEIINGTEEILYFENGLEGQRII
ASVDKETTRFLQFNSAFVVLSTTFWFTGEHSSTFFIRAKYPFNELKSPGYEFALIHQCMVMVFTGYTVFN
INIFFASVAVGCRCLKLVALSIRNICINIPVNKKNLITPEEEKIVKERLHCAISQHKCALNAAKDIKNC
ISEFLLVQFTVSIIIICTTAYQLAVVCLFQNKAIQNIQKTSMFGYILGASLEVFLFCFQGEFLRNAVRDC
EEIADAAYECPWYTLTQPLKRTLLIIMMRAQSPVILTAGGFIDLSIREFMGILKASYSFFTVLQOVSE

>gi|290563354|ref|NP_001166614.1| olfactory receptor 49 [Bombyx mori]
MLTCFATIFSAVNQTGYIVLFINLLAHELGHFYVITDVLNGIFEKNDADRPVFIKRLKFCACHYQYLL
KFHNEIKNLYKIIIFGAHFLMMTIVLVTTLQTMNSWDIRNTVLTAVTGIMPLFIYCFGGELLITAGMDMST
AIYQCGWEKMGVKQAKVVSIVILCLSQRPLCLTAANVFMNRETFGGIAQVVYKIYAVFN

>BmOR50a

PIFAAKTLKDKQHLLIQNKKEVTRFARLLLLTYVTVGGFIWPMSCFRRIKDPNTVVPFVYVPTPDNWTCLI
NEVTDIFNPCLTFQFFTSSVAICMVIYKLSDTYIVSLEFVFLNFIIVLLTQMFICYCYGNVVSYESKYI
NTSLYLSDWSSASPGVRKMFLIVMPWRTRPLVVRIARVPLSLDSFVSVRKYKCSIEHFYISHVKQTRAR
DIFSGASNKP

>BmOR50b

MEGTSEGDEPFYIRLNDNGTGNLNVKILYCPCWYTAHLMFPKLYHCFTAEIVRLMIVPLVDSQDVLPPV
ITQIVISIFITRCYSFIVEVNRHLLMQETLLKPARDPKIANYNMVRNDRLSARGGGTVIYYRRALHCV
PLDPPALANIEASVCR

>BmOR51

MDCTIVAFYSQAKTQIKMLRYDLEQLGKIDNIETKFTENIFERSSHIWKALKDEKIKIHSKLVFCVEHYR
QIVWFVKEVESIFGEAMTVQFFVMAWVICMTVYKIVGLSIYSAEFVSMGVYLGCMLAQLFIYCYGTQLK
VESESVNTSLYCSNWLSSLPKVRRQMLIMMQYCSKPLTPRTAYVIPMSLETYISVLKSSYSFLTLLNQKH

>BmOR53

MALKKMLALTKGLEDPHTPLLGPTLKALSVFGLWQTGSQKSTVIYNTFHFLTFLFVITEYIDLYTVRKEK
SKMLNNSVTVLSTICMIKTLVYVCRQSHLKVLRVREISELELELMKTTDKNIVKRLRQYTVYTRAVTYVY
WFLVVGINVVLLTSPLLKYASSEIYRSEIKNGTEPPPLILCSWFPFDSARMPGYFWATMVHIIMSIOGCG

VVATYDMNAVAVMSYLKGQTSILKDKCKAIFDETASSRDVLRIRDCRHHNILLRHYMFNSLLSPIMF
VYMLICSFTICCSIIQLDSSETTISQRIWIIQYSIGQISQLFLYCWHSNEFAAKVKKKHFPLFPINLF

>BmOR54

MGLNTIKEFFVNVKRRFQDVSIDSLLWIVNIVPSLAGFSIRSDRVSAFWIVHWSLLVYVYAVGNAVYQW
KFANEADIDYITSFINVSLILIGNNSWWFLANRRLKSVLHKIEVNDELSSRRSEQSRLKHKKLLKI IKRI
VLVIFYMSNYVNASFIYLPNRVDVLLNNYAMTPCVGMEPLTVSPNRELCLTILCMQEFSSIMTVVLLNFQALLL
CFIAHTAVMFQILADEIMALNNYENLEEHQAYVKEMLPIFVKRHSLSLTSAVDNYKSLYSVPLGVNFGSNA
LTILLILYLPVLEWFKFIPFVFCFMLFFLYCFLCQKLVNASEAFETAICYCCGWENFALREMKMIYVMLH
QAQKPVLELLAADIVPVMNMTFATTLQAMYKFVTVVKF

>BmOR55

MCFLKIKQOIIDIQKHFKDYSLSGLWIVNLLPRLMGFNLRADKVGCVFFWTIYILLVYVFGIGIFVYVLW
KHDVTMSGLMKSYLNLSLILVIVNNSCWFLSKRSLLNKVLKKIHLIEDLSCSEHALAKYRRVFKIVTHL
LLASYVLFYFTEIYFMFLFRNYDLEDYSLAPCVGLEPLSSSPNSEICLIIVLIEHFI STTVMMMSFAALF
LVLIAHTAVMFLVLAEDMTKLTDLINLADHRKMIRESLRSLIHRHSLLLQIVYELRLLYSVPLGINFISN
AMSILVLLCLPIHEWPSFLHIIGYCFFAFFLYCFLGQNVINASEKFIDAIYCCGWEHFGVAEKKLVHVML
RQAQKPVIEIIALGMISVNMNTYVEALQLIYKFVTVLKI

>BmOR56

MKLLLEKLEDPDRPLLGPVVKALKFWGLLLPESRSKKYFYLFMHFAVTVFTATEYIDVWVFKSDLALLLNN
LKITMLATVSVLKVTTFLWQNAWRDLIGYVSRADLEQRATSDSRKLALINGFTGYCRKITYYYWFLMYT
TVAIVTVQPIFKFFSSAAYRLDVQSGNGTYLQVSSWIPWDKNTLPGYLLASIQTYAAIYGGWITSFD
TNAIVIMVFFRAELELLRIDCAALFDDEKSFQDMAFMRRLKECHRRHTELKHSRFLDSCSPIMLLYMF
VCSVMLCVTAYQITITETNPMERFLMTEYLVFGVAQLFMYCWHSNDVLYASQDL SRGPYESAWWSRDVKYR
KNLYILVAQFNKIVIFSAGPFTKLTVATFIRILKGAYSYYTLLSQSQMNKT

>BmOR57

MPSLLKTESLALTLTLNLSWAGLILRDDYTKTQRIIMKVYGGVFLYLVFVFTAYVQIADLVVIWGNIDF
MTETSILILFMQLAVSAKVLTLMLKSKKIMEVTNEADAILNSEKKVEGQRIIASIDKNTTLFLKYYGFFVA
FTIICWFMGENTSTFFIRSKYPFNELKSPGREFAFVHQCIVVIFTGSFDFNVDIIISLVAVCRCRLKLV
ALSLRNLCLDIPMNKRNLITSDEEKVITERLRNIIISQHKRALDAAEAIKHYLSGALLVQLMVSIVVICCT
AYQLAVKKSTTMQSLTMAGYLFQTSLEVFLFCYQGEFLRESSEEIADAAYECPWYTLTRPLKKTLLIIMT
RAQRPATLTAGGFVTLDITEYMAIMKASYSFFTTLVQVSE

>BmOR58

MKLVFDNFIFALKVTLNWCRYFGIFIPDELGTGRQKLLVQAYSVFMFMLFIGFFIITQIILFILVWGDLS
LMTDVGLVGLTNLALSAKIAVFFFKREELASILKKNDDTLRFETREEGKKIISEYPCDKRSPAYEIMI
HQTIAVAVIASLAITADLLMLSMIAVCRCRVGLVGLYLOTICDDLPCNVKNKLTSDDEEVIVAKRIREYVI
EHQAVLDCISELQNHFSBALLVQLLTSVVIICVTAYQLAVEKSSDMLRKFTMASFLFGMSTEMFMFGYQG
GHLSHDSMEVATAAYS CPWYTFPTSLKRSLLVIMIRAQOPALLTAGGF'TTLSLETFTVVS

>BmOR59

MDTNPSAAGDSVAPHLRRLRQVGFQDPTSQSRPILALMHRVYHRLVLAATVLYIFEQLTYAYQARN
MERLSRVFLMLCHLTCIAKQFVHSDADKINQLVGLDDALCNQPVETHRLLLLLETSSRAARLLMLYSG
CAVSTCILWAVFPLLDQLRGRTVEFAFWIPIDYRHNAFQFAVVLAYAFYSTSLVAVANTTMDAFIATVLY
QCTTQLRILRMNFESLPERAYALSRKTRQDYHTVTHELLVDCLLHYKKITETCNLLEQIFGKAILVQFGV
GGWILCMAAYQIVDMEILSIEFASTALFMGCILTEFLYCYGNEVTVQSGLVSESVYAMSWLSLCP
RALVVVLERARRPLRPAAGRVPVPLTLNNTYKILKSSYSFYAVLRQTK

>BmOR60

MVRPCRYFAIHFILLRFLGLGWVHPHENETRNYPLGLYLYSILTQLVWVGLVGLLETIDPFVGEKMDR
FMFSLSFVITHDLTLIKLYIFYFRNVEIQDIVRTIEIDLYRYQNDKIRATIRISRIFTAALFFGVT
IGNANIYGIVQDLRWKDIVKNLNETTSKPLRTPQPIFIPWPYQEDKHYILTFILETMGLLWTGHIVMTI
DTFIASVILHMSTQFAILREAIVTAYDRMTIALSEALQSGVLCENSNGNEENQIFLESFYSKEHIESV
LESTLLSCIRQHOLLIGCVEKFSKTYSGFMTQLLSSMAGICVVMVQVSQGASSFKSVRLVTSLAFFFAM
VIQLAIQCFTGNELTIQAERIAADAVMESKWEKMPVRLRRLLLVMMRAQRPLHLTAAGFAYIDNTCFLSI
LKAAYSYYAVLSQKQG

>BmOR61

MARITDVFRNLNFIWKFLLGIWGSAPSXYNMAYTALYLSASLFFVYDIFLTLNLIHTPRKLETLLRETMFY
FNHLVAMTKILKMFIRKKILVIFDLLDCEEFKPSDEDSQEIMKRKNEFYIYWRIVAVTSNLSCFMQVV
GPLIKMLIWKSELGLPVCKYFMSDEFNRKYFVIWYIYQSFGIYNQMVNNLNLDTFNCGMLWMAVGQLQI
LKTTFVNFKLNLDIENSLDLKTRDDMQTERLRKYLTHYEIILKYCATVQDILNITIFVQLGMSSIVICVGL
CGFVAMPSTETAIFMSSYLITMTMQIFVPSWMTQISFECGELMSAAYCCEWIPRSKLFKRSLILFVER
AKTPVRITGLKIFTLSDTFTSIMKTTYSFFTLIRQLQVDEVN

>BmOR62

QNVILEYAKKGRWLCRAWAILTTCGMAQFFLKSIIIVCTIYSAIQGNFRIVQYVEVIYPEVIERHRNPNVI
FITMYFCTFFYSLYTSALYTSVLPGLPIFLLHGCAKLEIVRLNIKNLFDNDDYVVQERLKKTVLQMQEIIY
CYSNEINECFQVIYEFLLKSSSLVLPITIFAVIQVSSLHICFIFLIPNTQWNVCSQNKHFLGSLEMSCRNC
HSK

>gi|238623765|dbj|BAH66356.1| olfactory receptor 62[Bombyx mori]
MELNFDKIFRIAIISQKFSGTYPYTKRDKKWATHFILMHGELTIICMLFIYNIIEFDLKAVDYSQMCRRM
CLSFVYLVTLLYINMLYYQSKLKM

>BmOR63

MKLWIRNANFTISLSLTLRCLGFWSPDGLAGNKRLLYNCYSFVFFMFLGIIYILIQVDMIKIWDLPL
MTGTAFLLFTNFHAHATKVINIVIRKNRIQRVIOQANAVLMGVQSEEARIVKSCDFETSIOQLCLYFLLTF
VTTVGWATSAEKHQPLRAWYPYDTSKSPAYELTYIHQVAALLIAAYINVAKDSLVSLLIAQCRCRLRLV
GLALASLGQDLKIDYQSQLSPAQENILNLRKTCVLEHQTVLAAVTELOACFSKPTFAQFTVSLIIICVT
AFQLVSQTGNLVRLLSMGYLMNMIFQVFIYCYQGNKLSVESSEIAGSVYFSPWYLGSVKLRALLIVMV
RSRRVAKLTAGGFTTLSLASFMAIIKASYSLFTLLQOVKQKK

>BmOR64

MGVSNRGTVPFLYPLVDELVDYNLIVGVHLPFEYKTPSRYPPLAYITVVIAFIYVSFVMVTDLIMQAHL
LHLLCQFNVLADCFENMLNDCVKGFEGPLVSLHEYIHPLIDFEYNLVGLRPLPFSFDTPRLYLFYVIV
LIAFNHTAHYVMVTDLIMQSYLIPLICQYAVLADCFENILIDCSNDYGDHARRNDIVYSRSMELRAILSR
PMLGQLASSGLLFCFVGYQATTSISVNIVKCLMSLFYLGYNMFTLFFVVCRWCEEITNKS LNIGNAVYCSG
WESGMTVVPTVRSTILLVILRANKPIVFTAGGMYNLSLTSYTSLVKGSYSALTFLLRIOHE

>BmOR65

MRLGFEVSISEYLYRNIFYIYTLFHILLHFYIILHMIKLDLEAIFDDIDESVALLPHRDTRRIEVQKILN
GRMKRVVTVHISVFKAVEAVSSIIYGPPLAYQVMFTSIAICLIAIQITQKLENGILDIRFTMLGVAACLQ
WIPCYLGTLLRNKAFVGEACWNSGWHQTPGLGRMIRQDIIIVLLRAQOPVTIKFPGLOSIQLETFSSVI
NLYGYYYFLLLRWVDELTAHLVLSGYWSP

>BmOR66

MRFGKLVYIYTLFHILLHFYIILHMIKFDLEAIFDDIDESVALLPHRDTRRIEVQKILNGRMKRIVTVHI
SVFKAVEAVSSIIYGPPLAYQVMFTSIAICLIAIQITQKLENGILDIRFTMLGVAACLQMWIPCYLGTLLR
NKAFVGEACWNSGWHQTPGLGRMIRQDIIIVLLRAQOPVTIKFPGLOSIQLETFSSVIFNLYGYYYCYL
DG

>BmOR67

MRFGKGGAAVVTILETLELISQGGFIETIQVTFGGQLSSMLFISACIICSTAVQILAIESPDLNLTTVG
WILVYLSLCILILFVDCYFGNTITVKCAYLPTAVFSIPWLDQPKNIQVSTLLFMAKTQOPVQLIAAKLVP
VSLTTFQVSYCPPLDLKCLQGGVIAHLAKD

>BmOR68

MFTIDFHDERITSFNKNQTRKIIICVITGGRTSCESARVGTTLPIASSEDVCMPLYSCGWETRFDLNTR
KCIILMLCRALRPVSI RTIFRSVSLTTLTGVFQOAYALFNLLNAVWN

II. Predicted amino acid sequences of Gustatory Receptor queries

>BmGr1N

DIYGPEITDKDGALLDKHDSFYLNKTSLLVLFQIMGVMPIMRVPKSAQTTRRTTYNWISKATLWAYLVWGL
ECIIVVKVQERLANFQIGSNKRFDEVIYNIIFLSILIPHFLLPASWRHGPQVAIFKNMWTHYQLKYLKI
TGKPIVFPNLYILTWGLCIFSWVLSFAVVLSQHLYLQDDFELWHSFAYYHIIAMLDGFCSLWYINCNAFGTA
SRGLAINLHKALEAEHPALKLAQYRHLWVDLSHMMQQLGRAYSNMYGIYCMVIFFTTTTISLYGALSEILEH
GLSYKEMGLFVIVAYCMTLLFIIICNEAYHASRKVGHEFQDRLLNVNLGAIDRSTQREVEMFLVAIAKNPPI
MNLGDGFTNINRELFTANISFMSTYLIVLMQFKLTLLRQGARKTVTAIVRAIFNTTITDNGAGGSDEDQE

>BmGr2NJ

EQEQRDLLSSQDGTCEIHDQFYRDHKLKLLVLFRALAVMPITRSRPGTITFSWKSTATIYAVCFYIAATAV
VLIVGYERIQILQSIKRFDDYIYAILFIVFLVPHFWIPFVGVGVAHQVAIYKTNWGKFQVRYRVTGENLK
FPNLKTLIVIIISVGCLLLAVCFLLSLCALLDGFLLKHTSAYYHIIITMINMNCALWYINCKAIIKIASQSLSE
CFQRDVDIECSAQLIARYRYLWLNLSSELLQSLGNAYARTYSTYCLFMFANITIAVYGALSEIVDHGFGFTF
KEVGLFVDAAYCSTLLFVFADCSHKSTLKVAAAGVQDTLLSIDVLAVDRPTQKEIDHFIQAIEMNPAFVSLK
GYAHVNRELLTSAISMITIYLIIVLLQFKISLPKEPHGTGQ

>BmGr3F

MSFEIKNNFFRTSVPPIPNGFPVQTEAKSKNKPIFLDVSPAPTPKVNSPNAIIPMKNNLIDPFINKDIIYEN
IKPVFMVLRIMGVLPLTRTTSQVNEFHFIISPAMVYSLTVFIIILVSYISYLSLHKVQIVRNSEGKFEAEVIE
YLFYVYLFPLTVVPIILWYETRKIANVLNGWVQFEVYKQLSNRILPVKLYKKSLLIAIIPILSTTSVIVT
HVTMVHFKTSQIIPYVFLEILTYMLGGYWYLLCEILSLCANVLADDFQOALRHVGPAGKVAKYRALWLRSL
KLARNTGVANCYTFTFVNLVYLFLLIITLSIYGLLSKISEGFGTKDIGLALTALCSVFLFFICDEAHYASHN
VRTNFQKLLMVLSWMMNTDAQTEVNMFLRATEMNPSQISLGGFFDVNRTLFKSLLATMVTYLVVLLQFQI
SIPDATQPEIPTNIDDHVQNIIDTTTEASSPISTLMSAFKRKND

>BmGr4S

MDKDKFQEFPLTMSRIFSMTRYFGVSTCKPSIAFGWTVILLMLLAIIEVGAIWKIVRLLGGWAVHSTDSRG
FTARLSGCIFYGNALLSLILSIKRVSSWEQLSERWSRTETDPLRLPSDSRIKRRTVLVSAFVMTACVEH
MLSMMSATGFDCPPEEYTERYILSSHGFLVQNDENLWLAIPIFIMSKLATALWNFQDLIIILISMGFTSR
YNRLNTYVHRVVMLEARNLKEGAQVSSSENYMRFQIWRRIQAYVRQAALVRLVDDQLGALVLLSNVNNLYFI
CLQLFLGINSKDRGSFINRLYYFISLGLWLMFRACGVVLAADVIIHKKALISLYLCPDELAYNLEIKRLKY
QLKNDEVALTGMGLFSLNRELLLEVAAVLKYELVLVQYDK

>HvCr5N

AYLDKVFVLSCLYGVFGSKRFISLIWSTLILGSLVIEVLAIWKVIRALAGVARDMSGHRSVTARLAGTIF
YSISILSLVLVSKLYYNWRTNIAGVWGKVERSUGVKIPVDRTLKCRMTFVAGLMTFFSIFEHAMSILSSVG
LDCPPSLILKRYVLVSHGFIFMGQDYSEWFAMPLVISTIATLLWNFQDQVIVLISMGLTSRYRRLNECLA
KVCELEKQHKSDKKEAVKVYTRWKIREAYVKQAMLVRKIDVALGGIVILSCSCNFYFICLQMFGLITQG
LSSDLLSLIYYVISLAWLCTRVISVLAASSVNTSHKALNHLNYETHCYNVEVERLQDQLTKDYIALSG
MGFFYLNKTILLQMGAIIVTYELVLIQFDDQGNALNATKI

>BmGr5NJF

YFAFYLSTGCNTFIFLRVASKWPTLIKHVYETQLDSYIDVKVKNKCFAYIIFFSMSMTEHMLSLLSKFVI
TMDCLPKGSDLFESYIIRNFPWLFDFDVPYLLPIGVILQFLTIVSTINWSYSDLFIVCMSIYLTSLKQIN
KKIEMAGNSNHLPIPFWRTLREDYTRATRLVRSFDDTISVIFLSFASNLFICLQLYNLSNGVTSKYNL
LKEMCPNYPSPGLGGYEQIMYLLFSLFLLGRSLVSVLVAAKVHSASMPASALYNIIPRMYCSEIQRFLD
QVHGDKVALSGLRFFVYVTRSLVLSVAGTIVTYELVLLQFSNED

>BmGr6P

MLLRNYKQNLFSWTSAKKSKIHKIQSQETVTFQGSLLKLVLFIGQLFSLFPVCGLLSNDANKVXFVPISWKC
GYSMLSMIGQLFIIIVMCILYVAHFETTLNGTTPIIIFYGVTFISMIAFIRASRRWPELIQHISKSEELDPSF
DFRLKKKCNITLLLVLAILEHIFSIIRSAYSASQICYPHTGFYEGFVRYLYPWVDFLPHYSEELGMVTOF
LNIQSHFIWNFTDLFVICMSYYLTSRLDLVNKKLLPAQGKYLPEIFWRTTRETICRATKLVKRVDEIINGI
LFISFANNLFFVCVQLFNTFDDSDVMVGLCYNYSERRTKPVGREPVIYLLFSLGFLISRSITVSLIASQVN
LASTVPAPILYDVPSAVYCVQRFLEQVNGDNVALTGLQFFSVTRGLLLSVAGTIVTYELVMVQFNQAPA
SDSFTEKLVENNISTIETFYNYNS

>HvCr1

MGPTSLKRNMFVWIPVKKNKVDVAKPKVKNITTFQDALRATLIIGQVFSLLPFVGVFTNVASNVKFIKTSW
KCGYSLLSLIGQMFMAVLCVKNKLAKSNVSLNGTSPVIFYVTTCVTMMLFFQVARRWPALVQHISKAEDMDP
NFDCLSTRKCNITCAVVLILALLEHILSLLSAFAGASACYTGMMDTYQGFVTHFYFYPWFVNYLPYSIVLGVIT
QFLHFQSTFIWNFSDLFVICMSYYLTSRLEQVNRKLLAAQGKYLPEIFWRATREDYCRVTOIVRKVDEVIS
GVVVISFANNLFFICLQLFNTLEDGLKGTGECTQLNSQSKLKKIVVSKSGPLGGHEAAAYFLFSLVYLLSR
SVAVSLIASQVNSASSVPAPVLYDVPSVYCVQVRFQDQVNGDKVALSGLQFFSVTRGRLLLTVAGTIVTY
ELVMFQFNSSTPSLNITSPTSATHIITTLAT

>BmGr7

MVLEAHTQIQYCTAKANYCEFHAHLRHLMLRLARWAGFFPVQGLSQTNPDDVRFEFRLSYALYHAITVIGQT
VMTFLAFYSFVDSNVLSVVSNFLFYFTNYVTLVLLWRLSKNWSALISKTLEFEQSVTEIRTRNLVSRTN
TLTYVVLIIFAMVEHALSKVFNIRSVMCCLGETSLNHTVINNYFKFKWKFVFDYFSTSTTYSYFVGFIAEFL
CMQATFLWSFTDVLIMCFSIYLSFFEDFNSTVSSFMKKASKTVPWSTLRVQYSQIVLIVKQMDQDLYFV
LISYFTNLFFICFQLYNSLNRIYDANDVCNENMDIIATASVTYLYTYVFSFLFLVTRALLLSIMAANVHSC
AQVPQLALYEVPTADYSLDVQRFQQLRYTTVGLSGVCFNVTRGMILRVIGTIVTYELVLIQLTKKNDND
TSIRDYYLPKHLI

>BmGr8R

MAPRSVRSMVGTSSKDKMLKGGFYETVRIPLYIYRLIGILPISGLWHRSSKYNRFSLSKFYTIYIYAPTIVMQ
TFLLLVHIYDLFAFFFGHQRGLRIYHMNFYITITILIFMGSRKWKNVIKEIETIELTLPRLRNSKKALALT
KSFVFAFFVFLAEVVLILQFTLRLTKQRHVLPDGSGLYLRSYFVYIFPYLYDHFPPFSYVMGFIVQIIKVO
GIITLNMVNCVSVILSIYLTNRLKHYNRIVFAKGSKTNNRLKWVELNLLYTRISNLVKIIDKNLNPVFI
SFTANLSYICAFYILNKLTSSRTVKITSFLEDKRCDWETVLYISISFALVVLKVLVLSIIAAEVHTTSR
EPLRLLYTLPTAEYTIETQRLMTQVYYSNLSLSGLNFFHITRGMLLGMVATLLTYEIVLLQI

>BmGr9R

MPPSPDLRADEPKTPCLVGGAHAFILKISSFCGLAPLRFEPERSQEYAVTISKGKCFYSYILVTFVICTIY
GLVAEIGVGVKESVRMSSRMSQVVSACDILVAVTAGVGVYAPARMRTMSYMENIVAVDRELGRHHSAA
TERKLCALLLILLSFITILLVDDFCFYAMQAGKTGRQWEIVTNYAGFYFLWYIVMVLELQFAFTALSLRAR
LKLFFNEALNVTASQVCKPVKKPKNSQLSVYATSVRPVSCKRENVIVETIRVRDKDDAFVMMKTADGVPCLO
VPPCEAVGRLSRMRTLCEVTRHIADGYGLPLVILMSTLLHLIVTPYFLIMEIIVSTHRLHFLVLQFLWC
TTHLIRMLVVVEPCHYTIAREGKRTEDILCRLMTLAPHGGVLSRLEVLRSLLMLQNISSYPLGMCTLDRPL
MVTVLGAVTTYLVILIQFQRYDS

>BmGr10

MTMSIKPRLQCMVPPSLALALRVSRLAGIAPLKFVAKQSNIMIRLSTSLCVYSYLLVTALNVCTLIAMVID
FSVPVKLSIRMOTETKRFVWIADVIVGMLSGVGVYTAPIOQRRLIAYLHRIHKINSDLOTYSSSLTDKML
HRLTIGMLLITSVIIVTDFTFVMYLADLNHRQLLIAIMYWCYCSYFIAHLLMQFVLI AALALSSLKLVN
NGLRMTLHQSGIESLTEIPNSNEQHAANAVLPQPPKSVNNSIDTLAFVVTKRSVRFPTAGWTDQRTIRRL
ALSYSICEVVRQIDNNGIIVLLLLASFLHLVTPYLYIISFVTEPHTGFVKVLPILQTVWCLYHTF
GLVMIIEPCHRTHEEMETTRELVSVMCSADPRDPI SVELEMFFRQLVLNKASYAPLKVCTLTRSLVATIL
GSITTYLIVIVQLEIKNMQ

>HvCr4N

EVTAAPVPSESGSRSPRPTHCVVGGAHAFILRISSFFGLAPLRFESRSNGFTVSI SGAMCVYSYILVTVLV
ICTLFLGLVAEINVGVELSVRMSSRMSQVVSTCDVLVVVATAGAGVYGAPRRMRNMLKFMENIASVDTSIGG
QYSRVTERKLCGIIAILIFSVLIADDFTFYALQAKKLDREWDVVTNYLGFYLLWFVVLILELQFAFTALS
VRARFSAVNDALALTARQVSIPEKPKTSSPLNIYAIRVAPVDSQRSANVSLLDVTMTGREHVVIKRTAS
GEPRLIVSPCDAVRRLAALHGTLCDVVNSIDDSYGLPLVILISTLLHLIVTPYFLIMEIIVSTNRHIFLV
LQFLWCVTHMLRMIVVVEPGHYTIAEGKRTEGLVCRMLTSAPSTGVLP SRLEIFSRQLMLQSVSYAPMGMC
TLHRPLIASVIGAVTTYLVILIQFQRYDN

>BmGr11F

MKPFRRFFLVENVICVYRNYSFHKRYARAIILSRVMFEVSLIILTLHSCRNFVAVKYKTEIIFTYLATASS
TILILLALYKTRNFTELFLNFKAFYRNRNLDVDHLEKWNKQKMATVIVLFCVIKFSTLIYTDLIGEYST
PCRGYFTEYLFYTNLFMCNARYLFEFSTACVVLHLVSEQLDYIAISMDCTMFLYIDISKKNIMSSAKKRL

KYFDIFKQFEKWTDAYMNVKRSANLCDTVFRAQLAIMITTTITLYYIILLYGITSFNIERGKFSVVKLSYL
ISLFGFLIALLLLLSKAGQRIQKSAENLRRKLSKFLLSLEDPEFHRAATNLLRLVCTHHIKMRCFGFIDID
MTLLPSCLMFVTSYTVIALQFNNAV

>BmGr12P

MKNLKL CRTTFYFKIIMCSRFIGSLYFTATSKKWISYLYKVICVLYIICITRLFYAKEDTFKPLVFXQFIG
NSIESLRTGEGHVLKCYSTIFSLKLIRNYLPDSNNHIPISSITNFLV IWKVFDQVYIVLMHYFYTTDIII
HLRILSILTTIGVNL SLMPIIVIFELMWRRAVKALRKS LGEHLKGPV LIEGRERLKAQQILRCLNVYKDLNA
TLKFNSTPMKTMILISTLATFIRLTLFLYQAILGHNEGLHLPRKILAI IYYALPVCLLGVL MELVARECDK
LKTLMTKELLVCKDDSYCTVIVDAVSYIELNPLKFSILRAFNVNSTLILGLTNLCTTYLIAVIQFTYSCED
INGLSHSHSH

>BmGr13

MEDSFNRLLSIRNMIIFQNVCGFYHMCTEKLYISRI IKMYCVALAIVLSVFCFQNP DITYLSWDVVVWVTFG
YTLNVIICLRYNGNYFFQYWNGLHEIDIKMNLT SIDKEKVPISR AVFTVFLILRSTAFAMTIFVFGYLETG
ILSNTIISIYSINLTEFYRNM SNIPMILMFETFYVRIKILKEQLCSELSTVLGCNNDARQLKILKYLRNY
RSLVRHLM DTTLPFKILILVILVGSFLRSL LIGYAFVYNSDQI ILLSLPVMFSTKILSEVVEIKLICTEL
LKNKNEGLVLLDLDSK KPTFLTSKACGEQLQDALSFLNRSYSY TLLQVIEFDCSLAFVFTSFCITHLIVV
VQFTHVLD

>BmGr14

MNLHKNIIPIRNNLFANKVTAIALPKTLSVLFKLIHIFFLDLGVY EYKTFKIKCIVKFLTISGSLTISV
CFSFMVSNLSEHTFVGWYGF FISTYIFVVLFFNLSNRMTFVEFYKTLLRFDANYGIDSNEYKFNFKIIFVN
ILFIANRMVLSFVYCSYYPQNCIRPRYAQILFMLPWLTL DVLLTTNMFLFYATY CRIAKFPMLIKNSMNIV
ALRNSYKLIVDSLEKTQTSFDIVFIIALVFSVPEIMMSIYSTLLEVISKHFLEVASILSLNYVAIAQSLLL
TLAPSLCAGVLPWKTNNIKIILHEKLFTEKDKASAREIELFIKYIESRPLKLRACNLVPLDFSLTIIVLNI
CVTYLIVIIQFTHLY

>BmGr15

MISSSDINHKNKVFAYNVP GIALSKTLTVL FKLHLYVLLLDVGIY EYKTFKNCIVKFLT IATGVSIV
YFCL IATVLRKN AFFYWFYVLFISQYMIIVFIF TLSNGMSFTDYKMLLRFD AKYQINSNNYFNKIIILV
IIISILNRIGMAIIYCSYTKNCYEMSFSQIIFVLPWLTRD VILIMNVFLFYVTYCRITKFPALLEN TKNV
GSLRNSYKLIVDSLEKTQKPFDFVFTISL VFNIP EIMLSIYFTLLQVIHSHFLEVAP TLSISYFSITHSVV
LILAPSLCAGVLPWKTNNTIKIVLHDKLFLEKDKNSARNIKLFIKYIEARPLKLRACNLVPLDFSLPVIVLN
LCVTYLIVIVQFSHLS

>BmGr16F

MIMNLTDRISKRNKVFAYN VPEVTLPTTLKVLFKLIQFTLSLDFGVYKYKTFKMKCVAKVLTLAGCLAAS
AACVSLIISNIFENQLFFGWYTLFVCQYTIIVIFMFTFSNGMTFIDYKMMLLRFD AKYQIDSNVYHFNKIV
LVVVISVTSRFLCAVYCIYSTENCIPWYNQLLFFPWLSL DIVLIMNMFLFYATY CRLAKF PSLFENPKN
VVPLRNSYKLIVDSLEKTKSFD AVLIAALIFNIPEIMMSIY YTLFQVMNKH FQEVAPVLSLSYFTIILSV
LLILAPSLCAGVLPWKTRHMR LILLEKLF AEKDKNSAREIELFIKYIEARPLQLRACNLVPLDFNL PVIVL
NLCITYLIVIIQFTHLF

>BmGr17F

MGFSLGTTALSMFFFEKPVVFTIIQITMIIVKPAKYKLSDPFRPKDTSKLSESIIMYFKLFHIFLGLDGG
FRYQNRQVKYAVRLISLIQPLAIYGLCIYALLKIIANTEFLWYTI SFTEYVAMSVAITLFSNEMTYCNFMI
NLKFIDTKLIGDESFRIGVKLISSTILIGVTRCFTTTTYCLLGFC AKPTAAQILFQIPWLTIDLMLLQYM
FIFYACYCRLVKILRILKRN TDIEEMRRIYKTLVDVLD RARAPFDLAYLLGLLFSIPDVLYSIYESI IKV
GEINTAKALSMSIIYITNIQSLALMFAPALTAGFLPSLTMKMRIILHDKLLEE QDKKTYRHIVLFIKYIET
CPLKLCACQIIPLDFSP IIIILNIVVTYLIVAIQLTHFL

>BmGr18

MRRSTKVISMVNQSDKGEIKTCSR FMKIYFFVIYILTGFNFGFYTG RGLNFLRVIQASVLLLRFI IASNCI
YIAFHFRLL EAIWYSLTFSES LAIVVCFMLSRSALSCKNLF EYLYSVDQELKKS VGPSIEVKLALYTVVVS
VLRLTVYVFC AIAYYETLHEGFCVELVYNTPCYCS DLYLVIHFTIFHSVY CRLKALRISMNEKFDVYKGTL
IYKSLIDNLEEIKKSLDVPFFVILLNAVAIAMINILV TLEISYGQTMKFIRTAPRYLETVLLFSSAFAPVL

AADMMASEAQKIKVTLNINILQRDDSLLEDDRRKVKQFAGYVSARPFRLRACRVLSLDCTLPVTVLSICVTV
LIVVVQFTHLY

>BmGr19J

MRRSTKVISLVNQSDKGEIKTCSRFMKIYFFVIYILTGFNFGFYTGCGLNFLRVIQASVLLLRSLVASYSM
YIARYSPLLEVIWCCLTASENLAVVVCFMLSRSALSCKNLFYLYSVDQELKKSVMGSPSIEVKLALYTVVVS
VLRLIYVFCATAYYRKLFDGLRLELLYHTPCYSLDLYLVVHFTIFHSVYCRLKALRISLNEKFDVYKGT
IYKSLIDNLEEIKKSLDVPLFVILLNAVAIAMINILVTLHISYGKTMKLITAAPRYLETVLLFSAAPV
AADMMASEAQKIKVTLNINILQRDDSLLEDDRRKVKQFAGYVSARPFRLRACRVLSLDCTLPVTVLSICVTV
LIVVVQFMHLY

>BmGr20J

MRRSTKVISLVKQSDKGEIKTCSRFMKIYFFVIYILTGFNFGFYTGCGLNFLRVIQASVLLLRSLIASYSI
YVAIHFRVLEAIWYCLTFSESLMVVVCFMLSRSALSCKSLFEYLYSVDQELKKSVMGSPSIEVKLVLYTVVVS
VLRLTVYVFCIAIYYESLHEGFSVELIYNTPCYCSLDLYLVVHFTIFHSVYCRLKALRISMNEKFDVYKGT
IYKSLIDNLEEIKKSLDVPPFVILLNAVAIAMINILVTLHISYGQTMKFIRTASRYLETVLLFSSAFAPV
AADMMASEAQKIKVTLNINILQTDSDSLLEDDRRKVKQFAGYVSARPFRLRACRVLSLDCTLPVTVLSICVTV
LIVVVQFMHLY

>BmGr21

MAHRTNSINLFRSRPPDIRAGVGEPRIFSKFICGTMFTQKSLVNFVLDLTKTPRGGDQEHKSKFFKIYFLAVHS
VTALDFGFDRNAKKTILISMFISIVRMGLAAVSFMSLWGRPNALALGWAPGTLLENILVAVTYSASRS
TFKCGDLFADLSTIDELFGSACDYRIESKMLLFTATMTVLRVVIYSTSRLVRADGDFVDVLEVLNNLETM
CMYLFVTVYFFVLFVSIYCRFKKRLRELKNDFEIRRANLIYIALKDKTDKIKQSLDVFPVFLVFLVTVLVMMV
DVFITLEMIISNKYNMAVYVVRYLEITLDFLMLFAPVLLADMMAVQVDGLKITLHDLRLCLNNGVDMKRYSS
LAEFIGYVEARGCRLRACRVVPLDLTLPVTVFNVCVTVYLVIMIQFADLY

>BmGr22J

MTRFEFSQRTKTKSVSKTLNIFNCIYVLTCDMDFGFSGLGVYKRMKVLENISLVLRVMVAIMCAAMVMKQDI
LDSAWADITLTESLLVIVSFKLSKPKLSYRELLENLSIVDETOGAPPAGYKVERKLITYIAGVTALRLTVL
CLYCVAHTEQYSIDNFIIEFLYNVPCYCLDLYLIVHFIIFHSIYCRRLTLRKALSNNFDVYRAHLIYKTLID
CTEEIKKCLDIPLVILIAITILVVMVNLVTLRMLFKGESIIISAFLLRYIEVILSLALLFVPLVADMMAL
EAHKIHFILHGRMQTANDAAEERREVRQFAHYVGTTRPFRLRACHVLALDSSLPITVVSVCVTVYLVIVVQFT
HLY

>BmGr23J

MAQFQIPSMAGSGLNVAPFSRGRRHGPKHSNFTKKYFLLVHLVTCLDFGFHRDNDTKTYKWFHAANIGVR
LVLSAYVCSVLSQDLFSFASAAWTILNNSKHLVVAIFTIFKPKSSCAEILKDLLMIDEALKIHRGCDVKG
QITVCIVLVTAARLLIAAASSLSLHEAFSASVGAEEVLYSFQSYCLDFYILANFFIFYSVYCRLKNLRRVL
QNNFNIRGNMIYKVLVEHMDDIKKFLDIPFVTSLLVTVIMAMINVLKTLQLIHDGENDVLTIVLRYLEMF
LSFSLIFAPVILSDLMSIEADNINVVHLNYIYETDAAEERERRHLSQFAWYVSARPFRLRACRVLSLDCTL
PVTVLSICVTVYLVVVQFTHLY

>BmGr64F

MKISLRKIVSIRNMTLIQNMGFYHKFTDNRAIGVLLKIFCGFYSLFSLFCINCTPRFTNDFLTYDIFFF
VIEYLTSVLVCLLYDGQYFLNYLYDLKLDREAGIEESLEKLPISQPLFSLIFITRVIYLLSCLLMFDGIK
DSLFLPAQSSVFGANFTEFARTIGYFPRVIMFEMFYKRVNYLKSQLRNDLAHANLYPIGFVCSKVIMKYIN
FYKLLLRNLQONSLQFKILMSMSLYIIKALASAYAFIYREDGVHVFIFIEFATGVFLFFVMSSIIISIF
NEIEDIRQIVLAQLRYCKQGANTKRVQDALTILNIRCFKYALCRIYTVDFTFILRILDVSVTYVIVLVQFT
HILD

>BmGr65JI

MKISLRKIVSIRNMTLIQNMGFYHKFTDNRAIGVLLKIFCGFYSLFSLFCINCTPRFTNDFLTYDIVVF
VIEYLTSVLVCLLYDGQYFFNYLYDLKLDREAGFEESCSQKLPISQPLFCFVFITRVIYFLCLLMYDGI
NDTLFLHGQISVFGVHVFIIEFAIGVFLFFVMSSIIISIFNEIEDIRQIVLAQLRYCKQGANTKRVQDAL
TILNIRSFKYALCRIYTVDFTFILRILDVSVTYVIVLVQFTHVLD

>BmGr24P

CINKKIQSI I KSLVSIRTIMLVQSILGFYHKMSNNFFVSFLFLTYTTILISVLSFYSVNDVMAHKFAYTLS
MILEYDINTILSLITAGROYFNFFEEMKKIDFSIGFGELNIEDLPLSRTL FVTIFVTNILLSIMTAALILF
FSTPFLIISSGSTYAMAIVFFGLSLNVLPRIIIFELIYKRIKYINLSLKRKLKALALECDHTIARFEIINE
NLIIYNKLLQSLGNVNSLKSILLTTFTCFRCSLICYYVITMNEDKVYIMQIIELTKQTLFLGVLIIILA
EYIKNEIENLKMTVSLQLFTCTDTQLYHQVSDXFEIHRITPIQLCGFKNMSVDTNLFLGLINVCSTYLIIII
TQFLNAYVN

>BmGr25J

MVFKCLKYVKKFKPMFSVMFIMNFRLICGLYYRIHSDAFVCFVFKVYICILCSMFLFFTSSDLAAPFSRSIP
ILATLFEYVANVLDCILTGQSYFFHLRMELMRIDPRLRGLDRPPASSIVFTAILS YKIFILAVYIHGKART
TYLQYEWFFSSIGIHLLVLFNSLVHMNRMLIFEMVTF SLEAQKKT LGELLKSSLRERVERKCEILNRFLKT
YKRIIELFNNTMAATKMLTLISVVSCFIRILTYLYQVLTTLQSSSSAGSIFTTRHLTFIVTFVREHVLSVY
FLKKVGICQRLQINFKIKCNVKTETLELISQDDEYTEKLEDALDFINSCSSKITILRAMTVDATLPLTFIS
LCTTYIIIVVIQFSHIYD

>BmGr26

MNKTKIYRKKL DKNERLVCSVQ PAMFARLIVGLYYDIKVSNRVKWMIKSYCISLSSFCYLIIFRDDNFSL
HPKLT SVM EYI TYVTF SFLTCDKYLFRYLRFNPRTDGYPIFLYLCKKFEKFFKIIICLFVSFKILGVVLM
QSWPILSTPKYIWGTLALHFLWLASHMGRVLFILVYGILFCRMRTIRIIFENRGFQNT PQRNLT PKRYILM
YEAVLNSIESVD FPKFLIFTFICCFAPKLVVSLFEIMEEMKKGELSLTTFIWFVLELSPSYLFLLLSAIA
LDLVSEDEVQELLSITIDRRLNCKNEKERSEIQEFFQYLRNPNFNITLWQVVS LNLRTL L VATSFSIANVIA
IMQIKNSKI

>BmGr27

MVFKYKIMTKAPKSLPVLKILMLFRLVFGNYFRLSSNRYINFLVKSYSCTFTILLSVMCGKRLKNDSPYML
SLTEYILNKILNYATSEGYIFKYCNSIKTCDKIMGFKLPIITIDVFAIIITVITRTAITIYFGFLFPFD
KYQVVLYVGCIVFSNDLNSLTIMNVFGLLNRMNLLRKSLEAMTVPINIIIGKNEVAPKVRLVRNAFRYYSN
LLDNLDSVNHCQYSLSVTLLLKFPKAVLLCYDSIKTYFVKIDNNFAMDIVDPTEIILSIVVMSFPAMLC
MITNEVEKIKAILTKHLIQCSDNSLRFELNITLLYICHRPFKYILWRAIPLDTSVPIGIVSLIITYVIVLI
QLLHFST

>BmGr28P

MAHKIATVGPNTATATVKNKRKLKISKRVTIKVVVRCLRFILGHYTELTSSKLKAFLIKCCSLLLAVIIII
YAPLNYIKMAYVMGLIEYLLFVLLSLFTGDEYFYKFHNSIKSIDVLMGYKRGKIIDSNAIIFLLSVITIMR
IVIIYCRSTVLAFRFTIIGVYLAIFSLRISYMLITVIFFAMYHRMKFLRKKFEIITIPVTIIGKQKVASKI
RLIRKYLINYHLLDCLRDINGGLQYFLAIMIACNLPKYIFFAYS AIKIQVLEHITIHS AVQNVKCRILF
VVVPAIFAELTTAEVERIIDVINRQLLRCTDEHMELELKVALEFIRRRPFDYVIWRTVPLNASLP IAIISL
CITYVVIVIQLTQFHDNF

>BmGr29

MYLRSKKS RFLKFSFERMIKILLMICGHYVQTDSSNVVSSIHRIFSIVITICLCPYFQFNPFHVI ESVW
YSILS QFTQY GFFFRYCSTIKTFD LLSGFKQIPLYTKRVCFFLLITLLVRLIIVLIHFS AHQTKLKTFCAF
LIILSANTGHILMTIMFSILNTRMTLIQKLFANNPIPVNIVGKNQONASHIKRVRKGLICYNNLLD TLKVAE
KEIQFTLTVTYLCHVPTIICYVYFVITVIYKSKFSGYNLIPMLDMILACMAVTAPALFAELTKNTVDKIKK
ILGSQ LLRCSDESRLYELEITLEYVIQRPF SFSIWRVAVSLDASLPVAMTSLCITYVIVILQLTQLRP

>BmGr30S

MYLRSKKS RFLKFSFERMIKILLMICGHYVQTDSSNVVSSIHRIFSIVITICLCPYFQFNPFHVI ESVL
YSILS QFTQY GFFFRYCSTIKTFD LLSGFKQIPLYTKRVCFFLLITLLVRLIIVLIHFS AHQTKLKTFCAF
LIILSANTGHILMTIMFSILNTRMTLIQKLFANNPIPVNIVGKNQONASHIKRVRKGLICYNNLLD TLKVAE
KEIQFTLTVTYLCHVPKIIICYVYFVITVIYKSKFSGYNLVP LFD MILACMAVTAPAVFAELTKNTVDKIKK
ILGSQ LLRCSDESRLYELEITLEYVIQRPF SFSIWRVAVSLDASLPVAMTSLCITYVIVILQLTQLRP

>BmGr31JI

MYLRSKKS RFLKFSFERMIKILLMICGHYVQTDSSNVVSSIHRIFSIAITICLCPNF EFNPFYFHVIESVL
YSILS QFTQY GFFFRFCSTIKTFD LLSGFKQIPLYTKRVCFFLLITL FMRLFTVLIHFLAYQSKFVTFCAF
IIMLSANTGHILMTIMFSTLHTRMKS IQKLFANNPIPVNIVGKNENASHIKRVRKGLICYNNLLD TLKDAAE

KEIQFTLTVTCLCHVPKIIICYVYFVITVIYKSESLRYELEITLEYVIQRPFSSIWRAVSLDASLPVAMTS
LCITYVIVILQLTQFRP

>BmGr32S

MCYTNFVSRQVSKCINFFSTIRYVIYLRMFCGLYINCSSSFKIRCIARLYCFIIYCLNLHYNLYIFTSSVS
LTNFLHTFITLAEVSIHILFSLYTGESNFMSFCIEMNKLTSGPIDFVATKCVATHFIAFFVIGLHILSSTL
ICGAEVSCFTFSVVLASMTFLTLLSRFTTIIMFDLVWIRMRLRKILVNALESDDLSEDEKVKSIESFLKA
YKQIIASIRITKLATRNLVTFNFVSLFGKIMTLIYFCINCPGYLNTYLISWIFGILLAGFVTCAPPVLE
MNVNELDEIKYALADQLVDYTDNRYRTAIYNALDYVEVHSIRYTLWKNFPMDLTMFFGFAGFCATYIIGLL
QFTY

>BmGr33F

MCYTNFVSRQVSKCIHFFSTIRYIIYLRMFCGLYINCSSSFKIRCIARLYCFIIYCLNLHYNLYIFTTNS
LTNFFHTFII LAEVSVHILFSLYTGESNFISFCIEMNKLTSDPNEFIATKCVTTHFIAYLIVSHILSSTL
ICGARASCFTFSVILTSMTFLTLLSRFTTIIMFDVWVIRMRLRKILVNALESDLAENEKAKSIESFLNA
YKQIIASTRITKLATRNLVIFNFVSMFGRIMTLIYFCINNPYLDYHMSLWIFGILLAGFVTCAPPVLE
MNVNELDEIKYALADQLVDYTDNRYRTAIYNALDYVEVHSIRYTLWKNFPMDLTMFFGFAGFCATYIIGLL
QFTY

>BmGr34J

LTNFFYSFITFAEVS IHILLPLYTGESSFMSFCIEMNKLTSGPNEFIATKCVATHFIALLVIVSHILSSTL
MCGARASCFTFSVILASMMFLTLLSRFTTIIMFDVWVIRMRLRKILVNALESDLAENEKAKSIENFLNA
YKKVIASIRITKLATRNLVTFNFVFMFGKIMTLIYFCINNPYLDYHMSLWIFGILLAGFVTCAPPVLE
MNVNELDEIKYALADQLVDYTDNRYRTAIYNALDYVEVHSIRYTLWKNFPMDLTMFFGFAGFCATYIIGLL
QFTY

>BmGr38P

MKPKYVTNIKLVFLRFLCGYYYEMEIPRRLKTVAKAYCIFFLFFYLVLHHLVYCSFSNHTAKWSLYLEYSI
YVFMSLYSKMYLMDYYTSSRIIDFEPHSRIYKKNLNIYLAAILPFLVVLKIVNMVTFCLSKSFNCWSVSL
LHNLWVNFVTLGRIPPVVFALLFCRTRIRRTLVISITVGPSTVLKSLFKCTRYWTLVLRPNTHLNSXL
TVFLLCSTPKLILETFLMLNKIKESGPIVEKLAVYAIETFYTHLFFVVSILFDLINVDLQRIKILIVEKR
MKTKNTKHRIEVEKLFQFVKSQTIECTLWRVLSLNRNLSFVSVFVTTIIAVLQIKNNNIY

>BmGr40SP

MLPICYIKLVYNISSIMFLRLIFGLYFELNVSNRMRWLQRMVCFISIVIMYFCYFKTYRILMTVKVPFIL
EYGMHVILSLYLRENFEYTRYDPIIDSAADTKNFYKFDIFIKIFLVAILLKMZSMLVFCVLWSGLCYTG
FIGICGMNFIWIATFMGRMVLPLIFGILLCRIMFRLTLQKQGFNDLPYNRFSPPRYIMMYDSIVRGLEKT
DFPAKNIMVFVTICIIYSKILTGLFDLISVLKREGPKLMNVMFLTFLEFLPSYVLLMIYSVTLDMVSTEMKEI
LKIVTEKRVFYEQHANIQELCOYIKNNQLKYTIWRLVSLNMQSLLRATSFCIVSTIAILQIKDWNG

>BmGr47JR

MKIRFLFGFYCDFPFNKRFQNILKFYCSVVLVILGWSWACSTGFRSDKKIVYCEYIAYFLISLSTKDRY
IFDYKQOPLIDGSTTSKVLYKKLERLLKYFVTITIVLKMNLIFVFCGWNLTKCINELDGVLFINLLWIGL
LLARLSLPIYGLLYFRLRVLRTLESKGFNSPQNRFTPKKYITIEYKIMKDLLKMDYPLKYVFIIFLIG
SVPKLLQNSWQFLNSLKNYGPEISKILEFTLECLHSYIVIIIPVVALDLSEDEIKMKIITLNKRLACLN
ERQKMEIQQLFLLKNNSLRYNLWRVVPVNLKSVLIFLFSFGVTNAIAIMQAKNLN

>BmGr35S

MYSSLKLDYIVNMEVMSDQISITISFKNVFKVFFDYISSLDFMMVCRLCFGYYYEFNCSNLCKIMFKCF
SISVCIFCVSMHLVQLISPPYLNHCVMLESTVSIITSLVTEDEKYFFEFCLDMKDINSMMNQPRNIKSFKI
IYVVISGAICHVIRHISICREKALSFCFSTEYLTASFTIISGYWNYLNTMMFDLLYQRLVAVKQMLTNGL
NICDTDEYKIKSVQKFDIVYKALTVSLSKTSNLIKHTVSLGIFCALWRIIFVYYCISMDFOVESAOFITW
VSSMCLSVFLVYIPALIVELCSNEVDAIKWILASELLEYRDKRLRTSLRDALDYIDVCPIDFEIWHCFPMN
LSLCLGFIDISSYIISILQFKY

>BmGr36JP

MTVPYDKIKSALSQVQLLFSINVVLFVRFVLFVGFYMKIGSRKYFHIA TKIWIIVTLTIFRVYFQCRNFMNYP
SYALILHDFTCTVELVILCIISSLGGEQHFYTYCSEMAELIDNRKNKRASYFTTSTLLIGFIILIVPTSIS

CKKVSNALSMFLNIFNYVACFMHHLTIIYVFELLWREIRKCRISLERLEIMSVDDKIMKIENFLDSYKRS
LDSLKNKANGVMIPTMALAYFAIIAKIVFFTYNLSLRGFNILVHGDSWLLSTSIAIIFICAPALLVELAAN
EVNKIQNLLAVELLKMKDDKFZYRATLYDALDYIEVRSVKSMIWRNFPMDLNL CVGFINLIITYVIGLLQL
LY

>BmGr37JI

MSAKINYQEKLCISIKSIMYLGLFCGLYFRSSTSRMMLLMTKVYCVILLFLGIFHLNMLSSDLPTETTLHS
SIIMLEFFIHIITSLSTGQAKFLHFCTEMMKINGHNSKGLDFQLVITNIALIIIIITQTTSSLLYCIIRS
KCLSHSYVFTVITSLCVLFSSTMI IKYELIWNTRVSLKNTLVSNLDSFDLSEQEKVNSVYNFLSTYRDIK
ANVDLTIKGRTRTTDCLHASARVSAIVLSVAVTCIAPILVEINVEYEFGRIFKALADQLLEYTDSKLRRSVYD
VVEYITVAPPTVTIWPFTVDLGLYMDFIGLTVCYCIMILOFEY

>BmGr39SI

MNVSPQYSVLKIFKPLFKVQTLFGSVRVKVGDNGITKTTKLOKFYSIFNILFATTGHFYTSFVYSVCVPCV
GNSVAETSMALIQIYAGHLMNSFIVFSNTFLHNEKNVQMFKSLCSIDELMKIVRLEHRDLKLFIAIILLLS
STVIMNVYFLIYMVILPISEKWVPFANIGIMNEDLEAITFVSVLYMLYDRVKYINQ TALDPVNI AKLIKE
SDGQONDEETVSRILKAFKEISKAYKIVEKTFRVFNLSWGTFMSKNLIGVKFIARIMLISVCVSYLERELQK
TKGLCNLAVRNCENDIVRCHLKNIRIIDTEIEPMTVFGLFYINNVPDLISLTATYTVVLLQFAFL

>BmGr48F

MSGNYLEEYINMSFSPIYKYQKFLGSNRISLKAKNKITVANNWEKLYAFLWMLAASYSIHFFISFFYSYYY
ERSKILFLGCSLGTSSQYLTYILTITYDKFLTREADIDLFINLQKIDRLLKLDRCTVLFKKIRLIYIFLLI
LVTVPFISGFLIHVFDYIDQPYKTFFLGGLGTIIYVDVLTVAFFIANLTLRLAYINDRIAMYKRSPLRK
DSGIRRSRWICGSWIFQIMPKIKNNGTRMKNYTFIKYQSLIFNILKCYRLITEIYSLPVFLITATVSIWT
FLVIGSIVAGSRSEIKLFSIVAMITVGLWNLFFIIQLTSLAFVNDLFLMEVKNTKQLCIRVLSYTRDDSIN
KAVNTILKDIEYAPPIFSVYGIFVFDKSIILFLIGIITGNIMTVIQFSY

>BmGr41SF

MSENSLEEYIHMSFSPIYKYQKFLGSNRISLKAKNKITVANNWEKLYAFLWMLAASYSIHFFISFFYSYYY
ERSNIIFLACSLGISMHYLTYILTITYDKFLTREADIDLFDIQKIDRLLKLDRCTVLFKKFRLINIFLLI
LVTVPFISGFLIHVFDYIDKPYKTFFLGGLVGTITYVDVLTVAFFITKLTTLRLAYINDRIAMYNKINIPHKK
YSGIRRSILWIFGWRIFKIMPKIKKNGTREKKSTFIKYPSSIFNILKCYRSITEIYSLPVFLITATVSIWT
FLVIGSLVAGSRSEIKIFPVVAMITVGLWNFYIIQLTSLAFVNDLFLMEVKNTKQLCISVLLYTCDD SIN
KAANTILKNIECVPIFSVYGIFVFDKSIILFLFGIITSNVMTVIQFSY

>BmGr42P

MNKTKKIERLSRDILDEDFIDVFKSIFIFQRIFFGLLSVNITYKYITETSCLYKLFVMSLWTVNVLCLVDYI
LNYRTSFDVATDSMLKLVMSVNVTTNALIVWRNNFKLNTLKSQIYVKLQNLDRDLKTKDAVTMNNKLSALS
IALMICGFIWCTIWL FVYNAIAMNTFCVPLTIIILSANVGNWLEMVLLFIIIFYFVNVAEYVKNLLRRRLNQ
TECPDRVFLIQNAKPSDTSREFICGMQSLEIIGNIKDIYQFPFLSTCQVMLCILVIVQNLIIISVKEQT
STMVDSMLCMLPALLLMLTIFFSLCVIAEALTSKLDITKCLKAMGMHSFTDDISRNSXQIVLLLLKAKRPL
SVFKIYTLGTRLP IHL LGVTASYTIVLLQFAVL

>BmGr44P

IFLSTCQMMLCILVILQNLIIISVKQZTSTIVDSMLCMLTALLIMLTIFFSLCVIAEALTSKLDMTKKLCAM
SMHSFADDISRSSKQIVLLEAKRSM SVFN IYTLGTRLP IHL LGVTASYTIVLLQFAVL

>BmGr43JI

MLKKSAMITMKSPEYLSKDILDEDFVRVFRFPFLVQMVLGSCRVHLKARFITIPTLGQKLYTVMSIIICSL
LYFNITKLYISLYEESIVYFLFTVAGLDQLSFFANLIHVRFLNGETNTGFCIMMQRIDRKM KIDHNNIF
NKTVIRANILTITLIILLYMSLVISTIIILKKYSLVTLFGLVHGQLILLVEMAYCSNLIIFFFIRVRFVNAI
IKNHVHPENQNPPLKLVRYFVTNRIMRYLAAQTHDFIVNDTDVYLKQIFEGFSMFIDIYRFQVCLFCIKLI
VMSLLTFEFCLVGIQKNGPLRKKATRMLKIIESTPQFSIYDMWQMDGYTFVKICSLVTNLIVTSLQFAYL

>BmGr45JR

MITMKSPEYLSKDILDEDFVRVFRFPFLVQMALGSCRVHLKARFITIPTLGQKLYTVMSIIICSLLYFNMT
KLYLPLYYEHSIVYIFVTVTGLDQLSFFANLIHLRFLNGETNTAFYIMMQRIDRNMKIDHNNIFNKTVTL
ANILTITLIILHYVGLVISTIIILKEYSLLSLFGLLYGQLMLMVEALCSNLIIFFFMRVRFVNAI LKNHVV

PENQNQPPKLVRYFVTNRITRYLAAQTHDFIVNDTDVYLKQIFEGFSMFIDIYRFQVCLFCIKLVVLSLLN
FEFCLVGIQRNLLTKNLTNYIIMTYSVIGFFTALYVSGRCELFFREIRETKRLAVAVLLQYQEGPLREKA
TRMLKIIESTPQFSIYDMWNMDGYIFIRICSLVTYLVITLLQFAYL

>BmGr46JR

MITMKSPEYLSKDILDEDFVRVFRFPFLVQMALGSCRVHLKARFITIPTLGQKLYTVMSIIICSLLYFNIT
KLYLPLYYQHSIVYYLFLAVTGLDQLSFFANLIHVRFLNGETNTAFCEIMMQRIDRNMKIDHNNILNKTIVIR
ANIFTITFIIILYVVLVISTIMLNEYSLVTLFGLLYGQLIFMVEMAHCSNLILFFFTRVRFVNAI IKNHVH
PENQNQPPKLVRYFVTNRITRYLAAQTHDFIVNDTDVYLKQIFEGFSMFTDIYRFQVCLFCIKIVVLSLLT
FELCFVAVQRNLLTKNLTNYIIMTYSVIGFFTALYVSGRCELFFREIRETKRLAVAVLLQYQEGPLREKA
TRMLKIIESTPQFSVYDMWNMDGYIFIKICSLVTNLIIVTLLQFAYL

>BmGr49SJI

MAGIRTISFKVKPLELPDVSENNFADDGLKIVQRFKFFIYIQVITGINRLYLLKCNKFMVLFVSYLYAIFLI
SFVASVYWTKEPKMNSHLVIRLFSFIEYILLICISVFLKMKMMKFFENLSMFDQILKIDKNVNSTFCMKR
VFFVWTGSIVYNLIEFYALEFYDNTSKGLMTI ICTYTIAPAAIGVCVYLIVHCIKYTLLVVICYSSITA
TQVSLIRITLHDAINTIPLGKLQRRKVKAFYLMTKEYSFVYTLAGVIKLNMSLPLSYISLCTTYLVII IQF
SKFLD

>BmGr50S

MAGIRTISSKVKPLELPDVSENNFADDGLKIVQPFKFFIYIQAITGINRLYLLKCNKFMVLFVSYLYAIFLI
SFVALVYWTTEPKKNSHLVIRLFTFFEYTLACISVFLKMKMIKFFENLSLLDKMLKINKNVNSTCCMKQ
VFFVWTGSIVYNLIEFYAMEFYDNTNKGLKTI ICTYAIALAHDCQEIFFFTLQRVVYLRLLVVKRHIQYEF
KVEDSSRKKPNKYEMLSNNVQLNLTALHEVYALLHNCAEKLNTVMSIPVLLMLFTSGLSTTILLKFFVRV
IQLTDPSPNGSAIGVCMYLIVRCIKYTLLVVICYSSITATQVSLIRITIHDAINTVPLGKLQRRKVKAF
YLMTKEYSFVYALAGVIKLNMSLPLSYISLCTTYLVII IQFSKFLD

>BmGr51F

MAMGIRTILSKVKPLELPDVSENNFADDGLKIVQRFKFFIYIQVLTGINRLYLLKCNKFMVLFVSYLYAIFL
ISFVASVYWTKEPKMNSHLVIRLFSFIEYILLICISVFLKMKMMKFFENLSMFDQILKIDKNVNSTFCMK
RVFFVWTGSIVYNLIEFYALEFYDNTSKGLMTI ICTYTIALHDCEQIFFFTLQRVVYLRLLVVKRHIQEH
FKVEDSDNRKKPNKYEMLSKNVQLNLTALHEVYGLLHNCAEKLNKIMSIPVLLMLFTSGLTTTILLRILVR
VIQLADPSNPGSAIGLCVYLIVRCIKYTLLVVICYSSITATQVSLIRITINDAINTIAFGKLQRRKVKAF
FYLMTKEYSFVYTLAGVIKLNMSLPLSYISLCTTYLVII IQFSKFFD

>BmGr52J

MAGIRTISSKVKPLELPDVSENNFADDGLKIVQRFKFFIYIQVITGINRLYLLKCNKFMVLFVSYLYAMFLI
SFVVLVYWTTEAMKNSNLVIRNFTCLEYILLICIAMFLKMKMIKFFENLSCLDKMLKIDKNVNSTCCMKR
VSFVWAGSIVYNLIEFYAIEFYDNTNKGLVTI ICTYTFALAHDCQEIFFFTLQRVVYLRLLVVKRHIQYEF
KVEDSSRKKPNKYEMLSNNVQLNLTALHEVYALLHNCAEKLNTVMSIPVLLILFTSGLSTTILLKILVRV
IQFTDPSPNGSTIGVCVYLIVRCIKYTLLVVICYSSITATQVSLIRITLHDAINTIPLGKLQRRKVKAF
YLMTKEYSFVYDLGGVIKLNMSLPLSYISLCTTYLVII IQFSKFLD

>BmGr53

MAHIKDENSQKQOKEHETLNKNKLKVVYTLKPALMLNENWFLSDFLLVNEDELVLLMOTEFKGVILSIF
FIVMFAVFDVDFPDTESESIMELMDEVSPMVLSQYFIASITSSCLSAIAIRIFETFADLDSMLLITTTQD
FYNKSRVQTNKYLIILGVSHIISSTLDLLTDDEIVWCKFFVLPIYFLQKLEVLTFCKLIVMIQCRLQIINK
YLTNFIEEQEKNAKLVFTLAESNPCKTKDFNWIGCPSNNMKIRDLATMYDVIGTICSLINDLFNIQIFMT
LVSTFTYIVIAIWSTLYFYRAPNFTFGTLTTIIICWITIIILSVVMSFVVCERLVSVRNNTKILVNKVIMNY
DLPKTRVQAKAFMELIESWPLKIMVYDMFSVDISLMLKFISVATTYLVIIQLSHFV

>BmGr54S

MITIKNNFGFRQNNLSFYRPILIIQLCGYDFDYNNINLVNLVLTAKYCASLTCVVVYATIACSSIQLSH
IWSLIEYGTSVVI IACFRSQTKLFLKQLTTLDVYLRI SNRRFVLEKCKIFTITSVIFLLRIVYTSIYCSTH
HCFNVLIIYFLLSQFALVCLDVNRIWRCIVFDAIRYRLKTLRLRMEENPDCNYYLYVKNKNSIRKKNKISFCL
FLYRTIADLVLDVSPELNVSLFVSVACSLPKIVSNAYHLLLI IEDREPLETGGYVLMHTLQVSLLLFTPFI
IVECYTMEVEKIKLYLVHRLIDENGEDTTMRDNIRLFLEYMSVRTFRYRIFRIVPVNATLPLELVNLCVNY
VIVLINFTHLYG

>BmGr55

MERINLLKSF AFL ENVMCIYRNF MFYNQRARFIIIGRIVAE LVFYIF SAYNGFLLVYTDWFSQNF SVFFIE
IISKSSFYVITFFTMVNGILKSREYKTFIFSINKIHDIYILNDTDYLRKLCCTNIFCTATIIILFVVTLIRT
AIDGSNYGQLSGINARSVIWMLTTILLECQYQTECVVYFGFIFLFIHAIMKYLNI RVTNTIIKIARSDMAVK
RIPKYIIIGRTELKDETDGTGVDVNNVVDLEEVRYVWFYIRQLGLTTELLQKCFGMQTAFIFVTAVLNQIITV
FRVIAVFIYGLANRGAEHSIIANFLFTLLYRLPGLLMIIVGGQMVQNTDMLRRSMARLNIIISNPHRET
FSALSDFHRMIVKNPVKIYVLSVLPVGAYMLPLFMTLLINHIIILLQFNHVA

>BmGr56

MKKIRLLRSIVFLENLLCIYRNF LFFNKKARAIILIHITIELVLYVLSIVNNSFIIYSYFHSNRSMLIVF
TTICCFYVVTFVSI VMGILRSEEFKDLVTSLELINFNKT YLKS LGRSNTMIIAITTILYCVTCIGIA
VDKITLNDFYEF TSSDVIWTVSSTLLELR YQTECVVYFGIEYLF LIFTKHLNLLVKEAIK KVS LDNNGTVK
DVPISSDAVTKNEVKRWATIYRQLMSSKLLQACFSLOIICV FVSAVINFITTAFRMVKVS VLSGIATDMN
EIIIVNLIFTLLYQNI GLVLIIVTGQRVWNQILLNVL LARLYNGILIQPCRDTLRTLKNLQRMVVKNPVQ
IKMLS VLPVGSYMLPMFMTLSVSYII VMLQFGHV

>BmGr57

MEEIKAIKLVTFIENCICVYRNYAMCTKRNKKIIISLRIIVEIIIVFFVNINNILLHKYNGSGLLYIIYL
FLVVYIYINMFCIFYGALOGKAYRQLIFCFNKINAI AKRDKSYKKS LARLKNMCIVISIALLIISALS VFV
DRSNWNIIYEVSLRDSLLILSKIHMDFYHFYVYVYFTHIKIFHLTLRYLNSRVKMAQFEMKMTRRDVHDE
GERNIRILLTKELTTEWAVLYKCLVFGTKTKMSL FGLQMLIAMVMSFVNFTLSLYGIILIC SIEQSQTASQ
HNLLLILTYTATMLLIFIVAQS VYNEVEMLKRNLARMY NILAVDSDETQOKLVKDFLRMVYKNKVEIKML
SIFPVGMPMLTFFLSLSASYVVVMVQFSNVF

>BmGr58

MSSRRVLYRAEVL LSNVDAHVQDMLKPLNFFQFILFFPKYTIRDGYITPNSLIRNIWSATGAFVVISICV
FRILT MNKIAVYDTFTTMLLSKYFDVALY CIGFIVNTYVNIAYS NVNVL LYLK LQTIKTFIPRNEIMKN
VKWYSVILIIVLF CGTLAMFSFFHLSFSYFNIFDLTTDLAVFSFDLNLVYACSVLNF LAQSLDELNKEIWR
LGNAKVTVCKD GSKPDWNGINLTYINVLDA YNYFKEAFRLLIFFHTFKTLTHMFIYIQSIIELCKKFYPGD
DYDAITV GAVGVWFFRNITLQCLVGVSCQNFYSATSNTESICAVQVGSIVSDEHKLFLKAVRRLN NVFY
KWSMYGMFIVDATLPRRLIELIATYTVVFLQFAFK

>BmGr59F

MPYK KDSNRCEVLLYNNVD TDLDQDMLRPLNFIQTIYLSPKYTIKDG YITPNSLFCNLSAAGAI VFFSICV
YRILTASKIGTFEGFSTLLITKYFDAILFSLGFVANAYVSIRLSHLNVL LYLK LQAIKTFVPCKKIMQKV
KYYSIVLIIIGLIIVRLIMYIHFHWSLGYLSYLDLITDLGVISFDLNLVYASSIVKFLGYNLEELNKEILRL
DEIKATMDEEGSKPDWNGIRRTYLKFSEAYNYFKDAFRILILFHTLNTFAHVFIYVQSVIELCKPADNYS
AAFSVLI AVIVWLLRNIILQSLIGISQSFYSATSNTQSIC SILVRSVLSDDQKFLKTVORLNKANISKL
DVYGLFIVDATLPLRLIQVIATYTVVLLQFAFQ

>BmGr60JR

MLTPRSDLCNEKLS PPSFGKTTAADKDDTEARCQVDS SLERLLL PFNLVQHVSFIPMYSIRRGLVSPDGP
LAYLYSLLGFCLFTSVSVYRNAIMHGTRLSSLHLFTLYSDLVSVFVINYSLSLICNVVNSKSNVEFVCR LQR
LQTVLRRNQREQEQFARSNWAHLAVVTALY LAVVGLLNVVVLKQSLPDTLYLLL LFCIDVNVLYATRMLAL
LRCYLQLWTRKINEKAFNPVHNMFTA YLDILOEYEVYTTLFKKIITYYVLETFLHG LLYVQVAIQICKSI
RRSGRFSEQLMMIVSIFTWTIKNMIIMTLHNVECEK FYLAVEQAVAACQTQRASTTRCREEKR LYKNVCRV
SRAAFSRERGWLLAAGAALTLRFMDLATTYVTVLLQFAFVSRT

>BmGr61

MSIRFEKDLLHNYVEIELO YFLRPFNVMSLFFQSKYRIVDNFILPNTL FKNIMSFVVS VLVLCALSFIYTI
SVWQNTHATSFHALVTSVYLSYNIYGILIGSVLIIWLSDRNIEFVLKIQDLIKILEFNKCF LIEYAFINSI
IMAAIFILNFLLYGYFVVHLQKFALGLTFS AIVCILNQDLDIIVYIIFANILK KASRWTVEARQKNNFND
QGKWKLFNAFLNLTESYQLYQKIFEFYELLRRVGIVFLGLQLTVCRVCSNDIKSIQCTVMLHAFQLICVW
IVKKFITLSILSFEMEIFYEKLREIETVCIILVSSDNPSERELKIWKNIIRVSSCSVRKTTACGLCEVGAA
LPQWLLQATTAYTIVLLQFHITTF SRARNDIYDLD

>BmGr62

MNDLFLSKIVKWTKTTKYKLDLDDDFQSLFRVFNIAQAMNLCPKFLIYDKYITNNAWFIHILAISSFIVLVCL
DSFFANFRLVLSEAMGPPFYGFYSFYFISILYENIGVIIQITMNGYLTKNVLIITKLQDTFKDFRTTDTYIT
KSNRWTNWFIFFFIYMNFIANYSYFNFYVNTFSFHKFCFAFIKMCFDLNIYTYTIFIFKMGIDSLTMFKDTAF
CSKNMKLYEVSNRVYWNKMLRLYSNILDVFEFSKRTLNFYFYFVSNILLRILSHVQLAILMNSINWLQHV
AYSNIVMVLLTLAKEGIILIVLIAKCEKIYCVIGDVQTACQLALGNAACPEKRRFCKNVRSSSAAFSKIY
ICNILAVDAKLAVSLMSVTTTTYITIVMLQAILIK

>BmGr63F

MQIGNAVIHLKSTKLTTMNTISPTTKLLKIFALNSNIEEIDLKSTKLRIITMTAFVLCSLIFYSLYYKFIY
VFDYVNI SIKITDCVQMVYDFCQYIVDLYFVTNYGRNISSEYFQYKIIDKILEVVCYEIIKHRIKLLVW
FMCIWSSSCFDFIAWFLNYGWITPLVYSVAYIFLLIKILTTLDLAHSIMNVEIRLKMIAADLIHHYMSCE
DNFQAEETLCHKNWLNKERAKYELQFRIHALKQLSCNNNEIKLLSRCYLMLTEQVEIINRMYGFRILLN
SLSLIDMVRFTNISVRIMIGSQNLAYNCGYFPAVSSIFRLLTCGAVIINLVSHCERVYQORTRICNVIDH
MIVNKNLSRESTEALQEFRNLVQNHPIEFNMANFFQLNYSLLVSIASVVVTTYTIILLQSVN

>DmGr5a

MRQLKGRNRCNRAVRHLKVQGMWLNKLSGLEQIRESQVRGTRKNFLHDGSFHEAVAPVLAVAQCFCLMP
VCGISAPTYRGLSFNRRSRWFYSSLYLCSTSVDLAFSIRRVASHVLDVRSVEPIVFHVSILIASWQFLNL
AQLWPGMLMRHWAVERRLPGYTCCLOQRARPARLKLVAFVLLVSLMEHLLSIIISVYDYDFCPRRSDPVES
YLLGASAOQLEFVFPYSNWLAWLGKIQNVLLTFGWSYMDIFLMLGMGLSEMLARLNRSLQOVRQPMPEAY
WTWSRTLYRSIVELIREVDDAVSGIMLISFGSNLYFICLQLLKSINTMPSSAHAVYFYFSLFLLSRSTAV
LLFVSAINDQAREPLRLRLVPLKGYHPEVFRFAAELASDQVALTGLKFFNVTRKFLFAMAGTVATYELVL
IQFHEDKKTWDCSPFNLD

>DmGr64e

MARTTGDPAKRRRCMSRIKFWRRSRVGSSEATLGI IKYRVVEKDTKRFKLSLIKAWLLRIRQEDYKYSGSFO
EAIKPVLI IIAQIFALMPVRKVSSKFAEDLTFTWFSVRSYYALVTILFFGVSSGYMVAFVTSVSNFSDSVET
LVFYLSIFLISLSFFQLARKWPEIAQSWQLVEAKLPPLKPKERRSLAQHINMITIVATTCSLVEHIMSML
SMGYVNSCPRWDRPIDSFYLSFSSVYFVDYTRFLGIVGKVVNLSTFAWNFNDFVMAVSVALAARF
RQLNDYMMREARLPTTVDYWMQCRINFRNLCKLCEEVDDAISTITLLCFSNNLYFICGKILKSMQAKPSIW
HALYFWFSLVYLLGRTLILSLYSSSINDESKRPLVIFRLVPREYWCDELKRFSEEVQMDNVALTGMKFFRL
TRGVVISVAGTIVTYELILLQFNKEEKVPGCFEN

>DpGr64eP

MARTTGDPVKRQKCIARIKFWRRSRVGSIDITLGILKYKVVSNQAQRQFQFSKINAFRRRAVRDDYRYSGSFO
EAIKPVLI IIAQIFALMPVRGIGSKLAEDLTFWSSARTYYALAMMISFGVTSYIVAFMTNISFDFDSVET
MVFYGSIFLISMSFLQLATRWPAAIAQEWQAVETKLPPLRLGKERRSLAHHIKMITLVATTCSLVEHLLSMT
STMTYSVACPRWPGHPVDNFLYFNATVHFVVDYSTFLGLLGKVINVLSTFAWNFNDFVMAVSVALASRF
RHLNDYMQREARSATTVGLLDAVQSQFRNLCKLQVDDGISTITLLCFSNNLYFICGKILKSMQTKPSAS
HTMYFWFSLTYLLGRTLVLVSLYSSSINDESKRPLRIFRMVPREYWCDELKRFSEEVHMDTVALTGMKFFRL
TRGVVISVAGTIVTYELILLQFNKEETTAFTCENA

>DmGr64f

MKILPKLERKLRLLKRVTRTSLFRKLDLVERARKKAFQESCETYKNQIENEYEIRNSLPKLSRSDKEAF
LSDGSFHQAVGRVLLVAEFFAMMPVKGVTKGHPDLSFSWRNIRTCFSLFIASSLANFGLSLFKVLNNPI
SFNSIKPIIFRGSVLLVLI VALNLARQWPQLMMYWHTEKDLPOYKTQLTKWKMGTISMVMLLGMMLSFA
EHILSMVSAINYASFCNRTADPIQNYFLRTNDEIFFVTSYSTTLALWGKFQNVFSTFIWNYMDLFVMIVSI
GLASKFRQLNDDLNRNFKGMNMAPSYWSERRIQYRNICILCDKMDDAISLITMVSFSNNLYFICVQLLRSLN
TMPVAHAVYFYFSLIFLIGRTLAVSLYSSSVHDESRLTLRYLRVCPKESWCPEVKRFTEEVISDEVALTG
MKFFHLTRKLVLSVAGTIVTYELVLIQFHEDNDLWDCDQSYYS

>DpGr64f

MKFLPAKLERKFRRLKHSRSSLTRKLDVMHESARKKVI EENC DAYKNQKQSEYECRKRPTKFPGGTRET
LSEGSFHQAVGRVLLVAEFFAMMPVKGVTAHPGDLFSWRNVRTCFCLVFIASSLANFGLSLFKVLNNPI
SFNSVKPIIFRGSVLLVLI VALRLAQQWPTLMMYWHEVEQGLPQYPSQVKGQMGHTIRMVMLVGMMLSFA
EHLISMISAIHYARYCNSTSDPIKNYFLRTNDEIFYVTSYSTALALWGKFQNVYSTFIWNYMDMFVMIVSI
GLAAKFRQLNDDLNRNFKGMNMAPSYWSERRIQYRNICVLC DKMDDAISLITMVSFSNNLYFICVQLLRSLN

TMPSVAHAVYFYFSLIFLIGRTLAVSLYSASVHDESRLTLRYLRCVPKDSWCPEVKRFSEEVISDEVALSG
MKFFHLTRKLVLSVAGTIVTYELVLIQFHEDNDLWDCNQSYYS

>AgGr15

MGFAVSENHDTKPLIQPTWHTCLKRWCASWLHWPRVQRRASREDWLFNGTFHEASRGVLMMAQLFSIMPVC
GILAKDPRKLRFSYTAGRTFYAYFCAIGIGFLATMSVYFFASKRYHFQKMVTAFFYCYNLYAMYRFGRLGQ
RWPALMVKWARVDDSLPPQKGLFERAVLAYRIKLC SIMVMALSLEHLLSIVA AVHYSNNPCAVHDPYEAF
FKSNFAFVYYPYSTWRGFLT KFFNVICNFMWSYVDL FVIVISMGLSHAFRRINAHLFLHKREKMTEQFW
GEQRQKYRNVCDLVTTVDDHISAITMLSISNNLFFICVQILNSMNSRPTLVHTVYFWFNLIILIGRTLAVA
MFAAEVNDESKRPIEVLRTIPREGWCLEAKRFAEEVTTDTVALTGLKFFSMTRQLVNLVTGAIITYELVLI
QFHKDEASDVDLCKLKRMDTL

>AaGr4

MDSRFNGELVPVQSKSRAFLKHFYKPKRATRENWIHDGSFHDVAVSGLLITAQLFSIMPVCGIGQKDTTKLH
FSWKSKRIFYSYAACMGTAFLAVTSTIRFVDRNFNFSRLTG VFFYFYNYLYGMYCFVRVAQKWPVLMQKWFN
VEQLLPQSSNI IERGKLANKIKLISILVITLSLMEHMLSIVA AVYYPNCNPKDPVKMFFKSNFLFVYFY
FEYSEIRGFVVKFINVISTFVWSYIDL FVIVISIGLSHTFRRINNHLNMHKREKMTEQFWGEQRQNYRNIC
DLVRFVDDAISIITMLSISNNLFFICASILNSLNTHPTLVHTVYFWFGLAFLIGRTLAVSMCTAAVNDESO
RPFEVLRAIPRDGWCVEAKRFAEEVINDTVALTGMKFFNMTRKLVKVTGSIITYELVLIQFHQDETADYD
LCTFRRT

>CpGr4

MARKLVQDRLFRRRTNKVTRFNNDVAPSVERKSHFVTELNLFKRASREDWIRDGTFHDVAVGGLLATAQLFA
VMPVCDVTAKDPRRLHFSWFSKRALYTYVGLAGTAF LAMNAIRFLMKNFNFNRLTTVFFYSYNYLYGMYRF
LLLARKWPKLMQSWYDAEQTL PQLGNVVDRGALAWKIKMISLLVITMSLTHELISIIAAVYYSDCPDIGD
PVDFFFKSNFVFIH YFEYSKVRGFFIKYINILCTFLWSYIDL FVIVTSIGLSHTLKRINEYLMKHKRESM
TEKFWGEQRQNYRNICDLIQVDDVVSIIITMLSISNNLFFICVSILOSLNSHPTFVHTVYFWLGLIFLIGR
TLAVSMYAAEVNDESKRPIEVLRTIPRDGWCLEAKRFAEEVVNDTVALTGMKFFNMTRKLVKVTGSIITY
ELVLIQFHQDEPVEVDLCKMRSF

>AgGr16

MGLQKIYPAEKSNNSTEMLSKTVRILDKDFYHPPNRPRFINGGGYFCRSIRPVLIVGQMFGLPLDGWVCG
RWSWIHWRLLSWRNLYALFVQLGALIMACFSFATFWYSGVEFAKIMSWWFFTLNLLISINFAVLARSWPOL
MSRHWQLEQSLPDQPRLSAACRRNRARQVGLVATVLLTSGLIEHVL SKPAGLHRAYRCPINLLEAHYKQAF
PEMFSFVYPNPYIGFLAQTITSLLT VYWNVVDLFLISVSVGLRTNLAQVNDVIASSEKLYHRGIFWKDQCT
HYRRVLGLIRHVNNHIGVFIVISYASNLFICVQLVNVFQONSSFIVTSYFWYSLFHLIGRIVAVSLYGSA
IHDEYCRTRTLFYNL PDEYGYTDEVQRFRHQVEHDSVALNGYGFYLRKLI LKIAATVVTYELVLTQVNE
AEAKNGDDNPCT

>AaGr5

MSKTREYRMMFFTTLESVTITLTVYQKIIALWEFYRQRQVNL DQEGSYLAVFRPVII LGQVFAIFPVVGYGV
ALAERIQFKWCSLRMLYTMFQLGGAIMSGFSLATFWTTGVEFSKILSWMFFTINLSITIGFTVLARRWSA
MMTEWENTEQSLPFRPQLTASNRRVRRKVITIMVTLMLSALFEHALAKPSGLYRAYKCGIKDLLEAHLMOA
FPFMFSFIPYDIYVGFVAQVVT SVLTFYWNVVDLFLIVLSIGLRQSVRHVNEIILNSKAQYHSDFWHDYR
KHHQRVCNLVHIVGQNVAYLVVISFANNMFFICIQLIGVLKPYPGIIVAIYVWYSLAHLMTRMVMVAVYAA
AIHDESRRILPTFRTLPTQYYSKEVQRFHQOMENETVALSGFRFFHLTRKLI LKISGTIVTYELVLLQVND
AEEKNGDQNPCT

>CpGr5

MFTTSPRSDNLILVRPKGASLEKEFYQQRRTVKFDQEGSFLAVVRPVIILGQVFGIFPVVGYGAAQADRIR
FEVCSLRMFYSVLLQLGGATMSGFSLATFWTTGVEFSKILSWMFFTINLLITTSFTVLARRWPELMKEWEN
TEQSLPDQPLLAASNKKLHRKVVT TMSVLMVSALFEHALAKPAGLYRAYRCGIQDLLEAHLMOAFPEMFSF
IAYDIYVGFVAQVVT TILTFYWNVVDLFLITLSMGLRQNLVHMNQIIMSSRGQFHSELFWDHWKHFQKVC
ELVHLFKRKVAYLVILSFTNNLFFICIQLIGVLKVPGLIVAIYVWYSLAHLMTRMIMVAMYAASIHDES
KLLPMFRTMPTQFYNKEIQRFHQOMENDTVALSGYGFHHLTRKLI LKVAGTVVTYELVLLQVNDSEEKNGD
QNPCT

>DmGr61a

MSRTSDDIRKHLKVRROKQRAILAMRWCAQGGLEFEQLDFTFYGAIRPYLCVAQFFGIMPLSNIRSRDPQD
VKFKVRSIGLAVTGLFLLLGGMKTLVGANILFTEGLNAKNIVGLVFLVIVGMVNWLNFGVGFARSWSHIMLPW
SSVDILMLFPPYKRGKRSLSKVNVLALS SVVVLAVGDHMLYYASGYCSYSMHILQCHTNHSRITFGLYLEK
EFSDIMFIMPFNIFSMCYGFWLNGAFTFLWNFMDIFIVMTSIGLAQRFOQFAARVGALEGRHVPEALWYDI
RRDHIRLCELASLVEASMSNIVFVSCANNVYVICNQALAI FT KL RHP INYVYFWYSLIFLLARTSLVFMFTA
SKIHDASLLPLRSLYLVPDGDWTOEVQRFADQLTSEFVGLSGYRLFCLTRKSLFGMLATLVTYELMLLQID
AKSHKGLRCA

>DpGr61a

MSKAPDSILRRLKVRROKQRTILAMRWCAKGGKEFKELDFTFYRAIRPYLCVAQLFGIMPLSNVLSRDPQD
VKFRLRSVGMCF TG L F L L L G G I K T V M Q A N I L F R T G L N A K N M M N L V F L I V G I V N W L N F T G F A R S W S K L I L P W
SSLDILMQFAPYAPSKHSLRSLKRLIGCVVGLAVVDHLLYYASGYYSYHMHI FHCHTNHSRSLFSGSYLEK
EFSETFELLPNMFSVCYGFWLNAAFTFLWNFMDIFIVLTSIGLAQRFRQFADRVLALQGRQVPTLWYDI
RRDHIRLCELASLVEASMSNIVLMSANNVYVICNQALAI FT KL RHP INYVYFWYSLFLLSRTSLVFMFTA
SKIHDASLLPLRSLYLVPSTHWTEEVQRFVSQLTSEFVGLSGYRLFYLTRKSLFGMMATLVTYELMLLQMD
AKSHKAGLPDLCA

>DmGr64a

MKGNLNFRTKTPSKDNGVKQVESLARPETPPPKFVEDSNLEFNVLASEKLPNYTNLDFHRAVFPFMFLAQ
CVAIMPLVGIRESNRRVRFAKSIIPMFVTILFMIATSI LFLSMFTHLLKIGITAKNFVGLVFFGCVLSAY
VVFIRLAKKWPVAVRIWTRTEIPFTKPPYEIPKRNLSRRVQLAALAI IGLSLGEHALYQVSAILSYTRRIQ
MCANITTVPSFNMYQNTYDYVFQLLPYSPI IAVLILLINGACTFVWNYMDLFI MMISKGLSYRFEQITTR
IRKLEHEEVCEVFIQIREHYVKMCELLEFVDSAMSSLILLSCVNNLYFVCYQLLNVFNKLRWPINYYIFW
YSLLYLIGRTAFVFLTAADINEESKRGLGVLRRVSSRSWCVEVERLIFQMTTQTVALSGKKFYFLTRLLF
GMAGTIVTYELVLLQFDEPNRRKGLQPLCA

>DpGr64a

MEGPALNARKTGPKRRHESLLRRTLAQPANTVPKLADKTHLEFNVTSEKLPYARLDIFHRAVYPFMFLAQ
CFAVMPLTGIREPNRRVRFTYKSLPMLVTLTFIAAALMMELAMLKHLLOIGINAKNFVGLVFFGCVLLAC
VVFIRLARRWPLIRYWRTELVTTRAPYEMPKNLYRRVQLAGMMI IGLSLGEHAMYQVSAILSYKRRVN
LCSAAANITAVTSFEDYITLNYDYVFQWLPYSPI IASLILLINGACTFVWNYMDLFI MMVSKGLAYRFEQI
TARIRHLEHEEVAESTFIEIREHYVKMCELLEYVDSMSSSLILLSCVNNLYFVCYQLLNVFNKLRWPINYY
YFWYSLLYLIGRTAFVFLTAADINEESKRGLGVLRRVSSRSWCVEVERLIFQMTTQTVALSGKKFYFLTR
LLFGMAGTIVTYELVLLQFDEPNRRKGLLPLCA

>AgGr20

MIEVGFGRMVPGPVRSSNATRPTRSRWHWRKRGVNTFVRPAEIDDRKERFYLAIASVLRWARLFGVFP
LSNITATDPSAFRFHYFSPYIVLSALSIVGGLFIMAAALVRLNRVGINAMNIAEPIFFGMCTLLQLLQVRL
AQAWRGFMVYWAEREEMFFARPYGAINLRKVI GLAVCILTSALVEHVYVINQAYNVYQESLTCQYNVTN
PLKLYGTLTFGSVYQSVPYHLLTMYLLYTTISLTFIWTFTDLFIMLVATGIACRFGQLNKRIDSNLQNGS
EAFWGERMTHFVGLIELVERTNRIVGPLLIASCANDMYFLCLQTLNALEDKPYDINDWYFRYSFTFLILRT
SVKLVFAADVDENSVRTHKLVQKIRSEHYNDELEILRICSSGGVSI SGMGFFTITRIFLTMAGSILTYEL
VLMRFHRSSKGVGEDLPCGYID

>AaGr6

MIDPLWRDRYILWKNKILQPDDEEVPVNEENVSEYDFHIAIAPVLRFSQLFGVFPPLNSVMNRLPGNMLYK
SVSFATALSMMAIFGGYAVSLLSLKRLARTGLDAINMAEPPFFAVCATSAVLFWALAKEWQFVTVWSETE
RVFLRKPFGRKALRSSIRRTAFVVLTLALAEHIFSVANNIANLRREVHHCNWTISSPVKYFCLKTFSSTFD
SIPYNLPVALYNEYVVVAMTFANFVDFIVLVSIGLTTFRFTQLNIRISERIQSRKGTTEDFWEQIRIQYV
SLCDLVLLNRSINRLVFSYANDLYFICLQIMHATLEQPFLINRVYFFYSFSLLLRFTFLMFYSSQVQD
ASHQPCRLILRVPNHEYCDELQRVQMSRRGVSLTGMGVFLVSRRIFLTIAGTII TYELVLLSFRKRIMDE
PDDNNDVSCPELHLD

>CpGr6

MNYDPYWRPNILWKKSSILAAEPFTVAEYDKFHNEATGSDHFHTAIAPVLTMSQLFGVFPLOSVNRRAPE
SMTFRTVSVTCVVS AISIFGGY AISLLSIRQGRALNAINIAEPPFFSICATSSVIFWQMAKQWQAI IVTW
SRTERKFLHHPFRKTVLKWKIRSVATVLLLLLFAEHLISVANNVSNLRREVVDYCNWTIRDPVKFFCVRTFS

TAFHTVAYS L PVAAYNEY I I I S M T F V W N F V D L F I M L V S I G I S A R F D Q L R D R V F E R M N S R T P T T E H F W E Q I R
I L Y V A L C E L A G T I N R A I S K L V F V S Y A N D T Y F I C L Q I M N A S Q E Q P S A V N K V Y F C Y S F V Y L L L R T F L M F W Y S S
E V Q H A S H A T Y R L I L R V P N E E Y C D E L Q R L Q M Y S K C G A S L N G M G V F F V S R R I L L T L T G T I I T Y E L V M L S Y R K D
S S E Q H S S K L S C D P W

>CpGr7

M H T Y P Y W R N P N V L W K K S S I L A A K P F T V V E C G K P Q K G A S E S D H F H T A I A P V L T L S Q L F G V F P L Q S V L N R A P E
S M T F R T V S V T C V V S A I S I F G G Y T M L L L S L V R L G R D L N A I N V A E P I F F G I C A T S L V I F W Q L A K Q W A I A V A W
S R T E R T F V R Y K S N L K G K I R F V A A A L L L M A L A E H L L F V A N N V S Y M L K E I D Y C N W T I P D P A K F F F A K T F T T T F
H T F A Y S L P I A I Y N E Y I I I S M T F V W N F I D L F I M L I S I G I A A R F D Q L R D R V F D R I N S W T P T T E H F W E Q I R I Q Y
V A L C E L A A S I N R A I S K L V F V S Y A N D T Y Y I V L Q I M N A N Q E Q P S V V N K V Y F W Y S F A Y L L L R T F L M F W Y S A Q V E
H T S H G M C R L I Q L V P T A E Y C D E L Q R L Q M Y T K C G A S L N G M G V F S V S R R I V L T L T G T I I T Y E L V L L S Y R E G S S D
Q H S T T V S S C E P W Q L T

>AgGr21

M C V R S N P D K E N R A P V L E S V R T L A T S M C S S V T T T A M K L A A K G Y T L R Q R V R Q K L C P K I V D D D R D T F L R G I R P V
V I L G Q M F G I F P I Y G V T R N D P K R F R L K W F S L R V I L N L T V V V T A L L Q A Y Y E Y G R L K A I G I N A K N V S S L I F F I D
A C L I N V L F L N L A T K W R S V A M K W D E V D D T F N R P P Y H M Q S W S L R K R L G V V S F T L V F L A A V E H I L S I V S N V H N Q
M V E I K Y C N W T E P N Y F Q H Y S L R R F A N I Y L N F P Y N S L S A V F F T Y V S S A L T M Y W N Y Q D I F I I M I S I G L A T R F Q Q
I N N Y L K I L S D G V L I P G E D F W I R V R T N Y V A V C E L L D D V D R A I S W T M L I S C A T N L Y Y I C L Q I L H V S K K L A N T V
E D A Y Y G F S L G F L I V R T V I V F L S A A H I H D C A K K P L D I I M K I P N V G W C V E L E R F S T Q L K S E K V A L S G M G F F S L
T R Q L L F S M A G T I V T Y E L V M L K F D Q E S E S K G N I P L C T K F R R F E H V S V

>AaGr7

M Q C I F I V H S F I V L T D N F Q K D H Y K L N S E K F Y Y I N S V Y I L T G Q L F G I F P L S G V F D K D P N R I R L V W P T V R V A L D
L I V L G A G I A N T I A E C M R L R M V G V N A K N I N G L I F F V D G C I I N V L F L L M A T K W N R V A V K W D S V D R I F L T E S Y R
I E S K W T L K R R L W T A T A L L L G L A C C E H L L A T I N N L N D Q W H E I E H C G W K E N I T D T F R H F S L R K F S N M Y S I V P Y
S T V S A V F F S Y V S F A L T L Y W N Y L D V F I I L I S I A I A T R F D Q I N T H L R T L A G G G V L I P N E P F W I R V R T H Y V S L C
E L L D E V D Q A V A W I V L I S C A T N L Y F I C L Q I L N V S Q K L R Y P M N D V Y Y W F S L L F L M G R T A T L F L C A A H I H E A A K
R P L D I V A K I P N N G W S V E L D R F S S Q L K S E T V A L S G M G F F H I T R Q L L F S M A G T I V T Y E L V M L K F D K E S E G K Y
I R P C S F F D I E K K W L T

>CpGr8

M V A S D K A L K E Q P P V E N F P W S L H D T Y H E A V R P L L I I G Q I F G M F P V T G I F N R N P C K V H L E W I S V R V V L N L V I F
G A A L V N A V A E F L R L R Q V G A N A K N I N G L V F Y I D C G T I S V L F L K M A T S W N Q V A V K W A H V E R I F L E E T Y R V E S W
W T M K R K I R I V A G M L L L G A V A E H L L S I V N L A N D H R F E A I N C G W Q H N I T D A F R H F A L R K F S N I Y I H F P Y S T A S
A V F F L Y V S F A L T L S W N Y M D I F I I L L S V A I A S R F N Q I N A Y L E T L A A G G V L V P N E P F W I R V R I H Y V A L C E L L A
K V D R T M S W L M L V S C A T N L Y F I C L Q T L N V I S Q K H P H M N D L Y Y G Y S L F F L I V R T V T M F L C A A R I H E A A K K P L
D I V S K I P N T G W C V E L D R F S T Q L K S E T V A L S G M G F F H I T R Q L L F S M A G T I V T Y E L V M L K F D R E S E G K Y I P P
C S M F D I E R Q W L P S H

>AgGr19F

M N F H N T I R P I L V I F L L F G Q F P L Y G V L T R K P L R W H F R W C S L Q T V L S L G L I H V G L F L C F V E Y D R L K A I G V N A D
N L I G P L F Y L D V I I I M L L L L R V A Y R W P T V V P K W E Q I E S L E V M Q Y N A R Q O N A R S C R R I R A I A L L L I V L G F A E H
M L S I G K T V N A R V Y E A R T C H W N Y S N L P E Y Y A L R T Y G F F F R R V S Y N F P S F I F L E Y A N T A L T M A W T V Q D V L L I M
I S D S I A G Y F K R I N S R I Q F Y T T V Q V V A R E K F W S E I H S D Y V M V C E L L E H V M S I C S P L L V S C G T N L Y L I C Y Q L
F H L V D R T D D F I I V T V F T Y F S L F F I I L R T F L T M H Y C S A V H E V A R K P L K L F R R V P T S N W C S E L E R F Y S F I R K S
S I A I N A M G L F R L T K K T M L T M L G A V I T Y E L V M L H F A Q T T A N Q G I V R A C S P E Q F L F Q P K M Q I T T N

>AaGr13P

M P R E E T F N T A M R P V L L I F Q L I G V F P L C G I L R K D S R E L R F Q W F T L K A L L S V V I I L I G L T M S Y V E Y E Z L D R V G
G V N A Q N I I G I V F F V D T V I S T S L L V I L A Q K W H K L A V H F D E I H R I F S I S D E K I I K G I H F P I R F T A G V I L T C G I
L Q H M S S K T A D V Y N Q Y H E A E Y C G W E M K N F P Y Y F A S R N Y S F I F K H I P Y N I L I L L I F E Y A A T V L T L S W S C H D L M
I I L T S F G I T F Y F R K I Y E K I L P F H S G V M I A S E K F W M E I R S H Y V I L C E L V K A T N G S L S L I I H S C G K N L Y L M C
Y E L I N I A R K D E S I L S S V H H W C S L I N L T I Q T T M V F Y S A S M M H E I A K A P L A V C N R I P N F G W C S E L E R Y I G Q L K
S D R V A Y T G M G F F H L T K R S I L A M A G S V V T Y E L V M L K F A E D T E G V G D V V P C S N L A F S K D

>CpGr16

MDSLNNALRPVFFVYQLMGTFPVGGILQRSSVGLRFRWLSVQFLFSLTLIIVGLVMVYIEYERLERIGANA
NNTIGILFYVDTVLIMALLANLARKWRPLALEWERVDQEF LAKETGEAKRSLRKAVWFTSGVMIVCGLLEH
LLSKTAGIINQSHEAKFCNWEIQSFAHYASRQYAFIFKHIPFNIPVLAFFEYCNAALTMAWTCQDLLIIIL
ISMALSHRFROIYAQVQPFSSGIVIAAEKFWSDIRAQHTLLGQLVRDTRNLLAPLIIASCNTLYLICFQL
LNISRKQESLASSVNHWYALCYLIVKTNLVFYHTAMVNETARAPLAICRRIPNIGWCLELERLVDQLRNER
VSLSGMGFFHLTKRMTLAMAGTVVTYELVMLKFAEDTEGIGDVKPCSRLAFSKDT

>CpGr17

MNLNRFACYFIFSIKTRFRMSQSCLKLSFMPRKSRSPSSAMDSLNNALRPVFFVQLMGTFPVGGILQRSP
GLRFRWLSVQFLFSLTLIGFGLLMVYIEYKRLERIGANANNTIGILVYVDTVLIIALLVNLARKWRPLALE
WERVDREFLAKETGEAKKSLRKTWFTSGVMIVCALLDHLKSTADIINQSNEARFCNWEIKSSAHYFASR
QYAFIFNHIPFNIPVLAFFEYTAALTMAWTCQDLLIIILTMALSHRFROIYAQIQPFSSGIVVAAEKFW
DIRAQHSLGQLVHDTNRLAPLIIASSGNTLYLICFQLLNISKKQESLASSIHRWFALSYLIVRTTLVY
HTAMVNETARAPLTVCRIPNIGWCLELERLVDQLRNERVSLSGMGFFHLTKRMTLAMAGTVVTYELVML
FAKDTEGIGDVKPCSRLAFSKDT

>AaGr8P

MTEGGFHCIMRPIIVPVQFLGMFPIFGAAZPSSALNFRWTSRRTAWSGIIVCCSLLMATAEMRRIARTGI
NFSNIIIGTYFFVDTAIIIVCLTVLMASGWRRFLHEVEKLELIWTRWPYNLRRDNLKNCWILTMFWMFFATV
EHCLASSVQVYIQOQESLRCNWIYSNAMKNYAHRNYAYIFNWPYNVPVLFVRYVYTSVTMAWTYQDILI
MVISAYLVTRYRQFFWRIEVAACNGTVLPTESFWVEIREHYVIESEFLVHVDKMYSPVLVSSCCNDVFLICY
LLHSLKPHAYAISFVYFWYTLCLFLIGRTLTLWMAAELNREKRSALRVVQRISSDGWCTELERYYLQLRA
EVGALSGSRFFYLTHQTTTIVAVIFTYELVMIKYSRMTAADVGIPENC SAMAFSOD

>CpGr9

MFKYSSTSSSTRPVLSNNQRDTFHSIMQPIILSAQCLGLFPVIGITEKTTSALQFRWFSRLTVLSVTVMTS
AFLVAIAELRRIARTGVNFSNIIINPYFFADTAIIIVGLLIRLGRWEHLMVQVENVERILLKPCYNLGOVHL
KRNCWLAAGSWLVLATTEHFFATTSFVNDQRMESLRCNWTYTNAIENYARRNYAYVFNLPWMPYNIIVLLY
LRYVTFVSTLAWTYQDVILIVCCIYMNTRYRQFFTRIEVAASVERPPAESFWGEIRYHYIALSDLLQSMN
YELSALVINSCSNIFLVCIYLLHSLGPKQSTLSFTYFWFAVCFVVGRTCTVMLTAAKFDRTLKRALQVVH
RIPNEGWCDELSTRYYHHLRIEKVSLSGKRFYLRTRTAFGMFSVIFTIEIVMIKYSKMARNSGVPADCSTL
AFSOD

>DmGr64b

MPQGETFHRAVSNVLFISQIYGLLPVSNVRALDVADIRFRWCSPRILYSLIIGILNLSEFGAVINYVIKVT
INFHTSSTLSLYIVCLLEHLFFWRLAIQWPRIMRTWHGVEQLFLRVPYRFYGEYRIKRIIYIVFTIVMSSA
LVEHCLLLGNSFHLSNMERTQCKINVTYFESIYKWERPHLYMILPYHFWMLPILEWVNQTIAYPRSFTDCF
IMCIGIGLAARFHQLYRRIA AVHRKVM PAVFWTEVREHYLALKRLVHLLDAAIAPLVLLAFGNMNSFICFQ
LFNSFKNIGVDFVLMFAWYSLGFVAVRLLTIFVASSINDYERKIVTALRDVPSRAWSIEVQRFSEQLGN
DTTALSGSGFFYLTRSLVLA MGTTIITYELMISDVINQGSIRQKTQYCREY

>DpGr64b

MPQGETFHRAVSKVLFISQIYGLLPVSNVRALDVEDIRYRWLSPRIFYSALIIALNICEFGAVLNIVGQVA
INFHNSSTLSLYVVCLLEHFFFWRLAIQWPSIMRSWHSVEQLFLRVPYRFYGEYRMKKRIYIVFAVVMLSA
LAEHCLLLTNSFHLSNMERTQCKNNVTYFESIYRWERPHLYMILPYHFWMLPFLEWINETIAYPRSFTDCF
IMCIGIGLAARFHQLYRRIA AVHRKVM PAVFWTEVREHYLALKRLVHLLDAAIAPLVLLAFGNMNSFICFQ
LFNSFKNIGVDFVLMFAWYSLGFVAVRLLTIFVASSINDFERKIVTALRDVPSRAWSIEVQRFSEHLGN
DMTALSGSGFFYLTRSLVLA MGTTIITYELMISDVINQGGIRQKTQYCREY

>DmGr64c

MQQSGQKGRNTLQHAIGPVLVIAQFFGVLPVAGVWPSCRPERVFRWISLSLLAALILFVFSIVDCALSS
KVVFDHGLKIYTIIGLSFSVICIFCFGVFLLSRRWPYIIRRTAECEQIFLEPEYDCSYGRGYSSRLRLWG
VCMLVAALCEHSTYVGSALYNNHLAIVECKLDANFWQNYFQRRERQQLFLIMHFTAWWIPFIEWTTLSMTFV
WNFVDIFLILICRGMQMRQOMHWIRQHVRRQMPNEFWQRI RCDLLDLSDLLGIYDKELSGLIVLSCAHN
MYFVCVQIYHSFQSKGNYADELWFYFCLSYVIRVNLMMFAASSIPQEAKEISYTYEIPTEFWCVELRRL
NEIFLSDHFALSGKGYFLLTRRLIFAMAATLMVYELVLINQ MAGSEVQKSFCEGGVGSKSIFS

>DpGr64c

MKQVATRNTLQHAIGPLMVVAQFFGVLVPSGIWPSSPAEKVSFRWFSLSFLAAVGFVFSIMDCVLSSKVV
LDHGLKIYTTIGSLSFSVICIFCFGVFLQVSRWRPHLIQRTAECEQIFMQPGYECCFGRFRSRRRLRWGVIL
FVAALCEHCTYVASALYNNHLQIVECKLNVNFWLNYFQRRERQQLFLVLQFSSWWIPFIEWTTVSMTFVWNF
VDIFLILNFRGLQMRFQQMHWRIRQNAFQRMPEFQTVRGDFLDLNDLLSIYDKELSGLIVLSCAHNMYF
VCVQIYHSFQSKGNYADELYFWFCLFYVILRVLNMMFAASSIPEAKAISDTLYEIPTEFWSVELRRLNEV
LISENFALSQKGYFFLTRRLIFAMVGTLMVYELVLINQMAGTVSQKSFCDGGVGSKSVFA

>DmGr64d

MLRSHLSVHGLQMERSVQENTLHYTIGHVLI IARIFGVLP LAGINPNGKPENVRFRWFSPYILFFVVAFTF
VIADFMLSTKIVLNDGLQLYTMGSLFSVICIFCFGSFIKLSRRWPHI IRETALCERIFLQPCYANQEGLN
FTRFLRRWALILLVAALCEHLTYVGSAAWSNYVQIRDCNLKVG FVENYFLRERQELFSVFEYRAWMVFFIE
WNTMAMTFVWNFGDIFLFLMCRGLKIRFQQLHWRIRQNLGKPMKFEWQEI RSDFLDLDLKLKLYDKELSG
LILVCCAHNMYFICVQVYHSFQVKGAFMDELYFWFCLLYVISRLMMMLAASSIPEIKDISNTLYEVRSS
PWCDELGRLSEMLRNETFALSQKGYFYVTRRLIFAMAGALMGYELVLFROMQOAVVQKSI CSRGPSSMSI
FFS

>DpGr64d

MEWSAQSVPNKNTLHHAIGYVLVVAQFFGVLPLSGVEPSVPPVAVRFRWFSPLNLLPVAALCFVLLDFVLS
AKLVIQNLKLYTIGSLSFSVICIFCFGAFLLAPRWPHI IRRTFECERIFLQSCYNSSIGRRFSQRLRRW
AIALLVALCEHLSYVVS AVWSNWKQIRECHLDIDFWQNYFLRERQELFSILPYSTWFALYVEWCTLSMTF
VWNFVDIFLILVCRSMQMRFQQLHWRIRQHI GRRMSDEFWQEVRYDLDLNDLLKLYDKELSGLVLVACAN
NMVYFICVQIYHSFQVKGAVLDEVYFWFCLLYVVSRI VNMVLAASSIPEAKQINFTLDEVPTSCWSELER
LSEIFHNEAFALSQKGYFVLRRLFTMAATLMVYELVLINQMEGEEVQRSICNRGAGSSMSIFFS

>AgGr14

MLNMTPEVTPVKRFPVSRPPSTPSTALAEETPPADGAAERECSTHEA VAAVIFMGQLFSLIPIDGYARS
TDPRDVRMLRSVQFVYGCVTFLIMLTLIIMLCVHTAHEPSFGVQOATSLVYYAIVFFMVLMLLARNWS
QIMGRWYTDEAPFRTPYRPPSRTL PFRKRVHLIAFGVMFLAFVEDTLNFVSAYRLNELHIRYCPHTAGFW
KNFFHREHPYVLRVPIPYHPVVGWTIELTMRIAKFTWHYVDVFIICLSLGLQRRFVQFNERLERLDGQPQSQ
GVWRALRLDYVRLSELVTFVDERFSKLILFCCANDMFFITVQLFNSFDLKPTTVTTVYFWYSLGFLIGRCF
LMLFVVSSI SRASEKPLETLRRFPSTNWNLDLRLCDAVATSENALSGKRFFFVRRPLILAMAGTIITYEL
VLLDQVKKTPDTRDCNF

>AaGr11

MISIIHKQGYFANPLPTNLFTNRFIVTLLAVLDSYIFQLFQKMI SFQTPSAPT KKTIIIVQEVNVKFKAKAK
GCTAHEALAPIILVGQLFSLMPISGYFRTPISKLKFTLKS VHFAYGCFTVFMGAIMSMFFAFRIQRGTFG
IGATTTCIYYAVIITAMIEFIILARNWPLIMQRWTADE DVFLSNPYETGQYLPLESLVKRVAFTIIFFAFV
EDTINFISAYLLNVVHMKYCTHATDFWRNFFRREHAYIVRFIPYHPALGVAIEVVMRVAKFTWHYIDVFI
CVSLVLQRRFQYNDRI RTFNGNQOPEEVWRTLRLDFLRLSELV TYLDTKLSRIILLSCASDMFFISVQLY
NIFDPKQTTVTTFFYYWYSLFLICRCFVMLYVTSSIYEASL KPLELLRDFATSSWNLDIQRLLDHASLKS I
AFSGKRFFFITRPLILAMAGTIITYELVLLDQVAKEQDTRDCDF

>AaGr12P

MISIIHKQVYFANPLPTYLFTNRSIVTLLAVLDSSIFQLFQKMI SFQTPSPPKKKTIIIVQEVNVKFKAKGK
GCTAHEALAPIILVGQLFSLMPISGYFRTPISKLKFTLKS VHFAYGCFTVFMGAIMFMFFAFRIQRGTFG
IGATTTCIYYAVIITAMIEFIILARNWPLIMQRWTADEGVFLSNPYETGQYLPLESLVKRVAFTIIFFAFV
EDTINFISAYLLNVVHMKYCTHATDFWRNFFRREHAYIVRFIPYHPALGVAIEVVMRVAKFTWHYIDVFI
CVSLVLQRRFQYNDRI RTFNGNQOPEEVWRTLRLDFLRLSELV TYLDTKLSRIILLSCASDMFFISVQLY
NIFE

>CpGr15

MLFATKSAGSLKKGPIILVQEVKEESPIPNDC TAHALAPIILFGQLFSLMPVSGYFHRTPKLAFRVRS L
RFLYSCVTLFGIVSIVVFLMYSIRRGVGLGSSAATFIYYTVITLALIEFMNLGRNWHWIVAYWTEQEKPF
LYYPYSTRKGLKLDKLVKCVASAVIFFAFVEDIMNFI SAYKLNELHIKYCSHRDDFWRNFFHREHAHIVKV
IPYHTVVGVIELMMRVAKFTWHYIDVFIICVLSLEKRFQFNSRIERFKGVDQPPEVWREIRLDYLRLS
ELVNFMDRLSRIILMSCANNMFFISVQLYNIFELKPTPMTSVYFWYSLFLMSRCFVTLYISASIYEASL
KPLELLRDFSTLWNLDLQRLLDHISLKNIAFSGKRFFYITRPLILAMAGTIITYELVLLDQVSKDQDTTK
DCNF

>AgGr17

MESPAIDDFHRAVRPFLLLISQLFSLFPLGGLYGRTLQDIRFRWFGPGTVYSFYFFLSGLLTLVAHIYYSLT
VETLGTSEISNIIYYVLNLSGAIVLLAIAARWRTIMEKWSLEENFLHPPYAERRFWSLKRVAAGSTMV
VLAFFVEDTLHVASVYYTNLQYFKRCDNSTPFWTLFYQREHPKFFHYLPYSLPAVLLLELTHKIFLYVWTFM
DLFIIIFVALGLARRYEQFYRHAAQYKGRHVMGPVWQRLRLDYGRISLVAYMEGIMAPIIVCTTASDLYFI
FYQMYNAFQFSASLISELYFKFSLAFLIFRTLVMLLIASNIHVASLRPLDILRSVPMSCWTIDVQRFTQEL
LSGRNCLSGHGFFFLNRSVILAMAGTLITYELVMLKEVNPSSSEKSDFCDGVKRLY

>AaGr9

MQAPNQHCLAQLRKWHRHQFSPSDNAVMDSNSKIDDFWGAVRPIIFVAQLFTLFPVQGVFGRDLQQIRFQWL
HLRTLYSLTFVLAAALIIIAQINHTVSTANTSMITSVLYYILNFGSVCFLIATKWRNIMLNWKMYEEV
FLHKPYLMKGRSLKFKVRMVGILLLAFVEDLLHMLSCCRTIEVYIERCDNSSFWEFYTREHSKTFDY
ISYSLPLALLLEFVHKVYLFVWTFMDVVISVVSIGLATRFEQLFHRIEHLKKGKMLPESFWAEIRLDYTKIS
NLVIYMDGVLSPMIMITSASNIFFITYQLYMSVQLDASSMTTFYRFSLLFLILRTLVMLLTSSRVYVASR
KPLEILRAVPMSSWTTSVQRFTNEILNIENALSGHKFFFLKRGIIILAMAGTMITYELVMLSEVRHSDNTQF
CDGGHRLY

>CpGr11

MNSLPMDDFWGALKPVIIFVAQIFTLFPVQGVLAQDVYGINFRWRSRLTLYSLFFVVLAFIALCAQINLTAL
FTVTTGQVAGILYFGLNLTGAIICFLIISRKWRAMMIRWKSQEDVYLRPPYRVYGRSLKFKIRLIGFSVIIIL
AIIEDLLHVASSIKIHKKYINFCNVTGTFWELYNREHPQVFKYVSYNLPVLLVEFTHKVYLFIWTFMDL
FITLISIGLLTRFEQFYQRIEHLKKGKSKPEVFWAEVRGDYTKISSLVTYLDEILSPMILITCASDVFFITF
QLYMTVRMKTTSITTIYYRFSLIFLIFRALLMLLTSSHVYVASRKPLEILRAVPMSSWTTSVQRFINEILT
IDNALSGRHFFYLKKSIVILAMAGTLITYELVMLSEEKPLDSSNICG

>CpGr10

MISPNQDDFWGALKPVIIFVSQFLFSLFPVQGLFAKDASAIQFRWMSLRTLYALFFLTLAGLAIQAQVNFIVG
TKVSTGVVTEQLYFTFNFCGTVCFFVIACRWKQIMMYWRKQEDIFLRPPYKPYGISLRVKIGVTGLSLIAL
SFAEDILHILSSMKVNQDYIDFCNITEPFWMIFYTREHRKVFDYVPYNWPMPTLLVEFTHKVYLFVWSFMDV
FIALISIGLLTRFEQLYSRIEHLKKGKPMSEAFWAEVRRDYMQISNLVAYMDRVLSPMILITCASDVFFITY
QLYKSIQKLTSGTTFYRFSLVFLIFRVLVMLLTSSHVYVASRKPLEILRAVPMSSWTTSVQRFTNEILN
IDSVLSGHKFFFLKRRIILAMAGTLITYELVMLSQVKATDSEIKCED

>CpGr13P

MSSLPMDDFWGALKPVIIFVXQIFTFPPVQGVFAKDIYGINFRWRSRLTLYSLFFLVLGFI FLCTQINLTVL
YKGTLEWVEGGILYFGLNLTGAIYFLIISRKWSIMIRWKSKEVDVFLRPPYRMYGRSLKFKIRLIGFSVIIIL
AII EESLHLASTIKVHHKYINFCNVTGTFWELYNREHTRVFKYVSYNVLTVLLVEFTHKVYLFIWTFMDL
FITLISIGLLTRFEQFYQRIEHLKKGKSKPEVFWAEVRGDYTKISSLVTYLDEILSPMILITCASDVFFITF
QLYMTVRMKTTSITKIYYRFSLIFLIFRALLMLLIISSHVYVASRKPLKVLRAVPMSSWSTSVQRFINEILT
IDNALSGRHFFYLKRSVILTMAGTLITYELVMLSEEKPLENSNICG

>AgGr18

MYEKAANHFNKMTMSIENPHIRKNGYGRGNWKSFGROYVRPCVGSFHHA VAPVLLLGQCITLLPVVNI FSA
NYRTARFKLRSFRCIYSLVYLALTG IYCTLFI RWYIRKGLNLAYFANCIYMVVVYLSAWLFFFIALRWQSI
LGAFSRCEFSFLSDHYRRQSKGRFALGWKIRFTGFAIFALALVEDWLNYYSAQSNIVQIATCNRTNVTVW
QNFYLRHHPVHFHWL PFNGFTIAITWINRCMRYTWTYLDIFIISFCYGAQFRYEQIFRRLVAVQGIACPT
NFWHDVRMDYVAVSELVQVLDAQFGHLILLACANDMYFIATQLFNGFQRRRVIANIYVYFWYSLLLLMFRTI
VMLYVGSVYAASTSPQLLRNVPSQHWGIDLQRLTDEVASGENVLSGKQFFFLKRQLILAMAGTLVTYEL
VLLDQVKKIPDTSTDCSYF

>AaGr10

MSPSVDMLKLLTLTSRRAATAVAIGKESFFPNFHLPRWSKWI GRLKKGKSTFDG SFHQAVAPVLFVGCFTLM
PVVEIFSHNPNRTRFKLLSVRFAYTAIYLIAAGFYSILACRRFILRGLNVSSFADMFYLMFNYIITVLFLL
IAIQWQKVLKEFANCERLMLKDAYTKLTERVTRFNLAWRIRMVIAGIIVLAFFEDFLNFYSAYQDNVYQMD
YCNRTEISFWENFYIRDHPQVFOYVPVNI GSILFVEWINRCLRYTWTYLDLFIISFSYAAQFRYTQIYQRL
VSVEGTHYPTTFWREIRTDYVAVSQLVAFLEQFGHLILLSCANDMYFIATQLFNGFQRRPAFMTMVYFWY

SLALLIFRTLCLM LYIGSGVHVASMSPLNILRNVP SKYWGLDLQRLTDDVASGENTLSGKKFFYLKRQIILA
MAGTLV TYELV LMDQVKQAPDPTTDCSFY

>CpGr12

MKLLALTSRHFQLPWPQPRKGSAAVSSSYHGSFHQAVAPVLF IGQCIALMPVVEIFNHNFRRARFKPLSAR
FLYSMLYLVIAGVYGVCTCRWCFVKGLDVT LFGDSVFI VVVYMTAVLFLLIAPQWHTVLKMFNECEKIMLR
DTYRKVTERYTRFNLAWQIRL IAFGLLV LAFIEDALNCNSVYKGNVNLQFCNHSNVTFWENLFI REYPQI
WRNIPVNFGLVLI IEWI IRCMRLTW TYLDVFI ISFSLAAQFRYNQIYYRLISLPSVASLPSTFWRNIRTDY
LAVS QLVAF LDDKFGHLILLACANDMLFIATQLFQGFQRRPTFATIIYYWYSLGLLIFRTLCTLYVGSVH
VASMSLNLRSVPSEDWGLDLQRLMEDVASGDNTLSGKKFFYLRRQIILAMAATLV TYELV LMDQIKQAP
DKTKDCSYF

>CpGr14

MKLLALTSRHFQLPWPQPRKGSAAVSSSYHGSFHQAIAPVLF IGQCIALMPVVEIFNHNFRRARFKPLSAR
FLYSMLYLAIAGVYGVCTCRWCFVKGLDVT LFGDSVFI VVVYMTAVLFLLIAPQWHTVLKMFNECEKVMLR
DAYRKVTERYTRFNLAWQIRL IAFGIMLLAVIEDSLSFNSAYQGNVNLQFCNHSNVTFWENFYI REHPQV
LRNIPVNFVGSVLI IEWLNKCMRLTW TYLDVFI ISFSLAAQFRYNQIYYRLISLPSVASLPSTFWRNIRTDY
LAVS QLVAF LDDKFGHLILLACANDMFFIATQLFQGFQRRPAFATMIYYWYSLSLIFRTLCLM LYVGS GIH
VASMSPLTILRNVP SKNWGLDLQRFMDDVASGDNTLSGKKFFYLRRQIILAMAGTLV TYELV LMDQIKQAP
DGSKDCSYF

>TcGr4

MLNNSAQRINNF FKLILSLGCF LGFFPSFQMSFAWKS WTTTYTIFITSLSVIYNFIPILV VVNYHQONISF
EDVEIIHSAAVVFNFFILFGLAKNWNKI IDEWHNMDTTLNKNFSY PKHLKLLVTALTTLFLLFGIVVYFL
KQMAFFSKLSETEGPISIELFYKHS GKTIFWIIPYNWITATIFTFLOFNSFIVFIFTDILLISISLILANR
FQQLSKTLTKRQKIPQFHPDNASFWKNVRKDYCKLSLLFLIDDHISLAIIFS YCLNFFSLLRFLTKLLRD
SEQNLIVKFHDYCDALNFTLR IICLTLFSSWINEASQEPVAILNSVVEREYSAEVGRLLLQIGFDEVALTG
CKMFKLNKGLFLNIVSAIVTYELIVIQYNNN

>TcGr5

MVFAELWKKIRNRGTPPKFELPTTHNCLKKVLLLSQIVGVFPLNHLN EEPKLFHTFKSWKVLYTSLTSFG
YLF CASL FKFYKAFKIGILLNQLITPLFFFHSFMTSVLFSQV ASRWPLFLNEWTKIEINLLKHYQSTTDLHK
KIRYSAFGMIFVALLEHCFMNLNYVYSSKCENNSTGVEHFFKKQFHYIFTYMPYNIVFGLCLTFVSWTA AF
VWNFGDIFII LLSMIMTERFRQINQIQKKAELISTPSPTKNFKKADYQFWRQIREDYDHLTNIVRYL
DQILSNLVLLSYSCNLTFILIQLFNSLRQMK SAGESIYFFYSFGFVIMRIVFVSIFGAFINEESQAALSYL
TSLPTEHYNEEQRLVTQTHIDSAALTGHNFRLTKGLVLSVAAAII TYELVLIQFNQATLNKYMQANETI
CF

>TcGr6

MKVLSNDL FHRV KWILLGQTFGLLPVNGVTSEKCNLTFSWYSKKVFYSKIIISGSIFMTTTSFYRILNS
GYNLTTFGSFIFNANSAIEGIIFFNLAKSWPQLIEKWSRVEALDNWKNDKSLKRKYLTICTIMSAAAVE
HILSIVNTCSQIPSEVEDKYTTYFLNTYPHLFNFFEFVPLAIFAVVMNLCNVFVWNFLDAFLIIISIALT
EKFRQVTAKVIVAHNEKIHLKHHWV KLREDYNQISILCKTVNKKISTLIIVSFGTNMFFIMS QLYWSLSIV
KTTVPESIYFSFSGLLVLR TIAVTLFASNINDESKSMNYLLSLSDDIYNSEVERFAFQIHSQPVALTGN
DYFTITRGLLFSMAGSIVTYELFLIQSNEAVSY

>TcGr7

MRLIRKMSDLVLTIEASDAVLAYPQPSFHQTF SFVVFIFGQFFGIMPLHGVS RKNVQEIRLEWKSFRFVYA
VYNIFGAFVMGLFCILKFALDGLMLDKATMSFYVLNFFGSIQFIIISKHWVTIMKEWSFMEMSMRNYGSSI
NMKKRFVVMTSVIMTLALVEHLLFIANAFITSQSCENATLYSGDEMYFRVAFPSVFTLIDYSLWKACFVEI
ANILSTATWNYTDLFIIILISCSLASRFAQINHRLKNNKLLHEKFWREIREDYNKLAHLTAVVDRNIAALVV
ISFVSN AFFICVQLYNSLKIRVGT VETVYYFFSFGFLVARTIAVTLYGAWINDES RKP LEILHSVPSEHYC
EEISRFIQQINSSPVGITGSKFFILTRNFLKMASTIVTFELMFLQFGPLINTNINHRSTDCFM

>TcGr8

MTTTHSSLRFILIAAQIFGMFPVSGVAKKDPTFLKFKWTSKR TIYSIIFALAAVVNTIIFLVHRVSLGRL
KFADWVTLVFFSVTFLIVVLLLQIAKHWP SLMKKWTQVDEAMSGYGFPPKLERKLRIIFAITVVASLVEHG
LFIGVEYMSCRGNLSEALDRFLMFHYDYVFALVPYHVVLGIIILEIVNIFSTISWTFMDLFIILVSLSLSA

RFKQVAKYIKFLVERNVLNKNWSQRRARQDYTRLTNLCKDLDEVMSSTILLSFGNNIFIILVHLYNSLOKPL
EFGYLDEIYYLYSFCILLVRISAVALHAATINTESKRPIYLLSTIPHHRYNLEIDRLLLYTKYETAALTGY
KLFTRITRTLILKITLAIVIYELVLVEYLKVESY

>TcGr9

MKENTTONCLYFMLVFAQCFGMLPVTGISEENCKNLKFKWSSKRTFYSLTFALVATANTVFFLIKMRGKR
NEFQEWVALLFFFVTVITVVIIFLDVAKKWPQLMKKWTEVDTAMNSYGFPIALSCKLKTTLTLLVISAIVEH
GLFVAVASAPCEGKNWSELFNNYFKMRFDYVFDVIPYHFFWGIMFQVLNIFSTVSWNFMDFIILISLCLS
ERFKQVATRNLQAAKEVTDERIWEQLREYDTRTLTILSHTVDKTLANTVVLSFANNLFVILVQLFYSLQAP
PRFGILNKLYVYSFAFLIIRMVAVALNAATINNESLKPKYCLNTLPHFLWNVEIDRFIYQIKYSPVVLTG
HKLFKITNALVLQITVAIVTYELIMIYVVRVKWS

>TcGr10

MRVQPSNTPPEKSQSTADTANLINKSLGKHNLOKSFQVAVILAQIFGFFPAQGI LGRDFRAIHFTWASAR
VGYTIVTILGATFVTVLQLHKIFAKGLNVEANRLFFYCSGLASGYLYLKLAMKWPRFMKDWSCEVMMAS
YGWPAGLNRRNLVLLAVFMSLALIEYILMQTNKLVLALECNNTSEGFDYFFGKMSYSHIFSLMDYNIVMA
LVLQFITLQHTFIWVFNDFVVMLLSTALAYRFTQVTDRTQSMSESKNKSESAAWKNLREDYNRLCRLCKRVD
EEISYIVLMSFASDLLFILIQLFNLSLRQMKNNLERIYFYWSFGFLIVRTVCLCLFGGKVNDESTQPMVLVN
SVSADVYNLEIQRFIHOIGTLEVAFTGKNFFSITRGLILSIAGAIVSYELVLMQFNDSLLETISEQIDSCP
VYL

>TcGr11

MFKSPTNMEKSTKIFPVPDGNLHKSYSKMLILAQIFGFFPVQGVGPDFRSLRFSWKSARVVYALFTLLG
TFLISGFQMQKIATKGLDLLEANRLFFFLTGMASLLFLNLAKRWPKFVKDWCVV DATFASYGWPKGLNKK
LNTLTVVFMIALVEHILVQTNKLVLALECNNTAEGFTYFLGNMSFAHIFALVEYDIFKALVLOTINLQI
TFIWTYNDLVMLISTALAYRFGQITRRIA AVASEKIKNEI IWKKLREYDTRQCR LVRKVDKEIAYIVLLT
FASDLLFILIQLFNLSLRMRNDLERLYFYWSFALLITRIVCLCLFGAKVHDES IKPLLLTNSVPTEIYNLE
IQRFIQQIGNSDIAITGKNFFSITRGLILSIAGAIVTYELVLIQFNVNLLQGELNKKGSCPYYV

>TcGr12

MKKNKYVQNCIFYAMKRPLLVAQIFGYFPPLYGTNSDPTCLKFKWISFKTTYSVFTLVVTFIIVACQLHKM
IAVEMNILQMNIFYVLLCSILVNI AFIKLATEWQPMKAWLKIELLVGNLGMRRNFRKKLDFIFTFITLLT
IVEHLLMELSTRADSVACSKTVSDGIRHYVNVTFPHLFNGLVDYSLWKALIFQISNLQTTFGGTFGDTFI
ILLSMFATSRMKQSRTKIEALVKSHVKATTPWRKIREEQCSLLYLCTLLEQKISYLVLLSFCNSLYFVLVQ
LFSALKQMGDTLQKTYFFISFGILIFRIIFVSLSAASINEESRKILILLSTPSELYSVEVERLTNQINYK
AMAI SGNFFIITRGLILKIAGAVVTYELVLIQFNKLLNEFDETSVOQLEILHNNTYWLC

>TcGr13

MKNII SHNTENTIHSSLKFS LKILHIFGLFPVSGLSGPDYKSLKFSWRSFKFLYSLCFFC ILCFLVLTLLY
NVFFVKEATQEITNVLFYLSAAATNAVFLQLAKNWSRFIHEWHCVEVIMGSVAINHSLKRLKIITIVILV
VATVEHLLIQCYIAVSIFGSSSFEADLRQFYKTAYS AIFTVIDFSLCKAILVHAITIRSTFSWTFIDVFI M
LTSTAFVFR LKQLNAKVEMLKNARVKN TALWKQLRYEHYRLYQLSVLIDNNMSYIIIVSFATNLYFII IQL
FGSMKIVKGT LKTAYYLISFALLIMRLISVCLCGASVHSESSKVLPLLSVSSSSYNCEVERFIDQVIKNE
IILTGGKFFKITKQLILQIAGAIVTYELVVIQFNRLRLTEDNDSNEANLLA

>TcGr14

MLFSSAAKTRPKPKSPQHEKENVHKSLSKSIIVIAQIFGYFPVQGVLSNEPIFLNFSWFLRVVSSLVTIIT
GVVIVFGHIRLMAVGGGYSQFEMNGIIFYACGTLSCIFFLKL SMEWQSIMLKWQEVLDKMSSYGPKNLNR
RINVTSAIFLLLEAAEHVLIQSNKLVVAIQCKGSFSKGAEHFFVNMSFPIIFDLIKPYYGAWLGVFLQIVN
TRMAFSWTFIDLFIIILMSCALAAFRQINTRIRCLTNMKVTSEKSWIALNDDYNRLCHLCFLLEKLSYII
LTSFLNNFYFIIFQVFESFYLHKATTLETVYYFISLGLLILRLVSVCFYGSWINEESKLSLDLLSYVPREV
YNKEISRLVETLKFQSVGLTGKRFKIKTKQLILKITS AVVTYELVVIQFRKKMERDEKPYSRNSIC

>TcGr15

MAITVVAPQSKTKPFTQKT VYYTLNFFFVLLLSGYPVQGLFASPIHLKFKYFSREFFYSLYIIVVACIM
HFLRLYHYFTIKNDKITLGELIFMCTAFLSLVFFLQ LARKWPRLIQKWCHLDEKFNVTYSYPKYLKLQTL
VTSIYLLIVFGEYFYFMSVKLDGSENTFQKVVEKIYFYIFAHIPYNI AVVLVIVLP IFSNFIALSLIDV FV
ILVSITITFRFQOINELLKEQKNKNSINFWMTVRRNYSEIGRLVSEINDTISSITVLSYGSNMILLINEL

SSFINVVVEESKCFYVYSFLVLIIRLLSVYYFSSRINAESRKPIRILFDVSSEIYNVEIKRWFQMKLDSV
ALTGSTFFRITPGLILSIAGAVVTYELIFIQFSQPK

>TcGr16

MQSSSEDGDHIQNSLKLLIKIGKVGFFPLINSSNEQVSFKFRSCCFIYSLFVWTVLIFYILLMAVYSCCVMP
NFFRYNFVHVMYSSNLFCLFTIYLRRLAKKWPDIITYWKRVDQAMEPKYGYPKNLTRKVKRIVIFWACTSVV
NQIVVPFAPMYHLIVHGKLOFPLSPFAIFMHTILFLOSIIGKTTVHYADLFIVAIAISLKRRFQOITQRIV
NHKEQYKNVEFWRNIREDYDRLARLTQFLDKELSYLILFSIGFNCFWVMKLLYNVLRFGAESQITINFMFSF
GFILLRFLSVFESCTRLNNESSRKPSFVIQFSHIPVDNIEINRLIQINFDKVFYFSGCQLFKIKNGIILSFA
GALVTYELTLFQYHAFYLT

>TcGr17

MKKIRIDNSRNQRKTPRKKRPQLINALLLLMKSGKYLGIPLKRVTSFEEKYIDFKSCVFIYSSLVWILNF
VVVLLTSDWVYTNFVSKFVSLVFNSEIFFSLTLFIYLANWHFVMSFWNQVDQKMEYKYNQPRGFNRNV
KLGVLVYSILSVGNHFGSPMHSVVSFLQSQNQITEVTFPLQYNDFFSKIIFTIHSILGKTTMHYRDFFLIII
TLILREKFKQINQRIQDNSENISTDFWQEI RNHYDLLSHMVRHFDKEVSYLILASVGFNGFWVLLFFYKSY
TAKFSSSANLYFAYPGYIILRFLLLFHCALLNEESKPAIIHFSEIPVLNTEITRLLTQIEFDNVFLS
GGKIFRMKSGILLSVVGATVTYELTIVQYNIFSN

>TcGr18

MKAPQSGLLLIQPNNFHKSRLFLFVIAQVFGYFPVQGVSEEKVTGISFTWFSLRVLSSLLTAFLGIVVIF
AQIRFMKLITGYEQAQMNNAIVFYGSGTSSSFLFIKLARDWHEIMTKWNQLDKALISHGWPKGLDKTLKRIA
IIFLALEAAEHFTIQANKLIVAVRCRGSFSKGFYFAVDMSFVAVFDFVDYAHWLGMIQLMNTRMAFAWT
FLDLFIILVSCALSERFRQINDRIQHLDIKSKHFKEWIAINEDYNRLCLFCDYLDKISWLILISFFNNF
YFIIFQVHLSLNLVLAAPPLEIIYYLISSSLLILRMVSVCIYANRVHEESKSPMDILSVAPLEIYNQENIRL
IVTAKYQTTGLTARKMFLLTKNLIFAIAGAVLAYELIVIQLNKNQPRKQGPSIYSLC

>TcGr19

MILFPRHTEMDNTQKWSNSFKYVFFLAQCLALLPVNGKHQIYSKWKSLHILYSLFVIFVTSILLIFQIVFA
VTHEFDRNVLSIMMKIYSICALFLNIRLGSRWQIKHKQOWNQVDCVMDDRRYQOLKKNLRIIAILS VYFAT
SLVNILKLOGTSNILEFELYSFVFNYPNYAMALIFLVYFYFYFFLSNFIDVFIASLSMAIALRFKQIRT
RLELSEKSOFDLGMTEFWLEMRRDYDRLSHLCKELDDGISGLILMSFAYNLFEVISYLFHQLMMDSQONVA
FYFFFFPYMVLRLAVCLYTSWINDESLAPVNILNSVPSRNYNPEIGRWLVQMSFDNVALTGWKMFKVTRGI
FLGVASIVVTYELVIMQFYGFSGKT

>HvCr1

MGPTSLKRNMFVWIPVKKNKVDVAKPKVKNITTFQDALRATLIIGQVFSLLPFVGVFTNVASNVKFIKTSW
KCGYSLLSLIGQMFMAVLCVKNLAKSNVSLNGTSPVIFYVTTCTVMMLFFQVARRWPALVQHISKAEDMDP
NFDCSLTRKCNITCAVVLILALLEHILSLLSAFAGASACYTGMPTYQGFVTHFYPPWFNYLPYSIVLGVIT
QFLHFQSTFIWNFSDLFVICMSYYLTSRLEQVNRKLLAAQGYLPEIFWRATREDYCRVTQIVRKVDEVIS
GVVVISFANNLFFICLQLFNTLEDGLKGTGECTQLNSQSKLKKIVVSKSGPLGGHEAAAYFLFSLVYLLSR
SVAVSLIASQVNSASSVPAPVLYDVPSVYCVQVQRFLEQVNGDQVALSGLQFFSVTRGLLLTVAGTIVTY
ELVMFQFNSSTPSLNITSPTSATHIITTLAT

>BmGr6X

MLLRNYKQNL SFWTS AKKSKIHKIQSQETVTFQGS LKLVLF IGQLFSLFPVCGLLSNDANKVXFVPI SWKC
GYSMLSMIGQLFIIVMCILYVAHFETTNGTTPIIIFYGVTFISMIAFIRASRRWPELIQHISKSEELDPSF
DFRLKKKCNITLLLVLVLAILEHIFIRSAYSASQICYPHTGFYEGFVRYLYPWVDFLPHYSEELGMVTQF
LNIQSHFIWNFTDLFVICMSYYLTSRLDLVNKLLPAQGYLPEIFWRRTRETYCRATKLVKRVDEIINGI
LFI SFANNLFFVVCVQLFNTFDDSDVMVGLCYNYSERRTKPVGREPVIYLLFSLGFLISRSITVSLIASQVN
LASTVPAPILYDVPSAVYCVQVQRFLEQVNGDQVALTGLQFFSVTRGLLLSVAGTIVTYELVMVQFNQAPA
SDSFTEKLVENNISTIETFYNYS

>BmGr5N

YFAFYLS TGCNTFIFLRVASKWPTLIKHVYETQLDSYIDVKVKNKCFAYIIFFSMSMTEHMLSLLSKFVI
TMDCLPKGSDLFESYIIRNFPWLF EFDVPPYLP IGVILQFLT VSTINWSYSDLFIVCMSIYLT SILKQIN
KKIEMAGNSNHLPIPFWRTLREDYTRATRLVRSFDDTIS SVIFLSFASNLF FICLQLYNILSNGVTSKYNL

LKEMCPNYPSPGLGGYEQIMYLLFSLFLLGRSLVSVLVAAKVHSASMVPASALYNIPRNMYSCEIQRFLLD
QVHGDKVALSGLRFFYVTRSLVLSVAGTIVTYELVLLQFSNED

>BmGr7

MVLEAHTQIQYCTAKANYCEFHAHLRHLMLRLARWAGFFPVQGLSQTNPDDVRFEFRLSYALYHAITVIGQT
VMTFLAFYSFVDSNVLSVVSNFLFYFTNYVTLVLLWRLSKNWSALISKTLEFEQSVTEIRTRNLVSRNT
TLTYVVLIFAMVEHALSKVFNIRSVMCCLGETSLNHTVINNYFKFKWKFVFDYFSTSTTYSYFVGFIAEFL
CMQATFLWSFTDVLIMCFSIYLSFFEDFNSTVSSFMKKASKTVPWSTLRVOYSQIVLIVKQMDQLDYFV
LISYFTNLFFICFQLYNLNRIDANDVCNENMDIIATASVTYLTYVYVFSFLFLVTRALLLSIMAANVHSC
AQVPQLALYEVPTADYSLDVQRFQLQRYTTVGLSGVCFNVTRGMILRVIGTIVTYELVLIQLTKKNLDND
TSIRDYYLPKHLI

>BmGr8

MAPRSVRSMVGTSSKDKMLKGGFYETVRIPLYIYRLIGILPISGLWHRSSKYNRFLSKSFYTIYAPTIVMQ
TFLLLVHIIYDLFAFFFHGHQRLGRLIYHMNFYITITILIFMGRSKWKNVIKEIETIELTLPRLRNSKKALALT
KSFVFAFFVFLAEVVLILQFTLRLTKQRHVLPGDSGLYLRSYFVYIFPYLYDHFPSYVMGFIVQIIKVO
GIITLNMVNCVSVILSIYLTNRLKHYNRIVFAKGSKTNNRLKWVELNLLYTRISNLVKIIDKNLNPFFVI
SFTANLSYICAQLFYILNKLTSSRTVKITSFLEDKRCDWETVLYISISFALVVLKVLVLSIIAAEVHTTSR
EPLRLLYTLPTAEYTIETQRLMTQVYYSNLSLSGLNFFHITRGMILLGMVATLLTYEIVLLQI

>HvCr5N

AYLDKVFLLWSCLYGVFGSKRFISLIWSTLILGSLVIEVLAIWKVIRALAGVARDMSGHRSVTARLAGTIF
YSISILSLVLVSKLYYNWRTNIAGVWGKVERSVMGKIPVDRTLKCRMTFVAGLMTFFSIFEHAMSILSSVG
LDCPPSLILKRYVLVSHGFIFMGQDYSEWFAMPLVISTIATLLWNFQDQVIVLISMGLTSRYRRLNECLA
KVCELEKQHKSDKKEAVKVYTRWKIREAYVKQAMLVRKIDVALGGIVILSCSCNFYFICLQMFGLITQG
LSSDLLSLIYYVISLAWLCTRVISVLAASSVNTHSKLALNHLNYETHCYNVEVERLQDQLTKDYIALSG
MGFFYLKNTILLQAGAIIVTYELVLIQFDDQGDALNATKI

>BmGr4

MDKDKFQEFPLTMSRIFSMTRYFGVSTCKPSIAFGWTVILLMLLAIEVGAIWKIVRLLGGWAVHSTDSRG
FTARLSGCIIFYGNALLSILSIKFKVSSWEQLSERWSRTETDPGLRLPDSRIRKRTVLVSAFVMTACVEH
MLSMMSATGFDCPPEEYTERYILSSHGFLVQNDYENLWLAIPIFIMSKLATALWNFQDLIIILISMGFSTR
YNRLNTYVHRVVMLELNLKEGAQVSSSENYMRFQIWRRIQAYVROAALVRLVDDQLGALVLLSNVNNLYFI
CLQLFLGINSKDRGSFINRLYYFISLGWLMFRACGVVLAADVVIHKKALISLYLCPelaynLEIKRLKY
QLKNDEVALTGMGLFSLNRELLLEVAAAVLKYELVLVQYDK

>AmGr1N

SEPVAFSANSFNPKTDSLHASMRPIIMLAQFFSLFPVSGVNSPDSSYLRFRTWRSPKFIYCTISFLSSSIMT
IFNVLRIVTTGISSIKMTTFVFNGTNLIASFLFLKAMRWPCLMVTWEKLEKELSQRHRKISKISLSMKFK
IVTIVVMTFALVEHLSIIHGYPKAKECIEFHREQSILGVYFQMQFPQIFSRTSYSLWKILVDIINILST
FSWNFVDFLILISIALTDQFRQLNSRLYSIRGKAMPEWWAEARSYDYNHLATLTRQLDHSISIMVLLSFA
TDLYFICIQLLFSFNPMRGIIEKIYFGFSFGFLARTTVVSLCAATIHDESLLPAPILYSVSSSSFSSTEM
RFLSQVTTDNICLTGMKFFSVTRSLVLTVAGTIVTYELVLVQFNTOQTASNATIVCEVK

>NvGr1

MSQLHFRSSKIDSSPKRGRYESLKMDSLPADVSRPSASNSGANLVESTRSFHCALRPIIILAQCFAVFPVS
GVRSPDATHLKFTWRSFKILYCLSTLGSIVLMFFSVYRLATTTISSNKTSNLVFSLTAGITLLFLKLAR
QWPSFAVSWENMERELATRHNPRSSGINLATKFKILSVVMVFALVEHTLSILSGYVSAVECASLRGDKD
IMATYFALQFPQMFDTDSNYTLWKGLIVQFVNFLSTFSWNFMDLFLILVSVALTQFRQLNQRLYSIRGKAM
PEWWAEARIDFNRLATMTRRVDSDISDIVLLSFSTNLYFICIQLLNSFKPMPNAIQTVYFCFSFGFLLSR
TSAVSLYAATVHDESLLPAPILYSVCSASYSSTEVRRLTQVTTDNISLTGMKFFSITRSLILTAVGTIVTY
ELVLVQFNAVQAEOSESNTKVCEVK

>AmGr2

MHSEDQIQMLMLKTKDGLGEIPKGGKGRGSLNKIWSVSMYHKDDNNIEDISANQENDLSTKRPRAEARNYFRN
SEALENFHCAIGPVLKAAQIFGMFPVSGIGSSSLSKLQFKIFSLTMYSGFIALMISFMTIVSMIHMLKTF
NASTFQIRGGLGAATVAVFYGNLSVGSILFFSLSSRWVSLQYEWAMERYIDSNSTEPTRLRWKFFIIST
MVLVLSLIEHVLSIFNNIDGYEWNESNSTFHNFLEIYTLRSHSFIIDTLNYNFVYGLYVFFVSKLATFTWN

FTDLFIMLVATGLAERYKSLNKKLAVTMTKCQAAFNWRELREYAILSCIVKKVDDHISPIILLSFANNVY
FICLQLLNGLSISDKNSVLSEAYFFGSAFLICRTCAVTLLTARIHDQSKQSLPYLYNCSTSSYSVEVQRL
QCQLATDDIALTGLRFFSITRNFMLAVAGAIITYEVVLLQFNKG

>NvGr2

MTAEAKPKGHRNASPRRIHFGIGRKMMSSFFRSSKSGRGKPRSQHTPIFSKIHPAKRPALHSRRQSSNEDEP
ECFHRAIGNILLMSQFFGILPIRYIRSSSVRNFSFYKFAPRVIYSYFVLLAISVMTSISFLHLFRTLANS
FQTKGGIADATVGAMFYGNLLGNLMFLRLCPKWISIQHDWRAMERLIDNNGKWKGPVLRWRFTLISSTIL
SLALLEHILSMVNNTPSDVWFGKKNLEDFLIITYTNKSHRFIVRNVDYNFTLGLFIFFIKSVSTFTWNFTDL
FIMLVSTGLAERYKRLNARILEATPAQLSVTDWHELRECYAVLSALVKKVDNEISGIILLSFTNNIYFICL
QLLNGLSPSTAEPHIINSIYFFGSFIFLIGRTTAVTLLTARINDQCKLILPILYNCPSVNYCREAQRLOQQ
IATDDVALTGHRFFSITRNFMLAVAGAIIVTYEVVLLQFNIALQRDEELNNMAAGSNG

III. Predicted amino acid sequences of Odorant Binding Protein queries

>BM_BM_OBP28

MLKVFIVTFFAFQLSAIARLQANGCVAVPFPKDKTIIIVEAMKSCIAKTGANPNFIDVIRSGKVSEDEKFK
EFYYCTCNDTGFVNPDGHIKVKKECIELFPKETQPLVEPVIKNCCKEAGVVKYDTLFLKFLKCFQETSPVRVA
LA

>BM_BM_OBP22

MLKVFVVVVCTLGASQLCAALYTQKVAVSFPKDKTTIVVEAMKSCIAKTGANPNVIEVISSGKVSEDEKFK
EFFYCACNDIGVNPDGHIKVKKECIELFPKETQPLVEPVIKNCCKEAGVVKYDTLFLKFLKCFQETSPVRVTL
A

>BM_BM_OBP26

MKSVVLIICLAFVFNCGADNVHLAETQKEKAKQYTSECVRESGVSTEAINAAKIGKYSKDKAFKFNFLCFF
NKSAIFNSDGTLMNDVALAKLPPGVNKSEAQSVLKQCKNKTGQGAADKAFEIFRCYYKGTKTHILF

>BM_BM_OBP27

MKSVVLIICLAFVFNCGADNVHLTETQKEKAKQYTSECVKESGVSTEVINAAKTGOYSEDKAFKFFVLCFF
NKSAIILNSDGTLMNDVALAKLPPGVNKSEAQSVLEQCKDKTGQDAADKAFEIFQCYKGTKTHILF

>BM_BM_OBP25

MKSVVLIICLAFVFNCGADNVHLNEDEREKANWYTAECGVETGVSTEVINAAKIGKYSKDKAFKFFVLCFF
KKSAILNSDGTLMNVVALAKLPSGVNKSEAQSVLEQCKNKTGQDAADKAFAILQCFHKGTKTHILF

>BM_BM_OBP23

MTSKVLLSCVVLAVLATTVLAEDSRKLVSFAPVAKKLVLIQECLNENGLGEDAIEVIRAGEYREDEPFQ
NLVYCAKFKFGALDENNRISQVAAASFPKDIDVVTVIESCGKEDGNTPEVQVFKYKCFQKNSPVRMQLY

>BM_OBP30

MRSFVILLNYGLLCCGQFMAEDYYYDIVTRDPDDLREKENEVRALRAFQADCAEDVQVKPDLVVNLKSGD
WQTEDVSLKKWALCVLMKLGMLTAQGVFKMNEAMSKIIPDMNDKIIAEKLIDDCLSLQATTPHDAAWNYIKC
HHQKDPEGNFSSLNIF

>BM_OBP31

MKTFIVFVVCVVLQAALTDEQKENLKKHRADCLSETKADEQLVNKLKTGDFKTENEPLKKYALCMLIKSQL
MTKDGFKFKDVALAKVPNAEDKLVKELIDACLANKGNSPHQTAWNYVKYHEKDPKHALFL

>BM_OBP29

MTGPAAAVLLALLAAAGQATTGCKNCVILGKEERAMFRSHSDACLAQSRVEPRLLLESMMNGELIDDAALR
KHVYCVLLSCKMIGKDGKLLKAAILGKLAARPAGRDVTKVLEACAEQPGASPEDVAWNIFRCGYNRKAVLF
DYMPAGGASSGNTENHP

>BM_OBP14

MERKDFYLLIVVVALTSGVSSMSRQQLKNSGKMLKKQCMGKNDVTEEEIGDIEKGFIEQKNVMCYIACIY
QMTQI IKNNKISYEASIKQIDLMYPPELKESAKASAGRCKDVSKKYKDICEASYWTAKCMYEDNPKDFIFA

>BM_OBP17

MTRQQLKNSGKIMKKTCTMPKNDVTEEEIGQIEQGFLEQRNVMCYIACIYTVTQVVKNNKLSYDAVIKQVD
VMFPAEMRPAVKAAAENCKDISKTFKDI CEASYWTAKCMYDFDPKNFVFP

>BM_OBP15

MFLKNIFIECVLLYFVMLNTSFVNTMTKQOIKNSGKILKKACISKNDVTEDQISDIDKGFIEDKNVMCYI
ACVYSMSQVVKNNKFVHDAMVKQVDMMPTEMRDAVKASIANCRGVAKNYKDICEASFWTAKCMYEFDPAN
FVFA

>BM_OBP16

MRISFLFLISVTIITFDSVFAMTRAQVKKTMTIMKNQCMPKNGVTEDQVGKIEEGIFLENHVMCYIACVY
KTIQVVKNDRLDKDLISKQIDVLYPQEI RESTKKAVGDCINLQEKYDDWCEGIFRSTKCLYEKDPANFIFP

>BM_OBP18
MILIVIAKFLILISLCETMTMKQIKNTGKMMRKSCQPKNVDDKINPINDGVFIEENEVKCYIACIMKMA
NTMKNGKLNFEAAMKQADLLLLPDEMKEPTKEAIVACRQVADSYKDVCDASFHVTKCIYNHNPSVFFFF

>BM_OBP21
MITASLHVIFALLAFVYGGKDKPVLSEEIKEIIQTVHDECVGKTGVSEEDITNCESGIFKEDVKLKCYMFC
LLEEAGLVNDDGTVDYEMFTSLIPEEYFDRATKMIFSCKELDTPDKDKCERAFEVHKCSYEKDPDFYFLF

>BM_OBP20
MAVHIFLILASYMALAAHQLDDEIAELAAMVRENCADNESSVDLNLVEKVNAGTDLATITDGKCLKYIKCT
METAGMMSDGVVDVEAVLSLLPDSLKTKNEASLKKCDTQKGSDDCDTAYLTQICWQAANKADYFLI

>BM_OBP12
MTSFMVFFVLSVLTLYSDALTDQKNKIQSKFIEIGAECIVEHPISIDDINSFKNKKFPGSVNAGCFVAC
IFNKIGLFDDKGNLSHNSALEKAKGIFNADEEVKNLEEFNRCAKVNGEAVGDGVKGCERAKLAYNCLIEN
SLEFGFNIDF

>BM_OBP11
MSANSFVVLAFCALAVGVNALTEEQKAEITKSSLPLIAESKFEFSVNQGDIDAACKLGDPSGLNSCFVGC
MKGAGIINASGLFDVAATIEKSKKYLTSSEDLKAFEKLTETCAPENDKPVSDSDKGCERAKLLLDLDCFVANK
GSFVSFSL

>BM_OBP13
MLKIHVLLCFGMAILYFGSAKAVTPEESKAFAFAKPVIEQCQKDFGMDKESFAQKNLDEIDECLIACVVE
KFGITNDEKIDGALKALVTKFVGNEEERNKINKIVEECTEDANKSGDGT CNTSTILFLCCLKNGKDLWGF

>BM_OBP8
MLRVVVICVCFVLIAPYGINASSLDDLKVMYKNVIKECVGDYPITAADLKLKIKARQIPNDDIKCVFACAYK
KTGMMTEEGMLSVEGIKMSQKYLSDNPEQLRKSKEFAEACSSVNDQOVSDGKGCERAAIFKCSSTEKIT
NFGFEL

>BM_OBP9
MLRVVVICVCFVLPVAPYGINAVSYEQKIKIRDQLDRAGFECFKDHKITEDDIKNL RANKPATGENVPCFIA
CVMKKTGVMNDQGVIRKGPVLELAKKVLADDKDIKKLQDYIHSCSHVNSSETVHDKGKGCEFAMQAYTCMSA
NASKFGFNI

>BM_OBP10
MLRVVVICVCFVLIAPYGINAVSDEQKIKIREQIDKSGFECFKDHKITEDDIKNL RARKPATGENVPCFIA
CVMKKTGVMNDQGVIHTEPVLQLAKKVLTDKDIKKLQDYIHSCSHVNSKTVHDKGQGEFAIQTYTCMSA
NASKFGFDV

>BM_OBP7
AVTEEELKIEFTKLVKCTKDHPVDMSELMLQQLIAPKKTESKLLACAYKLNQVMTSQGLYNLEHAYKI
AEMSKNGDEKRENGKVVADICVKVNDVEVSDGEGKGCERAAIFKCTLENAPKVFKFGSSEYNCQ

>BM_OBP19
MTSAKTDVEIKAWFLGQAVECSKDHPVTTEELRMHKHELPSKNAKCLMKCVFRKCNWLDKSGMYDINAAY
ASSTKDFSDDKTKQENANKLFDTCVNEENVDGEEGCDRSLLLAKCLTKAAPQVSIYYS

>BM_OBP1
MWKLVVVLTVNLLQALTDVYVMKDVTLGFGQALEQCREESQLTEEKMEEFFHFWNDDFKFEHRELGCAIQ
CMSRHFNLLTDSSRMHENTDKFIKSFNGEILSQKMIDMIHTCEKKFDSEPDHCWRILRVAECFKDACNK
SGLAPSMELILAEFIMESEADK

>BM_OBP2

MFSFLILVVASVADSVIGTAEVMESHVTAHFGKTLEECREESGLSVDILDEFKHFWSDDFDVHRELGCAI
ICMSNKFSLMDDDDVRMHVNMDEYIKGFPNGQVLAEKMVKLIHNCEKQFDTETDDCTRVVKAACFKKDSR
KEGIAPEVAMIEAVIEKY

>BM_OBP3

MSIQGQIALALMVYMAVGSVDASQEVMMKNLSLNFNGKALDECKKEMTLTDAINEDFYNFWKEGYEIKNRETG
CAIMCLSTKLNMLDPEGNLHGHNAMEFAKKHGADETMQAQLIDIVHGCEKSTPANDDKCIWTLGVATCFKA
EIHKLNWAPSMDDVAVGEILAEV

>BM_OBP4

MKLQVVLVVLTVEMVCGSRDVMTNLSIQFAKPLEACKKEMGLTETVLKDFYNFWIEDYEFTRNTGCAILC
MSKKLELMDGDYNLHGHKAHEFARKHGADETMAKQLVDLIHGCSQSVATMPDECERTLKVAKCFIAEIHKL
KWAPDVELLMAEVLNEVSWKS

>BM_OBP6

MARYNIVVAVLVLVGARGSSSEAMRHIAATGFIKRVLDECKQELGLTDHILTDMYHFWKLDYSMMTRETGCA
IICMSKKLDLIDGDGKLLHGHNAQAYALKHGAATEVAAKLVEVIHGCEKLHESIDDCSRVLEVAKCFRTGV
HELHWAPKLDVIVGEVMTETI

>BM_OBP5

MKQRLRVLLLRFCILQTVLSESGVDVVKNLSSLFARFFLECDEERHFQPEVRLKVMFTFWYSESSTWDRDVG
CAFLCIFKKMEIDNPQDPSYRTHLELLSFANSEDNKIANQMVEIFYACGENTETDPCWLVALEQVKCYKNRI
NQLGLTPTF

>BM_OBP32

MYSHKYLNDFTNIPEILILLSSVALMSYGYNTKLFSSHSLGSEPSLSILYARDKKSDDKVTNECLMEMYPKN
LYKYPLRIDRNDIPCIHCVLKKFGIISNDGFINIKNYRRVQAIHRYDPRILISDVGETCAQNINGMNL
HDVCKKAKVFNDCQLYAISYREPEDW

>BM_OBP33

MYAHDKLSDMIADQCLNEMYPRSKRLEIEESDEPCIIFCVLKKFGIMSPTGVINLEAYRKRQVLPQOLAQR
NSINDFGSACLESAAEQHKQDVCKKAKVFNCTHLYKILLK

>BM_OBP34

MEKMILLNVFAVVLPCVLASRTRGSSGTLVDFTDPKVQGHLDALVRMAQSCVIKVRATPKDVRAVFTNSSP
VSRSGQCFATCMLEQSDIINHGVNRDILLVHLAGLVNGKNSRVVRKLNVSRLCLDSISGMTDRCLASTY
NDCLNENMIEFAFPLDIAEEAVRKMPFHLLIQPK

>BM_OBP35

GMSTHVLDFKRNMTTECLKEVQNNDKRPIKRLSPKQESPIHGELIACVLKKNQVQNGKVNKDNLMALVSK
FHAKETKLMKKLEKNLDRCLINISVKNHDECSLASQLNDCTNDIMASSKQKILFNY

>BM_OBP39

MVRKISALLCCFCVLGISMCDISAISTDNEQRCKNPPTAPQKIERTVITLQDEIKLSILREALDVIKEEHTM
PAERKRNRKREVPFTHDEKRIAGCLLQCVYRKVKAVDGFGFPTLEGLVGLYSDGVNERGYFMAVLEASRECL
MKNHDKFSRRTTPMDNDRNCVDFDIFECISDRIGEYCGTSGL

>BM_OBP38

MANLVLLLTFLVMTLSMARLSTEAPKSKTALFNDQDNMGEELDMEEIMSACNESFRIEYAYLESNDSG
SFPDETDKTPKCYIRCVLEKTEILSENGVLNPATAALVFAGERNGKPMSDLLEEMAVACADRHEKCKCEKAY
NFVKCLMYMEIDKYEKKN

>BM_OBP36

MAVSEISRILFTLIVSFIYIVYSFKPLTKDEHIERYNKMNEDIEPFRKNLTCARQVKASMAVVEKFLKR
IPQSNMEGKCFVACILKRNLIKNNKLSQENLLEVNRAVYGGDSEVMSRLKTAILECSKIVEDIFEICEYA
SVFNDCMHMKMEHILDKITMERRMEALGQMSNPDEWSEEEDEMLKLVKDEL

>BM_OBP37

MFYPPFRFTLLFYGLFVIYLVRAEPEKENHFTLALKKTLFSTARSCMSHVNANETDLEYLRKDPPFPDKAAC
I IKCLLEKIGVVKNNKYSKMGFLTAVSPLVFTNKKKLDHYKSVSENCEKEINHDTTECELGNEVVSCIFK
YAPELHFKT

>BM_OBP40

MSEFIQPSWRTOCNFRLNWDNRNRLSIDISHGAATTQTPVPTTKPKALRDFMVVPQSCDKTTCVFKKLNIV
SDKGVVDVKSFIKLLDKFTNSYPVWNSAKARVITTCCLRKSLIAYDGGCELNNILACTFDVLSENCPLNGNN
QTC

>BM_OBP41

MLTILFLLPIVVGVLSGNIPEQPRVYCGELPNTIYSCLGNPKIIQPEVSEKCNKPISECDKTRCIFKESGW
AKNNVIDKKKVSDFEQFAKDNPDWSAAVQNFKTTCLSDSLKPOGVDTNCPAYDIIHCALISFIKFASPSQ
WSTSEQCVYPRQYAGACPVCPERCFAPSPVNGSCNACLALLRTP

>BM_OBP42

MMGYACVFVILAVLQAI SAEDPPGLPPFLKDAPEKCKSPPRVKNPNECCISEPFFKEADFIIECGIEKPGSE
RGPPDCSKQONCLLKKYNLLKNDETPDIEAIKSLLDKYIEKNPSFKSSVEKAKECLREDLPGPPQICLANRM
TLCIGTVLLMECPDEKWN'TDDCKAFKDHMTECQKYFPK

>BM_OBP43

MKVCVLF AIFTVAQA AKATLKPISACCNIPELGNPEPLAEC SNPKLPGPCKDIQCVFEKSGFLTENKTLIK
EAYKTHLRQWAKEHEGWSVAVEKAI SDCVDKDLRQYLEFPC SAYDVFTCTGIAMLK KCPNEHWTC

>BM_OBP44

MSRLVLF FTILVVLQEF IINLYFN FITEIDSCCVKYPKLF DSEFITECYNTQRKANDKCERDMCVARKLN
LLTEEDSINKDALLRFVEEGFKTEIDL VNAIKKKCFEEDISNIGKPEMCEVAKYKICITSRMAEDCPKWS
KGICSSAQQKVENFMKMLS

IV. Predicted amino acid sequences for Chemosensory Binding Protein queries

>bmo-csp1

MKVLIVLSCVLVAVLADDKYTDKYDKINLQEIENKRLLESYMDCVLGKGGKCTPEGKELK
DHLQEALETGCEKCTEAQEKGAETSIDYLIKNELEIWKELTAHFDPDGKWRKKYEDRAKA
KGIVIFE

>bmo-csp2

MKSSLFCVLVLTVVVSSSRQOSYPRNDNININAILQNDRILLGYFKCVMDRGPCTKDGGKT
FKRALPEALPTACARCSNKQKAARFRTLLLAIRARSEPSFLELLDKYDPSRSNRELL

>bmo-csp3

MACVAVTWARPESTYTDKWDNINVDEILESRLKGYVDCLLGKGRCTPDGKALKETLPD
ALEHECVKCTGKQKSGADKVIHRLVNRKRPDLWKELAVKYDPDNIYQARYKDKIDAVKGS

>bmo-csp4

MKTIVIVCLLALTAVALARPEQYTDKYDQVLDLQDISNRLLIPYVHCILEKGQCTAEGKE
LKSHIKEALETNCAKCTKAQKGGTEKMIGHLINHEAEFWEELKAKYDPTNEFTKKYETEL
KRVTA

>bmo-csp5

MNSLIAFCLFAVLAVALARPDYTDKYDNDVNLDEVLSNSRLLKPYIKCILDKDRCAPDA
KELKEHIREALETECAKCTEAQKGGTRRVIGHLINNESKSWNELTAKYDPENKFTAKYEK
ELREIKA

>bmo-csp6

MKCLTIAALLFVAGLSIAEKYTDKYDNIDVDEILENRKLLVPYIKCVLDEGRCTPDGKEL
KAHIKDGMTACAKCTDKQKVSARKIVKHIKQHEADYWEQMKAKYDPKDEFKEIYEGFLA
GQN

>bmo-csp7

MKSLIVLSCLLAACLAADLSKYENFDVEPIVTSRLLKAYINCFLDKGRCTPEASDFKKA
LPDTIATNCGKCTEKQKANVRKVIKVIQKHSTEWKLVKKHDPGKHRADFDKFLG

>bmo-csp8

MRAVIFLYTCVFFVVVGQDINAMMSMPKYDERYDYLVDVDDIFRNKRLVRNYVDCLINAQRC
TPEGKALKRILPEALRTKICRTERQKRTSVKVIKNEYPEEWAKLASRWDPTGDFTR
YFEDYLAKEHFNTIPGSGPTVNVLSLQTPPPPPPPSRPASVFTNPPPPVMSTSPRPVV
LNRFR

>*Bombyx mori* CSP9 mRNA for chemosensory protein9, complete cds

MKFVLALIALAVVVAARPNDLFDYDKKYDNFVDEIIDNPRLLKAYTFCFNDKGGKCTAEG
NDFKKWIPESLQTSKCGKCEKQKYLVAKFVHAIKDKMPDEFDILRKLHDPKGEYTENLDK
FLETYGH

>bmo-csp10

MKSSLFCVLVLTVVVSSSRQOSYPRNDNININAILQNDRILLGYFKCVMDRGPCTKDGGKT
FKRALSEALPTACARCSNKQKAARFRTLLLAIRARSEPSFLELLDKYDPSRSNRELLYTF
L ATGL

>bmo-csp11

MKGFYVLCFALFAAVYCKETYSENDDLDIEALVGNIDSLKAFIGCFLETSPCDAVSGDF
KKDIPEAVAEACGKCTPAQKHLFKRFLVVKDKLPQEYEAFTKYDPOGKHFALLSAVA
NS

>bmo-csp12

MFMLFIISFIIIVPVLKCCGTETSTYTTQYDEVDIKEIMGNERLLVAYIGCLLDKNPCTPE
GKELKRNIPDALQSDCKSKQRENADAWIEFMIDNRPEDWTKLEER

>bmo-csp13

MKLLLVFLGLFLAVLAQDKYEPIDDSFDASEVLSNERLLKSYTKCLLNQGPCTAELKKIK
DKIPEALETHCAKCTDKQKQMAKQLAQGIKKTHPELWDEFITFYDPOGKYQTSFKDFLES

>bmo-csp14

MKSSLFCVLVLTVVVSSSRQOSYPRNDNININAILQNDRILLGYFKCVMDRGPCTKDGKT
FKRALPEALPTACARCSNKQKAAFRTLLLAI RARSEPSFLELLDKYDPSRSNRELLYTFL
ATGL

>bmo-csp15

MIENFYKCTISKSVLFLCLIFLPYALNQKYYDSRYDYYDIDHLVQNPRLKKYLDCFLG
KGPCTPIGRLFKQVMPEVITTACAKCTPTQKRFARKTFNAFRRYFPETLMELRRKFDPE
KYYDAFEKVITNA

>bmo-csp16

MIEWKRFKILHFLSYLGLLVLVVCAAQONRPQVTDALDEALNDKRFIQRLKCALGEA
PCDPIGKRLKTLAPLVLRGACPOCSPQETKQIQKTL SYVQRNFPQHWAKLVRQYAG