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UGT79B10 1 -----MGQTFHAFMFPWF-AFGHMTPYLHLANKLAERG-----
UGT79B11 1 -----MGQKIHFAMFPWF-AFGHMTPYLHLGNKLAELG-----
UGT79B9 1 -----MGQNFHAFMFPWF-AFGHMTPYLHLANKLAELG-----
UGT79B7 1 -----MEPKFHAFMFPWF-AFGHMIPFLHLANKLAELG-----
UGT79B8 1 -----MEPTFHAFMFPWF-AFGHMIPFLHLANKLAELG-----
UGT79B6 1 -----MGSKFHAFMFPWF-GFGHMTAFHLANKLAELK-----
UGT79B4 1 -----MGSKFHAFLYPWF-GFGHMIPYLHLANKLAELG-----
UGT79B5 1 -----MGSKFHAFMYPWF-GFGHMIPYLHLANKLAELG-----
UGT79B2 1 -----MGGLKFHVLMPWF-ATGHMTPFLFLANKLAELG-----
UGT79B3 1 -----MGGLKFHVLMPWF-ATGHMTPFLFLANKLAELG-----
UGT79B1 1 -----MGVFGSNESSSMSIVMYPWL-AFGHMTPFLLHLANKLAELG-----
UGT91B1 1 -----MAEPKPKLHVAVFPWL-ALGHMIPYLQLSKLIARGL-----
UGT91C1 1 -----MVDKREEVMHVAMFPWL-AMGHLLPFLRLSKLLAQLG-----
UGT91A1 1 -----MTNFKDNDGDGTKLHVVMFPWL-AFGHMVPELELAKLIAQLG-----
UGT86A1 1 -----MERAKSRKPHIMMIPYP-LQGHVIPFVHLAIKLAESHG-----
UGT86A2 1 -----MADVNRNPTKNHHGHHHLHALLIPYP-FQGHVNPVHHLAIKLAESQG-----
UGT87A1 1 -----MNPICKQPLGVRHVVPWP-GRCHINPMLNLCKSLVRRDPN--
UGT87A2 1 -----MDPNESPNQFRHVVPYP-GRCHINPMMNLCKRLVRRYPN--
UGT85A2 1 -----MGSHVAQKQHVVCVPYP-AQGHINPMMKVAKLLYAKG-----
UGT85A3 1 -----MGSRFVSNEQKPHVVCVPYP-AQGHINPMMKVAKLLHVKG-----
UGT85A1 1 -----MGSQI IHNSQKPHVVCVPYP-AQGHINPMMRVAKLLHARG-----
UGT85A7 1 -----MESHVVHNAQKPHVVCVPYP-AQGHINPMLKVAKLLYAKG-----
UGT85A5 1 -----MASHAVTSGQKPHVVCIPFP-AQGHINPMLKVAKLLYARG-----
UGT85A4 1 -----MEQHGGSSSQKPHAMCIPYP-AQGHINPMLKLAKLLHARG-----
UGT74E1 1 -----MREGSHVIVLPHF-AQGHITPMSQFCKRLASKSLK--
UGT74E2 1 -----MREGSHLIVLPHF-GQGHITPMSQFCKRLASKCLK--
UGT74D1 1 -----MGEKAKANVLFVSPF-IQGHINPLLQFSKRLLSKNVN--
UGT74C1 1 -----MSEAKKGHVLFVFPYP-LQGHINPMIQLAKRLSKKGIT--
UGT74F1 1 -----MEKMRGHVLAVPFP-SQGHITPIRQFCKRLHSGKGFK--
UGT74F2 1 -----MEHKRGHVLAVPYP-TQGHITPFRQFCKRLHFKGLK--
UGT74B1 1 -----MAETTPKVKGHVILPYP-VQGHINPMVQFAKRLVSKNVK--
UGT75B1 1 -----MAPPHFLLVTFP-AQGHVNP SLRFARRLIKRTG--
UGT75B2 1 -----MAQPHFLLVTFP-AQGHVNP SLRFARRLIKTTG--
UGT75D1 1 -----MANNNSNSPTGPHFLVTFP-AQGHINPSLELAKRLAGTISG--
UGT75C1 1 -----MATSVNGSHRRPHYLLVTFP-AQGHINPALQLANRLIHHCA--
UGT84A3 1 -----MDPSRHTHVMLVSFP-GQGHVNP LLRLGKLLIASKCLL--
UGT84A4 1 -----MEMESSLPHVMLVSFP-GQGHISPLLRLGKLLIASKCLI--
UGT84A2 1 -----MELESSPPLPPHVMLVSFP-GQGHVNP LLRLGKLLIASKGLL--
UGT84A1 1 -----MVFETCPSPNPIHVMLVSFQ-GQGHVNP LLRLGKLLIASKGLL--
UGT84B1 1 -----MGSSEGQETHVLMVTLF-FQGHINPMLKLAKHLISSLKSN--
UGT84B2 1 -----MGSNEGQETHVLMVALA-FQGHINPMLKFAKHLARTN--
UGT76C3 1 -----MDKSNGLRVILFPLP-LQCCINPMIQLAKILHSRGSFS--
UGT76C4 1 -----MEKSNGLRVILFPLP-LQCCINPMIQLAKILHSRGSFS--
UGT76C5 1 -----MEKSNGLRVILFPLP-LQCCINPMIQLAKILHSRGSFS--
UGT76C2 1 -----MEEKRNGLRVILFPLP-LQCCINPMIQLANILHVRGSFS--
    
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UGT76C1      1 -----MEKRNERQVILFPLP-LQCCINPMLQLAKTILYSRCFS--
UGT76B1      1 -----METRETQPVIFLFPFP-LQGHINPMFQLANIFFNRCFS--
UGT76F1      1 -----MEERKVKRIIMFPLP-FTGHFNPMIELAGIFHNRCFS--
UGT76F2      1 -----MEERKGRRIMFPLP-FPGHFNPMIELAGIFHHRGFS--
UGT76E1      1 -----MEELGVKRRIVLVPVP-AQGHVTPIMQLGKALYSKCF--
UGT76E2      1 -----MEEKQVKETRIVLVPVP-AQGHVTPMMQLGKALHSGCF--
UGT76E4      1 -----MEKRVEKRRIVLVPVA-AQGHVTPMMQLGKALQSKCF--
UGT76E6      1 -----MEKMEEKRIVLVPVP-AQRHVTPMMQLGTALNMKCF--
UGT76E5      1 -----MEKNAEKRIVLVPFP-LQGHITPMMQLGQALNLKCF--
UGT76E3      1 -----MEKRVEKRRIVLVPFP-LLGHFTPMMQLGQALILKCF--
UGT76E11     1 -----MEEKPAGRRVVLVAVP-AQGHISPMQLAKTILHLKCF--
UGT76E12     1 -----MEEKPARRSVLVPFP-AQGHISPMQLAKTILHLKCF--
UGT76E7      1 -----MEEKLSRRRRVVLVPVP-AQGHITPMIQLAKALHSGCF--
UGT76E9      1 -----MEEKQERRRRIVLIPAP-AQGHISPMQLARALHLKCF--
UGT76D1      1 -----MAEIRQRRVLMVPAP-FQGHLPMMNLASYLSSQCF--
UGT81B1      1 -----MMKVVSPTRTSDSITEKVFRRVYSNFN----
UGT81B2      1 -----MATVMALEKVLERVYGTSKSAVS----
UGT81A1      1 MQNPSTVTQESAAPVDFDFPRLRGLTSRNRSPCSNSDGYALSSSNALYFNGFRTLPSRRMGKTLASLSFNTKSSAGSSLRRFISDFNSFIRFHCDK----
UGT88A1      1 -----MGEEAIVLYPAP-PIGHLVSMVELCKTILSKNPS--
UGT83A1      1 -----MDNNSNKRMPHVVPYP-AQGHVLPILISFSRYLAKQC--
UGT82A1      1 -----MKVTQPKIIFIPYP-AQGHVTPMLHLASAFLSRCFS--
UGT92A1      1 -----MAEAKPRNLRIVMFPFM-GQGHILPFFVALALRIEKIMIMN-
consensus    1 .....
    
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UGT80A2      74 NKSFSRVWMTMPLEGSSSSDRAESSSTNQPRLDKSKTERQQKVTHILAEDAAKIFDDKISAGKKLKLKLLNR IATVKHGDGTVEFEVFPADAIPQP IVVDRGESK
UGT80A3      49 HRGLDHCETAPVG-----LYGDM LINDSEIQYSRSLTEKGSPA IHNKLDRLSEQEKQKLIVELVRIQNDGTVEVIDNGTPVSELWEFEPTKGGQ
UGT78D2      41 -----TVFSFFNTAQSNSSLFSSGDEADRPAN-----IRVYDIADGVPEGYVFSGRPQEAIELEFLQAAP-----
UGT78D3      41 -----TVFSFFSTARSNSSLSS----DIPTN-----IRVHNVDGVPPEGFVLTGNPQHAVELFLEAAP-----
UGT78D1      42 -----TIFSFFNTARSNASLFS----DHPEN-----IKVHDVSDGVPEGTMLG-NPLEMVELFLEAAP-----
UGT71B1      32 -----RLSVTLIVIPSRVSDDASS-----VYTNSE-----DRLRYILLPAR-----DQTTDLVSYIDSQ-----K
UGT71B2      32 -----HLSITIIIIIPQMHGFSNNSSSYIASLSSDSE-----ERLSYNVLSVDPKPDSD---DTKPHFFDYIDNF-----K
UGT71B7      32 -----RLSISVIIILPFISEGEVGASDYIAALSASSNN-----RLRYEVI SAVDQPTI-----EMTTIEIHMKNQ-----E
UGT71B8      33 -----RLSISIIIIPLLSGDDVSASAYISALSAAASND-----RLHYEVI SDGDQP-----TVGLHVDNH-----I
UGT71B6      32 -----NLSITVIIISFSSKN-----TSMITSLTSNN-----RLRYEII SGGDQQPT-----ELKATDSHIQSL-----K
UGT71B5      32 -----RLSITIIIIIPSRFDAGDASACIASLTTLSQDD-----RLHYESISVAKQPPTSD---PDPVPAQVYIEKQ-----K
UGT71C1      37 -----RIHTITILYWGLPFIPOADTIAFLRSLVKNEPR-----IRLVTLPPEVQDPPPMELFVEFAESYILEYVKKM-----V
UGT71C2      37 -----RIHTITILHWSLPPFLPQSDTIAFLKSLIETESR-----IRLITLPDVPQNPMPMELFVKASESYILEYVKKM-----V
UGT71C3      34 -----RIHTITILYWALPLAP--QAHLFAKSLVASQPR-----IRLLALPDVQNPPELLEFFKAPEAYILESTKKT-----V
UGT71C4      34 -----RIHTITILNLSPPSSP--HASVFARSLIASQPK-----IRLHDLPIQDPPPFDLYQRAPEAYIVKLIKKN-----T
UGT71C5      33 -----RISMITILSMNLPYAP--HADASLASLTASEPG-----IRIISLPEIHDPPP IKLLDTSSETYILDFIHKN-----I
UGT71D1      33 -----RIRITILLMKLQGGQSHLDTYVKSIASSQPF-----VRFIDVPELEEKP-TLG-TQSVEAYVYDFIETN-----V
UGT71D2      33 -----RIRITFLMKQQGQSHLDSYVKTISSSLPF-----VRFIDVPELEEKP-TLG-TQSVEAYVYDFIETN-----V
UGT72B2      36 -----FTVTMIISGETSPSKAQRSVLNSLPSS-----IASVFLPPADLSDVPST-ARIETRAMLTMTRS-----N
UGT72B3      36 -----FTVTFIIPGDSPPSKAQRSVLNSLPSS-----IASVFLPPADLSDVPST-ARIETRISLTVTRS-----N
UGT72B1      36 -----LTVTFVIAGEGPPSKAQRVLDLSDLPSS-----ISSVFLPPVDLTDLSSS-TRIESRISLTVTRS-----N
UGT72E2      35 -----FHVTIVFVLETDASAQSKFLNSTG-----VDIVKLPSPDIYGLVDPDDHVVTKIGVIMRAA-----V
UGT72E3      35 -----FHVTIVFVLETDASVQSKLLNSTG-----VDIVNLPSPDISGLVDPNAHVVTKIGVIMREA-----V
UGT72E1      26 -----FDVTIFVLETDASAQSQFLNSPGCDAA-----LVDIVGLPPTPDISGLVDP SAFFGIKLLVMMRET-----I
UGT72D1      33 -----IHVTIILAVTSGSSSPTEETAIAHAAAART-----ICQITEIPSVVDVNDLVEPDATIFTKMVVKMRAM-----K
UGT72C1      32 -----FDRVTVFLVTDVSRKSLIGKTLMEED-----PKFVIRFIPLDVS-GQDLSGSLLTKLAEMMRKA-----L
UGT73B2      38 -----AKSTILTTSLNSKILQKPIDTFKLNLPG-----LEIDIQIFNFPCVELGLPEGCENVDFFTSNNNDKKNEMIV
UGT73B3      37 -----AKSTILTTPLNSKIFQKPIERFKLNLPNS-----FEIDIQIFDFPCVDLGLPEGCENVDFFTSNNNDDRQYLTTL
UGT73B4      34 -----AKSTLLTTPINAKILEKPIEAFKVQNPDP-----LEIGIKILNFPCVELGLPEGCENRDFINSYQKSDSFDLFL
UGT73B5      37 -----AKSTLLTTPINAKIFEKPIEAFKNQNPDP-----LEIGIKIFNFPCVELGLPEGCENADFINSYQKSDSGDLFL
UGT73B1      38 -----AKSTILTTPLNAKLFFEKPIKSFNQDNPG-----LEDITIQILNFPCTELGLPDGCENTDFIFSTPDLNVGDLSDQ
UGT73C3      40 -----GVTITIVTTPHNAARFKNVLNRAIESG-----LAINILHVKFPYQEFGLPEGKENIDSLDST-----ELMV
UGT73C4      40 -----GATVITIVTTRYNAGRFFENVLSRAMESG-----LPINIVHVNFPPYQEFGLPEGKENIDSYDSM-----ELMV
UGT73C2      40 -----GVTITIVTTPHNAARFKDVLNRAIQSG-----LHIRVEHVKFPFQEAAGLQEQENVDLDSM-----ELMV
UGT73C5      38 -----GVIITIVTTPHNAARFKNVLNRAIESG-----LPINLVQVKFPYLEAGLQEQENIDSLDTM-----ERMI
UGT73C6      39 -----GVLITIVTTPHNAARFKNVLNRAIESG-----LPINLVQVKFPYQEAAGLQEQENMDLLTTM-----EQIT
UGT73C1      36 -----GVTITIVTTPQNAGRFFKNVLSRAIQSG-----LPINLVQVKFPSQESGSPEGQENLDLLDSL-----GASL
UGT73C7      35 -----GVTVCIIITTTQNVAKIKTSLS-FSSLF-----ATINIVEVKFSLSQQTGLPEGCESLDMLASM-----GDMV
UGT73D1      39 -----GNIVTIVTTPQNASRFKTVDRARLES-----LEINVVKFPIPYKEFGLPKDCETLDTLPSK-----DLLR
UGT89B1      44 -----LKITVTVLTPKNLPFLSPL--LSAVVN-----IEPLILPFPS-HPSIPSGVENVQDLPPSGF---PLMI
UGT89C1      37 -----ATVTVLTVTPKNSSYLDALRSLHSPEH-----FKTLILPFPS-HPCIPSGVESLQQPLPLEAI---VHMF
UGT89A2      46 -----FNVSIVVTPGNLTYLSPLLSAHPSS-----VTSVVFPPFP-HPSLSPGVENVKDVGNNGN---LPIM
UGT90A1      39 -----PTITVTVFTTPKNQPFISDFLSDTP-E-----IKVISLFPFENITGIPPGVENTEKLPSMS-----LFV
UGT90A4      39 VD-----DEEPTISVTVFTTPKNQPFVSNFLSDVASS-----IKVISLFPFENIAGIPPGVESTDMLPSIS-----LYV
UGT90A2      37 -----DISVTVFTTPLNRPFIVDSLSTGK-----ATIVDVFPFDNVP EIPPGVECTDKLPALSS---SLFV
    
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UGT79B10  33  -----HRITFLIPKKAQKQ--LEHLNLFDP-----SIVFHSLTIPHVDGLPAGAETFSIDIPMLW-----K
UGT79B11  33  -----HRVTFLLPKKAQKQ--LEHQNLFPH-----GIVFHPLVIPHVDGLPAGAETASDIPISLV-----K
UGT79B9   33  -----HRVTFLLPKKAQKQ--LEHHNLFDP-----RIIFHSLTIPHVDGLPAGAETASDIPISLG-----K
UGT79B7   33  -----HRVTFLLPKKAQKQ--LEHHNLFDP-----SIVFHPLTVPPVNGLPAGAETTSIDIPISLD-----N
UGT79B8   33  -----HQITFLLPKKAQKQ--LEHHNLFDP-----SIVFHPLTIPHVNGLPAGAETTSIDISISMD-----N
UGT79B6   33  -----HKITFLLPKKARKQ--LESLNLFDP-----CIVFQTLTIPSVDGLPDGAETTSIDIPISLG-----S
UGT79B4   33  -----HRVTFLLPKKAQKQ--LEPLNLFPN-----SIHFENVTLPHVDGLPVGAETTADLPNSSK-----R
UGT79B5   33  -----HRVTFLLPKKAHKQ--LQPLNLFDP-----SIVFEPLTLPVVDGLPFGAETASDLPNSTK-----K
UGT79B2   34  -----HTVTFLLPKKALKQ--LENLNLFPH-----NIVFRSVTVPHVDGLPVGTETVSEIPVTSI-----D
UGT79B3   34  -----HTVTFLLPKKSLKQ--LEHFNLFPH-----NIVFRSVTVPHVDGLPVGTETASEIPVTST-----D
UGT79B1   40  -----HKIVFLLPKKALNQ--LEPLNLYPN-----LITFHTISIPQVKGLPPGAETNSDVPFFLT-----H
UGT91B1   36  -----HTVSFISTARNISR-LPNISSDLS-----VNFVSLPLSQTVDHLPENAEATTDVPEITHI-----A
UGT91C1   37  -----HKISFISTPRNIER-LPKLQSNLASS-----ITFVSFPLPP-ISGLPPSSESSMDVPYNKQ-----Q
UGT91A1   42  -----HKVSFISTPRNIDRLLPWLLENLSSV-----INFVKLSLPPVGDNKLPEDEGATTDVPEFELI-----P
UGT86A1   37  -----FTITFVNTDSIHHSIHTAHQDDAGDIFS-AARSSGQHDIRYTTVSDGFP-LDFDRSLNHDQFFEGI-----
UGT86A2   45  -----LTVTFVNTYIHHQITNGSD---GDIFA-GVRSEGLDIRYATVSDGLP-VGFDRSLNHDTRYQSSL-----
UGT87A1   42  -----LTVTFVVTTEEWLGFIGSDPK-----PNRIHFATLPNIIP-SELVRANDFIAFIDAV-----
UGT87A2   42  -----LHVTFVVTTEEWLGFIGPDPK-----PDRIHSTLPNLIIP-SELVRAKDFIGFIDAV-----
UGT85A2   37  -----FHTTFVNTVYNHNRLLRSRG-----PNAVDGLPSFRFESIPDGLPETDVDVTQDIPTLCEST-----
UGT85A3   40  -----FHVTFVNTVYNHNRLLRSRG-----ANALDGLPSFQFESIPDGLPETGVDATQDIPALSEST-----
UGT85A1   40  -----FYVTFVNTVYNHNRFLRSRG-----SNALDGLPSFRFESIADGLPETDMDATQDITACEST-----
UGT85A7   40  -----FHVTFVNTLYNHNRLLRSRG-----PNALDGFPSFRFESIPDGLPETDGDRTQHTPTVCMSI-----
UGT85A5   40  -----FHVTFVNTNYNHNRLLRSRG-----PNSLDGLPSFRFESIPDGLPEENKDMQDVPTLCEST-----
UGT85A4   40  -----FHVTFVNTDYNHRRILQSRG-----PHALNGLPSFRFETIPDGLPWTDVDQAKQDMLKLDST-----
UGT74E1   35  -----ITLVLVSDKPSPPYKTEHDT-----ITVVPISNGFQEGQERSE--DLDEYMER-----VE
UGT74E2   35  -----LTLVLVSDKPSPPYKTEHDS-----ITVFPISNGFQEGEPLQ--DLDDYMER-----VE
UGT74D1   37  -----VTFLLTTSSTHNSILRRAITGGAT-----ALPLSFPVPIIDGFEEDHPSTD--TSPDYFAK-----FQ
UGT74C1   37  -----STLIIASKDHREPYTSDDYS-----ITVHTIHDGFFP-HEHPH--AKFVDLDR-----FH
UGT74F1   36  -----TTHLTLTTFIFNTIHLDPSSP-----ISIATISDGYDQGGFSSAG-SVPEYLQN-----FK
UGT74F2   36  -----TTLALTTFFVFNINPDLSP-----ISIATISDGYDHGGFETAD-SIDDYLKD-----FK
UGT74B1   40  -----VTIATTTYTASSITTP-----SLSVEPISDGFDFIPIGIPGFSVDTYSES-----FK
UGT75B1   33  -----ARVTFVTCVSVFHNSMIANHNK-----VENLSFLTFSDFDDGGISTYEDRQKR-----SVNLK
UGT75B2   33  -----ARVTFATCLSVIHRSMIPNHNN-----VENLSFLTFSDFDDGVISSNTDDVQNR-----LVHFE
UGT75D1   42  -----ARVTFASISAYNRRMFSTENV-----PETLIFATYSBGHDDGFKSSAYSDKSRQDATGNFMSEMR-----
UGT75C1   41  -----TVTYSTAVSAHRRMGEPSS-----TKGLSFAWFTDGFDDGLKSFEDQKIYMS-----ELK
UGT84A3   37  -----VTFVTTEKPGKMRQANKIQDGV-----LKPVGGLGFRFIRFEFFSDGFADDD-EKRFDFDAFRP-----HLE
UGT84A4   38  -----VTFVTTEEPKMRQANNIQDGV-----LKPVGGLGFLRFIRFEFFEDGFVY-----KEDFDLLQK-----SLE
UGT84A2   41  -----ITFVTTES-WGKKMRISNKIQDRV-----LKPVGKGYLRYDFFDDGLPEDDEASRTNLTILRP-----HLE
UGT84A1   42  -----VTFVTTEL-WGKKMRQANKIVDGE-----LKPVGSGSIRFIRFEFFDEEWAEDD-DRRADFSLYIA-----HLE
UGT84B1   39  -----LHINLATIESARDLLS-TVEKP-----RYPVDLVFFSDGLPKED--PKAPETLLK-----SLN
UGT84B2   37  -----LHFTLATTEQARDLLSSTADEP-----HRPVDLAFFSDGLPKDD--PRDPDTLAK-----SLK
UGT76C3   37  -----ITVIHTRFNAPKA--SNHPLFTFLQIPD-----GLSETETRTHDITLLLTLLNRSCEP-----
UGT76C4   37  -----ITVIHTCFNAPKA--SSHPLFTFIQIQD-----GLSETETRTRDVKLLITLLNQNCEP-----
UGT76C5   37  -----ITVIHTCFNAPKA--SSHPLFTFLEIPD-----GLSETEKRTNNTKLLLTLLNRNCEP-----
UGT76C2   38  -----ITVIHTRFNAPKA--SSHPLFTFLQIPD-----GLSETEIQDG-VMSLLAQINLNAESP-----
    
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UGT76C1  37  -----ITIIHTRFNAPKS--SDHPLFTFLQIRD-----GLSESQTQSRDLLLQLTLLNNCQIP-----
UGT76B1  38  -----ITVIHTEFNPNPNS--SNFPHFTFVSIPD-----SLSE-PESYPDVIEILHDLNSKCVAP-----
UGT76F1  37  -----VTILHTSFNFPDP--SRHPQFTFRTITH-----KNEGEEDPLSQSETSSGKDLVVLISL-----
UGT76F2  37  -----VTILHTSYNFPDP--SRHPHFTFRTISH-----NKEGEEDPLSQSETSS-MDLIVLVR-----
UGT76E1  38  -----ITVVLTQYNRVSS--SKDFSDFHFLTIPG-----SLTESDLKNLGPFKFLFKLNQICEAS-----
UGT76E2  39  -----ITVVLTQSNRVSS--SKDFSDFHFLTIPG-----SLTESDLQNLGPKQFVFLKLNQICEAS-----
UGT76E4  38  -----ITVAQRQFNQIGSSLQHFPGFDFVTIP-----ESLPQSESKKLGPAEYLMNLNKTSEAS-----
UGT76E6  38  -----ITVVEGQFNKVSS--SQNFPGFQFVTIPDT-----ESLPESVLERLGPVEFLFEINKTSEAS-----
UGT76E5  38  -----ITVALGDSNRVSS--TQHFPGFQFVTIP-----ETIPLSQHEALGVVEFVVTLNKTSETS-----
UGT76E3  38  -----IIVPQGEFNRVNS--SQKFPGFQFITIP-----DSELEANGPVGSLTQLNKIMEAS-----
UGT76E11 38  -----ITIAQTKFNYPSPSDDFT-DFQFVTIP-----ESLPESDFEDLGP IEF LHKLNKECQVS-----
UGT76E12 38  -----ITVVQTKFNYPSPSDDFT HDFQFVTIP-----ESLPESDFKNLGPIQFLFKLNKECKVS-----
UGT76E7  39  -----ITVVQTKFNYLNPSSNDLS-DFQFVTIP-----ENLPVSDLKNLGPRFLIKLANECYVS-----
UGT76E9  39  -----ITVAQTKFNYLKPSKDLA-DFQFITIP-----ESLPASDLKNLGPPVWFLKLNKECEFS-----
UGT76D1  37  -----ITIVRNEFN-FKDI SHNFPGIKFFT IKD-----GLSESDVKSLGLLEFVLELNSVCEPL-----
UGT81B1  28  -----ISTVEDEYIHRQRSSDYEKESRLRKR-----GLEDKEEVMEMEQMGAERIKTVLILMSDTG-----G
UGT81B2  26  -----VTSGDGEKTHR--HTHHIHRIKSYD-----DIDEDESLELIQIGAERTKNVILILMSDTG-----G
UGT81A1  97  -----VVPESFASVGGVGLSSDENGIRENGT-----GGV LGEEGLPLNGVEADRPKKVLILMSDTG-----G
UGT88A1  34  -----LSIHIILVPPPYQPESTATYISSVSSS-----FPSITFHHLPAVTPYSSSSTSRHHHES-----L
UGT83A1  40  -----IQITFINTEFNHNRIISSLPNSPHEDYVG-----DQINLVSIPDGLSDSPEERNIPGKLSSESVLR-----
UGT82A1  37  -----PVVMTPEIHRRI SATNEDLG-----ITFLALSDGQDRPDAPPSPDFFSIENSMEN-----
UGT92A1  40  -----RANKTTISMINTPSNIPKIRSNLPPSS-----ISLIELPFNSSDHGLPHDGENFDSL PYSLVIS-----LL
consensus 101  .. .
    
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UGT80A2 174 NGVCADESIDGVDLQYIPPMQIVMLIVGTRGDVQPFVAIAKRLQDYGHRVRLATHANFKEFVLTAGLEFYPLGGDPKVLVAGYMVKNKGFLPSG----PSE

UGT80A3 138 STITYEKSLT-ESFRSIPRLKIAILLVVGTRGDVQPFLLAMAKRLQEFGHRVRLATHANFRSFRVRAAGVEFYPLGGDPRELAAYMARNKGLIPSG----PSE

UGT78D2 100 -----ENFRREIAKAETEVEGTEVKCLMTDAFFFWFAAD-MATEINASWIAFWTAGANSLSAHLYTDLIRETIGVKHVGGERMEETIGVISGMEK-----

UGT78D3 96 -----EIFRREIKAAETEVEGRKFKCILTDAFLWLAAETAAMKASWVAYYGGGATSLTAHLYTDARENVGKHEVGGERMEETIGFISGMEK-----

UGT78D1 96 -----RIFRSEIAAAEIEVGKVKTCMLTDAFFFWFAAD-IAAELNATVWAFWAGGANSLCAHLYTDLIRETIGLKLIV--SMEETLGFIPGMEN-----

UGT71B1 83 PQVRVAVSVKAVGDVS--TRSDSRLAGIVVDMFCTSMIDIA-DEFNLSAYIFYTSNAYSILGLQFHVQSLYDEKELDVSE-FKDT-EMKFVDVPTLTQPFPA-

UGT71B2 95 PQVKATVEKLTDPGP--PDSPSRLAGFVVDMMFCMMIDVA-NEFGVPSYMEFYTSNATFLLGLQVHVEYLYDVKNYDVSD-LKSDTTELEVPCLTRPLPV-

UGT71B7 92 PKVRSVAVKLEEDYSS-KPDSPKIAGFVLDMFCMSMVDVA-NEFGVPSYMEFYTSNAGILSVTYHVQMLCDEKNYDVSENDYADSEAVLNFPPLSRPYPV-

UGT71B8 88 PMVKRTVAKLVDDYSR-RPDSPRLAGLVVDMFCISVIDVA-NEVSVPCYLYFYTSNVGILALGLHIQMLFDKKEYSVSETDFEDSEVVDVPSLTCPYPV-

UGT71B6 86 PLVRDAVAKLVDDST---LPDAPRLAGFVVDMYCTSMIDVA-NEFGVPSYLYFYTSNAGFLGLLLHIQFMYDAEDIYDMS-ELESDVELVVPVSLTSPYPL-

UGT71B5 95 TKVRDAVAARIVDP-----TRKLAGFVVDMMFCSSMIDVA-NEFGVPCYMYVYTSNATFLLGTMLHVQQMYDQKKYDVSELENSVT--ELEFPVSLTRPYPV-

UGT71C1 104 PIIREALSTLLSSRDE--SGSVRVAGLVLDFFCVPMIDVG-NEFNLPYIFLTCASAGFLG---MMKYLPERHREIKSEFNRSFNEELNLIPIGVNSVPT-

UGT71C2 104 PLVRNALSTLLSSRDE--SDSVHVAGLVLDFFCVPLIDVG-NEFNLPYIFLTCASAGFLG---MMKYLPERHREIKSEFNRSFNEELNLIPIGVNSVPT-

UGT71C3 99 PLVRDALSTLVSSRKE--SGSVRVVGLVIDFFCVPMIEVA-NELNLPYIFLTCNAGFLS---MMKYLPERHRITTELDLSSGNVEHPPIPGYVCSVPT-

UGT71C4 99 PLIKDAVSSIVASRRGG-SDSVQVAGLVLDLFCNSLVKDVGNELNLPYIYLTCNARYLG---MMKYIPDRHRKIASEFDLSSGDEELHPIPAFVNRVPA-

UGT71C5 98 PCLRKTIQDLVSSSSSSGGSSHVAGLILDFFCVGLIDIG-REVNLPYIFMNTSNFGLG---VLQYLPERQRLTPSEFDESSGEEELHIPAFVNRVPA-

UGT71D1 96 PLVRNIVMDILTSLALD---GVKVKGLVVDFFCLPMDIVA-KDISLBPYVVELTNSGFLA---MMQYLADRHSRDTSVFVRNS-EEMLSIPGFVNPVPA-

UGT71D2 95 PLVQNIIMGILSSPAFD---GVTVKGFVADFFCLPMDIVA-KDASLBPYVVELTNSGFLA---MMQYLAYGHKKDTSVVFARNS-EEMLSIPGFVNPVPA-

UGT72B2 95 PALRELFGSLSTKKSLSL-----PAVLVVDMMFGADAFDVAVDVHVSP-YIFYASNANVLSFFLHLPKLDK----TVSCEFRLTEPLKIPGCVPIITGKD-

UGT72B3 95 PALRELFGSLSAEKRL-----PAVLVVDLFGTDADFVAEEFHVSP-YIFYASNANVLTFLHLPKLDK----TVSCEFRELTEPLKIPGCVPIITGKD-

UGT72B1 95 PELRKVFDSFVEGGRL-----PTALVVDLFGTDADFVAVEFHVSP-YIFYPPTANVLSFFLHLPKLDK----TVSCEFRELTEPLMLIPGCVPVAGKD-

UGT72E2 92 PALRSKIAAMHQK-----PTALIVDLFGTDALCLAKEFNMLS-YVFIPTNARFLGVSIIYPNLDK----DIKEEHTVQRNPLAIPGCEPVRFED-

UGT72E3 92 PTLRSKIVAMHQK-----PTALIIDLFGTDALCLAAELNMLT-YVFIASNARYLGVSIYYPTLDE----VIKEEHTVQRKPLTIPGCEPVRFED-

UGT72E1 88 PTRSKIEEMQHK-----PTALIVDLFGGLDAIPLGGEFNMLT-YIFIASNARFLAVALFFPTLDE----DMEEHI IKKQPMVMPGCEPVRFED-

UGT72D1 95 PAVRDAVKLMKRK-----PTVMIVDLFGTELMVSVADDVGMTAKYVYVPTHAWFLAVMVYLPVLDT----VVEGEYVDIKEPLKIPGCKPVGPKE-

UGT72C1 93 PEIKSSVMELEPR-----PRVFVVDLLGTEALEVAKELGIMRKHVIVTTSAWFLAFTVYMASLKD----QELYKQLSSIGALLIPGCSPVKFER-

UGT73B2 106 KFFFSTRFFKDQLEKLLGTTR---PDCLIAMFFFPWATEAAGKFNVPRLVPHGTGYFSLCAGYCI GVHQPQKRVASSS---EPFVIPDLP-----

UGT73B3 105 KFFKSTRFFKDQLEKLLTTR---PDCLIAMFFFPWATEAAEKFNVPRLVPHGTGYFSLCSEYCI RVHNPQNIVASRY---EPFVIPDLP-----

UGT73B4 102 KFLFSTKYMKQQLSFIEETTK---PSALVADMFFFPWATESAEKIGVPRVPHGTSSFALCCSYNMR IHKPHKKVASSS---TPFVIPGLP-----

UGT73B5 105 KFLFSTKYMKQQLSFIEETTK---PSALVADMFFFPWATESAEKLGVPRLVPHGTSSFFSLCCSYNMR IHKPHKKVATSS---TPFVIPGLP-----

UGT73B1 108 KFLLAMKYFEEPLEELLVTMR---PDCLVGNMFFFPWSTKVAEKFGVPRVPHGTGYFSLCASHCIRLPKN---VATSS---EPFVIPDLP-----

UGT73C3 101 PFFKAVNLEDPVMKLMEMK-PRPSCII SDWCLPYTYSI IAKNFNIPKIVFHGMGCFNLLCMHVLRRNLEILENVKSDE--EYFLVPSFP-----

UGT73C4 101 PFFQAVNMLEDPVMKLMEMK-PRPSCII SDLLPYTSKIARKFSIPKIVFHGTGCFNLLCMHVLRRNLEILKNLKSDE--DYFLVPSFP-----

UGT73C2 101 HFFKAVNMLENPMKLMEMK-PKPSCLISDFCLPYTSKIARKFNIPKIVFHGMGCFCLLMSHILHRNHNILHALKSDK--EYFLVPSFP-----

UGT73C5 99 PFFKAVNMLEEPVQKLIEMN-PRPSCII SDCLPYTSKIARKFNIPKILFHGMGCFCLLMSHILHRNHNILHALKSDK--ELFTVPDFP-----

UGT73C6 100 SFFKAVNLLKEPVQNLIEMMS-PRPSCII SDMCLSYTSEIAKKFKIPKILFHGMGCFCLLMSHILHRNHNILHALKSDK--EYFIVPYFP-----

UGT73C1 97 TFFKAFSLLEEPVEKLLKEIQ-PRPNCLIAMCLPYTNRIAKNLGIPKILFHGMCCFNLLCTHIMHQNHETFLETIESDK--EYFIPNFP-----

UGT73C7 95 KFFDAANSLEEQVEKAMEEMVQPRPSCII GDMSLPFTSR LAKKFKIPKILFHGMGCFCLLMSHILHRNHNILHALKSDK--EYFDLPGLP-----

UGT73D1 101 RFYDAVDKLEQEPMERFLEQQD-IPPSCII SDKCLFWTSRTAKRFKIPRIVFHGMCCFSLSSHNIHLHSPHLS-VSSAV--EPFPPIPGMP-----

UGT89B1 101 HALGNLHAPLISWITSHPSP---PVAVSDFFLGTWTKNLGIPRFDSPSAAITCCILNTLWIEPMTKINEDDDN-----EILHFPKIPN-----C

UGT89C1 96 DALSR LHDP LVDFLSRQPPSD---LPDAILGSSFLSPWINKVADAFSISK-----

UGT89A2 104 ASLRQLREPIINWFQSHPNP----PIALISDFFLGWTHDLCNQIGIPRFAFBSISFFLVSVLQFCFENIDLKST-----DPIHLLDLPR-----A

UGT90A1 97 PFTRATKLLQPFEEETLKTLP--KVSFMVSDGFLWWTSESAAKFNIPRFVSYGMNSYSAAVSVFVKHELFTPEPE-SKSDTEPVTVPDFPW-----I

UGT90A4 103 PFTRATKSLQPFEEAELKNLE--KVSFMVSDGFLWWTSESAAKFPIPRFAFYGMNSYASAMCSAISVHELFTKPESVKSDTEPVTVPDFPW-----I

UGT90A2 95 PFTRATKSMQADFERELMSLP--RVSFMVSDGFLWWTQESARKLGFPRLVPHFGMNCAS TVICDSV FQNQLLSNVK---SETEPVSVPEFPW-----I

UGT79B10 87 FLPPAIDLTRDQVEAAVSALS---PDLILFDIA-SWVPEVAKEYRVKSMYNIISATSIAHDFVPG-----GELGVPPPYPGYS-----S  
 UGT79B11 87 FLSIAMDLTRDQIEAAIGALR---PDLILFDLA-HWVPEMAKALKVKSMYLVMSATSIAHDLVPG-----GELGVAPPYPGYS-----S  
 UGT79B9 87 FLTAAMDLTRDQVEAAVRALR---PDLIFFDFTA-YWVPEMAKEHRVKSIVYFVVISANSIAHELVPG-----GELGVPPPYPGYS-----S  
 UGT79B7 87 LLSKALDLTRDQVEAAVRALR---PDLIFFDFA-QWIPDMAKEHMIKSVSYIIVSATTIAHTHVPG-----GKLGVRPPYPGYS-----S  
 UGT79B8 87 LLSEALDLTRDQVEAAVRALR---PDLIFFDFA-HWIPEIAKEHMIKSVSYMIVSATTIAYTFAPG-----GVLGVPPPYPGYS-----S  
 UGT79B6 87 FLASAMDRTRIQVKEAVSVGK---PDLIFFDFA-HWIPEIAREYGVKSVNFIITISAACVAISFVPGRS-----QDDLGSTPPYPGYS-----S  
 UGT79B4 87 VLADAMDLLREQIEVKIRSLK---PDLIFFDFV-DWIPQMAKELGIKSVSYQIISAAFIAMFFAPR-----AELGSPPPGFPYS-----S  
 UGT79B5 87 PIFVAMDLLRDQIEAKVRALK---PDLIFFDFV-HWVPEMAEEFGIKSVNYQIISAACVAMVLAPR-----AELGFPPPDYPL-----S  
 UGT79B2 88 LLMSAMDLTRDQVEGVVRAVE---PDLIFFDFA-HWIPEVARDFGLKTVKYVVVSASTIASMLVPG-----GELGVPPPYPGYS-----S  
 UGT79B3 88 LLMSAMDLTRDQVEAVVRAVE---PDLIFFDFA-HWIPEVARDFGLKTVKYVVVSASTIASMLVPG-----GELGVPPPYPGYS-----S  
 UGT79B1 94 LLAVAMDQTRPEVETIFRTIK---PDLVFYDSA-HWIPEIAKPIGAKTVCFNIVSAAASIALSLVPSAEREVIDGKEMSGEELAKTPLGYPS-----S  
 UGT91B1 90 YLKKAFDGLSEAFTEFLEASK---PNWIVYDILHHWVPPIAEKLGVRRATICTFNAAASIIIGGPASVMIQGHDRPKTAEDLIVPPPVPWF-----E  
 UGT91C1 92 SLKAAFLLQPPLEKFLRRSS---PDWIIYDYASHWLPISAAELGISKAFPSLFNAAATLCFMGPSSSLIEEIR---STPEDFTVVPVVPWF-----E  
 UGT91A1 99 YLKIAYDGLKVPVTEFLESSK---PDWVLODFAGFWLPPISRRLGIKTGFPSAFNGATLILKPPG----FEEYRTSPADFMKPPKVPWF-----K  
 UGT86A1 101 LHVFSAHVDDLIAKLSRR-DDPPVTCLIAIDTFYVWSSMICDKHN-LVNVSEWTEPALVNLNLYHMDLLISNGHFKSLDNKRDVIDYVP-----GV  
 UGT86A2 106 LHVFYAHVEELVASLVG---GDGGVNVMIADTFYVWPSVVARKFG-LVCSSEWTEAALVFSLYYHMDLLRIHGHFQAQETRSDLIDYIP-----GV  
 UGT87A1 92 LTRLEEPFEQLLDRLNS----PP-TAIIADTYIIWAVRVGTRKRN-IPVASEWTTSATIISLFINSDLLASHGHFPIEPSESKLDEIVD-----YI  
 UGT87A2 92 YTRLEEPFEKLLDSLNS----PPSVIFADTYVIWAVRVGRKRN-IPVVSLLWTSATILSFFLHSDLLISHGHALFEPSE---EEVVD-----YV  
 UGT85A2 94 MKHCLAPFKELLRQINARDDVPPVSCIVSDGMSFTLDAAEELG-VPEVLFWTTTSCGFLAYLYYRFIEKGLSPIKDESYLTKHELD-TKID----WI  
 UGT85A3 97 TKNCLVPFKLLQRIVTREDVPPVSCIVSDGMSFTLDVAEELG-VPEIHFWTTTSCGFMAYLHFYLFIEKGLCPVKDASCLTKEYLD-TVID----WI  
 UGT85A1 97 MKNCLAPFRELLQRINAGDNVPPVSCIVSDGMSFTLDVAEELG-VPEVLFWTTTSCGFLAYLHFYLFIEKGLCPLKDESYLTKYELEDTVID----FI  
 UGT85A7 97 EKNCLAPFKEILRRINDKDDVPPVSCIVSDGMSFTLDAAEELG-VPEVIFWTTNSACGFMITLHFYLFIEKGLSPFKDESYSMSKEHL-DTVID----WI  
 UGT85A5 97 MKNCLAPFKEILRRINTTKDVPVSCIVSDGMSFTLDAAEELG-VPDVLFWTPSACGFLAYLHFYRFIEKGLSPIKDES-----SLD-TKIN----WI  
 UGT85A4 97 INNCLAPFKDLILRLNSGSDIPPVSCIISDASMSFTIDAAEELK-IPVLLWTTNSATALLYLHYQKLEKEIIPKDESDDLKKHLET---EID----WI  
 UGT74E1 83 SSIKNRLPKLIED---MKLSGNPPRALVYDSTMPWLLDVAHSYG-LSGAVFETQPWLVSALYYHVFKGSFVSPSTKYGH-STLASFPSPPLI-----E  
 UGT74E2 83 TSIKNRTPKLVED---MKLSGNPPRALVYDSTMPWLLDVAHSYG-LSGAVFETQPWLVTALYYHVFKGSFVSPSTKYGH-STLASFPSPFPM-----E  
 UGT74D1 91 ENVSRSLSELISS---MDP---KPNNAVYDSCLPYVLDVCRKHPGVAAASEFTQSSTVNATYIHFRLRGEFKEFQN-----DVLVLPAMP-----E  
 UGT74C1 84 NSTSRSLTDFISS---AKLSDNPPKALIYDPPMPFALDIADLD-LYVVAYFTQPWLASLVYYHINEGTYDVPVDRHEN-PTLASFPGFPL-----E  
 UGT74F1 85 TFGSKTVADIIRK---HQSTDNPITCIVYDSFMPWALDLAMDFG-LAAAPFETQSCAVNYINLYSYINNGSLTLP-----IKDLPL-----E  
 UGT74F2 85 TSGSKTIADIIQK---HQSTDNPITCIVYDAFLPWALDVAREFG-LVATPFFETQPCAVNYVYLYSYINNGSLQLP-----IEELPF-----E  
 UGT74B1 87 LNGSETLTLLEIK---FKSTDSPIDCLYDSEFLPWGLEVARSMELSAASEFTNNLTVCVSVLRKFSNGDFPLPAD--PN-SAPFRIRGLPS-----E  
 UGT75B1 87 VNGDKALSDFIEA---TKNGDSPVTCLYITILLNWAPKVARRFQ-LPSALLWIQPAAAFVFNIIYYTHFMGNK-----SVFELPNLSS-----E  
 UGT75B2 87 RNGDKALSDFIEA---NQNGDSPVSCLYITILLNWVPKVARRFH-LPSVHLWIQPAAAFVFNIIYYNYSTGNN-----SVFELPNLPS-----E  
 UGT75D1 103 RRGKETLTELIED---NRKQNRPFCTCVYITILLTWVLAELAREFH-LPSALLWVQPVTVFSLFYHYFNGYEDAISEMANTPSSIKLPSLPL-----E  
 UGT75C1 91 RCGSNALRDIKANLDATTEPETITGVYISVLVWVSTVAREFH-LPTLLWIEPATVLDIYYYYFNNTSYKHLFD-----VEPIKLPKLP-----E  
 UGT84A3 97 AVGKQEIKNLVKRY--NKE---PVTCLINNAFVPWVCDVAEELH-IPSAVLWVQSCACLTAYYYYYHHRLVKFPPTKTEP--DISVEIPCLPL-----E  
 UGT84A4 94 VSGKREIKNLVKRY--EKQ---PVRCLINNAFVPWVCDIAEELQ-IPSAVLWVQSCACLAAYYYYYHHQLVKFPPTETEP--EITVDVPFKPLT-----E  
 UGT84A2 101 LVGKREIKNLVKRY--KEVTKQPVTCINNPVSVWCDVAEDLQ-IPCAVLWVQSCACLAAYYYYYHHNLVDFPTKTEP--EIDVQISGMPL-----E  
 UGT84A1 101 SVGIREVSKLVRRY--EEAN-EPVSCINNPPIPWVCHVAEEFN-IPCAVLWVQSCACFSAYYHYQDGSVSPPTETEP--ELDVKLPCVVP-----E  
 UGT84B1 89 KVGAMNLSKIIIEK--RYS-----CIISPPFTPWVPAVAASHN-ISCAILWVQACGAYSVYYRYMKTNSFPDLEDL--NQTVELPALPL-----E  
 UGT84B2 88 KDGAKNLSKIIIEK--RFD-----CIIISVPFTPWVPAVAASHN-IPCAILWVQACGAFSVYYRYMKTNPFPDLEDL--NQTVELPALPL-----E  
 UGT76C3 89 -FRECLTKLLQSADSETGEEKQRISCLIDDSGW-IFTQPVQSFNLPRLVNLNTYKVSFFRDHFVLPQLRREMYLP-LQDSEQG-DDPVEEFP-----E  
 UGT76C4 89 -VRECLRKLQSAK----EEKQRISCLINDSGW-IFTQHLAKSLNLMRLAENTYKISFFRSHFVLPQLRREMYLP-LQDSEQ--DDPVEKFP-----E  
 UGT76C5 89 -FRECLSKLLQSADSETGEEKQRISCLIDDSGW-MFTQPIAQSLKLPILLVLSVFTVSFFRCQFVLPKLRREVLYLP-LQDSEQ--EDLVQEF-----E  
 UGT76C2 89 -FRDCLRKVLLESK-----ESERVTCCLIDDCGW-LFTQSVSESLKLPRLVNLCTFKATFFFNAYPSLPLIRTKGYLP-VSVLESEAEDEVPEFP-----E



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UGT76C1      89 -FRECLAKLIKPS--DSGTEDRKISCVIDDSGW-VFTQSVAESFNLPRFVLCAYKFSFFLGHFLVPQIRREGFLP-VPVSDSEADDLVPEFP-----
UGT76B1      89 -FGDCLKKLISEEP-----TAACVIVDALW-YFTHDLTEKFNPRIVLRTVNLSAFVAFSKFHVLREKGYLS-LQFTKAD--SPVPELP-----
UGT76F1      89 -LKQYYTEPS---LAEVGEGGTVCCLVSDALWGRNTEIVAKEIGVCTMVMRTSGAATFCAYTAFPLLDKGYLP-IQGSRLD--ELVTELP-----
UGT76F2      88 -LKQRYAEPFRKSVAAEVGGGETVCCLVSDAIWGNTEVVAEEIGVRRVLRTGGASSFCFAAAFPLLRDKGYLP-IQDSRLD--EPVTELP-----
UGT76E1      91 -FKQCIGQLLQE-----QGN-DIACVVYDEYM-YFSQAAVKEFQLPSVLFSTTSATAFVCRSVLSRVNAESFLLDMKDP-KVSDKEFPGLH-----
UGT76E2      92 -FKQCIGQLLHE-----QCNNDIACVVYDEYM-YFSHAAVKEFQLPSVVFSTTSATAFVCRSVLSRVNAESFLIDMKDP-ETQDKVFPGLH-----
UGT76E4      92 -FKECISQLSMQ-----QGN-DIACIIYDKLM-YFCEAAAKEFKLPSVIFSTSSATIQVCYCVLSELSAEKFLIDMKDP-EKQDKVLEGLH-----
UGT76E6      93 -FKDCIRQSLQ-----QGN-DIACIIYDEYM-YFCGAAAKEFNLPSVIFSTQSATNQVSRVLRKLSAEKFLVDMEDP-EVQETLVENLH-----
UGT76E5      91 -FKDCIAHLLLQ-----HGN-DIACIIYDELM-YFSEATAKDLRIPSVIFTTGSATNHVCSCILSKLNAEKFLIDMKDP-EVQNMVVENLH-----
UGT76E3      87 -FKDCIRQLLKQ-----QGN-DIACIIYDEFM-YFCGAVAEELKLPNFIFSTQTATHKVCNVLSKLNAKKYLIDMEEH-DVQNKVVENMH-----
UGT76E11     91 -FKDCLGQLLLQ-----QNEIACVVYDEFM-YFAEAAAKEFKLPNVIFSTTSATAFVCRSAFDKLYANSILTPLKHPKGQQNELVPEFH-----
UGT76E12     92 -FKDCLGQLVLQ-----QSNEISCVIYDEFM-YFAEAAAKECKLPNIIFSTTSATAFACRSVFDKLYANNVQAPLKEITKGQQEELVPEFY-----
UGT76E7      92 -FKDLLGQLLVN-----EEEEIACVIYDEFM-YFVEVAVKEFKLRNVILSTTSATAFVCRFVMCELYAKDGLAQLKEGGEREVELVPELY-----
UGT76E9      92 -FKECLGQLLLQKQ---LIPEEEIACVIYDEFM-YFAEAAAKEFNLPKVIFSTENATAFACRSAMCKLYAKDGLAPLKEGCGREEELVPKLH-----
UGT76D1      90 -LKEFLTNHDDV-----VDFIIYDEFV-YFPRRVAEDMNLPKMVESPSSAATSISRCVLMENQSNGLLPPQDAR-SQLEETVPEFH-----
UGT81B1      85 GHRASAEAIRDAFKIEFGDDYRIIIIKDVWKEYTGWPLNDMERQYKFMVKHVQLWSVAFHGTSPKWIHKSYLSALAAAYAKEIEAGLMEYKP-----
UGT81B2      81 GHRASAEAIRDAFKIEFGDKYRVIVKDVWKEYTGWPLNDMERSYKFMVKHVQLWKVAFHSTSPKWIHSCYLAATAAYAKEVEAGLMEYKP-----
UGT81A1     154 GHRASAEAIRAAFNQEFGDEYQVFIITDLWDHTPWPFPNQLPRSYNFLVKHGTLWKMFTYYGTSPRIVHQSNFAATSTFIARIEIAQGLMKYQP-----
UGT88A1      89 LLEILCFSNPSVHRTLFSLSRNFNVRAMIIDFCTAVLDITADFTFPVYFFYTSGAACLAFSFYLPTIDETTPGKNLKDIPTVHIPGVPEMKG-----
UGT83A1     100 -FMPKKEELIERMMAETSGGTIISCVADQSLGWAIEVAAKFG-IRRTAFCPAAAASMVLGFSIQKLIDDGLIDSDGTTVRVNKTIQLSSPGMP-----
UGT82A1      87 -----IMPPQLERLLLEEDLDVACVVVDLLASWAIGVADRCGVVAGFWPVMFAAYRLIQAIPELVRTGLVSQKCPRQLEKTIVQPEEQP-----
UGT92A1     102 EASRSLREPFRDFMTKILKEEGQSSVIVIGDFFLGWIGKVCKEVGVYSVIFSASGAFGLGCYRSIWLNLPHKETKQDQFLLDDFPEAGEIEKT-----
consensus   201

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UGT80A2	270	IPIQRNQMKDI IYSLLPACKEPDPDSG I SFKADAI IANPPAYGH THVAEALKIP I H V F F T M P ----- W T P T S E F P H P L S R V K Q P A G Y R L S Y Q I V D S L I W L
UGT80A3	233	ISKQRKQLKAI IESLLPACIEPDLETATSFRAQAI IANPPAYGH V H V A E A L G V P I H I F F T M P ----- W T P T N E F P H P L A R V P Q S A A Y W L S Y I V V D L M V W W
UGT78D2	186	----- I R V K D T P E G V V F G N L D S V F S K M L H Q M G L A L P R A T A V F I N S F E D L D P T L T N N L R S R ----- F K R Y L N I G P L G L L S S -- T L Q Q L V Q D P H G -
UGT78D3	183	----- I R V K D T Q E G V V F G N L D S V F S K T L H Q M G L A L P R A T A V F I N S F E E L D P T F T N D F R S E ----- F K R Y L N I G P L A L L S S P Q T S T L V H D P H G -
UGT78D1	180	----- Y R V K D I P E E V V F E D L D S V F P K A L Y Q M S L A L P R A S A V F I S S F E E L E P T L N Y N L R S K ----- L K R F L N I A P L T L L S S -- T S E K E M R D P H G -
UGT71B1	177	----- K C L P S V M L N K K W F P Y V L G R A R S F R A T K G I L V N S V A D M E P Q A L S F F S G G ----- N G N T N I P P V Y A V G P I M D L E S S G --- D E E K R K -
UGT71B2	190	----- K C F P S V L L T K E W L P V M F R Q T R R F R E T K G I L V N T F A E L E P Q A M K F F S G ----- V D S P L P T V Y T V G P V M N L K I N G P N S S D D K Q S -
UGT71B7	189	----- K C L P H A L A A N M W L P V F V N Q A R K F R E M K G I L V N T V A E L E P Y V L K F L S S S ----- D T P P V Y P V G P L L H L E N Q R D D S K D E K R L -
UGT71B8	185	----- K C L P Y G L A T K E W L P M Y L N Q G R R F R E M K G I L V N T F A E L E P Y A L E S L H S S ----- G --- D T P R A Y P V G P L L H L E N H V D G S K D E K G S -
UGT71B6	180	----- K C L P Y I F K S K E W L T F F V T Q A R R F R E T K G I L V N T V P D L E P Q A L T F L S N G ----- N I P R A Y P V G P L L H L K N V N C D Y V D K K Q S -
UGT71B5	185	----- K C L P H I L T S K E W L P L S L A Q A R C F R K M K G I L V N T V A E L E P H A L K M F N I N ----- G D -- D L P Q V Y P V G P V L H L E N G N D D -- D E K Q S -
UGT71C1	197	----- K V L P S G L F M K E T Y E P W V E L A E R F P E A K G I L V N S Y T A L E P N G F K Y F D R ----- C P D N Y P T I Y P I G P I L C S N D R P -- N L D S S E R D
UGT71C2	197	----- K V L P P G L F T T E S Y E A W V E M A E R F P E A K G I L V N S F E S L E R N A F D Y F D R ----- R P D N Y P P V Y P I G P I L C S N D R P -- N L D L S E R D
UGT71C3	192	----- K V L P P G L F V R E S Y E A W V E I A E K F P G A K G I L V N S V T C L E Q N A F D Y F A R ----- L D E N Y P P V Y P V G P V L S L K D R P S P N L D A S D R D
UGT71C4	194	----- K F M P P G L F N K E A Y E A Y V E L A P R F A D A K G I L V N S F T E L E P H P F D Y F S ----- H L E K F P P V Y P V G P I L S L K D R A S P N E E A V D R D
UGT71C5	193	----- K V L P P G V F D K L S Y G S L V K I G E R L H E A K G I L V N S F T Q V E P Y A A E H F S ----- Q G R D Y P H V Y P V G P V L N L T G R T N P G L A S A Q Y K
UGT71D1	187	----- N V L P S A L F V E D G Y D A Y V K L A I L F T K A N G I L V N S S F D I E P Y S V N H F L ----- Q E Q N Y P S V Y A V G P I F D L K A Q P H P E Q D L T R R D
UGT71D2	186	----- K V L P S A L F I E D G Y D A D V K L A I L F T K A N G I L V N T S F D I E P T S L N H F L ----- G E E N Y P S V Y A V G P I F N P K A H P H P D Q D L A C C D
UGT72B2	182	----- F L D T V Q D R N D D A Y K L L L H N T K R Y K E A K G I L V N S F V D L E S N A I K A L Q E P ----- A P D K ----- P T V Y P I G P L V N T S S S N V N L E D K F
UGT72B3	182	----- F V D P C Q D R K D E S Y K W L L H N V K R F K E A E G I L V N S F V D L E P N T I K I V Q E P ----- A P D K ----- P P V Y L I G P L V N S G S H D A D V N D E Y
UGT72B1	182	----- F L D P A Q D R K D D A Y K W L L H N T K R Y K E A E G I L V N T F F E L E P N A I K A L Q E P ----- G L D K ----- P P V Y P V G P L V N I G K Q E A K Q T E E S
UGT72E2	176	----- T L D A Y L V P D E P V Y R D F V R H G L A Y P K A D G I L V N T W E E M E P K S L K S L L N P ----- K L L G R V A R -- V P V Y P I G P L C R --- P I Q S S E T D H
UGT72E3	176	----- I M D A Y L V P D E P V Y H D L V R H C L A Y P K A D G I L V N T W E E M E P K S L K S L Q D P ----- K L L G R V A R -- V P V Y P V G P L C R --- P I Q S S T D H
UGT72E1	172	----- T L E T F L D P N S Q L Y R E F V P F G S V F P T C D G I I V N T W D D M E P K T L K S L Q D P ----- K L L G R I A G -- V P V Y P I G P L S R --- P V D P S K T N H
UGT72D1	180	----- L M E T M L D R S G Q Q Y K E C V R A G L E V P M S D G V L V N T W E E L Q G N T L A A L R E D ----- E E L S R V M K -- V P V Y P I G P I V R --- T N Q H V D K P N
UGT72C1	178	----- A Q D P R K Y I R -- E L A E S Q R I G D E V I T A D G V F V N T W H S L E Q V T I G S F L D P ----- E N L G R V M R G V P V Y P V G P L V R --- P A E P G - L K H
UGT73B2	190	G N I V I T E E Q I I D G D G E S D M -- G K F M T E V R E S E V K S S G --- V V L N S F Y E L E H D Y A D F Y K S C ----- V Q -- K R A W H I G P L S V Y N R G F E E K A E R G K K A N -
UGT73B3	189	G N I V I T Q E Q I A D R D E E S E M -- G K F M I E V K E S D V K S S G --- V I V N S F Y E L E P D Y A D F Y K S V ----- V L -- K R A W H I G P L S V Y N R G F E E K A E R G K K A S -
UGT73B4	186	G D I V I T E D Q A N V T N E E T P F -- G K F W K E V R E S E T S S F G --- V L V N S F Y E L E S S Y A D F Y R S F ----- V A -- K K A W H I G P L S L S N R G I A E K A G R G K K A N -
UGT73B5	189	G D I V I T E D Q A N V A K E E T P M -- G K F M K E V R E S E T N S F G --- V L V N S F Y E L E S A Y A D F Y R S F ----- V A -- K R A W H I G P L S L S N R E L G E K A R R G K K A N -
UGT73B1	189	G D I L I T E E Q V M E T E E S V M -- G R F M K A I R D S E R D S F G --- V L V N S F Y E L E Q A Y S D Y F K S F ----- V A -- K R A W H I G P L S L G N R K F E E K A E R G K K A S -
UGT73C3	188	D R V E F T K L Q L P V K A N A S G D -- W K E I M D E M V K A E Y T S Y G --- V I V N T F Q E L E P P Y V K D Y K E A ----- M D -- G K V W S I G P V S L C N K A G A D K A E R G S K A --
UGT73C4	188	D R V E F T K P Q V P V E T T A S G D -- W K A F L D E M V E A E Y T S Y G --- V I V N T F Q E L E P A Y V K D Y T K A ----- R A -- G K V W S I G P V S L C N K A G A D K A E R G N Q A --
UGT73C2	188	D R V E F T K L Q V T V K T N F S G D -- W K E I M D E Q V D A D D T S Y G --- V I V N T F Q D L E S A Y V K N Y T E A ----- R A -- G K V W S I G P V S L C N K V G D K A E R G N K A --
UGT73C5	186	D R V E F T R T Q V P V E T Y V P A G D W K D I F D G M V E A N E T S Y G --- V I V N S F Q E L E P A Y A K D Y K E V ----- R S -- G K A W T I G P V S L C N K V G A D K A E R G N K S --
UGT73C6	187	D R V E F T R P Q V P V E T Y V P A G -- W K E I L E D M V E A D K T S Y G --- V I V N S F Q E L E P A Y A K D F K E A ----- R S -- G K A W T I G P V S L C N K V G D K A E R G N K S --
UGT73C1	184	D R V E F T K S Q L P -- M V L V A G D W K D F L D G M T E G D N T S Y G --- V I V N T F E E L E P A Y V R D Y K K V ----- K A -- G K I W S I G P V S L C N K L G E D Q A E R G N K A --
UGT73C7	182	D K V E F T K P Q V S V L Q P V E G N -- M K E S T A K I I E A D N D S Y G --- V I V N T F E E L E V D Y A R E Y R K A ----- R A -- G K V W C V G P V S L C N R L G L D K A K R G D K A --
UGT73D1	187	H R I E I A R A Q L P G A F E K L A N -- M D D V R E K M R E S E S E A F G --- V I V N S F Q E L E P G Y A E A Y A E A ----- I N -- K K V W F V G P V S L C N D R M A D L F D R G S N G N I
UGT89B1	183	P K Y R F D Q I S S L Y R S Y V H G D P A W E F I R D S F R D N V A S W G --- L V V N S F T A M E G V Y L E H L K R E ----- M G -- H D R V W A V G P I I P L S G -- D N R G G P T S V S V D -
UGT89C1	143	-- I S F L P I N A H S I S V M W A Q E D R S F F N D L E T A T T E S Y G --- L V I N S F Y D L E P E F V E T V K T R ----- F L N H H R I W T V G P L L P F K A G V D R G G Q S S I P P A -
UGT89A2	186	P I F K E E H L P S I V R R S L Q T P S P D L E S I K D F S M N L L S Y G --- S V F N S S E I L E D D Y L Q Y V K Q R ----- M G -- H D R V Y V I G P L C S I G S G L K S N -- S G S V D P -
UGT90A1	186	K V K C D F D H G T T E P E E S -- G A A L E L S M D Q I K S T T T S H G --- F L V N S F Y E L E S A F V D Y N N N S ----- G D -- K P K S W C V G P L C L T D ---- P P K Q G S A K P A -
UGT90A4	193	C V K K C E F D P V L T E P D Q S -- D P A F E L L I D H L M S T K K S R G --- V I V N S F Y E L E S T F V D Y R L R D ----- N D -- E P K P W C V G P L C L V N ---- P P K P E S D K P D -
UGT90A2	182	K V R K C D F V K D M F D P K T T T D P G F K L I L D Q V T S M N Q S Q G --- I I F N T F D D L E P V F I D F Y K R K ----- R -- K L K L W A V G P L C Y V N N F I D D E V E E K V K P S -

UGT79B10 162 K-LLYRKHDAHALLSFSVYKRF----FSHRLITGLMNCDFISIRTCKEIEGKFCYLERQ-----YH--KKVFLTGPMPLPEPN---KSKPLEDRWS--  
 UGT79B11 162 K-ALYREHDAHALLTFSGFYKRF----FYHRFTTGLMNCDFISIRTCCEIEGKFCDYIESQ-----YK--KKVLLTGPMPLPEPD---KSKPLEDQWS--  
 UGT79B9 162 K-VLYRGHDAHALLTFSIFYER----LHYRITTTGLKNCDFISIRTCKEIEGKFCDYIERQ-----YQ--RKVLLTGPMPLPEPD---NSRPLEDRWN--  
 UGT79B7 162 K-VMFRENDAHALATLSIFYKRF----LYHQITTTGLKSCDVAIRTCKEVEGMFCDFISRQ-----YH--KKVLLTGPMFPEPD---TSKPLEERWN--  
 UGT79B8 162 K-VLYRENDAHALATLSIFYKRF----LYHQITTTGFKSCDVAIRTCNEIEGKFCDYISSQ-----YH--KKVLLTGPMPLPEQD---TSKPLEEQLS--  
 UGT79B6 165 K-VLLRGHETNSLSFLSYFPFGDGT--SFYERIMIGLKNCDVLSIRTCQEMIEGKFCDFIENQ-----FQ--RKVLLTGPMPLPEPD---NSKPLEDQWR--  
 UGT79B4 162 K-VALRGHDAN---IYSLFANTRK---FLFDRVTTGLKNCDVLAIRTCAEIEGNLCDFIERQ-----CQ--RKVLLTGPMFLDPQG--KSGKPLEDRWN--  
 UGT79B5 162 K-VALRGHEAN---VCSLFANS-H---ELFGLITKGLKNCDVVLSIRTCVEIEGKLCGFIEKE-----CQ--KKLLLTTGPMPLPEPQN--KSGKPLEDRWN--  
 UGT79B2 163 K-VLLRKQDAYTMKNLESTNTINVGPNLLERVTTSLMNSDVAIRTAREIEGNFCDYIEKH-----CR--KKVLLTGPFVPEPD---KTRELEERWV--  
 UGT79B3 163 K-VLLRKQDAYTMKKLEPTNTIDVGPNNLERVTTSLMNSDVAIRTAREIEGNFCDYIEKH-----CR--KKVLLTGPFVPEPD---KTRELEERWV--  
 UGT79B1 182 K-VVLRPHEAKSLSFVWRKHEAIG--SFFDQKVTAMRNCDAIRTAREIEGKFCDYISRQ-----YS--KPVYLTGPFVLPQSQ--PNQPSLDPQWA--  
 UGT91B1 179 TNIVYRLFVAKRIMEYPTAGVTGVELNDNCRGLAYVGVSEVIVIRSCMEIEPEWILQLLSKL-----QG--KPVIPIGLLPATPMDADDEGTWLDIR--  
 UGT91C1 178 SNIVFRYHEVTRYVEKTEEDVT--GVSDSVRFVGSIDESDAVFRSCPEFEPEWIFGLLKDLE-----YR--KPVFPVIGFLPPVIEDDDAVDTTWVRIK--  
 UGT91A1 183 TSVAFKLFECRFIFKGFMAETTEGNVPIHRVGGVIDGCDVIFVNRSCYEYBAEWLGLTQEL-----HR--KPVIPVGVLPKPKDEKFDTDWLSVK--  
 UGT86A1 189 KAIEPKDMSYLQVSDKDVDTNTVVYRILFKAFKDVKRAFDVVCNTVQELIEPDSLSALQ-----AKQPVYAIG---PVFST-DGVSVPVTSL-----  
 UGT86A2 193 AAINPKDTASYLQET----DTSSVHQIIFKAFEDVKKVDFVLCNTIQQFEDKTIKALN-----TKIPFYAIGPIIPFNNQ--TGSVTTSL-----  
 UGT87A1 176 PGLSPTRLSDLQILHG----YSHQVFNIFKKSFGELYKAKYLLFP SAYELBPKAIDFFTSK-----FDFPVYSTG---PLIPL-EELSVGNE-----  
 UGT87A2 174 PGLSPTKLRDLPPIFDQ---YSDRVFKTAKLCFDELPGARSLLEFTTAYELBHKAI DAFTSK-----LDIPVYAIG---PLIPF-EELSVQND-----  
 UGT85A2 187 PSMKNLRLKDI PSFIRTT-NPDDIMLNFI IREADRAKRASATILNTFDDLEHDDVIQSMKS-----IVPPVYSIGPLHLLLEKQ--ESGEYSEIGRTGSNL--  
 UGT85A3 190 PSMNPNVKKLDIPSFIRTT-NPNDIMLNFFVREACTRKRASATILNTFDDLEHDDVIQSMQS-----ILPPVYPIGPLHLLVNR--EIEEDSEIGRMGSNL--  
 UGT85A1 191 PTMKNVKKLDIPSFIRTT-NPDDVMISFALRETERAKRASATILNTFDDLEHDDVHAMQS-----ILPPVYSVGPLHLLANR--EIEEGSEIGMMSNL--  
 UGT85A7 190 PSMKNLRLKDI PSYIRTT-NPDNIMLNFLIREVERSKRASATILNTFDELEHDDVIQSMQS-----ILPPVYSIGPLHLLVKE--EINEASEIGQMGLNL--  
 UGT85A5 184 PSMKNLGLKDI PSFIRAT-NTEDIMLNFFVHEADRAKRASATILNTFDSLEHDDVRSIQS-----IIPQVYTIIGPLHLFVNR--DIDEESDIGQIGTNM--  
 UGT85A4 189 PSMKKIKLKDFPDFVTTT-NPQDPMISFILHVTGRIKRASATIFINTFEKLEHNVLLSLRS-----LLPQIYSVGFQI LENR--EIDKNSEIRKLG LNL--  
 UGT74E1 169 -----LNANDLPSFLCESSS--YPYILRTVIDQLSNIDRVDIVL CNTFDKLEEK--KWIK-----SVWPVLNIGPTVPSMYLDKRLAEDKKNYGF S-LF--  
 UGT74E2 169 -----LTANDLPSFLCESSS--YPNILLRIVVDQLSNIDRVDIVL CNTFDKLEEKLLKVVQ-----SLWPVLNIGPTVPSMYLDKRLSEDKKNYGF S-LF--  
 UGT74D1 169 -----LKGNDLPVFLYDNNL--CRPLFELISSQFVNVDIDFFLVNSFDELEVEVLQWMK-----NQWPVKNI GPMIPSMYLDKRLAGDKDYGIN-LF--  
 UGT74C1 170 -----LSQDDLPSFACEKGS--YPLLHEFVVRQFSNLLQADCI LCNTFDQLEPKVVKWMN-----DQWPVKNI GPPVPSKFLDNRLPEDKDYELENSK--  
 UGT74F1 162 -----LELQDLPTFVTP TGS--HLAYFEMVLQQFTNFDKADFLVNSFHDLDLHEEELS-----KVCPLVTIGPTVPSMYLDQQIKSDNDYDLNLFD--  
 UGT74F2 162 -----LELQDLPSFFSVSGS--YPAYFEMVLQQFINFEKADFLVNSFQELLEHLENELWS-----KACPVLTI GPTIPSIYLDQR IKSDTYDLNLFE--  
 UGT74B1 171 -----LSYDELPSFVGRHWLTHPEHGRVLLNQFPNHENADWLFVNGFEGLEETQDCENGES-----DAMKATLIGPMIP SAYLDDR MEDDKDY GAS-LL--  
 UGT75B1 163 -----LEIRDLP SFLTPSNT-NKAAQAVYQELMDFLKEESNPKILVNTFDSLEPEFLTAIP-----N-IDMVAVGPLLPAEIFTGSESGK-----DLSR--  
 UGT75B2 163 -----LEIRDLP SFLSPSNT-NKAAQAVYQELMDFLKEESNPKILVNTFDSLEPEFLTAIP-----N-IDMVAVGPLLPAEIFTGSESGK-----DLSR--  
 UGT75D1 190 -----LTVRDIPSFI VSSNV--YAFLLPAFREQIDSLKEEINPKILINTFQELPEPEAMSSVP-----DNFKIVPVGPLLTLRTDFSSRG-----  
 UGT75C1 176 -----ITTGDLP SFLQPSKA--LPSALVTLREHIEALETESNPKILVNTFSALEHDA LTSVE-----K-LKMIPIGPLVSSSEKTDLFK-----  
 UGT84A3 180 -----LKHDEIPSFLHPPSSP--YTAFGDI IILDQLKRFFENHKSFYLFIDTFRELEKDIMDHMS-----QLCPQAIISPVGPLFKMAQTLSS---DVKGD-I--  
 UGT84A4 178 -----LKHDEIPSFLHPPSSP--LSSIGGTILEQIKRLH--KPFVSLIETFQLEKDTIDHMS-----QLCPQVNFNPIGPLFTMAKTIRS---DIKGD-I--  
 UGT84A2 187 -----LKHDEIPSFIHPSSP--HSALREVIIDQIKRLH--KTFSIFIDTFNSLEKDIIDHMS-----TSLSLPGVIRPLGPLYKMAKT VAY---DVVKVNI--  
 UGT84A1 186 -----LKNDEIPSFLHPPSSR--FTGFRQAILGQFKNLS--KSFCVLIDSFDSLEQEVIDYMS-----SLCP---VKTVGPLFKVARTVTS---DVSGD-I--  
 UGT84B1 169 -----LEV RDLP SFMLPSG--GAHFYNLMAEFADCLR--YVKWVLVNSFYBLESEIESMA-----DLKPVIPIGPLVSPFLLGDGEEETL--DGKNLDF--  
 UGT84B2 168 -----LEV RDLP SMLPSQ--GANVNTLMAEFADCLK--DVKWVLVNSFYBLESEIESMS-----DLKPIPIGPLVSPFLLGNDEE-----KTLDM--  
 UGT76C3 177 -----PLRKKDLLQILDQESEQ--LDSYSNMILETTKASSGLIFVSTCEELDQDLSLQARED-----YQVPIFTIGP SHSYFP-----GSSSSL--  
 UGT76C4 172 -----PLRKKDLLRILEADSVQ--GDSYSDMILEKTKASSGLIFMS-CEELDQDLSLQARED-----FKVPIFAIGP SHSHFP-----ASSSSL--  
 UGT76C5 176 -----PLRKKDIVRILDVETDI--LDPFLDKVLQMTKASSGLIFMS-CEELDHDSDVSQARED-----FKVPIFAIGP SHSHFP-----ATSSSL--  
 UGT76C2 173 -----PLQKRDL SKVFGEFGEK--LDPFLHAVVETTTIRSSGLIYMS-CEELDKDSLITLSNEI-----FKVVPVFAIGPFHSYFS-----ASSSSL--

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UGT76C1 177 ----PLRKKDLSRIMGTSAQSKPLDAYLLKILDATKPASGITVMS-CKELDHDLSLAESNKV-----FSIPIFPFGPFHIHDVP-----ASSSSL
UGT76B1 168 ----YLRMKDLPPWFQTEDPRS--GDKLQIGVMKSLKSSSGIIFNA-IEDLETDQLDEARIE-----FPVPLFCIGPFHRYVS-----ASSSSL
UGT76F1 174 ----PLKVKDLPVIKTKEPEG--LNRILNDMVEGAKLSSGVVWNT-FEDLERHSLMDCRSK-----LQVPLFPFGPFHKHRTD-----LPPKPKNKD
UGT76F2 176 ----PLKVKDLPVMETNEPEE--LYRVVNDMVEGAKSSSGVWNT-FEDLERLSLMNCSSK-----LQVPPFPFGPFHKYSED-----PTPKTENKE
UGT76E1 173 ----PLRYKDLPTSAPGPLES---ILKVYSETVNIRTASAVIINS-TSCLESSSLAWLQKQ-----LQVPVYPIGPLHIAAS-----APS--SL
UGT76E2 175 ----PLRYKDLPTSAPGPLES---TLKVYSETVNIRTASAVIINS-ASCLESSSLARLQQQ-----LQVPVYPIGPLHITAS-----APS--SL
UGT76E4 174 ----PLRYKDLPTSAPGPLEP---LLEMCREVVNKRTASAVIINT-ASCLESSSLSWLQQE-----LGIPVYPIGPLHITAS-----SPGP-SL
UGT76E6 175 ----PLRYKDLPTSAPGPLEP---LFELCREIVNKRTASAVIINT-VRCLLESSSLKRLQHE-----LGIPVYALGPLHITVS-----AAS--SL
UGT76E5 173 ----PLKYKDLPTSAPGPLEP---FLEICAEEVVKRTASAVIINT-SSCLLESSSLKRLQHE-----LSIPVYPIGPLHITVS-----SANF-SL
UGT76E3 169 ----PLRYKDLPTSAPGPLEP---FLEICRDVVNKRTASAVIINT-VTCLLESSSLKRLQHE-----LQIPVYPIGPLHITVS-----STGF-TV
UGT76E11 174 ----PLRCKDFPVSHWASLES---MMELYRNTVDKRTASSVIINT-ASCLESSSLRSLQQQ-----LQIPVYPIGPLHIVAS-----AS-T-SL
UGT76E12 175 ----PLRYKDFPVSRAFASLES---IMEVYRNTVDKRTASSVIINT-ASCLESSSLRSLQQQ-----LQIPVYPIGPLHIVAS-----AP-T-SL
UGT76E7 175 ----PIRYKDLPSSVFASVES---SVELFKNTCYKGTASSVIINT-VRCLLESSSLKRLQHE-----LEIPVYSIGPLHIVAS-----APPT-SL
UGT76E9 179 ----PLRYKDLPTSAPGPLEP---SVEVFKSSCDKGTASAVIINT-VRCLLESSSLKRLQHE-----LKIPIYPIGPLHIVAS-----APPT-SL
UGT76D1 168 ----PFRFKDLPTAYGSMER---LMILYENVSNRASSSGIIFNS-SDCLENSFITTAQEK-----WGPVYPIGPLHIVAS-----AMSCPSL
UGT81B1 176 -----DIIISVHPLMQHIPLWVMKWQGLHKKVIFVTVITDLNTHCHPTWFHFGVSRRCYC-----PSKEVAKRALVDGLDSSQIRVFGLPVRPSFPRT
UGT81B2 172 -----EIIISVHPLMQHIPLWVWKWQELQKRVLFVTVITDLNTHCHPTWFHFGVSRRCYC-----PSQEVAKRALVDGLDSSQIRVFGLPVRPSFARA
UGT81A1 245 -----DIIISVHPLMQHVPLRVLRKGLLKKIVFTTVITDLNTHCHPTWFHFKLVTRCYC-----PSTEVAKRAQKAGLETSSQIKVYGLPVRPSFVKP
UGT88A1 182 -----SDMPKAVLERDDEVYDVFIMFGKQLSKSSGIIFNTFDALENRAIKAITTEEL-----CFRNIYPIGPLIVNGRIEDRNDN-----
UGT83A1 191 ----KMETDKFVWVCLKNKESQKNIFQLMLQNNNSIESTDWLLCNVHELETAAGFLGPNIV-----PIGPIGWAHSLSEEGSTSLG-----SF
UGT82A1 172 ----LLSAEDLPWLIGTPKAQKRKFWQRTLERTKSLRWLLTSSFKDEYEDVDNHKASYKKSNDLNKENNGQNPQILHLGPLHNQEATNNTITTKTSF
UGT92A1 195 -----QLNSFMLEADGTDDWSVFMKKIIPGWSDFDGFLENTVAEIDQMGLSYFRRITG-----VPVWPVGPVVKSPDKKVGSRSTEEAVKS
consensus 301

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UGT80A2 365 GIRDMVNDLRKKKLLKLRPVYIYLSGTQSGSNIPHGYMWSPHLVKPKD[WGPQIDVVGFVYLDL]ASNYE[PPAELVEWLEAGDKPIYIGFG]-----SLEPVQ
UGT80A3 328 SIRTYINDFRKRKLNLAIPAYFSTYHGSISHLPTGYMWSPHVVPKPSD[WGPLVDVVGYCFLN]LGSKYQPREEF[LHWIER]GSPVYIGFG-----SMPLD
UGT78D2 267 -----CLAWMEKRSSGSVAYISFGTVM-----TPP-PGELAAIA[AFGL]ESSKVPFVWSLKEKSLVQLPKG-----
UGT78D3 266 -----CLAWIEKRSTASVAYIAFGRVA-----TPP-PVELVAIA[QGLE]SSKVPFVWSLQEMKMTHLPEG-----
UGT78D1 261 -----CFAWMGKRSAASVAYISFGTVM-----EPP-PEELVAIA[QGLE]SSKVPFVWSLKEKNMVHLPKG-----
UGT71B1 253 -----EILHWLKEQPTKSVVFLCFGSM-----GGFSEEQ[AREIA]VALERSGHRFLWSLRRASPVGN----KSNPPPGEFT
UGT71B2 267 -----EILRWLDEQPRKSVVFLCFGSM-----GGFREGQ[AKEIA]IALERSGHRFVWSLRRAPKG-----SIGPPEEFT
UGT71B7 264 -----EILRWLDQPPSSVVFLCFGSM-----GGFGEEQ[VREIA]IALERSGHRFLWSLRRASPNI[FI]----KELPG--EFT
UGT71B8 261 -----DILRWLDEQPPKSVVFLCFGSI-----GGFNEEQ[AREMA]IALERSGHRFLWSLRRASRDID----KELPG--EFK
UGT71B6 255 -----EILRWLDEQPPRSVVVFLCFGSM-----GGFSEEQ[VRETAL]ALDRSGHRFLWSLRRASPNI[LI]----REPPG--EFT
UGT71B5 260 -----EILRWLDEQPSKSVVFLCFGSL-----GGFTEEQ[TRETA]VALDRSGQRFLWCLRHASPNIK----TDRPR--DYT
UGT71C1 273 -----RIITWLDQPESSVVVFLCFGSL-----KNLSATQ[INETA]QALEIVDCKFIWSFRITN-----PKEYA
UGT71C2 273 -----RILKWLDQPESSVVVFLCFGSL-----KSLAASQ[IKETA]QALELVGIRFLWSIRTD-----PKEYA
UGT71C3 270 -----RIMRWLEDQPESSIVYIICFGSL-----GIIGKLO[IBETA]ALELGTGHRFLWSIRTN-----PTEKA
UGT71C4 271 -----QIVGWLDQPESSVVVFLCFGSR-----GSVDEPQ[VKEIA]RALELVGCRFLWSIRTS-----GDVET
UGT71C5 270 -----EMMKWLEQPDSSVFLCFGSM-----GVFPAPQ[ITETA]HALELIGCRFLWAIRTN-----MAGDG
UGT71D1 264 -----ELMKWLDQPEASVVVFLCFGSM-----ARLRGSLVKE[IAHGLE]LCQYRFLWSLRK-----EEV
UGT71D2 263 -----ESMKWLDQPEASVVVFLCFGSM-----GSLRGLVKE[IAHGLE]LCQYRFLWSLRT-----EEV
UGT72B2 257 -----GCLSWLDNQPFQSVLYISFGSG-----GTLTCEQ[FNELA]IGLAESGKRFLVWVIRSPSEIVSSSYFNP[HS]----ET
UGT72B3 257 -----KCLNWLDNQPFQSVLYVSFGSG-----GTLTFEQ[FELAL]GLAESGKRFLVWVIRSPSGIASSSYFNP[QS]----RN
UGT72B1 257 -----ECLKWLDNQPLGSVLYVSFGSG-----GTLTCEQ[LNELA]LGLADSEQRFLVWVIRSPSGIANSSYF[DSHS]----QT
UGT72E2 252 -----PVLDWLNEQPNEVSVLYISFGSG-----GCLSAKQ[LTELAW]GLEESQQRFLVWVIRPPVDGSCCSEYVSANGGGT[ED]
UGT72E3 252 -----PVFDWLNKQPNEVSVLYISFGSG-----GSLTAQQ[LTELAW]GLEESQQRFLVWVIRPPVDGSSCSDYFSAKGGVTKD
UGT72E1 248 -----PVLDWLNKQPDESVLYISFGSG-----GSLSAKQ[LTELAW]GLEEMSQQRFLVWVIRPPVDGSACSA[YL]SANSKIRD
UGT72D1 256 -----SIFEWLDEQRERSVVVFLC[GS]G-----GTLTFEQ[IVELAL]GLELSQQRFLVWVIRRPAS-----YLGAISSDDE
UGT72C1 252 -----GVLDWLDLQPKESVVVVL[GV]V-----GALTFEQ[INELAY]GLELGTGHRFVWVIRPPAEDDPSASMF[DKTK]NETEP
UGT73B2 274 -IDEAECLKWLD[SKK]PNSVLYVSFGSV-----AFFKNEQ[LFEIA]AGLEASGTSFIWVVR--KTK-[DD]-----RE
UGT73B3 273 -INEVECLKWLD[SKK]PDSVLYISFGSV-----ACFKNEQ[LFEIA]AGLETSGANFIWVVR--KNIGIE-----KE
UGT73B4 270 -IDEQECLKWLD[SKT]PGSVVYLSFGSG-----TGLPNEQ[LLEIA]FGLGSGQNFVWVSKNENQV[GTGE]-----NE
UGT73B5 273 -IDEQECLKWLD[SKT]PGSVVYLSFGSG-----TNFTNDQ[LLEIA]FGLGSGQSFIWVVRKNENQ[Q]--D-----NE
UGT73B1 273 -IDEHECLKWLD[SKK]CDVYMAF[GT]M-----SSFKNEQ[LTEIA]AGLDM[SGHDFVWV]NRKGSQV[E]-----KE
UGT73C3 272 AIDQDECLQWLD[SK]EESVLYVCLGSI-----CNLPLSQ[LKELGL]GLEESRRSFIWVIRG-SEK-YKEL-----FE
UGT73C4 272 AIDQDECLQWLD[SK]EDGSVLYVCLGSI-----CNLPLSQ[LKELGL]GLEKSQRSFIWVIRG-WEK-YNEL-----YE
UGT73C2 272 AIDQDECLKWLD[SKD]VBSVLYVCLGSI-----CNLPLAQ[LRELGL]GLEATKRPFIWVIRG-GGK-YHEL-----AE
UGT73C5 271 DIDQDECLKWLD[SKKH]GSVLYVCLGSI-----CNLPLSQ[LKELGL]GLEESQRPFIWVIRG-WEK-YKEL-----VE
UGT73C6 271 DIDQDECLEWLD[SK]EPGSVLYVCLGSI-----CNLPLSQ[LLELGL]GLEESQRPFIWVIRG-WEK-YKEL-----VE
UGT73C1 267 DIDQDECLKWLD[SK]EESVLYVCLGSI-----CNLPLSQ[LKELGL]GLEESQRPFIWVIRG-WEK-YNEL-----LE
UGT73C7 266 SIGQDQCLQWLD[SQ]ETGSVLYVCLGSI-----CNLPLAQ[LKELGL]GLEASNKPFVWVIRE-WGK-YGDL-----AN
UGT73D1 273 AISETECLQFLD[SMR]PRSVLYVSLGSI-----CRLIPNQ[LIELGL]GLEESGKPFVWVIKT-EEKHMIE[L]-----DE
UGT89B1 269 ----HVMSWLDAR-EDNHVYV[CF]GSQ-----VVLTKEQ[TLALAS]GLEKSGVHFVAVKEPVEKDSTRG-----N-
UGT89C1 229 ----KVSAWLDSCPEDNSVYV[GF]GSQ-----IRLTAEQ[TAALAA]LEKSSVRFVAVRDAAKKVNSSD-----NS
UGT89A2 271 ----SLLSWLDGS-PNGSVLYV[CF]GSQ-----KALTKDQ[CDALAL]GLEKSMTRFVWVVKKDP-----
UGT90A1 268 ----WIHWLDQKREEGRPVLYVAF[GT]Q-----AEISNKQ[LMEIA]FGL[EDSK]VNFVWVTRKDVEE[LI]G-----
UGT90A4 275 ----WIHWLDRKLEERC[PM]VYVAF[GT]Q-----AEISNEQ[LKEIA]LGL[EDSK]VNFVWVTRKDL[EEV]TGG-----
UGT90A2 268 ----WMKWLD[EK]RDKGCNVLYVAF[GS]Q-----AEISREQ[LKEIA]LGL[ESK]VNFVWVVKG-----NEIG-----
    
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UGT79B10	243	-----HWLNGFEQGSVVFALGSQ-----	VTLEKDFQELCLGIELTGLPFFVAVTPPKGA--	K
UGT79B11	243	-----HWLSGFGQGSVVFALGSQ-----	TILEKNQFQELCLGIELTGLPFLVAVKPPKGA--	N
UGT79B9	243	-----HWLNQFKPGSVIYCALGSQ-----	ITLEKDFQELCLGMELTGLPFLVAVKPPKGA--	K
UGT79B7	243	-----HFLSGFAPKSVVFCSPGSQ-----	VILEKDFQELCLGMELTGLPFLVAVKPPRGS--	S
UGT79B8	243	-----HFLSRFPPRSVVFALGSQ-----	IVLEKDFQELCLGMELTGLPFLVAVKPPRGS--	S
UGT79B6	249	-----QWLSKFDPGSVIYCALGSQ-----	IILEKDFQELCLGMELTGLPFLVAVKPPKGS--	S
UGT79B4	245	-----NWLNGFEPSSVYVCAFGTH-----	FFFELDFQELCLGMELTGLPFLVAVMPPRGS--	S
UGT79B5	244	-----HWLNGFEPGSVVFCAFGTQ-----	FFFEKDFQEFCLGMELMGLPFLISVMPPKGS--	P
UGT79B2	249	-----KWLSGYEPDSVVFALGSQ-----	VILEKDFQELCLGMELTGSFPLVAVKPPRGS--	S
UGT79B3	249	-----KWLSGYEPDSVVFALGSQ-----	VILEKDFQELCLGMELTGSFPLVAVKPPRGS--	S
UGT79B1	267	-----EWLAKFNHGSVVFCAFGSQP-----	VVNKIDQFQELCLGLESTGFPPFLVAIKPPSGV--	S
UGT91B1	269	-----EWLDRHQAKSVVYVALGTE-----	VTISNEEIQGLAHGLELCRLPFFWTLRKRTR--	
UGT91C1	266	-----KWLDKQRLNSVYVSLGTE-----	ASLRHEEVTEALGLEKSETPFFWVLRNEP--	
UGT91A1	273	-----KWLDNRKSKSIVYVAFGSE-----	AKPSQTELENEIALGLELSGLPFFWLKTRRGPW--	D
UGT86A1	270	-WAESDCTEWLKGRPTGSVLYVDFGSYA-----	HVG-KKEIVEIAHGILLSGISFIWVLRPDIVGSNVPD--	
UGT86A2	273	-WSESDCTQWLNTPKPKSVLYLSFGSYA-----	HVT-KKDLVEIAHGILLSKVNFVWVVRPDIVSSDETN--	
UGT87A1	255	-NRELDYFKWLDLQPESSVLYLSQGSFL-----	SVS-EAQMBEIVVGVREAGVKFFWVARGGELKLK--	
UGT87A2	254	-NKEPNYIQWLEEQPEGSVLYLSQGSFL-----	SVS-EAQMBEIVKGLRESGVRFLWVARGGELKLK--	
UGT85A2	278	WREETECLDWLNTKARNSVYVDFGSIT-----	VLS-AKQLEFFAWGLAATGKEFLWVIRPDLVAGDEAM--	
UGT85A3	281	WKEETECLGWLNTKSRNSVYVDFGSIT-----	IMT-TAQLLEFFAWGLAATGKEFLWVIRPDSVAGEEAV--	
UGT85A1	282	WKEEMECLDWLDTKTQNSVLYLDFGSIT-----	VLS-VKQLEFFAWGLAGSGKEFLWVIRPDLVAGEEAM--	
UGT85A7	281	WREEMECLDWLDTKTPNSVLFVDFGCIT-----	VMS-AKQLEFFAWGLAASRKEFLWVIRPNLVGGEAMV--	
UGT85A5	275	WREEMECLDWLDTKSPNSVYVDFGSIT-----	VMS-AKQLEFFAWGLAATKKDFLWVIRPDLVAGDVPM--	
UGT85A4	280	WEEETECLDWLDTKAEKAVLYVDFGSIT-----	VLT-SEQILLEFFAWGLARSKEFLWVIRSGMVDGDDSI--	
UGT74E1	252	GAKIAECMEWLNKQPSVYVDFGSLV-----	VLK-KDQLIEIAAGLKQSGHFFLWVIRETERRKLPEN--	
UGT74E2	254	NAKVAECMEWLNKPEPNSVYLSFGSLV-----	ILK-EDQMLEIAAGLKQSGRFFLWVIRETETHKLPEN--	
UGT74D1	254	NAQVNECLDWLDSKPPGSVLYVDFGSLA-----	VLK-DDQMLEIAAGLKQGTGHNFVWVIRETETTKLPSN--	
UGT74C1	256	TEPDESVLKWLGNRPAKSVYVAFGTLV-----	ALS-EKQMEIAMAISQTGYHFLWVRESERSKLPSPG--	
UGT74F1	248	LKEAALCTDWLDRPEGSVYVAFGSM-----	KLS-SEQMBEIASAISN--FSYLWVVRASEESKLPSPG--	
UGT74F2	248	SKDDSFCTINWLDTRPQGSVYVAFGSM-----	QLT-NVQMBELASAVSN--FSFLWVVRSEEEKLPSG--	
UGT74B1	259	KPISKECMEWLETKQAQSVAFVDFGSGF-----	ILF-EKQLAEVAIALQESDLNFWVVIKEAHIKLPPEG--	
UGT75B1	242	KDQSSSYTLWLDKSTESSVLYVDFGTMV-----	ELS-KKQIBELARALIEGKRPFVWVITDKSNRETKE--	
UGT75B2	245	DHQSSSYTLWLDKSTESSVLYVDFGTMV-----	ELS-KKQIBELARALIEGGRPFVWVITDKLNREAKIE--	
UGT75D1	267	-----EYLEWLDTKADSSVLYVDFGTLA-----	VLS-KKQIVLVELCKALIQSRRPFVWVITDKSYR--NKE--	
UGT75C1	253	-SSDEDYTKWLDKSLERSVYVLSFGTHA-----	DDLPEKHMEALTHCVLATNRPFVWVIREKNPEEKKN--	
UGT84A3	264	SEPASDCMEWLDLREPSVYVLSFGTIA-----	NLK-QEQMBEIAHGVLSSGLSVLWVIRPPMEGTFVPEP--	
UGT84A4	260	SKPDSDCLEWLDLREPSVYVLSFGTLA-----	FLK-QNQIDEIAHGILLNSGLSCLWVIRPPLEGLAIEP--	
UGT84A2	270	SEPTDPCMEWLDLQPVSVYVLSFGTVA-----	YLK-QEQIDEIAYCVLNADVTFVWVIRQQELGFNKEK--	
UGT84A1	265	CKSTDKCLEWLDLQPKSVYVLSFGTVA-----	YLK-QEQIBEIAHGVLKSLGSLFVWVIRPPPHDLKIVET--	
UGT84B1	253	CKSDDCMEWLDKQARSVYVLSFGSML-----	ETL-ENQVETIAKALKNRGLPFLWVIRPKEKAQN--V--	
UGT84B2	247	WKVDDYCMWLDKQARSVYVLSFGSIL-----	KSL-ENQVETIATALKNRGVFVWVIRPKEKGEN--V--	
UGT76C3	254	FTVDETCIPWLDKQEDKSVLYVDFGSIS-----	TIG-EAEFMEIAWALRNSDQPFVWVIRGG--S--	
UGT76C4	248	FTPDETCIPWLDKQEDKSVLYVDFGSLV-----	TIN-ETELEMIAWGLRNSDQPFVWVIRVGSVNGTEWI--	
UGT76C5	252	STPDETCIPWLDKQEDKSVLYVDFGSIV-----	TIS-ESDLIEIAWGLRNSDQPFVWVIRVGSVIRGREWI--	
UGT76C2	249	FTQDETCILWLDKQEDKSVLYVDFGSVV-----	NIT-ETEFLIEIACGLRNSKQPFVWVIRPGSVLGAKWI--	

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UGT76C1  256 LEPDQSCIPWLDMRETRSVVYVSLGSLA-----SLN-ESDFLEIACGLRNTNQSFLWVVRPGSVHGRDWI-----
UGT76B1  244 LAHDMTCLSWLDKQATNSVIYASLGSIA-----SID-ESEFLEIAWGLRNSNQPFLLWVVRPGLIHGKEWI-----
UGT76F1  254 KDDDEILTDWLNKQAPQSVVYVSLGSLA-----AIE-ENEFFLEIAWGLRNSLPLFLWVVRPGMVRGTEWL-----
UGT76F2  256 D-----TDWLDKQDPQSVVYASFGSLA-----AIE-EKEFLEIAWGLRNSERPFLWVVRPGSVRGTEWL-----
UGT76E1  247 LEEDRSCLEWLNKQKIGSVIYISLGSIA-----LME-TKDMLEMAWGLRNSNQPFLLWVVRPGSIPGSEWT-----
UGT76E2  249 LEEDRSCVEWLNKQKSNVYIYISLGSIA-----LMD-TKDMLEMAWGLSNSNQPFLLWVVRPGSIPGSEWT-----
UGT76E4  249 LQEDMSCIEWLNKQKPRSVIYISLGTKA-----HME-TKEMLEMAWGLLNSNQPFLLWVVRPGSVAGFEWI-----
UGT76E6  249 LEEDRSCVEWLNKQKPRSVYIYISLGSVV-----QME-TKEVLEMARGLFNSNQPFLLWVVRPGSIAGSEWI-----
UGT76E5  247 LEEDRSCLEWLNKQKLRSVIYISVGSIA-----HME-TKEVLEMAWGLYNSNQPFLLWVVRPG-----T-----
UGT76E3  244 LQEDRSCVEWLNKQKPRSVIYISLGSMV-----LME-TKEMLEMAWGLNSNQPFLLWVVRPGSVSGSEGI-----
UGT76E11 248 LEENKSCIEWLNKQKKNVIFVSLGSIA-----LME-INEVIETALGLDSSKQQLWVVRPGSVRGSEWI-----
UGT76E12 250 LEENKSCIEWLNKQKVNVIYIYISMGSLA-----LME-INEIMEVASGLAASNQHFLWVVRPGSIPGSEWI-----
UGT76E7  250 LEENESCIEWLNKQKPSVYIYISLGSFT-----LME-TKEMLEMAYGFVSSNQHFLLWVVRPGSICGSEIS-----
UGT76E9  254 LDENESCIDWLNKQKPSVYIYISLGSFT-----LLE-TKEVLEMASGLVSSNQHFLLWVVRPGSILGSELT-----
UGT76D1  244 FEEERNCLEWLEKQETS SVIYIYISMGSLA-----MTQ-DIEAVEMAMGFVQSNQPFLLWVVRPGSINGQESL-----
UGT81B1  262 ILNKINELRKELEIDLNLPAVLLMCGGEG-----MGPVQKTALALGDSLYNKSKE SNP I GQLIVICGR-----
UGT81B2  258 VLVKDDL RKELEMDQDLRAVLLMCGGEG-----MGPVKEITAKALEEFLYDKENRKP I GQMVICGR-----
UGT81A1  331 VRPKVELRRELGM DENLPAVLLMCGGEG-----MGP I EATARA LADALYDKNLGEAVGQVLI I CGR-----
UGT88A1  256 --KAVSCLNWLDSQPEKSVVFLCFGSLG-----LFSKEQVIEI AVGLEKSGQRFLWVVRNPPELEKTELD-----
UGT83A1  270 LPHDRDCLDWLDRQIPGSVIYVAFGSFG-----VMGNPOLEELAI GLELTKRPVLWVTGDQQPIKLGSD-----
UGT82A1  267 WEEDMSCLGWLQEQNPNSVIYIYISFGSWVS-----PIGESNIQTLALALEASGRPFLWALNRVWQEG LPPG-----
UGT92A1  276 -----WLD SKPDH SVVYVCFGSMN-----SILQTHMLELAMALESSEKNFLWVVRPP I GVEVKSEFD-----
consensus 401      . . . . .      . . . . .      . . . . .      . . . . .
    
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UGT80A2	459	EPEKMT	EIVEALQRTKQ	RGILNK	GWGGLGNL	K-EPKDFVYLLDNVPHD	WLFPRCKA	VVHHG	CAGTTAAGL	KAS	CP	TTIV	PFFG	DQ	PFWGERVHARG	VGP																																																					
UGT80A3	422	DPKQ	TMDIILETL	KDTEQR	GI	IVDRGWGGLGNL	A	TEVP	ENVFLVED	CPHD	WLF	PQCSA	VVHHG	CAGTTATGL	KAG	CP	TTIV	PFFG	DQ	FFWGDRIYEK	GLGP																																																
UGT78D2	325	-----	FLDRTRE	QGI	VVP	WAPQ	VE	-----	LLKHEAT	GV	FVTH	CGWNS	VLE	SV	SG	GV	PMI	CR	PFFG	DQ	RLNGRAVE	VVWEIG																																															
UGT78D3	324	-----	FLDRTRE	QGM	VVP	WAPQ	VE	-----	LLNHEAM	GV	FVSH	CGWNS	VLE	SV	SA	GV	PMI	CR	P	FG	HAINARS	VEAVWEIG																																															
UGT78D1	319	-----	FLDRTRE	QGI	VVP	WAPQ	VE	-----	LLKHEAM	GV	VNTH	CGWNS	VLE	SV	SA	GV	PMI	GR	P	IL	ADNRLN	NGRAVE	VVWKVG																																														
UGT71B1	319	NLEE	ILPKG	F	LDRT	VEIG	KIIS	---	WAPQ	VD	-----	VLNS	PAI	GAF	VTH	CGWNS	I	LE	SL	WF	GV	PM	AAW	PI	YAE	Q	Q	FN	AF	FM	V	DEL	GLA																																				
UGT71B2	331	NLEE	ILPE	G	F	LERT	A	E	IG	K	I	V	G	---	WAPQ	SA	-----	ILAN	PAI	GG	FV	SH	CGWNS	T	LE	SL	WF	GV	PM	AT	W	P	L	YAE	Q	Q	V	NA	F	EM	V	EEL	GLA																										
UGT71B7	328	NLEE	EV	LP	E	G	F	D	R	T	K	D	I	G	K	V	I	G	---	WAPQ	VA	-----	VLAN	PAI	GG	FV	TH	CGWNS	T	LE	SL	WF	GV	P	T	A	A	W	P	L	YAE	Q	Q	F	NA	F	L	M	V	EEL	GLA																		
UGT71B8	325	NLEE	EV	LP	E	G	F	D	R	T	K	D	K	G	K	V	I	G	---	WAPQ	VA	-----	VLAK	PAI	GG	FV	TH	CGWNS	I	LE	SL	WF	GV	P	I	A	P	W	P	L	YAE	Q	Q	F	NA	F	V	M	V	EEL	GLA																		
UGT71B6	319	NLEE	EV	LP	E	G	F	D	R	T	A	N	R	G	K	V	I	G	---	WAPQ	VA	-----	VLAK	PAI	GG	FV	SH	CGWNS	T	LE	SL	WF	GV	PM	A	I	W	P	L	YAE	Q	Q	F	NA	F	EM	V	EEL	GLA																				
UGT71B5	324	NLEE	EV	LP	E	G	F	L	E	R	T	L	D	R	G	K	V	I	G	---	WAPQ	VA	-----	VLEK	PAI	GG	FV	TH	CGWNS	I	LE	SL	WF	GV	PM	V	T	W	P	L	YAE	Q	Q	V	NA	F	EM	V	EEL	GLA																			
UGT71C1	329	SPYE	AL	PH	G	F	M	D	R	V	M	D	Q	G	I	V	C	G	---	WAPQ	VE	-----	ILAH	K	A	V	GG	FV	SH	CGWNS	I	LE	SL	GF	GV	P	I	A	T	W	P	M	YAE	Q	Q	L	NA	F	T	M	V	KEL	GLA																
UGT71C2	329	SPNE	IL	PD	G	F	M	N	R	V	M	G	L	G	L	V	C	G	---	WAPQ	VE	-----	ILAH	K	A	T	GG	FV	SH	CGWNS	I	LE	SL	RF	GV	P	I	A	T	W	P	M	YAE	Q	Q	L	NA	F	T	I	V	KEL	GLA																
UGT71C3	326	SPYD	LL	PE	G	F	L	D	R	T	A	S	K	G	L	V	C	D	---	WAPQ	VE	-----	VLAH	K	A	T	GG	FV	SH	CGWNS	V	LE	SL	WF	GV	P	I	A	T	W	P	M	YAE	Q	Q	L	NA	F	S	M	V	KEL	GLA																
UGT71C4	327	NPND	V	L	PE	G	F	M	G	R	V	A	G	R	L	V	C	G	---	WAPQ	VE	-----	VLAH	K	A	T	GG	FV	SH	CGWNS	T	LE	SL	WF	GV	P	V	A	T	W	P	M	YAE	Q	Q	L	NA	F	T	L	V	KEL	GLA																
UGT71C5	326	DPQE	PL	PE	G	F	V	D	R	I	T	M	G	R	G	I	V	C	S	---	WAPQ	VD	-----	ILAH	K	A	T	GG	FV	SH	CGWNS	V	Q	E	SL	WY	GV	P	I	A	T	W	P	M	YAE	Q	Q	L	NA	F	M	V	KEL	GLA															
UGT71D1	317	TKDD	L	P	E	G	F	L	D	R	V	D	G	R	G	M	I	C	G	---	WSPQ	VE	-----	ILAH	K	A	V	GG	FV	SH	CGWNS	I	V	E	SL	WF	GV	P	I	V	T	W	P	M	YAE	Q	Q	L	NA	F	L	M	V	KEL	KLA														
UGT71D2	316	TNDD	L	P	E	G	F	M	D	R	V	S	G	R	G	M	I	C	G	---	WSPQ	VE	-----	ILAH	K	A	V	GG	FV	SH	CGWNS	I	V	E	SL	WF	GV	P	I	V	T	W	P	M	YAE	Q	Q	L	NA	F	L	M	V	KEL	KLA														
UGT72B2	323	DPFS	S	F	L	P	E	G	F	L	D	R	T	K	E	K	G	L	V	V	P	S	---	WAPQ	VQ	-----	ILAH	P	S	T	C	G	F	L	T	H	CGWNS	T	LE	S	I	V	N	G	V	P	L	I	A	W	P	L	F	A	E	Q	K	M	N	T	L	L	L	V	E	D	V	G	A
UGT72B3	323	DPFS	S	F	L	P	Q	G	F	L	D	R	T	K	E	K	G	L	V	V	G	S	---	WAPQ	AAQ	-----	ILTH	T	S	T	I	G	G	F	L	T	H	CGWNS	S	LE	S	I	V	N	G	V	P	L	I	A	W	P	L	YAE	Q	K	M	N	-	A	L	L	L	V	D	V	G	A	
UGT72B1	323	DPLT	F	L	P	P	E	G	F	L	E	R	T	K	K	R	G	F	V	I	P	F	---	WAPQ	AAQ	-----	VLAH	P	S	T	G	G	F	L	T	H	CGWNS	T	LE	S	V	S	G	I	P	L	I	A	W	P	L	YAE	Q	K	M	N	A	V	L	L	S	E	D	I	R	A			
UGT72E2	322	NTPE	Y	L	P	E	G	F	V	S	R	T	S	D	R	G	F	V	V	P	S	---	WAPQ	AE	-----	ILSH	R	A	V	GG	F	L	T	H	CGWNS	S	T	LE	S	V	V	G	GV	P	M	I	A	W	P	L	F	A	E	Q	N	M	N	A	L	L	S	D	E	L	G	I			
UGT72E3	322	NTPE	Y	L	P	E	G	F	V	T	R	T	C	D	R	G	F	M	I	P	S	---	WAPQ	AE	-----	ILAH	Q	A	V	GG	F	L	T	H	CGWNS	S	T	LE	S	V	L	C	GV	P	M	I	A	W	P	L	F	A	E	Q	N	M	N	A	L	L	S	D	E	L	G	I			
UGT72E1	318	GTPD	Y	L	P	E	G	F	V	S	R	T	H	E	R	G	F	M	V	S	S	---	WAPQ	AE	-----	ILAH	Q	A	V	GG	F	L	T	H	CGWNS	T	LE	S	V	V	G	GV	P	M	I	A	W	P	L	F	A	E	Q	M	N	A	T	L	L	N	E	E	L	G	V				
UGT72D1	319	QVSAS	L	P	E	G	F	L	D	R	T	R	G	V	G	I	V	T	Q	---	WAPQ	VE	-----	ILSH	R	S	I	GG	F	L	S	H	CGWNS	S	A	L	E	S	L	T	K	GV	P	L	I	A	W	P	L	YAE	Q	W	M	N	A	T	L	L	T	E	E	I	G	V					
UGT72C1	322	--LDF	L	P	N	G	F	L	D	R	T	K	D	I	G	L	V	V	R	T	---	WAPQ	EE	-----	ILAH	K	S	T	GG	FV	TH	CGWNS	V	LE	S	I	V	N	G	V	P	M	V	A	W	P	L	YAE	Q	K	M	N	A	R	M	V	S	G	E	L	K	I							
UGT73B2	334	EWL---	PE	G	F	E	E	R	V	K	G	K	G	-	M	I	R	-	G	W	A	P	Q	V	L	-----	ILDH	Q	A	T	CG	FV	TH	CGWNS	I	L	E	G	V	A	A	C	L	P	M	V	T	W	P	V	G	A	E	Q	F	Y	N	E	K	L	V	T	Q	V	L	R	T		
UGT73B3	334	EWL---	PE	G	F	E	E	R	V	K	G	K	G	-	M	I	R	-	G	W	A	P	Q	V	L	-----	ILDH	Q	A	T	CG	FV	TH	CGWNS	I	L	E	G	V	A	A	C	L	P	M	V	T	W	P	V	A	A	E	Q	F	Y	N	E	K	L	V	T	Q	V	L	R	T		
UGT73B4	335	DWL---	PK	G	F	E	E	R	N	K	G	K	G	-	L	I	R	-	G	W	A	P	Q	V	L	-----	ILDH	K	A	T	GG	FV	TH	CGWNS	T	LE	G	I	A	A	C	L	P	M	V	T	W	P	M	G	A	E	Q	F	Y	N	E	K	L	L	T	K	V	L	R	I			
UGT73B5	335	EWL---	PE	G	F	K	E	R	T	T	G	K	G	-	L	I	P	-	G	W	A	P	Q	V	L	-----	ILDH	K	A	T	GG	FV	TH	CGWNS	S	A	T	E	G	I	A	A	C	L	P	M	V	T	W	P	M	G	A	E	Q	F	Y	N	E	K	L	L	T	K	V	L	R	I	
UGT73B1	335	DWL---	PE	G	F	E	E	K	T	K	G	K	G	-	L	I	R	-	G	W	A	P	Q	V	L	-----	ILEH	K	A	T	GG	F	L	T	H	CGWNS	I	L	E	G	V	A	A	C	L	P	M	V	T	W	P	V	G	A	E	Q	F	Y	N	E	K	L	V	T	Q	V	L	K	T
UGT73C3	336	WML---	ES	G	F	E	E	R	I	K	E	R	G	-	L	L	I	K	-	G	W	A	P	Q	V	L	-----	ILSH	P	S	V	GG	F	L	T	H	CGWNS	T	LE	G	I	T	S	G	I	P	L	I	T	W	P	L	F	G	D	Q	F	C	N	Q	K	L	V	V	Q	V	L	K	
UGT73C4	336	WMM---	ES	G	F	E	E	R	I	K	E	R	G	-	L	L	I	K	-	G	W	S	P	Q	V	L	-----	ILSH	P	S	V	GG	F	L	T	H	CGWNS	T	LE	G	I	T	S	G	I	P	L	I	T	W	P	L	F	G	D	Q	F	C	N	Q	K	L	V	V	Q	V	L	K	
UGT73C2	336	WIL---	ES	G	F	E	E	R																																																													



UGT79B10	295	TIQDALPEGF	EERVKDRG-	VVLG-EWVQOP	-----	LLLAHPSVGC	FLSHCGFG	SMWESL	MSDCQIV	LLPFLADQ	VLNTRLMTE	EELKVS																																						
UGT79B11	295	TIHEALPEGF	EERVKGRG-	IVWG-EWVQPSWQ	-----	PLLLAHPSVGC	FVSHCGFG	SMWESL	MSDCQIV	FIPVLNDQ	VLTRVMTEE	EELEVS																																						
UGT79B9	295	TIQEALPEGF	EERVKNHG-	VVWG-EWVQOP	-----	LTLAHPSVGC	FVTHCGFG	SMWESL	VSDCQIV	LLPYLCDQ	ILNTRLMSE	EELEVS																																						
UGT79B7	295	TVQEGLP	GF	EERVKDRG-	VVWG-GWVQOP	-----	LTLAHPSIG	CFVNHCGP	GTIWE	SLVSDCQ	MVLLPFLSD	QVLFTRLMTE	EEFEVS																																					
UGT79B8	295	TVEEGLPEGF	QERVKGRG-	VVWG-GWVQOP	-----	LTLDHPSIG	CFVNHCGP	GTIWE	CLMTDCQ	MVLLPFLGD	QVLFTRLMTE	EEFKVS																																						
UGT79B6	301	TIQEALPKGF	EERVKARG-	VVWG-GWVQOP	-----	LTLAHPSIG	CFVSHCGFG	SMW	BALVND	CQIVFIPHL	GEOILNTRLM	SEELKVS																																						
UGT79B4	297	TIQEALPEGF	EERIKGRG-	IVWG-GWVQOP	-----	LTLSHPSIG	CFVNHCGFG	SMWESL	VSDCQIV	FIPQLVD	QVLTTRLLTE	EELEVS																																						
UGT79B5	296	TVQEALPKGF	EERVKKHG-	IVWE-GWLEQP	-----	LTLSHPSVGC	FVNHCGFG	SMWESL	VSDCQIV	FIPQLADQ	VLITRLLTE	EELEVS																																						
UGT79B2	301	TIQEALPEGF	EERVKGRG-	VVWG-EWVQOP	-----	LTLSHPSVGC	FVSHCGFG	SMWESL	LLSDCQIV	LVPQLGDQ	VLNTRLLS	DELKVS																																						
UGT79B3	301	TIQEALPEGF	EERVKGRG-	LVWG-GWVQOP	-----	LTLSHPSVGC	FVSHCGFG	SMWESL	LLSDCQIV	LVPQLGDQ	VLNTRLLS	DELKVS																																						
UGT79B1	320	TVEEALPEGF	KERVQGRG-	VVFG-GWVQOP	-----	LVLNHP	SVGC	FVSHCGFG	SMWESL	MSDCQIV	LVPQHGE	OILNARLMTE	EEMVA																																					
UGT91B1	319	-ASMLLPDGF	KERVKERG-	VIWT-EWVPOTK	-----	LTLSHG	SVGGFV	THCGW	GS	AVEGLS	FGVPLIM	FPCNLDQ	PLVARLLSG	MNIG-																																				
UGT91C1	315	---KIPDGF	KTRVKGRG-	MVHV-GWVPOVK	-----	LTLSHES	VGGF	LTHCGW	NS	VVEGL	GF	GKVP	IFFPVL	NEOGLNTR	LLHGKGLG-																																			
UGT91A1	326	TEPVELPEGF	EERTADR	G-MVWR-GWVEQLR	-----	LTLSHDS	IGLVL	THPCW	GTIIEA	IRFAK	P	MAMLV	FVYDQ	GLNAR	LVIEEKKIG-																																			
UGT86A1	333	FLPAGFVDQAQ	-----	DRGLVVQWCCOME	-----	LVL	SNPAV	GGFF	THCGW	NS	ILE	SVW	CGLPL	LLCY	PLLT	DQFTNR	KL	VDDWC	IG																															
UGT86A2	336	PLPEGFETEAG	-----	DRGLVLPWCCOMT	-----	VL	SHES	VGGF	LTHCGW	NS	ILE	T	WCE	V	PL	CF	PL	LL	T	DQV	LN	R	KL	V	DD	WE	IG																							
UGT87A1	315	-----EALEG	-----	SLGVVSWCDQLR	-----	VL	CHAA	IG	GF	W	THCG	W	NS	T	LE	G	I	C	S	G	V	P	L	L	T	F	P	V	F	W	D	Q	F	L	N	A	K	M	I	V	E	E	W	R	V	G				
UGT87A2	314	-----EALEG	-----	SLGVVSWCDQLR	-----	VL	CH	K	A	V	G	G	F	W	THCG	W	NS	T	LE	G	I	S	G	V	P	M	L	A	F	P	L	F	W	D	Q	I	L	N	A	K	M	I	V	E	D	W	R	V	G	
UGT85A2	342	VP-PEFLTATA	-----	DRRMLASWCPQEK	-----	VL	SHP	AI	GGF	LTHCGW	NS	T	LE	S	L	C	G	V	P	M	V	C	W	P	F	F	A	E	Q	T	N	C	K	F	S	R	D	E	W	E	V	G								
UGT85A3	345	IP-KEFLAETA	-----	DRRMLTSWCPQEK	-----	VL	SHP	AV	GGF	LTHCGW	NS	T	LE	S	L	S	C	G	V	P	M	V	C	W	P	F	F	A	E	Q	T	N	C	K	F	S	C	D	E	W	E	V	G							
UGT85A1	346	VP-PDFLMETK	-----	DRSMLASWCPQEK	-----	VL	SHP	AI	GGF	LTHCGW	NS	T	LE	S	L	S	C	G	V	P	M	V	C	W	P	F	F	A	D	Q	M	N	C	K	F	C	C	D	E	W	D	V	G							
UGT85A7	345	VLPQEFLAETI	-----	DRRMLASWCPQEK	-----	VL	SHP	AI	GGF	LTHCGW	NS	T	LE	S	L	A	G	V	P	M	I	C	W	P	C	F	S	E	Q	T	N	C	K	F	C	C	D	E	W	G	V	G								
UGT85A5	339	LP-PDFLIETA	-----	NRRMLASWCPQEK	-----	VL	SHP	AV	GGF	LTHCGW	NS	T	LE	S	L	S	G	V	P	M	V	C	W	P	F	F	A	E	Q	T	N	C	K	Y	C	C	D	E	W	E	V	G								
UGT85A4	344	LPAEFLSETKN	-----	RGMLIKGWCSQEK	-----	VL	SHP	AI	GGF	LTHCGW	NS	T	LE	S	L	Y	A	G	V	P	M	I	C	W	P	F	F	A	D	Q	L	T	N	R	K	F	C	C	D	E	W	G	I	G						
UGT74E1	316	YIEEIGEK	-----	GLTVSWSPQLE	-----	VL	TH	K	S	IG	CF	V	THCGW	NS	T	LE	G	L	S	L	G	V	P	M	I	G	M	P	H	W	A	D	Q	P	T	N	A	K	F	M	E	D	V	W	K	V	G			
UGT74E2	318	YVEEIGEK	-----	GLIVSWSPQLD	-----	VL	AH	K	S	IG	CF	L	THCGW	NS	T	LE	G	L	S	L	G	V	P	M	I	G	M	P	H	W	T	D	Q	P	T	N	A	K	F	M	Q	D	V	W	K	V	G			
UGT74D1	318	YIEDICDK	-----	GLIVNWSPOLQ	-----	VL	AH	K	S	IG	CF	M	THCGW	NS	T	LE	A	L	S	L	G	V	A	L	I	G	M	P	A	Y	S	D	Q	P	T	N	A	K	F	I	E	D	V	W	K	V	G			
UGT74C1	320	FIEEAEKDS	-----	GLVAKWVPQLE	-----	VL	AH	E	S	IG	CF	V	SHCGW	NS	T	LE	A	L	C	L	G	V	P	M	V	G	V	P	Q	W	T	D	Q	P	T	N	A	K	F	I	E	D	V	W	K	I	G			
UGT74F1	310	FLETVDKDK	-----	SLVLKWSPQLQ	-----	VL	SN	K	A	IG	CF	M	THCGW	NS	T	ME	G	L	S	L	G	V	P	M	V	A	M	P	Q	W	T	D	Q	P	M	N	A	K	Y	I	Q	D	V	W	K	V	G			
UGT74F2	310	FLETVNKEK	-----	SLVLKWSPQLQ	-----	VL	SN	K	A	IG	CF	L	THCGW	NS	T	ME	A	L	T	F	G	V	P	M	V	A	M	P	Q	W	T	D	Q	P	M	N	A	K	Y	I	Q	D	V	W	K	A	G			
UGT74B1	323	FVESTKDR	-----	ALLVSWCNQLE	-----	VL	AH	E	S	IG	CF	L	THCGW	NS	T	LE	G	L	S	L	G	V	P	M	V	G	V	P	Q	W	S	D	Q	M	N	D	A	K	F	V	E	E	V	W	K	V	G			
UGT75B1	306	GEEETEIEK	IAGFRHELEE	VGMIVSWCSQIE	-----	VL	SH	R	A	V	GC	F	V	THCGW	NS	T	LE	S	L	V	L	G	V	P	V	A	F	P	M	W	S	D	Q	P	T	N	A	K	L	L	E	E	S	W	K	T	G			
UGT75B2	309	GEEETEIEK	IAGFRHELEE	VGMIVSWCSQIE	-----	VL	RH	R	A	IG	CF	L	THCGW	NS	T	LE	S	L	V	L	G	V	P	V	A	F	P	M	W	S	D	Q	P	N	A	K	L	L	E	E	I	W	K	T	G					
UGT75D1	324	DEQEKEEDC	ISSEKSFDE	IGMVVSWCDQFR	-----	VL	NH	R	S	IG	CF	V	THCGW	NS	T	LE	S	L	V	S	G	V	P	V	A	F	P	Q	W	N	D	Q	M	T	N	A	K	L	L	E	D	C	W	K	T	G				
UGT75C1	317	RFLLELIR	-----	GSDRGLVVGWCSQTA	-----	VL	AH	C	A	V	GC	F	V	THCGW	NS	T	LE	S	L	S	G	V	P	V	A	F	P	Q	F	A	D	Q	C	T	T	A	K	L	V	E	D	T	W	R	I	G				
UGT84A3	328	HVLPRELEE	-----	KGKIVEWCPQER	-----	VL	AH	P	A	I	A	C	F	L	SHCGW	NS	T	ME	A	L	T	A	G	V	P	V	C	F	P	Q	W	G	D	Q	V	T	D	A	V	Y	L	A	D	V	F	K	T	G		
UGT84A4	324	HVLPLELEE	-----	KGKIVEWCPQEK	-----	VL	AH	P	A	V	A	C	F	L	SHCGW	NS	T	ME	A	L	T	S	G	V	P	V	I	C	F	P	Q	W	G	D	Q	V	T	N	A	V	M	I	D	V	F	K	T	G		
UGT84A2	334	HVLPPEEVK	C	-----	KGKIVEWCSQEK	-----	VL	SH	P	S	V	A	C	F	V	THCGW	NS	T	ME	A	V	S	S	G	V	P	T	V	C	F	P	Q	W	G	D	Q	V	T	D	A	V	M	I	D	V	W	K	T	G	
UGT84A1	329	HVLPQELKES	S	-----	AKGKGMIVDWCPQEQ	-----	VL	SH	P	S	V	A	C	F	V	THCGW	NS	T	ME	S	L	S	S	G	V	P	V	V	C	C	P	Q	W	G	D	Q	V	T	D	A	V	Y	L	I	D	V	F	K	T	G
UGT84B1	315	AVLQEMVKE	-----	GQGVLEWSPQEK	-----	IL	S	H	E	A	I	S	C	F	V	THCGW	NS	T	ME	T	V	V	A	G	V	P	V	V	A	Y	P	S	W	T	D	Q	P	I	D	A	R	L	L	V	D	V	F	G	I	G
UGT84B2	309	QVLQEMVKE	-----	GKGVTWQWQEK	-----	IL	S	H	M	A	I	S	C	F	I	THCGW	NS	T	ME	T	V	V	T	G	V	P	V	V	A	Y	P	T	W	I	D	Q	P	L	D	A	R	L	L	V	D	V	F	G	I	G
UGT76C3	311	VVHGAEWIEQLH	-----	EKGKIVNWAPQOE	-----	VL	KH	Q	A	IG	CF	L	THCGW	NS	T	VE	S	V	F	E	G	V	P	M	I	C	M	P	F	V	W	D	Q	L	L	N	A	R	F	V	S	D	V	W	M	V	G			
UGT76C4	312	EALPEYFIKRLN	-----	EKGKIVKWAPQOE	-----	VL	KH	R	A	IG	CF	L	THCGW	NS	T	VE	S	V	C	E	G	V	P	M	I	C	L	P	F	R	W	D	Q	L	L	N	A	R	F	V	S	D	V	W	M	V	G			
UGT76C5	316	ETIPEEIMEKLN	-----	EKGKIVKWAPQOD	-----	VL	KH	R	A	IG	CF	L	THCGW	NS	T	VE	S	V	C	E	A	V	P	M	I	C	L	P	F	R	W	D	Q	M	L	N	A	R	F	V	S	D	V	W	M	V	G			
UGT76C2	313	EPLSEGLVSSLE	-----	EKGKIVKWAPQOE	-----	VL	AH	R	A	T	IG	CF	L	THCGW	NS	T	LE	S	I	C	E	G	V	P	M	I	C	L	P	G	W	D	Q	M	L	N	S	R	F	V	S	D	I	W	K	I	G			

UGT76C1	320	ESLPSGFMESLD-----GKGKIVRWAPOLD-----	VLAHRATGGFLTHCGWNSTLESICEGVPMICLPCKWDOFVNARFISEVWRVG
UGT76B1	308	EILPKGFLENLE-----GRGKIVKWAPQPE-----	VLAHRATGGFLTHCGWNSTLEGEICEAIPMICRPSFGDQRVNARYINDVWKIG
UGT76F1	318	ESLPCGFLENIG-----HQGKIVKWVWNOLE-----	TLAHPAVGAFWTHCGWNSTLESICEGVPMICTPFCFSDQHVNARYIVDVWRVG
UGT76F2	314	ESLPLGFMENIG-----DKGKIVKWANOLE-----	VLAHPAIGAFWTHCGWNSTLESICEGVPMICTSCFTDQHVNARYIVDVWRVG
UGT76E1	311	ESLPEEF SRLVS-----ERGYIVKWAPQIE-----	VLRHPAVGGFWSHCGWNSTLESIGEVPMICRPFPTGDQKVNARYLERVWRIG
UGT76E2	313	ESLPEEFNRLVS-----ERGYIVKWAPQME-----	VLRHPAVGGFWSHCGWNSTLESIGEVPMICRPFPTGDQKVNARYLERVWRIG
UGT76E4	313	ELLPEEVIKMT-----ERGYIAKWAPQIE-----	VLGHPAVGGFWSHCGWNSTLESIVEGVPMICRPLQGEQKLNAMYIESVWKIG
UGT76E6	313	ESLPEEVIKMT-----ERGYIVKWAPQIE-----	VLGHPAVGGFWSHCGWNSTLESIVEGVPMICRPFHGEQKLNALCLESIVWRIG
UGT76E5	304	ESMPVEVSKIVS-----ERGCIVKWAPONE-----	VLVHPAVGGFWSHCGWNSTLESIVEGVPMICRPFNGEQKLNAMYIESVWRVG
UGT76E3	308	ESLPEEVSKMVL-----EKGYIVKWAPQIE-----	VLGHPVGGFWSHCGWNSTLESIVEGVPMICRPFYQGEQMLNAYLESVWRIG
UGT76E11	312	ENLPKEFSKIIS-----GRGYIVKWAPQKE-----	VLSHPAVGGFWSHCGWNSTLESIGEVPMICRPFSSDQMVNARYLECVWKIG
UGT76E12	314	ESMPPEFSKMVL-----DRGYIVKWAPQKE-----	VLSHPAVGGFWSHCGWNSTLESIGQVPMICRPFSGDQKVNARYLECVWKIG
UGT76E7	314	EEELLKKMVIT-----DRGYIVKWAPQKQ-----	VLAHSAVGAFWSHCGWNSTLESILGEGVPLICRPFPTDQKGNARYLECVWKVG
UGT76E9	318	NEELLSMMEIP-----DRGYIVKWAPQKQ-----	VLAHSAVGAFWSHCGWNSTLESIMGEGVPMICRPFPTDQKVNARYVECVWRVG
UGT76D1	308	DFLPEQFNQTVTD-----GRGFVVKWAPQKE-----	VLRHRAVGGFVNHCGWNSCLESSSGVPMICRPFYSGDQRVNTRLMSHVWQTA
UGT81B1	323	---NKLASTLASHWKIPVKVIRGFETQME-----	---KWMGACDCIITKACPGTIAEALICGLPIILNDYIPGOEKGNVPYVVDNGAG
UGT81B2	319	---NKKLASALEAIDWKIPVKVIRGFETQME-----	---KWMGACDCIITKACPGTIAESLIRSLPIILNDYIPGOEKGNVPYVVDNGAG
UGT81A1	392	---NKKLQSKLSSLDWKIPVQVKGFIITKME-----	---ECMGACDCIITKACPGTIAEAMIRCLPIILNGYIAGOEAGNVPYVVDNGCC
UGT88A1	319	-LKSLLPEGFLSRITEDKGMVVKV--WAPQVP-----	VLNHNKAVGGFVTHCGWNSILEAVCACVPMVAWPLYAEORFNRMIVDEIKIA
UGT83A1	334	-----RVKVVWRWAPQRE-----	VLSSGATGCFVSHCGWNSTLEGAQNCIPFLCIPYFADQFINKAYICDVWKIG
UGT82A1	332	-----FVHRVTITKNQGRIVSWAPQLE-----	VLRNDSVGCYVTHCGWNSTMEAVASSRRLLCYPVAGDQFVNCKYIVDVWKIG
UGT92A1	333	-VKGYLPEGFEERITRSEGLLVKKWAPQVD-----	ILSHKATCVFLSHCGWNSILESLSHCVPLLGWPMMAAEQFFNSILMEKHIGVS
consensus	501	.. . . . .	.. . . . . *

UGT80A2 558 SP~~I~~PVDEFSLHKLEDAINFMLDDK~~V~~KSSAETLAKAMKDEDG~~V~~VAGAVKAFFKHL~~P~~-----SAKQNI~~S~~SDP~~I~~PEPSGFLS~~E~~FRKCFGCS-----  
 UGT80A3 522 AP~~I~~PIAQLSVENLSSSIRF~~M~~LQPE~~V~~KSQVMELAKVLENE~~D~~GVA~~A~~AVDAFHRHL~~P~~PELPLPESSEK~~K~~DEDD~~R~~PDLLQWFF~~I~~QIGKKCCLPCGGV-----  
 UGT78D2 396 M~~T~~IIN-----GVFTK~~D~~GF~~E~~KCLDKVLVQDDG~~K~~KMKCN-----AKKLKELAYEAVSSK~~G~~RSSENFRGLLD~~A~~VVNI~~I~~-----  
 UGT78D3 395 V~~T~~ISS-----GVFTK~~D~~GF~~E~~ESLDRVLVQDDG~~K~~KMKVN-----AKKLEELAQEAVSTK~~G~~SSFENFGGLLDE~~V~~VNFG-----  
 UGT78D1 390 V~~M~~MDN-----GVFTK~~E~~GF~~E~~KCLNDV~~F~~VHDDG~~K~~TKMAN-----AKKLKEKLQED~~F~~SMK~~G~~SSLEN~~F~~KILLDE~~I~~VKV-----  
 UGT71B1 399 A~~E~~VKKEYRRDFLVEEP-EIVT~~A~~DEIERG~~I~~KCAMEQDS--KMRKR-----VMEMKDKLHVALVD~~G~~SSNCAL~~K~~KFVQDV~~V~~DNVP-----  
 UGT71B2 411 V~~E~~VRNSFRGDFMAADD-ELMT~~A~~EIEIRG~~I~~RCLMEQDS--DVRSR-----VKEMSEKSHVALMD~~G~~SSSHVALL~~K~~FIQDV~~T~~KNIS-----  
 UGT71B7 408 V~~E~~IRKYWRGEHLA~~G~~LPATV~~T~~AEEIEKA~~I~~MCLMEQDS--DVRKR-----VKDMSEKCHVALMD~~G~~SSSR~~T~~ALQK~~F~~IEEV~~A~~KNIVSLD~~K~~EFEHVA-----  
 UGT71B8 405 V~~K~~IRKYWRGDQLVGT~~T~~ATV~~I~~VTAEEIEIRG~~I~~RCLMEQDS--DVRNR-----VKEMSKKCHMAL~~K~~DGSSQSAL~~K~~LFIQDV~~T~~KYIA-----  
 UGT71B6 399 V~~E~~IKKHWRGDLLLGRS-EIVT~~A~~EIEK~~G~~IICLMEQDS--DVRKR-----VNEISEKCHVALMD~~G~~SSSETAL~~K~~RFIQDV~~T~~ENIAWSETES-----  
 UGT71B5 404 V~~E~~IRKYLKG-DL~~F~~AGEMETV~~T~~AEDIERA~~I~~IRRVMEQDS--DVRNN-----VKEMAEKCH~~F~~ALMD~~G~~SSSKAALE~~K~~FIQDV~~I~~ENMD-----  
 UGT71C1 409 LEMRLDYVSEDG----DIVK~~A~~DEIAG~~T~~VRSLMDGVD--VPKSK-----VKEIAEAGKEAVD--GGSSFLAV~~K~~RFI~~G~~DLID~~G~~VSISK-----  
 UGT71C2 409 LEMRLDYVSEYG----EIVK~~A~~DEIAG~~A~~VRSLMDGED--VPRR-----LKEIAEAGKEAVMD~~G~~SSSFVAV~~K~~RFI~~D~~GL-----  
 UGT71C3 406 V~~E~~LRLDYVSAYG----EIVK~~A~~EIEIAG~~A~~IRSLMDGED--TPRKR-----VKEMAEAAARNALMD~~G~~SSSFVAV~~K~~RFI~~D~~DELIGGDV-----  
 UGT71C4 407 V~~D~~L~~R~~MDYVSSRG----GLV~~T~~CDEIAR~~A~~VRSLMDGGD--EK~~R~~KK-----VKEMADAARKALMD~~G~~SSSLATAR~~F~~IAEL~~F~~EDGSSC-----  
 UGT71C5 406 V~~E~~LRLDYVADGDRVTL-EIVS~~A~~DEIATA~~V~~RSLMDSDN--PVRKK-----VIEKSSVARKAV~~G~~DGSS~~T~~VATCN~~F~~IKDILGDHF-----  
 UGT71D1 396 V~~E~~LKLDYRVHSD----EIVN~~A~~NEIETA~~I~~RYVMD~~T~~DNN--VVRKR-----VMDISQMIQRAT~~K~~NGSSFAAIEK~~F~~IYDVIGIKP-----  
 UGT71D2 396 V~~E~~LKLDYSVHSG----EIVS~~A~~NEIETA~~I~~SCVMNKDNN--VVRKR-----VMDISQMIQRAT~~K~~NGSSFAAIEK~~F~~IHDVIGTRT-----  
 UGT72B2 404 L~~R~~I~~H~~-----AGEDG~~I~~VRREEV~~V~~R~~V~~VKALMEGEEGKAIGNK-----VKELKEGV~~V~~RV~~L~~GD~~D~~CLSSK~~S~~FG~~E~~VLLK~~W~~KTHQ~~R~~DINQ~~E~~TSH--  
 UGT72B3 403 L~~R~~AR-----LGEDG~~V~~VGREEV~~A~~R~~V~~VKGLIEGEEGNAVRKK-----MKELKEG~~S~~VR~~V~~LR~~D~~D~~G~~FT~~S~~T~~K~~SLNEV~~S~~LK~~W~~KAHQ~~R~~KIDQ~~E~~QESFL-----  
 UGT72B1 404 L~~R~~PR-----AGDDG~~L~~VRREEV~~A~~R~~V~~VKGLMEGEEGKGV~~R~~NK-----MKELKEAACR~~V~~LK~~D~~D~~G~~FT~~S~~T~~K~~ALS~~L~~V~~A~~LK~~W~~KAHK~~E~~LEQNGNH--  
 UGT72E2 403 V~~R~~LDD-----PKED--ISR~~W~~KIEAL~~V~~R~~K~~VMTEKEGEAMRRK-----VKKLR~~D~~SAEMSLSID~~G~~GGLA~~H~~ESL~~C~~RV~~T~~KECQ~~R~~FLER~~V~~VDLSRG-----  
 UGT72E3 403 V~~R~~VDD-----PKEA--ISR~~S~~KIEAM~~V~~R~~K~~VMAEDEGEEMRRK-----VKKLR~~D~~TAEMSLSIH~~G~~GGA~~H~~ESL~~C~~RV~~T~~KECQ~~R~~FL~~E~~CV~~G~~DLGRG-----  
 UGT72E1 399 V~~R~~S~~K~~K-----LPSE~~G~~VIT~~R~~A~~E~~IEAL~~V~~R~~K~~IMVEE~~E~~GAEMRRK-----IKKLKETA~~A~~ESL~~S~~CD~~G~~-VAHESL~~S~~R~~I~~ADESEHLLER~~V~~RCMARG-----  
 UGT72D1 400 V~~R~~TSE-----LPSE~~R~~VIG~~R~~EEV~~A~~SL~~V~~R~~K~~IMAE~~E~~DEEGQKIR-----AKAE~~E~~VR~~V~~SSER~~A~~WSK~~D~~GSS~~S~~YN~~S~~L~~E~~FWAK~~R~~CYLVP-----  
 UGT72C1 401 L~~Q~~IN-----VADG~~I~~VK~~E~~VIAEM~~V~~K~~R~~VMDEEEGKEMRKN-----VKELK~~K~~TAE~~E~~AL~~N~~MTHIP~~S~~AYFT-----  
 UGT73B2 412 V~~S~~VGASKHMKVMMG----DFIS~~R~~EK~~V~~DKAV~~R~~EV~~L~~AGEA-----AEERRRR~~A~~K~~L~~AAMAKAAVEE~~G~~SSFN~~D~~LN~~S~~FIEEF~~F~~SS-----  
 UGT73B3 412 V~~S~~VGAKKNVRTTG----DFIS~~R~~EK~~V~~VKAV~~R~~EV~~L~~VGEE-----ADERRER~~A~~K~~L~~AEMAKAAVEE~~G~~SSFN~~D~~LN~~S~~FIEEF~~F~~TS-----  
 UGT73B4 413 V~~N~~VGATELVKKGK----LIS~~R~~AQ~~V~~EKAV~~R~~EVIGGEK-----AEERRL~~R~~A~~K~~ELGEMAKAAVEE~~G~~SSSY~~N~~D~~V~~N~~K~~FMEELN~~G~~RK-----  
 UGT73B5 413 V~~N~~VGATELVKKGK----LIS~~R~~AQ~~V~~EKAV~~R~~EVIGGEK-----AEERRL~~W~~A~~K~~KL~~G~~EMAKAAVEE~~G~~SSSY~~N~~D~~V~~N~~K~~FMEELN~~G~~RK-----  
 UGT73B1 413 V~~S~~VGVKMMQVVG----DFIS~~R~~EK~~V~~EGAV~~R~~EV~~M~~VGE-----ERRK~~R~~A~~K~~ELAE~~M~~AKNAV~~K~~E~~G~~SSD~~L~~E~~V~~D~~R~~LMEEL~~T~~LV~~K~~LQ~~K~~EKV-----  
 UGT73C3 414 V~~S~~AGVEEVMKWGEEDKIGVL~~V~~DKEG~~V~~KKAVEELMGDSDDAKE-----RRRRV~~K~~ELGELAHKAVE~~K~~GSSHS~~N~~IT~~L~~LLQ~~D~~IMQ~~L~~AQ~~F~~KN-----  
 UGT73C4 414 V~~S~~AGVEEVMKWGEEEEKIGVL~~V~~DKEG~~V~~KKAVEELMGASDDAKE-----RRRRV~~K~~ELGESAHKAVEE~~G~~SSHS~~N~~ITY~~L~~LLQ~~D~~IMQ~~V~~KSKN-----  
 UGT73C2 414 V~~S~~VGVEEVMKWGEEESIGVL~~V~~DKEG~~V~~KKAVEELMGESDEAKE-----RRKR~~V~~RELGELAHKAVEE~~G~~SSHS~~N~~IT~~F~~LLQ~~D~~IMQ~~V~~ESKS-----  
 UGT73C5 413 V~~R~~SGVEQPMKWGEEEEKIGVL~~V~~DKEG~~V~~KKAVEELMGESDDAKE-----RRRR~~A~~KELGDSAHKAVEE~~G~~SSHS~~N~~IS~~F~~LLQ~~D~~IMELAE~~P~~NN-----  
 UGT73C6 413 V~~S~~AEVKEVMKWGEEEEKIGVL~~V~~DKEG~~V~~KKAVEELMGESDDAKE-----RRRR~~A~~KELGESAHKAVEE~~G~~SSHS~~N~~IT~~F~~LLQ~~D~~IMQ~~L~~AQSNN-----  
 UGT73C1 409 V~~R~~AGVEESMRWGEEEEKIGVL~~V~~DKEG~~V~~KKAVEELMGDSNDAKE-----RRKR~~V~~KELGELAHKAVEE~~G~~SSHS~~N~~IT~~F~~LLQ~~D~~IMQ~~L~~EQPKK-----  
 UGT73C7 408 L~~K~~IGVEKLMKYGKEEEEIGAM~~V~~SREC~~V~~RKAV~~D~~ELMGDSEEAEE-----RRRK~~V~~TELS~~D~~LANKALE~~K~~GSSSD~~S~~NIT~~L~~LIQ~~D~~IMEQ~~S~~Q~~N~~QF-----  
 UGT73D1 416 V~~R~~VGVEIPVRWGDEERLGLV~~L~~VKKPSV~~V~~KAIKLLMDQDCQ~~R~~V~~D~~ENDDDDNEFVRRRRRIQ~~E~~LAVMAK~~K~~AVEEK~~G~~SSSIN~~V~~SILIQ~~D~~VLEQ~~L~~SLV-----  
 UGT89B1 405 V~~R~~ACEGP-----DTVP~~D~~DELAR~~V~~FADSV~~T~~GNQ~~T~~ER-----IKAVEL~~R~~KAA~~L~~DAIQ--ERGSS~~V~~ND~~L~~D~~G~~FIQH~~V~~VS~~L~~GLNK-----  
 UGT89C1 372 V~~R~~VGENR-----DSVP~~D~~SD~~K~~LARILAESAREDL~~P~~ER-----V~~T~~LM~~L~~KREKAMEA~~I~~K--EGSSY~~K~~N~~L~~DELVAEM~~C~~L-----  
 UGT89A2 399 V~~R~~VCEGG-----ETVP~~D~~SDELGR~~V~~IAET~~M~~GEGG~~R~~EV-----AARAE~~E~~IR~~R~~KTEAAV~~T~~EAN~~G~~SSVEN~~V~~Q~~R~~L~~V~~KE~~F~~EKV-----  
 UGT90A1 400 V~~R~~VE~~T~~EDGS-----VKGF~~V~~TREELSGKIKELMEGETG~~K~~TA-----RKNV~~K~~EY~~S~~KMAKAA~~L~~VEGT~~G~~SSW~~K~~N~~L~~DMIL~~K~~ELCKSR~~D~~SNGASE-----  
 UGT90A4 408 V~~R~~I~~E~~TEDVS-----VKGF~~V~~TREELSRKIK~~Q~~LMEGEMG~~K~~TT-----MKNV~~K~~EYAKMAK~~K~~AMAQ~~G~~T~~G~~SSW~~K~~SL~~D~~SLLEELCK~~S~~REP~~D~~G~~V~~NK~~L~~SSS-----  
 UGT90A2 398 ERV~~V~~AAS-----EGV~~R~~REEIAEK~~V~~KELMEGEK~~G~~KEL-----RRNVEAY~~G~~KMAK~~K~~ALEE~~G~~IGSS~~R~~K~~N~~L~~D~~NLINE~~F~~C~~N~~NGT-----

UGT79B10	376	VEVQR-EETGWFSKESLSVAITSVMDQASEIGNLVRNRHNSKL-----KEVLVSDCLLTGYTDKFDVDTLENLVSETKRE----
UGT79B11	380	VEVQR-EETGWFSKENLSGAIMSLMDQDSEIGNQVRRNRHNSKL-----KETLASPCLLTGYTDKFDVDTLENLVNEQGYIS----
UGT79B9	376	VEVKR-EETGWFSKESLSVAITSVMDKDSELGNLVRNRHAKL-----KEVLVSPCLLTGYTDFVETLQNIIVNDTNLE----
UGT79B7	376	VEVPR-EKTGWFSKESLSNAIKSVMDKDSIDGKLVRSNHTKTL-----KEILVSPCLLTGYVDHFVEGLQENLI-----
UGT79B8	376	VEVSR-EKTGWFSKESLSDAIKSVMDKDSIDGKLVRSNHAKL-----KETLGSHCLLTGYVDKFEELQEYLI-----
UGT79B6	382	VEVKR-EETGWFSKESLSGAVRSVMDRDELGNWARRNHVKW-----KESLLRHCLMSGYLNKFEALEKLVQININLE----
UGT79B4	378	VKVKRDEITGWFSKESLSDTVKSVMDKNSEIGNLVRNRHKKL-----KETLVSPCLLSSYADKFEVDELENHIHSKN-----
UGT79B5	377	VKVQR-EDSGWFSKEDLSDTVKSVMDIDSEIGNLVKRNHKKL-----KETLVSPCLLSCGYADKFEVDELEIEVMNNTKFS----
UGT79B2	382	VEVAR-EETGWFSKESLFDAINSVMKRDSEIGNLVKKNHTKW-----RETLTSPCLVTGYVDNFIESLQDLVSGTNHVSK----
UGT79B3	382	VEVAR-EETGWFSKESLCDAVNSVMKRDSELGNLVRKNHTKW-----RETVASPCMLTGYVDAFVESLQDLVSGTTHD----
UGT79B1	401	VEVER-EKKGWFSRQSLENNAVKSVMEEGSEIGEKVRKNHDKW-----RCVLTDSCHFSIDGYIDKFEQNLIELVKS-----
UGT91B1	398	LEIPRNERDGLFTSASVAETIRHVVEEEGK-IYRNNAASQQ-----KKIFGNKRLQDQYADGFIIEFLENPIAGV-----
UGT91C1	391	VEVSRDERDGSFSDSDSVADSIKRLVMIDDAGE-EIR-AKAKVM-----KDLFGNMDENIRYVDELVRFMRSKGSSSSSS-----
UGT91A1	406	YMI PRDETEGFFTKESVANSLRLVMVEEEGK-VYR-ENVKEM-----KGVFGMDRQDRYVDSFLEYLVTNR-----
UGT86A1	409	INLCEKKT-----ITRDQV SANVKRLMNGET-SS--ELRNNVE-----KVKRHLKDAVTVGSS-ETNFNLFVSEVRNR IETKLCNVNGLE
UGT86A2	412	INLCEDKSD-----FGRDEVGRNINRLMCGVS-KE--KIG-----RVKMSLEGAVRNSGSSSEMNLGLFIDGLLSKVGLSNGKA----
UGT87A1	385	MGIERKKQME--LLIVSDEIKELVKRFMDGES-EEGKEMRRRTC-----DLSEICRGAVAKGSS-DANIDAFIKDITKIV-----
UGT87A2	384	MRIERTKKNE--LLIGREEIKEVVKRFMDRES-EEGKEMRRRAC-----DLSEISRGAVAKSGSS-NVNI DEEVRHITNTN-----
UGT85A2	417	IEIG-----GDVKREEVEAVVRELMDE--EKGKNMREKAE-----EWRRLANEATEHKHGSSKLNFEMLVNVKVLGGE-----
UGT85A3	420	IEIG-----GDVKRGEVEAVVRELMDG--EKGKKMREKAV-----EWRRLAEKATKLP CGSSVINFETIVNKVLLGKIPNT-----
UGT85A1	421	IEIG-----GDVKREEVEAVVRELMDG--EKGKKMREKAV-----EWQRLAEKATEHKL GSSVMNFETVVSKFLLGQKSQD-----
UGT85A7	421	IEIG-----KDVKREEVETVVRELMDG--EKGKKLREKAE-----EWRRLAEEATRYKH GSSVMNLETLIHKVFLLENLR-----
UGT85A5	414	MEIG-----GDVRRREEVEELVRELMDG--DKGKKMRQKAE-----EWQRLAEEATKPIY GSSSELNFQMVVDKVLGGE-----
UGT85A4	420	MEIG-----EEVKRERVETVVKELMDG--EKGKRLREKVV-----EWRRLAEEASAPPL GSSYVNFETVVNKVLTCHTIRST-----
UGT74E1	387	VRVKADSD----GFVRRREEFVRRVEEVME--A-EQGKEIRKNAE-----KWKVLAQEAVS-EGSSDKNINEFVSMFC-----
UGT74E2	389	VRVKAEGD----GFVRRREIMRSVEEVME--G-EKGKEIRKNAE-----KWKVLAQEAVS-EGSSDKSINEFVSMFC-----
UGT74D1	389	VRVKADQN----GFVPKEEIVRCVGEVME--G-EKGKEIRKNAR-----RLMEFAREALS-DGGSNDKNIDEFVAKIVR-----
UGT74C1	393	VRVRTDGE----GLSSKEE IARCIVEVME--G-ERGKEIRKNVE-----KLKVLAREAIS-EGSSDKKIDEFVALLT-----
UGT74F1	382	VRVKAEKES---GICKREEIEFSIKEVME--G-EKSKEMKENAG-----KWRDLAVKSLS-EGGSTDININEFVSKIQIK-----
UGT74F2	382	VRVKTEKES---GIAKREEIEFSIKEVME--G-ERSKEMKKNVK-----KWRDLAVKSLN-EGGSTDTNIDTFVSRVQSK-----
UGT74B1	394	YRAKEEAGE---VIVKSEELVRLCKGVME--G-ESSVKIRESSK-----KWKDLAVKAMS-EGSSDRSINEFIESLGK-----
UGT75B1	389	VRVRENKDG---LVERGEIRRCLAEVME---EKSVELRENAK-----KWKRLAMEAGR-EGSSDKNMEAFVEDICGESLIQNLCEAEV
UGT75B2	392	VRVRENSEG---LVERGEIMRCLAEVME---AKSVELRENAE-----KWKRLATEAGR-EGSSDKNVEAFVKSILF-----
UGT75D1	407	VRVMEKKEEEGVVVVDSEEIRRCIEEVME---DKAEFRGNAT-----RWKDLAAEAVR-EGSSFNHLKAFVDEHM-----
UGT75C1	391	VKVKGVEEG---DVDGEEIRRCLKVMMSG---GEEAEEMRENAE-----KWKAMA VDAAA-EGGSPDLNLLKGFVDEDE-----
UGT84A3	401	VRLGRGAAEEM--IVSREVVAEKLLEATVG---EKAVELRENAE-----RWKAEAEAAVA-DGSSDMNFKEFVVDKLVTKHVTTREDNGEH--
UGT84A4	397	LRLSRGASDER--IVPREEVAERLLEATVG---EKAVELRENAE-----RWKAEAEASAVA-YGGT SERNFQEFVVDKLVDTMTNINN VV--
UGT84A2	407	VRLSRGAEAEER--LVPREEVAERLREVTKG---EKAIELKKNAL-----KWKEAEAAVA-RGSSDRNLEKFEKLGAKPVGKVVQNGSHNH
UGT84A1	407	VRLGRGATEER--VVPREEVAEKLLEATVG---EKAEELRKNAL-----KWKAEAEAAVA-PGSSDKNFREFVEKLGAGVTKTKDNGY---
UGT84B1	389	VRMRNDSVDG---ELKVEEVERCIEAVTEG---PAAVDIRRRAA-----ELKRVARLALA-PGSSSTRNLDLFI SDITIA-----
UGT84B2	383	VRMKND AIDG---ELKVAEVERCIEAVTEG---PAAADMRRRAT-----ELKHAARSAMS-PGSSAQNLDSFISDIPIT-----
UGT76C3	388	LHLEG-----RIERNVIEGMIRRLFSETEGKAIRERME-----ILKENVGRSVK-PKGSAYRSLQHLIDYITYF-----
UGT76C4	389	IHLEG-----RIERDEIERAIRRLLETEGEAIRERIQ-----LLKEKVGRSVK-QNGSAYQSLQNLINYISSF-----
UGT76C5	393	INLED-----RVERNEIEGAIRRLLEPEGEAIRERIE-----HLKEKVGRSFQ-QNGSAYQSLQNLIDYISSF-----
UGT76C2	390	IHLEG-----RIEKKEIEKAVRVLMEESEGNKIRERMK-----VLKDEVEKSVK-QGSSFQSIETLANHILL-----

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UGT76C1 397 IHLEG-----RIERREIERAVIRLMVESKGEEIRGRIK-----VLRDEVRRSVK-QGGSSYRSLDELVDRIISIIIEPLVPT-----
UGT76B1 385 LHLEN-----KVERLVIENAVRTLMTSSEGEIEIRKRIM-----PMKETVEQCLK-LGGSSFRNLENLIAYILSF-----
UGT76F1 395 MMLERC-----KMERTIEIEKVVTVMME-NGAGLTEMCL-----ELKEKANVCLS-EDGSSSKYLDKLVSHVLSFDSSAFAS-----
UGT76F2 391 MLLERS-----KMEKKEIEKVLRSVMME-KGDGLRERSL-----KLKERADFCLS-KDGSSSKYLDKLVSHVLSFDSSAFAS-----
UGT76E1 388 VQLEG-----ELDKGTVERAVERLIMDEEGAEMRKRFI-----NLKEKLQASVK-SRGSFSSLDNMFVNSLKMMNFM-----
UGT76E2 390 VQLEG-----DLDKETVERAWEVLLVDEEGAEMRKRAI-----DLKEKIETSVR-SGSSCSSLDDFVNSM-----
UGT76E4 390 IQLEG-----EVEREGVERAVKRLIIDEEGAAMRERAL-----DLKEKLNASVR-SGSSSYNALDELVKFLNTE-----
UGT76E6 390 FQVQG-----KVERGGVERAVKRLIVDEEGADMRRERAL-----VLKENLKASVR-NGSSSYNALEEIVNLM-----
UGT76E5 381 VLLQG-----EVERGCVERAVKRLIVDDEEGVMRRERAL-----VLKEKLNASVR-SGSSSYNALDELVHYLEAEYRNT-----
UGT76E3 385 IQVGG-----ELERGAVERAVKRLIVDKEGASMRERTL-----VLKEKLNASVR-SGSSSYNALDELVKHLKTE-----
UGT76E11 389 IQVEG-----DLDRGAVERAVRRLMVEEEGEGMRKRAI-----SLKEQLRASVI-SGSSSHNSLEEFVHYMRTL-----
UGT76E12 391 IQVEG-----ELDRGVVERAVKRLMVDEEGEEMRKRAF-----SLKEQLRASVK-SGSSSHNSLEEFVHFIRTL-----
UGT76E7 390 IQVEG-----ELERGAIERAVKRLMVDEEGEEMKRRAL-----SLKEKLNASVL-AQSSSHKSLDDFIKTL-----
UGT76E9 394 VQVEG-----ELKRGVVERAVKRLIVDEEGEEMKLRAL-----SLKEKLNASVL-PGSSSHSLDDLIKTL-----
UGT76D1 386 YELEG-----ELERGAVEMAVRRLIVDQEGQEMMRAT-----ILKEEVEASVT-TEGSSSHNSLNNLVHAIMMQIDEQ-----
UGT81B1 401 VFTRSPKE-----TAKIVADWF SNNKEELKKMSENALKLSQ-----PEAVFDIVKDIHHL SQQQRIPLNEFSY-----
UGT81B2 397 VFTRSPKE-----TARIVGEWFSTKTDELEQTS DNARKLAQ-----PEAVFDIVKDIDELSEQRGPLASVSYNLTSSFASLV-----
UGT81A1 470 KFSKSPKE-----ISKIVADWFGPASKLELEIMSQNALRLAK-----PEAVFKIVHDMHELVRKKNSLPQLSCTA-----
UGT88A1 399 ISMNE-----SETGFVSSTEVEKRVQEIIGECVPRER-----TMAMKNAAEALALTETGSSHTALTLLQSWSPK-----
UGT83A1 398 LGLERDARG-----VVPRLVKKKIDEIMRDGGEYERAMK-----VKEIVMKSVAKDGITSCENLNKFNWIKSQVN-----
UGT82A1 406 VRLSG-----FGEKEVEDGLRKVMEDQDMGERLRKLRDR-----AMGNEARLSSEMNF TFLKNELN-----
UGT92A1 415 MEVARGKRCEIKCDDIVSKIKLVMEETE VVGKEIRKKAREVKELVR-----RAMVDGVK GSSVIGLEEFLLDQAMVKKVEN-----
consensus 601 . . . . .
    
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UGT80A2	-----
UGT80A3	-----
UGT78D2	-----
UGT78D3	-----
UGT78D1	-----
UGT71B1	-----
UGT71B2	-----
UGT71B7	494 LK-----
UGT71B8	-----
UGT71B6	-----
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UGT71C1	-----
UGT71C2	-----
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UGT71C4	-----
UGT71C5	-----
UGT71D1	-----
UGT71D2	-----
UGT72B2	-----
UGT72B3	482 -----
UGT72B1	-----
UGT72E2	481 A-----
UGT72E3	481 A-----
UGT72E1	478 A-----
UGT72D1	-----
UGT72C1	-----
UGT73B2	-----
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UGT73C7	-----
UGT73D1	-----
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UGT89C1	-----
UGT89A2	-----
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UGT90A4	491 DA-----
UGT90A2	-----

UGT79B10	-----
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UGT91B1	-----
UGT91C1	-----
UGT91A1	-----
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UGT75B1	467 KVK-----
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UGT81A1	-----
UGT88A1	-----
UGT83A1	-----
UGT82A1	-----
UGT92A1	-----
consensus	701