

```

CYP7A1      -----MMTISLIWG-----IAMVVCCCIWVIFDRRRRKAGEPPL
CYP7B1      -----MAGEVSAATGRFSLERLGLPGLALAAALLLALCLLVRRTRRPGEPP
CYP8A1      -----MSWAVVFG-----LLAALLLLLLLT-RRRTRRPGEPP
CYP8B1      -----MVLWGLLGA-----LLMVMVWGLCLPGLLRQRRPQEPPL
CYP51A1     -----MDWDYYT-LLKTS-----VAITIVFVAKLITSSKSKKTSVPLPPV
CYP51A2     -----MELDSENKLLKTG-----LVIVATLVIAKLIFSFTSD-SKKRLPPT
CYP26A1     -----MGLPALLASALCTFVLP LLLFLAALKLWDLYCVSSRDRSCALPLPP
CYP26C1     -----MFPWGLSCLSVLGAAGTALLCAGLLLSLAQHLWTLRWMLSRDRASTLPLPK
CYP716A1    -----MYMAIMITLFLSSITLLSLLLLLRKHLSHFSYPNLPP
CYP725A1    -----MDSFIFLRSIGTKFGQLESSPAISLTLAPILAIILLLLFRYNHRSSVKLPP
CYP718      -----MVLLEPNFVLSWVFLCIAATISSTLFFFRKKHRRFITKKIQKKLLP
CYP90A1     -----MAFTAFLLLSSIAAGFLLLRRTRYR--RMGLPP
CYP90B1     -----MFETEHTLLPLLLPSLLSLLLFLILLKRRNRKTRFNLPP
CYP724A1    -----MLVLSIFLSLGLFFLSILILYISISKKNETNDHSSLT
CYP720A1    -----MAESAGESYRLLSVSSSTTFLAFIIIFLAGIARRKRRAPHRLLPP
CYP85A1     -----MGAMMVMGLLLITVSLCSALLRWNQMRYTKNGLPP
CYP87A2     -----MW--ALIIWVSLLSITHWVYSWRNPKCRGKLP
CYP708A1    -----MNNLISLDIMKEMGWALSFVIALVVKISLWLRWANPNCSGKLP
CYP702A1    -----MVEVYELLTVMVSLIVVKLFHWIYQSKNPKPNEKLP
CYP88A3     -----MAETTSWIPVWFPLMVLGCFGLNWLVRKVNVLYESSELGENRHYLPP
CYP88B1     -----MDFYNLALFFIALILGIFTFYALMRINGWYYAIFCSNKYNIIPN
CYP3A1      -----MDLLSALT-----LETWVLLAVLVLLYGFGRTRHGLFKKQGI
CYP5A1      -----MEVLGFLSPELNGPMVTMALAVLLALLKWKYSTAFSRLEKLGIR
CYP6A2      -----MFVLIYLLIAISSLLAYLYHRNFYWNRRGVP
CYP6B4      -----MLTIFIVTATLFAILYFYFTRNFNYWKDRNVV
CYP28A1     -----MLEITLILVLLLLGLFYVFMWNFGYWRKRKVP
CYP28C1     -----MFGSLLGIATLLGAIYAFLVSNFGHWRRRGVT
CYP13A2     -----MSLGFVLAVTFSIFLGIILTYLWIWYWMRKGVK
CYP13B1     -----MGAIIVLVLFATIAG--YFKWIHTYWRRGIS
CYP72A8     -----MSDTKISAVAVAAVVVTTVTVWIWKGLNVAWLRPKKNEAYLKRQGLS
CYP72B1     -----MEEESSWFIPKVLVLSVILSLVIVKGMSELLWRRPKIEEHFSKQGIR
CYP721A1    -----MAVFFILVLVFFFVFRFIYSNIWVPWRIQSHFKKQSVT
CYP709A1    -----MLLTILKSLLVIFVTTILRVLYDTISCYWLTPRRIKKIMEQQGVT
CYP709B1    -----MGLVIFLALIVLILIIGLRIFKAFMILVWH-PFVLTRRLKNQGIS
CYP715A1    -----MEFFEMSRVWYIFFKVFVVVICLMFLKFLRCWIWPVRAQKCLRNGFV
CYP714A1    -----MENFMVEMAKTISWIVVIGVLGLGIRVYGKVMAEQWRMRKLTMQGVK
CYP4C3      -----MSSKVITSLMAESILLSKVGQVISGYSPITVFLGSLIFLVVYNKRRSRLVKYIEKIP
CYP31A2     -----MGVIIP-----AVLLAMATVIAWLLYKHLR--MRQVLKHLN
CYP37A1     -----MGIAYVLLALVVIYVFNLSKILKFKVCRMRLYHLMASKID
CYP37B1     -----MHFLNIATIFLITIFLFYKLIYNFIRDRLRIYKYMRKFD
CYP32A1     -----MIIVISIVIGYVILVVNFQQILELWRINRKAQNLSMVN
CYP29A2     -----MTIFIPISIAIILAYLATWIPTLLKYKRHWYQYSGKLP
CYP86A1     -----MEALNSILTGYAVAALSVALWYFLSRRLTQPK
CYP86B1     -----MNFNSSYNLTFNDVFFSSSSSDPLVSRRLFLLRDVQILELLIAIFVVAIHALRQKQYGLP
CYP96A1     -----MALITLLEVSISLLFFSFLYGYFLISKKPHRSFLT
CYP96C1     -----MALASIEKVATGLICFILLIFSLKRIGHPR-----
CYP94A1     -----MFQFHLEVLLPYLPLLLLILPTTIFLTKPNKNSSTSTNN
CYP94B1     -----MEMLNAIILIFPIIGFVLI FSPTKLLKAKTASPSN
CYP704A1    -----MAIIVTTIFILLSFALYLTIRIFTGKSRND----
CYP704B1    -----MSLCLVIACMVT-----WIFLHRWGQRNKGSG----
CYP97A3     MAFPLSYTPTITVKP-VTYSRRSNFVVFSSSSNGRDPLEENSVPNGVKSLEKLQEEKRAEL
SARIASGAFTVRKSSFPSTVKNGLSKIGIPSNVLDFMF

```

```

CYP97B3  MAFPAAAATYPHFQGGALHLGRTDHCLFG-----FYPQTISSVNS-----RRASVSIKCS-----TEPKTNGN-----ILDNASNLLT
CYP1A1  -----MLFPISMSATEFLLASVIFCLVFWVIRA-----SRPQVFK
CYP1B1  -----MATSLSADSPQQLSSLSTQQTILLLLVSVLAIIVHLGQWL-----LRQWRRK
CYP17A1  -----MWELVTLGLILAYLFWPRQGS-----SGTKYPK
CYP19A1  -----MWLLLAVFLLTLAYLFWPKTKH-----SGAKYPR
CYP2A7  -----MLASGLLLVALLACLTVMVLMSVWQQRK-----SRGKLPP
CYP2M1  -----MDVLHILQTNFVSIIGFVVIILLWMNRGKQ-----SNSRLPP
CYP33A1  -----MIFFLLTAFVLYLFNEFYW-----KRRGLPP
CYP33C1  -----MIIILLTFLTIYFVYELYW-----KRRNFPP
CYP33B1  -----MILIFFALCTLFFLIHQYLW-----RRRGLPP
CYP23A1  -----MPSLRNAILLTIATTFLYFRIMRTLNFNDNYMATYIYFLTCITLYAIYELNY-----KRRRLPN
CYP35A1  -----MFLVLI FLALSCWLIIRQYQ-----KVSRLPP
CYP35B1  -----MIFVLLTTFLAVLIIRQYQ-----KARKLPP
CYP34A1  -----MFLVLLFFTIIISLALAHQWR-----ARKQLPR
CYP71A12 -----MEMILMVSLCLTTLITLFLKQFLKRTANKVN-----LPPS
CYP71C1  -----MALEAGYDYLHVAVVQCTPTQAAAVLGVLLLAIRLAAAARSSSATSPKWKQHRLPPT
CYP71D11 -----VALMILRKNLKK-----PDSIPNIPPG
CYP726A1 -----MEQKNLSFPSILISFLLVLLLVVVMR-----LWKKQNPFG
CYP71K1  -----MAELPLYLLLALLVAVPFLCLTRWSLRHGGGGGGRLLPPS
CYP99A1  -----RLISAVILAVCSLISRR---KPSPGSKKKRPPG
CYP71E1  -----MATTATPQLLGGSVPPQWQTCLLVLLPVLLVSYLLTSRSRNRSRSGKLGAPRLPPG
CYP71N1  -----MALPPLLSPPLSLVVLALLSLLLAGRKARGGSATWKLPPG
CYP71B2  -----MTILLCFVSLLTIVSSIFLKQNK---TSKFNLP
CYP83A1  -----MEDIIGVVALAAVLLFFLYQKPKTKRYKLP
CYP83B1  -----MDLLLIAGLVAAAAFFFLRSTTKKSLRLLPPG
CYP83E1  -----MLPMLLLVLCLTLPLLMFFHKHKTN-TNNPPG
CYP93B1  -----MEPQLVAVSVLVSALICYFFFRPYFHRYGKNL-----PPS
CYP93C17 -----MLVEIALALALFLQFRPTPTAKSKALRHLNPNPPS
CYP93A1  -----MAYQVLLICLVSTIVFAYILWRKQSKKNL-----PPS
CYP705A1 -----MDAIVVDSQNCFIILLCFSLSISYFVFFKKPK---VNFDLLPS
CYP712A1 -----MDLKLNTKLIILITSLAFPFLYALFKWFLKEQGSAAATKLPQS
CYP75A1  -----MVLLELAATLIFLTTHIFISTLLSI-----TNGRRLPP
CYP75B1  -----MATLFLTILLATVFLILRIFSHRRNRS-----HNN-RLPP
CYP92A2  -----MEGTNLTYAAVFLGTLFLLFLSKLLR-----QRKLNLP
CYP84A1  -----MESSISQTL SKLSDPTTSLVIVSLFIFISFTR-----RRRPYPP
CYP703A2 -----MILVLASLFAVLI LNVL LWRWLKASA-----CKAQLPP
CYP98A3  -----MSWFLI AVATIAAVSYKLIQRLR-----YKFPP
CYP706A1 -----METASSNFSLSQILNIEEPYSSVMLGVAALLAVVCYFWIQGSKS-----KNGPPLPP
CYP81D1  -----MEETNIRVVLYSIFSLIFLIISFKFLKP-----KKQNLPPS
CYP81E6  -----MDIISFLYSLFYVALFAIKLFLGS-----RKFKNLP
CYP81B1  -----MEIPYLLTTL LLLFTL YLLLR-----RSSTLPPT
CYP82A2  -----MELVLSNTTIGVGVSLILLLYLFLRG----GSWKS GEEGPPT
CYP82B1  -----MEKPILLQLQAGILGLLALICFLYYVIKVS LSTRNCNLVKHPPE
CYP76A2  -----MEWEWSYVFFSAILLP AFILFFS QKNTT-----KSSYKFP
CYP76G1  -----MINQLTKNELIGLFTSIAVLIYVTCLFYTK-----RCRTRLPP
CYP76E1  -----MDHQTL LLVITFVSATILIFFLRKSNQT-----QNSTKLPP
CYP76F2  -----MELL SCLLCFLAAWTSIYIMFSARRGRK-----HAAHKLPP
CYP76C1  -----MDIISGQALLLFCFILSCFLIFTTTRSGRIS-----RGATALPP
CYP76B1  -----MDFLIIVSTLLL SYLIWVLGVGKP-----KNLPP
CYP80A1  -----MDYIVGFVSISLVALLYFL LFKP-----KHTNLP
CYP79A1  -----MATMEVEAAAATVLAAPLLSSAILKLLL FVVTLSYLARALRRPRKSTTKCSSTTCASPPAGVGNPPLPP

```

```

CYP79B2 -----MNTFTSNSSDLTTTATETSSSFSTLYLLSTLQAFVAITLVMLLKKLMTDPNK-----KPKYLP
CYP79D1 -----MAMNVSTTIGLLNATSFASSSSINTVKILFVTLFISIVSTIVKLQFTKSAANK-----EGSKKLPLPP
CYP79E1 -----MELITILPSVLPN-IHSTATVLFLLLLTTALSFLFLFKQHLTCLKTKFTSKS-----KSTTLPP
CYP79C1 -----MDYYLNN-VIFSUVVTFISITLNVFLIKSVAR---FLGRR-----KKLPP
CYP79F1 -----MMSFTTSLPYPFHILLVFILSMASITLLGRILSRPTKTKDRS-----CQLPP
CYP77A6 -----MSILSFPHTFFNISPSTLYTILISSLVLLILTRRSKSKIVKLP
CYP77B1 -----MDLTDVIFLFAFYFINLWRRYFSAGSSQCSLN-IPP
CYP89A2 -----MEIWLTLASLSGSLLHLHLLRRRNSSSPPLPP
CYP27A1 -----MAVLSRMRLRWALLDTRVMGHGLCPQGARAKAAPALRDHSTEGPGTGQDRPRLRSLAELP
CYP27B1 -----MTQTLKYASRVFHRVVRWAPELGASLGEYHSARRSLADIP
CYP11A1 -----MLARGLPFRSALVKACPPLNTGREGWGHHRVGTGEGAGISTRTPRPSYSEIP
CYP11B1 -----MAFRLKSDVRLAGSWLCLRGARALGTRAVTASKAS-----VLPFEVIP
CYP12A1 -----MIKYKQYSRAIVALRQRGAQQYSTNVTNASQPDVKATTTTTTISPEWQEAQPFEEPM
CYP12C1 -----MLRLTVKHGLRANSQLAATRNPDASSYVQQLS-EWEGAKPFTELP
CYP74A -----MASISTPFPISLHPKTVRSKPLKFRVLTRPIKASGSETPDLTVATRTGSKDLPINRIP
CYP74C1 -----MASSPELPLKPIP
CYP74D1 -----MSSYSELNLPPIREIP
CYP74B2 -----MLLRTMAATSPRPPSTSLTSQQPPSPPSQLPLRTMP
CYP24A1 -----MSCPIDKRRTLIAFLRRLRDLGQPPRSVTSKASASRAPKEVPLCPLMTDGETRNVTSLP
CYP10 -----MAIMKKFIHHSKQLIKPNLTSTKRVVSTSPRKEQGVAAISLEPS
CYP9A1 -----MILLTLVWVVIITAVLLYFRSVYSQLSKQGVN
CYP9B1 -----MSFVEICLVLATIGLLLFWSTGTGFAFEGRNLY
CYP14A2 -----MSILIVAFVLSITVYIYFYWKVSKYPK
CYP21A1 -----MLLPGLLLLLLLLAGTRWLWGQKWLWKLRLPPL
CYP36A1 -----MLFAQLVILVIVMLFLCRFANKLRGLPP
CYP45A1 -----MITVVLVAVLAVLLTHFLWRRKKNHFQLLARNGIP
CYP18A1 -----MVFLGLLALVTLQLWLVARNYRELKLP
CYP707A1 -----MDISALFTLFAGSLFLYFLRCLISQRRFGSSKLP
CYP722A1 -----MEHLCLCLVLCAMLTLGKFLKIMFQDRKKSTAGVPP
CYP25A1 -----MALLILTSILILLVSVFIIYILFARREQFKLREKIGLT
CYP73A5 -----MDLLLLLEKSLIAVFAVILATVISKLRGKKLPP
CYP78A6 -----MATKLESSLIFALLSKCSVLSQTNLAFSLLAVTIIWLAIISLFLWTPGGPAWGKYLFGFR
CYP4A4 -----MSVSALSPTRLPGSLGLLQVAALLGLLLLLLKAAQLYLRQWLLRALQQFP
CYP719 -----MEMNPLLVCATVAIVFATTTIIRILFSSSSLPQMKWPS
CYP44A1 -----MRRSIRNLAENVEKCPYSPTSSPNTPPRTFSEIP
CYP302A1 -----MLTKLLKISCTSRQCTFAKPYQAIQPR
CYP22A1 -----MHLENRVLSSVLDYASKFYKRMSSLVFFSANSIQVMNISQSSWIKCRDWMFAF
CYP52A1 -----MSSSPSIAQEFLATITPYVEYCQENYTKWYFIPLVILSLNLISMLHTKYLERKFKA
CYP701A3 -----MAFFSMISILLGFVISSFIFFFKLLSFSRKNMSEVSTLPSVP
CYP315A1 -----MTEKRERPGPLRWLRHLLDQLLVRIISLSLFRSRCDDPPPLQRFPADELPPAVAAYKVPPI
CYP39A1 -----MELISPTVITIIIGLALFLLLQRKNLRPFC
CYP711A1 -----MKTQHQQWVEVLDPFLTQHEALIAFLTFAAVVIVYLYRPSWLSVCNVP
CYP46A1 -----MSPGLLLGSAVLLAFGLCCTFVHRARSRYEHTPG
CYP43A1 -----MILLILLPVAIFTYVFLRNFKLYTLHKCGLNPRFDIF
CYP59A1 -----MPSFSLTGHFGALKQTIDGMP
CYP710A1 -----MVFSVSIFASLAPYLISAFLLFLLVEQLSYLFKKRNIPG
CYP56A1 -----MELLKLLCLILFLTLVYAFVAFIIVPLNFPK
CYP57A1 -----MLVDTGLGLISELQAKLGAVLLQIVPITIVAYNLLWFIYASFFSSL
CYP53A1 -----MLALLSPYGAYLGLALLVLYLLPYLKRAHLRDI
CYP58A1 -----MAVLNWAASSRAATLSPCRPTAALVVITWLLYAIGLAVYRLYHPL
CYP20A1 -----MLDFATFAVTFLLALVGAVLYLYPASRQAAGIPG

```

```
CYP38A1 -----MLDFVIFAITAVAGLIGILLFFYFSRSTETKPVS
CYP54A1 -----MALTQLAHSASALLPLVLPSIAAILAFQRYFAFN
CYP55A1 -----MASGAPSPFASRASGPEPPAEFAKLRTNP
CYP727A1 -----MASPCEHHVPYTLLGALLSGGGPHAAACGGAFLRDYAERGTNALLWAALLAV
consensus 1.....10.....20.....30.....40.....50.....60.....70.....80.....90.....
```

```

CYP7A1      ENGLIPYLGCALKFSGSN-----PLEFLRANQRK-----HGH-----VFTCKLMGKYVHFITNSLS-----
CYP7B1      IKGWL P Y L G V V L N L R K D ----- P L R F M K T L Q K Q ----- H C D ----- T F T V L L G G K Y I T F I L D P F Q -----
CYP8A1      DLGSI P W L G H A L E F G K D ----- A A G F L T R M K E K ----- H G D ----- I F T V L V G G R H V T V L L D P H S -----
CYP8B1      DKGSI P W L G H A M T F R K N ----- M L E F L K H M R S K ----- H G D ----- V F T V Q L G G Q Y F T F V M D P V S -----
CYP51A1     LQAWP P F I G S L I R F M K G ----- P I V L L R E E Y P K ----- L G S ----- V F T V K L L H K N I T F L I G P E V -----
CYP51A2     LKAWP P L V G S L I K F L K G ----- P I I M L R E E Y P K ----- L G S ----- V F T V N L V H K K I T F L I G P E V -----
CYP26A1     G T M G F P F F G E T L Q M V L Q ----- R R K F L Q M K R R K ----- Y G F ----- I Y K T H L F G R P T V R V M G A D N -----
CYP26C1     G S M G W P F F G E T L H W L V Q ----- G S R F H S S R R E R ----- Y G T ----- V F K T H L L G R P V I R V S G A E N -----
CYP716A1    G N T G L P L I G E S F S F L S A G R Q G - H P E K F I T D R V R R ----- F S S S S ----- S C V F K T H L F G S P T A V V T G A S G -----
CYP725A1    G K L G F P L I G E T I Q L L R T L R S E - T P Q K F F D D R L K K ----- F G P ----- V Y M T S L I G H P T V V L C G P A G -----
CYP718      G E M G L P W I G E T M D F Y K A Q K S N R V F E D F V N P R I I K ----- H G N ----- I F K T R I M G S P T I V V N G A E A -----
CYP90A1     G S L G L P L I G E T F Q L I G A Y K T E - N P E P F I D E R V A R ----- Y G ----- S V F M T H L F G E P T I F S A D P E T -----
CYP90B1     G K S G W P F L G E T I G Y L K P Y T A T - T L G D F M Q Q H V S K ----- Y G ----- K I Y R S N L F G E P T I V S A D A G L -----
CYP724A1    G S M G W P F I G E T I S F F K P H R S D - S I G T F L Q Q R V S R ----- Y G ----- K V F K S N I C G G K A V V S C D Q E L -----
CYP720A1    G S R G W P L I G D T F A W L N A V A G S - H P S S F V E K Q I K K ----- Y G ----- R I F S C S L F G K W A V V S A D P D F -----
CYP85A1     G T M G W P I F G E T T E F L K Q G P ----- N F M R N Q R L R ----- Y G ----- S F F K S H L L G C P T L I S M D S E V -----
CYP87A2     G S M G F P L L G E S I Q F F K P N K T S - D I P P F I K E R V K K ----- Y G ----- P I F K T N L V G R P V I V S T D A D L -----
CYP708A1    G S M G F P V I G E T V E F F K P Y S F N - E I H P F V K K R M F K ----- H G G ----- S L F R T N I L G S K T I V S T D P E V -----
CYP702A1    G S M G F P I I G E T F E F M K P H D A F - Q F P T F I K E R I I R ----- Y G ----- P I F R T S L F G A K V I I S T D I E L -----
CYP88A3     G D L G W P F I G N M L S F L R A F K T S - D P D S F T R T L I K R ----- Y G P ----- K G I Y K A H M F G N P S I I V T T S D T -----
CYP88B1     G Y M G L P Y F G N T L S Y F K A S M C G - D P K S F I D F F A T R ----- F G E ----- G G M Y R A Y I F G K P T I M V T K P E I -----
CYP3A1      G P K P L P F F G T V L N Y M G L W ----- K F D V E C H K K Y G ----- K I W G L F D G Q M P L F A I T D T E M -----
CYP5A1      H P K P S P F I G N L T F F R Q G F W ----- E S H M E L R K Q Y G ----- P L S G Y L G R R M I V I S D P D M -----
CYP6A2      H D A P H P L Y G N M V G - F R K N R ----- V M H D F F Y D Y N K Y R K S G ----- F P F V G F Y F L H K P A A F I V D T Q L -----
CYP6B4      G P E P T V F F G N I M E S V I R R K ----- H L I M I Y K D I E Y A F P K E ----- K V V G I Y R M T T P C L L L R D L D V -----
CYP28A1     G P K P H C F T G N Y P H M Y N M K R ----- H S V Y D L N D I Y S E Y E H K ----- F D A V G I Y G A R S P Q L L V I S P Q V -----
CYP28C1     E P R A L P L I G S F P N M I W P R Q ----- H F T M D M R D I Y M H Y R N T ----- H S Y V G C Y L L R A P K L L V L E P R L -----
CYP13A2     G P R G R P F V G V L D V L L E H E T ----- P G L I K L G E W T K K Y G K V ----- Y G Y T D G T Q R T L V V A D P A M -----
CYP13B1     G P E G L P F I G N Y Y D L A D V N K ----- P R G Y L I H K W L Q I Q F G K V ----- F G Y Y E G A V P V L V S D M D M -----
CYP72A8     G T P F T F L V G D I K R E A S M V E Q E K S R P I N ----- L T D D Y T H R V M P L I Q Q T V K D H ----- G K T S Y M M W G P I A S V I V T K P E H -----
CYP72B1     G P P Y H F F I G N V K E L V G M M L K A S S H P M P ----- F S H N I L P R V L S F Y H H W R K I Y ----- G A T F L V W F G P T F R L T V A D P D L -----
CYP721A1    G P S Y R I F S G N S G E V S R L T A E A K S K P I P S G R --- N P H E F V H R V A P H Y H E W S R V Y ----- G K T F L Y W F G S K P V V A T S D P R L -----
CYP709A1    G P K P R P L T G N I L E I S A M V S Q S A S K D C D S ----- I H H D I V G R L L P H Y V A W S K Q Y ----- G K R F I V W N G T D P R L C L T E T E L -----
CYP709B1    G P N Y R I F Y G N L S E I K K M K R E S H L S I L D P ----- S S N D I F P R I L P H Y Q K W M S Q Y ----- G E T F L Y W N G T E P R I C I S D P E L -----
CYP715A1    G P A P S F P F G N L N D M K K L K M A S V V D N S K S S T - I I N H D I H S I A L P H F A R W Q Q E Y ----- G K V F V Y W L G I E P F V Y V A D P E F -----
CYP714A1    G P P P S L F R G N V P E M Q K I Q S Q I M S N S K H Y S G D N I I A H D Y T S S L F P Y L D H W R K Q Y ----- G R V Y T Y S T G V K Q H L Y M N H P E L -----
CYP4C3      G P A A M P F L G N A I E M - N V D H D E L ----- F N R V I G M Q K L W G T R I G ----- I N R V W Q G T A P R V L L F E P E T -----
CYP31A2     Q P R S Y P I V G H G L I T - K P D P E G F ----- M N Q V I G M G Y L Y P D P R ----- M C L L W I G P F P C L M L Y S A D L -----
CYP37A1     G P L A L P L L G T T F Q F - K M D P V E F ----- A L Q L Y N W G L E Y S T K G S ----- S L A A F W M G P Y P M V I V L T P E A N K V Q T R N M S G A Q N F H I -----
CYP37B1     G P Y S F P I I G T L Y M V N I F D I S K F ----- T T Q S M E L A Q Y Y C Q K G ----- G T I G L W L G P V P L I A V I N P Q H -----
CYP32A1     G P P A L P L V G S A H L F - K W N P Y A F ----- T F Q M E G W A Q K Y L F G R A K Y G E I A A P N N E V D G I M L L W I G P V I V F L G T S E C -----
CYP29A2     G P P A H P I F G N L G P I V G K K T E D L ----- P S V F I N W A A E Q R D Q G H S ----- V M R V M I L G K V Y A W P L N G K A A -----
CYP86A1     V L P P F V G S L P - Y L I A N R S R I H D W ----- I A D N L R A T G G T Y Q T C T M ----- V I P F V A K A Q G F Y T V T C H P K N -----
CYP86B1     V W P F L G M L P S L A F G L R G N I Y E W ----- L S D V L C L Q N G T F Q F R ----- G P W F S S L N - - S T I T C D P R N -----
CYP96A1     N W P F L G M L P G L L V E I P - R V Y D F ----- V T E L L E A S N L T Y P F K G ----- P C F G G L D - - M L I T V D P A N -----
CYP96C1     D W A L V G I L S V W F P S L G - H I Y E K ----- L A K S L A K N D K T F V L K G ----- S F L S K Q D - - V I F T C D P A N -----
CYP94A1     N I I T L P K S Y P L I G S Y L S F R K N L ----- H R R I Q W L S D I V Q I S P S A ----- T F Q L D G T L G R Q I I T G N P S T -----
CYP94B1     - - - - - P T S Y Q L I G S I L S F N K N R ----- H R L L Q W Y T D L L R L S P S Q ----- T I T V D L L F G R R T I I T A N P E N -----
CYP704A1    - - - - - K R Y T P V H A T I F D L F F H S ----- H K L Y D Y E T E I A R T K P T F ----- R F L S P G Q S - - - E I F T A D P R N -----
CYP704B1    - - - - - P K T W P L V G A A I E Q L T N F ----- D R M H D W L V E Y L Y N S R T V ----- V V P M P F T T - - - Y T Y I A D P I N -----
CYP97A3     D W T G S D Q D Y P K V P E A K G S I Q A V ----- R N E A F F I P L Y E L F L T Y G ----- G I F R L T F G P K S F L I V S D P S I -----

```

```

CYP97B3  NFLSGG--SLGSMPTAEGSVSDL-----FGKPLFLSLYDWFLEHG-----GIYKLAFGPKAFVVISDPIT-----
CYP1A1   GLKNPFGPWGWPLIGHMLTLGKNPHLALSRMSQQYGDVLRIRIGSTP-----VVVLSGL--DTIRQALVRQGDD-----
CYP1B1   PWSSPFGPFPWPLIGNAASVGRASHLYFARLARRYGDVVFQIRLGSCTP-----VVVLNGE--SAIHQALVQQGGV-----
CYP17A1  SLPSLPIVVGSLPFLPKSGHM----HVNFFKLQKQKYGSIYSFRLGSTT-----TVVIGHH--QLARELLIKKGKE-----
CYP19A1  SLPSLPIVVGSLPFLPRRGQQ----HKNFFKLQKQKYGSIYSFRLGSTT-----TVMIGHH--QLAREVLLKKGKE-----
CYP2A7   GPTPLPIFGNYLQNLNTE-----HICDSIMKFSECYGPVFTIHLGPRR-----VVVLGCH--DAVREALVDQAE-----
CYP2M1   GPAPIPLLGNLLRMDVK----APYKLYMELSKKYGSVFTVWLGSKP-----VVVISGY--QAIKDAFVTQGE-----
CYP33A1  GPIPLPIIGNMIELFSY----PPPTAAYDAWTKKFKGIYTVWMTD-----PAVITIGY--KELKDTFVNDGHS-----
CYP33C1  GPCPLPIVFNLLSIANP----PPGYKAFERWTKKYGDVYTFWIIGNT-----PHIMINTW--DKIKETFIRDADT-----
CYP33B1  GPTPIPIFGNLFQLSGSE---APGISIFQKWKDQYGFIFTFYMGATIEKKNDYKFKFSGPVPFVLTDY--QDIKETVIKDGDT-----
CYP23A1  GPVPLVAGNMPFSFINV----NNVDVLFQSWKQYGGIFTVWIGPIP-----LVMVSDL--PTIKKYFIQHADS-----
CYP35A1  GP-----KYGNIFTLWVGVPV-----HVSICDY--ETSHEVFKGANK-----
CYP35B1  GPVSLPLIIGNIHQLVYHIWNEKGVVPAFDLFRKKYGDVFTIWLGPPI-----HVSICNY--ETSQEVFKNGNK-----
CYP34A1  GPYPLPLIIGNLHQLLYYCWNKNGGLVEGYAEIQSFGKVTYTLWIGPLP-----TVFIADF--EVAHETHVKRAHE-----
CYP71A12 P-WRLPLIIGNLHQLSLHP----HRSLHSLSLRYGP--LMLLHFGF-----VPILVSS--GEAAQEVLKTHDLK-----
CYP71C1  PPGKLPPIIGHLHLIGSHP----HVSFRDLHAKYGHNGMLMVQVGA-----VPTIVST--PQAAEAVLRTHDHV-----
CYP71D11 P-WKLPPIIGSIPHLVGS---PPHRKLRDLAKKYGP--LMHLQIGE-----VIFIIVSS--AEYAKEVMKTHDVT-----
CYP726A1 P-WKFPPIIGNLPHLLTS--DLGHERFRALAQIYGP--VMSLQIGQ-----VSAVVSS--AEAQEVMTQADA-----
CYP71K1  P-WALPVIIGHLHHVAGA---LPHRAMRDLARRHGP--LMLLRLCE-----LRVVVACT--AEAAREVTKTHDLA-----
CYP99A1  P-WRLPLIIGNLHLLATS---QPHVALRDLAMKHGP--VMYLRIGQ-----VDAVVIS--PAAAQEVLRDKDTT-----
CYP71E1  P-AQLPILIGNLHLLG--PL---PHKNLRELARRYGP--VMQLRLGT-----VPTVVSS--AEAAREVLRKVDVD-----
CYP71N1  P-PKLPVIIGHLHLLGSSL---LHRSLWELSKKHGP--LMHLKFGF-----VPVVVSS--PEMAKEVLRKTHDLE-----
CYP71B2  P-SSLPIIGNLHHLA--GL---PHRCFHKLKSIKYGP--LVFLRIGS-----VPVVVSS--SEAAEAVLRKTHDLE-----
CYP83A1  P-SPLPVIIGNLQLQKLN---PQRFFAGWAKKYGP--ILSYRIGS-----RTMVVSS--AELAKELLRKQDVN-----
CYP83B1  P-KGLPPIIGNLHQMEKFN---PQHFLFRLSKLYGP--IFTMKIIGG-----RRLAVISS--AELAKELLRKQDLN-----
CYP83E1  P-KGLPPIIGNLQLDISN---LHLQFSQFSKIYGP--LFSLQGLG-----RPAIVSS--AEIAKEVLRKNDHV-----
CYP93B1  PFFRLPIIG--HMMLG--PLLHQS FHNLSHRYGP--LFSLNFGS-----VLCVVAST--PHFAKQLLRQTNELA-----
CYP93C17 PKPRLPIVFG--HLHLLDQ--PLLHNSLIKLGKEYGP--LYTLVFGS-----MPTVVAST--PELFLKFLQTHEATS-----
CYP93A1  PK-ALPIIG--HLHLVS--PIPHQDFYKLRSTRHGP--IMQLFLGS-----VPCVVAST--AEAAREVLRKTHDLE-----
CYP705A1 PP-SLPIIG--HLHLLLS--TLIHKSLQKLSKIYGP--LHLRLIFN-----IPFILVSS--DSLAYEIRFRHDVN-----
CYP712A1 PP-ALPIIG--HLHLIG--KVLVPSFQSLAHKYGP--LMEIRLGA-----SKCVVSS--SSVAREIFKEQELN-----
CYP75A1  GPRGWPIVIGALPLLGA---MPHVS LAKMAKK--YGAIMYLKVT-----CGMVVAST--PDAAKAFLRKTLDLN-----
CYP75B1  GPNPWPPIIGNLPHMGT----KPHRTL SAMVTT--YGPILHLRLGF-----VDVVVAAS--KVAEQFLKIHAN-----
CYP92A2  GPKPWPPIIGNLNLIGN----LPYRSIHESLAK--YGPVMQLQFGS-----FPVVVSS--VEMAKIFLRKSMIDN-----
CYP84A1  GPRGWPIIGNMLMMDQ----LTHRGLANLAKK--YGGIHLRMLGF-----LHMYAVSS--PEVARQVLRKQDSV-----
CYP703A2 GPPRLPIIGNLQLQGP----LPHRDLASLCKD--YGPLVYLRLLGN-----VDAITND--PDTIREILLRQDDV-----
CYP98A3  GPSPKPIVGNLYDIKP---VRFRCYEWQAQS--YGPVIVSWIGS-----ILNVVSS--AELAKEVLRKHDQK-----
CYP706A1 GPWPLPIVGNL PFLNSD---VLHTQFQALTLK--HGPLMKIHLGS-----KLAIVSS--PDMAREVLRKTHDIT-----
CYP81D1  PPGWLPPIIGHLRLKPPPI--HRTLRSFSETLDHNDGGGVMSLRLLGS-----RLVYVSSH--KVAEECFGKNDVV-----
CYP81E6  GPTSLPIIGNLHHLKRPL--HRTFRALSEKY-----GDVFSLWFGN-----RLVVVSS--FADVQECFTKNDVV-----
CYP81B1  IFPSLPIIGHLYLLKPPL--YRTLAKLSAKH-----GQILRLQLGF-----RRVLVSS--PSAAECEFTRKNDIV-----
CYP82A2  VAGAWPIIGHLPLL LGS--KTPHKTGLDLADK--YGPVFSIKIGA-----KNAVVSN--WEMAKECYTTNDIA-----
CYP82B1  AAGSWPIVGHLPQLVVGSG--KPLFRVLGDMADK--FGPIFVRFV-----YPTLVST--WEMAKECFTSNDKF-----
CYP76A2  GPPGLPIFGNMFELG---TEPYKKMAVLRQK--YGPVWLWLKLS-----TYTMVQT--AQASEELFKNHDIS-----
CYP76G1  GPNPWPVIIGNIFOLAG---LPPHDSLTKLSRR--HGPIMLTRIGS-----MLTVVSS--SEVAREIFKKHDA-----
CYP76E1  GPYPLPIIGNILELG---KNPHKALTKLSKI--YGPIMTLKLS-----ITTVISS--PQVAKQVLRKHDNSQI-----
CYP76F2  GPVPLPIIGSLLNLG---NRPHESLANLAKT--YGPIMTLKLY-----VTTIVISS--APMAKEVLRKQDLS-----
CYP76C1  GPPRLPIIGNLHLVG---KPHRSFAELSKT--YGPVMSLKLGS-----LNTVVIAS--PEAAREVLRTHDQI-----
CYP76B1  GPTRLPIIGNLHLG---ALPHQSLAKLAKI--HGPIMSLQLGQ-----ITTLVSS--ATAAEVLRKQDLA-----
CYP80A1  SPPAWPIVGHLPDLISKNSPPFLDYMSNIAQK--YGPLIHLKFG-----HSSIFAST--KEAAMEVLRKQNDKV-----
CYP79A1  GPVWPVVGNLPEMLLNK---PAFRWIHQMMREMGTDIACVKLGG-----VHVVSITCP--EIAREVLRKQDAN-----

```

```

CYP79B2 GPTGWPITIGMIPTMLKSR---PVFRWLHSIMKQLNTEIACVKLGN-----THVITVTCP--KIAREILKQQDAL-----
CYP79D1 GPTPWPLIGNIPEMIRYR---PTFRWIHQMLKDMNTDILIRFCRTF-----TNFVPISCP--VLAREILKKNDAI-----
CYP79E1 GPRPWPIVGSLSVSMYMN---PSFRWILAQMEGR--RIGCIRLGG-----VHVVPVNCPFTEIAREFLKVHDAD-----
CYP79C1 CPRGFPIIGNLVGMLKNR---PTSKWIVRVMDMKTDIACFRFGR-----VHVIVITSD--VIAREVVREKDAV-----
CYP79F1 GPPGWPIGLNLPFLMTR---PRSKYFRLAMKELKTDIACFNAG-----IRAITINS--EIAREAFRERDAD-----
CYP77A6 GPPGWPIVGNLQFARSG---KQFYEYVDDVRKKYGPITYLRLMGS-----RTMIIISD--SALVHDVLIQRGPMF-----
CYP77B1 GPKGWPVLVGNLLQVIFQR---RHFVFLMRDLRKKYGPIFTMQMGQ-----RTMIIITD--EKLIEHALVQRGPTF-----
CYP89A2 DPNFLPFLGTLQWLREGL---GGLESYLRSVHHRGPIVTLRITS-----RPAIFVAD--RSLTHEALVLNGAVY-----
CYP27A1 GPGTLR--FLFQLFLRGYVLHLHELQALNKAKYGPMTT---FGTRT-----NVNLASAPLLEQVMRQEGKYP-----
CYP27B1 GPSTPS--FLAELFCCKGGLSRLHELQVQGAHFQVWLAS--FGTVR-----TVYVAAPALVEELLRQEGPRP-----
CYP11A1 SPGDNGWINLYHFWRKKGSQRIHFHHIENFQKYGPIYRCK--LGNL-----SVYIIHPEGVAHLKFEGSYP-----
CYP11B1 QHQGNKRQRVLQFWKEQNHDLDLHEMHQTFQELGPIFRCD---VGSTR-----IVAVMLPEDCARLHQAESYP-----
CYP12A1 SMNSWPIIKNMLPWGKYGKMEPTQFLMALRDDMGPIVRTAAFMGRPP-----TVITHNPHDFEMVFRNEGIWP-----
CYP12C1 GPTRWQLFRGFQKGGGEYHQLGMDDVMRLYKKQFGDICLIPGLFGMPS-----TVFTFNVETFEKVYRTEGQWP-----
CYP74A GNYGLPIVGPDKDRWDYFYDQGAEEFFKSRIRKYNSTVYRVNMPPGA-----FIAENPQVVALLDGK-----
CYP74C1 GYGFPFLGPIKDRYDYFYFQGRDEFRRSRITKYNSTVFHANMPGP-----FISSDSRVVLLDAL-----
CYP74D1 GDYGFPIISAIKDRYDYFYNQGEDAWFHNKAEKYKSTVVKINMAPGP-----FTSNDYKLVAFLDAN-----
CYP74B2 GSYGWPIVGLPLSDRLD---FQGPDKFFRTRAEKYKSTVFRTNIPPTFP-----FFGNVNPNI VAVLDVK-----
CYP24A1 GPTNWPILLGSLLEIFWKG--GLKKQHDTLAEYHKKYGGIIFRMKLGSDFS-----VHLGSPSLLEALYRTESAHP-----
CYP10 EMAQCPRFKSIDTFTETTNAVKAAGMTEVQPFERIPGPKGLPIVGTFLFDYFKK-----DGPKFSKMFVYRQRAL EFGNIYIEKVGHFHCVVSSPG
CYP9A1 HLPITIPVFNLMWVMKQEHFVDTLGRVCVKAFPDD-----KIVGHYDMVSPILVVLVDVT-----
CYP9B1 FEKPYPIFLGNMAASALQKASFQKQISEFYNRTRHHKLVLGNLRTP-----MIQINDPQLIKKICVKDFDH-----
CYP14A2 GPFPLPFIQNLQIPSEN-----IQEYLDLDSKYTGPCFTLWTPLP-----AIVLTDYEHVKEAFVTQGD-----
CYP21A1 APGFLHFLQPNLPPVYLFQ-----LAQKLG-----IYRIRLGLQDVVVLNSNKT-----
CYP36A1 GPTPWPIFIGNTFQVPEDR-----IDLIIINEFKKKYGGIFTLWLPFP-----TIVICDYDMLKRNIVKNGES-----
CYP45A1 TPKYHWLLGHMEQTFYSPGKRSVVEVKHEWLQLYG-----KVCGFYSYGAIPRVLVADLDM-----
CYP18A1 GPWGLPVIQYLLFMGSEK-----HTRFMELAKQYGSIFSTRLGS-----QLTVVMSDYKMIREFCFREEFT-----
CYP707A1 GTMGWPYVGETFQLYSQDPNVFFQSKQKRYG-----SVFKTHVLGCPCVMISSPEA-----
CYP72A1 GSDGFPIGETLQFMLSNSGKGFYEFVRSRRIRYSGCFRTSLFG-----ETHVFLSTTES-----
CYP25A1 GPEPHWFMGNLKOIVDRKEKLGYYDSNKKWFNHLHKQYGETFGIYFG-----AQMNI VLSNEEDIKEVFIKNFSN-----
CYP73A5 GPIPIPIFGNWLQVGGDLN-----HRNLVDYAKKFGDLFLLRMGQRN-----LVVVSSPDLTKEVLHTQGVFEG-----
CYP78A6 LISGSYKTGNVIPGPKGFPLVGSMSLMSSTLAHRRADIADAAEKFGAKR-----LMAFSLGETRVIVTCNPDVAK-----E
CYP4A4 CPPFHLLGHSHREFQNDQELERIQKWVEKFFG-----ACPWWSLGNKARLLVYDPDY-----
CYP719 GPRKLPITIGNLHQLGDDVLHVALAKLAKVHGSVMTIWIIGSWR-----PVIVISDIEKAWEVLVNKSAD-----
CYP44A1 GPREIPVIGNIGYFKYAVKSDAKTIENYNQHLEEMYKKGKIVKENLGGF-----RKYVVIHFDPADVQTVLAADGKTP-----
CYP302A1 GPFMGNLNYLPGIGSYSWRLHQAGQDKYKYGAI VRETIVPGQD-----IVWLYDPKDIALLLNERDCP-----
CYP22A1 ALSHHIIMCIYLLILRNFLPQVVPDFEWQHYFMRVFI VHIYIIISYFIRITRYP-----PGPPPMVAVFGNSPFVNI LTPQTFLEYREIYGPIFTLHLS
CYP52A1 KPLAVYVQDYTFCLITPLVLIYYKSGTVMQFACDLWDKNLIVSDPK-----AKTIGLKILGIPLIETKDPEN-----
CYP701A3 VVPGFPIIGNLLQLKEKK-----PHKTFTRWSEIYGPITYSIKMGSSS-----LIVLNSTETAKEAMVTRFSS-----
CYP315A1 RVKGLPVVGTLDVLAAGGATHLHKYIDARHKQYGPFRERLGGTQD-----AVFVSSANLMRGV FQHEGQYP-----
CYP39A1 IKGWIPWIGVGFEGKAPLEFIEKARIKYG-----PIFTVFAMGNRMTFVTEEG-----
CYP711A1 GPTAMPVLVGHLPMLAKYG-----PDVFSVLAKYGP IFRFQMGKRP-----LIIIAEAEELCREVGIKKFKD-----
CYP46A1 PPRPSFLLGHLPCFWKKDEVGGRVLQDVFLDWAKKYG PVVRVNVFHKT-----SVIVTSPESVKKFLMSTKYNK-----
CYP43A1 GIKGLLWLDSSAAHENFTRMCSMIGDQTF SVLRG-----ATPVVITSNVDLIHAISTEH-----
CYP59A1 NATLHSLMLKLSQKFRSG-----MFYINMWPFGTGLV VVATPSG-----AA
CYP710A1 PFFVPIIGNAVALVRDPTSFWDKQSSTANISG-----LSANYLIGKFIVYIRDTELS-----HQ
CYP56A1 NIPTIPFYVVFLPVIFPIDQTELYDYIRESMEKYGAVKFFFGSRWN-----ILVSRSEYLAQIFKDEDTFAK-----
CYP75A1 RKIPGPIFLARISRVWEMKKTATGNIHEIMMDLHRRHGAIVRIGPR-----RYDFDTMEALKI IYRIG-----
CYP53A1 PAPGLAAFTNFWLLLQTRRGHRFVVVDNAHKYKGLVRIAPRHTS-----IADDGAIQAVYGHG-----
CYP58A1 ARFPGRKMAAVTTWYEFYYDFWYGGKYIFEIEKMHKEFGPIVRIN-----PHEL SIHDPEYYNELYVGSSKR-----
CYP20A1 ITPTTEKDGNLDPDIVNSG-----SLHEFLVNLHERYGPVVSFWFGR-----RLVVS LGTVDV LKQHINP-----

```

```

CYP38A1 SASPTSTIPRWSAPPADIEKGDLDVMMKKHGSLSLHQFLHLHDNGKTP-----VTSFWWGKTHVVSFCSPQAFK-----
CYP54A1 PLSNLPVIGEEYHGYEKKRQAYLTKAKDLYLEGYTKFKHG-----LFRIVTPNRNSVIVVSPRF-----
CYP55A1 VSQVKLFDGSLAWLVTKH-----KDVCFVATSEKLSKVRTRQG-----
CYP727A1 TWLLVLRLLAALLRLWALGARLPGPPAFPADPGLAAGDITGYLSKSLHG-----SYGPPVRLWLGPSQLLVSVKDSR-----V
consensus . 101.....110.....120.....130.....140.....150.....160.....170.....180.....190.....

```



```

CYP7A1      -YHKVLCHG-KYFDWKKFHYT-----TSAKAFGHRSIDPNDGNTTENTINNTFTKTLQGDALHSLSEAMMQNLQFVLRPPD-----LPK-----
CYP7B1      -YQLVIKNH-KQLSFRVFSNK-----LLEKAFSISQLQKN--HDMNDELHL CYQFLQGKSLDILLESMMQNLKQVFEP-----QL-----
CYP8A1      -YDAVVWEPRSRLDHFHAYAVF-----LMERIFDVQLPHYN----PGDEKSKMKPTLLHKELQALTDAMYTNLRTVLLG-----DTV-----
CYP8B1      -FGPILKDGQRKLDFFEYAKG----LVLKVFQYSIEGD----HRMIHLASTKHLMGHGLEELNKAMLDSLVLVMLGPE-----GRS-----
CYP51A1     -SSHFNAYESEL SQEIKYKF-----NVP-TFGPGVFDVDYVVRMEQFRFSSALKGQQLRGYVDQMTKETEDYFSK-----
CYP51A2     -SAHFFKASEDSL SQEYVYQF-----NVP-TFGPGVFDVDYSVRMEQFRFFTEALRVNKLKGYVDMVTEAEDYFSK-----
CYP26A1     -VRRILLGEHRLVSVHWPASV----RTILGAGCLSNLHD--SSHQRKQKVMQAFSREALQCYVLVIAEEVSSCLEQ-----
CYP26C1     -VRTILLGEHRLVRSQWPQSA----HILLGSHTLLGAVG--EPHRRRRLKVLARVFSRAALERYVPRLQGALRHEVRS-----
CYP716A1    -NKFLFTNENKLVVSWWPDVSV----NKIFP--SSMQTSSK--EEARKLRMLLSQFMKPEALRRYVGVMDIEAQRHFET-----
CYP725A1    -NKLVLVSNEDKLVEMEGPKSF----MKLIGEDSIVAKRG--EDHRIILRTALARFLGAQALQNYLGRMSSEIGHHFNE-----
CYP718      -NRLILSNEFSLVSSWPSS----VQLMGMNCIMAKQG----SLHVRVLRGIVANSLSYIGLESILPKLCDTVKFHHET-----
CYP90A1     -NRFILQNEGKLFECSPYASI----CNLLGKHSLLLMKG--EKHKRMHSLTMSFANSSIKDHLMLDIDRLVRFNLD-----
CYP90B1     -NRFILQNEGKLFECSPYRSI----GGILGKWSMLVLVG--DMHRDMRSISLNFSLHARLRTILLKDVERHTLFVLD-----
CYP724A1    -NMFILQNEGKLFSTDPKAM----HDILGKYSLLLATG--EIHRKLNVIISFINLTKSKPDFLHCAENL SISI LK-----
CYP720A1    -NRFIMQNEGKLFQSSYPKSF----RDLVGKDGVI TVHG--DQQRRLHSIASSMMRHDQLKTHFLEVIPVVMQLTSL-----
CYP85A1     -NRYILKNESKGLVPGYPQSM----LDILGTCNMAAVHG--SSHRLMRGSLLSLISSTMMRDHILPKVDHFMRSYLD-----
CYP87A2     -SYFVFNQEGRCFQSWYPDTF----THIFGKKNVGS LHG--FMYKYLKNMVLTFGHGDLKK-MLPQVEMTANKRLE-----
CYP708A1    -NFEILKQENRCFIMSYPEAL----VRIFGKDNLFFKQKG--DFHRYMRHIALQLLGPECLKQRFIQQIDIATSEHLK-----
CYP702A1    -NMEIAKTN---HAPGLTKSI----AQLFGENLFFQSK--ESHKHVRNLTQQLGSGQLKLSVMQDIDLTRTHME-----
CYP88A3     -CRRVLTDDDA-FKPGWPTST----MELIGRKS FVGISF--EEHKRLRRLTAAPVNGHEALSTYIPYIEENVITVLD-----
CYP88B1     -IRKVLMD E EY-LERGLPNYM----KKLIG----LTTSI--EEDKYFRRLTAP-VKSHGLLSDYFDYIDKTVSSTLE-----
CYP3A1      IKNVLVKECFVFTNRRDFGPV-----GIMGKAISVS-KDEEMKRYRALLSPTFTSGRLKEMFPVIEQYGDILVKYLR--QEKGP--
CYP5A1      IKQVLAEKFSNFTNRMATGLES-----KPVADSI LFL-RDKRMEEVRSVLTSAFSPKLNKLTPLISQACDLLLLLAHLERYAESGDA-----
CYP6A2      AKNILIKDFSNFADRQGFHNG-----RDDPLTQHLFNL-DGKKWKDMRQRLTPTFTSGKMKFMFPTVIKVSEEFVKVITEQVPAQNGAV-----
CYP6B4      IKHVMIKDFDLFNDRGVEFS-----EEGLGLNIFHA-DGDRWRVLRQCFTPLFTSGKLNMLNLMSDRGDKFIKMKVEKFC DKEPE-----
CYP28A1     ARR VFVSDFRHFHDNEISLMVD---EKSDFIMANNPFSQ-IGDEWKQRADITPGLTMGRIKTVYPVTQEVQKMTDWLKQIRLPPSGG-----
CYP28C1     VYEIYVSAFSHFENNDASKMVD---IAKDRLVALNPFVL-EGEWRHQRVAFSTLLTNGRIRTTTHAIMQRVCLDLCQFI--AIKSAGGKD-----
CYP13A2     VHEIFVKQFDNFYGRK-LNPIQGNPEK---EQRVHLLAA-QGYRWKRLRTISSQSFNSNLSKKMKRTVEDS---ALELLRHIEKQTAGGEQ-----
CYP13B1     LQELFLKDFNFYARKSTNHIHGNLECKSEPRINLFTS-RGARWKRLRALASPGFSVKALKQVHDMEDS---AINMVDLMAKHEDG-KP-----
CYP72A8     IKDVLNRVYD---FPKPPVHPH I---VELFAT-GVALY-EGEKWSKHRIINPSFHLEKLIKIMIPAFYESCSEMISKWEKLVTE---QGSS-----
CYP72B1     IREIFSKSEF---YEKNEAHP L-----VKQLEGDGLLSL-KGEKWAHHRKIISPTFHMENLKL LVPVVLKSVTDMVDKWSDKLSE---NGE-----
CYP721A1    IREALTTGGS---FDRIGHNPL-----SKLLYAQGLPGL-RGDQWAFHRRIAKQAFTEKLRWVWPQMTSTMMMLMEKWEDMRN---G GEE-----
CYP709A1    IKELLMKHNG-VSGRSWLQQQG-----TKNFIGRGLLMA-NGQDWHQRHLAAPAFTGERLKG YARHMVECTS KLVERLRKEVGEGANEV-----
CYP709B1    AKTMLS NKL G-FFVKSARPEA-----VKLVGSKGLVFI-EGADWRHRRILNPAFSIDRLKIMTTVMVDCTLKMLEEWRKESTKEETEHPK-----
CYP715A1    LSVMSKGVLGKSWGKPNVFKKD-----REPMFGTGLVMV-EGDDWTRHRHIITPAFAPLNLKVMTNMMVSVSNMLDRWGIQINSGNPEF-----
CYP714A1    VKELNQANTLN-LGKVS YVTKR-----LKSILGRGVITS-NGPHWAHQRIIAPEFFLDKVKGMVGLVVESAMPMLSKWEEMMKRE--GEMV-----
CYP4C3      VEPILNS--QK FVNKSHDYDYL-----HPWLGEGLLTS-TDRKMSRRIKILTPAFHFKILDDFIDVFNEQSAVLARKLAVEVG---SE-----
CYP31A2     VEPIFSS--TKHLNKG FAYVLL-----EPWLGISILTS-QKEQWRPKRKL LTPTFHYDILKDFLPIFNEQSKILVQKLCCLGA---DE-----
CYP37A1     FQKVL E S--NALINKSSEYDIF-----LPWLTGGLLLA-SGKWRGRKMMTPSFHFNVLIDFQVVFNSSQSMILLEQIENAAKKTDDS-----
CYP37B1     AKEILES--NEVITKAEYDIL-----FPWLTGGLLTS-TGSKWRQRKMLTPAFHFKVLNDFLSVHDYQAKVFLAQIKPYADSGKE-----
CYP32A1     IRPVLES--NTNISKPSQYDKM-----SEWIGTGLLTS-THKWFHRRKMLTPTFHFTIIQDYFPVFRNAEVLADAVELHVD---GD-----
CYP29A2     -AAIIDS--TTETNKGDYRFF-----DPWLGGLLLEGYGERWKSHRKM LTPAFHFAKLG YFEVFNNEKILIDLSDFSAS--GE-----
CYP86A1     VEHILKTRFDNYPKGPMMWRAAF-----HDLLGGGIFNS-DGDTWLMQRKTAAL EFTTRTLRQAMARWVNGTIKNRLWLILDRAVQNNK-----
CYP86B1     VEHLLKNRFSVFPKGSYFRDNL-----RDLLGDGIFNA-DDETWRQRKRTASIEFHS AKFRQLTTQSLFELVHKRLLPVLETSVKSSS-----
CYP96A1     IHHIMSSNFANYPKGTEFFK-I-----FDVLGDGIFNA-DSELWKDLRKSQAQSMTHQDFRFTLRIMS KLEKGLVPLLDYVAEKKQ-----
CYP96C1     MHHVMSTNFSNYPKGPENRN-V-----FDVYGEMLFTA-DHEKWKSHRKYVTNAYFHDQRFNGFSQKVNKEVIEKELFPFLDHAAEEAL-----
CYP94A1     VQHILKNQFSNYQKGTTFNTL-----SDFLTGTIFNT-NGPNWKFORQVASHFNTKSRNFVHEIVDTELNRILPILSSTQTN-----
CYP94B1     VEHILKTNFYNFPKGPFTDLL-----GDLLGGGIFNS-DGELWSSQRKLASHEFTMRSLEFTEFELREEVQNRILPVLSSAVDCGE-----
CYP704A1    VEHILKTRFHNSYKGPVGTVNL-----ADLLGHGIFAV-DGEKWKQRKLVSEFESTRVLNRFYSYVFRSAS-KLVGFIAEFALSGK-----
CYP704B1    VEYVLKTNFSNYPK-----VLLGDGIFNS-DGELWRKQRKTASFEFASKNLRDFSTVVFKEYSL-KLFTILSQASFKEQ-----
CYP97A3     AKHILKDN AKAYSKG-ILAEIL-----DFVMGKGLIPA-DGEIWRRRRRAIVPALHQKYVAAMIS--LFGASDRLCQKLDAAALKGE-----

```

```

CYP97B3 ARHVLRENAFSYDKG-VLAEIL-----EPIMGKGLIPA-DLDTWKLRRRAITPAFHKLYLEAMVK--VFSDCSEKMILKSEKLIREKETSSGEDT----
CYP1A1  FKGRPDLYTFTLISNG-----QSMFSFSDSPVWAARRRLAQNGLKSFSTIASDPASSTSCYLEEHVSKEAEVL-----
CYP1B1  FADRPFFASFRVVSGG-----RSLAFGHYS-ERWKERRRAAAYGTMRAFSTR---HPRSRLLEGHALGEAREL-----
CYP17A1 FSGRPLTTTVALLSDN-----GKGIAFADSSATWQLHRLVLSFSFLFRDG-----EQKLENIICQELSALEL-----
CYP19A1 FSGRIAFVATLDILSDN-----QKGI AFADSHCAHWLHRLALNAFALFKDG-----NLKLEKIINQEANVL-----
CYP2A7  FSGRGEQATFEWVFKG-----YGVAFSNGGERAKQLRFIAIATLRDFGVG-----KRGIEERIQEESGFL-----
CYP2M1  FSGRANYPVIMTVSKG-----YGVLVSSGKRSKDLRRFSLMTLKTFGMG-----RRSIEERVQEEAKML-----
CYP33A1 YLDKMIYSKLNLSL-----RGGDYGVIDTNGNTWKEHRKFALHTLRDFGMG-----KEAMEASTIQLEVDKI-----
CYP33C1 YTNKVVLPMVTLSE-----RGGEYGIIDSNCAMWREHRRFALSTMRDFGLG-----KNLMQENILMEVQDV-----
CYP33B1 YADKYLSPEFNKYFREMQFTKLLFQYCFPNLGGEYGMIDISGDRWKEHRKFVQLRELGVG-----KPLMESKILIEAEEL-----
CYP23A1 FSNRGNHFVTDSEIME-----GSGNIVQIDGNKWREORFALHTLRDFGVG-----KPLMEQMITLEVTSL-----
CYP35A1 YADIAHAPLFRDLRQE-----MGVLVTNGSHWSTMKRFALHTLFRDMGVG-----KDLMETRIMEELDAR-----
CYP35B1 YKDRFLPPVYLHVSNN-----LGLFTANGPVCAEMRKFTLLAFRNMGVG-----RDLMEQRILDELNTRYLWGFELFLVQKKFCR-----
CYP34A1 FGTRYAPGLMNYNRYE-----RGVVASNGEFFQEHRSFVLSTFRNFASG-----RNIMEERIMDEYRYR-----
CYP71A12 FANRPRSKAVHGLMNGGRD-----VVFPG-YGEYWRQMKSVCI--LNLLTNKM--VAFSEKIREEELNEMIKKLEKASSS-----
CYP71C1  LASRPRNPVADIIRYNSTD-----VAFAP-YGVYWRRTARKVNN--THLLSAKM--VFSKRREEREEVRLVVARIRDAAEASP-----
CYP71D11 FASRPRSLFTDIVFYGSTD-----IGFSP-YGDYWRQVRKICN--VELLSMKR--VQSLWPIREEEVKNLIQRIASEEGS-----
CYP726A1 FAQRPIVLDAQIVFYNRKD-----VLFAS-YGDHWRFQMKKIWI--LEFLSAKK--VQSSRLIREEEMEDAITFLRSKAGS-----
CYP71K1  FATRPITPTGKVLMAVSVG-----VVFAP-YGDGWRTLRRICT--LELLSARR--VRSFRAVREEEVGRLLRAVAAAAVAALTP-----
CYP99A1 FASRPSLLVADIILYGSMD-----MSFAP-YCGNWRLRKLKCM--SELLNTHK--VRQLAARDSETLSLVRKVVYAAGAGGGGGRGQR--
CYP71E1  CCSRPASPGPKRLSYDLKN-----VGFAP-YGEYWRERKLF--LELLSMRR--VKAACYAREQEMDRLVADLDRAAAS-----
CYP71N1  CCSRPSLLSFSKFSYGLSD-----VAFIP-YGERWRQLRKLCT--VELLSTRK--INSFRDIRKEEMERVTKLICSHVRA-----
CYP71B2 CCSRPKTVGSGKLSYGFKD-----ITFAP-YGEYWRVRKLVAV--IELFSSKK--VQSFYRIREEEVDVVKVSESALK-----
CYP83A1 FADRPHRGHHEFISYGRRD-----MALNH-YTPYYREIRKMGM--NHLFSPTR--VATFKHVREEEARRMMDKINKAADK-----
CYP83B1 FTARPLLKGGQQTMSYQGRE-----LGFGQ-YTAYYREMRKCM--VNLFSNR--VASFPRVREEECQRMMDKIYKAADQ-----
CYP83E1 FSNRPISYQONILSYNGSE-----IVFAP-YGDFWRERKICA--IHIFSSKR--VSYSSIRIFEVKKMIKNISVHADS-----
CYP93B1 FNCRIESTAVKLLTYESS-----LAFAP-YGDYWRFIKLSM--NELLGSR--INNFQHLRAQETHQLLRLLSNRARA-----
CYP93C17 FSTRFQTSAIRRLTYDNS-----VAMVP-FAPYWKFIKVMIM--NDLLNATT--VNKLRLRSQEIIRKVLKAMAQSAES-----
CYP93A1 SNRPQGNVAVKGLAYDSQDFL-----FAFAP-FGPHYKFMKLCM--SELLSGRM--MDQLPVRQETKRFISRVFRKGVAV-----
CYP705A1 VSSRPGVAIDESLAYGSSG-----FIQAP-YGDYWKFMKCLIA--TKLLGPQP--LVRSQDFRSEELERFYKRLFDKAMK-----
CYP712A1 FSSRPEFGSAEYFKYRGSR-----FVLAQ-YGDYWRFMKLCM--TKLLAVPQ--LEKFADIREEEKLKLVDVSAKCCRE-----
CYP75A1 FSNRPPNAGATHLAYGAQD-----MVFAH-YGPRWKLRLKLSN--LHMLGGKA--LENWANVRANELGHMLKSMFDMRSRE-----
CYP75B1 FASRPPNSGAKHMAYNYQD-----LVFAP-YGHRWRLRKLISS--VHLFSAKA--LEDFKHVRQEEVGTLTRELVRVG-----
CYP92A2 FVGRPKTAAGKYTTYNYSD-----ITWSP-YGPYWRQARRMCL--TELFSTKC--LDSYEYIRAEELHSLHNLNKNIS-----
CYP84A1 FSNRPATIAISYLYTYDRAD-----MAFAH-YGPFWRQMRKVCV--MKVFSRKR--AESWASVRDEVDMVRSVSCNVG-----
CYP703A2 FSSRPKTLAAVHLAYGCGD-----VALAP-MGPHWKRMRICM--EHLTTTKR--LESFTTQRAEEARYLIRDVFKRSET-----
CYP98A3 LADRHRNRSTEAFSRNGQD-----LIWAD-YGPHYVKVRKCT--LELFTPKR--LESRLPIREDEVTAMVESVFRDCNLPENR-----
CYP706A1 FANHDLPEVGKINTYGGED-----ILWSP-YGTHWRRLRKLKCV--MKMFTTPT--LEASYSTRREETRQTIVHMSEMARE-----
CYP81D1 LANRPQVIIGKHVGYNNAN-----MIAAP-YGDHWRLRRLCT--IEIFSTHR--LNCFLYVRTDEVRLISRLSRLAGTK-----
CYP81E6 LANRPRFLSGKYIFYNYTT-----LGSTS-YGEHWRLRRITS--LDVLSNHR--INSFSPIRRDERTLIRKLAEDSAKN-----
CYP81B1 FANRPKMLFGKIIGVNYTS-----LAWSP-YGDNWRNLRRIAS--IEILSIHR--LNEFHDIRVEETRLLIQKLSACNSG-----
CYP82A2 VSSLPDLISANLLCYNRSM-----IVVAP-YGPYWRQLRKLIM--SEFLSPSR--VEQLHHVRVSEVQSSITELFRDWSNKNVQS-----
CYP82B1 LASRPPSAASSYMTYDHAM-----FGFSF-YGPYWRERKIST--LHLLSHRR--LELLKHVPHTIEHNFIKGLFGIWKDHDQKQQQPTGR-----
CYP76A2 FANRVIPDVNQAHSYQGS-----LAIAP-YGPFWRFORRICT--IEMFVHKK--ISETEPVRRKCDNMLKWIEKEANSAEK-----
CYP76G1 LAGRKIYEAMKGGKSSDGS-----LITAQ-YGAYWRMLRRLCT--TQFFVTRR--LDAMSDVRSRCDQMLRFVEEGGQNGTK-----
CYP76E1 FSNRTVPHAITAVDHDKFS-----VGWVP-TLNLWKKLRKNC--TKVFSTKM--LDSTKILRQKQLQELLDYVNEKSHN-----
CYP76F2 FCNRSIPDAIRAAKHNLQS-----MAWIP-VSTTWRLRRTCN--SHLFTSQK--LDSNTHLRHQKVEQLLANVEQSCQA-----
CYP76C1 LSARSPTNAVRSINHQDAS-----LWVLPSSSARWLRRLSV--TQLLSPQR--IEATKALRMNKVKELVSFISESSDR-----
CYP76B1 FSTRNVPDAVRAYNHERHS-----ISFLH-VCTEWRTLRRIVS--SNIFSNSS--LEAKQLRSKKVEELIAYCRKAALS-----
CYP80A1 LSGRQPLPCFRIKPHIDYS-----ILWSD-SNSYWKGRKILH--TEIFSQKM--LQAEKNRERVAGNLVNFIMTKVGD-----
CYP79A1 FISRPLTFASETFSGGYRN-----AVLSP-YGDQWKKMRVLT--SEIICPSR--HAWLHDKRTDEADNLTRYVYNLATKAATGD-----

```

```

CYP79B2 FASRPLTYAQKILSNQYKT-----CVITP-FGDFKMKRKKVVM--TELVC PAR--HRWLHQKRSEENDHLTAWVYNMVKNKSGS-----
CYP79D1 FSNRPKTL SAKSMSGGYLT-----TIIVP-YNDQKKMRKILTSFTEIISPAR--HKWLHDKRAEEADNLVFIHNNQFKANKN-----
CYP79E1 FASRPVTVVTRYSSRGFRS-----IAVVP-LGEQMKMKRRVVA--SEIINAKRLFTQWQLGLRTEEADNIMRYITYQCNTSGDNTG----
CYP79C1 FADRPDSYSAEYISGGYNG-----VVFDE-YGERQMKMKKVM--SELMSTKA--LNLLKVRNLESDNLLAYVHNLNKDESKTKHG--
CYP79F1 LADRPQLFIMETIGDNYKS-----MGISP-YGEQFMKMKRVIT--TEIMSVKT--LKMLEAARTIEADNLIAYVHNSMYQRSE-----
CYP77A6 ATRPTENPRTITFSSNTFT-----VNASAYGPVWRSRKRKNMV--QNMLSSIR--FREFGSLRQSAMDKLVRIKSEAKDND-----
CYP77B1 ASRPPDSPIRLMFSVVGKCA-----INSAEYGSLLWRTLRRNFV--TELVTAPR--VKQCSWIRSWAMQNHMKRIKTENVEK-----
CYP89A2 ADRPP--PAVISKIVDEHN-----ISSGSYGATWRLLRNIT--SEILHPSR--VRSYSHARHWLEILFERFRNHGGEE-----
CYP27A1 IRDSMEQWKEHRDHKGL-----SYGIFITQGGQWYHLRHSLNQRIVKPAEAAALYTDALNEVISDFIARLDQVR--TESAS-----
CYP27B1 ERCSFSPWTEHRRRCQR-----ACGLLTAEGEEWQRLRSLLAPLLLRPQAARYAGTLNNVCDLVRRLRRQRGRGTGP-----
CYP11A1 QRYDIPPLAYHYRYQK-----PIGVLFKKSGAVKDRVVLNTEVMAPEAIKNFIPLLNPNVSDQDFVSLHKKRIKQOQS-----
CYP11B1 HRMHLEPWWAYREHRRQ-----NLGVFLNCPWELSNRRWLNPNVLSPKAVQNLLPMVDTVARDFSEALKKQKVLQSAQ-----
CYP12A1 IRPGGDAQMYHRTVLRDFFQ-----GVTGLVSVNGEKWGNFRSTVNPVLMQPKNVRLYLNKMAQVNDEFMARIRQIRDPETL-----
CYP12C1 VRGGAEPVIHYRNKRKDEFFK-----NCMGLFG-NGAEWGNRSAVNPVLMQHRNVAIYLKPMQVRNRQFVNRIREIRDKESQ-----
CYP74A --SFPVLFVDVKVEKKDLFTG-----TYMPSTELTGGYRILSYLDPSEPKHEKLNLLFLLKSSRNRIFFPEFQATYSELFDS-----
CYP74C1 --SFPILFDTTKVEKRNILDG-----TYMPSLFTGGIRTCAYPDSETEHTVLRKFLSFLASHHDFRIFLFRSSLSEMFVK-----
CYP74D1 --SFVCMFDNSLIDKTDLTGG-----TFKPGKEYYGGYRPVAFIDTKDPNHAALKGYILSSF AKRHNLFIPLFRNTLSDHLFN-----
CYP74B2 --SFSHLFDMDLVDKRDVLIG-----DFRPSLFGYGGYRVGVYLDTTEPKHAQIKGFAMETLKRSSKVLQELRSNLNIFWGT-----
CYP24A1 --QRLEIKPWKAYRDHRNEAYG-----LMILEGQEWQRVRSAFQKKLMKPVEIMKLDKKINEVLADFLERMDELCDERGR-----
CYP10 EYSRLVHAERQYPNRREMPPIAYR---KQKGFDLGVNSQGEEMYRQRTVSKKMLKLAEVSNFSTQMGEVSDDFVKRLSHVRDSDHGEIP-----
CYP9A1 VKRITVKDFEHFVDRSFTSSFD P-----IFGRGLLLHGDWEKAMRSTMSPAFTSSKMLMVPFMEEIALEMIRVLRGKIKDSGKP-----
CYP9B1 --FPNHQTLNIPNERLVN-----DMLNVMRDQHWNRMSVLTVPFTSAKMRNMF TLMNESFAQCHEHLKSSQPIAAGEN-----
CYP14A2 FIYRADRPPELTLQPHLNTG-----VLFSNCDNRFORRTALKILRDFGLGRNLMEEQVMRSVHEMLAQLERIADKKN-----
CYP21A1 IEEALIQKWYDFAGRPQILDGKMN-----FDLSMGDYSLTWKAKKLSRSALVLMGRDSMEPLVEQLTQEFCEMRMAQAG-----
CYP36A1 FSGRPDTFIMDMLVQGNYG-----LFFMENNWWKAQRFTTHIFRSLGVGQAGTQDTIASLASGLVEKIDGQKD-----
CYP45A1 LKHILVKDINN FVNRSF FGTDK-----KMLIFLRDQQWQDVRRIMTPVFSSAKMKKMMPLMGGCVEELMDMYETAADSG-----
CYP18A1 --GRPDTPFMQTLNG-----YGIINSTGKLLKQDQRRFLHDKLRQFGMTYMGNGKQMQKRIMTEVHEFIGHLHASDG-----
CYP707A1 --AKFVLVTSHLFFKPTFPASKE-----RMLGKQAIFFHQGDYHAKLRKLVLR AFMPESIRNMVDPDIESIAQDSLRSWEG-----
CYP722A1 --ARLVLNDSGMFTKRYIKSIG-----ELVGDRSLNLCAPQHKKILRSRLINLFSKRTALMVRHFDELVDALGGWEHRG-----
CYP25A1 FSDRIVPPIFDSANLQNS-----LLQNTYATGKHKHTRSIAIAPIFSTGKMKAMQETIHSKVDLFLDILREKASSG-----
CYP73A5 --SRTRNVVFDIFTGKGQD-----MVFTVYGEHWKMRRIIMTVPFFTNKVVQQRREGWEFEAASVEDVKKNPDSATKG-----
CYP78A6 ILNSPVFADRPVKESAYSLMFN-----RAIGFAPHGVYWRTLRRIASNHLFSTKQIRRAETQRRVISSQMVFELEKQSSN-----
CYP4A4 LKVILGRSDPKAPRNYKLMTPWIG-----YGLLLLDGQTFWFQHRMLTPAFHYDILKPYVGLMVDSVQIMLDRWEQLISQD-----
CYP719 YGARDMPEITKIASASWHT-----ISTSDAGSFWQNVKGLQSGAMGPLNVAANQYQERDMKRLIKAMSDEAANNNG-----
CYP44A1 FIVPLQETTQKYREMKGMN-----PGLGNLNGPEWYRLRSSVQHMMRPQSVQTYLPFSQIVSNDLVCHVADQQRKFG-----
CYP302A1 --QRRSHLALAQRKSRPDVYKT-----TGLLPTNGPEWYRIRAQVQKELSAPKSVRNFRVQVDGVTKEFIRFLQESRNG-----
CYP22A1 QPTIILA EYKTIQEALVKNGQQ-----TSGRSSAESFVLTGDRLNGDGVILAMRQWKDMRHEISRFMKNWYGAPMDELVLHHTRCLEQELAKIAET--
CYP52A1 VKAILATQFNDFSLGTRHDFLYS-----LLGDGIFTLDGAGWKHSRTMLRPQFAREQVSHVKLLEPHMQVLFKHIRKHHG-----
CYP701A3 ISTRKLSNALTVLTCDKS-----MVATSDYDDFHKLVRKCLLNGLLGANAQKRKRHYRDAL IENVSSKLHAHARDHPQE-----
CYP315A1 --QHPLPDAWTLYNQQHACQRG-----LFFMEGAELHNRRILNRLLLNGNLNWMMDVHIESCTRRMVDQWKRRTAEAAAIPLAESGE----
CYP39A1 --INVFLKSKKVD FELAVQNI VYR-----TASIPKNVFLALHEKLYIMLKGKMGTVNLHQFTGQLTEELHEQNLGTHG-----
CYP711A1 LPNRSIPSPISASPLHKKG-----LFFTRDKRWSKMRNTLSLYQPSHLTSLIPTMHSFITSAHNLDKSKPR-----
CYP46A1 --DSKMYRALQTVFGERLFGQG-----LVSECNYERWHKQRRVIDLAFSRSSLVSLMETFNEKAEQLVEILEAKADG-----
CYP43A1 --FDCFHSRIPEILSDDPITSDN-----IHMFAAKGERWKRLRTLTSYGLSTVKLKL LFPMTDTCVSEFMDHVNSLSDGQSVVIN-----
CYP59A1 QIQSLNLSKPNILRRPLETITG-----GPSLSMHGETWKRWRALFNPGFNPNYLIGLAPLIADEVVVFCEQLRQKARTG-----
CYP710A1 IFSNVRPDAFHILGHFPFGKLLFG-----DHNLIYMFGE DHKSVRRQLAPNFTPKALSTYSALQQLVILRHLRQWEGSTSGGSR-----
CYP56A1 SGNQKKIPYSALAAAYTGDN-----VISAYGAVWRNYRNAVNTGLQHFD DAPIFKNAKILCTLIKRNLEGGTS-----
CYP57A1 --NALPKADYKIPFGLPSFPN-----LFDEQNPARHSATKKQVASLYHTMTALLSYEEGV DGTQTAILKEQLRQFCDQK-----
CYP53A1 --NGFLKSDFYDAFVSIHRG-----LFNTRDRAEHTRKRIKTVSHTFSMKSIGQFEQYIHGNIELFVKQWNRMADTQRNPKTG-----
CYP58A1 --RTNFWPLFQGCTDDTDVN-----HFMTIDHDLHRQRKPFDPFFSRMAINIRYWPMLAEKASFLESRIRECKGQ GK-----
CYP20A1 --NKTLDPFETMLKSLRLRYQ-----SDSGNVSENHMRKKLYENGV TNCLRINFALLIKLSEELLDKWL SYPESQ-----

```

```

CYP38A1  ESAVFNRPVELFVGFPELITP-----FSIQANDEDWVQRSKCLYHTLKGDDLKSYFHFFVQIAQEEESLWSSYTSKD-----
CYP54A1  -LDELKKLPDDVVSFDAANDDS-----MHTKYTLIPTHEPTLPHTIKTSLTPSLPRLNPQLSEEVQAFSQEIAPLMSSSPSD-----
CYP55A1  ---FPELSASGKQAAKAKP-----TFVDMDPPEHMHQKSMVEPTFTPEAVKNLQPYIQRTVDDLLEQMKQKGCAN-----
CYP727A1 IKELLTKAEDKLPLTGKTYNLACG-----KLGLFISSFVKVKSRESLKSFLDEKLSVGTGGSSFKIIQIVLDRVDSIMAR-----
consensus
201.....210.....220.....230.....240.....250.....260.....270.....280.....290.....
    
```

```

CYP7A1      -----SKSDAWVTEGMYAFCYRVMFEAGYLTIFGRDTS-----KPDTQRVLI LNNLNSFKQFDQV
CYP7B1      -----LKTTSWDTAELYPFCSSII FEITFTTIYGVKIV-----CDNNKFISELR--DDFLKFDDK
CYP8A1      -----EAGSGWHEMGLLEFSYGFLLRAGYLTOYGV EAPPH-TQESQAQDRVHSADV FHTFRQLDLL
CYP8B1      -----PDASRWHEGDLFHFCYGMFKAGYLSLFGHTS-----DKRQDLLQAEEIFIKFRRFDLL
CYP51A1     -----WGESGEVDLKAELERLITLTASRCLL GREVR-----DQLFDDVAPLFHDLDKGMQPI SVI
CYP51A2     -----WGESGEVDIKVELERLILTASRCLL GREVR-----DQLFDDVSLFHDLDNGLM PISVL
CYP26A1     -----WLSGGERGLLVYPEVKRLMFRIAMRILLGCEPGPAGGGEDEQQLVEAFEEMTRNLFSLPID
CYP26C1     -----WCAAG-GPVSVDASKALTRMAARILLGLRLDEAQCAT----LARTFEQLVENL FSLPLD
CYP716A1    -----EWANQ-DQVIVFPLTKKFTFSIACRSFLSME-----DPARVRQLEE QFNTVAVGIFSIPI D
CYP725A1    -----KWKGK-DEVKVLPLVRGLIFSIASLTFD VN-----DGHQKQLHHLLETILVGLSVPLD
CYP718      -----EWRGK-EEISLYRS AKVLTFTVFECLYGIK-----VEIG---MLEVFERLVLEGVFALPVE
CYP90A1     -----SWS---SRVLLMEEAKKITFELTVKQLMSFDPGE-----WSESLRKEYRLLVIEGFFSLPLP
CYP90B1     -----SWQQN-SIFSAQDEAKKFTFNLMAKHIMSMDPGEE----ETEQLKKEYVTFMKG VVSAPLN
CYP724A1    -----SWKNC-REVEFHKEVKIFTLSVMVNQLLSIKPEDP----ARLYVLQDFLSYMKGFISLPI P
CYP720A1    -----NFKDG-EVVL LQDICKVAIHLMVNQLLGVSSSES-----EVDEMSQLFSD FVDGCLSVPI D
CYP85A1     -----QWNL-EVIDIQDKTKHMAFLSSLTQIAGN-LRKP----FVEEFKTAFFKLVVGTLSVPI D
CYP87A2     -----LWSNQ-DSVELKDATASMI FDLTAKKLISHDPDK-----SSENLRANFVAFIQGLISFPFD
CYP708A1    -----SVSFQ-GVVDVKDTSGRLLILEQMILMIISNIKPE-----TKSKLIESFRD FSDFLVRS PFD
CYP702A1    -----EGARR-GCLDVKEISSKILIECLAKKVTGDMEPE-----AAKELALCWRCFP S GWRFPPLN
CYP88A3     -----KWTKMGE-FEFLTHLRKLTFRIMIYIFLSSSES-----ENVMDALEREY TALNYGVRAMAVN
CYP88B1     -----KYATTEEPVEFLHKMHKLT FEVFMRL LIGDEVN----QELFDEMFE EITAVISGVHNL PIN
CYP3A1      -----VPVKEVFGAYSMDVITSTSFQVNVDSLNNPKDPFVEKAKKLLRIDFFDPLFLS
CYP5A1      -----FDIQRCYCCYTTD VVASVAFGTQVNSSEEP EHPFVKHCRFFAFVSRLILVL
CYP6A2      -----LEIKELMARFTTDVIGTCRFGIECNTLRTPVSDFR TMGQKVFDMRHKLLTM
CYP6B4      -----QQIIPLVRKFTMASITTCAFGMELD--EEMIETLDKLD SLIFTTSYG----NE
CYP28A1     -----IDAKDMSLRFTSEMVTDCVLGLKAESFSDKPTPIMGYIKDLFAQSWTFIIYFV
CYP28C1     -----LDCIDLGLRFTGESL FDCVLGIQARTFTDNPLPVVRQNH EMSAENRGLA IAGA
CYP13A2     -----IDMLRFYQEYTM DVIGRFAMGQTD SMMFKNPIVNVVREIFCGSRKNL-MLICQ
CYP13B1     -----FNIHAYFQEFTYDVISR LAMGQPNSELFNNSGVEIVKSI FMRTHRVL PWFYFTV
CYP72A8     -----NEIDVWPYLGDLTSDVISR TAFGSSYEEGKRIFELQEEQGRVLLKALELAFIPGM
CYP72B1     -----VEVDVYEFQILTEDVISRTAFGSSYEDGRAVFR LQAQQMLLCAEAFQKVFI PGY
CYP721A1    -----IEL EVHKEMHNL SAEMLSRTAFGNSVEEGKGFELQERM MRLFYLVRWSVYIPGF
CYP709A1    -----EIGEEMHKLTADII SRTKFGSSFEKGKELFNHLTVLQRRCAQATRHL CFPGS
CYP709B1    -----IKKEMNEEFQRLTADIIATS AFGSSYVEGIEVFRSQMELKRCYTTSLNQVSI PGT
CYP715A1    -----DMESEIIGTAG EIIAKTSFGVTGENGTQVLKNLRAVQFALFNSNRVYGV PFS
CYP714A1    -----CDIIVDEDLRAASADVISRACFGSSFSKGKEIFSKLRCLQKAITHNNILFSLNGF
CYP4C3      -----AFNLPFYVTLCTLDIVCETAMG---RRIYAQSNSESEYVKAVYGIGSIVQSRQA
CYP31A2     -----EVDVLSVITLCTLDI ICETSMG---KAIGAQLAENNEYVWAVHTINKLISKRTN
CYP37A1     -----TIDAFPYIKRCALDI ICETAMG---TTVSAQTNHHPYVAVNEMNSLAFKYQR
CYP37B1     -----VDLFPYIKRLALDVI CDTSMG---VTIDAQNNHDHQYVESVRLLS EYAFEWIL
CYP32A1     -----YFDAPFYFKRCTLDI ICETAMG---IQVNAQLGHNNEYVHAVKRIS EIVWNHMK
CYP29A2     -----TVDIFPYVKRCALDI ICETAMG---IKIDAQINHDHKYVAVGEGYNKIGVLVSF
CYP86A1     -----PVDLQDLFLRLTFDNI CGLTFGKDPETLSLDL PDN-PFSVAFDTATEATLKRLL
CYP86B1     -----PIDLQDVLRLTFDNVCMIAFGVDPGCLGPDQ PVI-PFAKAFEDATEAAVRFV
CYP96A1     -----VVDLQDV FQRFTFDTSFVLATGVDPGCLSTEMPQI-EFARALDEAE EAIFFRHV
CYP96C1     -----VFDLQDV FQRLMLDSSSILTTGQNHRSRLRVGLPYD-ETLEAINIANYQIFVRHI
CYP94A1     -----ILD FQDILQRFTFDNICNIAFGYDPEYLPSTNRS-KFAVEKATEDATEISSKRFR
CYP94B1     -----TVDFQEV LKRFADFVVKVSLGWDPDCLDLTRPVP-ELFVAFDVA AEISARRAT
CYP704A1    -----SDFDQDMLMKCTLDSIFKVGFGVELGCLDGF SKEGEEFMKAFDEGNGATSSRVT
CYP704B1    -----QVDMQELLMRMTLDSICKVGFGEVEIGTLA PELPEN-HFAKAFDTANIIVTLRFI
CYP97A3     -----EVEMESLFSRLTLDIIGKAVFN YDFDSL TNDTGVI EAVYTVLREADRSVSPIP

```

```

CYP97B3 -----I ELDL EAEFSSLALDII GLSVFN YDFGSVTKESPVIKAVYGT LFEAHRSTFYFP
CYP1A1 -----I STLQELMAGPGHFN P YRYVVSVTNVICAIC FGRRYDHNH -----Q ELLSLVNLNNNFG
CYP1B1 -----V AVLVRR CAGGACLDPTQPI I VAVANVMSAVCF GCRYNHDD -----A EFLELLSHNEEFG
CYP17A1 -----C DFLATCDG -- QVKDLSSSIFMTV VNIICMIFSVSYKEGD -----M ELVTIRRFRTGTGV
CYP19A1 -----C DFLATQH G -- EAIDL SEPLSLAVTNII SFICFNFSFKNED -----P ALKAIQNVNDGIL
CYP2A7 -----I EAIR --- STHGANIDPTFF LSRVTSNVISSV FGRDFYED -----K EFLSLLSMMLGIF
CYP2M1 -----V KAFG --- EYRDSVNPKE LL CNCVGNVICSIV FGH RFENDD -----P MFQLIQKAVDAYF
CYP33A1 -----D EELK --- KVEGKEVNIQEHFD LAIGNIINQFL FGNRFKDS -----S KFNELKLLDLFF
CYP33C1 -----F ARLD --- AKLGSETD VPEVFDHAVANV VNL FGYRFMGPK E -----N EYQELKHIIDSPA
CYP33B1 -----I KKLKT - AEILNEDFL LQSELDVAVG SVINQFL FGYRFDRSKL -----F EFTRIKTLVNNFM
CYP23A1 -----M NHMEKSCGLDGKELHL CPSI AVCVGNII NNML FGLRFNQDN -----S YMTRLHQLLDDQS
CYP35A1 -----C ADTKSATDGTVAQAGDFD LTVGSIINSILV GKRFEHNK -----D DFLKIKEAMGA AF
CYP35B1 TFRRI FK YREKFLNSQFPVQN FEKSVSSFR RFSCAEIDADAVNGKTI VHTTEFFDL TVG SVINSLLV GKRFEAEDK -----D DFLEIKRLMAEAA
CYP34A1 -----F EDFASSNGICNKERKIF ETWARPFFD LLTGSVINKI L INERFEQNDP -----E -FEKLVSR LAKGF
CYP71A12 -----S SENL SELFVTLPSDVT SRIALG KRKHS E -----E TARDLKKRVRQIM
CYP71C1 -----G TALDMTEL LGGYASDFVCRAVL GESHRKQ -----G RNKLFRELTETSA
CYP71D11 -----V VNL SQAIDSLIFTITSRSA F GKRYMEQ -----E EFISCVREVM
CYP726A1 -----P VNI TKI IYGIIISIMIRTSVGN -CKQK -----E RLLSVADAVN
CYP71K1 -----G ATA AVNL SERISAYVADS AVRAVIGSR FKNR -----A AFLRMLERM
CYP99A1 -----G EAPV VNL GRLV LSCSMAITGRATL GKL CG -----D EIMSVVDVAV
CYP71E1 -----K ASIVLNDHVFALTDGI IGTVA FGN IYASK -QF -----A HKERFQHVLD DAM
CYP71N1 -----S SMVNL SELLLSLSCNMTCRS AF GSGFDD -----G GDIQLHDM LREAQ
CYP71B2 -----Q SPVDL SKTF FSLTASII CRVALGQNFNESGFV -----I IDQRIEELV TESA
CYP83A1 -----S EVVDISELMLTFTNSV VCRQAF GKRYNED --G -----E EMKRFIKILYGTQ
CYP83B1 -----S GTVDL SELLLSFTNCV CRQAF GKRYNEY --G -----T EMKRFIDILYETQ
CYP83E1 -----S NVTNL SELLISLSSTIICRTAFGKSYEDD --G -----I EKS RFHGLLHEFQ
CYP93B1 -----F EAVNITEELLKLTNNV I SIMV G -----E AEEARDVVRDVT
CYP93C17 -----Q KPLNVTEELLKWTNSTI SRMMLG -----E AEHVKDIVREVL
CYP93A1 -----G EAVDFGDE LMTLSNNIVSRMTLSQKTS EN -D -----N QAEEEMKLLVSNIA
CYP705A1 -----K ESVMIHKEASRFVNSL YKMTG R SFSVE --N -----N EVERIMELTADLG
CYP712A1 -----G LPCDLSSQFIKYTN NVICRMAMSTRCSGT --D -----N EAEI ERELVKKSL
CYP75A1 -----G ERVVVAEMLTFAMANMIGQVILSKRVF --V NK -----G VEVN --EFKDMVVELM
CYP75B1 -----T KPVNLGQLVNM CVVNALGREMIGRRLFG-ADA -----D HKAD --EFRSMVTEMM
CYP92A2 -----G KP I VLKDYLT T LSLNVISRMVLG KRYLD -ESE -----S NSFVNPEEFKMLDEL F
CYP84A1 -----K PINVGEQIFALTRNITYRAAEG -----S -----S ACEKGQDEFIRILQEF S
CYP703A2 -----G KP INLKEVLGAFSMNNVTRMLLGKQFFGPGSL -----S VPKEAQEFLHITHKLF
CYP98A3 -----A KGLQLRKYLGA VAFNNITRLAFGKR FMNAEGV -----V DEQG -LEFKAIVS NGL
CYP706A1 -----G SPVNLGEQIFLSIFNVVTRMMWGATVEGDE -----D RTSLG -NELKTLISDIS
CYP81D1 -----K TVVELK PMLMDLTFNNIMRMMTGKRY YGEET -----D TEEEEAKRVRKLVADVG
CYP81E6 -----F SEVELTSRFFDMTFNNIMRMISGKRY YGEDCDM -----D TELQEASEFRDMVTELL
CYP81B1 -----S SQVTMKFSFYELTLNVMMRMISGKRYFGGDNP -----D EEEEEGRFRMDLDETF
CYP82A2 -----G FATVELKQWFSLLVFNMI LRMVCGKRYFSASTS -----D DEKAN --RCVKADFEV
CYP82B1 E-----D RDSVMLEMSQLFGYLTLNVVLSLVGKRVCNYHADGHLDDGEEAGQGQLHQITIDFF
CYP76A2 -----G SGI EVTRFVFLASFNMLGNLILSKDLADLES -----D EEASEFFIAMKRIN
CYP76G1 -----T --IDVGRYFFLMAFNLI GNLMFSRDLLDPDS -----D KRGSEFFYHTGKVM
CYP76E1 -----G EVFDIGETVFINVLSISNTLFSMDLAHSTPD -----D EKSQEFKTIWIGIM
CYP76F2 -----G GPVDIGQEAFTSLNLLSNTIFSVDLVDPIS -----D ETAQEFKLVIRGVM
CYP76C1 -----E ESVDISRVAFTTLNII SNLIFSVDLGSYNAK -----D ASINGVQDTVISVM
CYP76B1 -----N ENVHIGRAAFRTSLNLLSNTIFSKDLTPYE -----D DSGKEFREVI TNIM
CYP80A1 -----V VELRSW LFGCALNVLGHVVF SKDVFEYS DQ -----D SDEVGMDKLIHGML
CYP79A1 -----V AVDVRHVARHYCGNVI RRLM ENRRYFGE -----D PQADGGPGPMEVLHMDAVFTSL

```

```

CYP79B2 -----VDFRFMTRHYCGNAIKKLMFGTRTFSKN---TAPDGGPTVEDVEHMEAMFEAL
CYP79D1 -----VNLRTATRHYGGNVIRKMFVSKRYFTFGK--GMPDGGPGPEEIEHIDAVFTAL
CYP79E1 -----AIDVRFALRHYCANVIRRMVFGKRYFGSFT--GGEGGGPGKEEIEHVDATFDVL
CYP79C1 -----AVNVRDIVCTHTHNKMRLLFGRRHFKET---TMDGSLGLMEKEHFDAIFAAL
CYP79F1 -----TVDVREL SRVGYAVTMRMLFGRRHVTKENV--FSDDGRLGNAEKHHQVFNNTL
CYP77A6 -----GLVWVLRNARFAAFCLILEMCFGIEEMDEE-----SILNMDQVIMKCVL
CYP77B1 -----GFVEVMSQCRLTICSLICLFCGAKISEE-----KIKNIENVLKDV
CYP89A2 -----PIVLIHHLHYAMFALLVLMCFGDKLDEK-----QIKEVEFIQRLQL
CYP27A1 -----GDQVPDVANLLYHLALEAICYILFEKRVGCLEPS-----IPEDTATFIRSVG
CYP27B1 -----PALVRDVAGEFYKFGLEGIAAVLLGSRLGCLEAQ-----VPPDETTFIRAVG
CYP11A1 -----GKFVGDIKEDLRFASFESITNVMEGERLGMLEDT-----VDTEAQKFIDAVY
CYP11B1 -----GSLTMDMQPD IHKYTVEVSNFALFGERLGLFGCN-----PSSQSLKFIHALE
CYP12A1 -----EVPASFQEMNRWLTLESVSVALDKQLGLITTN-----RDNPD LKKLIGLL
CYP12C1 -----EVPGDFMNTINHLTFESVATVALDRELGLLREA-----NPPPEASKLFKNI
CYP74A -----LEKEAFPLRESGFRFRQRNRLLFLGSSFLRDE--SRRYK LKADAPGLITKWVLF
CYP74C1 -----LEDKLADKNKIADFNSISDAVSFDYVFR LFSDG--TPDSTLAADGPGMFDLWLGL
CYP74D1 -----NLEKQVTEQGKADFNL LPTMTDFDFIRLLCDQKNPSDTVLGAQGPEHLRKLWFP
CYP74B2 -----IESEIS-KNGAASYIFPLQRCIFSF L CASLAGVDASVSPDIAENGWKTINTWLAL
CYP24A1 -----IPDLYSELNKS FESICLVLYEKRFGLLQKETEEEEALTFITA IKTMMSTFGKMM
CYP10 -----ALERELFKWAMESIGTFLFEERIGCLGQETSPMAQTFIANLEGFFKTLQPLM
CYP9A1 -----YIDVEAKSMMTRYANDVIASCAFGLKVN SQASDHEFYVNSQAITKFKFS AFLKVL F
CYP9B1 -----AFELDMKVL CNKLSNDVIATTA FGLKVN SFDDPENEFHTIGKTLAFSRGLPFLKFM
CYP14A2 -----VDMFWPIQLCVGNVINESLFSYHYKYEDSK-----KFETFVKVLDKHL
CYP21A1 -----ASVAIHKEFSL L TCSIIISCLTFGDKQDSTLLN--ATHSCVRDLLKAWNHWSVKI
CYP36A1 -----KPIELRPLLVHVGVNIHKHLFGFTREWNETEILD FHVAINDVLEHFTSPKTQLL
CYP45A1 -----QPIDMMEAFQCLTMDVINRCAITLDINCIKNPKNEVLAFMRKYVSQPIPCIFKFI
CYP18A1 -----QPVDMSPVISVAVSNVICSLMMSTRFSIDDPKFRFNFLIEEGMRLFGEIHTVDY
CYP707A1 -----TMINTYQEMKTYTFNALLSIFGKDEVLYR-----EDLKRCYVILEKGY
CYP722A1 -----TVVLLTDLLQITFKAMCKMLVSLKEEELG-----SMQRDVGVFCEAML
CYP25A1 -----QKWDIYEDFQGLTLDVIGKCAFAIDSNCRDRNDVFYV NARKFIANIDIRHVKVI
CYP73A5 -----IVLRKRLQLMMYNNMFRIMFDRRFES EDDPLFLRLKALNGERSRLAQSFEYNY
CYP78A6 -----EPCFVRELLKTASLNMMCSVFGQEY ELEKN-----HVELRE MVEEGY
CYP4A4 -----SSLEIFQHVS LMTLDTIMKCAF SYQGSVQLDRNSHSYIQAINDLN LNFYRARNV
CYP719 -----IVKPLDHIKKN TVRLLTRLIFGQAFDDN-----KFIESMHYEIEDII
CYP44A1 -----LVDMQKVAGRWSLESAGQILFEKSLGSLGNR--SEWADGLIELNKKIFQLSAKMR
CYP302A1 -----GAIDMLPKLTRLNLEL TCLLTFGARLQSFTAQE QDPRSRSTRLMDAAETTNSCIL
CYP22A1 -----KSLIDL RDPLAGAIANVIQQITIGRNYMYQDQEFQTQLRDINAVVKEIMTAEVFFV
CYP52A1 -----QTFDIQELFFRLTVDSATEFLLGESAE SLRDE--SVGLTPTTKDFDGRNEFADAF
CYP701A3 -----PVNFRAIFEHELFGVALKQAFGKDVESIYVKELGV T LSKDEIFKVLVHDMMEGA
CYP315A1 -----IRSYELPLLEQQLYRWSIEVLC CIMGTSVLTCPKIQSSLDYFTQIVHKVFEHSSRLMT
CYP39A1 -----TMDLNNLVRHLLYPVTNMLFNKSLFSTN-----KKKIKEFHQYFQ
CYP711A1 -----DIVFSNLFLKLT TDIGQAAFVDFGLSGKPKIKDVEV TDFINQHVISSTQLKM
CYP46A1 -----QTPVSMQDMLTYTAMDILAKAAF GMETSMLLGAQKPLSQAVKLMLEGITASRNTLA
CYP43A1 -----HSHSLFQNHTSYVLARKAFGNFAELQKSTA EKIAIYIFPETKLIFKNSFVGHF
CYP59A1 -----TVFQLEPLTLRLTVDTICSVTLYVVPVGRWPFLTPDLEIHSSTTKLR TTPLPQR
CYP710A1 -----PVSLRQLVRELNLETSQTVFVGPYLDKEAKN-----RFRTDYNLFNLGSMALP
CYP56A1 -----IPMGPLSQRMALDNISQVALGDFD GALTHEKN-----AFHEHLIRIKKQIFH
CYP57A1 -----QVIDLPRFLQYYAFDVI GVTYVCKSMGMMESNSDTNGAC S DALDGMWHYASMMYAI
CYP53A1 -----FASLDALNWFNYLAFDIIGDLAFGAPFGMLDKGKDFAE MRKTPDSPPSYVQAVEVL
CYP58A1 -----AVRLDRAFSAFSADCIERIC TDDLEPGDGLDQPDFGPEWYDGMLGLIRNAPIL
CYP20A1 -----HVPLCQHMLGFAMKSVTQVMV GSTFEDEQ-----EVIRFQKNHGTVWS

```

```
CYP38A1 -----EVS1LTKEV2FPMTIKGIARTCF3GDIFKDE-----NELSKMAESYH
CYP54A1 -----WAPININSK1LRIVAKVSGRVFI2GPELCHDERYLEAAVGYTVSVMEQAQRAVERMNP
CYP55A1 -----GPVDLVKEFALPVPSYIIY1TLLG2VPFN-----DLEYLTQQNAIR
CYP727A1 -----DFLDCRYFSQHMAFNIVGSA1LFG2DAFFDWS3DASAYEELMMTVAKDACFWASYAVP
consensus 301.....310.....320.....330.....340.....350.....360.....370.....380.....390.....
```



```

CYP7A1      FPALVAG-LPIHLFKAHKAHQEQLAEGLK---HENLSVRDQVSELIRLRMFLNDTLS-----
CYP7B1      FAYLVSNIPIELLGNVKSIREKIIKCFSE---SEKLAKMQGWSEVFSRQDVLEKYY-----
CYP8A1      LPKLARGSLASAGDKDRVGVKGRWLKLS---PTRLASRAHRSRWLESYLLHLEEMG-----
CYP8B1      FPRFVYSLLPREWREVGRLQQLFHLLS---VKHNPEKDGMSNWIGHMLQYLSEQG-----
CYP51A1     FPKLPPIAHNCRD-RARGKIAKIFSNIIA---TRKRSGDSENDMLQCFIDSKYKDGR-----
CYP51A2     FPYLPPIAHRDRD-RAREKLSSEIFAKIIG---SRKRSG-KTENDMLQCFIESKYKDGR-----
CYP26A1     VPFSGLYRGVKARNLIHARIEENIRAKIR--RLQATEPDGGCKDALQLLIEHSWERGE-----
CYP26C1     VPFSGLRKGIARDQLHRHLEGAISEKLIH--EDKAAEPG----DALDLIIHSARELGH-----
CYP716A1    LPGTRFNRAIKASRLLRKEVSAIVRQRKE--ELKAGKALEE-HDILSHMLMNIGETK-----
CYP725A1    FPGTRYRKGLQARLKLDEILSSLIKRRRR--DLRSGIASDD-QDLSVLLTFRDEKGN-----
CYP718      FPCSKFARAKKARLEIETFLVGKVRKERR--EMEKEGAEPK-NTTLFSRLVEELIKG-----
CYP90A1     LFTSTTYRKAIQARRKVAEALTVVVMKR---REEEEGEAERKDKDMLAALLAADDG-----
CYP90B1     LPGTAYHKALQSRATILKFIERKMEERKLDIKEEDQEEVEKTEDEAEMSKSDHVRKQRTDDDLLGWVLKH--
CYP724A1    LPGTGYTNAIKARKRLSARVMGMIKERE---REEEDMNAIREEDFLDSIISNED-----
CYP720A1    LPGFTYNKAMKARKEIIRKINKTIEKR----LQNKAASDTAGNGVLGRLLLEES-----
CYP85A1     LPGTNYRCGIQARNNIDRLLRELMQERR----DSGETFTDMLGYLMKKEGNR-----
CYP87A2     --IPGTAYHKCLQG--RAKAMKMLRNLQERRENPRKNPS---DFDYVIEEIQKEG-----
CYP708A1    PSFWNALYNGLMVRSARSNVMKMLKRMFKERREEATSDDSKYGDFFMETMIYEVEKEG-----
CYP702A1    -----LPGTGVYKMMKARKRMLHLLKETILKKRAS--GEELGFEFFKIIFEGA-----
CYP88A3     IPGFAYHRALKARKTLVAAFQSIVTERRNQRKQNILSNKKDMLDNLN--VKDEDGK-----
CYP88B1     LPGFAYHGLKARKVLXEVFKKLIDERREAMKDGKSMPKANIDMLLSNNNQDYEAN-----
CYP3A1      VVLFPPFLTPVYEMLNICMFP----KDSIEFFKKFVYRMKETR----LDS-----VQKHRVDFLQLMMNAHNDK
CYP5A1      ILSFSPSIMVPLARILPNKKR----DEVNGFFNKLIRNVIALRD---QQA-----AEERRQDFLQMVLDLRHSAP
CYP6A2      VFVSPKLASRLRMRMPED-----VHQFFMRLVNDTIALRER-----ENFKRNDFMNLLIELKQK--
CYP6B4      IDMMYPGILKKNLSSIFSKM-----IAPFFDNLTKTIEEQRGG-----KPTNRKDLMDLILELRQKKA
CYP28A1     LVSTLPALRHVFKLRFVPLR-----IENFFVNLMQTAIDARRQQLAAG-----KQFERVDFLDYILHLGKK--
CYP28C1     VHGLFPNLPRLWLRPKVFPFRS-----HDFRYGQMISEALRLRS-----KHQERNDFINHLLEMQRE--
CYP13A2     VFPPIGQFIRDITFKFPRIP---AFKLYSIMQDVVAARIAQRE-REKGA-----ESGEPQDFIDLFLDARSDDV
CYP13B1     LFPQFEHLVKRMFYNHAAVQGGDIEKLLICKKTVESRIQEREENAKLG-----FENAENDFIDMFLNYYSEVQ
CYP72A8     RFLPTKNNLRMRQINKEVKS-----RLREIIMKRQR-----GMDT-----GEAPKNDLLGILLESNSGD-
CYP72B1     RFFPTRGNLKSWKLDKEIRK-----SLLKLIERRRQNAIDGEGEEC-----KEPAKDLLGLMIQAKN---
CYP721A1    RFFPSKTNREIWRIEKQIRV-----SILKLIENKT-----AVEK-----SGTLLQAFMSPYTNQNGQE-
CYP709A1    RFLPSKYNREIKSLKKEVER-----LLIEIIQSRDC----AEMGR-----SSTHGDDLGLLLNEMDIDK
CYP709B1    QYLPTPSNIRVWKLERKMDN-----SIKRIISSR-----LQS-----KSDYGGDDLGLILLKAYNTE-
CYP715A1    NILSYKQTVKAKGLGHEIDG-----LLLSFINKRK-----ISLAE-----GDDQGHDLGMLLKADQKG-
CYP714A1    TDVYFGTKKHGNGKIDELER-----HIESLIWETVKE----REREC-----VGDHKKDLMQLLILEGARSSC
CYP4C3      KI--WLQSDFIFSLTAEYKHLQSYINTLHGFSNMVIRERKAELAILQENN-----NNNNNNAPDAYD-----DVGKKKRLAFLDLLIDASKEGT
CYP31A2     -----NPLITEDGRTHEKCLRILHDFTKKVIVERK---EALQEN-----DYKMEGRFLAFLDLLLEMVKSQ-
CYP37A1     MP--WLWIKPIRQLIGYEADFQRNLDIVTSFTKKVIDRKLREHD-----ETDGMVVVE-----EESKKKAFLDMLIEK-KEEG
CYP37B1     RP--WLRLKPLWYLTGPGHEYDRHLKIVTDFTKTVIKEKWEFQ-----KFHVDPVVK-----TDKRSMFLDLLLEL-RNEG
CYP32A1     FP--WLWLKPIWYLTGLGFEDRNVMTNMFVRKVDAAFKIENQKNYYLGLIVLPEAFKINFQVIQERKELLNEDGNEASEKRRKAFDLLLTIQKEEG
CYP29A2     NP--HLKNQFIFWATGYKAQYDYLSTLKSMTKEKVIKERRAAHDSGEVEK-----ETSKRMMNFDLMLSMEESEN-
CYP86A1     YT-GFLWRIQKAMGIGSEDKLKSLEVVETYMNDAIDARKN-----SPSDDLRSRFLKKRD---
CYP86B1     MP-TCVWKFMRYLIDIGTEKKLKESIKGVDDFADEVIRTRKKELSLE--G-----ETTKRSDLLTVFMGLRD---
CYP96A1     KP-EIVWKMQRFIGFGDELKMKKAHSTFDRVCSKCIASKRDEITNGVIN-----IDSSSKDLLMCMYMNVDITICH
CYP96C1     LP-AKIWKFKQWLKIMGEEKIKKAWRI--DDISVEYMNRRKKEISS-----TISSQEDMDVVKFSEE--D
CYP94A1     LPLPIIWKIKKYFNIGSEKRLKEAVTEVRSFAKKLVREKKRELEEK-----SSLETEDMLSRFLSSGHS-
CYP94B1     EPVYAVWVKRFLNVGSEKRLREAIKTVHLSVSEIIRAKKSLDIGG-----DVSQKQDLLSRFLAAGHG--
CYP704A1    DP---FWLKLKCFNLIGSESRLKKSIAI--IDKFVYSLITTKRKELSKEQ-----NTSVREDILSKFLESEKDP
CYP704B1    DP---LWKMKKFLNIGSEALLGKSIKVVNDFTYSVIRRRKAELEAQ-----VKHDIILSRFIEISDDPD
CYP97A3     VWDIPWIKDISPRQKRVATSLKLINDTLDDLIIATCKRMVEEELQFHEE-----YMNERDPSILHFLLAS----

```

```

CYP97B3  YWNFPPARWIVPRQRKFQSDLKIINDCLDGLIQNAKETRQETDVEKLQER-----DYTNLKDasLLRFLVDMR---
CYP1A1   EVVGSNGPADFIP-----ILRYLPNPS---LNAFKDLNEKFYSFMQKMKVKEHYKTFEKG-HIR-----DITDSLIEHCQEKQLDEN
CYP1B1   RTVGAGSLVDVMP-----WLOLFPNPVRTIFREFEQINRNFNSFVLDKFLRHRESLVPGAAPR-----DMMDAFILSAEKKATGDP
CYP17A1  NSLSDDNLVDIFP-----WLKIFPNKTELMIRKYTEIRGAMLSKILKECKEKFRRSDSVSNLID-----LLIQAKVNNNNNSLDDQ
CYP19A1  EVLSTEVLLDIFP-----VLKIFPSKAMEKMKGCVQTRNELLNEILEKQVENFSSDSITNLH-----ILIQAKVNADNNNAGPDQ
CYP2A7   QFTSTSTGQLYEM-----FSSLMKHLPGPQQ--AFKLLGLLEDFFIAKKQVEHNQRTLDPNS-----PQDFIDSFLIHMQEEE
CYP2M1   NVLSSPIGAMYNM-----FPRIVWCFFPGNHHE--MFAIVNKAKVYIQEQAEIRLKTNLISE-----PQDFIEAFLVKMLEEK
CYP33A1  EVQGSRLRVYFAYT-----VDFLPQWMVELLTP--DVSVRVDGIYQFFDEQIEEHRQEI DFETSD-----SK--DYVETFMKEQKKRE
CYP33C1  EIFGKLIHIFLAMN-----IPIFAKLLPESLYEGPIKTRDRTTLAFFNKQIEAHRHRIDFEDLN-----SESTDFVETFLKEQKRRE
CYP33B1  EEVGKPLGVLAFT-----CHGIPSFVLKLMVS-GIEEQKRELFRFLRKQIDGAKMSQINYEHEE-----NE--DFVEAYLRKKFQRE
CYP23A1  HTVMQPIMGAYIA-----FPVTSKIPIINGEWNRLMGIKNELLEFLETKIQIEGRHMNWKDEMIE-----QEPEDLTYAYMIEVEKRR
CYP35A1  EVFSPFDMVVPVW-----FLRT--FFRSRYDMMMTTQNTAKRFAAAAEVKSJETLKT-----DNLMDVLLNLQKN--
CYP35B1  DLFTMFDLVVPVW-----FLKS--FFPSRFERVAIFEKALNYLSREALARYEKLKTGEYSVNA-----EDPQDFVEAYLAKMEQER
CYP34A1  ENTGFLDIFCPVR-----ILESRLKWRQDTIFEPFNYILELNKKSIAARRVAQLKADEHVLS-----DDPDDFLDAYLLKMQKDK
CYP71A12 ELLGEFPIDGYVP-----ALAW-IDRIN-GFNARIKEV--SQGFSDLMDKVVQEHLEAG-----NHK-----EDFVDILLSESEK-
CYP71C1  ALLGGFNVEDYFP-----KLAD-VDLFLRIICAKAKSV--SKRWDSL FNELLSEYALSGGKQGDHNS-----EDFVHLLLSLQKD--
CYP71D11 KLAGGFNIADLFP-----SAK--WLENL TRMRSKFEYL--HQKMDRILETIIDHDKANSRTKEGQVEG-----GEEDLIDVLLKYENSS-
CYP726A1 EAATSFGTADAFP-----TWK--LLHYIIGAESKPRRL--HQEIDDILEEILNEHKANKPFEA-----DNLMDVLLNLQKN--
CYP71K1  KLLPAQCLPDLFP-----SSR--AAMLVSRMPRRMKRE--RQEMMDFIDDFQEHESRAAAG-----AEEDLLDVLLRIQSQD-
CYP99A1  LYGSGFCAGDLFP-----SLW--FVDVVTGLTRRLWTA--RRRLDAIFDRILAECEARQRQEEKMT-----GDDGFLGVLLRIRDDD-
CYP71E1  DMMASFAEDFFP-----NAAGRLADRLSGFLARRERI--FNELDVFFEKVIDQHMDPARPVPDNG-----GDLVDVLLINLCKE--
CYP71N1  EELSGFLFLSDYLP-----LLG--WDRLSGMRSLERA--FLKLDISIYQRRIDYHQDRLRQQGKD-----GDVLDALLRMQKD-
CYP71B2  EALGTFTFSDFFP-----GGLGRFVDWL FQRHKKINKV--FKELDAFYQHVIDHLLKPEGRKNQDI-----VTLIDMIDKQED--
CYP83A1  SVLGGIFFSDFFP-----YCG--FLDDL SGLTAYMKEC--FERQDTYIQEVVNTLDPKR-VKPET-----ESMIDLLMGIYKE--
CYP83B1  ALLGTLFFSDLFP-----YFG--FLDNL TGLSARLKA--FKELDTYLQELLDETLDPNR-PKQET-----ESFIDLLMQIYKD--
CYP83E1  ALLAASFFADYIP-----FTG--WIDKLRGLHGRVDRN--FKEFDEFYQEIIDEHLDPNREQITDE-----EDIVDVLELKKK--
CYP93B1  EIFGEFNVSDFIW-LFKKMDLQGFGRITEDLQRFDTL--VERIISKREQTRKDRRRNGKKGEQSGD-----GIRDFLDILLDCTEDE-
CYP93C17 KIFGEYSLTDFIW-PLKKLRVGGYEQKRIDEIFNKFDPV--IEKVIKKRQEI IK--RRKERNGELEE------QSVVFLDTLLEYA-
CYP93A1  ELMGKFNVSDFIW-YLKPFDLQGFNRKIKETRDRFDV--VDGIIKQRQEERR-----KNKETGTAK-----QFKDMLDVLLDMHEDE-
CYP705A1 ALSQKFFVSKMFRKLLLEKLGISL FKTEIMVVSRRFSSEL--VERILIEYEKMD-----GHQG-----T--QFMDALLAARDE-
CYP712A1 ELAGKISVGDVLG-PLKVMDFSGNGKKLVAVMEKYDLL--VERIMKEREAKAK-----KKDG-----TRKDIIDLILETYRDP-
CYP75A1  TTAGYFNIGDFIP-----CLAWMDLQGIKGMKRL--HKKFDALLTKMFDEHKAT-----SYERKGGKPDFLDCVME-----
CYP75B1  ALAGVFNIGDFVP-----SLDWLDLQGVAGMKMRL--HKRFDAFLSSILKEHEMN-----GQDQK-HTDMLSTLIS-----
CYP92A2  LLNGVLNIGDSIP-----WIDFMDLQGYVKRMKV--SKKFDKFLHVIDEHNIRN-----GVENYVAKDMEDVLLQ-----
CYP84A1  KLFGAFNVADFIP-----YFGWIDPQGINKRLVKA--RNDLDGFIDDIIDEHMKKKE-----NQNAVDDGDVVDTDMVDDL LAF
CYP703A2 WLLGVIIYLG DYLP-----FWRWVDPGSGCEKEMRDV--EKRVDEFHTKIIDEHRRAKLE-----DEDKNGDMDFVDVLLS-----
CYP98A3  KLGASLSIAEHIP-----WLR-WMFPADKAFAEH--GARRDRLTRAIMEEHTLARQ-----KSSGAKQHFDVALLT-----
CYP706A1 DIEGIQNYSDFFP-----LFSRFDQGLVKQMKGH--VKKLDLLFDRVMESHVKMVG-----KKSEEEEDFLQYLLR-----
CYP81D1  ANTSSGNAV DYVP-----ILRL--FSSYENRVKKL--GEETDKFLQGLIDDKRGQ-----QETGTTMIDHLLV-----
CYP81E6  QLSGANNAKDFMP-----ILRLVDFEGLEKRVKGI--SSKTDRFLRGLLQEHDRKK-----QRTANTMIDHLLT-----
CYP81B1  VLAGASNVGDYLP-----VLSWLGVKGEKLIK--QEKRDVFFQGLIDQLRKS KGTED-----VNKKKTMIELLS-----
CYP82A2  RLAATFTVGD AIP-----YLRWDFGGEYENDMRET--GKELDEIIGEWLDEHRQKRKMG-----ENVQDLSVLLS-----
CYP82B1  KLSGVSVASDALP-----LLGLFDLGGKKESMKRV--AKEMDFFAERWLQDKKLSLSLSETNKNQ-N-----DAGEGDGDDFMDV LMS-----
CYP76A2  EWSGIANVSDIFP-----FLKKFDLQSLRKKMARD--MGKAVEIMSMFLKEREE--ERKKG-----TEKGKDFLDVLEFQGTG-
CYP76G1  EFAGKPNVADFFP-----LLRFLDPQGI RRKTQFH--VEKA FEIAGEFIRERTEVREREKS-----DEKTKDYLDVLEFRGGDG
CYP76E1  EEAGKPNISDFFP-----ILRPLDPQGLYARMTNH--MKKLCEIFDGIIEERICLKD SKGD-----YEVENDVLDLNLNIGE-
CYP76F2  EEAGKPNLVYFFP-----VLRQIDPQGI RRRLLTIY--FGRMIEIFDRMIKQRLQLRKIQG-----SIASSDVLDVLLNISE-D-
CYP76C1  DAAGTPDAANYFP-----FLRFIDLQGNVFTFKVC--TERLVRVFRGFIDAKIAEKSSQNNP-----KDVSKNDVFDVLLDYKGG--
CYP76B1  VDSAKTNLVDFVP-----VLKKIDPQGIKRGMARH--FSKVLGIFDQLIEERMRTGRFEQG-----DVLDVCLKMMQ-D-
CYP80A1  MTGGDFDVASYFP-----VLARFDLHGLKRKMDEQ--FKLLIKIWEGEVLARRANRNPEPK-----DMLDVLI-----
CYP79A1  GLLYAFCVSDYLP-----WLRGLDL DGHEKIVKEA--NVAVNRLHDTVIDDRWRQWKS G-----ERQEMEDFLDVLLITLKDAQ-

```

```

CYP79B2  GFTFAFCISDYLP-----MLTGLDINGHEKIMRES--SAIMDKYHDPIDIDERIKMWREG-----KRTQIEDFLDIFISIKDEQ-
CYP79D1  KYLYGFCISDFLP-----FLLGLDLDGQEKFVLDANKTIFTRDYQNPLIDERIQQWKS-----ERKEMEDLLDVFITLKDSD-
CYP79E1  GLIYAFNAADYVS-----WLKFLDLHGQEKVKVKAIDVVNKYFTHDSVIESRRERKVEGR-----EDKDPEDLLDVL LSLKDSN-
CYP79C1  DCFSPFYVADYYP-----FLRGWNLGQEEAELREA--VDVIARYNKMIIDEKIELWRGQNKDYNRAET-----KNDVPMIKDWLDLFTLKDEN-
CYP79F1  NCLFSPFADYVER-----WLRGWNVDGQEKRVTEN--CNIVRSYNNPIIDERIVQLWR-----E-----EGGKAAVEDLDTFTITLKDN-
CYP77A6  ITLNPR-LDDYLP-----ILAPFYSKE-RARALEVRQVDFIVKLIERR--RAIQKPGTDK-----TASS-FSYLDTLFDLKTEG-
CYP77B1  LITSPT-LPDFLP-----VFTPLFRRQ-VREARELRKTQLECLVPLIRNRRKFVDAKENPNEEM-----VSPIGAAYVDSLFRNLIE-
CYP89A2  LSLTKFNIFNIWP-----KFTKILRKRWQEFQIRRQQRDVLPLIRARRKIVEERKRSEQED-----KKDYVQSYVDTL LLELPE-
CYP27A1  LMFKNVYVTFPLP-----KWSRPLLP-FWKRYMNNWDNIFSFGEKMIHQKVQIEAQLQAAGPD-----GVQVSGYLHFLLTKE----
CYP27B1  SVFVSTLLTMAMP-----HWLRHLVPGPWGRLCRDWDQMFQAFQRHVERREAEAMRNGGQPEK-----DLESGAHLTHFLFRE----
CYP11A1  KMFHTSVPLLNLP-----ELYRFRTKTRDWHVAAWDTIFNKAEKYTEIFYQDLRQKT-----E-----FRNYPGILYHLLKSE-
CYP11B1  AVFQTTTQLMFLPR-----SLSRWMSQAWKEHFEAWDYISEYAENRIQKKYEELARG-----CSQNSIVANLMLQG----
CYP12A1  NDFFELGQKIEFGL-----PFWKYIKTPTFKLFMKTLDGELLEIGNKYVNEAIDRLEAERQSGVPE-----KPENEKSVLEKLIKI----
CYP12C1  EVLMSFFDLGVRP-----SLYRYIPTPTYKKFSRAMDEIFDTCSMYVNAIAIERIDRKSSQGD-----SNDHKS VLEQLLQI----
CYP74A  NLHP-LLSIGLP---RVIEEPLIHTFSLPPALVKSDYQRLY-EFLRIRGEILVEADK-----
CYP74C1  QLAP-LASIGLPKIFSVFEDLIIHTIPLPFFPVKSRYRKLKAFYSSSGSFLDEAEK-----
CYP74D1  QLIPSLSAKKLP---NIIEDMLFHNFLIPFGFIKSDYNKLVDAFSKSAVSMLEAEK-----
CYP74B2  QVIPTAKLGVP---QPLEEILLHTWPYPSLLIAGNYKKLYNFIDENAGDCLRLGQEE-----
CYP24A1  VTPVELHKRLNNTKVWQAHTLAWDTIFKSVKPCIDNRLQRYSQPGADFLCDIYQQD-----
CYP10  YNLPTYKLWSTKLWKQFENYSNDVIDIGRSLVEKKWHPCKMEVTQNLHLISYLVNNG-----
CYP9A1  FRCLPSVAQKLKMSLVPRECSDFSNVVLTTMKDREKKNVVRNDLINILMEVKKGQLTHEKDDADADAG-----FATVEESHIGRKQHN-
CYP9B1  MCLLAPKVFNFKLTIFDSTNVEYFVRLVVDAMQYREKHNITRPMIQLLMEAKKESK-----
CYP14A2  KTVQGTIFLMSAFPWLKHPFVIGELGYHRIKKNIQSYQEFINDEVTSQIKHYDGESE-----PENFVHAYMQQMKQSG
CYP21A1  DIIPFLRFFPNPGLWKLKQFQESRDHIVMRELKRHKDSL VAGQWKDMIDYMLQGVEKQRDARD-----
CYP36A1  DAWPWLAYLDKPLSLGIPRTRANDAI IQNLEQALAKHKTGINYDEEPSYMDAFLKEMKIRAAEN-----
CYP45A1  VAFPMLYDLIRLLIPENKRNNITFIEEHLTKVVKQRREQTQATVVDGLQLLVDAADANVDAS-----
CYP18A1  IPTMQCFPSISTAKNKIAQNRAMQRFYQDVIDDHKRSFDPNNIRDLVDFYLCEIEKAKAEGTDAELFD-----
CYP707A1 NSMPVNLPGTLFHKSMKARKELSQILARILSERRQNGSSHNDLLGSFMGDK-----
CYP722A1 AAFNLPLWTRFHKGIMARGVMEMLEKTIERRRNEINSHNNHEDFLQQLAVDNDTP-----
CYP25A1  AFSFILPELAPLWRLALYKYPPLADAEIPLVEGLSNVTFLLNFCSFSLILTKIFSERRRGGE-----GSDSDVLLKLLLNREDDKS
CYP73A5  GDFIPILRPFLRGYLKICQDVKDRRIALFKKYFVDERKQIASSKPTGSEGLKCAIDHILEAEQ-----
CYP78A6  DLLGTLNWDHLP-----WLSEFDPQRLRSRCSTLVPKVNRFVSRRISEHRNQTG-----DLPRDFVDVLLSLHGSD-
CYP4A4  FHQSDFLYRLSPEGRLFHRACQLAHEHTDRVIQQRKAQLQEGELEKVRKR-----LDLFDVLLFAKMENG
CYP719  RISGYARLAEAFYAKYLPSHKAAREAFLVKCRVEELVRPLLSSKPPTNSYL YFLLS-----
CYP44A1  LGLPIFRLFSTPSWRKMVDLEDQFYSEVDRMLDDALDKLVNDSKDMRFASYLINR-----
CYP302A1  PTDQGLQLWRFLETSPFRKLSQAQSYMESVALELVEENVNGSVGSSLISAYVKNPE-----
CYP22A1  NCYPWLRYLPEGILRKWTNYKRSQFRLQQWFRTILEEHHVNRHQGDFMSHMIDLQESK-----
CYP52A1  NYSQTNQAYRFL LQQMYWILNGSEFRKSAIAVHKFADHYVQKALELTDLEDLEKKEGYVFLFELAK-----
CYP701A3  IDVDWRDFFPYLKWIPNKSFEARIQKHKRRLAVMNALIQDRLKQNGSESDDDCYLNFLMS-----
CYP315A1  FPPRLAQILRLPIWRDFEANVDEVLEGAAIIDHCIRVQEDQRRPHDEALYHRLQAAD-----
CYP39A1  VYDEDFEYGSQLECLLRNWSKSKKWFLEFEKNIPIKACKSAKDNSMTLLQATLD-----
CYP711A1  DLSGSLIILGLLIPIIQEPFRQVLKRIPTGTMWRVEKTNARLSQGLNEIVSKRAKEAETDS-----KDFLSLILKARESDP
CYP46A1  KFLPGKRKQLREVRESIRFLRQVGRDWWQRRREALKRGEVVPADILTQILKAEEG-----
CYP43A1  LKSATQQKFLDYLLHLISNFQSRKNVDNNGICCTENDHYSLLGFFFEHHNEKKLIEKAEGQIDMKKVK-----
CYP59A1  CNGRSNGPRLELPSTPLRRYLTVRPLVMWYNNRLLMNRFDQEVDRAYREQSGRQSKSVISLALRDYMK-----
CYP710A1  IDLPGFAFGARRAVKRLGETLGCAGSKARMAAGEEPACLIDFWMQAIVAENPQP-----
CYP56A1  PFFLTFPFLDVLPIPSRKKAFKDVVSFRELLVKRQDELVNYYKFEQTTFAASDLIRAHN-----
CYP57A1  PNMHAWLRLSSLPLIEVPKIGLTYEYVERRIQRVLRKAAEFGDDAALKGENNFLAKLLLME-----
CYP53A1  NRRGEVSATLGCYPALKPFAKYL PDSFFRDGIQAVEDLAGIAVARVNERLRPEVMANN-----TRVDLLARLMEGKDSNG
CYP58A1  TKFPKALSSRLRYVPPRLLLWLPQGR IANKYDARTRTQIHKAVTKQHL SKDTTNTSEHTTLFRALAQSD-----
CYP20A1  EIGKGF LDGSLDKSTTRKKQYEDALMQL ESILKKIKERKGRNFSQHIFIDSLVQG-----

```

```
CYP38A1  VCWRTMEEGVPEAGSKRETEFLKHRRVLEDIIRRIIQRKEGEDLQELPFIDSMLQN-----  
CYP54A1  WVRPIAAWRLKEVRKLAQMERDATAFLRPVVEARREKQRKGEEKDNDMLQWLMSADQGQKQHG-----  
CYP55A1  TNGSSTAREASAAN-----QELLDYLAILVEQRLVEPKDDIISKLCTEQVKP-----  
CYP727A1 PFWKPDYRRYRTL CARLKLLTQGIVAKSRNQNGVLSLIDLSSCQRSERMIKDPCRGFSLLDG-----VISSRCLNEAAEG-  
consensus 401.....410.....420.....430.....440.....450.....460.....470.....480.....490.....
```

```

CYP7A1      -----TFDDMEKAKTHLAILWASQ--ANTIPATFWSLFQMIRSPDALRAASEEVNGALQSAGQKLSSE--
CYP7B1      -----VHEDLEIGAHHLGFLWASV--ANTIPTMFWAMYLLRHPEAMA AVRDEIDHLLQSTGQKKGS---
CYP8A1      -----VSEEMQA-RALVLQLWATQ--GNMGPAAFWLLFLKLNPEALAAVRGELETVLLGAEQPISQ---
CYP8B1      -----VAPAMQD-KFNFMMLWASQ--GNTGPASFWALIYLLKHPEAMRAVKEEATRVLGEPRLEAKQ---
CYP51A1     -----ETTESEVTGLIAGLFAQQ--HTSSITATWTGAYIQNKHWSAALDEQKKLIGKHGDKIDY---
CYP51A2     -----QTTSEVTGLLIAALFAQQ--HTSSITSTWTGAYLMRYKEYFSAALDEQKNLIAKHGDKIDH---
CYP26A1     -----RLDMQALKQSSTELLFGGH--ETTASAATSLLITYGLYPHVLOKVVREEIKSKGLLCKS-----
CYP26C1     -----EPSMQELKESAVELLFAAF--FTTASASTSLVLLLQHPAAIKIREELVAQGLGRACGCAPGAA---
CYP716A1    -----DEDLADKIIGLLIGGH--DTASIVCTFVNNYLAEPHVVYQRVLQEQKEILKEKKE-----
CYP725A1    -----SLTDQGILDNFSAMFHASY--DITVAPMALIFKLYSNPEYHEKVFQEQLEIIGNKKE-----
CYP718      -----VITEEEVDNMVLLVFAAH--DITSYAMSMTFKMLAQHPTCRDRTLQEHAKIRANKGE-----
CYP90A1     -----FSDEEIVDFLVALLVAGY--ETTSTIMTLAVKFLTETPLALAQLKEEHKIRANKS-----
CYP90B1     -----SNLSTEQILDILSLLFAGH--ETSSVAIALAIFFLQACPKAVEELREEHLEIARAKKELG-----
CYP724A1    -----LNYEEKVSIVLDILLGGF--ETSATLTLVYVFLAKSPNLLHKLKEEHAIRAKKGDG-----
CYP720A1    -----LPNESMADFIIINLIFAGN--ETTSTKTMFAVYFLTHCPKAMTQLLEEHDRLAGG-----
CYP85A1     -----YPLTDEEIRDQVVTILYSGY--ETVSTTSMALKYLHDHPKALQELRAEHLAFRERKRQD-----
CYP87A2     -----TILTEEIALDLMFVLLFAF--ETTSLALTLAIKFLSDDPEVLKRLTEEHETILRNREDA-----
CYP708A1    -----DTINEERSVELLSLLIASY--ETTSTMTALTVKFIAENPKVLMELKREHETILQNRADK-----
CYP702A1    -----ETMSVDNAIEYIYTLFLLAN--ETTPRILAATIKLISDNPKVMKELHREHEGIVRGKTEK-----
CYP88A3     -----TLDDEEIIDVLLMYLNAGH--ESSGHTIMWATVFLQEHPEVLQRAKAEQEMILKSRPEG-----
CYP88B1     -----MLSDKKIIEILVLFSAFAG--EPVALMSVKAIHFLQKHPHFLEKAKEEQEEIVKRRASS-----
CYP3A1      -----DKESH TALSDMEITAQSIIFIFAGY--EPTSSLSFVLHSLATHPDTQKQLQEEIDRALPNKA-----
CYP5A1      SVGVENFDIVRQAFSSAKGCPADPSQPHLPRPLSKPLTVDEVGQAFLLFIAGY--EIIINTLSFVTYLLATNPDCQEKLLREVDFSKKHP-----
CYP6A2      ---GRVTLD-----NGEVIEGMDIGELAAQVFVYVAGF--ETSSSTMSYCLYELAQNQDIQDRLRNEIQTVLEEQE-----
CYP6B4      IEPMKKTHD---EQVTTLELTDVIAAQTFIFYAAGY--ETSASTMSFLLFELAENPDIQEKVIAEVDETLKRHN-----
CYP28A1     -----KNLDTRHLTAHTMTFLLDGF--ETTALYDSCALVSRDQEAQQLRELEAHLDD-K-----
CYP28C1     -----LDLSEEDMASHAMTFMFDGL--DITTSNSIAHCLLLGRNPDCQRRLYEELQLVNPGR-----
CYP13A2     DFSAEAREDFSKR---NLKITKELSADEVGQCFLFLIGGF--DITTALSLSYVTYLLAVNPKIQEKVIEEIAREFGT-----
CYP13B1     EDIEFG---STVEKKVTAEDVIGACFVLLAGF--DITANSLAYASYLLAKHPEKMKLAQEEVDTVVGS-----
CYP72A8     -----HGMSIEDVVEECRLFHFAQQ--ETTAVLLVWTMIMLSHHQKWQDQAREEILKVIKGN-----
CYP72B1     -----VTVQDIVEECKSFFFAGK--QTTSNLLTWTITILSMHPWQAKARDEVLRVCGSR-----
CYP721A1    -----EKLGIEEVTDECKTFYFAAK--ETTANLMTFVLVLLAMNQEQWQNIAREEVICVLGQT-----
CYP709A1    N-----NNNNNNLQLIMDECKTFFFAGH--ETTALLLTWTTMLADNPTWQEKVREEVREVFGRN-----
CYP709B1    -----GKERKMSIEEIIHECRTFFFAGH--ETTSNLLAWTTMLSLHQDWQEKLREEIFKECGKE-----
CYP715A1    -----NFTAKELVDECKTFFFAGH--ETTALALTWTFMLAIHPWQDTRIREEIREVIIGDS-----
CYP714A1    DG-----NLEDKTSYKSFVVDNCKSIYFAGH--ETSAVAVSWCLMLALNPSWQTRIRDEVFLHCKN-----
CYP4C3      -----VLSNEDIREEVDTFMFEGH--DITSAAISWTLFLGCHPEYQERVVEELDSIFGDDKETP-----
CYP31A2     -----QMDETDVQAEVDTFMFEGH--DITSTGLMWAIHLGNHPEVQRKQVQAEDEVMGDDDED-----
CYP37A1     -----GLGYEDIREEVDTFMFEGH--DITTSAGIGWSLWCLANCPYQKKCHEELDEIFEGTSRE-----
CYP37B1     -----LMNEDDIREEVDTFMFEGH--DITTSASMGWTLWCLAHNPEFQEKVIOEVDGIFGTSDRD-----
CYP32A1     -----TLDSEDIREEVDTFMFEGH--DITSSGIGFTILWLGFYPECQKLLQKELDEVGFETNPQ-----
CYP29A2     -----QLTSEDIRQEVDTFMFAGH--DITTSSTSWACWLAHNPNVQEKVYKEMIEVFGDDPNTD-----
CYP86A1     -----VNGNVLPTDVLQRIALNFVLAGR--DITSSVALSWFFWLVMNNREVETKIVNELSMVLKETR--G-----
CYP86B1     -----EKGESFSDKFLRDICVNFILAGR--DITSSVALSWFFWLLEKNPEVEEKIMVEMCKILRQRDDHG-----
CYP96A1     TT-----KYKLLNPSDDKFLRDMILSFMLAGR--DITSSALTWFFWLKSNPKAITKIRQEIINTQLSPRT-----
CYP96C1     HV-----VLKSDASDN-LLRDTVKGILLAGT--DITATVLSWFFWLLKLNPRVEQKIREEIELYLKQKN-----
CYP94A1     -----EDFVADIVISFILAGK--DITSAALTWFFWLLWKNPRVEEIVNELSKK-----
CYP94B1     -----EEAVRDSVISFIMAGR--DITSAAMTWLFWLLSQNDDVETKILDELRNK-----
CYP704A1    -----ENMNDKYLRDIILNVMVAGK--DITTAASLSWFLYMLCKNPLVQEKIVQEIIRDVTSSEKTT-----
CYP704B1    -----SKETEKSLRDIVLNFVIAGR--DITATTLTWAIYIMMNNENVAEKLYSELQELEKESAEATNTSLH-----
CYP97A3     -----GDDVSSKQLRDDLMTMLIAGH--ETSAAVLTWTFYLLTTEPSVAKLQEEVDSVIGDRF-----

```

```

CYP97B3 -----GVDIDDRQLRDDLMTMLIAGH--ETTAAVLTWAVFLSQNP EKIRKAQAEIDAVLGGQP-----
CYP1A1  AN-----VQLSDEKIINIVLDLFGAGF--DVTTAISWSLMLVMNPRVQRKIQEELDTVIIGR-SRRPRLS--
CYP1B1  GDSP-----SGLDLEDVPATITDIFGASQ--DITLSTALLWLLILFTRYPDVQARVQAEILDQVVGGR-DRLPCMS--
CYP17A1 DS-----NLFSDKHILTTLGDIFGAGV--ETSSSVLWVIAFLLHNPQVKKKIQEEDHNVGF-SRTPTFS--
CYP19A1 DS-----KLSNRHMLATIGDIFGAGV--ETTSVKIKWIVAYLHHPSLKKRIODDIDQIIGF-NRTPTIS--
CYP2A7  KNPN-----TEFYLNKLMSTLNLFIAGT--ETVSTTLRYGFLLMKHPEVEAKVHEEIDRVIIGK-NRQPKFE--
CYP2M1  DDPN-----TEFNNGNMVMTAWSLFAAGT--ETTSSTLRQSFLLMMIKYPHIQESVQKEIDEVIG--SRVPTVD--
CYP33A1 AEG-----DFASFSNEQLKNMCFDMWVAGM--HITNTNTMGFLTAFALNNMDAQRKMKQKELTEVIG--DRVVTMK--
CYP33C1 SEANS-----KNLNFNSIQLLNVCIDLWFAGL--NTTNTNTITWATSYVLHHPVEVDKIHHEELDKVIGS-DRLITTA--
CYP33B1 QKN-----DFDSYCDSQLENVCFDIWAAGF--DITLNTVGFLLIAYAINYPEMOMLIHQEIDNYLAHHSRLLTLA--
CYP23A1 RNGE-----DVGFFDDQQLKMLLDLFFAGM--ETTVTTLKMAFLMLAKNOKVQKNVQAEILDSIGAP--MIEIQ--
CYP35A1 -----MIIDLWMTGQ-----ETTITTLISGFTQLLLHPEVMVKAREEILKITENGSRHLSLT--
CYP35B1 LRDS-----DTPYTMECLKFVIGDLWLAGQ--DITSTTLVAGFNHLVKNPEIVRKCREEILRITENGSRPLQLK--
CYP34A1 NEGL-----ETTFTLENLAVDMYDLWLGQ--ETTSTTLNWACACLNRPDVTITAREELIRVTC--GHRSLSLI--
CYP71A12 -----SIGFQAQRDDIKFMI-LDMFIGGT--SITSTLLEWIMTELIRNPNVMKKLQDEIRSTIRPHG-SYIKEK-
CYP71C1 -----YGLTTDNIKGIL-VNMFEEAI--ETSFLVLEYSMSELMNHRHVLAKLQKEVR-TATPDG-RMVMEE-
CYP71D11 -----TDQDFHLTIRNIKAIL-FDIFIAGS--ETSATTINWTAEMMKDPI LLKKAQDEVREIFQ--RRGKVDET-
CYP726A1 -----GNVPVPVTNESIKASV-LQMFTAGS--ETTSKATELWMAELMKNPTELKKAQEEVRQVFG--EMGKVDES-
CYP71K1 -----KTNPALTNDNIKTVI-IDMFVASS--ETAATSLOWTMSLEMRNPRVMRKAQDEVRRALAIAGQDGVTEE-
CYP99A1 -----EPETGGISTTSIKAIL-FDMLAGGT--ETTSSAAEWIMSELMRKPEAMAKAQAEEVRGALDGKSPE-DHEG-
CYP71E1 -----HDGTLRFTRDHVKAIV-LDTFIGAI--DITSSVTLLWAMSELMRKPPQLRKAQAEVRAAVGDDKPRVNSE--
CYP71N1 -----EEG---LTEDHIKGVL-MDIFIAGT--DITSAVTVEWAMAE LIRQPELMKRAQDEVRRRCVGS-KGEVEES--
CYP71B2 -----SDS-FKLNMDNLKAIV-MDVFLAGI--DTSAVTMIWAMTE LIRNPRVMKKAQESIRTTLLGLKKERITEE--
CYP83A1 -----QPFASFTVDNVKAVI-LDIVVAGT--DTAAAAVWAMTYLKYPPQLKKAQAEVREYMKKEGSTFVTED-
CYP83B1 -----QPFSEIKFTHENVKAMI-LDIVVPGT--DTAAAVVWAMTYLIKYPEAMKKAQDEVRSVIGDKG--YVSEE-
CYP83E1 -----RSFSFDINFDHIKGIL-TDMLVAAT--DITSAASVWAMTALIKNPRVMSKVKGGEIRNLGVKGD--FLYED-
CYP93B1 -----NSEIKIQRVHIKALI-MDFFTAGT--DITTAISTEWALVELVKKPSVLQKVREEDNVVVGKDR--LVEES-
CYP93C17 -----NMEIKITKEQIKGLV-VDFFSAGT--DSTAVATDWALAE LINNPRVLKKAREEVDSVVGKDR--LVDES-
CYP93A1 -----NAEIKLDKKNIKAFI-MDIFVAGT--DTSAVSIEWAMAE LINNPDVLEKARQEIDAVVYKSR--MVEES-
CYP705A1 -----NTEYKITRSHIKSLLTVEFFIGAA--DASSAIQWAMADIINNREILEKLRREEDSVVVGKTR--LVQET-
CYP712A1 -----TAEMKITRNDMKSFL-LDVFMAGT--DITSAAMQWAMGQLINHPPQAFNKLREEDINNVVYKSR--LVKES-
CYP75A1 -----NRD-----NSEGERLSTTNIKALLNLFTAGT--DITSSAIEWALAEEMKNPAILKKAQEGEMDQVIGN-NRRLLES--
CYP75B1 -----LKGTD-----LDGDGGSLLDTEIKALLNMFTAGT--DITSASTVDWAIAE LIRHPDIMVKAQEELDIVVGR-DRPVNES--
CYP92A2 -----LADD-----PKLEVKLERHGVAFTQDMLAGGT--ESSAVTVEWAISELSKKPEIFKKATEELDRVIIGQ-NRWVQEK-
CYP84A1 YSEEAKLVSETA-----DLQNSIKLTRDNIAKAIIMDMVFGGT--ETVASAIEWALTE LRSPEDLKRVQOELAEVGL-DRRVEES--
CYP703A2 -----LPGE-----NGKAHMEVVEIKALIQDMIAAAT--DITSAVTNEWAMAEAIKQPRVMRKKIQEELDNVVGSL-NRMVDES--
CYP98A3 -----LK-----DQYD---LSEDTIIGLLWDMITAGM--DITTAITAEWAMAEMIKNPRVQKQVQEEFDRVVGGL-DRILTEA--
CYP706A1 -----VK-----DDDEKAPLSMTHVKSLLMDMVLGGV--DITSVNASEFAMAEIVSRPEVLNKRIRLELDQVVGK-DNIVEES--
CYP81D1 -----LQKSD-----IEYYTDQIIKGIILIMVIAGT--NITSAVTLEWALSLLNHPDVISKARDEIDNRVGL-DRLIEEA--
CYP81E6 -----LQESQ-----PEYYTDQIIKGLALAMLLAGT--DSSAVTLEWMSMCNVLNYPEVLEKIKAEIDTHVGGQ-DRLVDES--
CYP81B1 -----LQETE-----PEYYTDAMIRSFLVLLAAGS--DITSAVTMEWMSLLNHPQVLLKKAQNEIDSIVIGK-NCLVDES--
CYP82A2 -----LLEG-----KTIEGMNVDIVIKSFVLTVIQAGT--EASITTLIWTSLILNNPSVLEKLAELDQVIGK-ERYICES--
CYP82B1 -----ILPDDD-----DSLFTKYSRDTVIKATSLSMVVAAS--DITTSVSLTWALSLLNNIQVLRKAQDELDTKVGR-DRHVEEK--
CYP76A2 -----KDEPAKLSHEHIKIFVLEMFLAGT--ETTSSSVWEALTE LRRHPEAMAKVKTEISQAIEP-NRKFEDS--
CYP76G1 -----VDEEPSFSSRDINVIVFEMFTAGT--DITITSTLEWALAE LHNPRTLTKLQTELRTYFKSSNQKLQEE--
CYP76E1 -----ATSELSRNEMVHLFLDLFVAGI--DITSSMIEWIAE LLRNPKDKLTKVRKELCQTIIGK-GETIEES--
CYP76F2 -----NSNEIERSHMEHL LLDLFAAGT--DITSSSTLEWAMAE LHNPETLLKARMEILLQTIIGQ-DKGVKES--
CYP76C1 -----DESEL S ISDIEHLLLDMFAGT--DITSSSTLEWAMTE LKNPKTMAKAQAEIDCVIIGQ-NGQVEES--
CYP76B1 -----NPNEFNHTNIKALFLDLFVAGT--DITTSITIEWAMTE LLRKPHIMSKAKEELEKVIIGK-GSIVKED--
CYP80A1 -----ANDFNEHQINAMFMETFGPGS--DITNSNIIEWALAQ LKNPKDLAKLREELDRVVGR-SSTVKES--
CYP79A1 -----GNPLLTIEEVKAQSQDITFAAV--DNPSNAVEWALAEVNNPEVMAKAMEELDRVVGR--ERLVQES--

```

```

CYP79B2 -----GNPLLTADEIKPTIKELVMAAP--DNPSNAVEWAMAEMVNKPEILRKAMEEIDRVVGGK--ERLVQES-
CYP79D1 -----GNPLLTPEDEIKNQIAEIMIAIVFTDNPNSNAIEWAMGEMLNQPEILKKAETEELDRVVGGK--DRLVQES-
CYP79E1 -----GKPLLDVVEEIKAQIADLTYATVDNFTPSNAVEWALAEMLNPPDILQKATDEVDQVVGGR--HRLVQES-
CYP79C1 -----GKPLLTPEIT-HLSDLDVVGII--DNAVNVIWTLAEMLNQREILEKAVEIDMVGK--ERLVQES-
CYP79F1 -----GKYLVTPEDEIKACVEFCTAAI--DNPANNMEWTGEMLNKPEILRKALKKELDEVVGR--DRLVQES-
CYP77A6 -----RITTPSNEELVSLCSEFLNGGT--DTTGTGTAIEWGIAQIIVNPEIQSRLYDEIKSTVGG--DREVEEK--
CYP77B1 -----RGGELGDEEIVTLCSEIVSAGT--DTSATTLEWALFHLVTDQNIQEKLYEEVGVVGGK-NGVVEED--
CYP89A2 -----ENRKLNEEDIMNLCSEFLTAGT--DITATALQWIMANLVKYPEIQERLHEEIKSVVGGEEAKEVEEEE--
CYP27A1 -----LLSPQETVGTFFPELILAGV--DITISNTLTWALYHLSKNPEIQEALHKEVTVGVVFG--KVPQNK-
CYP27B1 -----ELPAQSTILGNVTELLLAGV--DITVSNLTSWALYELSRHPEVQTALHSEITAALSPGSSAYSATS-
CYP11A1 -----KMLLEDVKANITEMLAGGV--DITSMTLOWHLYEMARSLNVQEMLRKEVSNARRQAEGDISK---
CYP11B1 -----NLPLRAMKANIMDLVAGSV--DITIALPLMMTLFEARNPTVQQALRQESMATEPNIIYENPQR---
CYP12A1 -----DRKIATVMA--IDMILAGV--DITSTTFTALLCLAKNPEKQEKLRREIIRQILPRKDSQFEPSS--
CYP12C1 -----DRKLAVVMA--MDMLMGGV--DITSTAISGILLNLAKNPEKQORLREEVLSKLTSLHSEFTVE--
CYP74A -----LGISREEATHNLLFATSFNTWGGMKILFPNMVKRIGPGGHQVHNRLAEEIRSVIKSNGGELTMGA-
CYP74C1 -----QGIDREKACHNLVFLAGFNAYGGMKVLFPTILKWVGTGGEDLHRKLAEEVVRTTVKEEG-LTFSA-
CYP74D1 -----LGIKREEAVQNILFLVGINMFAGLNAPFFHLFRFVGEAGASLHTQLAKEIRSVIKEEGGAILTSA-
CYP74B2 -----FGLTRDEAIQNLFLVLFNFAYGGFSVFLPSLIGRITGDNSGLQERIRTEVRRVCG--SGSDLNFKT-
CYP24A1 -----HLSKKEYAAVTEQLQAIV--ETTANSLSMWILYNLSRNPQAQRLLQEVQSVLPDNQTPR-----
CYP10 -----SMSTKEVTGLIVDLMLAIV--ETTSSATVWCLYNLAKNPQVQEKLFQEIIEAQAKNNGTISAED-
CYP9A1 -----YEWTDSDLIAQAALFLFAGF--DITVSTSMSFLLYELAVNPDVQDRLLQEIIEYDEKNHGKIDYN--
CYP9B1 -----DNWTDDEIVAQCIFFFFAFE--NNSNLICTTAYELRNLDIQRLEYEEVKETQEALGAPLTYD-
CYP14A2 -----NPNLDMNLCASVIDFWLAGM--ETTNSLRHMLAFMMKYPEIQDKVRKEILDNVGTARLPMSMDK-
CYP21A1 -----PGQLHERHVHMSVVDLFGGT--ETTAAATLSWAVAFLLHHPEIQKRLQELDLKLAPSSQLLYKN--
CYP36A1 -----ALEDFTEKQLIVAIYDLYSAGM--ETIIIVLRFALYLVNNPETQKRIHEELDRNVGRERQVVMDDQ-
CYP45A1 -----KTKLTDEEVDNAFLFLLAGF--ETTSTALTYTSYLLALNPDIOEKIIFQEEVEEVGLERAPSYED--
CYP18A1 -----GKNHEEQLVQVIIDLFSAGM--ETIKTTLWINVFMRLRNPKEMRRVQDELQVVGRRHRLPTIED--
CYP707A1 -----EELTDEQIADNIIGVIFAAR--DITASVMSWILKYLAENPNVLEAVTEEQMAIRKDKKEGESLWTG
CYP722A1 -----QLTDAEIKDNILTMIIAGQ--DITASALTMVVKYLGEMQKVLDIIEEQMATTKKASNKPFLEL-
CYP25A1 -----KPMTKQEVIENTCFALLAGY--ETTSTAMTYCSYLLSKYPNVQQKLYEEIMEAKENGLTYDS---
CYP73A5 -----KGEINEDNVLYIVENINVAI--ETTLSWSEWGAELVNHPEIQSKLRNELDTVLGPGVQVTEP---
CYP78A6 -----KLSDPDIIAVLWEMIFRGT--DITAVLVIEWILARMVLHPDMQSTVQNELDQVVGKSRALDESD--
CYP4A4 -----SSLSDQDLRAEVDTFMFEGH--DITASGVSWIFYALATHPEHQHRCREEIQGLLDGASITWEH--
CYP719 -----QNFEEVVIIFCIFELYLLGV--DSTSSTTTWALAYLIREQGAQEKLYQDIRMTLGDVLDVKIED--
CYP44A1 -----KELNRRDVKVILLSMFSDGLS--TITAPMLIYNLYNLATHPEALKEIQKEIKEDPAS-----
CYP302A1 -----LDRSDVVGTAADLLLAGI--DITISYASAFLLYHIARNPEVQQKLHEEARRVLPSAKDELSDM--
CYP22A1 -----QEQRDLSIILTCGDMWTGGM--ETTIVTTLRWGIYLLNPEVQAKQMEILDVFGNDIPDMG----
CYP52A1 -----QTRDPKVLRDQLNILVAGR--DITAGLLSFLFFELSRNPEIFAKLREEIENKFGLGQDARVEEIS
CYP701A3 -----EAKTLTKEQIAILVWETIETA--DITLVTTIEWAIYELAKHPSVQDRCKEIQNVCGGEKFKEE----
CYP315A1 -----VPGDMIKRIFVDLVIAG--DITAFSSQWALFALSKEPRLQQLAKERATNDSR-----
CYP39A1 -----IVETETSKENSPNYGLLLWASLSNAVPAVAFWTLAYVLSHPDIHKAIMEGISVVFQKAGKDKIKVS-
CYP711A1 -----FAKNIFTSDYISAVTYEHLLAGS--ATTIATFLSSVLYLVSGHLDVEKRLLEIDVFGNDRDLPHTAHD--
CYP46A1 -----AQDDEGLLDNFVTFFIAGH--ETISANHLAFTVMELSRQPEIVARLQAEVDEVIQSKRYLDFED--
CYP43A1 -----VEKSIYEEITAQCKFISVAGF--DITISNTLTLLFNFANNPDVQDKIYEAIEKNQPEQISFETVS--
CYP59A1 -----KDGSLDFKRRVAPQLRVFLFAGR--DITISSTLLYAFYLLSRHPEALAKVRLHHDQVFGPYHQVHEKIH
CYP710A1 -----HSGDEEIGGLFDLFAAQ--DASTSLLWAVTLTLDSEPEVLNRVREEVAKIWSPESNALITVD-
CYP56A1 -----NEIDYKQLTDNIVIIIVAGHE--NPQLFNSSLVLLAKYSNEWQEKLRKEVNGITDPKG-----
CYP57A1 -----KKGTVTPVETQAVGLNIGAGSDTTANALSTILYYLYTNPRTLHTLREELERYVWDKGPISFQSS--
CYP53A1 -----EKLGRAELTAEALTQLIAGS--DITISNTSCAILYWCMTPGVIEKHLKALDEAIPQDVDPHTA--
CYP58A1 -----NLSPADKAERLVREAKLIFLGGT--ISTGRTL SFVSYILLSRPDIKARLEDEL RDVMATWPEVPTWT-
CYP20A1 -----NLNDQQILEDTMIFSLASC--MITAKLCTWAVCFLLTYEEIQKLYEEIDQVLGKGPITS-----

```

```
CYP38A1 -----YDSEDKIADAI SFMVGGF--HTSGYMTWMLWYSSHPESQDRLRTEIERETGGERGDRLEKEY-
CYP54A1 -----KWGEDTTTTRKLARLQLAISFAAIHTTLVTTHAVYSLAADPKLQATLREI IQSVLQEHKGVFNLS--
CYP55A1 -----GNTDKSDAVQIAFLLLVAGN--ATIMVNMIALGVATLAQHPDQLAQLKANPS-----
CYP727A1 -----PLSSEEEICGNIMGLMLHGIS--TCANLIGNILTRLALYPNLQCQLHSEITVSGHSESSELKIDD--
consensus 501.....510.....520.....530.....540.....550.....560.....570.....580.....590.....
```



```

CYP7A1      -----GNAIYLDQIQLNNLP--VLDSTIKKALRLS--SASLNIRTAKEDFTLHLEDG-----SYNTRKDDITIALYPQLMHL-DPAIYDPF
CYP7B1      -----GFPIHLTREQLDSLII--CLESSIFEALRLS--SYSTTIRFVEEDLTLSSETG-----DYCVRKGDLVAIFFPVLHG-DPEIFEAP
CYP8A1      -----MTTLPQKVLDSMP--VLDVLSLSESLRLT-AAPFITREVVADLALPMADGR-----EFSLRKRDRLLLFPFLSPQKDPDIETDP
CYP8B1      -----SFTVQLSALQHIP--VLDVMEETLRLG-AAPTLYRVVQKDILLKMASGQ-----ECLLRQGDIVTLFPYLSVHMDDPDIHPEP
CYP51A1     -----DVLSEMD--FLFRSAKEALRLHPPKILLRLTRVHSDFTVTTRREGK-----QYEIPKGGHIVATSPAFANR-LPHYFKDP
CYP51A2     -----DILSEMD--FLYRCIKKALRLHPLIIMLRASHSDFSVTARDGK-----TYDIPKGGHIVATSPAFANR-LPHIFKDP
CYP26A1     -----NQDNKLDMETLEQLK--YIGCVIKKETLRLNPPVPGGFRVALKTFELNG-----YQIPKGNWVIYSICDTHDVADIFTNKE
CYP26C1     GGS-----EGPPPCGCEPDLSLAALGRIR--YVDCVKEVLRLLPPVSGGYRTALRTFELDG-----YQIPKGSVMYSIRDTHETAAYVRSPP
CYP716A1    -----KEGLRWEDIKMR--YSWNVACVEMRIVPPLSGTFREAIHFHFSFKG-----FYIPKGGKLYWSATATHMNPDYFPEPE
CYP725A1    -----GEEISWKDLKSMK--YTWQAVQESLRMYPVFGIFRKAITDIHYDG-----YTIPKGGWRVLCSPYTHLREEYFPEPE
CYP718      -----GEYLTVEDVKKMK--YSWQVRETRMLSPPIFGSFRKAVADIDYGG-----YTIPKGGKILWTTTYGTHNPEIFQDPM
CYP90A1     -----YSLWSDYKSMSP--FTQCVINETLRVANIIGGVFRKANDVDEIKG-----YKIPKGGKVFSSFRAVHLDPNHFKDAR
CYP90B1     -----ESELNWDYKMD--FTQCVINETLRGNVVRFLHRKALKDVRYKG-----YDIPSGWKVLPVISAVHLDNSRYDQPN
CYP724A1    -----ELLNWEDYQKME--FTQCVISEALRCGNIVKTVHRKATHDIKFNE-----YVIPKGGKVFPIFTAVHLDPSSLHENPF
CYP720A1    -----MLTWQDYKTMDD--FTQCVIDETLRGGIAIWL MREAKEDVSYQD-----YVIPKGGCFVVPFLSAVHLDESYYKESL
CYP85A1     -----EPLGLEDEVKSMK--FTRAVIYETSRLATIVNGVLRKTTTRDLEINGG-----YLIPKGGWRIYVYTRREINYDANLYEDPL
CYP87A2     -----DSGLTWEYKSMT--YTFQFINETARLANIVPAIFRKALRDIKFKD-----YTIPAGWAVMVCPPAVHLNPEMYKDDL
CYP708A1    -----ESGVTWKEYRSMNMFTHMVINESLRITGSLSPAMFRKAVNDVEIKG-----YTIPAGWIMLVVPSLLHYDPQIYEQPC
CYP702A1    -----ETSITWEEYKSMT--FTQMVINESLRITSTAPT VFRIFDHEFQVGS-----YKIPAGWIFMGYP-NNHFNPKTYDDPL
CYP88A3     -----QKGLSLKETRAME--FLSQVDETLRVITFSLTAFREAKTDVEMNG-----YLIPKGGKVLTFWRDVIDDPEVFPDPR
CYP88B1     -----NAGLSFDEIRQMT--FVSKIINETLRITATDQSVFLRDTSTTFNING-----YTIPKGGKFFAVVWNIHMNPDVYVQPK
CYP3A1      -----PP-TYDVTMEME--YLDMLNLETLRL--YPIGNRLERVCKKDVEING-----VFMKGSVMIPSYALHRDPQHWP-E
CYP5A1      -----SPEHCSLQQGLP--YLDMLVSETLRM--YPPAFRTREARDCEVLG-----QRIPAGTVLEVAVGALHHDPKHHPH-P
CYP6A2      -----GQLTYESI KAMT--YLNQVISETLRL--YTLVPHLE-RKALNDYVVP-----GHEKLVIEKGTQVIIPACAYHRDEDLYPN-P
CYP6B4      -----GEITYDTLSEMT--YLTQVFHETLRK--YPVADILL-RNAKADYAVP-----GTN-VTLKKGQTVVSGFGIHYDPKYYPD-P
CYP28A1     -----GIIDFEKLNELP--FLDACVQESLRI--FPPAFMSN-KLCTEPIELP-NK-TGENFTVERGTTVVPHYCFMMDDEFFPD-P
CYP28C1     -----YLPDLDALIDL P--YLSACFNESLRI--YPAGGWAS-KTCTKEYELRGS-HSEPLKLRPGDHVMVPIYALHNDPDPDLYPE-P
CYP13A2     -----SEVEFEKLGRLK--YMDCVIKKALRL--YPLASISNSRKCMTTTVN-----GVKIEAGVYVQMDTWSLHYDPELWGEDV
CYP13B1     -----ENVSDDMTKLLK--YLDVAVRESLRL--YPVAFACSRKCVKPTTLG-----DIYIDKGVKIEADVMSLHRSKEIWGENA
CYP72A8     -----NKPNFDALSRLK--TMSMILNEVLRLL--YPPGILLGRTEVEKETLGED-----MTLPGGAQVIMLVPSLHHRDPELWGEDV
CYP72B1     -----DVPTKDHVVKLLK--TMSMILNESLRL--YPPIVATIRRAKSDVKLGG-----YKIPCGTELLIPIIIVHHDQAIWGNV
CYP721A1    -----GLPTLDILQDLK--TMSMIINETLRL--YPPAMTLNRDTLKRAKLG-----LDIPAGTQLYLSVAMHHDKETWGDDA
CYP709A1    -----GLPSVDQLSKLT--SLSKVINESLRL--YPPATLLPRMAFEDLKLGD-----LTIPKGLSIWIPVLAIHHSSEELWGKDA
CYP709B1    -----KTPDSETFSKLLK--LMNMVIMESLRL--YGPVSAALAREASVNIKLG-----LEIPKGTTVVIPLMKHSDKTLWGSDA
CYP715A1    -----KIEYN-KLAGLK--KMSWMNEVLRLL--YPPAPNAQRQARNDIEVNG-----RVIPNGTNIWIDVVMHHDDELWGDV
CYP714A1    -----GIPDADSISNLK--TVTMVIOETLRL--YPPAAFVSREAL EDTKLG-----LVVPKGVCIWTLIPTLHRDPEIWGADA
CYP4C3      -----ATMKNLMDMR--YLECCIKDSLRL--FSPVPMARMVGEDVNIIG-----KIVPAGTQAIIMTYALHRNPRVF-PKP
CYP31A2     -----VTIEHLSRMK--YLECALKEALRL--FSPVPIITRELSDDQVIGG-----VNI PKGVTFLNLNLYLVRDPAQW-KDP
CYP37A1     -----CSVEDLKKMK--YLEKCVKALRLM--RPSVPQMARSVEEVEIDG-----KIIPKGCSSMISPAFIQNNPRTF-PNH
CYP37B1     -----CTNDDLKQMK--YLEKCLKESLRM--YPSVPPFGRTVEQDVING-----DFFPKGVRIIVMPLLLQRNPLIF-DNP
CYP32A1     -----PSMDDIKCS--YLEKCIKESLRM--FSPVPLIARRLSEDTVINH-----SGQKIVLPAGLAACVSPIAAADPRAP-PDP
CYP29A2     -----ITLENVNNLN--YLDIVLKEKRI--IAPVPALQRKLTNDLEIDG-----YIIVPAGGNVTISPMVLHSHNHVF-KNP
CYP86A1     -----NDQEKWTEEPLEFDEADRLV--YLKAAALAE LRL--YPSVPQDFKYVVEHDVLP-----DGTFFVPRGSTVYYSIYSIGRMKTIWGEDC
CYP86B1     -----NAEKSDYEPVFGPEEIKKMD--YLOAALSEALRL--YPSVPVDHKEVQEDDVFP-----DGTMLKKGDKVIYAIYAMGRMEAIWGDCC
CYP96A1     -----NDFDSFN-AQELNKL V--YVHGALCEALRL--YPPVPFQHKSPKSDVLP-----SGHRVDASSKIVFCLYSLGRMKSIVGEDA
CYP96C1     -----GEHGLYTNPEELNELM--YLHAAIYETMRL--YPAAPFTSRKSIQADVFP-----TGHQVNPNTTIVMAYYAVGRMKSIVGEDC
CYP94A1     -----SEL-MVYDEVKEMV--YTHAALS ESMRL--YPPVPMDSKEAVNDDVLP-----DGWVVKKGTVIYHYVYAMGRMKSIVWGDW
CYP94B1     -----GSLGLGFEDLREMS--YTKACLCEAMRL--YPPVAWDSKVAANDDILP-----DGTPLKKGDKVITYFPYMGMRMEKIVWGDW
CYP704A1    -----DVNGFIESVTEEA--LAQMQ--YLHAAALS ESMRL--YPPVPEHMRCAENDDVLP-----DGHRVSKGDNIIYYSIAMGRMTYIWQDA
CYP704B1    QYDTEDFNSFNEKVTEFAGLLNYDSLGLH--YLHAVITETLRL--YPAVPQDPKGVLEDDMLP-----NGTKVKAGGMVITYVPYSMGRMEYNWGSDA
CYP97A3     -----PTIQDMKKLLK--YTRVMNESLRL--YPPVPLIRRSIDNDILG-----EYPTIKRGEDIFISVWNLHRSPLHW-DDA

```

```

CYP97B3  -----PTYESMKKLE--YIRLIVVEVLR--FPQPPLLIRRTLKPETLPGGHKGEKEGHKVPKGTDFISVYNLHRSPPYFW--DNP
CYP1A1   -----DRSHLP--YMEAFILETFRH--SSFVPFTIPHSTTRDTSLKG-----FYIPKGRCVFNQWQINHDQKLW--VNP
CYP1B1   -----DQPNLP--YVMAFLYESMRF--TSFLPVTLPHATTANTFVLG-----YYIPKNTVMFVNQWSVNHDPKW--SNP
CYP17A1  -----DRNHL--MLEATIREVLR--RPVAPILIPHKANTDSSIGE-----FAIDKDTNMLVNLWALHHNEQEW--DRP
CYP19A1  -----DRNRLV--LLEATIREVLR--RPVAPTLPKHKAVIDSSIGD-----LTIDKGTDAVNLWALHHSKEKEW--QHP
CYP2A7   -----DRTKMP--YMEAVIHEIQRF--GDVIPMSLARARRVKKDDTKFRD-----FFLPKGTVEFPMGLSVLRDLRFF--SNP
CYP2M1   -----DRVKMP--YTDVAVIHEVQRY--MDLSPTSVPHKVMRDTEFYN-----YHIPEGTMMLPLSSVLVDPKLF--KNP
CYP33A1  -----DKLNL--YTNAFINEAQR--ANLVPMNLPHAVTRDVLQILG-----CTIPKGTTVIHQISSVMSDPEIF--EEP
CYP33C1  -----DKNDLP--YFNASINESQRG--INILPLNLQHATTRDVTIDG-----FKIPKGTGVAQISTVMNNEEVF--PDP
CYP33B1  -----DKNAL--YFNAFANEAQRV--SNILPMNLPHALTRDVKLKG-----YHLKKGTVIHQIANVMTDETIF--KDS
CYP23A1  -----HRTRL--YVOATINEIQRI--ANILPINLRTVAEDIEIDG-----YNFKKGDLIIPQISILMNDPEIF--ENP
CYP35A1  -----DRTSTP--YLNAMIGEIQRH--ASILNVSFWKINKELTYMGG-----HPVDAGALVTAQLSALHVNDTIF--KNP
CYP35B1  -----DRAESH--YLNATIAEQRH--ASILNVNFWRLVHEPTTVQG-----HPVDSGSVICAQLGALHVNDLDF--KNP
CYP34A1  -----DRRETP--YLSAVISEVQRF--ASILNMNLFRIIKEDTVVDG-----QPLRAGTAVTAHIAMIHVDEDLF--KNH
CYP71A12 -----DVENMK--YLKAVIKVFRV--HPPLPLILPRLLEDVVKVKG-----YNTAAGTEVINAWAIQRDPATWGPDA
CYP71C1  -----DLSRMP--YLKATIKESMRT--HPAPFLLPHFSTHDCEING-----YTIPAGTRVIVNAWALARDPTCWD--KA
CYP71D11 -----CIYELK--YLKAFINEVLR--HPPG--PLVFRECRQACEING-----YHIPAKSTLVNTFAIGTDSKYW--AEP
CYP726A1 -----RFHDLK--FFKLVKETLRL--HPPV--VLIPRECRETTRIDG-----YETHPNTRIVVNAWAIGRDPNTW--SEP
CYP71K1  -----SLRDL--YLHLVIKESLRL--HPPVTMLPRECRETCTVMG-----FDVPEGVMMLVNAWAIGRDPAHW--DSP
CYP99A1  -----QMDKLS--YTRMVKEGLRL--HPVLPPLLPRSCQETCDVGG-----FEVTKGTVIVNAWALARSPERW--HDP
CYP71E1  -----DAAKIP--YLRMVKETLRL--HPPATLLVPRETMRDTTICG-----YDVPANTRVFNWAWAIGRDPASW--PAP
CYP71N1  -----DLHQLH--FFKCVIKETMRL--HPAPLLLPRETMQHFKLNG-----YDILPKTWMYVNAWAIGRDPNSW--GRP
CYP71B2  -----DLGKVE--YLNHILKETFRL--HPALPFVVPRETMSHIKIQG-----YDIPPKTQIQLNVWTIGRDPKRW--NDP
CYP83A1  -----DVKNLP--YFRALVKETLRL--EPVIPLLIPRACIQDTKIAG-----YDIPAGTTVFNWAWAVSRDEKEWGNP
CYP83B1  -----DIPNLP--YLKAVIKESLRL--EPVIPILLHRETIADAKIGG-----YDIPAKTIIQVNAWAVSRDTAAWGDNP
CYP83E1  -----DIQNCP--YLKAVKETLRL--HLPAPLLVPRESIENCTING-----YNIPAKTILYVNAWAIQRDPDIW--INP
CYP93B1  -----DCPNLP--YLOATLKETFRL--HPPVPMVTR--RCVAECTVEN-----YVIPEDSLLFVNWVSIGRNPKFW--DNP
CYP93C17 -----DIQNL--YIRAIVKETFRM--HPPLPVVKR--KCVQCEELNG-----YVIPEGALVFNWAVQRDPKYW--KTP
CYP93A1  -----DIANLP--YLOAIVRETLLR--HPGGPLVVR--ESSKAVVCG-----YDIPAKTRLVFNWAWAIGRDPNHW--EKP
CYP705A1 -----DLPNLP--YLOAVKESLRL--HPPTPLVVR--EFQEGCEIGG-----FFVPKNTTLIVNSYAMMRDPSW--QDP
CYP712A1 -----DVPNLP--YLRAVLRTELRL--HPSAPLIIR--ECAEDCQVNG-----CLVKSKTRMLVNVYAIMRDELW--ADA
CYP75A1  -----DIPNLP--YLRAICKETFRK--HPSTPLNLPRISENEPCIVDG-----YYIPKNTRLSVNIWAIGRDPEVW--ENP
CYP75B1  -----DIAQLP--YLOAVIKENFRL--HPPTPLSLPHIASSECEING-----YHIPKGTLLTNIWAIARDPDQW--SDP
CYP92A2  -----DIPNLP--YIEAIVKETMRL--HPVAPMKATECR--ENSKVAG-----YDVQKGTURLVSVWTIGRDPPTLW--DEP
CYP84A1  -----DIEKLT--YLKCTLKETLRM--HPIPLLLHETA--EDTSIDG-----FFIPKSRVMINAFAIGRDPTSW--TDP
CYP703A2 -----DLVHLN--YLRVVRVETFRM--HPAGPFLIPHESVRATTING-----YYIPAKTRVFINTHGLGRNTKIW--DDV
CYP98A3  -----DFSRLP--YLQCVKESFRL--HPPTPLMLPHRSNADVKIGG-----YDIPKGSNMHVNVWAVARDPAVW--KNP
CYP706A1 -----HLPKLP--YLOAVMKETLRL--HPTLPLLVPHRNSSETSVMAG-----YTVPKDSKIFINWAIHRDPKNW--DEP
CYP81D1  -----DLSELP--YLKNIIVLETLRL--HPATPLLVPHEASDDCKIGS-----YDMPRGTLLVNAWAIHRDPNTW--DDP
CYP81E6  -----DIPKLT--YLKNVINETLRL--YTPAPLLLPHASDDCTIGG-----YKVPRTIVLINAWAIHRDPQLW--TEA
CYP81B1  -----DIPNLP--YLRCIINETLRL--YPAGPLLVPHASDDCVGG-----YNVPRGTILIVNWAIAIHHDPKW--DEP
CYP82A2  -----DLSKLT--YLOAVKETLRL--YPPAPLSRPREFEEDCTIGG-----YTVKKGTRLITNLSKIHTDHNWV--SNP
CYP82B1  -----DIDNLV--YLOAIVKETLRM--YPAGPLSVPHEAIEDCNVGG-----YHIKTGTRLLVNIWKLORDPRVW--SNP
CYP76A2  -----DIENLP--YMOAVLKESLRL--HPPLPFLIPRETIQDTKFMG-----YDVPKDQVLVNAWAIGRDPECW--DDP
CYP76G1  -----DLPNLP--YLSAVIMETLRL--HPPLPFLVPHKAMSTCHIIFDQ-----YTIPKETQVLVNVWAIGRDPKTW--IDP
CYP76E1  -----HISKLP--FLOAVKESLRL--HPIPLLLPHKCDLVNILD-----FNVPKNAQVLVNVWAMGRDPAIW--DNP
CYP76F2  -----DISRLP--YLOAVKESLRL--HPAVPFLPRRVEGDADIDG-----FAVPKNAQVLVNAWAIGRDPNTW--ENP
CYP76C1  -----DISKLP--YLOAVKESLRL--HTPVLLIPRKAESDAEILG-----FMVLKDTQVLVNVWAIGRDPSVW--DNP
CYP76B1  -----DVLRLP--YLSAIVKESLRL--HPPSPLLLPRKVVTQVELSG-----YTIPAGTLLVFNWAWAIGRDPTVW--DDS
CYP80A1  -----HFSELP--YLOACVKETMRL--YPPISIMIPHRCMETCQVMG-----YTIPKGMVHVNAWAIGRDPKDW--KDP
CYP79A1  -----DIPKLN--YKACIREAFRL--HPVAPFNVPHVALADTTIAG-----YRVPKGSHVILSRTGLGRNPRVW--DEP

```

```

CYP79B2 -----DIPKLN--YVKAILREAFRL--HPVAAFNLPHVALSDTTVAG-----YHTPKGSQVLLSRYGLGRNPKVW--ADP
CYP79D1 -----DIPNLD--YVKACAREAFRLFTHPVAHFNVPHVAMEDTVIGD-----YFIPKGSWAVLSRYGLGRNPKTW--SDP
CYP79E1 -----DFPNLP--YTRACAREALRLHPFTVAAFNLPHVSLRDTHVAG-----FFIPKGSVLLSRVGLGRNPKVW--DNP
CYP79C1 -----DVPNLN--YVKACCRETLRL--HPTNPFLVPHMARHDTTLAG-----YFIPKGSNILVSRPVGGRNPKTW--DEP
CYP79F1 -----DIPNLN--YLKACCRETFRIT--HPSAHYVPSHLARQDPTTLGG-----YFIPKGSIHVCRPGLGRNPKIW--KDP
CYP77A6 -----DVDKMV--FLOAVVKEILRK--HPPTYFTLTHSARQPTTVAG-----YDVPVGINVEFYLPGINEDPKLW--SDP
CYP77B1 -----DVAKMP--YLEAVVKEETLRR--HPPGHFLLSHAAVKDTELGG-----YDIPAGAYVEIYTAWVTENPDIW--SDP
CYP89A2 -----DVEKMP--YKAVVLEGLRR--HPPGHFLLPHSVTETDVLGG-----YKVPKNGTINFMVAEIGRDPVEW--EEP
CYP27A1 -----DFAHMP--LLKAVIKETLRL--YPVVPTNSRIITEKETEING-----FLFPKNTQFVLCHEYVSRDPSVF--PEP
CYP27B1 -----VLSQLP--LLKAVVKEVLRLL--YPVVPNGSRYP--DKDIHVGD-----YIIPKNTLVLCHYATSRDPAQF--PEP
CYP11A1 -----MLQMPV--LLKASIKETLRL--HPISVTLQRVP--ESDLVLQD-----YLIPAKTLVQVAIYAMGRDPAFF--SNP
CYP11B1 -----LRMELP--LLWAAIKETLRM--YPVGLFLERFL--TSPVLVQN-----YHIPAGTLVHLNLYSMGRNPEVF--LSP
CYP12A1 -----SLNHIP--YTRACIKREALRM--YPLTLGNARIL--ANDTVLSG-----YRVPKGTLSMISTGLLQDDNHY--TKA
CYP12C1 -----DMKSLP--YLRVAVIKESLRL--YPVTFGNARSA--GADVLDG-----YRIPKGTLLMTNSFLLKDDRLY--PRA
CYP74A -----IEKME--LTKSVVYECLRFEPVTAQYGRAKKDLVIESHDA-----FKVKAGEMLYGYQPLATRDPKIF--DRA
CYP74C1 -----LEKMS--LTKSVVYEALRIEPPVPFQYGKAKEDIVIQSHDSC-----FKIKKGETIFGYQPFATKDPKIF--KDS
CYP74D1 -----INKMS--LVKSVVYETLRLRPPVPLQYGKAKKEFMVQSHDAS-----YKINKGQFVGYQPMASRDPKIF--ANP
CYP74B2 -----VNEME--LVKSVVYETMRFSPVPPLQFARARKDFQISSHDAV-----FEVKKGELLCGYQPLVMRDANVF--DEP
CYP24A1 -----AEDLRNMP--YKACLKESMRLT--PSVPFTRTLDKPTVLG-----EYALPKGTVLTLNTQVLGSSEDNF--EDS
CYP10 -----LCKLP--MVKAVVKETLRLY---PITYSTSRNIAEDMELGG-----YTIPAGTHVQANLYGMYRDPSLF--PEP
CYP9A1 -----VVQSMT--YLDVVSEGLRLWPPAAVVDRCVKDYNIGRPNKK--ATKDLIHTGQAVAI SPWLFHRNPKFF--PEP
CYP9B1 -----AAQEMT--YMDMVISESLRKWTLSAAADRLCAKDYTLTDDEG---TKLFEFKAGDNINIPICGLHWDERFF--POP
CYP14A2 -----PNMP--YTOAVIHEVQRCS--NMIPILGHTNRDDILLKG-----KKIPTGTLVFAQIWSVLKNDPVF--EES
CYP21A1 -----RMLP--LLMATIAEVLRLR--PVVPMALPHRATKASSISG-----YDIPKDTIIPNIQGANLDEMFW--ELP
CYP36A1 -----KHLIP--YTCAFLOEVYRLG--YVLPVNFLRCTLTDVEDCEG-----YRLNAGTRVIAQFQSVHVDKKhF--PDP
CYP45A1 -----LSKLV--YTEAVALESTRM--YPPVTGFITRQATQDWOYGP-----YTIPAGTEVEVPVWSIHHNPELY--POP
CYP18A1 -----LQYLP--ITESTILESMRR--SSIVPLATTHSPTRDVELNG-----YTIPAGSHVIPLINSVHMDPNLW--EKP
CYP707A1 -----DTKKMP--LTSRVIQETLRV--ASILSFTFREAVEDVEYEG-----YLIPKGWKLPLFRNIHSDAIF--SNP
CYP722A1 -----EDLSEMP--YASKMVKESLRM--ASVVPFPRRLVLQDCEMEG-----YKIKKGNWINIDPRTSIHLDPYV--SEP
CYP25A1 -----IHNMK--YLDYVYKETLRC--YPPVHFINRRCLADITIRG-----QFYPKGSVITCLPASHLNPENW--DSP
CYP73A5 -----DLHKLIP--YLOAVVKEETLRLR--MAIPLLVPHMNLHDAKLAG-----YDIPAESKILVNAAWLANPNNSW--KKP
CYP78A6 -----LASLP--YLTAVVKEVLRLLHPPGPLL SWARLAITDITVDGR-----LVPAGTTAMVNMWAVSHDPHVW--VDP
CYP4A4 -----LDQMP--YTTMCIKREALRL--YPPVPSVTRQLSKPVTFPDG-----RSLPKGVILFLSIYGLHYNPKVW--QNP
CYP719 -----VNKLK--YLDQGVKETMRMK--PIAPLAIPHKTAKETTLMG-----TKVAKGTIRMVNLALHNNQNIW--PDP
CYP44A1 -----SKLT--FLRACIKETFRMF---PIGTEVSRVTQKNLISG-----YEVPAGTAVDINTNVMRHELVFSDSP
CYP302A1 -----ALRTDITYTRAVLKESLRLN---PIAVGVRILNQDAIFSG-----YFVPKGTTVVTQNMVACRLQEHF--QDP
CYP22A1 -----KMNQTP--YVRATLSEIQRL--ANVLPWAIPHKTIEECNIGG-----YDIPVNTIIPALGAVLFDPNVF--ESP
CYP52A1 -----FETLKSCEYKAVINEETLRIYPSVPHNFRVATRNTTLPRGGEG--GLSPIATIKKGQVVMYITLATHRDKDIYGEDA
CYP701A3 -----QLSQVP--YLVGVFHTLRLK--YSPAPLVPIRYAHEDTQIGG-----YHVPAGSEIAINIYGCNMDDKKRW--ERP
CYP315A1 -----LMHGLIKESLRLY---PVAPFIGNYLPQDAQLGG-----HFIEKDTMVLLSLYTAGRDPShF--EQP
CYP39A1 -----EDDLENLLIKWCVLETIRLK---APGVITRKKVVKPVEILN-----YIIPSGDLLMLSPFVLHRNPKYF--PEP
CYP711A1 -----LQHKFP--YLDQVIKRAMFEY---MVSPLVARETAKAVEIGG-----YLLPKGTWVWLAGVLAKDPKNF--PEP
CYP46A1 -----LGRILQ--YLSQVLKESLRLY---PPAWGTFRLLEETLIDG-----VRVPGNTPLL FSTYVMGRMDTYF--EDP
CYP43A1 -----SLR--LLQNCIFETLRL--FPHASPLQTRICTEPFKIGK-----YQFLENVQIVVNPWGPVHHDREIWNVDV
CYP59A1 -----QDAKLLNQLP--YTTAVLKETLRLFPSPASMREGGPGVEITDDNGQ---VYPTAGCNVWTLTVALHHNSAHW--AEA
CYP710A1 -----QLAEMK--YTRSVAREVIRYR--PPATMVPVHVAIDFPLTET---YTIPKGTIVFSPVFDSSFOGFT---P
CYP56A1 -----LADLP--LLNAFLFEVVRMY---PPLSTIINRCTTKCKLGA-----EIVIPKGVYVGYNNFGTSHDPKTWGTTA
CYP57A1 -----QSMF--YLOAVIKREALRLH--PGVGTQLRVVTKGGLVIEG-----QFFPEGTEVGVNGWALYHNKAI FGND
CYP53A1 -----MVKDIP--YLDQVIVWETMRIHSTSAMGLPREIPAGNPPVTISG-----HTFYPGDVSVSPSYTIHRSKEIWPDA
CYP58A1 -----ELEKLP--YLDQVIKREALRNRLSYGFMRRLLPRVSPDVAIQYK-----EYTIPTGTPVGM SAYLMHNSNPEVY--QDP
CYP20A1 -----EKIEELR--YCVRLCETVRTAKLTPVSARLQDIEGKIDK-----FITPRETLVLYALGVVLQEXGTW--SSP

```

```

CYP38A1  -----SLRADTFIRQVQDEITIRLS---TLAPWAARYSDKKVTVCG-----YTTPAKTPMIHALGVGLKNKTW-ENT
CYP54A1  -----ALQAMK--KTDSFLKETMRFHPLGQTSFNRKVLRTFALSNGQ-----VIPKGSTIEVPNYAVSRDPEAY-PNP
CYP55A1  -----LAPQFVEELCRY--HTASALAIKRTAKEDVMIGD-----KLVANEGIIASNQSANRDEEVFENPD
CYP727A1 -----VIRMKFLLATVCSARL--LPAGPLLQRCSLQQDVNLNSS-----ITPAGAILVIPLHLVQMEASTWGND
consensus
601.....610.....620.....630.....640.....650.....660.....670.....680.....690.....

```

```

CYP7A1      LTFKYDRYL DENKKA KTSFYSNG-----NKLKYFYMPFGSGATI--CPGRFLFAVQETIKQFLILMLS YFELELVESHVKCPPLDQSR A-----
CYP7B1      EEFRYDRFIEDGKK-KTTFFKRG-----KCLKCYLMPFGTGTSK--CPGRFFALMEIKQLLVILLTYFDLEIIDDKPIG--LNY SRL-----
CYP8A1      EVFKYNRFLNPDGSEKKDFYKDG-----KRLKNYSLPWGAGHNQ--CLGKGYAVNSIKQVFLVLTQFDLELITPDVDIPEFDL SRY-----
CYP8B1      TTFKYDRFLNPNGRSRKVD FYKAG-----QKIHHYTMPWGSVSI--CPGRFFALSEMKL FVLLMVQYFDLELVDPNTPVPPIDPRR W-----
CYP51A1     ENFDPDFRSKEREEDKAAGSCS-----YISL GAGRHE--CPGGSFALQIKAVWHCHLLRNFELELVSP-----FPEINW-----
CYP51A2     DTYDPERFSPGREEDKAAGAFS-----YIAFGGGRHG--CLGEPFAYLQIKAIWSHLLRNFELELVSP-----FPEIDW-----
CYP26A1     E-FNPDFRFLVPHPED-----ASRFSFIPFGGGLRS--CVGKEFAKILLKI FTVELARHCDWQLLN-GPPTMKT SPTV-----
CYP26C1     EGFDPERF GAAREDSRGA-----SSRLHYIPFGGGARS--CLGQELAQAVLQLLAVELVRTARWELATPAFPAMQTVPIV-----
CYP716A1    R-FEPNRFEGSG--P-----KPYTYVPFGGGPRM--CPGKEYARLEILIFMHNLVNRFKWEKVF PENKIVVDPLP-----
CYP725A1    E-FRPSRF EDEGRHV-----TPYTYVFGGGLRT--CPGW EFSKIEILLFVHHFVKNFSSYIPVDPNKVLSDPLP-----
CYP718      S-FDPTIRFDKPIQ-----AYTYL PFGGGPRL--CAGHQLAKISILVFMHFVVTGFDWSLVYP-DETI SMDLPP-----
CYP90A1     T-FNPWRWQSN SVTTGPS-----NVFTPF GGGPRL--CPGYELARVALSVFLHVLVTGFSWVPAEQDKLVFFPTTRT-----
CYP90B1     L-FNPWRWQQQNGASSSGSGSF-----STWGNNYMPFGGGPRL--CAGSELAKLEMAVFIHHLV LKFNWELAEDDKPF AFPVDF-----
CYP724A1    E-FNPWRWTDKAKMNKKT-----TAFGGGVRV--CPGGE LGLQIAFFLHHLVLSYRWKIKSDEMPIAH PYVEF-----
CYP720A1    S-FNPWRWLDPETQQKR N-----WRTSPFYCFPGGGTRF--CPGAE LARLQIALFLHYFITTYKSVHVMLLKYVCLRL-----
CYP85A1     I-FNPWRWMMKKSLESQNS-----CFVFGG GTRL--CPGKELGIVEISSFLHYFVTRYRWE EIGGDEL MVFPRVFA-----
CYP87A2     V-FNPSRWEGSKVTNAS-----KHFMAFGGGMRF--CVGTDFTKLQMAAFLHSLVTKYRWE EIKGGNITRTPGLQF-----
CYP708A1    E-FNPWRWEGKELLSGS-----KTFMAFGG GARL--CAGAEFARLQMAIFLHHLVTTYDFSLIDKSYIIRAPLLRF-----
CYP702A1    V-FNPWRWEGKDLGAIVS-----RTYI PFGAGSRQ--CVGAEFAKLQMAIFIHHL S-RDRWSMKIGTTILRN FVLMF-----
CYP88A3     K-FDPA RWDNGFV PKAG-----AFLPFGAGSHL--CPGNDLAKLEISIFLHHFLLKYQVKRSNPECPVMYLP HTR-----
CYP88B1     E-FNPSRWDD-IETKPG-----IFLPFSMGPKS--CPGSN LAKLQISVILHYLLHYRVEQINPEARCYPPENCL-----
CYP3A1      EEFRPERFSKE-----NKGSIDPYVYL PFGNGPRN--CIGMRFALMNMK LALTKVLQNF SFPCKETQIPLKLSRQ-----
CYP5A1      ETFDPERFTA E-----AQRLQPFYTL PFGAGPRS--CLGVO LGLLEIKLTLHLIRKFRFEACPETQVPLQLESK-----
CYP6A2      ETFDPERFSPE-----KVAARESVEWL PFGDGPRN--CIGMRFQGQARIGLAQIISRFRVSVCDTTEIPLKYS PM-----
CYP6B4      EKFDPERFSPE-----NVRNRHPCAYI PFGAGQRK--CLGMRFGQWQVQVCIIKLLSKFRFEPSTKTMSEFN YDPK-----
CYP28A1     QAFKPERFMQPD-----AAKMYREQGVFMAFGDGPRV--CIGMRFAL TQIKGALVELLTKFIIRVNPKTRSDNEYDPT-----
CYP28C1     DVFRPERFLDG-----GLKNCKQQGIFLGF GNGPRQ--CVGMRLGLAMAKAALAAIVQRFEVVVSPRTLNGTELDPL-----
CYP13A2     KEFKPERWSTDE-----PLEHKG---AYLPFGLGPRQ--CIGMRLAIMEQKILLTHLLKNYTFETGNKTR IPLKLVGS-----
CYP13B1     DDVFRPERWLEPS-----SRHTM---SWIPFGAGPRQ--CVGMRLGLSEKTA LAHLRRYDLVAGVETEKELNLGC-----
CYP72A8     HEFNPERFADG-----ISKATKNQVSFL PFGWGPRF--CPGQNFALMEAKMALV LILQRF SFE-LSPSYTHAPHTVL-----
CYP72B1     NEFNPARFADG-----VPRAAKHPVGFIPFGLGVRT--CIGQNLAI LQAKLTLAVMIQRFTFH-LAPTYQHAPT VLM-----
CYP721A1    EEFNPRRFED-----PKKQSALLVPEFLGPRT--CVGQNLAVNEAKTVLATILKYYSFR-LSPSYAHAPVLFV-----
CYP709A1    NOFNPERF GG-----RPFASGRHFIPFAAGPRN--CIGQQFALMEAKIILATLISKFNFT-ISKNYRHAPIVVL-----
CYP709B1    DKFNPMRFANG-----VSRAANHPNALAF SVGPRA--CIGQNFVMI EAKTVLTMILQRFRIISLCDEYKHTPVDNV-----
CYP715A1    NEFKPERFDGN-----LHGGCKNKMGYMPFGFGGRM--CIGRNLTTMEYKIVLSLVL SRFEIS-VSPGYRHSPTYML-----
CYP714A1    NEFNPERFSEG-----VSKACKHPQSFV PFGLGTRL--CLGKNFGMMELKVLVSLIVSRFSFT-LSPTYQHSPVFRM-----
CYP4C3      EOFPDNFLPEN-----CAGRHPFAYI PFSAGPRN--CIGQKFAILEEKAVISTVLRKYKIEAVDR-REDL TLLGE-----
CYP31A2     DVFDPDFRFLPEN-----SIGRKSFAFI PFSAGSRN--CIGQRFALMEEKVIMAHLLRN FNKAVEL-MHEVRIGNT-----
CYP37A1     EVFDPERFNEDE-----ISKRHAYAYI PFSAGPRN--CIGQKFAMQEEKTVISWVLRRFHIHTDIG-LLENMPLPE-----
CYP37B1     NOYNPENFSEDK-----IGSRHAYSDI PFSAGPRN--CIGQKFAMMEEKAVISWFFRKYRV T ASQP-FGMNKILPE-----
CYP32A1     DTYNPDFNFDIDA-----IAGRDYPYAI PFSAGPRN--CIGQKFALLEQKTI LSTFFRKYEVESLQT-EENLRPVPE-----
CYP29A2     TEFNPDFRFLPDE-----VSKRHPYDFM PFLAGPRN--CIGQKFAQLNEKVMISHIVRNFKIEPTLK-YNDTKPCLE-----
CYP86A1     LEFRPERWLTADG-----ERFETPKDGYKFAVFNAGPRT--CLGKDLAYNQMKSVASAVLLRYRVFPVPG--HRVEQKMS-----
CYP86B1     LEFRPERWLRDG-----RFMS--ESAYKFTA FNGGPRL--CLGKDFAYYQMKSTAAAIVRYKVKVNG--HKVEPKLA-----
CYP96A1     SEFKPERWISSES-----GRLIHPVSPFKFLS FNAGPRT--CLGKEVAMTQMKTVAVKIIQNYEIKVVEG--HKIEPVPS-----
CYP96C1     LEFKPERWLSDK-----GKLIPVQTNKFLA FGTGPRI--CPGKELGLNRVKAVAAIIPKYSFKIMRN--KPVMPAAC-----
CYP94A1     AEFRPERWLEKDEVNG-----KWFVGRDSYSYFPVFAQGPRV--CLGKEMAFMQMKRIVAGI V GKFKVPEAHLAQEPGISF-----
CYP94B1     DEFKNRWFEEKPSYGT-----KPVLKS VSSFKFPVFAQGPRV--CIGKEMAFMQMKRYVGSVLSRFKII PVCNRR--PVFVPL-----
CYP704A1    EEFKPERWLKDG-----VFQ PESQKFISFHAGPRI--CIGKDFAYRQMK-IVSMALLHFFRFK MADENSKVSYK KM-----
CYP704B1    ALFKPERWLKDG-----VFQNASPFKFTAFAQGPRI--CLGKDSAYLQMK--MAMAILCRFYKFHLPV-NHPVKYRMM-----
CYP97A3     EKFNPERWPLDGPN-----PNETNQNF SYLPFGGGPRK--CIGDMFASFE--VAIAMLIRRFNFQIAPG-APPVKMTTG-----

```

```

CYP97B3 HDFFPERFLRTKESNGIEGWAGFDPSRSPGALYPNEIIADFALPFGGGPRK--CTGDQFALMESTVALAML FQKFDVELRGT-PESVELVSG-----
CYP1A1 SEFLPERFLTPDGAI-----DKVLSEKVIIFGMGKRK-CIGETIARWEVFLF-----LAILLQRVEFSVPL-GVK-----
CYP1B1 EDFDPAFLDKDGFII-----NKALASSVMI FSVGKRR-CIGEEI SKTLLFLF-----ISILAHQCNFKANQ-NEP-----
CYP17A1 DQFMPERFLDPTGSQ-----IIVPSSSYLPFGAGPRS-CVGEALARQEIFLI-----TAWLLQKFDLEIVPEGGQL-----
CYP19A1 DLFFPERFLDPTGTQ-----LISPSLSYLPFGAGPRS-CVGEALARQELFLF-----MSRLLQRFNLEIPDDGKL-----
CYP2A7 RDFNPOHFLGKGGQF-----KKRDA--FVPSIRKRN-CFGEGLARMEFLF-----FTTVMQNFRLKSSQSPKD-----
CYP2M1 DEFDPENFLDENGVF-----KKNDG--FFAFVGVKRA-CVGEALARVELFLF-----FTSVLQRFTFTGKTPPEE-----
CYP33A1 ERFFPERFLDESGNL-----KKIEE--LVPFSIGKRV-CLGEGLARMEFLF-----TANSFNRYEFNC--GSNG-----
CYP33C1 YTFNPDRLDENGKL-----KKVDE--LAPFSVGKRS-CVGEGLARMEFLF-----IANFLNRYKIHP--SKEG-----
CYP33B1 QRFDPNRFIDENGKL-----KKIEE--LCPFSMGKRQ-CVGEGLARMEIFLL-----AANLFNYFEFLP--ASDG-----
CYP23A1 EEFNPSRFLDENDNV-----KKIDE--FLPFSIGRRQ-CLGESLARAELYLV-----FANLIQNFNEV--ADD-----
CYP35A1 QEFNPERFLRDE-----ELLQK--VIFPVGKRS-CVGEGLARAELYLISLLCICGTSNKSFLHKYLP LWNLSVA-----
CYP35B1 DKFFPERFIENE-----QLLSQ--IIPFGIGKRS-CVGENIAKSELYLM-----IGNLILRYDIKPHGSEPS-----
CYP34A1 TFFRPERFLDND-----DLDDK--LIPFGIGRRS-CLGESLAKAELYL V-----LGNLLLDYDLEPVGEIPK-----
CYP71A12 EEFKPERFLDS-----TLDYHGKDLNFI PFGSGRRI-CVGINLALGLVEVT-----VANLVGRFDWR--AEAGPN----GDQ
CYP71C1 EEFFPERFLEQGR-----DAEVDMYGKDIRFV PFGAGRRI-CAGATFAIATVEIM-----LANLIYHFDWEMPAEMERT----GAK
CYP71D11 ERFCPERFID-----SSIDYKGTNFEHL PFGAGRRI-CVGINYGMANVELV-----LALLYHFDWTL PKGIGN-----ED
CYP726A1 GKFNPERFKD-----CAIDYKGTTFELV PFGAGRRI-CVGITSAITNLEYV-----IINLLYHFNWELADGITP-----QT
CYP71K1 EEFAPERFEG-----VGAADFKGTD FEYI PFGAGRRM-CVGMAFGLANMELA-----LAALLYHFDWELPGGMLP-----GE
CYP99A1 EEFRRPERFADDDGSSA-----AVAVDYRGSQFEYI PFGSGRRM-CVGNTFGLAAL ELM-----VARLLYFDWSLPDGMRP-----EE
CYP71E1 DEFNPDRLFVG-----SDVDYYGSHFELI PFGAGRRI-CVGLTMGETNVTFT-----LANLLYCYDWALPGAMKP-----ED
CYP71N1 HVFDPERFMH-----DSTEASGQDFKLI PFGEGRRI-CVGNLGLMVELV-----LANLLYSFDWHLPPGMVK-----ED
CYP71B2 EEFNPERFAN-----SSVDFRGQHFDLI PFGSGRRI-CVGMMAIASVELA-----LMNLLYFDWSPMDGTGK-----ED
CYP83A1 DEFRRPERFL-----EKEVDFKGTDFEYI PFGSGRRM-CVGMPLGAAMLEVP-----YANLLS FNFKLPNGMKP-----DD
CYP83B1 NEFITPERFMNE-----HKGVDFKGQDFELI PFGSGRRM-CVAMHLGIAMVEIP-----FANLLYKFDWSLPKGIKP-----ED
CYP83E1 EEFYPERFL-----ESSINFIGQDFELI PFGAGRRI-CVSIPIVASLELI-----LANLLYSFDWKLPHGLVK-----ED
CYP93B1 LEFRPERFLKLEGDSS-----G--VVDVRGSHFQLI PFGSGRRM-CVGVSLAMQVEPAL-----LGAI IQCFDFHVVGPKGEILKGDIV
CYP93C17 LEFRPERFLEEAD-----IDLKQHFELI PFGSGRRM-CVGNLATAGMATL-----LSSVIQCFELQVVGPKGQILKGSDAK
CYP93A1 FEFRPERFIRDGNQ-----LDVRGQHYHFI PFGSGRRT-CV GASLAWQVVPVN-----LAI IQCFQWKL VGGNG-----K
CYP705A1 DEFKPERFLASLS-----REEDYKKEKILNFI PFGSGRRM-CVGSNLGYIFVGT A-----IGMMVQCDFWE-INGDK-----
CYP712A1 DRFITPERFLESSEEKI-----GEHQMQFKGQNFYRI PFGSGRRG-CV GASLAMNVMHIG-----VGS LVQRFDWKSVDGQK-----
CYP75A1 LEFYPERFLSG-RNS-----KIDP-RGNDFELI PFGAGRRI-CAGTRMGIVMVEYI-----LGT LVHSFDWKLPS--EV-----IE
CYP75B1 LAFKPERFLPGGEKS-----GVDV-KGSDFELI PFGAGRRI-CAGLSLGLRTIQFL-----TATLVQGF DWELAGGVTP-----EK
CYP92A2 EVFKPERFHEK---A-----SIDV-KGHDYELI PFGVGRM-CV GYSLGLKVIQAS-----LANLLHGFNWSLPDNMTP-----ED
CYP84A1 DTFRPSRFLP---G-----VPDF-KGSNFEFI PFGSGRRS-CVGMQLGLQTVRLA-----VAHILHCFTWKL PDGMKP-----SE
CYP703A2 EDFRPERFHWPVEGSG-----RVEISHGPDFKIL PFSAGKRK-CV GAPLGVMTV LMA-----LARLFHC FEWSSPG-----N
CYP98A3 FEFRPERFLEE-----DVDMKGHDFRLI PFGAGRRV-CVGAQLGINLV TSM-----MSHLLHHFVWTPPQGT KP-----EE
CYP706A1 NEFKPERFLEN-----SLDFNGGDFKYL PFGSGRRI-CAAINMAERLVL FN-----IASLLHSFDWKAPOGQK-----
CYP81D1 DSFKPERFEKEE-----EAQKLLAFGLGRR A-CVGSGLAQRIVGLA-----LGS LIQCFE WERVGN-----VE
CYP81E6 TTFKPERFDKKG-----ELEKLI PFGLGRR A-CV GELAIRAISMT-----LALLIQCFDWKRVSD-----EE
CYP81B1 ETFKPERFEGLGT-----RDGFKLI PFGSGRRS-CVGEGLAVRMLGMT-----LGSIIQCFDWKERTSE-----EL
CYP82A2 LEFKPERFLTDDKD-----IDMKGQHFLI PFGGRRRI-CVGINLGLQTVRLT-----LASFLHSFEILNPST-----EP
CYP82B1 SEFRPERFLDNQSN G-----TLLDFRQGHEFYI PFGSGRRM-CVGNFATLILHMT-----LARLLQAFDLSTPSS-----SP
CYP76A2 MSFKPERFLG-----SKIDVKGQHYGLI PFGAGRRM-CVGLPLGHRMMHFA-----LGSLLREFEWELPDGVSP-----KS
CYP76G1 IMFKPERFLSDP-----DARDFKQDYEFI PFGSGRRM-CPALPLASRVLPLA-----IGSMVRSFDWALENGLNA-----EE
CYP76E1 NTFVPERFME-----CDINYKGNFELI PFGAGKRI-CVGLPLAHRMTMLM-----VASLLHNFEWNLADGLIP-----EH
CYP76F2 NSFPERFLG-----LDMDVKGQNFELI PFGAGRRI-CVGLPLAIRMVHLM-----LASLIHSYDWKLEDGVTP-----EN
CYP76C1 SQFEPERFLG-----KDMDVGRDYEYELI PFGAGRRI-CVGMPLAMKTVSLM-----LASLLYSFDWKL PKGVLS-----ED
CYP76B1 LEFKPQFLE-----SRLDVRGHDFDLI PFGAGRRI-CVGIPLATRMVPI M-----LGSLLNFDWKLIDTKVPY-----DV
CYP80A1 LKFOPERFLD-----SDIEYNGKQFQFI PFGSGRRI-CVGRPLAVRIIPLV-----LASLVHAFGWELPDGVPN-----EK
CYP79A1 LRFYTPDRFLAT-----AASDVALTENDLRFISFSTGRRG-CIAASLGTAMSVML-----FGRL LQGFTWSKPAGVEA-----

```

```

CYP79B2  LCFKPERHLN-----ECSEVTLTENDLRFISFSTGKRG--CAAPALGTALTTMM-----LARLLQGFTWKL PENETR-----
CYP79D1  LKYDPERHMNE-----GEFTVVLTEHELRFVTFSTGRRG--CVASLLGSCMTTML-----LARMLQCFTWTTPANVSK-----
CYP79E1  LRFDPDRHLHGGPT-----AFTKVELAEPELRFVSFTTGRRG--CMGGPLGTAMTYML-----LARFVQGFTWGLRPAVEK-----
CYP79C1  LIYRPERHITGN-----EVLTEPDLRLVSFGTGRRG--CVGAKLGTSMIVTL-----LGRL LQGFDWTIPPGETDR-----
CYP79F1  LVYKPERHLQGDG-----ITKEVLTETEMRFVSFSTGRRG--CIGVKVGTIMMVML-----LARFLQGFNWKLHQDFGP-----
CYP77A6  KKFNPDRLFSGKE-----EADITGVTGKVMMPFGIGRRI--CPGLAMATVHVHLM-----LAKMVQEFWESAYPPESEID-----
CYP77B1  GKFRPERFLTGGDGV-----DADWTGTRGVMTL PFGAGRRI--CPAWSLGLIHINLM-----LARMIHSEFKWIPVP--DSPPD-----
CYP89A2  MAFKPERFMGEEE-----AVDLTGSRGIKMMPFGAGRRI--CPGIGLAMLHLEYEY-----VANMVREFQWKEVQ--GHEVD-----
CYP27A1  ESFQPHRWLRKREDDN-----SGIQHPFGSV PFGYGVRS--CLGRRIAELEMQLL-----LSRLIQKYEVVLS PGMGEVK-----
CYP27B1  NSFRRPARWLGE-----GTPHPFASL PFGFGKRS--CMGRRLAEELQMA-----LAQILTHFEVQPEPGAAPVR-----
CYP11A1  DKFDPTIRWLKDKD-----LIHFRNLGFGWGVRRQ--CVGRRIAELEMTLF-----LIHILENFRVEMQQ--IGDVN-----
CYP11B1  EHYNPDORWLENKE-----TYKHLAGFGFVRRQ--CIGRRLAEVEMLLF-----LHHVLSKFCVETAF--QEDVK-----
CYP12A1  KEYLPERWWRPTKEETEDSA-----TCPHALKASSPFIYLPFGFGPRS--CVGRRIVEMELELG-----IARLVNRFRIEFNY--PTENA-----
CYP12C1  KEFITPERWLRKDDDKSDVL-----MN-----KDLNAFIYLPFGFGPRM--CVGKRIVDLEMELT-----VANLVNRFHIEYNY--STEKP-----
CYP74A  DEFVPERFVGEEGEKLLR-----HVLWSNGPETETPTVGNKQ--CAGKDFVVLVARLF-----VIEIFRRYDSFDIEVGTSP-----
CYP74C1  EKFFVGDRLFVGEEGEKLLK-----YYWWSNERETVEPTAENKQ--CPGKNLVMMGRII-----VVEFFLRYDTFTVDVADLA-----
CYP74D1  DEFVPDREFMND--GEKMLK-----HVLWSNGRETESPAPDNKQ--CPGKDLVHLLGRLLI-----LVEFFIRYDTFTLEITPLF-----
CYP74B2  EEFFKPDRIYVGETGSELLN-----YLWWSNGPQTGTPSASNKQ--CAAKDITVLTASLL-----VADLFLRYDTITGDSG-----
CYP24A1  HKFRPERWLQKEK-----KINPFAHLPFGIGKRM--CIGRRLAELQLHLALCWI IQKYDIVATDNEPVEMHLHG-----
CYP10  EGILPERWLRMNGSQ-----MDATIKSTSQLVWGHGARM--CLGRRIAEQEMHIT-----LSKIIQNFTLSYNHDDVEPILN-----
CYP9A1  AKFDPERFSPENR-----HKILPFTYFSFCLGPRN--CIGSRFALCEIKVILYLLIREMEVYPFEKTIYPPQLSKDRFN-----
CYP9B1  QRFDPERFSERRK-----KDLIPYTYLPFGVGRS--CIGNRYAVMQAKGMLYNLMLNYKIEASPRTRTDMWESARG-----
CYP14A2  SKFNPDRIYLMADG-----KTINKSVLERTIPFSVGRN--CVGEGLARMEFLI-----FSALI QKYEFIPKTIENIDVKP-----
CYP21A1  SKFWPDRFLMSG-----KSPERTIPFGGARV--CLGEP LARLEFFVVLARLLQTFTLL PPPDGTLP SLQLPYTG-----
CYP36A1  EHFNPDRLFNSRG-----EYIRDDRVPFSMGKRS--CLGENLARMEVFLYFCTLMQNF EWHTDGPYAPPIDVITS-----
CYP45A1  ELFKPERFLPKAK-----KDRHTMAYLFGGGGPRN--CLGLRFALMEMKLVLSV IQRFYIKPCSHTKVPLTLVTRNVFTNPDE-----
CYP18A1  EEFRPSRFIDTEG-----KVRKPEYFIPFGVGRM--CLGDV LARMEFLFFASFMHCFDIALPEGQPLPSLKGNGV-----
CYP707A1  GKFDPSRFVAP-----KPNTFMPFGNGTHS--CPGNE LAKLEMSIMIHHLTTKYRVCVYLLITFS-----
CYP722A1  HKFNPLRFEEEEAKAN-----SFLAFMGGRRT--CLGLALAKAMMLVFLHRFFITTYRWEVDEDP SIEKWTLFAR-----
CYP25A1  EEFFKPDRIYFENWEE-----KSSSLKWI PFGVGRY--CVGMRFAEMEFTKTIVKLLDTFELKQFKGEADLIPDCNG-----
CYP73A5  EEFRPERFFEEES-----HVEANGNDFRY PFGVGRS--CPGII LALPI LGITIGRMVQN FEL PPPGQSKVDTSEKGGQ-----
CYP78A6  LEFKPERFVAKEGEVEFS-----VLGSDLRLAPEFGSGRRI--CPGKNL GFTTVMFWTAMMLHEFEWGPSDGNVDLSEKLR-----
CYP4A4  EVFDPRFAPDS-----AYHSHAFLPFSGGARN--CIGKQFAMRELKVAVALTL LRFELL PDPTRVPIPIARVVLK-----
CYP719  YKFMPERFLEGETGTAYN-----KAMEQSFLPFSAGMRI--CAGMDL GKLFQAFALANLVNAFKWSCVEEGLK PDMGEELS-----
CYP44A1  REFKPDRIWLEKSK-----EVHPFAYLPFGFGPRM--CAGRRFAEQDLL TSLAKLCGNYDIRHRGDPITQIYETLLLP-----
CYP302A1  LRFQPDRIWLOHRS-----ALNPLYLVPFGHGMRA--CIARRLAEQNMHILL LRLREYELTWSGSDDEMVKTL LLIN-----
CYP22A1  KQFKPERFLDEEG-----KYRVMEEFRPFGLGPRV--CLGERTARTELYLIFASLLQNFRFYLNRGDPPIVAERVIGG-----
CYP52A1  YVFRPERWFEPETR-----KLGWAYVPFNGGPR I--CLGQQFALTEASYVTVRLLQEFGNL KQDPNTEYPPKLQN-----
CYP701A3  EDWVPERFLDDGK-----YETSDLHKTMAFGAGKRV--CAGALQASLMAGI AIGRLVQFEWKL RDGEEENVDTYGLTS-----
CYP315A1  ERVLPERWCIGET-----EQVHSHGSLPFAIGORS--CIGRRVALKQLHSL LGRCAAQFEMSCLNEMPVKS SVLRMT-----
CYP39A1  ELFKPERWKKAN-----LEKHSFLDCFMAFGSGKFQ--CPARWFA LLEVQMCIIIL ILYKYDCSLDLPKQSYLHV LG-----
CYP711A1  EKFKPERFDPNGEEE-----KHRHPYAFIPFGIGPRA--CVGQRFALQEIKL TLLHLRYRNYIFRHSLEMEIPLQLDYG-----
CYP46A1  LTFNPDRIFGPGAP-----KPRFTYFPFSLGHR S--CIGQQFAQMEVKVVMAKLLQRLEFRLVPGQRFGLQEATLKP-----
CYP43A1  DCFRPSRFENLTE-----QQRKAFMPFGVGRQ--CVGMRFALLEMKT TAFRMLQKYSVFTNSPVHDRHGKTVRMTVR-----
CYP59A1  ESFITPERVLVGS DHP-----LYPAKGAWRAF EFGPRS--CIGQTLAMEL LRV ALAMTLREFDIAPAYDKWDHIYPNDAVKEFN--GH-----
CYP710A1  DRFDPDRI FSETRQED-----QVFKRNFLAFGWGPHQ--CVGQRYALNHLVLFIAMFSSLLDFKRLRSDGCDEIVYCP-----
CYP56A1  DDFKPERWGSDIETIRKN-----WRMAKNRCAVTFHGGRR A--CLGEK LALTEIRISLAEMLKQFRWSDPEWEKLT P GAG-----
CYP57A1  SIFRPERWLEANEN-----INIGGSFAFGAGSRS--CIGKNISILEMSKAIPQIVRNF D I EINHGDMTWKNECWFWVKP-----
CYP53A1  EQFVPERWDPARLTP-----RQKAAFTIPFSTGPR A--CVGRNVAEMELLVICGTVFRLFEFEMQQEGPMETREGFLR-----
CYP58A1  DQFVPERWLG DTR-----VMQRSYVPFTKGSRS--CLGQNL SMAEISLVLAVLFRPDGPRMELFETDES DVKHHVD-----
CYP20A1  YKFDPERFDDES-----VMKTFSLLGFS--GTRE--CPELRFAYMVTAVLLSVLLRRLHL L SVEGQVIETKYELVTS-----

```

```

CYP38A1  DSWDPDRFSPNGR-----RGNDFCPFGVHSRRKCPGLFSYFEVGVFASILLSRFEIVPVEGQTVIQVHGLVTE-----
CYP54A1  DVDPPLRFFYNLRNEAREKGEAEQG-----ASGQFVSVNKEFLTFGYGRHA-CPGRFFANEIKMILANLVMTYEMGLVEGETERYRDWDIAAG-----
CYP55A1  EFNMNRKWPPQDP-----LGFGFGDHR-CIAEHLAKAELTTVFSTLYQKFPDLKVAVPLGKINYTPLN-----
CYP727A1 COFNPNRFLKKEINFEEILAAAHKGSNG-INLFTDECDKTESFLPFGSGSRA-CVGQKFAVLGIAMLIASLLRSYEVQPHPALSQEMESLVDSN-----
consensus 701.....710.....720.....730.....740.....750.....760.....770.....780.....790.....

```



```

CYP7A1      -----GLGILPPLNDIEFKYKCLKHL-----
CYP7B1      -----LFGIQPDSVDFRYKVKVKS-----
CYP8A1      -----GFGLMQPEHDVPPVRYRIRP-----
CYP8B1      -----GFGTMQPTHDRIRYRLKPLE-----
CYP51A1     -----NALVVGAKGNVMVRYKRRPFS-----
CYP51A2     -----NAMVVGKGNVMVRYKRRQLS-----
CYP26A1     -----YPVDNLPARFTYFQGDI-----
CYP26C1     -----HPVDGLRLLFFHPLTPSVAGNGLCL-----
CYP716A1    -----IPDKGLPIRIFPQS-----
CYP725A1    -----LPANGFSLKLFPRS-----
CYP718      -----FPSLGMPIKISPKVS-----
CYP90A1     -----QKRYPIFVKRRDFAT-----
CYP90B1     -----PNGLPIRVSRI-----
CYP724A1    -----KRGMLLEIEPTKFLED-----
CYP720A1    -----
CYP85A1     -----PKGFLRISPY-----
CYP87A2     -----PNGYHVKLHKKRD-----
CYP708A1    -----SKPIRITISENPLSSSHQANL-----
CYP702A1    -----PNGCEVQFLKDTEVDNSSGSPDCCNG-----
CYP88A3     -----PTDNCLARISYQ-----
CYP88B1     -----VKFKKLSISSNGN-----
CYP3A1      -----GLLQPTKPIILKVVPRDEIITGS-----
CYP5A1      -----SALSPKNGVYIRIVPR-----
CYP6A2      -----SIVLGTVGGIYLRVERI-----
CYP6B4      -----RLLVYPKSGIFLNIIPRNY-----
CYP28A1     -----TFIGTCKGGIWLDFELRQ-----
CYP28C1     -----IFVGVHKGGIWLQFVPRKNVTTK-----
CYP13A2     -----ATTSPEDVVFVHLRPRIW-----
CYP13B1     -----TTTSPEAVTLYLKPRI-----
CYP72A8     -----TLHPQFGAPLTFHML-----
CYP72B1     -----LLYPQHGAPITFRRLTNHED-----
CYP721A1    -----TLQPQNGAHLIFTRISS-----
CYP709A1    -----TIKPKYGVQVILKPLVS-----
CYP709B1    -----TIQPQYGLPVMLQPLED-----
CYP715A1    -----SLRPGYGLPLIIRPL-----
CYP714A1    -----LVEPQHGVVIRVLRQ-----
CYP4C3      -----LILRPKDGLRVKITPRD-----
CYP31A2     -----AD-----
CYP37A1     -----TITRPSLGFPLKFTVRQQ-----
CYP37B1     -----LILKSSLGFPLTVHHRTDNK-----
CYP32A1     -----LILRPYNGMKIKIKRREAADYVVFVTTFFRMKLDECEKKSFFVFILSLMIDSPRRFLSNFSN-----
CYP29A2     -----VVTKPSNGIPVRLIRR-----
CYP86A1     -----LTLFMKNGLRVYLQPRGEVLA-----
CYP86B1     -----LTMVMKHGLMVNLINRSVSEIDQYYAKSFDEGYIN-----
CYP96A1     -----IILHMKHGLKVTVTKRNSLL-----
CYP96C1     -----ATLYLKDGLIVRVNKII-----
CYP94A1     -----LSSQMEGGFPVTIQKRDS-----
CYP94B1     -----LTAHMAGGLKVKIKRREQCDSMYI-----
CYP704A1    -----LTLHVDGGLHLCAIPRTST-----
CYP704B1    -----TILSMAHGLKVTVSRRS-----
CYP97A3     -----ATIHTTEGLKLVTKRTRKPLDIPSPILPMDTSRDEVSSALS-----

```

```

CYP97B3  -----ATTIHKNGMWCKLKRRSK-----
CYP1A1   VDMTPIYGLTMKHACCEHFQMLRS-----
CYP1B1   SNMSFSYGLSFKPKSFKIHVSLRESMKLLDSAVEKLAEEACQ-----
CYP17A1  PSLEGIPKIVFLIDPFKVKITVRPAWKEAQAEQSA-----
CYP19A1  PSLEGHASLVLQIKPFKVKIEVRQAWKEAQAEQSTP-----
CYP2A7   IDVSPKHVVFATIPRNYTMSFLPR-----
CYP2M1   INIEPACSSFGR LPRSYDCYIKLRTEK-----
CYP33A1  VPSLERTFAFIAKAQDYTCQVKPRYSS-----
CYP33C1  LPSMAKSGSPVVAAPRLFTA LTRRF-----
CYP33B1  LPSLYKDFSLVSHVIPYKCRQYIP-----
CYP23A1  -VTTERVLGLTVSPVEYSCKITRRGLDHNQNSVK-----
CYP35A1  LLLPVKLSRPAFAALISSLPLDKLLPHI-----
CYP35B1  TEDKLPYSAGKTPDKSVKLEFVKL-----
CYP34A1  LKTLAPFGLLKQSPE-FRIRFVEVEKH-----
CYP71A12 PDLTEAFG-LDVCRKFPLIAFPSSVI-----
CYP71C1  VDMSDQFG-MTLRRTQKLYLVPRIPKCVSSS-----
CYP71D11 LDLTEEFG-VTVSKKEDLC LIPSISHPLPST-----
CYP726A1 LDMTEAIG-GALRKKIDLKLIPIPYQVSLGNSIS-----
CYP71K1  LDMTEALG-LTTRRCSDLLLV PALRVPLRDHER-----
CYP99A1  LDMDTVVG-STMRRRNHLHLVSPYKETE LTVGI-----
CYP71E1  VSMEETGA-LTFHRKTPLVVVPTKYKNRRAA-----
CYP71N1  ISMEEAPG-VTVHREYALCLMATKYD ATTA-----
CYP71B2  IDMEEAGN-ISIVKKIPLQLVPVQRY-----
CYP83A1  INMDVMTG-LAMHKSQHLKLV PVQVNY-----
CYP83B1  IKMDVMTG-LAMHKKEHLVLAPT KHI-----
CYP83E1  IDTSMLPG-ITQHKKNPLCLIAKVPK-----
CYP93B1  INVDERPG-LTAPRAHNLVCPVDR TSGGGPLKIIEC-----
CYP93C17 ANMEERAG-LTVPRANSLMCVPLAR SKVAAELLSS-----
CYP93A1  VDMEEKSG-ITLPRANPIICVPVPR INPFPTI-----
CYP705A1 INMEEATGGFLITMAHPLTCTPI PLRQTNSLISHL-----
CYP712A1 VDLSQGSFSAEMARPLVCNPVDHFN TF-----
CYP75A1  LNMEEAFFG-LALQKAVPLEAMVTP RLPIDVYAPLA-----
CYP75B1  LNMEESYG-LTLQRAVPLVVHPK PRLAPNVYGLGSG-----
CYP92A2  LNMDEIFG-LSTPKKFPLATVIE PRLSPKLYSV-----
CYP84A1  LDMNDVFG-LTAPKATRLFAVPTTR LICAL-----
CYP703A2 IDTVEVYG-MTMPKAKPLRAIAK PRLAAHLYT-----
CYP98A3  IDMSENPG-LVTYMRTPVQAVATP RLPSPDYKRVPYDM-----
CYP706A1 FEVEEKFG-LVLKLSPLVAIPVPR LSPDKLYTA-----
CYP81D1  VDMKEGVG-NTVPKAIPLKAICKAR PFLHKIIS-----
CYP81E6  IDMGERDG-FVLMKSIPVKAMCKSR PVINNVFK-----
CYP81B1  VDMTEGPG-LTMPKAIPLVAKCKPR VEMTNLLSEL-----
CYP82A2  LDMTEVFR-ATNTKATPLETLLIK PRLSPSCYESI-----
CYP82B1  VDMTEGSG-LTMPKVTPKLVLLTP RLPPLPLYDY-----
CYP76A2  INMDGSMG-VTARKRDSLKVIPKKA-----
CYP76G1  MDMGERIG-ITLKKAVPLEAIPYRGT-----
CYP76E1  LNMDEQFG-LTLKRVQPLRVEA ISSA-----
CYP76F2  MNMEERYG-ISLQKAQPLQALPVRV-----
CYP76C1  LDMDETFG-LTLHKTNP LHAVPVK KRANIN-----
CYP76B1  LDMTEKNG-TTISKAKPLCVPIPLN-----
CYP80A1  LDMEELFT-LSLCMAKPLRVIPKVRI-----
CYP79A1  VDLSESK--SDTFMATPLVLHAE PRLPAHLYPSISI-----

```

```

CYP79B2 VELMESS--HDMFLAKPLVMVGDRLRPEHLYPTVK-----
CYP79D1 IDLAETLDFTELTPATPTSAFAKPRRLAPHLYPTSP-----
CYP79E1 VELEEEKFTCSMFLGKPLRALAKPRQ--ELLQSF-----
CYP79C1 VELVESK--ENLFMANPLMACVKPRLDPNMYPKLWTGPA--
CYP79F1 LSLEEDD--ASLLMAKPLHLVSEVRLAPNLYPKFRP-----
CYP77A6 ---FAGKLEFTVVMKKPLRAMVKPRV-----
CYP77B1 ---PTETYAFTVVMKNSLKAQIRSRT-----
CYP89A2 ---LTEKLEFTVVMKHPLKALAVPRRCH-----
CYP27A1 ----SVSRIVLVPSKKVSLRFLQRQ-----
CYP27B1 ----PKTRTVLVPERSINLQFLDR-----
CYP11A1 ----TIFNLILTPDKPIFLVFRPFNQGPPQA-----
CYP11B1 ----FAYRFVMMPTSAPLLTFRPV-----
CYP12A1 ----FKFKLINVPNIPLKFKFTDVEN-----
CYP12C1 ----YKCRFLYKPNIPKFKFTDLKY-----
CYP74A ----LGVSVNFSSLRKASF-----
CYP74C1 ----LGPVKFKSLTRATASV-----
CYP74D1 ----RAPNVAFNLTLKASK-----
CYP74B2 ----SIKAVVKAK-----
CYP24A1 ----ILVPSRELPIAFRPR-----
CYP10 ----TMLTPDRPVRIEFKPRQ-----
CYP9A1 ----MHLEGGAWRLRVRPEKS-----
CYP9B1 ----FNIIPTTGFWMQLVSRK-----
CYP14A2 ----VCGAVLTTKPYICELVPQAA-----
CYP21A1 ----INLLIPPFQVRLQPRNLAPQDQGQKSSTG-----
CYP36A1 ----SLRAPKPFTVRASRR-----
CYP45A1 GVWLT LHRRTDLP HHYEPPTQVLYNRLCQVPLTK-----
CYP18A1 -ATITPESFKVCLKRRPLGPTAADPHHMRNVGAN-----
CYP707A1 ----FTHFVLFFQIYV-----
CYP722A1 ----LKSGYPIRVSRR-----
CYP25A1 ----VIMRPKDPVRLLLKPRN-----
CYP73A5 ----FSLHILNHSIIVMKPRNC-----
CYP78A6 ----LSCEMANPLPAKLRRRRS-----
CYP4A4 ----SKNGIHLRLRKLH-----
CYP719 ----FVLLMKTPLEARIAGRN-----
CYP44A1 ----RGDCTFEFKKL-----
CYP302A1 ----KPDAPVLTDLRLRRE-----
CYP22A1 ----ITAPPKPYATRVEYLG NR LIN-----
CYP52A1 ----TLTSLFEGAEVQMYLIL-----
CYP701A3 ----QKLYPLMAIINPRRS-----
CYP315A1 ----VPDRTLRLALRP RTE-----
CYP39A1 ----VPQPEGQCRIEYKQRI-----
CYP711A1 ----IILSFKNGVKLRRTIKRF-----
CYP46A1 ----LDPVLCTLRPRGWQPAPPPPPC-----
CYP43A1 ----DTGTIWPTDKLGLVLKQR-----
CYP59A1 RAYQAEKGGGAHPADGMPCLVTFRV-----
CYP710A1 ----TISP KDGCTVFLSRRVAKYPNFS-----
CYP56A1 ----LCPLNLK LKFNENIME-----
CYP57A1 ----EYKAMIKPRRCCLSRDESLV-----
CYP53A1 ----KPLGLQVGMKRRQPGSA-----
CYP58A1 ----FVVPLPKLDSLGV RVMVR-----
CYP20A1 ----SKEEAWITVSKRY-----

```

```
CYP38A1  -----PKDDIKIYIRSRKED-----  
CYP54A1  -----TIPDPTKDVMFRKL-----  
CYP55A1  -----RDVGIVDLPVIF-----  
CYP727A1 -----SLHHIPNPKIILKKRSI-----  
consensus  
801.....810.....820.....830.....840.....850.....860.....
```