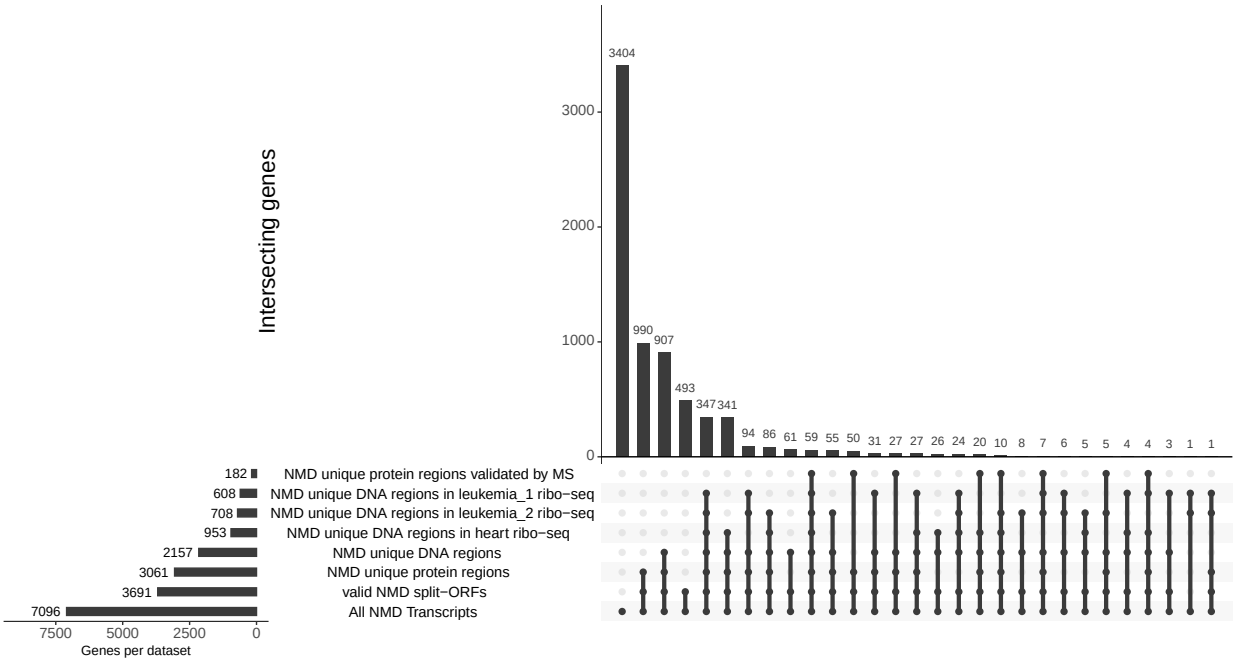
Gene Statistics

18 August 2021

Human statistics

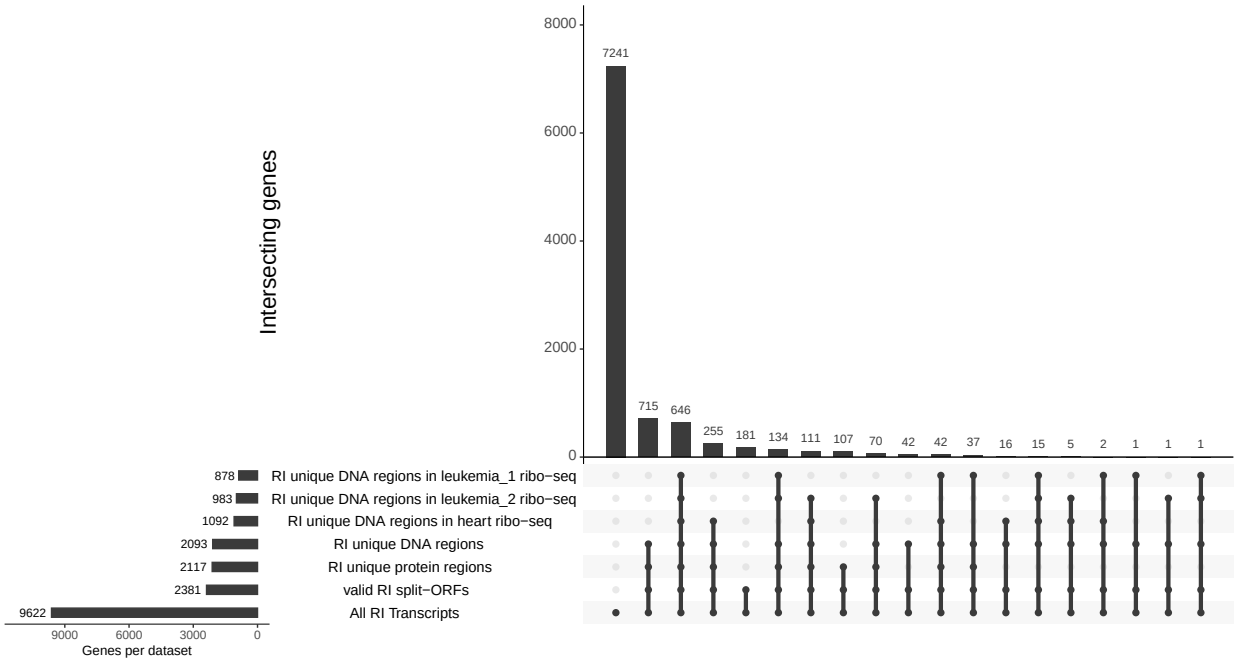
Upsetplot showing the overlap of genes between the different result files for the NMD transcripts



The following genes were found in all datasets:

```
##  [1] "RUVBL2"    "TPM4"      "PPP4R1"    "SUGP2"     "TPM3"      "IL1RAP"
##  [7] "NT5C2"     "SAE1"      "NDUFA10"   "HAT1"      "DBNL"      "PDCD6IP"
## [13] "PSMD13"    "NCAPG2"    "GOSR1"     "CHCHD3"    "HSD17B4"   "XPO1"
## [19] "POLR2F"    "UBL4A"     "QTRT1"     "POLR1E"    "EIF3I"     "TIA1"
## [25] "EEF1AKMT2" "RAB7A"     "ZBTB8OS"   "RHOC"      "IVD"       "LRSAM1"
## [31] "ATP6AP2"   "LASP1"     "SRSF6"     "DCUN1D5"   "HARS1"     "USP28"
## [37] "SPG7"      "NPEPPS"    "PKM"       "HMBS"      "ACAT1"     "VPS28"
## [43] "EIF3E"     "COQ6"      "PDLIM5"    "NDUFA13"   "LMNA"      "DHODH"
## [49] "EIF4A1"    "NUP85"     "ETHE1"     "SMARCA4"   "LSM4"      "VPS13C"
## [55] "ACTN2"     "BLVRB"     "LONP1"     "CAPZB"     "ETNK1"
```

Upsetplot showing the overlap of genes between the different result files for the RI transcripts



The following genes were found in all datasets:

```
##   [1] "PRR29"          "MAU2"           "RBM23"          "SSRP1"
##   [5] "INTS11"         "OTUB1"          "ANAPC5"         "HNRNPU"
##   [9] "CDK11A"         "RNASET2"        "SUN1"           "PARP1"
##  [13] "NAA40"          "WASH6P"         "TPM3"           "PHLDB1"
##  [17] "HAGHL"          "CCDC9B"         "PMPCA"          "CDK10"
##  [21] "INTS3"          "SSR2"           "CTSL"           "PHGDH"
##  [25] "HYI"            "GBP3"           "LMNA"           "GPS1"
##  [29] "MCOLN1"         "TIAL1"          "ZMYM5"          "ZNF446"
##  [33] "GSTM5"          "GRHPR"          "KMT2A"          "ATXN2"
##  [37] "WDR26"          "TPCN1"          "FADS3"          "WDR90"
##  [41] "DDX47"          "IFFO1"          "CDC40"          "TUBB6"
##  [45] "FIG4"           "SLC2A1"         "FIBP"           "CENPT"
##  [49] "ATG4B"          "SEPTIN7"        "EXOC7"          "CDK16"
##  [53] "NDUFA9"         "EIF4A1"         "WBP2"           "ATAD3A"
##  [57] "CTSB"           "RPL13"          "DDT"            "RABL2A"
##  [61] "MORN1"          "CCNL2"          "DPF2"           "BAG6"
##  [65] "CYP4F8"         "PPP1R37"        "METTL3"         "TPT1"
##  [69] "SLC35B1"        "RBM5"           "CCNDBP1"        "TPP1"
##  [73] "NDUFS7"         "MLH1"           "TMEM107"        "RPL28"
##  [77] "UBE2T"          "RAF1"           "GUSB"           "SYVN1"
##  [81] "COMMD3"         "MRPL28"         "IFRD2"          "CEACAM19"
##  [85] "ALG3"           "FLNA"           "ANKRD13D"       "TTC31"
##  [89] "FAM136A"        "RUSC1"          "PISD"           "HDLBP"
##  [93] "PUSL1"          "SETDB1"         "TKT"            "AAMP"
##  [97] "PABPC4"         "TRAPPC4"        "DDX1"           "SGSM3"
## [101] "RPS9"           "RBM39"          "MEI1"           "SCLY"
```

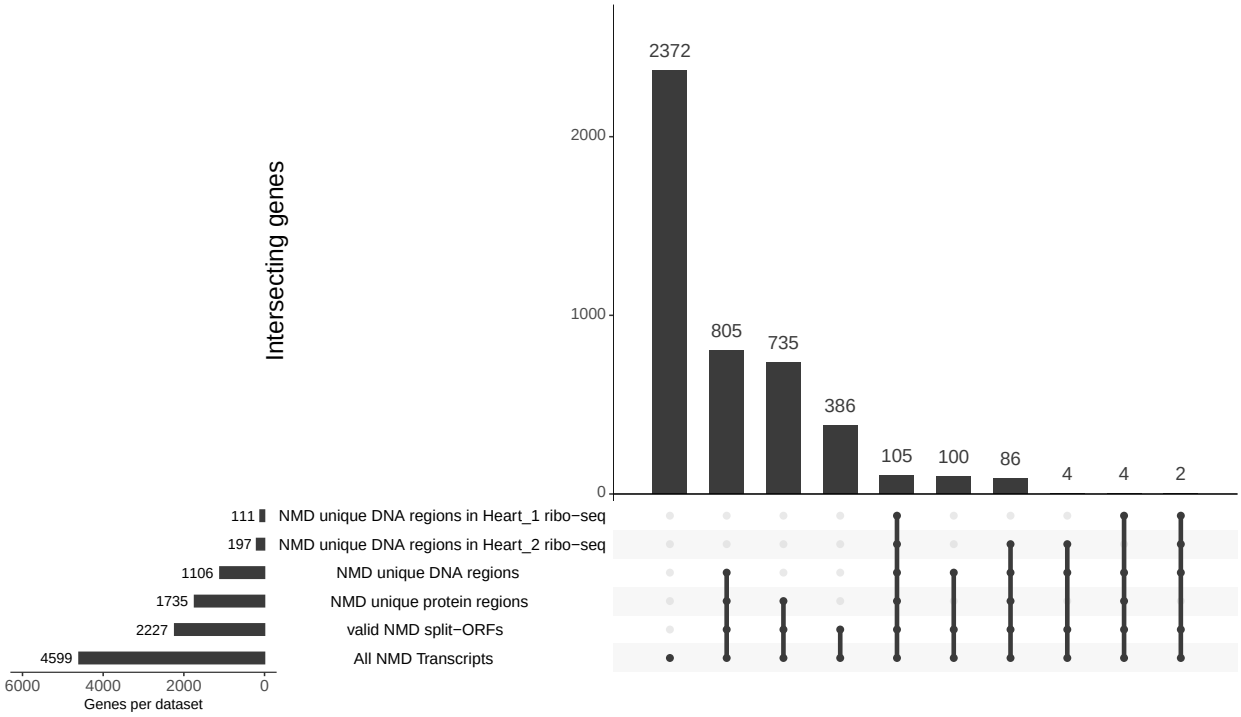
```
## [105] "PI4KA"          "FASTK"          "SLC5A6"         "POLR1C"
## [109] "IDE"            "USP34"          "TTLL3"          "BIRC6"
## [113] "UROD"           "CYB5RL"         "XPO1"           "IDH3B"
## [117] "DDX39B"         "PMM1"           "RNPEPL1"        "RAD54L2"
## [121] "DENND4B"        "OGT"            "FBXW5"          "DPAGT1"
## [125] "UFD1"           "SMTN"           "TECPR1"         "PYCR2"
## [129] "FXR1"           "CERS2"          "NCL"            "CDCA3"
## [133] "AUP1"           "PIK3CA"         "SBDS"           "NCBP2"
## [137] "TSC2"           "ACTB"           "HAX1"           "AXIN1"
## [141] "PSMC2"          "ASCC2"          "BUD23"          "DNAJC10"
## [145] "ADAM9"          "SLC2A11"        "EIF4A2"         "HSPD1"
## [149] "IMPDH2"         "PDHB"           "ATG2A"          "FCGRT"
## [153] "APEH"           "PFKL"           "VDAC2"          "PTBP2"
## [157] "CC2D1B"         "DCTN1"          "UNC45A"         "PLXNB2"
## [161] "SPCS1"          "AKR1C2"         "MAN2B1"         "STAT3"
## [165] "TRIP6"          "U2AF1"          "PARK7"          "NPRL2"
## [169] "METTL26"        "CLK3"           "SLC11A1"        "EIF1"
## [173] "TPM2"           "DPM2"           "NOL10"          "COPS6"
## [177] "ARPC3"          "SF3B1"          "NELFCD"         "NOC2L"
## [181] "SMARCD3"        "INTS1"          "DBN1"           "PPM1G"
## [185] "MSL3"           "RHOC"           "ATP13A1"        "NFS1"
## [189] "CBWD1"          "CARS1"          "BRAT1"          "PTK7"
## [193] "PWP2"           "P4HTM"          "LIMS2"          "ADGRL2"
## [197] "TANC1"          "ASL"            "NONO"           "TSPAN4"
## [201] "POLR3GL"        "GLA"            "PMPCB"          "WSB1"
## [205] "DRG2"           "NAGK"           "PCCB"           "NOM1"
## [209] "PICK1"          "GARS1"          "ZSCAN25"        "CD55"
## [213] "MAPK12"         "PSMD11"         "BRD2"           "FAM50A"
## [217] "CPNE1"          "ADSL"           "ATG16L1"        "ATAD3B"
## [221] "DYNC1LI1"       "PES1"           "WRAP53"         "TWF2"
## [225] "MRPL2"          "RPL10"          "COMT"           "CASP2"
## [229] "NIT2"           "PSEN2"          "EIF2B5"         "MAP2K7"
## [233] "SMYD2"          "GNB2"           "EXOSC10"        "ARAP1"
## [237] "CSNK2B"         "COG2"           "RPL13A"         "YDJC"
## [241] "GSTP1"          "RWDD2B"         "KRTCAP2"        "PRPF31"
## [245] "STARD3"         "USP11"          "EIF2D"          "PSMB4"
## [249] "PIGO"           "CTNNB1"         "UBXN11"         "L3MBTL2"
## [253] "HTRA2"          "DNAJC2"         "GAPDH"          "ATP6V0B"
## [257] "MITD1"          "PITRM1"         "ALAD"           "CNNM3"
## [261] "NSUN5"          "EIF3I"          "CCDC180"        "TMEM41A"
## [265] "RNF123"         "STARD3NL"       "GRIPAP1"        "AP5Z1"
## [269] "KMT2C"          "ADAMTS1"        "RASA4B"         "GPC1"
## [273] "VCP"            "PREB"           "PPP2R5D"        "TBCE"
## [277] "CCDC115"        "WDR6"           "JMJD4"          "HADHA"
## [281] "SLC25A1"        "ACO2"           "FBXO9"          "TRO"
## [285] "PTGES2"         "FBXO7"          "MAP4K4"         "MPV17"
## [289] "ACOT8"          "SMARCB1"        "CTSA"           "EIF4H"
## [293] "C1orf174"       "OXA1L"          "KCNT1"          "ADAM17"
## [297] "NDUFS2"         "NDUFA10"        "CTPS1"          "TMEM147"
## [301] "GMPPA"          "TFG"            "AKT2"           "KDM6A"
## [305] "LLGL1"          "RPS12"          "ATP6AP2"        "TXNIP"
## [309] "EEF1A1"         "LRWD1"          "DIABLO"         "UPF3B"
## [313] "ATP6AP1"        "RAB7A"          "NOTCH2"         "ZGPAT"
## [317] "GMPPB"          "NDUFAF3"        "NF1"            "TIA1"
```

```
## [321] "DSN1"          "DHX57"         "ANKHD1-EIF4EBP3" "BET1L"
## [325] "IGF2R"         "KRI1"          "MCM5"            "DDX3X"
## [329] "CDK5RAP2"      "WDR27"         "DHX34"           "EPC1"
## [333] "MPST"          "CAPZB"         "GBF1"            "DOT1L"
## [337] "HNRNPA3"       "DPH2"          "MRPL43"          "HSPA8"
## [341] "COQ6"          "HNRNPH1"       "PPP1R16A"        "TMEM63B"
## [345] "BCKDHA"        "ASAH1"         "SHMT2"           "HADH"
## [349] "HARS1"         "CTCF"          "MAN2C1"          "ITGA5"
## [353] "RPL18"         "COX4I1"        "CCDC81"          "IKBKB"
## [357] "SMARCC2"       "STAT2"         "PLCB2"           "CTU2"
## [361] "RELA"          "AAAS"          "SMG1"            "TRPT1"
## [365] "CNPY2"         "SC5D"          "SCARB2"          "COQ9"
## [369] "MYL6"          "PLK1"          "NPEPPS"          "PHB2"
## [373] "CPLANE1"       "BTF3"          "SLC38A9"         "SIDT2"
## [377] "MED17"         "G3BP2"         "ESPL1"           "CTSH"
## [381] "KRT8"          "CLN3"          "KDM2B"           "KATNB1"
## [385] "SPATA20"       "DYNC1H1"       "DDX41"           "GTF2H2"
## [389] "TMED9"         "STING1"        "WDR70"           "PNP"
## [393] "RPL4"          "WDR83"         "RPLP0"           "DDX24"
## [397] "CHD8"          "SNRPA1"        "CWC15"           "PFDN5"
## [401] "MCRS1"         "EIF3F"         "ATXN2L"          "PPP2R2A"
## [405] "ACSF2"         "SLC30A9"       "ALDOA"           "KIF5A"
## [409] "CHMP1A"        "VPS11"         "PIDD1"           "FBXL6"
## [413] "CLCN7"         "RACK1"         "HNRNPA1"         "CTSC"
## [417] "ACAD8"         "GGH"           "NUBP2"           "PSMD13"
## [421] "ZFPL1"         "ACAD10"        "SCFD1"           "LETMD1"
## [425] "C17orf58"      "CDAN1"         "OS9"             "TCF25"
## [429] "PHKG2"         "GINS3"         "DGKZ"            "ILVBL"
## [433] "TSG101"        "SLC37A4"       "C17orf49"        "MAEA"
## [437] "HTT"           "NECAP1"        "CIAO3"           "SORD"
## [441] "PRKAG1"        "ORC6"          "DDX46"           "GALNS"
## [445] "RNH1"          "CIAO2B"        "CYC1"            "NDUFV1"
## [449] "GAK"           "BID"           "RPS2"            "AGA"
## [453] "LARS1"         "FHOD1"         "LMF2"            "POLD4"
## [457] "SDCBP"         "CD151"         "LRRC57"          "PPP4C"
## [461] "C2CD5"         "SLC25A3"       "SPG7"            "KIF22"
## [465] "CAPN1"         "ITGA3"         "RPL6"            "VPS33B"
## [469] "NAGPA"         "RARG"          "ZNF195"          "NDUFS3"
## [473] "MRPS18C"       "FIP1L1"        "CS"              "HNRNPD"
## [477] "SART1"         "GPAA1"         "ARFGAP2"         "MRPS11"
## [481] "CDIPT"         "MARCHF6"       "ABHD14A-ACY1"    "CSK"
## [485] "SELENOS"       "TGFBI"         "RUSF1"           "NEK9"
## [489] "PPP1CA"        "AARS1"         "MTHFD1"          "DCTN2"
## [493] "RPS14"         "FKBP2"         "SCAMP2"          "TONSL"
## [497] "HSPA9"         "CD82"          "GATM"            "RHPN2"
## [501] "DCAF13"        "GSTZ1"         "PDCD6"           "COPB2"
## [505] "NUDT8"         "REEP5"         "EDC4"            "BCKDK"
## [509] "PABPC1"        "KIAA0586"      "RPS6KA4"         "NADSYN1"
## [513] "ATP6V1B2"      "PTGR2"         "RNASEH2C"        "CHORDC1"
## [517] "AFTPH"         "MVB12A"        "RNASEK"          "MED13L"
## [521] "MARK2"         "ZNF419"        "RBM25"           "EIF3E"
## [525] "TNIP2"         "GRSF1"         "BRMS1"           "ARHGAP1"
## [529] "NSMCE1"        "NDUFB9"        "KIF2A"           "G3BP1"
## [533] "HK1"           "CERS4"         "CAPN15"          "ACAD9"
```

```
## [537] "MRPL17"          "NIPBL"          "CYBC1"          "RPAIN"
## [541] "HM13"            "CNDP2"          "TECR"           "ARHGEF1"
## [545] "HDDC2"           "GALK1"          "MINK1"          "ARL16"
## [549] "ELP1"            "EIF3G"          "GPX4"           "NDUFAF8"
## [553] "GSS"             "STXBP2"         "LAS1L"          "SPAG5"
## [557] "AP2A1"           "KIAA0100"       "CORO7"          "ACD"
## [561] "ZZEF1"           "NAPA"           "PLEKHJ1"        "GIPC1"
## [565] "TBCD"            "ECH1"           "SGTA"           "PIH1D1"
## [569] "RPL27"           "PSMB6"          "HGS"            "TMEM205"
## [573] "STK11"           "HEXD"           "MKS1"           "SLC12A4"
## [577] "DDX5"            "CSNK2A1"        "DDX39A"         "DNMT1"
## [581] "SLC25A39"        "GFAP"           "GGA3"           "SYNRG"
## [585] "TMEM94"          "MFN2"           "ALDH16A1"       "TSEN54"
## [589] "KPNA2"           "U2AF1L5"        "PMF1"           "SMARCA4"
## [593] "GABRD"           "DPP9"           "MTMR2"          "PTBP1"
## [597] "PSMC4"           "EFTUD2"         "NOP56"          "SPPL2B"
## [601] "SAFB"            "FAM98C"         "RPS11"          "NOSIP"
## [605] "TNFRSF12A"       "CARM1"          "TUBB4B"         "DHX8"
## [609] "QTRT1"           "SEPTIN4"        "UNC13D"         "CIRBP"
## [613] "TMEM259"         "ISYNA1"         "ACTG1"          "MIF4GD"
## [617] "CNOT3"           "PIGT"           "ACAP1"          "RUVBL2"
## [621] "VPS4B"           "ILF3"           "RPL19"          "TRIM8"
## [625] "ARHGDIA"         "NMT1"           "REX1BD"         "EMG1"
## [629] "PPT1"            "PLEKHH3"        "RAVER1"         "YIF1B"
## [633] "RIPK1"           "ZNF213"         "SLC52A1"        "SYNCRIP"
## [637] "XAB2"            "CDC37"          "ZNF396"         "SPNS1"
## [641] "TXNDC17"         "ARHGAP35"       "PABIR3"         "CAMLG"
## [645] "CCDC27"          "HOXA2"
```

Mouse statistics

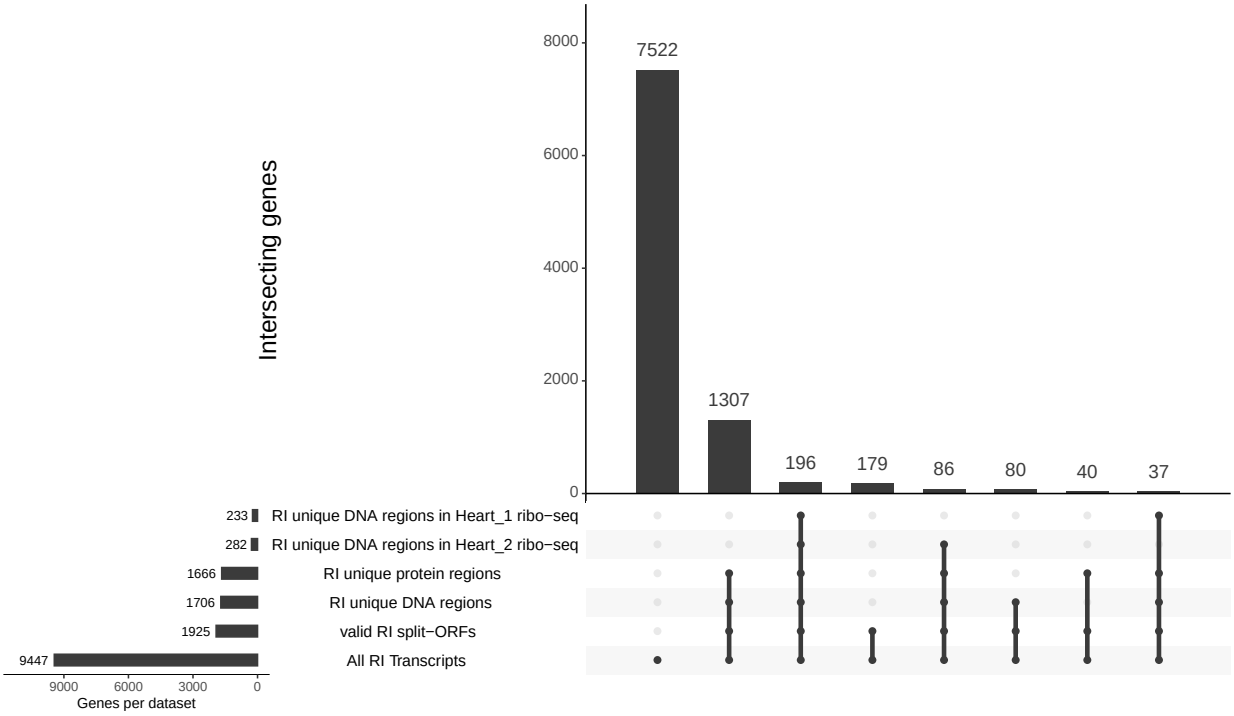
Upsetplot showing the overlap of genes between the different result files for the NMD transcripts



The following genes were found in all datasets:

```
##   [1] "Glo1"     "Cyb5a"    "Becn1"    "Map2k2"   "Mef2a"    "Smpx"
##   [7] "Dhrs3"    "Rpl12"    "Smarca2"  "Ablim2"   "Hdac5"    "Fxn"
##  [13] "Samhd1"   "Idh2"     "Aamdc"    "Abhd11"   "Tor1aip1" "Prpf31"
##  [19] "Hras"     "Ccpg1"    "Clec16a"  "Obscn"    "Camk2d"   "Syne2"
##  [25] "Tpm1"     "Ilk"      "Czib"     "Rps19"    "Gpt2"     "Oxsr1"
##  [31] "Fgf1"     "Mavs"     "Rbm3"     "Atp5pb"   "Araf"     "Son"
##  [37] "Supt4a"   "Snrpb"    "Egfl7"    "Dnajc11"  "Akap1"    "Ehmt2"
##  [43] "Dhrs11"   "Dmpk"     "Usp21"    "Tmem134"  "Gnas"     "Azi2"
##  [49] "Me3"      "Homer2"   "Slc25a3"  "Usp4"     "Bclaf1"   "Glod4"
##  [55] "Lmo7"     "Rbm20"    "Ankrd11"  "Trafd1"   "Agl"      "Tgfb1i1"
##  [61] "Rap1gds1" "Hnrnpl"   "Lrp5"     "Rit1"     "Supt5"    "Opa1"
##  [67] "Fxr1"     "Ndufb8"   "Kctd9"    "Fbrsl1"   "Spint2"   "Mrpl17"
##  [73] "Gstm5"    "Pcmt1"    "Rbm4b"    "Il6st"    "Dcun1d2"  "Dnajb2"
##  [79] "Trak1"    "Immt"     "Rragc"    "Nedd4"    "Adipor2"  "Snd1"
##  [85] "Ube2d3"   "Crtc2"    "Calu"     "Mical3"   "Mrps9"    "Clip4"
##  [91] "Dtnbp1"   "Hsf1"     "C2cd2l"   "U2af1"    "Ppp2r2a"  "Colec11"
##  [97] "Rock1"    "Odc1"     "Polr3a"   "Rpsa"     "Tars"     "Gsto1"
## [103] "Glb1"     "Atl2"     "Atad1"
```

Upsetplot showing the overlap of genes between the different result files for the RI transcripts

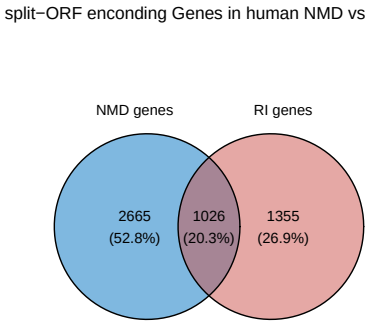


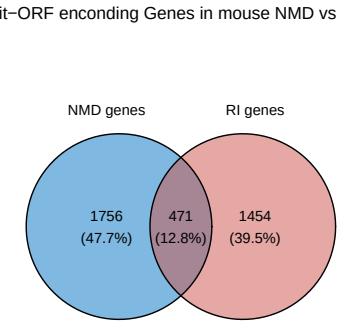
The following genes were found in all datasets:

```
##   [1] "Myh8"      "Ppard"     "Paf1"      "Fastk"     "Kcnip2"    "Fus"
##   [7] "Becn1"     "Psmd13"    "Ncaph2"    "Phb2"      "Pigq"      "Nono"
##  [13] "Dynlt1c"   "Coq6"      "Rpl12"     "Stk25"     "Uqcc1"     "Mapk8ip3"
##  [19] "Sptan1"    "Tex261"    "Anxa11"    "Ehmt2"     "Eif4enif1" "Ppif"
##  [25] "Ldb1"      "Appl2"     "Lpcat3"    "Hspa8"     "Coq7"      "Idh3g"
##  [31] "Rmc1"      "Myl12a"    "Ucp3"      "Cnot3"     "Slc4a3"    "Ndufb7"
##  [37] "Tpr"       "Hdac5"     "Myh9"      "Ppp1r16a"  "Pcolce"    "Adrm1"
##  [43] "Inpp5k"    "Rpl10a"    "Sccpdh"    "Las1l"     "Doc2g"     "Sympk"
##  [49] "Sf1"       "Akr1b3"    "Irf9"      "Plcg1"     "Leng8"     "Hnrnpm"
##  [55] "Gcdh"      "Dusp1"     "Acsl1"     "Rbm38"     "Zdhhc3"    "Srsf5"
##  [61] "Srpk3"     "Rpl30"     "Polr3c"    "Parp3"     "Clk2"      "Angptl2"
##  [67] "Idh2"      "Atp1a2"    "Zmynd11"   "Rack1"     "Acadvl"    "Aldoa"
##  [73] "Psmd4"     "Slc25a42"  "Ahcyl1"    "Npepl1"    "Rpl35a"    "Tm9sf4"
##  [79] "Dmpk"      "Asb11"     "Nelfcd"    "Ube2m"     "Slc25a11"  "Tsc22d3"
##  [85] "Gstm2"     "Pi16"      "Tesc"      "Eml1"      "Polr2e"    "Tmcc2"
##  [91] "Ctdsp1"    "Smarcd3"   "Fkbp4"     "Tmbim1"    "Fam50a"    "Camk1"
##  [97] "Lmo7"      "Hp1bp3"    "Fuca2"     "BC004004"  "Echs1"     "Psmd3"
## [103] "Lrpap1"    "Lrpprc"    "Myh7"      "Hif1a"     "Hadh"      "Ptpn11"
## [109] "Gdi1"      "Smox"      "C1qbp"     "Srprb"     "Tnpo2"     "Dctn2"
## [115] "Ryr2"      "Sorbs1"    "Rpl3"      "Safb"      "Slc2a4"    "Ptov1"
## [121] "Arap3"     "Ankrd17"   "Cct3"      "Ankrd1"    "Myzap"     "Numa1"
## [127] "Pdhb"      "Fam120b"   "Ncl"       "Psme1"     "Fibp"      "Slc44a2"
## [133] "Zswim8"    "Ilf2"      "Stub1"     "H2-Ab1"    "Dhx30"     "Slc29a1"
## [139] "Gpt"       "Ppp1ca"    "Rhot2"     "Usp19"     "Cox5a"     "Ccdc25"
```

```
## [145] "Rit1"      "Ddb1"      "Slc38a3"   "Slc39a7"   "Mrpl4"     "Camk2g"
## [151] "Dhx15"     "Csrp3"     "Dync1li1"  "Vps28"     "Txnrd1"    "Inppl1"
## [157] "Kif5b"     "Eif5b"     "Exosc5"    "Slc27a1"   "Fth1"      "Septin7"
## [163] "Smpd1"     "Ppp6r1"    "Cdc34"     "Cd34"      "Rps24"     "Vldlr"
## [169] "Mrpl16"    "Xpo6"      "Pofut2"    "Clcn4"     "Chmp2a"    "Rrp1"
## [175] "Gpihbp1"   "Ubn1"      "Dynlt1f"   "Ubxn1"     "Dynlt1a"   "Rps12"
## [181] "Ushbp1"    "Ipo5"      "Pip4k2c"   "Rorc"      "H2-Q7"     "Fabp4"
## [187] "Twf2"      "Actb"      "Adcy6"     "Ndrg1"     "Pgap6"     "Brd4"
## [193] "Timm13"    "Ube2n"     "Rpl18a"    "Pkd1"
```

Overlap between NMD and RI genes





The following are the overlaping human genes:

```
##    [1] "PAPLN"        "FAM135A"      "COMT"         "RNASET2"
##    [5] "RUVBL2"       "PPP2R5D"      "PTK7"         "SLC2A11"
##    [9] "PFDN5"        "P2RX7"        "SLC25A37"     "NGLY1"
##   [13] "PPP4R1"       "VWA3A"        "GRM2"         "CAPN10"
##   [17] "PIK3R5"       "TBRG1"        "CHFR"         "MEIS2"
##   [21] "SCFD1"        "FCAMR"        "MPPE1"        "FOXP1"
##   [25] "CRTC2"        "TMEM184A"     "MAPK10"       "MUC4"
##   [29] "DCAF11"       "KLK11"        "HDDC2"        "STARD5"
##   [33] "DDX39A"       "SLC26A6"      "CYP4F8"       "DCDC1"
##   [37] "TRIOBP"       "MPDU1"        "AASS"         "TPM3"
##   [41] "ABHD11"       "TTLL6"        "CCDC144A"     "CCDC17"
##   [45] "DTNB"         "RBM39"        "KLF8"         "HLA-C"
##   [49] "CERKL"        "FAM189A2"     "SLC11A1"      "FGD2"
##   [53] "NARF"         "ECHDC2"       "ATAD3A"       "IKBKB"
##   [57] "CUTA"         "CIBAR1"       "PARVG"        "PAQR6"
##   [61] "CCDC66"       "CASP2"        "NUP35"        "CHIA"
##   [65] "NT5C1B"       "YDJC"         "MICALL2"      "ADAM9"
##   [69] "TCAIM"        "LETMD1"       "TTC7A"        "CPNE1"
##   [73] "DIS3L2"       "ECI2"         "GCC2"         "IFT140"
##   [77] "DGKA"         "RASSF1"       "NDUFA10"      "AMT"
##   [81] "HDAC10"       "EIF2B4"       "RANBP17"      "MITD1"
##   [85] "DBNL"         "SLC22A17"     "DPAGT1"       "TTC5"
##   [89] "CLK1"         "GAD1"         "ZNF692"       "DEPDC5"
##   [93] "POMT1"        "TRMU"         "LZTR1"        "SBDS"
##   [97] "MBTD1"        "SPATA6L"      "SEPTIN5"      "MMS19"
```

```
##  [101] "WT1"           "TNFRSF25"      "SREBF1"        "ALG3"
##  [105] "RBCK1"         "ARHGAP4"       "MPV17"         "IFRD2"
##  [109] "PSMD13"        "METTL8"        "SMPD4"         "ADAMTS6"
##  [113] "PPIL3"         "HYDIN"         "CBWD5"         "MKS1"
##  [117] "MST1R"         "CATSPERG"      "LPO"           "UQCRC1"
##  [121] "ZSCAN25"       "NPHP4"         "BICD1"         "PAPOLG"
##  [125] "MTO1"          "TANGO2"        "THUMPD2"       "EOGT"
##  [129] "LRRIQ3"        "ACAA1"         "SERHL2"        "CDCA7"
##  [133] "CYB5RL"        "NCAPG2"        "BPHL"          "GUSB"
##  [137] "CPLANE1"       "GPD2"          "AP4M1"         "DAZAP2"
##  [141] "CHRNA7"        "AIFM1"         "SLC5A9"        "POLE"
##  [145] "ACTB"          "SHPRH"         "PISD"          "IGFN1"
##  [149] "WDR6"          "OSBPL9"        "EIF4A2"        "SULT1C2"
##  [153] "CYP3A43"       "HSD17B4"       "DNAJC10"       "NPRL2"
##  [157] "NFS1"          "WAC"           "SLC26A5"       "TBX2"
##  [161] "BUD23"         "ATP6AP1"       "CHRD"          "HSF4"
##  [165] "MTA1"          "SCARF1"        "HPS4"          "TSPAN32"
##  [169] "TBXAS1"        "TBC1D10A"      "VPS50"         "FKBP1B"
##  [173] "DCTN1"         "SYT8"          "FLNA"          "LMBR1L"
##  [177] "DQX1"          "NCBP2"         "LRRC23"        "TTLL3"
##  [181] "TTC21A"        "RANBP1"        "RHBDF1"        "ALS2CL"
##  [185] "SLC5A2"        "ITPRID2"       "HAUS5"         "RAF1"
##  [189] "GDI1"          "NEU4"          "TTC31"         "ZNF74"
##  [193] "ETV1"          "RGL4"          "CCDC150"       "PRPF39"
##  [197] "LMBR1"         "MAP4K2"        "ATG16L2"       "ABCA7"
##  [201] "DPP4"          "NKTR"          "TSC2"          "XPO1"
##  [205] "QARS1"         "CHTF18"        "SELENBP1"      "DDX11"
##  [209] "CFAP69"        "ZNF655"        "CLDN15"        "MZB1"
##  [213] "KLK3"          "LTO1"          "PON3"          "PROM2"
##  [217] "AKR1B1"        "STRC"          "ZDHHC19"       "MSH5"
##  [221] "FGGY"          "CYP11A1"       "MED15"         "QTRT1"
##  [225] "ABCD4"         "GORASP1"       "TKT"           "ACAD11"
##  [229] "MYLK"          "NEPRO"         "DMKN"          "APBB3"
##  [233] "CDK5RAP2"      "EIF3I"         "TOX4"          "CCNL1"
##  [237] "BRD9"          "ING4"          "DLG4"          "RHBG"
##  [241] "SKIV2L"        "TTC19"         "PHYKPL"        "LAS1L"
##  [245] "NF1"           "CCNL2"         "PMPCB"         "NOP56"
##  [249] "PORCN"         "ST3GAL3"       "RNF123"        "PNLIPRP1"
##  [253] "SLC22A5"       "PAXIP1"        "IL17RC"        "FAM136A"
##  [257] "APTX"          "SUPT20H"       "CCDC30"        "PHF20L1"
##  [261] "HEMK1"         "FBXW5"         "TIA1"          "COG4"
##  [265] "SEC31B"        "L3MBTL1"       "DNAH1"         "IDH3B"
##  [269] "NUP205"        "PGAP2"         "NECAP1"        "IDE"
##  [273] "COG2"          "TSNAXIP1"      "PDE8A"         "CYP2J2"
##  [277] "MLH1"          "STRIP1"        "NECAP2"        "YWHAB"
##  [281] "GMPPA"         "WDTC1"         "FANCI"         "PREB"
##  [285] "ABHD14A-ACY1"  "SLC37A3"       "RABL6"         "HLA-DQB1"
##  [289] "CYP2C8"        "RXRB"          "ABCA2"         "NEBL"
##  [293] "DHX34"         "ASZ1"          "MSTO1"         "PTBP2"
##  [297] "GARS1"         "PDHB"          "NAGK"          "ATXN2"
##  [301] "NEU1"          "CDK11A"        "RAB7A"         "RHOC"
##  [305] "HDAC7"         "METTL26"       "LILRB2"        "SZT2"
##  [309] "BRD2"          "SSX2IP"        "AMD1"          "ABCB8"
##  [313] "SH2D6"         "SEC14L2"       "C1orf159"      "PABPC4"
```

```
##  [317] "IFFO1"          "DLG5"           "CLEC7A"         "OSBPL5"
##  [321] "GRHL1"          "TAMM41"         "CCDC24"         "GNAS"
##  [325] "PRKAG2"         "INTS3"          "CFAP91"         "LRSAM1"
##  [329] "JMJD7-PLA2G4B" "NPHP3"          "ACOT8"          "DOCK8"
##  [333] "DDX3X"          "C16orf86"       "ATRX"           "ABTB1"
##  [337] "SLCO2A1"        "EYA1"           "GBP3"           "HMCN2"
##  [341] "GPR89B"         "CLK3"           "PCBP4"          "MSL3"
##  [345] "PATJ"           "PABIR3"         "ACY1"           "C2"
##  [349] "SFI1"           "PCCB"           "CTC1"           "ZFAND2B"
##  [353] "SDF4"           "DDX39B"         "KRT13"          "ALKBH6"
##  [357] "DRG2"           "STK19"          "CAMKV"          "RAD52"
##  [361] "MIB2"           "TMEM191C"       "ROBO2"          "GLB1L3"
##  [365] "CACNA2D4"       "SMARCD3"        "MEGF11"         "PFN2"
##  [369] "CCDC27"         "ASCC2"          "ATXN7L2"        "RABL2A"
##  [373] "MYO1G"          "AGBL5"          "NCF1"           "KCNT1"
##  [377] "U2AF1"          "TOR2A"          "PIGT"           "VCPKMT"
##  [381] "WDR26"          "TERT"           "GLYCTK"         "FRMD1"
##  [385] "LRP8"           "ALDH3A2"        "CCDC183"        "DPH2"
##  [389] "ST6GAL1"        "DEPDC1"         "BRAF"           "UGP2"
##  [393] "RGSL1"          "CTPS1"          "ADPGK"          "SLC35B1"
##  [397] "RACK1"          "TAF1C"          "SPATA20"        "SLC25A3"
##  [401] "CTSH"           "RPLP0"          "RNF175"         "RELT"
##  [405] "POLR3E"         "TMEM260"        "MUS81"          "MMS22L"
##  [409] "ZFAND1"         "MACF1"          "HARS1"          "RBM25"
##  [413] "TGFB1I1"        "RPAIN"          "B4GALNT1"       "DNAAF1"
##  [417] "ELAPOR1"        "RPS6KB2"        "RNH1"           "ABCC12"
##  [421] "MRPL46"         "WDR83"          "STRA6"          "DIABLO"
##  [425] "ADGRB1"         "VEZT"           "PFKM"           "MFSD8"
##  [429] "PRKAG1"         "SLCO1A2"        "NTRK1"          "SRSF5"
##  [433] "TLE3"           "MED17"          "GLOD4"          "DDX41"
##  [437] "CENATAC"        "HNF1A"          "BEST1"          "SMARCC2"
##  [441] "CLN3"           "GLG1"           "SHMT2"          "SPG7"
##  [445] "BBS1"           "CORO7"          "ALDH1L2"        "RABGGTA"
##  [449] "PARP6"          "TPM1"           "OTUD6B"         "GATB"
##  [453] "NR1I3"          "DYRK4"          "PHB2"           "SCHIP1"
##  [457] "SLX1A"          "RAB26"          "ESRP2"          "WDR97"
##  [461] "IL10RA"         "ADGRG3"         "SLC17A3"        "PHLDB1"
##  [465] "SCAMP2"         "RSL24D1"        "VPS51"          "XRRA1"
##  [469] "SFXN1"          "ACAD8"          "CSPP1"          "NMT1"
##  [473] "RCE1"           "SLC30A9"        "ULK3"           "MLST8"
##  [477] "GSDMB"          "SH3TC1"         "ARHGEF9"        "ZFR"
##  [481] "GDPD5"          "IPO4"           "RHOT2"          "COPG1"
##  [485] "GLYATL1"        "CLN6"           "NDUFV1"         "MOK"
##  [489] "CARD8"          "RGL3"           "PIDD1"          "CC2D2A"
##  [493] "IDH3A"          "UCHL1"          "SH3BP2"         "HMBS"
##  [497] "FANCA"          "HEXA"           "SORD"           "MRPS22"
##  [501] "PPT1"           "FOXRED1"        "TMEM116"        "PPP4C"
##  [505] "MAP3K12"        "CYP2F1"         "CCS"            "RNASEK"
##  [509] "DIS3L"          "RPL13"          "GTF2H2"         "TBC1D10C"
##  [513] "LRRC49"         "TM7SF2"         "NPEPPS"         "CLK4"
##  [517] "GLA"            "SULT1A1"        "POLG"           "OS9"
##  [521] "ADSS1"          "USP6"           "TRAPPC4"        "HNRNPD"
##  [525] "GALT"           "WDR90"          "PARP8"          "RPL18"
##  [529] "BFAR"           "PSTPIP1"        "ACAD9"          "CES4A"
```

```
##  [533] "B4GALT7"      "SLC38A9"      "INO80E"       "DCTN2"
##  [537] "C1orf141"     "FUS"          "IFT172"       "VPS28"
##  [541] "STARD9"       "CDK2AP2"      "PABPC1"       "ANXA2"
##  [545] "ERAP2"        "MAPKBP1"      "CCNDBP1"      "ITGB2"
##  [549] "CDK10"        "MMP19"        "NAALAD2"      "RPS2"
##  [553] "CIAO3"        "SLC9A5"       "COMMD4"       "HNRNPH1"
##  [557] "P2RX4"        "CENPT"        "MTUS1"        "ZAN"
##  [561] "LETM2"        "CYP4F12"      "EPS8L2"       "CDAN1"
##  [565] "CARS1"        "GSTP1"        "TIAL1"        "GALNT10"
##  [569] "LTA4H"        "OXLD1"        "PKD1"         "ANAPC5"
##  [573] "C2CD5"        "UBAP1L"       "COQ6"         "SLC15A3"
##  [577] "ZXDC"         "VPS13B"       "GABRG2"       "IQCK"
##  [581] "ELP1"         "FAXDC2"       "TRIM41"       "NFASC"
##  [585] "NOX5"         "PTPN21"       "MAEA"         "IFT122"
##  [589] "MTFMT"        "KLHDC4"       "FIP1L1"       "CEP120"
##  [593] "TMEM106C"     "AQP7"         "NUP54"        "DENND3"
##  [597] "ATXN2L"       "GAS8"         "MTHFD1"       "SYNE2"
##  [601] "TEP1"         "MINK1"        "OGFOD2"       "RIC8A"
##  [605] "DOC2A"        "VIRMA"        "ADCY4"        "ITGA3"
##  [609] "ZNF276"       "ARHGAP6"      "DNHD1"        "MAN1B1"
##  [613] "CCDC189"      "DDX5"         "ABCC8"        "RCHY1"
##  [617] "ABHD16A"      "NAGPA"        "GALNS"        "CUL9"
##  [621] "IRF9"         "GRSF1"        "DGKZ"         "NAA25"
##  [625] "ZZEF1"        "NUDCD1"       "CDK18"        "PHF21A"
##  [629] "SKP2"         "FCSK"         "FGFR1"        "ABCE1"
##  [633] "ARFGAP2"      "GSTZ1"        "NAA40"        "MTMR10"
##  [637] "ACSM1"        "CNTROB"       "NEK9"         "INTS11"
##  [641] "SPEF2"        "TMC2"         "CTU2"         "RELA"
##  [645] "NDST4"        "NSMCE1"       "MYEF2"        "DNAH10"
##  [649] "METTL3"       "SLTM"         "RPL8"         "PSMA3"
##  [653] "RDH11"        "RAPGEF3"      "WDR19"        "CPNE6"
##  [657] "SLC47A2"      "RPAP1"        "SAAL1"        "DOCK2"
##  [661] "CNOT2"        "ZFYVE26"      "VPS33B"       "MAN2A2"
##  [665] "REEP5"        "NDRG2"        "ARFIP2"       "TATDN1"
##  [669] "SH3GL3"       "DHRS1"        "KDM2B"        "TNFRSF12A"
##  [673] "ANKRD33"      "GPAA1"        "FAN1"         "IBTK"
##  [677] "PDE1B"        "CTSB"         "TRAPPC6B"     "AVIL"
##  [681] "CCDC38"       "BCKDK"        "DENND4C"      "TMEM175"
##  [685] "RAD50"        "RIN1"         "EIF3E"        "CIITA"
##  [689] "CDK4"         "NCAM1"        "DHODH"        "SEPTIN1"
##  [693] "EIF2B5"       "TRIO"         "IFT43"        "NADSYN1"
##  [697] "SGSH"         "FHOD1"        "AP2A2"        "PPOX"
##  [701] "ANGPTL4"      "MTHFR"        "ERCC3"        "PNKP"
##  [705] "ASAH1"        "SGCE"         "DENND1C"      "ATP6AP2"
##  [709] "KIFBP"        "PIH1D1"       "LRRC37B"      "ST3GAL5"
##  [713] "GGA3"         "RMC1"         "ADAM17"       "COPA"
##  [717] "SMARCE1"      "PHGDH"        "TBCE"         "HDAC8"
##  [721] "LIAS"         "CCDC88A"      "KCNMA1"       "DNMT1"
##  [725] "CHD4"         "EIF4A1"       "EZH1"         "PIGN"
##  [729] "CEP78"        "TCF4"         "HNRNPUL1"     "HEATR9"
##  [733] "GIT1"         "DPH1"         "RTTN"         "KDM5B"
##  [737] "ATG4D"        "CNOT3"        "SAFB"         "MLLT10"
##  [741] "HERC2"        "NOMO3"        "GIPC1"        "RTN2"
##  [745] "WDR27"        "TRIM8"        "SCARB2"       "DOCK7"
```

```
##  [749] "ANKS3"         "HADHA"         "CACNB4"        "GATD3A"
##  [753] "KLK4"          "CD55"          "CARD14"        "MED13L"
##  [757] "HEATR6"        "CNTN2"         "CIRBP"         "PCSK4"
##  [761] "FLT3LG"        "CARM1"         "ACSL6"         "SCN1A"
##  [765] "ACADVL"        "PIGA"          "CBWD1"         "SYMPK"
##  [769] "CSNK2A1"       "ARID1B"        "PDE4C"         "EHMT1"
##  [773] "TSC1"          "DDX49"         "CACNA1D"       "AKAP8L"
##  [777] "TRPV1"         "CDK5RAP3"      "SAMHD1"        "DNAJC7"
##  [781] "TBK1"          "GNAO1"         "STXBP2"        "FKTN"
##  [785] "PLXDC1"        "THOC1"         "TOP3A"         "TRPM4"
##  [789] "HM13"          "KIAA0586"      "GPS1"          "SMARCB1"
##  [793] "TAZ"           "U2AF1L4"       "MANBA"         "CLCN2"
##  [797] "PRPS1"         "CYP3A5"        "SUCLA2"        "ZNF213"
##  [801] "RHPN2"         "HSPH1"         "VPS4B"         "RMND1"
##  [805] "RAB15"         "STAT6"         "RANBP3"        "TSEN54"
##  [809] "MYT1L"         "HDAC6"         "KLK15"         "LLGL2"
##  [813] "STING1"        "SMARCA4"       "DHX57"         "TACC3"
##  [817] "CDC37"         "PSMC5"         "HEXD"          "HSD11B1L"
##  [821] "GFAP"          "VPS13D"        "SLC2A1"        "EPHB6"
##  [825] "TNFRSF13B"     "EPOR"          "FCGRT"         "CCDC120"
##  [829] "NRG1"          "ATP9B"         "RORC"          "CTNNB1"
##  [833] "POLD1"         "AP5Z1"         "WNK4"          "FLOT2"
##  [837] "PSG11"         "KLK2"          "ATP5F1A"       "PSMC3IP"
##  [841] "ENOSF1"        "KLK1"          "CC2D1A"        "SLC1A7"
##  [845] "ARHGAP21"      "EFHC1"         "KIAA0100"      "CYP4F2"
##  [849] "DHPS"          "COQ8B"         "EML2"          "TMEM259"
##  [853] "DPY19L3"       "NPRL3"         "PGAP3"         "CSF3"
##  [857] "CYBC1"         "ADAR"          "NIBAN3"        "DNAJA3"
##  [861] "MOGS"          "WRN"           "DMPK"          "ISYNA1"
##  [865] "PAX6"          "USE1"          "FRMPD2"        "GSS"
##  [869] "OSBPL7"        "MALT1"         "HECTD4"        "DYNC1H1"
##  [873] "MYO19"         "SCN2A"         "NAPA"          "DDX52"
##  [877] "IZUMO1"        "STARD3"        "SF3B1"         "TPP1"
##  [881] "CTSA"          "STAT2"         "ATP7B"         "MYO15A"
##  [885] "GCDH"          "GRM4"          "ADSL"          "SLC1A2"
##  [889] "HADH"          "PTBP1"         "ZNF317"        "NOL11"
##  [893] "GABRA1"        "ALDH16A1"      "KCNN4"         "POLR1C"
##  [897] "MKNK2"         "CD22"          "GSTT4"         "LIN37"
##  [901] "DNM1"          "EIF3F"         "KCNQ3"         "CLN5"
##  [905] "AP2A1"         "ALDH3B1"       "SLC27A1"       "NSMAF"
##  [909] "PLEKHH3"       "TIMM50"        "HNRNPU"        "HSPA9"
##  [913] "CNKSR2"        "CTCF"          "TEKT1"         "U2AF1L5"
##  [917] "CAMTA2"        "SLC7A10"       "FARSA"         "GALK1"
##  [921] "LONP1"         "SPTBN4"        "ARMH1"         "STRADA"
##  [925] "CPT1C"         "RGR"           "ERBB2"         "KCP"
##  [929] "DDB2"          "ICAM3"         "NAT9"          "AP3B2"
##  [933] "FIG4"          "TWF2"          "MTMR2"         "RIPK1"
##  [937] "CIT"           "CEP104"        "TRIM2"         "NDUFS2"
##  [941] "IMPDH2"        "MKRN2"         "JAK1"          "LMNA"
##  [945] "CTSF"          "LAMB1"         "NPM1"          "CEP41"
##  [949] "PSEN2"         "UNC45A"        "CAPZB"         "CEP290"
##  [953] "PARP1"         "MARK3"         "SYNE1"         "CTSL"
##  [957] "AARS1"         "ADGRL2"        "OBSCN"         "GBF1"
##  [961] "COPB2"         "STAT3"         "PTGES2"        "TFG"
```

```
##  [965] "CTSC"          "PITRM1"        "NCL"           "MARK1"
##  [969] "PCSK6"         "SERPING1"      "HSPD1"         "BRPF1"
##  [973] "IGF2R"         "DDX1"          "ACO2"          "TNNT2"
##  [977] "G3BP2"         "CAPN3"         "G3BP1"         "SYNCRIP"
##  [981] "LARS1"         "HNRNPA2B1"     "MYH11"         "CTSK"
##  [985] "CAST"          "ADAMTS1"       "RPL19"         "HGS"
##  [989] "TNK2"          "NONO"          "XKR8"          "ASL"
##  [993] "GPSM2"         "HSPA12A"       "BAG6"          "HEY1"
##  [997] "KCNAB2"        "CHMP1A"        "SRP54"         "SGTA"
## [1001] "MYO6"          "PLAT"          "PAFAH1B1"      "GMPPB"
## [1005] "MFN2"          "CCHCR1"        "EPC1"          "EML6"
## [1009] "VCP"           "KIF5C"         "PPIG"          "PIK3CA"
## [1013] "KDM6A"         "EEF1A2"        "MARK2"         "TERF1"
## [1017] "ITGB1"         "CSNK2B"        "DDHD1"         "CAMK2A"
## [1021] "EFCAB14"       "GATM"          "ODAD1"         "ACP2"
## [1025] "MYO7A"         "PSMC2"
```

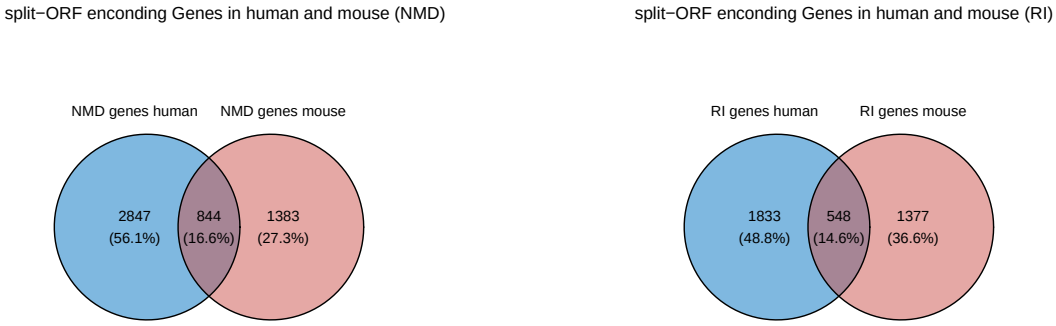
And the overlaping mouse genes:

```
##   [1] "Srpk1"         "Srsf6"         "Pfdn5"         "Ttyh1"
##   [5] "Vldlr"         "Slc4a3"        "Arfip2"        "Zdhhc3"
##   [9] "Becn1"         "Tmem241"       "Ptbp1"         "Dhx33"
##  [13] "Slit2"         "Ulk4"          "Chid1"         "Sf1"
##  [17] "Rpl12"         "Gtpbp3"        "Tyw5"          "Tmem44"
##  [21] "Pofut1"        "Meis1"         "Phykpl"        "Fance"
##  [25] "Aasdh"         "D230025D16Rik" "Tial1"         "Ptgr2"
##  [29] "Ikbkb"         "Map4k2"        "Cit"           "Hdac5"
##  [33] "Pnkp"          "Arid3b"        "Mical1"        "Idh2"
##  [37] "Mpdu1"         "Sdccag8"       "Clk4"          "Pld5"
##  [41] "Dtx2"          "Ankrd42"       "Tia1"          "Tfe3"
##  [45] "Uspl1"         "Pde10a"        "Ankrd24"       "Dock7"
##  [49] "Htra2"         "Tesc"          "Pcdh15"        "Slc25a22"
##  [53] "Abcc1"         "Bcas2"         "Camk2d"        "Pidd1"
##  [57] "Ccnl1"         "Slc35c2"       "Rpl10a"        "Mtmr11"
##  [61] "Tsc1"          "Eml1"          "Ankrd16"       "Mrps11"
##  [65] "Tcirg1"        "Prpf39"        "Matk"          "Rasgrp2"
##  [69] "Cul7"          "Piezo1"        "Mus81"         "Gtf2h2"
##  [73] "Agbl3"         "Dph7"          "Mindy3"        "C2cd3"
##  [77] "Dgkq"          "Nol9"          "Dhodh"         "Nhlrc3"
##  [81] "Mboat7"        "Manba"         "Osgepl1"       "Mmp12"
##  [85] "Nfrkb"         "Cdk5rap3"      "Polg"          "Zfp523"
##  [89] "Sfi1"          "Clk2"          "Mthfsd"        "Eif4a2"
##  [93] "Guf1"          "Pcsk4"         "Rnf207"        "Tarbp2"
##  [97] "Arhgap4"       "Prpf38b"       "Chka"          "Mtmr2"
## [101] "Sccpdh"        "Uckl1"         "Tmem67"        "Nfxl1"
## [105] "Spic"          "Clcn2"         "Nr1i3"         "Cdc7"
## [109] "Carm1"         "Vwa5b2"        "Piezo2"        "Dlx1"
## [113] "Jmjd8"         "Stx1a"         "Rptor"         "Arhgap6"
## [117] "Ddx39a"        "Brat1"         "Ing3"          "Uqcc1"
## [121] "Ift122"        "Ap4m1"         "Sez6"          "Atp2b2"
## [125] "Per3"          "Dnajc8"        "Donson"        "Hps5"
## [129] "Napb"          "Dcaf11"        "Ilk"           "Coq6"
## [133] "Plcg1"         "Rhpn1"         "Afap1l1"       "Iqck"
```

```
## [137] "Ubfd1"         "Cpne1"         "Dnajc11"       "Zfp326"
## [141] "Fastk"         "Spns1"         "Lrrc49"        "Parl"
## [145] "Tm9sf1"        "Clk1"          "Uimc1"         "Taf1c"
## [149] "Brd2"          "Cyb5rl"        "Prss44"        "Ankrd54"
## [153] "Hipk1"         "Lrrc45"        "Pstk"          "Rab4b"
## [157] "Foxred1"       "Chrd"          "Ebf4"          "Sympk"
## [161] "Zfp688"        "Luc7l"         "Pisd"          "Eme2"
## [165] "Nop56"         "Iffo1"         "Trnau1ap"      "Ehmt2"
## [169] "Med24"         "Acer3"         "Rasal3"        "Tmem82"
## [173] "Dmpk"          "Ahcyl1"        "Lmf1"          "Usp21"
## [177] "Sema6c"        "Wdr91"         "Nt5c1b"        "St7"
## [181] "Dguok"         "Gria3"         "Rcn2"          "Ctu2"
## [185] "Large2"        "Pigt"          "Tbc1d17"       "Nrip2"
## [189] "Sat1"          "Rnf167"        "Lrrc14"        "Rhbdd2"
## [193] "Plcd4"         "Trpm5"         "Rhbdf1"        "Zfp687"
## [197] "Jmjd4"         "Ankzf1"        "Ank3"          "Gpc2"
## [201] "Polq"          "Slc6a20b"      "Tubgcp6"       "Serbp1"
## [205] "Uba7"          "Mutyh"         "Stk16"         "Fes"
## [209] "Tars2"         "Sharpin"       "Nemp2"         "Dclre1a"
## [213] "Cpsf4"         "Tor2a"         "Gipr"          "Usp7"
## [217] "Arfrp1"        "Lmo7"          "Ppp1r9a"       "Emc8"
## [221] "Ibtk"          "Xpnpep3"       "Msh5"          "Tubgcp3"
## [225] "Fkbp14"        "Fam133b"       "Mdm2"          "Rbm5"
## [229] "Vmn2r10"       "Dop1a"         "Ccdc150"       "Arpp21"
## [233] "Slc2a8"        "Abcc10"        "Birc6"         "Rapgef3"
## [237] "Gramd1a"       "Kif14"         "Fn1"           "Gusb"
## [241] "Ncoa4"         "Qars"          "Evi5l"         "Mettl17"
## [245] "Tgfb1i1"       "Slc30a9"       "Adamts10"      "Hacl1"
## [249] "Aftph"         "Adck5"         "Ppat"          "Catsperg2"
## [253] "Alox5"         "Armc2"         "Abhd12b"       "Ptcd3"
## [257] "Rit1"          "Rrnad1"        "Traf3ip3"      "Ipo7"
## [261] "C2cd5"         "Opa1"          "Hddc2"         "Zfp263"
## [265] "Dph2"          "Trip12"        "Plaur"         "Traf7"
## [269] "Smox"          "Slc25a40"      "Gtf2ird1"      "Dis3l2"
## [273] "Slc25a37"      "Nbeal1"        "Pfkfb4"        "Mr1"
## [277] "Fam227a"       "Slc26a6"       "Chtf18"        "Pear1"
## [281] "Phc1"          "Adgrb1"        "Tmem147"       "Wdr35"
## [285] "Clasrp"        "Tra2a"         "Col27a1"       "Snx17"
## [289] "Pif1"          "Ankrd13c"      "Tbce"          "L3mbtl2"
## [293] "Ms4a6b"        "Rps13"         "Hyou1"         "Parp6"
## [297] "Exosc9"        "Eef1aknmt"     "Fuz"           "Exog"
## [301] "Kdm5d"         "Pigk"          "Gria2"         "Nob1"
## [305] "Sike1"         "Relb"          "Rpgrip1"       "Fam71e1"
## [309] "Mccc1"         "Tubgcp5"       "Farsa"         "Rusc2"
## [313] "Tcf12"         "Arhgef4"       "Aup1"          "Mmp16"
## [317] "Gbp6"          "Gstk1"         "Fbxw17"        "Ccdc163"
## [321] "Catsperg1"     "Meis3"         "Cacna1f"       "Plekhg4"
## [325] "Immt"          "Bub3"          "Smpd2"         "Actr5"
## [329] "Blmh"          "Iqca1l"        "Tm7sf2"        "Hnrnpll"
## [333] "Ceacam1"       "Bscl2"         "Gpatch2"       "Slc2a3"
## [337] "Atrip"         "Psma3"         "Crtc2"         "Psmd13"
## [341] "Krit1"         "Polrmt"        "H2-T3"         "Cse1l"
## [345] "Bud23"         "Robo3"         "Celf2"         "Apbb2"
## [349] "Il17re"        "Ythdc1"        "Slc50a1"       "Dnase1"
```

```
## [353] "Vps9d1"        "Rbm38"          "Agbl5"         "Gnb4"
## [357] "Map11"         "Zbtb48"         "Uggt1"         "Vmn2r116"
## [361] "Epb41l3"       "Gfus"           "Tbc1d10c"      "Rnf31"
## [365] "Nudt13"        "Dennd6b"        "E4f1"          "Carmil3"
## [369] "Vmn2r23"       "Cdk10"          "Vmn2r120"      "Gpr137"
## [373] "Slc30a10"      "Yeats2"         "Cenpt"         "Dop1b"
## [377] "Slc22a17"      "Malt1"          "Cpsf1"         "Cep72"
## [381] "Mau2"          "Vmn2r65"        "Vmn2r76"       "Kif15"
## [385] "Capn15"        "Atad2b"         "Flt3l"         "Vmn2r67"
## [389] "Vmn2r124"      "Clcn4"          "Hspa13"        "Trpm4"
## [393] "Nfkb2"         "Lrrc73"         "Akap8"         "Abcd4"
## [397] "Parn"          "Vmn2r113"       "Acy1"          "Nckap1l"
## [401] "Tmed1"         "Ilf3"           "Anks3"         "Naa40"
## [405] "Nars"          "Ushbp1"         "Vmn2r3"        "Dis3"
## [409] "Acd"           "Gga1"           "Phf20l1"       "Gns"
## [413] "Rpl18a"        "Tecpr2"         "BC004004"      "Ccdc134"
## [417] "Tmem143"       "Rgl3"           "Cnot10"        "Npas4"
## [421] "Proz"          "Ddx11"          "Slc17a4"       "Smpd4"
## [425] "Zdhhc17"       "Coro1b"         "Dpp3"          "Vmn2r114"
## [429] "Ankrd1"        "Ssh3"           "Tfdp1"         "Adcy6"
## [433] "Vmn2r84"       "Vac14"          "Adgrg3"        "Sfxn2"
## [437] "H2-Eb1"        "Khnyn"          "Cdk20"         "Psmb9"
## [441] "Riok3"         "Zfp90"          "Pkd1"          "Slc25a28"
## [445] "Armc12"        "Irf7"           "Cfap20"        "Cuta"
## [449] "Slc44a2"       "Cep192"         "Tubgcp2"       "Mfsd7a"
## [453] "Ggt5"          "C030006K11Rik"  "Slc7a6"        "Vmn2r8"
## [457] "Trpm3"         "Casp1"          "Kifc2"         "Atl2"
## [461] "Dnajc7"        "Vps13a"         "Cyp2d9"        "Rrp1"
## [465] "Vmn2r4"        "Enkd1"          "Dock9"         "Fastkd3"
## [469] "Vmn2r79"       "Tube1"          "Klhl17"
```

Overlap between human and mouse genes



The following are the overlaping NMD genes:

```
##   [1] "FAM135A"   "ARHGEF10L" "LRRC74A"   "RNF170"    "RNF8"      "ALKBH8"
##   [7] "ST8SIA1"   "TMEM33"    "KCTD20"    "TM6SF1"    "PFDN5"     "SLC25A12"
##  [13] "SLC25A17"  "SLC25A37"  "LARS2"     "SLC6A5"    "ENGASE"    "PPP4R1"
##  [19] "VWA3A"     "RETREG2"   "AGBL3"     "SS18"      "ACER3"     "CFAP298"
```

```
##  [25] "HNRNPLL"   "ATP8A2"    "FAM126B"   "PDGFC"     "CHFR"      "MPHOSPH9"
##  [31] "RAD1"      "SH3TC2"    "FOXP1"     "CRTC2"     "VWF"       "MDM2"
##  [37] "MAPK10"    "PTDSS1"    "DCAF11"    "ANKRD11"   "PANK2"     "BSCL2"
##  [43] "TERB1"     "HDDC2"     "NSD2"      "TTLL9"     "USHBP1"    "DDX39A"
##  [49] "SLC26A6"   "SETD2"     "SCNN1A"    "MPDU1"     "DCUN1D2"   "AGL"
##  [55] "UQCC1"     "ABHD11"    "PRKN"      "SETD3"     "ESR2"      "XYLT2"
##  [61] "PLD5"      "SLC50A1"   "SLC30A10"  "DAW1"      "ICA1"      "DFFB"
##  [67] "TAF1"      "KLRD1"     "DTNB"      "RBM39"     "SLC15A4"   "NR3C2"
##  [73] "CUL2"      "RXFP1"     "SNX27"     "PBX3"      "GLI2"      "FGD2"
##  [79] "RBM38"     "N4BP2L1"   "ECHDC2"    "ERC1"      "NCSTN"     "TARS2"
##  [85] "MLXIPL"    "ST7L"      "IKBKB"     "SEPSECS"   "KANSL3"    "CUTA"
##  [91] "IL1RAP"    "FUZ"       "NT5C2"     "PTCH1"     "CASP2"     "PCDH15"
##  [97] "SHARPIN"   "NEMP2"     "HNRNPL"    "NT5C1B"    "PFKFB2"    "TCAIM"
## [103] "LETMD1"    "PAX5"      "HACL1"     "CPNE1"     "DIS3L2"    "NLRC4"
## [109] "EXOG"      "DGKA"      "RASSF1"    "ATF2"      "NDUFA10"   "AIPL1"
## [115] "ERCC8"     "FSIP2"     "FOXP2"     "CLASRP"    "RANBP17"   "DMTF1"
## [121] "SLC22A17"  "FKBP14"    "ABHD12B"   "DPAGT1"    "PHYHD1"    "TTC5"
## [127] "SLC35F5"   "CLK1"      "UEVLD"     "HAUS2"     "FAM133B"   "DEPDC5"
## [133] "SNCAIP"    "ARID5A"    "CLIP4"     "LZTR1"     "IL17RE"    "SETMAR"
## [139] "SPATA6L"   "SEPTIN5"   "MMS19"     "RNF216"    "IL31RA"    "IMMT"
## [145] "DCLK2"     "ALG3"      "LMO3"      "ATG9A"     "ARHGAP4"   "DPP8"
## [151] "SENP2"     "SLC26A3"   "PSMD13"    "COPS7B"    "SMARCAD1"  "METTL8"
## [157] "SMPD4"     "DNA2"      "ADAMTS6"   "RAB4B"     "PIAS2"     "SLC35F6"
## [163] "MST1R"     "TCTN1"     "APH1B"     "FAM76B"    "CLCN6"     "ZSCAN25"
## [169] "MTMR14"    "PBRM1"     "WDR35"     "BICD1"     "MTO1"      "TANGO2"
## [175] "THUMPD2"   "RASGRP1"   "ESCO1"     "DNMT3A"    "SLC7A6"    "RAD18"
## [181] "PLEKHG4"   "NFAT5"     "PKP4"      "CYB5RL"    "LMAN2L"    "TBL2"
## [187] "LUC7L"     "SRSF7"     "GUSB"      "HMGXB4"    "GART"      "DGUOK"
## [193] "CFL2"      "RSRC2"     "AP4M1"     "CNOT10"    "EIF4G1"    "NWD1"
## [199] "PISD"      "KLHL18"    "IGFN1"     "OSBPL9"    "RNF181"    "EIF4A2"
## [205] "DONSON"    "CHCHD3"    "BRPF3"     "CHEK2"     "TPH1"      "THOC2"
## [211] "BUD23"     "ENPP3"     "SLC4A3"    "DECR2"     "PARL"      "CHRD"
## [217] "C2CD3"     "HSF4"      "POU6F2"    "LIMK1"     "TSPAN32"   "PSMG1"
## [223] "SERPINB13" "SPOPL"     "SUMF2"     "MDFIC"     "DTX2"      "FLNA"
## [229] "ING3"      "XYLB"      "E2F6"      "TTLL3"     "XPNPEP3"   "RASGRP2"
## [235] "RHBDF1"    "KCTD10"    "FRMD5"     "SLC5A2"    "HAUS5"     "TEX35"
## [241] "AGPAT4"    "NR4A2"     "OXSR1"     "SMDT1"     "TMEM39B"   "CCDC150"
## [247] "OGG1"      "PRPF39"    "BOLL"      "MAP4K2"    "ATG16L2"   "PPIL2"
## [253] "ARPC1A"    "SLC25A40"  "CELF6"     "BBS9"      "CHTF18"    "SELENBP1"
## [259] "DDX11"     "CFAP69"    "COLEC11"   "ARMC9"     "CCNT1"     "GLS2"
## [265] "MIEF1"     "ATP13A4"   "SNX17"     "PON3"      "TARDBP"    "CTTNBP2"
## [271] "MBOAT7"    "P2RX6"     "HELB"      "GRIP2"     "CAPZA2"    "MSH5"
## [277] "TAF6"      "PIEZO1"    "UGGT1"     "QTRT1"     "ABCD4"     "NEPRO"
## [283] "MAPK14"    "ATL2"      "SFXN2"     "CCNL1"     "DCAF8"     "SON"
## [289] "ACSS2"     "ATP11A"    "PAXBP1"    "REPS1"     "PHYKPL"    "RSBN1"
## [295] "FAS"       "TTC26"     "NOP56"     "DNAI4"     "PORCN"     "TESC"
## [301] "SLC2A2"    "KCNK2"     "EZH2"      "ICMT"      "TRMT11"    "PHF20L1"
## [307] "SEC22C"    "TIA1"      "COG4"      "KPNA1"     "U2SURP"    "PGAP2"
## [313] "PFKFB3"    "RABL3"     "SF1"       "CLCN1"     "MLH1"      "TMEM222"
## [319] "SCAI"      "FANCI"     "DUSP12"    "SERINC4"   "EBF4"      "SLC37A3"
## [325] "KIF15"     "TMEM241"   "SNRPB"     "EIF2A"     "ATP2B2"    "ERCC6L2"
## [331] "ABHD18"    "ZBTB41"    "GK5"       "PTBP2"     "ARIH2"     "TTLL11"
## [337] "GABBR1"    "MUTYH"     "UBA3"      "ZFAND4"    "CREM"      "ADCY10"
## [343] "RAD51C"    "UBE3B"     "ZGRF1"     "TUBGCP2"   "SZT2"      "CD200"
```

```
## [349] "SAMD7"     "BRD2"      "MITF"      "PABPC4"    "IFFO1"     "RHBDD2"
## [355] "LUC7L2"    "GNAS"      "B4GALT2"   "SLC9C1"    "IRF7"      "DNAJC25"
## [361] "ABRAXAS1"  "NPHP3"     "ACOT8"     "FAM71F1"   "TMF1"      "PIK3CB"
## [367] "ABTB1"     "SLCO2A1"   "B4GALT4"   "ERMP1"     "HMCN2"     "ABHD10"
## [373] "ALDH7A1"   "CLASP2"    "TYW5"      "TRPC4"     "ACY1"      "DIS3"
## [379] "CCDC154"   "AKAP1"     "SFI1"      "SLC30A6"   "CTC1"      "ACP1"
## [385] "GOLGA1"    "SRPK2"     "TSC22D2"   "LY9"       "ARPP21"    "CRHR2"
## [391] "SRSF6"     "RAD52"     "SLC38A6"   "ANKUB1"    "ADAMTS18"  "CPA6"
## [397] "NFXL1"     "CCDC28B"   "CYP4B1"    "INTS7"     "ARF4"      "MYO1G"
## [403] "TTC14"     "COL4A3"    "AGBL5"     "PFKFB4"    "MIER3"     "U2AF1"
## [409] "SLC49A4"   "TOR2A"     "PIGT"      "VCPKMT"    "ABHD12"    "MED24"
## [415] "CSAD"      "WDR26"     "TERT"      "KMT5C"     "STAG1"     "DPH2"
## [421] "PDZD7"     "BMP1"      "SLC35B1"   "TAF1C"     "SLC25A3"   "NPAS4"
## [427] "CYP2R1"    "CNIH2"     "MFSD10"    "SART3"     "P4HA3"     "RELT"
## [433] "PRDM4"     "TMEM260"   "MUS81"     "MMS22L"    "DTNBP1"    "SNTG1"
## [439] "RAD51"     "SLC9B1"    "TARBP2"    "RBM25"     "TGFB1I1"   "RPAIN"
## [445] "B4GALNT1"  "VAC14"     "SLC36A4"   "ELAPOR1"   "PSMA6"     "RPS6KB2"
## [451] "ADAM18"    "TMEM161B"  "ABCC12"    "DIABLO"    "SYT9"      "FASTKD3"
## [457] "RAB35"     "ADGRB1"    "VEZT"      "SEZ6"      "HAL"       "MTHFSD"
## [463] "LIN54"     "CEP192"    "EXOSC9"    "FBXO22"    "GLOD4"     "HNF1A"
## [469] "AASDH"     "NUP107"    "ADCK5"     "GLG1"      "PDE2A"     "PRMT9"
## [475] "RIC1"      "UFSP2"     "SLC25A32"  "PKNOX1"    "MYO5C"     "SYT7"
## [481] "BBS1"      "ELOVL7"    "SSH3"      "STAU2"     "SLC25A36"  "PANK4"
## [487] "POLK"      "TMEM126A"  "MICAL3"    "CORO1C"    "MINAR1"    "PARP6"
## [493] "TPM1"      "OTUD6B"    "OPRM1"     "NR1I3"     "ASTE1"     "RNF10"
## [499] "YARS2"     "WASHC4"    "UIMC1"     "FBXW10"    "TM9SF1"    "USP33"
## [505] "IL10RA"    "ADGRG3"    "LRP5"      "GIN1"      "FBXO28"    "PSMA8"
## [511] "TEC"       "PXMP2"     "RCE1"      "SLC30A9"   "SH3TC1"    "IPO4"
## [517] "COL27A1"   "ALKBH1"    "DNASE1"    "KLHL8"     "DIO1"      "RGL3"
## [523] "PIDD1"     "ISL2"      "FAM214A"   "ALDH1L1"   "TMPRSS4"   "POLB"
## [529] "PPT1"      "FOXRED1"   "RC3H2"     "NDUFB8"    "NEK11"     "SOAT2"
## [535] "PDE4DIP"   "TOMM20L"   "GTF2H2"    "CHPT1"     "TBC1D10C"  "SERGEF"
## [541] "MMAA"      "CIAPIN1"   "NEURL4"    "LRRC49"    "TM7SF2"    "SCNN1B"
## [547] "POC1B"     "CLK4"      "POLG"      "KLHDC1"    "GABRA2"    "BCL7C"
## [553] "HNRNPD"    "PARP8"     "PHC1"      "PPM1A"     "BRSK2"     "DTWD2"
## [559] "DHX33"     "STARD9"    "CDK2AP2"   "RNF212"    "TRPC7"     "MKRN2OS"
## [565] "SLC22A1"   "NCKAP1L"   "ITGB2"     "TK2"       "CDK10"     "ARHGEF40"
## [571] "MDGA2"     "ZBTB49"    "CENPT"     "SENP1"     "TFDP1"     "DCTD"
## [577] "PAK1"      "TIAL1"     "RCOR3"     "CNOT1"     "METTL17"   "ATF1"
## [583] "CEP57"     "PKD1"      "TAPT1"     "ANAPC5"    "C2CD5"     "COQ6"
## [589] "MBD4"      "IQCK"      "KCTD9"     "PTPN21"    "PPP2R1B"   "KANSL2"
## [595] "IFT122"    "TFE3"      "KLHDC4"    "ZDHHC11"   "ENPP1"     "CDK8"
## [601] "TNFRSF8"   "DENND3"    "BCLAF1"    "MCCC1"     "MRPL13"    "TMEM68"
## [607] "SYNE2"     "TEP1"      "MTRR"      "RIC8A"     "DOC2A"     "ARHGAP6"
## [613] "ERN2"      "KDM3B"     "HAPLN3"    "DDX5"      "HNRNPDL"   "KIF27"
## [619] "LMF1"      "ABHD16A"   "CCPG1"     "HIKESHI"   "CYB561A3"  "DGKZ"
## [625] "NOX4"      "NAA25"     "PRIMPOL"   "FCSK"      "GAS2"      "RXYLT1"
## [631] "LUC7L3"    "BDP1"      "NAA40"     "MTMR10"    "IL6ST"     "ATP8A1"
## [637] "CNTROB"    "INTS11"    "BTBD10"    "TDG"       "CTU2"      "RELA"
## [643] "CASP1"     "YLPM1"     "PTPN22"    "LRRK1"     "ATG10"     "PBX4"
## [649] "TMEM231"   "METTL3"    "SLTM"      "RIPK2"     "PSMA3"     "RAPGEF3"
## [655] "RPAP1"     "METTL16"   "CMAS"      "ATP8B4"    "DOCK2"     "ASH2L"
## [661] "LRRC36"    "CNOT2"     "NEDD4"     "MAP2K3"    "VPS33B"    "MAN2A2"
## [667] "ZW10"      "GORAB"     "ARFIP2"    "TATDN1"    "SH3GL3"    "KDM2B"
```

```
## [673] "USP7"      "DAGLA"     "GPAA1"     "FAM172A"   "IBTK"      "GLMN"
## [679] "CORO1B"    "TRAPPC6B"  "ZFP90"     "PAIP1"     "AREL1"     "DYNC2H1"
## [685] "RNF41"     "INPP4B"    "DHODH"     "PPARGC1A"  "EDC3"      "NADSYN1"
## [691] "SGSH"      "DUS2"      "CDH10"     "RPTOR"     "HRAS"      "PHRF1"
## [697] "EFCAB1"    "ANGPTL4"   "SLC29A3"   "ENTPD1"    "OPA1"      "PNKP"
## [703] "DENND1C"   "BLMH"      "FGFR2"     "RAD51D"    "GGA3"      "ADAMTS10"
## [709] "ADAM17"    "ADGRV1"    "CDH8"      "TBCE"      "KCNMA1"    "TUBGCP3"
## [715] "ASPSCR1"   "CEP78"     "ALG9"      "CFTR"      "RTTN"      "EPB41L3"
## [721] "TMED1"     "FOXP3"     "DOCK7"     "ANKS3"     "SAFB2"     "SMURF2"
## [727] "TBC1D17"   "PARN"      "COL11A1"   "PCSK4"     "CARM1"     "SCN1A"
## [733] "CARMIL1"   "PIGA"      "MAP4K1"    "SYMPK"     "TSC1"      "PDE10A"
## [739] "DUSP22"    "CACNA1D"   "LGI1"      "SLC35B3"   "CDK5RAP3"  "SAMHD1"
## [745] "DNAJC7"    "TBK1"      "GNAO1"     "FKTN"      "TRPM4"     "SYT6"
## [751] "CELF2"     "PITPNA"    "FAM71E2"   "U2AF1L4"   "MANBA"     "CLCN2"
## [757] "WDR62"     "CCDC163"   "DGKH"      "SHMT1"     "STING1"    "PSMC5"
## [763] "GIPR"      "SLC2A1"    "RNF114"    "ATP9B"     "MAP2K4"    "CEP89"
## [769] "CTNNB1"    "WNK4"      "FLOT2"     "MYNN"      "AGO1"      "PARG"
## [775] "TTC27"     "SPAST"     "DHPS"      "COQ8B"     "CRLF3"     "EML2"
## [781] "GRAMD1A"   "NPRL3"     "ODF4"      "ROCK1"     "ARFRP1"    "ATCAY"
## [787] "DMPK"      "SMARCA2"   "WIZ"       "RIT2"      "MALT1"     "POU6F1"
## [793] "SCLT1"     "AKAP8"     "XKR5"      "CDC25C"    "GRM4"      "ADSL"
## [799] "BORA"      "PTBP1"     "TPCN2"     "PCGF6"     "CD22"      "PER1"
## [805] "ANK3"      "AANAT"     "SLF2"      "SAMD8"     "CBARP"     "PLEKHH3"
## [811] "TUBE1"     "CAMTA2"    "VRK3"      "SLC7A10"   "FARSA"     "LONP1"
## [817] "FECH"      "KCP"       "DOCK9"     "KCNH6"     "ATRIP"     "TBC1D24"
## [823] "PIEZO2"    "MTMR2"     "CIT"       "NDE1"      "MSH3"      "CEP41"
## [829] "UNC45A"    "OBSCN"     "NFKB1"     "B3GALNT2"  "CLCN4"     "CAPN3"
## [835] "DLG1"      "SYNCRIP"   "CEP126"    "SHANK3"    "ATP6V0A2"  "POLG2"
## [841] "ITGB1"     "DDHD1"     "ABCC1"     "MYO7A"
```

And the overlaping RI genes:

```
##   [1] "ESRP2"     "MAU2"      "SLC22A17"  "CPT1C"     "SFI1"      "PLCH2"
##   [7] "SRPK1"     "GDPD3"     "NAA40"     "PHF20L1"   "HAGHL"     "VPS16"
##  [13] "MCOLN1"    "PCSK4"     "ODF2"      "FIBP"      "GRK2"      "CENPT"
##  [19] "PKD1"      "SEPTIN7"   "DIS3L2"    "MYD88"     "EIF4A1"    "TMEM191C"
##  [25] "RBM5"      "L3MBTL1"   "HPS3"      "CRIP1"     "SYVN1"     "SCART1"
##  [31] "STAB1"     "XPO5"      "SIRT2"     "RUSC1"     "PISD"      "TKT"
##  [37] "ENTPD8"    "ILKAP"     "AP4M1"     "CFAP65"    "ARHGAP30"  "UROD"
##  [43] "PLCD4"     "IDH3B"     "CHRD"      "ZBP1"      "MSTO1"     "TMEM176A"
##  [49] "IBTK"      "EHMT2"     "DLG3"      "SH3GLB2"   "NCL"       "ACTB"
##  [55] "TAMM41"    "CLK1"      "BUD23"     "CPNE6"     "MICAL1"    "DALRD3"
##  [61] "CUL9"      "CDK20"     "ADAM15"    "TNRC6A"    "CCDC78"    "TRABD"
##  [67] "SUSD2"     "FASTK"     "NPRL2"     "CLK3"      "CFAP410"   "HDAC7"
##  [73] "RGL3"      "PPOX"      "PEAR1"     "BIRC6"     "SKIV2L"    "IL12A"
##  [79] "APEH"      "CHTF18"    "BRAT1"     "P4HTM"     "PCK1"      "ADGRL2"
##  [85] "NONO"      "PMPCB"     "ARHGEF25"  "SMARCD3"   "ING4"      "TPM3"
##  [91] "CUTA"      "ANKZF1"    "CD55"      "TAZ"       "GUSB"      "FAHD2A"
##  [97] "MAPK12"    "ATP13A1"   "BRD2"      "FAM50A"    "HPS4"      "TWF2"
## [103] "ALKBH6"    "NAA10"     "ARHGAP4"   "TOR2A"     "YEATS2"    "DPF1"
## [109] "ZFAND2B"   "RAF1"      "AUP1"      "GSTK1"     "RALGDS"    "SLC11A1"
## [115] "ADAM33"    "YDJC"      "GRIA2"     "TTC21A"    "SLC27A3"   "MAN2B1"
## [121] "USP11"     "MAP4K2"    "L3MBTL2"   "DNAJC2"    "SYT8"      "GAPDH"
```

```
## [127] "SYNE1"     "HDAC10"    "RHBDF1"    "GPC2"      "NSUN5"     "CCDC150"
## [133] "STARD3NL"  "RAB24"     "AP5Z1"     "CCNL1"     "CDK10"     "FGFR1"
## [139] "TIAL1"     "KDM5D"     "GDI1"      "TBCE"      "WDR91"     "WIPI2"
## [145] "DST"       "VILL"      "PICK1"     "PDHB"      "CCDC24"    "ATG4B"
## [151] "PLXNA3"    "AIFM3"     "PLOD3"     "TECPR1"    "ATG16L1"   "DVL3"
## [157] "PRPF39"    "TMEM131"   "HDAC6"     "PLEKHG5"   "MEIS1"     "NDUFS2"
## [163] "JMJD4"     "DYNC1LI1"  "NELFCD"    "ARHGEF33"  "TMEM147"   "NUP35"
## [169] "CHKB"      "RAPGEF3"   "ASZ1"      "ABCD4"     "RPS12"     "SLC20A1"
## [175] "IFFO1"     "FUS"       "SNRNP200"  "NT5C1B"    "MTMR11"    "CFAP44"
## [181] "TRIOBP"    "AAMP"      "DNAH10"    "EEF1A1"    "LRWD1"     "PGGHG"
## [187] "CAMKV"     "FN1"       "EIF4A2"    "RORC"      "POMT1"     "GBP5"
## [193] "GMPPB"     "NOC2L"     "DIP2A"     "CRIP3"     "STK16"     "TTYH1"
## [199] "RNF123"    "ARHGEF4"   "CPNE1"     "HEMK1"     "RGS11"     "BET1L"
## [205] "TRAF3IP3"  "ABCB8"     "TRPV6"     "KRI1"      "RNF207"    "SLC26A6"
## [211] "PHYKPL"    "TOGARAM2"  "RNPEPL1"   "PLEKHG3"   "PARP9"     "PCED1A"
## [217] "COL3A1"    "ZDHHC3"    "PSMD11"    "SMPD4"     "CC2D1B"    "ARHGEF16"
## [223] "TIA1"      "MEN1"      "HTRA2"     "ARHGAP6"   "PTCD3"     "EXOSC8"
## [229] "GLT8D1"    "FDPS"      "PYCR2"     "TAP1"      "SLC2A3"    "CRTC2"
## [235] "IFRD2"     "CYB5RL"    "AGBL5"     "CNTN2"     "ATXN2"     "ZBTB48"
## [241] "MAPK15"    "HAX1"      "KCNT1"     "MANBA"     "RHPN1"     "SLC9A5"
## [247] "MAN2C1"    "ADCY4"     "IKBKB"     "EML6"      "TCTN2"     "ADGRB1"
## [253] "SPSB3"     "RASA4"     "ISCA2"     "UBR5"      "WDR90"     "KIF21B"
## [259] "FANCA"     "EPS8L2"    "ARFIP2"    "CTSH"      "TAOK3"     "DGCR8"
## [265] "MXD3"      "VPS13B"    "WDR83"     "TCIRG1"    "TSPYL2"    "ROBO3"
## [271] "VPS28"     "IFT122"    "PIDD1"     "TUBGCP6"   "VWA5B2"    "PSME2"
## [277] "ANO9"      "PPP1R16A"  "LTK"       "PAN2"      "MORF4L1"   "ABCC8"
## [283] "ZFYVE26"   "ARHGAP9"   "CIAO3"     "TAF1C"     "NAE1"      "INO80E"
## [289] "OGFOD2"    "TGFB1I1"   "SEPTIN1"   "CCDC33"    "P2RX4"     "PSMA3"
## [295] "FHOD1"     "PCK2"      "HSPA8"     "POLE"      "SLC25A37"  "PITPNM1"
## [301] "CLK4"      "APBB3"     "SIRT7"     "PUSL1"     "NPEPL1"    "FADS3"
## [307] "MARK3"     "FIP1L1"    "DDX11"     "LMBR1L"    "GPT"       "RCCD1"
## [313] "PFDN5"     "COG2"      "SLC15A3"   "ACAD10"    "RUSF1"     "PAPLN"
## [319] "DHRS1"     "LMF2"      "NR1I3"     "CTSF"      "DENND6B"   "SRSF5"
## [325] "STAG3"     "CIT"       "SLC18A2"   "ERCC3"     "HIP1R"     "GFUS"
## [331] "CPM"       "RACK1"     "NUDT8"     "PPP1CA"    "IRF9"      "MOK"
## [337] "MYG1"      "DCAF11"    "AAAS"      "WDR19"     "LRRC49"    "DDX23"
## [343] "MUS81"     "CCNL2"     "NPEPPS"    "DCTN2"     "PTGR2"     "DDX47"
## [349] "ADCY6"     "RHOT2"     "C2CD5"     "COQ6"      "CHD8"      "TRIO"
## [355] "AFTPH"     "RABGGTA"   "LARGE2"    "DNAJB5"    "COPG1"     "PHB2"
## [361] "KIF22"     "CCDC14"    "CTU2"      "SAAL1"     "SNX32"     "ADGRG3"
## [367] "TLE3"      "SETDB1"    "EMSY"      "RAB26"     "TM7SF2"    "CARMIL3"
## [373] "MED13L"    "POLG"      "ALDOA"     "ZFYVE16"   "DPH2"      "ALDH6A1"
## [379] "SPG7"      "CCDC180"   "SLC30A9"   "GTF2H2"    "TRA2A"     "PSMD13"
## [385] "CEP164"    "CYC1"      "DRAP1"     "MFGE8"     "DGAT1"     "MTFMT"
## [391] "CYP11A1"   "ADPGK"     "ODAD1"     "FOXRED1"   "STAT2"     "IQCK"
## [397] "CD19"      "ILK"       "PSTPIP1"   "KLRK1"     "PKD2"      "HTT"
## [403] "TBC1D10C"  "CAPN15"    "STAT6"     "BRD9"      "MRPS11"    "ACAD9"
## [409] "ATXN7L2"   "PPIA"      "OSGEPL1"   "FBXL6"     "CERS4"     "ZXDC"
## [415] "NSMAF"     "ARHGAP32"  "BECN1"     "GBF1"      "TRMT1"     "EME2"
## [421] "STUB1"     "ARHGEF1"   "LIAS"      "CDK5RAP3"  "DMPK"      "PNKP"
## [427] "RUNDC3A"   "LAS1L"     "ACD"       "RASGRP4"   "TRIM2"     "NPC1"
## [433] "DDX49"     "USE1"      "AP3D1"     "REC8"      "TPP1"      "RMC1"
## [439] "PSMC3IP"   "ZFPL1"     "SLC25A42"  "SCFD1"     "MPDU1"     "MTMR2"
## [445] "NOP56"     "SAFB"      "LIG3"      "FAM98C"    "GCDH"      "HADH"
```

```
## [451] "DDX39A"    "TNFRSF12A" "ATR"       "ZZEF1"     "TOX4"      "CXXC1"
## [457] "ACADVL"    "CYBC1"     "SMARCB1"   "AKAP8L"    "RAP1GAP"   "PTBP1"
## [463] "RAB15"     "GSS"       "SEPTIN4"   "OSBPL7"    "PAFAH1B1"  "NIBAN3"
## [469] "NUP205"    "PARP6"     "TNK2"      "FARSA"     "POLD1"     "MSH5"
## [475] "SLC6A1"    "ISYNA1"    "ATG4D"     "CLUH"      "TMEM259"   "MAST1"
## [481] "CARM1"     "DHODH"     "PSMC4"     "DUS1L"     "DUS3L"     "SHFL"
## [487] "RASAL3"    "E4F1"      "ANKS3"     "GRB7"      "CLCN2"     "COPA"
## [493] "ARRDC2"    "THOC1"     "ALDH16A1"  "IZUMO1"    "PLEKHJ1"   "TMC4"
## [499] "IZUMO4"    "ACP2"      "PIGT"      "UBXN6"     "RHBDF2"    "DCXR"
## [505] "NUBP1"     "MALT1"     "TSC1"      "PPP2R5D"   "CAMKK1"    "CARMIL2"
## [511] "XAB2"      "EVI5L"     "MPPE1"     "DPP9"      "HDDC2"     "DOCK7"
## [517] "CEP120"    "ILF3"      "MZF1"      "SPNS1"     "ATRX"      "CORO7"
## [523] "ACY1"      "SLC27A1"   "PSMB8"     "STRN4"     "RIOK3"     "CCDC39"
## [529] "SFTPD"     "ECH1"      "ZAN"       "DNAJC7"    "FBXW7"     "PDE4C"
## [535] "GREB1L"    "CUL7"      "AIFM1"     "TRPM4"     "KIF12"     "SYMPK"
## [541] "SLC25A11"  "RANBP3"    "CNOT3"     "PLAUR"     "SPAG5"     "TEDC2"
## [547] "DVL1"      "EMG1"
```