

UGT73B2 -----MGSDDHHRKLVHVFPPFM-AYGHMIPPTLDMAKLFSRRG-----AKSTILTTSLSNKKILQKPIDTFKNLNPGL--LEIDIQIFNFPCVE
 UGT73B3 -----MSSDPHRKLVHVFPPFM-AYGHMIPPTLDMAKLFSRRG-----AKSTILTTPLNKIFQKPIERFKNLNPS--FEIDIQIFDFPCVD
 UGT73B4 -----MAKLFARRG-----AKSTLLTTPINAKILEKPIEAFKVQNPDP--LEIGIKILNFPCVE
 UGT73B5 -----MNREVSEIRIHLFFPPFM-AQGHMIPILDMAKLFSRRG-----AKSTLLTTPINAKIFEKPIEAFKNQNPDP--LEIGIKIFNFPCVE
 UGT73B1 -----MGTPVEVSKLHFLFFPPFM-AHGHMIPPTLDMAKLFSRRG-----AKSTILTTPLNKILFFKPIKSFNQDNPGLEDITIQILNFPCTE
 UGT73C3 -----MATEKTHQFHPSLHFLFFPPFM-AQGHMIPMIDIARLLAQR-----GVTITIVTTPHNAARFKNVNLNRAIESG---LAINILHVKFFPYQE
 UGT73C4 -----MASEKSHKVHPPLHFLFFPPFM-AQGHMIPMIDIARLLAQR-----GATVITIVTTRYNAGRFEVNLSRAMESG---LPINIVHVNFPYQE
 UGT73C2 -----MAFEKTRQFLPPLHFLFFPPFM-AQGHMIPMVDIARLLAQR-----GVTITIVTTPHNAARFKDVLNRAIQSG---LHIRVEHVKFFPYQE
 UGT73C5 -----MVSETTKSSPLHFLFFPPFM-AQGHMIPMVDIARLLAQR-----GVITIVTTPHNAARFKNVNLNRAIESG---LPINLVQVKFFPYLE
 UGT73C6 -----MAFEKNNPEPPLHFLFFPPFM-AQGHMIPMVDIARLLAQR-----GVLITIVTTPHNAARFKNVNLNRAIESG---LPINLVQVKFFPYQE
 UGT73C11 -----MASEFRPPLHFLFFPPFM-AQGHMIPMVDIARLLAQR-----GVTITIVTTPQNAGRFKNVLSRAIQSG---LPINLVQVKFFPSQE
 UGT73C7 -----MCSHDPLHVVVPPFM-AQGHMIPLVDISRLLSQRQ-----GVTVCIITTTQNVAKIKTSLS-FSSLF---ATINIVEVKFFLSQQ
 UGT73D1 -----MESKIVSKAKRLHFLVLIPLM-AQGHMIPMVDISKILARQ-----GNIVTIVTTPQNASRFKTVDRARLESQ---LEINVVKFFIPYKE
 UGT89B1 -----MKVNEENNKPTKTHVLIFFPP-AQGHMIPLLDFTHRLALRGGAA-----LKITVVLVTPKNLFFLSPL--LSAVVN-----IEPLILFFPS-H
 UGT89C1 -----MTTTTTKKPHVLIFFPP-QSCHMVPHLDTHQILLRG-----ATVTVLVTPKNSSYLDALRSLHSPHEH-----FKTLILFFPS-H
 UGT89A2 MTEVLLLPGTKSENSKPPHIVVPPFP-AQGHMIPLLDTHQILLRG-----FNVSVIVTPGNLTYLSPLLSAHPSS-----VTSVVFPPFP-H
 UGT90A1 -----MSVSTHHHVVVLPFFM-SKGHIPLLLQFGRLLLRHHRKE-----PTITVTVFTTPKNQPFISDFLSDTP-E-----IKVISLPPFENI
 UGT90A4 -----MAVSSSHHVVLPFFM-SKGHTIPLLLQFARLLLRHRRIVSVDDEEPTISVTVFTTPKNQPFVSNFLSDVASS-----IKVISLPPFENI
 UGT90A2 -----MELEKVVHVVLPFFYL-SKGHMIPMLQLARLLLSHSFAG-----DISVTVFTTPLNRPFIVDSLSGSK-----ATIVDVPPFDNV
 UGT71B1 -----MKVELVFIPLP-GVGHIRATTALAKLLVASDN-----RLSVTLIVIPSRVSDDASS-----VYTNSEDRRLRYILLPAR-
 UGT71B2 -----MKLELVFIPLP-GDGHLRPLVEVAKLHVDRDD-----HLSITIIIPQMHGFFFFSSSSSYIASLSSDSEERLSYNVLSVDP
 UGT71B7 -----MKFELVFIPLP-GIGHLRSTVEMAKLLVDRET-----RLSISVILPFISEGEV GASDYAALSASSNNRLRYEVI SAVDQ
 UGT71B8 -----MKNFALVFIPLP-ILGHLLKSTAEMAKLLVEQET-----RLSISIIIPLLSGDDVSASAYISALSAAANDRLHYEVI SDGDQ
 UGT71B6 -----MKIELVFIPLP-AISHLMATVEMAEQLVDKND-----NLSITVLIISFSSKN-----TSMITSLTSNNRLRYEII SGGDQ
 UGT71B5 -----MKIELVFIPLP-GIGHLRPTVKLAKQLIGSEN-----RLSITIIIPSRFDAGDASACIASLTTLSQDDRLHYEVI SVAKQ
 UGT71C1 -----MGKQEDAELVFIPLP-FSGHILATIELAKRLISQDNP-----RIHTITILYWGLPFIQADTIAFLRSLVKNEPRIRLIVTLPEVQDP
 UGT71C2 -----MAKQQEAELFIPLP-IPGHILATIELAKRLISHQPS-----RIHTITILHWSLFPFPQSDTIAFLKSLIETESRIRLITLDPVQNP
 UGT71C3 -----MKAEAEIIFVTYP-SPGHLLVSIIEFAKSLIKRDD-----RIHTITILYVALPLAP--QAHLFAKSLVASQPRIRLLALPDVQNP
 UGT71C4 -----MVKETELFIPLP-STGHILVHIEFAKRLINLDH-----RIHTITILNLSPPSSP--HASVFARSLIASQPKIRLHDLPPIQDP
 UGT71C5 -----MKTAEIIFVPLP-ETGHLLSTIEFGKRLNLNDR-----RISMITILSMNLPPYAP--HADASLASLTASEPGIRIISLPEIHDP
 UGT71D1 -----MRNVELFIPLP-TVGHILVPELFAKRLIEQDD-----RIRITILLMKLQGGSHLDYVKSIASSQPFVRFIDVPELEEK
 UGT71D2 -----MRNAELFIPLP-TVGHILVPELFAKRLIEQDD-----RIRITFLLMKQGGQSHLDYVKTISSSLPFFVRFIDVPELEEK
 UGT88A1 -----MGEEAIVLYPAP-PIGHILVSMVELGKTIILSKNP-----SLSIHILVPPPPYQPE-STATYISSVSSSFPSTIFHHLPAVTPY
 UGT72B2 -----MPSP-GMGHILPVEELAKRLVQHDG-----FTVTMIISGETSPSKAQRSVLNSLPSS--IASVFLPPADL
 UGT72B3 -----MADGNTPHVAIIPSP-GIGHILPVEELAKRLLDNHG-----FTVTFIIPGDSPPSKAQRSVLNSLPSS--IASVFLPPADL
 UGT72B1 -----MEESKTPHVAIIPSP-GMGHILPVEELAKRLVHLHG-----LTVTFVIAGEGPPSKAQRVLDLSPSS--ISSVFLPPVDL
 UGT72E2 -----MHITKPHAAMFSSP-GMGHVIPVIEELGKRLSANNG-----FHVTVFVLETDAASAQSKFLNSTG-----VDIVKLPSPDI
 UGT72E3 -----MHITKPHAAMFSSP-GMGHVLPVIEELAKRLSANHG-----FHVTVFVLETDAASVQSKLLNSTG-----VDIVNLPSPDI
 UGT72E1 -----MFASP-GMGHILPVEELGKRLAGSHG-----FDVTFVLETDAASAQSQFLNSPGCDALVDIVGLPTPDI
 UGT72D1 -----MDQPHALLVAVP-GLGHILPVEELGNRLSSVLN-----IHVTILAVTSGSSSPTEFAIHAAAARTICQITEIPSVDV
 UGT72C1 -----MELHGALVAVP-GMGHIVPVEELGKRLLNHHG-----FDRVTVFLVTDVSRSKSLIGKTLMEEDPKFVIRFIPLDV
 UGT86A1 -----MERAKSRKPHIMMIPYP-LQGHVIPFVHLAIKLSHG-----FTITFVNTDSIHHSISTAHQDDAGDIFS--AARSSGQHDIRYTTVS
 UGT86A2 -----MADV RNP TKNHGHGHHHLHALLIPYP-FQGHVNPVHLAIKLSAQG-----ITVTFVNTHYIHHQITNGSD---GDIFA--GVRSESGLDIRYATVS
 UGT87A1 -----MPWP-GRGHINPMLNLCKSLVRRDPN-----LTVTFVVTVEEWLGFIGSDPK-----PNRHIFATLP

UGT87A2 -----MDPNESPPNQFRHVVAMPYYP-GRGHINPMMNLCKRLVRRYPN-----LHVTFFVTEEWLGFIGPDPK-----PDRTHFSTLP
UGT85A2 -----MGSHVAQKQHVVVCPYPYYP-AQGHINPMMKVAKLLYAKG-----FHITFVNTVYNHNRLLSRSG-----PNAVDGLPSFRFESIP
UGT85A3 -----MGSRFVSNEQKPHVVVCPYPYYP-AQGHINPMMKVAKLLHVKG-----FHVTFVNTVYNHNRLLSRSG-----ANALDGLPSFQFESIP
UGT85A1 -----MGSQI IHNSQKPHVVVCPYPYYP-AQGHINPMMRVAKLLHARG-----FYVTFVNTVYNHNRF LRSRSG-----SNALDGLPSFRFESIA
UGT85A7 -----MESHVVHNAQKPHVVVCPYPYYP-AQGHINPMLKVAKLLYAKG-----FHVTFVNTLYNHNRLLSRSG-----PNALDGFPSFRFESIP
UGT85A5 -----MASHAVTSGQKPHVVCIPFPYYP-AQGHINPMLKVAKLLYARG-----FHVTFVNTNYNHNRL LRSRSG-----PNSLDGLPSFRFESIP
UGT85A4 -----MEQHGGSSSQKPHAMCIPYYPYYP-AQGHINPMLKLAKLLHARG-----FHVTFVNTDYNHRRILQSRG-----PHALNGLPSFRFETIP
UGT74E1 -----MREGSHVIVLVPFPYYP-AQGHITPMSQFCKRLASKSLK-----ITLVLVSDKPSPPYKTEHDT-----ITVVPIS
UGT74E2 -----MREGSHVIVLVPFPYYP-GQGHITPMSQFCKRLASKCLK-----LTLVLVSDKPSPPYKTEHDS-----ITVFPIS
UGT74D1 -----MGEKAKANVLVFSFPYYP-IOGHINPLLQFSKRLLSKNVN-----VTFLLTTSSTHNSILRRAITGGAT-----ALPLSFVPID
UGT74C1 -----MSEAKKGHVLFVFPYYPYYP-LOGHINPMIQLAKRLSKKGIT-----STLLIASKDHREPYTSDSYS-----ITVHTIH
UGT74F1 -----MEKMRGHVLAVPFPYYP-SQGHITPIRQFCKRLHSGGFK-----THTLTTFIFNTIHLDPSSP-----ISIATIS
UGT74F2 -----MEHKRGHVLAVPFPYYP-TQGHITPFRQFCKRLHFKGLK-----TTLALTTFFVFN SINPDLSPG-----ISIATIS
UGT74B1 -----MAETTPKVKGHVVLFPYYPYYP-VQGHINPMVQFAKRLVSKNVK-----VTIATTTTYTASSITTP-----SLSVEPIS
UGT75B1 -----MAPPHFLLVTFPYPYYP-AQGHVNP SLRFARRLIKRTG-----ARVTFVTCVSVFHN SMIANHNK-----VENLSFLTFS
UGT75B2 -----MAQPHFLLVTFPYPYYP-AQGHVNP SLRFARRLIKRTG-----ARVTFVTCVSVFHN SMIPNHNK-----VENLSFLTFS
UGT75D1 -----MANNNSNSPTGPHFLVTFPYPYYP-AQGHINP SLELAKRLAGTISG-----ARVTFVTCVSVFHN SMIRRMFSTENV-----PETLIFATYS
UGT75C1 -----MATSVNGSHRRPHYLLVTFPYPYYP-AQGHINPALQLANRLIHHCA-----TVTYSTAVSAHRRMGEPSS-----TKGLSFAWFT
UGT84A3 -----MDPSRHTHVMLVSFPYYPYYP-GQGHVNP LLLRLGKLIASKGLL-----VTFVTTTEKPGWKKMRQANKIQDGV-----LKPVGLGFI RFEFFS
UGT84A4 -----MEMESSLPHVMLVSFPYYPYYP-GQGHISPLLRLGKLIASKGLI-----VTFVTTTEELPGKMMRQANNIQDGV-----LKPVGLGFI RFEFFE
UGT84A2 -----MELESSPPLPPHVMLVSFPYYPYYP-GQGHVNP LLLRLGKLIASKGLL-----ITFVTTES-WGKKMRISNKIQDRV-----LKPVGKGYLRYDFFD
UGT84A1 -----MVFETCPSPNP IHVMLVSFOYYPYYP-GQGHVNP LLLRLGKLIASKGLL-----VTFVTTTEL-WGKKMRQANKIVDGE-----LKPVGSGSIRFEFFD
UGT84B1 -----MGSSEGOETHVLMVTLFPYYPYYP-FOGHINPMLKLAKHLSLSSKN-----LHINLATIESARDLLS-TVEKP-----RYPVDLVFFS
UGT84B2 -----MVALA-FOGHINPMLKFAKHLARTN-----LHFTLATTEQARDLLSSTADEP-----HRPVDLAFSS
UGT76C3 -----MDKSNGLRVILFPFLP-LOGCINPMIQLAKILHSRGFS-----ITVIHTRFNAPKA--SNHPLFTFLQIPD-----GLSET
UGT76C4 -----MEKSNGLRVILFPFLP-LOGCINPMIQLAKILHSRGFS-----ITVIHTRFNAPKA--SSHPLFTFIQIQD-----GLSET
UGT76C5 -----MEKSNGLRVILFPFLP-LOGCINPMIQLAKILHSRGFS-----ITVIHTRFNAPKA--SSHPLFTFLEIPD-----GLSET
UGT76C2 -----MEEKRNGLRVILFPFLP-LOGCINPMLQLANILHVRGFS-----ITVIHTRFNAPKA--SSHPLFTFLQIPD-----GLSET
UGT76C1 -----MEKRNERQVILFPFLP-LOGCINPMLQLAKILYSRGFS-----ITVIHTRFNAPKA--SDHPLFTFLQIRD-----GLSES
UGT76B1 -----METRET KPVI FLFPFPYYP-LOGHINPMFQLANIFFNRGFS-----ITVIHTEFN SPNS--SNFPHFTFVSIPD-----SLSE-
UGT76F1 -----MEERKVKRIIMFPFLP-FTGHFNPMIELAGIFHNRGFS-----VTILHTSFNFDPD--SRHPQFTFRTITH-----KNEGE
UGT76F2 -----MEERKGRRIIMFPFLP-FPGHFNPMIELAGIFHNRGFS-----VTILHTSYNFDPD--SRHPHFTFRTISH-----NKEGE
UGT76E1 -----MEELGVKRRIVLVFPVPYYP-AQGHVTPIMQLGKALYSKGFSS-----ITVVLTOYNRVSS--SKDFSDFHFLTIPG-----SLTES
UGT76E2 -----MEEKQVKE TRIVLVFPVPYYP-AQGHVTPIMQLGKALYSKGFSS-----ITVVLTOYNRVSS--SKDFSDFHFLTIPG-----SLTES
UGT76E4 -----MEKRVEKRRIVLVFPVAPYYP-AQGHVTPIMQLGKALYSKGFSS-----ITVAQRQFNQIGSSQLQHFPGFDFVTIP-----ESLPQS
UGT76E6 -----MEKMEEKKRIVLVFPVPYYP-AQRHVTPIMQLGTALNMKGFSS-----ITVVEGQFNKVSS--SQNFPGFQFVTIPDT-----ESLPES
UGT76E5 -----MEKNAEKKRIVLVFPFPYYP-LOGHITPMMQLGQALNLKGFSS-----ITVALGDSNRVSS--TQHFPGFQFVTIP-----ETIPLS
UGT76E3 -----MEKRVEKRRIVLVFPFLP-LLGHFTPMMQLGQALILKGFSS-----IIVPQGEFNRVNS--SQKFPGFQFITIP-----DS
UGT76E11 -----MEEKPAGRRVVLVAVPYYP-AQGHISPI MQLAKTLHLKGFSS-----ITIAQTKFNYFSPSDDFT--DFQFVTIP-----ESLPES
UGT76E12 -----MEEKPARRSVVLVFPFPYYP-AQGHISPI MQLAKTLHLKGFSS-----ITVVQTKFNYFSPSDDFT--HDFQFVTIP-----ESLPES
UGT76E7 -----MEEKLSRRRRVVLVFPVPYYP-AQGHITPMIQLAKALHSKGFSS-----ITVVQTKFNYLNPSNDLS--DFQFVTIP-----ENLPVS
UGT76E9 -----MEEKQERRRRIVLIPAPYYP-AQGHISPI MQLAKALHLKGFSS-----ITVAQTKFNYLKP SKDLA--DFQFITIP-----ESLPAS
UGT76D1 -----MAEIRQRRVLMVBPAPYYP-FOGHILPMMNLASYLSSQGFSS-----ITIVRNEFN--FKDISHNFPGIKFFT IKD-----GLSES
UGT78D2 -----MTKPSDPTRDSHVAVLAFPYYP-FGTHAAPLLAVTRRLASASPS-----TVVFFFNTAQSNSSLFSSGDEADRPAN-----IRVYDIA
UGT78D3 -----MAKPSQPTRDSHVAVLVFPYYP-FGTHAAPLLAVTCRLATAAPS-----TVVFFFSTARSNSSLSS----DIPTN-----IRVHNVD

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UGT78D1 -----MTKFSSEPIRDSHVAVLAEFFPVGAHAGPILLAVTRRLAAASPS-----TIFSFFNTARSNASLFS-----DHPEN-----IKVHDVS
UGT79B10 -----MGQTFHAFMFPWF-AFGHMTPYLHLANKLAERCHR-----ITFLIPKKAQKQLEHLNLFPDSIVFHS-----LTIPH---V
UGT79B11 -----MGQKIHFAMFPWF-AFGHMTPYLHLGNKLAEKCHR-----VTFLLPKKAQKQLEHQNLFPHGIVFHP-----LVIPH---V
UGT79B9  -----MGQNFHAFMFPWF-AFGHMTPYLHLANKLAAKCHR-----VTFLLPKKAQKQLEHHNLFPDRIIFHS-----LTIPH---V
UGT79B7  -----MEPKFHAFMFPWF-AFGHMIPFLHLANKLAEKCHR-----VTFLLPKKAQKQLEHHNLFPDSIVFHP-----LTVPP---V
UGT79B8  -----MEPTFHAFMFPWF-AFGHMIPFLHLANKLAEKCHQ-----ITFLLPKKAQKQLEHHNLFPDSIVFHP-----LTIPH---V
UGT79B6  -----MGSKFHAFMFPWF-GFGHMTAFLLHLANKLAEKDHK-----ITFLLPKKARKQLESNLNLFPCIVFQT-----LTIPS---V
UGT79B4  -----MGSKFHAFLYPWF-GFGHMIPYLHLANKLAEKCHR-----VTFLAPKKAQKQLEPLNLFPNSIHFN-----VTLPH---V
UGT79B5  -----MGSKFHAFMYPWF-GFGHMIPYLHLANKLAEKCHR-----VTFFLPKKAHKQLQPLNLFPDSIVFEP-----LTLPP---V
UGT79B2  -----MGGLKFHVLMYPWF-ATGHMTPFLFLANKLAEKCHT-----VTFLIPKKAQKQLENLNLFPHNIVFRS-----VTVPH---V
UGT79B3  -----MGGLKFHVLMYPWF-ATGHMTPFLFLANKLAEKCHT-----VTFLLPKKSLKQLEHFNLFPHNIVFRS-----VTVPH---V
UGT79B1  -----MGVFGSNESSMSIVMYPWL-AFGHMTPFLLHLNKLAEKGHK-----IVFLLPKKALNQLEPLNLYPNLITFHT-----ISIPQ---V
UGT91A1  ----MTNFKDNDGDGTKLHVVMFPWL-AFGHMVPLYLLELCLKLIAQKCHK-----VSFISTPRNIDRLLPWLPELNLSSVINF-----VKLSLPVGD
UGT91B1  -----MAEPKPKLHVAVFPWL-ALGHMIPYLQLSKLIARCKHT-----VSFISTARNISRLP-----NISSDLSVNF-----VSLPLSQTV
UGT91C1  -----MVDKREEVMMHVAMFPWL-AMGHLLPFLRLSKLLAQKCHK-----ISFISTPRNIERLP-KLQSNLASSITF-----VSFPLPPIIS
UGT83A1  -----MDNNSNKRMGRPHEVVIPYP-AQGHVLPPLISFSRYLAKQCIQ-----ITFINTFEFNHNRISSLPNSPHEDYVG-----DQINLVSIP
UGT92A1  -----MAEAKPRNLRIVMFPWF-MQGHIIIPFVALALRLLEKIMIMN-----RANKTTISMINTPSNIPKIRSNLPPESSISLIELPFNSSD
UGT82A1  -----MKVTQKPKIIFIPYP-AQGHVTPMLHLASAFLSRCFS-----PVVMTPEHSIHRRISATNEDLG-----ITFLALS
consensus ..... .. .. .. ..
1.....10.....20.....30.....40.....50.....60.....70.....80.....90.....
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UGT73B2 LGLPEGCENVDFFTSNNDKDN--EMIVKFFFSTRFFKDQLEKLLGTTR---PDCLIADMFFPWATEAAEKFNVPRLVFGHTGYFSLCAGYICGVHKPQK
UGT73B3 LGLPEGCENVDFFTSNNDDRQ--YLTCLKFFKSTRFFKDQLEKLLLETTR---PDCLIADMFFPWATEAAEKFNVPRLVFGHTGYFSLCSEYICIRVHNPQN
UGT73B4 LGLPEGCENRDFINSYQKSDSF--DLFLKFLFSTKYMKQQLSFIEETTK---PSALVADMFFPWATESAEKIGVPRLVFGHTSSFALCCSYNMRIHKPHK
UGT73B5 LGLPEGCENADFINSYQKSDSG--DLFLKFLFSTKYMKQQLSFIEETTK---PSALVADMFFPWATESAEKLGVPRLVFGHTSSFSLCCSYNMRIHKPHK
UGT73B1 LGLPDGCENTDFIFSTPDLNVG--DLSQKFLAMKYFEFPLEELLVTMR---PDCLVGNMFFPWSTKVAEKFGVPRLVFGHTGYFSLCASHCIRLPKN--
UGT73C3 FGLPEGKENIDSLDST-----ELMVPFFKAVNLLLEDPMVKLMEEMK-PRPSCLISDWCLPYTYSIIAKNFNIPKIVFHGMGCFNLLCMHVLRRLNLEIL
UGT73C4 FGLPEGKENIDSYSM-----ELMVPFFQAVNMLEDPVMKLMEEEMK-PRPSCLISDLLLLPYTSKIARKFNSIPKIVFHGHTGCFNLLCMHVLRRLNLEIL
UGT73C2 ACLQEGQENVDLDSM-----ELMVHFFKAVNMLENPMVKLMEEMK-PKPSCLISDFCLPYTSKIARKFNIPKIVFHGVSCFCLLSMHILHRNHNIL
UGT73C5 ACLQEGQENIDSLDTM-----ERMIPFFKAVNFLEEPVQKLIIEEMN-PRPSCLISDFCLPYTSKIARKFNIPKILFHGMGCFCLLCMHVLRKNREIL
UGT73C6 ACLQEGQENMDLLTTM-----EQITSFFKAVNLLKEPVQNLIEEMS-PRPSCLISDMCLSYTSEIARKFKIPKILFHGMGCFCLLCVNVLRKNREIL
UGT73C11 SCSPEGQENLDLLDSL-----GASLTFFFKAFSLLEEPVEKLLKEIQ-PRPNCLIAMCLPYTNRIAKNLGIPKIIIFHGMCCFNLLCTHIMHQNHFL
UGT73C7 TGLPEGCESLDMLASM-----GDMVKFFDAANSLEEQVEKAMEEMVQPRPSCLIGDMSLPFTSRLAKKFKIPKLIIFHGFSCFSLMSIQVVRES-GIL
UGT73D1 FGLPKDCEITLDTLPSK-----DLLRRFYDAVDKIQEPMERFLEQQD-IPPSCCLISDKCLFWTSRTAKRFKIPRIVFHGMCCFSLSSSHNIHLHSPHL
UGT89B1 PSIPSGVENVDLPPSGF-----PLMIHALGNLHAPLISWITSHSPSP---PVAIVSDFFLGWTKNLGIPRFDSPSAATCCILNLTWIEMPKINED
UGT89C1 PCIPSGVESLQQLPLEAI-----VHMFDALSRQLHDFLVDLRSRQPPSD--LPDAILGSSFLSPWINKVADAFSLKS-----
UGT89A2 PSLSPGVENVKDVGNNGN-----LPIMASLRQLREPIINWFQSHPNP---PIALISDFFLGWTHDLCNQIGIPRFAFFSISFFLVSVLQFCFENIDLII
UGT90A1 TCIPPGVENTEKLPSMS-----LFVPPFTRATKLLQPFFEETLKTLP---KVSFMSDFGLLWWTSESAAKFNIPRFVSYGMNSYSAAVSI SVFKHELFT
UGT90A4 ACIPPGVESTDMPLPSIS-----LYVPPFTRATKSLQPFPEAELKNLE---KVSFMSDFGLLWWTSESAAKFEIPRLAFYGMNSYASAMCSAISVHELFT
UGT90A2 PEIPPGVECTDKLPALSS-----SLFVPPFTRATKSMQADFERELMSLP--RVSFMSDFGLLWWTQESARKLGFPRLVFFGMNCASTVICDSVFNQQLLS
UGT71B1 -----DQTTDLVSYIDSQ-----KPQVRVAVSVKAVGDVS--TRSDSRLAGIVVDMFCTSMIDIA-DEFNLSAYIFYTASNAYLGLQFHVQSLYDE
UGT71B2 KPDSD---DTKPHFFDYIDNF-----KPQVKATVEKLTDPGP--PDSPSRLAGFVVDMMFCMMIDVA-NEFGVPSYMFYTSNATFLGLQVHVEYLYDV
UGT71B7 PTI-----EMTTIEIHMKNQ-----EPKVRSTVAKLLEDYSS-KPDSPKIAGFVLDMMFCTSMVDVA-NEFGFPSYMFYTSAGILSVTYHVQMLCDE
UGT71B8 P-----TVGLHVDNH-----IPMVKRTVAKLVDDYSR-RPDSPRLAGLVVDMFCISVIDVA-NEVSVPCYLFYTSNVGILALGLHIQMLFDK
UGT71B6 QPT-----ELKATDSHIQSL-----KPLVRDAVAKLVDST---LPDAPRLAGFVVDMMYCTSMIDVA-NEFGVPSYLFYTSNAGFLGLLLHIQFMYDA
UGT71B5 PPTS---PDPVPAQVYIEKQ-----KTKVRDAVAARIVDP-----TRKLAGFVVDMMFCSSMIDVA-NEFGVPCYMVYTSNATFLGTMLHVQQMYDQ
UGT71C1 PPMELFVEFAESYILEYVKKM-----VPIREALSTLLSSRDE--SGSVRVAGLVLDFFCVPMIDVG-NEFNLPYSYIFLTCASAGFLG---MMKYLPER
UGT71C2 PPMELFVKASESYILEYVKKM-----VPLVRNALSTLLSSRDE--SDSVHVAGLVLDFFCVPLIDVG-NEFNLPYSYIFLTCASAGFLG---MMKYLLER
UGT71C3 PPLELFFKAPEAYILESTKKT-----VPLVRDALSTLVSSRKE--SGSVRVVGLVIDFFCVPMIEVA-NELNLPYSYIFLTCNAGFLS---MMKYLPER
UGT71C4 PPFDLYQRAPEAYIVKLIKKN-----TPLIKDAVSSIVASRRGG-SDSVQVAGLVLDLFCNSLVKDVGNELNLPYSYIYLTICNARYLG---MMKYIPDR
UGT71C5 PPIKLLDTSSEYIILDFIHKN-----IPCLRKTIQDLVSSSSSSGGSSHVAGLILDFFCVGLIDIG-REVNLPYSYIFMTSNFGFLG---VLQYLPER
UGT71D1 P-TLGSTQSV EAYVYDVIERN-----IPLVRNIVMDILTSLALD---GVKVKGLVVDFFCLPMDVA-KDISLPFYVFLTNSGFLA---MMQYLADR
UGT71D2 P-TLG-TQSV EAYVYDFIETN-----VPLVQNIIMGILSSPAFD---GVTVKGFVADFFCLPMDVA-KDASLPFYVFLTNSGFLA---MMQYLAYG
UGT88A1 SSSSTRHHHESLLEILCFS-----NPSVHRTLFLSLSRNFN-----VRAMIIDFFCTAVLDIT-ADFTFPVYFFYTSGAACLAFLSFYLPITIDET
UGT72B2 SDVPST-ARIE TRAMLTMTRS-----NPALRELFGSLSTKKSLSL-----PAVLVVDVDFGADAFDVAVDVHVSP-YIFYASNANVLSFFLHLPKLD--
UGT72B3 SDVPST-ARIE TRISLTVTRS-----NPALRELFGSLSAEKRL-----PAVLVVDLDFGTDADFVAEAFHVSP-YIFYASNANVLTFFLLHLPKLD--
UGT72B1 TDLSSS-TRIESRISLTVTRS-----NPELRKVFDSFVEGGRL-----PTALVVDLDFGTDADFVAVEFHVPP-YIFYPTTANVLSFFLHLPKLD--
UGT72E2 YCLVDPDDHVVTKIGVIMRAA-----VPALRSKIAAMHQK-----PTALIVDLDFGTDALCLAKEFNMLS-YVFIPTNARFLGVSIIYYPNLD--
UGT72E3 SCLVDPNAHVVTKIGVIMREA-----VPTLRSKIVAMHQN-----PTALIIDLDFGTDALCLAAELNMLT-YVFIASNARYLGVSIYYPPTLD--
UGT72E1 SCLVDP SAFFGIKLLVMMRET-----IPTIRSKIEEMQHK-----PTALIVDLDFGLDAIPLGGEFNMLT-YIFIASNARFLAVALFFPTLD--
UGT72D1 DNLVEPDATIFTKMVVKMRAM-----KPAVRDAVKLMKRK-----PTVMIVDFLGT ELSVADVGMTAKYVYVPTHAWFLAVMVYLPVLD--
UGT72C1 S-GQDLSGSLLTKLAEMMRKA-----LPEIKSSVMLEPR-----PRVFVVDLLGTEALEVAKELGIMRKHVLTITSAWFLAFTVYMASLD--
UGT86A1 DGF P-LDFDRSLNHDFEFGI-----LHVFSAHVDDLIAKLSRR-DDPPVTCLIADTFYVWSSMICDKHN-LVNVSFWTEPALVNLNLYYHMDLLISN
UGT86A2 DGLP-VGFDRSLNHDTYQSSL-----LHVFYAHVEELVASLVG--GDGGINVMIADTFYVWPSVVARCKFG-LVCVSWTEAALVFSLYYHMDLLRIH
UGT87A1 NILP-SELVRANDFIAFIDAV-----LTRLEEPFEQLLDRLNS----PP-TAIIADTYIIVAVRVGTRKRN-IPVASFWTTSATILSLFINSDLLASH
UGT87A2 NILP-SELVRAKDFIGFIDAV-----YTRLEEPFEKLLDSLNS----PPPSVIFADTYIIVAVRVGRKRN-IPVSVLWMTSATILSFFLHSDLLISH

UGT85A2 DGLPETDVTQDIPITLCEST-----MKHCLAPFKELLRQINARDDVPPVSCIVSDGCMSTFLDAAEELG-VPEVLFWITTSACGFLAYLYYYRFIEK
UGT85A3 DGLPETGVDATQDIPALSEST-----TKNCLVPFKLLQRIVTREDVPPVSCIVSDGSMSTFLDVAEELG-VPEIHFWITTSACGMAYLHFYLFIEK
UGT85A1 DGLPETMDATQDITALCEST-----MKNCLAPFRELLQRINAGDNVPPVSCIVSDGCMSTFLDVAEELG-VPEVLFWITTSACGFLAYLHFYLFIEK
UGT85A7 DGLPETDGDRTQHTPTVCMSI-----EKNCLAPFKEILRRINDKDDVPPVSCIVSDGVMSTFLDAAEELG-VPEVIFWITNSACGFMITLHFYLFIEK
UGT85A5 DGLPEENKQDMQDVPITLCEST-----MKNCLAPFKELLRRINTTKDVPVSCIVSDGVMSTFLDAAEELG-VPDVLFWITPSACGFLAYLHFYRFIEK
UGT85A4 DGLPWTVDVAKQDMLKLDST-----INNCLAPFKDLILRLNSGSDIPPVSCIISDASMSFTIDAEEELK-IPVLLWITNSATALILYLHYQKLEK
UGT74E1 NCFQEG-QERSED-LDEYMER-----VESSIKNRLPKLIED---MKLSGNPPRALVYDSTMPWLLDVAHSYG-LSGAVFFTQPWLVSALYYHVFKGSFS
UGT74E2 NCFQEG-EEPLQD-LDDYMER-----VETSIKNLTPKLVED---MKLSGNPPRALVYDSTMPWLLDVAHSYG-LSGAVFFTQPWLVTALYYHVFKGSFS
UGT74D1 DCFEED-HPSTDT-SPDYFAK-----FQENVSRSLSELISS---MDP---KPNNAVYDSCLPYVLDVCRKHPGVAAASFFTQSSTVNATYIHFILRGEFK
UGT74C1 DCFPP--HEHPHA-KFVDLDR-----FHNSTSRSLTDFISS---AKLSDNPPKALIYDFPFMPFALDIKDL- LYVVAYFTQPWLASLVYYHINEGTYD
UGT74F1 DGYDQGGFSSAGS-VPEYLQN-----FKTFGSKTVADIIRK---HQSTDNPITCIVYDSFMPWALDLAMDGF-LAAAPFFTQSCAVNYINLYSYINNGS
UGT74F2 DGYDHGGFETADS-IDDYLKD-----FKTSGSKTIADIIQK---HQSTDNPITCIVYDAFLPWALDVAREFG-LVATPFFTQPCAVNYVYLYSYINNGS
UGT74B1 DCFDFPIGIPGFSVDTYSES-----FKLNGSETLTLLEK---FKSTDSPIDCLIYDSFLPWGLEVARSMELSAASFFTNNLTVCSVLRKFSNGDFP
UGT75B1 DCFDDGGISTYEDRQKR-----SVNLKVNKGDKALSDFIEA---TKNGDSPVTCLIIYITILLNWAPKVARRFQ-LPSALLWIQPAALVFNIYYTHFMGNK-
UGT75B2 DCFDDGVISNTDDVQNR-----LVHFERNGDKALSDFIEA---NQNGDSPVSCLIYITILPNWVPKVARRFH-LPSVHLWIQPAFAFDIYYNYSTGN-
UGT75D1 DGHDDGFKSSAYSDKSRQDATGNFMSEMRRRRGETLLELIED---NRKQNRPFITCVYITILLTWVAELAREFH-LPSALLWVQPVTVFSLFYHYFNGYED
UGT75C1 DCFDDGLKSFEDQKIYMS-----ELKRCGSNALRDIKANLDATTEPITGVYISVLVWVSTVAREFH-LPTLLWIEPATAVLDIYYYYFNTSYK
UGT84A3 DCFADDD-EKRFDFDAFRP-----HLEAVGKQEKIKNLVKRY--NKE---PVTCLINNAFVPWVCDVAEELH-IPSAVLWVQSCACLTAAYYYHHRLVK
UGT84A4 DCFVY----KEDFDLLQK-----SLEVSGKREIKNLVKKY--EKQ---PVRCLINNAFVPWVCDVAEELQ-IPSAVLWVQSCACLAAYYYHHQLVK
UGT84A2 DGLPEDDEASRTNLTILRP-----HLELVGKREIKNLVKRY--KEVTKQPVITCLINNPVSWVCDVAEDLQ-IPCAVLWVQSCACLAAYYYHHNLVD
UGT84A1 EEWAEDD-DRRADFSLYIA-----HLESVGIREVSKLVRRY--EEAN-EPVSCLINNPPIPVWCHVAEEFN-IPCAVLWVQSCACFSAYYHYQDGSVS
UGT84B1 DGLPKED---PKAPETLLK-----SLNKVGAMNLSKIIEEK--RYS-----CIISSPFTPWVPAVAASHN-ISCALWIQACGAYSVYYRYMKTNS
UGT84B2 DGLPKDD---PRDPDLAK-----SLKKGAKNLSKIIEEK--RFD-----CIISSVPFTPWVPAVAASHN-IPCALWIQACGAFSVYYRYMKTNP
UGT76C3 ETRTHDITLLLTLLNRSCESP-----FRECLTKLLQSADSETGEEKQRISCLIDDSGW-IFTQPVAQSFNLPRLVNLNYYKVSFFRDHFVLPQLRRE
UGT76C4 ETRTRDVKLLITLLNQNCESP-----VRECLRKLLQSAK----EEKQRISCLINDSGW-IFTQHLAKSLNLMRLAFNYYKISFFRSHFVLPQLRRE
UGT76C5 EKRTNNTKLLLTLLNRSCESP-----FRECLSKLLQSADSETGEEKQRISCLIDDSGW-MFTQPIAQSCLKLPILVLSVFTVSVFFRCQFVLPKLRRE
UGT76C2 EIQDG-VMSLLAQINLNAESP-----FRDCLRKVLLESK-----ESERVTCCLIDDCGW-LFTQSVSESLKLPRLVLCIFKATFFFNAYPSLPLIRTK
UGT76C1 QTQSRDLLLQLTLLNMCQIP-----FRECLAKLIKPS-DSGTEDRKISCVIDDSGW-VFTQSVAESFNLPFVLCAYKFSFFLGHFLVLPQIRRE
UGT76B1 PESYPDVIEILHDLNSKCVAP-----FGDCLKKLISEEP-----TAACVIVDALW-YFTHDLTEKFNFRIVLRTVNLSAFVAFSKFHVLRREK
UGT76F1 EDPLSQSETSSGKDLVVLISL-----LKQYYTEPS---LAEVGEGETVCCVSDALWGRNTEIVAKEIGVCTMVMRTSGAATFCAYTAFPLLDK
UGT76F2 EDPLSQSETSS-MDLIVLVRR-----LKQRYAEPFRKSVAAEVGGGETVCCVSDAIWGNTEVVAEEIGVRRVVLRTGGASSFCFAAFPLLRDK
UGT76E1 DLKNLGPFKFLKLNQICEAS-----FKQCIQQLLQE-----QGN-DIACVVYDEYM-YFSAAVKEFQLPSVLFSTTSATAFVCRSVLSRVNAE
UGT76E2 DLQNLGPKQFVFLKLNQICEAS-----FKQCIQQLLHE-----QCNDIACVVYDEYM-YFSAAVKEFQLPSVVFSTTSATAFVCRSVLSRVNAE
UGT76E4 ESKKLGPAEYLMNLNKTSEAS-----FKECISQLSMQ-----QGN-DIACIYDKLM-YFCGAAAKEFKIPSVIFSTSSATIQCVCVLSLSAE
UGT76E6 VLERLGPVEFLFEINKTSEAS-----FKDCIRQSLIQ-----QGN-DIACIYDEYM-YFCGAAAKEFNLPVIFSTQSATNQVSRVLRKLSAE
UGT76E5 QHEALGVVEFVVTLNKTSETS-----FKDCIAHLLQ-----HGN-DIACIYDELM-YFSEATAKDLRIPSVIFTTGSATNHVCSCILSKLNAE
UGT76E3 ELEANGPVGSLTQLNKIMEAS-----FKDCIRQLLQ-----QGN-DIACIYDEFM-YFCGAAAEELKLPNIFSTQTATHKVCNVLKLNNAK
UGT76E11 DFEDLGP IEFHLKLNKECQVS-----FKDCLGQLLLQ-----QNEIACVVYDEFM-YFAEAAAKEFKLPNIFSTTSATAFVCRSAFDKLYAN
UGT76E12 DFKNLGP IQFLKLNKECKVS-----FKDCLGQLVLQ-----QSNEIACVIYDEFM-YFAEAAAKECKLPNIFSTTSATAFACRSVFDKLYAN
UGT76E7 DLKNLGPGRFLIKLANECYVS-----FKDLLGQLLVN-----EEEEIACVIYDEFM-YFVEVAVKEFKLRNVILSTTSATAFVCRFVMCELYAK
UGT76E9 DLKNLGPVWFLKLNKECEFS-----FKECLGQLLLQKQ---LIPEEEIACVIYDEFM-YFAEAAAKEFNLPKVIIFSTENATAFACRSAMCKLYAK
UGT76D1 DVKSLGLLEFVLELNSVCEPL-----LKEFLTNHDDV-----VDFIYDEFV-YFPRRVAEDMNLPKMVFSPSSAATSISRCVLMENQSN
UGT78D2 DCVPEGYVFSGRPQEAIEFL-----QAAPENFRREIAKAEDEVGTEVKCLMTDAFFWFAAD-MATEINASWIAFWTAGANSLSAHLYTDLIRET
UGT78D3 DCVPEGFVLTGNPQHAVELFL-----EAAPEIFRREIKAAEDEVGRKFKCILLTDAFLWLAETAFAAEMKASWVAYGGGATSLTAHLYTDAIREN
UGT78D1 DCVPEGTMLG-NPLEMVELFL-----EAAPRIFRSEIAAAEIEVGKVKTCMLTDAFFWFAAD-IAAELNATWVAFWAGANSLCAHLYTDLIRET

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UGT79B10 DCLPAGAETFSDIPMPLWKFLP-----PAIDLTRDQVEAAVSALSPDLILFDIA-SWVPEVAKEYRVKSMLYNIISATSIAHDFVPG-----
UGT79B11 DCLPAGAETASDIPISLVKFLS-----IAMDLTRDQIEAAIGALRPDLILFDLA-HWVPEMAKALKVKSMLYNVMATSIAHDLVPG-----
UGT79B9  DCLPAGAETASDIPISLGKFLT-----AAMDLTRDQVEAAVRALRPDLIFFDFA-YWVPEMAKEHRVKSVIYFVISANSIAHELVPG-----
UGT79B7  NCLPAGAETTSDIPISLDNLLS-----KALDLTRDQVEAAVRALRPDLIFFDFA-QWIPDMAKEHMIKSVSYIIVSATTTIAHTHVPG-----
UGT79B8  NCLPAGAETTSDISISMDNLLS-----EALDLTRDQVEAAVRALRPDLIFFDFA-HWIPEIAKEHMIKSVSYMIVSATTTIAYTFAPG-----
UGT79B6  DCLPDGAETTSDIPISLGSFLA-----SAMDRTRIQVKEAVSVGKPDLIFFDFA-HWIPEIAREYGVKSVNFITISAAACVAISFVPGRS-----
UGT79B4  DCLPVGAETTADLPNSSKRVLA-----DAMDLLREQIEVKIRSLKPDLIFFDFV-DWIPQMAKELGIKSVSYQIISAAFIAMFFAPR-----
UGT79B5  DCLPFGAETASDLPNSTKKPIF-----VAMDLLRDQIEAKVRALKPDLIFFDFV-HWVPEMAEEFGIKSVNYQIISAAACVAMVLAPR-----
UGT79B2  DCLPVGTETVSEIPVTSADLLM-----SAMDLTRDQVEGVVRAVEPDLIFFDFA-HWIPEVARDFGLKTVKYVVVSASTIASMLVPG-----
UGT79B3  DCLPVGTETASEIPVTSTDLLM-----SAMDLTRDQVEAVVRAVEPDLIFFDFA-HWIPEVARDFGLKTVKYVVVSASTIASMLVPG-----
UGT79B1  KCLPPGAETNSDVPFFLTHLLA-----VAMDQTRPEVETIFRTIKPDLVFDYSA-HWIPEIAKPIGAKTVCFNIVSAAASIALSLVPSAEREVI
UGT91A1  NKLPEDEGATTDVPPFELIPYLK-----IAYDGLKVPVTEFFLESSKPDWVLDQDFAGFWLPPISRRLGIKTGFFSAFNGATLGLKPPG-----F
UGT91B1  DHLPENAEATTDVPETHIAYLK-----KAFDGLSEAFTEFLEASKPNWIVYDILHHWVPPIAEKLGVRRRAIFCTFNAAASIIIGGPASVMIQG
UGT91C1  G-LPPSSESSMDVPYNKQQLK-----AAFDDLQPLKEFLRRSSPDWIYDYASHWLPSIAAELGISKAFFSLFNAAATLCFMGPSSS---LI
UGT83A1  DGLEDSPEERNIPGKLSESVLR-----FMPKKVEELIERMMAETSGGTIISCVVADQSLGWAIEVAAKFGIRRTAFCPAAAAASMVLGFSIQKLIDDG
UGT92A1  HCLPHDGENFDLPSLVISLL-----EASRSLREPFRDFMTKILKEEGQSSVIVIGDFFLGWIGKVCKEVGVYSVIFSAAGAFGLGCYRSIWLNLPHK
UGT82A1  DCQDRPDAPPDFFFSIENSMEN-----IMPPQLERLLLEEDLDVACVVVDLLASWAIGVADRRCGVVPVAGFWPVMFAAYRLIQAIPELVRTG
consensus ..
101.....110.....120.....130.....140.....150.....160.....170.....180.....190.....

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UGT73B2 RVASSS-----EPFVIPLEPGNIVITEEQIIDGDGESDM--GKFMTEVRESEVK--SSGVVLSNFYELHHDYADFYKSCV----Q----KRA
UGT73B3 IVASRY-----EPFVIPDLPGNIVITQEQIADRDEESEM--GKFMIEVKESDVK--SSGVIVNSFYELHDPDYADFYKSVV----L----KRA
UGT73B4 KVASSS-----TPFVIPGLPGDIVITEEQANVTNEETPF--GKFWKEVRESETS--SFGVLVNSFYELHSSYADFYRSFV----A----KKA
UGT73B5 KVATSS-----TPFVIPGLPGDIVITEEQANVAKEETPM--GKFMKEVRESETN--SFGVLVNSFYELHSAYADFYRSFV----A----KRA
UGT73B1 -VATSS-----EPFVIPDLPGDILITEEQVMEITEESVM--GRFMKAIRDSEED--SFGVLVNSFYELHQAYSDFYKSFV----A----KRA
UGT73C3 ENVKSDE-----EYFLVPSFPPDRVEFTKLQLPVKANASGD-WKEIMDEMVKAEY--SYGVIIVNTFQELHPPYVKDYKEAM----D----GKV
UGT73C4 KNLKSDK-----DYFLVPSFPPDRVEFTKQPVPVETTASGD-WKAFLDEMVEAEY--SYGVIIVNTFQELHPAYVKDYTKAR----A----GKV
UGT73C2 HALKSDK-----EYFLVPSFPPDRVEFTKLQVTVKTNFSGD-WKEIMDEQVDADD--SYGVIIVNTFQELHSAYVKNYTEAR----A----GKV
UGT73C5 DNLKSDK-----ELFTVPDFPDRVEFTRTQVPVETYPVAGDWKDIIDFGMVEANET--SYGVIIVNSFQELHPAYAKDYKEVR----S----GKA
UGT73C6 DNLKSDK-----EYFIVPYFPDRVEFTRPQVPVETYPVAG-WKEILEDMVEADKT--SYGVIIVNSFQELHPAYAKDFKEAR----S----GKA
UGT73C11 ETIESDK-----EYFPIPNFPDRVEFTKSQLP--MVLVAGDWKDFLDGMTEGDNT--SYGVIIVNTFEELHPAYVRDYKVKV----A----GKI
UGT73C7 KMIESND-----EYFDLPGPLPKVEFTKQPQVSVLQPVVEGN-MKESTAKIIEADND--SYGVIIVNTFEELHVDYAREYRKAR----A----GKV
UGT73D1 S-VSSAV-----EPFPIPGMPHRIEIRARQLPGAFKLAN-MDDVREKMRSESE--AFGVIIVNSFQELHPPGYAEAYAEAI----N----KKV
UGT89B1 DDN-----EILHFPKIPNCPKRYFDQISSLYRSYVHGDPAWEFIRDSFRDNVAVSGLVNSFQELHPEFVETVKTRF----G---HDRV
UGT89C1 -----ISFLPINAHSISVMWAQEDRSFFNDLEATTESYGLVINSFYDLHPEFVETVKTRF----LN---HHR
UGT89A2 KST-----DPIHLLDLPRAPIFKEEHLPSIVRRSLQTPSPDLESIKDFSMNLLSYGVSFNSSEILEDDYLQYVKQRM----G---HDRV
UGT90A1 EPE-SKSDT-----EPVTVPDFPWIKVKKCDFDHGTTEPEES-GAALELSMDQIKSTTTSHGFLVNSFYELHSAFVDYNNNSG----D---KPKS
UGT90A4 KPESVKSdT-----EPVTVPDFPWCVKKCEFDVLTPEPQDS-DPAFELLIDHLMSTKKSARGVIVNSFYELHSTFVDYRLRDN----D---EPKP
UGT90A2 NVK---SET-----EPVSVPEFPWIKVRKCDVFKDMFDPKTTTDPGFKLILDQVTSMNQSQGIIIFNTFDDLEPVFIDFYKRKR----KLKL
UGT71B1 KELDVSE-FKDT-EMKFDVPTL-----TQPFPAKCLPSVMLNKKWFPYVLRARSFRATKGIIVNSVADMEPQALSFFSGGN----GNTNIPPV
UGT71B2 KNYDVSD-LKSDTTELEVPCL-----TRPLPVKCFPSVLLTKEWLPVMFRQTRRFRETGILVNTFAELHPQAMKFFSG----VDSPLPTV
UGT71B7 NKYDVSENDYADSEAVLNFPVPSL-----SRPYPVKCLPHALANMWLPVFNQARKFREMKGILVNTFAELHPYVLKFLSSS----DTPPV
UGT71B8 KEYSVSETDFEDSEVLDVPSL-----TCPYPVKCLPYGLATKEWLPMLYNQRRFREMKGILVNTFAELHPYALSLHSSG----DTpra
UGT71B6 EDIYDMS-ELESDVELVPSL-----TSPYPLKCLPYIFKSKEWLTFFVVTQARRFRETGILVNTVDPLEPQALTFLSNG----NIPRA
UGT71B5 KKYDVSELENSVT--ELEFPVPSL-----TRPYPVKCLPHILTSKEWLPPLSLAQARCFRKMKGILVNTFAELHPHALKMFNING----D--DLPQV
UGT71C1 HREIKSEFNRSFNEELNLIPGY-----VNSVPTKVLPSGLFMKETYEPWVLAERFPEAKGILVNSYTALEPNNGFYFDR----CPDNYPTI
UGT71C2 NRETKEPILNRSSDEETISVPGF-----VNSVPTKVLPPGLFTTESYEAWVEMAERFPEAKGILVNSFESLERNAFDYFDR----RPDNYPPV
UGT71C3 HRITTESELDLSSGNVEHPVPGY-----VCSVPTKVLPPGLFVRESYEAWVEIAEKFPGAKGILVNSVTCLEQNAFDYFAR----LDENYPPV
UGT71C4 HRKIASEFDLSSGDEELVPGF-----INAIPTKFMPPGLFNKEAYEAYVELAPRFADAKGILVNSFTLEPHPPFDYFS----HLEKFPV
UGT71C5 QRLTPSEFDESSGEEELHIPAF-----VNRVPAKVLPVGFVKLSYGLVKIGERLHEAKGILVNSFTQVEPYAAEHFS----QGRDYPHV
UGT71D1 HSRDTSVFRNS-EEMLSIPGF-----VNPVPAKVLPVGFVIEDGYDAYVKLAILFTKANGILVNSVDFIEPYSVNHFL----QEONYPV
UGT71D2 HKKDTSVFARNS-EEMLSIPGF-----VNPVPAKVLPVGFVIEDGYDADVVKLAILFTKANGILVNTSFDIEPTSLNHFL----GEENYPV
UGT88A1 TP-GKNLKDIPVHIPGVPMK-----GSDMPKAVLE---RDDEVYDVIFMFGKQLSKSSGIIINTFDALENRAIKAIT-----EELCFRNI
UGT72B2 --KTVSCEFRLTEPLKIPGCV-----PITGKDFLDTVQDRNDAYKLLHNTKRYKEAKGILVNSFVDFLESNAIKALQEP-----PDK-----
UGT72B3 --ETVSCEFRELTEPVIIPGCV-----PITGKDFVDPQDRKDES YKWLHNVKRFKEAEGILVNSFVDFLEPNTIKIVQEP-----PDK-----
UGT72B1 --ETVSCEFRELTEPLMLPGCV-----PVAGKDFLDPAQDRKDDAYKWLHNTKRYKEAEGILVNTFFLEPNAIKALQEPG-----LDK-----
UGT72E2 --KDIKEEHTVQRNPLAIPGCE-----PVRFEDTLDAYLVPDEPVYRDFVRHGLAYPKADGILVNTWEEMEPKSLKSLLNPK-----LLGRVAR--
UGT72E3 --EVIKEEHTVQRKPLTIPGCE-----PVRFEDIMDAYLVPDEPVYHDLVRHCLAYPKADGILVNTWEEMEPKSLKSLQDPK-----LLGRVAR--
UGT72E1 --KDMEEHIKQPMPVMPGCE-----PVRFEDTLETFLDPNSQLYREFVPFGSVFPTCDGIIVNTWDDMEPKTLKSLQDPK-----LLGRVAG--
UGT72D1 --TVVEGEYVDIKEPLKIPGCK-----PVGPKELMETMLDRSGQYKECVRAGLEVPMDSGLVNTWEELQGNLALALREDE-----ELSRVMK--
UGT72C1 --KQELYKQLSSIGALLIPGCS-----PVKFERAQDPRK--YIRELAESQRIGDEVITADGVFVNTWHSLEQVTIGSFLDPE-----NLGRVMRG
UGT86A1 GHFKSLDNR-KDVIDYVP-----GVKAIKPKDLMSYLQVSDKDVDTNTVVYRILFKAFKDVKRAFVVCNTVQELHPPDLSALQ-----AKQPVYAI
UGT86A2 GHFGAQETR-SDLIDYIP-----GVAAINPKDTASYLQET-----DTSSVVHQIIFKAFEDVKKVDFVLCNTIQQFEDKTIKALN-----TKIPFYAI
UGT87A1 GHFPIEPSE-SKLDEIVD-----YIPGLSPTRLSDILQILHG-----YSHQVFNIFKKSFGELYKAKYLLFP SAYELHPKALDFFFTSK-----FDFPVYST
UGT87A2 GHALFEPSE----EEVVD-----YVPGLSPTKLRDLHPIDFG-----YSDRVFKTAKLCFDELPGARSLLFITAYELHKAIDAFFTSK-----LDIPVYAI

UGT85A2 GLSP IKDES-YLTKEHLD-TKIDWIPSMKNLRLKDI PSFIRTT-NPDDIMLNF I IREADRAKRASAI I IINTFDDEHHDV IQSMKS-----IVPPVYSI
UGT85A3 GLCPVKDAS-CLTKEYLD-TVIDWIPSMNVLKLDI PSFIRTT-NPNDIMLNFV VREACTRKASAI I IINTFDDEHDI IQSMQS-----ILPPVYPI
UGT85A1 GLCPLKDES-YLTKEYLEDTVIDF IPTMKNVVKLDI PSFIRTT-NPDDVMISFALRETERAKRASAI I IINTFDDEHDDVHAMQS-----ILPPVYSV
UGT85A7 GLSPFKDES-YMSKEHLD-TVIDWIPSMKNLRLKDI PSYIRTT-NPDNIMLNF LIREVERSKRASAI I IINTFDDEHHDV IQSMQS-----ILPPVYSI
UGT85A5 GLSPIK-----ESSLDTKINWIPSMKNLGLKDI PSFIRAT-NTEDIMLNFV HEADRAKRASAI I IINTFDSLEHDDVRSIQS-----IIPQVYTI
UGT85A4 E I IPLKDSS-DLKKHLET--EIDWIPSMKKIKLKDIPDFVTTT-NPQDPMISF I LHVTGR I KRASAI F I INTFEKLEHNVLLSLRS-----LLPQIYSV
UGT74E1 VPSTKYGH--STLASFP SLPI-----LNANDLPSFLCESSS-YPYILRTVIDQLSNIDRVDIVL CNTFDKLEE--KKWIK-----SVWPVLNI
UGT74E2 VPSTKYGH--STLASFP SFP M-----LTANDLPSFLCESSS-YPNILLRIVVDQLSNIDRVDIVL CNTFDKLEEKLLKWVQ-----SLWPVLNI
UGT74D1 EFQN-----DVVLPAMP-----LKGNDLPSVFLYDNNL-CRPLFELISSQFVNVDIDFFLVNSFDELEVEVLQWMK-----NQWPVKNI
UGT74C1 VPVDRHEN--PTLASFP GFPL-----LSQDDLPSFACEKGS-YPLLHEFVVRQFSNLLQADC I I CNTFDQLEPKVVKWMN-----DQWPVKNI
UGT74F1 L TLP-----IKDLPL-----LELQDLPTFVTPTGS-HLAYFEMVLQQFTNFDKADFLVNSFHDLDLHEEELLS-----KVCPLVTI
UGT74F2 LQLP-----IEELPF-----LELQDLPSFFSVSGS-YPAYFEMVLQQF INF EKADFLVNSFQELLEHENELWS-----KACPVLTI
UGT74B1 LPAD--PN--SAPFRIRGLPS-----LSYDELPSFVGRHWLTHPEHGRVLLNQFPNHENADWLFVNGFEGLEETQDCENGES-----DAMKATLI
UGT75B1-----SVFELPNLSS-----LEIRDLP SFLTPSNT-NKGAYDAFQEMMEFLIKETKPKILINTFDSLEPEALTAFP-----N-IDMVAV
UGT75B2-----SVFEFNLPS-----LEIRDLP SFLSPSNT-NKAAQAVYQELMDFLKEESNPKILVNTFDSLEPEFLTAIP-----N- IEMVAV
UGT75D1 AISEMANTP-SSSIKLP SLPL-----LTVRDIP SFIVSSNV-YAFLLPAFREQIDSLKEEINPKILINTFQELPEPEAMSSVP-----DNFKIVPV
UGT75C1 H LFD-----VEPIKLPKLP-----ITTGDLPSFLQPSKA-LPSALVTLREHIEALETESNPKILVNTFSALEHDA L TSVE-----K-LKMIP I
UGT84A3 FPTKTEP---DISVEIPCLPL-----LKHDEIP SFLHPSSP-YTAFGDI I LDQLKR FENHKSFYLFIDTFRELEKDIMDHMS-----QLCPQAI I
UGT84A4 FPTETEP---EITVDVPFKPLT-----LKHDEIP SFLHPSSP-LSSIGGTILEQIKRLH--KPF SVLIETFOLEKDTIDHMS-----QLCPQVNF
UGT84A2 FPTKTEP---EIDVQISGMPL-----LKHDEIP SF IHPSSP-HSALREVI I DQIKRLH--KTFSIFIDTFNSLEKDI IDHMS-----T LSLPGVI
UGT84A1 FPTETEP---ELDVKLPCVPV-----LKNDEIP SFLHPSSR-FTGFRQAILGQFKNLS--KSFCVLIDSFDSLEQEVIDYMS-----SLCP---V
UGT84B1 FPDLEDL---NQTVELPALPL-----LEVRDLP SFMLPSG--GAHFYNLMAEFADCLR--YVKWVLVNSFYELESE I IESMA-----DLKPIVIPI
UGT84B2 FPDLEDL---NQTVELPALPL-----LEVRDLP SMLPSQ--GANVNTLMAEFADCLK--DVKWVLVNSFYELESE I IESMS-----DLKPIIPI
UGT76C3 MYLPLQ-----DSEQG-DDPVEEFPP L RKKDL LQILDQEQSEQ--LDSYSNMILETTKASSGLIFVSTCEELDQDLSLQARED-----YQVPIFTI
UGT76C4 MFLPLQ-----DSEQ--DDPVEKFPP L RKKDL LRILEADSVQ--GDSYSDMILEKTKASSGLIFMS-CEELDQDLSLQ SRED-----FKVPIFAI
UGT76C5 VYLPLQ-----DSEQ--EDLVQEFPP L RKKDI VRILDVETDI--LDPFLDKVLQMTKASSGLIFMS-CEELDHDSV SQARED-----FKIPIFGI
UGT76C2 GYLPVS-----VLESEAEDSVPEFPPLQKRDLSKVFGEFGEK--LDPFLHAVVETTTIRSSGLIYMS-CEELEKDSITLSNEI-----FKVPVFAI
UGT76C1 GFLPVPGTALTHSRFVSDSEADDLVPEFPPLRKKDLSRIMGTSAQSKPLDAYLLK I LDATK PASGI I VMS-CKELDHDSLAE SNKV-----FSIPIFPI
UGT76B1 GYLSLQ-----ETKADSPVPELPLYLRMKDLPWFQTEDPRS--GDKLQIGVMKSLKSSSGIIFNA-IEDLETDQLDEARIE-----FPVPLFCI
UGT76F1 GYLP IQ-----GSRLDELVTLPPLKVKDLPVIKTKEPEG--LNRILNDMVEGAKLSSGVVWNT-FEDLERHSLMDCRSK-----LQVPLFPI
UGT76F2 GYLP IQ-----DSRLDEPVTLPPLKVKDLPVME TNEPEE--LYRVVNDMVEGAKSSSGVIWNT-FEDLERLSLMNCSSK-----LQVFFFPI
UGT76E1 SFLLDM-----KDP-KVSDKEFPGLHPLRYKDLPTSAFGPLES---ILKVYSETVNIRTASAVIINS-TSCLESSSLAWLQKQ-----LQVPVYPI
UGT76E2 SFLLDM-----KDP-ETQDKVFPGLHPLRYKDLPTSVFGPIES---TLKVYSETVNTRTASAVIINS-ASCLESSSLARLQKQ-----LQVPVYPI
UGT76E4 KFLIDM-----KDP-EKQDKVLEGLHPLRYKDLPTSGFGPLEP---LLEMCREVNVNKR TASAVI INT-ASCLESLSLSWLQKQ-----LQIPVYPL
UGT76E6 KFLVDM-----EDP-EVQETLVENLHPLRYKDLPTSGVGPLDR---LFELCREIVNKR TASAVI INT-VRCLSSSLKRLQHE-----LGIPVYAL
UGT76E5 KFLIDM-----KDP-EVQNMVVENLHPLKYKDLPTSGMGPLER---FLEICA EVNVNKR TASAVI INT-SSCLSSSLSWLKQK-----LSIPVYPL
UGT76E3 KYLIDM-----EEH-DVQNKVVENMHPLRYKDLPTATFGELEP---FLELCRDVVNKR TASAVI INT-VTCLSSSLTRLQKQ-----LQIPVYPL
UGT76E11 SILTPL-----KEPKGQQNELVPEFHPLRCKDHPVSHWASLES---MMELYRNTVDKRTASSVI INT-ASCLESSSL SRLQKQ-----LQIPVYPI
UGT76E12 NVQAPL-----KETKGQQEELVPEFYPLRYKDFPVSRFASLES---IMEVYRNTVDKRTASSVI INT-ASCLESSSL SFLQKQ-----LQIPVYPI
UGT76E7 DGLAQL-----KEGGEREVELVPELYPIRYKDLPSV FASVES---SVELFKNTCYKGTASSVI INT-VRCLMSSLEWLQKQ-----LEIPVYSI
UGT76E9 DGLAPL-----KEGCGREEELVPKLHPLRYKDLPTSAFAPVEA---SVEVFKSSCDKGTASAMI INT-VRCL EISSLEWLQKQ-----LKIPYIPI
UGT76D1 GLLPPQ-----DAR-SQLEETVPEFHPRFKDLPFTAYGSMER---LMILYENVSNRASSSGI IHNS-SDCLENSFITTAQEK-----WGVPVYYPV
UGT78D2 IGVKEVGE-----RMEETIGVISGMEKIRVKDIP EGVVFGNLD S-VFSKMLHQMGLALPRATAVFINSFEDLDP TLTNNLRSR-----FKRYLNI
UGT78D3 VGVKEVGE-----RMEETIGFISGMEKIRVKDITQEGVVFGNLD S-VFSKTLHQMGLALPRATAVFINSFEE LDP TTFNDFRSE-----FKRYLNI
UGT78D1 IGLKDV-----SMEETLGFIPGMENYRVDIPEEVVFE DLD S-VFPKALYQMSLALPRASAVFISSFEELDP TLTNNLRSK-----LKRFLNI


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UGT79B10 -----GELGVPPPGYPSSK-LLYRKHDAAHALLSFSVYKR-----FSHRLITGLMNCDFISIRTCKEIEGKFCEYLERQ-----YHKKVFLT
UGT79B11 -----GELGVAPPGYPSSK-ALYREHDAHALLTFSGFYKR-----FYHRFTTGLMNCDFISIRTCEIEGKFCDYIESQ-----YKKKVLLT
UGT79B9 -----GELGVPPPGYPSSK-VLYRGHDAHALLTFSIFYER-----LHYRITTGLKNCDFISIRTCKEIEGKFCDYIERQ-----YQRKVLLT
UGT79B7 -----GKLGVRPPGYPSSK-VMFRENDVHALATLSIFYKR-----LYHQITTGLKSCDVIALRTCKEVEGMFCDFISRQ-----YHKKVLLT
UGT79B8 -----GVLGVPPPGYPSSK-VLYRENDAAHALATLSIFYKR-----LYHQITTGFKSCDI IALRTCNEIEGKFCDYISSQ-----YHKKVLLT
UGT79B6 -----Q-----DDLGSTPPGYPSSK-VLLRGHETNSLSFLSYPFGDGT--SFYERIMIGLKNCDVISIRTCQEMEGKFCDFIENQ-----FQRKVLLT
UGT79B4 -----AELGSPPPGFPSSK-VALRGHDAN---IYSLFANTRK--FLFDRVTTGLKNCDVIAIRTCAEIEGNLCDFIERQ-----CQRKVLLT
UGT79B5 -----AELGFPPPDYPLSK-VALRGHEAN---VCSLFANS-H--ELFGLITKGLKNCDDVISIRTCVELEGKLCGFIEKE-----CQKKLLLT
UGT79B2 -----GELGVPPPGYPSSK-VLLRKQDAYTMKNLESTNTINVGPNLLERVTTSLMNSDVIAIRTAREIEGNFCDYIEKH-----CRKKVLLT
UGT79B3 -----GELGVPPPGYPSSK-VLLRKQDAYTMKKLEPTNTIDVGPNNLLERVTTSLMNSDVIAIRTAREIEGNFCDYIEKH-----CRKKVLLT
UGT79B1 DGKEMSG-----EELAKTPLGYPSSK-VVLRPHEAKSLSFVWRKHEAIG--SFFDGKVTAMRNCDAIAIRTCRETEGKFCDYISRQ-----YSKPVYLT
UGT91A1 EYRTSP-----ADFMKPPKWVPFETSVAFKLFECRFIFKGFMAETTEGNVPDIHRVGGVIDGCDVIFVRSCEYEAEWLGLTQEL-----HRKPVIPV
UGT91B1 HDPRKTA-----EDLIVPPPWVPFETNIVYRLF EAKRIMEYPTAGVTGVELNDNCRLGLAYVGSEVIVIRSCMELEPEWIQLLSKL-----QGKPVIPV
UGT91C1 EEIRSTP-----EDFTVVPWVPFKNIVFRYHEVTRYVEKTEEDVTG--VSDSVRFGYSIDESDAVVFVRSCEPEFEPWFGLLKD-----YRKPVFPI
UGT83A1 LIDS DGTVR-----VNKTIQLSPGMPKMETDKFVWVCLKNKESQKNIFQLMLQNNNSIESTDWLLCNVHLEETAAAFGLGPNIV-----PIGPIGWA
UGT92A1 ETKQDQ-----FLLDDFPEAGEIEKTQLNSFMLEADGTDWVFMKKIIPGWSDFDGFLENVVAEIDQMGLSYFRRIT-----G-----VPV
UGT82A1 LVSQKGCPR-----QLEKTIVQPEQPLLSAEDLPWLIIGTPKAQKKRFKFWQRTLERTKSLRWLLTSSFKDEYEDVDNHKASYKKSNDLNKENNGQN
consensus
201.....210.....220.....230.....240.....250.....260.....270.....280.....290.....

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UGT73B2 WHIGPLSVYNRGFEEKAERGKKAN--IDEAECLKWLD SKKPNSVLYVYV SFGSVAFFK-NEQLFEIAAGLEASGTSFTWVVR----KT-----K-D
UGT73B3 WHIGPLSVYNRGFEEKAERGKKAS--INEVECLKWLD SKKPDVLYYLSFSGVACFK-NEQLFEIAAGLETSGANFTWVVR----KN-----IGI
UGT73B4 WHIGPLSLSNRGAIEKAGRGKKAN--IDEQFCLKWLD SKTPG SVVYLSFSGGTGLP-NEOLLEIAFGLGSGQNFITWVSKNENQV-----GTG
UGT73B5 WHIGPLSLSNRELGEKARRGKKAN--IDEQFCLKWLD SKTPG SVVYLSFSGGTNFT-NDOLLEIAFGLGSGQSFTWVVRKNENQV-----
UGT73B1 WHIGPLSLGNRFEEKAERGKKAS--IDEHECLKWLD SKKCDVLYYMAFGTMSFFK-NEOLLEIAAGLDMSGHDFVWVVR---KG-----SQV
UGT73C3 WSIGPVSLCNKAGADKAERGSKA--AIDQDECLKWLD SKEEGSVLYVCLGSLICNLP-LSQLKELGLGLEESSRRSFTWVIRG-SEK-----YKE
UGT73C4 WSIGPVSLCNKAGADKAERGNQA--AIDQDECLKWLD SKEDG SVLYVCLGSLICNLP-LSQLKELGLGLEEKSORSFTWVIRG-WEK-----YNE
UGT73C2 WSIGPVSLCNKVGEDKAERGNKA--AIDQDECLKWLD SKDVE SVLYVCLGSLICNLP-LAQLRELGLGLEATKRPFITWVIRG-GGK-----YHE
UGT73C5 WTIGPVSLCNKVGDKAERGNKS--DIDQDECLKWLD SKKHG SVLYVCLGSLICNLP-LSQLKELGLGLEESSORPFTWVIRG-WEK-----YKE
UGT73C6 WTIGPVSLCNKVGVDAERGNKS--DIDQDECLEWLD SKPEG SVLYVCLGSLICNLP-LSOLLELGLGLEESSORPFTWVIRG-WEK-----YKE
UGT73C11 WSIGPVSLCNKLGEDQAERGNKA--DIDQDECLKWLD SKEEGSVLYVCLGSLICNLP-LSQLKELGLGLEESSORPFTWVIRG-WEK-----YNE
UGT73C7 WCVGPVSLCNRLGLDKAKRGDKA--SIGDQCLQWLD SQFTG SVLYVCLGSLICNLP-LAQLKELGLGLEASNKPFITWVIRE-WGK-----YGD
UGT73D1 WFGVPVSLCNDRMADLFD RGSNGNIAISETECLQFLD SMRPR SVLYVSLGSLCRLI-PNOLLELGLGLEESSGKPFITWVIKT-EEKH-----MIE
UGT89B1 WAVGPIIPLSG-DNRGGPTSVSVD-----HVMSWLDAR-EDNHVYVYVCFGSQVLT-KEOTLALASGLEKSGVHFTWAVKEPVEKDS-----TRGN-
UGT89C1 WTVGPIILPFKAGVDRGGQSSIPPA-----KVSAWLDCPEDN SVVYVYVCFGSQIRLT-ABQTAALAAALEKSSVRFITWAVRDAAKKVN-----SSDNS
UGT89A2 YVIGPLCSIGSGLKSN--SGSVDP-----SLLSWLDGS-PNGSVLYVYVCFGSQKALT-KDQCDALALGLEKSMTRFVWVVKKDP-----
UGT90A1 WCVGPICLTD-----PPKQGSAPPA-----WIHWLDQKREGRPVLYVAFGTQAEIS-NKQLMELAFGLEDSKVNFLWVTRKDVEE-----
UGT90A4 WCVGPICLVN-----PPKPE SDKPD-----WIHWLDRKLEERC PVMYVAFGTQAEIS-NEOLKEIALGLEDSKVNFLWVTRKDLEE-----
UGT90A2 WAVGPIICYVNNFLDDEVEEEKVKPS-----WMKWLD EKDRDKGCNVLYVAFGSQAEIS-REOLEEIALGLEESKVNFLWVVKG-----
UGT71B1 YAVGPIIMDLESSG-----DEEKRK-EILHHLWKEQPTKSVVFLCFGSMGGFS-EEQAREIAVALERSGHRFLWSLRASP VGN---KSNPPPGEF
UGT71B2 YTVGPVMNLKINGP-----NSSDDKQS-EILRWLDEQPRKSVVFLCFGSMGGFR-EGQAKETIAIALERSGHRFVWSLRRAQPKG-----SIGPPEEF
UGT71B7 YPVGPIILHLENQRD-----DSKDEKRL-EILRWLDQPPSSVVFLCFGSMGGFG-EEQVRETAIALERSGHRFLWSLRASP NIF---KELPG--EF
UGT71B8 YPVGPIILHLENHVD-----GSKDEKGS-DILRWLDEQPPKSVVFLCFGSI GGFN-EEQAREMAIALERSGHRFLWSLRASRDID---KELPG--EF
UGT71B6 YPVGPIILHLKNVNC-----DYVDKKQS-EILRWLDEQPPRSVVVFLCFGSMGGFS-EEQVRETAIALDRSGHRFLWSLRASP NIL---REPPG--EF
UGT71B5 YPVGPIVLHLENGND-----D--DEKQS-EILRWLDEQPSKSVVFLCFGSLGGFT-EEQVRETAVALDRSGQRFLWCLRHASPNIK---TDRPR--DY
UGT71C1 YPIGPILCSNDRP-----NLDSSERDRITWLD DQPESSVVVFLCFGSLK NLS-ATQINEIAQALEIVDCKFLWSFRITN-----PKEY
UGT71C2 YPIGPILCSNDRP-----NLDLSEDRIRLWLD DQPESSVVVFLCFGSLKSLA-ASQIKEIAQALELVGIRFLWSIRTD-----PKEY
UGT71C3 YPVGPIVLSLKDRPS-----PNLDASDRDRIMRWLEDQPESSIVYICFGSLGIIG-KLQIEEIAEAELELTGHRFLWSIRTN-----PTEK
UGT71C4 YPVGPIILSLKDRAS-----PNEEAVDRDQIVGWLD DQPESSVVVFLCFGSRGSVD-EPQVKEIARALELVGCRFLWSIRTS-----GDVE
UGT71C5 YPVGPIVLNLTGRTN-----PGLASAQYKEMMKWLD EQPDSVVLVFLCFGSMGVFP-APQITEIAHALELIGCRFLWAI RTN-----MAGD
UGT71D1 YAVGPIFDLKAQPH-----PEQDLTRRDELMKWLD DQPEASVVVFLCFGSMARLR-GSLVKEIAHGLELCOYRFLWSLRK-----EE
UGT71D2 YAVGPIFNPKAHPH-----PDQDLACDESMKWLD AQPEASVVVFLCFGSMGLR-GPLVKEIAHGLELCOYRFLWSLRK-----EE
UGT88A1 YPIGPILIVN--GRI-----EDRNDNKAVSCLNWLDSQPEKSVVFLCFGSLGLFS-KEQVIEIAVAGLEKSGQRFLWVVRNP-----PELEKTE
UGT72B2 PTVYPIGPLVNTSS-----SNVNLEDKFGCLSWLD NQPFVSVLYVYV SFGSGTTLT-CEQFNEIAIAGLAE SGRKRFITWVIRSPSE----IVSSSYFNPHSE
UGT72B3 PPVYLI GPLVNSGS-----HDADVND EYKCLNWLDNQPFVSVLYVYV SFGSGTTLT-FEQFIEIAIAGLAE SGRKRFITWVIRSPSG----IASSSYFNPQSR
UGT72B1 PPVYVPGPLVNI GK-----QEAKQTEESECLKWLD NQPLG SVLYVYV SFGSGTTLT-CEOLNEIALGLADSEQRFLWVIRSPSG----IANSSYFDSHSQ
UGT72E2 VPVYPIGPLCR-----PIQSSETDHPVLDWLD NEQPNE SVLYYLSFSGGGCLS-AKQLTE LAWGLEQSQRFFWVVRPPVDGSCCSEYVSANGGGTE
UGT72E3 VPVYVPGPLCR-----PIQSSTTDHPVFDWLD NKQPNE SVLYYLSFSGGGSLT-AQQLTE LAWGLEESSQRFFITWVVRPPVDGSSCSDFSAKGGVTK
UGT72E1 VPVYPIGPLSR-----PVDPSKTNHPVLDWLD NKQPD E SVLYYLSFSGGGSLA-AKQLTE LAWGLEMSQRFFWVVRPPVDGSACSAYLSANSKIR
UGT72D1 VPVYPIGPPIVR-----TNQHVDKPN SIFEWLDEQRERSVVVCLGSGTTLT-FEQVTEIAIAGLEL SGRKRFVWVLR RPAS-----YLGAISSDD
UGT72C1 VPVYVPGPLVR-----PAEPG-LKHGVL DWLD LQPKESVVYVLLGVV GALT-FEQVTEIAIAGLEL SGRKRFVWVVRPPAEDDPSASMFDKTKN--E
UGT86A1 G---PVFST-DSVVP TSL-----WAE SDCTE BWLKGRPTG SVLYVYV SFGSYAHVG-KKEIVEIAHGLLLSGISFTWVLRPDIVGSN-----VPDF
UGT86A2 GPIIPFNQ-TGSVTTSL-----WESDCTQWLNTPKPKSSVLYYLSFSGSYAHVT-KKDLVEIAHGLLLSKVNFWVVRPDIVSSD-----ETNP
UGT87A1 G---PIIPL-EELSVGNE-----NRELDYFKWLD EQPESSVLYYLSQGSFLSVS-EAQMBEIVVGVREAGVKFFHWVARGGELK LK-----
UGT87A2 G---PIIPF-EELSVQND-----NKEPNYIQWLEEQPEG SVLYYLSQGSFLSVS-EAQMBEIVKGLRESGVRFLWVARGGELK LK-----

UGT85A2 GPLHLLLEKQ-ESGEYSEIGRTGNSLNWREETECLDWLNTKARNSSVYVNFSGSITVLS-AKQLVEFAWGLAATGKEFLWVIRPDLVAGD-----EAMV
UGT85A3 GPLHLLVNR-EIEEEDSEIGRMGNSLNWKEETECLGWLNTKSRNSVYVNFSGSITIMT-TAQLLEFAWGLAATGKEFLWVMPDVS VAGE-----EAVI
UGT85A1 GPLHLLANR-EIEEGSEIGMSSNLWKEEMECLDWLDTKTQNSVIYVNFSGSITVLS-VKQLVEFAWGLAGSGKEFLWVIRPDLVAGE-----EAMV
UGT85A7 GPLHLLVKE-EINEASEIGQMGLNLWREEMECLDWLDTKTTPNSVLFVNFSGSITVMS-AKQLVEFAWGLAASRKEFLWVIRPNLVVGE-----AMVV
UGT85A5 GPLHLFVNR-DIDEESDIGQIGTNMWREEMECLDWLDTKSPNSVYVNFSGSITVMS-AKQLVEFAWGLAATKKDFLWVIRPDLVAGD-----VPML
UGT85A4 GPFQILLENR-EIDKNSEIRKLGGLNLWEEETECLDWLDTKAEKAVIYVNFSGSLTVLT-SELLEFAWGLARSGKEFLWVIRSGMVDGD-----DSIL
UGT74E1 GPTVP SMYLDKRLAEDKKNYGF S-LFGAKIAECMEWLN SKQPSVYVYV SFGSLVVLK-KDQLLELAAGLKGSGHFFLWVVRRETERRKL-----PENY
UGT74E2 GPTVP SMYLDKRLSEDKKNYGF S-LFNAKVAECMEWLN SKPEPNSVYVYV SFGSLVILK-EDQMLELAAGLKGSGRFFLWVVRRETETHKL-----PRNY
UGT74D1 GPMIP SMYLDKRLAGDKDYGIN-LFNAQVNECLDWL LSKPPG SVIYV SFGSLAVLK-DDQMI EVAAGL KQTGHNF L W V V R E T E T K K L ----- P S N Y
UGT74C1 GPVVP SKFLDNRLPEDKDYELENSKTEPDESVLKWLGNRPAKSVYVVAFGT L V A L S - E K O M K E I A M A I S Q T G Y H F L W S V R E S E R S K L ----- P S G F
UGT74F1 GPTVP SMYLDQQIKSDNDYDLNLFDLKEAALCTDWL D K R P E G S V Y Y I A F G S M A K L S - S E Q M E E I A S A I S N -- F S Y L W V V R A S E E S K L ----- P P G F
UGT74F2 GPTIP SIYLDQRIKSDTGYDLNLFESKDDSF CINWLDTRPQGSVYVVAFGSMAQLT-NVQMBELASAVSN--FSFLWVVR S S E E K L ----- P S G F
UGT74B1 GPMIP SAYLDDR MEDDKDY GAS-LLKPI SKECMEWLET KQ A Q S V A F V S F G S F G I L F - E K O L A E V A I A L Q E S D L N F L W V I K E A H I A K L ----- P E G F
UGT75B1 GPLL L P T E I F S G S T N ----- K S V K D Q S S Y T L W L D S K T E S S V I Y V S F G T M V E L S - K K O I B E L A R A L I E G K R P F L W V I T D K S N R E T ----- K T E G
UGT75B2 GPLL PAE I F T G S E S G K ----- D L S R D H Q S S Y T L W L D S K T E S S V I Y V S F G T M V E L S - K K O I B E L A R A L I E G G R P F L W V I T D K L N R E A ----- K I E G
UGT75D1 GPLL L T L R T D F S S R G ----- E Y I E W L D T K A D S S V I Y V S F G T L A V L S - K K O L V E L C K A L I Q S R R P F L W V I T D K S Y R ----- N K E D
UGT75C1 GPLV S S S E G K T D L F K ----- S S D E Y T K W L D S K L E R S V I Y I S L G T H A D D L P E K H M E A L T H C V L A T N R P F L W I V R E K N P E E K ----- K K N R
UGT84A3 SPVGP LFKMAQTLSS---DVKGD-ISEPASDCMEWLD SREPSSVYI SFGTIANLK-QEOMEEIAHCVLSSGLSVLWVVRPPMEGTF-----VEPH
UGT84A4 NPIGPLFTMAKTIRS---DIKGD-ISKPDSDCLEWLD SREPSSVYI SFGTLAFLK-QNOIDEIAHG I L N S G L S C L W V I R P P L E G L A ----- I E P H
UGT84A2 RPLGPLYKMAKT VAY---DVVKVNI SEPTDCMEWLD S Q P V S V Y I S F G T V A Y L K - Q E O I D E I A Y C V L N A D V T F L W V I R Q Q E L G F N ----- K E K H
UGT84A1 KTVGP LFKVARTVTS---DVSGD-ICKSTDKCLEWLD SRPKS VYI SFGTVAYLK-QEOIEEIAHCVLKSGLSFLWVIRPPPHDLK-----VETH
UGT84B1 GPLVSPFLLGDGEEETL-DGKNLDFCKSDCCMEWLDKQARSVYI SFGSMLET-ENQVETIAKALKNRGLPFLWVIRPKKAQN-----VA
UGT84B2 GPLVSPFLLGNDEE----KTLDMWKVDYD CMEWLDKQARSVYI SFGSILKSL-ENQVETIATALKNRGV PFLWVIRPKKEKGEN-----VQ
UGT76C3 GPHSHYFP-----GSSSLFTVDETCIPWLDKQEDKSVIYV SFGSISTIG-EAEFMETAWALRNSDQPF L W V V R G G ----- S V
UGT76C4 GPHSHFP-----ASSSLFTPDETCIPWLD R Q E D K S V I Y V S I G S L V T I N - E T E L M E I A W G L S N S D Q P F L W V V R V G S V N G T ----- E W I E
UGT76C5 GPHSHFP-----ATSSSLSTPDETCIPWLDKQEDKSVIYVSYGSI VTIS-ESDLIEI A W G L R N S D Q P F L L W V V R V G S V R G R ----- E W I E
UGT76C2 GPFHSHYFS-----ASSSLFTQDETCILWLDQEDKSVIYVSLGSSVNIT-ETEFLEIACCLSNSKQPF L W V V R P G S V L G A ----- K W I E
UGT76C1 GPFHIHDVP-----ASSSLLEPDQSCIPWLD M R E T R S V Y V S L G S I A S L N - E S D F L E I A C C L R N T N Q S F L W V V R P G S V H G R ----- D W I E
UGT76B1 GPFHRYVS-----ASSSLLAHDMTCLSWLDKQATNSVIYAS LGSIASID-ESEFFLEI A W G L R N S N Q P F L W V V R P G L I H G K ----- E W I E
UGT76F1 GPFHKHRTD-----LPPKPKNKDKDDDEILT DWLNKQAPQSVYV SFGSLAAIE-ENEFFLEI A W G L R N S E L P F L W V V R P G M V R G T ----- E W L E
UGT76F2 GPFHKYSED-----PTPKTENKED-----TDWLDKQDPQSVYVYASFGSLAAIE-EKEFFLEI A W G L R N S E R P F L W V V R P G S V R G T ----- E W L E
UGT76E1 GPLHIAAS-----APS--SLLEEDRSCL E W L N K Q K I G S V I Y I S L G S L A L M E - T K D M L E M A W G L R N S N Q P F L W V I R P G S I P G S ----- E W T E
UGT76E2 GPLHITAS-----APS--SLLEEDRSCEWLNKQKSNVIYI S L G S L A L M D - T K D M L E M A W G L R N S N Q P F L W V I R P G S I P G S ----- E W T E
UGT76E4 GPLHITAS-----SPGP-SLLQEDMSCI E W L N K Q K P R S V I Y I S L G T K A H M E - T K E V L E M A W G L L N S N Q P F L W V I R P G S V A G F ----- E W I E
UGT76E6 GPLHITVS-----AAS--SLLEEDRSCEWLNKQKPRSVYI S L G S V V Q M E - T K E V L E M A R G L F N S N Q P F L W V I R P G S I A G S ----- E W I E
UGT76E5 GPLHITT-----SANF-SLLEEDRSCL E W L N K Q K L R S V I Y I S V G S I A H M E - T K E V L E M A W G L Y N S N Q P F L W V I R P G ----- T E
UGT76E3 GPLHITDS-----STGF-TVLQEDRSCEWLNKQKPRSVYI S L G S M V L M E - T K E M L E M A W C M L N S N Q P F L W V I R P G S V S G S ----- E G I E
UGT76E11 GPLHLVAS-----AS-T-SLLEENKSCIEWLNKQKNSVIYV S L G S L A L M E - I N E V I E T A L G L D S S K Q Q F L W V I R P G S V R G S ----- E W I E
UGT76E12 GPLHMVAS-----AP-T-SLLEENKSCIEWLNKQKNSVIYI S M G S I A L M E - I N E I M E V A S G L A A S N Q H F L W V I R P G S I P G S ----- E W I E
UGT76E7 GPLHMVVS-----APPT-SLLEENESCI E W L N K Q K P S V I Y I S L G S F T L M E - T K E M L E M A Y G F V S S N Q H F L W V I R P G S I C G S ----- E I S E
UGT76E9 GPLHMVSS-----APPT-SLLENESC I D W L N K Q K P S V I Y I S L G S F T L L E - T K E V L E M A S G L V S S N Q H F L W V I R P G S I L G S ----- E L T N
UGT76D1 GPLHMTNS-----AMSCP S L F E E E R N C L E W L N K Q E T S V I Y I S M G S L A M T Q - D I E A V E M A M G F V Q S N Q P F L W V I R P G S I N G Q ----- E S L D
UGT78D2 GPLGLLSS-----TLQQLVQDPHGC L A W M E K R S S G S V A Y I S F G T V M T P P - P G E L A A I A E G L E S S K V P F V W S L K E K S L V Q L ----- P K G F
UGT78D3 GPLALLSSP-----SQTSTLVHDPHGC L A W I E K R S T A S V A Y I A F G R V A T P P - P V E L V A I A Q G L E S S K V P F V W S L Q E M K M T H L ----- P E G F
UGT78D1 APILTLSS-----TSEKEMRDPHGC F A W M G K R S A A S V A Y I S F G T V M E P P - P E E L V A I A Q G L E S S K V P F V W S L K E K N M V H L ----- P K G F

UGT79B10 GPMLPEPN-----K GKPLEDRWSHWLNGFEQGSVVF CALGSQ-VTLEKDOFQELCLGIELTGLPFFVAVTPPKGA-----
 UGT79B11 GPMLPEPD-----KSKPLEDQWSHWL SGFGQGSVVF CALGSQ-TILEKNOFQELCLGIELTGLPFLVAVKPPKGA-----
 UGT79B9 GPMLPEPD-----NSRPLEDRWNHWL NQFKPGSVIY CALGSQ-ITLEKDOFQELCLGMELTGLPFLVAVKPPKGA-----
 UGT79B7 GPMFPEPD-----TSKPLEERWNHFL SGFAPKSVVFCSPGSQ-VILEKDOFQELCLGMELTGLPFLAVKPPRGS-----
 UGT79B8 GPMLPEQD-----TSKPLEEQLSHF LSRFPPRSVVFCALGSQ-IVLEKDOFQELCLGMELTGLPFLIAVKPPRGS-----
 UGT79B6 GPMLPEPD-----NSKPLEDQWRQWLSKFDPGSVVIY CALGSQ-IILEKDOFQELCLGMELTGLPFLVAVKPPKGS-----
 UGT79B4 GPMFLDPQG-----KSGKPLEDRWNNWLN GFEPSSVVFCAFGTH-FFF EIDQFQELCLGMELTGLPFLVAVMPPRGS-----
 UGT79B5 GPMLPEPQN-----KSGKPLEDRWNHWL NGFEPGSVVFCAFGTQ-FFF EKDOFQEFCLGMELMGLPFLISVMPPKGS-----
 UGT79B2 GPVFPEPD-----KTRELEERWVKWL SGYEPDSVVFCALGSQ-VILEKDOFQELCLGMELTGSPFLVAVKPPRGS-----
 UGT79B3 GPVFPEPD-----KTRELEERWVKWL SGYEPDSVVFCALGSQ-VILEKDOFQELCLGMELTGSPFLVAVKPPRGS-----
 UGT79B1 GVLPEGSQ-----PNQPSLDPQWAEWLA KFNHGSSVVFCAFGSQPVVNKIDQFQELCLGLESTGFPPFLVAIKPPSGV-----
 UGT91A1 GVLPEKPDEK-----FEDTDTWLSVKKWLDSRKSKSIVVYVAFGSE-AKPSQTELNELALGLELSGLPFFWVWLKTRRGPW-----
 UGT91B1 GLLPATPMDD-----ADDEGTWLDIREWLD RHOAKSVVYVALGTE-VTISNEEIQGLAHGLELCRLPFFWTLRKR-----
 UGT91C1 GFLPEVI EDD-----DAVDTTWVRIKKWLDKQRLNSVVYVSLGTE-ASLRHEEVTELAIGLELTKRPVLWVTGDQQPIKLG-----
 UGT83A1 HSLEEGSTSLG-----SFLPHDRDCLDWLDRQIPGSVVIYVAFGSFGVMG-NPQLBELAIGLELTKRPVLWVTGDQQPIKLG-----
 UGT92A1 WLVGPEVLKSPDKKVG-----SRSTEEAVKSWLDSKPDHSVVYVCFGSMNSLL-QTHMLELAMALESSEKNF LWWVRPPIGVEVKS-----EFD
 UGT82A1 PQILHLGPLHNQEATNNITITKTSFWEEDMSC LGWVLEQNPNSVIYLSFGSWVSPIGESNIQTLALALEASGRPFLWALNRVWQEGLP-----
 consensus
 301.....310.....320.....330.....340.....350.....360.....370.....380.....390.....

UGT73B2 DREEWLPEGFEEERVKGKGLIIR-GWAPQVL----ILDHQATGGFVTHCGWNSILEGVAAGLPMVTPVPVGAEOFYNEKLVTVQLRTGVSVGASKHMKVMMG
UGT73B3 EKEEWLPEGFEEERVKGKGLIIR-GWAPQVL----ILDHQATGGFVTHCGWNSILEGVAAGLPMVTPVAAEOFYNEKLVTVQLRTGVSVGAKKNVRTTG-
UGT73B4 ENEDWLPGGFEEERNKGKGLIIR-GWAPQVL----ILDHKATGGFVTHCGWNSTLEGIAGLPMVTPWPMGAEOFYNEKLLTKVLRIGVNVGATELVKKKGK-
UGT73B5 DNEEWLPEGFKERTTKGGLIIP-GWAPQVL----ILDHKATGGFVTHCGWNSATEGIAGLPMVTPWPMGAEOFYNEKLLTKVLRIGVNVGATELVKKKGK-
UGT73B1 EKEDWLPEGFEEKTKGKGLIIR-GWAPQVL----ILEHKATGGFVTHCGWNSILEGVAAGLPMVTPVPVGAEOFYNEKLVTVQLKTGVSVGVKKMMQVVG-
UGT73C3 LFEWMLSESGFEERIKERGLLIK-GWAPQVL----ILSHPSVGGFVTHCGWNSTLEGITSGIPLITWPLFGDQFCNQKLVVQVLKAGVSVAGVEEVMKWGEE
UGT73C4 LYEWMMESGFEERIKERGLLIK-GWSPQVL----ILSHPSVGGFVTHCGWNSTLEGITSGIPLITWPLFGDQFCNQKLVVQVLKAGVSVAGVEEVMKWGEE
UGT73C2 LAEWILSESGFEERTKERSLLIK-GWSPQML----ILSHPAVGGFVTHCGWNSTLEGITSGVPLITWPLFGDQFCNQKLVVQVLKAGVSVAGVEEVMKWGEE
UGT73C5 LVEWFSESGFEDRIQDRGLLIK-GWSPQML----ILSHPSVGGFVTHCGWNSTLEGITAGLPLITWPLFADQFCNEKLVVEVLKAGVRSVGEVQPMKWGEE
UGT73C6 LVEWFSESGFEDRIQDRGLLIK-GWSPQML----ILSHPSVGGFVTHCGWNSTLEGITAGLPLITWPLFADQFCNEKLVVQILKGVSAEVEKVMKWGEE
UGT73C11 LLEWISSESGYKERIKERGLLIT-GWSPQML----ILTHPAVGGFVTHCGWNSTLEGITSGVPLITWPLFGDQFCNEKLVVQILKAGVVRAGVEESMRWGEE
UGT73C7 LANWMQOSGFEERIKDRGLVIK-GWAPQVF----ILSHASTGGFVTHCGWNSTLEGITAGVPLITWPLFAEOFLNEKLVVQILKAGLKTIGVEKLMKYGKE
UGT73D1 LDEWLKRENFEERVVRGRGIVIK-GWSPQAM----ILSHGSTGGFVTHCGWNSTLEBAICFVPMITWPLFAEOFLNEKLIVEVLNIGVRVGVVEIPVRWGDE
UGT89B1 -----ILDGFDDRVRAGRLVIR-GWAPQVA----VLRHRAVGAFLTHCGWNSVVEAVVAVLMLTWPMRADQYTDASLVVDELKVGVRACEGP-----
UGT89C1 VEEDVIPAGFEERVKEKGLVIR-GWAPQTM----ILEHRAVGSYLTHLWGSVLEGMVGVMLLAWPMQADHFFNTLLIVDKLRAAVRVGENR-----
UGT89A2 -----IPDGFEDRVSGRGLVVR-GWVSQLA----VLRHVAVGGFVSHCGWNSVLEGITSGAVILGWPMADQFVNARLLVEHLGVAVRVCEGG-----
UGT90A1 ---IIG-EGFNDRIRESGMIVR-DWVDQWE----ILSHESVKGFVSHCGWNSAQESICVGVPLLAWPMAEQPI NAKMVVEEIKVGVVRETEDGS-----
UGT90A4 ---VTGGLGFVKRVKEHGMIVR-DWVDQWE----ILSHKSVKGFVSHCGWNSAQESICAGVPLLAWPMAEQPI NAKLVVEELKICVRIETEDVS-----
UGT90A2 ---NEIGKGFEEVGERGMMVRDEWVDORK----ILEHESVRGFVSHCGWNSLTESICSEVPLAFPLAAEQPI NAILVVEELRVAERVVAAS-----
UGT71B1 TNLEEILPKGFVLDRTVEIGKIIS-WAPQVD----VLNSPATGAFVTHCGWNSILESLWFGVPMATAWPIYAEQQFNAAFHMVDELGLAAEVKKEYRRDFLV-
UGT71B2 TNLEEILPEGFVLDRTAEIGKIVG-WAPQSA----ILANPATGGFVSHCGWNSLWVFGVPMATAWPIYAEQQVNAFEMVEELGLAVEVRNSFRGDFMA-
UGT71B7 TNLEEVLPEGFVLDRTKDIGKIVG-WAPQVA----VLANPATGGFVTHCGWNSLWVFGVPTAAWPIYAEQKFNAFVMEVEELGLAVEIRKYWRGEHLA-
UGT71B8 KNLEEILPEGFVLDRTKDKGVIG-WAPQVA----VLAKPATGGFVTHCGWNSILESLWFGVPIAPWPIYAEQKFNAFVMEVEELGLAVKIRKYWRGDQLV-
UGT71B6 TNLEEILPEGFVLDRTANRGKIVG-WAPQVA----VLAKPATGGFVSHCGWNSLWVFGVPMATAWPIYAEQKFNAFEMVEELGLAVEIKKHWRGDLLL-
UGT71B5 TNLEEVLPEGFVLDRTLDRGKIVG-WAPQVA----VLEKPATGGFVTHCGWNSILESLWFGVPMATAWPIYAEQKVNAFEMVEELGLAVEIRKYLKG-DLF-
UGT71C1 ASPYEALPHGFMDRVMQGIVCG-WAPQVE----ILAHKAVGGFVSHCGWNSILESLGFGVPIATWPMYAEQQLNAFTMVKELGLALEMRLDYVSEDG--
UGT71C2 ASPNEILPDGFMMNRVMGLGLVCG-WAPQVE----ILAHKATGGFVSHCGWNSILESLRFGVPIATWPMYAEQQLNAFTIVKELGLALEMRLDYVSEYG--
UGT71C3 ASPYDLLPEGFVLDRTASKGLVCD-WAPQVE----VLAHKALGGFVSHCGWNSVLESWVFGVPIATWPMYAEQQLNAFMSVKELGLAVELRLDYVSAYG--
UGT71C4 TNPNDVLPPEGFVMDRVRAGRGLVCG-WAPQVE----VLAHKATGGFVSHCGWNSLWVFGVPMATAWPMYAEQQLNAFTLVKELGLAVDLRMDYVSSRG--
UGT71C5 GDPQEPPEGFVDRVTMGRGIVCS-WAPQVD----ILAHKATGGFVSHCGWNSVQESLWVGVPIATWPMYAEQQLNAFEMVKEKGLAVELRLDYVADGDR-
UGT71D1 VTKDDLPEGFVDRVDRGGMICG-WSPQVE----ILAHKAVGGFVSHCGWNSIVESLWVGVPIVTPWPMYAEQQLNAFVLMVKEKGLAVELKLDYRVHSD--
UGT71D2 VTNDLLPEGFVDRVDRGGMICG-WSPQVE----ILAHKAVGGFVSHCGWNSIVESLWVGVPIVTPWPMYAEQQLNAFVLMVKEKGLAVELKLDYRVHSD--
UGT88A1 LDLKSLPEGFVLDRTEDKGMVVKSWAPQVP----VLNHHKAVGGFVTHCGWNSILEBAVCAVPMVAWPIYAEQRFNRMIVDEIKIAISMNESETG-----
UGT72B2 TDPFSFLPIGFLDRTKEKGLVVPVSWAPQVQ----ILAHPTSTGGFVTHCGWNSLWVFGVPIVTPWPIYAEQKMNALLLVEVDVGAALRIH-----
UGT72B3 NDPFSFLPQGFVLDRTKEKGLVVPVSWAPQAQ----ILTHSTIGGFVTHCGWNSLWVFGVPIVTPWPIYAEQKMNALLLVEVDVGAALRAR-----
UGT72B1 TDPLTFPLPPGFVLDRTKRGFVVPVSWAPQAQ----VLAHPSTGGFVTHCGWNSLWVFGVPIVTPWPIYAEQKMNALLLVEVDVGAALRPR-----
UGT72E2 DNTPEYLPPEGFVSRVSDRGFVVPVSWAPQAE----ILSHRAVGGFVTHCGWNSLWVFGVPMATAWPIYAEQNMNAALLSDELGIIVRLDD-----
UGT72E3 DNTPEYLPPEGFVTRVCDRGFMIPVSWAPQAE----ILAHQAVGGFVTHCGWNSLWVFGVPMATAWPIYAEQNMNAALLSDELGISVRVDD-----
UGT72E1 DGTDPDYLPPEGFVSRVTHRGFMVSSWAPQAE----ILAHQAVGGFVTHCGWNSLWVFGVPMATAWPIYAEQNMNAALLSDELGIIVRVSKK-----
UGT72D1 EQVSASLPPEGFVLDRTRGVIVVTPWAPQVE----ILSHRSITGGFVSHCGWNSALESLTKGVPIVTPWPIYAEQNMNAALLSDELGIIVRVSKK-----
UGT72C1 TEPLDFLPPNGFLDRTKDIGLVVVRTWAPQEE----ILAHKSTGGFVTHCGWNSLWVFGVPMATAWPIYAEQKMNARMVSGELKIALQIN-----
UGT86A1 LPAGFVDQAQ-----DRGLVVQWCCQME----VLSNPAVGGFVTHCGWNSILESVVCGVPLLCYPLLDQFTNRKLVVDDWCIGINLCEKKT-----
UGT86A2 LPEGFETEAG-----DRGLVVPWCCQMT----VLSHESVGGFVTHCGWNSILETIWCEVPLVCFPLLDQFTNRKLVVDDWECIGINLCEDKSD-----
UGT87A1 -----EALEG-----SLGVVSWCDQLR----VLCHAAVGGFVTHCGWNSLWVFGVPIVTPWPIYAEQKMNARMVSGELKIALQIN-----
UGT87A2 -----EALEG-----SLGVVSWCDQLR----VLCHKAVGGFVTHCGWNSLWVFGVPIVTPWPIYAEQKMNARMVSGELKIALQIN-----

UGT85A2 P-PEFLTATA-----DRRMLASWCPQEK----VL SHPAI GGF LTHCGWNSTLES LCGVPMVCWPFFAEQQTNCKFSRDEWEVGLIEIG-----
UGT85A3 P-KEFLAETA-----DRRMLTSWCPQEK----VL SHPAV GGF LTHCGWNSTLES LSCGVPMMVCWPFFAEQQTNCKFSCDEWEVGLIEIG-----
UGT85A1 P-PDFLMETK-----DRSMLASWCPQEK----VL SHPAI GGF LTHCGWNSTLES LSCGVPMMVCWPFFADQOMNCKFCCDEWDVGLIEIG-----
UGT85A7 LPQEF LAETI-----DRRMLASWCPQEK----VL SHPAI GGF LTHCGWNSTLES LAGVPMICWPCFSEOPTNCKFCCDEWVGGLIEIG-----
UGT85A5 P-PDFLIETA-----NRRMLASWCPQEK----VL SHPAV GGF LTHCGWNSTLES LSGVPMVCWPFFAEQQTNCKYCCDEWEVGMIEIG-----
UGT85A4 PAEFLSETKN-----RGMLIKGWCSQEK----VL SHPAI GGF LTHCGWNSTLES LSYAGVPMICWPPFFADQLTNRKFCCEDWGLGMEIG-----
UGT74E1 IEEIGEK-----GLTVSWSPQLE----VL THKSI GCF VTHCGWNSTLEGLSLGVPMIGMPHWADQPTNAKFMEDVWVKVGVVRVKADSD-----
UGT74E2 VEEIGEK-----GLIVSWSPQLD----VLAHKSIGCF LTHCGWNSTLEGLSLGVPMIGMPHWTDQPTNAKFMQDVWVKVGVVRVKAEGD-----
UGT74D1 IEDICDK-----GLIVNWSPQLQ----VLAHKSIGCF MTHCGWNSTLEALSLGVVALIGMPAYS DQPTNAKFIEDVWVKVGVVRVKADQN-----
UGT74C1 IEEAEKDS-----GLVAKWVPQLE----VLAHESIGCF VSHCGWNSTLEALCLGVPMMVGPVQWTDQPTNAKFIEDVWVKVGVVRVRTDGE-----
UGT74F1 LETVDKDK-----SLVLKWSPOLQ----VLSNKAI GCF MTHCGWNSTMEGLSLGVPMMVAMPQWTDQPMNAKYIQDVWVKVGVVRVKAEKES-----
UGT74F2 LETVNKEK-----SLVLKWSPOLQ----VLSNKAI GCF LTHCGWNSTMEALTFGVPMMVAMPQWTDQPMNAKYIQDVWVKVGVVRVKTEKES-----
UGT74B1 VESTKDR-----ALLVSWCNQLE----VLAHESIGCF LTHCGWNSTLEGLSLGVPMMVGPVQWSDQMNDAKFVEEVWVKVGYRAKEEAGE-----
UGT75B1 EEETEIEK IAGFRHELEEVGMIVSWCSQIE----VLSHRAV GCF VTHCGWSS TLES LVLGVPVVAFPMWS DQPTNAKLLEESWKTGVRVRENKDG-----
UGT75B2 EEETEIEK IAGFRHELEEVGMIVSWCSQIE----VLRHRAI GCF LTHCGWSS LLES LVLGVPVVAFPMWS DQPANAKLLEELWKTGVRVRENS EG-----
UGT75D1 EQKEEDCISSEKSFDEIGMVSWCDQFR----VLNHRSIGCF VTHCGWNSTLES LVS GVPVVAFPQWNDQMTNAKLLED CWKTGVRVMEKKEEEGV-----
UGT75C1 FLELIR-----GSDRGLVVGWCSQTA----VLAHCAGV GCF VTHCGWNSTLES LSGVVPVVAFPQFADQCTTAKLVEDTWRIGVKVKVGEEG-----
UGT84A3 VLPRELEE-----KKGKIVEWCPQER----VLAHPAIA C FLSHCGWNSTMEALTAGVVPVCFPQWGDQVTDVAVYLADVFKTGVR LGRGAAEEM-----
UGT84A4 VLPLELEE-----KKGKIVEWCPQEK----VLAHPAVAC FLSHCGWNSTMEALTS GVPVICFPQWGDQVTNAVY MIDVFKTGLRLSRGASDER-----
UGT84A2 VLPPEEVKG-----KKGKIVEWCSQEK----VLSHPSVAC FVTHCGWNSTMEAVSS GVPVCFPQWGDQVTDVAVY MIDVFKTGLRLSRGEAEER-----
UGT84A1 VLPQELKESS----AKGKGMIVDWCPQEQ----VLSHPSVAC FVTHCGWNSTMESLSS GVPVCCPQWGDQVTDVAVYLIDVFKTGLRLGRGATEER-----
UGT84B1 VLQEMVKE-----GQGVVLEWSPQEK----ILSHEAI SCF VTHCGWNSTMETVVA GVPVVA YPSWTDQPIDARLLVDVFGIGVRMRNDSVDG-----
UGT84B2 VLQEMVKE-----GKGVVTEWQQEK----ILSHMAI SCF ITHCGWNSTIEIVVT GVPVVA YPTWIDQPLDARLLVDVFGIGVRMKND AIDG-----
UGT76C3 VHGAEWIEQLH-----EKGKIVNWAPQOE----VLKHOAI GGF LTHCGWNSTVESVFE GVPMICMPFVWDQLLNARFVSDVWVMVGLHLEGR IERNV-----
UGT76C4 AIPEYFIKRLN-----EKGKIVKWAPQOE----VLKHRAI GGF LTHCGWNSTVESVCE GVPMICLPFRWDQLLNARFVSDVWVMVGLHLEGR IERDE-----
UGT76C5 TIPEEIMEKLN-----EKGKIVKWAPQOD----VLKHRAI GGF LTHCGWSS TVESVCEAVPMICLPFRWDQMLNARFVSDVWVMVGLNLEDRVERNE-----
UGT76C2 PLSEGLVSSLE-----EKGKIVKWAPQOE----VLAHRATGGFL THCGWNSTLES ICEGVPMICLPGGWD-----
UGT76C1 SLPSGFMESLD-----GKGKIVRWAPQLD----VLAHRATGGFL THCGWNSTLES ICEGVPMICLPCKWDQFVNARFISEVWRVGLHLEGR IERRE-----
UGT76B1 ILPKGF IENLE-----GRGKIVKWAPQPE----VLAHRATGGFL THCGWNSTLES ICEAIPMICRPSFGDQRVNARYINDVWVKIGLHLENKVERLV-----
UGT76F1 SLPCGFLENIG-----HQGKIVKWVNQLE----TLAHPAVGAFWTHCGWNSTLES ICEGVPMICTPCFSDQHVNARYIVDVWRVGMMLERCKMERT-----
UGT76F2 SLPLGF MENIG-----DKGKIVKWANQLE----VLAHPAIA C AFWTHCGWNSTLES ICEGVPMICTSCTFDQHVNARYIVDVWRVGMMLERSKMEKK-----
UGT76E1 SLPEEF SRLVS-----ERGYIVKWAPQIE----VLRHPAVGGFWSHCGWNSTLES IGEVPMICRPF TGDQKNARYLERVWRIGVQLEGLDLDKET-----
UGT76E2 SLPEEFNRLVS-----ERGYIVKWAPQME----VLRHPAVGGFWSHCGWNSTLES IGEVPMICRPF TGDQKNARYLERVWRIGVQLEGLDLDKET-----
UGT76E4 LLPPEEVIKMVT-----ERGYIAKWAPQIE----VLGHPAVGGFWSHCGWNSTLES IVEGVPMICRPLQGEQKLNAMYIESVWVKIGIQLEGEVEREG-----
UGT76E6 SLPEEVIKMVS-----ERGYIVKWAPQIE----VLGHPAVGGFWSHCGWNSTLES IVEGVPMICRPFHGEQKLNALCLES IWRIGFQVQGVKVERGG-----
UGT76E5 SMPVEVSKIVS-----ERGCIVKWAPQNE----VLVHPAVGGFWSHCGWNSTLES IVEGVPMICRPFNGEQKLNAMYIESVWRVGVLLQGEVERGC-----
UGT76E3 SLPEEVSKMVL-----EKGYIVKWAPQIE----VLGHPVSGGFWSHCGWNSTLES IVEGVPMICRPFYQGEQMLNAYLESVWRIGIQVGGELERGA-----
UGT76E11 NLPKEFSKIIS-----GRGYIVKWAPQKE----VLSHPAVGGFWSHCGWNSTLES IGEVPMICKPFFSSDQMVNARYLECVWVKIGIQVEGLDLDRGA-----
UGT76E12 SMPPEFSKMVL-----DRGYIVKWAPQKE----VLSHPAVGGFWSHCGWNSTLES IGOVPMICRPFSGDQKNARYLECVWVKIGIQVEGELDRGV-----
UGT76E7 EELLKKMVIT-----DRGYIVKWAPQKQ----VLAHSAVGA FWSHCGWNSTLES LSGVPLICRPF TTDQKNARYLECVWVKVGIQVEGELERGA-----
UGT76E9 EELLSMMEIP-----DRGYIVKWAPQKQ----VLAHSAVGA FWSHCGWNSTLES SMGEVPMICRPF TTDQKNARYVECVWRVGVQVEGELKRGV-----
UGT76D1 FLPEQFNQTVTD-----GRGFVVKWAPQKE----VLRHRAVGGFVNHCGWNSLES ISSGVPMICRPFYSGDQRVNTRLM SHVWQTAYEIEGELERGA-----
UGT78D2 LDRTREQ-----GLVVPWAPQVE----LLKHEATG V FVTHCGWNSVLES SVSGVPMICRPF FGDQRLNGRAVEVVWEIGMTIINGVFTKDG-----
UGT78D3 LDRTREQ-----GMVVPWAPQVE----LLNHEAMGV FVSHCGWNSVLES SVSAGVPMICRPIFGDHAINARSVEAVWEIGV TISSGVFTKDG-----
UGT78D1 LDRTREQ-----GLVVPWAPQVE----LLKHEAMGVNVTHCGWNSVLES SVSAGVPMIGRPIILADNRLNGRAVEVVWVKVGMMDNNGVFTKEG-----

UGT73B2 ----DFISREKVDKAVREVLAGEA-----AEERRRRAKKLAAMAKAAVEEGSSFNDLNSFMEEFSS-----
 UGT73B3 ----DFISREKVVKAVREVLVGE-----ADERRERAKKLAEMAKAAVE--GGSSFNDLNSFIEEFTS-----
 UGT73B4 ----LISRAQVEKAVREVIGGEK-----AEERRLRAKELGEMAKAAVEEGSSYNDVNKFMEELNGRK-----
 UGT73B5 ----LISRAQVEKAVREVIGGEK-----AEERRLWAKKLGEMAKAAVEEGSSYNDVNKFMEELNGRK-----
 UGT73B1 ----DFISREKVEGAVREVMVGE-----ERKRKAKELAEMAKNAVKEGSSDLEVDRLMEELTLVKLQKEKV-----
 UGT73C3 DKIGVLVDKEGVKKAVEELMGSDDAKE-----RRRRVKELGELAHKAVEKGGSSHNSITLLLQDIMQLAQFKN-----
 UGT73C4 EKIGVLVDKEGVKKAVEELMGASDDAKE-----RRRRVKELGESAHKAVEEGSSSHNSITYLLQDIMQVKSKN-----
 UGT73C2 ESIGVLVDKEGVKKAVIDEMGESDEAKE-----RRKRVRRELGELAHKAVEEGSSSHNSIIFLLQDIMQVSKS-----
 UGT73C5 EKIGVLVDKEGVKKAVEELMGESDDAKE-----RRRAKELGDSAHKAVEEGSSSHNSISFLLQDIMELAEFPNN-----
 UGT73C6 EKIGVLVDKEGVKKAVEELMGESDDAKE-----RRRAKELGESAHKAVEEGSSSHNSITFLLQDIMQLAQSNN-----
 UGT73C11 EKIGVLVDKEGVKKAVEELMGSDNAKE-----RRKRVKELGELAHKAVEEGSSSHNSITFLLQDIMQLEQPKK-----
 UGT73C7 EEIGAMVSRECVRKAVDELMGDSEAEFE-----RRRKVTELSDLANKALEKGGSSDSNITLLIQDIMEQSQNQF-----
 UGT73D1 ERLGVLVKKPSVVKAIKLLMDQDCQRVDENDDNEFVRRRRRIQELAVMAKKAVEEKGGSSINVSILIQDVLQSLSLV-----
 UGT89B1 ----DTPDPDELARVAFADSVTGNQTER-----IKAVELRKAALDAIQ--ERGSSVNDLDGFIQHVVSLGLNK-----
 UGT89C1 ----DVPDSDKLARILAESAREDLPER-----VTLMKLRKREKAMEAIK--EGSSYKNLDELVAEMCL-----
 UGT89A2 ----ETVPDSDDELGRVIAETMGEGRREV-----AARAEELRRKTEAAVTEANGSSVENVQRLVKEFEKV-----
 UGT90A1 --VKGFVTREELSGKIKELMEGETGKTA-----RKNVKEYSKMAKAAALVEGTGSSWKNLDMILKELCKSRDSNGASE-----
 UGT90A4 --VKGFVTREELSRKVKQLMEGEMGKTT-----MKNVKEYAKMAKKAMAQGTGSSWKSLSLSLEELCKSREPDGVNKLSSSDA-----
 UGT90A2 --EGVVRREEIAEKVKELMEGEKGKEL-----RRNVEAYGKMAKKALEEGIGSSRKNLDNLINEFCNNGT-----
 UGT71B1 ---EETVTADEIERGIRCLMEQDS-----KMRKRVMEMKDKLHVALVDGSSNCALKKFVQDVVDNVP-----
 UGT71B2 ---ADD-ELMTAAEIERGIRCLMEQDS-----DVRSRVKEMSEKSHVALMDGSSSHVALLKFIQDVTKNIS-----
 UGT71B7 ---GLPTATVTAEEIEKATMCLMEQDS-----DVRKRKVKDMSEKCHVALMDGSSSRTALQKFIIEVAKNIVSLDKEFEHVALK-----
 UGT71B8 ---GTATVIVTAEEIERGIRCLMEQDS-----DVRNRVKEMSKKCHMALMDGSSQSALKLFIQDVTKYIA-----
 UGT71B6 ---GRS-EIVTAAEIEKGLICLMEQDS-----DVRKRKRVNEISEKCHVALMDGSSSETALKRFIQDVTENIAWSETES-----
 UGT71B5 ---AGEMETVTAEDIERAIRRVMEQDS-----DVRNNVKEMAEEKCHFALMDGSSSKAALEKFIQDVIENMD-----
 UGT71C1 -----DIVKADEIAGTVRSLMDGVD-----VPKSKVKEIAEAGKEAVD--GSSFLAVKRFIDGLIDGVSISK-----
 UGT71C2 -----EIVKADEIAGAVRSLMDGED-----VPRRKLKEIAEAGKEAVMDGSSSFVAVKRFIDGL-----
 UGT71C3 -----EIVKAAEIEAGAIRSLMDGED-----TPRKRKVKEMAEAAARNALMDGSSSFVAVKRFIDDELIGGDV-----
 UGT71C4 -----GLVTCDEIARAVRSLMDGGD-----EKRRKVKEMADAARKALMDGSSSLATARFIAELFEDGSSC-----
 UGT71C5 ---VTL-EIVSADEIATAVRSLMDSND-----PVRKKVIEKSSVARKAVGDGSSSTVATCNFIKDILGDHF-----
 UGT71D1 -----EIVNANEIETAIRVMDTDNN-----VVRKRKVMDSQMIQRATKNGSSFAAIEKFIYDVIGIKP-----
 UGT71D2 -----EIVSANEIETAIQVMDNDNN-----VVRKRKVMDSQMIQRATKNGSSFAAIEKFIHDVIGTRT-----
 UGT88A1 -----FVSSTEVEKRVQEIIGECPE-----VRERTMAMKNAEALALTEGSSHTALTLLQSWSPK-----
 UGT72B2 ---AGEDGIVRREEVVRVVKALMEGEEGK-----AIGNKVKELKEGVVRVLGDDGLSSKSFGEVLLKWKTHQRDINQETSH-----
 UGT72B3 ---LGEDGVVGREEVARVVKGLIEGEEGN-----AVRKKMKELKEGSRVLRDDCFSTKSLNEVSLKWKAHQRKIDQEQESFL-----
 UGT72B1 ---AGDDGLVRREEVARVVKGLMEGEEGK-----GVRNKMKELEAAACRVLKDDCTSTKALSVALKWKAKHKELEQNGNH-----
 UGT72E2 ---PKED--ISRWKIEALVRKVMTEKEGE-----AMRRKVKKLRDASAEMSLSIDCGGLAHESLCRVTKECQRFLEVRVVDLSRGA-----
 UGT72E3 ---PKEA--ISRSKIEAMVRKVMTEKEGE-----EMRRKVKKLRDASAEMSLSIHGGSSAHESLCRVTKECQRFLECVGDLGRGA-----
 UGT72E1 ---LPSEGVITRAEIEALVRKIMVEEEGA-----EMRKKIKKLETAEAESLSCDGG--VAHESLSRIADESEHLLERVRMARGA-----
 UGT72D1 ---LPSEGVITRAEIEALVRKIMAEEDDE-----GQKIRAKAEVVRVSSERAWSKDGSYSNLSFEWAKRCYLVP-----
 UGT72C1 -----VADGIVKKEVIAEMVVRVMDDEEGK-----EMRKNVKELKKTAEALNMTHIPSAFYT-----
 UGT86A1 -----ITRDQVSANVKRLMNGET--SS-----ELRNNVEKVKRHLKDAVTTVCGSS--ETNFNLFVSEVRNRIETKLCNVNGLEISPSN-----
 UGT86A2 -----FGRDEVGRNINRLMCGVS--KE-----KIG----RVKMSLEGAVRNSGSSSEMNLGLFIDGLLSKVGLSNGKA-----
 UGT87A1 -----LLIVSDEIKELVKRFMDGES--EEGK-----EMRRRTCDLSEICRGAVAKCGSS--DANIDAFIKDITKIV-----
 UGT87A2 -----LLIGREEIKEVVKRFMDRES--EEGK-----EMRRRACDLSEISRGAVAKSCSS--NVNIDEFVRHITNTN-----

UGT85A2 ----GDVKREEVEAVVRELMDE---EKGK-----NMREKAEWEVRRLANEATEHKHGSSKLNFMELVNVKVLGGE-----
UGT85A3 ----GDVKRGEVEAVVRELMDG---EKGK-----KMREKAVEWRRLAEKATKLP CGSSVIN FETIVNKVLLGKIPNT-----
UGT85A1 ----GDVKREEVEAVVRELMDG---EKGK-----KMREKAVEWQRLAEKATEHKL GSSVMNFETVVSKFLLGQKSQD-----
UGT85A7 ----KDVKREEVETVVRELMDG---EKGK-----KLREKAEWEVRRLAEEATRYKH GSSVMNLETLIHKVFLENLR-----
UGT85A5 ----GDVRREEVEELVRELMDG---DKGK-----KMROKAEWQRLAEAEATKPIY GSSSELNFQMVVDKVLGGE-----
UGT85A4 ----EEVKREERVEVVKELMDG---EKGK-----RLREKVVWEVRRLAEEASAPPL GSSVYNFETVVNKVLTCHTIRST-----
UGT74E1 ----GFVRRREEFVRRVEEVME---A-EQ GK-----EIRKNAEKWKVLAQEAVS-EGSSSDKNINEFVSMFC-----
UGT74E2 ----GFVRRREEMRSVVEEVME---G-EKGK-----EIRKNAEKWKVLAQEAVS-EGSSSDK SINEFVSMFC-----
UGT74D1 ----GFVPKEEIVRCVGEVME DMS-EKGK-----EIRKNARRIMEFAREALS-DGGSNDKNIDEFVAKIVR-----
UGT74C1 ----GLSSKEELARCIVEVME---G-ER GK-----EIRKNVEKLVLAAREALS-EGSSSDKKIDEFVALLT-----
UGT74F1 ----GICKREEIEFSIKEVME---G-EKSK-----EMKENAGKWRDLAVKSLS-EGGSTDININEFVSKIQIK-----
UGT74F2 ----GIAKREEIEFSIKEVME---G-ERSK-----EMKKNVKKWRDLAVKSLN-EGGSTDTNIDTFVSRVQSK-----
UGT74B1 ----VIVKSEELVRCLKGVME---G-ESSV-----KIRESSKKWKDLAVKAMS-EGSSSDRSINEFIESLGK-----
UGT75B1 ----LVERGEIRRCL EAVME---E-KSV-----ELRENAEKWKRLAMEAGR-EGSSSDKNMEAFVEDICGESLIQNLCEAEVVKV-----
UGT75B2 ----LVERGEIMRCL EAVME---G-AKSV-----ELRENAEKWKRLATEAGR-EGSSSDKNMEAFVKS L F-----
UGT75D1 ----VVVDSEEIRRCIEEVME---DKAE-----EFRGNATRWKDLAAEAVR-EGSSSFNHLKAFVDEHM-----
UGT75C1 ----DVDGEEIRRCL EKVMSG---GEEAE-----EMRENAEKWKAMAVDAAA-EGGSPDLN LKGFVDEDE-----
UGT84A3 ----IVSREVVAEKLL EATVG---EKAV-----ELRENARRWKAEEA EAVA-DGSSSDMNFKEFVDKLVTKHV TREDNGEH-----
UGT84A4 ----IVPREEVAERLLEATVG---EKAV-----ELRENARRWKEEAESA VA-YGGT SERNFQEFVDKLV DVK TMTN INNVV-----
UGT84A2 ----LVPREEVAERLREVT KG---EKAI-----ELKKNALKWKEEAEEA VA-RGGSSDRNLEKFVEKLGAKPVGKVQNGSHNHVLAGSIKSF-----
UGT84A1 ----VVPREEVAEKLLEATVG---EKAE-----ELRKNALKWKAEEA EAVA-PGGSSDKNFREFVEKLGAGVTKTKDNGY-----
UGT84B1 ----ELKVEEVERCIEAVTEG---PAAV-----DIRRRAELKRVARLALA-PGGSSTRNLDL F ISDITIA-----
UGT84B2 ----ELKVAEVERCIEAVTEG---PAAA-----DMRRRAT ELKHAARSAMS-PGSSSAQNLD SF ISDIPIT-----
UGT76C3 ----IEGMIRRLFSE---TEGK-----AIRERMEILKENVGRSVK-PKGSAYRSLQHLIDYITYF-----
UGT76C4 ----IERAIRRLLE---TEGE-----AIRERIQLLKEKVGRSVK-QNGSAYQSLQNLINYLSSF-----
UGT76C5 ----IEGAIRRLIVE---PEGE-----AIRERIEHLKEKVGRSFQ-QNGSAYQSLQNLIDYI LSSF-----
UGT76C2 -----
UGT76C1 ----IERAVIRLMVE---SKGE-----EIRGR IKVLRDEVRRSVK-QGSSSYRSLDELVDRI S I I IEPLVPT-----
UGT76B1 ----IENAVRTLMTS---SEGE-----EIRKRIMPME TVEQCLK-LGGSSFRNLENLIAYILSF-----
UGT76F1 ----EIEKVVT SVMM---ENGA-----GLTEMCLELKEKANVCLS-EDGSSSKYLDKLVSHVLSFDSSAFAS-----
UGT76F2 ----EIEKVLRSVMM---EKGD-----GLRERSLKLKERADFCLS-KDGSSSKYLDKLVSHVLSFDSDSYAFAS-----
UGT76E1 ----VERAVERLIMD---EEGA-----EMRKRVINLKEKLQASVK-SRGSSFS SLDNFVNSLKMNMFM-----
UGT76E2 ----VERAVEWLLVD---EEGA-----EMRKRAIDLKEK IETSVR-SGSSCSSLDDFVNSM-----
UGT76E4 ----VERAVKRLIID---EEGA-----AMRERALDLKEKLNASVR-SGSSSYNALDELVKFLNTE-----
UGT76E6 ----VERAVKRLIVD---EEGA-----DMRERALVLKENLKASVR-NGSSYNAL E EIVNLM-----
UGT76E5 ----VERAVKRLIVD---DEGV-----GMRERALVLKEKLNASVR-SGSSSYNALDELVHYLEAEYRNT-----
UGT76E3 ----VERAVKRLIVD---KEGA-----SMRERTLVLKEK LKASIR-GGGSSCNALDELVKHLKTE-----
UGT76E11 ----VERAVRRLMVE---EEGE-----GMRKRAISLKEQLRASVI-SGSSSHNSLEEFVHYMRTL-----
UGT76E12 ----VERAVKRLMVD---EEGE-----EMRKRAFSLKEQLRASVK-SGSSSHNSLEEFVHFIRTL-----
UGT76E7 ----IERAVKRLMVD---EEGE-----EMKRRALS LKEK LKASVL-AQGSSHKS LDDFIKTL-----
UGT76E9 ----VERAVKRLIVD---EEGE-----EMKLRALS LKEK LKVSVL-PGGSSHSS LDDLIKTL-----
UGT76D1 ----VEMAVRRLIVD---QEGQ-----EMRM RATILKEEVEASVT-TEGSSSHNSLN LNVHAIMMQIDEQ-----
UGT78D2 ----FEKCLDKVLVQ---DDGK-----KMKCNAKK LKELAYEAVS-SKGRSSENFRGLLD AVVNI I-----
UGT78D3 ----FEESLDRVLVQ---DDGK-----KMKVNAKK L EELAQEAVS-TKGSSFENFGGLLDEVVNF G-----
UGT78D1 ----FEKCLNDV FVH---DDGK-----TMKANAKK LKEKLQEDFS-MKGS SLENFKILLDEIVKV-----

UGT79B10	-----KESLSVAITSVMDQASEIGNLVR-----RNHSKLKEVLVSDG-LLTCYTDFVDTLENLVSETKRE-----
UGT79B11	-----KENLSGAIMSMDQDSEIGNQVR-----RNHSKLKETLASPG-LLTCYTDFVDTLENLVNEQGYIS-----
UGT79B9	-----KESLSVAITSVMDKDSELGNLVR-----RNHAKLKEVLVSPG-LLTCYTDFVETLQNIIVNDTNLE-----
UGT79B7	-----KESLSNAIKSVMDKDSDIGKLVR-----SNHTKLLKEILVSPG-LLTCYVDHFVEGLQENLI-----
UGT79B8	-----KESLSDAIKSVMDKDSLGLKLR-----SNHAKLKETLGSHG-LLTCYVDKFVEELQEYLI-----
UGT79B6	-----KESLSGAVRSVMDRDELGNWAR-----RNHVKWKESLLRHG-LMSCYLNKFVEALEKLVQININLE-----
UGT79B4	-----KESLRDITVKSVMKDNSEIGNLVR-----RNHKKLKETLVSPG-LLSSYADKFVDELENH IHSKN-----
UGT79B5	-----KEDLRDITVKSVMIDSEIGNLVK-----RNHKKLKETLVSPG-LLSCYADKFVEALEIEVNNTKFS-----
UGT79B2	-----KESLFDAINSVMKRDSEIGNLVK-----KNHTKWRETTLTSPG-LVTCYVDNFIESLQDLVSGTNHVSK-----
UGT79B3	-----KESLCDAVNSVMKRDSELGNLVR-----KNHTKWRETVASPG-LMTCYVDAFVESLQDLVSGTTHD-----
UGT79B1	-----RQSLNAVKSVMEEGSEIGEKVR-----KNHDKWRCVLTDSG-FSDCYIDKFEQNLIELVKS-----
UGT91A1	-----KESVANSLRLVMVEEE--GKVYR-----ENVKEMKG-VFGMDRQDRYVDSFLEYLVTNR-----
UGT91B1	-----SASVAETIRHVVEEE--GKIYR-----NNAASQOKKIFGNKRLQDQYADGFIEFLENPIAGV-----
UGT91C1	-----SDSVADSIRLVMIDDA--GEEIR-----AKAKVMKD-LFGNMDENIRYVDELVRFMRSKGSSSSS-----
UGT83A1	-----LEVKKKIDEIMRDGG-----EYEEERAMKVKELVMKSVAKDGISCEENLNKFVNWIKSQVN-----
UGT92A1	-----DIVSKIKLVMEETEVEVGKEIR-----KKAREVKELVRRAMVDGVKGSVIGLEEFLDQAMVKKVEN-----
UGT82A1	-----EVEDGLRKVMED-----QDMGERLRKLRDRAMGNEARLSSEMNFTFLKNELN-----
consensus
	501.....510.....520.....530.....540.....550.....560.....570.....580.....590...