```
                    1        10          20        30        40
                    .         .           .         .         .
1 Drer1    ...|..MKFIITLGVLLV.........SVHIGSSFLIGAFNIKSFGNSKVSNATL
  Trub1    ...MSRMRVACVLGLFVA.........LLQISHSLLLGAFNIRTFGDTKASNVTL
  Hsap1    ...MRGMKLLGALLALAA.........LLQGAVSLKIAAFNIQTFGETKMSNATL
  Uurs1    ...MRCARLMGALLALAG.........LLHVALSLKIAAFNIRTFGETKMSNATL
  Lafr1    ...MRASRLIETLLAVAS.........VLQVALSLRIAAFNIQTFGETKMSNATL
  Mdom1    ...MRAMRLAASLLCLAC.........LLHGARCLRIAAFNIRSFGENKMSNDTI
  Ggal1    ...|.MARLVLELLAAAL.........LLRVAATLRISAFNIRTFGDSKMSNQTV
  Tgut1    ...MATSRLVLSLLVTAL.........LLHVATTLRIKAFGDTKMSNQTV
  Acar1    ...|..MWGLWVLGLAA.........FVRPSLALRVSAFNIQTFGDSKLSNDTI
  Pbiv1    ...|.....MKILLLVAS.........LLQLAFSLRIGAFNIRAFGDKKLSNQTI
  Cpbe1    ...MGAMRPALALLSLAY.........VLRTAATLRICAFNIRTFGDSKLSNETI
2 Hsap1L2  ...MGGPRALLAALWALE.........AAGTAALRIGAFNIQSFGDSKVSDPAC
  Uurs1L2  ...MGGPRVLLAALWALG.........AAGAAALRVGAFNIQSFGDSKVSDPAC
  Lafr1L2  RRYAGILTSILPPALPYK.........ELSRPPKRIGAFNIQSFGDTKVSDPAC
  Mdom1L2  ...MGSPPALLAALLLLHGLLGQAPAAAASRAAKVRVGAFNIRSFGDSKVADPAC
  Ggal1L2  ...MGTVVLALSLLSTAL.........LCPATAVLRIGAFNIQAFGDSKMSDESV
  Tgut1L2  ...MGTVTLGLPLLAVAL.........LCPATAMLRIGAFNIQAFGDTKMSNKEV
  Acar1L2  ...|.MKQLLLLVFGLVS.........LAQTVSPLRICAFNIQSFGDTKLSDEGT
  Pbiv1L2  ...|..MKLAAVLLRLAL.........LLHAAEALRICAFNIQSFGDTKLSDQSI
  Cpbe1L2  ...MGAMKPALALLSLAY.........LLHTAATLKICAFNIKSFGDSKLSDETT


                   50        60        70        80        90
                    .         .         .         .         .
1 Drer1    LDIITKVVHRYDIILIQEVRDSDLSATSKLMDSVNGGSSPYQYDYIASEPLGRNT
  Trub1    MNIISKIVHRYDIILIQEVRDSDLSATKKLMEHINKGSPPFRYSFIVSEPLGRSS
  Hsap1    VSYIVQILSRYDIALVQEVRDSHLTAVGKLLDNLNQDA.PDTYHYVVVSEPLGRNS
  Uurs1    SHYIVQILSRYDIAVVQEVRDSYLTAVGRLLDILNQDD.PDTYHYVVVSEPLGRNS
  Lafr1    SHYIVQILSLYDIALVQEVRDSHLVAVGKLLDSLNQHA.TGTFHFVVVSEPLGRNS
  Mdom1    SDYIVRILNQYDIALVQEVRDKYLVAVGKLLDKLNRET.SNSYHFVASEPLGRNS
  Ggal1    AGFIVSILVQYDITLVQEVRDADLSSVKKLVSQLNSAS.SYPYSFLSSIPLGRNS
  Tgut1    ANIIISVLSEYDIVLVQEVRDADMSAVNYLMDQLNSAG.KHPYSSLVSVPLGRTS
  Acar1    TDLIVQIVSGYDITLVQEVRDADLSAVKKLMHRLNQAS.AHPFSYVVSKPLGRSS
  Pbiv1    SSFIVRILTTYDLTLIQEVRDADLSAVKKLMNQVNWAS.PDPYSYLVSKPLGRSS
  Cpbe1    AGIIVNIVQTYDIAVMQEVRDSDQSAIRKLMDQLNRAS.LQPYSYVVSEPLGRTS
2 Hsap1L2  GSIIAKILAGYDLALVQEVRDPDLSAVSALMEQINSVS.EHEYSFVSSQPLGRDQ
  Uurs1L2  GGVIAQILAGYDITLVQEVRDPDLSAVSALMEQINSVS.RHEYSFVSSEPLGRDQ
  Lafr1L2  IIVIAQILAGYDITLVQEVRDPDLSAVSALMEQINRVS.KHNYNFVSSEPLGRDQ
  Mdom1L2  GNYIAQILAEYDVTLVQEVRDPDLSAVSALLEEINRIS.EYTYSYVASEPLGRDN
  Ggal1L2  ADVIINILRRYDVVLVQEVRDSDLSAVTELLEQLNSVS.SSPYDYEISGPLGRDN
  Tgut1L2  ADIIINVLRRYDVVLVQEVRDSNLSAVTELMEQLNSAS.TSPYDYEISGPLGREN
  Acar1L2  SKIIVKVLSRYDIALVQEVRDSDLSAVNELMERLNRAS.KEPYEFEISQSLGREN
  Pbiv1L2  SKIIVKILSQYDIILVQEVRDADLSAVQELMERLNRAS.KYSYDYVASESLGREN
  Cpbe1L2  AGIIVKILSRYDIALVQEVRDADLSAVTSLLDQLNSAS.KHQYSYEISEPLGREN


                  100       110       120       130       140
                    .         .         .         .         .
1 Drer1    YKERYLFVYRSESVSAVNSFHYDDGCEPCGTDTFNREPFVVMFSSK.TAVR....
  Trub1    YKERYLFLYREDTVSVAKNYTYDDGCEPCGTDTFNREPFVVMFSSKHTAVE....
  Hsap1    YKERYLFLYRPDQVSAVDSYQYDDGCEPCGNDTFNREPAIVRFFSRFTEVR....
  Uurs1    YKERYLFLFRPDQVSVRDSYQYDDGCEPCGNDTFSREPAIVWFHSPLTAVQ....
  Lafr1    YKERYLFLYRPDQVSVLDSYYYDDGCEPCGNDTFAREPAIVKFSSPFTQVS....
  Mdom1    YKERYLFVFRPDKVSVLDSYYYDDGCTPCGNDTFSREPVVVKFSSPTTVVK....
  Ggal1    YKEQYVFIYRSDIVSVLESYYYDDGCESCGTDIFSREPFIVKFSSPTTQLD....
  Tgut1    YKEQYLFIYRSDMVSVLGSYYYDDGCESCGNDSFSREPFIVKFSSPTTQVQ....
  Acar1    YKEQYLFIYRQDQASLLDSYYFDDGCEPCGNDTFSREPFVVRFAAPQTELG....
  Pbiv1    YKERYLFIYRQDRVSPVESYYNDGCEPCGNDTFSREPFVVRFAAPQTAVK....
  Cpbe1    YKEQYLFIYRTDMVSVVDSYYYDDGCEPCGSDTFSREPFIVKFSSPYTEVQ....
2 Hsap1L2  YKEMYLFVYRKDAVSVVDTYLYPD.....PEDVFSREPFVVKFSAPGTGERAPPL
  Uurs1L2  YKEMYLFVYRKDAVSVVDTYQYPD.....LEDAFSREPFVVKFSAPGS.......
  Lafr1L2  YKEMYLFVYRDDKVSVVDTYHYPD.....LEDAFNREPFVVKFSAPSS.......
  Mdom1L2  YKEMYLFVYRTETISVLDSYCYPD.....PEDVFSREPFIVKFSSPNT.......
  Ggal1L2  YKEMYLFIYRTDAVSVVDTYQYED.....PQDIFSREPFVLRVSAPHSKAE....
  Tgut1L2  YKEMYLFIYRTDVVSVVDTYQYPD.....PQDIFSREPFILRVSAPSTKVK....
  Acar1L2  YKEMYLFIYRTSSVSVVDQYQFPS.....KSNAFSRAPFILKFSASESNGK....
  Pbiv1L2  YKEMYLFLYRTKSFSLMDKYQYPD.....PDSTFSRPPFVVKFAASGSKES....
  Cpbe1L2  YMEMYLFIYRTQVVSVVATYQYPD.....PSNTFSREPFIVKFSSPNSSKQS...
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                    150       160       170       180
                     .         .         .         .
1 Drer1    ................DFALVPQHTSPEVAVQEIDALHDVVLDTRQRLNTNNIML
  Trub1    ................NFVLIPQHTSPNSAVKEIDALYDVVVDVRHRWKTNDILL
  Hsap1    ................EFAIVPLHAAPGDAVAEIDALYDVYLDVQEKWGLEDVML
  Uurs1    ................EFAIVPLHAAPLDAVAEMDALYDVYLDVRQKWDLEDIML
  Lafr1    ................KFAIVPLHAAPLDAVAEIDALYDVYLDVQKKWDLEDIML
  Mdom1    ................EFVIVPLHAAPKDAVSEIDALYDVYLDVRLRWNMEDIMF
  Ggal1    ................EFVLVPLHAEPSSAPAEINALTDVYTDVINKWETNNIFF
  Tgut1    ................EFVLVPLHSEPSHAAQEIDALYDVYLDVINKWGTNDMIF
  Acar1    ................ELVLVPLHAAPNDAVLEIDALYDVYLDVKHRWGTQDVLL
  Pbiv1    ................ELILVPLHAAPERAVTEIDALFDVYLAVKAKLGATDALF
  Cpbe1    ................EFVLVPLHTPPSEAVAEIDALYDVYLDVIDKWGTDNILF
2 Hsap1L2  PSRRALTPPPLPAAAQNLVLIPLHAAPHQAVAEIDALYDVYLDVIDKWGTDDMLF
  Uurs1L2  .............AAGEFVLIPLHAAPHRAVSEIDALYDVYLDVIDKWGTDDLLF
  Lafr1L2  ............AAKEFVLVPLHAAPHHAVVEIDALYDVYLDVIDKWGTDDILF
  Mdom1L2  ............AVKEFVLVPLHSAPHNAVAEIDALYDVYHVIDKWGTDDILF
  Ggal1L2  ................EFVMVPLHSAPHDAVAEIDALYDVYLAVVNKWGTDNIVF
  Tgut1L2  ................EFVLVPLHSAPHDAVAEIDALYDVYLAIINKWGTDNLMF
  Acar1L2  ...............ELILVPLHTAPNDAVAEIDALYDVYLKIIDKWGTDNMMF
  Pbiv1L2  ...............ELVLVPLHTSPSQAVAEIDALYDVYLKIIDKWETDNIMF
  Cpbe1L2  .............PLEFVLVPLHTPPSEAVAEIDALYDVYLDVIDKWGTDNIMF


                    190       200       210       220       230
                     .         .         .         .         .
1 Drer1    LGDFNAGCRYVSNSAWANIRLRTDQSYTWLIPDSADTTVTHTNCPYDRIVATPDM
  Trub1    LGDFNAGCNYVTRSEWQQIRLFTDKSFHWLITDDEDTTVTHTICPYDRIVTADM
  Hsap1    MGDFNAGCSYVRPSQWSSIRLWTSPTFQWLIPDSADTTATPTHCAYDRIVVAGML
  Uurs1    MGDFNAGCSYVAPSQWASIRLRTSPAFQWLIPDTADTTSTSTHCAYDRIVVAGTL
  Lafr1    MGDFNAGCSYVSLSHWASIRLRMSPTFRWLILDNADTTVKSTHCPYDRIVVAGTS
  Mdom1    MGDFNADCSYVTPSQWPSIRLRTSSTFQWLIPDTADTTVTPTDCAYDRIVVSGRK
  Ggal1    MGDFNADCSYVTAEQWPSIRLRSLSSCEWLIPDSADTTVTSTDCAYDRIVACGSA
  Tgut1    LGDFNAGCSYVTSSQWPSIRLRSLPACEWLIPDSADTTVADTDCAYDRIVACGTA
  Acar1    LGDFNAGCSFVRAQDWAHIRLRTDPAFQWLIPDTADTTAGRSDCAYDRIVAVGAH
  Pbiv1    LGDFNAGCSYVQTEDWPSIRLRTSKDFQWLIPDTADTTVTNTACAYDRIVAAGTK
  Cpbe1    LGDFNADCSYVGPQDWPSIRLRTSDAFQWLIPDSADTTVSYTDCAYDRIVASGSE
2 Hsap1L2  LGDFNADCSYVRAQDWAAIRLRSSEVFKWLIPDSADTTVGNSDCAYDRIVACGAR
  Uurs1L2  LGDFNADCNYVREREWPSVRLRSSEVFKWLIPDSADTTVGNSDCAYDRIVACGAR
  Lafr1L2  LGDFNADCSYVRAQDWAAIRLRSSEVFKWLIPDSADTTVGNTDCAYDRIVCGVH
  Mdom1L2  LGDFNADCKYVRPNDWAKIRLRTSEIFKWLIPDDTDTTVGNSDCAYDRIVACGSH
  Ggal1L2  LGDFNADCSYVKQSDWASIRLRSSDVFKWLIPDSADTTVGKSDCAYDRIVVCGAK
  Tgut1L2  LGDFNADCSYVQPSDWSSIRLRTSDIFKWLIPDSADTTVGKSDCAYDRIVVCGNK
  Acar1L2  LGDFNADCSYVGKKDWASIRLRTSEVFKWLIPDEEDTTVGHSDCAYDRIVVSGAQ
  Pbiv1L2  LGDFNADCNYVGKTDWNSIRLRTSEVFNWLIPDDTDTTVGNSDCAYDRIVVSGSR
  Cpbe1L2  LGDFNADCSYVKKGDWGSIRLRTSEVFEWLIPDSADTTVGKSDCAYDRIVVCGSK


                    240       250       260       270
                     .         .         .         .
1 Drer1    MR.GVAPGSAQVFDFMEAHGLSQDWALAVSDHFPVEVK................
  Trub1    MG.GVVPHSAAVYDYMMDLNLIHSLALAVSDHFPVEVN................
  Hsap1    LRGAVVPDSALPFNFQAAYGLSDQLAQAISDHYPVEVM................
  Uurs1    LQHAIVPDSAAPFDFQAAYGLSSQLTQAISDHYPVEVM................
  Lafr1    LQDAVVPSSAMPFDFQAAYGLSNQMAEAISDHYPVEVA................
  Mdom1    LQSAIVPGSATIFDFQAAYNLSSGIALAISDHYPVEVT................
  Ggal1    LRQAVEYGSATVNNFQETLRIQNKDALAISDHFPVEVT................
  Tgut1    LRQGTEPGSATINNFQQKFHLQMKDALAVSDHFPVEVT................
  Acar1    LQGGLLPGSAQVNNFQETFRLSYKDALAISDHYPVEVT................
  Pbiv1    LKGSILPGTAKVDNFQKTFGLSSKDALAVSDHFPVEVT................
  Cpbe1    LQRCMVARSAKVNNFQETFHLQREDALAVSDHFPVEVT................
2 Hsap1L2  LRRSLKPQSATVHDFQEEFGLDQTQALAISDHFPVEVT................
  Uurs1L2  LRRSLKPQSAAVHDFQEEFGLDQAQALAISDHFPVEVT................
  Lafr1L2  LRRSLKPQSAAVHDFQEEFGLDQAQALAISDHFPVEVT................
  Mdom1L2  LRKCIAPNSAMVNNFQKSFSLDQTAALAISDHFPVEVT................
  Ggal1L2  LKRSIVPNSATVYNFQRAFQLEQEEALAVSDHYPVEVK................
  Tgut1L2  LKRSILSNSAGIYNFQRALQLDQEEALAVSDHYPVEVK................
  Acar1L2  MKKWVKPNSAKVFDFQEEFKLSQEKDFAVAKEPALDGGPSGQSLDTALAALEPGE
  Pbiv1L2  LRKWIEPKSAKVFDFQRAFKLSQEEALAISDHFPVEVG................
  Cpbe1L2  LKKSIKPKSAAVYNFQHTFKLEDAEVPWAETDP....................
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1 Drer1      ......LM...................
  Trub1      ......LIGRSFLSE.............
  Hsap1      ......LK...................
  Uurs1      ......LKRV.................
  Lafr1      ......LKKV.................
  Mdom1      ......LK...................
  Ggal1      ......LKAR.................
  Tgut1      ......LKAH.................
  Acar1      ......LKSN.................
  Pbiv1      ......LKSA.................
  Cpbe1      ......LRAR.................
2 Hsap1L2    ......LKFHR................
  Uurs1L2    ......LKSH.................
  Lafr1L2    ......LKSS.................
  Mdom1L2    ......LKTH.................
  Ggal1L2    ......LMA..................
  Tgut1L2    ......LAA..................
  Acar1L2    KPCKEVQRSPCVTSNPPPPKGQRKHSSF
  Pbiv1L2    ......LKSP.................
  Cpbe1L2    ......QRANI................
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