**Protein sequences – Zebrafish**

**Colour coding showing intron/exon boundaries taken from Ensembl zebrafish (*Danio rerio*) database, version Zv9, release 79.**

**SLC genes**

**>Si\_ch211-196h16.11**

**MWPRGWTQARCQDSGVDQDREQLWAELFQQLDLNKDGRVDVNELRIGLAARGLSWSSVEE**

**QIVRAGDINHDGQLDFEEFTEYLRSHEKRLRLMFRSLDRNNDGEVDVGEIQQSLHNLGVD**

**ITLEQAAKILQSMDKDHSMTIDWIEWRDHFLFNPLHNMEEIAQFWKHSVMLDIGEHLTVP**

**DEFSEKEKRSGFVWRQLMAGAVAGSVSRTGTAPLDRLKVFLQVHGQSSDKGNVWSGLRAM**

**VKEGGLTALWRGNGINVLKIAPETAIKFLAYEQIKRLMRGSNEGGTLKVHERFVAGSLAG**

**ATAQTIIYPMEVLKTRLTLRKTGQYSSVADCAKQILQKEGVRAFYKGYLPNMLGIIPYAG**

**IDLAVYETLKNAWLQRHTEGSADPGVLVLVGCGTVSSTCGQLASYPLALIRTRMQAQASI**

**KGAPQLSMLTLFRSIVAQEGVVGLYRGIAPNFLKVIPAVSISYVVYEHMRKVLGVGT**

**>BX088718.1**

**MGVVTTMDSDSARQPQGKLGGHALIGANLGARGKHYVCGSLAAFTNIIVTFPIQKVLFRQ**

**QLHGVRATEAVGQLQREGLRHLYRGLLPPLLQKTTTVAIMFGLYEDFSRLLLRHARSSGA**

**PELVTRSAAAALAGTAEAALTPFERVQTLLQDHRHNGRFNNTAHTFRTLLRDYGVRECYR**

**GLVPVLLRNGPSNVLFFGLRGPIKQWLPDARSRMGNMANDFVCGGLLGAALGIMFYPLNV**

**VKSRAQAQVGGKFVPCHTILMTVWRERGGSIVLLFRGATLNYHRSLLSWGIINATYELLL**

**KVF**

**>Slc18b1**

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**IALCFITRSINAVGFSAAITSSFAVSAKIFPDNIATVLGFMEIFTGLGLILGPPLGGWLY**

**QAFGYEIPFVFTGCLLFATVPLNMWILPSFDAVPSQNSFLRLCTRIKILLICFVVFTMSS**

**GLGFLDATLSIFAIEKLKLSAGSVGLLMIGLSLPYGAASPIFGVISDKYPSFRKWMMVIG**

**GMATAVSFCFLGPLPFFHIRSQLWLTVLMLVIVGFSLCMTCIPTFAEMIACAHEYGFEES**

**LSTLGLVSGLFSAVWSAGMFFGPTIGGYITEALNFEWSAGVQGALAFLAALLQVIYFTIE**

**DIQKKSKNANQNEISGEKSPLLPKTDDLRADIS**

**>Slc52a3**

**MPLYIHALACAFGLGSWVSINGLWVELPLIVNVLPEGWDLPSYLTVIIQFANLGPLLVTL**

**AHKFCPGRLRENLAIYAVLSIGVVACILLAVFWNYTTVIFGQPRSTAFFILTFFLALVDC**

**TSSVTFLPFMMQLPAKYITTYFIGEGLSGLVPGLVALAQGVGMSKCVNVTNVSDNVTDPG**

**PPTFIVETQYLPPNFSTEIFFSFLAVMTTISLGAFLILNRLPRTFELSTENLVSDSDAVA**

**TVCRGLEGPMDPKTNCPEEVEQKQNEVLLPKPQHSSYQLAFIYVMVLWVNSATNGLLPSV**

**QTFSCMPYGNMAYHLSAALSAVANPVACIIAMFFPKRSLVFLGILCLLGSTFGGYNMAMA**

**AMSPCPLLQDTPLGDAIIVLSWVFFTGLLSYVKVMVGVILRDRSHSALVWCGAAVQTGSL**

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**>Slc16a6a**

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**TNSRVSWIISICVFVMTFTAPLSTMLSNRFGFQPVVMFGGFLISLGTISTAFTSSINQMY**

**LTIGIVTGLGYCLTFLPTVTILSQYFSRRRSVVIAMASTGESFATFAFAPAFTALKNYIG**

**RRYTLVVIGMLQGITIICGALLRPIVIKPTSLTETEQKITYTLPVEQVQGFGSSGDSVVQ**

**SLEQEQGLKSGIELEEVEPVQINLKQQDNTSKNRLLDLTVLKEGSFLCYSAFGLFATLGF**

**FAPQLYVVELSASLGTERDKAAYMLSIMAISEIFGRLSIGWVMNCGCIRKIFVLLICVSL**

**MCLVLVLFTIVNGFWGLVVCCVLYGFLLGNITSTHIPMLAEDDVVGIQRMPLAVGVYVCI**

**QSFAGLAGPPLGGVLVDITQNYSAAFYSCAAGMGLGAIFLGLVRPAKTGHLCRRRNNGEN**

**NSAVEQVSKASQRNC**

**>Slc27a2\_4of4**

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HERVWASSFIQGVCGVTSEDIFYINLPLYHSAGFLIGLVGCIERGSTFVLRRKFSASQFW  
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RELYAATEGNVGFINYTDKVGVVGRINIISKLFFPFALIKFDIEKEEPVRNAEGFCIPVE  
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DRVGDTFRWKGENVATTEVADILTMVDCIEEANVYGVKVEGHEGRIGMAAVKLKEGREFD  
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**>CABZ01050100.1**

**MLGKFGLSAAFSIIYPVTAELYPTVLRNTALGACSMSSRVGGISAPYFNYLGSYHRSLPY  
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**>Slc19a3a**

**METLKRWMKDWKYPTSLLFIYGFFSTVKPLEPFLYPFLTGPDKNLTTEQLNNQIFPVWTY  
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GYNQTVNYVQSLWEHVEPSSNFTVYNGGAEALSNLFGAAAAYGIGLSSADWSRWGEMALS  
ALSALEGGALFAMVFSGNIWVCYGGYILFKSLYMLLITIAMFQIAAGLNMERYALVFGAN  
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**>Slc2a11a**

**MTTKEKKGHSYTLVLMVTSAAIGGTLQYGYNLAIMNAPTIFIQNFVNETFQERWGIQLGV  
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LLGSEPYWQYLLASNAIPGFIQLLTLPWFPESPRYLLFDCKDKEACLSALKRLRGCEVRR  
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QEAGISAGQIQYVTIGTGMCEFTACILCNLLIERLGRKLMLMGGYVLMTGWAVVFTVALS  
LENIVTWMPYLSMTCIFTYILSFGMGPAGVSVILPTEIFNQTARPAACMTAGFLMWLNLF  
IIGMIFPFLVSGLGQYCFVPFGTVCLVTATYIHMVLPETKGKTLPMITKEFYKLNYRGHR  
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**>Slc22a31**

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AGLQNNLVTEWNLVCDDYWKIPLQHICFMTGWTLGYILLGTLCDWLGRRRALLLSVVLSG  
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FSARNGMCVSDELYPAETLLSEIDEAFPEDVQPEYHHVFELRHTRVIWKNCLILGFTLFI  
GTGIQYCFTRNLHIYSPHFYFSYFLRVLTGALACIFLCVTVDRYGRRGMLLLAAIITGLS  
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GMAASSLMELQNNGGYFLHHVIFASFAVLSVLCIMLLPESKHKPLPDSLKDGERQRRPPL  
FLSRMSRDNPPLLRTEPNGPEYNRDNYSRLVSATKKMLSKDTLPYKISSSTQAPLLSSNG  
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**>Slc5a8**

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KAMSLFYGAVCIGMAGIASMMGGMLQAAFSISGVIGGPLLGLFSLAILFPCANSKGGLAG  
LVSGLGLSLWVCIGAQIYPPPAENSRPLTLNTHGCNLSMAPDTTNWTASMDIYRIEEETL  
ERPLLADNWYSLSYLYFGLLGTVTAIAVGLIVSILSGGQRMKLQPGLTLSKEDLTCYKAY  
KILKAKVSGNAGKLDLTRELEVSLRENNCDFGDVELS**

**>Flvcr2a**

**MLGQFACSCAQVFILGMPSQVASVWFGSDEVSTACAIGVFGNQLGIAIGFLVPPVLVPNV  
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IARLMCNKPFILLLISYGLNVGSFYAVSTLLNRMIIEHYPGEEVNAGRIGLTLVVAGVVG  
SLICGVWLDKTKTYKQTTLSVYLLSFVGMLIYSFTLNLGHLWLVFLTSGVLGFFMTGYLP  
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**>CU638740.1**

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VKSRAQAQVGGKFVPCHTILMTVWRERGGSIVLLFRGATLNYHRSLLSWGIINATYELLL  
KVF**

**>Slc2a3b**

**IQNSKHSQGKKVTLCLMFCVSTAVIGSLQFGYNIGVINAPDVKVQNFFRNVTLVRTGEPM  
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SSYELLIVGRLVIGVFCGLSTGLTPMYVGEIAPTALRGAFGTLHQLGVVIGILVAQILGL  
ESLLGSQTLWPLLLALTALPAVIQSIMLIFCLESPRYLLISLNKEDEARQALTSLRGHSD  
VEDDIREMKDEAMKMSMEKRVSIPELFRNPAYRQPIIIAIILQLSQQLSGINAVMYYSTE  
IFRNAGITEPVFATIGMGVVNTVFTVVSLFLVERAGRRTLHLIGLTGMTFCVLLVTISLK  
LVDSEIEKAKLLQNGTAIIDSASPSEGISTVKVLAILAVFGFVASFEMGPGPIPWFIVAE  
LFAQGPRPAAMAVAGCCNWTASFLVGLLFPILSKKIGAYVFIIFLILLVVFIVFTYFRVP  
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**>CU695013.3**

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**>Slc16a6b**

**SIMSSLKGCMSPNVYSEVPDGGWGWMVAAAFFFVEVFTYGIIKTFGIFLQDLMTEFHETN  
SRVSWAVSICVFVMAFTAPLSTLLSNRFGHRPVVMVGGFLISLGTITTALTQSIDEMYIT  
MGIVAGLGYCLTFLPTVTILSQYFSKRRSLVTSIASTGECFSMLAFAPAMNALKEQIGWR  
YCLMVIGVLQASIIVCGALLKPIVIKPKPATQEASTSPLKVLDSKYDAENEFTCTSFDSV  
DSGVQSISSSQVNLAKEQQKKEEEGESPETPLKQKQEDSSVSRTKLLDFSVLRDASFNCY  
ALFGLFATLGFFAPQIYIIQLSVSRGVSQKSATYMLSAMAVAEIGGRLSMGWVLNRKPIR  
KIYILLICTVLLCPVLVVFTFVSEFWGLMSCSCLYGFLLGTVASSHIPMLAEDDVIGIQR  
MSSAVGVYVCIQSFAGLAGPPLGGFLVDQTNNYGSAFYSCAAGMGVGALFLGLVRPAKTG  
LCFGKRKRKDQQSADRDASSQGSDDSPADFVEMDMETDNSPAKSKPWPV**

**>Slc38a3b**

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**>Dirc2**

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THLPSTKATLYTSCILVGIFINSSVPIFLELFIETVYPVPEGITCGVVTFLSNLFTGLLL  
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**>Flvcr1**

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**>CABZ01059390.1**

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YDQAKQLVLGTGLMGDNILTHFLSSFIAVSSRASYWSITG**

**>Mtch2**

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**>Slc22a6l**

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**>Rhag**

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**>Rhbg**

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**>Rhcga**

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**>Rhcgb**

**MGNCFGSRGICDRPKNTNIRLSLPAVCFVWQVSMIILFGVFVRYNEEADTNWVYKKKEKN  
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**>Rhcgl1**

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TAACASESVYGHEGLINMFGFEGKVNRTASVQGGYQAAGIFVAIAFGLVGGALVGGILKL  
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**>Slc22a21**

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**>Flvcr2b**

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**>Slc27a2b**

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TEGTLGFLNYAGKIGAVGTVNSFHKKLYPYVFIKFDHEKEEPVRNADGFCIEVAKGETGL  
LVTRLTQKIEFSGYARDPKQTEKKKLHDVFEKGDVYFNTGDLFRTDRENFIYFQDRVGDT  
FRWKGENVSTNEVSDIMTLVPCIEEANVYGVTVPGFEGRIGMAAIILKKDHQFECDDVFN  
HVTSYLPVYARPRFIRIQSSLAVTCTFKQLKGRLVEEGFNPALITDPLFILDETVKSYRP  
LTHDTYESILDARFRL**

**>Si\_dkey-204f11.59**

**MGEEGTRFPSCWTWARCQDNGVSDPEREKRWAELFDQLDLNKDGRIDLNELRTGLTAWGI  
VRGEVDEIVRVSDTNHDGQLDFKEFTQYLRTHEKELRLMFSSLDHNNDGHIDVPEIQLSL  
RSLGVNVSTEQASRILQSIDRDGTMTIDWNEWRDHFLFNPLHNMEDIAHYWKHSLMLDIG  
EQLTVPDEFSEKERRSGVVWRQLVAGAMAGAVSRTGTAPLDRLKVFLQVHGTSGVTLFSG  
LQGMVREGGLRSLWRGNGINVLKIAPESAIKFMAYEQIKWLIRGRREGGTLRVQERFIAG  
SLAGATAQTIIYPMEVLKTRLTLRKTGQYSGMADCAKQILRKEGVRAFYKGYVPNTLGII  
PYAGIDLAVYETLKNAWLQRYCMGSADPGVLVLLACGTVSSTCGQLASYPLALIRTRMQA  
QASAEGAPQLSMVGQFKHIVSHEGVPGLYRGIAPNFLKVIPAVSISYVVYEHMKKALGVG  
S**

**>Slc10a1**

**MVVTINPTTELNLSSFDWSVNTTANDSTFNETADMVIRLALIVLLFITMVSLGCTMDISK  
IKDHLMKPKGVVIAVGAQYGIMPFTAFCLAKLFRLSPMESLSVLICGCCPGGNLSNIFAL  
ALQGDMNLSIVMTACSTVLALAMMPLLLYLYSWGFSNLVDFVPFTGIIFSLILILVPCGI  
GILLNYRVPQYSKIITQAGLTLMLISCIVIGVLAGVADGGQIFKVLSSQLVATAALMPLT  
GYIFGYILSALFRMNEPCRRTVSMEVGCQNIQLCTTILKVAFPAEIIGRLYFFPVIYIVF  
QIVEALIFIFLFRCHQKLRPSQKGTQAYRTVERAAEVTNEPQQ**

**>Slc10a2**

**MCTLEPVCPVNATICTGTSCLVPRDPFNDILSVVMSVAITVMLAMVMFSMGCTVEARKLW  
GHVRRPWGIFIGFLCQFGIMPFTAFILSLLFNVLPVQAVVIIIMGCCPGGSSSNVFCYWL  
DGDMDLSISMTACSSILALGMMPLCLLIYTTIWTAGDAIQIPYDNIGITLVSLLVPVGLG  
MLVKHKWPKAAKKILKVGSVVGIVLIIVIAVIGGVLYQSSWTIAPSLWIIGTIYPFIGFG  
LGFLLARFVGQPWHRCRTIALETGMQNAQLASTITQLSFSPAELEVMFAFPLIYSIFQLV  
VAGIAVSIHYSIKRCRHQTLVEEDGEGTTEDCDKHSYSLENGGFSCDENGNNQNKDKGTK  
L**

**>Slc10a3**

**MKTALVFLCLLFLTCAGDPDHTEPRTLQYLRIGDGSAREFQFPQNTRGVIVISSQYRSSG  
GRKGRDSLKQTLRVRSLDPDVISILNVSDSGPQSSYTISIRSGLPGTAPLLLQLLELSRD  
AEPLLIEERSDYSIRVEAAPEHMEAGGLQHFSENPVLFALLPLIFVNKCAFGCKVEVEVL  
LALLRRPVPLLLGVAAQFLLMPLYAFALSQLAALPTALALGLVITCSAPGGGGGYLYSLL  
LGGDVTLAICMTLVSTVVATAAMPLSSALYGRLLGVHAALHVPFVKILGTLLFIAIPISL  
GLLVKLRVPAVASVLLALIRPFSFVLIVGGIFMAYQMGSSILAHVRTPMVVVGVTVPVFG  
LLAGLALARLAGLASPQRRTVGIEVGVQNSLLALAVMQLSFQRAEADYASQAPFIVALSS  
TSEMLLLVLAHIARSRLCPPAPATRTLS**

**>Slc10a4**

**METYSTYRRLLSFTEGLDSFPESPLMAELRATQEPLSLVPRSDVAPAGLLAAQFSSSEAP  
THRIVAFWDSPLSHWINVFVGIVLCFTMLGLGCTVELSQLGEHIRKPIGVLLAAVCQFVL  
MPLIAFLLALAFSLNDVAAMAVLLCGCCPGGNLSNIMTLLVNGDMNLSIIMTISSTLLAL  
VLMPLCLWMYSRAWINTPVVDLLPFGPIILTLCSTLIPIGLGVWLRQRYIHVAEVIIKVS  
LWSLLVTLLMLFIMTGTMLGPELLATIPASVYLVAVLMPMAGYTAGYGLATLFDLPPNSR  
RTVSLETGCQNIQLCTAILKLAFPPQLMGGMYMFPLLYALFQAAEAGIFILVYRMYRKEV  
LHKQDLMEDDDDDTNVSYKRMKEEDVPFDSTYGAVIVSDPNVIVLESQDGAGSPTPV**

**>Slc10a7**

**MGLIARVRKEWFIIGIVLVITFAKLQPSVGVKGGPLHPEITITYVAVSVIFFNSGLSLKT  
EELASALMHVKLHFFVQTFTLVFFPIAIWLLLKVLALTAINEWLLRGLQTVACMPPPVSS  
AVILTKAVGGNEAAAIFNSAFGSFLGIVVTPLLLLVFLGSSSSVPFTSIFSQLFMTVVVP  
LIVGQVCRRFLRECLDRRKPPFGAVSSVVLLMIIYSTFCDTFNNPNIELDHLSLLTVVFI  
IFSIQLSFMALIFFLSTRKSSGFSAADSVAIMFCATHKSLTLGIPMLKIVFEGYEHLSLI  
SVPLLIYHPAQILLGSVLLPSIKTWMSGRQKTLTPI**

**>Slc11a2**

**SQQCNETGSPHTDLFPANNETLEVDIYKGGVVLGCFFGPAALYIWAVGILAAGQSSTMTG  
TYSGQFVMEGFLNLRWSRFARVLLTRSIAIFPTLLVAVFQDVQHLTGMNDFLNVLQSMQL  
PFALIPILTFTSLTSLMHDFANGLVWKIGGGLLILLVCAINMYFVIVYVTDLNSTVLYVL  
AALLSIAYLSFVIYLVWQCLLALGVSALACGSSAEFPAAALIQEQPEFDS**

**>Slc12a1**

**MENPGFQTSKDDPPQYEETSFCTNGFGNGERRAIRSSVVSAFGHDTLDRVPNPDFYRNAA  
SISGHRAVRPSLHELHDVFQKNGGLNLPSPVEDSEGVDSSTLGDVESVTPLEEKDTGGVV  
KFGWIKGVLVRCMLNIWGVMLFIRLSWVFGQAGIGLGIVVVLLSMVVTSVTCLSMSAICT  
NGVVRGGGAYYLISRSLGPEFGGSIGLIFAFANAVAVAMYVVGFAETVVELLKDSNALIV  
DPTNDIRIIGCITVVLLMGITVAGMEWEAKAQVALLVILLVAIANVFVGTVIPSTQDKRS  
KGFFNYHESIAKENFIPDFRDGETFFSVFAIFFPAATGILAGANISGDLRDPQGALPKGT  
LLAIFITGVTYLGIALVVSVTVVRDATGNRNDTIQAGASCNFSSACDFGYDFSICQTTKC  
NYGLMNNFQVMTLVSGFGPLITAGTFSATLSSALASLVSAPKVFQALCKDNIYKALKFFA  
KGHGKNNEPIRGYVLTFIIAVAFILIAQLNTIAPIISNFFLASYALINYSCFHASYAKSP  
GWRPAYKYYNMWLSLFGAVLCCAVMFVINWWAALLTYGIEFFLYIYVTVKKPDVNWGSST  
QAVTFINAVNNALILSGVDDHIKNFRPKCLVLTGSPRSRPALLDLSHSFTKNYGLCLTCE  
VFVGSRDKNLQDMIEGDVQNQLWLNKQKHKAFYTPIASDTLRDGAQALMQASGLGRMKPN  
TVMLGFKRDWRTSKPQDVQNYVGILHDTFDFELGTVIMRVSQGMDISHILKAEEEMERMI  
LEQQALEMEENDFQPGPRGFFNRAKKTPKKEPTSK**

**>Slc12a10.1\_first**

**MGHRFSKRGLSSTDNLPSGQFSGSEEAPPHYSSYSNGIDTAITVDSPTRRSSEVLNSRQD  
SRRPSIYSTIDAMPHLEFYANATTTGRIRRSRPSLETLRKVCDNGECGVNSGDSCAGSIA  
ALQETENKSEENGETAKKSEPVRFGWVTGVMIRCMLNIWGVILFLRLSWITSQAGILLTW  
LIILMSVLVTSITALSVSAISTNGRVSSGGAYFMISRTLGPELGGPIGVVFSFANALACA  
LNTVGFSETVRDLLINNSQIVDSVNDVRIIGSITVTALLLISLAGMEWESKTQILFFLVL  
MVSFTNYFVGSVIPATPQKQSIGFFSYRSEIFVENLFPDWRGPDGDFFRMFAIFFPSAIG  
ILAGANISGDLKEPEIAIPRGTLMAIFCTTISYLAISSTVGACVLRDASGNMNDSLPLNF  
TEACDSLSCSLGWNFTECEQSGSCSYGLSNSFQVLVQVSGFGPLIYAGIFAATLSSALAF  
LVSAPKIFQCLCRDNIYPYIGFFGKGYGKNSEPLRAYLLCYIIAMCFILIAELNTIAPLI  
SNFFLCSYALINFSCFHASITNSPGWRPSFRYYSPWTGLFGAAISVVLMFLLTWWAALIS  
LALIIFLFGYVAYKKPEVNWGSSVQASTYNMALSYSVSLAGVEDHVKNYRPQCLVLTGPP  
TLRPALVDFVGSFTKNVSLMICGDIIMEDEKSIMSECNTNEMLKWLNQRKVRSFYTAFRS  
SSLREGARHLLQASGLGKLRPNILVMGFKMNWQESNSQDIEDYINTIYDSFDSNHGVCVL  
RMMDGLDIRDELQTEVNPVFEPDEPIEFDQQNSDSDSDVDNTKNIANDQIKTVFQTKQGK  
KTIDVYWISDDGGLTLLVPYLLTRRKRWRRSKVRVFIVGEQKTMEDERKEMKTLLQRFRL  
DVHDVIVMTDSKRQPLAKKLNDAQLDERTVQQQRMENPWKVTDKQMDALRLKSERKVRLN  
EIIRRNSQHAALVLVSLPVPQADCPSSLYMAWLDTLSCGLHCPVLLIRGNQQNVMTFYCQ**

**>Slc12a10.2**

**MAKYIERIRNVIPGMRRRDSNVPHQGDVAVDMGEADFGKKENQKMSIYNPLDPVPKYDFY  
AKDTWAGRIKKSRPSLDVLRNPPDDITPTPDEEDGRPKVKLVRFGWVLGVWIRCMLNIWG  
VIMYLRLPWVTSQAGLVLTFVIIFMSVTITTITATSVSAISTNGKVYSGGTYFMISRSLG  
PELGAPIGLLFAFACSIACALHTVGFSETVRDMLKDFKSQMVDDVNDVRIIGAITVTICL  
LITFAGMAWEAKAQILFFIAIILSLLNYFVGTVIPPTQEKEAVGFFGYHSDIFVSNLLPS  
FRGPSGSFLVVFAIFFPACTGILSGVNICGDLKDPTGGIPKGTLLSILCTTLSYLLIAAT  
CAATVVRDASGNKNDSLAISNYTIHCSGLGCKYGWNFDSCEQYRNCTQGLANNLRILTVV  
SGWGILITIGTFAATLSSALGFLVSAPKVFQLLCKDKIYPYIGFFGKGYGKNKEPLRAYV  
LTFIIAMCFILIGNLNTIAPLISNFFLASYGLINFSCFHASITKSPGWRPQYRYYSPWLS  
LFCCCLSFTLMFLFTWWAALVTFSVVLFLIGYVNYKKTYVNWGSSYQAAFYNMALNFSMN  
LTTVPDHVKNFRPQCLVLSGPPNTRPALVDFVGTFTKNVSLMICGNITIEGEQSDFPEHS  
SDLVVEWLTKRKVRSFYTTFAAESLQDGAHNLMLASGLGKLKPNTLVLGYKTNWQECKPE  
SLQDYINTINDAFDSNYGVALLRMMDKLDITDDMYSAEDGLSAIDNPAFERDEVPQSRSD  
TIDRDSDNSDEESSDQIRTVFQAKQGKKTIDIYWISDDGGLTLLVPYLLTRRNRWKKSKI  
RVFILGDQETKKEDRDDMKMLLKRFRLEIEEVIVITDVDKPPLAKNVQRFEDTITPFRLS  
EEQTRVDLQEFRRLNPWAVSDKDLEAVRPKVERTVRLNEIIKKNSLYAALVVVSLPVPDL  
NCPSSLYMAWMDALSIGINCPALLIRGNQENVMTFYCQ**

**>Slc12a10.3**

**MNLEKVDYVMEQEQDKRKMSIFNPLDPTPKFEFYAKDTWTGRIKSARPSLDVLRKSPDPD  
DLPPPPEDDGRPKVKLVRFGWVLGVMIRCMLNIWGVIMFLRLPWITSQAGIILTYVIIFM  
SVTITTITATSVSAISTNGKVYSGGTYFLISRSLGPELGAPIGLLFSFANALACSLNTVG  
FAETVRDVLKMVDDVNDVRIIGTITVCILLLITFAGMAWEAKAQILFFIALLISLANYFV  
GTLLPPTPEKQAVGFFGYRAEIFVDNLLPSFRGKDGSFFRMFSIFFPSATGILSGVNICG  
DLKDPSGGIPKGTLLAIFWTTVSYLLIAITVAASVVRDASGNLNDSLALDSSIQCSGLGC  
KLGWNFDHCEQNHTCSFGLANYFQILTTASGTGHLITIGIFAATLSSALGFLVSAPKIFQ  
CLCKDNIYPYIGFFGKGYGKNQEPLRGYLLMFFIALAFILIGDLNTIAPLISNFFLCSYG  
LINFSCFHATITKSPGWRPHYHYFSPWTSLFAAFLSFILMFLFTWWAALVTFAIVLSLLG  
YVTYKKPKINWGTSYQASFYNMALSFSMSLTGVEDHVKNFRPQCLVLTGPPNVRPALVDF  
VGTFTKNISLMICGNIFMVEEKSRFPQHSTDMLVDWLNQRKVRAFYTSFTADSLTEGTHS  
LMQASGLGKLKPNTLVLGYKTNWQECKPERLQDYFNTISDAFDSSYGIAVLRMMDGLDIR  
EDLTSGRSSAIDNPAFEADENTKSENEETDRNSDISDDGSNDQVKTVFQTKQGRKTIDIY  
WISDDGGLTLLVPYLLTRRNRWKKSKIRVFVLGDQETMQEDHKDMKMLLKRFRLEIEDII  
VITDVDKPPLAKNLQRYDDSVAPFRLTEEQSRGDLQEFRRLNPWTVSDKDLEAIRPKIER  
TVRLNEIIKKNSNHAALVVVSLPVPDLNCPSSLYMAWMEALSFGIHCPALLIRGNQENVM  
TFYCQ**

**>Slc12a2\_first**

**MSASPPISAGDYLSAPEPDALKPAGPTPSQSRFQVDLVTESAGDGETTVGFDSSPPEYVA  
EPPPDGLRDSVSGGEEAKGRFRVVNFAASSPDAAPAETAQNGDTVMSEGSLHSSTGGQQH  
HHYDTHTNTYYLRTFGHNTIDAVPKIDFYRQTAAPLGEKLIRPTLSELHDELDKEPFEDG  
FANGEELTPAEESAAKDVSESKGVVKFGWIKGVLVRCMLNIWGVMLFIRMTWIVGQAGIA  
YSCIIVIMATVVTTITGCSTSAIATNGFVRG**

**>CABZ01084014.1**

**MSLVSGFGPLITAGIFSATLSSALASLVSAPKVFQALCKDKIYPGIHVFAKGYGKNKEPL  
RAYVLTFIIGLAFILIAELNIIAPIISNFFLASYALINFSVFHASLANSPGQCLLLLHYC  
THVHLYKCLT**

**>CABZ01084010.1**

**MKDPLVSINIKDFDSDSSKPSSKSTSCQSSPLIFRDSKKPQLKLSAADEKLLSASQQFQK  
KQSKGTIDVWWLFDDGGLTLLIPYLLTNKKKWRDCKIRVFIGGKINRIDHDRRAMAALLS  
KFRIDFSDITVLGDINIKPKKHNKQVFQEMTEPYRLREDDMEQEAAEKLKADEPWRITDN  
ELELYRSKSNRQIRLNELLQEHSSTANLIVITMPLARKGTVSSALYMSWLDTLSKDLPPI  
LLVRGNHQSVLTFYS**

**>CABZ01084012.1**

**MCVCSPADVNWGSSTQALMYNQALTHSLHLTGVEDHIKNFRPQCLLMCGYPNSRPALLYL  
THTFTKDMGLMICGHVRTGYRRPNYKEMLNEQARYQRWLLKMRIKAFYSPVFADDHRQGA  
QYLLQAAGLGRLKPNTLVLGFKNNWRDGDMRDVETYINIIQ**

**>Slc12a2\_second**

**GGAYYLISRSLGPEFGGSIGLIFAFANAVAVAMYVVGFAETVVELLMDSGLLMIDQTNDI  
RVIGTITVILLLGISVAGMEWEAKAQIFLLVILITAIFNYFIGSFIAVDSKKKFGFFSYD  
AGILAENFGPDFRGQTFFSVFSIFFPAATGILAGANISGDLADPQMAIPKGTLLAILITG  
LVYVGVAISAGACIVRDATGIESNFTLISNCTDAACKYGYDFSSCRPTVEGEVSSCKFGL  
HNDFQVMSVVSGFSPLISAGIFSATLSSALASLVSAPKVFQALCKDNIYPGIAIFGKGYG  
KNNEPLRGYFLTFGIALAFILIAELNVIAPIISNFFLASYALINFSVFHASLANSPGWRP  
SFKYYNMWASLAGAILCCVVMFIINWWAALLTNVIVLSLYIYVSYKKPDVNWGSSTQALT  
YHQALTHSLQLCGVADHIKTFRPQCLVMTGAPNSRPAILHLVHAFTKNVGLMLCGHVRIS  
SRRPNFKELNSDMLRYQRWLLNNNSKAFYTCVVAEDLRQGTQYMLQAAGLGRLRPNTLVI  
GFKNDWRTGDIKEVETYINLIHDAFDFQYGVVILRLREGLDISHIQGQDDSSGMKDVVVS  
VDISKDSDGDSSKPSSKATSVQNSPAVQKDEDDDGKAHTQPLLKKDKKSPTVPLNVADQR  
LLDASQQFQQKQGKGTVDVWWLFDDGGLTLLIPYLIANKKKWKDCKIRVFIGGKINRIDH  
DRRAMATLLSKFRIDFSDITVLGDINTKPKSEGLTEFAEMIEPYKLREDDMEQEAAEKLK  
SEEPWRITDNELELYKAKGNRQIRLNELLKEHSSTANLIVMSMPLARKGAVSSALYMAWL  
DTLSKDLPPILLVRGNHQSVLTFYS**

**>Slc12a2\_4of5**

**MSDQPSSPSSGHKPSLRPPGSGSGAGASQSRFQVDPVADSGAPKSSEEPKSRSRVVNFWN  
PSDGAADPGLNGDTVRSEASLHSSTGGLSHFSDTHSSTYYLRTFGHNTIDAVPNIEFYRQ  
TEAPLGEKLLRPSLAELHDELDKEPFEEGFPTAEELTAAEILTPKDLSDSKGGTVKFGWV  
KGVLIRCMLNIWGVMLFIRMSWIVGQAGIALSCGIILMAIVVTTITGLSTSAIATNGFVR  
GGGAYYLISRSLGPEFGGSIGLIFAFANAVAVAMYVVGFAETVVELLDSIDALMTDEIND  
IRIVGTLTVILLLGISVAGMEWEAKAQIVLLVILLAAIVNYFIGSIIPMKSKESRGFFGY  
SAAIMMENMGPDFREEETFFSVFAIFFPAATGILAGANISGDLAVSSAH**

**>Slc12a3**

**IQQTNDGMNLQSARSPFSVSSLSNGDDRKFSLGGCSSYDTDSVASRSSGVFSGYDTLDAP  
PSYDFYTNTEVFGRAKKSRPSLFELHSNPQQDDPSPPPLYEESSVDKQSPEDEDEPTEPP  
PEPARFGWAQGVMIRCMLNIWGVILYLRLPWITAQAGIGLTWIIILVSSSITGITGLSTS  
AIATNGKVKGAGGTYFLISRSLGPELGGSIGLIFAFANAVAVAMHTVGFAETVQVLMQET  
EVSMVDKLNDIRIIGVITVTCLLAISMAGMEWESKAQVLFFFVIMISFASYIIGTIIPAT  
PQKQARGFFSYRADIFATNFVPGWRGPEGSFFGMFSIFFPSATGILAGANISGDLKDPNV  
AIPRGTMLAIFWTTVSYLIISATIGSCVVRDASGDVNDTISSLTGECLGVGCNYGWNFTD  
CMTNNTCTYGLSNYYQSMSMVSAVAPLITAGIFGATLSSALACLVSAPKVFQCLCKDKLY  
PGIGFFGKGYGKNNEPLRSYLLAYIIAICFILIAELNTIAPIISNFFLCSYALINFSCFH  
ASITNSPGKPPTFRFYSKWLSLLGAVVSVIIMFLLTWWAALIAIGIVIFLLGYVLYKKPE  
VNWGSSMQASSYNMALSQCVGLNQVEDHIKNYRPQCLVLSGPPCARPSLVDFIGAFTKNQ  
SLMICANVLASGPSPGTADSMSSTHLKWLNNRKIKSFYHTVVADDLRTGVQMLLQSTGLG  
RMKPNVLVMGYKKNWRKVQPGIIENYVGILHDAFDLQYGVCVLRMKEGLDITRTIQAQVN  
LGFETSTEQGLDTNSTAPTSPTIEASLDPETLMALTQPSTLFQTRQGKKTIDVYWLSDDG  
GLTLLIPYLLTRKKRWGRCKVRVFVGGEAQQIEEQKKELKGLISRFRLGFKDIQVLPDIN  
GAPQSEHIRKFEDFIAPYRVSSVQKDGQEADEATKEFSWMVSDEEMETFKAKSLRQIRLN  
EVIQDYSRDAALIVVTMPVGRRGSCPSPLYMAWLEIVSRDLRPPVLLVRGNQENVLTQYC  
Q**

**>Slc12a6\_2of2**

**CRPQLLVLVKLDEDAHVKSPRLLTFASQLKAGKGLTIVGTVIPGNFLHTYGEALAAEQTL  
KHLMEKERVKGFVQCIVAQKPREGISHMIQSSGLGGMKHNTVVMGWPHAWRQS**

**>Slc12a5b**

**XDATSKESSPFINSSTSDVEKSQQYDGKNMALFEEEMDTSPMVSSLLSSLANYSNLTQGS  
KEHEEAENNEEARKKAAQAPRMGTIMGVYLPCLQNILGVILFLRMTWLVGVGGVLGTFTI  
VFMCCSTTMLTAISMSAIATNGVVPAGGSYYMISRSLGPEFGGAVGICFFLGTTFAGAMY  
ILGCIEILLIYIVPSAAIFKMEGLEGSEAEAALLNNMRVYGTIVLTFMAIVVFVGVKYVN  
KLALVFLACVILSILAIYAGVIKTSFDPPDFPVCVLGNRTLVSKAYDICAKTIERGNATI  
TTKLWRSFCDSEFLNATCDEYFVNNNISQIQGIPGVTSGILAENLFSGYMEKNSVLEKRG  
LQAVQDPELPVTNSNRYVLADITSFFTLLVGIYFPSVTGIMAGSNRSGDLQDAQKSIPVG  
TILAITTTSIIYMSSVILFGACVDGVVLRDKFGEGVSGNLVIGTLAWPSPWVIVFGSFFS  
TCGAGLQSLTGAPRLLQAIARDGIIPFLRVFGHGKANGEPTWALLLTACICESGILIASL  
DAVAPILSMFFLMCYMFVNLACALQTLLRTPNWRPRFKFYHWALSLLGMSLCLTLMFLCS  
WYYAIVAMVIAGCIYKYIEFCGAEKEWGDGIRGISLSAARFALMRLEEGPPHTKNWRPQI  
LVLTTLDGEQNVEQPRLLSLTSQLKAGKGLTIVGACIEGTYLNNQPKTQKADQSLRKLME  
VEKVKGFSQVVISSNLRDATSHLIQAGGLGGLRHNTVLVSFPKNWKQAEEHHRCRNFIEV  
VRETTAGHMALLVPKNISAYPSNGERFTEGHIDVWWIVHDGGMLMLLPFLLRQHKVWRKC  
KMRIFTVAQMDDNSIQMKKDLMTFLYHLRLDAAVEVVEMLDNDISAYTYEKTLMMEQRSQ  
ILKEMHLTKNEREREIQSITDVSRGSIRRKNPSNLHPQRSIAEESVAGSGEEKPEEESVR  
VSHPRQVQLIQGKNATPTPTSPTSPTAPTPATMSPGEEIQMTWTDDTEKANNPAVANPEN  
IKDMFNMKPNQSNVRRMHHAQKLNEVIVKKSQEAKLVLLNMPGPPRNRTGEENCILFFFS  
KHLSIGPFRNMEFLEVLTEGLNRVLLVRGGGREVITIYS**

**>Slc12a5a**

**MALFEDEMDTIPMVSSLLSSLANYSNLPQGSKEHEEAENNEGSRKKPVQAPRMGTLMGVY  
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YYMISRSLGPEFGGAVGICFYLGTTYAGAMYILGCIEILLVYIVPQAAIFKMEGLEGAEA  
EAAMLNNMRVYGTLVLSFMAIVVFVGVKYVNKLALVFLACVICSILAVYAGVIKTAFEPP  
VFPVCVLGNRTLVWKGFDVCAKVIERENATVTTKLWRLFCDSEFLNATCDTYFTNNNVTE  
MQGIPGVMSGTLRENLFGNYMDKGAFIEKTGLSSVVEPDSIPTNTNRYVLADITSFFTML  
VGIYFPSVTGIMAGSNRSGDLRDAQKSIPIGTILAITTTSIIYMSSVVLFGACIEGTVLR  
DKFGEAVRGNLVIGTLAWPSPWVIVIGSFFSTCGAGLQSLTGAPRLMQAIARDGIVPFLR  
VFGHGKANGEPTWALLLTACICESGILIASLDNVAPILSMFFLMCYMFVNLACAVQTLLR  
TPNWRPRFKFYHWTLSFLGMSLCLSLMFICSWYYAIVAMGIAGCIYKYIEFRGAEKEWGD  
GIRGLSLSAARFALMRLEEGPPHTKNWRPQILVLVNMDGELKVDQPRMLSLTSQLKAGKG  
LTIVGTALEGTYLENHDQGQQAEQSLRKLMETEKVKGFSQVVISSNMRDAMSHLVQASGL  
GGLQHNTVLASWPRNWKQAEDHQSWRNFIELVRETTAGSKALLVPKNISAFPSNGERFTE  
GHIDVWWIVHDGGMLMLLPFLLRQHKVWRKCKMRIFTVAQMDDNSIQMKKDLTTFLYHLR  
IDAAVEVVEMHDSDISAYTYEKTLMMEQRSQILKQINLTKTEREREIQSITDSSRGSIRR  
KNPAAVTTQLSVTEEPAASSKEQKPEEECVPVSPSQQEQLIHDKSTNPPTPATPQSPSAD  
AQTPGTAVQMTWSEVKCDGEQNKPVGATTPEAIKDLFNMKPEWENLNQSNVRRMHTALRL  
NEVIIKKSQEAKLVLLNMPGPPRNRSGDENYMEFMEVLTEGLNRVLLVRGGGREVITIYS**

**>Slc12a6\_1of2**

**MCTLAYTHTHTHTYPLTHINVYTREHTHTHTYPLTHINVYTLMHTCTHTHTHTHINVYTP  
AHXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXDEDAHVKSPRLLTFASQLKAGKGL  
TIVGTVIPGNFLHTYGEALAAEQTLKHLMEKERVKGFVQCIVAQKPREGISHMIQSSGLG  
GMKHNTVVMGWPHAWRQSEDPQSWKTFINTVRVTTTAHLALLVLKNISLFPSNSEACTEG  
FIDIWWIVHDGGMLMLLPFLLRQHKVWRKCALRIFTVAQMEDNSIQMKKDLATFLYHLRI  
DAAVEVVEMVKHTR**

**>Slc12a7b**

**MPTNFTVVPVEDGRKSAQEDSDDNNVLKEEDEEAGGDGNPRESSPFINNTDDDKGNLYDG  
KNMALFEEEMDSNPMVSSLLNKLANYTNLTQGVREHEEADEDEGAKKQTVKSPQMGTFIG  
VYLPCLQNILGVILFLRMTWIVGTAGILEAFIIVSMCCSCTMLTAISMSAIATNGVVPAG  
GSYYMISRSLGPEFGGAVGLCFYLGTTFAGAMYILGTIEILLTYIVPSAAIFKAEDKADE  
AEALLNNMRVYGTCCLTLMALVVFVGVKYVNKLALVFLACVVLSILAIYAGVIKTIFEPP  
VFPVCVLGNRTLQNHDFDKCMKTEIIDNVTVTTKLWSLFCSGPELNASCNEYFTLNSVTE  
IQGIPGLTSGVISENMWGKYGPAGMLVEKDIPSVSASDSSQDKYMPYVVNDITAFFTLLV  
GIYFPSVTGIMAGSNRSGDLRDAQRSIPIGTILAIATTTIIYLSCVVLFGACIEGVVLRD  
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FGHGKANGEPTWALLLTALICESGILIASLDAVAPILSMFFLMCYLFVNLACALQTLLRT  
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IRGLSLNAARYALIRLEEAPPHTKNWRPQMLVLLNLDSELCVKHPRLLSFTTQLKAGKGL  
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GMKHNSVLMAWPSNWRQSSDPHTWRSFIETVRETTAAHLALLVAKNVDSFPHQERLTEGT  
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QSEAHSSSLQNQNTAHEQQDEAQLIHDRNTASHTAMNDKADATPERVHMTWTKEKLFSER  
SRRTEANASMAVRDLFNMKPEWESLNQSNVRCMHTAVKLNEVIVNKSQGAHLVLLNMPGP  
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**>Slc12a7a**

**MECEPGAIEQILGDETPRETSSLISTDHDDSTYGKNMALYEEEMDSTPMVSSLLNKLANY  
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ILEALAVVFMCCACTMLTAISMSAIATNGVVPAGGSYYMISRALGPEIGGAVGLCFYLGT  
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NKLSLVFLSCVVLSIMAIYAGVIQSAIKPSSFTICLLGNRTLQHFGKSGKFDKCMKTEVI  
DNITKPTELWYHFCNGTCDEYFNLNELTEISAVPGLLSNAITENLWSRYGEYRTTVEKEN  
ITSEAALSSEPEVLNSYVVNDMATFFTLLVGIYFPSVTGIMAGSNRSGDLRDPQRSIPTG  
TIMAIATTSFIYISCVVLFGACFEGVVLRDKYGDSVNKNLVVATLAWPSPWVIVIGSFFS  
CCGAGLQSLTGAPRILQAIARDGIMPFLQVFGRSKSGGEPTWALLLTAAICEIGILIASL  
DAVAPILSMFFLMCYLFVNLACAVQTLLRTPNWRPRFKFYHWSLSFLGMSLSLSLMFVSS  
WYYALVVILIAGCIYKYIEYRGAVKEWGDGLRGLSLNAARYALIKLEEAQPHTKNWRPQL  
LVLMKLDTDLTVKHPRLLSFTSQLKAGKGLTIVCSVLEGTFMVRGADAKLAEQNIKAAMA  
KEKTKGFCHVVVSSNQRDGFSHLIQSAGLGGMKHNAVLVAWPANWKQAESSLSWKNFIET  
VRETTAAHQALLVAKNVDTFPSNQDRLAEGTIDVWWIVHDGGLLMLLPFLLRQHKVWRKC  
KMRIFTVAQMDDNSIQMKKDLQMFLYHLRLDAKVEVVEMNAGDISAFTYEKTLVMEQRSQ  
MLKQMQLSKTEREREIQSISDESRISIRRKPCGEKQTHNSKLKVATVNLDEEAQLIHDKN  
TKSHATLVEKATPTSDRVHMTWTKEKLIGERNRLRDASMHVRDIFNMKPEWENLDQTNVR  
RMHTAVKLNEVVVKKSKGAQLVLLNMPGPPKNKGGDENYMEFLEVLTEGLDHVLLVRGGG  
REVITIYS**

**>Slc12a8**

**MSPQVQELFHEDAQGSQINAQPWWKVQLFVWEPVLFGTWDGVFTTCMINIFGVVLFLRTG  
WLVGNTGVFLGMLLVSLVVLVALVTVMSGVGVSECCSVGNGGVYSMISTVLGGRIGGTVG  
LLYVFGQCVAGAMYITGFAESIAQVLSLQSTWVVRGISVAVLLGLLGINLAGVKWIVRLQ  
LVLLGILAMSTLDFVIGTFSHLDPEHGFVGYSEKLLRKNTLPDYTAGETFFTVFGVFFPA  
ATGVMAGFNMSSDLQRPEHNIPVGTLAAVCTSWFLYLVFVFLLGAICTREALRYDFLIAE  
KVSLVGFLFLLGLYISSLASCMGGLYGAPRILQCIAQERVIPVLAFLGKGRGPNKTPVAA  
ICLTSLITMGFIFIGQVNVLAPIVTINFMLTYSVIDYCYFCVVKTYELQVQQRKKLISRS  
SSRKSLVSSTHPRYGSGGAISDPVNGTLLQFTKDMDQIFPLPSTEEQRASPASKARGRKT  
KIPAKEMLMNSFGLDLNSNAPLDKGKDERELEQAAGLDDDTSSQIGLIESDLKMGNQMNL  
SLPNSGPAELEQLPKEKIDRNGSETNLEGSEIRSIQSSVYARFCNPWVSLIGALCSFMIM  
FIIQWMYALINISAALILFIYIGTTSPGLPTGAASHFSFFKWLKTSLHNLGRQNGALQDQ  
IVVTPSLSAVGMETRQLTEENADFALRDRYHHSSFITTTDKMVHPQSN**

**>Slc12a9**

**MANEHSPLLVHGVYSMMGNAEDSRGGSAGTGEASNPKTDPRKLNTFFGVMVPTILSMFSI  
VLFLRTGFVVGHAGLLHGLLMLFVAYFIISLTILSICAISTNGAVEGGGAYFMISRSLGP  
EFGGSIGLMFYLAKVCACGVYVLGLVEAIMDVFGQDPGSSVAQGLRVLPQGYWYTVLYSS  
VVLLLCMLVCLVGAHIYAKASFLILLVVTVSLISIIISPLIVSPQGFNITHTYGNNHSVT  
VSPSYTGFNSTTLKNNLGPRYSLDYSTNTMMSFATVFAVMFTSCTGIMAGANMSGELKNP  
SESIPKGTIMAVAYTFTVYVLLYLLLSSTCDRSLLLNDYAVFQRVNVWPPFVTIGVYCAS  
LSAAMCSMIGASRILHALALDQLFGLPLAPAAVTSSSGNPWVSVLYTWALVQCTLFAGQL  
NVIAGIVTVFYLLAYAAVDLACLALEWASAPNFRPTFQFFSWHTCLLGIISCVVMMFVIN  
PVYSSASIVLLLLLLLFLHYRSPTSSWGYISQALIFHQVRKYLLMLDSRKDHVKFWRPQV  
LLMVSNPRSSCQLICFVNQLKKGGLFVLGHVQIGDLDVLPADPVQPQYNFWLSLVDKLGV  
KAFVDLTLSPSVRQGTQHLLRITGLGGMKPNTLVLGFYDNSYPEDYFLQDPVFCKGDRSE  
GDNFGVDLPSLQAHFPPVRHAESPRALQPQEYVSIIQDAIKMGKNICLARYFFQLPPESK  
GATYMWGKDSMDTIDVWPTNLLTPGSASYADVGSLFLLQMACVLNMASGWRRARLRIFVC  
VESESEDQGWLAKEEQFRELLGKLRIRAAIKIVAWDNVARMVRGPNTESQPVSEDFLCAV  
NGLLKEHSSTAAVRFLYLPDPPSSCELSQQYLTQLDTLTRDLGPTLLIHGVTPVTCTEL**

**>Slc13a1**

**MRRLRCSWSALKPLIIISTPLAILPLPLVIKTKEAECAYVLILMAVYWMTEVLPLSVTAL  
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GMLMLGFMVGCAFLSMWLSNTSTVAMVMPIVEAVIQQVLSASEEANKDHKGALNGISNPA  
LQLEDIEAQHDQSEKIKSIEAGITEPEPTSEEHETAKAPTPPYSGKYRTREDHMMCKGLS  
LCIAYSSSIGGLTTLSGTSTNLIFAEYIYQYYPECTIVNFGNWFVLCLPICIIMLILSWL  
FLHWMYLGSNFRASLCSRQRTEKEKITARVLRDHYNSLGPISWQEIVTLIIFILMAILWF  
TRNPGFMPGWSSLFSDNPGYATDATVALLLGFLFFLLPSHKLNADHYEALITWKDFQACM  
PWEISLLVGGGFALAEGTKISGLSSWVAELLTPLGSLPPLATVTIACLIVTSITEVASNA  
ATMTIFLPILAPLAEAIGVNPLYMLIPTALAVSFSFLLPVSNPPNAIVFTYGHLTSMDMV  
KAGLGVNVIGILTVLLALTTWGTPLLKLDTYPDWAPVVNSTGV**

**>Slc13a2**

**MGCTKASLVLRWLLLHRNYILIFCVPLLILPLPLVLPTPEARCGFAIILMALFWCTECMP  
LAITALLPVVLFPMMGIMESGKVCVQYLKDTNMLFIGGLLVAIAVEHWNLHKRIALSVLL  
VVGVRPALLMLGFMIVTAFLSMWISNTATTAMMLPISQAVLEQLSATEADSDEKELREGQ  
VNQAFELTEVNIKQPLDNTQGEKPNNNADVEEGINALSERRRKAREAKYLRLFKGMSLSV  
CYSASIGGTATLTGTTPNLILKGQMDEIFPDNNDVINFASWFGFAFPNMVLMLVLSWLWL  
QCMYLGFNFKQSFGCGTKNEGDKDAYKVMKNEYKKLGPMSFAEGAVLVIFIFLVILWFTR  
EPGFMPGWATELFNKNGQYVTDGTVAIFMSTLFFVIPSRVDFLCSIKYEEQDEEAVGEEQ  
DGVEKEKKRKLKGTPTLLNWKVVHERMPWNIVLLLGGGFALASGSEESGLSVWLGQSLSP  
LKSIPPFAISIILCLLVGTFTECSSNTATTTLFLPILASMATTIGLHPLYVMLPCTISAS  
LAFMLPVATPPNAIAFSYGNLKVLDMAKAGFILNIIGILCINLGINTWGMAMFKLDTFPS  
WANNTLVNITGTP**

**>Slc13a3**

**MDPAKFSKKLWCARQQLILVLAPLLLLPLLFVVPPKEGKCLYVVLLMAVYWCTEALPLAV  
TAMLPVCLFPTMGILPSKKVCPQYFLETNFLFLSGLVMASAIEEWGLHRRIALKVLKIVG  
VKPAWLILGMMITSSFLSMWLSNTATTAMMLPIANAILESLFGNLETLKENCKTRSDPEG  
DSQVKMHVLPEKQILTVEDRPDWTDRSEQRNQEEVRREAEYQMKVWKGFLICIPYAASIG  
GTATLTGTAPNLILVGQLKSYFPECDLVNFGSWFVFAFPLMLLFLILGWIWIAFLYGGLN  
TRLCISKNDERAAAEAKANAVIDEDYKKLGPIKFAEGSIAFFFIIFAILLFTRDPKFVTG  
WSVFFPKGYVSDAVTGVIIISILFFFPSQRPSLRWWFDSRASNTPYVPLLSWRKAQECVP  
WNIILLLGGGFAMAKGCEESGLAVWIGNHLQPLAQVPPPVAVMLITAFIACFTEFASNTA  
TIIIFLPVIAELAIRVKVNPLYFMIPATTGCSYAFMLPVSTPPNSIAFASGHLMVKDMVK  
TGFVMNILGILCVSLAMNTWALHMFNLHLYPDWARPLNASLATVATHTVAAMNMTG**

**>Slc13a4**

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PLGAAALVPAFLYPLFGVLKSSEVASEYFKDTTLLLMGVICLAASIEKWNLHKRIALRMV  
MIAGAKPGMLVLGFMCCTVFLSMWLSNTSTTAMVMPIAEAVLQQLICTGIADSQEDSQDL  
TQDEESDKEENLESSKNHLELLDCKNEKNEVCMMNEAPISIPVPKKPKIRRDSLYPTKRD  
HMICKCLTLSITYAATIGGLITITGTSTNLIFAEQFNNRYPEAKVINFGTWFIFSLPIAL  
IMLILTWIWLHFLFLGCNFRETCSLSKKRKTRREILSEKRIHEEYQKLGPISYPEVVTGI  
FFILMTVLWFTREPGFVPGWTSLFEKKGYRTDATVSVLLGFLLFLIPARKPWPSAFSSQS  
KDDEDEDEEQDPLAPMITWKDFQRLMPWEIVILVGGGYALAAGCKVSGLSMWIGRQLEPM  
SGLPPWAVTLLACLLVSAVTEFASNPATLTVFLPILSALSETLQMNPLHTLIPATMCVSF  
GVMLPVGNPPNAIVFSYGHVQISDMVKAGFGVNLIGVFVVMLAILTWGEPLFHLSQFPTW  
AAMRNVTGSL**

**>Slc13a5b**

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LLPAVLFPMLGIMQSKMVCMQYLKDTNMLFVGGLMVAVAVEHWNLHKRIALRVLLIVGVR  
PALLMLGFMGVTAFLSMWISNTATTAMMVPIVQAVLEQLNKQETEPLQMTCGVERPRTPE  
AEYKHAAKDRDRQDHDNNKIVLRMLDVSPEVRQKELAEKRHMAKGMTLCVCYAASVGGTA  
TLTGTGPNLVLKGQMNQLFPENGDVINFASWFGFAFPNMIIMLTIAWLYLQFIFMGFNIR  
KTWGCGAVKSEKEIAAYNVIREQHLQLGPMCFGELSVLALFSLLVALWFTRDPGFVAGWA  
THTFNIEAEFRYVTDATVAVFIAMLLFVLPSKPPQLCFSSSTGSETESQRSSAPGTALLS  
WKVAQKKLPWNIVLLLGGGFALAKGSEESGLSRWLGNQLTPLHSIPPWAVVIILCLLIAI  
FTECTSNVATATLFLPVLASMSQSVGINPLYIMVPCTLSASFAFMLPVATPPNAIVFSYG  
YLKVSDMAKTGIMMNIIGIFCITLAINTWGKAMFNLDSFPAWANQTNFSEKRLTALYLRA  
NKSLQSP**

**>Slc13a5a**

**MMASRALKLVWKMKNTLILFCTPFLLLPLPLVIGSKEAGCAYVVVLMAVYWCTEVLPLAV  
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VRPALLMLGFMGVTAFLSMWISNTATTAMMVPIVQAVLEQLNNTAQQEQSSIPETEEKST  
EKQPESPGEEKVVLNGDNFSMESDPEEHSREAEERLKMSKGLTLCVCYAASIGGTATLTG  
TGPNLVLMGQMSQLFPDNPDIINFASWFGFAFPNMIIMLTLAWLWLQIVFLGINFKKTWG  
CGTVKTEKEIAAYNVIKEEHRSLGPMTFGELSVLALFILLVVLWFTRDPGFVDGWATRFF  
NADKEFVTDATVAVFVAALLFVFPSKPPRLCFWRTESFDTVPQQESGPTPALLTWKVTQK  
KMPWSIILLLGGGFALAKGSEISGLSKWLGDQMSPLQSIPPWAIAIVICLMIATFTECTS  
NVATATLFLPILASMSQSIGVNPLYVMVPCTLSASFAFMLPVATPPNAIVFSYGYLKVSD  
MAKTGIVMNIIGILSITLAINSWGRAIFSLDTFPSWANTTDV**

**>Slc14a2**

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SGQRFKANLIKWVSFISGDMAAFGEWMKGQFILLQIMDWVLRGAAQVMFVNNPLSGLIIF  
AGLILQNRWWALNGFVGTLFATISALILCQNRGAIAAGLYGYNGILVGLLMAVFSNAGDW  
YWWLLLPNIFMSMACPIVSSALASINSRWDLPVFTLPFNILVCLHMVATGHYNQYFPQIL  
IQPTTSMSNLTWSELDYAQLF**

**>Slc15a1a**

**XGTFTHTLSHTHAPAANMPDSKMDETKKKKKKTAECCGYPISIFFIVVNEFCERFSYYGM  
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GQVVMAVSTIHDITDANRDGTPDNFTLHIALSMLGLVLIALGTGGIKPCVAAFGGDQFQE  
HQSRQLNTFFSVFYLCINAGSLLSTLITPVLRAQECGIHTQQQCYPLAFGVPAALMVVSL  
VVFIAGSGMYTKTAPEGNIMGSVCKCIWFALNNRFRHRSDIYPKREHWMDWAEEKYDKLL  
IAQIKMVLKVLFLYIPLPMFWTLFDQKGSRWTLQATTMTGDFGGFVLQPDQMQTVNPILI  
LTLVPIMDRIIFPLIKKCGLNFSPLKRMTVGMLFAATAFIAAALVQMEIDKTLPNFPSSS  
ESQLKVVNMHSESLIVTVPSQEPLLIGSFESSPDYITFDQQDIRLAFNTTPEINKDLSLI  
KGSRQTLIIPSEPAEMYLKEDIKSKPKEGKNAVRFVNGWTAYLNITNLESSLQPSETSNY  
TLVSQGMRKFTLTDGIQSCEFSRKFGFGSSYTFLIPSDLFSTDCESIKEIEDMQPNSVHM  
ALQIPQYFLITTGEVMFSVTGLQFSYSQAPKNMKSVLQAGWLCTNAVGNIIVLIVAELGK  
LPKQWAEYVLFASLLVAVSIIFSIMAYFYTYIDPAEIEAEILKQQETDPDKKKKKETLEM  
EEKENEQEIKQTKI**

**>Slc15a1b**

**MADKEGHKQKKERASCFGYPVSIFFIVVNEFCERFSYYGMKAVLVLYFKYFIGWDDDLST  
TIYHTFVALCYLTPIMGAIIADSWLGKFKTIVYLSIVYTIGQVIMAISAIHDITDANRDG  
KPDNKTLHISLSMLGLILIALGTGGIKPCVAAFGGDQFEDHQEKQRSTFFSIFYLSINAG  
SLLSTLITPILRSQECGIYAKQSCYPLAFGVPAALMVVALIVFVIGHKMYIMESPKGNIL  
LQVINCIGFALNNRFRHRGKQYPKREHWMDWAEEKYDKLLIAQVKMVVKVLFLYIPLPMF  
WALFDQQGSRWTIQATTMDGNFGGFVIQPDQMQIVNPILIVIMVPIMDSAIYPLIKLCRI  
NFTPLRKMTVGMVLAALAFVAAALLQLQIDETMPKFPSTSQTQLKFLNVESTSLPVVVEG  
QDQFMVPGFNASSEYLTLDKENVTISAGGVNDTAFLKTGTRHTVLMNAAGMRNTLDDLTK  
KPEQGLNAIRFVNGWENRLNVSVKSNNVHADPLDASVYLLVPHGKVNFTIFDGGDGKCHY  
IMQLGFGSTYTVLIPSTFAFGQTCSESFEAVQDMEPNRIHMAWQVIQYFLLTCGEVVYSV  
TGLDFSYSQAPSNMKSVLQAGWLLTVAVGNIIVLIVAEAGSLPDQWAEYLLFASLLVAVS  
IIFAIMAYFYTYIDPNEIEAKFKELEPEDKKRKEMQMTAKDNMAYVHNENTNIKQTKI**

**>Slc15a2**

**MGKMKDKDVDAEKYEKAQRSPKLCGTNYPVSIAFIVVNEFCERFSYYGMKAVLTLYFMNY  
LHWDKNLSTAIYHAFSGLCYFTPLLGALIADSWLGKFKTIIYLSIVYVIGHVVKSVGAIP  
DVGDSTVHIALSMVGLGLIALGTGGIKPCVAAFGGDQFDEDNIDERRKFFSIFYMSINAG  
SVLSTIITPILRGDVQCFGGDCYALAFGVPAALMVIALVVFISGSGLYKKSPPEGNVLVR  
VCKCIGFAISNRWTNSKKSPKRSHWLDWAEEKYSKRLIQEIKMVCRVLVLYIPLPMFWAL  
FDQQGSRWTLQATRMNMDFGGGFIIKPDQMQMLNALLILVFIPIFDMGIYPLVGLCRIKL  
TPLKKMATGMILAALAFCAATAVEVYVIKTVVEPPPAKESLVQVYNLMDSDVTVQFPAHN  
VFSEPLKPYEEPSGYSSLPLTGESQLQNVVVSHNGMNYQCRLTFTERMAYSLLLHPTAQH  
NGSVCNLVKDHITKSETGAAYIRFINTHTENINVTVGTEEVHASANYGISRNISVPRGEY  
NKAVCVTDTKEYEINLGLLDFGAFYTVILSEAGNNLAVKKMEDIQANNIHIGWQIPQYVF  
LTAGEVMFSITGLEFSYSQAPASMKSVLQAGWLMTVAFGNVIVLIVAEGAGMEQWVEFLL  
FAALLVAVSIIFSIMAYFYTYVDPDQLDKLFKEDGDGGKVESSKKDELSLGDMPKQTKM**

**>Slc15a4**

**MAGRDINESSPLLENSVTSTRSESVFNGRRLACAAILLAESLERMAFYGITSNLVLFLNS  
SPFYWEGTLASQGPLIFMGVTYLISPFGGWLADAYLGKFLTIALSLGLYLLGMLLFPFVA  
SDNTRNYLCGEEMAFPVQPAECFPENGTVPANVTCVNRPSYCRPAIYSGLVLVALGVGAV  
KSNITPFGADQVKDRGPEATRRFFNWFYWCINLGAIFSLGGIAYIQQNISFSIGYIIPAV  
CLGVSLIIFFLGKAVFITKPADGSAFSDMFRILGSALCGRGPKEPSLLRPKPTVLDGAKV  
TYGGRFSDEKVEEVKSLVKILPVFLALIPYWTVYFQMQTTYYLQSLHLTIPGADPNSTDS  
HPNTFRFPAAWLTMFDAVLILMLIPLKDKVVDPILKRKGLLPSSLKRIAVGMFFVMCSAV  
AAGILETKRLDIVRTRGPIPQSLGGVIYYAADLPIWWQVPQYVLIGVSEIFASIAGLEFA  
YSAAPRSMQSAIMGLFFFFSGIGSFVGSGLLAIVSLKAIGWMSSHQDFGNINECRLNYYF  
FLLAAIQGITLLIFLIVSVKYDKQKPKPASHRASMSNS**

**>Slc15a5**

**MLPIDVFDRPEHLLHGICKTSHPGMFNKPHKGRKKLQVIICVLFVELFERFTFFGIVCNM  
ILFCTIKLGYSSYQAAMVNTCFVGACILTPVLVGWFAETCLGRTTVLCFCALLHFIGTAL  
LPVVAFPFEDFYINTHNIVHQLEPHEQHILFYLALIAVALGIGGIRAILCPMAAYHLQSC  
DQPKLLSFFNWFYWMVNLNSTVVFLGIAYIQQSVAKNLCFLIPFTSVLLALIALHMVRNK  
LTFRPKKGSSLLTTLGVFLNSFKMCCLHYRHLSGDVANWLDRAKENNGGCYSETSVENVK  
ILVKLFPLFGLQLLYRACITQIPSGYYLQTMHSNLKLNGFLLPVAVMKVISILPVLILAP  
LLELLNTYYQSPKKKLPSPATFITMGHGCAALSALLAGISEIHRKDYPEVEQTLSGKVLQ  
VSSMTCFQLTPQYILLGVAEAFVTPACSLIAFCLTPSNLRGVSLHFLTLSYGGGCFLGAF  
LIHLLYFVSGGNFYPNNLSSGNMERFFFILATLMAINTLVFWRISQSRYADLSVELSSGI  
KDSPLSEKLLQYKTCLRFYDTMERSDTLTSMETVL**

**>Slc16a1**

**MPPATGGPVGYTPPEGGWGWAVVVGAFISIGFSYAFPKSITVFFKEIEVIFNATSSQVSW  
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GLGLAFNLNPALTMIGKYFYKRRPIANGIAMAGSPVFLSTLAPLNSWLFDQFGWRGSFLI  
LGGALLNCCVAGSLMRPIGPKPQPAIPKEDAEIKPQEKKTVMQTINGFLDLTLFTHRGFL  
LYLLGNVIMFFGLFAPLVFLSNYAKSKHISKDKAAFLLSILAFTDMIARPSMGLVANTRW  
VRPRIQYFFAASVLYNGVCHLLAPLSTDYLGFAIYAVFFGVAFGWLSSVLFETLMDLVGA  
QRFSSAVGLVTIVECAPVLLGPPLLGRLNDIYDDYKYTYQGCGIVLVIASIFLFVGMGIN  
YRLVDKEKKEEEKRAKLEDKDEETNLDNALNEKEKEADGVV**

**>Slc16a1\_1of2**

**MAPAVGGPVGYTPPEGGWGWAVVLGAFISIGFSYAFPKSITVFFKEIEVIFNATSSQVSW  
ISSIMLAVMYGGGPVSSILVNKYGSRPIMILGGCLSGAGLIAASFCNTVEGLYFCVGVVG  
GLGLAFNLNPALTMIGKYFYKKRPIANGIAMAGSPVFLSTLAPLNTWFFDQFGWRGSFLI  
LGGLLLNCCVAGSLMRPIGPKPQPAVKADNSNSRAKERKTVVEVINGFIDLTLFKHRGFL  
LYLLGNVVMFFGLFSPLVFLSNYAKSKQIPREKAAFLLSILAFVDMVARPSMGIVANTKW  
VRPRVQHFFAASILLNGVCHLLAPLSTDYTGFVIYAIFFGFAFGWLSSVLFETLMDLVGA  
QRFSSAVGLVTIVECGPVLLGPPLLGKFNDIYHDYKYTYMGCGIVLLIGSLFLFVGMGIN  
YKLLEREAKEESKKANQQDDPGKEVVEALKAAEDNAAEEAV**

**>Slc16a10**

**MTEPEPTLEQEPTPEPEPTQEPTPEPTPEPEPTQEPESEPELELKQENGCTKASEQKSPE  
EFEPPEGGWGWVVMLASMWCNGSVFGIQNAFGIMFVYLLNEFGSEHDADLRFKTAWVGSL  
SMGMIFFCSPIVSVFTDLLGCRITAVGGAAVGCVGLLASSFVTSLGPMYFTYGIVFACGC  
SFAYQPSLVILGHYFKRRLGLVNGIVTAGSSVFTITLPYMLSGLLKSVGLYHTLRVLAIF  
MFILMLAGLTYKPLLPKPVSSSKPGSRCPPLSRIFNVNIWKSLGYRIWAFGIPAALYGYF  
VPYVHLMTHVEERFGPEANKEVLLACIGITSGVGRLIFGRVADYVPGVNKVFLQVSSFMV  
IGVMSMMIPLCHVFGGLIAVCLLMGLFDGCFICIMAPIAFELVGSQNVSQAIGFLLGMMS  
IPMTVGPPIAGFLRDRLGSYDVAFYLAGIPPLIGGAVLCAIPWVEARRKRREAANTAENT  
EKMLESRSPPLEDTVCRTEEPESVI**

**>Slc16a12a**

**MKTRSNRNMREKELVNTSRTEPGRAKPAETGQKRKQEAERSEGMKERMKRGRLEMGEKNP  
CLATAPDGGWGWMIVAGCFLTTVCTRAVTRCVSIFFVEFQLYFSRDYSATAWIHSLLDCT  
TMLCAPLGSYIGNRLSSRIAIMIGGLLSSTGLLLSSLATSVEFLYLTLGVLTGVGFALSY  
TPAIAMVGSYFRQRKALAYGIAMSGSGIGTFILAPAVQLLIEFFSWRGALLILAGLVSHL  
CVCGALMRPLQSQRGRQNKMDLENGKTVDLLNVKLAYVELRGSMEVTHAVVKEMEKKEPS  
ENMLRNGKGWIEADDMKQSHLDGEENHGQDLSENPKTVNKWSEEEPRTISIPALVQSSGL  
PLENLLKYQKNITFPESKSEGNNNQSTVAKSKVVKAKLLKESKENVWSVLRKTVLKEYSF  
LLIPDFLLLLVSFLFLAYGCSVPFVYLVPYSLSAGVSPQQAALVMSILGVSGIIGTITFG  
WIADRKCLRPYRVVSYMLAVGSEGLSCLFLPLLSGFSLLVPFSLIYGYFDGAYVALIPVV  
TSDTVSSAQLTSALGVVYFLHAIPYLISPPIGGWLVDQTGSYTATFILSGVSLICSAVIL  
AAVKVIFRCTRGSSCLK**

**>Slc16a12b**

**MAIKVVGRTDYMAQEKKKGGVLPPDGGWGWMIVAGCFVVTVCTRAVTRCISIFFVEFQMH  
FAKDYSGTAWIHSLVDCTTMLCAPLGSLIGNQLSCRIAVILGGFLASVGLVLSSFATSLE  
YLYATLGLLTGLGFALCYTPAIAMVGIYFCERKALAYGIAMSGSGIGTFILAPVVQLLIE  
HYSWRGALLILGGFVLNLCVCGALLRPIILKEEEACPLPVDSECGYSVKPPTLNGGPTRS  
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MLIIPATS**

**>Slc16a13**

**MEKPQKTEEEQPPCPQGAAPDGGWGWVVVGALFVISALVFGLIRSLGVFFVEFVQYFDES  
AQAVSWITSIGLAMQQLMSPIGAAASNVYGTRPVVMIGGFLSGLGFILASQATSLLHLYL  
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DLGKIRLLHMLVVWTGLLGLSLMLIPVAVVYAGLLLVSIVYGFCAGAMAPLAFAVVPEIV  
GIERVLGALGLLQLIESAGGLLGAPLSGWLKDSTGTYTVSFIAAGSFLMIGMLIAMTLPY  
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**>Slc16a2**

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HVAFYLAGVPPIVGGIVMFFVPLVHQRMQKRRKETDDPSMDKMLKNCSNGDMLPGYTDME  
THI**

**>Slc16a3**

**MGGAVVDTGDSGVKAPDGGWGWAVLFGCFIITGFSYAFPKAVSVFFKELIREFGVGYSDT  
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ITGLGLALNFQPSLIMLNRYFSEKRPLANGLAAAGSPVALCCLSPLGQVLQYKYGWRGGF  
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SIMVLGLFVPPVFVVSYAKELGNEDTKSALLLTILGFIDIFARPTSGIIAGLKWVRPRCV  
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IGLVLLVEAIAVLVGPPGAGRLLDATKNYMYVFMLAGCEVVLSALVLAICNLLFIKRKPQ  
QPDPPAKMEMAITETEMEELNKAPKDDQDNGGGAENEKKQAIEPETKTTSKDEVKELESI  
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**>Slc16a3\_1of2**

**MGGVALDDGGCKVKAPDGGWGWAVLFGCFVITGFSYAFPKAVSVFFKELIREFGVGYSDT  
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IYTIAASIMVLGLFVPPVFVVSYAKELGNEDTKSALLLSILGFIDIFARPTCGIIAGLQW  
VRPRCVYLFSFALIFNGITDLVGSLSKDYTSLVVFCIFFGISYGMVGALQFEVLMAVVGT  
EKFSSAIGLVLMLEAIAVLVGPPSAGRLLDHTKKYMFVFLLAGIEVVLSALVLAICNFLC  
IKKKPEAPDAAAVESGEPVEEKNHSSPPATEEPHTPNGNSEKPKTDLRPENVTEEPTEEE  
TFLKEEDEKEKTITCSAESDL**

**>Slc16a4**

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SAGFLFSIFATSVTYLYISMGLVVGLGFALLYQATSVVIVTYFRKRLATAYSIGRSGMGL  
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DPLKNNMNGNTPVANGTSKSDSSPPIHKDTLIIKNPVHEQNSLPHLDLKKPTQNGVNGTD  
SSQTKTSPEMNGVSPVDSLLENGRTENVPENSPKVLDFSLLKNPFFCIYTWSLVFSQLAY  
FIPYFHLSARARNLGIDPMDASFIISVAGITETVAQLASGWVTDRNLVHKYHYHKAYLIL  
CGVVNLLSPLATSYILLMVYAVFFAIFCGGYMALLLPVLVDLVGADKLNNSMGFSMFFVG  
LGCLTGPPLAGFLYDYTQTYDCSFYLAGVCYLLSSISLFLEPLARRWQARKERLETLNQE  
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**>Slc16a5\_1of2**

**MTEGVEVHQPQPNTTVTRSRASSLQAFENADTASCKSEEPDQEEEEEQSSSTLPEERHCS  
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FSLCFQPSITMVGHYFVRRRAFANALSSTGTALGLSILPLLANYLLRNFGWRGSFLVLGG  
VLLNCCVCGAVMRPLAAKPKTETRTKETDNHHLKTNCLSVHQGLKGRLRATLSTIMTFLR  
RHMAFDLLCSNPYFCAYALGVSWMMLGFVVPLVYLVPYATAYGMEQDQAALLMAILGLIN  
IIVRPATAIVFGLPRFRGSHNFAYLFAIAVVINGLSNCVCGIGTSFLVLLVYVILFGFSM  
SLVGSLLFTVLMDTVEMSRFPSALGLISIMESIMLLLGPPLAGILVDSTGQYIYVFFACS  
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RDTETDV**

**>Slc16a5**

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FGGVLSGFGMAVSSFSHSIVDLYITAGVITGLGFCFSFQPAVTILGHYFVRRRPFANAMS  
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NSPKTSDKKGCMLGICQSLASSLRQQMAFDLFCSNTRFRVFSLGITWMMLGFVVPLIYLV  
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ICCISASFPVLLVYVLTYGLSMSVVGSLMFTVLMDTVEMSRFPSALGLLSIMESVTLLIG  
PPLAGFLVDRTQLYTYVFMACTIIVVLSALFLMFTFYWLDSRDAAKKDSPAKPAINISTD  
CQYSSVPIDGDKTNKPSSETENTTCV**

**>Slc16a7\_first**

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LGLAFNLQPALTMIGRYFYKKRPIANGFAMAGSPVFLSTLAPLNQYLINEYGWRGSFLIL  
GGLLLNCCVAGSLMRPLVAPAGSIAPPPVVEVKHAEKEKLTAWQTVNKYLDLSLFKHRGF  
LIYLSGNVIMFLGFFAPIVFLSPYAKDNGVDEYQAAFLLSILAFVDMFARPSMGLLANSR  
WVRPRIQYFFSFAVLYNGVCHLLCPLAESYTGMVVYAVFFGFAFGMVSAVLFETLMDLVG  
AQRFSSAVGLTTIVECCPVLIGPPLAGKLVDITKNYKYMYLCCGAVVVLSSIWLFIGNFI  
NYRLLDRERKRDESYRQAEREEPEPTENTADAHTHTDTDTQAEQQLCDSTDGVMQRETNI**

**>Slc16a8**

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GLGLALNFQPSLIMLGAYFDKRRPLANGLAAAGSPVFLSALSPLGQLLLDQYGWRGGFLI  
TGGLLLNCCTCGAVMRPLKLKERKACNQELKEMLPPEAGQENIVCENNNDKQPSKKKLLD  
FSVLRDKGLIIYIIAKFIVVLGLFVPTILLVNYAKDQGVPDKEAAFLLSIIGFIDIFARP  
TCGVVAGLKWVRPKMSYFFSLALLFNGLTDVCSATSTDYKGLIIFCVFFGLSYGMVGALQ  
FEVLMGIVGTSKFSSALGLVLLFEAVAVLIGPPSAGYLVDKYKNYELIFYMAGGELITAG  
IFLALASFCCISQKKRKDSPQTQQTDVEVNPER**

**>Slc16a9a**

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GLVYAATLTITCQYFDKRRGLALGIVTTGTSVGGFIYATLQNELIELFGLEGCLLIIGAL  
ALNLMACAGPMRPLNLPGYYLKQRAALQRTEDPEPLYSKPTAVIIESGSDLKTKPGLAEN  
TTTVKLLINKDPIELQDSEGERKVHILSSSIIARAIKKWMRPYGQYFCETVELLQDRIFM  
AFCIAMFLFSLGAFPPVLFMEDVAQSEGLIDGIALIPLVSIVAMTTGIGKLILGVLADMR  
WVNSLYLYALTLIGSGTALLLIPVSKSYLGLQILSASVGFFSGNWSLTSYITTKIVGIER  
LGQAHGILMCFGGFGIALGPPVVGWFFDWTQSYDLAFYLSGTCVLVSGVFLFLAALPCWN  
RTAQEGNSQAEEDVNTSQQHHSFDCDKVASVA**

**>Slc16a9b**

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GLVYAATVTITCQYFDKRRGLALGIVTTGTSVGGFLYAAAQNEFIALFGLDGCLLLIGCF  
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FLEDLAQSEGLITGISTIPLVSIMSIAAGVGKLLLGVMMDVRWMNSIYLYAVTLLGTGVA  
LLIIPVTKNYAGLQVISAVLGFFSGNWSVIPYMTTKVVGMDRLTEAYGILMFFGGFSIML  
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KVATVA**

**>CU929219.1**

**MALEDGYSINTTEDDQDSDTAPLLEKEVQEIKVPPKCCSVRCNLAVMMFFGFAVVYGLRV  
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LGAFFFGYLFTQIPGGYLSGRFGGSLFLGGGVLGTALLTLLTPLSAQLGAKWLFALRALE  
GFGEGVTFPAMMAMWARWAPPLERARLMTFSGAGSSFGAFVALPLTGFICHSLGWPAVFY  
SCGGAGCLWAVFWFILVSDEPRTHPRITVQEKDYIINSLGQQGTAHGWSVPVWSMLFSMP  
LWAIIIPQMCSNWSYYTLLTSLPIYMDTVLHFDLRQNSFLSALPYLAGWLFSVGSGVLAD  
NLLEKEILSVTAVRKIFTFIGLFLPAAFLLAVGFSGCSGVLAVTFLTLSSAFGGFSAAGV  
FINQIDIAPRYAGMLLGITNTFGTIPGVLAPIVVGYFTKNHSVSGWRNVFWLSAGVSAFG  
AIFYVIFGTGKIQSWARTDEESDTDEHD**

**>Slc17a5**

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CFVSNSPSSHKRITEAEKTYIMSSLKNELSPTQDYIPWTSIFKSMPLWAIVVAHFSYNWT  
FYTLLTLLPTYMNDVLGFSIQQNGMLSALPYLGCWLLALLGGQLADLLRERFLFRTVIVR  
KAFTVVGMAGPAVFLVAAGYTGCNYILAVAFLTISSSLGGISASGFNINHLDIAPSYAGI  
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WAVQTIHIQ**

**>Slc17a6a**

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DPETVGMIHGSFFWGYIVTQIPGGYISSRLAANRVFGAAILLTSTLNMFIPSAARVHYGC  
VMFVRILQGLVEGVTYPACHGIWSKWAPPLERSRLATTSFCGSYAGAVVAMPLAGILVQY  
SGWSSVFYIYGSFGIVWYMFWILVSYESPADHPTITDEERTYIEESIGESAKLLGAMEKY  
KTPWRKFFTSMPVYAIIVANFCRSWTFYLLLISQPAYFEEVFGFEISKVGMVSALPHLVM  
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VGFSGFAISGFNVNHLDIAPRYASILMGISNGVGTLSGMVCPLIVGAMTKNKTREEWQNV  
FLIASLVHYGGVIFYGIFASGEKQPWADPEETSDEKCGFIDEDELAEETGDITLSHAPFG  
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**>Slc17a6b**

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PETVGLIHGSFFWGYIVTQIPGGYISSRLAANRVFGAAILLTSTLNMFIPSAARGHYGCV  
IFVRILQGLVEGVTYPACHGIWSKWAPPLERSRLATTSFCGSYAGAVIAMPLAGILVQYT  
GWSSVFYVYGCFGIFWYMFWILVSYESPAEHPTITAEERCYIEESIGESAKLLGPADKFK  
TPWRKFFTSMPVYAIIVANFCRSWTFYLLLISQPAYFEEVFGFEISKVGMLSALPHLVMT  
IIVPIGGQLADHLRSKNILSTTTVRKIMNCGGFGMEATLLLIVGYSHSKGVAISFLVLAV  
GFSGFAISGFNVNHLDIAPRYASILMGISNGVGTLSGMVCPLIVGAMTKHKTREEWQYVF  
LIASLVHYGGVIFYGIFASGEKQPWADPELTSDEKCGFIDEDELAEETGDITQSYGALGA  
PAKSYGATTQLNGGWAEGWDKREEYVQDGVEEGGYGYRQGGNYS**

**>Slc17a7**

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GSFFWGYIVTQIPGGFICQKFAANRVFGFAIVATSTLNMLIPSAARVHYGCVIMVRVCQG  
LVEGVSYPACHGIWAKWAPPLERSRLATTAFCGSYAGAVVAMPLAGVLVQYTGWSSVFYV  
YGSVGIFWYLFWILVSYESPAAHPTITPEERKYIEDAIGESAGLVNPLQKFKTPWRHFFT  
SMPVYAIIVANFCRSWTFYLLLISQPAYFEEVFGFEISKVGMVSALPHLVMTIIVPIGGQ  
LADYLRTHNLMTTTNVRKLMNCGGFGMEATLLLVVGFSHTKGVAISFLVLAVGFSGFAIS  
GFNVNHLDIAPRYASILMGISNGVGTLSGMVCPLIVGAMTKHKTREEWQYVFLIAALVHY  
GGVIFYGLFASGEKQPWADAENTSEEKCGILGEDELANETEELYRTGGQYGAINNPHVGG  
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**>Slc17a7\_2of2**

**MEVRPERFKAVAAKTLGRINRVLEKRQENGETIELSAEGRPELQEEKELPVVDCTCFGLP  
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GSFFWGYIVTQIPGGFICQKFAANRVFGFAVVSTSILNMMIPTAARMHFGCVILVRILQG  
LVEGVSYPACHGIWAKWAPPLERSRLATTAFCGSYAGAVIAMPLAGVLVQYSGWSSVFYV  
YGSFGVCWYLFWILVSYESPAAHPTITPEERKYIEDAIGESAGLVNPLTKFNTPWRQFFT  
SMPVYAIIVANFCRSWTFYLLLISQPAYFEEVFKFEISKVGILSALPHLVMTIVVPIGGQ  
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GFNVNHLDIAPRYASILMGISNGVGTLSGMVCPLIVGAMTKNKTREEWQYVFLIASLVHY  
GGVIFYGLFASGEKQPWAEPENTSEEKCGILGEDELADETEELYRSAGGGYGATMQSGDP  
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**>Slc17a8**

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LVQYVGWPSVFYIYGVFGIIWYIFWILLAYNSPAVHPTISEEERNYIETSIGEGANLMSS  
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**>Slc17a9a**

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SSWGIMTALTPILAKTGLSPLLTMTASRFLLGVMQGVHYPSLVSICSQRVTEGERGLLMS  
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ISRKDVSESSRINWLYLLREPSVWAMIIAHLCFSSSYYTLMSWLPTFFKDTFPHAKDWVF  
NVIPWFVALPTSLFGGSISDHLIRQGCGTAAVRKLMQFCSMGVASVFILFLCKTSSFIQA  
VACVSVTIGLSTFHNSGVSVNVNDQAPSCAGALYGVMNTCAAFTGLLMVYISGYMIEVTG  
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**>Slc17a9b**

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AAAWGAMTAFTPILAHFCSQPIFSMTLSRFLMGLLQGVHYPSLASLCSQKVVESERGFLM  
STVGSGSYLGTLVIGGVGSLMLDLYGWESVFYVSGLLSVLWAYCMWKYLLKGEGPIITLE  
SLGSAGTQSKIPKRNWLRLFRQPAVCAVIITHLCTASTFFTLLSWLPTFFKDTFPDAKGW  
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AAVAFVSATMGLTTFSHSGVSVNVQDLAPSCAGALFGVMNTCGAFTGVIMVYFSGYLIET  
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**>Slc18a1**

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TLLFFARSLQGIGSSFSTVAGLGMLASVYTDDSERGIAMGIALGGLAMGVLIGAPFGSIM  
YEFVSKSSPFLVLAFLAMFDGALQLCILQPSKISPTSMEGTPLFILLKDPYILISAGSLC  
FANMGVAVLEPTLPIWMMQTMCAPKWQLGVAFLPASVSYLIGTNLFGILANKMGRWLCSM  
VGMFIVGISLLCVPFAKNLYGLIGPNGGLGFAVGMVDTSMFAIMGYLVDIRHVSVYGSVY  
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**>Slc18a2**

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SSTFQSIVSLYDNTTRVTGFSPQMSTAGPMSLAPTFVSPQNQSDCPKADDQLLNENVKVG  
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GVGSSCSSVAGMGMLASVYTDDEERGNAIGIALGGLAMGVLVGPPFGSVMYEFVGKTAPF  
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PALPIWMMETMCPRKWQLGIAFVPASISYLIGTNIFAVLAHKMGRWLCSLIGMLLVGISI  
LCVPLAKDIYGLIVPNFGVGFAIGMVDSSMMPIMGYLVDLRHVSVYGSVYAIADVAFCMG  
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RSYSTQGSSYQMGDDFDPESPE**

**>CABZ01112647.1**

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TLAFLVDVRHVSVYGSVYAIADISYSVAYAMGPVVAGQIVHNLGFVQLNLGMGLVNVLYA  
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**>Slc18a3a**

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RVGYDIPLLIGLSIMFVSTCIFAFAENYATLFMARSLQGLGSAFADTSGIAMIADKYAEE  
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SRTRENMPVGTPIYKLMIDPYIAVVAGALTTCNIPLAFLEPTIANWMEETMNASQWQIGI  
TWLPAFFPHILGVYLTVKLAAKYPHLQWFYGALGMVIIGASSCIVPACKNFEQLIIPLCG  
VCFGIALVDTALLPTLAFLVDVRHVSVYGSVYAIADISYCVAYALGPIVAGKIVHDLGFV  
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**>Slc19a1**

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FYGFMVQLKPGEPFITPYLLSTEKNFTREQVTNEINPVLSYSYMVVLVPVFLLTDYLRYK  
PVLVLQSLSHVSIWLLLLLGNSLLEMQFMEFFYGITMAARVAYSSYIFSLVPATVYQRVA  
SYSRSSVLMGVFTSSVLGQMCVSLGGISYTMLSAVSLGFVSFGLLLSFCLPWPKRSMFFN  
KARMEEERKEAAKSELAKMKPEEKDGIVEGMDTNRSSPSWTNSVFVGMLKELKHVVKVPS  
LRLWSLWWVFNSTGYYLVLFYVHILWNKVYPATENKNVYNGAVEAASTLLGAITSFAAGY  
VKIRWNLWSELVIGLITAAQAALLLLMGMTEDIWVCYVAYALFKGFYQFLVPIAIFQIAS  
SLTKELCALVFGVNTFLGTILKAIITIIVADKRGLALSVHSQFFVYFFYFTLLTVIYLGC  
SAFIITCHYRNQRAGAESTEEAVSTELSPIATAASESTTVHNGTSIKT**

**>Slc19a2**

**MSEPWLYPTVLLCIYGFFSSHRPLEAFLMPFLMGPDKNLTETEVVSEIYPLWTYSYLALL  
FPVFLATDYLRYKPVIILQAASYVVTYALLVKAQGLQAMQIVEVFFGLATATEIAYYSYI  
YSVVEPSHYQMVTGFCRSVTLLGSAMGSLLGQILFSVADIALFYLCVITLVSFCIAFVAP  
WFLPMPSKSLFFHQSESSSQDEAVLETVNTSPLIEKPEDPESNKQPNANEKTTLKSNTSS  
SGLLDVLKMLWTDFLQCYSSSTLLAWSVWWALSTCGYLQVINYAQALWEDILTSKNYDIY  
NGYVETISTLLGAFAAFVVGYVKVSWAVWGELALCIFTVVIAVCVYLMYAVRNIWVCYTS  
YIIFRAVYMLLITIATYQIAANLSMKRYALVFGVNTFIALSLQMLLTVIVVDSAGLHLEI  
SIQFLIYASYFAAVAVIFFIAGLYKLFRSRTSGGQNELSSAEA**

**>Slc19a3b**

**MRRSDWVFPTVLLSLYGFFANCRPAEPFLTPYLVGPKNISEEVVTNYLFPIWTYSYLSLL  
CPVFLLTDLLRYKPLIVAQGLFLVTNYIILSFANSLPALTYLQFNFAVVTSTEVAYFSYI  
YSVIPPERYQRATGYVRSAMLAGYTFGAILGQMLISLANTSYFHVNTVTLSLMIVALCIS  
LSLPMPQHGVFFKKKQVEVSMDTMNEVADGGSSRDLEKEVTGRSVKICEYIKTSGKQMWE  
SLKESYSSRRLVQWSLWWALATAGYGQVFNYVQLMWDHIEPSSTSSVYNGGVEAVCALVG  
AAAAFSVGYIQVQWGVWGELSLGVFSAVGAGCVFLMGLTNSIWLSYAGYAIFKASYMFLI  
TITMFQIAVNLSMECYALTFGINSFVALTLQTILTAIVVDNTALGLDIATQFLVYGGYYS  
IISVLFLIQGLYTVCKHFCTSTVTNTEALTVIMEDQRKSDTSGKQETQSSSSSSSLQNKE  
QSALQAYTETAL**

**>Slc1a1**

**MEMLGKKERRSRDVKGLLKRNWILIATIIAVILGIGLGVVVRDYTSLTQLEKQYFGFPGE  
ILMRMLKMVILPLIVSSMITGVAALDSEVSGRIGLRAVVYYISTTIIAVILGIVLVMTIK  
PGVSQSADNIDREGTTPNVTTVETLLDLIRNMFPENLVQACFQQYKTQRREIEPTKPSIN  
TTNATAFPPFTTIISTVAQNLTKDYKIVGSYSDGINVLGLIVFCVTFGLVIGKMGERGRI  
LLEFFDALNEATMRIVQIIMCYMPIGIFFLIAAKIIEVDDWEIFRKLGLYMVTVLSGLAI  
HSIIFLPLIYFVFVRKNPFTFTLGMAQALVTALMISSSSATLPVTFRCAEENNRIDKRIT  
RFVLPVGATINMDGTALYEAVASIFIAQLNNYDLNAGQIVTISITATVASIGAAGVPNAG  
MVTMVIVLTAVGLPADDVTLIIAVDWLLDRFRTMINVLGDAYGAGIVQKLSKRELERMDL  
TSDVDAANPFALETTLDDDECEDKKSYVNGGFTIDKSDAISFTETSQF**

**>Slc1a2a**

**MQKQVEIRMHENHLDPLPEPEESICGSCCDKLMKNLLLTLTVLGVITGSVAGILLRYASP  
LPADVIMVIAFPGDILMRMLKMVILPLIISSLITGLAGLDAKSSGRLGTRAMIYYMSTTV  
IAAVLGVILVLLIHPGNPKLKANLGEGKKNDEVSSLDAFFDLIRNLFPENLVQACFQQIQ  
TVTTKVEIAPPPPPTRFGRNATKGAAKYVIKKSLQFKSGMNVLGIIGFFVAFGICMGKMG  
EKAKLMVDFFNTLNEIVMRLVGMIMWYSPIGIACLICGKIISINDLEMVAKQLGMYMVTV  
IVGLIIHGGIFLPLIYFVIVRKNPFKFFMGLFQAWVTALGTASSAGTLPVTFRCLEENLG  
IDKRVTRFVLPVGATINMDGTALYEAVAAIFIAQMNGIELDPGQIVTVSLTATLASVGAA  
SIPSAGLVTMLLILTAVGLPTQDISLLVAVDWLLDRFRTSVNVIGDSYGAGIVYHLSKDE  
LDMFDAQQIRPDDFEMAKTQSYYENNSNHGVYHNSCQPIQIDDCKVTLASNGSPAEFSLV  
EEEPWIRE**

**>Slc1a2b**

**LWMMPKHVEVRMHESHLEPIEARPLSKWGTICQKMRKNLLLTLTVMGVIMGAVSGMLLRV  
ASPIDDNIVMVIAFPGDILMRMLKMLILPLIISSLITGLAGLDAKSSGRLGSRAMIYYMT  
TTVIAAVLGVILVLLIHPGNPKLKENLGEGLENDEVSSLDAFFDLIRNLFPENLVQACFQ  
QIQTVVKKVEVQPDLDDTNSTMSEYLSNATKPPPIFKDKKSLQFKSGMNVLGLIGFFIAF  
GICMGKMGEKARLMIDFFNILNEIVMKLVIMIMWYSPFGIACLICGKIISIKDLEVVARQ  
LGMYMITVIVGLIIHGAIFLPCIYFAIVRKNPFSFFMGIFQAWITALGTASSAGTLPVTF  
RCLEENLGIDKRVTRFVLPVGATINMDGTALYEAVAAIFIAQMNGIDLDPGQIVTVSLTA  
TLASVGAASIPSAGLVTMLLILTAVGLPTQDISLLVAVDWLLDRFRTSVNVVGDSYGAGI  
VYHLSKAELDALDAQHGKTDDIEMMTKTQSYYDDLKNHHENNSNQCVFAAQNTGLVDDCK  
VTLAATNGSTAEITVVEEEPWKND**

**>Slc1a3a**

**MTQSNGETRLQRSRVQQLRDGLTERSLRAKNTVQNISSNDVKGFFMRNAFVILTVAAVIV  
GIILGFGLRPYKMSYREVKYFSFPGELLMRMLQMLVLPLLVSSLITGMAALDSRASGKMG  
VRAVVYYTTTTIIAVFIGIVMVLIIHPGKGSKDEFTKHEKIEQVSPADAFLDLIRNMFPP  
NLVQACTQQFKTQYGKRVVTVKVLVNDTVFSLNNGTQELKREEVIPVLGTVNGINALGLV  
VFSMCFGLIIGNMKEQGQPLRDFFDCLNEAIMRLVAIIMWYAPLGIMFLIAGKIVEMDDL  
SEMGGQLGMYTITVIIGLLIHAVIVLPLLYFLVTRKNPFVFIAGLLQALITALGTSSSSA  
TLPITFKCLEENNGVDKRVTRFVLPVGATINMDGTALYEALAAIFIAQVNDMEMNFGEIL  
TISITATAASIGAAGIPQAGLVTMVIVLTSVGLPTDDITLIIAVDWFLDRLRTTTNVLGD  
SIGAGIVEHLSRHELRSIDAEIGNSVLEENETKKSYQLISQESESDNAKIPDSESKM**

**>Slc1a3b**

**MTKSTGEKPRSRSRVQQFREGIQLRSLKARKKVEDISKDDVKGFLRRNAFVLFTIGAVVF  
GITLGFALRSYKMSYREVKYFSFPGELLMRMLQMLVLPLLVSSLITGMAALDSRASGKMG  
MRAVIYYMTTTFIAVFIGIIMVLIIHPGKGSKDEFTKQQKIEQVSPADAFLDLIRNMFPP  
NLVQACTQQFKTQYGKRIIHVKMIVNDSIFNLTNATQEIAQEEVIPLSGTTNGVNALGLV  
VFSMCFGLIIGNMKEQGQALRDFFDSLNEAIMRLVAIIMWYAPIGILFLIAGKIVEMDDI  
TAMGGQLGMYTVTVIIGLMIHGIIILPTLYFVITRKNPFIFITGLLQALITALGTSSSSA  
TLPITFKCLEENNKVDKRVTRFVLPVGATINMDGTALYEALAAIFIAQVNNMEMNFGQII  
TISITATAASIGAAGIPQAGLVTMVIVLTSVGLPTDDITLIIAVDWFLDRLRTTTNVLGD  
SIGAGIIEFLSKDELQGGDVELGSSVLEENELKKPYQKIPQENEYENEKPPDSETKM**

**>Slc1a4**

**MEEKKSEINGHAGHKCSLPTVSIKSEKKSCKDKCAGFFKRNLLVIMTVSGVLVGVGLGMM  
VRNMNLTRAQMTYFAFPGEMLLRMLKMIILPLVVCSLISGAASLDTRSLGKLGGIAVSYF  
LVTTLIASSIGVALAFIIKPGVGAGALNTNNLGLEGVSNNKETADSFLDLARNLFPSNLV  
AAAFRSYATDYKTVLIGNGTNGTLNYQKVPFGTDTDGMNILGLVLFAMVFGVALRKLGAE  
GEELIRFFNAFNEATMVLVSWIMWYVPFGIMFLVGSKIVEMEDVVLLVTSLGKYIFASIL  
GHIIHGCIILPLIYFGFTRTNPYSFLSGLITPFTTAFATCSSSATLPTMMKCVEENNGVD  
KRISRFILPIGATVNMDGAAIFQCVAAVFIAQLNNVDLNAGQIFTILVTATASSVGAAGI  
PAGGIITIAIILEAIGLPTHDLSLMLAVDWIVDRTTTVVNVEGDALGAGILHHINEQEMK  
KQKHQQEHQEEQELLEVKVEVVANVKAEEETSPLVTHQNQEENSSRETLNDKDGVESVL**

**>Slc1a5\_first**

**STAQKVKRFVLANLLVILTVSAVIVGVLIGLGVRNAGLSRTQIIYFGFPGELLIRLLKMI  
IIPLVVCSLVSGAASIDPKALGKLGGWAMLFFLVTTLIASAIGVIMAFIIHPGSSDGKMS  
QLNAQDDSSVPEAKDVIDSFLDLIRNIFPSNLVAAAFQSYATGYKFVKNDTNSSVLLEKV  
PVGTDVDGMNILGLIVFAMAFGVALRKLGEEGVILMKFFNSFNEATMVLVSWIMWYAPLG  
IMFLVAAKIVEMEDVSLLFTSLGKYIACCVIGHAIHGLLVLPLIYFIITRKNPYTFLLGL  
VTALATAFGTSSSSATLPLMMKCVEENNGVSKHISRFILPIGATVNMDGAACFQCVAAVF  
IAQLNGIPLNFVQVITILVTATASSVGAAGIPAGGVLTLAIILESVGLPTNDLSLILAVD  
WLVDRTCTVINVEGDAYGAGLLQYLVDRHPNKNEEEELDKIRVEEDDATPKPEIRPLIEK  
QGNFEPEEAAGPKPCEKESVM**

**>Slc1a5\_second**

**MTEENISIEDVKASNGEAHLDVPPHANGLSEHRRSEPESTAQKVKRFVLANLLVILTVSA  
VIVGVLIGLGVRNAGLSRTQIIYFGFPGELLIRLLKMIIIPLVVCSLVSGAASIDPKALG  
KLGGWAMLFFLVTTLIASAIGVIMAFIIHPGSSDGKMSQLNAQDDSSVPEAKDVIDSFLD  
LIRNIFPSNLVAAAFQSYATGYKFVKNDTNSSVLLEKVNSFSLNTVVKIIEICLVPVGTD  
VDGMNILGLIVFAMAFGVALRKLGEEGVILMKFFNSFNEATMVLVSWIMWYAPLGIMFLV  
AAKIVEMEDVSLLFTSLGKYIACCVIGHAIHGLLVLPLIYFIITRKNPYTFLLGLVTALA  
TAFGTSSSSATLPLMMKCVEENNGVSKHISRFILPIGATVNMDGAACFQCVAAVFIAQLN  
GIPLNFVQVITILVTATASSVGAAGIPAGGVLTLAIILESVGLPTNDLSLILAVDWLVDR  
TCTVINVEGDAYGAGLLQYLIDRHPNKNEEEELDKIRVEEDDATPKPEIRPLIEKQGNFE  
PEEAAGPKPCEKESVM**

**>Slc1a6**

**MNEKPPNSTSLFLSEDSEKPQRADEGLHRLCRVLQKQMSGSRRKMGGITRNSVKTFLRRN  
AFVIFTVAAVALGVALGFALRPHNLSIRQVKYFSFPGELLMRMLQMLVLPLIVSSLVTGI  
SSLDSKASGKMGIRAIVYYMVTTLIAVFIGIVMVIIIKPGKGSRDSPVASSGSIEPVQAA  
DAFLDLIRNMFPPNLVEACFKQYKTLYKKTVLTKNVTIVVNATENVNSTDLSQVSNFSPV  
LQTIQETVEEAVPVSGSSNGVNALGLVVFSMCFGLVIGNMKQQGQALRDFFDCLNEAIMR  
LVAIIIWYAPVGILFLIAGKIVEMKDLAQVGGQLGMYTVSVIVGLLIHGLLVLPLLFFVV  
TKKNPFTFIAGLLQALITALGTSSSSATLPITFRCLEENNHVDKRVTRFVLPVGATINMD  
GTALYEAVAAIFIAQVNDMDLNFGQILTISITATAASIGAAGIPQAGLVTMVIVLTSVGL  
PTEDITLIIAVDWFLDRLRTTTNVLGDSFGAGIVEHLSRQELQNQDVEISNSVIEENEKP  
YQLICQENDSLKHRNSETTM**

**>Slc1a7b**

**MLILPLVVSSLMSGLAALDAKCSSRLGLITVSYYLWTTFLAVVVGIVMVLIIHPGGMAQK  
EDSEDSGKPIMSSADALLDLIRNMFPANLVQATFQQYRTNSVPIMKAPKTTVATSLAEST  
TRRALIYGIQDDNGTDIQNFQLDLTPPPDVVFRTLPGTSEGMNVLGIVIFSATMGIMLGR  
MGPNGSALVNFCQSLNEAVLKIVAIVIWYFPFGIVFLVAGKILEMSDPSAMGKKLGFYAI  
TVVMGLILHGLFILPSMYFFITKKSPIVYIRGILQALLISLATSSSSATLPITFKCLLEN  
NHIDRRIIRFVLPVGATINMDGTALYEAVAAIFIAQVNNYELDFGQIITISITATAASIG  
AAGIPQAGLVTMVIVLTSVGLPTDDITLIIAVDWALDRFRTMVNVMGDALATGIMAHICR  
KDFIKEGDGVPLICETKPTTNPALPNCQQNNGSFQPPPAGVKPEHIPPDVARLMQLEEGV  
RLPPPDRKKPPVPPRHLKHRDKDHCAIDMNGLETNV**

**>Slc1a7a**

**MALGAVWSRVKNVCQQNGLLILSVLAVVIGCLLGFFLRSKHLSEQEVKYFQFPGELLMRM  
LKMLILPLVVSSLMSGLAALDAKCSSRLGIMTISYYLWTTFVAVVVGIVMVIIIHPGGAA  
QKEDSEDSGKAIMSSADALLDLIRNMFPANLVQATFQQYRTRSIPIMKPKPTISQDILET  
TTKRVFIYGIQDDNGTDIQNFSLDLTPPPDVVFRTLPGTSEGMNVLGIVIFSATMGIMLG  
RMGPNGSALVNFCQSLNEAVLKIVAIVIWYFPFGIVFLVAGKILEMDDPSAMGKKLGFYA  
ITVVMGLVLHGLFILPSMYFFITKKSPIVYIRGILQALLISLATSSSSATLPITFKCLLE  
NNHIDRRIIRFVLPVGATINMDGTALYEAVAAIFIAQVNNYELDFGQIITISITATAASI  
GAAGIPQAGLVTMVIVLTSVGLPTDDITLIIAVDWALDRFRTMVNVMGDALATGIMAHIC  
RKDFVKEGEEVRIPLICETKPMISIQQMMSYQKNGCFQPPPPGPMRKPEHLAPDVARLMQ  
LEEGIRPADNKKSSHLSPLHYKRDQKDKEHCTIDMNGLETNV**

**>Slc1a8a**

**MHDALISCKKRLLLALLCRLKHLTMEELLIPADADKAPPESSFFTSMGPAKSLLERIKDF  
MAPTFSISVREFIKEYIKRNGLLTLSVLAVITGCVLGFMLRGLSLSTQAKIYFSFPGELL  
MRILKMLILPLITSSLMSGLSSMESKACCKMGVLTVTYYLWTTFIAVVVGIVLVLIIKPG  
YGTDMESNRLGNGQVMTSADALLDLVRNMIPSNLIEATFQQYKTDLIPIIKTPLNPGTQN  
FFYLMPDDNNPKGRTVLLELTPAPDIEYKTRPGSSQQMNVLGIVIFSATMGLLLGKMGER  
GAPLVNVCQCINECVMKIINAAVWYFPFGIIFLVAGKILDMSDPSTLGKKLGWYGVTVLA  
GLFVHGLVLLPLFYFILTGKNPFTYIRGLLQAMVIALATSSSSATLPITMKCLLENCRVD  
RQIARFVLPVGATINMDGTALYEAVAAIFIAQVNEYELDFGQLITISITATAASIGAAGI  
PQAGLVTMVIVLTSVGLPPDDITLIVAIDWILDRFRTMINVLGDALAAGIIGHLCRKDFP  
PDRAANENGGAKDPRADHDMENVPLTEVPLLAGKDCIFEVVGDTVFERPTVYYNICQV**

**>Slc1a8b**

**MDESRSSSRPASSQCHSPPPSPWRNMVEYFKNIVKNSVSQKIREWLKDYCKRNGLLTLSV  
LAVMSGCVVGFTLRSLNLSTQAKIYFSFPGELLMRMLKMLILPLITSSLMSGLSAMDTKA  
SGRLGLLTITYYLWTTFIAVIVGIILVLIIHPGTGTEKEGHKAAGGPVMTSADALLDLIR  
NMIPSNLIEATFQQYKTELVPNFKNSAKSSQANFVYIMPDYENPKMGHPVFLELTPPPEI  
HYKIVPGKSNGMNVLGIVIFSATMGLLLGRMGSRGSPLVNVCLCINECVMKIINAAMWYF  
PFGIVFLVAGKILDMHDPAVLAEKLGMYFITVLAGLFVHGVILLPLFFFVFTRKNPFSYI  
RGLLQALVIALATSSSSATLPITMKCLLENCHVDRKIARFVLPVGATINMDGTALYEAVA  
AIFIAQVNEYELDFGQLVTISITATAASIGAAGIPQAGLVTMVIVLTSVGLPPDDISLIV  
AIDWILDRFRTMINVLGDALAAGIMAHVCRKDFQKDMPSSGNSERRDTMISFGNQSVQSF  
PTSEVPLLANRDYILEVVGDQVIEKPTACYNLCQV**

**>Slc1a9**

**ILSSVLRYSPVGIASLICGKIAAIGDLEVVARQLGMYMVTVIVGLIIHGGLILPVIFFAV  
TRKNPFMFYSGIFQAWITALGTASSAGTLPVTFRCLEENLKIDKRVTRFVLPIGATINMD  
GTALYEAVAAIFIAQMNDIALDGGQIITVSMTATLASVGAASIPSAGLVTMLLILTAVGL  
PTQDISLLVAVDWLLDRMRTSINVVGDSFGAGIVDHLSRAELAVIDGDIPLSDEEFVPPP  
PLLTEIDLIDPLKPPELPPRSPRPPKLNHHAPSLTPSQSQSHSIPHSPRSVRSPSPHSIR  
SPSPRSVCSHSPRPFRTHSPRLLRRMEPGYCALPTHDNQITTLPRGFRERGRDRERDRER  
DRERDRERERLRERERDKGSETEEDEEKEKMVDEASDGEESDDTAYDRRHTIPPCDLP**

**>Slc20a1a**

**MESTTLASLAAVSVLAAGAQTDMSDVLWLLILGFVIAFILAFSVGANDVANSFGTAVGSG  
VVTLRQACILATIFETVGAMLLGAKVSETIRSGIIDVHMYNGSEAVLMAGSISAMFGSAV  
WQLAASFLKLPISGTHCIVGATIGFSMVARGHQGVKWLELLRIVASWFLSPLLSGIMSAV  
LFYFVRKFILNKDDPVPNGLRALPVFYAVTMGINLFSIMFTGAPMLGFDRIPWWGTLLIS  
LGCAILTALVVWFIVCPRLKKKMQSKCLGPNIADTSGTQLVEKKPSSNGLMDHHPGPPRN  
YSPVPQTPPADSNKVAFDIGGSAETDLDKKEFDTKDQDCTHALNGGGGIVIPDLSGNQFH  
TVHKDSGIYKDLLHKLHLAKVGECIGEPVEKPIRRNNSYTSYTMAIYGIHGSLKDGEGGS  
RTGLDGEKRRSRYDSYNSYCTAVADGEAALEDAALAVGMEDEALRGDVLEEDIDELEIDK  
PEVSTLFQFLQILTACFGSFAHGGNDVSNAIGPLVALWLIYDSASVAPSAPTPIWLLLYG  
GVGICTGLWIWGRRVIQTMGKDLTPITPSSGFSIELASAITVVVASNIGLPVSTTHCKVG  
SVVSVGWLRSRKAVDWHLFRNIFIAWFVTVPISGLISAAIMALFYYVILPLT**

**>Slc20a1b**

**MVSTTLATITIMSTLVGYTTGHLTAYMWLLIVGFIIAFVLAFSVGANDVANSFGTAVGSG  
VVTLRQACILASIFETLGSVLLGAKVSETIRKGIIDVTMYNDYEHVLMAGSVSAMFGSAV  
WQLAASFLKLPISGTHCIVGATIGFSLVAKGQQGVKWLELLRIIASWFLSPLLSGVMSAV  
LFYFVRMFILQKKDPVPNGLRALPFFYAVTMGINLFSIMFTGAPMLGFDKLPWWGVLLIS  
IGFGIITALIVWFAVCPRLKKKIECEVKSSSPSESPLMEKRELHEAHSPILKPVPEESSV  
LSSSTPTTPPLPPPEERRVTFDIGDSDDADQKDCKESDLGGAPKTAHVHFTNGPAHIPSN  
GYSQYHTVHKDSGLYKDLLHKLHLAKVGDCMGEGGDRPIRRNNSYTSYTMAIIGMHGDFK  
PKESEFRASEDGDKEKAGAQERKRIRMDSYTSYCNAVAENGTPEDLGEGEVTLEMVDEDA  
GSSRSSLEEDRTDADKPEVSMLFQFLQILTACFGSFAHGGNDVSNAIGPLVALWLVYESG  
SVISSAPTPIWLLLYGGVGICVGLWVWGRRVIQTMGRDLTPITPSSGFSIELASAVTVVV  
ASNIGLPVSTTHCKVGSVVAVGWLRSRKAVDWRLFRNIFMAWFVTVPISGLISAAIMALF  
TYVIL**

**>Slc20a2**

**MDLESYLWMVVIGFIIAFILAFSVGANDVANSFGTAVGSGVVTLRQACILASIFETLGSM  
LLGAKVGETIRKGIIDVSLYNDTVPILMAGEVSAMVGSAVWQLIASFLKLPISGTHCIVG  
STIGFSMVAIGTKGVQWMQLVKIVSSWFISPLLSGLMSGLLFFVIRYFILSKDDPVPNGL  
RALPLFYASTIGINTFSIMYTGAPLLGLEMLPVWAIALITLAGALVCAGLVWIFVCPWMR  
RKIASRLKKEHALSRISDESLDKIPEEEEEAPVFKELPGAKSSNDAVLPMTEESTGELNS  
LANGGTVLPNGRVYGRTNSMTNGCLKSPVSNGGFSFDGHMRSDGQVYHTVHKDSGLYKDL  
LHKIHKGRLEDERHGSRPDNNYRHLRRNNSYTCYTAAICGMPVQPLLRSESSAPPPEDSE  
KLVGDTVFYSKKRLRYDSYSSYCNAVAEAEIEAEEGDVDVNLAADKREPRVPAEGVLEDC  
VDEDKAEKDNSQVFLLFHFLQILTACFGSFAHGGNDVSNAIGPLVALWMIYDQGGVMQDA  
ATPVWLLFYGGVGICAGLWVWGRRVIQTMGKDLTPITPSSGFTIELASAVTVVLASNIGL  
PISTTHCKVGSVVAVGWIRSRKAVDWRLFRNIFLAWFVTVPVAGLFSAAVMALFVYGILP  
YV**

**>Slc22a13**

**MIDFTQILSSVGEFGAFQKRLLVAVCLPNIFTAFHMFGQVFTAISFPHYCNSSWILRQAP  
NLTEEKQLNLTVPLDSKGQYESCKMFTPVEMDIEDIEHYGINTTTSCIDGWVYKAPKDSS  
TLITEFDLVCENKVYSEASQSIYMAGLLVGALLFGPMADKYGRRFATLLSLFLQFLSGVG  
VAFSPNIYVYIALRFVVGTTISGISINTFVLGTEWCGSAKRALFTILSHCFFAIGLMLLS  
GVAYGIRNWRVLQLVLSAPVGLFFIYYWFLPESARWLLTQGKLDSAKREILKAARINGRK  
VSENLLDKMEAENTAKSSTMIDLFRVGYLRKRALIMCYMWFVTSLVYYGVSLNVGNFGLD  
IYLTQLIFGMAEFPARLSCFPLIQRFGRRICQSVVLLLGGTACLIIPAIPAKYPIVVTVI  
AVIGKFSLAASFSIVYVYTAELYPTVVRQNGVGLNSMCARVAGILAPLIGLLDVYHHAIP  
MIIYGSLPFVGGALTFLLPETLNTDLQD**

**>Si\_dkey-190l8.2**

**MKKDAAAFPRLAGTLQIHVFAILTLPIFFTAFTFFVDVFTLHITPCSVDIATKTLNRSVD  
SNVSIFASWTDNHSDPTSSQTCLKANHFAHGQATYMTGLLIGSLIGGALSDKYGKKILLI  
CCTAIHAVATVIVAFLPYVPVYLTARAISGVSCCAIHICTYSLGVEWSLPKYRIWPPTLF  
SFIFSLGMMGLAAVAFLSSTWIQFHLALGIPQILFLPLYFFLPESPRWLLLNKRMKTLES  
YQNRSSKDKRYLDLLLHSVDNEAQKSLSEKSSTETRSNFTNFTSPIILLRLFIMSYIGFA  
SALTYYGICFSIGSFGVNIYLAQFFSGLSEAPSLLLPFLLKRWGRRPFTMGSLFLSGISC  
MLSLLVSKFCNMPALVMTLALMGKLCMQSTYCVSTLYGIELFPTVIRQKCVGVVSLCYRV  
ACIINAVMSPEGGIPLPAMISYSGGPIIGAALCLLLPETSGIPLPDTVHECEKQPRLKLS  
CCACGSIKPTRKSTQNTEATFIKEECSPLSA**

**>Slc22a15\_1of2**

**MDLEEAFQVVGEFGSHQKRMITVLVFLQIYMACQSMLIILVGAVPEYHIEPVTEGVDGDV  
TQSVKFTEDVNSIVTEWYLVKHQAYKVNLAGSLFFAGVLIGNVVFGPLSDKIGRKPVFLT  
GLFFEVLFGYGTALAPSYEAFAVSRLLVGVMNGGMALVCFVLTQEYVGKSYWAMTGTLTN  
MTFAVGISLFAALGYYVRPWRNLATAANCPGLLLFLLCVTLPESPRWLYSRGYTEKAEDI  
LQDFALRNGKGRIVVKLRRAFSSPNSSSPGVFQLVTHPVLRWRTVVLMYVWYACSLVYYG  
LTLSAGEDKGNRYLSVAMYGLVELPAYPLCMYFINKQWAGRRKSMANFLAFAGISCLLTM  
VVPVSGSLLSATSLALVGKLMVSAAFNIVYVYTSELYPTVIRNAGLGVCSMSCRVGGILA  
PFVPSMKSLHTSMPFMVFCLSGISAGCLGLLLPETLNKPAAETLDELHSPSYQRILEPQV  
RLLEEKHLTDHNEDGSD**

**>Slc22a16**

**MTTGVERLFDELGHFKRFQACLYFAAIFQAISCGIHYLASVFLVETPKFLCNPPLNITDV  
LYKNLSFTSLADIWTHYKTGDGPVVVRTSQGDQWELSPCLKALRLDAINFQYEFFGNKSV  
ESCGAFVYDHSEVEQSIVTDWDLVCEREWLAKLTQPTFMLGVLIGALMFGDAADRIGRRP  
VLMATSLCQFIFGVTVAFTGNYYLFVVMRFLLATVSSGYLVVVFVYVTEFTGIKVRTWTS  
MHVHAAFAVGIMVVALVGYLVRVWWIYQIILTLSTSPFLLYCWKFPETPFYLMAKGRYKE  
AQELLDTMAYINGLPPTLKVSDLQDGCDRTPLKDNKQAMEVEKRLSMLDMFGSLKMAGRS  
ATCWAIWFIGSLGYYVFSLGSVNLGGNQYINLFLAGAVEVPSYLIGCFAMDRFGRKKTCA  
PALLLGGVACMLIIVVPQDVEVLAIVLSMTGKFAIAIAFGLIYLYTCELYPTIIRSLAVG  
SGSMMCRVGSVVAPFCVYLADIWIYLPQLIVGILAFIIGILTMFLPETLGEPLTSTLEEA  
EALGSKPNTKNTEVNALEMNQSIKA**

**>Slc22a17\_1of2**

**NEHGVTSGVFCLTSCLCQWDLVCSRYWLVPVEEVCFILGTLTGCLCLGYTSDRLGRHRSL  
LASLTLAVVFPSPPLFIAMRFCLAAASAGVYLTLYITRDLELCDPSLRLLVTMLSGLTMF  
SGELLLLAVALGCGSWRGLIGTGAAPLSLFLCYGIPGVFPESPRWLLLTERTGDANSFCE  
RSDRQRDDDSFTDEHEGKYPQELCESSSSPTRPHLSFPELLHSRNIWKNLCVLGFTSFIS  
HGISHCYSSFSDDVRGTPPTFYWTYLLSVCAGGGAWLLLWATVDRCGRRGILLLAMTLTG  
LASLILLGLMDYLSDGAMKVFSIMGLFSSQAAASLSILFTAEVMPTVIRGSGVGAVMALG  
CVGRLSSPLMDLRNHYGYFLHHVVYSSLALLAVLSILLLPESKRKPLPQTLADGEQYRRP  
PLVRHRRDNVPLLATPNPET**

**>Slc22a17\_2of2**

**MSSPLASPSPCPPPPPSLPSSPTPSSPAPSSLPLPPALPPTGEVMILALGRKKQRLLIAL  
SVLPNLFLAFLLSSDPLLTLASPFRCRLPGPAPALKLTNSSRRVQDQPECRQYIFINGTQ  
TGVRDCDAGFNFTVTEGLANNIVTEWDLVCSRYWLVPVEEVCFILGTLTGCLCLGYTSDR  
LGRHRSLLASLTLAVVFGVCVCVSPSPPLFIAMRFCLAAASAGVYLTLYITRLELCDPSL  
RLLVTMLSGLTMFSGELLLLAVALGCGSWRGLIGTGAAPLSLFLCYGIPGVFPESPRWLL  
LTERTGDANSFCERSDRQRDDDSFTELDSESSSSPTRPHLSFPELLHSRNIWKNLCVLGF  
TSFISHGISHCYSSFSDDVRGTPPTFYWTYLLSVCAGGGAWLLLWATVDRCGRRGILLLA  
MTLTGLASLILLGLMDYLSDGAMKVFSIMGLFSSQAAASLSILFTAEVMPTVIRGSGVGA  
VMALGCVGRLSSPLMDLRNHYGYFLHHVVYSSLALLAVLSILLLPESKRKPLPQTLADGE  
QYRRPPLVRHRRDNVPLLATPNPET**

**>Slc22a18**

**MMDPAAKQKVIYITYLIAALEITWMFLQFSITPYLARRLGFDTIWFGYLQTTVGVIQLLG  
GPIYGRFADIFGARAALSVSCGASVFYFLLLTVADSPFMLFVHKLPAVFMHALPGAQMVV  
ADLSEKEKRAEALGKLGLCFGIGMIAGSSLGGTLSTRFGERFAASFGAVGSFVSLMLVLN  
FIPKQTKTQTTPESDEKGSSKSVFNMGEITRLMKFPGVAKTFTVKIISGLPTGIFQVMFS  
IIAMNFFQLKAEQNGYLMAYFGIVQMVIQGAVIGRLTSSFSENSLLLLSVGVSSLVGLAQ  
ALMTNVFQFCFIVIPMMFSLSVFNVITDSMLTKSVSPADTGTMLGLCASVQSLLRTVGPT  
IGGFLYETYGVPSFGYIQCVINAAVFGLLLTTGGRSQTHRP**

**>Slc22a2**

**MTTFEEILEEAGTFGRSQIRIFCTFCLVSIPFSFVYVGIVFQGFTPEHWCRDPAVSEIRE  
RCGWSLQDARRATVPLINGSSGASYSQCGRFDVDWNATGLSCENPDGDFNQSQLSVMPMM  
SCVDGWEYDYVGRQSFVTEFDLVCGDAWYVDMFQATLSIGFLVGSIAIGYLADKYGRMKS  
FLMTNFFIGVTGILVATSPNYISLLVFRALFGFGVKGGWMVGYVLITELVGVDHRRTVGV  
TYQLFFSMGILLLPLLAYFITNWRWLQVVFTVPYICFLTYYWFIPESPRWLLTQNKIAEA  
VEITKSIAKENRKTLSKKIETLKDDNIDSGSTASFMDLFKTAKLRTYTFILSFNWFTSAV  
VYQGLIMRLGILGGNVYVDFLISGIVELPAAFLILLTIERIGRRLPFATANIVAGAACLI  
TAFIPDSMFWLKSAVACVGRLGITMAFEMVVFVNTELYPTVIRNLGVSVCSTLCDVGGIV  
APFLLYRLAVIWLELPLIIFGALAFVAGGLVLLLPETKGVPLPETIDDIEHPNRNKENPQ  
QSQQLENLMTSDVTKNKDVTAV**

**>Slc22a23\_1of2**

**MCETVMAVSQLDTESHAPENGFVTPETSKSPGLLSQTDGGVLPSVGGFGKYQKQLIVLTW  
IPAIFIGFSQFSDNFLLTNPCPEPHNNSSQLLTVAPTAVSTVFTGVNTEAASQCNCTPSS  
YKLQNGLEQNIVTKWNLVCDSAWKIHIAKFSLLVGSIFGYLVLGVLADWFGRHPVLILSV  
VFLLVFGMTVAFSVNLPMFGTLRFFEGFCLAGITLSLYVLRIELCLPGWRFSITMVANFM  
MLAGQLLMPGLAALCRDWQILQAVIVCPLLLMLSYIWAFPESLRWLLATQQYSRSKWIME  
RISKKNNINLQEDAEELMTELNGALQKQPKKTCIVKMVGTRNLWKNIVVLCVNSLTGYGI  
HHCFARSMMEKKTVGFVEKLHDFYAEYYVMAVIAVASCVFLCPAVALMGRRGGLLMFMII  
TALASLLQLGLLNLLGKYGDHLSLVHSDELNDKFSVAFSIIGMFSSHAVSNLSIFFCAEI  
TPSVIRGGGLGLVLASAGFGMLTSPIMELHNQKGYFLHHIIFACCTLICIICILLLPETR  
NQPLPETLSDGESYTRQPLLPPRKPGEQRLLLTKSESREYARVGDTPLHEAAATVVSTMD  
STASSAVDIHMLIDAPIQQEPAQVQLLSMETLTSSQGQDELKQSVEEHPKSVLGTIPNTS  
TPLAVNSIPKSKRPESPPHDVLAVLSSAVEDASLIIHPVPTGLPSILDSVVPPAAVGSPL  
EVGNEVDSIESKRPESPPDDVLAVLSSPIEDTSLTIHPVPSELPSTLDTVIPATVGSPLE  
VNNEEDSTDSVSPPIDLPLCALTQSNNPSSIGQSPNLLNDIPPSSSIDSHTHPVSEILPP  
SPTELSMLDPSSQMNAAPPIDSGTPLLQLDAPPELNSIESAPPSLSNGSTSLLAAHATST  
DSDSVTESGNPLMVNSTVSSPIDSGLPSDVDIPNTANGGTSS**

**>Slc22a23\_2of2**

**ELETELQQKPKTSCVTQLSGTRNLWKNTVVLCVNSLTGYGIHHCFVRSVLEDSASHLHYY  
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TLNRRFSYAFSIIGMFSSHAVSTLSIFYCAEITPTVIRGGGVGLVLASAGFGMLTAPLME  
LHNQKGFFLHHVILTCCTLLCIICIPLLPETAGQPLPETMAEGEGLLRRPILPGEQHHLL  
ARTEVREYSRVQDTPLHQVVTPGNGMVPSNSTVNGMRTS**

**>Slc22a3**

**MSNFDELLQHAGDFGFYQKRISVLGSLPILLLAFVLIGVVFLGYTPDHWCKTASLQEKCG  
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NRTTIVTEFSLVCEDSWLADLNQVSLAGGFFIGALVTGYLADRFGRKSCFIASIFGLGVS  
GTCIIFSPYYPLLLFFRCLQGFFAKGAWTATYVLIIEFFGSNNRKFVSVMSRTFYSLGLV  
LLPALAYYIPSWRNLQLAMTLPTFIFLIYHWVIPESPRWLLSQRKTKEALSIVKSIAKCN  
KRSLPEDFHEMDLLIEKQEEIMRPSYKDLFKTPKMRKHTFILIYAWFTGAVVFQGLVLRL  
GITGDNVFLDFLISAVVELPTGLIFYFLVDRIGRRPLMATVNFIGGAACLAVPFISPNIS  
WLRRTIAIVGRLAVAIGNETVNFANTELYPTPLRNLGVSVCSSASDIGAVVAPFILYRLA  
SIWQELPLLVYGVMSVLYSGLVMLLPEMKGVDLPETVDDVENLRSRHKRKEKDGAQFPEI  
NIVPMKAVEKTSQK**

**>Slc22a4**

**MRDYDDITSFLGTWGQFQLTVFLALAISILPNGFVGLYIVFVGDTPAHECLIPEQINISS  
VWRDAAIPTQMQDGVLKRSSCSRYRLDTLRQLSMLNYTPNVEVNLSQIETEPCVDGWSYS  
QEFYQSTIVTEWDLVCEREYKGPLTSSIYFCGVLVGTFLSGQMSDRYGRRPVLFAMMALQ  
TITILIQMFSPSWEVFSAIYFFVGFSGFSNYVVAYVLGSEILSPASRVLFGSLGVFMGSG  
IGQMFFPLAAYFIRSWRWLVLTNALTGLLYFPLWWFIPESPRWLLSQGRTAEAEAVLRRA  
AEKNRVTAPEVIFSSSEIEEAAKKRIQKHSILDILSNCNAVSTILICSLLWMVITMSYYA  
LILNTTNLHGNPYLNFFLSAVVEVPAYIIAALLLRFCSRRICQASTLLLGGALIFIIQLI  
PTELQGLSTALEMLGKLCVTAAFCVVYAVTSELFPTVVRNMAMGSCSMTARIGSIISPFI  
IYLGNYYRYIPYIVIGGLALFSGVMSLLLPESKGKVLPETIAQMQSVRGLRRCRKPPAAS  
TEDKSKVLQEVKL**

**>Slc22a7\_3of5**

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STLATQFDLVCDKRGLAKASATIFFVGVMCGAVFFGVLCDKYGRRSMLLVSYVFSIVFSV  
TSAFSSSYIMFAAFRFLTGLALTGISNISVVLSIEWVDTKHRTFMGLFGSMSWSIGNMLL  
AGFAFMVTDWRLLIVIVTAPLFLATATWWWIPDSARWLIANGKTETAYKYLHKCATFNQR  
LDFTSRVKPETLSTVVTVDHRGHSYTYLDLVKTPQLRKLTLFTGIVWYGVASTYYGISLN  
ITGFGLDPYLTHFIYAAIEVPAKILVYFSLNKVGRRNTQTGTLVLTGFCILINIITPTEY  
WTFRTVIAVLGKGLSEASFTTVILYTTELYPTVMRQNGLGFTNFMARMGASISPLIMLLE  
DIWKLLPEVIFCSMAIFCGIIALLLPETNNASLPETVEDIEDMRYKKFSQSTFCDTIESQ  
TQHNNLIQTSC**

**>Slc22a7\_4of5**

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ISTLATQWDLVCDNRGLNKAVATIFFVGVMFGAAFFGGMSDRFGRKPMLLVSYISGMAFA  
LASVFSTSFTMFAVLRFFSGFTITGIVIVSSVLNLEWVDIEHRRLVSIIDSMAWAVGSTS  
LALIAYFIRDWRWLTVAVTSPLVLCTILWWWVPESARWLIANGDVEKAHYYLHKCAVMNR  
KAEVTSRIKPEALAISVSDQGKKKYTYLDLVRTPKMRKLAMLTGTVWFCVATMTYGISLN  
ITGFGLNMYLTQFVYGAIEVPSKLIVYYLLEKIGRRKTEAGAQLFAGISLMINIFIPKDQ  
WIGRTVVAVLGKGFAVAAFCTIVLYSSELYPTVLRQNGMGYNSFLARLGVSVAPLVLLLD  
TFWGQFSQTILCSVALIASVVAWNLPETRDRCLPETIEDVEGTGKTPNKDQEKQENEEKI  
AMNEPQ**

**>Slc22a7\_5of5**

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SVIISTVLNVEWVSIEHRKLVGVIDSLAWTFGFMGFPVIAYFIRDWRWLTVAISLPNVIS  
IITWWWVPESARWLIVNGKADKAHYYLKKCAAMNHKKEVTARIKPEDLSKIIVTDRGSRK  
YSYLDLVRTPKMRRLSLLTGITWFSVATVAYGISFNITGFGLNMYLTQFVYGAIEIPAKF  
CIYYLLDKFGRHVTQAGSLLFVGISFIINIFIPKEKTVIRTVIAVLGKGCSATSFGTVIL  
YTSELYPTVVRQNGMGYTSFIARFGVSVAPLILLSNDVWSYFSQVILCFLALSAAFVAYQ  
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**>Slc22a7a**

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VYDRSQFTSTTATEWDLVCDNKKLNQALATFFFIGVTMGAVVFGQLSDKFGRKPMIQVSF  
VSSAVFGIIEAFSSSYVMFAIARTLCGFALTGMSITTVALCVEWTDVKHRTFTGTIISLG  
WSVGNMLLALLAYLIRDWRHLILVVTSPCLVGIIAWWWIPESARWLLANGRVEEAQKYLI  
NCAKMNGKYSYTKKLDIENLKKITIAEDSNKNHSYLDLVRTPKLRKIVLCSGIFWFAVAF  
TYYGISFNITGFGLNIYLTQFIYGVIEVPAKVGTYLTLDRIGRRNGQAWSLIIAGALIGL  
NSVIPTEFAAVRTGIAVIGKGFSEAAFTIAFLYTSELYPTVLRQCGLGYTSFIARIGGSL  
APMVILFEDIWHYGPPVVFSATAVFSGCVVFLLPETTNVQLPENILDVEEGRHTLSTEAE  
RDVELNEMNSGPADLQEKGS**

**>Slc22a7b**

**MKFENLLAEVGGFGKYQFCLMALLVIPRVTLPCHFLLNNFIAAIPSHHCDISSLSADGIF  
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KSTLATEFDLVCDRRGLNKATATIFFAGVMIGAAIFGWLTDRFGRKRMLMLAYLISITFG  
VASAFAQSFIVFAIMRFFTGMGLTGISIISIVLCIEWADIAHRTIAGVMISLDWSLSCMI  
LSGVAYLVNDWRALILTVTAPIALAMITWRWLPESARWLIANGKLEEAHFYLSKCASVNN  
RQHNLRDIKPETLANVIIADRGDRTYSYLDLVRSSKMRKLAMLTGITWFGVAFTYYGISF  
NISGFGLNLYLTQFIYGAIELPSKLVAYVCLDKLGRRYSQVGTMITTGVCIGITVLIPRV  
LWVPCTVIAVLGKGFSEASFTCVFLYTTELYPTVLRQNGLGYSSFIGRVGVSLAPLVSLL  
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TFKETK**

**>Slc23a1**

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RLPLFQASAFAFLIPAQAILRLDRWKCPPEEEIYGDWSLPLNTSHIWHPRIREIQGAIIV  
SSMIEVVIGFAGIPGFLLNSIGPLTVTPTVSLIGLSVFQTAGDRAGSHWGLSLLCIFLIV  
LFAQYLRNWACPLPSFSKEKGCHITHVQIFKMFPIIMAIMVVWLVCYILTLTNVLPDDPD  
LYGYKARTDARGDIMTQAPWFRFPYPCQWGLPTVTVAGVLGMFSATLAGIVESIGDYYAC  
ARLSGAPPPPVHAINRGIFTEGVCCIIAGLLGTGNGSTSSSPNIGVLGITKVGSRRVIQY  
GAGIMLILGTIGKFTALFASLPDPILGGMFCTLFGMITAVGLSNLQSVDLNSSRNLFVLG  
FSMFSGLMLPNYLDAHPGSIKTGVAELDQIITVLLTTEMFVGGFLAFVLDNTIPGTRKER  
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EEDIKIKEGVTDAPIEMVCTKI**

**>Slc23a3**

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RDTIVAYVLFHSGISTLLQSWIGSRLPLIQAPSLDFLIPAMALLSDQSGSAVSCRGQCVE  
PQEPVAPANPIRELRGMVVVAGVVQLAAGSTGLGGFALGRCGPLVLAPLLCILGFSIYKE  
AALLCSDHWGLAILAVVLLVILSQHLHSFLHLSVLSVCRRLSVLLSVMVTWVVCAALSHW  
GHVHLNSVTEMISINTNATFNQYQNSPQSIHKLIIHNGSLPWLDFPLPASSLPLLSGRSV  
AAGLAGGLSASMSSPAVYVLCARLLKAPVPPAHACNRGLCVDGLGSVFAGLMGAPVGLCS  
SASNACVIGLSQSGSRSTVQLAGVSLLILGLSPQLAQMLCSVPLAIHGAVLSVTYALAVA  
TGITYFQHADVDSGRNIFNIGFTMFMSLALPHWFRLHSGFIQTGVGSVDVFLQSLLTLPV  
FLVGVLAFLLEHTVSGTLPERGLVRQEGTKKIQSFADQQQGYSHSPDPVYDPPAPVMKVL  
NLTGFRTVLFCACRTHTVEEVLVTEPEMSSLLPDKDTGACNG**

**>Slc24a1**

**MFLTRRKRLHLSRIIFLLSGVFLCSLYQLTIRARLPDPWPEPQRAGDPEDGSGLALEGGL  
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PKPTPVPTPATETTTLVPNTTASQPGDAPHMKGEYPEDIFSIEDRRKGWVSLHIFGMVYM  
FVSLAIVCDEFFVPTLGVITDKLAISDDVAGATFMAAGGSAPELFTSLIGVFISHSNVGI  
GTIVGSAVFNILFVIGMCALFSREMLHLTWWPLFRDVSFYILDLIMLIIFFLDNTIMWWE  
SMMLVGGYALYVTFMKFNVQLERAFKSQLSKHKSIVKVIAVEEPEKDNGTSGEENRPPEP  
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PIVFPLWLTVPDVRNPASKKFFVITFLGSIVWIAIFSYLMVWWAHQVGETIGISEEIMGL  
TILAAGTSIPDLITSVIVARKGLGDMAVSSSVGSNIFDITMGLPVPWLMFSFFHSFAPVP  
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PVSI**

**>Slc24a2\_2of2**

**RRKLRPARVLGLLLSLIAISAVALTWRSTEQWEELQSHAPHRTLLSTHQGYHSNVSEDTP  
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TEKLTISDDVAGATFMAAGGSAPELFTSVIGVFISHSNVGIGTIVGSAVFNILFVIGMCA  
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IVARKGLGDMAVSSSVGSNIFDITVGLPFPWLLFSMVNGMVPVQVSSNGLFCAIVLLFLM  
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**>Slc24a2\_1of2**

**MDPTFPSINLGAFCTPLERNSKRHHRLQYVRRKLRPSRIFGFILSVSAVTSFLSWSAFTS  
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LFTLEQRRQGAVVLHMFGMMYMFIALAIVCDEFFVPALTVITEKLEISDDVAGATFMAAG  
GSAPELFTSVIGVFISHSNVGIGTIVGSAVFNILFVIGMCALFSREILNLTWWPLFRDVS  
FYIIGLIMLIVFFLDNYITYVESFALLSCYGSYVTFMKFNSSVETWIKTRLLGNQVDDIE  
APPKVVSVPDDENKLSAKPRLQRGGSSASLHNTLMRNSIFQLMIHTLDPLSEGKFKEKAS  
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QVGETIGITEEIMGLTILAAGTSIPDLITSVIVARKGLGDMAVSSSVGSNIFDITVGLPF  
PWLLFSMLNDFSSVAVSSNGLFCAIVLLFLMLLFVIISIAVCKWKMSKMLGFLMFLLYFV  
FLVVSVMLEDKIITCPVSI**

**>Slc24a3**

**XSSLAENSGYGIPSLSAEDSKKWESRRLLQDFDIDSNYTDEVQLGPNADKNCTPPGIHEF  
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FSPRTRLTMASRMLITERQRLINSRFSNGDSEVTVKMPGKRGVENGLAGPDRGLNGRKGG  
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TFLAAGTSVPDCLASLIVARQGMGDMAISNSIGSNVFDILIGLGLPWALQTLAINYGSTI  
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**>Slc24a4b**

**MRAGIWDSESSAAVSVFGIQTSEHCAILIRRSFKPATMTSGAHQEQHQDHSVSKKSIIAR  
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PENTTEEKNCTEPAIHEFPDDVFTNAERKSGAVLLHIIAALYMFLALAIVCDDYFVTSLE  
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VFSYFMVWMVTIIGYTLGIPDVIMGITFLAAGTSVPDCIASLIVARQGLGDMAVSNTIGS  
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**>Slc24a4a**

**MIQLQASEELEKSCGISKKSMITKIFKVRKRREMLLVQVCFICSVLFVAWSMSALLTKTG  
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EE**

**>Slc24a5**

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GLVCLACYILFATLSILYELGIIGNNPIRSCSD**

**>FP103011.3**

**MRALRLLLLFSSVALQWDRASCQKSVYIQLIPPPGNARSSHGPTEVTPSRKGDECDVVMN  
VSASQRCEYVKNTPDCASDEGFIKYPFVTFCLFTPSLLPLAITIYVIWLLFLFLVLGLIA  
SDFFCPNLSAIASTLRLTHNVAGVTFLALGNGAPDVFSAMAAFSHPQTAGLAIGALFGAG  
IFVTTVVAGSVALVKPFTVASRPFLRDVIFYMAAVFWTFTVLYKGHISLGESVGYLGMYI  
AYVFTVILSSYIYNRQKHQLTESPQSSDREQGGILSSDLTYRETVSIQAHG**

**>Slc25a1a**

**MSSLYKPFCVSEGPCKDAILRRGCAPLQHPAAPTRIPSPGGGSTRTFTPIPNIYPGQRTL  
AAAAIGGRKITHPWKAIFAGGIAGGIEICITFPTEYVKTQLQLDERANPPRYRGIGDCVK  
LTVQYHGLRGLYRGLSSLLYGSIPKSAVRFGTFEVLSNPMRDATGRLDNKASLLCGLGAG  
IAEAVLVVCPMETVKVKFIHDQCSLRPRYRGFFHGVREIIRDQGVRGTYQGLTATLLKQG  
SNQAIRFYVMNLLRNWYKGDDPARDMHPLVTAMFGATAGAASVFGNTPLDVVKTRMQGLE  
AHRYKSTMDCAFQILKNEGPLAFYKGTVPRLGRVCLDVAIVFVLYEEVVKLLNNVWRTD**

**>Slc25a1\_3of3**

**XFGVFEILSNQMKDESGKLDSTRGLLCGLGAGVMEAVLVVCPMETVKVKFIHDQTSANPK  
YRGFFHGVREIIRTQGIRGTYQGLTATVLKQGSNQAIRFFVMTSLRNWYKGDNPNKSINP  
VVTGTFGAIAGAASVFGNTPLDVIKTRMQGLEAHKYKNTMDCAMKIMRHEGPAAFYKGTV  
PRLGRVCLDVAIVFIIYEEVVKILNKAWKTD**

**>Slc25a1b**

**REQETLSCQNTSRARHFTYDHRLHNLHHFCCWFVRRPRFKTRKMSGSPKFVSPFHRPHCL  
SAAAPAGQAKLTHPGKAILAGGIAGGIEICITFPTEYVKTQLQLDEKANPPRYKGIVDCV  
KQTVQGHGVKGLYRGLSSLLYGSIPKAAVRFGVFEFLSNQMRDESGKLDSTRGLICGLGA  
GVAEAVVVVCPMETVKVKFIHDQTSANPKYRGFFHGVREIVRTQGLKGTYQGLTATVLKQ  
GSNQAIRFYVMTALRNWYKGDNPNKSINPVVTGLFGAVAGAASVFGNTPLDVIKTRMQGL  
EAHKYKSTVDCAIKIMKYEGPAAFYKGTVPRLGRVCMDVAIVFIIYEEVVKVLNKLWVSK  
LTENVHFCMNYLFKRAQLVHTDVILQFCPRKPHKQVNTHTNKDSPV**

**>Slc25a11**

**MAAAADTAKPKTSPKSIKFLFGGLAGMGATVFVQPLDLVKNRMQLSGQGSKAREYKTSFH  
AVGSILRNEGVRGIYTGLSAGLLRQATYTTTRLGIYTILFERMSKADGTPPNFFMKALIG  
MTAGATGAFVGTPAEVALIRMTADGRLPPDQRRGYTNVFNALVRITREEGVTTLWRGCIP  
TMARAVVVNAAQLASYSQSKQALLDSGYFRDDILCHFCASMISGLVTTAASMPVDIVKTR  
IQNMRMIDGKPEYKNGLDVLVKVIRNEGFFSLWKGFTPYYARLGPHTVLTFIFLEQMNKF  
YKIYFLDS**

**>Slc25a12**

**MRAHLLALFTRFLSPRPRACATPRPHVTSDSSMAAKVQLTKRADPNDLKVIFQKYASVVD  
KDGERYMTPIDFVQRYLGLHTQLHFNPKTVHLLAGVADTTKDGLISYQEFLAFESVLCMP  
DALFIVAFQLFDKTGTGDVSFENVRDIFSQTTVHHHIPFNWDCEFIRLHFGNARNKRLSY  
LEFGQFLQELQLEHARQAFVQKDKVKSGMISSLDFSDIMSTIRHHMLTPFVEENLVSAAG  
GGTSHMVSFSYFNAFNSLLNNMEMIRKIYSTLAGSRKDTLVTKEEFVHAANKFGQITPME  
IDILFQLSGLHSQTGRLNMTDIERIAPLEEGSLPYNVAEAQRQHSHGEVSRPVWLQAAES  
AYRFTLGSIAGATGATAVYPIDLVKTRMQNQRSTGSFVGELMYKNSFDCAKKVLRYEGFF  
GFYRGLLPQLIGVAPEKAIKLTVNDFVRDKFTTNDDTIPLAAEILAGGCAGGSQVIFTNP  
LEIVKIRLQVAGEITTGPRVSALSVIRDLGFFGLYKGAKACFLRDIPFSAIYFPVYAHTK  
ALLADEDGRLGALQLLSAGAIAGVPAASLVTPADVIKTRLQVAARAGQTTYNGVIDCFRK  
IMKEEGFRALWKGAGARVFRSSPQFAVTLLTYELLQRWLYVDFGGHRPAGSEPTPKSRIS  
ELPPVSSEHVGGYRLAAATFAGVENKFGLHLPKFKSSGISTIHPETPKETAGAS**

**>Slc25a13**

**VCLCLQVMIKRADPAELKFIFLKYASVEKNGERYMSPEDFVFKFLHAQTDIWLSKDSAVL  
LTGVLDQTKDGLISFQEFLAFESVLCAPDALFMVAFQLFDKTGNGIATFEDVKQVFTQTT  
IHQHIPFNWNSEFVQLHFGADRKKHLNYGEFTQFLLEMQLEHARQAFVQRDKAKSGTITA  
LDFRDIMVTIRPHMLTRFVEESLVAAAGGSTAHQVSFSYFNGFNSLLNNMELIRKIYTTL  
AGNRRDVEVTKEEFIIAAQRFGQVTPMEVDILFQLADLSEPRGRLGLVDIEMIAPLEEGA  
LPYNLAEIQRQHSGGEASRSVLIQAAESAYRFTLGSVAGAVGATAVYPIDLVKTRMQNQR  
SSGSLVEELMYKNSLDCFKKVVRYEGFFGLYRGLVPQLLGVAPEKAIKLTVNDFVRGKTL  
QKDGSVPLPAEILAGGCAGGSQVIFTNPLEIVKIRLQVAGEITTGPRVSAFSVIRDLGFF  
GLYKGAKACFLRDIPFSAIYFPCYAHTKAALTDEDGRVGPGRLLLAGALAGMPAASLVTP  
ADVIKTRLQVAARAGQTTYNGLIDCFWKILQEEGPRAFWKGAGEKFFKILNDFLLLLKTH  
FKIKELYYNSFTFEKPAGAEPTPKSRISLPAPNPDHIGGFRLAVATFAGIESKFGLHLPR  
FQASAGP**

**>Slc25a14**

**MANLNWKPFVYGGMASIVAEFGTFPIDLTKTRLQVQGQTHCMEVRYRGMFHALLRIGREE  
GVRALYSGISPALLRQASYGTIKIGTYNTLKKLFVSHPEEETMVINVFCGVVSGVLSSSL  
ANPTDVLKIRMQAQGSLLQGSMMSNFMNIYQTEGTRGLWRGVIPTAQRAAIVVGVELPVY  
DITKKHLIRSGLMGDTVLTHFISSFTCGLAGALASNPVDVVRTRMMNQRVLAGNPLYKGT  
LDGLMQTWRNEGFFALYKGFWPNWLRLGPWNIIFFMTFEQLKKLPL**

**>Slc25a15a**

**MAPHPVTQAVIDLSAGACGGTACVISGQPFDTAKVKMQTFPGLYRGFVHCFVSVYKQVGL  
RGLYQGTTPALIANIAENAVLFMSYGFCQNVVRFLSGLDRNTELSDVQKACSGSVASVFS  
SLALCPTELVKCRLQAMHEMEASGKIASGQKSTVWSVVRNVLRTNGPLGFYQGFTTTIVR  
ELPGYFCFFGGYELSRSIFAHHMATDKEHIGVVPLMFSGGFGGACLWLVVYPIDCVKSRI  
QVLSLAGKQEGFIKTLMGILRNEGVAPLYSGLTPTMIRTFPANGALFLAYEVSRKFMMKQ  
FDH**

**>Slc25a15b**

**MAPHPVVQAVIDLSAGAIGGAACVFSGQPLDTAKVKMQTFPTLYRGFVDCFVSTYRQVGL  
RGLYQGTTPALMANIAENSVLFMCYGFCQEVVRFVSGQGKGAELRHVQFNDMQKACAGSV  
ASVFSSLVLCPTELVKCRLQAMHEMASSGKITQSQNTVWSVMKSIMHNDGPAGFFQGLTT  
TIAREVPGYFCFFGAYELCRSLFADYMHCGKDDIGVAPIVFSGGFGGACLWLVVYPMDCV  
KSRIQVMSMTGRQSGFFKTFMHIFRTEGVRALYSGLTPTMIRTFPANGALFLGYEASRKV  
MMAQFDS**

**>Slc25a16**

**MTTEAVSSGARPQIPAPVQRDGYYWLRSFTAGGVAGCCAKSTIAPLDRVKILLQAQNPHY  
KHLGVFATLKAVPKKEGFLGLYKGNGAMMIRIFPYGAIQFMAFDNYKKFLHTKVGISGHV  
HRLMAGSMAGMTAVICTYPLDVIRARLAFQVTGHHRYTGIRHAFQTIYHKEGGISGFYRG  
LIPTIIGMAPYAGFSFFTFGTLKTLGLTHFPEQLGKPSLDNPDVLVLKTQVNLLCGGVAG  
AIAQTISYPLDVARRRMQLGASLPDHDKCCSLTKTLKHVYSQYGVKKGLYRGLSLNYIRC  
VPSQAVAFTTYEFMKQVLHLN**

**>Slc25a17**

**MKLMDVFSYESLVHAVAGAMGSVTAMTVFFPLDTARLRLQVDEKRKAKSTPAILSEIIKE  
EGLLAPYRGWFPVICSLCCSNFVYFYCFHSLKATWLQGQRSTAGRDLIIGIAAGVVNVLV  
TTPLWVVNTRLKLQGAKFRNEDIQPTHYNGIKDAFVQIMRQEGVGALWNGTFPSLLLVLN  
PAVQFMIYEGLKRQILRGVHRELSSVEVFLIGAVAKAVATTITYPQTVQSVLRFGQHGQP  
AGQSRLLNSLRSVMYLLINRVRKWGILGLFKGLEAKLLQTVLTAALMFLLYEKIASTTFR  
VMGVKRPMTSH**

**>Slc25a18**

**MAEKKLSLPAKLINGGVAGLVGVTCVFPIDLAKTRLQNQQGARVYSGMLDCLAKTIKMEG  
YFGMYRGAAVNLTLVTPEKAIKLAANDVFRQKLSKDGKLPLWGEILAGCGAGTCQVVVTT  
PMEMLKIQLQDAGRLAAQRTVAASAPASGPTPSLVASQTAHPGTSAPPRRSATRITVELL  
KTRGLRGLYKGAGATLMRDVPFSMIYFPLFANLNAVGRAEDCKAQERAPFLQSFMAGCMA  
GSVAAVAVTPLDVIKTRLQTLQKGEGEDSYRGIIDCAQRILKREGPSAFLKGATCRALVI  
APLFGIAQGVYFLGVGEHLIGQQLFNLKSI**

**>Slc25a19**

**MVGYDPNSPSVSLAPEEAALAGSAAGIVTRALISPLDVVKIRFQLQIEKVSWRSRQGKYW  
GLWQATRCILTEEGLPAFWKGHIPAQLLSVCYGAVQFASFEVLTELVHKKTPYNSQTAGV  
HFICGGLAACSATVACQPLDTLRTRFAAQGEPKIYRNLRHAIGTMLRSEGPFTFYRGLTP  
TLVAVFPYAGLQFFFYNILKKLLELQDTKSKAGLHSLISGSCAGVISKTLTYPFDLIKKR  
LQVGGFEEARLKFGEVRTYHGFVDCVLRIGREEGPRGFFKGLSPSLLKAALSTGFTFFWY  
EFFISAIVTLKSR**

**>Slc25a20**

**MSKQQPISPMKNFFAGGFGGVCLVFAGHPLDTIKVRLQTQPKPRPGEVAQYAGTFDCFKK  
TLAKEGVRGLYKGMAAPIIGVTPMFAVCFFGFGLGKKLQQKTPDDILTYPQLFAAGMLSG  
VFTTAIMAPGERIKCLLQIQAASGQVKYAGPMDCVKQLYRESGIRGIYKGTALTLMRDVP  
ASGMYFMTYEWLKHALTPEGKSPSELSVPSILFAGGMAGIFNWAVAIPPDVLKSRFQTAP  
EGKYPNGFRDVLRELVREEGVRSLYKGFNAVMLRAFPANAACFLGFEVAMKFLNWIAPNL**

**>Slc25a21**

**MTSKKQSLLREASHQIIAGGSAGLVEICLMHPLDVVKTRFQIQRWKSDPNSYKGLGDCFR  
TIFRTEGVYGFYKGILPPILAETPKRAVKFFTFEQYKKLLSFTSLSPGMALSVAGLGSGL  
TEALVVNPFEVVKVSLQANRDSFKVQPSTFAQARNIINTDGFGLRGLNKGLTSTLGRHGV  
FNMIYFGFYFNVKDAIPASQDPRLEFMRKFAIGLVSGTVSSCVNIPFDVAKSRIQGPQPV  
PGEIKYRSCFQSMALVYREEGYLALYKGLIPKIMRLGPGGAVMLLVYEYMSGWLQKNW**

**>Slc25a22**

**MSQQISLPAKLINGGIAGIVGVTCVFPIDLAKTRLQNQRQGQQVYKSMIDCLIKTVRTEG  
YFGMYRGAAVNLTLVTPEKAIKLAANDFFRCHLSRNGRGLNVFKEMLAGCAAGMCQVIVT  
TPMEMLKIQLQDAGRLAAQQRKPGLIPPTRLAANTVLCRSYNVVPNSSARAVSATQIARE  
LLHTQGIQGLYKGLGATLLRDVPFSIVYFPLFANLNKLGKPSPDEAAPFYWSFISGCVAG  
STAAVAVNPCDVVKTRLQSLSKGANEDTYSGIVDCFSKIMRREGPSAFLKGAGCRALVIA  
PLFGIVQVMYFLGVGEFIVSQTQLKLISD**

**>Slc25a22\_1of2**

**MADKQISLPAKLINGGVAGLIGVTCVFPIDLAKTRLQNQQNGSRLYTSMSDCLIKTIRSE  
GYFGMYRGAAVNLTLVTPEKAIKLAANDFFRHHFSKDGWQKLTLLKEMLAGCGAGTCQVI  
VTTPMEMLKIQLQDAGRIGKNICRKEEGARGEAAAQRKLMPQAVTPGGPVEMKSPTAMQL  
TRQLLKEKGIAGLYKGLGATLLRDVPFSIIYFPLFANLNNLGKKGGDGPAPFYVSFISGC  
IAGSTAAVAVNPVDVIKTRLQSLTRGSEEDSYSGVTDCIRKILRNEGPAAFLKGAYCRAL  
VIAPLFGIAQVVYFLGVGEFILSHLPKRNN**

**>Slc25a22\_2of2**

**MADNQISLPAKLINGGIAGLIGVTCVFPIDLAKTRLQNQQNGSRVYTNMSDCLMKTVRSE  
GFTGMYRGVGAAVNLALVTPEKAIKLVANDFFRQQLSKDGEKLTLVREMLAGCGAGTCQV  
IITTPMEMLKIQLQDAGRLEAQRKMIGPDAVRGRAKDRTVHLKSPSALQLSRNLLKHKGI  
AGLYTGLGATLLRDVPFSIIYFPLFANLNSLGRRNADGSAPFYISFLSGCFAGCAAAVAV  
NPVDAVIKTRLQSLSRGHHEDTYSGVRLSDSKILRHEGPSAFLKGSYCRALVIAPLFGIV  
QVVYFLGVGEFVLSLLHGQIH**

**>Slc25a24l**

**MDHFRGLFEKLDKNKDGFISTEELQSEMRRIGVEPVNEKVKAILSSYDKNEDGRLSYQEF  
LVYMMDKEKKWKIDFHAIDRNESGVIDLEDIMTLFKELGLIISKPNAKRIIQMMDKDNSM  
TVDWEEFLHHVIVNPAENIGELVSSWKHNLVFDVGESRSIPIELTQEETDLSVWGNFILA  
AGLADAVSRTVTAPIDLLKTRLQVFGSKAVSLGFRELQTGGIRSLWQGNAVNVLKGTPQS  
TLQCFIYAQLRMYSLGERDNLSVYQRFGLGCVSGAVAHAVFYPLEVLKVRLNLQPAGTYS  
GVLGCAKLIYQSESVAAFYRGFKPSILCMIPYAGVECAVHQSIMSWVKQDPEDFGDSKLF  
LFSFAAFASGQATSYPLAVIRTQQQAQAFCLSSQKPGDVLQGLTGIYTKYGVRGFYNGMG  
ASFVRAVPCALLNYSLTSKFQTLLSTVS**

**>Slc25a25a**

**MLCLCLYVPVHNSDQIEVEYFESNGLPSELKSLKSLSVLLPSQEFSTYRRWRKKSLKTEE  
KEHDGQLDFEEFVHYLQDHEKDLKLVFKSMDRKIAGQVNANDIVNSLRDLGVHISLKQAE  
KVLKSMDKNGTMTIDWNEWKKYPTLQPAENIPEIILYWKHSTIFDVGESLMVPDEFTVEE  
HLTGMWWRHLVSGGGAGAVSRTCTAPLDRLKVLMQVHGCQGKSMCLMSGLTQMIKEGGVR  
SLWRGNGINVIKIAPETALKFMAYEQIKRVMGSSQETLGISERFVAGSLAGVIAQSTIYP  
MEVLKTRLALRKTGQYKGISDCAKHILKTEGMSAFYKGYVPNMLGIIPYAGIDLAVYETL  
KNTWLQRYGTENADPGVFVLLACGTVSSTCGQLASYPLALIRTRMQAQASVEGSSQVSMT  
GLFKQIMKTEGPTGLYRGLTPNFLKVIPAVSISYVVYEHIKSTLGVRSR**

**>Slc25a25b**

**MHKRSSIVSPLLSGVFCQCRPEEYQGSDPGGGRTQGSTLAAVSVSEHGHDESCDSPHQCP  
VCGGPEQEHRLKVLFQILDVNRDGGICVNDLTIGLKKLGVHRTEHELMKVVKAGDKDLDG  
QLDFEEFVHYLRDHEKKLRLVFKSLDKKNDGHIDSQEIMQSLRDLGVHISEEQAEKILKS  
MDKNGTMTIDWNEWRDYHLLHPAENIPEIILYWKHSTIFDVGESMLVPDEFTAEEKNTGM  
WWRHLVAGGGAGAVSRTCTAPLDRLKVLMQVHATRSNSMGIAGGFTQMIREGGLRSLWRG  
NGINVLKIAPESAIKFMAYEQIKRLIGSNQETLGILERLVSGSLAGAIAQSSIYPMEVLK  
TRLALGRTGQYSGIADCAKHIFKKEGMTAFYKGYIPNMLGIIPYAGIDLAVYETLKNSWL  
QRFATDSADPGVFVLLACGTMSSTCGQLASYPLALVRTRMQAQASQEGSPQMTMSGLFRH  
IVRTEGAIGLYRGLAPNFMKVIPAVSISYVVYENLKITLGVQSR**

**>Slc25a26**

**MDRREFTASLVAGGCAGMCVDLTLFPLDTIKTRLQSQQGFYKAGGFRGIYAGVPSAAIGS  
FPNAAAFFVTYESTKSVFSGYTTTNLAPITHMLAASLGEIVACLIRVPTEVVKQRTQANP  
SISTYRVLLNSLQEEGFRGLYRGYGSTVLREIPFSLVQFPLWEYLKAVWWRRQGGRLDSW  
QAAVCGALAGGVAAFVTTPLDVAKTWIMLAKAGTSTASGNIPMVLCEVWRSRGIPGLFAG  
SIPRVMFISMGGFIFLGAYEKVRRTLL**

**>Slc25a27**

**MSHLQENSRWPRVSKFTLSACAAAVAELVTFPLDLTKTRLQIQGEGRSGKNGGSVQTQKY  
RGMLSTAAGIVREEGPLKLWQGVTPAIYRHIVYSGGRMLAYEQMRESVLGKSEDGIFPVW  
KAVIASMISGALGQFIASPTDLVKVQMQMEGRRRLEGKPPRVRGVYHAFTKIVAQGGIRG  
LWAGWVPNVQRAALVNLGDLMTYDTVKHFLLRNTSIPDNSICHGLSSICSGLVAATMGTP  
ADVVKTRVMNQPRDSNGRGLLYRNSTDCLLQSVRREGFFSLYKGFLPTWFRMAPWSLTFW  
LTFEQLRRAMGISSF**

**>Slc25a28\_first**

**MILKDRVLQMEADGFVRRRRMTADTSSGDAAVAGASAGAEIHWFGGRFWGVSESLVGTLT  
PRISGEPDLHVGHFYGSQEASDLSEPDYEGLPQGASTSTHMLAGAVAGIMEHCLMFPIDC  
VKTRMQSLQPEPAARYRNVMDALWRIMRTEGIWRPIRGLNITAVGAGPAHALYFACYERL  
KKVLSDIIHPGANSHLANGAAGCVATLLHDAAMNPTEVVKQRMQMYNSPYRSVLDCMRCV  
WQREGALAFYRSYTTQLTMNVPFQALHFMTYEYLQELLNPQRHYNPSSHMVSGALAGAIA  
AAATTPLDVCKTLLNTQESLAVDSVSRSGRHITGLGHAFRTVYRLGGLPAYFKGVQARVI  
YQMPSTAISWSVYEFFKYMITKHQHEKRRIQRDAEK**

**>Slc25a28\_second**

**MTADTSSGDAAVAGASAGAEIHWFGGRFWGVSESLVGTLTPRISGEPDLHVGHFYGSQEA  
SDLSEPDYEGLPQGASTSTHMLAGAVAGIMEHCLMFPIDCVKTRMQSLQPEPAARYRNVM  
DALWRIMRTEGIWRPIRGLNITAVGAGPAHALYFACYERLKKVLSDIIHPGANSHLANGA  
AGCVATLLHDAAMNPTEVVKQRMQMYNSPYRSVLDCMRCVWQREGALAFYRSYTTQLTMN  
VPFQALHFMTYEYLQELLNPQRHYNPSSHMVSGALAGAIAAAATTPLDVCKTLLNTQESL  
AVDSVSRSGRHITGLGHAFRTVYRLGGLPAYFKGVQARVIYQMPSTAISWSVYEFFKYMI  
TKHQHEKRRIQRDAEK**

**>Slc25a29**

**MDFLAGCIGGAAGVLVGHPFDTVKVRLQVQSVDKPLYRGTFHCFQSIIRQESVLGLYKGI  
GSPMMGLTFINAIVFGVQGNAMRRLGEDTPLNQFLAGAAAGSIQCVICCPMELAKTRMQM  
QGTGEKKSSSRKVYKNSLDCLARIYQREGLRGVNRGMVTTLIRETPGFGVYFLAYDLLTR  
SLGCEPDDPYMIPKLLFAGGMSGIASWLSTYPVDVIKSRLQADGVGGKYQYSSIMDCTRK  
SIQREGFRVFTRGLTSTLLRAFPVNAATFATVTLFLLYVRPDEGSKDCEAAHHATLQQQA  
QPSSL**

**>Slc25a29\_2of2**

**NTLPFSLGCSAGVSAGVLVGHPFDTVKVRLQVQSVDKPLYRGTIHCFQSIIRQESMLGLY  
KGIGSPLMGLTFINAIVFGVQGNAMRMLGSDTPLHQFMAGAAAGLIQSVICCPMELAKTR  
MQMQGTGEKSLSRRLYRNSLDCLIRIYRRQGFRGINRGMVSTVIRETPGFGIYFLTYDTL  
TRSLGCEAGDRFIVLKLLLAGGASGIASWISTYPVDVIKSRLQADGVGGDCRYSGMLDCF  
AQSWQREGWRAFTRGLTSTLLRAFPVNATTFATVTLFLMYMRQEEVEDACESIRPDLQHS  
SL**

**>Slc25a32a**

**MTATISRQRHAAVAADSSGSSFSITANLLQLSKHIKYENLAAGLAGGVISTMVLHPLDLI  
KIRFAVSDGLKMRPQYDGMLDCMKTIWKLEGIRGLYQGVTPNIWGAGSSWGLYFLFYNAI  
KAYTQEGRQTELSACEHLVSAAEAGILTLCLTNPVWVTKTRLVLQYNADPSRKQYKGMMD  
ALVKIYRHEGIPGLYRGFVPGLVGTSHAALQFMTYEGLKREQNKCKKMPSESLLSPLEYI  
AIAAISKIFAVAVTYPYQVVRARLQDQHNNYSGIVDVMRRTWSNEGVEGFYKGMVPNLVR  
VIPACCITFLVFENVSRLLLGEYH**

**>Slc25a32b**

**MSSSPGPGSPVPLTPSLQRLFSHVRVENLIAGLSGGVLSTLALHPLDLVKIRFAVSDGLD  
VRPKYSGIVHCMKSIWHQEGFRGLYQGVTPNIWGAGASWGLYFFFYNAIKGYNKETRQIE  
LTATEHLLSAAVAGAMTLCLTNPIWVTKTRLVLQYSADPSQKQYKGMMDALVKIYRHEGI  
SGLYRGFVPGLFGTSHGALQFMAYEELKRDYNKYRKKQSDAKLNPLEYITMAALSKIFAV  
ATTYPYQVVRARLQDQHNTYNGLTDVVWRTWRNEGLLGFYKGMVPNLIRVTPACCITFVV  
YENVSRVLLDQNK**

**>Slc25a33**

**MAQKDTLLHLFAGGCGGTVGAIMTCPLEVLKTRLQSSGLTLRPVFQVQLGTLNGAGVIRP  
GSVTPGLLQVLRSILEKEGPRSLFRGLGPNLVGVAPSRAIYFAAYSKSKETFNGIFVPNS  
GVVHMSSAGFAAFITNSLMNPIWMVKTRMQLEKKARGEKKMNALQCARYVYKTEGMRGFY  
RGLTASYAGISETMICFLIYETLKKYLAQSRFTTPDTDNDKGASDFLGLMFAAAFAKGCA  
SCIAYPHEVIRTRLREEGSKYKYFFQTARLVAVEEGYAAFYRGLIPQLIRQIPNTAIVLS  
TYELIVHLLAEPSK**

**>CABZ01052268.1**

**MNSAFSGPSSPTPGPSPPRPPLWPPLDFGLGALACCGACVFTNPLEVVKTRLQLQGELRA  
RGSYRRLYRGVLQALWVVGRTDGLRGLQKGLTAALLYQGLMNGLRLGSYAQMQAAGVTDG  
PCCSLIAGAAAGALGAFIASPAYLVKTHLQAQTRATHTHTHTHTHTHPSAGWLAVCAAEG  
VLGLYKGMTPVFVPCCCGTSCDSAHCHTHTDLPTMHLEGALSLTAFSTDSLHLIVCVCVC  
VCVWCSPVINSEVSPHVCVCAPQGRLYCGFVDCLLKVCAAEGVLGLYKGMTPVFVRLAPH  
TTLSMLLWDVLRQRALPYTH**

**>Slc25a36a**

**MSQRDTLVHLFAGGCGGTVGAILTCPLEVVKTRLQSSSVTFYISEVQLSTVNGASVARMA  
PPGPLHCLKLILEKEGPRSLFRGLGPNLVGVAPSRAIYFAAYSTSKEKLNNVFDPDSTQV  
HMLSAGLAGFTAITATNPIWLIKTRLQLDARNRGERRMSAFECVRRVYQSDGLRGFYRGM  
SASYAGISETVIHFVIYESIKRKLIEHKANSNMDDEDESVKDASDFVGMMLAAATSKTCA  
TSIAYPHEVIRTRLREEGSKYRSFFQTLNMVFREEGYRALYRGLTTHLVRQIPNTAIMMC  
TYELVVYLLNG**

**>Slc25a36b**

**LSLIFTVCLLSFLRCGGTVGAILTCPLEVVKTRLQSSSITLCISEVHLSTVNGASVARVA  
PPGPLHCLRIILEKEGPRSLFRGLGPNLIGVAPSRAIYFAAYSSAKEKLNCVFEPDSTGL  
HMASAGIAGFTAITATNPIWLIKTRLQLDARSRGERRMNAFECVRRVYQTDGVRGFYRGM  
SASYAGISETVIHFVIYESIKRRLSEAKAATHMNEDEDRAKSASDFVGMMLAAATSKTCA  
TCIAYPHGSAEVIRTRLREEGTKYRSFFQSLNLVIQEESYRALYRGLTTHLVRQIPNTAI  
MMCTYEFVVYLLDG**

**>Slc25a37**

**MELRTDAVLASLEMSEPVKNDEDYESLPAHASLGTHMTAGAVAGILEHTVMYPVDSVKTR  
MQSLQPDPKAQYRSVYGALKRIVRTEGLLRPLRGLNITVLGAGPAHALYFACYERIKRSL  
SDVIQNGGNSHIANGVAGSVATVLHDAVMNPAEVVKQRMQMYNSPYRSLYDCVLMVSRKE  
GLAAFYRSYSTQLTMNIPFQAVHFITYEFMQEHFNPHRQYRPETHIISGAAAGAVSAAVT  
TPLDVCKTLLNTQENVALSSAHVSGHLSGMVNALRTVYRLGGVPAFFKGIQARVIYQMPS  
TAIAWSVYEFFKYFLTQHESHVQEVSHKTSPT**

**>Slc25a38b**

**MYQFLFHVSDSTTAIEEVKRRELSSSSVQTSSSSSAMEVALAHPALKAFMCGSLSGTCST  
LLFQPLDLVKTRLQTLQNNMHPGAPKVGMITVLFNVIRTEKLLGLWKGVSPSFMRCIPGV  
GIYFSTFYSLKQHYFQEGSPSAGEAVLLGAGARCVAGVAMLPFTVIKTRFESGRYNYISV  
AGALKSVCQNEGPKALYSGLTATLLRDAPFSGIYVMFYSQAKKALPQEISSSSIAPLVNF  
GCGVVAGILASLATQPADVIKTHMQVSPALYPKTSDAMRHVYVKHGLSGFFRGAVPRSLR  
RTLMAAMAWTVYEQLMARMGLKS**

**>Slc25a38a**

**MEFSVAHPAVKAFMCGSLSGTCSTLLFQPLDLVKTRLQTLQSGVQPGTGRVGMVTVFVNV  
LRTEKLLGLWRGVSPSFVRCIPGVGIYFSTYFTLKQRYFSSGAPGPLQAVLLGAGARCVA  
GVFMLPVTVIKTRFESGRYRYSGVFGALRSVCQTEGPKALFSGLMATLLRDAPFSGIYVM  
IYSQTKHLLPPEISQSSYAPVANFSCGVLAGVLASVLTQPADVVKTHIQVSPDVFSRTSD  
VVRYIYKEHGLVGFFRGAVPRSLRRTMMAAMAWTVYEQLMAQIGLKS**

**>Slc25a39**

**MGDRPAVRISAAITPVQQMLASGTGAVLTSLFVTPLDVVKIRLQAQQTPLFQAIAAESRP  
WFRVTRPSKWKCFLYCNGLMDHVYVCQNMSSCSNLYKTSTHFSGTLDAFVKITRNEGLRS  
LWSGLPPTLVMAVPATVIYFTCYDQLRDFLCYSMGYHGDHIPLIAGGLARLGAVSVISPL  
ELVRTKMQSRRLQYSELMVCIRSSVAQDGWLSLWRGWGPTVLRDVPFSALYWFNYELVKA  
QLCEHYRTPQASFTISFTAGAVSGAIAAVLTLPFDVVKTRRQIQLGEMEALGAVSMKKPS  
STWNMMRNIWIDMGYKGLFAGFLPRVIKVAPACAVMISTYEFGKTFFQERNLHQARCGL**

**>Slc25a3a**

**XSSMHPVHYNQQQTLVKMYPNTLTQLARSNPFQAPLFSIKTDQQHEKQQTKRKLAAASYD  
DAEVSCEYGSNKYYALCGFGGILSCGLTHTAVVPLDLIKCRIQVDPEKYKSIFNGFSVTL  
REDGFRGLGKGWAPTFIGYSMQGLCKFGFYEIFKALYNDMLGEENAYLWRTSVYLAASAS  
AEFFADIALAPMEACKVRIQTQPGYANTLRECAPKMHAEEGLNAFYKGVYPLWLRQIPYT  
MMKFACFERTVETLYKYVVPKPRSECSKPEQLVVTFVAGYIAGVFCAVVSHPADSVVSVL  
NKEKGSSAVEVLKRLGPVGVWKGLFARIIMIGTLTALQWFIYDSVKVYFRLPRPPPPDMP  
ESLKRKMGLLDY**

**>Slc25a3b**

**MYPNALTQLARANPFSAPLFTLQKVEEPETQTPVQKRRLAAAAVADSGDSCAFGSGKYYA  
LCGFGGILSCGITHTAVVPLDLVKCRLQVDPAKYKSIFTGFSVTIKEDGVRGLAKGWAPT  
FIGYSMQGLCKFGFYEVFKILYGDMLGEENAYMWRTSLYLAASASAEFFADIALAPMEAC  
KVRIQTQPGYANTLRECAPKMYGEEGLWAFYKGVVPLWMRQIPYTMMKFACFERTVELLY  
KYVVPKPRNECSKAEQLVVTFVAGYIAGVFCAIVSHPADSVVSVLNKEKGSTAGQVLKRL  
GPMGVWKGLVARIIMIGTLTALQWFIYDSVKVYFRLPRPPPPEMPESLKKKLGLTE**

**>Slc25a4**

**MSDAAISFLKDFLAGGVAAAISKTAVAPIERVKLLLQVQHASKQITADMQYKGIIDCVVR  
IPKEQGFLSFWRGNLANVIRYFPTQALNFAFKDKYKKIFLGGVDKNTQFWRYFAGNLASG  
GAAGATSLCFVYPLDFARTRLAADIGKGAAEREFTGLGNCVAKIFKSDGLRGLYLGFNVS  
VQGIIIYRAAYFGIYDTAKGMLPDPKHTHIVVSWMIAQTVTAVAGIISYPFDTVRRRMMM  
QSGRKGADIMYKGTIDCWKKIAKDEGGKAFFKGALSNVIRGAGGAFVLVLYDEIKKYT**

**>Slc25a40**

**MSCQESSPGPPGDITPFQQMMASCSGAIITSLLVTPLDVVKIRLQAQKNPFPKGKCFVYC  
NGLMDHICVCENGNTKVWYKAPGHFSGTLDAFLKIIRMEGIRSLWSGLPPTLIMAVPATV  
IYFTCYDQLFALLKLKMGDRSDLAPLFAGAIARVGSATVISPLELIRTKMQSEKQSYREM  
SAVIRSALKNEGLRSLWRGWGPTLLRDVPFSAMYWFNYEKGKWWLCKRYSCSEPTVAITF  
TAGALSGSIASIITLPFDVVKTKRQVEMGELQTMKLSTQVSSSTCSVMKRIVAENGVSGL  
FAGFMPRLIKVAPACAIMISTYEFGKAFFRKYNHQKEGQATASQHIISHTEKH**

**>Slc25a42**

**MDQVRMGNVVQERQGALAQGEVLPRPAASQSEGFKQGRSVLNSLVSGAFAGAVAKTAVAP  
LDRTKIIFQVSSNRFSAKEAYRLIYRTYLKDGFFSLWRGNSATMVRVIPYAAIQFCAHEQ  
YKGILGKYYGFQGKALPPVPRLLAGSLAGTTAAIITYPLDMVRARMAVTPKEMYSNIMDV  
FVRISREEGLKTLYRGFTPTILGVVPYAGLSFFTYETLKKTHAEKTGRAHPFPYERLVFG  
ACAGLIGQSASYPLDVVRRRMQTAGVTGHTYSTVLGTMREIVAEEGIVRGLYKGLSMNWV  
KGPIAVGISFMTFDLTQILLRKFQLL**

**>Slc25a43**

**MATVKKDARLTSSQSLMCVGFAGIFSKTVTSPLEVVKILSQVGTFHCKRGFLDSFVLICQ  
NEGLRAFWKGNMVSCLRLFPYSAIHLATYKNIVNLHVDELGDISQWRAIVAGGLAGISAA  
LATYPLEVVETRLIAQNCQEPTYRGLLHSLSVIYRNEGLQALYRGFSLTVLGAVPFSVGC  
YAVYINLDKLWQERHVRFTSLQNFINGCLAAGVAQTLSFPFETVKKKMQAQSLVLPHCGG  
VDVHFNGMADCFRQVIKNKGVMALWSGLTANMVKIVPYFGLLFSCFEMCKQVCLYRNGYI  
ISPLSYKLKPGVDQSLGPYELQEFKRYLRNRKSHKAQSSSIGNRW**

**>Slc25a44a**

**MRSSAAMMQQKRNIQIIEWEDLDKRKFYSLGVFMTMTTRAAVYPFTLIRTRLQVQKGKSL  
YNGTFDAFCKILKVEGARGLYRGFMINTFTLISGQAYITTYELVRKYVSWYSSNNTVKSL  
VAGGAASLVAQSITVPIDVVSQQLMVQGQGCQLTRFKLKPKMAMATGKHKYTFGQTRDIV  
VQIFHADGFRGFYRGYVASLLTYIPNSAVWWPFYHFYGEQLSRLAPADCPHLILQAIAGP  
MAAATASTLTNPMDVVRARVQVEGRSSVIETFKQLMAEEGIWGLTKGLSARIISSTPTSI  
MIVIGYETLKRLSLRPELVHSRHW**

**>Slc25a44b**

**MQQKRNIQIIEWEDLDKRKFYSFGLFMTMTIRATVYPATLIRTRLQVQKGKSLYTGTYDA  
FRKILRTEGLRGLYRGFMVTTFTLISGQAYITTYELVRKYVSSYSKDNTLKSLVAGGSAS  
LVAQSITVPIDVVSQQLMMQGQGEHLTRFKVKPKTPSGAKHSVFFGQTRDIIGQIFAADG  
IRGFYRGYVASLLTYIPNSAVWWPFYHFYAEQLSKMAPSNCPHLVLQAMAGPLAAATAST  
VTNPMDVIRARVQVEGRTSVIETFYQLIREEGFWGLTKGLSARIISSAPTAIVMVVGYET  
LKKLSLRPELVDSRHW**

**>Slc25a46**

**MTSRRPDSFEGLGYRGREDPAFSGGYSGRSFNNSSSSDLQNWVTTPPDIPGSRNLHFDDR  
TPQFETAPDEAQSAAPPSEQLNRFAGFGIGLASLFTENVLAHPCIVFRRQCQVNYHARCY  
HLSPMTAISVMYNVTKTQGPKALWKGMGSTFVVQGVTLGTEGIISECTPLPRELSHKWNP  
KQVVGHLVLKGLTYVVAMPFYSASLIETVQSEIIRDNPGILDCVKEGLGRVMGMGIPHSK  
RLLPLWNLVLPTVLHGILHYIISSSIQRLVLYLLRRRNNGSPKHSSPGSGMDTVQSMLDA  
YFPELMASFAASLCADVLLFPLETVLHRLHIQGTRTIIDNTDLGFEVLPINTQYEGMRDC  
INAIRREEGTMGFYKGFGSIVVQYSLHATVLQITKMIYSTLLRNA**

**>Slc25a47a**

**MHFADFLAGSFGGACGVAVGYPLDTVKVRIQTQKQFTGIWQCIVLTIRKEGVHGFFKGMF  
LPITTISMTSSVVFGTYRNCLQALSYIRKAENTKLDVFMSGLAGGVAQVSVMSPGDIVKV  
RLQCQTESRHSVNPKYSVKPKYSGPIHCLLSICREQGLSGLYRGALPLALRDGPSFATYF  
LTYHTLCARLTPDGQKEPEWTVVLLSGGVAGMSGWAVGTPMDVIKARLQMDGVRGQRRYR  
GLLHCLTVTTRTEGLGVFFRSLGINCLRAFPVNMVVFAVYEVSVRVLRSAPLVS**

**>Slc25a47b**

**MHLADFLAGSVGGAFGVAVGYPLDTVKKRLDKKRSYSNFERCAKWTARDEGLRGFYRGMS  
MPISTVSISSSLVFGTYRNILQFLHQLQHRSAGEPHHKAHIFLAGFTGGVTQVLVMAPAD  
IVKVRLQCQTEPVQHISQESSSKYRGPVQCLLRIARDEGLLGLYKGSAALALRDGPSFAT  
YFLTYNTICEILTTENQRPG**

**>Slc25a48**

**MTVFQLDDFLAGWIGGASSVIVGHPLDTVKTRLQAGKGYKNTFHCVVTIYKKENVIGFFK  
GLSFPLASITLYNSMVFGFFSNTQRLISKYRYGDGRHPCSMLDLTVASMLTGLVSVGVGA  
PVDLVKIRLQMQTQPVLAENFNLAGNGSVPLRSMGIQSQSFYRGPLHCISTVLQNEGIQG  
LYRGAGAMILRDIPGYALYFIPYTLFCNWLNPDDNSSPPPCCIWLAGGLAGSISWVTATP  
SDVVKSRLQADAMHQRKYKGILHCIMQSYRTEGIHVFFRGATVNAIRGFPMCATMFLGYE  
LSLQFFRSF**

**>Slc25a5**

**MSETAISFAKDFLAGGIAAAISKTAVAPIERVKLLLQVQHASKQITADKQYKGIMDCVVR  
IPKEQGFLSFWRGNLANVIRYFPTQALNFAFKDKYKKVFLDGVDKRTQFWRYFAGNLASG  
GAAGATSLCFVYPLDFARTRLAADVGKAGAEREFSGLGNCLVKISKSDGIKGLYQGFNVS  
VQGIIIYRAAYFGIYDTAKGMLPDPKNTHIVVSWMIAQSVTAVAGLASYPFDTVRRRMMM  
QSGRKGADIMYSGTIDCWRKIARDEGGKAFFKGAWSNVLRGMGGAFVLVLYDELKKVI**

**>Slc25a6**

**MADAAFSFAKDFLAGGVAAAISKTAVAPIERVKLLLQVQHASKQISADKQYKGIVDCIVR  
IPKEQGFASFWRGNLANVIRYFPTQALNFAFKDKYKQIFLGGVDKHTQFWRYFAGNLASG  
GAAGATSLCFVYPLDFARTRLAADVGKAGSTREFSGLADCLAKIFKSDGLRGLYQGFNVS  
VQGIIIYRAAYFGVYDTAKGMLPDPKNTHIMVSWMIAQTVTAVAGVVSYPFDTVRRRMMM  
QSGRKGADIMYTGTLDCWRKIARDEGSKAFFKGALSNVLRGMGGAFVLVLYDEFKKYI**

**>Slc25a6\_1of2**

**MSDSVVSFAKDFLAGGVAAAVSETAVAPIERVKLLLQVQHASKQITTDKQYKGIVDCVVR  
IPREQGFLSFWRGNLANVIRYFLTQALNFAFKDKYRRIFLDGVDQRTQFWRYFAGNLAAG  
GAAGATSLCLVYPLDFARTRLAADVGKTGTAGREFKGLANCLVKIYRSDGVRGLYQGFNV  
SVQGIIIYRAAYFGIYDTAKGMLPDPENTHIAVSWMIAHTVTIVAGFISYPFDTVRRSMM  
MQSGLKGADVMYSGSIDCWRKIARNEGPKAFFKGAWSNVLRSLGGSIVLVLYDEFKKVI**

**>Slc26a1**

**MEEDLNCVAVGLLKRRVRQKRGVREIIKTKIQRNLSCTGPKIKSTLTGFFPVVKWLPKYK  
VKEYIWGDVMSGLIIGIILIPQAIAYCLLAGLEPIYGLYTSFFSNIIYFFMGTSRHVSVG  
IFSLMSLMVGQVVDREVFLAGFDLNEDSTKNAFGFNDTGETNITAVNLKIMSLNMECGKE  
CYAISIATALTFLAGVYQVLMAFLRLGFVSVYLSSPMLDGFATGASCTILSVQAKYLLGL  
KIPRHQGYGTVVVTWINIFKNIHKTNFCDLITSAICIIVLLAGKEIQDRYKKILKIPLPT  
ELVVVAVATIVSHFADLNGQFSSSISGAIPTGFIPPKMPSIELMPRIAWDAIPLAVISFA  
FTVSLSEMFAKKHGYTVRPNQEMIAIGFCNIIPSFFHSFTTSAALAKTMVKDSAGCQTQV  
SSIVSALVVLLVLLFFAPFFYALQKCVLACIIIVSLRGALRKFRDVPKQWRQSKIEAIVW  
LVTMSSTALISVELGLVIGVIFSMICVVVQTQNPKVSLLGQIEQTNDYEDMEEYDNLSPV  
PNVKIFRFQAPLFYANKDFFLKSLYKATKLEPFLELTRRRKLEKKARAKGQKMTDGVDQT  
NGDVGICLISKDVGFHTIILDCSCISMIDTTAVSTFKTVSKDYKEVGVNVILACCNTTVI  
DSLRKGSFFGADDIDMDRLLFHTIHSAVCFANSTTQPVNDSSV**

**>Slc26a10**

**MSASVAIYRNIYTEDRFRQTYGTEDQSGGRERLRDRLAQRCSCSQVECVHLLHKRLPVCS  
WLPKYKLRKWLLGDIIAGLTVGIVHIPQGMAFALLTSVAPVYGLYTSFFPVVLYMLFGTG  
HHVSTGTFAVLSLMTGSVVEQLVPIPLALNSSSPEAAEFEAQRIGVASAVAFLSGIMMLC  
MCGLQLGFLSTYLSEPIVKAFTSAAAFHVTVSQLQSMLGLRLPRYAGAFSLFKTLASVME  
NVPHTNLAELVISLLCLAVLVPVKEVNSRFRERLRTPIPVEIITVIIATGITYAFSLDSK  
YDIQIVGHIPAGFPEPRLPALETVPEIAGDTVAITLVAYAVSVSLAMIYADKHGYSIDPN  
QELLAHGISNTVSSLFTCFPNSATLATTNILESAGGHTQLAGLFTSLVVLIVLLLIGPLF  
YFLPKAVLACINVTSLRQMFLQFQDLPELWRISKIDFMVWLVTWLSVVVLNVDLGLAIGM  
VFSMMTVVCRTQRASCSVLGRAANTEIYRSINNHNKCYEVPGVKILTYNGPIYYGNRSFF  
KADMAQLLGLTPERIRSREKALKAIEKREREAISTVEQGVADSSFSSKNDLFTSEMAEGE  
VQAVLIDCSSVIFVDIAGARLFIQMCMECQKIGVRIYLANCNESVLKILTSSGLMNYMNP  
QHIFVTIHDAVVYIQQQREKPPETNTMVWV**

**>Slc26a11**

**MEPHTCWFPALRSCFPIITWLPRYNLTWLKMDVIAGLTVGLTAVPQALAYAEVAGLPVQY  
GLYSAFMGGFIYCIFGTSKDITLGPTAIMSLLCSSYITGDPVFAVVLTLLCGVIQTGMAL  
LRLGFLLDFISYPVIKGFTCAAAVTIGFGQVKNILGLKEIPQQFFLQVYYTFHKIPEARV  
GDVILGLSCLFFLLILTFMKNSLSSAEDEASFLVRSARQLLWSLATIRNALVVIAAAGVA  
YSAEVTGNHFFSLTGKTAKGLPPFRAPPLSETIANGTVITFSDIAKDLGGGLAVIPLMGV  
LESIAIAKAFGSKNNYRIDANQELFAIGLTNIMGSFVSAYPVTGSFGRTAVNSQTGVCSP  
AGGIITSVIVLLSLAFLMPLFFYIPKASLAAVIICAVSPMVDFRVPLHIWRVKRLDLLPF  
LVTFLLSFWEVQYGIAGGVLVSAFMLLYIMARPKVKVSDHGVIVLEIDNGLNFPSTEHLS  
RLVYKHALHASPPRSLVLDCSQISSIDFTVIHELTDLLKQFQIRGAALIFTGLKPSVLQV  
LLLADLPAFRHTDTVDEALQLLTANIHYNQHL**

**>Slc26a2**

**MPTEGSCNNLSAEEDAKREPNLPFRLEECVKEKVSWKEALRKKVKKCSCSTARVKSQIMK  
SFPIVKWLPRYRFKDWIIGDAMSGLIVGILLVPQSIAYSLLAGQDPIYGLYTSFFANIIY  
ALLGTSRHISVGMFGVLCLLVGQVVDRELTLAGYSSDINQTTLGNVDNSTGPICDRSCYA  
IMVGATLTFTAGIYQVLMGLLQIGFVSVFLSDSLLSGFATGASLTILTSQIKYFLGLHLP  
RVQGWGSLIKTWISLFKNLGHTNLCDLITSLICLLVLVPAKELNDRFKAKLKAPIPFELF  
VVIAATLASHFGHFKDTYGSDVAGTIPTGFMAPQSPNLSLVPNIAIDALSIAIVGFAITV  
SLSEMFAKKHGYIVNANQELNAIGNCNIISSYFHCFTVSAALTKTLVKESTGCHTQISGL  
VTALVLLLVMLVIAPAFYSLQKCVLAVIIVVNLRGALRKFGDIPQMWRVNRVDTVIWLLT  
MATSALVNTELGLLVGVVVSAFCVLGRTQFAQALQLGQAGDRELFEDIASYNGLQTQPDV  
AVFRYEAPIYYANQSLFKKSLYRNVGLDPLKEKAKQRKLEKQRKQKHSREDQKQEMDAST  
NVNLLQHSSFHTLVIDCSSVLFLDTAGVNALKEVFKDYKELGVNVLLAQCNTSVIDSLRR  
GDYYDPNKGTKDIQFHTIGEAILYGQSLKSQNGNCDTSV**

**>Slc26a3**

**MQPFGRHYVVVRPLFSEDSFAEQHERINRKRKTLRHHLKDYFSGVSFSKLCLCCSCDAKR  
AKNAALSLFPFIGWMKDYKIKEWLLGDIVSGISTGLVAVLQGLAFSLLASLPPGYGLYTA  
FFPAIIYFFLGTSRHLSVGAFPILSLMVGAVVTRLVPDEGPSFNITGFEGLSLEQQRVLV  
ASSVTFLMGAFQLVMGLLQVGFIVMYLSETLVSGFTTAAAVHILVSQLRFVLGLDFPGIN  
GPLAIIYTLVEVFSRITSTNVADLVTSIAIMALVLIVKEINDRFKSKLPVPIPIEVIMTV  
IACGVSYAFNFEERFDVVIVGEMVNGYESPVAPNLEVIEETAVEAFPMAIVGFAVAFSVA  
KVYSVKHDYTIDGNQELIAFGVSNMFGASFRSFAASTALSRTAIQESTGGKTQIAGILSA  
MMVLIVIVGVGFLLEPLPRSVLGALVIVNLKGMLMQFSELPFLWRNDRPDFVTWMVTFMA  
SLFLGLDLGLAVGIGAELFTVVYRTQFPRCSVLANISGTDLYRDRKDYTSIYEPDGVKIF  
KIPSPIFFANIDFFRDKLVQEVGFNPMRVLKKRNKALRKIRKMLCNGELEVSDRGPVLRQ  
PSVDTSEGSMEDLDQPIDFSDLPIQVNWNSQLPANISVPPVNIHSLILDFCAVSFIDVSA  
LKGLKATLKEFIRIEVDVYIVSCDVYIMEKLQHCTFFDDEIKTSIFYPTLHDAMLHILET  
HPDHGELEKDININYEVIQRDSLTV**

**>Slc26a3\_1of2**

**MLRASAQKYTVSRALYSEEHLEEEHAKAYRKHKGLLDHIKLYCTCTSERAKNAALSLLPV  
IGWMKIYSIKEWLLNDIVSGVSTGLVAVLQGLAFSLLASISTWYGLYAAFFPVIIYFFLG  
TSRHISVGAFPVLSLMVGAVVTKLVPDEGPPANITAFEGLTKEEQRILVSASLTFLVGLF  
QLGMGLLQVGFIVMYLSEPYISGFTTAAAVHILVSQLKFILGLTVPGFSGPLSIIYTLES  
VFTQITSTNIHDLVTSIVVMVAVLAVKEINDRFKSKLPVPIPIEVIMTIIACGVSYAFNF  
RDNHGVDVVGKIPNTFESPIAPDLQVFQMAAVDAFPIAIVGFAVAFAVAKVYSVKHDYII  
DGNQELIAFGASNIFGGSFKALAASTALSRSAVQESTGGKTQIAGLLSAIIVLVVILGIG  
FLLEPLPKSVLGAVVIVNLKGMLMQVVTVPYLWKKDRPDCIVWVGTCLAAIILGLDIGLA  
VGLGLEFLTVVFRAQFPRCCVLANIPGTDIYRDRKHYINIFEPEGVKIFRIPSPIFFANI  
EFFRDKLKDAVGFNPLRILRKRNKAVKKIKKMLKKGELTLTSNGLQTTCLMPIEESEYDS  
NADDLDQPTDYTDLPIQINWNAELPANISVPPVNIHSLILDFSAVSFIDISAIKGLKAAI  
KEFIRIDVDVYIVGCDTGIMEKLKNCKFFDDEIKSSIFFLTIHDAVLYIQESHPPRTVSE  
KVSGSHQYQHLNGSSVSNGVALQEIADMKIEEETDPKPETRF**

**>Slc26a4**

**MAIHLVEYECNLFMMDECFHENDYLVSRPIYSNQIFDQVHERRNQETQSLQERLSRTFGH  
TDKWAVQKVKGLLPIMEWLPKYPVKQWLPGDVVSGVTTGLVCCLQGVAYALLTSVAPVYG  
LYSAFFPILTYFVLGTSRHISVGPFPVTCLMVGSVVLTLAPDEHFLRSVNMTDVNETMVE  
DTLMEVDVEAREAQRVMVACTMTVLVGLMQVAMGLMQVGFLVRYLSDPLVGGFTTAAAFH  
VFISQIKTILSVPTHNHNGFFSFAYTLIDVGSNINQANMADLIAGLLTISIVMAVKEINT  
KFQHKIPVPIPIEVIVTVIASAISHVMDLNSQYGASIVHNLPRGFASPQPPNIELIGSIL  
GSSFSTAVVGYAVAVSVAKVYAAKHDYTVNGNQELIAFGVSNIFGGCFSSFVASTALSRT  
AVQESTGGKSQVAGLISAVMVMIVILALGPFLQPLQKSVLAGIVIANLKGMFLQISEVPV  
LWRQNRTDCFIWIASCLASVVLGLDVGLLAGLVFEMGTVVVRTQFPSCATLGNVPNTDIY  
KNMKDYKKVDEIPGVKIFKCNSPIYFANIDYFKEKLRDEVGFDAVRVFKKRNKALKKIHK  
LIKKGKLQVTEAGLVPVASLGVENKGFENEPGHEMEKQASKTDSEVKIQVDWTSELPVSV  
SVPRVHIHSLVVDFSSVSFLDVVAAKSLKLVVKEFIRIGVSVYIAGCDGELVRKMEALSF  
FDEEVNRDLLFLSVHDAILFIQHQNSIGYEDNPLAEKTVL**

**>Slc26a5**

**MEHVTVSEEPSATLMYHVERPIFSEAYIDSELLHKRKKTPKPYKLRVAEHLCCSSEKVKS  
VVFGFLPILTWLPSYPLKEYLFGDIVSGISTGVMQLPQGLAYAMLAAVPPVFGLYSSFYP  
VLLYTFFGTSKHISIGTFAVISLMIGGVAVREAPDSMFMVNGTNSSLVVNIEARDSRRVE  
VVVALTTLVGIIQFVLGLLRFGFLAIYLTEPLVRGFTTAAAVHVSVSQLKYLLGVKTARF  
NGPLSVVYSLDAVLRNIADTNIVTLIIGLGCTVFLYIIKQLNERFKKKLLIPIPGEIIVV  
IVSTGISYGMLMSENYGVDVVGKIPTGLLPPKVPDFSVFPNLFADAVPIAVVGFSITISL  
AKTFALKYGYSVDGNQELIALGLCNFVSSFFHTFVVTASMSRSLVQESTGGHTEIAGLLA  
SLLVLLVVVAIGFVFQPLPTTVLAAIIMVNLLGMFKQTRDIPVLWRKSKIELAIWLVSFF  
ASVLLGLDYGLAVAMAFAILTVIYRTQRPKNVVLGQIPDTGLYFDVDEYEEAEECSGIKI  
FQSNSSIYFANSELYVKALKAKTGIDPEKLLDAKKLQLKYAKRDTEGTKTVNQGSLLKKN  
AVVLLDMELGVTHEVLNGPQKPKHVHTNGQMTEKHIESESEDEFFLQRLTPIHSVILDFT  
PVNFIDSVGAKTIKSVIKEYATVDVKVVLAGCSRTLLSELRTLQFFSEPVTPDLIFPTIH  
DAVLQCKRWRDLPVHPNIH**

**>Slc26a6\_second**

**MEEDMKELRKRVPYHIQREVLDELSVDQVAEKSDFNISVKEKLKDAVRCTGPKAKSCFLS  
FIPLLAWLPKYPFRENAIGDLISGISVGIMHLPQGMAYALLAAVPPVFGLYSSFYPILIY  
FIFGTSKHISVGTYAVMSVMIGSVTERLAPDSDFTFPGNETNSTYIDFSSRDAERVKIAA  
TVTFLSGIFQLLLGVVRFGFVVTYLSEPLVRSYTTAAAIHVIVSQLKYSFGINPHRYSGP  
LSLIYTVIEICALLGKTNIGTLVVSIVTIVGLIIAKELSALAAKKIPIPIPVELITIIIA  
TVVSWYMDLKTIYKVEVVGEIPSGLQAPVAPKVSQLGSMVGDAFALAVVGYGIAISLGRI  
FALKYAYKVDSNQELIALGLSNSIGGLFSCFAISCSMSRSMVQVSTGGKSQVAGAISALV  
ILVILLKIGELFEELPKAVLAAIIYVNLQGMMKQFGDICSLWRTNKVDMVVWVMTMILTI  
LFNPDMGLAASIAFSILTVVFRTQLPKYSILGQIPGTDIYKPVEDYNQVKEIPGITIFRS  
SATLYFANAEMYIDALYEKTGVDVAKLLSHKKKLQAKRLRKEKKAAKKAKKEAKKRAKEA  
ARQAKEEPVFSDTEESEEEPELVSHSQTNGNVHELSVKEPKDMVVVEAGPYTDPDTPLPK  
AIILDLNPVNFLDTVGVKTLRNIYKDYGEAGVQIYLCGCQRGVVESMEKGDFFNEKVTKS  
ILFSTVHDAVLYCQQGNNEKVMQGTHL**

**>Slc26a6\_3of4**

**VSKHAGEKHCMDRIILDELKLEDVAQWQREIPEPSLKEKIRDSLRCTVGQWKVWILAWMP  
VLSWIPCYSIRENGLGDLVSGVSVGIMHLPQGMAYALLASVPPVFGLYTSFYPVLVYFIF  
GTSKHISIGTFAVISIMIGSVSERLAPDGHFLTNGTNGLVVVDTEARDLQRLKVAAATTL  
LCGIFQVLLGVVRFGFVVTYLSEPLVRGYTTGAAAHAITAQLKYMFGVSPRRFTGPLQLL  
YTLVELCGLLPQTHVPTLVVSLVSLTALVIVKEINSCYSHRLPLPIPIELMVITAGTLIS  
HYTEMKTINGVDVVGEIPKGLMPPRVPEVCFFSSVAGDAFAVAVVGYAISISLGKIFALK  
HGYKVDSNQELVALGLSNTIGGFFQCYAVTSSMSRSLIQESTGGKTQVAGLISAVIVLIT  
VLKLGPLFEELPTAVLSTIVFVNLKGMFMQCRDLPALWRSNKVDLLVWLVTFLCTVLLNL  
DLGLAASITFTLLTVIFRTQRPRYSLLGRVPDTELYLETESYKAAKAIPGITIFRSSTMI  
YYANAELYHEALLEKSGINIPKILELKKRKEEEEKSKKGQAKDQDKQVREECSPCPGYCS  
LHVLQLYTLLMINHRHDLCQLTGNFLNCKETNRKMLVSLHHHETDHEHIVNDTSIATVTQ  
GNTNCSFQSEQVTEEQEWGKTNTHSSSCEQTHSIILDFSSVSFIDTVTLKTIQNICRDYA  
KVDVTVYISGCQACVVQQLERGGFFSGSVSKRRLFPSIHDAVLHCLSNRDLSSSESALES  
PCITRL**

**>Slc26a6l**

**MDSRHEGYHVKREVINEQRLKERSQRMNPSQINLPISHRLKTSFSCSVPRIKRSIVGFLP  
VLSWLPRYSIWDYGMPDLISGISVGIMHLPQGMAYALLASLPPVFGLYTSLYPSLIYFIF  
GTSRHISVGTFTILSIMIGSVTERLAPDTDFLIYNGTNVTGEVDIASRDLYRVQVAAAAT  
VLGGLIQVVLGLVQFGFVGTYLSEPLVRGYTTAASAHAVVAQLKYILGVSPKRFNGPLSI  
VYTLVDLFTLLPETHLPTLVASVVSIVVLITAKELNNALKKKMIIPIPVELCTIVVATVI  
SFYTRLNESYKISVVGDIPSGLQPPSVPNVYIFSEVVLDAFAMAIVGYAISISLGKTFAL  
KHGYKVESNQELVALGLSNTVGGFFQCFSVCSSMSRSLIQESTGGKTQIAGVVSGVIVLV  
TVLKLGSLFQELPKAVLSAIVFVNLKGMFKQYYDIVTLWRSNKIDLLIWLVTFVSTVLFN  
LDMGLGASMGFALLTVIFRTQRPSYSLLGHLPGTELYLDMETHKEVREVPGITIFRSSAT  
MYFANAELYLEALKKKSGLDIGKMLTYKRRQEAKQKRRERRAERRARREAKRQKKAFREA  
SQRSKHAVFSVEEEAGQLSDMNGDLHREAEIGWKERENNTVFVIPETARTSDGQHTWMYL  
KGTDPDTATLGSVSDLHDADVTTIDSSSEDTLSRDLERVSLGSLGKWTWDIHSIILDLST  
ANFIDTVAIKTLRNIFHDFGEIDVHIYMAGCQELVMKQLERGGFFSDVITEACVFATVHD  
AVLYCVKHHGAATINGHENALDMSGTRL**

**>Slc27a1a**

**MHYVASGSLSLGSLGLLRLFGASWSWSLAAGLSVYLGTGGWRYLYVVVRTAKRDINGLYV  
LLRVKLALWHYMRNRNTIPSIFAQTVARHPDKPALVYEATGETWTFSQLDQISNAVAHWA  
LSQGWTSGDVVALFMESRPLQVALWLGLAKVGVEAALINFNLRRDSLLHCVGVSASRGIV  
FGAELADAVSEVSHSLSQTMVRFSTGDLKPDLMATLKCQPLDPILASAPRHPPSCTVSKG  
FNDHLFYIYTSGTTGLPKAAIVVHSRYYRIAAFGYLSFRMRPDDIIYDCLPLYHSAGNIM  
GVGQCLIHGLTVVVKRKFSASRFWEDCIKHNCTVVQYIGEICRYLLAQPVRPSERQHRVR  
LAVGNGLRPSVWEAFVERFRVKQIGEFYGATECNCSIANMDGKVGACGFNSRILPNVYPI  
RLVKVNEETMELVRDKQGLCVSCRPGEPGLLVGRINQQDPLRRFDGYASQEATRKKIAYN  
VFRKNDSAYLSGDVLVMDELGYMYFRDRSGDTFRWKGENVSTTEVEGTLSGLLRQTDVAV  
FGVNVPGVEGKAGMAAIADSTGSFNCNSFLKEVQQALPPYARPIFLRICPCVDTTGTFKI  
QKTRLQREGYDPRLTTDQIYFLNSRAGRYELVNEELYNAFEEGRISL**

**>Slc27a1b**

**MGAGDGFRAPVALIIAGLLSALGVPWFWSLVSLLGVYLCSGGWRFVYVAVRTAKRDLIGL  
QVLLRVKFYMRQYIRNRSTIPSLFAQRVALHPEKAALVDESSGEVWSFSELDRRSNAVAQ  
WVLAQGWRSGDVVAIFMESRPQMVALWLGMAKVGVEPALINFNLRRDSLIHCMGVSGACG  
MVFGAELLDVVLEVRESLRSLSLFSCGSAPAEMLDSLSAADLDALLSKSPETPPAVAHNK  
GFNDRLFYIYTSGTTGLPKAAIVVHSRYYRIAAFSYYSFGLQPDDVVYCCLPLYHSAGNI  
IGVGQCLLHGLTVVIRRKFSASRFWDDCVKYNCTVVQYIGEICRYLLSQPVRPSESLHRV  
RVAMGNGLRPNVWESFMKRFSVKRIGEFYGATECNCSLANMDNKVGACGFNSVVLPSVYP  
IRLLRADEDTMELIRDSRGLCVPCKPGEPGIIVGRINPQDPLRRFDGYANEEATSKKISH  
NVFRKGDSAYVSGDLMVMDELGYVYFRDRGGDTFRWRGENVSTTEVEGVLSALLKQTDVA  
VYGVSVPGVEGKAGMAAIADPENVFDCETFLRDVQNALPSYARPVFLRLSPEVDKTGTFK  
IQKTRLQKEGFDPHQTADRLFFLNSRQGRYESLTEELHSAIMQGKVSL**

**>Slc27a2a**

**MLCPLLLGLLLSALLFLYIRFPFLPQDCAFALRTLNLGRLLARFGSRSPCFSTLERFAEV  
ARKHPDKLFIVFGDERYTYRDADRISNRLANALRDRSGQIVALFHGNAPMYVFTWLALAK  
LGCTVALLNTNIRSRSLVHCCECSGAKTLITAAELVPAVLEVLQSLRQQQVSVLMLSGEA  
ETQDIINLTNQVSRASEEAPPISLRQHITMKSPALYIYTSGTTGLPKAAVVTHEKVWMMS  
FLQRLSGVCSSDIIYICLPLYHSAGFLAGLSGAIERGITVVLKSKFSASRFWDDCREHNV  
TVIQYIGEVMRYLCNTPERENDRQHSVRLALGNGIRAETWREFLRRFGDVRVCECYGATE  
GNIGFFNYTGKIGSIGRVSAIHKMLFPYAFLKFDPEKEEPVRGSDGLCVEAAPGETGLLV  
AKIHKLAPFEGYAKNSTQTEKKRLRDVFQRGDMYFNTGDLILADRQGFLYFQDRIGDTFR  
WKGENVATTEVSEILLMLDCIEAANVYGVTVPGHEGRVGMAALQLTDGMEFDGSAAYEHM  
KNLLPAYARPRFIRIQEELRLTGTFKQVKVQLVQEGFDPNSTRDRLFIMEENQQTFVPLT  
EEIFSAITAGRTRL**

**>Slc27a3**

**MWGEDSYNKQFSSVRVTHHHVVMSWAISTLAVGIVTLLIIQMKFYPYFWDDLMYYVKVRR  
VGWRMMARMKRGVVTYLQCFELQATNIPDKPFIVFEDQTLTYRDVDVRSNKLANVLKSHR  
GLKHGDIVALLMNNEADFICVWLGLCKLGCEVAFLNFNIKSQSLQHCLDRCGAKTLVIGS  
DLVKSLDEVLLMLTDGGIEIWVASESSSHQNVKTLLDKLDSASPEKPVVDAPQPNLMSNF  
LFIFTSGTTGLPKAARISHIKAVMCMAFLRLCGACADDKIYLTLPLYHMSASLLGIGGCI  
ELGATCVLKRKFSASQFWKDCLKYDITVFQYIGELCRYLVNQPKTLEEVAHNVRLAAGSG  
LRADVWKEFIRRFGKIQIREAYGLTEASIGFVNYTDEIGPIGRASYFNKLNLPFEFLKCD  
PQTFEPLRTDTGHCIKVSKGEAGLLVAPVVFTNPFLGYAGDKAMSEKKLLRDVFKTGDVY  
FNTGDLMLQDHRDFVYFKDRIGDTFRWKGENVSTTEVSEVLGSLDFLLDVNVYGVTVPGY  
EGRAGMAAVVLKDGHELDGKRVYSHLLHTLPPYAWPWFLRLQTSLDMTDTFKQQKGLLVK  
QGFSPDTVQKPVYLLDTSQKTYTPLTAQLYDDVVSGKIRL**

**>Slc27a4**

**MLRLACATALLFVLRLFIGLPWWQVLPSILIFYVGSGGWKSLYVFSKTIYRDLHAASVLL  
RVKLNVKKHLRERNTVPKLFAKSVKKYGNKTALIFEGTDEKWSFKELDEYSNRVANFLLQ  
QGFREGDVVALFMENRHQYVGLWLGMAKIGVEAALINFNLRLEALVHCVNISSAKAVVFG  
SELTEAMCEVHSSMGKTVKLFVSGEWDPKRVPVGTEHLDPLLETTSTIQPKQPDRSFTDR  
LFYIYTSGTTGMPKAAIVVHSRYYRMAALVYYGFRMKPEDVLYDCLPLYHSAGNIVGIGQ  
GLIHGMTVVIRKKFSASKFWDDCIKYNCTIVQYIGEICRYLLNQPRKDTERKHKVRMALG  
NGLRQSIWEEFTNRFNVPQIAEFYGATECNCSLGNFDNKTGACGFNSRILPYVYPIRLVK  
VDEETMELIRGPDGVCIPCGPGEPGQLVGRIIQNDPLRRFDGYVNQTATNKKIAQDVFKK  
GDSAYLSGDVLVMDDFGYMYFRDRTGDTFRWKGENVSTTEVEGTLSRLLDMKDVVVYGVE  
VPGAEGKAGMAAIADPENNTDLAKFSRDLEKALPPYARPVFLRFLPEVDKTGTFKFQKTD  
MRRDGFDPNIVSDKLYFLDCTKGQYVELNAELHRNIVSGKQKL**

**>Slc27a6**

**RFDSFNQVSACLFFPEMLSWIAALLTGILTAHLAQRLCFPYFWKDALYLMKVIRYGARLE  
IYKRTSLIVTIVDRFVQQAQRFPEKPFVIFEGVTYTYGDLEARSNRVARLFQDTVKKGDT  
VALLMNNEPDFISVWFGFCKLGCALAFLNTNIKSRSLLHCFNCCGAKQLVVGADLLDNLE  
DILPSLQEDNITVWSLGHGNSHPGVHSLLDKIEKSSQEPIAAKRRSISCLKTPTLYIFTS  
GTTGLPKAAVITHLQSLKAAGGFWAYGGTEKDVIYTPLPLYHSAASLVGIGGTIELGATC  
ILKKKFSASQFWNDCRKYNVTIFQYIGELCRYLCNQPMGENEKDHKVHMGVGNGLRQDVW  
REFLQRFGEIRMCEIYGSTEGNLCFMNHIGKIGAVGRSNFFYKLIFKYDLVKYDLLRDEP  
VRDHNGFCQRVQKGETGLLLSKICSQSPFFGYAGSKQLTEKKILRDVFVKGDAYFNTGDL  
MAEDENNFISFKDRVGDTFRWKGENVATTEVTEILGLVDFIQEASVYGVQVPGNEGRAGM  
AAVIVRPECTFDGKKLFDLVVRELPSYARPLFIRLQESIETTSTFKHQKFGLVESGFNPS  
TISDPLYFLDYTEKSYIPLTSSIYASISNGQKKV**

**>Slc28a2**

**MKDKEDLQLTDVSYGNEQGVDNPVFVKEDTLPDDLSDSDKESEKDSKSEKESSSCMSKAC  
LPITVTETFFKTHSKIIKYIVLAILAAGYLAYFIYACYLSFQRALALVVLTCLGVFILVC  
ELVFRYKGDSIKRCFKPVQRCFRSNMKWMKWVFIVIVVGLLVAWLAVDTRKRPEQLISFG  
GVCLFIVAIFLFSAHRTAVRWSTVFWGLGLQFAIGLFVIRTEPGLVAFEWLGKQVQIFLD  
YTKAGSGFVFGNLIDNIFAFQALPIVVFFSSVMSVLYYLGVMQWVITKISWVMQVTMGTS  
STETLSVAGNIFVGQTEAPLLIRPYLKDMTKSEIHAVMTGGFATIAGSVMGAFISFGIDA  
SSLISASVMAAPCALAISKLSYPETEKSKFTSKSQIKVDSGGEQNVLEAVSGGASASIGL  
VANIAANLIAFLAILGFINATLRWLGGMVGYPDVTFELICSFVFMPVAFMMGIPYDESFK  
VAELIGTKLFLNEFIAYEKLSELKNNRLNGILDDNGDPNWISVRSEIICTYALCGFANFS  
SLGIVIGGLSSICPPKKGVISSLVLRALFTGTCVSLINACIAGILFVPPLDCVGLLQNAV  
FEPTTANLETCCYDLFKSTVNNGTVSFEGSWSVVANATIYFENCCGLYNATVCM**

**>Slc29a1a**

**MTAVNAPRDRYNAVWIIFFILGLGTLLPWNFFMTATLYFTKRLEETNGGLNQTANTTEIR  
SVLQSKFNNVMTLCAMVPLLIFTCLNSFIHQRIPQKLRISGSLSVILVVFLITAVLVKVE  
MEPLPFFTLTMIKIICINSFGAILQGSLFGLAGMLPASYTTPIMSGQGLAGAFAAFSMIC  
AIASGSELEDSAFGYFITACVVILLAIVSYLALPRMEFFQYFSESNRSRSSTDEENKMDL  
LKPEGQAEKRPVLSLTEEESKPTVSVFAIFKQIWVMALSVCFVFIITIGIFPAVTVEVQS  
TIPDRGAWEKYFIPVSCFLLFNVMDWVGRSLTAVCMWPGKDSIWLPILVIARVVFVPLFI  
LCNVQPRSFLPVVFSHDAWYIIFMIFFSFSNGYLASLCMCFGPKKVSQHEAETAGAIMAF  
FLSLGLAVGAALSFGFRNMI**

**>Slc29a1\_2of2**

**KHSTFPLSVRYNGVWLIFFMLGLGTLLPWNFFMTATMYFTSRLADPLTAMNNASMNSTEE  
DSRSVLQAKFNNVMTLCAMVPLLVFMCFCLFLLTQIPQKIRIAGSLTLILLVFLLTAILV  
KIHLEPLPFFIVTMVKIIFINSFGAVLQGSLFGMAGLLPASYTTPIMSGQGLAGTFAAFS  
MICAIASGSELHDSAFGYFITACAVISLAIASYVVLPKLEFYQHYQESRQNKPAEDEENK  
MDLLKKGNVTYSNSHTSAFDNSAGDDDKKSPSILAIFKKIWVMALSVCFAFTITIGTFPA  
VTVDVKSTIADGGAWEKYFIPVSCFLFFNVFDWAGRSLTAVCMWPGKDSKLLPALLLARV  
VFVPLFMLCNVQPRYNLPVFFTHDGWFIAFMILFAFSNGYLASLCMCFGPKKVDPSEAET  
AGAIMAFFLSLGLALGASLSFLFRGLV**

**>CABZ01058113.1**

**MMLPKLEFARFYLENKGKSYELETSRELLPTGDAEVSEKTSEPLNGPVANGTPSNGINSV  
SEEDSGKQAFISLQQESASTQKSSVIQVFRKIWVMAFCVTFVFIVTLSVFPAVTVDVKTA  
YGGKWEQYFIPVFCFLCFNLCDWAGRTVTSVFKWPHKDSRLFPLLVVSRVIFVPLLMMCN  
VQDRQNLPVLFSNDFIFVFIMLLFSVSSGYFVCLSMTYAPQLVEPKDAETAGALMTFFLA  
LGLSLGAAISFPLRLLV**

**>Slc29a2\_2of2**

**MSKDAPADRGFLVAIIFFILGLGTLLPWNFFMTASMYFNXRLNTSESGNGTIASGKEYYF  
NNWMTLLSQLPLLLFTLLNSILYPRISEKMRIGGSLVFIFLLFFLTAVLVMIPMEEDRFF  
SITMATIWFINCECQIHGIYIHHN**

**>Slc29a2**

**MRICKGALDKGGLVAVIFFLLGMGTLLPWNFFITAMTYFTDRLKNGTNSTQPDTYMFSNN  
SVLLAQLPLLLFTLLNSFLYQHIAEKIRIAGSMVAILLLFILTAILVKVEMDRDSFFSIT  
MATIWFINMFGAILQGSLFGLVGKLPSRFSSVFMSGQAVAGIFSGLAMLFSNIFETNPES  
SALGYFITPCAATLLTLFCYLLLPHLRFARTYLEKVSCETADAVKEPSANGSETVKVKLN  
DLGHEFNDIGETEACEKLNKFNDEQTEEKSTVPQVFRKIWVMALCVTCVFAVTLSVFPAI  
TINTKPSGFFEGKDHIFVPLCSFLVFNVMDWIGRSLTSCLQWPSMKSRLFPIFVLSRVVF  
IPALMLCNVQPRNYLPVVFNHDMAYIIFMSLFAISNGYLACLSMSYAPQLVRPKDAETAG  
ALMTFFLALGLSLGAAFSFGLKSLLSGKSN**

**>Slc29a3**

**XFSSQVRILFSLVVILVVFVVTTVLVKVDTSGYRVQFFEGTLASVALVSGASNIFTGSVF  
GISGHFPMRISQAYISGQAMGGTLSAVSSIVDLAVSGDVTSSALVFFLSAVIFTVVCIIM  
YLMLPKLEYSRYYMELAALPSTESNGSSDASANSVPPLKPILKKTWVLGFCVFYVFFISI  
MIFPALSSGIQSMNQDSGNPWSTTYFVPLTSFLLYNVADFSGRQMTAWLQIPGPTSGLLP  
LLVISRTILVPLFVFCNYQPRYHLHNVFFAHDLFPVVFICVLGVSNGYLGTLPMIYGPKV  
VPRELAEPAGVIMSFFLTLGLAVGSAFSVGLVHSI**

**>Slc29a4**

**MGSKGAERRKQATPGQTPEGNVVMSFSFESYQLEEEDCQGKDISDKGVLALSEPAFEEAV  
PDDRYHGIYFAMLLAGVGFLLPYNSFITDVDYLHHKFEGTSIVFDMGLTYILVALVAVIL  
NNVLVEMLSLHTRITVGYLFALGPLLFVTIFDVWLERFTIKQAYVINLMSMGTVAFGCTV  
QQSSFYGYMGMLPKRYTQGVMTGESTAGVIISLSRIFTKLLIKDERKNTIIFFVISICMV  
LVCFILHLLVRRTRFVQYYTSLARRGLSHAKDHSQHASQYQVHHDVITEEGNGAVGCSPA  
EDGCADFAGGNTYVRFDVPKPKMKRSWPGVKDMILHRYVVARVIWTYMLSIAVTYFITLC  
LFPGLESEIKNATLGEWLPILIMAIFNISDFVGKILAAVPYEWNGTRLLFFSCVRVVFIP  
LFIMCVYPAQMPMFSHPAWPCIFSLFMGITNGYFGSVPMIHAAGKVAPEQRELAGNIMTV  
SYMSGLMLGSVVAYAAYSFTASGSSFHSQTGYNFTQGY**

**>Si\_ch211-160d14.6**

**MYSEEWSRNRQGREKTVITNFSFSQLPEEEKTGRRKPHSAHDSDESIPDDRYHSIYFAML  
LAGVGFLLPYNSFITDVDYLHRKFKGTSIVFDMSLTYILVALSAVIVNNALVERLSLHTR  
ICVGYLFALGPLVCVSVFDVWLELFNTQQSYAVTLAAVAIVAFGCTVQQSSFYGYTGMLP  
KRYTQGVMTGESTAGVIVSLSRIFTKLLVEDEKNNTIIFFLFSVSMETLCFLLHVVVRRT  
HFVRYHTSRARQSHSWLKGQINNVTTQKHSGYQIHYDSSAEEEDGMASSMVDDADAVNLG  
NGSHGDGIYVRFDVPKPEAKRSWISVKELLGRRCAVARVIWPYMLSILVTYFITLCLFPG  
LESELHNDTLGEWLPILTMALFNMADFVGKILAACPYEWGGVQLLVCSCLRVLFLPLFVM  
CVSPVQRPLLAHPAWPCGLSVMLGISNGYLGSVPMIQAAGKVPLQQREVAGNTMTVSYMA  
GLMLGSAVSYSTYSLTSQAHSSHTTLKLNSTLTLHNYMPGH**

**>Slc2a10**

**MGCSVLLLTITVSTLGGLVFGYELGIISGALPQLQTHFSLGCVQQEAVVSALLIGSLFAS  
IIGGWLIDRHGRRTSILLSNLLILAGSVILTTGTSFFALVIGRAVIGFAMTVSSMSCCIF  
VSEMVTPERRGLMVTLYEVGITVGILIAYAVNYIFNNVPLTGWRYMFGFAIIPSLIQLAS  
IVLLPKQAEVFVIHDDDSRQADRLTEETETSNQHQQSEKYGVSDLFKSKDNMRRRTVIGV  
GLVLSQQFTGQPNVLFYASTILFSVGFQSNASAILASVGFGIVKVIATLLAMLCSDRAGR  
RSLLIGGCSMLAVGLILTGFLCRQSVIDTTKRCTSVGPHSNLTLSAEHDEGVGFSSQTLD  
VHEHLRSFSQSEDIYKWIIFTCLMAVVSAFSVSFGPMTWVVLSEIFPKDIRGRAFSFINC  
FNVGANLIVSFSFLSIIDVIGLSGVFLMYGVVGIAGVVFIYLVLPETKGKSLQDIDRELS  
QTRMIHRQELCSIFQRRRFSPGYQRVQLTSTAT**

**>Slc2a11b**

**MNEITISGPEAQPTTLAKKVPSKYLLLAVWAAGIGGTFQYGYNISIINAPTKAVQNFINQ  
TWTERYSTEISSDMLTLLWSIIVSIFTIGGLVGASVGGTLAIRFGRKGTLLFNNTFALLA  
ALFMGLSYPASTFELLVIGRFLTGVNAGIAICVQPLYIGEIAPRALRGAMAMGTSIFITG  
GILTGQVMGLKELLGKDEYWPILLSTICIPAVLQLLTLPWFPESPRYLLIDRGDDIACQK  
ALMWFHGQDKYHGEMEDIERERVSALGIKPKKPWELFTDRSIRWQLLTLVVIHTSQQLNG  
INAIYFYADYVFTQAGIPDDKIPYATVGTGACECITALTCGLLIESLGRRALIIGGYTLM  
SVCCICFTIALTFQDSSPWVPYLSMVCVLAFILSFGLGPGGVTNILTTELFTQTDRPAAY  
MIGGSINWTSFFVIGMIFPFIVNGLKQYCFLVFLVICLLVATYIFFVVPETKNKTFLEIQ  
NEFKSRKKIINANGTEGPLLSTPM**

**>Slc2a11l**

**MTGALRQLTKSPVLVAAILIAGIGGTFQYGFNISVLNSPSPFIKELVNSTCQQRYGHSLE  
PWELSLIWSFIVSIYSIGGLAGTLYAGRVAGMYGRKTTLLLNNVLAISGAILMLFSKTAL  
SFEMIMVARVLYGINAGVSLTVHTMYILECAPKRLRGMVGVSVASFVSLGKFSGQLLGIS  
EVLGTEEGWIWLLAFSGAAGLLQLLTLPFLPESPRYLLLEKADKHGCETALRRLWGTERD  
PGPEMEEMLAEHAALKGVKIHRLMDLFLDHNVRWQLFTIIVTFITLQLCGINAVYLYSFD  
VFQAAGIAKENLRYAALGTGLCEVSTSIACVLIIESTGKRLLLFRGYICMAASLALLTLT  
LYLQDFVSWMPYCSMVLIFIYIFFFSSGPAGVTAPLPGEIFTQSYKPPAFVVACVLNWIG  
LFLVGMLFPLIVEHLDYFCFLVFFVFCFFSGVFVWFHVPETKNKTVLEITEDFKKMHQKR  
RHSLQSKMSSILINDIQSTKCTKL**

**>Slc2a12**

**MDAPEESIRMTSDPQSKIYVQNPDTHIHLEQGPSAKSGNGRALVLCSVSVACLSGLLMGY  
EMSLISGALLQLRDVLTLSCPEQEQVVGSLLLGAFLLSLGGGTILDHYGRRFTIILTALL  
CVLGTLLSVCVVSFWALVVGRMLVGMSVALSGTASCLYAAEVAPAAWRGRCVCVYELMVV  
LGMLLGFGLSWAFAGVPDGWRFTFGGALLPALLQAGVMPLLPDSPRFLLAQQREKEAHAT  
LLRLRAGIKEVEPVEDELRAIRLAMGAERLHGFLDLFQSRDNMLQRLLVGAALVFLQQAT  
GQPNILAYASTVLSSVGFHGNEAATLASTGFGVVKVGGTIPAIFLVDKVGPKALLCVGVV  
VMMLSTATLGAITMQSRTHVSSLCRGPGNTANFTLFETGDETDIQTNTPLGLYQPQNKLK  
TNTFLTSINDTREHWILNHTYNHRTALMETAELSKKDSAKIALQSLHEVSPSLKWISLVS  
LLVYVAGFSISLGPMVHVVLSAIFPTGIRGKAVSVISAFNWATNLLISMTFLTLTERIGL  
PTVIFSYSAMSFLLVVFVIVFVPETKGRSLEQISKELAMKNHLRGTLLCHRRKHKATAQP  
SQEEKALATV**

**>Slc2a13\_3of3**

**MLTFPPARRALIVGCGLQMFQQLSGINTVMYYSATILQMSGVRDDKLAIWLVTVTAFTNF  
LFTLLGVWLVERVGRRKLTLGSIFGTVLSLCVLSVGFLLSAQHSPPVTLHLSDPTTPNSS  
CAAHLSCEPCMLDPGCGYCYQENSTAVFASSCVPVNPASTERAAWGKCSNSTHLPDSGIW  
AYNFCPTSYSWVVLLGLVLYLASFAPGMGPMPWTVNSEIYPLWARSTGNACSAGVNWTFN  
VLVSLTFLHMAQYLTYYGVFFLYTSLAFTGFFFIYGCLPETKGRRLEEIESLFENRLCSC  
GISDCDEDRQVEYIRVKGSNYHLSDNDASDVE**

**>Slc2a13b**

**MEDQRAYARVEDESTLIKTASKRDHELQPGPPCFVYTLAFFSALGGFLFGYDTGVVSGAM  
LLLKREKKLSSVWQELLVSITVGAAAVSALAGGFLNGRFGRRVCILLASFIFCAGGIILS  
VARNKEALLCGRLTVGLGLGIASMTVPVYIAEVSPPDLRGQLVTVNTLFITGGQFIASVV  
DGAFSYLPHDGWRFMLGLSVVPAALQFLGFLFLPESPRWLLQKGFTQNALLVLRQIRGDV  
DVEEEFESIRCSIQEEQRDVAGGPVLWRMLASPPARRALIVGCGLQMFQQLAGINTVMYY  
SATILQMSGVQDDQMAIWLAAGTAFTNFLFTLVGVWLVERVGRRRLTMASLLGTAVSLMV  
LAAGFLLSAQASPPVTFHPSNPSIHNSTCGNYGFCESCMLDPDCGFCYGLNATAVVQSSC  
VPVDPANTETAALGRCFNGTQKASSVFWAYNYCPTPYSWVVLLGLILYLAFFAPGMGPMP  
WTVNSEIYPLWARSTGNACSAGVNWICNVLVSLTFLHVAQYLTYYGAFFLYAALALLGFV  
FVSGCLPETKGLRLEEIESLFSRRLCSCGAHTDQYMRRLEFGALHYATSEPEGRISYISL  
Q**

**>Slc2a13\_1of3**

**MTVPVYIAETSPPHLRGRLVTINTLFITAGQFTASVIDGAFSYMKHEGWRYMLGLSVIPA  
LLQFLGFLFLPESPRWLIQKGLTQKARRVLSQIRGNQNIDEEYDTIKSSIEEEEKDCGGG  
EKKVLHVFTHASSSKKHKCRLGTLASFNYGKYSSAKENQGT**

**>Slc2a15a**

**MAEEVLIMSSGKITSHLTSSLLAVAFLTSFGSSMLYGYNLAVVNSPAGYIKEFYNRTVVS  
RNGTGLNEEALTLMYSLTVSVFAIGGLIGSLMVGTLVTRFGRKGTVVNSTALVFLAATLM  
GFSRICSSPEMVIFGRFVTGIHSGISLSVVPMYLGEIAPKNLRGFLGLMPSIFICAGVFL  
AQVLGLHELLGKEEHWPLFLSLVVVPTFIQLMLLPWFPESPRYLLIEKHNVHATITALKW  
YRAKCNIQAEIEEMQEEQRSLSSVDTISVWQLILDHTVRWQVLSVVVINIGMQLSGIDAI  
WFYTNDIFQNAGIPAPEIQYTTVGTGAIEIVAGLIGCFTIERLGRRPLIIGGFGVMGMCC  
AGITLSLILQTHVPFMKYVSVGCVVGIIAGFCIGPAGVPFLITAELFKQSHRPAAYTVGG  
SLNWMSNFTIGFIFPFLQMSAGSYCYLVFCAVCLSVAIYVYIIIPETKNKTFVEISQMFA  
TKEAVEESQALTHPDQLKLKKMNGYGTLENGSLEFDSSSSCP**

**>Slc2a15b**

**MAEEVLIDPGKTRGHLTSSLLAVAFLSSFGSSMLYGYNLAVVNSPSQYIKDFFNQTIVRR  
HGSGVDEETLTLMYSFTVSIFAIGGLVGSLTVRMQVTRFGRKGTLVHSTVLVFIAGVLMG  
FSRLCGSPEMIIVGRFITGIHSGIALSVVPMYLGEIAPKNLRGFLGLVPSIFICIGVFIA  
QILGLHELLGKEEHWPLFFSLVVVPTFIQLMLLPWFPESPRYLLIEKRNIHATITALKWY  
RAKGNIQAEVEEMQEEQRSLSSVETVSVLQLFRDPSVRWQLVTVIVVNAGMQLSGIDAIW  
FYTNDIFENAGIPFDQIQYTTVGTGAIEVIAGLIGCFAIERVGRRPLMIGGFTFMGLCCA  
GITFSLLLEAHLSFMRYISVACVVGIIAGFCIGPAGVPFLMTGELFKQSYRPSAYIVGGS  
LNWISNFAVGFVFPFLQMSAGAFCYLVFCGVCVGVAAYVFFIIPETKNKTFLEISELFAL  
RNACEIENQSLVTSAQLALKKMNGYGALVTVVDVDKKEKTET**

**>Slc2a1a**

**MESNKKEVTPQLMMAVGTAVIGSLQFGYNTGVINAPQKIIEGFYNETWHNRYSEYIPPTT  
LTTLWSVSVAIFSVGGILGSFSVGLFVNRFGRRNSMLIANILAFIAAAFMGFSKLAESWE  
MLIIGRFIVGLYSGLSTGFVPMYVGEIAPTSLRGALGTLHQLGIVIGILMAQIFGIKEIM  
GSPTLWPFMLGFTFIPAVLQCALLPFCPESPRYLLINQNEEAKAKSVLKKLRGTDDVGAD  
MQEMRDESRQMMREKTVTIPELFRSSLYRQPIFIAIMLQLSQQFSGINAVFYYSTGIFEK  
AGVSEPVYATIGAGAVNTAFTVVSLFIVERVGRRSLHLVGLMGMAVSSVLMTIAMALLTK  
VEWMSYVSIVAIFSFVAFFEIGPGPIPWFIVAELFSQGPRPSAFAVAGFSNWFANFLVGM  
CFQYVEELTGPYVFIIFTVLLLIFFVFTYFKVPETKGRSFEEITASFRTGADKYNRDDLN  
TLGADSQL**

**>Slc2a1b**

**LFFPQQQLTLPLMLAVGTAVIGSLQFGYNTGVINAPQKIIEAFYNETWTARHGDMISKTT  
MTTLWSLSVAIFSVGGIVGSFSVGLFVNRFGRRNSMLMANVLAFIAAALMGFSKMAASWE  
MLIIGRFVVGLYSGLSTGFVPMYVGEVAPTALRGALGTLHQLGIVVGILMAQVFGMEAIM  
GNATMWPFLLGFTFIPALVQCCLLPICPESPRFLLINRNEESKAKSVLKKLRGTTDVSAD  
MQEMKEESRQMMREKKVTIPELFRSPLYRQPIVIAIMLQLSQQLSGINAIFYYSTKIFEK  
AGVQQPVYATIGAGVVNTAFTVVSLFVVERAGRRSLHLLGLLGMAGSAILMTIAIALLEK  
YDWMSYMSIVAIFAFVAFFEIGPGPIPWFIVAELFSQGPRPSAFAVAGFSNWTANFIVGM  
CFQYVEEVCGAYVFVIFTVFLLCFFIFTYFKVPETKGRTFDEISAGFRQASGAEKHTPEE  
LNSLGADSQL**

**>Slc2a2**

**MEKQLTGTLALAVFTAALGSLQMGYSLGVINAPQKVIERHYARSLGVYNEDLARSEGGNG  
TEHEKPTDPSVVMYWSLSVAIFSVGGMLSSFLVSFVGDFRGRIKGMLAINVLAITAGLLM  
GLAKMGTPHLMVIAGRAIMGLYCGLSSGLVPLYIGEISPVKYRGAMGALHQLAIVIGILI  
SQVIGLDFLLGNDYMWHILLGLSGAPAILQSLLLLVCPESPRYLYIKQGKVEDACKSLKR  
LKGDYDTSKDIAEMKAEKEEAMKEAKMSILRLLRSSVYRQQLFVALMMHFSQQFSGINAI  
FYYSTSIFQTAGVGQPVYATIGVGVVNIIFTLVSVLMVDRAGRRTLTLVGLGGMCCCAVA  
MTVGLAFQGAYSWMSYVSMVAIFMFVSFFEIGPGPIPWFIVAEIFSQGPRPAAIALAGFC  
NWTCNFIVGMFFPYLVSLCGSYVFIVFAVLLFGFTLFIYFRVPETKGKTFEEIAAVFHRK  
HGGVPPSKPQEEAEMVQLKGSSEA**

**>Slc2a3a**

**MEGEKKQVTCYLLFSLSTAVIGSLQFGYNTGVINAPEQKLRAFFNATWMERYGEPISPGV  
CTIVWSFAVAIFSVGGMAGSFSVGVVANKFGRRKSMILVNVLALIGGGLMGLCTLCSSFE  
MIIAGRLMIGLFCGLFTGLTPMYVGEVSPTPLRGAFGTLHQLGVVVGILIAQIFGLESLL  
GSDKLWPILLALTILPAILQCFLLPFCPESPRYLLINLNEEEQARKALVRLRGYEDVGKD  
MQEMKEESAKMAMEKKVTIPELFRSAAYRQPLFIAIMLQLSQQLSGINAVFYYSTGIFKS  
AGVTQPIYATIGAGVVNTVFTVVSLFLVERAGRRTLHLIGLGGMAISALAMTIALLLKDI  
EALQYLSIAAIFAFVAMFEMGPGPIPWFIVAELFSQGPRPAAMAVAGCSNWTANFIVGIT  
FPKLEELCGPYVFIIFMIFLIIFFIFTYFKVPETKGRTFDEIARGFSGAPPPSATSVEEP  
GRVALPASPVKEKVPLVEAPKSSSEQGPSSSEQPAKVEEKSSSVTQPLVDSSKEEKSNST  
M**

**>Slc2a5**

**MDEEVNMKKGERKGKVTLILAAASLVAGFGSSFQYGYNVAVVNSPAPEMQQFYRRIYVDR  
YGPMSDNLLTLLWSVTVSMYPLGGFFGSLMVAPLVNKFGRKGTLLFNNIFSIVPAIMMGV  
SEVAGSFEIIIVARFLVGICAGLSSNVVPMYLGEIAPKNYRGAVGIVPQLFITVGILVAQ  
IFGIRSILGNKEGWPIMLGLTGIPAAIELLLLPFFPESPRYMLIQKGDEKTARKGLQRLR  
GCEDVDEELCEMRVEEQSERAEGRLSLLNLFTFRSLRWQLLSVIFMNMGQQLSGVNAIYY  
YADSIYSSAGVSEDHVQYVTVGTGAVNVFMTITAVFIVEKSGRKLLLLIGFGICCAACVI  
LTIALYFQTTLDWIPYVSIVCVIVYVIGHAIGPSPIPTVITTEMFRQSSRPPAFMVAGSV  
HWLSNFTVGLVFPFLERGLGPYSFIIFACICLATLIYIWIVIPETKNKTFLETSKLFAQR  
NKVEIMAEASDSEIKGTGEGNCGQEISSTFL**

**>Slc2a6**

**MADRSDEATPLINNSPPRISHGKLYLAVFSAVLGNFNFGFALVFPSPVIPQLKQGDDTRL  
QMNVHQISWFGSIFTLGAAAGGLSAMFLNDRVGRKISIMISGLPSVLGLLVMGSAQNFWM  
LLWGRFLTGIAGGITAGSIPVYVSEISHPSVRGALGSCPQITAVFGSLALYAFGLILPWR  
WLAVAGEVPVVIMMLLLCCMPTSPRYHIMKGNRAKAVKSLEWLRGPNSDYMTEFNKIERS  
ITTQGVQWSDLKTKSYYKPILISVVMRFLQQMTGITPILVYLEPIFHLTAISLEPKYDAA  
LVGAVRLISVAIAASLMDKAGRKALLFTSGFLIYIAMLSMTMYTHQTPCSQGNLTLTDGL  
NISSEVQAGAAFDPKTLIPLISAMVIIFGYAMGWGPITWLLMSEILPLGARGVASGLCVG  
VSWITAFVLTQLFMHVVVAYGLYVPFLFFCVVSVVNIIFTAKCVPETKGRTLEEIENYFR  
TGRSFTIHDP**

**>Slc2a8**

**MNEYEENRPLLVNDERTEEDRSEQDAYLDKVKNGKLFIATFAAVLGPLSFGFVLGYSSPA  
IPELRRIQDLRLQLSVEEASWFGSVVTIGAALGGLLGGWIVERIGRKLSLMFCAIPFIFG  
FTTIIAAQNHWMFYVGRVLTGLASGVTSLVVPLYISEMAHERVRGTLGSCVQLMVVIGIM  
GAYVTGLFLDWRWLAVASSIPPTLMLLSMCFMPETPRFLLCQGKRREAEDALRFLRGPDA  
PAEWECARIEDAYKNEEQSFSLGDLKDPGVYKPLGIGVMMMLLQQFTGINAIMFYAETIF  
EQAHFKSSDVATVIVAATQVVFTAIAALIMDKAGRKVLLILSGVVMCISEAVFGVYFKLT  
VMKPNNSSLTSVLTDTHGLLEDQPSADLAWLAVGSMGFFIAGFAIGWGPTPWLVMSEIFP  
TRVRGLGSALCVLTNWTCAFIVTKTFQNLMDALSSAGTFWMFSALCASNVVFTAFFVPET  
KGKTLEEIQAGFKGTRMR**

**>Slc2a9l1**

**INMTRLLKQLAGGKAVVLIIVLGFGGSFQNGFHLTSISSPTPYIQSFINSSWTHHYGHIP  
KESTITFIWSAVVALYGLGGLIGSSSVKYLTRRLGRKRTTLLNSAIAVVASIIMYISKPT  
YSFELILIARFLFGFIAGLGLNVHSIYLGESSPKKIRGVVLLTSAIFLALGKLSGQFAGL  
REILGREEWWNILLCFPSVFCVIQLAVLPFLPDAPRYILIEKNNTEQCRKALQYLWGLGE  
YKMEIEEMSEEQAVIGEKQNMSVLDLLRDKSVRWQVISLLVLNIGIQFSGISAITIFSFN  
IFLEAGIPEDKIRYVTLGIGASEVLITITCGLFIERVGRKPLMWRGFGGMSVVMALIIVT  
LYLRDYSFVIPYFTVFLIFLFMIFYGGGPAATVGAVCNEMFIQSYRPAAFVYIGILRWVG  
FTLLGFVFPFLIVVLKSLSFVLFSCICLLAALYIFFILPETKGKTILEISQEFQRIRVCG  
STKEDTMFLETKL**

**>Slc30a1a**

**MACAPNRVRLLCMLSLTFGFFIVEVVVSRITSSLAMLSDSFHMLSDVIALVVALVAVRFA  
EQTQSTNKNTFGWIRAEVMGALVNAVFLTALCFTIILEAIERFTEPHEIEQPWVVIGVGA  
LGLLVNLLGLCLFHGHAGGGGHGHSHGGHGHSHGGAKKHKNGKVRRSETLEDSRSAGEET  
NNLVANHNSPNGVNAERKAADMCHSDSLDLQINGSAPYDELENGHDAASQLNMRGVFLHV  
LGDALGSVIVVINAIIFVFVWKPCEPGTICENPCSGQHCADHALNISSPLTNGTLIKAGP  
CWVLYLDPTLCIIMVCILLYTTYPLLKESALILLQTVPKQIDMHQLNARLRDLEGVLAVH  
ELHIWQLAGSRIIATAHIKCHDPTSYMDVAKRIKDFFHDEGIHATTIQPEFVTVNSESRA  
SLCELSCRTQCAPKLCCGAVDTAKPLEGSLESKKSCESKTPTLPSASVTSLEIISESVED  
TSRPESVVIITREVESSL**

**>Slc30a1b**

**MGLGQNRMRLLCMLTLTLVFFVVEVVVSRITASLAMLSDSFHMLSDVIALTVALIAVSFA  
ETTRSTSKNTYGWIRAEVMGALVNAVFLTALCFTIFLEAVERYTQPHEIENPRVVIWVGV  
AGLLVNVLGLFLFHGHAGFGGHGHAHGGHSHAGHSHAHQTNHREKPKAHEEACTLMINSS  
QGDHTCEQKSDSLNIRITAKGSLEDLDQSPESASQLNMRGVFLHVLGDALGSIVVVVNAL  
IFTFVWTPCHSDQICYNPCRNNHLTDHHHVNTTVLSISKTPDRIPRTISVAGPCWVLYLD  
PTLCLIMVCILLYTTFPLLKESALILLQTVPEQIDMPKLKGKLKSLDGVLAVHDLHIWQL  
AGARIIATAHIKCTDPALYMDIAKRIKDVFHDEGIHATTVQPEFSAFSEGFGDPQCELSC  
RSQCKPKLCCNPTKRAKPEEELAKCRHDKPHSHAVEWGDGKKVDDAVHTEMESSV**

**>Slc30a10**

**MGRYSGKTCRLILMLVITVIFFVAEIVAGYMGNSVALVSDSFNMLSDILSLCVGLTAARV  
SRRAGSGRFSFGLGRAEVVGALANAVFLIALCFSISMESLKRLAMPQAIDDAPLVLIVGS  
LGLAVNLVGLVIFQDCGRLCGRRGKEKKREEHREDREQELEQVETGLQEEKTEKDGAPLN  
IRGVLLHVLNDALGSVVVVVASALFYVWPLEPDQPCNWQCYVAHTLRPIFIHAFINQGSP  
LRNELPTIPLQPSTGKPPYTLILESVCRLPGVSSVHEAHVWELAKGRNVASHVKLQAPAG  
ALWAQVSLQQQITQIFHRAGVHSLTLQLELADSDADSSCSAPCLSSSCQKLSCCPAGPVC  
VCAPPRDSSTEKHTPQACTHSSKL**

**>Slc30a2**

**MDPPPSSEKSHLINERNAKIYSLKLNSEFSGSKESCPNLPLGNGEMAGAIELKRPVGTHC  
HGKKAAYDDSREKLLAKKKLFIASIVCLVFMIGEVIGGYLAHSLAIMTDAAHLLTDFGSM  
MVSLFSLWISSRPPTKIMNFGWHRSEILGALISVMSIWIVTGVLVYLAIERIVKNDYEIE  
GRVMLLTSGCAVVVNIIMAYILHHSTTFHSHGSGYHKIDESGMSPVGHGHSHSLLGNHGN  
TSVRAAFIHVLGDLLQSFGVMVAAIIIYFRPEYKIADPICTFLFSVFVLATTLTILRDVF  
RILMEGAPKGIQFNSVKEVLLSLKAVKAMHSLHLWALTLSQSLLSVHIAIEENADPQSVL  
KEATELLQTKFGFYSTTIQVEPYSEDMIHCTQCQDPMD**

**>Slc30a4**

**MSGLIGRVRSAFRSRPDSWHLSDAAAFDFSEDLQEEESPRFSRLQVVVSGEAEERPAVNG  
SARSTLTDDDDSLLGASTGSTGPEACDGCQRNREQQRRRRVMRKLGGAAVLYFLFMVGEL  
IGGYVANSLAIMTDALHMLTDLIGIIVSLLALWLSAKPPTYRFTFGLHRLEVLSAGISVL  
LIYILTGVLLNEAAQRTIHQDFTIDGDVMLITAAVGVAVNLLMGFLLNQSGHLHSHGHGH  
GHSHGSAGHGSSDQGSSGQGQRGHGSLAVRAAFIHALGDLVQSVGVLIAAYIVRFKHIPD  
HQRHRHHPAGGCTASHGRVGHQSRAAEAAACGVCGGAEAVGADGR**

**>Slc30a5**

**MDEKYSSNVISSGKLGRVEAPNARLTRYIVLLYFTKMLKAFGIFESYDILKVVHIVQFLF  
ILKMGCAVILVFFQKPFSSGKMIPKRQWIKILKHAVISCIISLLGFFGLTLCGPLRSLLL  
FEHSDLVVISLLSVLFTSSGGGPSKTRGAAFFIIAVICLLLFDNDDLMAKMAEHPEGHHD  
SALTHALYTGIAFLGVADHKGGVVLLVLALCLKVAFNTASRKLSVEIGGAKRLYALSNLV  
SAVVLLPWVIVLSATTESKVESWSGLIFPFAMIIFSVMILDFYVESICMAKLETSRCARY  
GAIFLFLNGLLLANFWTHPLTGQIRAISTTGQQSSTEHVLSGGVLVSACFFIMADSILSA  
PSSKGQKGTLVGYSPEGTPLYNFMGDALQHTSQSLPRFIKDSLKQILEEYDSRQIFYFLC  
LNLAFTFVELFYGVWTNSLGLISDGFHMLFDCSALVLGLFAALMTRWKATRIYSYGYGRV  
EILSGFINGLFLMVIAFFVFVESVTRLVDPPNINTDMLTPVSVGGLIVNLVGICAFSHAH  
SHGASKGSCSGHDHGHSHHGHGHSSMEHSHGGHGHSHGGHGHSHGHGHSHSSGGMNANMR  
GVFLHVLADTLGSVGVIISTILIRQFGWLIADPICSLFISTLIFLSVIPLLKDACEVLLL  
RMPPQHEKELNFALEKIQKIEGVLSYRDPHFWRHSASVIAGTIHLQLMSDVVEQRVIQQV  
SAVLKDAGVNNLTIQLEKEAYFQHMSGLSSGFHEVLTMTQQMESMKYYKDGTCIM**

**>Slc30a6**

**MALDGSSTSVVMAHGNPYQHTHVSDYYSRKLSNKPDVVPSGVTERKVFPADKPDMVALDV  
LGITDSDAPVYRQKQEADTLVLGTIHPFRKAHRSVLGKLAQEFRLVTSDRRSWKILLFGV  
LNVVCTGCLLMWCSSTNSMG**

**>Slc30a7**

**MLPLSIKDDEYKPAKFNLVVKLSGWFRSILADKTSRNLFFFLCLNLSFAFVELLYGIWSN  
SLGLISDSFHMFFDCTALLAGLAASVISRWRSNDSFSYGYVRAEVLAGFVNGLFLIFTAF  
FIFSEGVERALEPPDVHHDRLLPVSIAGLLVNLVGIFVFQHGGHGHSHGGDDHGHSHSLF  
NGSAAHGHSHGGHGHSHGGHGHSHESKHGHDHGHSHGGHGHSHDDQHCHDDHTLTPGKGS  
SKQILQGVFLHIVADTLGSVGVIISAILMQKYDLMIADPICSMLIALLIGVSVVPLLRES  
IGILMQRTPPSLDHALPECYQRVQQLQGVYNLQEPHFWTLCTDVYIGTLKLLVAPDADSR  
WILSQTHNIFTQVGVRQLYVQIEVAAM**

**>Slc30a8**

**MFTKKPEKIHLVSENSAKMYTIMSESMPSVDMKDGKHCHDNNRALEDREREKKIAKKRLY  
IVSAVCLVFMVGEILGGYFAGSLAVMTDAAHLLVDLTSFIISLCSLWLSSRPATRTLNYG  
WHRAEILGALLSIFTIWLVTGVLVYLAVERIINDNFTIEGTVMLITSGCAVLANIIMALT  
LHQSGHGHSHGGLSAGHGHSHDHGKENGHSHSDGSHHDVEEQRPGKTQANASVRAAFVHV  
IGDLLQSISVLVSALIIFFKPEYKIADPICTFLFSLFVLGTTFTIMRDIVIVLMEGTPAG  
VNYNEVRQLLLGVKGVKAVHNLHIWALTMNQAVLSAHVATDETVDPQEVLREMTQVCFTK  
YSFHSVTIQLEPQADQRPDCSLCQDPAK**

**>Slc30a9**

**MFPCLAHRPWQVLCRVYLQQRAPLSQRSSKISKPCFGWQSRGGVHKLWFSFPDFRVTSLT  
WTQVQNCSTSGSGKDGSPTRPEEPKTTEKAQAAQPAAKGAGSKPQGLTKAESIQVKVRAV  
LKKREYGLKYTQNNFITAVRAMNEFCLKPSDLEHLRKIRRRSPHDDTEAFTVFLRSDVEA  
KALEVWGSQEALARERDQRKEVEREYQENIFRNQKLLKEYKDFWGNTKPRSRKRATFLQG  
PGKVVMVAICINGLNFFFKLLAWVYTGSASMFSEAIHSLADTCNQALLALGISQSVRNPD  
AIHPYGFSNMRYIASLISGVGIFMMGAGLSWYHGIMGLLHPQPIESLLWAYCILAGSLVS  
EGATLLVAINEIKKSARTQGLSFYEYVMQSRDPSTNVVLLEDAAAVLGVVLAAGCMGLTS  
LTGNPYYDSLGSLGVGTLLGTVSAFLIYTNTEALLGRSIQAEHMQKLTEFLENDPAVRAI  
HDVKATDMGLSKVRFKAEVDFDGRVVTRSYLEKQDIEQILNEIQQVKTPEELENFMLKHG  
ENIIDTLGAEVDRLEKELKQRNPEVRHVDLEIL**

**>Slc31a1**

**MDMSHSHHHVEETTMPSPASDDHGGHLTTSGNGHGDHMMMMQMTFYFGYKNVELLFAGLV  
INTPGEMAGACIGVFLLAVLYEGLKIGREVLLRRNQVNVRYNSMPVPGSDGTVLMETHKT  
VGQRMLSMAHFLQTLLHIIQVVVSYFLMLVFMTYNGYLCIAVAAGAGLGYFLFSWKKAVV  
VDITEHCH**

**>Slc31a2**

**FEGSSNVTLLFNFWNVHGPAGMVLSVFVVLLLTVVYELLKVWKITVGKQKSSPNTSPSTA  
MSFSQNKQSCFATVIKCQEGSSSLANSPSEVSLTPTENTDNAADSSTAAKRRRWILHCLQ  
TAIHIVQVTLGYMLMLCVMSYNIWIFLGVITGSVLGYFVAFPLLNHTQSCHVL**

**>Slc32a1**

**MATLIRSKISNKLSNAATTVTNKSQAKVSGMFARLGFQAATDEEALGFAACDDLDYDHRQ  
GLQMDILKNDEMGGEGGGEMGEDGMAEGDSHYQRDGTGPPPSASKDGGLCSEIGNPDKPR  
ITAWEAGWNVTNAIQGMFVLGLPYAILHGGYLGLFLIIFAAVVCCYTGKILIACLYEENE  
DGQLVRVRDSYVDIANACCAPRFPALGGHVVNVAQIIELVMTCILYVVVSGNLMYNSFPT  
LPVSQRSWAIIATAALLPCAFLKNLKAVSKFSLLCTLAHFVINILVIAYCLSRARDWAWD  
KVKFYIDVKKFPISIGIIVFSYTSQIFLPSLEGNMQKPSEFHCMMNWTHIAACILKGLFA  
LVAYLTWADETKEVITDNLPSSIRAVVNLFLVSKALLSYPLPFFAAVEVLEKTFFQDGGR  
AFFPDCYGGDGRLKSWGLSLRCALVVFTMLMAIYVPHFALLMGLTGSLTGAGLCFLLPSL  
FHLKLLWRKLLWHQVFFDVAIFVIGGICSISGFIHSVEGLIEAYKYNLPD**

**>Slc33a1**

**MELSESLTHKNGRQRKPVLLNMGERESKLEVGGDEEALLPNSDRADGRTQTHKGIKGELG  
NVSLLLFLYVLQGIPLGLAGSIPLIMQSKNVSYKDQAYFSFVFWPFSLKLFWAPLVDSVY  
LKQFGRRKSWLVPTQYLLGLFMLYLSLTVDSMLQTDGQKGPDVITLTAVFFLLAFLAATQ  
DIAVDGWALTMLSRENVGYASTCNSVGQTAGYFLGNVLFLALESADFCNKYLRFEPQERG  
IVTLSDFLFFWGIVFMVSTTLVAVLKKENGKPHPAKKKPKEETQGVKETYKLLFSIIKMP  
TVFTFCALLLTAKVGFSAADAVTGLKLVEAGVPKEQLALLAVPMVPLQILLPLVISKYTA  
GPRPLDIFYKAFPFRLLIGLEYALLVWWTPSVRQEEGFPVYYYAVVLLSYAVHQVALYSM  
YVACMAFHAKVSDPVIGGTYMTLLNTVTNLGGNWPSTLALWLVDPLTSKECDGAPGQTCS  
SIEEAGLCVREGGSCVTSLDGYYVESVVCVLIGLCWWIFFGKRMKRLQEESPSAWHCRVA  
K**

**>Slc34a1a**

**MCSRPIRITTAEQTISIAVGCHDAGKCSSSLDLVSNCGDADADASSIHWETGKHPCTTTM  
SSDSSESRSAGMFSSVLRIPLLLLLLYGFVCSLDVLSSAFQLAGGKVAGDIFQDSVILSN  
PVAGLMVGILVTVLVQSSSTSTSIIVSLVSSGLLEVKSAVPIIMGSNIGTSVTNTIVALM  
QAGERNEFKRAFAGATIHDCFNWLSVLVLLPLEVFSGLLSFLARVTVSSFQMHSGEEAPE  
LLKTLTEPFTTLIIQLDKSVITGIALGDESMRNHSLIKVWCKSSVLVSSVNVTHAAVRNC  
TGLHCGRDGDLTWITQNITTHINTEKCRHVFVDTGLSDLAVGLILLAGSLMLLCSCLLFI  
VKVLNSLLKGQVAKVIEGVINTDFPYPLGWLSGYLAMLMGAGMTFIIQSSSVFTSALTPL  
IGIGVISLNRAYPLTLGSNIGTTTTAILAALASPKEKLPAACQIALCHFYFNIFGILLWY  
PFPLTRLPIRMASALGERTAKYRWFAVLYLLLCFLLLPCLVFGLSLAGWQAMVGVGAPFV  
ALTLFVLLVNLMQARSPAHLPKTLRSWDFLPQWMHSLKPLDKLISRSTALCCSPLRIKDP  
EPLVEPSDLQKPADQCFDNPALEEIPAEPRVFRLRGLERCNSTPL**

**>Slc34a1b**

**MQAQTVHHYMRSEEHVMEATGKHIFINICKIPLLLLFLYMFICSLDILSSAFQLAGGKVA  
GGIFKDNAVLSNPVAGLVVGILVTVLVQSSSTSTSIVVSLVSSGLLDVGSAIPIIMGSNI  
GTSVTNTIVALMQAGEREEFKRAFAGATVHDCFNWLSVLVLLPLEAITGMMRLMSEAIVE  
SFNIVTGEKGPELLKVITEPFTKRIIQLDRTVIVGIATGQEVLRNKSLIKVWCQTQIAIQ  
KNASFVPSENSTVLTTSLHMNAEKCTHLFVETRLSDLAVGLILLVCSLLVLCTCLLLLVK  
LLNSLLQGQVAKAIQKVINTDFPFPFSWLTGYLAILIGAGMTFVVQSSSVFTSAITPLIG  
IGVISIERAYPLTLGSNIGTTTTAILAGLASPGDKLAAAFQVALCHFIFNILGILLWYPV  
PHTRLPIRMACFLGERTAKYRWFAVLYLILCFLLLPSFVFALSMAGWQILMGICVPVVAV  
LLCIVILNRLQSHKPHLLPRWLQTWDHLPLWMHSLKPMDSIITRAT**

**>Slc34a2a**

**MAPRPKHEHESDEKQPETLDGARKKSLSMAPAVSTAALIEDDPWEMMELQDTGVKWADLD  
TKKKVLRVFTTAAKLIMLLGLLYMFVCSLDVLSSAFQLVGGKAAGDIFQENKVLSNPLAG  
LVIGMLVTLLVQSSSTSSSIVVSMVSSGMLEVATAVPIIMGTNIGTSVTNTLVAITQVGD  
RNKFRRAFAGATVHDFFNWLSVLVLLPLEVASGYLVKVTSLIVKSFNIESGENAPALLNV  
ITDPLTHSIIQLDETVISGIAVGDPEARNKSLIKVWCHTASNTTLQNVTTTNCTDLCWEL  
KNVTEIINIKKCSHIFVNTSLSDLAVGLILLAGSLLILCTCLICIVKLLNSMLKGQVAVV  
IKKIVNTDFPFPFAWLTGYIAILVGAGMTFIVQSSSVFTSAITPLVGIGVISIERAYPLS  
LGSNIGTTTTAILAAMASPGETLGNSLQIALVHLFFNLSGILLWYPIPITRIPIRLAKGL  
GETTAQYRWFAAFYIIVCFFGLPLLVFGLSMAGWKVLVGVLVPIAVILIFAIIVNILQKH  
KPQWLPSALRSWDFLPLWAHSLDPWDRVVTVIAARCCCCCKCCNSKEEDEKAKLENLANG  
IEINDNTMTTVEIIEPKKTVDSCEILKATSL**

**>Slc34a2b**

**MAPLAETHPASPPPELGADADKHEPQTPTRTLSPWPAQQWEPEQEEEVDPWELPELLDTG  
VKWSELDRRGKVLRVCTSVLKLLLLLGLLYMFVCSLDILSSAFQLVGGKAAGDIFKDNAV  
LSNPVAGLVIGVLVTVLVQSSSTSSSIVVSMVSSGLLEVKSAVPIIMGANIGTSVTNTIV  
AVMQAGDRNEFRRAFAGATVHDFFNWLSVLVLLPLEVASGMLYRLTKLVIDSFNIQTGAD  
APDLLKVITEPLTKNIIELDTSVIRDIATGDPAARNKSLIKIWCKTEKITNLVNVTVPGI  
ANCTPDALCWVDGDLIWTQKNQTDTIYLKKCTHMFVFADLPDLAVGLILLALSLLALCTC  
LILIVKLLNSMLKGQVAVVIKKVLNTDFPFPFAWVTGYLAILVGAGMTFIVQSSSVFTSA  
ITPLVGIGVISLERAYPLTLGSNIGTTTTAILAAMASPGETLANSLQISLCHFFFNIAGI  
LLWYPIPFTRVPIRLAKALGNRTAKYRWFAGLYLILCHLLFNTILERRHLFNTSLERHLL  
FNTSLEHHLLFNTSLERRHRFNTSLERHLPFNTSLERRLPFNTSLERHLPFNTGLERRHR  
FNTGLERRLPFNTSLERHLPFNTGLERRLPFNTGLERRLPFNTGLERRLPFNTAGDSGEN  
SFLLLLLLLKSYYLVQSRFHE**

**>Slc35a1**

**MASESVSVLFKLYCLTVMTLIAATYTVALRYTRTVSTELYFSTTAVCLAEIIKLLLSLIM  
LVRETGDVGRCRAALVTHIFRSPKELLKLSVPSVVYAIQNNMAFVALSNLDAAVYQVTYQ  
LKIPCTALCTVLMLNRSLSRLQWFSVFMLCAGVTLVQWTPPHSTKVQVEQNPFLGFMAIA  
VAVLCSGFAGVYFEKVLKSSDTSLWVRNIQMYLSGIAVTLMGVYMTDGARVLEKGFFYGY  
TPWVCLVVFLASVGGMYTSVVVKYTDNIMKGFSAAAAIVLSTVASVLLFGLQITLTFISG  
ALLVCVSIYLYGLPKQDTTKVMKAGAEQDDTHKLISV**

**>Slc35a2**

**MMMMAAAGNESPNRNSEDKTSSRRQNEVNKKLKYTSLAILVIQNASLILSIRYVRTLPGD  
HFYTTSAVVMAEVLKVITCLFIILIQKRGNVKSFVSLLYDSIVIQYWDTLKLAVPSLIYT  
LQNNLQYVAISNLPAATFQVTYQLKILTTALFSVLMLRKSLSRIQWISLVLLFAGVAIVQ  
VEQESGKQKEAVTAANQNYFKGLLSVIISCLSSGFAGVYFEKILKGSSASVWMRNIQLGI  
FGTVLGLLGMWWNDGAAIAEKGFLFGYTPMVWGVIFNQAFGGLLVAVVVKYADNILKGFA  
TSFSIIVSTITSVYLFGFHVDLVFTLGAGLVIGAVYMYSLPKANTSTSSTSTASSSKAGE  
SELDAFLPKRKNLKPIWNLLRESKNLKAPGKKKGN**

**>Slc35a3\_1of2**

**MASAKLKYLSLGVLVFQTTSLVLTMRYSRTLQGDGPRYLASSAVVVAEFLKILTCVGLVF  
KENSYSGRALSSIMRQEIIHKPVETLKLAIPSGIYTLQNNLLYVALSNLDAATYQVTYQL  
KILTTALFSVSMLGRRLGVYQWLSLLILMAGVAFVQWPTDSPADPQKEHLTAGSQFVGLV  
AVLVACCSSGFAGVYFEKILKETKQSVWVRNIQLGLFGLVFGVFGMLAYDGDRVREHGMF  
QGYNTLTWIVVALQALGGLVIAAVIKYADNILKGFATSLSIILSTLISYFLLEDFEPTSV  
FFLGAILVIMATFLYGYENKPPSNPSRA**

**>Slc35a3\_2of2**

**MAIISIHWTACVSLEQTKQGHSSLSSVSGSAEASSISTSSRLKYASLGVLVFQTTSLVLT  
MRYSRTLHTEEPLYLASSAVVCAELLKIVACILLVFRDHSFSVRSLNLVLKEEIINRPLL  
TLKLAIPSGIYTLQNNLLYVALSNLDAATYQVTYQLKILTTALFSVSMLGKRLGIYQWLS  
LVILMFGIALVQWPTEVSSSTGEKDLTASSQLIGLLAVLVACFSSGFAGVYFEKILKESK  
QSVWVRNIQLGLFGLVFGFGGVFTYDRERVLENGLFQGYNNVTWSVVALQALGGLVIAAV  
IKYADNILKGFATSISIILSTLISYFLLDDFDPTSVFFLGAMLVIAATFLYGCERTPAIC  
TSKV**

**>Slc35a4**

**MIAISADESPESSSPALRLRWLFLLLLLVLIYGSHAPLLSLCKTQAQIPFSASSCVLLIE  
TSKLFISFASLLASGSVSTLRISISMTTASPYAVPAVLYAFNNHLVVFMQAYMDPSSFQV  
LSNLKIASTALLYTSCLGKRLHRRQWFAMGLLVSAGVSHSCFSYDLEGKQETAVYITSWG  
LLLVLVYCFVSGLAAVYTERVLKSQRLPLSMQNLFLYAFGVVVNLASHLSGGEQKGFFEG  
YSAVVWVIVAGQVANGLLMSVVMKHGTGITRLFVISSAMLVNAVLSWGILGVQLTGYFLF  
PVVLIGWAVYLYYT**

**>Slc35a5**

**MSFTMARYSSSSSSASSSSCGCCRPCSRICSRSSAYTLALGLGFVTLGTSRILLLKFSGN  
EENKYDYLPASVNLMAEAIKLVFCLVMSVRVIIREGRSFKDLGCSSGASFLSYLKWSVPA  
FLYFLDNLIIFYVIAYLQPAMAVLFSNIVIFTTAFLFRVVLKRRLSWVQWASLIILFLSI  
VSLTTGNGDQHAMAVHGLHPAHISTPSNSCLKYTHLHQVHQSHNESYWSRELWDSQLIHK  
LNSFGLGYVLLLLQCFISALANIYNEKILKEGEQLVESIFIQNSKLYLFGLVFNSLTLLL  
HADYRNLTLHCGILYGHNVFSVALGFVTAALGLSVAFILKFRDNMFHVLTGQITTVVVTA  
LSFFLFDFQPSMDFFMQAPVVLLSIFIYHSSKMKDPEYALQQERLRVINGEVFERSRGDG  
EELERLTKANTESESEEESF**

**>Slc35b1\_first**

**MAAGKAASKPSLWQNERVRFAVCFCGVFVCYFYYGILQETITRADYTHAGKKEKFRYATT  
LVFIQCIINAAFARLLIQFFEGSKQDHTRSWLYGLCSLSYLGAMVSSNSALQYVNYPTQV  
LGKSCKPIPVMILGVTILRKKYPMAKYLCVFLIVGGVALFLYKPNKGSSTSDEHVFGFGE  
MLLLLSLTLDGLTGVVQDHMRGRFQTGANHMMLNVNMWSTLVLGIAVLWSGEVWEFLAFT  
DRYPSIIYNILLFGITSALGQTFIFMTVVYFGPLTCSIVTTTRKFFTILGSVLLFGNVIS  
HMQWFGTILVFLGLGLDAKFGKSPKKTTH**

**>Slc35b1\_second**

**MAAGKAASKPSLWQNERVRFAVCFCGVFVCYFYYGILQETITRADYTHAGKKEKFRYATT  
LVFIQCIINAAFARLLIQFFEGSKQDHTRSWLYGLCSLSYLGAMVSSNSALQYVNYPTQV  
LGKSCKPIPVMILGVTILRKKYPMAKYLCVFLIVGGVALFLYKPNKGSSTSDEHVFGFGE  
MLLLLSLTLDGLTGVVQDHMRGRFQTGANHMMLNVNMWSTLVLGIAVLWSGEVWEFLAFT  
DRYPSIIYNILLFGITSALGQTFIFMTVVYFGPLTCSIVTTTRKFFTILGSVLLFGNVIS  
HMQWFGTILVFLGLGLDAKFGKSPKKTTH**

**>Slc35b2**

**MPLFPWSVCVCAALCFLPAVNADAVDASLLGGWQDVWLFRLFLNVLGYATIIIPGYFLIS  
YFKRVNYLETGRGLCFPLIKTCVFGNESKTGLLDDASPAGRNESESSSSARQAFKLIFCA  
AGLQVSYLTWGVLQERVMTRSYGSSEAEGSGERFRDSQFLVFMNRILALTVSGLWCVLFK  
QPRHGAPMYKYSFASLSNILSSWCQYEALKFISFPTQVLAKASKVIPVMLMGKIVSRKSY  
EYWEYLTAVLISLGVSMFLLSSSTDKHPSTVTTFSGVLILAGYIVFDSFTSNWQDNLFKY  
KMSSVQMMFGVNLFSCLFTVGSLLEQGAFFNSLAFMTRHSEFAFHAVLLSVCSAFGQLFI  
FFTIAQFGAAVFTIIMTLRQALAILLSCFLYGHPVSLTGGLGVGVVFLALFLRIYARSRV  
KKSTKRPAQTPVQKV**

**>Slc35b3**

**MKPTQEIKQEPADMSGKFGLVNYSSRKHISITVPSSTEVMSPHIKSVEELRVLGINLNSF  
NTPTQFFICVAGVFLFYLIYGYLQELIFSVEGFKPFGWYLTLVQFGFYSLFGLVELQLTQ  
DKRRRIPCKTYMIIAFLTVGTMGLSNTSLGYLNYPTQVIFKCCKLIPVMIGGVFIQGKRY  
NVADVSAALCMSLGLIWFTLADSKIAPNFNVTGVLLISLALCADAAIGNVQEKAMKLHNG  
SNSEMVLYSYSIGFVYILLGLLSLGGLGPAVSFCAQHPMTTYGYAFLFSLTGYFGISFVL  
ALIKLFGALVAVTVTTGRKAMTIVLSFLFFSKPFTFQYVWGGLLVVFGIFLNVYSKNKDK  
MKLPSLAELRKRVLSGRKVRLLSQDV**

**>Slc35b4**

**MNTLFAVTLVFVGCCSNVVFLELLVRDFPGCGNIVTFAQFAFIALEGFIFETNFGRKKPQ  
IPLSNYVIMVTMFFTVSVINNYALNFNIAMPLHMIFRSGSLIANMILGIIILKKRYSMSK  
YLSIVLVSVGIFICTIMSAKQVNVEKGGTEEDGVYAFMHWLLGIAMLTFALLMSARMGIF  
QETLYKKYGKHSKEALFYNHCLPLPGFLLLSTNIYNHAVLFSQSSPMEVPVIGLSMPVMW  
FYLLMNVITQYVCIRGVFILTTECASLTVTLVVTLRKFLSLIISILYFQNPFTAWHWVGT  
AVVFLGTLLYTEVLSSIPAAFKGYKADKKAE**

**>Slc35c1**

**MAFTDSTRPGDKEEPFFMRATKIALVVTLYWFISISMVFLNNYLLDSKELDAPVFITFFQ  
CVVSVGLCLLMSFLSSLCPGSVDFPSLKFDLRVSREILPLTIVFISMITFNNLCLKYVGV  
AFYTVGRSLSTVFNVILSYVVLKQTTSLYAVLCCGVILGGFWLGVDQEAVAGSLSWAGVV  
FGVIASLCVSLNAIFTKKVLPVVDGNIWKLSYYNNLNAIVLFLPLLIILGEVKSVFEFSR  
LTDLHFWGMMTLGGVFGFAIGYVTGLQIKFTSPLTHNVSGTAKSCAQTVLAVVYWASEKS  
TLWWTSNLMVLGGSFAYTWVKGMEMKKAPVPTETQSLNPQKNKEDLGV**

**>Slc35d1a**

**MKQCEARNEAAGMADQTLTVLLKLSAAGFYGISSFLIVVVNKSVLTNYRFPSSICVGIGQ  
MLATVVVLRVGKALRVITFPEFDGSIPRKTFPLPLLYVGNQITGLFGTKRLNLPMFTVLR  
RFSILFTMLAEGFLLKKKFSRPVQLTVFTMILGAFVAASADLAFDLQGYVFILMNDVLTA  
ANGAFVKQKLDSKELGKYGLLYYNALFMILPTLLLAHVTGDMDKAFDYDGWSDVLFISQF  
FLSCIMGFILMYSTVLCTQYNSALTTTIVGCLKNILVTYIGMVFGGDYIFSWTNFIGLNI  
SIAGSLVYSYITFTEEQITKQSENTNKLEVKGKVAV**

**>Slc35d1b**

**MANARARRSAGTPGKRGKHEVSGEDEDTSALYLKLFAAAFYGISSFLIVVVNKSVLTNYR  
FPSSLALGIGQMFATVVVLRGAKALNVISFPDFDWHVTYKVFPLPLLYVGNQLTGLFGTK  
QLNLPMFTVLRRFSILFTMLFEGYLLKQKFSWSIKATVFTMILGAFVAASSDLAFDLQGY  
VFITLNNILTAANGAYMKQKLDSKELGKYGLLYYNALLMIIPTVVLAYFTGDVQKTLECE  
VWADYFFVIQFVLSCVMGFILMYSIMLCTHYNSALTTTIVGCIKNILVTYIGMVFGGDYI  
FSWMNFVGLNISIAGSLVYSYITFTKEQKKQADGTSVIWHNRRMSTRLVEVKHPQHWPHF  
PVT**

**>Slc35d2**

**HGRLAKFLSATFYAFCSFLIIVINKSILTEYKFPSFMFLGIGQMAATIIILYAAKMNKTI  
HFQDFDRSIVGKIFPLPLLYVGNHVTGLGGTKKLSLPMFTVLRKFTILLTMIMESRILKK  
SFAPPLVCSVLAIVLGALIAASSDLSFNAEGYTFVLMNDVFTAASGVYTKKKLGMEGLGK  
YGVLFYNAFIIIIPTVLASAYTGDLQKALTYEGWLSFTFIFYFLLSCVMGFILMYSIILC  
SYYNTALTTTVVGAIKNAGVMYIGMFVGGDYIFSWPNFIGLNICISAGLVYSYITLSSA**

**>Slc35d3**

**MEVCKGRMLGITVAVAHGFFSGSLNILLKFLITTYSFTYLTLIQCLTSGTAALTLEVLRR  
LGKIDIPPFSLQLVKVFASVCILATLQSTLTLWSLRGLSLPMYVVFKRCLPLVTLGIGVC  
VLKNGIPSAGVITAVLITTGGAALAGAGDLTGDPFGYVTGILAVIVHASYLVLIQKVSSD  
SDYGPLTAQYTIAVVATPVLFICSIVSMDAIDMWTYEGWKNPFITGIFVTCILIGCAMNF  
TTLHCTYINSAVTTSFVGVVKSIATITVGMLAFSDVMPTKLFVAGVVVNTVGSVTYCVVK  
YFEDMDESAKDGELPGEPYVEPAKPDGDTMEIPSNIPEDVPNGGLSESADQNHIRENKVA  
ESIELERPAVPSDDPTRLSLSDSYVGVWRSVRTLKFLKKDTLIDNMEVQSP**

**>Slc35e1**

**MAATEQRPPVREGMRIAVLCLCWYTVSSGGNVINKIILNSFPYPVTVSLFHIVSIIVFLP  
PLLRAWGVPRTELPARYYRWYILPLAFGKYFASVSAHFSIWKVPVSYAHTVKATMPIWVV  
LLSRIIMKEKQTTKVYVSLIPIIGGVLLATVTELSFDMSGLISALAATLCFSLQNIFSKK  
VLRDTRIHHLHLLNILGFNALLFMLPTWILVDLSSFLMDGDLSEVSSWTGTLMLLLISGF  
CNFAQNMIAFSVLNLVSPLSYAVANATKRIMVISISLLMLRNPVNTSNIIGMMTAILGVF  
LYNKAKYDSNQEAKKGLLPVSAQDVVSFDKPQSNGTGAFTHSSDFQHGRSTVLTDHFQYS  
RQAYTANYSSSQYVV**

**>Slc35e2b**

**GGGDRSSRLSFWARPERVCLSRSESTPGEPVLKITITETTVIEADAGIWSSRALTHLTLW  
YFFSFCTLFLNKYIQTPELGRVSILCAVQMLSTTVIGCVQMFVPCPLYQHKSRSEYPSNF  
IMIMLFVGLMRFTTVVLGLVSLKNVAVSFAETVKSSAPIFTVIMSRLILGEYTGTHTHTG  
VMLSLSVFSLQNVFSKKLYNGAKNKMNPPELQFYTSAFAVIMLIPAWIFLMDFPGIGKSE  
RSFKLSQDIVVLLLLDGALFHLQSVTAYALMGRISPVTFSVASTVKHALSIWLSIIVFSN  
PITVVSAIGTLMVFVGVLLYNKAKQFQRDALIQHALDQSTEAEQKPMIQN**

**>Slc35e3**

**MSSTMATRLSDLFGNSRIIAGLLVNLLSSVCIVFINKWIYVHYGFPNMTLTLIHFVMTWL  
GLFICQKMDIFAPKSLRPSKILLLALSFCGFVVFTNLSLQSNTIGTYQLAKVMTTPVIIA  
IQTMYYRKTFSTKIKLTLVPITLGVILNSYYDVRFNLMGMIFATLGVLVTSLYQVWVGAK  
QHELQVNSMQLLYYQAPMSSAFLLVLVPFFEPLTGDGGIFGPWSFLALFMVLLSGVIAFL  
VNLSIYWIIGNTSPVTYNMFGHFKFCITLLGGYVLFQDPLSLNQGLGILCTLTGILAYTH  
FKLAEQEEGKSRLTQRP**

**>Slc35e4**

**XTHNNTCMQTRRNVFTVCFQNTRLLYSALRPVIALFLTHFRLVSCAYQQIYFAKYVRCRL  
KMCLPRRCEDEATMISADGRSAKREETRDSGKKSRRAPEMLHLMFAVSVWLVTGTTISSL  
NKWIFAVYNFRYPLLLSALHMLTAIVVDYGLIKSRVVRHKGVGEQDLTTSAKCKVFLLSL  
TFCASIAFGNVGLNYVQLSFAQMIYTTTPLFTLAISALILGKQHHFLKYTAMMPICLGAS  
FSIMGEVQFDQTGCLFVFAATMLRGVKTIQQSILLQEEKINSVFLLYLMSIPSFCILAVA  
ALALENWAALQSPFQYDHHLWGFILLSCLGSVLYNLASCCVITLTSAVTLHILGNLNVVG  
NLLLSQVLFGHELTALSCAGAALTLSGMIIYQNSEIIVAYLDARRARTPAGGGGEEELLA  
RENDLNISQTTAETCSDEESFADAQEPNERTEMEIHEKTD**

**>Slc35f1**

**MMPEHQNHVVTTIETLPPESVGASTPSLYQRMKKVLNRELVLTLALGQVLSLLICGIGLT  
SKYLADDYHANTPVFQSFLNYILLFLVYTTTLAVRQGEENLLAILKRRWWKYMILGLIDI  
EANYLVIKAYQYTTLTSVQLLDCFVIPVVLLLSWFFLLVRYKVLHFVGVGVCLLGMGCMV  
GADVLVGRQQGLGDHKLLGDLLVLGGATLYGISNVCEEFIVKNLSRVEFLGMMGLFGSFF  
SGIQLAIMEHKELLKVQWDWQIGLLYIGFSACMFGLYSFMPVVIKRTSATAVNLSLLTAD  
LYSLFCGLFLFQYKFSGLYLLSFFIIVLGLVLYSSSSTYVAQDPRVYKQFRNTGNALTDT  
PTSGHLEPSVTYTSLGQEIEEEPRIRVA**

**>Slc35f2**

**MDCEAGETSTENRSLETLRRWGRFLCGPRNLALKNVFTWQLFKTIAMGQALSMLICGTAV  
TCQYLAKDVETPMLQSFLNYSLLLLTYTFVLALRRGENNIVQILKTKWWKYFLMALTDVE  
ANYTVVKAYQFTTLTSIQLLDCFVIPVLMVLSWIFLKTRYRPWHFVSVAVCLFGVGAMVG  
ADLLAGRDQGSSSHVLLGDGLVLVSAALYAVSNVCQEYTVKNLSRVEYIGMIGLFGTLIS  
GVQMAILEYKAIPAINWDWQKCLLFFAYTLCMYGLYSFMPVVVKMTSATAVNLSLLTADL  
FSLFCGIFLFGYKFTGLYIVSLVVIMVGFVMFNVVPTFTADQSHVNDDVVYHLDSSANYQ  
QGGDIVENCLPKEGQENPDRTWSSHKAPCNGICSQT**

**>Slc35f2\_2of2**

**LLKILLMGQGLSALICGTAVTSQYLASVYYLNTPMLQSFINYTLLGITYTMALIFRRGDG  
NILQILKTKWWKYLLLAVADVEANYAVVKAYQYTTLTSIQLLDCFIIPVLMILSWFFLKT  
RYRIIHYAAVGICLAGVGAMVGADILAGQDQGSSSDVLLGDGLVLVSATLYAISNVCQEY  
TVKNLSRVEFLGMVGLFGSIISAIQLGILEHKEVANIQWTWEKALLLSGYALCMYGFYSF  
MPVVIKRSSATAVNLSLLTGDLFSLFFGLFLFHYNFSGLYIVSLVGILIGFIMFNTVPTL  
SRLSDPLSDEEGVDNHTADTDNNSIEGCEGEI**

**>Slc35f3b**

**MKKHSARVAPLSACNSPVLTLTKVRGEDRPRENVVGTADGQAMVGGAGVESGAGRQRLRC  
CVRVTAVQVRKAIWGVAMVMCVCSSWAGSTQLAKLTFKKYDAPFTLTWFATTWNCLFFPL  
YYIGHLCKSPERQTPKQRFRECCRFFGDDGLTAKVFFTKVAPFGLLWILTNYLYLQALRK  
INSTDVSALFCCNKAFVFLLSWIVLRDRFMGVRIVAAILAIAGIVMLTYADGFHSHSVIG  
ITLVVASASASALYKVLFKLVLGSAKFGEAALFLTIVGGANFIFMSFVPVLLYFTHVEYF  
TSFADLPWACMCGVAALLLAFNILVNFGIAITYPTLISLGIVLSVPVNAMVDLYTCDIHF  
NTVRLIAVCIICLGFLMLLLPEDWDQCLIELGTKLRKREQPAE**

**>Slc35f3a**

**MQKEDETPLQLQGPQKDRGMRKPSDMSPRRLSDISPQIRQLKSLVLDEDLNEELKSSRSV  
EYIQNASIEERILRITGYYGYEPWSASVRGEEQSSSEKVEVKVDGHSGTALLDCADRLQR  
LRCCLHLTAVHLRGALWGVAMVICICMSWSGSTQLAKITVRRLNIPFTLTWFSTSWNCAI  
FPVYYLGHLCWSKDRQTPRQRFRECCQFLGDDGLSLKMLLSRVAPFGVLWTLTSYLYLQG  
LRRIPATDACALFCCSRAFVFLISWIVLRDRFMGVRIVAAVLAIGGIVMMTYADGFHSYS  
VIGISLVVGSASTAAIYKVLFKLVLGSAKLGEAAVYLTILGGANLIFISAVPLILLLTGA  
EDFISPRDLPWSSICGMSALLLVFNFLLNCGVLITLPTLISLGVVLSVPVNAVIDRYMYD  
IQLNSVRVIAVSIICLGFLLLLLPEDWDQCLPQLRSILHSRRQPQESARDKHSEMLHIRP  
REAKNCNSKTTGVR**

**>Slc35f4**

**CPCGGKMSSPEIQDSGEEPCFRLEPLPGKSPHLTGKASPQVTSRWDAPQVTANGLHDIED  
RILRITGYYGYNPGYSSHRREEGSDSHAETPVSETSGEATACQTCANTVLKVLGGLLLVL  
CVSSSWVGTTQVVQLTFKSFSCPFFITWFSTNWNILFFPLYYSGHVATTREKQTPIQKFR  
ECSRLFGEDGMSLKVFLKRTAPFSILWTLTNYLYLLALRKLTATDVSALYCCHKAFVFLL  
SWIVLKDRFMGVRIVAAIMAITGIVMMAYADGFHGDSFMGVALAVGSASTSALYKVLFKM  
FLGSANLGEAAHFFSTMGFFNLIFISCVPLILYFTRVEHWGSLSSLPWGYLCGVAGLWLV  
FNILVNVGVVLTYPILISIGTLLSVPGNAAIDVLKHEVIFSVVRLAATCIICLGFLLLLL  
PEEWDTVTLRFLTTLADKKTEEHGEELTESSVHTRSRSRANGAVSIPLA**

**>Slc35g1**

**MGDIRQRNGSVSNNDTDLSVVPYTADDIRVLCHKVEDGKVGEEFEMRTLSEVPDGDAGES  
RPVNRGAFYRVCLPACCKRSDTHRDEDEDDGEEDTGENTVQKEKQPSCPGLGLMYSLLAS  
VFFSIAALLVKKMEGMHAIQISAIRCFFQMLFVLPAMIYYKTGFLGPRGMRIYLFLRGFL  
GSNAMILLYYAVLQMPLADATVIMFSNPVFTALLAWIFLKERCTIWDVVFTVFTLTGVIL  
IARPPFLFGGELSGIEGDYSSHIKGTVAAFSGAVGAACTMVILRKIGKRVHYFLSVWYYA  
VLGLIECVVVLFILDEWTIPSCGWDRWTLMAIGVLGIAGQAFLTKALQIEKAGPVALMRT  
MDVVLAFVLQFLFLNRKPTWWSLGGALCVISSTSGVALRKWYNSTRQKS**

**>Slc36a1**

**MASDINYQDGPDFSRRDESPTEDEPIHSPGSRQTEYERIGGRTGSSVLQTIIHLLKGNIG  
TGLLGLPLAVRNAGLLVGPLSLLIMGIVAVHCMNLLVKCAHHLSAKLGKPFLSYGDAVEY  
GMENVSWLSRHSIWGRHVVNLFLNITQLGFCCVYFVFLSDNVKQVVETANATTGNCHNNE  
TAVPVPSYDSRLYMVFFLPFIILLVFIRNLKYLAPLSFAANICMCASLVLIYYYCLTNIP  
NPINLPLAGRGADYPLFFGTAIFAFEGIGVVLPLENKMQNPRNFTKVLYLGMGIVTFLYI  
SLGTIGYIGFGEEIRGSITLNLPLCWLYQIVKLLYSFGIYITYALQFYVSAEILIPPAVA  
RCGPRWALMVDLSIRVALVGLTCALAILIPELDLVISLVGSVSSSALALIIPPLLQIITF  
HNEDMKPWVFAKDILISVLGFVGFIAGTYTSIQEIVARNGDRHNSTVL**

**>Slc36a4**

**MASAEQLDMEVMTPLMEKAEGEEEEEDENVDGDEDSKHLPQGITFTQTLLHLLKGNIGTG  
LLGLPLAVKNAGIVLGPVSLVLMGVVCVHCMHILVNCSHQLSERLKRSPLGYSETVAAAM  
ELSSSQCLRRSAHFGRHLVNFFLVLTQLGFCSVYFVFLAENIKQVMEGTHMNSTAETVLL  
SSNSSEASVASSVAIDLRLYMVFLLPFIIVLTFIRDLRNMAALSAIANLCMAISLIFIFS  
YILNDLSDPRRLPYASTWRKFPFFFGTAIFAFEGIGVVLPLENQMREPKRFPQALNIGMG  
FIIVLYVTLATLGYLRFRDDIKGSITLNLPHDSWSNQLVKVLYSFGVFVSFAVQFFVPAE  
ILLPPMCERVRKSWRRVADLSLRALLVCLTCVTAVLIPRLDLVISLVGAVSSSALALVFP  
PLVELIAFPSQPPPPMLLLKDISIAALGFIGFLTGTYVTVEEIIYPDVQGQIRLHDDGNW  
TTPTTSTP**

**>Slc37a1**

**MAPVPPGIRFLASFNRDQWYKAFTFALTFLLYTSFHLSRKPISIVKSELHKNCSHAVEAP  
TEISSSSQQPGHHPEFDCSWKPFDRNNYKQLLGAMDYSFLFAYAIGMFLSGIIGERLPIR  
LYLTVGMLTSGLFTCLFGLGYIYDIHSLGFYIFVQVANGLVQTTGWPSVVTCIGNWFGKG  
RRGLIMGLWNSHTSVGNILGSLIAGYYVSSNWGLSFIVPGVIIAAMGVICFFFLIEHPND  
LKTASTQSSAPSSQKFHKSCNGVNGHKDLYLQYKPGAKAQSWDTELLLGQESIGVCVPVQ  
QVVVVKSEAEPSAISFMGALRIPGVVEFSLCLLFAKLVSYTFLFWLPLYITKAAHLDAKK  
AGDLSTLFDVGGIVGGILAGVISDKMHKRATTCAVMLLLAAPMLYGFSMMSQFGLGPTIG  
MLLVCGGLVNGPYALITTAVSADLGTHKSLKGNARALSTVTAIIDGTGSVGAAVGPLLAG  
LLSARGWDQVFYMLMTADFFALLLLLRLVMKELRYHRNRPGIAVE**

**>Slc37a2**

**MKSLAPGIKLITSFSRDSWYRFSILFLTFVFYTSYHLSRKPISIVKSQLHRNCSNVVHPA  
NLNITDNDTWCDWVPFDGKNYQNLFGVLDNCFLVAYAVGMFFSGIFGERLPLRYYLSTGM  
LLSGLFTALFGLGFYWQIHSLWYYCLVQALNGLVQTTGWPAVVACVGNWFGKGKRGFIMG  
VWNSHTSVGNILGSLIAGVYVSSAWGLSFIVPGIIIASTGVICFLFLVERPEDVNCTAPQ  
HHERVEEEPLLRNSSTNEEIFNSHTSTAVEPVEDHSEAISFCGALRIPGVVEFSFCLLFA  
KLVSYTFLYWLPLYIANVAHFDPKKAGDLSTLFDVGGILGGIVAGLVSDYTGGRASTCCA  
MLIIAAPMLFLYNKIGQNGLPTTVGMLLWCGALVNGPYALITTAVSADLGTHESLRGNSR  
ALSTVTAIIDGTGSIGAAVGPLLAGLISPTGWNNVFYMLIAADVLACLLLSRLVYKEIRG  
WCGYTTRQRGFKEI**

**>Slc37a3**

**LFLLLFIQTLIMWPLYTYHHLLTFLLTFFSYVLLHASRKTFSNVKVSISAQWTPSALQQN  
GTAFTLSPTETWEGNALFADMGEATLFLGALDSIFLFSYAVGLYVSGVIGDRFNLRYVLS  
FGLCGSAITEFVFGTLTEWLHFYNVYLYCVLWVINGLLQSTVWPCVVAIMGNWFGKSGRG  
FVFGLWSACASVGNILGAFLASSVLKYGYEYAFLVTSVVQFAGGVVVFFGLLTSPKEIGK  
PKGLRPVTRDSDSQRPLMSDEEDELTDEYSSIQQQDEEPQPQPQPRAIGFFQAFCLPGVL  
PYSLAYACLKLVNYSFFFWLPFYLSKNFGWKEVEADRLSVWYDVGGIIGGTVQGLISDLL  
GKRAPVLAISLLLAMGSLVGYSHSPNNQLVNGALLATTGFLIGGPSNMISSAISADLGRQ  
EALHNSQQALATVTGIVDGTGSIGAAGGQYLVSLIESKLGWMCVFYFFIIMTGCSVLFII  
PLLFREIQSLCRDRQARTLQL**

**>Slc37a4a**

**MAKTGYGYYRATIFLAMFVGYTLYYFNRKTFSFVMPSVMQEITLDKDDLGLITSSQSLAY  
AISKFISGVLSDQMSARWLFSIGLFTVGGINVIFSQSSSVAVFSGLWFLNGLGQGLGWPP  
CAKVLRKWFEPSQFGTWWAVLSCSMNLAGGLGPIIATLMAQSYSWRSTLSISGLTCVVTS  
IFCLIIIRNEPSEVGLPNIEAGAKKVKGGSSKNESTFKEFIFSPYLWLMSLGYLVVFGVK  
TAYTDWGQLFLIQDKGQSALMGSSFMSALEIGGLLGSLAAGFLSDRAVAKHGLRLYGNPR  
HGLLLSMMAGMFVSMYLFRTTVTAHSSNVWILLLGAAFGFSSYGPIALFGVLANESAPSN  
YCGTSHAIVALMANVGGFLSGLPFGTVAKHHGWNTAFWVAEIACMVTTVGYFLLRNIRTK  
MGSIPKKAD**

**>Slc37a4b**

**MGAAGYGYYRTVIFISMFVGYMLYYFNRKTFSFLMPSVMEEIELDKEELGLITSSQTLAY  
AISKFISGVLSDRISARWLFSIGLFIVGTINIAFSCSSTVMLFTVLWFVNGFGQGFGWPP  
CGKVLRKWFEPSQFGTWWAILCCSMNLAGSLGPIITTVLVQYYDWRVIMSVSGLICMAVA  
VVCLLMVKNEPSDVGLPSIQPGAKKGKGKKGGPNDESSLKDFLLSPYLWVLSAGYLVVFG  
VKIACTDWGQLFLMQEKGQSAMMGSSYMSALEVGGFFGSIGAGYLSDRAVARQGLGVYGN  
PRHGLLLMMMAGMAVSMYLFRVTITPETPEEAPLWVLALHPVSVLTGVSEKELWILILGA  
AFGFSSYGPIALFGVIASESAPSNFCGTSHAIVALMANVGAFIAGLPFSTIAKRYSWDTA  
FWVAEVSCAITTVCFFFVRNMRTKMGHVPKKMD**

**>Slc37a4\_3of3**

**XEAPLWVLALHPVSVLTGVSEKELWILILGAAFGFSSYGPIALFGVIASESAPSNFCGTS  
HAIVALMANVGAFIAGLPFSTIAKRYSWDTAFWVAEVSCAITTVCFFFVRNMRTKMGHVP  
KKMD**

**>Slc38a10**

**MTASNWGLIMNVVNSIVGVSVLTMPFCFKQCGIVLGTLLLFFCSWMTHQSCMFLVHSASN  
TKRRTYAGLAFHAYGKPGKALVELSMIGLMLGTCIAFYVVIAELGSNFFAQLLGLQVTGS  
FRVVLLFAVSLFIVLPLSLQRNMMSSIQSFSAMALIFYTLFMFTIVLSSLRYGIISGSWV  
ERVHLWRFKGVIQCLPIIATTFCCHPQVLPTYDSLDEPSVKRMSTIFTSSLNVVTTFYIT  
VGFFGYVSFTDNIAGNVLMNFPSNLVTEMIRVGFMMSVAVGFPMMILPCRQAINTMLFEQ  
QQKDGTFAAGGYMPPLRFKSITLCIVFGTMFVGILIPNVETILGLTGATMGSLICFICPA  
LIYKKIMKNAWTAQLVLWVGLGILLISTATTMSISSNEPAKITPAQDVPAKTENKLPNII  
APELPKVPVQENRVEPDPGEKPDRPPIEVEQPAEKKADEPPQIKVPVDVVEQKKKEEEVQ  
LDRPEAGVAVPEGEAHRHEPPIPHDGVQIDEIKNQEELEDEKKQPAIVEEEKKLPAREEE  
EFLAEQGAGQAQEVGSDAVKEEEQKEQDDVEKRAVDKANKVENPEDPKQPLGVHKEPENL  
PEVKQQHGENEADGQKKPEEIEKAPEPQEEKPKEKIVEEHKDEKVPDGKDGGAEKDGDGD  
KMEEGQLDHMLLQVIKEQQEQQKRLLDQQEKLLAVIEEQHKEIHHLDQEEKHLPVNDVVP  
QVKEGEAEPKAPAAGEGASEVENAVPKQQEDIAVAVKPKVAVDAPEQFQQPQGEPVQVPV  
AVAVPEEPAAKEAQAVAGLPKNSLELVQDQGVEVPKKEDLELKNEGVLPEVGARGVPLRQ  
REPEVDKINPDALAEKEEKVKQKLAQLEAEKERIEKEKLEKERIEKEVQARVEKERKERE  
KREELAREKELELVRQQKEHLEKERLEAERLKEEREKMEKEIIERAEEKKRLLEHKERVD  
QLQQVIDARHEKQKKESLEDENLKQEREKMDKEIMERAEKEKVIQEHKERLEQLQQVIDA  
KKEADALKEGVPPMPKQNGGRDLKENIVPLEEQKQEKRSREDGGLDLKRRRRALDLEGGE  
GADLDLLQDVGGLFLNPDLKGQLMAETLVHTRQLQQTFQRQVNEE**

**>Slc38a11\_first**

**MESERSCLLSSHDAGKGGSSSVSSASFNFINSIIGSGIIGLPYSMSQAGLPMGLLLLILV  
AFITDYSIILLVRGGNLSGTHSYQSLVRSTFGQIGYIIVSVLQFLYPFIAMISYNIIAGD  
TLTKVFMRIPGVGPGNILTERHFVIAMSTVLFTLPLSLYRDIAKLGKVSLLSMILTFGIL  
MTVVVRAATLGPQIPASDDAWVFARWNAIQAVAVMSFALICHHNSFMIYGSLQEPTLSRW  
SLVTHISVGSSVLVSAVFAAAGYATFTVYTQGDIFENYCRSDNLATFGRFCYGVSIITTF  
PLECFVTREVISNALFKGGELSKSSHVIITLVIISATTAISLSYDCLGIVLELNGILSAV  
PLMFIFPSACFLKLSNERWCRGENLIASMILVAGVFVMIIGLIMMALFPQDCSHGAEMFY  
CSASNTSSTASPSNILQFINTTQNTSIV**

**>Slc38a11\_second**

**MESERSCLLSSHDAGKGGSSSVSSASFNFINSIIGSGIIGLPYSMSQAGLPMGLLLLILV  
AFITDYSIILLVRGGNLSGTHSYQSLVRSTFGQIGYIIVSVLQFLYPFIAMISYNIIAGD  
TLTKVFMRIPGVGPGNILTERHFVIAMSTVLFTLPLSLYRDIAKLGKVSLLSMILTFGIL  
MTVVVRAATLGPQIPASDDAWVFARWNAIQAVAVMSFALICHHNSFMIYGSLQEPTLSRW  
SLVTHISVGSSVLVSAVFAAAGYATFTVYTQGDIFENYCRSDNLATFGRFCYGVSIITTF  
PLECFVTREVISNALFKGGELSKSSHVIITLVIISATTAISLSYDCLGIVLELNGILSAV  
PLMFIFPSACFLKLSNERWCRGENLIASMILVAGVFVMIIGLIMMALFPQDCSHGAEMFY  
CSASNTSSTASPSNILQFINTTQNTSIV**

**>Slc38a2**

**MNKAPAQMSRFNIAPDMDSSSTNSNEYTNYQDHASKVPLNGIQYSDVEAESQNFLSDHHL  
GKKKYEAEYSPGSASFGMSVFNLGNAIMGSGILGLSYAMANTGIAMFVILLVAVAIFSLY  
SVHLLLKTANEGGSLVYEQLGYKAFGIPGKLAASCSITMQNFGAMASYLYIVKYELPIVI  
RAFLDSNDNAWYTNGDYLVLIVTMSIILPLSLLKNLGYLGYTSGFSLLCMVFFLIVVIYK  
KFQIPCPLPENFINITVNVSQPPQTNNSTDEECCKPKYFIFNSQTVYAVPILTFAFVCHP  
AILPMYEELKDRSRRKMQNVANVSFLGMFIMYLLAALFGYLTFNEAVEPELLHTYSKVYN  
FDVVLLIVRLAVLTAVTLTVPVVLFPIRTSVNHLLGASKEFSWPRHICITVALLVCVNIL  
VIFVPTIRDIFGFIGASAAAMLIFILPSAFYIKLVKKESMKSVQKIGATLFLIMGFLVMT  
GSMALIIMDWIHNALSSEEHTGGH**

**>Slc38a5b**

**MELQKLTNGHHQEFQQLEEGEPTEREEFLPHKSDGGKTPQFTDFEGKTSFGMSVFNLSNA  
IMGSGILGLSYAMSNTGIVLFLVLLTCIAVLSSYSVHLLLRSAGVVGIRAYEQLGKRAFG  
HPGKILAAVVITMHNIGAMSSYLFIVKYELPLVIQAFLGLQHSSGEWFLNGNYLIIIVSI  
SIILPLALMRQLGYLGYTSGFSLTCMVFFLISVIYKKFNIPCPFEDFSNHTVVSNISIIE  
GECEAKFFTINQQTAYTVPILAFAFVCHPEVLPIYTELRNPTKRRMQAIANVSILGMFVM  
YLLTAIFGYLTFYLNTEAELLHTYSKVDPLDTLILCVRVAVLVAVTLTVPVVLFPIRRAL  
LQLLFPEKPFHWARHISIALCLLFVVNLLVIFVPNIRDIFGIIGATSAPSLIFILPGLFY  
IRIVSPEQEPMNSRPKILAACFTALGFIFMTMSLTFITLDWVYGENRSGGGH**

**>Slc38a4**

**MERMELKKVSAEMEDESSVDDSYRENMDSEKATINSQFLDEDDAESQKFLTNGLMKKKKY  
EEYNEEYHPGHASFGMSVFNLSNAIMGSGILGLSFAMANTGIILFVILLLGVAILSLYSV  
HLLLVTAKEGGSLIYEKLGERAFGWPGKMAAFGSITLQNIGAMSSYLFIVKYELPEVIRA  
FLGLEESSGEWYLNGNYVVVLVSIGIILPLSLLKNLGYLGYTSGFSLSCMVFFLGVLIYK  
KTILPCPLPFFFEHGSNVSINGSDAIALYGLHNASALAYMSETAANAVDPHTPLHDSVQF  
SAHPEDHQDMCTPKYFIFNSQTVYTVPILAFAFVCHPEVLPIYSELKNRSRRRMQSVSNL  
SILAMLVMYLLSALFGYLTFYDHVEAELLHTFTKVYKFDTMLLMVRLAVLTAVTLTVPIV  
LFPIRSSVITLCFAGKEFSWIRHFLIAAAILAFNNLLVIFVPTIRDIFGFIGSSAATMLI  
FILPAAFYLRLVKSLPMKSPQKISALIFLVVGIFFMIGSLSLIVLDWIHNPPGSKGAH**

**>Slc38a5a**

**METVNKMPNGHHDIPMNLEKEFTGFDALENMAEGDQFLSSKSNGKIETQFTDFEGKTSFG  
MSIFNLSNAIMGSGILGLAYAMANTGIILFVFLLITIALLSSYSIHLLLRSAGVVGIRAY  
EQLGYRAFGTPGKVVAGCIITLHNIGAMSSYLFIVKIELPHVIEGLTGLPDNSGHWYVDG  
RYLIIIVSVCVIFPLALMKRLGYLGYTSGFSLSCMVFFLISVIYKCLSNSGIDSESNQNE  
KCTFSNASMISSTTEINEINSTTEICEAKLLTINPQTAFTIPIIAFAFVCHPEVLPIYTE  
LKNPSKKQMQKVANISILAMFVMYLLTAIFGYLTFFANVDSELLKMYNKNDILMLCVRLA  
VLVAVTLTVPVVLFPIRRAVLQLLFPEKPFSWVRHIIIAMCLLFAVNLLVIFVPNIRDIF  
GFIGATSAPSLIFILPGIFYIYIVPEEQEPLKSRPKILAILFVTLGFIFMIMSITFIIIE  
WVNGKQSVGGH**

**>Slc38a6**

**MGRNGANHSIQTVSEYEPIGEDEERTPLLPQGVQTRGSSFMSSAFNLMNAIMGSGILGLS  
YAMANTGTVGFSILLLMVASLAAYSIHLLLLLCDKTGINSYEALGEKAFNRPGKILVACT  
ILIQNIGAMSSYLFILKTELPAAIIGFMSTDSETSGKWFENGVTLLILVTAIIVLPLALL  
PKIGFLGYTSSIAFLFMLFFTVVVVVKKWSIPCPLPINSTLSLSLNTSECTAQLFVISSK  
SAYAVPTMAFSFLCHTAVLPIYCELHRPTKRRMQRVTNVSIFLSFVVYLISALFGYLTFY  
SHVGSELLLAYNTYLPLDILVMSVRLAILLAVLLTVPLIHFPARKAVLMLCRGEREFSWL  
SHTLSCFFILTLVLLLAIFVPDIKNVFGVVGSTTSTCLLFVYPGMFFLRISSEPIRSFNS  
VGAVFLLVIGLVVGVLSLSVIIVSWVQGP**

**>Slc38a7**

**MSRPDRAINSEAGDWGYSEDAGERAWLLQSPSVDSVQPPSQSDDSRGGTSSLGAVFIVVN  
AALGAGLLNFPAAFNMAGGVTAGVTLQMCMMAFIITGLVILAYCSQVSNESTYQEVVRAV  
CGKALGVICELAIAVYTFGTCIAFLIIIGDQLDKLIGAINNESEKEISLHWYTDRKFTIT  
LTSVLIILPLSIPKEIGFQKYASTLSVIGTWYVTIIVIVKYIWPSKDVSPGIIPVRPASW  
TDVFNAMPTICFGFQCHVSSVPVFNSMKKPEIRPWWGVVTISMIICLFVYTGTGVCGFLS  
FGSSVSQDVLMSYPSDDVAVAIARAFIIICVVTSYPILHFCGRAVLEGLWLRFKGEEVET  
DVAKERRRRILQTLVWFCLTLILALFIPDIGRVISLIGGLAACFIFVFPGLCLIQAKLSE  
HDVRSNSWNAMVAYGVIMVTIGAFIFGQTTTNAIYKDIINNPNSP**

**>CR352249.1**

**MEELARESIRSISLLSKPARGSDVPRLGSFGAIFIMLKSALGAGLLNFPWAFEKAGGVNT  
AISVEMVSLVFLISGLVILGYASSISRQNTYHDVVRNVCGRRIGHLCEICFVFNLFMISV  
AFLVVVQDQLEKLCLSLYETVTGNTEAEMPHHWYTDYRFALSFMCLIIILPLSIPKEIGI  
QKYTSVMGTLAATYLSVAVIAKYYLKDTHTADLTPEHSQGLGSWASMFSVVPTICFGFQC  
HEASIAIYSSMENKKITHWVFISVTSMIFCLLIYTLTGVFGFLTFGRKVASDILMSYPGN  
DVVMIIARLLFGISIVTIYPIILLLGRSVILTQILRFWERRTIMTPVFEGRCRLILTILW  
ITVTLLIAIFVPDMSEVISVIGGISAFFIFIFPGLCLIFVMQTEPINHRIRILLTGWGVV  
TIVIGAFIFGQSTTIAVMELAHKF**

**>Slc38a8\_1of2**

**MEELAKESISFLSKSSLETNEPRLGSLGAVFIMLKSALGAGLLIFPWAFAKAGGIHSAVT  
VEMISLVFLISGLVILGYSSSVSGRNTYQAVVTDICGPAIGKLCEICYVFNLFFISVAFL  
VIVADQLHKLCLSMYELITGLPESEMPYHWYTDQRFALFLLCLLFIFPLSVPKEISIQKY  
TSVLGTFAAAYLTVAIVVKYHMRPIHEINLSPLYSSGISSWDSVFSVIPTICFGFQCHEA  
CVAVYSSMENRRLSHWVFISVLSMLICLLIYSLTGVFGYLTFGKNVAPDILMSYSGGDVT  
MIVARLLFGISIITIYPIIVLLGRSETNSAILLQRLKHTAVTESYESRTRVALTTAWVTV  
TLLIAVFIPDISKVISVVGGVSAFFIFIFPGLCLIFVVQSESVSPTMRYLLVTWGMITLL  
CGTLIFGQSTSVAIMQLITEV**

**>Slc38a9**

**MDEDSKPLLGSVPTGDYYTDSLDPKQRRPFHVEPRNIVGEDVQERVSAEAAVLSSRVHYY  
SRLTGSSDRLLAPPDHVIPSHEDIYIYSPLGTAFKVQGGDSPIKNPSIVTIFAIWNTMMG  
TSILSIPWGIKQAGFTLGIIIIVLMGLLTLYCCYRVLKSTKSIPYVDTSDWEFPDVCKYY  
FGGFGKWSSLVFSLVSLIGAMVVYWVLMSNFLFNTGKFIFNYVHNVNTSDAFGTNGTERV  
ICPYPDVDPHGNSSTSLYSGSDNSTGLEFDHWWSKTNTIPFYLILLLLPLLNFRSASFFA  
RFTFLGTISVIYLIFLVTYKAIQLGFHLEFHWFDSSMFFVPEFRTLFPQLSGVLTLAFFI  
HNCIITLMKNNKHQENNVRDLSLAYLLVGLTYLYVGVLIFAAFPSPPLSKECIEPNFLDN  
FPSSDILVFVARTFLLFQMTTVYPLLGYLVRVQLMGQIFGNHYPGFLHVFVLNVFVVGAG  
VLMARFYPNIGSIIRYSGALCGLALVFVLPSLIHMVSLKRRGELRWTSTLFHGFLILLGV  
ANLLGQFFM**

**>Slc39a1**

**MDYLLQVKVGALVGLLLLTLFFGFIPARMKWFHVTGGTELHKAVLSFVSCFAGGVFLSAC  
LLDIIPDYLSDIHGELQKRDLDDGFPLPEFIMACGFFTVLILEKMVLSCTEGHRNEETAP  
LLAPAAPNGHAHGHPSVNDLEGSGHHVHVDFHAHSSFRSFMLFLSLSLHSVFEGLAIGLQ  
TTNAKVLEICIAILVHKSIIVFSLSVKLVQSAVKPLWVVLYVTVFAIMSPLGIGIGIVVI  
ETERQAGGLIQAVLEGLAAGTFIYITFLEILPHELNSSERPLLKVLFLLCGFSIMAALCF  
LG**

**>Slc39a10**

**MMRVHTHTRLCFLCVLTLLYHQCSHCHEGGSHHHHGHNHGDHDHIHSDLQISEMSCNGLS  
DRLVHGSQGEPAENEQRYYIHQLFCRYGQKDRLDFKGFQSLLLSLGLGEVRVVGLEHEDL  
GHDHVAHLDILEVQDGRHSHSAGHPHSHQNPNISHKTHQHSHHENEEHTLAEDVPCSKTL  
GTGATPPSVSEEHDHDHEHDHDHDKDSDHEHNHRHVTDSPQTQDHEHDHIHLHTHSHKQD  
SDVTQRLELDHDQKSREHAQEHNDLSDQNHHHHDHHHHKHPHPHLHAPESVVHTTSAMPK  
IQPSVPPELPANQTRRHRRPSKVKAHRGRNRTSVTVTQAVELETSGDDHEHSLQDHSPAQ  
QQRGRREVPGSPAHGVLHQHEECLNLTQLLHQYGLSSDSLISPVQFTYLCPALLYQIDRR  
FCILHYHHVEAEEQVAPSSGWVWMWGFVSITIISLLSLLGVVLVPILNQSCFKFLLTFLV  
ALAVGTLSGDALLHLLPHSQGDHDHNHGEQMEEEPEVDFLIKFDGVWKGLTALAGIYLLF  
IIEHCIGMFKHYSDQRGGLCHKKKKGEQAKIGRKLSDHKLNRRSDAEWLHLKPLTEGDGT  
TCEAGHNDTQMTELQPLDSPSKMPLNISDSDHPYEAPVKTEEDNVPKAKSKKHGHGHGHG  
HGHGHGHSHHGHCHSDQEMKDAGIASIAWMVIMGDGMHNFSDGLAIGAAFSANITGGIST  
SVAVFCHELPHELGDFAVLLKAGMSVKQAIVYNLLSALMAYAGMVIGTAVGQYTHNVTSW  
IFAVTAGMFLYVALVDMLPEMLHGDSEEHKRCEMGHFVLQNFGMLTGFGIMLLIAIFEDH  
IVLDFGF**

**>Slc39a11**

**MFPGLSPLVQALLGTLFTWALTAAGAALVFIFSSRQKRILDGSLGFAAGVMLAASYWSLL  
APAIEMAEESGKYGDFAFLPVAVGFALGALFVYLADLMMPALVSVWMIFLFADHMQRSQY  
SQI**

**>Slc39a13**

**MYLPSALRRSGLMSAGPERPVWAFAVLLLGAALLASSFGGKMMIQTAVAQAKTAPAGPGP  
WSIKDLVDLQYLDELMSIDNLDVWFCSLVGSIAIGLSGIFPLLVIPIEAGTALKTEAGCQ  
KLKKLLSFAIGGLLGDVFLHLLPEAWAYTSSPGGSHRHYCTQGLWVIGGLMSFLTLEKMF  
PDEVGDPETKTSFQRTTSSSSDLSSQFSVSPQTNGICSNNNSDSKPKTDISPYTPPEKIK  
TSGYLNLLANCIDNFTHGLAVAGSFLVSRKVGFLTTFAILLHEIPHEVGDFAILLRAGFD  
RWKAARMQLSTALGGVLGACFALCSQSQHGAENATTWILPFTSGGFLYIALVNVVPDLLE  
ETNPRNSLLQVLLLFSGIGVMALLSIAMD**

**>Slc39a14**

**FRPVWGYGLLCVTVISLCSLVGASVVPFMRKTFYKRLLLYFIALAIGTLYSNALFQLIPE  
AFGFDPMEDYYVPKSAVVFGGFYLFFFTEKILKMILKPKDTGGHGHGHSHFPAERYANSN  
GKTLPYIPVQKFTCHPNAQKTHINRRVAFLTQDTQSSGGGGTGGCYWLKGRAYSDIGTLA  
WMITLSDGLHNFIDGLAIGASFTASVFQGISTSVAILCEEFPHELGDFVILLNAGMSIQQ  
ALFFNFLSACCCYLGMGFGILAGNNFSPNWIFALAGGMFLYIALADMFPEMNEVSREEEE  
AGGSGFLLTFALQNAGLLTGFAIMLVLTIYSGQIQLG**

**>Slc39a3**

**MMMMDSSAALHLNLLTLTVMFCFSLLCGFSPGFFMRQAARYTSDPGSRLRALSLASCLSS  
GVFLGFSLLDLLPKYLTDMRDTFSRLDITLRFPLSEFLLAMGVLLVLLVEQMLLAFREQV  
CVSSVEKQTLIERTRLYVEDSRTHEALRVCLLLLCVCVRSLLEGVCAVPPPLWSCGAALL  
REGLLAFGLALQLAPAGLRRAVATGGLVLFCSARPVAMGTAMLRGTPGDQAYTADVVRCA  
VEGLTCGIFICISISGLLFPESSSPKQRMHKVAFLLTGFALVTAVLISQV**

**>Slc39a4**

**MITIGDGIHNFADGLAIGAAFSISWRSGLATSLAVLCHELPHELGDFAVLLHCGVSVKRA  
LLLNFGSSLTSFIGLYIALSVSTDSAAEQWISAVTAGLFLYVGLADMLPTLIHVDSRRPW  
LIFTLQNLGLLSGWGILLLLSFYEDQIGL**

**>Slc39a5**

**MGGQTVWMTLSFKLLLYYCMISLLMPAIFILATRAQVDKFRKFNESTQTKSSQELFEEAF  
EEQGYYLQRLFLQYGDNGTLTYEGLQKLLGSLGLGEVSVLEIRHGEAKHPSQSISHSHSH  
EDHHPSQGTTNSPPLRESLDAKSALSGSPAELGRSDYFLHPALRNKQEESVSLLSDHPTE  
KHLHGNCLNVTQLLWNFGLGQASHITPAHFTFLCPALLYQIESGVCLRHTEDHSQASKTS  
EGFLIALGWASLALLVISLPSLVALGMAPLLQPSVLQVFLCPMAGMAVGTLCGDALLHLM  
PHAIFSQHTDHQNAVFKGLSVLGGLYLLFIFESLLGLKQHFKNLKRRKHDAECGRELDAL  
QGTSSANQNESSGHGHSHGQAEPGQTGIRSMAWMVVMGDGIHNLTDGLAIGVAFSQSLTG  
GFSTAIAVFCHELPHELGDLAVLLSAGWPVRRLLVFSGLSALLGFVGVLAGSALGNHWAS  
HSPWILTLTAGVFLYVALADMMPEMLHGACGSVSPLKRFLLQALGLLTGGAIMLCIALFE  
DHIAVSLGENSLGEN**

**>Slc39a6**

**MMTFLCTRSGRRASGVECRIAAERAYFRARGLPVANMIGWWPRLCPVMSLALLWACSVGA  
GSDCKSVAIETDSRIAEQTQQRHLQALFDKYGQNGSISLEGLFNLLKGVGLDRIRKVMVH  
HPGNAHNHTHTHDHTHTHVDKLTAHTHPVTTKKGDMDHSVEKSDPVPKAQPDPASGKKSQ  
SDAHHNLYMKMNQESTTALTTPSYVTRSRRTNRSADYDFTQDHASFSPSQPNVTHSNHTH  
HDEDTPTHQHDDHDEHEHGRASLGCQNASTILQTHGMRKEASLSVKDFSFLCPALLMQID  
SKSCIVHEDEDEHSDHSHHHKHHHHHHDHQHLQHPHNHTNGRGQRNTPVYIAWLGGFLSI  
TLISLLALVGVVLIPLMNRVCFNFLLSFLVALAVGTLSGDALLHLIPHSQGHHHHGHSEE  
HAEEEDSLRPVWTGLTALSGVYIMFLIEHFLTLGKMYKDKNQKVQKRVDLTTEVLESEKL  
PSLEENDVKIEAAETNGGRALAEEEEVMLGAELYNDMDCENKCHSHFHDTVGQSDEQHHH  
HHDYHHILHHHHSQNHHPHTHTHRHTHSYSQQHFEQAGVATLAWMVIMGDGLHNFSDGLA  
IGAAFTEGLSSGLSTSVAVFCHELPHELGDFAVLLKAGMSVRQAMLYNLLSALMGYLGMI  
IGILIGHYAENVATWIFALTAGLFMYVALVDMVPEMLHNDASEAGFSHYGFFLLQNAGIL  
LGFGIMLIIAVFEDRIQLDLGY**

**>Slc39a7**

**MRVFSKSLLLIAVGILMSQQTLAHSHHHHGHGDGGCHGHSHGGAKMHHGASKWSAEANLP  
HAEEEHHVHDHGHTHNHAHDHGHAHSHGDIHDHGHAHKHGHAHDHGAEKSKKVVEAGKRN  
MVELWMQAIGATLLISAAPFLILFLIPVQSNTDQHQNLLKVLLSFASGGLLGDAFLHLIP  
HALEPHSHHSQPHSEESHGQSHGEESHGHSHGAAHGHMMSVGLWVLGGIVAFLVVEKFVR  
LLKGGHSHSHSHSPSAPKSKDSDEEDDKKGQKKGEKDKVVSQQKPTKKTVETSSDIKVSG  
YLNLAADFTHNFTDGLAIGASFLVGPAVGAVTTITILLHEVPHEIGDFAILVQSGCTKRK  
AMCLQLLTAVGALAGTACSLLAEGVGDAATAWILPFTAGGFVYIATVTVLPELLAGHSSF  
WQSLLEILALLFGVGMMVLIAEYE**

**>Slc39a8\_1of2**

**CLSLSELLSAFGLSNASVVSVSNLEMMCPAILNQVLIPACPYTSSNLNASASISDHKVWG  
YGFLAVTVINLAALLGLFLVPFTKKKYFPKVLMYFIGLAIGTLFSNAVLQLIPEALGLDP  
KDDNYVLNVVGIFGGFYILFVTERILKMVLKTDTENLYSHSEIDNFPKPKPNHHSTPSPN  
PNPTITGIIVYTVPKPKPNHHIHLEKTSKFDISSNACALFACRWLKGSAMSNIKTVAWMI  
TVSDALHNFIDGLAIGASFTLSLLSGFSTSIAIFCEEFPHELGDFVILLNSGMSVGQAAF  
FNLLSAMCCYLGLALGILLGSNFAPNAIFAIAGGMFLYISLADMFPEMNSIMASHTKDYQ  
ERVVFFLIQNAGLLTGFTIILLITLFAGDINLQ**

**>Slc39a8\_2of2**

**MEESFLQNVLGFYGEESSLSVGNLELFLQLITSRRAAAVEDEGNPLKSAECLSLSELLSA  
FGLSNASVVSVSNLEMMCPAILNQVLIPACPYTSSNLNASASISDHKVWGYGFLAVTVIN  
LAALLGLFLVPFTKKKYFPKVLMYFIGLAIGTLFSNAVLQLIPEALGLDPKDDNYVLNVV  
GIFGGFYILFVTERILKMVLKTDTELGHSHFPPLQSSDVTLSTISNDVVISNISGDIITN  
NTNHELNSISEKSNNPSESPAVEQ**

**>Slc39a9**

**MDDFSSISLLSLSMLIGCYVAGTIPLAVNFSEEKLKLVTVLGAGLLCGTALAVIIPEGVH  
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LLVDQIGSAHMHSSDDPEAARAASSKITTTLGLVVHAAADGVALGAAASTSQTSVQLIVF  
VAIMLHKAPAAFGLVSFLMHAGLERNRIRKHLLVFALAAPVLAMVTYVGLSQSSKEALSD  
VNATGVAMLFSAGTFLYVATVHVLPEVGGMGGHSHSPGGSAGKGLSKLEVGALVLGCLIP  
LVLSIGHQH**

**>Slc3a1**

**XRRVSSLPEESEYTQIKPYAGMPKEVLMLYSNKPCYRIPREVIFWLVIACTLALIAMTAA  
IVALSPRCMSWWQLSPIYQVYPRSFKDSNADGVGDLRGIKEKLSHFEYLNIKAIWISPFY  
KSPMRDFGYDVEDFRDVDPLFGTMEDFDDLLTSMHDKGLKLIMDYIPNHTSDKHVWFQLS  
RNYTEPYTDYYIWVNCTADKHPNNWVSVFGNSTWEYDEIRQQCYFHQFLKEQPDLNYRNP  
LVLQEMTDIIHFWLKKGVDGFRMDAVKHMLEATHLRDEPQVNPDQDPSTVDTEFELYHDY  
TYTQAGLHEILTDWRIQMDTYSREPGRYRFMVMESYDYEEIDKTMRYYGTNYAKESDFPF  
NFYLLDLPDNLSGNYAKSIVERWMSNMPKGKWPNWVVGNHDKPRIGSSAGKEYVRALNML  
LLTLPGTPTTYYGEEIGMVDVNISVIQDPAGQYDPSKSRDPQRTPMQWNNELNAGFSESL  
NGTWLDIASDYRTVNVEVQQDDTSSTISQYRALSLLRSSNVILSRGWFCYVWNDVNVFAY  
LRELDGLSKGFLVVLNFGKETTTDLSSVKELPDSLTLHLSTESITQTEFPKSRIPTSQGQ  
GLLLEYSSSQKFHLNHQSQCYVSEKACYLPALDILYQC**

**>Slc3a2a**

**MNKEDEMKEVELNEMDQEKQPMTGETPTGTEKNGSVKVKVPEDAEVKFTGLSKEELMKVA  
GTAGWVRTRWALLVLFWLGWVGMLAGAIVIIVQAPRCKPIPEMHWWNEGPLYQISNLDAF  
SKNGLKGVEEKLDYLSQMKVKGLVLGPVHSVQADQSSALELTSINPDFGSESELTSLLDR  
AHRKGISIVLDLTPNYRGVSSWFNNAASVAEKLKKACVYWLNKGVDGIFLSDLNDIVNTY  
AWSSIQAIFNKTDGTPKKALMGTASSLSVDETSLLLNQSGVDLLLTKLPYPAGLSGRQAT  
LMQRLCSGHQEASLGWGLGQTAGSQASRTPALPVKLYQTLLFALPGTPVFSAGDELGLKA  
GEAMWEDVNSTAEEERTAVRNFFKTLSDLKGKERSLLHGEYVNLHNSPTSLAFLRLWDQS  
ERFMVAVNWGNDSISMTPTNDDLPAEARVRATTDIEKLAVDSKVKLEKLELGSKQAVLLS  
YPFPG**

**>Slc3a2b**

**MSNDTEVDMKDVELNEVEQEKQPMTEGDAGNNYAISPVTEKNGIVKVKIPDEESKFTGLS  
KEELMKVAGTPGWVRVRWALLILFWLGWLGMLAGAIAIIIQAPRCKPLPEMNWWNNGPLY  
QIGDVGAFTNSSDIKDLAGKVQALDDLKVKGLIIGPIHVSSEDKPNELNLIKISEDDGVL  
AQFKEVITAAHKRGISVILDLTPNYKGKDPWFSDAVNTVQKVEPALIFWLKQGVDGFLFY  
GVEKVAAAAPTFWSDVVALIHNQTDAEGKTKKVLIGVTDQSSPEEISATLNKTGVDLLLS  
GALRSKSVQEVAQAVESLYSTYNQTRLAWNIGGRIAGHLASVVGFAKVKLSQLMLLTLPG  
TPVFNYGDEIGLEDEVNKYPTMLWKFNDEEKQKEMSTYHSFFKSVSVKRMKERSLQHGEY  
LPLFNSDFAMAYVRSWDQNERYLIALNWHSNETVSLQLKHADIPESATVVFSTSGETEVN  
KELNLAQLEVNPGEGIMLKFPYTS**

**>Slc3a2\_3of3**

**MKDIELKEVDQTKQLMTRENGCVKVTVPENTAVKYTGLSKDELVKVAGTPGWIRIRWALL  
ALFFLGWVGMLAGAIVIIVQAPRCKPIPEMHWWNEGPLYQISDVNAFTESGLKGLEGKLD  
YLSQMNVAGVVLGPIHSLKIDQLDTLNLISVQSEVGTENELESLLGLAHKKGIFIVLNLT  
PNYNKTSAWFNNFNAVAEKIKDACTYWLDKGLDGIFLSDLNEIPTDAWPSIKEIFNRSDA  
TKEVALMGSVNSMSINDISVLLNRSGVDLLLTGQPDLSDSGEKQAQIIKEFNSSIQQTSL  
GWRSRQDPGTLAAEFPIRLYQILLFTLPGTPVFSAGEELGLKAEEQLQALWDLENPVEEK  
NAKAKALQEERLAVRNFFKTLSDLRGKERSLQHGEYVGLSNSKSSLAFLRVWDQSKRFIT  
ALNWGDKPVTMKLTYRDLPAEAQVLLSTDTSSLALESMVSVEKLQLDPKQAVLLTYSYAG**

**>Slc40a1**

**MDSPASKKPRCERFREFFKSAKFLIYVGHALSTWGDRMWNFAVAVFLVELYGNSLLLTAV  
YGLVVAGSVLLLGAIIGDWVDKNPRLKVAQTSLVVQNSAVILCGALLMAVFQFKQQLSSM  
YDGWLLTTCYIMVISIANIANLASTAMSITIQRDWVVVVAGDDRSKLADMNATVRIIDQL  
TNILAPMLVGQIMAFGSHFIGCGFISGWNLFSMCLEYFLLWKVYQKTPALAFKAGQKDSD  
DQELKHLNIQKEIGNTESPVEASQLMTESSETKKDTGCCYQMAEPIRTFKDGWVAYYNQS  
IFFAGMSLAFLYMTVLGFDCITTGYAYTQGLNGSVLSLLMGASAVSGICGTVAFTWIRKK  
CGLIRTGFIAGVTQLSCLTLCVASVFAPGSPFDLSVSPFEEVLRHLFGDSGSLRESPTFI  
PTTEPPIQANVTVFEEAPPVESYMSVGLLFAGVIAARVGLWSFDLTVTQLIQENVIESER  
GVINGVQNSMNYLLDLLHFIMVILAPNPEAFGLLVIISVSFVAMGHMMYFRFAYKSLGSR  
LFLFCSPEQKPDPNIPSLPNSV**

**>Slc41a1**

**MVLWLKDQDKLSDMSTGTERIEMKKEGVPPAYHHSNGSVHPVILPDSPEEVPQTPGEYEL  
TEVTSLPDCGDQENERPDMVVLDCRANAKGQREEDALLENASQSNESDDTSTDQSPVPPA  
PLKETSFSIGLQVLIPFLLAGFGTVAAGMVLDIVQHWTVFTEVTEVFILVPALLGLKGNL  
EMTLASRLSTAANIGQMDTAKDMWKMIMGNLALIQVQATVVGFLASIAAVIFGWIPEGNF  
RMGHAILLCASSVATAFIASLALGLIMIGVIIASRKVGINPDNVATPIAASLGDLITLSL  
LAGISTGLYKELEFNNYANPMVCAFFVALTPIWVLIARRIPSTREVLYSGWEPVIIAMAI  
SSVGGLILDKTVSNPNFAGMAVFTPVINGVGGNLVAVQASRISTYLHMNALPIVEPNPAP  
RKCPTPWGTFFGSGVNSRSAKVLFLLVAPGHLVFLYTINSMRGGHTTLTYIFIAFYLAAA  
LLQVIILLYLADWMVNWMWRRGMDPDNFSIPYLTALGDLLGTGFLALCFHILWLIGDRDT  
DVGD**

**>Slc41a2b**

**MSLRTIGGAVLSSLGPSLAAQAGGAWSSVSFRPIPCMLQTMVPSGYTALQEERLAMVDLG  
TPKPESHKNGFHRESRRHSDRGSRTSISLSEAGDGRYAETEPMLPESRLSGEEADEEEEE  
SEEEKQQLRNVNMPKESLLAMGLQILVPFLLAGFGTVSAGVVLDIVQHWEAFKTVTEIFI  
LVPALLGLKGNLEMTLASRLSTAVNVGKMDSPIEKWNLIIGNLALKQVQATVIGFLAAVA  
AVVLGWIPEGKFQISHAVLLCSSSVATAFIASLLQGIIMVGVIVGSKKTGINPDNVATPI  
AASFGDLITLAILAWISQGLYNCIDSHPYVSFLVCAFFISLTPLWMVISSKHPASRQLLY  
SGWEPVITAMFISSIGGLILDKTVSDPNLAGMVVYTPVINGIGGNLVAIQSSRISTYLHF  
HSTPGEVPDEAKGCYYPCRTFCGSGANHRSAQVLLLLVIPGQLIFLYTIDLMERGHTSLT  
VVFILVYLAAALFQVFLLLCIADWMVHSMWKSGKDPDSFSIPYLTALGDLLGTALLALSF  
HFLWTIGDQDSDVGD**

**>Slc41a2\_2of2**

**MESVIEVNQGEGQLTSSLLSSSENSHQLSPETGDLDRASSLTRVCSREPSESDPLLSTAF  
YGATVNISQDEPHNIQEMPSESIRAMVLQILFPFLLAGFGTVLAGMLLDVVQHWDVFRNV  
TEIFILVPPLLGLKGNLEMTLASRLSTAVNVGRMNCSREKWNLIKGNLALKQVQATVLGF  
LAALVASFLEWILKAELITNHVALLCGCSVVTAFTASLLQGILMVGVIIGSKKVGINPDN  
IATPIAASFGDLITLGLLAVISQGLYYCMEPYPYITYLVCLFFLCLTPMWVILSFHHPES  
QKLLFSGWEPVITAMVISSLGGLILDRTITNPKLDGLVLYTPVINGVGGNLVSIQASRIA  
TYLHFQCPLGELPEDTKGCYCPCRYFCSKGPNGRSAQVLLTLVAPGHLVFIYTIYIIQGS  
QSPPTAVFIFFYIIAAFTQVLLLMSIADVMVHCLWRYGRDPDSFSIPYLTALGDLLGTAL  
LALCFFLKSLVT**

**>BX294434.1**

**MPGDEVRQRKGGGRKKSKKGKGKGGLDRTGSLDGQNDLLLPPTIIPSKKPVEEKTKTAQA  
KIEEESAFSICLQVLFPYLLAGMGMVMAGMVLDSVQHWEVFKVITEVFILVPALVGLKGN  
LEMTLASRLSTAANTGQMDDPKQQWLMVTCNLALIQVQATVVGFLAALAAVGLGSLSRGG  
VELDQAAVLCASSVTTAFVAALSLGLVMIGVIIGSRKVGINPDNVATPIAASLGDLITLS  
LLAGVSSTLFQYRDVWYLSPLVCVFFLLLIPVWVVIARRSPQIKEVLKSGWQPVIVAMSI  
SSFGGLILDKTVSDPNFEGMAVFTPVINGVGGNLVAIQASRISTYLHFWSVPGVLPYKMR  
QHWPNPCVTFFSSGVNSKSARVLFLLVVPGHLLFLFAINMLQGGHTAITPAFTCCYLSAA  
LLQVGILIYTADLIVRLMWRKSLDPDNFSIPYLTALGDLLGTGFLALCFRLVMLVEGLGL**

**>Slc43a1a**

**MKGMAPSLEQAFRRRWWMAVTAVLENLLCSAVLLGWGSLLIMLKREGFYSHLCTENKTVN  
ATGEEDKWLSCVEQEEMLNLGFTIGSFLLSAATLPLGILMDRFGPRPLRLTGSACFALSC  
VMMSVSAYQPEVLSAIIFLALSFNGFGGICLTFTSLTLPNMFGSLSSTVMSLMIGSYASS  
AVTFPGVKLIYDAGVSFTLIMWMWAGLAGLVFLNCFFNWPEKGFATPEEIETKKMHEAEN  
HKLTPAEEATGETKKPALPQETQTASVPFRRSVFSPIFLWSLITMGMTQLRIIFFMGAMN  
KMLEFMVTHGDPHPSEELQYTAKKNVSFYSSIFGTLQLLCLVTCPLIGYIMDWKMKECEV  
DQAVDGEKRAVAVPKRDGKIQKLTNAMRAFIFTNILLILFGILSLINNLPLQILTFILHT  
MVRGFIHSCCGGMYAAVYPSNHFGTLTGLQSMISAVVALLQQPLFMIMVGPLNGDAFWIN  
LGLLIFSFTGFLLPGYLFYHRRQLQIQAKGKTSTHTPDENQALTNGHSNGHVPQEA**

**>Slc43a1b**

**MAPSLSQAYRRRWWMAVTSIIENLLFSAVLLGWGSLLIMLKNEGFYSHLCTENVTEGHSN  
VSLTEQTVWLSCIEQEEILNLGFTIGSFIISAATLPLGVLMDKFGPRPIRLFGSSCFALS  
MVLIAVASYNPKVLSALIFIAVSMNGFGGICLTFTSLTLPNMFGNVRSTILSLMIGSYAS  
SAVTFPGVKLIYDVGVSFSVIFWLWAGFACLVFLNCFLNWPGESFPAPEDIRYIAMGKLR  
GKELDQKMTDTNVVLREQEEPKKLPSSNEAPSDGAEAQSSPPFRRSVCSPIFLWSIITMA  
MTQLRIIFFMGAMNKMLEFLVTHGDPNPSEVLVKESEEQVSLYSSIFGTLQLLCLLSCPL  
IGYIMDWRMKECEDDVSSADGEKSPSRPPKRDRKIQKLTNAIRAFIFTNMLLVTFGILSL  
IDNLPIQVVSFILHTAVRGFIHSCCGGLYAAVYPTNHFGTLTGLQSMISAVFALLQQPLF  
MLMLGPLKGDPYWINLGLLLFSLVGFLLPGYLFYHRRHLIQEKAARDGQSLSLNQTNDSS  
KHQGTNGDI**

**>Slc43a2a**

**MAPTLATAFSRRWWMAITAVIENLLFSAVLLGWGSLLIMLKSEGFYSYLCREAGNGTGHN  
VSESENGTMNATRLEEEDNLQMNGWPICKEQDEMLNLAFTIGSFLLSAITLPLGIIMDKY  
GPRKLRLLGSASFAISCILISYGASDPQNLSILIFFALALNGFGGMCMTFTSLTLPNMFG  
DLRSTFIALMIGSYASSAVTFPGIKVIYDLGAAFITILLVWAGCAGLVFINCFFNWPLEP  
FPGPEDMDFTVKIKFSWLGFDHKITGKQFYRQVTTVGRRLSVGNSMKTNPKQLATQDGNK  
LCLSTLDLEVQCKPEEESQSFMRSIFSPIFMLSLITMCVTQLRLIFYMGAMNNILESLAD  
GDLTKVSTYTSIFGVLQLLCLLTAPVIGYIMDWRLKECEEENEKQSAKDPTQPKKRDRQI  
QKISNATRAFIFTNLLLVGFGMTCLVPNLYVQILSFVLHTIVRGFIHSAVGGLYAAVYPS  
SQFGSLTGMQSLISALFALLQQPLFMAMMGPLEGDPLWVNVGLLVLSMLGFCLPSYLLCY  
GRRLRREKAEREEDPKIYVQINNSTNTEAFV**

**>Slc43a2b**

**MAPTLATAFARRWWMAVTAIIENLLFSAVLLGWGSLLIMLKSEGFYSYLCTDPGKSSMAN  
FSLPAVPSSLANDPDYEYDEFQPSSRDDGVEVVPLKHPEDHLRMNGWLICKEQDEMLNLA  
FTVGSFLLSAITLPLGIVMDKYGPRKLRLLGSACFALSCLMIAYGASNPNELSVLIFIAL  
TFNGFGGMCMTFTSLTLPNMFGDLRATFIALMIGSYASSAVTFPGVKVIYDLGVTFIMIL  
VVWAGCAGLVFINCFFNWPLEPFPGPEDMDYTVKIKFSWLGFDHKITGKQFYKQVTTVGK  
RLSVDNTQKQKELAKEGHKLCLSTMDLELQCEPKEETQSFMKSIFSPLFMLSLVTMCVTQ  
LRLIFYMGAMNNILESLSGGDLNTVSLYTSIFGVMQLLCLMTTPVIGQIMDWKLKECDDG  
ETNEKQPNKDEPQPKRRDRQIQKVTNATRAFIFTNILLVGFGITCLIPNLPLQMLSFVLH  
TIVRGFIHSAIGGLYAAVYPSSQFGSLTGMQSLVSALFALLQQPLFMAMMGPLKGDPLWV  
NVGLLVVSMLGFLLPLYLLYFRKTLHKKRKEKENNAKIYLKINGSDVPEAFV**

**>Slc43a3a**

**MMAYKGSSGKVVRYKLTLATGLLECLCFAGVVFGWASLVFVLKTDGYFGDLCSNATDAGG  
EFSSDCGLQDEHFSLVFTVASFMNNFLTLPNGFLYDHFGTMATRLLAIFLYTTGTLIVAF  
SNKALSVLLFPALSFIAVGGILFLMTNMQVGNLFGSHRSTIITVYNGAFDSSSVIFLIIK  
VLYEKGVSLRSSFLFLSACNLIHLIRTLFLMPKSHIPYPIPQDYQYGISCAKSNSYNVEE  
YEAKREASSDRSRRAEEELLETDSIKLTDNPEKDSFRSCVLSWFFLWHLVWLSVMQLRHY  
FFIGTLNPMLNRLANQNPVTVSEYTNAFAFTQFCGVLCAPWNGLLMDRHKRKPLDPDVSE  
READLRSSILSLLLTSLQCFLFSICASIPFLPLQYLTFILQVLNRSFLYGGNAAFISIAF  
PARHFGKLYGLVMSLSAVVSLLQYPCFALNKALGGDPLYVNILLTILTLLAFIHPVYVFL  
HCRELAKHRENSRTLEASIQETSMY**

**>Slc43a3b**

**MFGCQGDGLRVRSWFTLISGLVECLGFAGAVFGWASLVFVLKNEGYFSSLCVNTTINGTA  
VEDCSRQDEQFSLIFTIASFMNNFLTLPNGFLFDRFGTTVARLLGISVYSTGMLLIAFST  
TASSILLFPALSFISVGGILFLMTNIQVGNLFGTHRSTIITLYNGAFDSSSAVFLIIKLL  
FEDGVSLRGCFLFMACCSVIHLFRTFVLMPRTHIPYPLPENYTYGINCGGTQDYTIAKVE  
EKNIQTSQAEEEVAFTESSPQGQNTNKMERSFKSCFLSWFFLWHLLWLSVMQLRHYLFIG  
TLNPMLNHLTAGDPSLVSRYTNAFAFTQLCGILCAPWNGLLMDRHKGKQREPGQSEQEAD  
LKAAILSLSLTALQCVLFSVCAATPILPLQYLTFILQVLNRSFLYGGNAAFISVAFPSVH  
FGKLYGTVMALSAVVSLLQYPCFALIKGTLGGDPLYVNIGLTVLSLLAFVNPLYVYLHCR  
RQAAQRRAAKKTSSS**

**>Slc44a1a**

**MGCCGSTQKERDWKPLEQRRCTDIPWLLLFILFNIGMLCICGFAIATGAATRLVSGYDSY  
GNTCGQKNAQIPGIEHSGLDHSNRKYVFFLDPCKIDIAKRKIKSVALCVSKCPKVQLDTY  
EDLTKFATVNGSALCTYDVQPEAYSSNPNKDVKCPKLPVFPSASLPVFHRCMPVDISCFA  
TFAKAFITFVSDNSVLHRVIAGVMMAKEIIMGLCLLALVLSLILMVVIRYISVLLVWILT  
AVVVIGSVGGCGILWWLYVDQGKALNATMPAHDLEIAHDNQQALLIYAIGATIFTVLLLL  
LMFFMRKRVALTIALFHVAGKVFTHLPLLALQPFWTFLTLMLFWVYWISVLLCLGTAGSP  
VKNNRTGLVEFKMDGPLQYMVWYHAVGLIWVSEFILACQQMTIAGAVVTYYFTRDKSQLP  
FTPIVSSVLRLMRFHLGTVAKGAFIITLVEIPRLILTYIHSQLKGKENACARCMLKACIC  
CLWCLEKCLSYLNMNAYTATAINSTNFCTSARDALFILAENALRVAAINSVGDFVLFLGK  
ILIVSCTAFAGVLSLNYQREYSVWVLPLIIVCVFAFLVAHCFLSVFEIVVDVLFLCFAID  
TKQNDGSPGREYYMDKSLMEFVENSRKATEKYSKAEGDSREMKSMKFGSLNI**

**>Slc44a1b**

**MTWYHAVGLIWISEFILACQQMTVAGAVVTYYFTRDKTKLPVTPILSSVLRLVRYHLGTV  
AKGSFIITLVKIPRLILMYIHNQLKGKENACARCMLKACICCLWCLEKCLNYLNQNAYAA  
TAINSTSFCTSARDAFMILVENALRVATINTVGDFVLFLGKVLIVTCTAFAGVLALNYQR  
DYTEWVLPLIIVCLFAFLVAHCFLSIFEIVVDVLFLCFAIDTKYNNGTPGREFYMDKALM  
EFVENSRRSMAMEERGRSKRARPKEEVELTEVKAMAPGTSSA**

**>Slc44a1\_2of3**

**MGCCGSAERTKREWKPLEDRSCTDLPWFLLFTLFLVGMCGICGFTIATGGAARLVFGYDS  
YGNTCGQRNEPIEGVRLSGLDHTDRKFVFFLDPCNIDIIQRKIKSMALCVSQCPTEELLT  
YYDLKRFAMMNGSELCSYELPGHKYPSLPERFDKCPKLPVPESKALPVFNRCTPVDISCY  
AKFAEAVVTFVSDNSMLNRLIAGVAASKEIIVGLCLLALGNGCRGSFLIA**

**>Slc44a2**

**MEPEEKNPESKYGEPRKFDPTFKGPIYNRGCTDILCCILFILALLGYFAVGILAWSQGDP  
RKVIYPTESTGQFCGQAGTPLEKKPLLFYFNIMKCASPLVLLEFQCPTTQICVEKCPDKF  
MTLVNALKSQSDKTYYTQFCKEGVDMTKNAPQILSEGLCPSILFPSKNFTRRCLPALETM  
KGGVVVIGNETQFTVDQGEVINATDLLNAAKKSNVVVEARAVAMRIFEDYTQSWHWILLG  
LVIAMLISLIFILLLRFLAGVMVWVMIIMVIIVIGYGIFHCYMQYASLKGQAGSDVTIKD  
LGLQTDFSVYLQIQQTWLAFMIILCIVEAVILLLLIFLRKRLLIAIALIKEASKAIGHVM  
SSLFYPLLTYALMSLVIAYWAITAVFLSTSNEPIYKVFNTSNCSYSRATCNPATFNTSNV  
TTECPDAECLFAFYGGETLYHKWLIVFQFYNLFLFFWCVNFVIALGQVTLAGAFASYYWA  
FKKPDDMPAFPIFNSLGRALRYHTGTLAFGSLILAIVQVIRVVLEYLDQKLKGAQNKFAK  
FLLSCLKCCFWCLEKFIKFINRNAYIMVAIYGKNFCTSARDAFFLLMRNIVRVAVLDKVT  
DFLLFLGKLLIVGIVGICSFFFFTGKIKIAQDVTPALNYYWVPILTVVFGAYLIAHGFFS  
VYAMCVDTLFLCFLEDLERNDGTVDRPYFMPERLMATLKKSNQSPGVTRVAPKTAKI**

**>Slc44a2\_1of2**

**MDMEEKPKYGEPRKFDPSFKGPIQNRGCTDIVCCIIFIIAIVGYLAVGILAWTHGDPRKV  
IYPTDSMGQFCGQGKLEKQPFLFYFNMMKCASPMVLLEFQCPTPQVCVQTCPNRTMTLIT  
AISKPQDWEYYKSYCKEDPGHKAAAQILKEKLCPAYLVSSNPFLQRCFPSMGKKGEVITV  
GDQEKFSDGVNELDAKDLMAGMKNASIVMEGRQVAMKIFEDYTKSWYWILICLLIAVVLS  
LIFIVLLRFLAGVMVWVMILMVVAVIAYGIAHCSIKYVSLKDTPGSNITLQQLGFQPDFA  
VYLHIRQTWLAFIIILAILELIIILLLIFLRNRIRVAVELMKEASRAIGYVMSSLVFPIF  
TFFLLAIVIAFWGVNAVFLSTSSEPVYKVFNETECVHSRETCNPENFTSSSMKSDCPHSQ  
CLFAFYGGETPYHKYLILLQFYNVFLFFWCANFVTALGQMTLAGAFASYYWAFDKSKDMP  
AFPLCASLGRSLRYHTGSLAFGSLLLAIVQVIRVLLEYIDHKLKGAENKFAKFLLCCLKC  
CFWCLEKFIKFINRNAYIMVAIYGKNFCRSARDAFFLLMRNVVRVVVLDKVTDFILFLGK  
LLIVGLVGIFAFFFFSGQTDAFKGTAPSLHYYWVPILVSYLSES**

**>Slc44a4**

**MGKKKQEEEQNSSEYGAPAQYDPTFNGPIHKRSCTDIICCVLFMLVITGYMVVGILAWLY  
GDPRHVLYPRNSTGMFCGIGQNQNKPSVLYFDILKCATATNIMAAALQGLQCPTTQVCVS  
SCPSGFWALSPLAYLPNAKPADYFQQELCVPSLQLKDTTYTVMEIINKELCPYYYTPTTS  
VFTLSSLSSATTNPSLQCSSLSSTTPPLVFTFTIQTLTHVCVDLTNSFNMKDVGLRIXED  
FAKTWQWIVAGLVIAMVVSVLFLLLLRFTAPVLIWILIFGVLAVGAFCVCVCVCVCVCVC  
VCVFKSAFNFSTTVRVCVQVPVKHLFNAIIFLSTRTLTYMRTYTHTHTHARTHTHTHTSQ  
VALGHMMSTLLYPVVTFVLLLVCVSYWGITALYLATSGAPIYKVVALNATQGDCSNIQAN  
QTCDPQTFNSSRYSSCPSARCVFINYNTEGLFQRNLFNLQIYNVVAFLWCVNFVIALGHC  
TLAGAFASYYWAFSKPADIPTFPLTQSFMRALRYHVGSLAFGALILTLVQIVRIILEYLD  
HKFKAAQNPCARFLMCCLKCCFWCLEKFIKFINRNAYIMIAIYGKNFCVSAKNAFFLLMR  
NIVRVIMCVCVCICIFMCVCVCVCVCECVFVYVYLCHIRILNNAHQSFVTNLFTTFNTVV  
FGAYLIAHGFFSVYNMGVDTLFLCFLEDLERNDGSAEKPYFMSKNLMKILNKKNKQPKTG**

**>Slc44a5a**

**MARKSQVPSAYYGEPRKFDPTFRGPVYNRGCTDVLCCVLFVIVILGYIALGTVAWIHGDP  
RKVIYPTDSTGQFCGQKGTPNAKKAILFYFNILKCASPAVLINLQCPTTQMCVSKCPDRF  
ATYTDMQLLYRFNKSHWDYYKQFCKPGFNNPQKSVAQVLRDEDCPSMIVPSRPFLQRCFP  
DFITRNGTLTVANKTAFKDALDTARSVTELRDAANGITSIHEAKEVGMKIVEDYASCWYW  
IVIGLFIALVISLIFILLLRFTAGFLLWFIIFAVILLVAYGIWHCYWEFAVLRETPGADV  
TISDIGFQTDLHVYLQLSQTWLVFMVTLGLTEASIVLMLIFLRKRVRIAIALLREGSRAI  
SYIMSALFYPIITFVLLAICISYWAMTALFLASSGDAVYKVASGNPNCKYANQTCSPESF  
NRTNITKQCPGAQCLFAFYGGESLYHRYIFILQLCNLLVFLWLVNFTIALGQCTVAGAFA  
SYYWARRKPADIPPCPVFSSFSRALRYHTGSLAFGSLILAVVQLIRVILEYLDHKLKGAH  
NAFARFLLCCLKCCFWCLERFIRFMNRNAYIMIAIYGKNFCTSAREAFYLLMRNVVRVAV  
LDKVTDFLLFLGKLLIAGSVGVIAFFLFTRKIPIIQEEVPVLNYYCVPLLTVILGSYLIA  
HSFFSVYAMCVDTLFLCFCEDLERNDGTTAKPFFMSPGLKRILGKAEQSPKKSRG**

**>Slc44a5b**

**MARKSAIPPSYYGEPHKFDPTFRGPVHKRGCTDVLCCVIFVIVILGYIVLGTVAWMHGDP  
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ATYIDMQYSYRRNKGSWEYYKQFCKPGFNNPDKPISQVLRDEDCPSMIVPSRPFLQRCFP  
DFITRNGTLTVANQTSFKDGHGKIRSVVDLRDAANGITSLLDAKEVGTKIFEDYASSWFW  
ILIGLVISMLVSLVFILLLRFTAGVLFWLVIFGVIAAVGYGIWHCYWEYSSLKGKPDSDV  
TISDIGFQTDFRVYLQLSQTWLIFMTSLAVIEAIIILVLIFLRNRVRIAIALLKEGSKAI  
GCIMSTLFYPIITFLLLALCIAYWAVTAVFLASSGEAVYKVMSTLPDCKYTNLTCDPETF  
SQSNVTKLCPGSQCTFAFYGGESLYHRYIFVLQLCNLLVFLWLVNFTIALGQCTLAGAFA  
AYYWALRKPADIPPCPLASSFGRALRYHTGSLAFGALILSIVQFIRIILEYLDHKLKGAH  
NAFTRFLLCCLKCCFWCLEHFIKFMNRNAYIMISIYGKNFCTSARDAFFLLMRNVMRVAV  
LDKVTDFLLFLGKLLISGSVGVLAFFFFTRQIPVIQEEVPSLNYYWVPLLTVIFGSYMIA  
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**>Slc45a1**

**MSSPGMGTPSDPLLSSPVGGKFGSAQDATWRPTLSKTSSFPTSTTRHLSHRANNFQRHPK  
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LLQMGLPDQFYSLVWFISPILGFLLQPILGAWSDRCTSRFGRRRPFIFALAIGALLGLTL  
VLNGRDIGSALADTTLDHKWGIVLTVCGVVLMDFSADSADNPSHAYMMDVCSPEDQDRGL  
NIHALLAGLGGGFGYIVGGINWDKTEFGRTMGGQLRVIYLFTSITLAAATAMTLTSIPER  
PLPQSQPQTRNTRNLKSPNLPLPPSPPPPPGAAADQDEEDEEEALYNSQFSNCRNPDLFG  
RSSSANARLYAGLTSPISPLSPLTPKYGSFISRDNSLTGINEFASSLGTSYIDRVLIECY  
TGQQTPQPMECEAVAVAPPLPPGDTPPPHGQSETLEVPQQIKVSQPNGELATDALQADEQ  
KQAIEPDEQQNEAAAGSQRGSSSGILKRPQSLALMEDPLIAPSAGLDNGRRRTVTFSQQV  
ANILLNGMRYDSDLSGNHEAADSQMSIKLLCTAIYRMPPCLRSLCTNHFLGWLSFEGMLL  
FYTDFMGEVVFGGDPKAHHDSEEYKRYNSGVSMGCWGMCIYAFSAAFYSAILEKLEERFS  
LRSLYFFAYLAFGLGTGLATLSTNLYVVLSLCVTYGVLFSSLCTLPYSLLCEYYQSPQFC  
GSSEDGTRRGMGVDISLLSCQYFLAQILVSVAMGPLTSLVGGAQGVMYFSSLMSFVGCLY  
SSLCVVYHLPPPEGRADVEAVV**

**>Slc45a2**

**MTLLTEDQPCRFSAPESPIASMEQYQVDSELKEDCLDNMEAAVFGVVEPPRRSRGRLIMH  
GSAMFGREFCYAVEAAFVTPVLLSVGLPRRLYSLVWLISPILGFILQPVIGSASDYCRSS  
WGRRRPYILLLGILMLVGMTLFLNGDAVTTAIISDRNLKRTWAIVVVMFGVVLFDFAADF  
IDGPIKAYLFDVCSHRDKERGLHYHALLTGLGGACGYLIGAMDWGHSALGSILGSEYQVI  
YFFSSLTWGIFLTTHLFSIPEKPLMKEPSSDSCPSASLLPEGPLQNGYGSVCKEPVSLSN  
VRERTFSVLSEANAVTPSAKQPNSEVQKRMTLKSLLSAMVSMPSHYRCLCMTHLLGWTAF  
LCNMLFFTDFMGQIVYKGNPYAEHNSTAYATYERGVEVGCWGLCINAVSSALYSYVQRLL  
LPYIGLKGLYFLGYFMFGLGTGLIGLFPNIVATLTLCCVFGVMSSTLYTIPFNLISEYHK  
AEEEQRKLGGDGVAPEGRGTGMDCAALTCMVQLAQVIVGAGLGALVNLAGSVIVVVLSAS  
TVSLIGCLFIAIFM**

**>Slc45a3**

**MHGRTSQLFLINALTCGLEVCLAAGTIYIPPLLLEAGVEERFMTMVLAVGPVLGLIIVPL  
IGSASDSLKSKYGRRRPFIWVLSMGVLLGLLIIPQTSTILTILTQRQGHWLEVPLLVLAI  
CLVEFCGQACFTLLEALVSDLFPGEEESRKAFSIYSLMLSLGGCIGYLLPAVDWTTSDTA  
VYLGGQEAFIYTVLTFIFLACLIGTWFISEEQTGRERFGEVDMFRKPTFCCPCLAFGFLP  
LRRTLSGLLSVFPRLYRLCSRMPKVMARLFVAELCSWMALMSFLLFYTDFVGEGLYNGVP  
SEEPGSLGRIRYDEGVRMASLGLFLQCVTSVIFSLLMERMVMCVGVRKLYLSSVVVLAVS  
TAIMTVSNNITLVTIMAAATGYTFCTLQILPYTLTCLYHSNSQVFFSNDRRQLPLKEDDL  
KLIKSETHFSAKQKRTNGCVNGYPGAISFQNNIKTLDLQVSIPMDPPASSLRGMGTDIAI  
LDSAYLLSHVLPSLLMGSIVQLFHSVTAYMACASVLSVVAVYFSSKIVFEKADIDAR**

**>Slc45a4**

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KWGRRRPFILALCIGLLIGLALFLNGSLIGLSLGDVPSDQPAGIVLTVVGVVVLDFCADA  
LDGPIRAYLLDVADSEEQDVALNIHAFSAGLGGALGYMLGGLDWTNTFLGQAFKAQEQVL  
FFFASIIFIISATLHLFSIKEHLYNPSLTGALKDEDEEKLAPVQPYGSFPSTRLLPQLEI  
IPEEEPFTPHEDDRSERDLSTDFLNIDLVRSKSDSVLAMPDATIELDPDLDRDGQFLCDI  
EPNLFQDYQGVQDDGATLDYYNTNQLDQCSGDHLQQCSSNGDHICTAHKTLNGSFSASGN  
PINGAANATNQHGKVGLRPYNVPMRRRTPSFYRQPSFTFSYHGRVGFQWRRRYGNMAGPI  
KSSRSLNDLDKITRRHERRKLQLGGISASRRNEEDEESEDGESETTVKLLWLSMLKMPPQ  
LWRLCVCHLLTWFSMIAQAVFYTDFMGQVIYGGDPTKQAAANSTALHDYGKGVKMGCWGL  
VIYAATAALCSSYLYVLQRILNNYDLSIRITYMLGTLGFAVGTAVMSIFPNVYVAMVMIS  
TMGVISMSMSYCPYALLGQYHEIKEYIHHSPGNSRRGFGIDCAILTCQVYISQILVASAL  
GAVVDAVGTVRVIPMVASGGSCLAFLAAAFLVIYPDTLDDEDDDDEEEQGPGSVKSEVAS  
NSSAEKLRNKPETASSV**

**>Slc45a4\_1of2**

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LFLFASVLFTVSVALHLFSIEEQQFSPQQERLDEEADTESSVKTAPHQPLDMIHEDEPYD  
YYDCERRSERDLDMDFLDVEIVRSKSDSVLAMADATLDHHDMLFLREIEPSIFQDRVSSY  
HGSPPRRSSSTGSQEFLRGKFCRLSAFLQQMERDGEEALLNNQLNECKAANGHQVDINGH  
VDLKASSANASIRRRRHTFYRQSSCTFSYYGRVGSHRYRYRRANAAFLIKPSRSMNDIYE  
LEKRQKQRNGQRIRHQSGNTNSSGDTESEEGEAETTVRLLWMSMLKMPKELFRLCVCHLV  
TWFSIIAEAVFYTDFMGQVIYEGDPTVRKNYCKSHFINPECKLECKLTFNLINKYILNYS  
ISIPKTIMKGKLPYIITRLHLSKFPSAVLQIQINFQIFKLLFLSLNNCSSVYLNFFKTIM  
QYVQHSPGSSKRGFGIDCAILSCQVYISQILVASALGSVVEAVGSVRVIPMVASGGSFLG  
FLASCFLVIYPGSHQPEPDGAKSEHTKALTSNGSGVEKPSFLKLNRKGTATTTCKVECES  
TL**

**>Slc46a1**

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VILLGSWSDRAGRRLVLIIPSLGLAVQAAVYLTVMYLKLPVFWFLIGRICSGLSGDFNAI  
LAGCFAYVADTSERGSRTFRVAILEACLGLAGMFASIIGGQWRRAQGYINPFWLVLATNL  
TAALYAYLFVPETVTPDPQARLFSTRHHQAVCRLYSSDAPPGRRSKLWLYIFCFFLVVTV  
HLGCSDLYVLYELSAPLCWGPELIGYGSAAKHLAYLTSLTGLRAMQCCLEDSWVALVGLT  
SNMVGLVVISVADTTALMFTGYGLCFLFMASTPVLRSKLSKLVDPAEQGALFASVACVEG  
LCSLVSSGVFNALYPATLHFMKGFPFVFGAAILLIPAGIIGGLGCQEKRESRENREGFGI  
S**

**>Slc46a2**

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GFASYWAGVMALVSVSSGEEERSVSIMMTELVYGIAGFIGSLASGHLFALYTVNLKQGVI  
LSGSSVVLYLLCLLYAATFLRVGPPAVLGDRLERRESFGIINHEARDKINIALLFVSGIL  
YDIAVAGGMEMLAAYVLKEPLNWGATLVGYGNAAGSLLFITSFLGVKMFTRLSLRDESMI  
MVGMVSFATGIYFMAFVTTTPMYFLARSVTLFALIPMPTIRSLLSKQVKGTSYGITFVML  
QLSFKLASLATTPIYTKIYQATLDTFPGFVFILSSIFTVLSIVPISIVGCRSSRQNGYER  
IQGN**

**>Slc46a3**

**MARVSLIEPAVGLYAFAMFMFYPLLQQYVYRRLWFELSGFIYTSESLSHCSSNHSYITLH  
QAVQKETSLFLLHSELCFLIPSLISALLLVSYSDYCGRKVAIVPPLVGEALHALSYVLVS  
RFSFSLNYLLASSFMSGLMGGPPTLIGGCFAYVADLCGEDLEGQKTVRMARLDMILGVLT  
GLASLCTGFFIKAAGFTWPFLTAVFLHLINLLYVLVVLKESLVLPNSAVSTSSPSASEAP  
RLRQTQALTTRLQGVYLLFAASNRRRNVVLLLMLAAFAFFKLALQGGWSIFILYELNTPL  
CWSEVFVGYGSALSTAIYLVSFAGVALLSRCLPDAYIILLGLMSVAAGLIMAAFAKTTLL  
MFLVRLPLLLSIMPTPVLRSMMSKIVSGSEQGAMFACVAFVEMLSVGVSFTVFNSIYAAT  
LSWFSGFSFLLAAGLTVIPSALICVILCLRLDVYEESIKLTESMENHTEILEIPQ**

**>Slc46a3\_2of2**

**MKRLYFIEPVVAIYAFASFMLYPLIQQYVYRRLWLEITNSTYPVSENTSQCAANSSNHTS  
RQEEVQKAASLFSMYTDLSSMIPSLIVTLLLVSYSDQRGRKITIIMPLIGTLIYTLSFLT  
VSFFQLNLYLLIVASFVSALFGGIGTMLGGCFSYVADLCEDGKQKTLRMAVVDMMIGMLA  
GVASISTGYFLHAAGFNWPFFTSAIFQVVNLLYAIFILEETRVIDRSETLACCQALRNLA  
CSIYSLFAGGSRRRTWVLVLLIITFSSLSFVNTGGLSIFTLYELNEPLCWTEILVGYGSA  
ASTSIFITSFVGVFLFSLCLPNIAIAFIGMLSVAVSMLMTGFAKTTLTMFLVRIPAMFAI  
MPFPVLRSMMSKVVSKSEQGALFACVAFTETLSTNGSAASFSRIYAATVAWCPGFVFLLG  
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**>Slc47a1**

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ATGCGLALACDTLVSQTFGSKNHKRVGEILQRSMLILLLFCLPCWAILINAESILLTLKQ  
EPEVARIAQLYVTAYLPAVPAMFLHYLQVSYLQNQGIILPQMYTAVAANILNVATNYILL  
HAMKLGVKGSAAANSISQITICLLLFAYIRWKKLHLKTWGGWSTASLQEWGSYMKLAIPS  
TLMLCFEWWIYEIGGFLAGMLGEVDLAAQHVLLEIGSIAYMFPLGVHAAACVRVGNALGA  
GDTVRALITSKVTLMISGILAFAQGIGIALTKSKLGYIFTSDESIVAIVSQNLTLYVFLQ  
FFDALVCVCSGILLGAGKQKIAAVSNLICYYCIGLPVGISLMFLAELRILGLWLGLLICV  
IIQTCFFTTLIFKLDWKKVTEQAQKRAGKHAKVVCLPKAPLIGPVVETLVSEDQDNAEQT  
DGTSSIPEPWDDITGNKAQLTSSSSEVSSYIQVSTQDQDKLASECGEGQPKVLLSIKQLV  
LRRGLTLLITLLILIAGITVHVVCPLPEHSVQRQSNFTNDSGNFSTPFSILNITMS**

**>Slc47a2**

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TFGSNNLKRVGVILQRGILILLLACFPCWALLINTEPILLAVRQSPNVASLSQLYVKIFM  
PALPAAFMYQLQGRYLQNQGIIWPQVITGAAGNILNALINYVFLHLLELGVAGSAAANTI  
SQYSLAVFLYVYIRWKNLHKATWDGWSRDCLQEWGAFIRLALPSMLMLCVEWWTYEIGGF  
LAGLISETELGAQSVVYELATIAYMFPLGFAVAASVRVGNALGAGNTERAKLSAKVALVC  
GVLVSCVVATLIGCTKDVIAYIFTTEEEIVSRVSQVMIMYGFFHLFDAIAGITGGIVRGA  
GKQLLGALCNIVGYYFVGFPTGVSLMFALSMGIIGLWIGFFGCVFLQSLFFIILIYKLDW  
KKATQEALIRAGVQLTETKDESFGLENKGCTEEAAKESQITEEGLTDANTDLEGLSKGGE  
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**>Slc48a1a**

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**>Slc48a1b**

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SFLLTLYSHRYRKEFADISILNDF**

**>Slc4a10b**

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ASNVLVGELEFLDRPVVAFVRLSPAVLLNGLAEVPITTRFLFILLGPLGKGAQYHEIGRS  
IATLMTDEVFHDVAYKAKDRNDLIAGIDEFLDQVTVLPPGEWDPSIRIEPPKNVPSQEKR  
KIPAVPNGELAETEEHGGHGGPELQRTGRLFGGLILDVKRKAPHLLSDFGDALSLQCLAS  
FLFLYCACMSPVITFGGLLGEATEGRISAIESLFGASMTGIAYSLFAGQPLTILGSTGPV  
LVFEKILFKFCKEYGLSYLSLRVCIGLWTAFLCLLLVATDASSLVCYITRFTEEAFASLI  
CIIFIYEAIEKLIHLGETYQFNKNNNLDKLTTYRCSCIEPENPSNATLQYWEQNNISAPE  
IFWEALEVEDCIEKKGVFVGSACGPHGPYVPDVLFWSIVLFFSTVAMSAFLKEFKTSRYF  
PTKVRSIISDFAVFITIVTMVLVDYALGVPSPKLQVPNEFKPTRDDRGWLISPLGPNPWW  
TCVITVIPALLCTILIFMDQQITAVIINRKEHKLKKGCGYHLDLFMVGVMLGVCSIMGLP  
WFVAATVLSISHVNSLKLESECSAPGEQPKFLGIREQRVTGLMIFLLMGCSVFMTSVLKF  
IPMPVLYGVFLYMGASSLRGIQFFDRLRLFGMPAKHQPDFIYLRHVPLRKVHLFTIIQLS  
CLVLLWVIKTSRAAIVFPMMVLALVFIRKLLDFIFTKRELSWLDDLMPESKKKKLEDAER  
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**>Slc4a10\_2of2**

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ARWLKFEEDVEDGGERWSKPYVATLSLHSLFELRSCILNGTVMLDMRASSLEEIADMVLD  
QHETSGPLGEEVRKKIRNALLKQHHHQNQKKLANRIPIVRSFADIGRKQSEPHSMDKNGS  
QMVSPQTQPINTEGRGEGSRENSAVDFSKIDLHFMKKIPPGAEASNILVGELEFLEKPVV  
AFIRLSPAVLLNGLAEVPITTRFLFILLGPMGKGPQYHEIGRSIATLMTDEVFHDVAYKA  
KERSDLVAGIDEFLDQVTVLPPGEWDPTIRIEPPKNVPSQEKRKVPPLANGGADLGEEEE  
HGGHGGPELQRTGRIFGGLFLDIKRKAPHYLSDYTDALSLQCLASFLFLYCACMSPVITF  
GGLLGEATEGRISAIESLFGASMTGIAYSLFAGQPLTILGSTGPVLVFEKILFKFCKEYG  
LSYLSLRVCIGLWTAFFCLLLVATDASSLVCYITRFTEEAFASLICIIFIYEALEKLIHL  
GETYPFNMHNDLNKLTQYSCVCTIPKEPSNATLKYWEEKNITASEIDWLGLDVKGCVENR  
GEFVGSACGHHGPYIPDVLFWSVVLFFSTVAMSSFLKEFKTSRYFPTKVRQIISDFAVFI  
TIMTMVLIDYGLGVPSPKLQVPNVFKPTRDDRGWIISPLGPNPWWTVIVTCIPALLCTIL  
IFMDQQITAVIINRKEHKLKKGCGYHLDLFVVGVMLGVCSVMGLPWFVAATVLSISHVNS  
LKLESECSAPGEQPKFLGIREQRFTGLMIFVLMGSSVFMTSVLKHIPMPVLYGVFLYMGA  
SSLRGIQFFDRLKLFGMPAKHQPDFIYLRHVPLRKVHMFTIIQLSCLVLLWVIKTSRAAI  
VFPMMVLALVFIRKLLDFVFSKRDLSWLDDLMPESKKKKMEDAQQEENQCVLIEDEGIVQ  
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**>Slc4a11**

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LDDVLKTMLRHVSQDPHTAEPGCNFEEIMSSLFTDAGSQEVNDRSANFIFYDNVHLLSET  
LQCVTATATGIQYQQSWLCILCNVKNLQRRHVCISRLDRPQNWGENCAEVRYVILILAPS  
KMKSTKTAMELGRTFASMFSDISFRQKLLESKTQEEFKEALVIQRYHLTAAKRKTTAVEG  
EETDPHSQKPLKCRDFFRVGRGIYEDLCRRLPLYPSDFTDGLVGNNKALVKFMTTSIFLY  
IAVLLPAIAFGSLNDESTRGEIDVQKTIIGQSIGGIIYSLCAGSPLVIPLTTAPIAIFIS  
VIRGICDDYELDFAAFYACIGLWNSLFLIMGGVFNLSLLVKLFKRSIEEVIALFISIAFV  
ADAVKGTVKIFHDNYHAPTLANGSAAELNRISGSVHLGELNQTEAGPVSLPESFILCTRA  
RPLLCLLLMMGTLWVGYTLYQFRRSPFLHVKMREILSDCALPISVLVFSYVGSYVFNDIA  
LPVFNFHEGPVFQVAPLDKLTGASVLSAMGLGFLLFLLIFIDQNIVVSLTNAPENRLLKG  
TAYHWDLTLSGLINILMSVLGLPWMHAAFPHSTLHVRQLAIVEERVEGGHLYETIVSVKE  
TRVTSLVANILIGVSVFLLPVPLQWIPKPVLYGLFLYIALTSIEGNQMCDRMALLLKEQT  
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**>Slc4a1a**

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SLIQLRKVMSTGAVLLDVDDSSLSSIGQKMVEQLLLKKEIRPSDRDALVTILQRKRSQLE  
PVVSPGSADLELQTFSVTKQRDQVDRVEGSVVLSGVVENLQKPVVAFARLRDSVVMEGVL  
EASIPVRFVFFLVGPSHSGMDYHESGRAMAALMADWVFSLEAYLATNERDLYNAMADFMD  
CSIVIPPTDIQDDSMLKPIINFQKKMLHDRVRPYDTRIMVGGKAPTGPAKPREDPLARTG  
LPFGGMVKDIKRRYKHYLSDFTDALDPQVLSAVIFIYFAALSPAITFGGLLADKTEHMMG  
VSEMMVSTCVQGVIFCLFAAQPVLVIGFTGPLMVFEEAFFQFCKGYGFEYIVGRVWVGMW  
LIVIVVIIMAVEGSFLVRFISRFTQEIFSILISLIFIYETFSKLIKIFKAHPLILNYEHL  
NDSLDDPFHPIKKVINVTLHPDGNVTEHHEIIERAYPNTALLSMCLMFGCFFIALYLRGF  
KTSTYLPGPIRRMVGDFGVPIAIFFMIAVDISISDAYTQKLVVPKGLTVSNTSARGWFIS  
PFGEKKTFPVWMMFACVVPAMLVFILIFLESQITTLIVSKPERKMVKGSGFHVDLLLLVF  
LGGVGSLFGVPWLSAATVRSVTHANALTVMTKGPRPQIERVLEQRVSGILVAVMVGVSIL  
MEPILKMIPMTALFGIFLYMGITSLSGIQLWDRMLLLITPKKHHPAVPYVTRVPTMRMHL  
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DDEDD**

**>Slc4a1b**

**MEMNESAKSPNQQSYWQEMGRWAGYEETYDVEAGRWSPSHISYLTFKSLVQIRRTMNTGV  
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PTIDGMNYHECGRAMAALLADKVFNQAAFQAQSDRELTDAVGDFMDCCIVIPPTEIQNES  
LLTSLIPFQKKLLQERLRPSNPKLRLDVKPRKPSKSSGPPPEDPLTRTGVPFGGMIRDMK  
RRYKHYISDLTDALNAQVLAAIIFIYFAALSPAITFGGLLALTFLIADKVDNMMGVSELM  
ISTSLLGIIFCLIAAQPVLVIGFSGPLLVFEEAFFNFCKSQGIEYIVGRVWVGIWLVVIV  
VGIVALEGSFLVRFISRFTQEIFSILISLIFIYETFAKLLKIFREHPLTLNYEHLNTSVE  
DPWHSIVSYQKIFDNATGNVSVVRTVEHQAYPNTALLSMCLMFGCFSIAYYLRMFKNGKF  
LPGKIRRLLGDFGVPIAIFLMAAIDINIEDTYTQKLVVPKGLQVSNPSMRGWLINPFGEH  
KSFPVWMMFASIVPAILVFILIFLESQITTLIVSKPERKMVKGSGFHMDLLILVSMGGLS  
AFFGIPWLSAATVRSVSHANALTVMSKGPKPEIEKVLEQRVSGVVVALLVGLSILMEPIL  
KMIPITALFGIFLYMGITSLSGIQLWDRMLLLLIPKKYHPNEPYATRVSTSKMHVFTAIQ  
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**>Slc4a2a**

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TSHSKLHTSISIPEDVTGASGRRWGRIPPNGRRVSAPCLFPSVSSPDGSCKTGRSYDLQE  
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VHIGKDYKEFSSRIRTKLDRTPHEVFVELNELLMDKNQEMHWKETARWIKFEEDVEEETE  
RWGKPHVASLSFRSLLELRKTISHGAVLLDLDQKTLPGIAHQVVEQMIISDQIRAHDRAN  
VLRALLLKHSHPSDGKEHSLFNRNISATSLGSLISHYHSTNHIGAPELPATDPLIGGLRN  
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DDIALQPPLKPEDDPLRRTGRLFGGVIRDVRRRYPKYISDFKDALSPQCMATVIFIYFAA  
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LDLLIIVVSGGIAALFGLPWLTGATVRSVTHANSLTVMSKAVAPGDKPRIQEVKEQRVTG  
FLVALLVGLSIVIGDLLRQVPIAVLFGIFLYMGVMSLNGIQLTERMMLLFMPPKYHPDHT  
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QCLDADDAEPTLDDKDGQDEYTEMQMPV**

**>Slc4a2b**

**MTDPVTSDQLTNAVDSVVHNPESSSLPVRVSQREEEEEDDLNKSLGVQRFQQILSPTARV  
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LAIEEGEDEEEEEEEESAENQSVTPAPTTDNDRKDNVQFFVSDDDPHVSTPETSDPVPTR  
GILIVPTTAVCSEPQDSTSTEASEAAPASPSTAEHGSIPRVSSRSYDLQERRRTGNMTGT  
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GLLGEKTEGLLGVSELIVATCVQGVLFCLLGAQPLLIVGFSGPILVFEEAFFSFCKGNNM  
EYLTGRVWIGFWLIIIVVLMVAFEGSFMVRFVSRFTQEIFSFLISLIFIYETFSKLAKIF  
QEHPLQRCSAVLVDVRNSSLNSSMDEVTESPLAVTNSSSQEMLKVVGEPNTALLSLVLMS  
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SGFHLDLLLIVTLGGTSALFGLPWMAAATVRSVTHANALTVMSKAVAPGDKPRIQEVKEQ  
RVTGLLVAILVGLSIVIGDLLRQIPIAVLFGIFLYMGVMSLNGIQMTERILLLLMPPKYH  
PDHTYVRKVRTLRMHLFTAIQVVCLAVLWAVMSTVASLAFPFVLIMTVPVKMFLLPRIFS  
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**>Slc4a3**

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LPQGRKCTLSLGSEEDLAADLPLSSFHMESERPASSEETLPSPASMEEKEETQQPPDGGA  
QRTSYDLRERICIGSMTAMETAVYQKVPTDEAEAQMLASADLDDMKSHRFEDNPGVRRHL  
VKKSSRCQLPRSSNGSPPLSSLKRRKRMDKKTHEVFVELNELIVDKNQEMRWKERARWIK  
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DQIRAEDRANVLRALLLKHSHPNDEKEGLFHRNHSVTSLGSFRHNHNHVHDTSLPLVSQD  
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ADDRQDLLNGINEFLDCSIVIPPSDVEGKDLLKTVASFQKQMLRKRKERELKKCASTVTG  
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VIFIYFAALSPTITFGGLLGEKTQGMMGVSELIISTATVGVLFSLLAGQPLLIIGFSGPL  
LVFEEAFYKFCQAQGFEYLTGRVWIGFWLIFIVLVIVAAEGSFLVRYISPFTQEIFAFLI  
SLIFIYETFSKLIKVFQEHPLMMSYTSAAFKHSDQRGSSVIGEPILNQPNTALLSMVLMM  
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QRVTGMCVAILVGLSIVMTDVLRHIPLAVLFGIFLYMGITSLTGIQLYERITLMVTPAKH  
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**>Slc4a4a**

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SVDGQEMEWKETARWIKFEEKVEKGGERWSKPHVATLSLHSLFELRTCIEKGTIMLDLEA  
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LFSTPDNGSPTTAHRNLTSSSLNDISDKPEKDQLKNKFMKKLPRDAEASNVLVGEVDFLD  
SPFVAFVRLQQAVMLGALTEVPVPTRFLFILLGPKGKAKSYHEIGRAIATLMSDEVFHEI  
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GDTPHSGGHGGGGHAVGDELKKTGKFCGGLILDVKRKVPFFFSDFYDSLHIQSLSAILFI  
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WWVYLGASVPALLVTILLFMDQQITAVIVNRKEHKLKKGAGYHLDLFWVAVLLAVCSFMG  
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SC**

**>Slc4a4b**

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LEWKETARWIKFEEKVEKGGERWSKPHVATLSLHSLFQLKNCIEKGTIVLDMDANSLQQI  
VENITDSQIESGQLKADLRETVIYTLLRKHRHQTKKSNLRSLADIGKSVSSASRLFSSQE  
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TNAITFGGLLGDATENMQGVLESFVGTALTGAVFCLLAGQPLTILSSTGPVLVFERLLFN  
FSRENAFDYLEFRLWIGLWSGFMCLVLVATDASFLVQYFTRFTEEGFSALISFIFIYDAF  
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SLSRSECQEWGGQLVGATCDFVPDITLMSFILFFGTYACSMGLKKFKTSRFFPTTVRKLI  
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ALLVTILIFMDQQITAVIVNRKEHKLKKGAGYHLDLFWVSILLVVCSFLGLPWYVAATVI  
SIAHIDSLKMETETSAPGEQPKFLGVREQRVTGIMVFILTGLSVFMAPVLKFIPMPVLYG  
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**>Slc4a5**

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MEWKESARWVKFEEKVEEGGERWSKPHVSTLSLHSLFELRTCLQTGCILLDLDGYSLPQI  
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ARSGSGFHRSTEDLRARQSAGLGKLHPSQCRSMNDISVTPSSDQLKNKFMKKIPRDAEAS  
NVLIGEVDFLDKPFVAFVRLAQAATLGGLTEVPVPTRFLFVLLGPSGKTKSYNEIGRAMA  
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VFSLNELGQPNGNAGGGSASAEDEEMPAPHELGEELKFTGRFCGGLWLDIKRKAPWFFSD  
FYEGFHIQSVSAVLFIYLGCITNAITFGGLLGDATDNYQGVMESFLGTALAGAVFCMFGG  
QPLIILSSTGPILIFEKLLYEFSINNNIDYMEIRLWIGLHSCLQCLILVATDASYIIKYM  
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DRGWIVMPMGRNPWWMCLASFVPALLVTILIFMDQQITAVIVNRKENKLKKGCGYHLDLF  
WVGVLMAVCSFMGLPWYVAATVISIAHIDSLKMESESSAPGEQPQFLGVREQRLTGTLVF  
VLTGVSVFMAPILQFIPMPVLYGVFLYMGVASLHGIQFWERIKLYLMPAKHQPDFVFLRH  
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ILPDKDKKKKEDEKKKKKSKTDEHNNSDEECC**

**>Slc4a5\_1of2**

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SGGTRSPARTPAAQAANFNRSTEDLRTKQAANYGRLRHAQSRSMNDIADTPSTDQLKNKF  
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VAPDPIPVPDNTSALFGFNITALDWTQLSKKECVKYGGSLVGQSCKYVPDLALMSFILFC  
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LVFVLTGVSIFLAPILQFIPMPVLYGVFLYMGVASLSGIQFWDRIKLIMMPAKHQPDFSY  
LRHVPLRRVHLFTLVQIVCLAVLWILKSTFLAIIFPVMILGLMVVRKMLDMVFSQHDLAW  
LDDILPEKEKKKKDDEKKNIKKDKKKGKGGDDSEDDDKYHPYTNCTPGDSDLDRSITLHL  
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**>Slc4a7**

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KQFKTKRYFPTKVRSSISDFAVFLTIMIMVLVDYLVGIPSPKLHVPDRFEPTSKNRGWLI  
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**>Slc4a8**

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TVLLDMKAGSIEEIADLVLEKQETPHELDDSVRMKVREALLKRHHHQNDKKRNNLLPMVK  
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AALICLIFIYEALEKLFYLGELYPINRHSDLDKLTLAYCRCAEPDNPSNKTLEVWNQRNI  
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**>Slc50a1**

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QLSQLGLTCSVFTISMYLSPLADLLDIMRTKSVERLSFSLTVATFFTSTSWTLYGLQLGD  
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**>Slc5a1**

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FEWNALVVVIILGWLFVPIYIKAGVVTMPEYLKKRFGGQRIRIYLSVLSLCLYVFTKISA  
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FAFNKVGGYENFRDSYMTAIPSVIGTNISESCYTPRADSFHIFRDPINGDLPWPGLLFGL  
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VHYLYFALILFGLSCILILSISLMTKPIEDKHLYRLCWSLRNNTEERIDLEADDWTEDQD  
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ANAVILLTVCVFFHGFFG**

**>Slc5a10**

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LSLLLSVFTKISTDLYSGALFVQVCLGWNLYLSTVLMLVVTALYTIAGGLAAVIYTDTLQ  
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SLTSIFNSSSTLFTMDIWKKYRRGASEKELLLVGRIVTVILVVISVVWIPILQSANSGQL  
YVYIQSVTSYLAPPVTAIFVMAVFWKRTNEAGAFWGLMVGLVVGLTRMVLEFAFPPPRCG  
VFDPAPSVLRSMHYLHFAIILCALTAIVVAVISLLTPPPTEEQTRNLTWWTLHNSTEREI  
PLQKVSTLSRRTDGFVNQNFRSQIDEGGAFLFSHGVLSCESVRRGKCVRTAGFCSPRPGR  
FASGTPPPIIHSTTEDPFWSRFCCVNAIILMCVNIFLYAYYA**

**>Slc5a11**

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YAKLVMELLPAGLRGLMMAVMLAALMSSLTSIFNSSSTIFTMDLWRNIRHTASEWELMIV  
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FWGLMVGMAVGCTRMILDFIYPTPQCYESDTRPDIIKYVHFLYFSIILTILTLVVVVCVS  
LATEKPKPEQISRLTWYTRFDAVIESEEVVSSELYTIDNDIKVRENEALPAKEDSSGSVS  
SNAGSSKLKSALFWLCGMEKQTEKSSSSPAPPDAAMCSLEEEPCMKHVVNANLIICVSVA  
VFLIAYWA**

**>Slc5a12**

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CKLVRVAATLIYIIQTILYTGVVVYAPALALNQVTGFDLWGSIFATGIVCTFYCTLGGLK  
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TLSVGGTFTWLGIYGVNQSTIQRCISCKTEGHARWALYLNLLGLWIILFCAVVSGLIMYS  
YYSHCDPWSSGLISAPDQLMPYFVMEILGAFPGLPGLFVACAFSGTLSTVAASINALATV  
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VLGLFSLGILFPFTNLKGAVGGLIVGISLSFWVGVGAFIYPAPSNNTHALELNTAGCNIT  
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**>Slc5a2**

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NISQHCYMPREDAFHLLRDPTTGDLPWPGVIFGIAIIGSWYWCTDQVIVQRCLAARSLTH  
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VVSVMPTGLRGLMLAVMLAALMSSLASIFNSSSTLFTMDIWTRIRPQARDKELMVVGRVW  
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MGGLVMGLCRMVPEFVFGSGSCLKPSNCPKVICGVHYLYFAILLFFCTAILVLFVSYNTP  
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YA**

**>Slc5a3\_2of2**

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GGKRLKIYFAGLSLLLYIFTKLSVDLYAGALFIQESLGWNLYLSIILLISMTALLTVTGG  
LVAVIYTDTLQAVLMIGGALTLTIISLIKVGGLEGVREKYMEAVPNVTAILASSNFSFEY  
TNSCRIYPKPDSLKLLRGPLDEDIPWPGFLLGQTPSSIWYWCADQVIVQRVLAAKNIAHA  
KGSTLMAGVLKILPMFIIVIPGMISRILFPDELACIGPEHCMAVCGSQAGCSNIAYPRLV  
MSVMPVGLRGLMMAVMIAALMSDLDSIFNSASTIFTLDIYKMLRARASSRELVVIGRIFV  
IFMVAISIAWVPVIIEMQGGQMYLYIQEVAGYLTPPIAALFLLGVFWKRCNEIGAFCGGM  
TGFVLGTTRLLLGFIYREPKCDQPDERPAFITRIHYMYIAAGLFWISGLVAVVVSLCTTP  
PDEERIKRTTMWGLRKLRRLVVTEREEMYKLTNGSGNGILKKDVPEDVQKEKCLDGADIK  
LLLPSPCDQDPTTPNTEASTPMELYGNGHAKLVKQKDESQSDDESCLQVIDWICCHKEKT  
SVVEPKFIKEDEETIREMLHEPPKIKLLLNICLVLICLLGIFMFVYFSL**

**>Slc5a3\_1of2**

**MASTMEAADIIVVAMYFVLVLCFGFFSMWRANRGTVSGYFLAGRSMNWFVIGASLFVSNI  
GSEHFIGLAGSGAASGLAVGAWEFNAILLLQLLGWVFIPVYIHSGVYTMPEYLSKRFGGN  
RLKIYFASLTLLLYIFTKLSVDLYSGALFIQESLGWNLYLSIILLITLTALLTVTGGLVA  
VIYTDTLQAFLMISGALCLMAISLVKVGGLEGLRTKYMNALPNITFITLENNLTYSNSCH  
VNPKADSFKLLRSPLDKDLPWPAFLLGQTPASIWYWCADQVIVQRVLAARNIAHAKGSTL  
LAGVLKVLPMFIIVIPGMISRVLFADELACIGPEHCMQVCNSRAGCTNTAYPRLVMNIMP  
VGLRGLMMAVMLAALMSDLDSIFNSASTIFTLDIYKMIRHQASSKELMVVGRLFVVLIVA  
ISIAWVPFVIEMQGGQMFLYIQEVSDYLTPPIAALFLLGVLWKRCNETGAFWGGFVGLIL  
GIVRLILAFVYREPDCDSVDDRPAFIKDVHFMYVAAVLFWVSGFVMVVVSLCTNPPSKEQ  
ISKTTLWGLRNRNQPADTKAKGGNGKLEQTLDGVEFQPLPPEMLPNGHLEAPHTHRQATE  
HAARNKGRCVKCLGWFCGYNEHSEESDSPFEDDGRSVHEMLKESAQNKTALNIGLLLVCA  
LGIFLYVYFSL**

**>Slc5a5**

**MAMDSDRPPGFCLVDYAVFAAMLGVSVGIGLFQSLRKTPGRSKVDSFFTGGRGFSAVPVG  
LSLCASFMSAVQVLGVPSETYLYGFKFLYMCLGQGLNSLMTAVLFVPVFYRLKITSSSQY  
LGMRFGRGMQLLGSLQFIVATLLYTGIVIFAPAVILNQATGLNMWASLFSTGLICTFYTT  
VGGMKAVIWTDVFQIVVMLSGFIAVFIQGTILAGGPARVLEIANNGSRINFNDFAIDPQR  
RYSFWSFTVGGTMVWLSMYGANQAQVQRYISCRTEKQAQLALLVNQVGLCLIVSSAATCG  
IVMFALYSNCDPLKIGRISAPDQYMPYLVLDIFRNHPGFPGLFLACAYSGTLSTVSTSIN  
AMAAVTMEDVMKPWLITISQRKQLMLSRALSLFYGLGCITMAALSSLLDWGVLQGSFTVM  
GVVNGPLLGAFALGMFVPATNKPGVFSGVAVGFCLSLWLAVGSTIYPPSPQIMGVLPTSA  
GQCLTTNATLNTTASVLASSVPLDYSFQNIYSISYLYFGALSTSAVVLVGVVVSYITGPT  
KKDSISPGLLRWNLEQKPCDASCHILNETITLNPTEILLTPKELFPIAADKQDILLTKGE  
I**

**>Slc5a6**

**MDPAGHKYFTVIDYVIFGLLLVASMSIGLYYAFTGGRQSTTQEFLIADRSMKCLPLSLSL  
MATFQSAVAIIGTPAEVYAHGTQYWFIGCSYVLGLLIPAHIFIPLFYRLHLTSVYQYLEL  
RFCKAVRICGTVTFIFQMVIYMGVGIYTPALALNAVTGFHLWGAVLATGLVCTLYTALGG  
LKAVVWTDVFQTVVMFTGQLAVIIVGVHQAGGLSEAWGKVRDGGRISGIDLNPDPTVRHT  
FWTLAVGGVFLMLSLYGVNQAQVQRYLSSRTEREAVMSCYMVFPCLQLALLLSCLMGLVM  
FACYGQNSPVEQQYITSKDQMVLYFVMDMLQNFPGLPGLFVACLFSASLSTISSAFNSLA  
TVTMVDLIKPHYSMTEARATLLSKLLALSYGIICLAMAYLVHLMNSSVLQAALSIFGMIG  
GPLLGLFCLGIFFPCANSIGAVTGLSAGLLMAFWVGIGGFLTRMPSPVIPLLNSTITVPD  
VSENITAATAELEADSRSAGLHGFYSLSYMWYSALSSCTVLIVGLIISCITGPTKGDDVA  
SGTVYPVVKTAQSYLKPSTCCKTTAEHKQVDGQKEMNGTVKEDAGSQEETQRFLPDVELE  
TSV**

**>Slc5a6\_2of2**

**MGDTVQMHFSTVDYVIFVVLLVASAGIGLYYAFSGGRQRTTQEFLLADRSMRCLPVSLSL  
LATFQSAVAILGAPSEIYTYGTQYWFLGCSYFLGLLIPAHIFIPVFYRLRLSSAYEYLEL  
RFSKSVRICGTVTFIFQMVIYMGVVLYAPALALNAVTGFDLWGAVLAMGLVCTLYTALGG  
LKAVIWTDVFQTIVMFAGQLAVIVVGTHQAGGIAEVWRKAQNGSRIAGLDLNPDPLERHT  
FWTLGVGGVFLMLALYGVNQAQVQRYLSSRTEKEAIMSCYAVFPCQQVVLTLGCLMGLVM  
YARYGEESPLDQGYVTTNDQMVLYFVMDVLRDLPGLPGLFVACLFSGALSTISSAFNSLA  
TVTMEDLIKPHVPAMTEARATLLSKMLALAYGLVCLAMAYIASLMGSVLQAALSIFGMVG  
GPLLGLFCLGMFFPWANSTGALVGLASGLVMAFWIGIGSFVSRMSPSALPVINATIIPDV  
GNMTTAVMTTLTTTKPRPSGVQALYSLSYMWYSAHNSATVVVVGLVVSFLTGPWKEKDLN  
PGTVYPVLGNLLFFLPQRYREKLCCVTPLEDKSKDLDRQPYQMAQKESNGVACTKEEDKL  
REEEGERVTAQPTCNLAHTLQETAL**

**>Slc5a7\_1of2**

**MAIHVEGLLAIVIFYLLILMVGIWAAWKNKHAGISEGTDRSETIMVGGRDIGLFVGGFTM  
TAATWVGGGYINGTAESVYVPGCGLAWAQAPFGYALSLVVGELGFAKPMRSRGYVTMLDP  
FQQLYGQRMGGLLFIPALLGEIFWSAAILSALGATLSVIVDMDINMSVMISALIAVFYTL  
VGGLYSVAYTDVVQLFCIFLGLWISVPFALSNPAVSDIAVTAVKAVFQDPWLGEIHPSDG  
WMWADNFCLLLGGIPWQVYFQRVLSASSATYAQVLSFLAAFGCLVMAVPSVLIGAIGAST  
DWNQTSYGPVAPVDKDESDMILPIVLQHLCPSFVSFFGLGAVSAAVMSSADSSILSASSM  
FARNIYQLAFRQSASDREIVWVMRITIFVFGAVATAMALLTGSVYGLWYLSSDLVYVIIF  
PQLLSVLFIKGTNTYGSVAGYVFGLLLRIGGGEPYLRLPPFIYYPGWQMREKQHRLTQEV  
ERFVEQRFPYKTVSMLASLLSNAAFSYLAKYLFESGTLSPKYDFLDAVVSKHSKETMDKT  
TLVAHDTILLSELSAVKPRHTSSLAGTFINADVLRDEGSVSPDLE**

**>Slc5a7\_2of2**

**MNIHVEGLVAIVIFYLLILLVGIWAAWKNKNSGVMEGTDRSETIMVGGRDIGLFVGAFTM  
TATWVGGGYINGTAEYVYLPGFGLAWAQAPFGYALSLVLGGLFFAKPMRSRGYVTMLDPF  
QQLYGKRMGGLLFIPALMGEMFWSAAILSALGSATLSVIIDIDINMSVVISALIAIFYTL  
VGGLYSVAYTDVVQLFCIFLGLWVSVPFALSNPAVSDIGVTAVKQLHANQTAWLGKIESS  
DKWMWADNFCLLMLGGIPWQVYFQRVLSASSATYAQVLSFLAAFGCIIMAIPSVLIGAIG  
ASTDWNQTSYGPIPPMQKDQSDMILPIVLQHLCPAYISFFGLGAVSAAVMSSADSSILSA  
SSMFARNIYQLAFRQSASDREIVWVMRITIFVFGALATAMALLTGTVYGLWYLSSDLVYV  
IIFPQLLSVLFIRGTNTYGSVAGYFFGLILRIGGGEPYLKLPPFIYYPGWTIEEKVHHLT  
HEVEYLVMQRFPFKTASMLASFLSNVAFSYLFKYLFESGTLSAKYDFLDAVVAQHSAEIM  
DKTTLVNKNIIGLNEMAPVKPRLSVTLAATFTRKETLTEEEDSSPESPIHEKNDE**

**>Slc5a8l**

**MPGSGGPVATFSVWDYVVFAGLILVAAGIGLFQSFRGRKEASSDEFLLGGRQMTAVPVAL  
SLTASFMSGITVIGTPAEAYLYGTPFWLFFISYAIMSTISAEIFVPLFYRLNITSTYEYL  
EMRYNKLIRVIGTSMYIIQTALYTGMVIFAPALALNQITGLDLWGVLVATGAVCIIYCTL  
GGLKAVIWTDVFQMIIMLGGFVAVIARGAVLQGGLGRVWNDSFYGGRLETFSFDPDPLRR  
HSFWTIVVGGSLMWASMYSINQSQVQRYISCRTMTHAKLSLYVNMVGLWVTVSLAMMSGL  
TMYSIYKDCDPFTNKDVGATDQLLPYLVMDILADFPGLPGLFVAAAYSGTLSTVSSSINA  
LVAVTVEDFMKPAWPSLTERQLSWINMGMSVFYGAVCIGMAGVASMMGNILQAALSIFGM  
ISGPLLGLYMLGMFFRCANSTGGLAGLASGLAITLWVGIGAQLYPPLPEKTLRLPLSVEG  
CVALNTSETTTMTPFSTVLQTTTPQPRPALADNWYSLSYLYFSPVGIIVTMFIGLIVSAI  
SGGCKQKKVRPELFISKSDLICFRCKKSDSEVSDLIETKPKDIQGLDSPVFYDNEIVLKE  
KDQQEKITKL**

**>Slc5a9**

**MPASPEPVTATPEPEEVPAKFTLEAADIAVVVVYFVFVLAVGIWSSIRANRGTVGGYFLA  
GRSMTWWPIGASLMSSNVGSGLFIGLAGTGAAGGLAVGGFEWNAAWVLIALGWIFVPVYI  
SAGVVTMPEYLRKRFGGQRIRIYMSVLSLILYILTKISTDIFSGALFIQVSLGWDLYLST  
VILLAVTALYTIAGGLTAVIYTDALQTVIMVIGAFVLMFIAFDKVGWYEGLLVQYEKAAP  
ALTVPNTTCHLPRSDAFHIFRDPVTGDIPWPGLIFGLTVLATWVWCTDQVIVQRSLSAKN  
LSHAKAGSVLGGYLKVFPMFFVVMPGMISRALYPDEVACVDPDECQKICGAKVGCSNIAY  
PKLVVELMPVGMRGLMIAVMMAALMSSLTSIFNSSSTLFTMDIWQRIRPRASEKELMVVG  
RVFILLLVALSIVWIPVIQTANSGQLFDYIQAITSFLSPPITTVFIMAIFWGRVNEQGAF  
WGLMVGLVVGMVRMIMEFVYGTPSCGETDLRPSLLKDVHYLYFALILLALTVLIITAVSL  
CTAPIPEKHLVRLTWWTRHSKEERVELEDPWAKPAGSDLSTTESEGSDEDAPAWWKRAGM  
WLCGLSQTTKQDLTEEERQALEKKLTSIEEDHMWKTVCNVNALILLTANVFLWGYFA**

**>Slc6a1l**

**MKQAIPFEDLDHNSIPVEEKENKIPDRGSWKGKFDFLLSCVGYAIGLGNVWRFPYLCGKN  
GGGAFLIPYFTTLVFAGIPLFLLETALGQYTSVGGLGVWKLIPMMKGVGLAAVVLSFWLN  
IYYIIIIAWALYYLFSSLKAELPWQTCDNPWNTDRCFSNYSLLDTTNLSSAVTEFWERNM  
HQLTNGLEEPGELRWPLVGTLALSWILVYFSIWKGVEWTGKVVYFSATYPYFMLFILFFR  
GVTLPGAIDGVLFYITPNFNKLLKSEVWLDAATQIFFSYGLGLGSLIALGSYNSFNNNVY  
RDSVIVCCINSCTSMFAGIVIFSIVGFMSYITKRPIEELAASGPGLAFLAYPQAVTQLPM  
SSLWAILFFSMLMMLGLDSQFCTVEGFITALMDEYPTVLRKRKKIFILIVCLVSFIIGFS  
NITQGGLYVFKLFDYYSASGMCLLFLVFFETISIAWFYGAEKFYKNIEEMIGYRPCGFWK  
QCWIYFTPTICLGVFTFSAIEMTPLTLGKYVYPAWGQGVGWLMSLSSMVLIPGYIIYMFF  
STKGNIRQRWHKMTKPTELTTSDVNDLTHTGIMDEASV**

**>Slc6a1b**

**MATNGTKASDGHVLTEVNEAPTANDKPKTLVVKVQKKKELPDRETWQGKFDFLLSCVGYA  
IGLGNVWRFPYLCGKNGGGAFLIPYFLTLIFAGVPLFFLETALGQYTSIGGLGVWKLAPM  
FKGVGLAAAVLSFWLNIYYIVIIAWAIYYLYNSFTTDLPWKSCDNPWNTDKCFSNYSMAN  
IGNMTSAVVEFWERNMHQLTDGLEKPGEIRLPLAITLAIAWVLVYFCIWKGVGWTGKVVY  
FSATYPYFMLFILFIRGVTLPGAKEGILFYVTPEFSKLKESEVWLDAATQIFFSYGLGLG  
SLIALGSYNPFNNNVYKDSIIVCCINSFTSMFAGFVIFSIVGFMAHITKRPIADVAASGP  
GLAFLAYPEAVTQLPISPLWAVLFFSMLLMLGIDSQFCTVEGFITALVDEFPRALRGRRE  
IFIAVVCLVSYLIGLSNITQGGLYVFKLFDYYSASGMCLLFLVFFECVSISWFYGVNKFY  
GNLEEMIGYKPCIWWKLCWVVFTPLIVAGVFLFSAVQMVPLTLNNYVFPKWGQGVGWCMA  
LSSMVLIPGYMGYMFLTLKGSYKERLRIMIQPTAAAVRTQENGPEQQPENPTPANDEAYI**

**>Slc6a1a**

**MATNNTKSTDGQVVTELNEITTNDKPKTEDAKPEKNKKDIPDRETWGGKFDFLLSCVGYA  
IGLGNVWRFPYLCGKNGGGAFLIPYFLTLIFAGVPLFFLECALGQYTSIGGLGVWKLAPM  
FKGVGLAAAVLSFWLNIYYIVIIAWALYYLYNSFTTDLPWKSCNNPWNTDRCYTNYSIVD  
TTNLTSAVMEFWERNVHQMTDGLEKPGEIRVPLAITLAIAWVLVYFCIWKGVSWTGKVVY  
FSATYPYFMLFILFIRGVTLPGAKEGILFYITPDFEKLKESEVWLDAATQIFFSYGLGLG  
SLIALGSYNPFNNNVYRDSIIVCCINSFTSMFAGFVIFSIVGFMSHVTKRPIADVAASGP  
GLAFLAYPEAVTQLPVSPLWAILFFSMLLMLGIDSQFCTVEGFITALVDEFPRLLRKRRE  
IFIACVCVVSYAIGLSNITQGGLYVFKLFDYYSASGMCLLFLVFFECISISWCYGVNKFY  
DNIQEMIGYKPCIWWKLCWVFFTPLVVAGVFLFSAVQMVPLTMNNYVFPKWGQGVGWLMA  
LSSMVLIPGYMGYMFLNLKGTYKERIRIMLQPPAVKRAQENGPEQQQSQPPIQEQSPQQP  
QSPQQPQSPLQPQSPQQPQSPEQPQSPQQPQSPQQPQSPQQPQPPDQAPQQPQSPPQPLQ  
PQVQADSSSPTNPGNDANV**

**>Slc6a11**

**ERGQWNNKVEFVLSVAGEIIGLGNVWRFPYLCYKNGGGAFFVPYVIFFVCCGIPVFFLET  
ALGQFTSEGGITCWRKVCPLFEGIGYATQVIEAHLNVYYVVILAWAIFYLFNCFTTELPW  
ASCGHYWNTENCVDFNNESIANFTNPYSTSPVMEFWERRVLKISSGIEEVGGLRWELALC  
LAIAWVICYFCIWKGPKSTGKVVYVTATFPYFMLLILLLRGITLPGAANGIKFYLYPDIS  
RLSDPQVWVDAGTQIFFSYAICLGCLTALGSYNSYNNNCYRDCLMLCCLNSGTSFVAGFA  
IFSVLGFMAYEQNVPIEAVAESGPGLAFIAYPKAVTMMPWAPLWAALFFMMLIFLGLDSQ  
FVCVESLVTAIVDMYPKTFRVGYRRELLILGMSIASFFLGLIMLTEGGALCSLLVVYVAV  
VVVFLVVVMVYIASICLYWL**

**>Slc6a11a**

**MAGSSTRRTGNQQADITPEERGQWANKIEFLLTVAGAIIGLGNVWRFPYLCYKNGGGAFF  
IPYVLYLVTCGIPLFVLETSLGQYTSQGGIMCWRKVCPLFEGMGYASQLIIVYGSITYII  
IIAWAFLYLFSSFNVELPWASCNNPWNTDTCIVLSGRNSSSELASPLNSSSSVMEFWHHR  
VLRLSSGVEHLGTVRWDLALILLLVWILVYFCIWKGVKSTGKAVYFTATFPYVMLLILLL  
RGVTLPGALNGIYYYMYPDLTRLADPQVWMDAGTQIFYSYAICLGYLSSLGSYNQYNNNC  
YRDSFYLCLLNSGTSFLGGFAIFSVLGHMAQEQGVDISLVAESGPGLVFIVYPQAVTMLP  
LSQFWAVCFFIMIILLGLDSQFVGLESIMTSVTDIFPTVLRRGFRREMLLLGICLVCYFM  
GLLMITEGGLYIIQLFDHYVCSGTTLLFLATCQSVAIGWVYGADRFYENIQDMIGYKPWP  
MVKYCWLYVTPSVCVGTFIFSLVKYSPLKFNNKYMYPWWAYGIGWFLAVSSLSLIPINMI  
YKLHKGKGTFWERLQLACSPAEDLPQSQRPSAHHYTLSASTDREKSPDNL**

**>Slc6a13\_first**

**MEIQHDPDLQFKLAYSDAQSNETGLKTQIRGQWSSKVEFILAVAGQIIGLGNVWRFPYLC  
YKNGGGVFFIPYVVFLFACGIPLFLMETALGQYTSQGSVTCWRKICPLFEGLGYGSQVVV  
LYSSAYYIIILAWAFFYLFSSFSGELPWASCRNWWNSENCVEFDRMQGAKNLSFMANASS  
PVKEFWERRVLNITGSVNELGSVRWELALCLLLAWVICYFCVWKGVKSTGKVVYFTATFP  
YVMLMVLLIRGLTLPGAIDGITFYLYPNPARLADPQVWMDAGTQIFYSYALCIGCLTALG  
SYNKYNNNCYKDCVYLCLLNSGTSFVAGFAIFSVLGFMALEQGVDISVVAESGPGLAFIA  
YPRAVAMMPMAQLWSICFFLMIILLGLDSEFVGLESLMTAITDMNPNFFLQGHRRKLFLL  
VICIACFLIGLLMVTEGGLYVFQLFDYYSCSGMTLLLFAIAQSICIGWFYGADRLYENIA  
DMIGYHPLTLMKYCWKYITPIVCIGTFIFSLVKFTPLKFNNTYEYPWWGYAAGWWFTLSS  
TLLVPIWMIYAILVTPGTLKQRLRVLCTPASDLPLTSERPKETL**

**>Slc6a13\_second**

**SAGQKEMEPSNGLNRPLEIVPHAEVKMKDRGQWSNKLEFVLSVAGEIIGLGNVWRFPYLC**

**YKNGGGAFFIPYLIFLFTCGIPVFFLEISLGQYTSEGGITCWRKISPLFEGIGYATQVIV**

**ALLNFYYIIVLAWGIFYLSNSFTWNLPWSSCNNTWNTESCMEFQRRNDSVDQSYLDNATS**

**PVIEFWERRVLRISSGIEDIGTLHWDLVLCLLLAWVLCYFCIWKGVKSTGKVVYFTATFP**

**YVMLVILLIRGVTLPGASRGIQFYLYPDLGRLADPQVWMDAGTQIFFSYAICLGCLTALG**

**SYNKYNNNCYRDSLALCFLNSGTSFVAGFAIFSILGFMSYEQNVPISEVAESGPGLAFIA**

**YPRAVSMMPISPLWACFFFIMIVLLGLDSQDICSKSLVTAMVDMYPSFFRRKNRRELLIL**

**VVAIVSFLVGLIMLTEGGMYVFQLFDYYAASGMCLLFVAIFETVCIAWIYGANRFYDNIE**

**DMIGYRPGPYIKYCWLFFTPATCFGTFAFSLIKYTPLKYNNEYVYPWWGYALGWMLALSS**

**MICVPLWVIYRMGTTKGSLMERVQFLIRPSPDLPKSRREQEKLQAVFSADGDSLQEKESH**

**C**

**>Slc6a13l**

**MEHSSRPAVKLNLLNGALVKARPKPPAREQWANKLEFLLAVAGHIIGLGNVWRFPYLCYK  
NGGGAFFVPYVLFLFTCGIPLFFLETSLGQFTSQGGITCWRKICPLFEGLGFGSQVVVLY  
TGVYYIIILAWAFLYLFSSFTSELPWASCNNYWNTPSCMEFSESNITEYSPNKTTSPVIE  
FWERRILGLSGGIEQIGNVRWDLALCLLLAWIICYFCVWKGVKSTGKVVYFTATFPYLML  
IVLLVRGLTLPGAINGITFYLYPDPSRLKDPQVWMDAGSQIFYSYGVCTGVLTALGSYNK  
YDNNCYRDCVYLCLLNSLTSFVAGFAIFSVLGFMADEQGVDISLVAESGPGLAFIAYPRA  
VALMPLPQLWAIFFFIMIIFLGLDSEFVYQEALVTSISDMYPSFFQVGHRRKFLLLFICS  
ASFFVGLLMVTEGGLYVFQLFDYYACSGMTLLTFAILQSICVGWVYGADRHYDCVEDMIG  
YRPWPFMKCCWKYLTPAICTGTFIFSLVQYTPLKFNNEYEYPWWGYAIGGFFTLSSTLLV  
PLWMIYLVGTTPGSMRQRVRALCTPAEDLPDPKCPKQKLNTATFETFTDLLTLRTVHIQN  
SLPHRDAV**

**>Slc6a14**

**MKDYSLKNIRGVLFKNSVGDEQDKDKSDKAEHVVQNDENSDRGNWSSKREYMLSMIGYAV  
GLGNVWRFPYLAYKHGGGAFLIPYTIMLAVSGLPLFFMESSFGQFCSQGPINVWKAVPIL  
QGVGITMMLVSTFVAIYYNVIIAYSIYYLFASFQDPLPWSIKNCNTTASNISTAAVNVSC  
GQISGQSLSEKYWDEVALQRSSSMDETGPVVWHLALCLLLSWILVGAALFKGIKSSGKVV  
YFTATFPYIVLLILLIRGATLEGAKDGIEFYIGSQSNLTKLAEAEVWKDAATQIFFSLSI  
AWGGLMALSSYNKFYNNCYQDSIVVCVTNCGTSIFAGFAIFSVLGHMAHVYQRPVSEVAD  
AGFALAFIAYPDALSKLPISPLWSILFFFMLITLGLDSQFAGIEVISTCLLDAYPEVLKS  
KRGLVTTAVCIILFLLGLPCVTRAGIYWVNLIDTFSAGWILLVAGLLEVLGLCILYGGNR  
FIKDIEMMIGTKSSLFWLWWRACWFFITPVVLSIILIWSLYTFTSPTYSSVAYPDWGISL  
GWCITAFSLMWIPIVAVWKVCKARGGLWQRIKSACSPTEDWGPYLECHRGERYGTRGETD  
PNIFVISNKVSTRL**

**>Slc6a15**

**MPKNSKTIKREIDDDDVTESVKDLLSNEDSCDDSFKKSSLMVGDVPQNKQKDVEEGSEEE  
EEEEEEERPAWGSKLQYILAQVGFSVGLGNVWRFPYLCQKNGGGAYLVPYLILLLLIGIP  
LFFLELAVGQRIRRGSIGVWNYISPHLGGIGFASCLVCFFVALYYNVIIGWSLFYFSQSF  
QQPLPWHECPLVKNKTNTYIEPECEKSSATTYYWYRVALDISDSISEGGGLNWRMTLCLL  
AAWTMVCLAMIKGIQSSGKVMYFSSLFPYVVLICFLARAFLLKGSVDGIIHMFTPKLEIM  
LEPKVWREAATQVFFALGLGFGGVIAFSSYNKRDNNCHFDAVLVSFINFFTSVLATLVVF  
AVLGFKANIMNAKCVEMNTKKIIGFLGKEINPGLIPHHINFSQVSPEDYQQMTNIIQGVM  
ENDYPRLGLDNCDIKEELNKAVQGTGLAFIAFTEAMTHFPASPFWSVMFFLMLVNLGLGS  
MFGTIQGILTPIVDTFKVRKEYLTVGCCVLAFFIGLTFVQRSGNYFVAMFDDYSATLPLL  
IVVLLENIAVAWVYGTDKFFEDLKDMLGFTPYRYYYYMWKFVTPVLLLGLLAASVIQLGL  
APPSYSAWNQQLAKEQSLSYPPWGLAVCISLVVTAILPVPVVFILRCLNIIDEKTGGLST  
VSYKKGRIIKDTACRTREDDEDDASLLNAKTPSEAPSPMPANYRKQSGPASAADAKLNGS  
CSTGYLMPNITDIPDMPESDL**

**>Slc6a16\_1of2**

**MEKPPLPSDENGSVLTESQSDMALVSADDEGSAGADGQEDDRPAWDSKLQYVLAQVGFSV  
GLGNVWRFPYLCHQNGGGAFMLLYVMLLLIIGVPLFFMELAAGQSIRQGSIGVWKHISPR  
LAGIGYSSCMVCFFVALYYNVIIAWSLFYMGNSFQYPLPWEQCPVDMISNQTVKECAASS  
PTSYFWFRKALDISDSIDQSGEFNPIMTGCLLAAWAIVCLAMIKGIKSSAKVMYFSSVFP  
YAVLICFLIRGLMLDGAIDGIKYMFYPKVEIWGEVQVWRQAATQVFFALGLGYGSVIAYS  
SYNPIHNNCHRDAIMVSGINFMTSVLASLVVFVVLGFRAKNIALDCVATNVARMAEMAQT  
GSSQHWRPLFNMSDPKSVVLQDYRQWYSSYGSLLGSNITDCDLEREMSKGVEGTGLAFIA  
FTEAMALFPASPFWSTLFFLMLLNLGLSTMFGTMQGILTPLMDNFRVLGRHKTMLTVCSC  
ILGFFIGLLFTQRSGNYFVTMFDDYSATLPLIIVVIFETVSVAWIYGADRFLDDVEVMLH  
WRPPVVYRYLWKYVCLLGMVGLLAASLLRMVFKRPTYTAWNHTTGSEASLEYPGWALVVL  
SMLIIVASLPVPIGYLLSFLRGGLNLPVEEGEIQPPRELYSKCSSAEPEPNHHHCTMDQE  
RNRPHSAFLTLAPEHYRLLSQQEDGEEEEDTGV**

**>Slc6a16\_2of2**

**MTSAKPPLPADGQQDEVELRLGLEPEVPLETARDGWDSKVEYFLAQVGFSVGLGNVWRFP  
YLCHQNGGGAFILLYVVLMALVGVPLFFLELAAGQSIRQGSIGVWRHISPKLVGIGYSSC  
VVCFFVALYYNVIIGWSIFYLGNSFQYPLPWEKCPTEGNSTVKECAASSPTAYFWYRKAL  
DITDSIDETGEFNFILTGCLLAAWVIVCLAMYKGIKSSGKVMYFSSVFPYVVLLCFLIRG  
VTLDGASEGIKFMFYPRLEIWADVQVWRQAATQVFFALGLGFGSVIAYSSYNPRNNNCHR  
DAFTVSGVNFMTSVLATLVVFAVLGFRAKTIATECVKRNLKALLKVTSSAPLPVLSINAS  
DVESISLDEYANWYSTQGMELSISDYNITACSLEDELRQGVEGTGLAFIAFTEAMTLFPG  
SPFWSALFFLMLLNLGLSTMFGTMAGILTPLTDTFKTLRNHKLIFTICSCTVGFLIGLVF  
TQRCGNYFVTMFDDYSATLPLIIVVIFQTISVSWVYGADRFLEDLKQMLNRPIPVIYKYL  
WKFVCPIAMLGLLGASLLKMILKRPEYSAWNREKASKEDLPYPDWALAVLIILIIIASLP  
VPIGYIHSLLLERLGQSPADTEARYTPCATTDADLTPLSTLPPSRDDLNSSHPLLEGNHN  
SHLQNGHIESVESSVL**

**>Slc6a17**

**MPKSSKVTQREHSNEPVTESVADLLALEAPMDYKSSQMSMNMTGGSAPPIGKPDISPDLE  
DGRPAWNSKLQYILAQVGFSVGLGNVWRFPYLCQKNGGGAYLVPYFILLILIGIPLFFLE  
LAVGQRIRRGSIGVWNYVCPRLGGIGASSLMVCGFVGLYYNVIIGWSIFYFFQSFQYPLP  
WSDCPIRKNGSQAIVEPECEKSSATTYFWYRETLNITSTIADSGGLNWRMTLSLLAAWII  
VCLAVIKGIQSSGKVMYFSSLFPYVVLFCFLVRGLFLKGAVDGIAHMFTPKLEIMLEPQV  
WREAATQVFFALGLGFGGVIAFSSYNKRDNNCHFDAVLVSVINFLTSILATLVVFAVLGF  
KANIMNEKCVVENAEKILGYLNSNVLSHDLIPPHVNFSHLTTSDYAEMYGVIKIVKEDSF  
AQLGLEQCLLEDELNKAGAVQGTGLAFIAFTEAMTHFPASPFWSVMFFFMLINLGLGSMI  
GTMTGITTPILDTFKIRKEYLTVGCCIVAFLCGLLFVQRSGNYFVTMFDDYSAGLPLTIV  
VILENVSVAWIYGTKRFMQDLEDMLGFRPYSVYFYLWKYVSPVCLIILISASVVEMAISP  
LGYNAWVQDLAMERFQSYPPWAIVMCFALIIVAMLPLPLVFIARHFNWLPDGSNKLSVSY  
RKSLAKEASTLEDETRFILGKNPSEAPSPMPSHRAYLGPGSTSPVELITNSTSISGYGSG  
YQTNPAPPKSES**

**>Slc6a18**

**MDTASETSSVQERPKWDNKVQYLLTCVGFAVGLGNIWRFPYLCQIYGGGAFLIPYLIALV  
FEGLPLLYLELAIGQSLRKGSIGVWHSISPLLGGVGVASMVVSFLVGLFYNTILAWVLWY  
FFHSFEDPLPWSQCPINDNLEGYVEECVSSTPVNYYWYRQTLNISPDIEQSGSLQWTLVL  
CLATAWSIVYICFIRGIETIGKAVYVTATFPYLVLTIFLVRALTLPGATDGLQYLFTPDW  
SLLTNPQVWLDAATQIFFSLSLAFGGLIAFSSYNPKKNDCERDALFVGIINSATSLYASI  
PIFAILGFKATSNFNSCVNSNILDLTNAFDIGDRNITIENYDSWLRDLNASDPDRVSSLN  
LKHCVLKNFLDQSASGTGLAFIVFTEAVIEMPGSQVWAVLFFVMLFSLGLSSMFGNLEGV  
LTPLLDLHMVPRWMPKEIFTGLICVVNFLVALIFTLGSGNYWLEIFNSYVGSVPLLVIAF  
FEIIAVVCFYGIKRFSDDIEQMTGRRPNLFWRCCWMGISPVMLLVVLVAYVVVQVQKHPT  
YPAWNPQYENFPETEEKPYSTWVFSICVLLSSVPVISIPIVALYRLMRRHTHPHSGYPNP  
YTNQSYTDDTHTQSFKQI**

**>CU856173.1**

**MKLKLKLPNPGLEQRIPSHSELEKLELQEAGERPKWDNKAQYMLTCVGFCVGLGNVWRFP  
YLCQSHGGGAFMIPFLILLVLEGIPLLHLEFAIGQRLRRGSVGVWRSINPYLLGVGIASM  
LVSFIVGMYYNTIIAWVMWYFFNSFQDPLPWSQCPINGSRTGFVSECERSSPVDYFWYRK  
TLNTTPHIEDSGGLQWWMVLSLLCAWTVLWVCCIRGIETTGKAVYITSTLPYLVLTIFLI  
RGLTLKGSVSGIKFLFTPDVNELLDPQTWLDAGAQVFFSFSLAFGGLIAFSSYNSVHNNC  
EQDAVIISIINGMTSIYAAIVIYSIIGFRATERFDDCLNGNILSLLNAFDLPEGSIIEGN  
YTEAIQQLNISRPDIIQELQLKTCDMQTFLSQGVEGTGLAFIVFTEAITKMPVSPLWSVL  
FFIMLFCLGLSTMFGSIEGVVVPLQDLDILPKNWPKEAYTALVCVVSFAFAIIFAQGSGE  
YWLALFDGFAVSIPLLIIAFCEMMAVSYVYGIDRFNDDIKFMIGHKPNIFWQATWRLISP  
LIVLVIFLFYFVTTVSKKLTYIAWDPESENFPTLSVLPYPGWISAIIFILAGIPVLVIPT  
VALVRLIRNRCCKKEETHATETPYSISDRVQMMEETEQNNPISTALH**

**>Slc6a19a**

**MKLKLPNPGLEQRIPSHSELEKLELQEAGERPKWDNKAQYMLTCVGFCVGLGNVWRFPYL  
CQSHGGGAFMIPFLILLVLEGVPLLHLEFAIGQRLRSGSVGVWRSISPYLTGVGIASMLA  
SFIVGMYYNTIMAWVMWYLFNSLQEPLPWSQCPVNLNRTGLVSECERSSPVDYFWYRETL  
NTSTAIEDSGALQWWLVLCLLCAWTFLYICCIRGIETTGKAVYITSTLPYVVLTIFLIRA  
LTLKGSVNGIKFLFTPDVNELMNPSTWLDAGAQVLFSFSLAFGGLISFSSYNSVHNNCEQ  
DAVTISIINGLTSVYSATVIYSIIGFRATENYDICLDSNILSLLNAFDLPEGSITENNYT  
VALQQLNISRPDIIQELQLKTCDMQTLLSEGVEGTGLAFIVFTEAITKMPVSPLWSVLFF  
IMLFCLGLSTMFGNIEGVVVPLQDLNLLPKRWPKEVFTGLTCVVSFLTALVFVQSSGNYW  
LALFDGFAGSIPLLVIALCELIAVVYVYGIDRFNEDIKFMVGHKPNIFWQISWRFLSPVI  
LLVILIFYFITTVSKQLTYNVWDPQSADFPTLKEVDYPNWISVVIFVLAGVPSLCIPGVA  
IGRALWRCCTRRKHKSISEKQQMSVNTIA**

**>Slc6a19b**

**MKLKLVLPNPGLEERILNHEALERLEVEEAGDRPKWDNKAQYMLTCVGFCVGLGNVWRFP  
YLCQSHGGGAFMIPFLILLVFEGIPLLHLEFAIGQRLRKGSVGVWRTINPYMLGVGIASM  
CVSFLVSLYYNTIIAWVMWYFFNSFQDPLPWSQCPINENRTGPIPECGKSSPVDYFWYRE  
TLNTSAAIDDTGGLQVWMVLCLISAWAVLYVCCIRGIETTGKAVYVTSTLPYLVLTIFLI  
RGLTLKGSVDGIKFLFTPDINELANPSTWLDAGAQVFYSFSLAFGGLISFSSYNSVHNNC  
EQDAVIISVINAFTSIYAATVIYSIIGFRATERFDDCMNGNILTLLNTFDLPEGFINQSN  
YQDVFQSLNSTSPDIISSLSLKTCDLNNFLSEGVEGTGLAFIVFTEAITKMPLSPLWSVL  
FFIMLFCLGLSSMFGNIEGVLVPLQDLGVFPKSWPKEIISGVTCLVCCLVGLIFVQGSGN  
YWLALFDSFAGSIPLLIIAFSEMIGVVYVYGIDRFNEDLIFMIGHKPNIFWQATWRFISP  
LIMLAIFVFYFSTTVTKEIFYSAWDPESENFPTLEKKPYPTWIYVIIFLLAGVPSLAVPG  
TAVFRAIRDYCCKKHPSASIQQLDSVSYKVQMHDEEVKTQKTEKFDQKLYT**

**>Slc6a2**

**SGPRERQGAKMNIQVLPEHKLSSVAPLKQFNVEKKEVELILVKEQNGVQYTNSSVVASPS  
SRACTSASGEEIERETWGKKMDFLLSVIGFAVDLANVWRFPYLCYKNGGGAFLIPYVLFL  
FIAGMPLFYMELALGQYNREGAATLWKICPVFKGVGYTVIVIALYVGFYYNVIIAWSLYY  
LYASLTSELPWLHCNNPWNSPNCTEPKDINGTVLGNGTSYAKYKNTPAAEFYERGVLHSH  
ESKGIGDLGLPRWELTICLVVVAFILYFSLWKGVKSSGKVQKLQITATMPYIVLLVLLIR  
GITLPGAMNGIRAYLHIDLKKLNNPQVWIDAATQIFFSLGAGFGVLIAFSSYNKFNNNCY  
RDAILTSTINCVTSFFSGFAIFSVLGYMAEQHKVNIKDVATEGAGLVFVIYPEAISTLPG  
ATFFAIVFFIMLLTLGIDSSMGGMEAVLTGLSDDFKILKRNRKLFTFATVVGTFLMALLC  
VTNGGIYVLTLLDKYAAGTSILFGVLFEAIGVSWFYGVDRFSEDIERMMGFKPGIYWRLC  
WKFVSPAFLLLVVIASIVTSGRLTYDEYVFPYWADMLGWSIALSSMLFVPFYAIYKFFSV  
PSSFKERLAYCVTPEHEHHLVAEGNVRQFKLKHWLTI**

**>Slc6a3**

**SAAGPREVELVLVKEQNGVQFTSSSLRSPASGQQRETWGKKIDFLLSVIGFAVDLANVWR  
FPYLCYKNGGGGAFLVPYLFFMVIAGMPLFYMELALGQYNREGAAGVWKICPIFKGVGFT  
VILISLYVGFYYNVIIAWALFYLFSSFSGELPWIHCNNTWNSPNCSDLNATLLNDTYKTT  
PALEYFERGVLHVHESSGIDDLGAPRWQLTACLAVVIVVLYFSLWILGNTHRQVVWITAT  
MPYVVLTVLLLRGVTLPGAIDGIKAYLSVDFLRLHMCAAAICTIILHSAASFIFVLNEFP  
AIIFNDSCFRDAIITSSINSLTSFFSGFVIFSFLGYMSQKHNVEICSNVLDCPGLVFIIY  
PEAIATLPGSSVWAVIFFIMLLTLGIDSAMGGMESVITGLIDEFKFLHKHRELFTLFIVV  
STFLISLICVTNGGIYVFTLLDHFAAGTSILFGVLIEAIGIAWFYAVRSLNLQSLQSTGE  
TVMFTVLMCCRYSVKNVTYTQFMVVISFATFNPPKYGSYYFPTWATMVGWCLSISSMIMV  
PLYAIYKFCSLPGSFCDKLAYAITPETDHHLVERGEVRQFTLHHWLVV**

**>Slc6a4a**

**MDMKESMMMNQEYGGEQQKVPESQENGRLVVDSVPEKDQKSGSGPGQVSNGYRSTSPQSP  
KEGAGTGTDRVNTPGTFRTLVVQQTSLDPPRETWSKKMDFLLSVIGYAVDLGNVWRFPYI  
CYQNGGGAFLLPYLLMAVFGGVPLFYMELALGQFHRSGCISIWKHVCPIFKGIGFAICII  
ALYIAFYYNTIMAWALYYLLSSFRATLPWTTCNNRWNTPNCTHYLSTDLNVSWTNNSISP  
AEEFYVRQVLQVHLSPGLHQLGWVSWQLALCLLFIFTVVYFSIWKGVKTSGKVVWVTATF  
PYLVLLILLIRGATLPGAWRGVVFYLKPDWKKLLTTTVWLDAAAQIFFSLGPGFGVLLAF  
ASYNPFHNNCYKDALITSSVNCLTSFLSGFVIFTVLGYMAEMRQQGVETVAKDAGPSLLF  
IIYAEAIANMPAATFFAIIFFLMIIMLGLDSTFAGLEGVITAMLDEFPHLLARRREWFVL  
GLVCVCYLGALSTLTYGGAFVVKLFEEYATGPAVITVVFLEVIAVSWFYGTTRFCNDVQL  
MLGFAPGLFWRVCWIAICPCFLLFIIVSFLAFPPEVKLFDYLYPFWTTVLGYCIGVSSFI  
CVPSYMVYHLVTTKGTFQQRLLKGITPEAPGSSGPQRDTIVITNAV**

**>Slc6a4b**

**MPHQEQVIAHGNLCAPGPPNNAGYNSNPVPVIIQTESRDKWSKKMDFLLSVIGFAVDLGN  
VWRFPYICYQNGGGAFLIPYVLMAVFGGVPLFYMELALGQFHRTGAISIWKHICPIFKGI  
GFAICIIALYVSFYYNTIIAWALFYFYSSFSSTLPWTSCDNDWNTENCTNYFGKDNVTWT  
NYSRSPAEEFYTRNVLAVHESSGLGNVGYIRWQLMLCLFLIFTIVYFSLWKGVKTSGKVV  
WVTATLPYVVLLILMIRGATLPGAWKGVVFYLNPKWEKLKETSVWVDAAAQIFFSLGPGF  
GVLLALSSYNPFTNNCYRDAIVTSLVNCLTSFVSGFVIFTVLGYMAEQRNVNVEDVARDK  
GPSLLFITYPEAIANMVGSTFFAIIFFVMMITLGLDSTFGGLEAIITAVMDEYPDVLSHR  
RELFVLGLVVVCFLGSLSTLTKGGAYVVKLLEEFGVGSSIIAIVFLEATAVSWFYGINRF  
SNDIKSMLGYTPGLFWKVCWVAISPAFLAYIIISSLLNPQTLTLFDYEFPDWSITVGYII  
GASSFIWIPIYMVYKLVWTPGSLKQRLAVCLRPERTLPDIHTDGMSLSPVP**

**>Slc6a5\_first**

**MDFSEHGEMLRQPSNSVPPQPSGGPVGATTNTKPENSKPAPPPPPVNERKTFCPSENKPC  
DMEANKAYGTFKNTAPGPTFAGVNSAVRKDSVGKMDASTGKATSDFMSNNQSAVRIAAEH  
NNSTGDWTSMSQTTIILGTDGNTSVLPGTVTGPPTDDTGRLFQDDDDDDGGDENKARGNW  
SNKLDFILSMVGYAVGLGNVWRFPYLAFQNGGGAFLIPYLIMLGLAGIPIFLLEVSLGQF  
ASQGPVSVWKAIPALQGCGIAMLIISVLIAIYYNIIMCWTLYYLFASLKETLPWATCKNE  
WNTVECKDKDMLLLDTCILRDRNITSIKNTTFCLSANVVGNLSKLLNVTVDNKTYVSPSE  
EYFKYNVLHISKGIEYPGDIRWPLAACLFLAWLIVYASLAKGIKSSGKVVYFTATFPYVV  
LVILLIRGVTLPGAGSGILYFITPKWEKLNDAKVWKDAATQIFFSLSAAWGGLITLSSYN  
KFHNNCYRDTLIVTCTNSATSIFAGFVIFSVIGFMAHELKVPIESVADEGPGIAFVVYPE  
ALTRLPLSPFWAIIFFLMLLTLGLDTMFATIETIVTSVSDEFPKYLRKHKPQFTLVCCLS  
FFVLGFPMITESGMYMLQLVDTFAASYSLVIIAIFELVGISYIYGLQRFCEDIEMMIGFQ  
PNKFWRVCWAFVTPTILTFILALSLYQWKVMTYEDYTYPNWSMVLGWLMVICSVIWIPIM  
FAIKMHLAPGSLIERLKLVCSPQPDWGPFLMKHRGERYKNMIDPLGTNSLGLKLPPKDFQ  
LSAQYQ**

**>Slc6a5\_second**

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DMEANKAYGTFKNTAPGPTFAGVNSAVRKDSVGKMDASTGKATSDFMSNNQSAVRIAAEH  
NNSTGDWTSMSQTTIILGTDGNTSVLPGTVTGPPTDDTGRLFQDDDDDDGGDENKARGNW  
SNKLDFILSMVGYAVGLGNVWRFPYLAFQNGGGAFLIPYLIMLGLAGIPIFLLEVSLGQF  
ASQGPVSVWKAIPALQGCGIAMLIISVLIAIYYNIIMCWTLYYLFASLKETLPWATCKNE  
WNTVECKDKDMLLLDTCILRDRNITSIKNTTFCLSANVVGNLSKLLNVTVDNKTYVSPSE  
EYFKYNVLHISKGIEYPGDIRWPLAACLFLAWLIVYASLAKGIKSSGKVVYFTATFPYVV  
LVILLIRGVTLPGAGSGILYFITPKWEKLNDAKVWKDAATQIFFSLSAAWGGLITLSSYN  
KFHNNCYRDTLIVTCTNSATSIFAGFVIFSVIGFMAHELKVPIESVADEGPGIAFVVYPE  
ALTRLPLSPFWAIIFFLMLLTLGLDTMFATIETIVTSVSDEFPKYLRKHKPQFTLVCCLS  
FFVLGFPMITESGMYMLQLVDTFAASYSLVIIAIFELVGISYIYGLQRFCEDIEMMIGFQ  
PNKFWRVCWAFVTPTILTFILALSLYQWKVMTYEDYTYPNWSMVLGWLMVICSVIWIPIM  
FAIKMHLAPGSLIERLKLVCSPQPDWGPFLMKHRGERYKNMIDPLGTNSLGLKLPPKDFQ  
LSAQYQ**

**>Si\_ch211-132b12.4**

**MWLEWATCGGFPYLCYRNGGWAFLIPYLMFVVTCGVPLFLLETAMGQFTQQGAITCWHHL  
CPLAGRIGYAGQLKVVYGCMYYIIILAWALFYLIYCFSSQLPWASCDNIWNT**

**>Slc6a6b**

**MKDIMAQKEKLQCLKDFHKDILKPSPGKSPGTRPEDEAEGKHPQREKWASKLDFLLSVAG  
GFVGLGNVWRFPYLCYKNGGGAFLIPYFIFLFGGGLPVFFLEVALGQFTSEGGITCWEKL  
CPIFTGIGYASIVIVSLLNIYYIVILAWGLYYLFQCFQPELPWASCNNKWNTENCVEDTL  
RRNKTLWAAANATNFTSPVTEFWERNVLSISDGIEEVGHVKWDLALCLLAMWVICFFCIW  
KGVKSTGKVVYVTATFPFVMLIVLLVRGVTLPGAAEGIKFYLYPNVTRLGDPEVWIDAGT  
QIFFSYAICLGAMTSLGSYNKYKYNCYRDCLLLGGLNSATSFVSGFAIFSVLGFMAQEQG  
VDIADVAESGPGLAFIAYPKAVTMMPLPTFWAILFFIMLLLLGLDSQFVEVEGQITSLVD  
LYPSFLRKGYRREIFIAIVCFVSYLLGLTMVTEGGMYVFQLFDYYAASGVCLLWVAFFEC  
IAVAWVYGEYKTCTTYNGVM**

**>Slc6a7**

**MKPLSELCSEHLKKSAAEMPTEEARTAPGNGVITTPSTENPAHQNGAVSSPVASQSQPPS  
SAASPPAQPPRDQWGGKYEFLLSCIGYCVGLGNVWRFPYLCYRNGGGVFLIPYFIMLFFT  
GMPLFLMELSLGQYGAAGPITVWKCCPLLKGIGIGMLCVSTLVCLYYNVIIAWTFYYLGS  
SFQSPLPWSCDALQNIALCANKTNSTQSPSEVFWNEKVLGVVHSTGLSDPGPVRWPLALC  
LLAAWIIIFLCMLKGIHSSGKVVYVTATFPYFVLLVLIIRGATLEGSLDGVAFYLTPKWD  
QLADAQVWNDAASQIFYSLGIGVGGLLSMASYNKFDNNVIRDTIIITIGNCSTSFFAGFA  
IFSILGHMAFKKGVPVDKVADSGPGLAFVAYPEALALLPGSVFWSILFFLMLFMLGVDTL  
FGNMEGICTAVLDEFPQLRSNLKHKTLFLAVLCFSFYLMGLLLITDGGIYWFTLIDSFST  
SFGLIIITLFMCIGISFFYGVNQFCQDIVDMICRCPPWCTKMLLYFKACWVVFTPFLLTF  
ILTYIFIEMYRTSLRYGSYVYPIWGKALGVCMGALCCLQILIWAIVAISKESGTLKDRFK  
KSIRPLNSWRVNNINSSSQEQHVEPHTIEGPFTVNLTEADYTGMNWEGISEA**

**>Slc6a8**

**EEKKGHLIPNGNAHPSVNGTLNGGPMSAATGAISAVEKKREGYPERETWTRQMDFIMSCV  
GFAVGLGNVWRFPYLCYKNGGGVFLIPYVLFIFLGGIPIFFLEIALGQFMKAGSINVWNI  
APLFKGLGYASMVIVFFCNTYYIMVLAWGFYYFIKSFNATLPWSTCDNPWNTENCIEIFR  
QGDCKNGTIGNSTFGNLTCEELANGRSPIIEFWENKVLNISDGLDEPGAVNWELMLCLLA  
VWVMVYFCVWKGVKSTGKIVYFTATFPYVVLIILLVRGVTLPGAYDGILYYVKPDWSKLG  
EAQVWIDAGTQIFFSYAIGLGALTALGSYNRFNNDCYKDAFVLALINSGTSFFAGFVVFS  
ILGFMASEQGVDISKVAESGPGLAFIAYPKAVSMMPVAPVWAALFFIMLLLLGLDSQFVG  
VEGFVTGILDLFPGKYYMRYQREIAVAICCLLCFIIDLSMVTQGGMYVFQLFDYYSASGM  
TLLWQAFWECVVVAWVYGADRFMDDIARMIGYRPFPWMKWCWSIITPCVCMGIFLFHLLN  
YKPLTYNNVYVYPWWGEVIGWCLALSSMLCIPVSLVYKLSGAKGTFKERWENLTKPVWGA  
HHLEYMAPDTDIKSLASLSPGMEENKVIIFESVM**

**>Slc6a9**

**MSESNTTAAVMADQNGAVPGEPVKRDENSRRGNWGNQIEFVLTSVGYAVGLGNVWRFPYL  
CYRNGGGAFMFPYFIMLVFCGIPLFFLELSFGQFTSLGCLGVWKVSPMFKGVGYGMMVVS  
TYIGIYYNVVICIAFYYFFMSMTNLLPWTYCNNPWNTPDCSGVVSTHRANATFANMSAVV  
SGVTEIVNRTKRTSPSEEYWRNYVLNISDGIGNFGEVRLPILGCLAVSWFVVFLCLIRGV  
KSSGKVVYFTATFPYVVLTILFIRGITLDGAISGIKYYLTPQWQKILDAKVWGDAASQIF  
YSLGCAWGGLITMASYNKFHNNCFRDSIIISVTNCGTSVYAGFVIFSILGFMAHHLGVDV  
SEVADHGPGLAFVAYPEALTLLPISPLWSLLFFFMLILLGLGTQFCLLETLVTAVVDEIG  
TDWIIKNKTYVTLGVAIIGFLLGVPLTTQAGIYWLLLMDNYAASFSLVIISCIMCICIMY  
VYGHKNYFKDVEMMLGFPPPIFFRICWRYVSPFIITFILIFTVIQYKPITYNDYVYPGWS  
LVIGFAMALSSVICIPIYALFKIAMSEGSTFLERLKNSVKPDPDWGPALQEHRKGRYATA  
GPESVEVSPLKEDLKDEGKDKLTEKEKETEKKDEIGLTIPGSNGSTLNPTPSA**

**>Slc7a1**

**MVLKKLLRFGKQLLRVKVVNCNSEESRLSRCLNTFDLVALGVGSTLGAGVYVLAGAVARE  
NAGPAIVLSFLIAALASVLAGLCYAEFGARVPKTGSAYLYSYVTVGELWAFITGWNLILS  
YVIGTSSVARAWSATFDELIGKHIEHFCRQYMSMNAPGVLAEYPDMFSVFIILTLTGLLA  
FGVKESAMVNKVFTCINILVLLFMVVSGLVKGTLKNWHLDPDEILNATNSTLNSATQPLP  
SEEMLGQGGFMPFGFTGVLSGAATCFYAFVGFDCIATTGEEVKNPQRAIPIGIVSSLLIC  
FVAYFGVSAALTMMMPYYMLDKNSPLPVAFKYVGWEGATYAVAVGSLCALSTSLLGAMFP  
MPRVLWAMADDGLLFKFMAGISERTKTPIKATIMSGFLAAIMAFLFDLKDLVDLMSIGTL  
LAYTLVAACVLVLRYQPEQFSQTYHIANTHEDMEMSETISTPSMGILPGVEERFSFKNLL  
FPDIIEPSNLSGFTVNICTSLLGLLILSFSLLAVRGGIASWNIITLAVLFGLCVIVTFII  
WRQPESKTKLSFKVPCLPFIPVVSMFVNVYLMMQLDRGTWIRFAIWMSIGLVIYFGYGIW  
HSTEAALAHSSMDEELSVYKPACGLNRDSVTPEKEAFLCNGHGSQVDDDGDI**

**>Slc7a1\_2of2**

**LVTLSARLMSGSCLLRHLITFCFNTEESRLSRCLNTFDLVALGVGSTLGAGVYVLAGAVA  
RENAGPAIVLSFLIAALASVMAGLCYAEFGARVPRTGSAYLYSYVTVGELWAFITGWNLI  
LSYIIGTSSVARAWSATFDELIGKHIEEFCRRHMSINTPGLAEYPDMFAVIIILTLTGLL  
AFGVKESAMVNKVFTCVNVLVLMFVVVSGLIKGTLQNWNLNPEDILNHTTSANVSVPLPT  
EESLGFGGFMPFGFSGVLSGAATCFYAFVGFDCIATTGEEVKNPQRAIPIGIVASLLICF  
VAYFGVSAALTMMMPYYMLDKNSPLPVAFKYVGWEGATYAVAVGSLCALSTSLLGSMFPM  
PRVIWAMAEDGLLFKFLANISEKSKTPIMATVTSGIVAAIMAFLFDLKDLVDLMSIGTLL  
AYTLVAACVLVLRYQPEQPSVNVQYQRASCQEETEAESINESSAGFLPGSSDLFSLRNLL  
SPQNEEPSRLSGLTVNICTSILGVLVCVFCVVAVQGGFQTWTLAVLISLALVCLIITLLI  
WRQPESKTKLSFKVPLLPFLPVLSMFINVYLMMQLDKGTWMRFAIWMVIGFIIYFGYGIW  
HSTEAALARSETEDINAFKPTTTDEAATPEKEAFLGN**

**>Slc7a10a**

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LLWSAVLIMYPTTLAVIALTFSNYVLQPAFPNCLPPYIATRLLSTTCVLFLTWVNCSSVR  
WGTRIQDVFTVGKLLALVLIIVVGMVQIAKGHYDALEPQAAFEFIKDPSVGQIALAFLQA  
SFAYSGWNFLNYVTEEVVEPRKNLPRAIYISIPLVTLVYTLTNIAYFSSMSPQELLESNA  
VAVTFGEKLLGMFSWVMPISVALSTFGGINGYLFTSSRLCFSGAREGHLPYLLAMIHLKS  
CTPIPALIVCCTATIVILCIGDTHNLINYVSFINYLSYGVTIAGLLYYRWKKPNMFRPIK  
VNLLVPCSYLVFWAVLLGFSLYSEPVVCGMGLVIMLTGVPIYFIGVQWKNKPQWIYSAIE  
RVTYLGQKMCYVVFPQDDPSEIQPLTEKSEL**

**>Slc7a10b**

**MDGVERKKTEARRSIMKDSELKRDSGIPERVTLKKEIGLLSACTIIIGNIIGSGIFISPK  
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WSAVLIMYPTTLAVIALTFSSYVLQPVFPHCVPPYIATRMLSAICILFLTWVNCYSVRLA  
TRIQDAFTVGKLLALGLIITVGLVQICGGNYESLTPQTAFTFNKAPSIGQIALAFLHASF  
AFSGWNFLNYVTEEVVDPRRNLPRAIYISIPLVTCVYTLTNIAYFSSMSPEELLSSNAVA  
VTFGEKLLGMFSTLMPISVALSTFGGINGYLFTSSRLCFSGAREGHLPSLLAMIHFKHCT  
PIPALLVCCTATIVILCIGETHNLINYVSFINYLSYGVTIAGLLYYRWKKPNLYRPIKVS  
LLVPVCYLLFWALLLAFSLHSEPLVCGVGLVIMLTGVPVYFLGVYWKDKPRCIYDFTEWA  
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**>CU367845.1\_first**

**MPRRTVSAPHPNGDPTPSNFGEKEPLKLNGEPPKEKVELRKKVTLLRGISIIIGTIIGAG  
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VAFVRLWADMIAIRPAGLAVIALAFGRYILEPIFMPCGVPEIAIKLATTIGITIVMYLNS  
MSVSWTARLQIFLTFSKLLAIAIIIVPGLYQLFKGETKNFENAFEVNTAQLTGLPLAFYS  
GMYAYAGWFYLNFVTEEVENPERTVPLAICISMVIVMICYTLTNVAYYTVMSADELLASN  
AVAVTFAEKLMGNFSYAVPVFVALSCFGSMNGCLFAISRMFFVASREGQLPEVLSMIHIR  
RHTPLPAVIVLYPITLLILFLGDIYSLLNFMSFLRWLFIGVAVVGLIYLRFTRPDLPRPF  
KVPIFIPAVFSFTCFFMVFLSLYSDPINTGIGFAISLTGIPAYYIFIHSKRKPKWFQKFS  
DSMNRSLQILLEVVPAEH**

**>CU367845.1\_second**

**MPRRTVSAPHPNGDPTPSNFGEKEPLKLNGEPPKEKVELRKKVTLLRGISIIIGTIIGAG  
IFISPKGILQNSGSVGMSLVVWVACGILSLFGALSYAELGTCIKKSGGHYTYILEAFGPQ  
VAFVRLWADMIAIRPAGLAVIALAFGRYILEPIFMPCGVPEIAIKLATTIGITIVMYLNS  
MSVSWTARLQIFLTFSKLLAIAIIIVPGLYQLFKGETKNFENAFEVNTAQLTGLPLAFYS  
GMYAYAGWFYLNFVTEEVENPERTVPLAICISMVIVMICYTLTNVAYYTVMSADELLASN  
AVAVTFAEKLMGNFSYAVPVFVALSCFGSMNGCLFAISRMFFVASREGQLPEVLSMIHIR  
RHTPLPAVIVLYPITLLILFLGDIYSLLNFMSFLRWLFIGVAVVGLIYLRFTRPDLPRPF  
KVPIFIPAVFSFTCFFMVFLSLYSDPINTGIGFAISLTGIPAYYIFIHSKRKPKWFQKFS  
DSMNRSLQILLEVVPAEH**

**>Slc7a13**

**MESSKLKLKPEVGLLGGVSLIAGVIIGSGIFISPQYVLIFMGSPGASLIIWTLCGLLAMV  
ASLCYAELGTVIRESGGEYIYILRTSGNVMAFICAFTNNIVVRPTGMIASALVFSQNALA  
PFYEDCPPPNVTVKCFAALGILTLTVVNCLNVRSSIKVTVLFTAIKVMALIIIMIGGLVL  
LIRGTTSNSLQNSFEGTTLSIKTMGIAFYHCLWAYDGWNTLNFVTEEVNRPEVNLPRALM  
IAIPMVTILYLLVNVSYLVAMSPAEMISSSAVAVTWGNKVLGGWGWVMSIAAALSSFGSL  
NGSFFSGGRVCYVAAREGHMPDILAMAHMHRLTPSPALIFNTVIALIVLIPGDFQAIVNF  
LSFTAWFFYGVTLSGLLYLKIKKPELPRAISVPIILPIVALLAAVFLVLAPIIDDPQIEY  
LYAVIFILSSIVIYIPFIHFKLFPGMLNKLTVFLQLFLEVAPTAKNL**

**>Slc7a14a**

**MSGLFAKLDPRRVQWGANWFAFRSRVLRTKPVESMLETSGGTGAHGTKLARVLSTVDLVS  
LGVGSCVGTGMYVVSGLVAKEMAGPGVIVSFIIAAVASILSGVCYAEFGVRVPKTTGSAY  
TYSYVTVGEFVAFFIGWNLILEYLIGTAAGASALSSMFDSLANHSISGFMINHIGTLNGL  
GKGEQSYPDILALVIGILVTVIVALGVKNSVGFNNVLNVINLVVWVFIMIAGLFFVSGSN  
WDEGRFLPYGWSGVMQGAATCFYAFIGFDIIATTGEEAKSPNTSIPYAITASLVTCLTAY  
VSVSVILTLMVPYTEIDSDAPLMEMFSLHGFQTAKYIVAIGSIAGLTVSLLGSLFPMPRV  
IYAMAGDGLLFRFLAHVSTYTETPAVACVVSGFLSALLALLVSLRDLIEMMSIGTLLAYT  
LVSVCVLLLRYQPEGDIHGFVNFLSEQNSKRKEGVLAECEKEACSPVSEGDDYGGVPTNT  
CGAKNLPSLGDNEMLIGKPDKSTYTASHPNYGTVDMSSGIESDETDSAYLLKLKKLLGPR  
YYTMRIRLGLPGKMDRPTVATGRIVTRCVVLLFILIFCFCSLIIFGSGQIADGQWWAVLL  
LVVLLLVLTLLVFIIIQQPENPKRLPYMAPCVPFVPASAMLVNVYLMLKLSTITWIRFGV  
WCFVGVLIYFGYGMWNSTLEITAREEEAHASTYQRYDMGVDDNFAVDDDLYPSGDQGPFQ  
NWGKGGQQKQPQQEQSEPQSDGLDRLDNHRTSSSSSHSRAKSKASKPSPGFEALVVDDDL  
DDPLE**

**>Slc7a14b**

**MSALFAKLDPRRIEWDSSWYGLHSRILRTKPVDSMLEGSGDLHGTRLASVLTTVDLVSLG  
VGSCVGTGMYVVAGLVAKEMAGPGVILSFIIAAVASILSGVCYAEFGVRVPKTTGSAYTY  
SYVTVGEFVAFFIGWNLILEYLIGTAAGASALSSMFDSLANHTISRYMINHLGTLNGLGK  
GEESYPDLLALLIALVVTVIIALGVKNSVSFNNVLNVVNLVVWVFMVLAGLFFLSGANWE  
GGRFLPYGWSGVMQGAATCFYAFIGFDIIATTGEEAKSPDTSIPYAITASLVTCLTAYVS  
VSVILTLLVPYNLIDGDAPLMEMFADHGFLAGKYIVAVGAVAGLTVSLLGSLFPMPRVIY  
AMAGDGLLFRFLSFVSPHTETPVVACAVSGSLAALLALLVSLRDLIEMMSIGTLLAYTLV  
SVCVLLLRYQPDRDGFTSFLTEEEEEERRRKEEMMAASEKDLNSPGGEEYAENPCGAKNL  
PSKGDNETLIEKSDSGGYQSENQGYGVGENGIEVDDSDGLFKRVLGSHYYTIRMRLGLPN  
VSDKPTPATGRTVTSCVLIFFILTFFLWTLVIYGFDRVSGGARWAILPFILTIIVLMVTL  
LIIILRQPENPKKLPYMAPCVPFVPTAAMLVNIYLMLKLSSITWVRFVVWCSLGVLIYFS  
YGMWNSSLELSAREEAAHASSYQRYDTEVDDSFNVEEELPPEENEEDGQYQGWAAEERGY  
HYQKQYQDEEQSHNYRSKGRTNKGFEELDNEEYSPE**

**>Slc7a2**

**MLEHCLTFGRSLVRRKNVDQGCLEESKLCRCLSTVDLIALGVGSTLGAGVYVLAGEVAKG  
SSGPSIVVSFLIAALASVMAGLCYAEFGARVPKTGSAYLYSYVTVGELWAFITGWNLILS  
YVIGTSSVARAWSGTFDEIIGGHIEKFCKMYFKMSLPGLAEYPDFFAVCLILLLSGLLSF  
GVKESAWVNKIFTAVNVLVLMFVIISGFVKGDSLNWNISEESLVNYTVVKRNISSAANVT  
SDYGAGGFFPYGFGGTLAGAATCFYAFVGFDCIATTGEEVKNPQRAIPIGIVVSLLVCFL  
AYFGVSAALTLMMPYYLLDEKSPLPLAFEYVGWGPAKYVVAAGSLCALSTSLLGSIFPMP  
RVIYAMAQDGVLFKVLAQINPKTKTPLIATMSSGVVAAIMAFLFDLKALVDMMSIGTLLA  
YSLVAACVLILRYQPDASFERSRISEGKEEVGESELTESESHLNMLKDGGVTLRSLLHPP  
LLPTKNTSSVVNVSVIITVLVVCVVSTLNTYYGQAIIAMELWALGVLAASLFIFIICVFL  
ICRQPQTRKKVSFMVPLLPFLPILSIFVNVYLMVQLSGDTWIRFSIWMAIGFLIYFGYGM  
WHSDERKRHLQNCAVATEKKTLTGNEGFVENKTHTEKTSPC**

**>Slc7a3a**

**MVDKMASFGHILLRRRALDFSGEETRFARCLSTLDLVALGVGSTLGAGVYVLAGEVAREK  
AGPAIVLCFLVAALSSMLAGLCYAEFGARVPKTGSAYLYSYVTVGEIWAFITGWNLILSY  
VIGTASVARAWSSTFDNLIEQKISNFFRASMAMKVPGKVLAEYPDLFALILILLLTGLLA  
FGVSESALVNKIFTGINLIVLGFIIISGFVKGNTANWNLTYEYFINDTNITEPERIESTF  
GSGGFAPFGLGGILSGAATCFYAFVGFDCIATTSEEAKNPMRSIPVGIVASLLICFFAYF  
GVSAALTLMMPYYKLNTQSPLPEAFSYVGWAPARYIVAVGSLCALSTSLLGSMFPMPRVI  
YAMAEDGLLFRSLSRMNKRTKTPLLATIASGIVAALMAFLFDLAALVDLMSIGTLLAYSL  
VAVCVLILRYQPGNLSSSSQTEKLVELVGGEKVAVCGDSGDEYGVELDDSPRKEKFTAKL  
LLVPSKDSPTEMSGTIVYGTTAIISVLITVLCVVLAQRLESIINLEIVWVTACVILVLLC  
VLCVIVIFRQPESKEALTFKVPLLPWLPLFSIFVNIYLMMQLDVATWCRFTVWMAIGFAI  
YFGYGIWHSTEAMNSSVRKYEPALQNKSPIYLGGEESEIEGISP**

**>Slc7a3\_2of2**

**LASFGKMLLRRRVLDDSPVESHFARCLTTLDLIALGVGATLGAGVYVLAGEVAREKAGPA  
IVLSFLIAALSSVLAGLCYAEFGARVPKTGSAYVYSYVTVGEIWAFITGWNLILSYVIEG  
TASVARAWSATFDSLLAQKISTFFKAFMSFPDTQNVLAKYPDVFALILVMLLTGLLAFGV  
SESALVNKIFTGINLVVLTFVIISGFVKGDTANWNLTVEDYINRTNITGAQKIEKEFGSG  
GFAPFGLNGVLSGAATCFYAFVGFDCIATTSEEAKNPMRSIPIGIVASLLICFFAYFGVS  
AALTLMMPYYMLDKHSPLPQAFDYVGWGPARYIVSVGSLCALSTSLLGSMFPMPRVIYAM  
AEDGLLFRFLSRMHKKTKTPALATLVSGIVAALMAFLFDLDALVDLMSIGTLLAYTLVAV  
CVLILRYQPSRLGSSGADVKPVELQRLEAKAVMDVDSGDEYSQDMETIPLKKRFSIRMLV  
QPICDVPTKISGIIVYSACGTISVLFTLLCLVLSVCLEQVAMGHPLFICLVVLLSVLSTV  
CIVVIWRQPQSKEALTFKVPLLPILPLISIFVNIYLMMQMSGATWIRFAVWMAIGFLIYF  
AYGIRHSSEGKNNSPQKFEPILQGKKPIYLAEDGSENEGATP**

**>Slc7a4**

**MASCVSGCSPVMRFCQKLNRLKTLDDDVMATSLKRCLNTVDLALLGVGGMVGSGLYVLTG  
TVAKDTAGPAVVISFLIAGVASLMAALCYAEFGARVPKTGSAYMFTYVSVGEIWAFLIGW  
NVILEYMIGGAAVARAWSGYLDSIFNHRIQNFTESHVMRWEVPFLAHYPDLLAAAILLVA  
SFFISFGVRVSSWLNHIFSAISMVVIVFILVFGFILADPVNWSAREGGFAPFGLSGIMAG  
TATCFYAFVGFDVIAASSEEASNPQRAIPAATAISLGLAATAYVLVSTVLTLMVPWHTLD  
PNSALSDAFFRRGYSWAGFIVAVGSICAMNTVLLSNLFSLPRIVYAMAEDGLFFSVFSRV  
NPVTKVPVIAILVFGSLMAILALIFDLEALVQFLSIGTLLAYTFVAASVIVLRFQPDKSS  
GSSGAGGVKTDASSTPSGNQSGQQMDLSVAANEAQTFAQDGGELKEYESFSDKLQLVERQ  
KAGKEKRAPGMLKARWEPYLGRLLGDCEPGEVVAFSVLALMVSGVSLSAVLVFGNNQLHL  
PVWSFTLLLVIFSVVFLLSLALISVHEQRPNLKTFQVPLVPFIPGFSILLNVFLMLKLSP  
LTWIRFTVWVAAGLLVYFGYGIWHSKEGLREQQGQDVAARYVVLPSGSLVETVQNVQPEG  
HTHSTHTSTVDNPPASR**

**>Slc7a5**

**MSGLKKRSSNASTERDEDDKQVTEKMLTGRGGNGNTSPSGDITPGSPSTDISPADGEETV  
VLKRTITLVNGVAIIVGTIIGSGIFVTPTGVVKEAGSVGLSLVVWTVCGVFSTIGALCYA  
ELGTTITKSGGDYAYILEVYGSLPAFLKLWIELLIIRPSSQYIVAYVFATYILKPIFPVC  
PVPETGAKLVACLCILLLTAVNCYSVKAATRVQDAFAAAKLLALGLIIIIGFVEIGKGDT  
VELLPENSFKGSNTDFGNIGLALYSGLFAYGGWNYLNFVTEEMIEPYKNLPRAIIISLPI  
VTVVYVLTNLAYFTTLSPEKMLSSEAVAVDFGNYHLGPMAWIIPVFVGLSCFGSVNGSLF  
TSSRLFFVGSREGHLPSLLSMIHPDLLTPLPSLIFTCIMTLLYAFSNDIFSVINFFSFFN  
WLCIAMAIVGMMWLRYKKPELERPIKVNILLPIVFVLACLFLIVVSFWKTPVECAIGFGI  
IATGVPVYFFGVWWQTKPKWLLQIIFSSTVMCQKMMEVVPQES**

**>Slc7a6**

**MENNTDSKKMNGQPESPAALSKPRESMQLKKEISLLNGVSLIVGNMIGSGIFVSPKGVLI  
YSASYGLSLVIWAIGGIFSVVGALCYAELGTTITKSGASYAYILESFGGFIAFIRLWTSL  
LIIEPTSQAVIAITFANYLVQPLFPTCEPPYSASRLIAAACICLLTFINSAYVKWGTRVQ  
DVFTYAKVLALIVIIITGIVKLCQGFTINFEDSFQGSSRDPGGIALALYSALFSYSGWDT  
LNFVTEEIKNPERNLPLSIAISMPIVTIIYILTNVAYYAVLDMSAILASDAVAVTFADHT  
LGVMSWTIPIAVALSCYGGLNSSIIAASRLFFVGAREGHLPDALSMIHIERFTPVPALLF  
NCAMALIYLTVEDVFQLINYYSFSYWFFVGLSIAGQIYLRWKEPDRPRPLKLSLVYPIIF  
CLCVVFLVAVPLYSDTLNSLIGIAIALSGVPVYFLGIHLPESKRPPIITKLLSAITRFTQ  
FTCFCVLTEMDTVD**

**>Slc7a7**

**MASYSPTPAEEASPEVSNGNLKASSSQESMKLKKEISLLNGVCLIVGNMIGSGIFVSPKG  
VLMYSGSYGLSLVVWTIGGIFSVFGALCYAELGTTITKSGASYAYILEAFGGFLAFIRLW  
TSLLIIEPTSQAVIAITFSNYMVQPIFPTCIAPYVANRLLAAACICLLTFVNCAYVKYGT  
RVQDFFTYVKVVALIAVIITGLVKIFQGYTQNFEGLFSDSSHDPGDVALALYSALFSYSG  
WDTLNFVTEEIKNPERNLPLAIAISMPIVTVIYILTNLAYYTILPIPAILDSDAVAVTFA  
DQVFGYLNWTIPVAVAFSCFGGLNASIVAASRLFFVGSREGHLPDYLCMIHITRFTPIPA  
LLFNGAMALVYLCVEDVFKLINYYSFSYWFFVGLSILGQLYLRWKQPDRPRPLKLSLFFP  
IIFCLCTVFLVVVPLYSDTINSLIGIGIALSGVPVYFLCCHLPATRRPMWLRKFIASSGV  
LIQKVCFCVLTEMDKEEEKTE**

**>Slc7a8b**

**MTDGPRQRGSAAPSTASEDGGAADTGNTAGQSVALKKEIGLVSACGIIVGNIIGSGIFVS  
PKGVLENASSVGLALIVWILTGIITAIGALCYAELGVTIPKSGGDYSYVKDIFGGLAGFL  
RLWIAVLVIYPTNQAVIALTFSNYVLQPLFPTCFPPENGLRILAAICLLLLTWVNCSSVR  
WATRVQDVFTAGKLLALILIIIMGIVQICKGEYYWLEPANAFEPFQDYDVGLIALAFLQG  
SFAYGGWNFLNYVTEELVDPYVNLPRAIFISIPLVTFVYVFANIAYVTAMSPQELLASNA  
VAVTFGEKLLGVMSWIMPISVALSTFGGVNGSLFTSSRLFFAGAREGHLPSLLAMIHVKR  
CTPIPALLFTCISTLLMLCTSDMYTLINYVGFINYLFYGVTVAGQIVLRIKQPDMHRPIK  
ISLVWPVIYLLFWAFLLIFSLYSEPVVCGIGLAIMLTGVPVYFLGVYWDNKPQCFNTFVD  
KMTYLGQKFCVVVYPMEEVKKTDESAEGIELKEQTAPLSAEGEETPKSADC**

**>Slc7a8\_1of2**

**MSSGGTRRRTASVPDSDPDGEPAVTLKKEIGLLSACGIVVGNIIGSGIFVSPKGVLENSG  
SVGLALIVWILTGIITAIGALCYAELGVTIPKSGGDYSYVNDIFGGLAGFLRLWIAVLVI  
YPTNQAVIALTFANYALQPLFPSCFPPERALGLLAAVCLLLLTWINCSSVRWATRVQDVF  
TTGKLLALGLIIIMGIVQICKGHFYWLEPEHAFHPLQPYDMGRIALAVLQGSFAYAGWNF  
LNYVTEELIDPYRNLPRAIFISIPLVTFVYVSANIAYVTAMSPQELLASNAVAVTFGEKL  
LGVMSWLMPISVALSTFGGVNGSLFTSSRLFFAGAREGHLPRLLAMIHVNRCTPIPALLI  
TCISTLLMLCVSDIYTLINYVGFINYLFYGVTVAGQIVLRIREPDIYRPIKVSLAWPAVF  
LIFWAFLLIFSLYSEPVVCCIGLAIMLSGVPVYLFGIYWENKPKSFSSFVARLTHLGQKL  
CLVVYPGEDREDGNEDREEDG**

**>Slc7a9**

**TMEEDLKKTKANNGSVSRAVEAKNPDQPKAAVLHQDVGLLSGICLIVGTMIGSGIFISPK  
AVLEGTGAVGPCLCVWAACGVLATLAGALCYAELGTMIIKSGGEYPYLMEGFGPVLAYLY  
SWTTIIVLKPSSFAIIALSCAEYASTPFYPGCTPPQVVTKCLAAACILIITLVNCLSVKL  
AYRVQNFFTAAKLLIIIIIVVSGIVMLAQGNTQNLRDPFAGATTSFGAIGLAFYNGLWAY  
DGWNQLNFITEELKNPYKNLPLAIIIGIPLVTVCYIMVNIAYFSVMTSTELLQSSAVAVT  
FGDRVLYPLSWIVPVFVVCSTFGAANGSCFTAGRLTYVAGREGHMVKIMSYISVKRYTPS  
PALMFNGIVSIIYIMPTDINTLINYFSFATWLFYGLTCLALIVMRFTRKDLKRPVKVPIV  
IPALVVVVSCYLVLAPIIDKPEWEYLYCTMFIVGGLLLYVPFIHYKFNWTRRLMRPFTMH  
LQLLLQVVPPEKIE**

**>Slc8a1a**

**MGQSGTSSYFSLALNLSIFLLVFSYELTPVIAGSSKSSLDVDTSNANSSQETCGGSYECK  
EGVILPIWTPVNPSFGDKLARATVYFVGLFYMFLGVSIIADRFMASIEVITSQEKEITIK  
KPNGETTTTTVRIWNETVSNLTLMALGSSAPEILLSVVEVCGHNFDAGELGPNTIVGSAA  
FNMFVIIGLCVSVIPEGEHRKVKHLRVFFVTATWSIFAYTWLYLILAVISPGIVEVWEGL  
LTLFFFPICVLFAWVADRRLLFYKYVYKRYRVGKKRGIIIETEGEPELQSKADIEMDGGM  
LNSHAEEFLDGAVDNEDKDADEDEARREMAKILKELKQKHPEKEMEQLVELANYHVLSQQ  
QKSRAFYRCQATRLMTGAGNILKKHAADQARKALGIHELRSEVSDNDISSKIFFDPGTYQ  
CLENCGTVALNVVRRGGDLTSTVSVEYRTEDGTANAGSDYQFTEGVIIFKPGETEKEIRV  
DIIDDDIFEEDEHFLVHLSNVKVISEGANNGNPGTNHVDALAGLGLPSTATVTIFDDDHA  
GIFLFEEPIVHISESIGMMEVKVVRTSGARGVVVIPYKTIEGTAKGGGEDFEDTHGVLEF  
QNDEISKTIQINIIDDEEYEKNKNFFLEIGEPQLVEMSERKAMLLHECGGFVKTDKQLYG  
RDVYRKVQGRDKPIPSTIISISEDGEEETLTKKEKDERRIAEMGRPTLGEHVKLEVIIEE  
SYEFKSTVDKLIKKTNLALLVGTNSWRDQFVEAITVNSGDDDDEECGQEKMPSCFDYVMH  
FLTVFWKVLFAFVPPTDYWNGWACFIVSIMMIGVLTAFIGDIASHFGCTIGLKDSVTAVV  
FVALGTSVPDTFASKVAAIQDQYADASIGNVTGSNAVNVFLGIGVAWSIAAIFHQSQGRQ  
FRVDPGTLAFSVTLFTIFAFVCIAVLMYRRRPEIGGELGGPRHPKIITTTLFFSLWLMYI  
ILSSMEAYCIIKGF**

**>Slc8a1b**

**MRHRETSPRLFLTFQCLVLLVIVVHNVHHVTAEHAPDHSQDHSSPANKSLSCGGGSAICA  
PGVILPVWEPPNPSFGDKVARATVYFVALVYMFLGVSIIADRFMASIEVITSQEKEITIK  
KPNGETTTTTVRIWNETVSNLTLMALGSSAPEILLSVIEVCGHNFEAGDLGPSTIVGSAA  
FNMFVIIGICVYVVPDGEHRKVKHLRVFFVTAAWSIFAYLWMYLILAVLSPGIVQVWEGL  
LTLFFFPICVVFAWIADRRLLFYKYVYKRYRAGKHRGMIIETEGDRPLPSKVDIEMDGKM  
LNSHAVDFLDGTLALELEDKDLDEDEARREMAKILKELKQKHPDKEVEQLIELANYQVLS  
QQQKSRAFYRCQATRLMTGAGNILKKHAADQARKAVSMHEVRSDTGENDPISKIFFDPCS  
YQCLENCGTVAVNVIRRGGDLNQTVSVEFRTEDGTANAGSDYEFTEGTVVFKPGETQKEI  
RVGIIDDDIFEEDENFLIHLSNVRVVHEGDEPETTEANHVETIATLGLPSTATVTIFDDD  
HAGIFTFEEPVTHVSESVGVMEVKVLRTSGARGVVSVPYKTIEGTARGGGEDFEDSHGFL  
EFQNDEILKTITVRVLNREEYHKQCSFFIELQTPLWRRRGWTVYRDEEKEVVKEEEEPLT  
GEEEEERRIAEMGKPMLGDHPRVEVIIEESYEFKNTVDKLIKKTNLALLVGTNSWRDQFI  
EAITVSAGEDDDDEECGEEKLPSCFDYVMHFLTVFWKVLFAFVPPTDYWNGWACFVVSII  
MIGVLTAFIGDLASHFGCTIGLKDSVTAVVFVALGTSVPDTFASKVAAIQDQYADASIGN  
VTGSNAVNVFLGIGVAWSIAAIYHNSKGNDFRVEPGNLAFSVTLFTIFAFICVAVLMYRR  
RPDIGGELGGPRTAKALTTMLFVSLWLLYILFSSLEAYCHIKGF**

**>Slc8a2a**

**YLVMAPPLLLHLLLLLVSPQVCAGGSAHRDSNSSADGPKKPCFEKVKCQPGILLPVWLPH  
DPPLAMQAVRAVIYFACLLYMFLGVSIIADRFMAAIEVITSQEKEVTVTGANGEKTVMTV  
RIWNETVSNLTLMALGSSAPEILLSVIEVCGHGFESGELGPGTIVGSAAFNMFVIIGVCV  
WVIPDGEVRKIKHLRVFFITASWSIFAYIWLYLILAVISPGVVQVWEALVTLFFFPVCVL  
MAWIADRRLLFYKYLNKRYRTDKRHGIIVEMEGELAPRGIDAIMGEKYQNNTTSVDMEKN  
KEPEQDREEVIRILKDLREKHPDKDLDQLIEMANYASMQKQRKSRAFYRVQATRMMIGAG  
NILKKHAAAEQAKRLAGESTGNDLATCSQISFEQAQYQCTENCGSVSLWVCLRGGTGTRT  
FHIDYKTENGSANSGDDFENCEGTIIFQPGETRKEIKVGIIDDDVFEEDEHFFVRLSNLR  
EGEGGTNTDGARLVEPLVTTVTILDDDHAGVFAFGQRELCVGECSGVVEVPVNRTSGVRG  
TVMIPYHTEDGSARQGVDYEQIQGELEFTNEQTSKTLQVRIINMQEYEKRENFYIVLEEP  
KWLKRGISATPGPEVEEARRIAEKGKPALGEHCKLEVIIEESMAFKNTVDRLLKDTNLAE  
VLGTHSWREQFIEAVTVSAGEADEEGGEPQPPSCCDYFMHAVTVFWKILFAFVPPTEYWN  
GWACFIVSILVIGLLTAVIGDLASHFGCTVGLRDTVTAVVFVALGTSIPDTFASKVAATQ  
DQYADASVGNVTGSNAVNVFLGIGVAWSVSAVYWEVKGQVFYVDPGSLAFSVTLFTIFAF  
INIGVLMLRRRPSVGGELGGPKVMKVLTSMLYVGLWLLYITFSSLEAYCHITGF**

**>Slc8a2b**

**MARFSSVFLSLVLLLSLPWSCSPESQREEPSIQPSIIPEYSTEPYSNLTDDGAALNKPCS  
DPVECKPGILLPVWKPVNPGLVEQIVRAIIYFVSLMYMFLGVSIIADRFMASIEVITSQE  
KEVTITMPNGETSVATVRIWNETVSNLTLMALGSSAPEILLSVIEVCGHGFKSGELGPGT  
IVGSAAFNMFVIIGICVWVIPEGEVRKIKHLRVFFITAFWSIFAYIWLYLILSVISPGIV  
EVWEALVTLCYFPVCVILAWIADRRLLFYKYMSKRYRADKRTGVVVETEGEMTPKGMEMM  
MDGKFPLRAGDIGIGTQEHYQDGTGHTTGTMATLPNSNSTTVYMDGVKDLDESRKEVIRI  
LKDLKQKYPDKELDQLVELANYYALLHQQKSRAFYRVQATRMMIGAGNVLKKHAADQSRR  
AVVVGGDEALEEEDLAVCSRISFESPHSQCMENCGSIMIPVVCRGGLGESTFYVDYCTED  
GTANAGSDYEYCEGTLVFKPGETRKDIKVGIIDDDIFEEDEHFFVRLLNLRIGDAEGMFE  
SDDMDQGPKARLVEPLMATVTILDDDHAGIFTFTDRMMRVSECVGTMEVTVVRNSGARGT  
VIIPYHTEPGTAQGGGVDYEDTHGELEFTNDQTTQTLQVRIIDDEEYEKHENFFIVLEEP  
RWLKRGISEDAEGQLSAEEEEARRIAEMGKPVLGEHSRLEVVIEESYEFKSTVDKLIKKT  
NLALVIGTHSWREQFVEAVTVSAGDGDEDDEEGREEHPPSCSDYVMHFLTVFWKVLFAFV  
PPTEYWNGWACFVVSITVIGLLTAVIGDLASHFGCTVGLRDTVTAVVFVALGTSIPDTFA  
SKVAAKQDQYADASIGNVTGSNAVNVFLGIGVAWSVAAVYWAVQGKRFNVDPGSLAFSVT  
LFTIFAFICMAVLLFRRRPSIGGELGGPRVSRLLTTLLFLGLWFLYILFSSLEAYCHIEG  
F**

**>Slc8a3**

**MDRSRTKTSAYLWLGVVSVATAFLCAEARVTPSPPLTNNTTCVGETDRCKPGIILPIWYP  
EDPSMGDKIARVIVYFVAMIYMFLGVSIIADRFMAAIEVITSQEKEIIIKRPNGETTTTT  
IRVWNETVSNLTLMALGSSAPEILLSLIEICGHEFHAGELGPSTIVGSAAFNMFVIIGLC  
VSVIPEGEVRKVKHLRVFFVTAAWSVFAYIWLYMILAVFSPNVVQVWEGLLTLAFFPICV  
ILAWVADRRLLFYKFMHKKYRTDKHRGVIIETEGDRTKGIEMDGKMMNSHFIDGGAASNL  
MGLIEGKEVDESRRDMIRILKDLKQKHPEKELDQLVEMANYYALSHQQKSRAFYRIQATR  
MMTGAGNILKKHVAEQAKRSASVQEVHVEEPEEFVSRIMFEPAIYQCLENCGAVLLTAVR  
KGGDITKTIYVDYKTEDGSANAGADYEFTEGTVVFKPGEVIKEITVGIIDDDIFEEDEHF  
FVRLSNVRVLETEDEVLSPSSLPYPKALIGFPAVATVTILDDDHAGIFTFESDSMHVSES  
VGIMEVKVLRTSGARGTVIIPFRTMEGLAKGGGEDFEDAYGELEFKNDETCKTIQVKIID  
DEEYEKNKNFYLELAEPRMVDMSLQKDIQDRKLSSEEEEARRIAEMGKPILGEHSKIEII  
IEESYEFKSTVDKLIKKTNLALVVGTNSWREQFMEAITVSAGDEDEDEGAEERLPSCFDY  
VMHFLTVFWKVLFACVPPTEYWNGWACFIVSIIIIGLLTAVIGDLASHFGCTIGLKDSVT  
AVVFVALGTSIPDTFASKVAAVQDSYADASIGNVTGSNAVNVFLGIGVAWSVAAIYWHMQ  
GRAFEVPAGSLAFSVTLFTIFAFLAVGVLLYRRRPHIGGELGGPRGHRILTTLFFFSLWF  
LYILFSSLEAYCHIQGF**

**>Slc8a4a**

**MFHLRLSRSSFSSITPCLSSVLLLIFLSGLTHLSQASGDVSHSGPGNCSGEDSCSEGVVL  
PIWNPQNPSVGDKVARAIVYFVALIYMFLGMSIIADRFMSSIEVITSQEKEITIKKPNGE  
TTTATVRIWNETVSNLTLMALGSSAPEILLSVIEVCGHKFEAGHLGPSTIVGSAAFNMFI  
IIALCVYVVPDGEVRKIKHLRVFFVTAAWSIFAYIWLYLILSVFSPGVVEVWEAVLTFLF  
FPLCVVQAWIADRRLLFYKYVHKRYRTDKNRGIIIETEGDGMFTKMDMEMDGQGANSHHK  
EALDGMLAGVEEGGGGGEEEEARREMARTLKELKQRHPEKDMEQLIEMANYQVLVQQQKS  
RAFYRIQATRMMIGAGNILKKHAADQARKVVSCHEANPQEEDPHTIYLEFEPSHYQCFEN  
CGSLKLSVTRHGGDSGCTVKVDYRTEDGTANAGSDYEFAEGTLVFKPGETVKELTVGVID  
DDIFEEDEHFYVHLSNPRVVHRAEVSILDPNAVSPGNSIIGSSHVPPKAALGNAHSATVT  
IYDDDHAGIFTFESNSTRVSESVGIMQVKVHRTSGARGKVAVPYHTTEGTAKAGEDYDEV  
AGKLEFLNDETMKILEVKIIDDEEYEKNKTFTIHLGEPVLLEIGQKHGDSNDNKPAVGAE  
EEEVAKMGCPSLGEHTKLEVVIEESYEFKNTVDKLIKKTNLALVVGSSSWREQFVSAVTV  
SAGDDDEEESGEERLPSCFDYIMHFLTVFWKVLFAFVPPTEYWNGWACFIVSITLIGVLT  
AVTGDLASHFGCTVGLKDTVTAVVFVALGTSVPDTFASKVAAIQDQYADASIGNVTGSNA  
VNVFLGIGVAWTIAAVYWHSQGKKFQVPPGSLAFSVTLFTILALVCVVTLLYRRRPSVSG  
GELGGPRTPKLLTAFLFIVLWLIYIMLASLEAYCHVPGF**

**>Slc8a4b**

**MHFSINSSRLSPFFFSSLFLPILLLYVSLPQVDAQDLDQSTSNCSQNDVCTDGVLLPVWN  
PQNPSVGDKVARAIVYLVALVYMFLGMSIIADRFMTAIEVITSQEKEITTKRPNGETVTT  
TVRIWNETVSNLTLMALGSSAPEILLSVIEVCGHNFEAGSLGPSTIVGSAAFNMFVIIGL  
CVYVVPEGERRKVKHLRVFFVTAAWSMFAYIWLYLILAVISPGEVEVWEAVLTFLFFPLC  
VVQAWIADRRLLFYKYARKRYRTDKGRGIIVSEGGEELGKEAGFTKMDMLEIDGITTHLD  
GVLGGESGLGGRDQEEEARREMARTLKELKQRHPEKDMEQLIEMANYQVLMQQQKSRAFY  
RIQATRMMIGAGNILKKHAADQARKVVSSGEPREQEDDPHVTRIDFEPALYQCFENCGSL  
KLTVQRHGGDAGCSVKVDYRTEDGTANAGSDYEFAEGTLVFKPGENVKDIAVGIIDDDIF  
EEDEYFYVRLSNPRIVGWADGHPIALETGAPAPSAALGEAHTATVTIYDDDHAGIFTFES  
ESMRVSESIGIMQVKVQRTSGARGLVAVPYQTVDGTACGGEDYEEVSGKLEFQNDETMKT  
IEVKIIDDEEYEKNKTFSIELGEPVLLEIGQKHGDSNENKPEIGAEEEEVAKMGCPSLGE  
HTRLEVVIEESYEFKNTVDKLIKKTNLALVVGSSSWREQFVSAVTVSAGDDDEEESGEER  
LPSCFDYIMHFLTVFWKVLFAFVPPTEYWNGWACFIVSIFLIGALTAVTGDLASHFGCTV  
GLKDSVTAVVFVALGTSVPDTFASKVAAIQDQYADASIGNVTGSNAVNVFLGIGVAWSIA  
AIYWRSKGKSFHVDPGSLAFSVTLFTALAVVCVSVLLYRRRPSVAGGELGGPRTCKILTS  
LLFISLWLIYILLASLETYCHIPGF**

**>Slc9a1**

**SFLIISGFHLIPRISSIVPESCLLIVVGLLIGGLMKLVGEVPPVLRSDIFFLYLLPPIIL  
DAGYFLPIRPFTENLGTILMFAVVGTLWNSFFIGGLLYGVCQLEGVHLVHVDLLSCLLFG  
SIISAVDPVAVLAVFEEIHINELLHILVFGESLLNDAVTVVLYHLFEEYSSVGTITITDV  
FLGIVCFLVVSLGGIVVGAIYGILAAFTSRFTSHTRVIEPLFVFVYSYMAYLSAEVFHLS  
GIMALIACGAVMRPYVEANISHKSHTTTKYFLKMWSSVSDTLIFIFLGVSTVAGPHQWNW  
TFVIVTLILCLVARVLGKINLIVIQNNGTVKTLQSQSQPSVFYHYSTAAVILQQGFIWFI  
REALIDFFLCALDCCLLITIFVYGMTIRPLVDLLAVKKKQETKRSINEEIHTQFLDHLLT  
GIEDICGHYGHHHWKDKLNRFNKKYVKKCLIAGERSKEPQLIAFYHKMEMKQAIELVESG  
GGAKLPSALPSTVSMQNIQPKKPPADRALPQLSKAREEEIRKILRTNLQKTRMRLRSYNR  
HTLVADPYEDGWNDIIKRKKMIELEKKISQMNNYLTVPAPPPDSPTISRARLASDPQAWG  
MKTTTESIPTIKVDLASPQSPESVNVVDELSKKEKQQKQSKDKDEEGGLTMKLPERKEKE  
GDEDPPKCLMRCLSDPGPAPEDEDEDQPFLP**

**>Slc9a2**

**MVLHFHVGSSFNFQVFLCICFASVGYGENVDVTTKATAGFPSKSPLWSSNDDTAGTEADK  
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HAVRKEPPAVISSNVFFLYMLPPIILESGYFMPTRPFFENVGTVMWFAVVGTLWNTMGIG  
ISLFAICQIEEFGVQDINLQENLLFAAILSAVEPVAVLSVFEDISINEQLYIVMFGECLF  
NDAVTVVLYNLFNHVAAMEVDEPAVIFMDIGGFFVVGLGGIFFGLLFGFLTAFTTRFTGK  
VREIEPLVIFMFSYMSYLIAELFALSSIMAILICTLSMKYYVEENVSQRSCTTIRHVIKM  
VGSVSETLIFFFLGVVSITTEHEWNWGYILFTLFFTLFWRFLGILVLTQIINPFRKIPFN  
FQDQFGLAYGGLRGALSFALAFTLPNSIPHRKLFITDTIAVIIFTVFIQGITIRPLLKLM  
NIRKTNRNLETINDEIHKRLMEHTVAGIEDLCGQWSHYRWKDMFMKFNNRFIRKILIRDN  
RPESSIVSLYKKLELRNALEILDTMSGDISAAPSLMSLYEERKNASKHKKFLPSDVENMH  
ELLSKNMYKIRQRTVSYTNRHSLPNENIAKEILMRRHTTIRSSLRSGSFHATNSANTSHK  
FSSLPVGQSLNSGFPPGRFRHTDHIDAESETAYPSNRSTFRHQRRSSSKAGIPLRPLNDL  
REDNEPNEEIPYKMSHPRSKFRHSGHQTSRQYYGTSRNCRDTDFEEQQSSLSPHGWTEEP  
QNNSDVQHPLMRKPQ**

**>Slc9a3.1**

**MASSTYICLLRAAFLVCLVYPLVKGNSVEVSDPHHHQTENLTGLPIVTFKWHHVETPYLV  
ALWVFVAGLAKLSVIQLNHSITGVFPESGLLIILGFILGGIVVGADKAQTFKLLPSTFFY  
YLLPQIILDASYFMPNKLFFRNLGAILIYAIFGTCWNAAAVGLSLWGCHEAGAMGDLNIG  
LLQFLLFGSLIAAVDPVAVIAVFEEVHVNEVLFILVFGESLLNDGVTVVLYNVFDGFVSL  
GGPMIDAAEIFKGICSFVVVAFGGSFVGVAFAILLSLLTRCTKHVQIIEAGFVFLVGYLS  
YLTAEMLSLSAILSITFCGVCCQKYINANMDERSVTTVRHAMKMLANGSETMIFLFLGVT  
AIDTEIWVWNTGFILLTLLFIFIYRIIGVFMFTWMLNKFRLVPVELIDQVVMSYGGLRGA  
VAYGLAAMLDESRIPEKKLMISTTLIVVYFTVILQGITMKPLVQWLKVKRAAHSDLKLVE  
KLNNRAFDHILAAVEDICGRIGDNWWTRGWNRFEEKYISWLLMKPKARKNRDYLFNIFHK  
LNLEDAMNYVSEGERQGSLAFIRNDEAANVDFKKQFDSEFADVMPDIMVDMSNYDFGIEN  
ISVATIVKDTIPSVSLDIHGQDGKNVVDDINAHRLLQQHLYRSRKHHHHKYSRSHFSINQ  
SEEEVQEIFQRTMRSRLESFKSAKMGVNPTKKITKFHKKDPTDKMNGHTEGNGYLYGDEA  
DSGVGADGAISSTFMRDTYKMGAGIENPVFMPDMDSPVHSPVHSPPWLLETEMSVAPSQR  
AQRRLPWTPNRRLAPMRISTCSTDSFLMADVSSTLEVHEEQPQSDNGESVFE**

**>Slc9a3.2**

**MAFSTLLLAFLVVSGALHEAAAGLDFYGAEGKQNYSSRSSAEGSASSGNSSHSATITTLP  
IVTWKWHHVETPYLVALWILTCWLCKLVTELNHNITSVIPESGLLIILGFILGGIVWGAD  
KAQTFKLIPVNFFYYLLPQIILDASYCMPNKLFFGNLGAILVHAIIGTCWNAGTVGIALW  
ACYEGGAMGTLNIGCLQFLLFGALMSAVDPVAVIAVFEEVHVNEVLYILVFGESLLNDGV  
TVVLYNVFDAFVSLGGPKINAAEIIKGIVSFAVVAFGGSFLGVVFAVLTSMLTRVTKNVQ  
IIEAGFIIVLGYLSYLTAEMLSLSAILSLTFCGVCCQKYINANMDEKSVTCLRYSLKVLA  
NGSETMIFVFLGVSAIDQTIWVWNTGFILLTLLFIVVFRMMGVFFLNWILNQSRLIPIDL  
TDQLVMGYGGLRGAVAYGLAASLDENKIPEKNLMLGTTLIVVYFTVILQGITMKPLVNWL  
KVKKATQSDLTLNGKLNNRVFEHTLTGMEDICGRMGDNWWTRHWNHFEEKYVCWLLMTSE  
ARKRNDKILDAFHKLNVEDATKYVNEGESKGSLAFIRSYDSASVDFKKKLALEYADIIPD  
IMADMSEYDFDIDSVPVTSVMKNPIPSVSLDIHEQERRGMSNDLNAHHLLEQHLYKSRRN  
NRATYSRSHYNTSENPDEMQEIFQRTMRNRLESFKSAKMGVNPAKKVSKHPKKDAPHKPN  
GKPADPNRDHLYGDEDFEFSADSASSSENTGQFPRRVINTTGAGVDNPAYIPELDTSPSM  
RNPPWQTETGHNTAVAPSQRAQGRLPWTPTNLRRLAPLRVSSRSTDSFAMPEPAADEETP  
EEKPATHHTRL**

**>Slc9a5**

**MRGLSLLLFITLARDAVTDLYVTGASLPPNLGVSAAPPATSPVAARYIPREYGHPGIALA  
RSAEEPTTPSTEDGESSHHHGGGFKIVQWEWSYVQTPYIIASWLLVASVAKILFHFSQRF  
TTAVPESCMLILLGLALGTVVLLASKKQPYQLDPGLFFLFLLPTIVGDAGYFMPARLFFD  
NLGAILMYAVVGTLWNAFCTGFCLYGVKMAGVIDEKVDAGLMEFLLFGALISAVDPVAVL  
AVFEEVHVNETLFIIVFGESLLNDAVTVVLYKVYISFVEVGPGNVNTADYFKGIASFLIV  
SIGGTLVGLIFAVILAFFTRFTKKVRIIEPMFIFLLVYLAYLTAELFSLSAILSLTFCGI  
GCNKYVEANISQKSRTTVKYTMKTLASIAETIIFIFLGISAVDKSKWAWDTGLVVSTLIF  
ILVFRAMGVIGQTWFLNWFRLVPLDKIDQVVMSYGGLRGAVAFALVVLLDKEHVKAKDYF  
VATTIVVVFFTVMFQGLTIKPLVKWLKVPRSTNRKPTINEEIHERAFDHILAAVEDIAGL  
NGYHHWRDKWEQFDKNYLSKLLLRKSVYHKSELWEAYQKINIRDAISVIDQGGNVLTSAR  
VSLPSMASRTSFPEVTNVTNYLRENGSGVCLDLQVIDTVPGAKIEEELETHHVLAGNLYK  
PRRRYQSHYSRHFMTLGEKERQDREVFQRNMRNRLESFKSTRYKRHKKDRSQKKRKGSDA  
KEQDTSDKPRRNVSWQDKDPLVAPLAPEEDKHDPTEVDKDDDVGIIFVARRTPETPKERP  
KSVPAALDVCQSPITAPPSLTCGEKNLPWKSGMGSLPPCVSVEATKIIPVDLQQAWNQSI  
SSLESLASPPAPAEPLHPRISALSRLGGPLRTPAKDKSAGVDAGLESTTSSPSSGQFKYP  
MGKEEEEEGALSQQHREMQPLMSSLRPPPPPPPLAAQSAGKRRNPCVYLRSLVTVPPTGA  
EPHSRKPTQL**

**>Slc9a6a**

**MGSTSEMKAVAMRVWRRLPVHVFVLASSLCLCQCGAEEDSAMENIVTEKKAEESHRQDSA  
DLLIFIMLLTLTILTIWLFKHRRFRFLHETGLAMIYGLLVGVVLRYAIHVPSDINNVTLS  
CHVNASPATLLVNVSGKFYEYTLKGEIGANKVNDIQDNEMLRKVTFDPEVFFNILLPPII  
FHAGYSLKRRHFFRNLGSILAYAFVGTVVSCFIIGALMYGCVMLMKKIGHLQDDFFFTDC  
LFFGAIVSATDPVTVLAIFNELQVDADLYALLFGESVLNDAVAVVLSSSIVAYQPTGDNS  
HTFEAMAMLKSFGIFLGVFSGSFALGVATGIVTALVTKFTKLRDFPLLETALFFLMSWST  
FLLAEACGFTGVVAVLFCGMTQAHYTFNNLSPESQDRTKQLFELLNFLAENFIFSYMGLT  
LFTFQNHVFNPIFIVCAFLAVFLGRAANIYPLSFLLNLGRRNKISSNFQHMMMFAGLRGA  
MTFALSIRDTATYARQMMFSTTLLVVFFTVWICGGGTTQMLSCQKIRVGVDTDHENSIGP  
DGVERRSTKQESAWLFRIWYNFDHNYLKPILTHSGPPLTATLPACCSPLARCLTSPQAYE  
NEGELKNADSDLILNDGDITLTYGDIAVSTDGTGAHSSGVLMGGAAVNSDEALDRELAFG  
DHELVIRGTRLVLPMDDSEPPLTLDSHRQRHRNEFMS**

**>Slc9a6b**

**MGCQRRRSPASGARLLPRLLCLMCFSVVILAENTEMVNVVTERKAEESHRQDSANLLIFI  
TLLTITILTIWLFKHRRFRFLHETGLAMIYGLFVGVILRFGVHSLQDTSEVTLSCAVNSS  
PTTILVNVSGRFYEYSLKGEVQDSKGHDVPNAEMLRKVTFDPEVFFNILLPPIIFHAGYS  
LKRRHFFRNLGSILSYAFVGTMTSCFVTGLAMYSCVVFMKIIGQLGGDFFFTDCLFFGAI  
VSATDPVTVLAIFNELKVDVDLYALMFGESVLNDAVAIVLSSSIVAYQPEGDNRHTFDAS  
ALLKCLGVFLGVFSGSFAMGAATGVMTALVTKFTKLRDFPLLETALFFLMSWSTFLLAEA  
CGFTGVVAVLFCGITQAHYTYNNLSVESKSRTKQLFELLNFLAENFIFSYMGLTLFSFQH  
HVFNPFFIIGAFVAIFLGRLANIYPLSFLLNLGRKNKIPSNFQHVMMFSGLRGAMTFALS  
IRDTATYARQMMFSTTLLIVFFTVWVCGGGTTPVLSLMQIRVGVDTEQDNSATAADGMTQ  
RSTKHESAWPFRLWYTFDHNYLKPFLTHSGPPLTTTLPACCGPIARCLTSSQAYENAGQL  
HDEDTELILNDGGGLMYSDMTVSTDVHGVPTTSSSQAGLYSLAGTSDDPLERELAFGGTR  
LVLPTDEPLDPLTSFPPPPPSPPLSDPLRHRV**

**>Slc9a7**

**MEAAKAPKPWTLYLPNPSSLFPLFVFILSQCYRISADDGGIEELATEKEAEESHRQDSVN  
LLTFILLLTLTILTIWLFKHRRVRFLHETGLAMIYGLLVGVILRYGIPSTSYHNKTPPSC  
MLKEGPVSTVLLNVSGKFFEYTLKGEINLREIHSVEQNDMLRKLTFDPEVFFNILLPPII  
FHAGYSLKKRHFFRNLGSIITYAFLGTAISCFVIGNLMYGVVKLMQVLGQLTDKFYYTDC  
LFFGAIISATDPVTVLAIFNELHADGDLYALLFGESVMNDAVSIVLSSSIVAYQPSGANT  
HTFDASAFFKSVGVFIGIFSGSFAMGAVTGVVTALVTKFTKLHCFPLLETALFFLMSWST  
FLLAEACGFTGVVAVLFCGITQAHYTYNNLSEESTKRTKQLFEVLHFLAENFIFSYMGLA  
LFTFQNHVFSPIFIVGAFLAIFIGRALNIYPLSFLINLGRRHKIRGNFQHMMMFAGLRGA  
MAFALAIRDTATYARQMMFTTTLLIVFFTVWVFGGGTTPMLSWLHIRVGESSDAEKERMR  
RLWNYDSRVGVDPDQDLQPCGDSFQVLQGDGSQSEGQSKTKQESAWLFRLWYTFDHNYLK  
PILTHSGPPLTSTLPACCGPLARCLTSPQAYETHEPLRDNDSDLILNEGDLTLTYGDTAI  
TANGASSSSGPEGSAGIWGLNGKRSDSTSEDALERELDTREHELLSRGTRLVFPIEDHA**

**>Slc9a8**

**XICIILVHLLIKFKLHFLPESVAVVSLGILMGAFIKIIESQQLANWKEEEMFRPNMFFLL  
LLPPIIFESGYSLHKGNFFQNIGSITLFAVFGTAISAFIVGGGIYFLGQADVIYKMTMTD  
SFAFGSLISAVDPVATIAIFNALNVDPVLNMLVFGESILNDAVSIVLTNTAEGFGGSDVS  
TGWETFMQALGYFLKMFFGSAALGTLTGLISAISLKHFDLRKTPSLEFGMMIIFAYLPYG  
LAEGIKLSGIMAILFSGIVMSHYTHHNLSPVTQILMQQTLRTVAFMCETCVFAFLGLSIF  
SFPHKFELSFVIWCIVLVLVGRAVNIFPLSFLLNFFRDHKITPKMMFIMWFSGLRGAIPY  
ALSLHLGLEPIEKRQLIGTTTIVIVLFTILLMGGGTMPLIRIMDIEESQSRRKSKKDINL  
SKTEKMGNAIESEHLSELTEEEYEAQIYQRQDLKGFLWLDAKYLNPFFTRRLTQEDLLHG  
RIQMKTLTNKWYEEVRQGPSGSEDEEDEAELL**

**>Si\_dkey-162b23.4**

**MEQKCSAMEDVQSRPHSAHSLYSQRTEDATSALGNHAEHHLTVSQTVLVVPKRPESPNPS  
MTEETIYVPRPVSAVDACTNTDPPYECCPWLRRLCPCPPRGMLAAIITKVTMAAVLFGVV  
WSITEKECLPGGNLFGIVTLFICSVAGGKLFGRIRLPRLPPVPPLLGMLLAGFILRNIPV  
VTDAVYIDVRWSSSLRNIALGVILVKAGLELDSKALKKLKAVCLRLSMFPLIFEAATMAV  
MSYLILGLPWIWGFILGFVLGAVTPAVVVPSMLLLHRQGYGLEQGIPTLLMAACSVDDII  
AITCFTTCLGIAFATGSVWLNVLRGPLEVLGGAVTGVALGFFLHYFPSRDQRNLVLKRSF  
LVLGLSVFALFGSNVAGIPGAGGLCTLVLAFVAGIGWGRAKASVEAVVERFWLVFQPLLF  
GLIGAEIVISSLELTTVFLGIAALFIGLTVRLLVTFIVVLRAGFNLKEKIFVTLAWMPKA  
TVQAAIGSTALDMARSKQDLELQKYGMDVLTVAVLSIIITAPIGALLISLLGPRLLQKPK  
NPEWAVSQGALSASGTPVTYESAL**

**>Slco1c1**

**MPRNCMKESSSPKENEIFLWRMDLPNKERRSPENSPSSSRRCCSSFKMFLVALSFAYFSK  
ALSGSYMKSTITQLERRFDIPSYLIGVIDGSFEIGNLLVIAFVSYFGAKLHRPKIIAIGC  
LLMSLGTFLIALPHFIIGRYKFETSIRLSVNSSSSLSPCSLSSAEPSTSSVPSTGCEHES  
RLSMWIYVFLGNILRGIGETPVQPLGISYIDDHALEENAAFYIGCVQTISVIGPVFGYLL  
GSVCAKIYVDIGFVNMESISITPGDARWVGAWWLGYLIAGFITLLSAVPFWFLPKSLPLP  
ERRLSKYSPERNSFIKDSALLEHKYQADEPANFLEMAKDFLPTLRSLLGNPVYFLYLCVT  
IIQFNSLIGMVTYKPKYIEQHYGQSASKANFLMGVINIPAVALGMFSGGVIMKKFKLSIM  
GAAKFALGTSLLGYFLSLFFFSMGCENASVAGITMSYNGTESLFMADGSLRASCNAACHC  
PEKNWDPVCGEDGLTYVSPCLAGCRTSHGSGMDTVFEQCSCIGVGNQTATAGQCNNRESC  
HRIFPYFLALSVITSFIISLGGTPGYMLLIRCIKPQLKSLALGFHTLTTRTLAGIPAPIY  
FGAIIDTTCLKWGHKKCGGRGACRIYNTAAYRIAYLGLTLGLRTVSFFLCILGLLVLRRH  
VQKQERSTMVNGGSAAAGELQALRKEENNSCNSEQCPQNTDYDPERETRL**

**>Slco1d1**

**MCVCVCFQMFLAAMCFVFFAKAFQGSYMKSSVTQIERRFDVPSSLIGFIDGSFEIGNLFV  
IAFVSYFGAKLHRPRLIAAGCLVMSAGSFITAMPHFFQGQYKYESTISHFSASVNGTENV  
LPCLTNASLAQDSEIPTVESQAECEKASSSSLWLFVFLGNMLRGIGETPVMPLGLSYLDD  
FSREENTAFYLALIQTVGIMGPMFGFMLGSFCAKLYVDIGTVDLDSITINYKDSRWVGAW  
WLGFLVTGGVMLLAGIPFWFLPKSLTRQGEPESEKKPGAPEGGEQERFIPDNNKHNPPAS  
KPAPVTMSALAKDFLPSLKKLFSNTIYVLLVCTGLIQVSGFIGMITFKPKFMEQVYGQSA  
SRAIFLIGIMNLPAVALGIVTGGFIMKRFKVNVLGAAKICIVASVLAFCSMLIQYFLQCD  
NSQVAGLTVTYQGAPEVSYQTETLISQCNIGCSCSLKHWDPICASNGVTYTSPCLAGCQT  
STGIGKEMVFHNCSCIGEALLPYTNMSAVLGQCPRKSDCDFMFKIYMAVTVIGAFFSAVG  
ATPGYIILLRSITPELKSLALGMHTLIVRTLGGIPPPIYFGALIDKTCLKWGLKQCGGRG  
ACRIYDSGAFRNAFLGLIYALYSSSYLLFGLLYNRLSHREKKQALKDQLKAPEQDSCGVS  
TTNGNASSAIVKCENPDQETTI**

**>Slco1f1**

**TGNMLVITLVSYVGAKFHRPKIIGAGVLLMGIGTLLMASPHFLMGRYKYGTAATHTNDAG  
NFTVISTCSSDSQETLQQPYSECQIIEAESSLLWVVVLLGNAMRGIGEASIVPLGMSFID  
DYARPENSAFYIVGCLNTLRGIGPIFGFILGSLCANLYVDFDLVNQESVTITPQDSRWVG  
AWWLGFVVSGLLTLLAAFPFWFLPRALPENSQTSELDHPSEQHKTTPSLTEIIKDFAPTF  
KRLLTNKIYILYLAYSIVAFNDFAIVATYTPKYLEQQFGQSASKANFLIGVTCIPAVALG  
IFLSGLMMKRFKWGLLASARVNLFTGVTMLLLAVPFFALSCENLDVAGVTVPYQGSTEVQ  
GVISDVLPSCNADCGCPDLQWDPVCGENGVTYISPCHAGCNSTQGAGWNKTFHDCRCIQS  
WGLSVGNSSAVLGQCSRDPNCNQMIYVFLGVQSLVLFVYSLGAVPFLTFSMRIVDPEMKA  
LSVGVLLLSIRVLGGIPAPIYFGGLIDTTCLKWGQRKSCGRGACRIYDNETFRFLFQGMT  
IGLRVLACSVLWIATIEIKRKSAEQ**

**>Slco1f2**

**MEHSDRNQKTSQTKCCPPRLKIFIAALAFCYFSKSMTASYTKSTITQIERRFEIPSSTVG  
IIDGGFEMGNMLVITLVSYVGAKFHRPKIIGAGVLLMGIGTLLMASPHFIMGRYKYGTAA  
THTNDAGNFTVISTCSSDSQKTLQQPFSGCRKEEAESSPLWVIVVLGNTMLGIGEASIIP  
LGMSFVDDYARPENSAFYIGCLNTIKGIGPIFGFVLGSLCANLYVDIGLVNKESVTITPQ  
DSRWVGAWWLGYVVSGLLTVLAAFPFWFLPKALPENSQISLLDNTPQQHKTTPSLTEIVK  
DFAPTFKRLLTNKIYILYLAYSIVAFNDFAILVTYTPKYLEQQFGQSASKANFLIGVTCV  
PAVALGVFLSGLMMKRFKWGLLASARVNLLTIVATVFLTVPFFALSCENLDIAGVTVPYQ  
GSTEVQGVTSDVLPSCNADCGCPDLHWDPVCGENGVTYISPCHAGCSSTQGAGRNKTFHD  
CGCIQSWGLSVGNSSAVLGQCSQNPNCNRMMYLYLGLQSLALFVYSLGAVPLFTMSLRIV  
DPELKSLSVGVLLLSIRVLGGIPAPIYFGALVDSSCLKWGQRKSCGRGACRIYDIETFRH  
RITAGI**

**>Slco1f3**

**MGIGTLLMASPHFIMGRYRYGTAATHTNDDGNFTVISTCSSDSQETLQKPFSGCQKEESG  
RSPLWVMVLLGNTMRGIGEASIVPLGMSFIDDYARPENSAFYIGCLNTLGVIGPIFGFML  
GSLCANLYVDIDSVYQASVTITPQDYRWVGAWWLGYVVSGLFTLLAAFPLWFFPRALPEN  
SQISELNHPRQQHKTTPSLTEIVKDFPPSFKHLLTNKIYILYLAHSIVAFNDFAIGASYT  
PKYLEQQFGQSASKTNFLIGATSVPAVALGIFLSGLMMKRFKWDLLTSARVNLYAGVAML  
FLAVPFFALSCGNLEVAGVTVPYQGSTEVQGVISDVLPSCNADCGCPDIHWDPVCGENGV  
TYISPCHAGCNSTLGAGRNMTFHDCGCIQSWGLSVGNSSAVLGQCSRDPKCNRMFYIYLG  
LQSLAFFVYSLGTVPYFTLSLRIVDPELKSISVGMLLFTVRVLGGIPAPIYFGSLIDSTC  
LKWGRTKSCGRGACRIYDIETFRFLFQGLTIGLRVLAYSLLWIATIEIQRKMKNDKQLSR  
DTELQKSPSNDPEHEETIK**

**>Slco1f4**

**MGNMLVITLVSYIGAKFHRPKIIGAGVLLMGIGTLLMASPHFLMGRYKYGTAATHTNDAG  
NFTVISTCSSDSQETLQQPFSGCQKEEAESSPFWVIVVLGNTMRGIGEASIVPLGMSFID  
DYARPENSAFYIGCLNTLKGIGPIFGYMLGSLCANLYVDFGLVDQESVTITPQDSRWVGA  
WWLGYVVSGLLTLLAAFPFWFLPKVLPENSQISLLDNTPQQHKTTPSLTEIVKDFAPTFK  
RLLTNKIYILYLAYSIVAFNDFAIVATYTPKYLEQQFGQSASKANFLIGVTSIPAVALGV  
FLSGLMMKRFKWGLLASARVNLLTIVATVFLAVPFFALSCENLDIAGVTVPYQGSTEVQG  
VTSDVLPSCNADCGCPDLQWDPVCGENGVTYISPCHAGCNSTQGAGRNMTFHDCRCIQSW  
GLSVGNSSAVLGQCSRDPKCNRMIYIYLGLQSLAFFLCGLGIIPFFTMSLRIVDPELKSL  
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**>Slco2a1**

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ASRQDMCYLRANVTGAEACGQEDSRKLMDTSKFWVLMATAQLLFGIGSVPIQPFGISYVD  
DFAGAGNSPLYIAILFAVSVFGPSFGYLLGSVVLRIYVDVDKSSAGEALELTPVDPRWVG  
AWWIGLLITSGGLALTSIPYFFFPRSLHVEQSFNLEGEIMKEDPKKSESSLLDFFKMFPK  
IFVRLLLSPLFMLLVLCQCCFSSVIAGLATFLNKFLERQYSASAAYSSLLIGALNLPSIA  
IGMVLGGLIMKRWGLSFRAIPRFSVVMLTISVFCCVPLFFMGCPTQDVAGVYPIKSNSTN  
GIHLTCSANCSCPISTFNPVCGEGNNIEYISPCHAGCANYTTDPKNPYRVQSYINCKCIP  
TGTAKPGPCSNTCPHYLLPVMLLISLAGLIASLTHNPIYMMVLRAVPPEEKSFAIGIQFL  
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LLAFIGWKTHRSREYVLEKKPEGPL**

**>Slco2b1**

**MTAFEPQGNPQTARPRRSMGLFNNIKFFVLCHGMLQLSQLLVSGYLKASITTIEKRYGFS  
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YTEFISNTRLNSSLCQTQDIESSPTCSQNDTDPQLGVYPILLLGQLLLGIGGVPIQPFGI  
SYIDDYAERRNSPFYLGILFAVTVIGPAFGYIMSSAVLRLYVDIDKMSLNENKLEHGDPR  
WIGAWWLGFLIAATLLSLTSLPYLFFPRKMSKEEIEEAPVEPSTEKMIQNKKPETDQIEE  
VSLTQFLKSFPTIVLRTLRNPIYLLVVFAQVNLAAMVAGLATFMGKFIEKQFARTASFSN  
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SGLNYRDSQQCSNSCYCSDEAFNPVCGSDGVEFRSPCHAGCKIVNIKTIGRIQNVTYTDC  
GCVKSSGSPGFAFAGPCASGCSNLLIPFMILSSLTCFVASLSHTTSFMMILRTVTPEDKS  
FAVGIQFMLFRVLAFLPSPVLYGTAIDTACLVWGKKCSKSTSCLYYNLDLFRHRFLGLQI  
FFICGGFVCFLLSFLVLRRADSSQQQQHQQQQQQQQQQQQQQHHEMNIQTKSESSQETKD  
DKQTVSNSNGHSNTTCP**

**>Slco3a1**

**MQVKKQRSSEDPQRDDIKKKPSCFSNIKIFLVAECALMLAQGTVGAYLVSVLTTLERRFN  
LQSADVGVIASSFEIGNLALILFVSYFGAKAHRPRLIGCGGIVMALGALLSALPEFLASQ  
YKITDTWSKDQGRDVCSNTSKADEPCGNRANTNMMYLLLIGAQVLLGIGATPVQPLGVSY  
IDDHVRKKDSSLYIGILFSTLVFGPACGFILGSVCTNFYVDALFIDTTQLNITPDDPRWI  
GAWWGGFLICGALLFFSALFMFGFPQSLPSKEMEGVPESEQAMLPASLSQDFEKSKPSNG  
VVQNYQPNSNSLSCCQQLRVIPKVTKHLLSNPVFTCIVLAACMEIAVVAGFAAFLGKYLE  
QQFNLTTSSANQLLGMTAIPCACLGIFLGGLLVKKLNLSALGAIRMAMLVNLISTACYVS  
FLFLGCDTGPVAGVTVAYGNETLQVGQTPEAPCMSHCNCYTSSVSPVCGSNGVTYLSSCF  
AGCTRAISTGLPAPLSQNLSGCACISGYNDFATAVPGKCPRPGCQEAFLTFLCVICGCSM  
IGAMAQTPSVIILIRTVSPELKSYALGVLFLLLRLLGFIPPPLIFGAGIDSTCLFWSAEC  
GVKGACLLYDNVTYRHLYISMAIVLKIMAFLLYTTTWHCLRRNYKKYIKNIEGYLTPTEV  
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**>Slco3a1\_2of2**

**MYAEGSTPDTEPDECQKKTSCFSNIKIFLISECALMLAQGTVGAYLVSVLTTLERRFNLQ  
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YQTGESRPVGQGQNVCSNSSRAGLSDPGYICGNRTNTNMMYLLLIGAQMLLGVGATPLQP  
LGVSYIDDHVRREDSSLYIGILFSTLVFGPACGFILGSLCTKVYVDAVFIDTTTLDITPD  
DPRWIGAWWGGFIICGLFLFVSSFFMFGFPQSLNEPGEGPGGESEQAMLPAELVQEYEGV  
KTSDDLEISTGLTCCQHLQVIPKVTKHLLSNPVFTCVILAACMEIAVVAGFAAFLGKYLE  
QQFNLSTSSANQLLGMTAIPCACLGIFLGGLLVKKLDLSALGAIRLAMIVNIISTACYVS  
FLFLGCDTGPVAGVTVAYGNESLGSWERTEAACLSGCNCYKSSLSPVCGSNGVTYLSACL  
AGCTRTNLTGCKCIAHSEGLGTATPGKCPSPGCQQAFLTFLAVVCACSMIGAMAQTPSVI  
ILIRTVSPELKSYALGVLFLLLRLLGFIPPPLIFGIGIDSTCLLWSSMCGIKGACMLYDN  
VTYRYLYVSIAIVLKSSAFILYAVTWQCLRHNYCKYIKNSEDYLTPSQLFASNLTLDNLG  
KDIAQNPSNRTKFIYNLDDHAWSENMESAI**

**>Slco4a1**

**MPHLLNNDTSFSSKQELLVLHNSPLGPSPDTPSPVESQGSGSGSPSGDAHTPLHNTGKLG  
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TVITSIERRFDLRSYQAGLIASSYDIAACLCLTFVSYFGGTGHKPRWLGWGVLVMALGSL  
VFALPHFTTPAYQVRVPERMGLCSENHTETCVGEEGGLSAYRYVFMLGQFLHGVGATPLY  
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WVGAWWIGFLAGGAAALLIALPILGYPRQLPGSQRYVAMRVSEAHQLKDGSQVTASDPQF  
GKTVKDMPRSMLLLLKNPTFIFLCLAGATEATLIAGMSTFGPKFLESQFSLSASEAATWF  
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ISYYSNVTHNHNSALYLQKDKHNSSFSDLSNLTVACNIGCHCLEESFNPVCGADGVMYFS  
PCHAGCSSLNHTFGPRGRQVFSGCSCVAGNISWGEQGFAEEGRCVSSCNHMPAFLTFLFI  
LILFTFLCSIPALTATLRCVPDSQRSFGLGIQWIVVRTLGGIPGPIAFGSVIDISCLLWE  
EQCGEYGSCYLYHNSAMSQYSLVAGIIYKVLGTFFFLLATLLYKPPPESPQSSCESTDVG  
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**>Slco5a1**

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SLARLIRFPVRKYLRVILSDSRCFLFCMCYLTFIQSLMVSGYLSSVITTIEKRYSLRSSE  
SGLLVSCFDIGSLLVVVFISYFGGRGQRPRWLAVGGVFIAVGAALFSLPHFISPPYQIKE  
VNSSMGNEGLCLNGNRSRDALDVSSCPRDQEGNDHSIYVALFVCAQVLVGMGSTPIYTLG  
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NWWSGFLLCAFAMLLVIFPMFTFPKKLPPRHKKKKKKHAADSASNDDDDVLKEKSNSKGQ  
TVASSMGFGRDIKDLPKAAIRILSNMTFLFVSLSYTAESAIVTAFITFIPKFIESQFGIP  
ASNASIYTGVIIVPSAGVGIVLGGYIIKKLKLGARESAKLAMICSGVSLLCFSTLFIVGC  
ESINLGGINIPYTTGPTLTLTHRNLTGGCNVNCGCRINEYAPVCGSDGITYFNPCLAGCS  
TVGNDSTGIRNYTDCACVQSRQVITPPTSGQGNQLQLVIVKTYLNENGFALSGKCDRTCN  
TLIPFLIFLFIVTLITACAQPSAIIVTLRSVDEQERPFALGMQFVLLRTLAYIPTPIYFG  
AVIDTTCMLWQQDCGIHGSCWEYDVTSFRFVYFGLAASLKFVGFIFIFLTWYSIKYKEDR  
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**>Slc35g2b**

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ITRLAADRSKVPSLELIFIRSVIQVLSVLVVLYYKEAPFGPKGYRLRLFFYGVCNVISIT  
CAYTSFAIVPPSNGTIMWRATTTVFSAVLAFLLLDERLGYTDVVTVVGSLFGLCLVMIPN  
IADEEKSALGFWKEAFGYTMTVMAGLTAALSMIVYRAIKERVSMWTALFTFGWTGTVWGA  
STMFIMQEPIIPLDGETWGYLTGICICSTVAFLGVYYALNKFHPALVSTVQHLEIVVAMF  
LQLIVLRMIPSVYDVFGALVIMVSVFVLTGLKLYRVSRAIRQDYQEILDSPIK**

**>Ucp1**

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AGCTTGAMAVSMAQPTDVVKVRFQAQMNLQGVGRRYNGTMQAYRQIFQLEGLRGLWKGTL  
PNITRNALVNCTELVSYDLIKEAILKHRLLSDNLPCHFVSAFGAGFITTVIASPVDVVKT  
RYMNSPPGQYSSSTNCAWTMLTKEGPTAFYKGFVPSFLRLGSWNVVMFVSFEQLKRAMMV  
SRNRIEAAA**

**>Ucp2**

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LMAGCTTGAMAVAVAQPTDVVKVRFQAQVSAGSSKRYHSTMDAYRTIAKEEGFRGLWKGT  
GPNITRNAIVNCTELVTYDLIKDALLKSSLMTDDLPCHFTSAFGAGFCTTIIASPVDVVK  
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AARQNWHTPL**

**>Slc27a2\_3of4**

**MLLLLVLLLLLLLVSPLLLRRFSPLLWPDLLYHARLLRALLRFESRRRRRPVFLPVDRFL  
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WIALAKLGCACALLNTSIRDDSLIRSFRCCRGAKVLIASADLQAAVQQVCVPLQQDGVCV  
LMMGMECSGMRSLSRAAQESSDTAVPAAVRAHLTNNTPAVYIYTSGTTGLPKAAVITQTR  
LLASLAVLPSIGVTHTDVLYVTLPLYHTAGFLIGFMGCVETGSSMVLRRKFSASRFWDEC  
RAHEVTVVQYIGEILRYLCNTPQRAVDQHHAVRLAIGNGLRADVWREFLQRFGQMEVREF  
YASTEGNIGFLNYTGRLGAVGRVSFLHRMAVHYALIQFDTEREEPVRDSSGRCVEVPKGQ  
TGLLVSQITHMAPFVGYAHDEQQTERKRLRDVFRRGDVYFNSGDLMRMDQDNFLYFIDRV  
GDTFRWKGENVATTEVSDVLSLLECVAEASVYGVCVPGHEGRIGMAAVKLKDGAEFEQKQ  
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**>Slc38a3a**

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TVVAGLSAYSIHLLLKSSGVVGIRAYEQLGYRAFGTPGKMAAGIAITLQNIGAMSSYLYI  
VKYEFPLVIQAFLKVDNPSGEWYLNGNYLVVFVSCTIILPLALMKQLGYLGYTSGFSLSC  
MVFFLVSVIYKKFQVKCPFEDFSHNRTVLGFNTSVAADPGGVEITPEGDPACTPRLFNLN  
SQTAYTVPILAFAFVCHPEVLPIYTELRNPTKTKMQHVSNISIGVMYVMYLLAALFGYLT  
FIDKVEAELLHTYSRIDPYDTLILCVRLAVLTAVTLTVPIVLFPVRRAIQQLFFPNKTFW  
WPRHIAIAVTLLTLINLLVIFAPNILGIFGIIGATSAPCLIFIFPAVFYIRIVPKEEEPM  
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**>Zgc\_73228**

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PFERVQTLLQDPRHHGNFQNTAHIFRVLLQQHGFLELYRGLVPILIRNGPSNALFFGLRG  
PIKEFLPEVESKAGHLINDFVCGGILGAGLGVVFYPLNVAKSHAQVQIGGPFQSSRVILA  
SVLRERDGKVSRLFRGVHLNFQRSIFSWGIINAAYELLLKMM**

**>Slc51a**

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DNAFLRRCEKQTFKISTGPCCCCCPCLPNVPITRRSLFILKLGSYQFALMKLVLTIFSIV  
LWTNGSFSLANVSASGAAIWINSFIGVLTIIALWPVAIMFMHVREALRTLKIVPKYAMYQ  
LVLILSQLQTAIINILALNGTIACSPPYSSQARGYMMSQQLLIVEMFIITLVTRVLYRRQ  
YEPIPEPDDVEEKKTVLSSKKAIDVA**

**>Slc25a24**

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INLSDKDAEKILHSIDVDGTMTLDWNEWREHFLFNPAEDLQQIIRYWKKSTVLDIGDSLT  
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EGSEQVSMSKLVKKIMQKEGFFGLYRGILPNFMKVIPAVSISYVVYEYMRSGLGISK**

**>Slc6a6a**

**MAQKEKLQCLKDFHKDTLKPSPGKSPGTRPEDEAEGKAPQREKWASKLDFVLSVAGGFVG  
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TGIGYASIIIVSLLNIYYIVILAWGLYYLLQCFQHELPWARCRHSWNTENCVEDTVRKNK  
TLWLSANATNFTSPVTEFWERNVLSISSGIDEVGGLKWELALCLLAVWVICFFCIWKGVK  
STGKVVYFTATFPFLMLIVLLIRGVTLPGATEGIKFYLYPDLSRLKDPEVWIDAGTQIFF  
SYAICLGAMTSLGSYNKYKYNCYRDCMLLGCLNSGTSFVSGFAIFSVLGFMAQEQGIAIA  
DVAESGPGLAFIAYPKAVTMMPLPTVWAILFFIMLLLLGLDSQFVEVEGQITSLVDLYPS  
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WVYGADNFYDAIEDMIGYRPNSWMKWSWMLITPVLCVGCFVFSLVKYKPLTYNKLYKYPD  
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**>Slc12a4**

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APKSPNMGTLMGVYLPCLQNIFGVILFLRLTWIVGTAGVVQSFLIVLMCCSCTMLTAISM  
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HCDEYFFHNNVTEIKGIPGLASGIIKENMWGDYMEKGQILEKAKLPSVDVHGSMETFGFY  
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LFGACIEGVVLRDKFGDAVSKNLVVGTLSWPSPWVIVIGSFFSTVGAGLQSLTGAPRLLQ  
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LTFASQLKAGKGLTIVGSVIQGNFLECYGETQASEQAIKNMMEIERVKGFCQVVVASKVR  
EGIAHLIQSCGLGGMKHNTVVMGWPYGWRQSEDPRAWKTFINTVRCTTAAHLALMVPKNV  
SFYPSNHERFTDGYIDVWWIVHDGGMLMLLPFLLKQHKVWRKCKMRIFTVAQMDDNSIQM  
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LVKDRHSLIRMGSLYSDEEEETIEILPEKNQMTWTSEKIEAERRNRNNAPENFRELISIK  
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LLVRGGGREVITIYS**

**>Slc35g2a**

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VALITRLAADRSRVPSLELLFIRSVIQVLSIGVVFYYQEPPFGPQGYRLRLFFYGVCNVI  
SITCAYTSFAIVPPSNGTIMWRATTTVFSAILAFLLIDERLGMTDVVTVVSSVFGLCLVM  
IPNIVGEHRSLSFWKEAFGYTMTVMAGLMAAMSMIIYRAIKERVSMWTALFTFGWTGTVW  
GVSTMFVLQEPIIPLDGETWGYLIGICVCSTVAFLGVYYALNKFHPALVSTVQHMEIVVA  
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**>Slc47a1\_4of6**

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FWPLVITGVVANILNALINYILLFVLNMGVEGSAAANTISQYSLATILFIYIRWKGLYKE  
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IAYMFPIGFSIAGSVRVGNAMGAGDVAQAKLSAKVSIMCAVSVAVVLATVIGCSKNVIAR  
IFTNDKDIIQRVATVMVLYTPFHIFDATTAAGSSIVKGLGKQKLGAICNLLGYYGIGCPI  
GIPLMFAAKMGIFGLWIGLLVSVFLQSIFFIVLLVKLNWKKASEEAQIRAGVAIRRTDGA  
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AVKYSLKR**

**>Slco5a1\_2of2**

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YTTGPTLTLSHRNLTGSCNVNCGCKIHEYAPVCGSDGITYFNPCLAGCSNIANHTSGIRN  
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LITACAQPSVIIVTLRSVDEEDRPFALGMQFVLLRTLAYIPTPIYFGAVIDTTCMLWQQD  
CGFHGSCWEYDVTSLRFVYFGLAASLKFLGFLFIFLTWYSLKRREEQTHTHTHQHTLSTL  
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IRSLEKVAV**

**>BX248108.1**

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**>Slc26a6\_first**

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VGTFAIMSVMVGTVTADVLLPGSSSTENQHADSARVALASQLTILCGLIQIVLYVLRCGG  
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TLVVSFISLVVLVGGKMVNSRWSTRFPVPWELVLIIFATLSSVQLDLSGQYGIQIIGPIP  
TGLSPPSLPSFSFSQELVSTALALAVVGYGFQASLGMMFAHKHGYPFHSNQELLAMGLCN  
SIGGVFQCFPVSGSISRSTVQESTGGKTQMSSLVSSLVILLILLKLGPLFQQLPKTVLAV  
IILVNLQGVFAQVKEVPKLWNTDRMDLVVWVVTLLSALVFNLDLGLGIAVVFSLLTIVFR  
IQRAKSAILGHIAGTDCYRDLDKYSKAIQVPGVTVFSCFNPLYYANADQTFTSLKQAVTK  
GIKENPEMCPPNQQGASSAQHCVILELSGVTFMDSVAMGSFKSVLQDFENKQTLFFCAAS  
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**>Si\_ch1073-100f3.2**

**MTETRVSRWYFGGIASCAAACCTHPLDLIKVHLQTQQEVKMRMTGMAVQVVRSDGVFALY  
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MVNVRMQNDMKLPPVLRRNYAHALDGLLRVLKEEGIRKLFSGASMAASRGALVTVGQLSC  
YDQAKQLVLGTGLMTDNIFTHFVASFIAGGCATVLCQPMDVVKTRLMNSKGEYRGLIHCL  
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**>CU695232.1**

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YCAMHDPRAGMYRGNSLTATLGLLIHAAADGVALGAAAASSQVSVQIVVFFAVILHKAPA  
AFGLVSFLLHAGLEKKTIQKHLLAFSAAAPLMAISTYFILSASNGSSQSRLSATGIGMLF  
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LLALKLPDD**

**>CABZ01043017.1**

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LIVGRLIFGLFCGLVMSLNPLYIQGVSPTNLRGAFATLNQVFFASGILLGMVVGLETVLG  
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**>Rhd**

**MAPQYAPSLRSRLPLVAFLLETLFLLLFVFWVKIEKQEYRRSESEPFVHSYADFQDVHVM  
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WVAMVIGFCASLLSGLGFRYMKNHMLFAFECHDTCGVLNVHTIPGILGWFAHLCLRLASM  
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**>Slc6a20**

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**>Slc12a10.1\_second**

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**>Zgc\_92113**

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**>Si\_dkey-246g23.4**

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LIANSRFMVYSMFGIFAALGFFAPSLFLVPYARSQGVEEYQAASLMSISAVLDLLGRVFF  
GWVANLRLVETVHQLIGTVVLLGAVLLLCPLATTFTQLAVFSAGYGLVFGATVAIHITVL  
AEVVGVERLGSALGFFMLIRSSGGLLGPPLAGIFIDKMSDYGAGFLMAGVALLVSALFLI  
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**>Zgc\_77158**

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QCKLRALKSGPLMCLLRTCWSMTPAIYRSYCHVPRVMRQLCLAQLCSWMGVMSFMLFYTD  
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**>Slc25a35**

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AQLATFSASKEMVNDLQVFSEGSWLIALSAGMISSVVVVLAMTPFDVVSTRLYNQPVDHL  
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**>CR847939.1**

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**>Zgc\_91890**

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**>Oatx**

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ISSIVSEDSIVIQLRKIRQLTQPRYIGKVLAGQAILGSVSCRFGRKALLIWSYFQLALLG  
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LAGVAYSLRDWRKIQMAVCLPFFIFFMYSWWFSESARWLVLNGRSEEALKLLHRVAKING  
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**>Si\_dkeyp-120h9.1**

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**>Gpr98**

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**>Slc16a7\_second**

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**>Si\_ch73-335m24.5**

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SLHPHQFSFSEASLRVMITPHFSPRTRLSMAGRMLITERQRLIRNRSPGDSSGSGAGDTP  
GQDGPGMEAVPWGLENGGALESETQPLEEPRRRSQGGELERVADIEDTQPKDDEEDEEEA  
DEEPFRPFTVPEGRWEQAKWMFSWPLSCLLYYTVPNCVLPRWERWFMVTFVASTLWIAVF  
SYLMVWMVTIISFTLDIPDVVMGITFLAAGTSVPDCMASLIVARQGMGDMAVSNSIGSNI  
FDILLGLGFPWALRTLVVDYGSTVSINSKGLVYSVILLLASVFLTVLSVHLNHWRLDRRL  
GLGLMFLYAIFLLCSICFEKL**

**>CU571169.1**

**GSEKAVKDDAVHLRRRIGLLPAISFIIGTVVGSGIFIAPKGVLMNSGSVGLSLLVWALCG  
VLSTCGALCYAELGTSFTKSGGHYTYLLETLGPLPAFLRLWTEYIFIFRPAVASYVSLAF  
GRYVVEPFFMPCVAPTVLVKMVSMLGVTFVVAVNCWSVSLAARTQVSLTFIKMFALVLII  
IPGIMALANGNTKNFQNAFESDSVSLTKLPLAFYSGLYAYGGWFYLNFITEEVINPNRTV  
PLAIIFSMVTVTVFYVLVNVAYYTMMTANELLVSDAVAVTFANRALQGVAPAIPVLVALS  
CLGALNGGFFGSPRMLFVGAREGHLPAIFSMIHIRRQTPLPAVLFLYPLVIVMMARGEIF  
QLINFASFSRWLFIALATLGLIIHRYRFPEHPRPFKVPIAVAVVFTIVCFFIVGLSLYSD  
PWNTGGSCALTISGVPVYYLTVKKSCIPERWKKAFNYVSEKLQILLEVAQQEVQTY**

**>CABZ01071177.1**

**EFPEDVFTKEQRKRGAILLHVSQAIYMFYALAIVCDDYFVPSLEKISENLQLSEDVAGAT  
FMAAGSSAPELFTSLIGVFITKGDVGVGTIVGSAVFNILVIIGVCGIFARQTVVLTWWSL  
FRDSLYYIFSVLALILVIFDERVVWWESMLLISMYGVYILIMNRDLCFARIAHIFISCRY  
VCKCMYTEAAEGEQDEPGLGEELQGNGERWKCYAQQTLEDAGVKLEVENTQPEEEDEDED  
QIFRPLRIPAGCSARLKWLVSWPLGVLLYFTVPNCILPRWHRWFMITFIASTLWIAIFSY  
LMVWMVTIISYTLDIPDYIMGITFLAAGTSVPDCMASLIVARQGMGDMAVSNSIGSNIFD  
ILLGLGFPWALRTLVVDHGSAVFINNKGLVYSVVLLLASVFLTVLSVHLNGWKLDRRLGL  
GLMLLYSIFLLCSILF**

**>Rh50**

**MKKNSTNLRLRLPALIFASEVVIVVLYACFVTYDDHANALLQNNQTRHMENSFYQNYPFF  
ADIQVMIFIGFGCLLAFFRRYGFGGMVFNFLVATFTIQWAILIQGFFQFFYDGKIHLSVL  
NLINAEFACAVVLISFGAVLGKTSPVQLLIMALLEIPLFGVTEWAVLKYLRINDAGGSIL  
IHIFACYFGLGVTFVLYRPSLNEGHPKVSTSYQSDLLSVMGTLFLWVFWPSFNSALTFKG  
DDQHRAVLHTFIGLSASTITAFALSSMLSKNGKISMADVQNVTLAGGVTVGASVDMMISP  
AAAYVLGVMGCFACMLGYKYLSPVLAQKLRIQDQCGIHNLHGLTGLISSLAGICAILLAT  
EETYGPSLYETFSHQAPPEGDPQLMELQQLIPDLEAGLGRSAKEQALFQVAALFGTIAVS  
AVGGMLTGVVLKLPFLASPSDEQCFDDEVFFTVPSDYDCVNVLSETRKAENE**

**>Si\_dkey-106n21.1**

**MHLIQQDQKLDTVFKNQGATGSTFEFSADSSRDPEKIIAEPQSDSLEEGLDPSPEGNLIY  
SISDRPPWYLCILLGFQHYILAFGGILAIPLILAEPLCIKENNAAKSQLISTIFFVSGLC  
TLLQTTLGTRLPILQGGTFTFITPTLAILALPKWRCPDSSADPQVNGTDPASLLVNEDEL  
WKVRIREIQGAILVASLLQLVLGLSGLVGLVLKFIGPLAIAPTINLIGLSLFIQAGQKSG  
AHWGIAALTVCLIFLFSQYLSKVNLPLIAYKDKKWKVFQYPLFKLFSALFGMCGAWLLCF  
LLTYFNALPSSPSEYGYKARTDINLSAVKSAAWFYLPYPGQWGVPTVSMSSVLGMMAGVL  
ASTMESIGDYYACARLSGAPPPPTHAINRGIAVEGVGCILAALWGSGNGTTSYSQNIAAL  
GITRVGSRLVLQTAGLLMIILGLFGKFSAVFITIPEPVIGGMFLVMFGMVAAVGISNLQY  
VDLNSSRNLLILGFSTFSGLVLPTWFHSNPGMINTGVKELDQLIMILFTTHMFIGGFFGF  
VLDNTIPGTEEERGIKCWRKAVHKGPQMHTTDDSCYNLPFCTNFIARFRLLQRLPFLPST  
ATQELRTQM**

**>Si\_ch211-283g2.1**

**MAAKEEAGRPTWSRQIEFTLAGIGCAVGLGNIWRFPYLCYRSGGGAFLLPYLLMLVVLGI  
PLLHMELTLGQYLRRGPVLALAKACPLFKGVGMATVAISFIMCTYYNIIITWALYYMFSS  
FRSELLWQNCNNTWNTVNCTDQVTNSSSSSTASQQFFNYKVLERTSGVEETGTLRWELFL  
LLLLAWILVYLCIFKGVKSTGKVVYFTALFPYVILLALLINNVQLPGALDGIKFFIIPEW  
DKLLNVQVWINAAAQIFNSIGIGFGSLMAMASYNNYNNNVLKDTLAIAITNSLTSIFAGF  
VIFSAFGYMSHLQNVPVSEIAVDAVSLDFSPAGPGLVLVVYPQAFVTMPVAPLWAFLFFF  
MLLCLGLDSQFAMVEVMVTSLLDSYSKPILKHLKRKEFLVLLVCGAAFLLGIPNVMQVGI  
YVFQLMDHYTAIVSIMFLAFFEVVGVCWCYGVKRLSSNLVEMTGKRPSIFFRICWWVICP  
ALITVILVFSVIQFKPARYEDYVYPPWAQGVGWLIALASIIWIPLAAVHTLWVLPGSFTE  
KFKKSITPFSLDEDDSPYYQQKGGIMETIPNIAVISPIAPLPDKPIQTNL**

**>Zgc\_114041**

**MSRYSRDPPDGGYGWVVVASAFFIMGLTAAVLKNFGLFFLELQNYYSVLTSTTSLMTSTT  
IAVFHLGSPLASALSMHLSQRPVIMVGGLLAASGMIIASLGLSLPWMYLSVGVIQGLGVS  
FTWVPANSMVNHYFKRWRPIACAISSSGECVFGMAFSPFFQWLIESYSWRGALLVIGGLQ  
LNLIVCGALMKPLQPVQTCRKAVLDSKEETRTSKKVTFQCSLIQRPELLLYIVFAIFAAA  
GFFIPPLFLVPYVNNLGMDQYWAASLLSVLSLADLLGRLGCGWLANLCLLRNLQLLTMVA  
TAMGVVLLLLPIAYGYWSVLVFTSLYGFLFGCVVAIHVTSIVDIVGLEGFDSALGLFMLL  
RSIGGFLGPPAAGWLVDWTHNFGAAFYLSGICLLLSGCFVVLVDWLVEKKKKKKLQETLQ  
DPCTETTDLKADV**

**>Zgc\_110789**

**MAPEKNSDGLDNYAFTVDGVDHFCELPENKKESDGFSERGDPNKLAYCVTDIPPWYLCIF  
LGIQHYLTAFGGIIAIPLILSQGLCLQHDGLTQSHLISTIFFVSGVCTLLQVTFGVRLPI  
LQGGTFTLLSPTMALLSMPEWTCPAWTQNASLVNTTSPEFIHVWQSRMQMLQGSIMVGSL  
FQVLVGFSGLIGLFMRFIGPLTIAPTISLIGLSLFDSAGMNAGHHWGISAMTTCLIVIFS  
QYLRHIAIPVPKYSRAKKFHTTRIFIFQILPVLLGITLSWLICYLLTIYNVLPSDPDKYG  
YLARTDIKGDVTGKAPWFRFPYPGQWGVPSVSLAGVFGILAGVISSMIESVGDYHACARL  
SGAPPPPRHAINRGIGIEGIGCLLAGAWGTGNGTTSYSENVGALGITKVGSRMVIVASGF  
IMIIMGMFGKIGAIFTTIPTPVIGGMFLVMFGVITAAGISNLQYTDMNSSRNIFIFGFSM  
FTGLTIPNWIIKNPTSIATGVVELDHVLQVLLTTSMFVGGFFGFLLDNTIPGTKRERGIT  
AWNKAHQDDSDNTLESDEVYGLPFRINSCLSSLTWTKYVPFCPTHQISTHDDTPSSLESL  
ETKTEPNKDDTHIIAGVAL**

**>CR381630.1**

**MVRISTHTVLLVLIFAFLVCEIVVGQICRSLLIAVDSFHTLYVFINMALSALKHQTNASC  
TPEASREVPDPVYDVRMRLQPFCILISALLLASQCVSISLEVLTHLVQPEAIQHPHLCIV  
VGGVSVLFNTLVLLWRRRAMDDGTQNKMRSASEPKESALPDGALMFCNPQTSSVLDPNQT  
SPDGSSSCQNTNVTESKHTQTSQSSIGEAPQKIPEPIEKPPEEQKHTAPQCVSQVSIFRE  
HHLGLLSIVQDLLCSVLVLSNGLVLLLSRAHCHRPHSDCHLLVYLDAVFSTVCVVFLLSA  
ALPRLHRYGLLVLQAAPLHLSVRQVRLCLGQVPGVLSVHELHIWQLSDSLIIASLHVHCP  
AGMSAAECEELIANIKAVFYSFGVNHCTVQPEFLTPEKSEAAPAEGSGRPGCSLRCGQEC  
VEKLCCAPQVDESTKTINPTCIREEKPCDRDVVIENTSVIQD**

**>Si\_dkey-166k12.1**

**MNFDQLLATIGGFGKYQKLLYVWICLPQIFLGFHMMASVFTGATPPHRCRGSTSGMEDWT  
FTSNLSHVNLSISRLAGFADACTAASGVNRSARTNCETGWVYSHEVFQSTTVTEWDLVCD  
KRGLSSLGSSIYMLGLLVGAVVFGAMADRYGRRFAMLVSLALQTVFGVAAAFAPNFPVYV  
GLRFIIGMTVSGVIINAFVLGTEWTCTQRRMLAGIFTDYFFGFGYMLLAGVAFLIRDWRK  
LQLAISAPGFLFIFYIWVLPHSARWLLVNNRKEEAIDLLRKAASVNGRTLPPTVQLCIKV  
LLLLWQVERYESPQGRSKYTVVDLLRTPQMRKRALILFYIWFVNVLVYYGLSLGVSDLGA  
DLYLTQFMFGLVEIPARTLVLVLLPCSRKIPLSVFLVVGGGACLLTLTLPADSAHVRTAL  
AMVGKFGITASFAIIYVYSAELFPTVLRQTGIGVSSMFARMGGVLAPLINLLGRHTPVVP  
MLIFGSTPLLAAALALALPETARQPLPDSIHDTEKSTLKYDGQIPVQASQSPNNTEGQEL  
QSLA**

**>CR392362.1**

**GWRPHYHYFSPWTSLFAAFLSFILMFLFTWWAALVTFAIVLSLLGYVTYKKPKINWGTSY  
QASFYNMALSFSMSLTGVEDHVKNFRPQCLVLTGPPNVRPALVDFVGTFTKNISLMICGN  
IFMVEEKSRFPQHSTDMLVDWLNQRKVRAFYTSFTADSLTEGTHSLMQASGLGKLKPNTL  
VLGYKTNWQECKPERLQDYFNTISDAFDSSYGIAVLRMMDGLDIREDLTSVDNPAFEADE  
NTKSENEETDRNSDVTTKDGSNDQVKTVFQTKQGRKTIDIYWISDDGGLTLLVPYLLTRR  
NRWKKSKIRVFVLGDQETMKEDHKDMKMLLKRFRLEIEEIIVITDVDKPPLAKNLQRYED  
SIAPFRLTEEQSRGDLQEFRRLNPWTVSDKDLEAIRPKIERTVRLNEIIKKNSNHAALVV  
VSLPVPDLNCPSSLYMAWMEALSFGIHCPALLIRGNQENVMTFYCQ**

**>Si\_dkey-24c2.6**

**MANFGEILEAIGDFGLFQKLLLFALCFPNLILPFQLSSLVFNHADTNHHCNTDWILKADP  
NLTKEEQLNLTLPRLSDGSFNPCQMYKPVDWNLSAIQEYGLNQTTTCTDGWVHNDTIYEA  
TIVTDFDLVCENVNIFRGAQTVFFAGVLVGAILFGPFSESFGRKRATQIPMVLMLIFTVV  
TGLSPNFYVYLVSQFINGVGLGGFRINSIILASEWIGVAQRSYAACLSQVLAALGQVMFL  
AVVYFVRDWRLDQFIMAGPIGIVVIYIWFLPESARWLLDRGRTKDAKKLIQKAAAVNKRA  
VPESLVEEVLKEKPVEKGGIKILFGSRVLRKYFLAITFAWCALNLAYYSLSLNVGKFGLD  
IFLTQLIFGLSEIPVHFLCMWSLEVVGRKPSLIVSLVLGGCLCLLTVAVPQNSSIAIAVL  
ATCGRFLMNAAGSVCNVYFQELFPTSIRQTATGLGSTAARAGSMLSPVVNMLEIFHFSIP  
MVVISSLALASGVTAFLLPETRRTELPASTEEAEGKRKPKLTSPATRDCEDTKVTKL**

**>Si\_ch211-254p10.2**

**IHHARNQYFKTLYHLGSALIYLKGPKFLIYVSGALSMWGDRMWHFAISVFLIELYGHNLL  
LTAIFGLVVAGSVLLLGALIGDWVDRNPRNKVAHASLFIQNTSVTVCSIVLMLVFSYKKW  
IEEIWDGWLTVVCYTVVIILADVANLASTALTIAIQRDWIVVITGYNRGHLAGMNATMRR  
IDQVTNILAPLAVGQVMTLASNVVGCGFILGWNVVSLIVEFIFLSRVYRIVPALSVKPPA  
MEHQSYLEKKRERRCLKAPAISEETSSGLHLQEMTRIPMCIQRLRGLLSTCQEGWRAYYR  
QPVFLAGLGLAFLYTTVLGFDCITTGYAYTQGISGSLLSILMGVSAVAGLLGTVLFTKLR  
KAFGLVNTGVISSALHMLCLLLCVCSVFAPGSPIDLSVLNIGNVSDVGGMTGGHQRHGYP  
LRGGINQPLLPDRSSIHWTNNTVLFENAPAGTEPESYISIILLFLGVITARVGLWSFDLT  
VTQLLQESICESERGVVNGVQSSMNYLMDLLHFLMVIAAPQPQHFGILVIISVLFIFTGH  
TMYFLYARK**

**>Slc3a2\_4of4**

**MTLKVEGDPAYGSVSGARFTDVEGSESVPLLTPGPPPPPPARRRAWKPLSREELERCAGG  
PQWRKFRRRLVLCFWICWMLLLGAAVLIVIRSPRATSPVLHWWQRDLIYRLQPMLFLDAD  
RQQDSRINRVCERLPYLKSVGAGAVILEGLFGNSSSSTNLTEIDQNLGTLPQLTQLITES  
RKAGVRVILDLCELDLFEQESNNDTAVWSGASESIQYSLRYWLDHGVSGFGICDTDAAFS  
AKTLMEWNKLMQEFSSQDDERILMVRQTGNTLPVLNVSSFAGSLVELVTKSLIPPSHHPL  
STAEVAEAIEVSLQMPQRDWPSWTVGGGVPRELNRAILLLIMTLPGTPIIKYGDELSSAQ  
GWNRLNQPLALFQSLSQSRAREEALHFGRFTFLSFNTSLPSSSGLNTTDTPLLAYLRSWG  
CVHFLVLFNLGSAPHTMDPDWAPSLPEGGVFVTSTGLDRFGPVSLNTIKMQPHEAIVIKL  
FESDSSS**

**>Zgc\_153039**

**GFVVGQCGLYQTIAMLLVAYFIISMTVLSVCAISTNGALDAGGAYYMISRALGPEFGGSI  
GIMFFLANVCGSALYVLGLVEAVLTTFGLPDDGSLSMSRSAVLPVGYWWSLLYGTVILLL  
CVLVCLVGAHIYAKATFLIFIIVMVVLGTIFISFFAVPFRTVQLPGSNSTIGPSRANFTG  
FKLDTLTGNLQADYTLDYTTKAMMSFATVFAVMFNGCTGIMAGSNMSGDLKNPSYSIPRG  
TITAVIFTFIIYNLLSLLISCTCDRILLQKDYGFLRDINVWGPFVTVGVYSSTLSAAMSN  
LIGASRILFALAKDDLFG**

**>Slc47a1\_3of6**

**STKLFCCRSVRRCIPLVYRQELYHILCMTGPLVASRILNYLLPFVITMFCGRLGNSVLAG  
YGMASATINITTAATGGGLALAADTLISQTFGGKNLRRVGIILQRSVLILLLFCLPCCAL  
LINTQPILLLLRQDPEVARIAQLYVVCYLPAVPAMFLHQLSKDTLTRAVLGLQGVILPQM  
YAAIAANVANVLTNYILLHWLELGVYGSAAANTISQIYICAFLYLYIRWKKLHVETWGGW  
SCDSLQEWDGYMKLAIPSTMMLCFEWWIYEVGGFLAGMLGELDLAAQHAVIMLAFINYML  
GCQFPLGIQGAACVRVGNALGAGDTAGAIRTSKVSLTCTAALAVLQGLVLVSTKTVIGFL  
FTSDRHIVALVSKLLNVYCVLQFFDGLVCVSMGILLGSGQQKIAAVANFFGYYCIGLPLG  
TSLMFAAKLDVVGFWLGLLICVCVQSSFFIGVIFKFNWERVTKEAVERAGRSKISAMTAP  
DSVTARHRENGDEYMTVSAADPTVEPNATGIEEKPPVLLSTSQLVLRRGLTTLAALLILA  
GGITVHLIVPLPQMFYGASANFTLNSNFTTPSSFIHSTSAS**

**>Slc6a12\_3of8**

**MERINGEIEERGYWGSKMEFLLAVAGNVVGLGNVWRFPYLCYKYGGGAFLIPYLVFVVTC  
GVPLFLLEMAMGQYTQQGGVTCWHRLCPLAEGIGYGGQLILLYSCMYYIVILAWALFYLI  
FSFKSQLPWATCDNTWNTDDCINLVTKNLTINRTSLINSTPAATEFWERRVLSLSGGIED  
IGKINWEILLCLIAMWIICYFCVWKGVKSTGKVVYFTATFPYVMLLVLLIRGLTLPGALQ  
GVVFYLYPEPARLADPQVWLEAGTQILFSYSVSVGSITVLASYNKYHNNCYRDCLGLCLL  
NSVTSFVAGFAVFTVLGFMAQEQGVPIEEVAESGPGLAFIAYPQAVAMMPFPQLWAVCFF  
IMIILLGLDTQFVSMEAVVTSVMDMFPVVLRREGRREILLLFFCLTCFFGQFIMVTEGGM  
YVFQLFDYYACNGTCLLFLSVFESLTMGWIFGADRLFDIIEDMTKSRPNYIFMLCWKYLT  
PLVSLVCFVCSMVEYQPLTFNRWYVFPDWAYVLGWLLALSSIVLVPGWALGRLCSEKGSL  
KQRWRRLCSADKDLPLTCKQRAQLKETAFMTEMEDLVRASTEQHEI**

**>CU571162.1**

**MAMSILTHILAGLFGMGSWVTICGLFVELPLIVPHVPEGWYLPSYISVIIQMANIGPLFV  
TLMHRFRPGTLSETAVIYFIIAFGILASLLLAFFWSERVVVQGVERSVPLLLLIFFISIV  
DCTSSVTFLPFMTQLKAEYLMTYYIGEGLSGLVPALMAMVQGVGVMECVNASLILRSNQS  
HFNSSEENANYLVPSYQPANFSVEAYFFFLTAMMVVCLVAFLLLNYHPAVARERPNGSPV  
SRWKNKKSEKKPMMNSQRTVQKARSSFGTGTYTWVQVVYIYIIITWVNALTNTGLPSVQS  
YSCLPYGDQAYHWSATMANVANPIACFITIFYTQRSLVLMGVLTSLGSLIGVYIMAMAVL  
SPCPLLVHDTSGAVIIVLAWFLFILVLSYVKVIAAVILRDEGHSALVWCGAVVQLGSMLG  
AVTMFPLVNVFDFFTSGDPCSTNCL**

**>Slc6a12\_4of8**

**MNTIKGQTEERGFWGRKAEFLLAVAGNVVGVGNVWRFPYLCYRNGGGVFLIPYLVFVMTC  
GVPLFLLETVMGQFTHEGGITCWHLLCPLAQGVGYAGQLIELYSCMYFTIILAWALFYLI  
FSFSSQLPWASCDNIWNTDNCVNLAAGNLTFNRTTQINSTSAATEFWERRVLSLSGGIEE  
IGKINWEIALCLFVMWIICYFCIWKGVKSTGKVVYFTATFPYVMLLVLLIRGLTLPGALQ  
GVVFYLYPEPAHLADPQVWMEAGTQVFFSYSLCSGILIALGSYNQYSNNCYRDSFWLCLL  
NSGTSFVAGFAVFSVLGFMAHVQGVPVEEVAESGPGLAFIAYPQAVAMMPFPQLWAVCFF  
IMIILLGLDSQFVAMECVVTSVTDLFPEVLRRAGRRELFVLLLCLTCFFGQLIMVTEGGM  
YVFQLFDNYASNGACFLFLSVFESLTIGWIFGAEKMFDIIKDMTESRPNYWFMLCWKYLT  
PLVSLTSFVYSMVRYTPLTYNRWYVYPDWAHVLGWLLALSSILLVPGWALGQMCTGKGSL  
KQRWGHLCSPDTNLMLSSIQIQEQTAEMEDLVRSSTI**

**>Slc6a12\_5of8**

**MSTIKEKIEERGFWGKKTEFLLAVAGNVVGLGNVWRFPYLCYRNGGGVFLIPYLVFVVTC  
GVPLFLLETAMGQFTHEGGITCWHRLCPLAQGIGYAGQLTVLYSCMYFTIILAWALFYLI  
SSFSSQLPWASCDNIWNTDNCVNLAAGNLTFNRTTQMLINSTSAATEFWERRVLSLSGGI  
EDIGKINWEILLCLIAMWIICYFCIWKGVKSTGKVVYFTATFPYVMLIVLLIRGLTLPGA  
LQGIVFYLYPEPARLADPQVWMEAGTQIFFSYSVIGGVLISLGSYNQYNNNCYRDCFWLC  
LLNSGTSFVAGFAVFSVLGFMAHVQGVPIEEVAESGPGLAFIAYPQAVAMMPFPQLWAVC  
FFIMIILLGLDTQFVSVECVITSVMDLFPEVLRRAGRRELLVLLLCLTCFFGQLIMVTEG  
GMYVFQLFDNYACNGACLLFLSVFESLAIGWIFGAEKMFDIIEDMTESRPNYWFMLCWKY  
LTPLVSLTSFVYSMVRYTPLTFNRWYIYPDWAYVLGWLLALSSILLVPAWALGQMCAGKG  
SLKQRWRHLSSPETNFPLSFKQVQKQTAEMEDLLKSGTI**

**>Slc22a5**

**MGNYDEDTAFLGQTGPFFIRLFCLLNLIYISTGLHGLYIVFVAASPAHRCRVDVNLTEDW  
LEASAPTETLSNGDLQVSQCWRYSLQTLTNLSGQGYSPGQINITDIPRERCEDGWVYSAD  
VYHSTIVSEWDLVCDSEWRVPLASSTLYMGYLLGSIVSGQLSDRFGRKKVLFGSLAAEAL  
LMFAQSFSPSWLIFCVLYFFIGAFQISLYITAFVLGNEVLSGSLRVLFTTLGAFLHYCVG  
YMLLPWVAFAIRHWRTLLRVLSGLTVVYIPLWWLIPESPRWLLSQGHVQESEAILRDAAR  
KNRVPAPEVIFKQSQIKEAAFQKSKYSALDVLRTSNIRRTTFMCLLLWMAINIGYFGLSL  
NTTNLSGDPFLNCFLSAVTEVPAYIVSTFLLKSCPRRPVLSAFLVIGGGFLLLVQLIPDR  
LQTLALALEMAGKFGFTMSFTVVYIYTAELYPTVLRNLGMGMCSSAARIGSITAPYIIFL  
GTFNRHLPYVLMGSLTITASLANLFLPETFGKVLPENLEQMQKSRSFPGRDKQSVEDGGG  
GEKMREEKL**

**>CABZ01040253.1**

**DSTLAENIEFLPNSESKKPRFTDFDGKTSFGMSVFNLGNAIMGSGILGLAYAMANTGILL  
FLFLLTAVAGLSCYSIHLLLKSSGVVGIRSYEQLGFRAFGMTGKMAAAIAITLQNIGAMS  
SYLYIVKSEFPLVLQAFLRTDTTSG**

**>Si\_dkey-119m7.4**

**MNFDKVLDRIGGFGRFQKTLYVWICLPQIFLAFHMLVSVFTGAVPPHLCRSSWPVGDSAG  
PRLNLSFSSAPGESCTPSQDGSLPQRNHSLPITEHSSTAKGCTGGWEFSKEVFLSTIATE  
WDLVCENATMNNIGSSIYMFGLLVGAVLFGALADKYGRRIIILIGLAIQAIFGVGAAFAP  
NFYIYVLLRFVVGTTVSAVIMNAFVLGTEWTGPKKRMLAGVITDYFFGFGYILLAGVAYL  
IRDWRKLQLAISAPSFLFLFYVWVLPKSARWLMANNKHEEALDLIRKAALINGKPLEDDD  
MELYQSPKSSEKLQEQRKYTVLDLVRTPRMRKQSLILFYLWFVNVLVYYGLSLNISDFGM  
NIYLTQMIFGLVEMPARTITLFTLNRSRRISQLAFLAVGGLACLLTIFIPDDLSVVRTVL  
AMVGKFGITASLSIVYIYSAEVFPTVIRQNGIGMGSMCARAGGVIAPVIYLLRGIGRHTP  
MVVFGLCPLIGAVLTMFLPETAHKHLPDTIEDVENTGVSAASEKSQHAMYEECPKQNPTI  
IL**

**>Si\_dkey-150i13.2**

**MDTVESDRRVSPLKNFVAGGFGGICLLLAGHPLDTIKVRLQTQDCAVYKGTFDCFRKTVS  
KEGIFGLYKGMGAPLAGVTPMMALNFFGFGLGKELLQRDPTVPATYTQIYLAGMLAGVCT  
TVIVAPGERIKCLLQILPLAGRMKYTGPLDCAVRLYKQQGICSVYKGTILTLIRDVPSNG  
VYFLTYDYLKHYLTPDGECVHHLSTSRVLLAGGIAGMINWLIALPADVLKSNYQSATDGR  
YQGVRHVLRTLLKEEGAQGLYKGFSAVMLRAFPANAACFLGFEVALKYLNYIAP**

**>Si\_ch211-117c9.5**

**MSPEEHFSNDGGSCEDESQEDAEVARPLVSETEGSNTDVAEPSVCAGLVDTGDPTAELGH  
SDRQTWSRQMDFIMSCVGFAVGLGNVWRFPYLCYKNGGGVFLIPYILMVFFGGIPVFFLE  
IALGQFMKQGGVATWNIAPLFKGLGLASMVIVFFCNTYYIMVLVWGLYFLAHSFTSSLPW  
ATCGHEWNTINCTTNFSRVCFNQSPSHPNNSSLNISAGCLEPTGLRSSVMEFWERKVLRL  
SGGLDEVGDISGHMVLCLLATWIIVYFCIWKGVKSAGKVVYFTAVFPYLVLVVLFVHGVS  
LPGAINGIIYYLKPNWSKLSEAQVWIDAATQIFFSYAIGLGALTALGSYNRFNNNCYQDA  
FILALINSGTSFFAGFVVFSVLGFMAAEQDVDISNVAESGPGLAFIAYPKAVSLMPLAPL  
WAVLFFLMLLVLGLDSQFVGVEGFITGIMDMLPPKSFIGSLRREVVVAICCFTCFTIDLS  
MVTEGGMYVFQLFDYYSASGITLLWQAFWECVVVAWVYGADRFMDDVACMIGYRPLPYMK  
WCWSYITPVVCMGVFLFHVVNYKRLVYNAVYVYPWWGEALGWFLALSSMLCIPLTVLYKL  
LHCKGSLMERWQHLTTPIWGRHHLEFLPPENEARLLAKAEENKSTLLYESVI**

**>CABZ01086663.1**

**MRTLGGIPAPIYFGALIDSACLKWGLKKCGGRGACRIYDSNMYRVIFLSLTTALSGCSYF  
FIIAVIVLLRRQFIKEEVKALQQMAGKQNEIELRSPEMQNPDGTKTDERDKNNTEG**

**>Mfsd9**

**MNNSKCAITHRRRRPTRIIRCIYVVGFMDLFGVSMIIPLLSHHVKYLGASPTVAGIVGST  
YGVLQLFSSTLVGSWSDVVGRRYSLLTCLLLSAFGYGLLGLSTSIALFVLARIPVGLFKH  
SLSICRALLSDLVTEKERPLVMGHFNAASSVGFILGPVVGGSLTEHEGGFYLSSFVCAAI  
FLLNAGLVWILPWSETLNHCIDANANGKPKTSKAYDSLNNSVQRNCSEKNHLRHPDASAV  
GSREHGGWSWTNMSIVQPAWRQLTSVWIRIQMVASSDMWDVFLVRLLMALAIMLYYSNFS  
LAMEERFQLKPKITGYLISYSSMLGALAGFLVGPVTNLYGSNMSALLLHSTVLTCTLIFL  
YAAAPNVWQVVLTSTFFAISTTIGRTCITDLELQRGGSQASGTLIGAGQSVTAVGRVLAP  
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**>Si\_ch211-263p13.7**

**MNKLSAKISPSSGPVPVALHLPTPTSEKDPLEQALVQDESDAEKPSKRCCARCPFRAVRR  
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KRLPTTEFRKCSVFLGEELTVRFVLKGAAPFSLLWGLSGYLYLLALCRISKVDVSAVLCC  
CQAFTFLLSWIGLKDRFMGVRIVAVILSITGIVMLAYGDGFHSDSITGVALGVGSASTLA  
LFKVLFRKCVGEVQPGPASVLLSCVGLCSFVLHSWVCVLLYFTHVEYWPPSQHIPWDKLC  
VMASLLLVFNLLVNLGEMFTYPSLISLGILLTIPASAAVDGLVTLTLQISHVRAAAAGII  
SAGYLMLQLPENWDESTFRWLSALWRGNWREDSIVGEESMVDTAGILRTKAKPAVVT**

**>Si\_dkey-126h10.1**

**SHLQLSWLKRLHAGAEESQGLVLRDELGQTYGDHRSQSQTSSPEDPDQPQNTHSATITTW  
EAGWNVTNAIQGLFVLGLPYALLQSGYLGLLLLVLAALICSYTGKILVSCLYEEDESGCP  
VRVRHTYEDIANACCRHICPCIGGKVVNVAQLVELVMTCILYLVVSGNLMCHSLFFLHLS  
PTTGSAISFLILLPCMLIRDLRVVSRLSLFCSLAQFLITFIVIGYCVRQSPQWASRSLRA  
DVVDFDGFQVAVGVIIFSYTSQIYLPTLEESMMDRLDFNTMMDWTHALACVLKTAFSVLA  
FLTWGEETKEVITDNLPSALRTVVNLCLLAKALLSYPLPFYAAAEILQTGLLKLDSGSER  
WTLLLLRGSLLLLTLLMALFVPRFSLLMGLTGSVTGAAMTLLLPALFHLQLKWTQLDLSR  
RMLDLLILLLGGFCSVSGVICSIRGMITAFEDK**

**>Zgc\_175280**

**MSCNKVLSFLKSLSRRKPLEPDGEESNFKRCLSTLDLVALGVGSTLGAGVYVLSGEVART  
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YVIGTSSVARAWSGTFDDLIGNKIGNFFSANTPMNLPGLAPYPDFFAAALIMVLAGILAF  
GVKESAIVNKIFTGLNMVVLVFVIISGFIKGDIGNWQITPEEIFNYTITANLSISNETLS  
SFGQGGFFPFGFEGTFAGAATCFYAFVGFDCIATTGEEVRNPQKSIPIGIVASLLICFLA  
YFGVSAALTLMMPYYRLNLQSPLPVAFEYVGWEPAKYAVAVGSLCALSTSLLGAMFPMPR  
VLFAMARDGLLFSPLSKMSSRQSPVIATIASGVVAAIMAMVFDLKALVDMMSIGTLFAYT  
LVAICILILRYQEEPAVISEKADVQSKKWNPFRPPNTATAKSSKAVSLLTLLTIVFSIIL  
SVIITKGVEAGLIAEWWMILIITVVAVGFLLTIIIIWRQPQNRTKAAFMVPLLPLLPIFS  
TFINVYLMLQLGSETWIRYAVWMAVGLLIYFCYGVHFSVQRKRNKSQKHPEMADAKLEDE  
QRNGSIIQTQTKL**

**>Si\_dkey-175a17.4**

**MDVSSPGTDNLSMEPSAKLFCCGFMRRCIPLVYREELYHILRMTGPLLVCRFLNFLLFFV  
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GIVILTLFSLPCWALLVNTQPLLLYLGQEPEVARIAQLYVVVYLPAIPAMFLYQLQLSYL  
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TVIGYIFTSDESITELVSQLLNIYCPLQFFNGILCVGMGVLLGTGQQKIAAIANLFGYYC  
IGLPSSIVLMFTAGLQVAGFWLGLLIAVFLLAIFFTVAIFKLNWKKMTEEAIARTGKSAN  
GAANGTMTTEFCSNHRNSFYQVVLNAENGNGYMVVSSQDQDERLNSTAVPEEPNVTGVEE  
KPPVLLSTTQLVLRRGLTTVAALLILAVGIIIHLTVPLPQVSYGAGANYTVDSNFTTANP  
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**>CABZ01072557.1**

**MVLFAGFNMKEKIFISLAWMPKATVQAAIGSTALDMARSIGDEQLQKFGMDILTVAVLAI  
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**>Slc47a1\_5of6**

**STKLFCCRSVRRCIPLVYRQELYHILCMTGPLVASRILNYLLPFVITMFCGRLGNSVLAG  
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LINTQPILLLLRQDPEVARIAQLYVVCYLPAVPAMFLHQLQVAYLQNQGVILPQMYAGIA  
ANVANVLTNYILLHWLELGVYGSAAANTISQIYICAFLYLYIRWKKLHVETWGGWSCDSL  
QEWDGYMKLAIPSTMMLCFEWWIYEVGGFLAGMLGELDLAAQHAVIMLAFINYMLGCQFP  
LGIQGAACVRVGNALGAGDTAGAIRTSKVSLTCTAALAVLQGLVLVSTKTVIGFLFTSDR  
HIVALVSKLLNVYCVLQFFDGLVCVSMGILLGSGQQKIAAVANFFGYYCIGLPLGTSLMF  
AAKLDVVGFWLGLLICVCVQSSFFIGVIFKFNWERVTKEAVERAGRTKISAMTAPDSITA  
RHRENGDEYITVSAADPNVEPNATGVEEKPPVLLSTSQLVLRRGLTTLAALLILAGGITV  
HLIVPLPQMFYGAAANFTLNSNFTTPSSFIHSTSAS**

**>CABZ01088330.1**

**MYVFQLFDSYAASGMCLLFVAIFESICIGWVYGSDRFYLNIEDMIGYKPIFFIKWCWKFF  
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FRERIKKLTTPSADLRMRGHVASRGPCAINDADAKMRADGKISTITEKETHF**

**>Zgc\_174356**

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LLDNISVYWTLMAAALMGLTGGHVSIFLSSFSYLADLTMGSSSTRTLRMAVAESMIFVGG  
TIGFLLGGFLEQEFGLQAAFGAYIGCHVLVLLYIVLWLRDPSVGKNTRLVLCKEETAESG  
SQEDQSRLFILKYAKMSFKAVFKRRSGQERMKLHFLMLCTFINNLVAVGEQSILLLYLMY  
EPREFTTALFGVFNSVKMLLLGFGLLGLFPLLMRCVKEMTLAKLSAVFRIASYILLALSN  
NTWMVFLVAVVGAPSGISQAVIRSLSSAIVGPDEQGAMFSFSASVEATCILIAATIFNGL  
YPLTLPTFPGMPFIIMAAFMLIVLILLQWISELPSTHPRLVLSD**

**>Gpr98\_2of2**

**MQVFSVSLYGRGSKPLSEGQEVVYRIHTPDRRGKPKPSQSLCLLWNQAAESWLSDGQFCR  
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**>CABZ01087514.1**

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VLLTTPMWVVNTRLKLQGAKFRNEELHQTHYKGIVDAFSQIIAHEGVGTLWNGTLPSLVL  
VFNPAVQFMFYEAMKRKAGRGGRKISSFEIFLIGAIAKAIATTATYPLQTVQAILRFGQY  
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FRLMGLQRKLKH**

**>Ucp3**

**MVGIKPTDLPPTAAVKFFGAGTAACFADLVTFPLDTAKVRLQIQGESGTAPGSAVLKYRG  
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AGCTTGAMAVAFAQPTDVVKVRFQAQVRHTDGGKRYNGTMDAYRTIARDEGVRGLWKGCM  
PNITRNAIVNCAELVTYDIIKDLILKYDLMTDNLPCHFTAAFGAGFCTTIVASPVDVVKT  
RFMNSSAGQYGSALNCALMMLTKEGPAAFYKGFMPSFLRLGSWNIVMFVSYEQIKRCMTR  
MQHSWESPF**

**>Slc22a14**

**FVTSLVYYGVSLNVGNFGLDIYLTQLIFGMAEFPARLSCFPLIQRFGRRICQSVVLLLGG  
TACLIIPAIPAKYPIVVTVIAVIGKFSLAASFSIVYVYTAELYPTVVRQNGVGLNSMCAR  
VAGILAPLIGLLDVYHHAIPMIIYGSLPFVGGALTFLLPETLNTDLQD**

**>CABZ01044569.1**

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DYARPENSAFYIGCLNTIGVIGPIVGFSLGSLCANLYVDIGLVNQESVTITPQDSRWVGA  
WWLGYVVSGLLTLLAAFPFGFLPRALPENSQISELDHPSEQHKNPPSIMEIVKDFAPSFK  
RLLANKIYILYLAHSIVAFNDFAIGITYTPKYLEQQFGQSASKTNFLIGITSIPTFALGI  
FLSGLMMKRFKWGLLASARVNLYTGVTTLFLTITFFALSCKNLDVAGVTAPYQRSTEVQD  
IISDVLPSCNADCGCPDLQWDPVCGENGVTYISPCHAGCNSTKGAGWNMTFHDCGCIQSW  
GLSIGNSSAVLGQCSRDPNCNRFFYIYLGLQSLAFFVYSLGTVPFLTMSMRIVDPELKSL  
SVGMLLLAVKVLGGIPAPIYFGALIDSTCLKWGLKKSCGRGACRIYDIETFRFLFQGLTM  
CLRVLASSLLWIATIKIKREFRNDKQMSKDIKL**

**>Slc6a12\_7of8**

**MNPIKEEIEERGFWGKKAEFLLAVAGNVVGLGNVWRFPYLCYRNGGGVFLIPYLVFVVTC  
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DIGKINWEILLCLIAMWIICYFCIWKGVKSTGKVVYFTATFPYVMLLVLLIRGLTLPGAL  
QGVVFYLYPEPARLADPQVWMEAGTQVFFSYSVCSGILISLGSYNQYSNNCYRDSFWLCL  
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FIMIILLGLDSQFVGIECVITSVMDLFPEVLRRAGRRELFVLLLCLTCFFGQLIMVTEGG  
MYVFQLFDNYACNGACLLFLSVFESLAIGWLFDTGAEKMFDIIEDMTESRPNYWFMLCWK  
YLTPLVSLMSFVYSMVRYTPLTFNRWYVYPDWAYALGWLLALSSILLVPGWALGQMWAGK  
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**>Slc6a12\_8of8**

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FSFSSQLPWASCDNIWNTDACVNLAENKLNLSTPMLLNSTSSVTEFWQHRVLALSGGIEK  
VGKINWEILLCLIVMWIICYFCVWKGVKSTGKVVYFTATFPYVMLLVLLIRGLTLPGALQ  
GVVFYLYPEPARLADPQVWMEAGAQIFFSYALGTASLTVLGSYNKYNYNCYRSSLWLCLL  
NSSTSVIAGFAVFSVLGFMAQKQGLPIEEVAESGPGLAFIAYPQAVAMMPFPQLWAACFF  
IMIILLGLDTQFVAMEVFMTSVIDLFPTVLRKAGRREIFLLLFCLFCFFGQLVMVTEGGM  
YVFQLFDYYACSGACLLFLCVFESLAMGWVFGAEKMFGIIEDMTNSRPNYWFMLCWKYLT  
PIVSLASFVCSLVKYKPLTFNRWYVYPDWAYVLGWLLALSSILLVPGWALGRMFAGKGSI  
KQRWSHLCSPDTNPHFACKIQNKRHEKTPVTEMEDLFRSNTN**

**>Si\_dkey-16n15.6**

**XLYCGLCHTRLQISLYLPVLIEIFKESHLMSLCFMFFRFHSTMRNRNCTLMGGGIPLSSE  
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IISLYVPRSSSLCNFIASLYHSITLLKFMGLIKNFFGGNTRMLEALAGEQVSPNPFPCCC  
CCCLPLFDINKTSVSWMMAAVLQLSVVRTILFFLTLVLWTDEQYDYGDVNSVNLNMYVNA  
IIAISTFLSFYGYLLFYKATKRALPGHGLRAKFICIIVVLVLCGLQSGVLETMGALNVIP  
CTPPFSDLFRSQLIYHYSIIVEMFCISLFAHYTFRKVEPCQDVAEEMEVDVLRVFNEKSI  
QTEEELPIAVQLSSQEDDAFHSNLGYNSDSEDSSLCKIEHAPLDRFTFPSQHRMQTAANT  
EKVHTPPPEDSMRVKMPTITVSAQINHVDNGDVTVV**

**>Si\_dkey-119m7.8**

**DLSVVRTVLAMVGKFGITASLSIVYIYSAEVFPTVIRQNGIGMGSMCARAGGVIAPVIYL  
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**ABC genes**

**>Abcd3b**

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SLFRVLGELWPLCGGKLTKPERGKLFYVPQRPYMTLGSLRDQVIYPDTLEDQMKKRTSDR  
VLKEYLDNVQLGHILEREGSWESVQDWMDVLSGGEKQRMAMARLFYHKPQFAILDECTSA  
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**>Abce1**

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KGSVRALLHDKIRDAYTHPQFVTDVMKPMQIESIIDQDVQNLSGGELQRVALALCLGKPA  
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**>Abcb4**

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IYYSIMGFVVLVAAYMQVAFWTLAAGRQVKKLRKIFFHSIMKQEIGWFDVNETGQLNTRL  
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MTTFTSKEQTAYAKAGAVAEEVLSSIRTVFAFGGQKKEIKRYHKNLEDAKNVGVRKAITV  
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GGMQPAFAVIFSKIIAVFAEPDQNLVRQRCDLYSLLFAGIGVLSFFTLFLQGFCFGKAGE  
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**>Abcc12**

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SEQTNPDEPKANGIENPAFDMSDEKPATNETPKDSSETKGKKDQLVTREVAQEGSVTWRT  
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ILYVFQRSIRHMKRMENVSRSPWISLTTSTIQGLSTIHAYDKRQQYIERFKMLSDNNSNH  
FMLFNAGTRWLSFWLDVLSATVTLIVSLFVVLSPNETINPSLKGLALSYTIQLTGILQFV  
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RSQLSVIPQDPVLFIGTVRYNLDPFNNYKDEELWLALEKTYMKDTISKLPEKLQSPVVEN  
GENFSVGERQLMCMARALLRNSKIILLDEATASIDSETDSLIQHTIRDGFQHCTMLTIAH  
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**>Abca2**

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FLTIYAVATIMFCFLVSVLYSKAKLASACGGIIYFLSYVPYMYVAIREEVAHDKITAFEK  
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VLTWYIEAVHPGMYGLPRPWYFPLQKSYWLGSGRIETWEWPWGGGTRLSVMEEDQACAME  
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RQFHGLIVKRFHCAKRNTKGIFSQILLPAFFVCVAMTVALSVPEIGDLPPLILSPSQYHN  
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NRFGDGYMITVRTKTTASVKEVIRFFNRNFPEAILKERHHTKIQYQLKSENISLAQVFSK  
MEQVVEVLSIEDYSVSQTTLDNVFVNFAKKQSDNLEQQESSPSSGGQSPLQHLLSLLRPR  
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**>Abcc2**

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CVDSGSLFMFWLLQVVCAVFQFQTLLREALSQGISDVPRFCLFYISYGLQIIALVLSAIA  
DVSPEAKKVAETNPEAKATFLSRITFNWFNSMVWKGFKRPLVQEDMWDLNKNDSTHFICQ  
TFEDVMAKELKKARNNLQKKKSKKRKTVDAEGQNGLAKGVSQDVLVMETETEKESKKKKK  
KKQKDSDSDYPQSWLVTTIVKSFKGVLLESALFKLLQDLLSFASPQLLKLMIAFTQNKDS  
YAWTGYLYAVLLVLVAFVQSVVLQQYFQRCFILGMKVRTAIMAAVYKKALVVSNDSRKES  
TAGEIVNLMSADAQRFNDVTNFIHLLWSCPLQIALSIAFLWIELGPSVLSGLLVMVLMVP  
INGWLATKSRQFQMQNMKFKDSRMKIVNDLLNGIKILKYYAWETSFEAQVQEIREKELKV  
MRKFAYLSSVSTFIFSCAPALVSLATFAVFVSVSPDNILDAEKAFTSISLFNILRFPLAM  
LPQLISIMVQTSVSKKRLEKFLSGDDLDTTTVTHDSSITAAVSMTNGTYAWERDTEPVLK  
QVSLDIKPGRLVAVVGAVGSGKTSLVSALLGELHSIKGNININGSVAYVPQQAWIQNATL  
KDNILFGSSVDEERYQSVIKACALGPDLDLLPGRDQTEIGEKGINLSGGQKQRVSLARAV  
YSSADVYLLDDPLSAVDSHVGKHLFEKVIGPNGLLRDKTRILVTHGISFLPYVDEIVVLV  
HGVVSEIGSYESLRASKGAFSEFLETYGKDESNKDNDKKAAAAQTPVYEEIETLPEGLET  
QADGSPEDIVSSTLKRENSLRHSQRHSKRNGSVKVRKNSSLRAQKDPEDKKGQRLIEKEM  
METGRVKFSVYLQYLSAMGWWYVGFSFVFYFIQNVAVIGQNLWLSDWTDDSIEYFNQTYP  
NHIRDTRIGVFGALGLAQGFLVFFGTILLADGSISASRTLHTSLLTNILKVPMMFFDTTP  
SGRIVNRFAKDIFTVDEMIPMSFRSWILCLLGVLGTLFVICLATPIFTAVVVPMAVVYYF  
VQRFYVATSRQLRRLDSVSRSPIYSHFGETVSGLSVIRAYGHQDRFLKHNEHTIDQNLKS  
VYPWIVSNRWLAMRLESLGNLVVFFAALFAVISRDSLNSGLVGLSISYALNVTQTLNWLV  
RMTSELETNIVAVERVREYAEIQNEAPWVTSVRPPDDWPSAGNIRFEDYKVRYRPELELV  
LHGVTCDIQSTEKIGIVGRTGAGKSSLTNCLFRIVEAADGRILIDDIDIATLGLHDLRSR  
LTIIPQDPVLFSGTLRMNLDPFQTFSDAEIWSVLELAHLKEYVRGLPTGLEHEVSEGGEN  
LSLGQRQLLCLARALLRKSRILILDEATAAVDLETDDLIQSTIRREFSHCTVLTIAHRLN  
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**>Abcd3a**

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IANADQLLTQDVERFCNSVVDLYSNLSKPLLDIGLYIFKLTTAIGAQGPATMMAYLLISG  
LFLTRLRRPIGKMTVTEQKYEGEYRYVNSRLITNSEEIAFYNGNTREKQTIHSTFKKLVD  
HLHNFIFFRFSMGMVDSIIAKYFATVVGYLVVSRPFLNLSHSRHLNSSHAELLEDYYQSG  
RMLLRMSQALGRIVLAGREMTRLSGFTARITELMRVLKELNSGKYERTMVSQSEKDASEK  
LTLVPGSGRIINIDNIIKFDHTPLATPNGDVLIRDLCFEVKSGTNVLVCGPNGCGKSSLF  
RVLGELWPLFGGNLTKPERGKLFYVPQRPYMTLGSLRDQVIYPDTHESQKKKGISDLVLK  
EYLDNVQLGHILDREGSWDTVQDWMDVLSGGEKQRMAMARLFYHKPQFAILDECTSAVSV  
DVEDYIYSHCRKVGITLFTVSHRKSLWKHHEYYLHMDGRGNYEFKPITPETVEFGS**

**>Abcc9**

**MALSFCGNDRDSNAYSVDNGVLDNGCFVDALNLVPHVFLLFITFPILFIGWGSQSSKVQI  
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VVYYHNIETANFPKLLLALFIYWILAFITKMIKLWKFAEASLGVQHLRFCITALLVVLYG  
LLMAVEINVIRVRKYVFFANPQRVKPPEDLQDLGVRFLQPFVNLLSKATYWWMNPLIIGA  
HKRPIELKKIGKLPIAMRALTNYLRLKDSYEEQRQNTEDPEKSPSIWKSMYRAFGGSILL  
SSTFRYMADLLGFAGPLCISGIVEHLHNSTEIDRTNKTGNMTFGVYFMSSTELLQNTSVL  
AVLLFLALVLQRTFLQASYYVTIETGINLRGALLAMIYNKILRLSTSNMSMGEMTLGQIN  
NLVAIETNQLMWFLFLCPNLWAMPVQIIMGVILLYYLLGNSALIGAGVILLLAPVQYLIA  
TKLADIQKSTLDYSTDRLKKTTEILKGIKLLKLYAWENIFCDRVEETRGKELTSLKTFAL  
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AVKALVSVQKLSEFLQSDEIGDDSWRNGDMCMSLEVGKKYKYQGDTKAINRKGRYRMDNY  
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LLAMLGEMQTISGKVYWSNKNRYSVAYATQKSWLLNATVEENITFGSPFNKQRYKAVIDA  
CSLQPDIDLLPFGDQTEIGERGINLSGGQRQRICVARALYQNTNIVFLDDPFSALDIHLS  
DHLMQEGILKFLQDDKRTVVLVTHKLQYLIHADWIIAMKDGSVLREGTLKDIQTHDVELY  
EHWKTLMNRQDQELEKDTDLESQTTLERKTLRRAFYSREAKNHVDDEDEEEEVEEEDDDN  
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SFVNSSFNHTLNDDATQIAEHRSYVPVFIILCAAAIALCLITSLTVEFLGVAAATNLHHN  
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LTYALTLTNYLNWVVRNLADLEVQMAAVKKVNSFLSTESENYEGSMDVSQVPEDWPQHGE  
ITIHDLCVRYDSMLKPVLKHVNAHINPGQKVGICGRTGSGKSSLSLAFFNMVDVFEGKIV  
IDGIDICKLPLQTLRSRLSIILQDPVLFSGSIRLNLDPERTCTDDRLWEALEIAQLKNMV  
KALPGGLDAVVTEGGENFSVGQRQLFCLARAFVRKSSILIMDEATASIDMATENILQKVV  
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**>Abcc6a**

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VIHWERVRGCRSSVFLFFFWLLGVLCSIIPLHAKVQLAVEQGLSPDIVRYLAFFSYFALQ  
LAQLFLSCFADQAPLGKAVHKNACPVQDASFLSKILFWWFSGLIFKGYRSPLQAEDLWSL  
REEDTSERIISDLEEEWTAKRTKLQQQENHMSTSAALGSRLPDQAQLLRKIQKEQSSGFC  
LLRTLARSFGPYFLTGTLCLIVHDVFMFSVPQVLSLLLGFMKDEDTPLWKGYFYATLMFL  
LSCLQSVFNHQYTYTCFTVGMRVKTAVMGLVYRKSLVMNSSARRTCTVGEIVNLVSADTQ  
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FNSSSFLIAFAMFGVYVLIDDKNVLDAQKIFVSMALINILKTPLSQLPFAMSTTMQALVS  
LKRLGKFLCQDELKPDNVARESFKSDVDGVVFDNGTFSWSKDGPPCLKRISVKVPCGSLV  
AVVGHVGSGKSSLLSAMLGETEKRSGTVSVKGSIAYVPQQAWIQNASLQDNILFGREKKE  
SWYQRVLEACALLPDLDNLPAGDATEIGEKGLNLSGGQKQRVSLARAVYRKGDVYLLDDP  
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LLNRNGAFADFIHTFANSERKECFSEALQRGSRKSVRLSVTDYMPFSRDLSQEQLIGGDT  
NSIAIEPLPDSDEDHIPEDLGKLTKVDKARIGRVKLEMYIEYFRTIGLPLIISIVFLYAF  
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SRHLHLDLLNNVLHSPMSFFESTPSGNLLNRFAKEIDAIDNMIPDGLKMMLSYFFKLTEV  
CIIVLMATPFAAVIILPMVFLYGFIQSFYVATSCQLRRLESVSRSPIYTHLNETVQGASV  
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LSPGMVGLAVSHSLQVTGFLSWIVRSWTDVENNIVSVERVKEYADTPKEAAWSIEGSSLP  
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LAHLKNFVSELPDKLNHECSEGGENLSLGQRQLVCLARALLRKTKVLVLDEATAALDLET  
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CREAGLL**

**>Abcg2d**

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KCLSGYVVQDDIVMGTLTVRENLSFSAALRLSSHVSPREKEARVNHLISELGLNKVADSK  
VGTQIIRGISGGERKRTSIGMELIIDPSVLFLDEPTTGLDASTAHSVLLLLKRMAGQGRT  
IIMSIHQPRFSIYRLFDSLTLLANGKQVYHGPAQDALDYFSNIGYACEAHNNPADFFLDV  
INGSSVTKIQNNGDAECDVSAVSRQSVEDQLMEKYRSCSFARAVRAELDHIIQTKDSSSS  
SVAAECHSITYSSSFCQQLRWVLWRTFWNLMLNPQTSVAQLAVTTLMAAIVGAIFYGVKD  
DQSGIQNRRVDHFYHEYTSGYYRVSVFFLSKILSDIITQRTIPSVLFSCVVYFMIGLKPT  
ASAFFIFMLTVILVSCTAAAMAMAISADQSVVAVANILMTVSFIFMMASSHLVTTQNIFS  
GLLVNLKSIMDWLSWLKYLSIPRYGLEEHPGFQLMRCFDEYLEQALEINEFVGLSFCGNV  
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S**

**>Abcf1**

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IFAALSQGQSDDEDDEAGGDDNDDDDDKPRSKKSSKEVEKVAKGKKKDKPKPKPIKEASE  
DEQDEGAEKKDENEKKGGKKGKKAAAAAKPSKEEDDIEEKEQEKSQKKGKKEPPKKGKPA  
RPPPSDDDEEEEEKSDDNDIMMSAEDAIAAQEAKEKQDDDPFANMSKKEKKKKKKIMEYE  
RQVASVRAQNAIEGDFSVSQAELSSRQAMLENASDIKLERFSISAHGKELFVNADLLIVA  
GRRYGLVGPNGKGKTTLLKHIANRALSIPPNIDVLLCEQEVVADDTPAVQAVLKADTRRL  
KLLEEERQLQSRLEKGDDSVSERLDKVYEELRAIGAAAAEAKARRILAGLSFTPEMQNRP  
TKKFSGGWRMRVSLARALFMEPTLLMLDEPTNHLDLNAVIWLNNYLQSWKKTLLIVSHDQ  
SFLDDVCTDIIHLDNQKLYYYRGNYLTFKKMYIQKQKELQKQYDKQEKKLKDLKAGGKST  
KQAEKQTKEALTRKQQKGKKKSQEEESHEATELLKRPKEYTVKFTFPNPPPLSPPILGLH  
SVDFGYEGQKPLFKNVDFGIDMESRICIVGPNGVGKSTLLLLLTGKLNPTKGEMRKNHRL  
KVGFFNQQYADQLNMDEAATEYLQRNFNLQYQDSRKCLGRFGLESHAHTIQISKLSGGQK  
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**>Si\_dkey-57h18.2**

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ILIYMVWEMAFPHGGSSKGGRNQKKDEEARALLMRVIRYSRLDYLYLGAAFIFLSLAALF  
ETFIPYCTGKVIDILSGKYQHSNFTWAILLLALCSLGSSMFSGLRGGMFMFSLNRLNKRI  
RNLLFQNVMKQEIDFFDEIKPGNLASRLISDTDKMGRAVAMNVNVLLRSMVKTCGMLYFM  
LGVSWQLTLLTCIEMPLLAFLQNSYNSLSQKTSKELQDCNAETGELASSVIGSIKTVRSF  
KAECQEQQRYEQTINRKLQVLRRKGFYSAVYLLIRRFITVGLKVAMLCQGRNLISSGQLS  
SGSLLAFVFYQKDMVTSMKHLVYIYGDMLSTVGSSVKVFQLLDRKPQMREAGDLAPEKLK  
GRITFEKVTFSYLSRPDDTALKSVTLELSPGKLTALVGPSGGGKSSCVSLLQRFYEPKEG  
EMFLDGEPLYHYQHQYLHKKVAVVSQDPVLFSGSVRYNIEYGLQDCTLERIEEAARKANA  
HNFICNLEQGYDTDVGECGGQLSAGQKQCIAIARALIRNPQILILDEATSHMDSSTQQAI  
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**>Abcb3l1**

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LGSHYQWDNFRSAIIFMGLFSLGSSFSAGCRGGLFMCAINSFTCRVKVQLFGSLIRQDIG  
FFETIKTGDITSRLSTDTTLMGRAVALNVNVLLRTLVKTLGMLYLMVSLSWKLTLLMLME  
TPLTGLLQNIYDTHYQKLSKEVQDSMAQANDAAGEAVSGIRTVKSFKTELGEAHRYDGRL  
METHNLKTRRDTVRAIYLLIRRMTELGMKVAMLYYGRLFIQYGQMSTGNLVSFILYQQDL  
GDNIRTLIYIFGDMLNSVGAAGKVFEYQDRKSEVSIDGNLMPKDLKGHVKFQNLTFSYPR  
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VGERGNLLSGGEKQRIAIARALIREPQVLILDEVTSSLDTESEQMVQQALSCCPTQTLLV  
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TVKTQ**

**>Abcf2a**

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SECEKLMELYERLEELDADKASMRASRILHGLGFTTSMQQKKLKDFSGGWRMRVALARAL  
FLKPFMLLLDEPTNHLDLDACVWLEEELSQFKRILVLISHSQDFLNGVCTNIIHLHQRKL  
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QKMVASGLTERVVNDKTLSFYFPPCGKIPPPVIMVQNVSFRYSENTPYIYKNLEFGIDLD  
TRVALVGPNGAGKSTLLKLLTGELLPSDGMIRKHSHVKIGRYHQHLTEQLELDLSPLEYM  
MKCYPEIKEKEEMRKIIGRYGLTGKQQVSPIRNLSDGQKCRVCFAWLAWQNPHMLFLDEP  
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HLKSKIDKQMHDL**

**>Cftr**

**MQRSPVEDANCLSRYFFWWTNPIMRKGFKEKLRPSDVYQAPSQDAADILAERLEKEWDRE  
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LVSLMSANLGKFDQSLGMAHFIWISPLQCILCTGLIWELIDVNSFCALAAISLLGVLQAF  
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GSLRYFYSSAYFFSAIFVIVAAVVPHALSRGINLRRIFTTLSYCMVLRMTVTRQLPGSIQ  
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GHHNGDAGLFFTNLYVAPVLKDISLKLKKGEMLAVTGSMGSGKSSLLMTILGELVPSSGK  
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AEGGLNLSGGQKARVALARAVYRDADLYLLDAPFTHLDIATEKEIFDKCLCKLMASKTRI  
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EVRRTLPDRKFSLVPENELVDESFMGSDVYHNHGVHMAGQRRQSVLAFMTNAQGQGRREH  
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TTKWNTYVRYVSNNKSLLYVLIFILFIAAIEIAGSVAGIFLITDELWREEHQRSEPNMTK  
HSNASSSGQTYAITVTPTSSYYILYIYVATSESLLAMGFFRGLPFVHTTITISKKLHQKM  
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PYIFLAATPLAIIFIVMRKYFLRTGQQLKQLETEARSPIFSHLIMSLKGLWTIRAFERQA  
YFEALFHKTLNTHTATWFLYLSTLRWFLFRADILFVFFFTLAAWIAVGTNQDKPGEIGII  
ICLAMLILGTFQWCVATSIAVDGMMRSVDRVFKFIDLPSETPKPDKGKDSDLIIENVDAQ  
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LVYTDGEISIDGVNWNKMPLQKWRKAFGVVPQKVFIFTGPLRMNLDPYGCHSDEELWRVA  
EEVGLKTVIEQFPDKLDFQLEYGGYVLSNGHKQLICLARSILSGARILLLDEPSAHLDPV  
TIKVLKKTLRQSFSTCTILLSEHKVEPLLECQSFLMMDKGQVKTYDSIQKLLNETSHLKQ  
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**>Abcg2a**

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QDDVVMGTLTVRENLRFSAALRLPKSIKQREKDEKVERLIQELGLSKVADSRVGTQLIRG  
VSGGERKRTNIGMELIIDPPVLFLDEPTTGLDASTANSVLMLLKKMGNNGRTIILSIHQP  
RYSIYRLFDSLTLLVGGKLVYHGPAQDALSYFSQIGYTCEPHNNPADFFLDVINGDSSAV  
TLNKLYEEVVDQDQLSSSLKGIEDRLVEEYQRSSIFQQTHADLQRIVQGQDYSTRPKSRT  
ITYSTSFCHQFHWVLKRTFRNLMLNPQTSVAQIGVMIFLALVVGAIFFGVAENSSGIQNR  
MGALFFITTNQCFSSVSAAELFIAERKLFVHEYISGYYRVSVYFLSKILSDILTLRTIPA  
VIFSCVAYFMIGLKPAAEAFFIFLFSIIMVSYTATAMTLAISADQTVVAIANIFMTISFV  
FMMLFLNLMARINSLLIILFWIKWQKLKRFVLTALQINEFTGLFFCDNRNNSGSVCSSGE  
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**>Abcc8**

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STYWWMNTFITSAHRRPIDLKVIGRLPIAMRALTNYIKLRQAFEAQKGPQDTPPQGSKWI  
WAALRQAFGKPLILSITYRFMADLLGFAGPLCISGIVHHLSKENHTILPPVKHLGMYFIS  
SQEFLANGYVLAVLLFFALLLQRTFLQASYYVAIETGINLRGAIQTKIFNKIMRLCTSNL  
SMGGMTVGQICNLVAIDTNQLMWFFFLCPNLFAMPVQIIVGIILLYYLLGISALIGATII  
TLLAPVQYFVATKLSDAQKSTLEYSSERLKKTNELLRGIKLLKLYAWEHIFCSNVEETRC  
KELTSLQAFALYTSISIFMNTAIPIAAVLVTFVAHVHLSDDADLSPAVAFASLSLFHILV  
TPLFLLSSVVRSTVKALVSVQKLSEFFSCDEIGGEQEPRATVVPNSTNHNKYQALPLKVV  
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VAYASQKPWLLNTTLAENITFEMPLIKQRYRAVIEACSLQPDIDILPQGDQTIIGERGII  
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KLQYLPHADWIIAMKDGSIQTEGTLKDIQKSQPELFEQWKTLMHRQDKEFEKETVDENMT  
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PFLFSGTIRFNLDPEMKATDSMLWEALEIAQLKPVVKTLPGGLDAIITEGGENFSQGQRQ  
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**>BX322787.1**

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HEDSECEKLMEIYERLEELDADKAEVRASRILFGLGFTPAMQRKKLKDFSGGWRMRVSLA  
RALFIKPFMLLLDEPTNHLDLDACVWLEEELKSFKRILVLISHSQDFLNGVCTNIIHLHQ  
RKLKYYTGNYDQYVKTREELEENQMKRYNWEQDQIAHMKNYIARFGHGSAKLARQAQSKE  
KTLQKMVASGLTARVMNDKTLSFYFPPCGTIPPPVIMVQNVSFRYSSDTQIIYKNLEFGI  
DLDTRVALVGPNGAGKSTLLKLLMGELLPTDGMIRKHSHVKIGRYHQHLTEQLELDLSPL  
EYMMKCFPEIKEKEEMRKIIGCYGLTGKQQVSPIRNLSDGQKCRVCFAWLAWQNPHMLFL  
DEPTNHLDIETIDALAEAINEFEGGMMLVSHDFRLIQQVAQEIWVCEKQTITKWKGDILA  
YKEHLKSKIDKQTHDI**

**>Abcb9**

**MRVAVIVSCNLVFTLVDIVLTTVLYIHGSNIDIFSDETEDFDIHRSTVDLWGTVLIRVSL  
LFGASIGVFFNRRDGPRRVSNLGTLVALICLTNMTYALAKLLMLSEEGNLMYDPWFLSLF  
SWTCVAAIGVMIFWKILSQTPNAVSDREDSEDTERLVDETEDESEKSMKSGKEHTHSGAT  
IGRLLSYCKKDSSLLSIAFFFLLLSAVCEAFIPYYTGQAIDGIVIQKSMDHFAKPMITLS  
VLALVSSIAIGFRGGVFSVTFARLNIRLRNLLFRSLMHQEIGFFDANHTGDITSRLTSDT  
TQVSDLISQNVNLFLRSFVKAVGIFIFMFGMSWKLSVVTIMGFPYIAVVSKLYGEYYKKL  
TKEVQTALAQANKVAEETISAMRTVRSFANEDQEGDMYYSRLQEMFVLNKKQAIAYACFM  
WSSYISELALQVAILFYGGHLVVTNQMSGGTLISFVIYELELGEALESISSVYTGLMQGV  
GAAEKVFEYIDRKPKHALNGQEAPETLEGQVEFNNVTFAYPSRPEMDVLKNVSFSLRPGQ  
VTALVGPSGGGKSSCVCLLENFYAPQQGQVLVDGRPVNTYQHKYYHSKVALVAQEPVLFA  
RTVQMNISYGVPEAPMEAVIRAAINANAHDFITGLSKGYDSGVGEKGTQLSGGQKQRVAI  
ARALIRSPRILILDEATSALDSESEYIVQQALNNLMREHTVLVIAHRLSTVERADNILVI  
DKGSVVEQGPHAELMARGGLYCKLVQRQILGTEIDVDDKNPSPAPTWELKTEDKENAEDC  
SDTEYETRY**

**>Abcb8**

**MFHFARCSRLTRGTVTSDRLLSSHKTRDFLFQHLNRRGNHSAPWSSSQIPSTQLTVGVPV  
LRVWRQAQKLLRLTSRQQPRPPSIALKFILGPAALTVTARLLGPSAHCEADVNNNKVPLE  
VQVKEKIPEFSWAVLWEFVRPQLFALMGAILLAFGAAALNIQIPLMLGDLVNVVARHMRE  
QAGHYMRDIQAPAVKLLGLYALQGLLTSGYIILLSRVGERVAADMRTTLFTSLLRQDIAF  
FDANKTGQLVNRLTSDIQEFKSSFKLVISQGLRSATQTVGCFVSLYFISPKLTGLTVVVL  
PCLVGAGALIGSFLRKLSRKAQEQVAKATGVADEALGNVRTVRAFAMEDRELEMYAAEVQ  
KSAAMNETLGTGIAVFQGLSNIVLNCIVLGTIFAGGSLMARDDLSPGDLMSFLVASQTVQ  
RSLASISILFGQMVRGMSAGARVFEYLALDPSVPLTGGGRIPLDSLMGRVDFMNISFSYP  
TRPGNQILKHFSLTLPPCKTVAIVGESGGGKSTVAALLERFYDPSSGVVMLDGLDIRTLD  
PSWLRGHVIGFISQEPVLFGTSVMENIRFGKPSATDAEVVSAAKQANAHNFITGFADGYN  
TVVGERGVTLSGGQKQRIAIARALVKNPSILILDEATSALDAESERVVQEALDRATTGRT  
VLIIAHRLSTIQAADLICVMSNGRIVEAGTHLELLSKGGLYAELIKRQRSNGHK**

**>Abca4a**

**MGTNSQVRLLLWKNWTVRKRQKTRLFMEIMWPVVLFIGLVWLRKANPLYRQHECHFPNKA  
MPSSGVLPWIQGIVCNANNPCFQHTTRGESPGLVSNYNNSILARFWSDAQELLFEDTEFL  
QLGRLWQELMAMSSFMDTLRTNPEAIAGRGIKVEDILKDDETLTAYLLRDVPLTESVVQQ  
LINSQIRPEQFAYGVPDLHLKDIACSQTLLERFLIFPNRWGLYAVRNAMCVLTPQRLQII  
EDKFYANLDFFKLFRLLPLVLDSYSNGLDLHFWARLLPDVSDKLKALLNRPSSKDLLQLV  
SPLFQSYEGPSFSQLMSATSSLFCGYTEGAFSRVTSFNWYEDNNYKAFLGINSTRGEGKY  
IYDHAATPFCNDLMKDLESNPVTRIVWRSVKPFLMGKILYAPDSPAARQIIKNANTTFEE  
LERLRNMGRAWEEVGPQIWSFFQDSVQINMLRDSIRNPTVMDHINKGLRNAAFTGQHILN  
FLYSGPEEDREQDMPNFDWRNIFNLTDQVIRLINRYGECLVLDKFSSISDEDQLTHRALN  
LLEEGKFWAGLVFVDMYSWTTKVPPHVKVKIRMDIDVVERTNKIKDRYWDPGPRADPMDD  
LRYIWGGFAYLQDMIEHGIIKTHTGKEWPLGVYLQQMPYPCYVDDLFMLTLNRCFPIFMV  
LAWVYSVSMTVKSIVLEKEMRLKETLKAMGVTNRVLWCTWFIDTFFMMASSTALLTLIIM  
GGKVLNYSNPIILFLFLLTFTTATIMQCFLMSVFFNKANLAAACSGIIYFTLYLPHVVCF  
AWQDRITKDMKIMASLMSQVAFGFGTEYLSRYEEQGLGLQWDNIQTSLLEGDEFSFLNSI  
IMMAVDTVLYGVLAWYLDSVFPVPGKPTVEKPAFDNLVNNTDDQAKNHTAPEKPPEPPGS  
CKHGDIREKLEREKLQKRIVEEEINRSMSTDSSGKVFFEPEPSGLVAGVCVENLYKVFSG  
SSRPAVDGLSLTFYEGQITAFLGHNGAGKTTTMSVLTGMFPPTSGTAYIYGKDIRTDMDA  
IRKSLGMCPQHNIIFHHMTVAEHILFYSLLKGRPLPEAQLEVENMLEDLGLPHKRNEEAQ  
NLSGGMQRKLSVAMAFVGGAKVVFLDEPTSGVDPYSRRSIWDLLLKYRRTLILSTHHMDE  
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SCKCSLCTKFKASDTEKPRVSERQMEGNIESITALVHHHVPEARLIEVIGQELTFLLPSR  
AFKHRSYASLFRELEETLADMGLSSFGVSDTSLEEVFLKVTADGEAAHINTASDTDRSHA  
NGQSNSANVISKEGRGSQQVKGFFLVVKQFFALLIKRFHHTTRSGKDFLAQIVLPASFVF  
ISLMFTLIVPPFGEYPSLTLSPWMYGRQFTFFSNEQMQSPDMRYFGEVLLNRPGFGTRCM  
VDEPLEEYPCNNITTEWEMPLVNPMLIEMLSNSEWTDISPSPSCQCSTPNKLTMLPVCPE  
GAGGLPPPQRIQSTGDMLMDLTGRNISDYLVKTYPNLIRTSLKSKYWVNEQRYGGISVGG  
RLPVLNLDPKSIQNAAAQIGRLLNVTGGRYSKLALDEFATFLRYMETENNVKVWFNNKGW  
HAMVAFMNVANNAILRANLPPGVDLNEYGITAINHPLNLTKEQLSEVTVLTTSVDAVVAI  
NVIFAMSFVPAGFVLYLIQERVTQAKHLQFVSGVSPLVYWTANFFWDMINYSVSAAMVVG  
IFIAFDKKCYTSPGNLQALIALLMLYGWSVTPMMYPMSYIFNVPSTAYVSLSCINLFIGI  
NSSAITFILDLFDSTEALYKCNQVLKKALLVFPHFCLGRGLIDMAMNQAVMDVYARFGED  
FSLDPFSWDFVGENLTFMAVEGFVYFILNILIQYRFFLDHWMSDFKKPPITDEDVDVAKE  
RERIYKGGSSNDILQIKDLSKTYTGTFRPAVDRICVGVSPGECFGLLGVNGAGKTTTFKM  
LTGDIDVTSGEADVAGYSILTNILDVHQNMGYCPQFDAIDDLLTGREHLHLYARLRGVPE  
SEISRVAEWGIQKLGLSEYAGCTAGTYSGGNKRKLSTAIAMIGCPALLLLDEPTTGMDPH  
SRRFLWNSIMSVIQGGRAVVLTSHSMEECEALCTRLAIMVNGTFKCLGTIQHLKYKFGDG  
YVVTMKIRAAKVGAVPDLNPAEAFMESTFPGCIQREKHYNTLQYEIASSSLAKIFQVVLA  
NKEMLNIEDYSVSQTTLDQVFVNFAKHQSGEDDAVVLHPRAAGARRDVRVFPVKTKA**

**>Abcc4**

**MEPIKKDAKSNPSASANLFSQIFFCWLNPLFSIGSKRRLEEDDMFNVLPEDRSKKLGEEL  
QSYWDQEKEKAAKELKTPKLTKAIIRCYWKSYAVLGVFTLIEESIKVIQPVFLGKLIKYF  
ENYRHDDMAALSEAYGYATGVCLSTLGLALLHHLYFYHVQRAGMKIRIAMCHMIYRKALC  
LSAAAMGQTTTGQIVNLLSNDVNKFDELTIFLHFLWVGPLQAAAVIGLLWQEIGPSCLAG  
MAVLVFLMPLQTMFGKLFSKYRSKTAALTDSRIRTMNEVVSGIRIIKMYAWEKPFAMLVN  
DVRRKEISKIMSSSYLRGLNMASFFTANKIILFVTFTVYVLVGNTMSASRVFVAVSLYSA  
VRLTVTLFFPAAIEKVSESAISIRRIKKFLLLDELVKNHLPLSQEEKKEPSVEMQDLICY  
WDKTLDAPTLQNVCFTVKPGQLLAVIGPVGAGKSSLLSTVLGELPAEKGVIKVKGELTYA  
SQQPWVFPGTIRSNILFGKELQPQRYERVLRACALKRDMELLPDGDLTVIGDRGATLSGG  
QKARVNLARAVYQDADIYLLDDPLSAVDAEVSRHLFEQCVCGILKDKPRILVTHQLQYLK  
AANQILVLKEGHMVARGSYSELQQSGLDFTSLLKKDEEEESGSEKGEAPRSPRSRTVSQN  
SVRSHSSSVLSVKDDSDQLPAEPVHTMAEELRSEGNIGIRMYWKYFRAGANVVMLVLLLL  
LNLLAQTFYILQDWWLSYWATEQEKLDHNTNNTNTNNTSAGNTTQQLDLNFYLGIYAGLT  
GATIVFGFMRCLIMFNALVSSAEMLHNRMFNSILRTPVRFFDINPIGRILNRFSKDIGHL  
DSLLPWTFVDFIQVFLQIVGVIAVASSVIPWILIPVLPLLICFLFLRRYFLRTSRDVKRI  
ESTTRSPVFSHLSSSLQGLWTIRAFKAEERFQQTFDAHQDLHSEAWFLFLTTSRWFAVRL  
DGMCSVFVTITAFGCLLLKDTMNAGDVGLALSYAVTLMGMFQWGVRQSAEVENMMTSVER  
VVEYTELESEAPWETQKRPSPDWPNRGLITFDRVNFSYSSDGPVVLKNISAMFRPREKVG  
IVGRTGAGKSSLISALFRLSEPEGKILVDGVLTSEIGLHDLRQKMSIIPQDPVLFTGTMR  
KNLDPFNQHSDHDLWKALEEVQLKAAVEELPGKLETELAESGSNFSVGQRQLVCLARAIL  
RKNRVLIIDEATANVDPRTDELIQKTIRDKFKECTVLTIAHRLNTIIDSDRILVLDAGRI  
HEYDAPHVLLQNQSGIFYKMVQQTGKAEATSLLQTAKQAYANRSPAHQLNGFATTGDGSL  
IIFETAL**

**>Abcd2**

**MSNILHAASTGKWDRSTAAKRALFLAAAAYGAKTLYPILCRQLQQRKTSRNHTPAAGHEN  
GSLAIHKAPPETLSTVKSPGVDAEFFKQILALVKIVFPRFITKELGLLCLHSVALVSRTF  
LSIYVAGLDGKIVKTIVEKQPRSFMIKLMKWLLIAIPATFVNSAIRYLECKLALAFRTRL  
VDHAYKTYFTDQTYYKVSNMDGRLANPDQSLTEDVMMFSQSIAHLYSNLTKPILDVILTS  
YTLIQTARSRGANASGPTLLAGLVVFATAKVLRACSPRFGKLVAEEAHRKGYLRYVHSRI  
IANAEEIAFYRGHKVEMKQLQKCYSALAEQMNLILSKRLWYIMIEQFLMKYVWSGSGLVM  
VAVPIITATGFADNELADGQTQVLVSERTEAFTTARNLLASGADAIERIMSSYKEVTELA  
GYTARVHNMFLVFDEVQRGLYKRSSAACSTGEMISGDQAEMHIDGPRQIKGLFHMKRCSA  
DACALKETVHPPNYILTWSNYISFVGRKN**

**>Abcc1**

**MGIDSFCSLDGSDPLWDWNRTWQTYYPDLTPCFQNTVLVWIPCLYLWLFAPLYILYLKSH  
DRGYICMTHLNRAKTVIGFTLWLICWADVFYSFWERSHGATVAPVYLVSPTMLGVTMLLA  
TFLIQYERMKGVQSSGVMLNFWLITIVCATITFRSKIMHALNDPASVGVFRYTTFYIYYT  
LLLISLILACLSDQPPLFSEVVKDSNPCPESGASFLSKITFWWITGLMVKGYKRPLEEKD  
LWSLNNEDKSERVVPQLVRRWDQECVKVKRPVDKTLYSPKRSTRGEKKDGQPVEESEILL  
AKALQKTGEPSLFFALCRTFGPYFLVSSLYKIIHDVLMFVGPEILRLLILFVNDSSAPTW  
HGYFYTALLFVCTCLQTLILQKYFHVCFVTGMRLRTAIVGAVYRKALVITNAARRTSTVG  
EIVNLMSVDAQRFMDLITYINMIWSAPLQVILALYFLWQNLGASVLAGVAVMVLMVPLNA  
VIAMKTKTYQVAQMKSKDNRIKLMNEVLNGIKVLKLYAWELAFKGKVSAIRESELRVLKK  
MAYLGAISTFTWVCAPFLVALSTFAVYVLVDENNILDAQKAFVSLALFNILRFPLNMLPM  
VISSMVQASVSMQRLRVFLSHEELDDDNVERPAISGTPDSIRIADGAFSWSKDDPPTLKR  
INVSIPEGALVAVVGHVGSGKSSLLSALLGEMHKQEGSVSIKGSVAYVPQQAWIQNATLK  
DNILFGRETKDSWYQKVVEACALLPDLEILPGGDTTEIGEKGVNLSGGQKQRVSVARAVY  
CNCSVYLLDDPLSAVDAHVGKHIFEKVIGPQGLLQGRTRVLVTHGLSFLPQADLILVMVD  
GEITEMGSYTELLGRQGAFAEFLRTYTNTEQEEGEESLGVSSLVLPCSDGKRVSNDMVTS  
PAYFKEKQSQISLNATGAGKTTQKTEANDDAAATKTKSAEASRLTEADKANTGRVKLSVF  
WEYMKAIGLPLSIFSIFLFFCHHLSSLGSNYWLSLWTDDPVVNNTQPKREMRLGVYGALG  
ISQGIAVFCYSVSVSVGGILASRYLHQTMLYNVLRSPMSFFERTPSGNLVNRFAKETDTI  
DSVIPSIIKMFMGSMFNVLGSCAVILIATPLVAIIIPPLGLLYFFVQRFYVASSRQMKRL  
ESVSRSPVYTHFNETLLGTSVIRAFGEQQRFIKESDGRVDHNQKAYFPSIVANRWLAVRL  
EFVGNCIVTFAALFAVMARNNLSPGIMGLSISYALQVTASLNWLVRMSSELETNIVAVVK  
IIQIEISYLEAEWKLENSNLPPGWPTAGHIEIHKFGLRYREDLELAICDISVNIAGGEKV  
GIVGRTGAGKSSLTLGLFRIIEAAEGEIRIDGVNIADLGLHELRSRITIIPQDPVLFSGS  
LRMNLDPFDGYTDEEVWRSLELAHLKTFVSGLPDKLNHECSEGGENLSLGQRQLVCLARA  
LLRKTKILVLDEATAAVDLETDNLIQSTIRTQFEDCTVLTIAHRLNTIMDYTRRVLVLDK  
GQMAEFDSPSNLIAKKGIFYKMAKDSGLV**

**>Abcg4a**

**MLASDSIGFKGNYSSKAEKTLEPGSVSIPMEETKRAGGDAAMLTHLKKVENHITEAQRFS  
HLPRRSTVDLEFTELSYTIREGPCWRRRGFKALLKCLSGKFCSRELIGIMGPSGAGKSTL  
MNILAGYRETGMKGQILVNGRPRDLRTFRKMSCYIMQDDMLLPHLTTREAMMVSANLKLN  
ENMEVKKELVNEILTALGLQECAQTRTISLSGGQCKRLAIALELVNNPPVMFFDEPTSGL  
DSASCFQVVSLMKSLAQGGRTIICTIHQPSAKLFEMFDKLYILSQGQCIYKGTVPYLIPY  
LKNLGLHCPTYHNPADFIIEVASGEYGDLNPVLFEAVQGGLCSDDSKKNSSDKNDPTTSC  
PSQCYPDSGYIEKHTFATSTLTQFCILFKRTFITICRDVVLTHLRVMSHLCIGVLIGLLY  
LNIGNDASKVFNNTGFLFFSMLFLMFAALMPTVLTFPLEMGVFIREHLNYWYSLKAYYLA  
KTMADIPFQVICPIMYCSIVYWMTEQPPEAGRYLLFMALSTSTALVAQSLGLLIGAASTS  
LQVATFVGPVSAIPVLLFSGFFVNFDTIPKYLQWSSYVSYVRYGFEGVILSIYGMNRSEL  
ECPGIVCKFQKPEEVLQLLDVEDAKLYVDFMVLGVFFLVLRLATYFVLRYKVKSER**

**>Abcc5**

**MKGHDLGKDCLAAGSAYRAVPSRETLPGPDGDHYELSKVQDAFETAARAEGGLSLDRGNA  
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GQLFLEDIWAVSQFESCEINRRRLAGLWEEEIRSRGDDASLRRVVWHFCRTRLLLSILCL  
MVTQLAGFSGPAFVVWRLLEYTQRSEPDLPYGLLLVLGLLATELIRSWSLALTWALNYRT  
GTRLRGAILTMAFHKILRLRSLREKSMGELINMCSGDGQRMFEAAAVGSLLAGGPLVAVL  
GMAYNLFVLGPTSLLGSAVFILFYPTMMFSSRLTAYFRRKGVAVTDQRVQKMNEILNYIK  
FIKMYAWVKAFSQAVRRIRDEERQILERTGYFQSITVGVAPIVVVIASVATFSTHMLLGY  
DLTAAQAFTVVTVFNAMTFALKVTPFSVKSLSEASVAIDRFKSLLLMAEVKMIRELPRNP  
SVAVEMSGASLAWETGGHSAQPSPRGTPHVGTRGCRKKRRQRDVPKHHAILEEETHGQLL  
NDVSGEMASSPEDQTLHVPTISQRLQRTLHCIDLSIQKGKLVGVCGSVGSGKTSLISAIL  
GQMTLLEGTVAVDGDFAYVAQQAWILNASFRDNILFGKEMEEERYQAILSACCLRPDLAI  
LPSGDLTEIGERGANLSGGQRQRISLARALYSNRGIYILDDPLSALDAHVGNHIFNNAIK  
KQLRGKTVIFVTHQLQYLVDCDDVIVMRDGSITEQGSHEDLMNVNGDYAAMFNNLQLGET  
PIIEVPNKKSGSSLKKPLEKSKAGSVKKEKSTTQGDGQLMQVEERGKGSVPWAVYKVYIQ  
ALGGWPVFLFILALFILNVGSTAFSNWWLSYWIKQGSGNTTVQVGNSSVLSESMRDNPLM  
QHYAAVYTMSMGVMLLLKLLRGIVFVKGTLRASSRLHDELFQKILRSPMKFFDTTPTARI  
LNRFSKDMDEVDTRLPFQAEMFIQNVILVLFCLAVIGSVFPWFLVAVGPLVLLFTVLHVV  
SRVFIRELKRLDNVTQSPFLSHIASSIQGLTTVHAYGKEDEFLHRYQELLDQNQAPFYLF  
SCAMRWLAVRLDVISVALISITALMIVLMHGQIPPAYAGLAISYAVQLTGLFQFTVRLAS  
ETEARFTSVERIHHYIKSLSLEAPARVKNKAPPSDWPQEGEIVFDQTEMKYRDNLPLILK  
KVSFTVRPKEKIGIVGRTGSGKSSLGVVLYRLVEPCGGSIKIDGVNICDIGLADVRSKLS  
IIPQEPVLFSGTVRSNLDPFSQYSEAQIWDALERTHMKECVSQLPLKLESEVVENGENFS  
VGERQLLCVARVLLRQCKILILDEATAAMDTETDCLIQETIRNAFQDCTTLTIAHRVHTV  
LSCDRIMVLNQGQVVEFDEPSKLLANENSRFCAMLAAVENKISVRG**

**>Abcb10**

**MYGTMLRMTGFAIGKLQQCSITCCRSSTFHHWSTRTSRTWSRQVRKNGSFDICVLPVYKG  
RNISKLSCLRTEGLFSPKHSRHIVALYSTSTDSNQTSKSVVNQESSAKTTADSLPVPSED  
VKKLLQLAHPQRWRLTAAVGFLVISSTVTMSAPFFLGKVIDTIYTSPTEDFSSSLTSLCL  
MLTGVFLCGGAANAARVYLMQISGQQIVRKLRESLFSSILKQELGFFDKTRTGELINRLS  
ADTAIVGRCLTDNLSDGLRSLAQAGAGVGMMLYVSPSLAAFVLMVVPPIACLAVIFGRFL  
RSISRRTQDALAEATQLAEERISNLRTVRAFGKELTEVQKYSQKVDHIFELAKKEAVVSA  
GFYGVTGLSGNVIILSVLYKGGLLMASEAMTVGQLSSFLMYAFWVGISIAGFSSFYSELM  
KGLGAGTRLWELIDRKPEFPLNEGLVLTSELLKGELEFRNVSFAYPTRKDSPIFQDLSLH  
VPAGSVLAVVGSSGSGKSSLVSLLLRLYDPDSGIVSVDGHDIRDLNPYWLRSHIGTVSQE  
PVLFSCSIAENIAYGAPDPSQVTVEDIYRAAQIANAHDFIQEFPKGYDTVVGEKGVLLSG  
GQKQRVAIARALLKNPKILLLDEATSALDAENEFLVQEALERLMDGRTVLIIAHRLSTIQ  
SADSVAVLDQHRVMEIGSHSQLLANDQGLFRKLMEKQAFLQAEQKQALLK**

**>Abcd4**

**MTPMKQSSVKRPKLDWKFLQRFYSILKILFPSWSNQNVRMFMTLLGVTLSVQLVIYQVGL  
IPSQFYRVLSERSYGKFKDLVVFAVVLILINSTLKSLDQYICSLLYVRWRKTLTEDLHHL  
YFKGRVYYTLNILCKDIDNPDQRISQDVERLCKQMSTMASRLLITPFTVTYYTYQCFNSA  
GWIGFVSIFSYFVVGTIINKILIGPIVSMLVEQEKLEGDFRFKHMQIRVNAESAAFYRAS  
NVEHMRTDRKLQMLLSTQRSLMNKELWLYLGVNTFDYMGSILSYIVIAIPIFAGNYDHLT  
PGELSALISKNAFVCIYLINCFTQLIDLSTTVSDVAGYTHRIGELQEAMADIAKKQRDEY  
QYDPVSKAESNSDRELQSVPADTAFVLDRLCYKSPLSEELLVKDLTLSISQGTHLLVVGN  
TGTGKTSLLRVLNSLWEPCRGSVQMTTCFGPRGLMFLPQKAYLTDGTLRDQIIYPLKDIY  
PSSGSIDDERILKYLELVGLSNLLTRIGGLDTEVTWNWYDVLSPGEMQRLCFARLLYLQP  
KFAVLDEATSALTEEAEGQLYNACKQQGMTLISLGHRSTLEKHHDVMLRLCGGGQWELSK  
LKEP**

**>Abca4b**

**MSTGRQIRLLLWKNWTLRKRQKIRFFVEILWPVFLFIGLVWLRRANPLYRQHECHFPSKA  
MPSAGILPWIQGIFCNANNPCFRHQTRGESPGVVSNYHNSILARFYLDSQELLFNDTEFL  
QLGRLWREASIMSNFMETLRTSPERVAGKGLKVEDILKDDETLTAFLLRDARLSEGVVHD  
LTNAQIRVEQFAYGVPDLTLKEIACSQALLEQFLIFPSRGGMYGVQNAMCALSQHRLQRI  
EDVLYANIDFFKLFRLMPMVLDSHSTGIDLQFWGRVLSAVSDKLQELADRPSAQDLMQVL  
YSIFQPGGPSSFSQLISKVSDLFCGYPEGEGTRVFSFNWYEDNNYKAFLGINNSRGHDSY  
IYDKTATPFCNALMQNLESNPITKIVWNSVKPLVMGKILYTPDSPAVRKIIKSANTTFEE  
LERLQKIGKVWEELGPQLWDFFQNSIQMNMIRDTLRNPTVMDFLDRRLRETEFSTKDILN  
FLHNGPEGERFMNMTSFDWSDVFRLADQAIRMFNRYSECISLDKFVGHMDENLMTHQALH  
LLGENKFWAGLVFMDMYPWTIELPRHVKFKIRMDIDAVERTNKIKDRYWDPGPRADPVED  
HRYIWGGFAYLQDLIEHGILKLHTGHDWPLGVYLQQMPYPCYVDDMFMLTLNRCFPIFMV  
LAWIYSVSMVVKSIVLEKEMRLKETLKAMGVSNGVIWYTWFIDSFIMMTASTALLTGIVM  
AGKVLNYSNPIILFLFLLTFTVATIMQCFLMSVFFNKANLAAACSGIIYFTLYLPHIFCF  
AWQDRITKDMKLAVSLLSPVAFGFGTEYLSRYEEQGLGLQWDNIGTSPLEGDEYSFFTSI  
RMMLLDAVLYGVLAWYLDNVFPGQYGIGRPFYFPLQSSYWLKPSPPSETSNAGINEYFSS  
EHQKPLENHVEKQEDVEYGGLSPEHRECNGSRNSKHCKLKMQEEIQQEEIQQWYCEQNII  
HLKQFFKQNTFYQKNPFFEPEPESLLIGVSVQDLVKMYNRYSRPAVDCLNMNFYESQITS  
FLGHNGAGKTTTLSILTGLFPPTSGTAYIYGRDIRTEMDAIRQSLGMCPQHNILFKHLTV  
EEHILFYSLMKGREHKEAEQEVENMLEDLGLPHKRDEEAQNLSGGMQRKLSVAMAFVGGS  
RVVILDEPTSGVDPYSRRSIWDLLLKYRTGRTVILSTHHMDEADLLSDRVAIISKGKLHC  
SGSPLFLKNCFGVGFYLTLVRRMKDQRKKENECDCASECSCTCSTCTRYKEESQALQPER  
VLDGNVESITTLIHHHVPEAKLIEMIGQEMTYLLPNKGFKYRAYASLFRELEETLGDMGL  
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ALLSTYDANGVGASLESDSSEGRASRQVKGFSLVLKQFHALLVKRFHHATRSHKDFLAQI  
VLPASFVLIALVFTMIVPPFGEYPCLTLTPWMYGPQFTFISNEQPSHPKMKHFIQTLLKD  
PGMGTRCMANQPLENIFTCLNSSSDWEVPPVSPEVSNILSSPEWDSRNPSPSCECSTDLK  
LTMLPMCPAGAGGLPPRQRKEPTGDILLDMTNRNISDYLVKTYTKLIKTSLKSKYWVNEQ  
RYGGISVGGRLPILDVDPEEIQNIFSQLGRMMNIRGGRYSKSAMDELETFLHYMESEYNV  
KVWYNNKGWHAMASFLNVANNAILRAYLPPHANPSDYGITAINHPLNLTKEQLSEVTVLT  
TSVDAVVAICVIFAMSFIPASFVLYLIQERVTKAKHLQFVSGVSPLVYWFANFFWDMLNY  
SVSTAMVVAIFVGFDKKCYTSPTNLPALIALLCLYGWSVTPMMYPLSYMFNVPSTAYVSL  
SCINLFIGINSSAITFILELFENNRSLLMFNEVLKKVLLVFPHFCLGRGLIDMAMNQAVT  
DVYARFGEEFSMDPFRWNFVGKNLFCMAVEGFVYFIFNLLIQYKFFLHHWISDYGMSLGT  
DEDDDVAQERERIYKGGNKNDILLIRDLSKTYRRRKRPAVDKICVGVPAGECFGLLGVNG  
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HLKYKFGGGYVVTMKIKAAKPGLSPDLVPAESFMDSSFPGCIQREKHYNTLQYEIAAASL  
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PLQRVATKNR**

**>Abcb7**

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PKDRPDLRARVVISLSLLAGAKITNVMVPFMFKYAVDSLNQMSGHMLNLSDAPNTVVTMA  
TAVLIGYGVSRTGSALFNELRNAVFGKVAQSSIRRIAKNVFLHLHNLDLGFHLSRQTGAL  
SKAIDRGTRGISFVLSALVFNLGPTLFEMMLVSGILYYKCGGHFALVTLGTLSAYTAFTV  
AVTQWRTQFRIEMNKADNEAGNAAIDSLLNYETVKYFNNEKYEAERYDGFLKVYESSSLK  
TTSTLAMLNFGQSAIFSVGLTAIMVLASKGIMSGTMTVGDLVMVNGLLFQLSLPLNFLGT  
VYRETRQALIDMNTLFTLLSVDTKIKEKEMAPPLIVTPQEATIRFEDVYFEYLEGQKVLN  
GVSFEVPAGKKVAIVGGSGSGKSTIVRLLFRFYEPQQGNIYIAGQNIRDVGLESLRKAVG  
VVPQDAVLFHNTIFYNLMYGNINATAEDVYRVARLAGIHDAILKMPHKYDTQVGERGLKL  
SGGEKQRVAIARAILKNPPILLYDEATSSLDSVTEENILTSMKEMVKDRTSVFIAHRLST  
IVDADEIIVLNQGKVAERGNHQTLLDTPGSLYANLWNTQNSRILSNGSKPEPVPERVSQK  
EEERKKLQEEIMNSVKGCGNCSC**

**>Abcg8**

**GRDILFSSPEEDSSLYFTYSGGRNELEVRNLNYEVDTAAQIPWYEKLSEFKMPWEMHSNK  
QTVIKDLNLHVHSGQMLAVIGSSGCGKTSLLDIITCRDEGGSMNSGEILINGKPSTRSLV  
KKSIAHVRQDDRLLPHLTVRETLAFVAKLRLPANFSQKQRDQRVDDVIAELRLRQCAHTR  
VGNEYVRGVSGGERRRVSIAVQLLWNPGILILDEPTSGLDSFTAHNLVITLYRLARGNRL  
VLLSVHQPRSDIFQLFDLVVLLSSGSAVYCGQAKDMVSYFTTLGYPCPRYCNPSDYYVDL  
ISIDRRTPEKEAQCLEKASMLAAQFLEKVKNNEDFMWKSEVCGPPALEAPQSSVPSVSMK  
ESVITVSKQKDQLPGKVHQFTTLIRRQVFNDYRDLVTLVVHGLEALLMSLLIGFLYFGCT  
EEGLSIQDTVALLYMIGALTPFAVVLDVIAKCHSERAMLYHELEDGMYSVTPYFFAKVLG  
ELPEHCAFTLVYGVPIYWLAGLNVAPDRFLLNFLLVWLTVYCSRSMALFVAAALPTLQTS  
SFMGNALFTVFYLTAGFVISLENMWMVASWFSYISFMRWGFEGMLQVQFRGTRIPITIGN  
LTVEFDGIKVVEMMKMNQYPLFSCYLVLIAVSLVFILLYYLSLKFIKQKSSQDW**

**>Abcg5**

**MSHSYSMKDVVQKNGLNGSFKVVSEMETARSNPDYIEPSSCLSVKNVSYSVSERVGPWWD  
LSSFRKKWTRQILNEVSFHLDSGQIMGILGNSGSGKTTLLDAIAGRIGNSGNLQGEVFVN  
GRKLKREQFQDCFSYVLQSDNLLSYLTVEETLTYTAQLALRKHSAEAIRKKVTAVMAELS  
LGHVAHSVIGGRVFPGISGGERRRVSIASQLLQDPKVILLDEPTTGLDSMTANQIVMLLA  
ELARRDRIVIVTIHQPRSELFRIFNRIAIMSQGELVFCGEPHKMVDFFSSCGYECPEYCN  
PFDIYVDLTSVDTRCSEREAATYRRMHDITSAYQNSEIYTNMQEKIEQSCQRPDKPMIPF  
KSKESPNCISKLGVLLRRTFRNVSRDRMGILMRLSQNLIYGLFIAFFLMRLGKDVTKGAV  
QDRIGLIYQSMGASPYTGMLNAVALFPALRAISDQESKDGLYQKWQMFLAYIIHILPFSI  
ISVFIFASFLYWTVGMNPDPVRFLCFSAVVMVPHIIGELLTLVLLGVVQDPNMVNSGVAL  
LNIAGIMVGSGFLRGFKQMPVVFQWLSYLTFQKYGCELLIVTEFYGLNFTCTPIAGLPGE  
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**>Abcb6a**

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LERRKVLVRDRTRGHSTVLLLYWAVAFAADNLAFVSWMSPQWWWSLETSEQQMEFAFWLV  
RYFCSGLLFLLGLKAPGLPRRPYMLLVNEDERDVEHGAPLLGNSDEDQSTWKDFGKKVRL  
LVPYMWPKGSVLLQLLVLMCLGMLGIERAINVFVPIYYKNIVNQLTDGSSWKTLAMTVCV  
YCLLKFLQGGGAGASGFVSNLRSFLWIRVQQYTNRVVQVRLFAHLHALSLRWHLGRRTGD  
VLRSIDRGTSSINSLLSYIVFSIFPTIADIVIAIVYFISNFNAWFGLIVFVCMALYLTLT  
IFITEWRTKYRRDMNTQDNNAKSKAVDSLLNFETVKYYNAESYEVGRFEDAILKYQVSEW  
KTNASLALLNQTQNLIIGLGLLTGSLLCAYFVTEGKFQVGDYVLFGTYIIQLYTPLNWFG  
TYYRMIQNSFIDMESMFKLFTEEEEVKDEVNAGNLYFRQGKVEFENVFFSYTQGKEILKD  
VSFTVLPGQTVALVGQSGSGKSTIIRLLFRFYDVQGGCIKIDGQDISKVKQSSLRAHIGV  
VPQDTVLFNDNIRDNIRYGRVTATDQEVEEAAIAADIHDKIIGFPDGYETQVGERGLKLS  
GGEKQRVAIARTILKAPQIILLDEATSALDTQTERNIQASLAKVCANRTTVVVAHRLSTI  
IGADVILVLRDGQIVERGRHEELLAKGGLYSDMWQKQQQAQDSDSASDSETKDRKSEKLQ  
PQTSTTAHRGH**

**>Abcg1**

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VAIMGPSGAGKSTLMNILAGYRETGMKGEILINGHPRDLRSFRKVSCYIMQDDMLLPHLT  
VQEAMMVSANLKLQEKDEGRREMVREILTALGLLECAKTRTSHLSGGQRKRLAIALELVN  
NPPVMFFDEPTSGLDSSSCFQVVSLMKALAQGGRTVICTIHQPSAKVFELFDKLYVLSQG  
QCIYRGKVSSLIPYLRDLGLSCPTYHNPADFIMEVASGEYGDQTARLVKAVQEHKCEKDY  
KTEMNGNGVHNPFLWHRPSDEDSSSSEGCHSFSASCLTQFCILFKRTFLSIMRDSVLTHL  
RIMSHLGIGILIGLLYLGIGNEAKKVLSNSGFLFFSMLFLMFAALMPTVLTFPLEMGVFL  
REHLNYWYSLKAYYLAKTMADVPFQIVFPVAYCSIVYWMTSQPSDAVRFILFLALGTLTS  
LVAQSLGLLIGAASTSLQVATFVGPVTAIPVLLFSGFFVSFDTIPKYLQWISYISYVRYG  
FEGVILSIYGLDREDLHCDKDETCHFQKSEAILKELDVEDAKLYMDFIVLGIFFISLRLI  
AYFVLRYKISAER**

**>Abcb11b**

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TFVCGFLMGFARGWKLTLVIISVSPLIGIGAGLMALFVAKLTGMELQAYAKAGAVADEVL  
SSVRTVAAFGGEKKEVDRYDRNLISAQQWGIRKGLIMGFFTGYMWFIIFLCYALAFWYGS  
SLVVDTQEYSPGTLLQVFFGVLIAALNLGQASPCLEAFAAGRGAATIIFETIDREPEIDC  
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QLIQRFYDPKEGMLTLDGHDIRGLNIQWLRSLIGIVEQEPVLFATTIAENIRYGRPGVSN  
DDIITAAKEANAYNFIMDLPQKFETLVGEGGGQMSGGQKQRIAIARALVRNPRILLLDMA  
TSALDNESEAVVQEALDKVSMHKTTISIAHRLSTIKNADVIVGFEHGRAVERGKHDELLE  
RKGVYFTLVTLQSQGDKALNQKAQQEMEEAECCDSDAERRSLNRAGSYRASLRASIHQRS  
RSQLSNAVPESSVAIAGELGPRSYSETTVPQEFMGKSGVPEDTAEEVEPAPVARILKYNA  
PEWPYMFFGSIGAAVNGGVNPVYSLLFSQILATFSMPDPVEQRREINGICLFFVVVGLVS  
FFTQMLQGYAFSKSGELLTRRLRRLGFQAMLGQEIGWFDDRKNSPGALTTRLATDASQVQ  
GATGSQIGMIVNSLTNIGVAVIISFYFSWKLTLVILCFLPFLALSGGFQAKMLTGFAKQD  
KEAMETAGQISGEALNNIRTIAGLGKERNFVEMFETQLEAPYQAALKKANVYGACYGFAQ  
CVVFMANSASYRFGGYLVYHEGLHFSFVFRVISAIVTSGTALGRASSYTPDYAKAKISAA  
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AFVGSSGCGKSTSVQLLERFYDPNSGRVLIDGRESSQINVAYLRSKIGIVSQEPILFDCS  
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ARAIIRDPKILLLDEATSALDTESEKTVQEALDKAREGRTCIVIAHRLSTIQNSDIIAVM  
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**>Abca5**

**MYFIPVSDPCGSQLKHAGRMQPLTRRDAGVWHQTRSLLYKNLLIKWRTKQQSLQELILPL  
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SIYLVLAFTPFVSFLIVNVAAEKEQRLKDTMGMMGLYDSAFWLSWGLLYAALVTTMSILM  
AVIATCTPLFSNSNFFVIFLLIFLYGISSIFFSFMLTPLFKKPKFASTVGSMLTVVFGCL  
SLFTVLMRDFPQSAVWLLCLLSPSAFSIGIAQVVYLEAQGDGAVFSSLGNGPHALYVPLV  
MLFLDCILYLLLAIYLDQVLPGEFGTKRSVLYFLKPSYWSKRRKRYVEVSSVYEGEVNGT  
PAIDESVEAVSPEFRGKEVIRICNIRKIYREKDTKVEALRGLTFDIYEGQITALLGHSGA  
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DEPTAGMDPVSRHQVWSLLKSRRAGRVTVLSTHYMDEADILADRKAVISQGQLKCVGSSL  
YLKTKCGVGYHLRMSVTEGCEVEGITSLVKQHVPKAQLSRQQEAELTFTLPFESMDTFPG  
LFAELDCRPDLGIINYGVSMTTLEDVFLRLEAEAEVDQADYSVFNQEKVEEEGDASSMDD  
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LSVATGNIQIHSPERLFSPIYLLRRNEAPHKYTTSLLVQNSTDSDLSGFIHNLQSQDIKV  
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HIRTWSKPFDYQIPDKTSYALVYIEAVILGMLAAGMPAYFAMDHTRDRELKCRSTLRISG  
LVPSAYWCGQAAIDVPFYYLILTCMTSTLFAFHSTNLLTSHNILSVALCLIGFSPAMVLF  
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LMGCLNCITVATFVQSPHDDDFLWKNLFISVVAPYIQCILLLVSLRWLEIRYGGKTMKND  
QLCRISSQAKSKAQRNPEENMSEDEDVQMEKARVKEAMTCQCCEEKPVVVVSNLRKQYKG  
KREGFSLNKKRKVATKNISFCVRKGEVLGLLGPNGAGKSTIMHMLSGDTEATAGQILMGD  
YGTDFQPAENPLEHVGYCPQVNPLWPRITLQEHLEIYSAIKGLRQRDIPNIIKRVVSALE  
LKDHLYKQSKNLSAGLKRKLCFALSMLGNPQIVLLDEPSTGMDPKSKQRMWRAIRAAFKN  
KQRGALLTTHYMEEAEAVCDRVAIMVSGQLRCIGSIQHLKGKFGRGYSLEINLREELTGL  
QQVALLHKEILKIFPHAVRQDSFATMMVYKIPMEDVKSLAKSFAQLESAKQNFNFEEYNF  
SQSTLEQVFMEFAKEQENEEEEVGSLSTTFQWQRLRQDGPVSINHADSIVHQL**

**>Abca7**

**MAIGTQLYLLLWKNFTYRRRNKVQLVVELLWPLFLFLILIAVRQSHPPYKQSQCHFPNKA  
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QLDFSKIVTRDRLQANAADFRIISRAVSSASQELASIMDDISSLSSFSELNSEIRLLTPE  
NRSVLPRESFRAFSRIMCGHPEAGGERIPSFNWYEDQDIKSFLGRNASEETSLENDNSTT  
SFCENLIQNLESNPLSRIVWRGIKPLFIGKLLYTPDTPITRTIMSEVNKTFQDFEILKDV  
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STHRILASFLSPVAFGFGCEYFSQYEEQGVGIQWFNLKSSPMEGDTYSFNTSIMMLYADA  
LIYALATWYIEAVFPGQYGIPRPWYFIFQLNYWGGVPLELGLPIPPAPREEQDARIEAEP  
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NSLLEDVGLQHKRFEQTKNLSGGMQRKLSVAIAFIGGSKVVVLDEPTAGVDPYSRRGIWD  
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**>Abcb6b**

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RTKYRREMNTQDNNAKSKAVDSLLNFETVKYYNSEGFEVRRFEDAILKYQACEWKTNASL  
ALLNQTQNLIIGLGLLAGSLLCAYYVTVDKFQVGDYVLFGTYIVQLYTPLNWFGTYYRMI  
QSAFVDMESMFDLLTEEKEVKDTVNAGDLSFTKGRVDFKNVCFSYTAGKEILSDVSFTVM  
PGQTFALVGPSGSGKSTIIRLLFRFYDVQSGCILIDGQDIAKVRQNSLRSYIGVVPQDTV  
LFNDNIRENIRYGRISASDQEVEEAAVAADIHDKILSLPDGYDTEVGERGLKLSGGEKQR  
VAIARTILKSPRIILLDEATSALDSQTERNIQASLAKVCANHTTLVVAHRLSTIVSSDQI  
LVLHDGRIAEQGRHEELLAKGGLYAAM**

**>Abca1a**

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KVLIKGFGVHLTDLCNSTSLEEFVTIADKDVSQLTQNIICQSPADWLNNAEQHFLSNLDF  
LKPIRKDVKSDPKIIKDVSIATDSLLESLGALAVELASMKSWRDMRNEILYLTGNSTQSP  
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**>Abca12**

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ALSLFSPTCFSYASQYIARYEKQEEGIQWSNMYISPLAGDTSSFGWLCWLLLIDSLVYFI  
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FGLLGVNGAGKTTTFKMLTGDISPSGGSAKIRDIDGRMVDIIDCRREGINIGYCPQVDAL  
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IDSLDSFNT**

**>Abcd1**

**MSVYSKLPSQLKKPLVKKAVVLLIALYGVKKLSPYFFGKLKGRTSKQVKGADPLTSNGEP  
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LDGQIVKTIVKKDPRAFVVELTKWLLIAIPATFVNSAIRYLEGQLTLAFRTRLVTHAYML  
YFSDQTYYRVSNMDGRLANPDQSLTEDVVMFAASVAHLYSNLTKPILDVVVTCYTLIKTA  
ESKGANTTWPSVIAGIVVALTAKVLRAFSPRFGKLVAEEARRKGDLRYMHSRIIANSEEI  
AFYGGHKIEMLQLQRSYNSLSRQINLILFKRLWYVMLEQFLMKYLWSASGLVMVAVPIIT  
ATGYSKYDSEDVKQAALDMKEEDLVSERTQAFTTARSLLNAAADAVERIMVSYKEVTELA  
GYTARVYEMFEVFEDVRDGVYRRSATEVKPEETGAPQNVTHGMRVEGPLQIRGQVIDVEQ  
GIKCENLPIITPTGDVVVSSLNMQVDEGMHLLITGPNGCGKSSLFRILSGLWPVYSGVLY  
KPSPDHMFYIPQRPYMSVGTLRDQVIYPHSVQEMQEKGITDRQLEEILQTVSLRYILERE  
GGWDAVSDWKDVLSGGEKQRMGMARMFYHKPQYALLDECTSAVSIDVEGKIFEAAKDAGI  
SLLSITHRPSLWKYHSHLLQFDGEGGWRFEKLDASTRISLQDEKIRLETQLSGIPKMQQR  
LTELCRILGEDSSLPTPGDEEEDEEEDEKQTERDVQSAGKEKDLME**

**>Abca3b**

**MAMGAQLIGMFEGKGTGIQWHNLFEAVTVDDDFSLAQVIGLLLLDALLYGLVAWYVEAVF  
PGEYGVPQPWYFFILPSYWCSSPRVAFLKEKEDEEDAEKASKGEFMEEEPAGLVAGVKIK  
RLAKVFKVGNKSKEAVRDLTLNMFEGQITVLLGHNGAGKTTTLSMLTGLFPPSSGRAYIN  
GYDICQDMALIRRSLGLCPQHDVLFDNLTVREHLLFYTQLKGYPREKIPGEVDRIIRILN  
LEDKRNAKCKTLSGGMKRKLSIGIALIGDSKVVMLDEPTSGMDPSARRATWDLLQGEKRG  
RTILLTTHFMDEADLLGDRIAIMASGELQCCGSPLFLKNKYGAGYHMVIVKDAFCNVSEI  
TRLVHMYVPDATLESSAGAELSYILPKESTSRFELLFAELEMNRDELGIASYGASVTTME  
EVFLRVGKLVDSSLDIQAIQLPALQYQHERRSHDWTMDDSSSISGMTDVTDFTDSCTMIS  
EDGSNIKLNTGARLYMQQFYAMFLKRALYSWRNWKVMVAQFLVPLIFTVLALVVARSLPS  
SHSSPQLRLALKQYGQTHVPVAVEANAGPLASLLAEIYTTQLPSQNAIAAPNITDFSEYV  
LYNAQREGGAFNEHCVVGAAFRSSDVIGYFNNQGYHTPATALMLVDNALFKLLAGPNASI  
QTGNDPMPRNVSETAQSQLSESQTGFAIAINLMYGMASLASTFALLLVSERSVKSKHVQQ  
VSGVYLTNFWFSALLWDLINFLLPCLLMLVVFRVFSVKAFVAQNHLVDVLFLLLLYGWAV  
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QGVVFIILLFLIELRCIRLLLNLCRRRKKALLLAEEALQPEDRDVAEERKRVLECQPVVE  
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ITSGDAFIDGYSILTDVKKVQQRIGYCPQFDAVLDHMTGRETLSMYARLRGIPEKYVTAC  
VENVLRSLLLEPHADKLVRSYSGGNKRKLSAGMALIGGPPVIFLDEPSTGMDPVARRLLW  
DAITRTRESGKAIIITSHSMEECEALCTRLAVMVNGQFKCLGSPQHLKSKFGSGYTLLAK  
VRVETELEESDLQLFKDFIESTFPGSLLKDEHQGMVHYHLTDKTLTWAQVFGVLETAKEK  
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**>Abcc8\_2of3**

**STLSFCGSDNSSAYKVDNGLNNGCFLDALDVVPHVFLLFSTFPILFIVGWGSQSSKVHIH  
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SICFRFISDLLGFAGPLCISGILQHISRDNHTAPPPLFIYPSIYLLIHSFIYILIHLFIS  
ITMQCIYINNVYVVMLQYVEHLKTSFLQTKIYNKIMRLCTSNMSMGDMTTAQICNLVARD  
TNQLMWFFFLCPNLWAMPVQIVIGVLLLYYLLGASALIGATVITVLAPLQYFVATRLSRA  
QKSTLEYTSERLKKTNELLRGIKLLKLYAWEHIFRSSVEETRRQELTSLRTFALYTSLSI  
FMNAAIPIAAVLTIFVVHVHLQSSSDFALSPAVAFGSLSLFHILVTPLFLLSSVLHSTVK  
ALVSVQKLSEFLSSAEIETDQDPIAQTPANNNGNIKSVLQAKLVNRKNKAKQDVNRNFEQ  
QDQELRASAQHEDNICIKIVNGYFSWTQGCPTLTNIDIKVPFGQLTMIVGQVGSGKSSLL  
LAALGEMQKISGSITWNLPRSDSDENISREWSLSKRNEGRWRKSPAQSVQKDVMFKACIQ  
YFVCCVFRYKDVIEVCQLGPDIDTLPQGDQTVIGERGIILSGGQRQRISVARALYQQTNV  
VFLDDPFSALDIHLSDHLMHEGILKFLRQEKRSVVLVTHKLQYLPHADW**

**>CABZ01071494.1**

**MHEGILKFLRQEKRSVVLVTHKLQYLPHADWIIAMRDGTVQTQGTLKDIQCAEPELFEQW  
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TPLGNILNRFSTDTNTIDQHIPVTMECLSRSTLLCVSAVGVISYVTPVFLIALLPLTVAC  
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SSLKPVLKHVSAHIRPGQKVGICGRTGSGKSSFSLALFRMVDTFEGQISIDGIDISKLPL  
QTLRSKFSIILQDPILFSGTIR**

**>Abcc3\_1of2**

**NLTLYGQQPDLPECFQMSVLSWAPCIYLWAAAPLYILHLRRNNRGYIMMSILNRIKTVLG  
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FSSAVMDRSEPHPETTAGFLSRMTFWWFTRMAIKGYKSPLENKDLWSLNKNDSSELVVPG  
LLNQWEVEKSKAHSSDDQNVKEQVTFTKPGSGAESNHVNESPEEAEVLLSKQQQKSRQPS  
FLWALLRAFGPYFLIGSAFKLLQDLITFINPQLLRMLIAFTKQSDVPSWWGYALAFLMFG  
TSLLQTLILHQHFQYCFVTGMRLRTGIIGAIYRKALVITNEAKRSSTVGEVVNLMSVDAQ  
RFMDLTTFLNMLWSAPLQIFLALFFLWQNLGPSVLAGVAVMVLLIPFNAFIAMKTRTYQV  
EQMKYKDDRIKLMNEILNGIKVLKLYAWEPSFRDKILQIRQKELHVLRKTAYLSALSTMA  
WTSAPFLVALTSFAVFVNVDEKNVLDAEKAFVSLSLFNILRFPLNMLPQVISSIVQASVS  
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QKYRCVLEACALTPDLEVLPGGDLTEIGEKGINLSGGQRQRVSLARALYSEADVYLLDDP  
LSAVDAHVAKHIFDHVIGPEGALKGKTRILVTHGISFLPQVNNILVLVDGRVSEMGSYQD  
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VVDEVLPSTLLMFLGTFFASLSTMIVIISSTPVFAFVIAPLALIYFFVQRFYVATSRQLK  
RLESVSRSPIYSHFSESITGTSVIRAYGRNAAFVLMSDNKVDENQKSYYPGIVSNRWLGV  
RIEFIGNCIVLFAALFAVTGKDKLSPGLLMRNTVQIIVQVTMSLNWMVRMTSDLESNIVA  
VERVKEYSETQTEAPWEVLEKKPPPDWPPLGNVEFVDYSVRYREGLDLVLKNISLKVRGG  
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LDKGQIAEFDTPTNLMNQKGLFFGMAKDAGLA**

**>Abcc10**

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RGALVLVYLLGYIFPCYRTQRDLLSCNAEDEAPLIVTFEPFEEVTVAEDGSSLLSRLLYL  
WLNPLLNRGKRGELGRPSDVFELPSRLRTKSVTRRFYQCWEKCLHSRALERPERPDRRPR  
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GGLVGFMETEGAPLSKGVWCAVGLFASTFLAALLKNIFVYEVSKVALEARAAVISTIYCK  
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LGGVGVAVLLVPLNKVLASRILENNKHMLQHKDGRVKLMTEILFGIRVLKYYNWEEHFTQ  
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VGMLILPLNAFPWVLNGTLEAKVSLDRIQRFLAVQDQDLSVYYSQVCPEDPPSAVQMVQA  
SFSWKQSEEADSVSIPDDITEEGSPPRSFYLHALNLNVKMGSLVVVVGKVGCGKSSLLAA  
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DDLNILPGGDQTEVGENGVTLSGGQKSRLALARAVYMDKEIYLLDDPLAAVDADVAHHLM  
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TTPLGRILNRFSSDIYSVDDSLPFVLNILLANVFGLLGMLIVMSYGLPWVLLPLVPLGAL  
YYQTQCFYRYSSRELKRLCSLTLSPVYSHFSETLSGLSTVRGSGHTTRFEEENERRLEQN  
QRCLFNSNAAMQWLDIRLQMIAVTVVTGISVIAVIQHQLKSIDPGLVGLSLSYALSITNL  
LSGLIFSYAQTEMQLVSIERTEEYSTSIPQEPQQASLEVLDRWPERARVEFVDVVLSYRP  
GLPNALDGVSVEVLPGEKIGIVGRTGSGKSSLFLALFRMVELNQGQILLDGVDISSVRLS  
DLRSKLAIIPQDPFLFSSSVRENLDPHGRHPDYRLLEALEQCHLGNVVQRNGGLDSEVGE  
RGKSLSVGQRQLLCLARALLTEANILCIDEATASVDQKTDMLLQKTIREKFKDKTVLTIA  
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**>Abcg4b**

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MTGQILVNGKLRDPRTFRKMSCYIMQEDKLLPHLSVQEAMMVSANLKLNESSEVKKELIK  
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MKSLAQGGRTIICTIHQPSAKLFEMFDKLYILSQGQCIYKGSVPYLIPYLRGLGLHCPTY  
HNPADFIIEVASGEYGDLNPVLFEAVQGGMCALEEKCNCIDKTTVTSCAAKCVKDPGHVE  
SHTFATSSLTQFCILFKRTFITICRDQVLTHLRLMSHISIGVLIGLLYLNIGNDASKVFN  
NTGFLFFSMLFLMFGALMPTVLTFPLEMAVFLREHLNYWYSLKAYYLAKTMADIPFQVLC  
PIMYCSIVYWMTEQPPEASRYLLFLALSICTALVAQSLGLLVGAASTSLQVATFVGPVTG  
IPVLLFSGFFVNFDTIPEYLQWSSYVSYVRYGFEGVILSIYGMNRTELECPGRVCKFQRP  
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**>Abca1b**

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KVLIKGFGVHLRDMCSSIKLEDFVTIPDTSVARFTQDMICRSPKNWLDQAESHFKSNLDF  
LKPVRSEIRTNATDVRKVTKATDNLLESLGSLAVELASMRSWSDLRNEILFLTENATGSP  
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SMMRNMEASPISRMIWRALKPLLMGKILYTPHSPATQKIIHEVNKTFQELGILRDLGGMW  
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GVVYEKEARLKETMRIMGLDNGILWFSWFISSLIPLLISAGLLVLLLKMGNLLPYSDPGV  
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LILKHVPAARMVEDQGHEITYVLPYESAKNGAFVELFHDLDDRLADLGISSYGVSDTTLE  
EIFLKVAEDSGVDTEMLSDGTLPVRRQRRHAFGADHQSCLKPLTEDDSFDCNESEGDPES  
KETDYLSGSDGKGSYQVKGWSLKRQQFVALLWKRLLYARRSRKGFFAQIVLPAVFVCIAL  
VFSLIVPPFGKYPSLALNPWMYEEQFMFFSEDAPYDVSTHKLLRALFDDPGFGTRCMKGE  
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GLPPPQIKISETETLQNLTGRNISDYLVKTYAQIIGKSLKNKIWVNEFRYGGFSLGARST  
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IILRVAGPDPDLQPVMKFIESELPGSTLKEKHRNMLQYQLPSSLTSLAHIFSILAKNKEF  
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FV**

**>Tap1**

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HYTGKMTDWIMNEDEPEAFNHAITVMTLMTIMSAVCEFVCDLIYNITMSRIHTSIQGLVF  
QAVLKQDIAFFDKATTGDIVSRITTDTNTMSESLSEKLSLLMWYFMRVIFLFGSMLMLST  
RLCCFTLLGLPVIWIIPEIFGRFYQKLSAQVQDSLAKANEVATETFSSMKTVRSFANEDG  
ETERYRKCLEDTFALNKVEAAAYAVSTWTNSMSSLALKVSILYYGGRLVTGSDVSSGDLV  
SFVLYELQFTSAVEVLMSYWPHVKKAVGASEKIFEYVDRKPDVPPDGSLAPKTLKGHVQF  
RNVTFAYPKRPDTDVLKNVSLELKAGKITALVGPSGSGKTTVVSLLERFYQPQNGEILLD  
QKPLLSYKDQYLHEKISVVSQEPVLFARSVRENIKYGKENATNEEIYAAARLANAHDFIS  
SLPKGYDTDAGEKGGQVSGGQKQRIAIARALIQKPQILVLDDATSSLDTESEHRVYSALK  
KELQSCTVLLISHRLSGVENADHILFLREGELVEEGNHQQLLDKQGFYAEFVKQQNTAIH  
RNADNGTNSSQ**

**>Abcf3**

**MVKESEVALRFPDNFEKLSPPILQLDEVEFGYSPEQRLFSGLCISADLESRICIVGENGA  
GKSTLLKLLMGELTPLGGARHAHRKLKIGYFSQHHVDQLDLNVCSIELLLKRFPGETEEE  
YRHQLGRYGITGELATRPVASLSGGQKSRVAFAQMTMPCPNFYILDEPTNHLDMETIEAL  
AKALNKFKGGVVLVSHDERLIRMVCKELWVCEAGRVHRIDGGFDEYRDILQEQFRKEGYL**

**>Abcc6\_2of2**

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GFSADPMRFAAFFTFFSLQLAQLILSCFADQRPDTLKPVYVKNPCPVEDASFLSKLLFWW  
YGRLVVKGYRSPLKAEDLWSLREEDTSEKIICDLEKEWAKQWAKLQQKKSSLNEAQTLGF  
KLSSCVKQLFRKLFKEQCTGFVLFRTLAKIFSPYFLTGTLFLVIQDALMFSIPQVLSLLL  
GYVRDEDAPLWKGYLFAFSLFLLSCLQSLFNHQYMYTCLTVGMRVKTAVMGLVYRKSLVI  
NSAARKTCTVGEIVNLVSADTQKLVDFVMYFNALWLAPIEIALCLFFLWQHLGPSTLAGI  
TTVILIFPLNGFIAKMRSKLQEVQMKHKDERIKLMNEILSGIKILKFYAWEKAFRERVLG  
YREKELNALKKSQILYSVSIASFNSSTLLIAFAMFGVYVLIDDKHVLDAQKIFVSMALIN  
ILKAPLSQLPIAMSTTMQVVVSLKRLGTFLDQDELKLDSVQRVPYNPNIESVVINNGTFS  
WSKDSTPCLRRINVKVQRGSLVAVVGHVGSGKSSLLSAMLGEMEKKSGHITITGSVGYVP  
QQAWIQNATLKDNILFGCEKKDSLYQKVLEACALLPDLEILPARDATEIGEKGLNLSGGQ  
KQRVSLARAVYRNSDIYLLDDPLSAVDAHVGQHIFEKVIGPNGSLKNKKQTRVLVTHGLS  
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GLKIMLGYVFKLLEVCIIVLMATPFAGVIILPLTLLYAFIQSFYVATSCQLRRLESVSRS  
PIYTHFNETVQGASVIRAFGEQPRFILQANCRVDLNQTSYFPRFVASRWLAVNLEFLGNL  
LVLAAAILSVMGRATLSPGTVGLAVSHSLQVTGILSWIVRSWTDVENNIVSVERVKEYAE  
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GAGKSSLALGIFRILEAAKGKIFIDGINIAEIGLHELRSRITIIPQDPVLFSGSLRINLD  
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SPSNLISQHGQFYRMCREAGLV**

**>Abcc3\_2of2**

**XETPTEKKEPKVEKLIQAETTETGRVKLQVYWEYVKAIGPLLALFICFLYGCQSAAAIGA  
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MLNSVLRAPQAFFEATPSGRVLNRFSKDVDTIDSLIPDNIDIWMRTFWYTVNVLMVCSVL  
TPIFLIVIVPLMLFYWWVQRFYVATSRQLKRLESVSRSPIYSHFSESITGTSVIRAYGRN  
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**>Abcd2\_2of2**

**MLLTHFVFNCLSFSASRSTGKVIDVDKGIVCEQVPIITPNGDVVVSCLNFKVEEGMHLLI  
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MHSKGYRDKELEVILDIVNLNHIVTREGGWDAEMDWKDVLSGGEKQRMGMARMFYHKPKY  
ALLDECTSAVSIDVEGKIFQAAKDAGISLLSITHRPSLWKYHTHLLQFDGEGGWRFEQLD  
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**>Abcb5**

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**>Abcb11a**

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**>CABZ01117534.1**

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**>Abcc6**

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CASDGQRLYEAVSVGCLLAGGPLVGMLGLTYTTYFLGPTALVGSAIFIIFYPTMMLASRM  
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**>CABZ01009047.1**

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**>CABZ01103841.1**

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GVCIRNLVKVYKTGNKLAVDGLSLDFYQDHITSFLGHNGAGKTTTMSILTGLFAPTSGTA  
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**>Abca7\_2of3**

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LTCINLFIGINGSVATFVMELFDDPNITRINDIVKQALLVFPHFCLGRGLMDMAKNQAVA  
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**>Abca7\_3of3**

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**>Abcc13**

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VLHLPVHSQKMNTRKLMQALTQDMQVIDEELPKHLHSILKSLLDVLSTITLISFIIPVFS  
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**>Abcg2b**

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VRNPQTSYAQIAMNILFALLIGLVYYQMPLTLPEALQNRIGAFFFLIINMVFGNLSAVEL  
FINERAIFVHENSGGYYRTSVYFLSKVFVDLLPNRIVPILIFSSISYYMMGLNPAFTSFL  
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**>Abcg2c**

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