Fig.S1

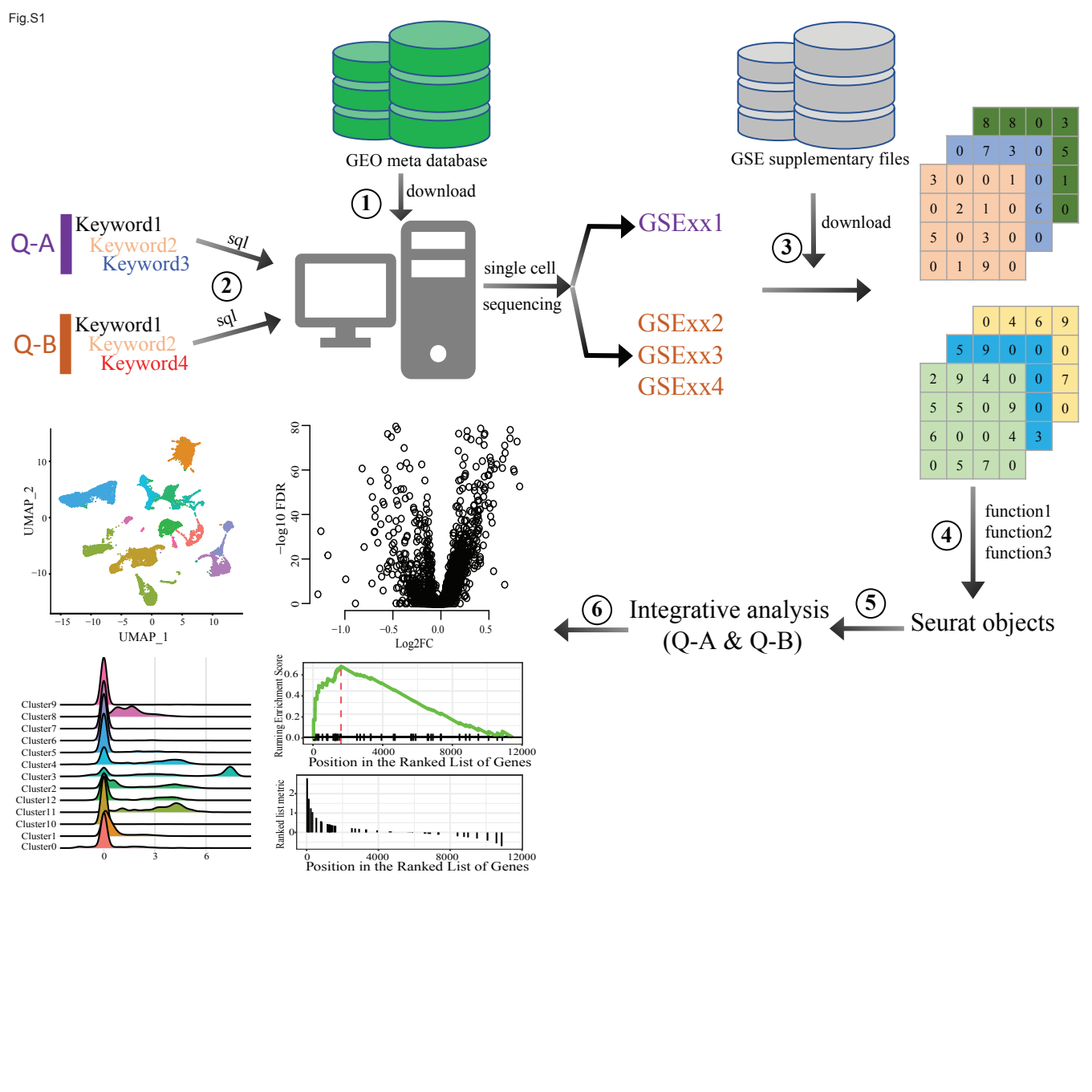

GEO meta database
download
1
GSE supplementary files
download
3
Q-A
Keyword1
Keyword2
Keyword3
sql
2
Q-B
Keyword1
Keyword2
Keyword4
sql
single cell
sequencing
GSExx1
GSExx2
GSExx3
GSExx4
function1
function2
function3
4
Seurat objects
5
Integrative analysis
(Q-A & Q-B)
6
UMAP_2
UMAP_1
−log10 FDR
Log2FC
Running Enrichment Score
Position in the Ranked List of Genes
Ranked list metric
Position in the Ranked List of Genes
Cluster9
Cluster8
Cluster7
Cluster6
Cluster5
Cluster4
Cluster3
Cluster2
Cluster12
Cluster11
Cluster10
Cluster1
Cluster0

Fig.S2

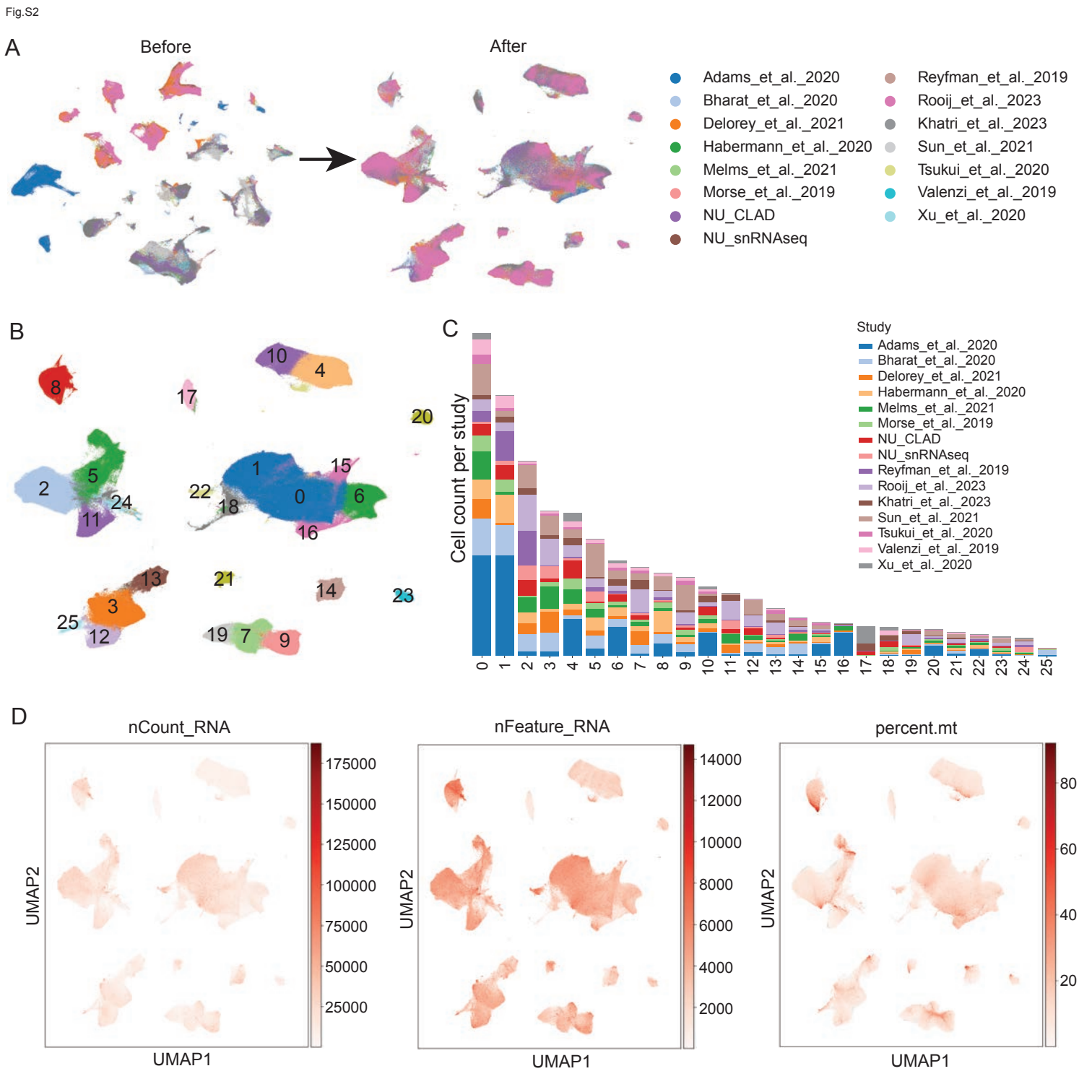

A
Before
After
Adams_et_al._2020
Bharat_et_al._2020
Delorey_et_al._2021
Habermann_et_al._2020
Melms_et_al._2021
Morse_et_al._2019
NU_CLAD
NU_snRNAseq
Reyfman_et_al._2019
Rooij_et_al._2023
Khatri_et_al._2023
Sun_et_al._2021
Tsukui_et_al._2020
Valenzi_et_al._2019
Xu_et_al._2020
B
C
Study
Cell count per study
D
nCount_RNA
nFeature_RNA
percent.mt
UMAP1
UMAP2

Fig.S3

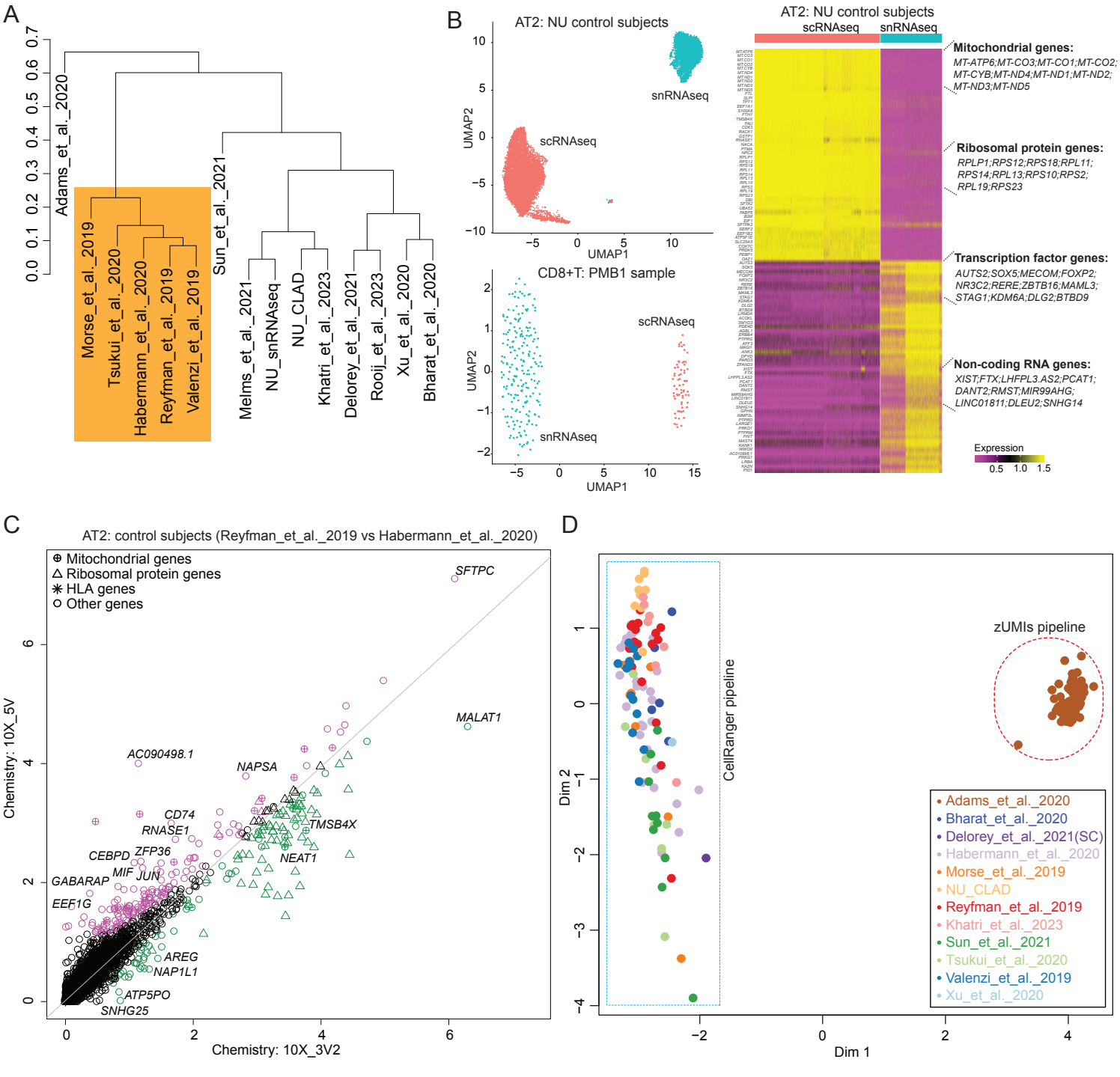

A
Adams_et_al._2020
Morse_et_al._2019
Tsukui_et_al._2020
Habermann_et_al._2020
Reyfman_et_al._2019
Valenzi_et_al._2019
Sun_et_al._2021
Melms_et_al._2021
NU_snRNAseq
NU_CLAD
Khatri_et_al._2023
Delorey_et_al._2021
Rooij_et_al._2023
Xu_et_al._2020
Bharat_et_al._2020
B
AT2: NU control subjects
scRNAseq
snRNAseq
UMAP1
UMAP2
CD8+T: PMB1 sample
AT2: NU control subjects
Mitochondrial genes:
MT-ATP6;MT-CO3;MT-CO1;MT-CO2;
MT-CYB;MT-ND4;MT-ND1;MT-ND2;
MT-ND3;MT-ND5
Ribosomal protein genes:
RPLP1;RPS12;RPS18;RPL11;
RPS14;RPL13;RPS10;RPS2;
RPL19;RPS23
Transcription factor genes:
AUTS2;SOX5;MECOM;FOXP2;
NR3C2;RERE;ZBTB16;MAML3;
STAG1;KDM6A;DLG2;BTBD9
Non-coding RNA genes:
XIST;FTX;LHFPL3.AS2;PCAT1;
DANT2;RMST;MIR99AHG;
LINC01811;DLEU2;SNHG14
Expression
C
AT2: control subjects (Reyfman_et_al._2019 vs Habermann_et_al._2020)
Mitochondrial genes
Ribosomal protein genes
HLA genes
Other genes
SFTPC
MALAT1
AC090498.1
NAPSA
CD74
RNASE1
TMSB4X
CEBPD
ZFP36
NEAT1
GABARAP
MIF
JUN
EEF1G
AREG
NAP1L1
ATP5PO
SNHG25
Chemistry: 10X_5V
Chemistry: 10X_3V2
D
zUMIs pipeline
CellRanger pipeline
Dim 1
Dim 2
Adams_et_al._2020
Bharat_et_al._2020
Delorey_et_al._2021(SC)
Habermann_et_al._2020
Morse_et_al._2019
NU_CLAD
Reyfman_et_al._2019
Khatri_et_al._2023
Sun_et_al._2021
Tsukui_et_al._2020
Valenzi_et_al._2019
Xu_et_al._2020

Fig.S4

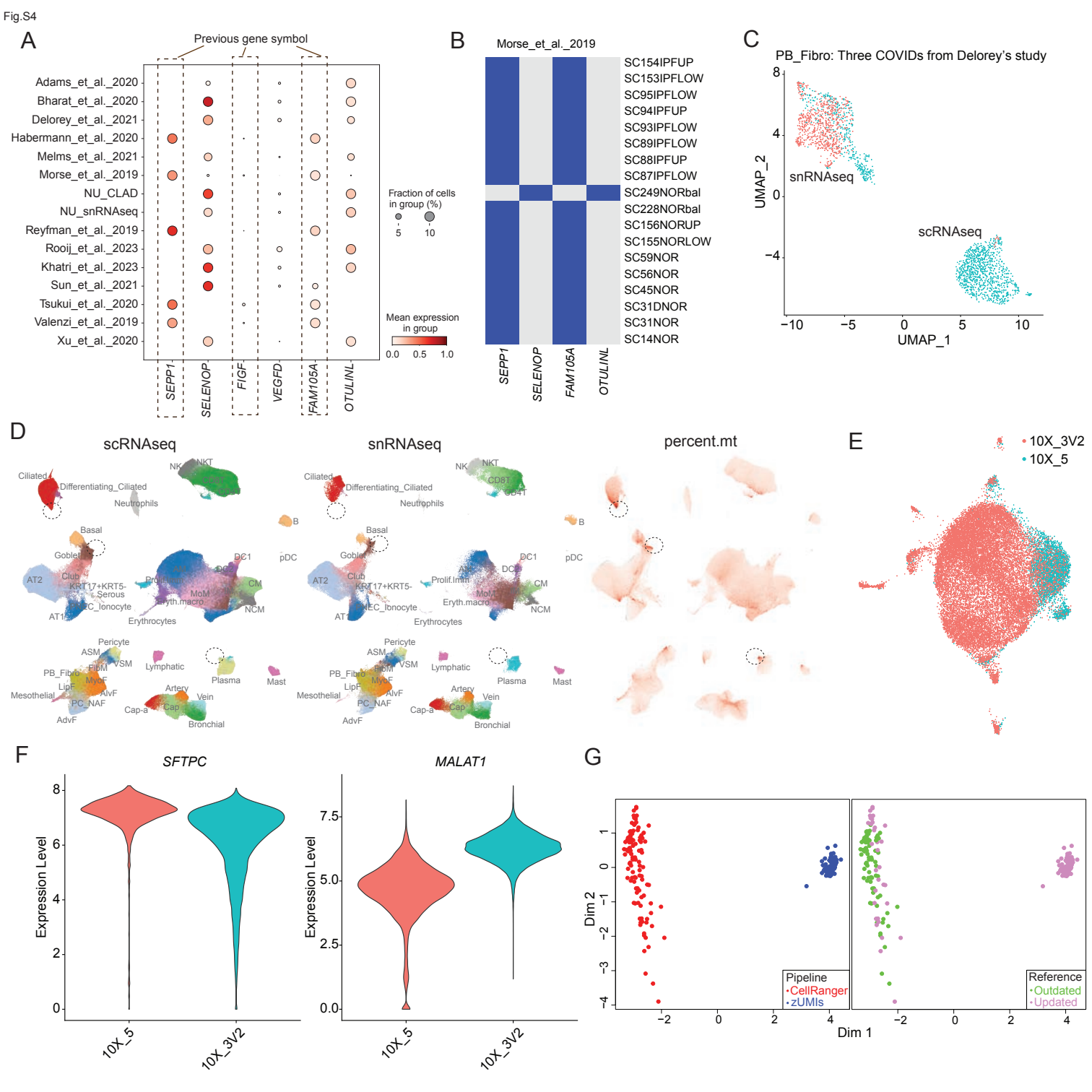

A
Previous gene symbol
Adams_et_al._2020
Bharat_et_al._2020
Delorey_et_al._2021
Habermann_et_al._2020
Melms_et_al._2021
Morse_et_al._2019
NU_CLAD
NU_snRNAseq
Reyfman_et_al._2019
Rooij_et_al._2023
Khatri_et_al._2023
Sun_et_al._2021
Tsukui_et_al._2020
Valenzi_et_al._2019
Xu_et_al._2020
SEPP1
SELENOP
FIGF
VEGFD
FAM105A
OTULINL
Fraction of cells in group (%)
5
10
Mean expression in group
0.0
0.5
1.0
B
Morse_et_al._2019
SC154IPFUP
SC153IPFLOW
SC95IPFLOW
SC94IPFUP
SC93IPFLOW
SC89IPFLOW
SC88IPFUP
SC87IPFLOW
SC249NORbal
SC228NORbal
SC156NORUP
SC155NORLOW
SC59NOR
SC56NOR
SC45NOR
SC31DNOR
SC31NOR
SC14NOR
SEPP1
SELENOP
FAM105A
OTULINL
C
PB_Fibro: Three COVIDs from Delorey's study
snRNAseq
scRNAseq
UMAP_2
UMAP_1
D
scRNAseq
snRNAseq
percent.mt
Ciliated
Differentiating_Ciliated
Neutrophils
NK
NKT
B
pDC
Basal
Goblet
AT2
Club
KRT17+KRT5-
Serous
AT1
DC_Ionocyte
Erythrocytes
DC1
Prolif.Imm
MoM
Eryth.macro
CM
NCM
Pericyte
ASM
VSM
PB_Fibro
FibM
MyoF
LipF
AlvF
Mesothelial
PC_NAF
AdvF
Lymphatic
Artery
Cap
Cap-a
Vein
Bronchial
Plasma
Mast
E
10X_3V2
10X_5
F
SFTPC
MALAT1
Expression Level
10X_5
10X_3V2
G
Dim 1
Dim 2
Pipeline
CellRanger
zUMIs
Reference
Outdated
Updated

Fig.S5

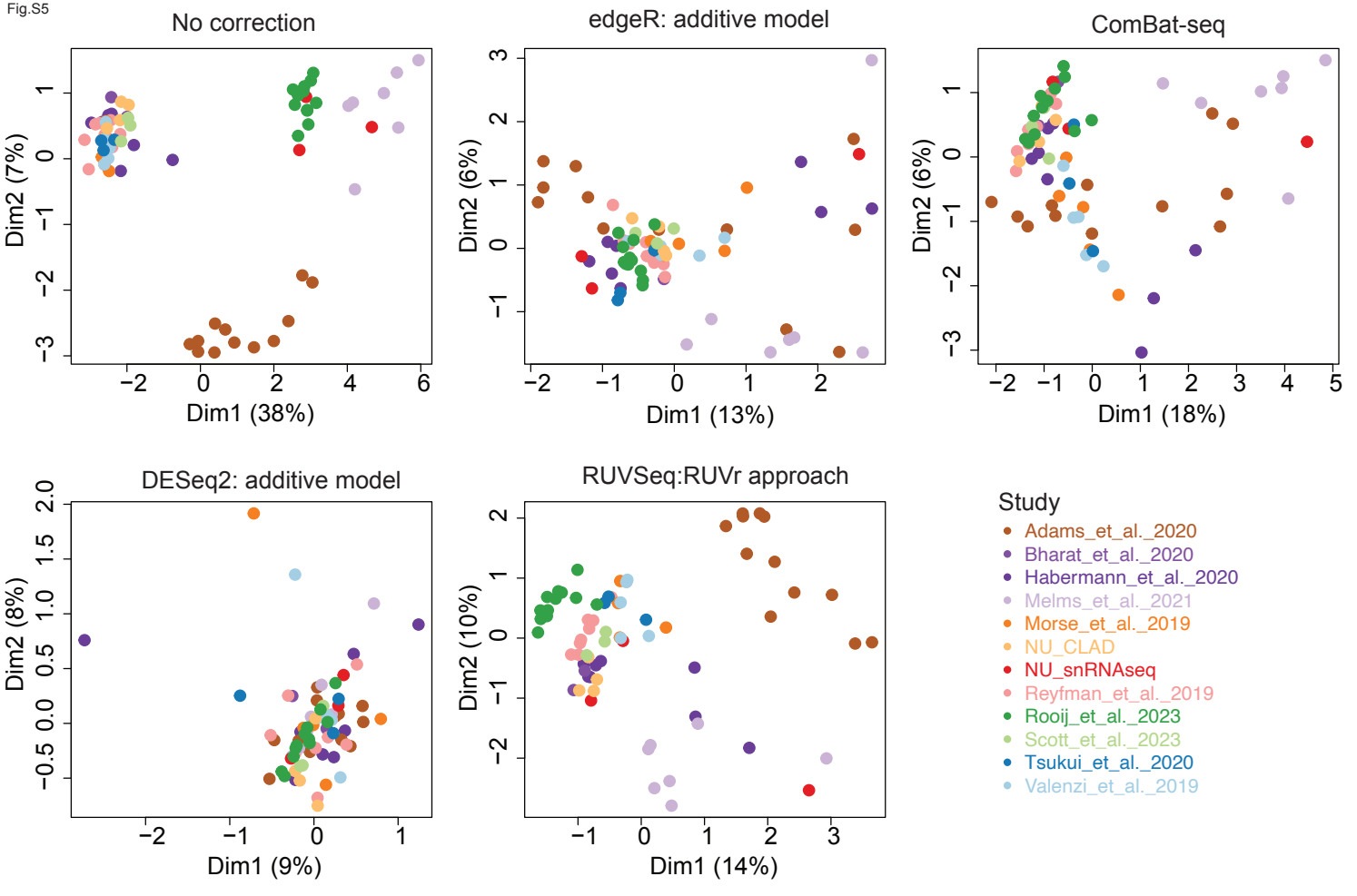
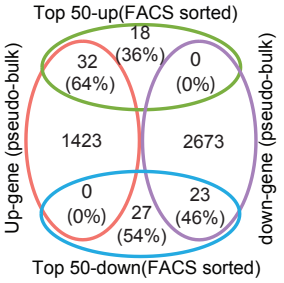
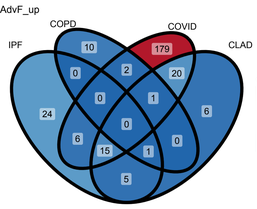
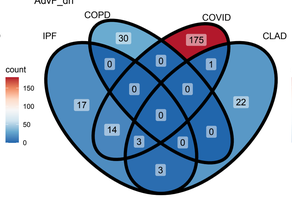

No correction
Dim2 (7%)
Dim1 (38%)
edgeR: additive model
Dim2 (6%)
Dim1 (13%)
ComBat-seq
Dim2 (6%)
Dim1 (18%)
DESeq2: additive model
Dim2 (8%)
Dim1 (9%)
RUVSeq:RUVr approach
Dim2 (10%)
Dim1 (14%)
Study
Adams_et_al._2020
Bharat_et_al._2020
Habermann_et_al._2020
Melms_et_al._2021
Morse_et_al._2019
NU_CLAD
NU_snRNAseq
Reyfman_et_al._2019
Rooij_et_al._2023
Scott_et_al._2023
Tsukui_et_al._2020
Valenzi_et_al._2019

Fig.S6


Top 50-up(FACS sorted)
18
(36%)
32
(64%)
0
(0%)
1423
2673
0
(0%)
27
(54%)
23
(46%)
Up-gene (pseudo-bulk)
down-gene (pseudo-bulk)
Top 50-down(FACS sorted)

AdvF_up


AdvF_dn


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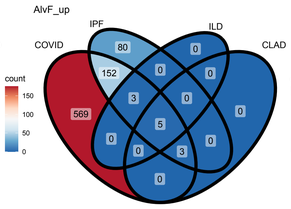

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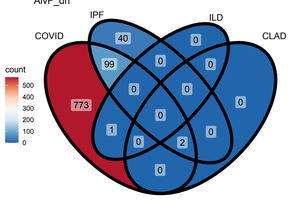

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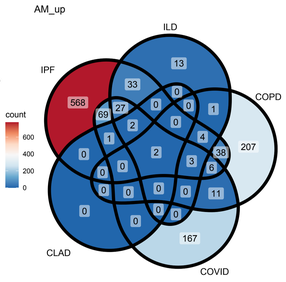

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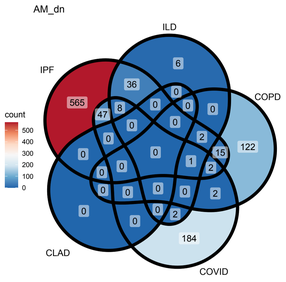
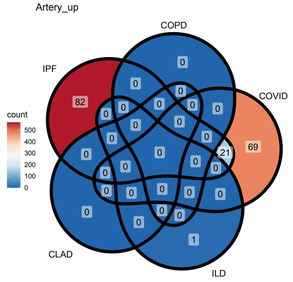
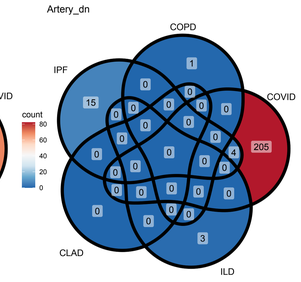


Artery_up


Artery_dn


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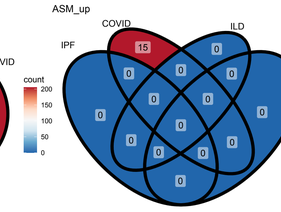

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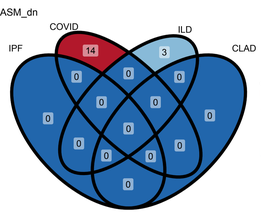

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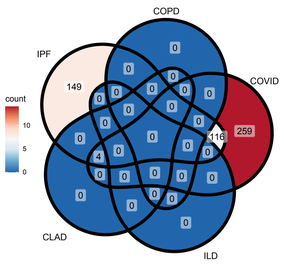

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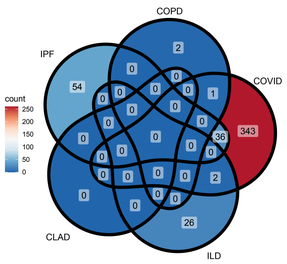

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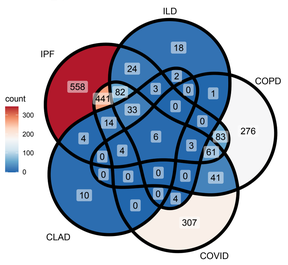

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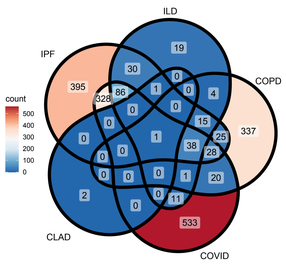

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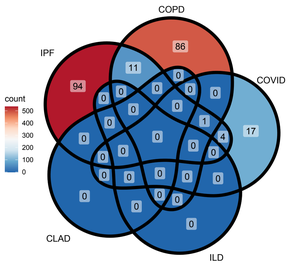
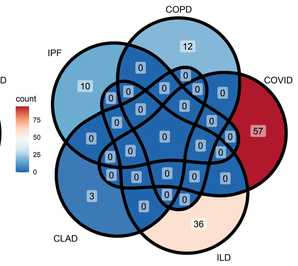


B_dn


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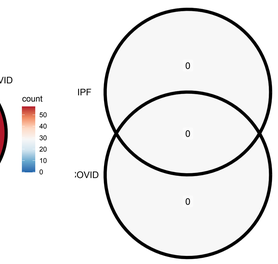

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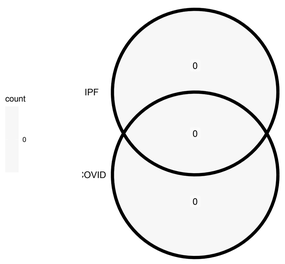

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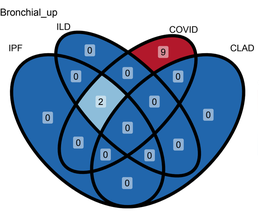

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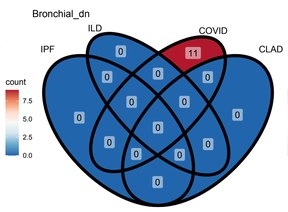
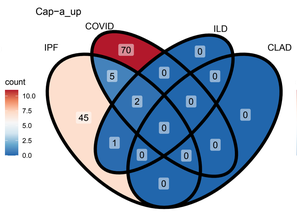
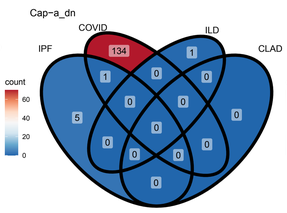


Cap−a_up


Cap−a_dn


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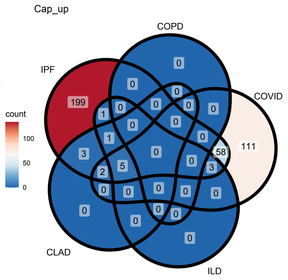
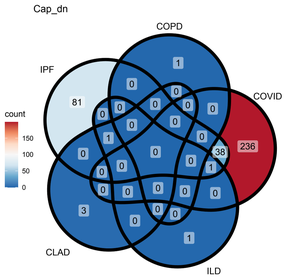


Cap_dn


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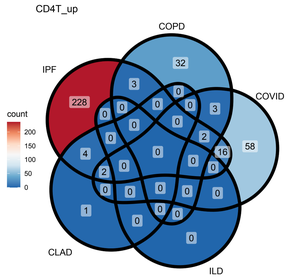

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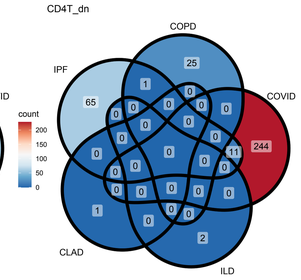

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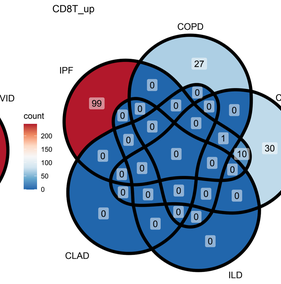

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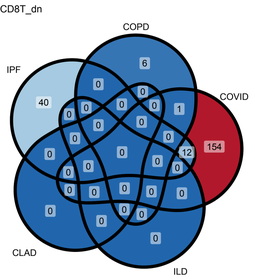
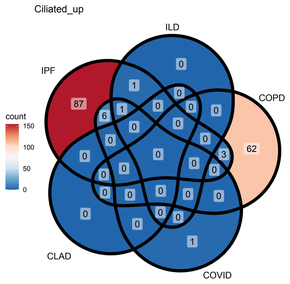


Ciliated_up


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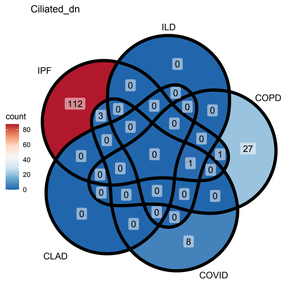
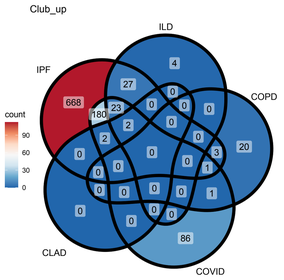
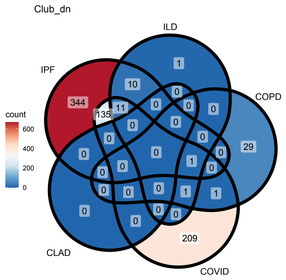


Club_up


Club_dn


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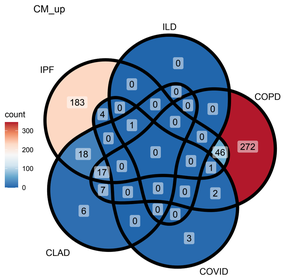
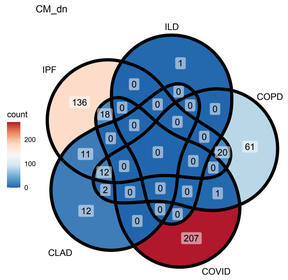
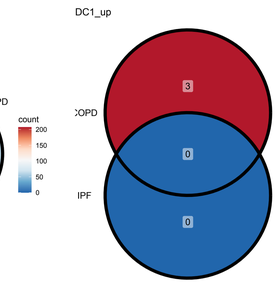
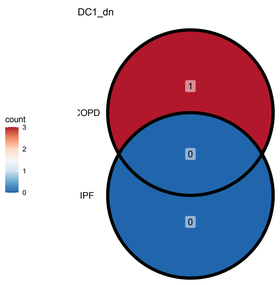
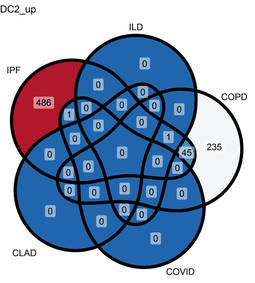
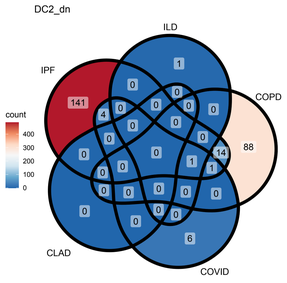


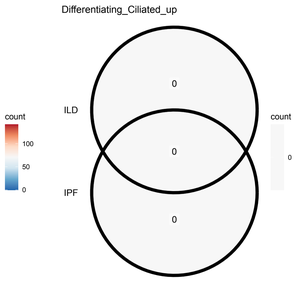
CM_dn


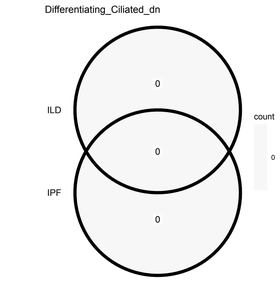
DC1_up


DC1_dn


DC2_up


DC2_dn


Differentiating_Ciliated_up


Differentiating_Ciliated_dn


Eryth.macro_up

Eryth.macro_dn

Goblet_up

Goblet_dn

IM_up

IM_dn

KRT17+KRT5−_up

KRT17+KRT5−_dn

Lymphatic_up

Lymphatic_dn

Mast_up

Mast_dn

MoM_up

MoM_dn

MyoF_up

MyoF_dn

NCM_up

NCM_dn

Neutrophils_DEG

NK_up

NK_dn

NKT_up

NKT_dn

PB_Fibro_up

PB_Fibro_dn

Pericyte_up

Pericyte_dn

Plasma_up

Plasma_dn

Prolif.IM_up

Prolif.IM_dn

Vein_up

Vein_dn

Erythrocytes_DEG

FibM_DEG

LipF_DEG

ANKRD35 in AT2 (IPF) | ASB2 in AT2 (IPF) | CAPS in AT2 (IPF) | CCNO in AT2 (IPF) | CHST9 in AT2 (IPF) | CIBAR2 in AT2 (IPF) | CTSK in AT2 (IPF) | CXCL6 in AT2 (IPF)

CYP24A1 in AT2 (IPF) | FMO2 in AT2 (IPF) | FOXC1 in AT2 (IPF) | GALNT14 in AT2 (IPF) | GPR87 in AT2 (IPF) | HCAR1 in AT2 (IPF) | HHLA2 in AT2 (IPF) | IGFBP2 in AT2 (IPF)

IGFBP6 in AT2 (IPF) | IVL in AT2 (IPF) | KCNN4 in AT2 (IPF) | KRT5 in AT2 (IPF) | MS4A8 in AT2 (IPF) | NR2F1 in AT2 (IPF) | NTF3 in AT2 (IPF) | PGF in AT2 (IPF)

PKP1 in AT2 (IPF) | PLEKHS1 in AT2 (IPF) | PROM2 in AT2 (IPF) | QPCT in AT2 (IPF) | RIIAD1 in AT2 (IPF) | SLITRK6 in AT2 (IPF) | TMEM132A in AT2 (IPF) | TRIM29 in AT2 (IPF)

VMO1 in AT2 (IPF) | ADAM19 in AT2 (COPD) | ADAMTS10 in AT2 (COPD) | ADAMTS12 in AT2 (COPD) | ADAMTS2 in AT2 (COPD) | ADCY10 in AT2 (COPD) | ADGRA2 in AT2 (COPD) | ADTRP in AT2 (COPD)

ARHGEF4 in AT2 (COPD) | ASB16 in AT2 (COPD) | AUNIP in AT2 (COPD) | BACH2 in AT2 (COPD) | BAIAP2L2 in AT2 (COPD) | BFSP1 in AT2 (COPD) | BMPER in AT2 (COPD) | BTK in AT2 (COPD)

C17orf99 in AT2 (COPD) | C19orf38 in AT2 (COPD) | C19orf47 in AT2 (COPD) | C5orf34 in AT2 (COPD) | C8orf88 in AT2 (COPD) | CA5A in AT2 (COPD) | CACNA1A in AT2 (COPD) | CACNB2 in AT2 (COPD)

CAGE1 in AT2 (COPD) | CAND2 in AT2 (COPD) | CATSPERD in AT2 (COPD) | CCDC110 in AT2 (COPD) | CCDC3 in AT2 (COPD) | CCDC62 in AT2 (COPD) | CD22 in AT2 (COPD) | CD247 in AT2 (COPD)

CD6 in AT2 (COPD)
CD70 in AT2 (COPD)
CDH23 in AT2 (COPD)
CETP in AT2 (COPD)
CFAP58 in AT2 (COPD)
CFAP74 in AT2 (COPD)
CHN2 in AT2 (COPD)
CNKSR2 in AT2 (COPD)
CNTNAP2 in AT2 (COPD)
COL8A2 in AT2 (COPD)
COLGALT2 in AT2 (COPD)
CORO2B in AT2 (COPD)
CPNE5 in AT2 (COPD)
CPS1 in AT2 (COPD)
CPT1C in AT2 (COPD)
CSPG4 in AT2 (COPD)
CTRL in AT2 (COPD)
DENND2A in AT2 (COPD)
DLGAP2 in AT2 (COPD)
DMC1 in AT2 (COPD)
DNAH3 in AT2 (COPD)
DNAH9 in AT2 (COPD)
DOK7 in AT2 (COPD)
DPY19L2 in AT2 (COPD)
DRC7 in AT2 (COPD)
DZIP1 in AT2 (COPD)
EFCAB12 in AT2 (COPD)
F10 in AT2 (COPD)
FAM222A in AT2 (COPD)
FBLN7 in AT2 (COPD)
FBXO10 in AT2 (COPD)
FBXW10B in AT2 (COPD)
FGD2 in AT2 (COPD)
FGF14 in AT2 (COPD)
FHOD3 in AT2 (COPD)
FSIP1 in AT2 (COPD)
GABRP in AT2 (COPD)
GJC1 in AT2 (COPD)
GLT1D1 in AT2 (COPD)
GRAP2 in AT2 (COPD)
GRIK4 in AT2 (COPD)
GRIN1 in AT2 (COPD)
GZMM in AT2 (COPD)
HCK in AT2 (COPD)
HIGD1B in AT2 (COPD)
HIPK4 in AT2 (COPD)
HMCN2 in AT2 (COPD)
HSD17B3 in AT2 (COPD)
HSF2BP in AT2 (COPD)
IL12RB1 in AT2 (COPD)
IL18R1 in AT2 (COPD)
IL20RB in AT2 (COPD)
IL21R in AT2 (COPD)
IL5RA in AT2 (COPD)
ILDR2 in AT2 (COPD)
ITGAL in AT2 (COPD)
ITGAM in AT2 (COPD)
ITGB2 in AT2 (COPD)
KANK3 in AT2 (COPD)
KCNMB4 in AT2 (COPD)
KCTD16 in AT2 (COPD)
KIF17 in AT2 (COPD)
KIF24 in AT2 (COPD)
KPNA7 in AT2 (COPD)
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

LMNTD1 in AT2 (COPD)
LMOD1 in AT2 (COPD)
LOXL3 in AT2 (COPD)
LPAR5 in AT2 (COPD)
LRRC43 in AT2 (COPD)
LRRC7 in AT2 (COPD)
LSMEM2 in AT2 (COPD)
MAMLD1 in AT2 (COPD)
MAP4K1 in AT2 (COPD)
MAP7D2 in AT2 (COPD)
MARCHF1 in AT2 (COPD)
MEI1 in AT2 (COPD)
MPIG6B in AT2 (COPD)
MPP4 in AT2 (COPD)
MRLN in AT2 (COPD)
MUC12 in AT2 (COPD)
MYEOV in AT2 (COPD)
MYO1H in AT2 (COPD)
MYOM1 in AT2 (COPD)
MYOZ3 in AT2 (COPD)
NFAM1 in AT2 (COPD)
NKG7 in AT2 (COPD)
NLGN4X in AT2 (COPD)
NLRC4 in AT2 (COPD)
NLRP3 in AT2 (COPD)
NPW in AT2 (COPD)
NRG2 in AT2 (COPD)
NT5M in AT2 (COPD)
NTNG1 in AT2 (COPD)
NTRK3 in AT2 (COPD)
P2RX1 in AT2 (COPD)
PALD1 in AT2 (COPD)
PALM in AT2 (COPD)
PDE1C in AT2 (COPD)
PHEX in AT2 (COPD)
PIEZO2 in AT2 (COPD)
PIWIL2 in AT2 (COPD)
PIWIL4 in AT2 (COPD)
PLB1 in AT2 (COPD)
PLCD4 in AT2 (COPD)
PLXNA4 in AT2 (COPD)
PLXNC1 in AT2 (COPD)
PPM1E in AT2 (COPD)
PPP1R36 in AT2 (COPD)
PREX1 in AT2 (COPD)
PRKCG in AT2 (COPD)
PRR19 in AT2 (COPD)
PTPRO in AT2 (COPD)
RAB26 in AT2 (COPD)
RAB3A in AT2 (COPD)
RAB44 in AT2 (COPD)
RAD51 in AT2 (COPD)
RAD51AP2 in AT2 (COPD)
RAD9B in AT2 (COPD)
RAPSN in AT2 (COPD)
RASGRP2 in AT2 (COPD)
RASGRP4 in AT2 (COPD)
RBPMS2 in AT2 (COPD)
RFTN2 in AT2 (COPD)
RGS20 in AT2 (COPD)
RGS9 in AT2 (COPD)
RIMS2 in AT2 (COPD)
RNF122 in AT2 (COPD)
RNF17 in AT2 (COPD)

Batch adjusted CPM

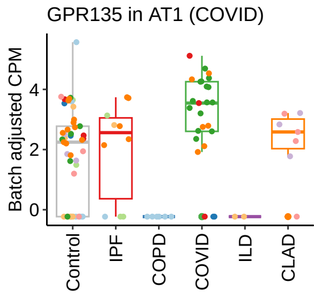
Control
IPF
ILD
COPD
COVID
CLAD

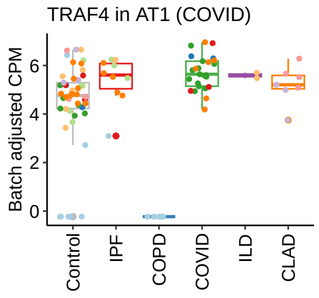
RUBCNL in AT2 (COPD)
RYR2 in AT2 (COPD)
SEPTIN4 in AT2 (COPD)
SERF1B in AT2 (COPD)
SERHL2 in AT2 (COPD)
SFRP1 in AT2 (COPD)
SGCD in AT2 (COPD)
SH2B3 in AT2 (COPD)
SHC4 in AT2 (COPD)
SKAP1 in AT2 (COPD)
SLA2 in AT2 (COPD)
SLC13A3 in AT2 (COPD)
SLC14A2 in AT2 (COPD)
SLC16A14 in AT2 (COPD)
SLC18A2 in AT2 (COPD)
SLC24A1 in AT2 (COPD)
SLC24A4 in AT2 (COPD)
SLC25A18 in AT2 (COPD)
SLC37A2 in AT2 (COPD)
SLC45A1 in AT2 (COPD)
SLC47A2 in AT2 (COPD)
SLC6A4 in AT2 (COPD)
SLC9B1 in AT2 (COPD)
SLC9C2 in AT2 (COPD)
SLCO5A1 in AT2 (COPD)
SLFN12L in AT2 (COPD)
SMPD3 in AT2 (COPD)
SPACDR in AT2 (COPD)
SPRED3 in AT2 (COPD)
ST8SIA6 in AT2 (COPD)
STOML3 in AT2 (COPD)
SVEP1 in AT2 (COPD)
SVOPL in AT2 (COPD)
SYT1 in AT2 (COPD)
SYT11 in AT2 (COPD)
TACR2 in AT2 (COPD)
TENM1 in AT2 (COPD)
TFAP2E in AT2 (COPD)
TG in AT2 (COPD)
TGM4 in AT2 (COPD)
TMPRSS7 in AT2 (COPD)
TMTC1 in AT2 (COPD)
TOX2 in AT2 (COPD)
TRAF3IP3 in AT2 (COPD)
TRHDE in AT2 (COPD)
TTLL10 in AT2 (COPD)
TUBB2B in AT2 (COPD)
UNC5C in AT2 (COPD)
UPB1 in AT2 (COPD)
USP6 in AT2 (COPD)
VIL1 in AT2 (COPD)
VWCE in AT2 (COPD)
WSCD1 in AT2 (COPD)
XYLT1 in AT2 (COPD)
ZGLP1 in AT2 (COPD)
ZNF221 in AT2 (COPD)
ZNF365 in AT2 (COPD)
ZNF385C in AT2 (COPD)
ZNF385D in AT2 (COPD)
ZNF521 in AT2 (COPD)
ZNF707 in AT2 (COPD)
ZNF724 in AT2 (COPD)
AJM1 in AT2 (COVID)
ALDH1L2 in AT2 (COVID)

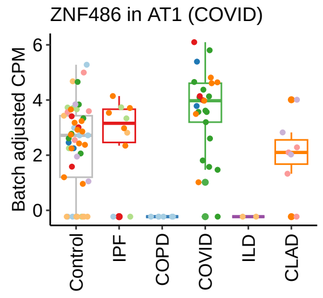
Batch adjusted CPM

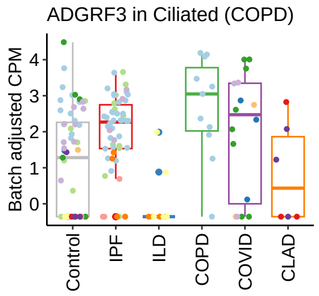
Control IPF ILD COPD COVID CLAD

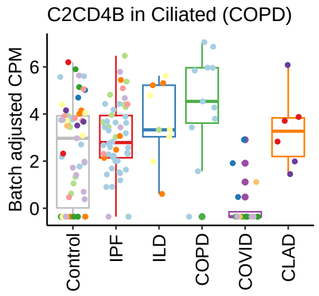
ANGPTL1 in AT2 (COVID)
ANKRD45 in AT2 (COVID)
ANLN in AT2 (COVID)
ARHGAP22 in AT2 (COVID)
ASPN in AT2 (COVID)
C17orf67 in AT2 (COVID)
CACNB3 in AT2 (COVID)
CCNA2 in AT2 (COVID)
CENPE in AT2 (COVID)
COL13A1 in AT2 (COVID)
COLEC10 in AT2 (COVID)
DENND1A in AT2 (COVID)
DRICH1 in AT2 (COVID)
E2F8 in AT2 (COVID)
EMILIN1 in AT2 (COVID)
EXO1 in AT2 (COVID)
FGF2 in AT2 (COVID)
FKBP10 in AT2 (COVID)
HJURP in AT2 (COVID)
HS3ST5 in AT2 (COVID)
IER5L in AT2 (COVID)
IGF1 in AT2 (COVID)
IQGAP3 in AT2 (COVID)
KRT80 in AT2 (COVID)
NEIL3 in AT2 (COVID)
NLGN2 in AT2 (COVID)
NYAP2 in AT2 (COVID)
OMD in AT2 (COVID)
PDZRN3 in AT2 (COVID)
PLK4 in AT2 (COVID)
POGLUT2 in AT2 (COVID)
PRR16 in AT2 (COVID)
PRRX1 in AT2 (COVID)
RIMS3 in AT2 (COVID)
SAMD9 in AT2 (COVID)
SATB2 in AT2 (COVID)
TBX5 in AT2 (COVID)
THBS2 in AT2 (COVID)
ZCCHC24 in AT2 (COVID)
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

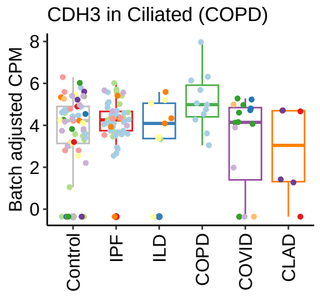

GPR135 in AT1 (COVID)
Batch adjusted CPM
0
2
4
Control
IPF
COPD
COVID
ILD
CLAD

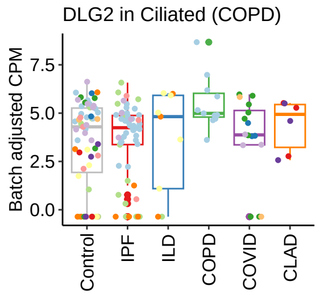

TRAF4 in AT1 (COVID)
Batch adjusted CPM
0
2
4
6
Control
IPF
COPD
COVID
ILD
CLAD

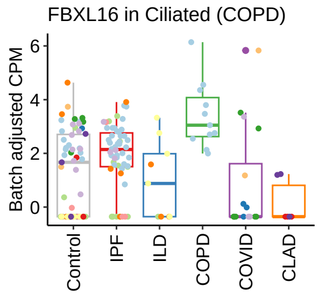

ZNF486 in AT1 (COVID)
Batch adjusted CPM
0
2
4
6
Control
IPF
COPD
COVID
ILD
CLAD

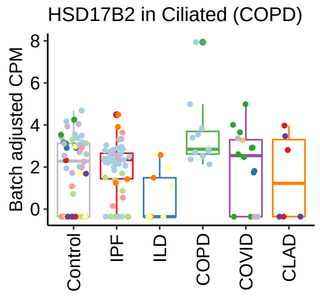

ADGRF3 in Ciliated (COPD)
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

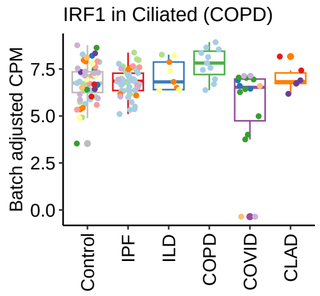

C2CD4B in Ciliated (COPD)
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

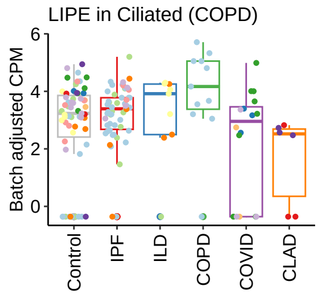

CDH3 in Ciliated (COPD)
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

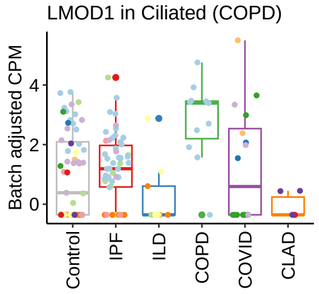

DLG2 in Ciliated (COPD)
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

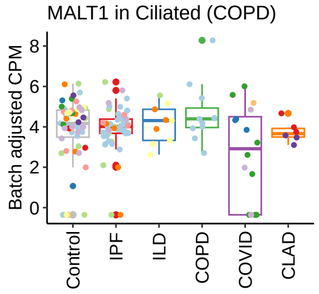

FBXL16 in Ciliated (COPD)
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

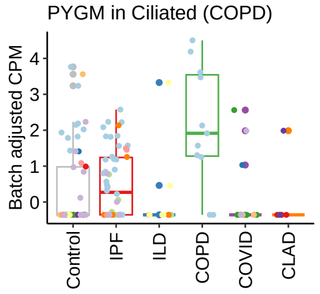

HSD17B2 in Ciliated (COPD)
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

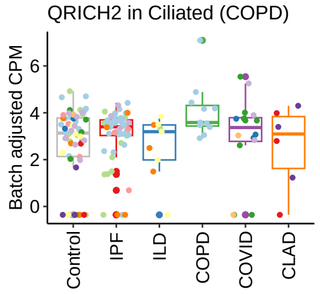

IRF1 in Ciliated (COPD)
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

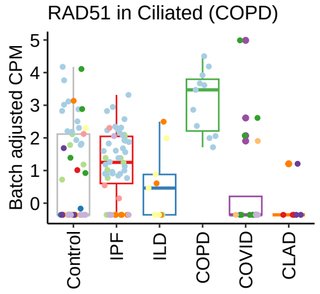

LIPE in Ciliated (COPD)
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

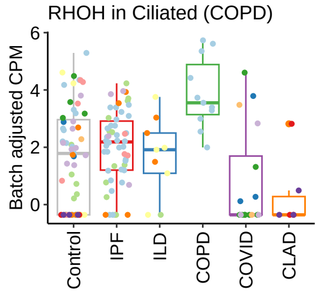

LMOD1 in Ciliated (COPD)
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

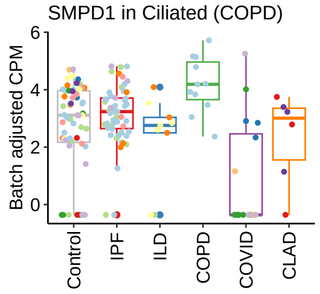

MALT1 in Ciliated (COPD)
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

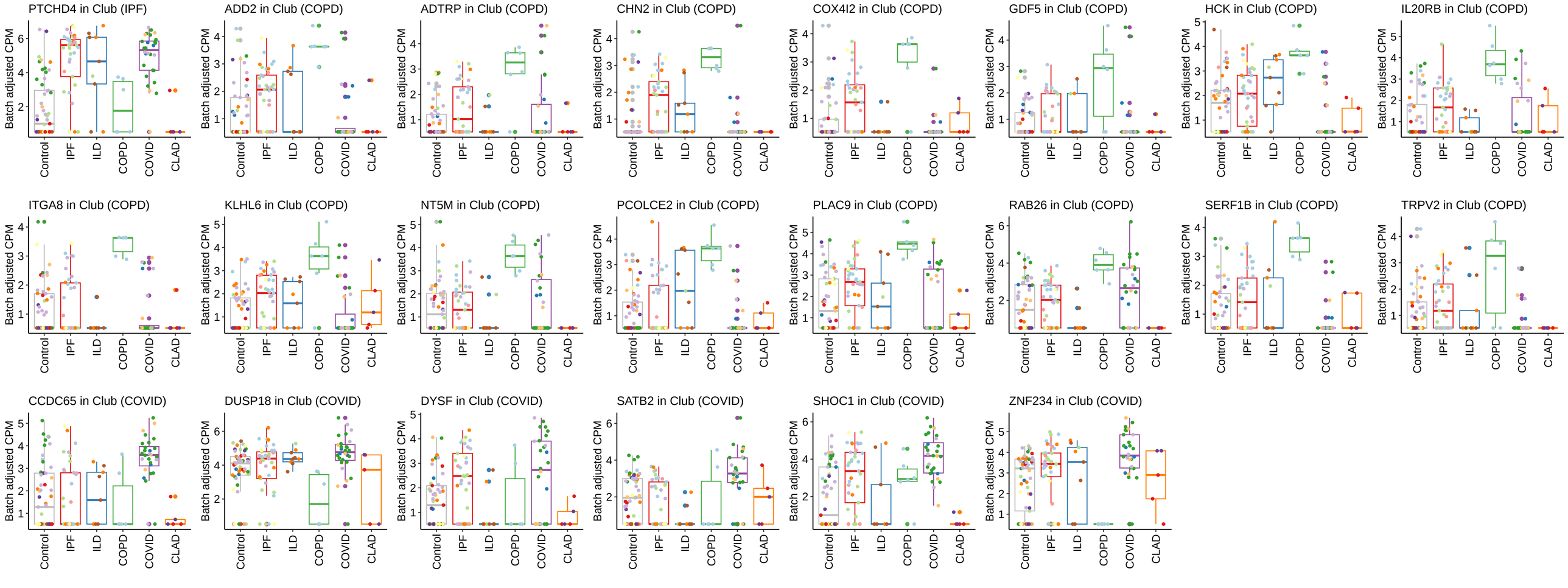

PYGM in Ciliated (COPD)
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

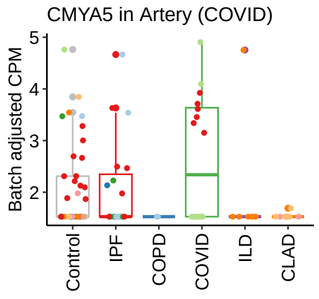

QRICH2 in Ciliated (COPD)
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

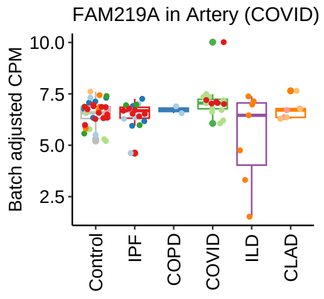

RAD51 in Ciliated (COPD)
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

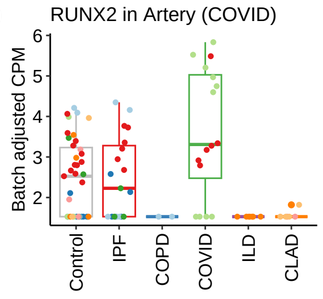

RHOH in Ciliated (COPD)
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

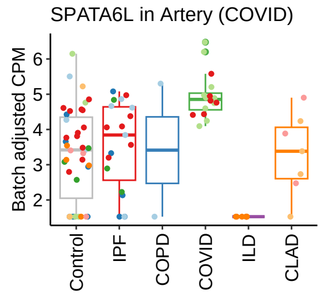

SMPD1 in Ciliated (COPD)
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

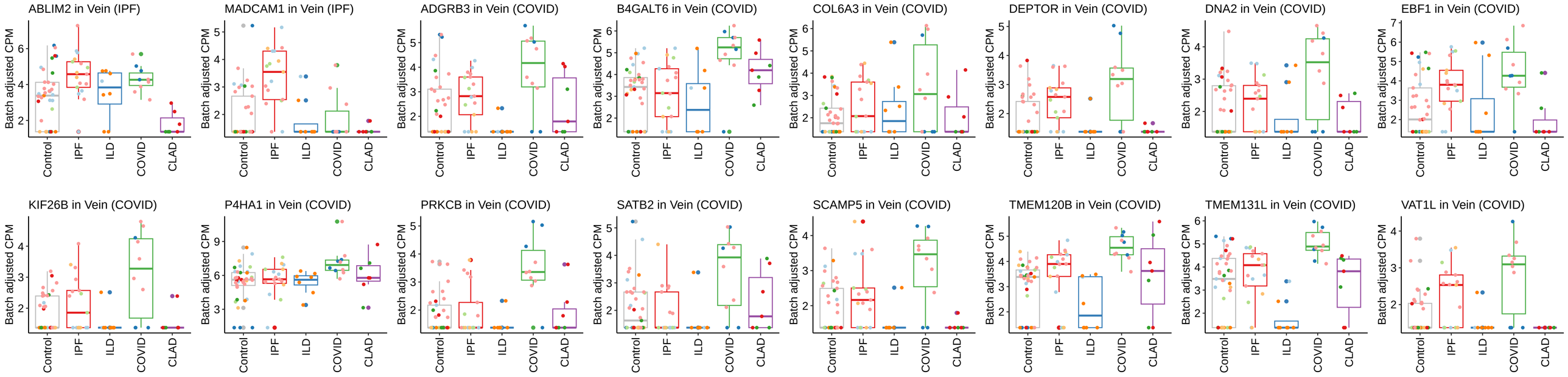

PTCHD4 in Club (IPF)
ADD2 in Club (COPD)
ADTRP in Club (COPD)
CHN2 in Club (COPD)
COX4I2 in Club (COPD)
GDF5 in Club (COPD)
HCK in Club (COPD)
IL20RB in Club (COPD)
ITGA8 in Club (COPD)
KLHL6 in Club (COPD)
NT5M in Club (COPD)
PCOLCE2 in Club (COPD)
PLAC9 in Club (COPD)
RAB26 in Club (COPD)
SERF1B in Club (COPD)
TRPV2 in Club (COPD)
CCDC65 in Club (COVID)
DUSP18 in Club (COVID)
DYSF in Club (COVID)
SATB2 in Club (COVID)
SHOC1 in Club (COVID)
ZNF234 in Club (COVID)
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

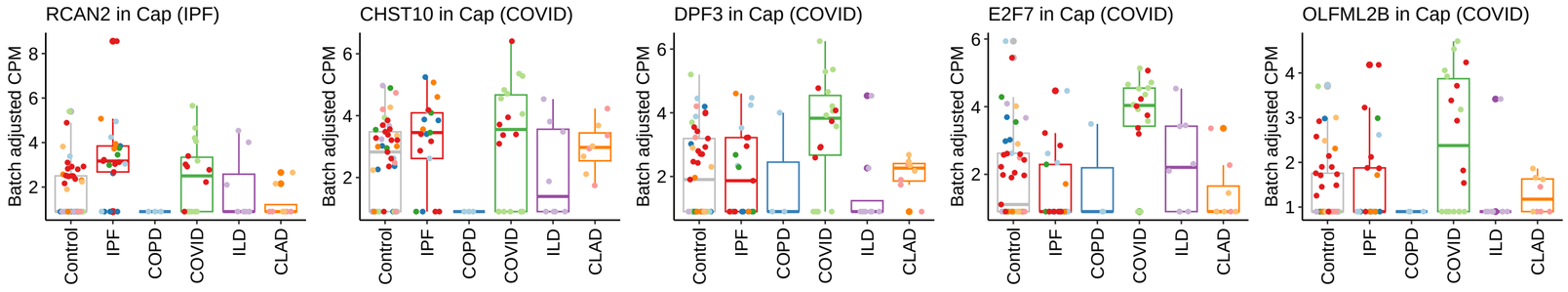

CMYA5 in Artery (COVID)
Batch adjusted CPM
5
4
3
2
Control
IPF
COPD
COVID
ILD
CLAD

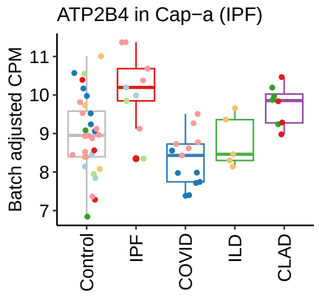

FAM219A in Artery (COVID)
Batch adjusted CPM
10.0
7.5
5.0
2.5
Control
IPF
COPD
COVID
ILD
CLAD

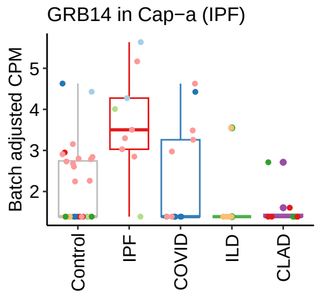

RUNX2 in Artery (COVID)
Batch adjusted CPM
6
5
4
3
2
Control
IPF
COPD
COVID
ILD
CLAD

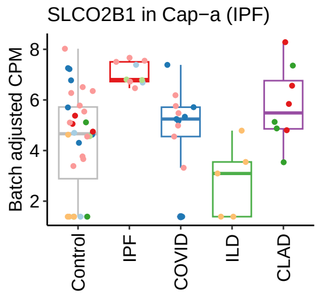

SPATA6L in Artery (COVID)
Batch adjusted CPM
6
5
4
3
2
Control
IPF
COPD
COVID
ILD
CLAD

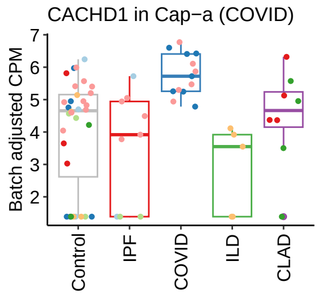

ABLIM2 in Vein (IPF)
MADCAM1 in Vein (IPF)
ADGRB3 in Vein (COVID)
B4GALT6 in Vein (COVID)
COL6A3 in Vein (COVID)
DEPTOR in Vein (COVID)
DNA2 in Vein (COVID)
EBF1 in Vein (COVID)
KIF26B in Vein (COVID)
P4HA1 in Vein (COVID)
PRKCB in Vein (COVID)
SATB2 in Vein (COVID)
SCAMP5 in Vein (COVID)
TMEM120B in Vein (COVID)
TMEM131L in Vein (COVID)
VAT1L in Vein (COVID)
Batch adjusted CPM
Control
IPF
ILD
COVID
CLAD

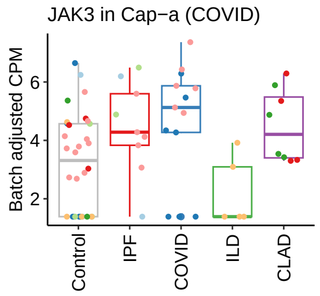

RCAN2 in Cap (IPF)
CHST10 in Cap (COVID)
DPF3 in Cap (COVID)
E2F7 in Cap (COVID)
OLFML2B in Cap (COVID)
Batch adjusted CPM
Control
IPF
COPD
COVID
ILD
CLAD

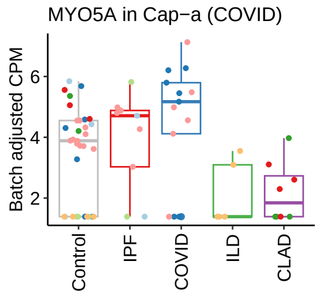

ATP2B4 in Cap−a (IPF)
Batch adjusted CPM
Control
IPF
COVID
ILD
CLAD

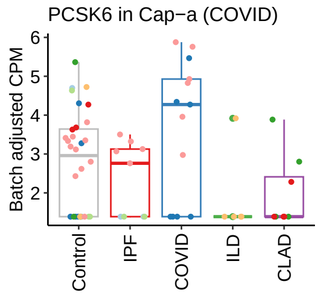

GRB14 in Cap−a (IPF)
Batch adjusted CPM
Control
IPF
COVID
ILD
CLAD

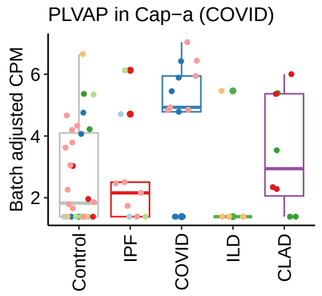

SLCO2B1 in Cap−a (IPF)
Batch adjusted CPM
Control
IPF
COVID
ILD
CLAD

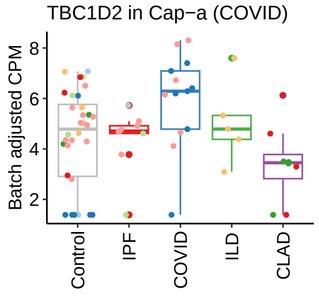

CACHD1 in Cap−a (COVID)
Batch adjusted CPM
Control
IPF
COVID
ILD
CLAD

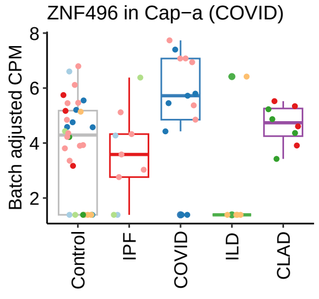

JAK3 in Cap−a (COVID)
Batch adjusted CPM
Control
IPF
COVID
ILD
CLAD

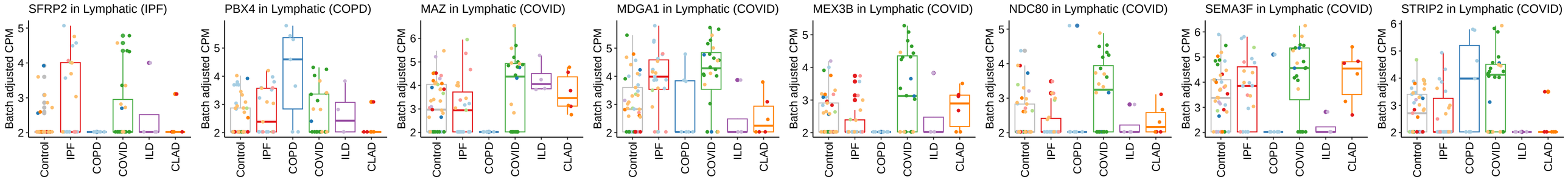

MYO5A in Cap−a (COVID)
Batch adjusted CPM
Control
IPF
COVID
ILD
CLAD

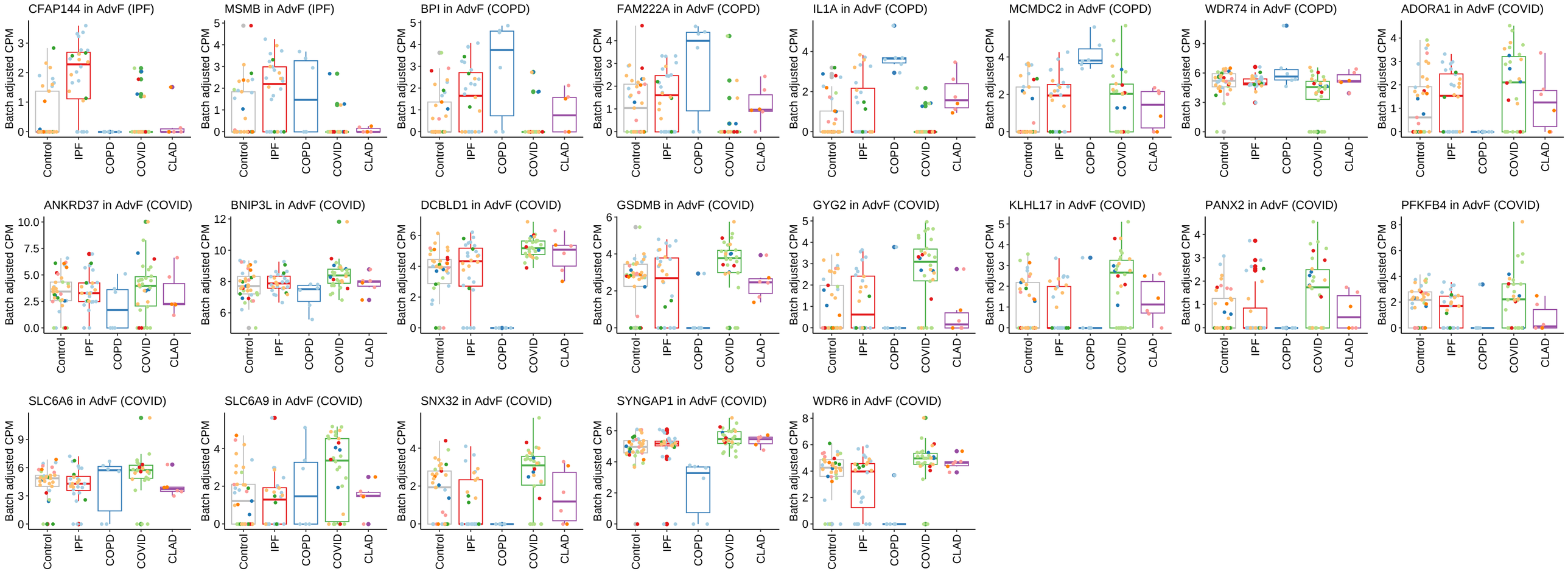

PCSK6 in Cap−a (COVID)
Batch adjusted CPM
Control
IPF
COVID
ILD
CLAD

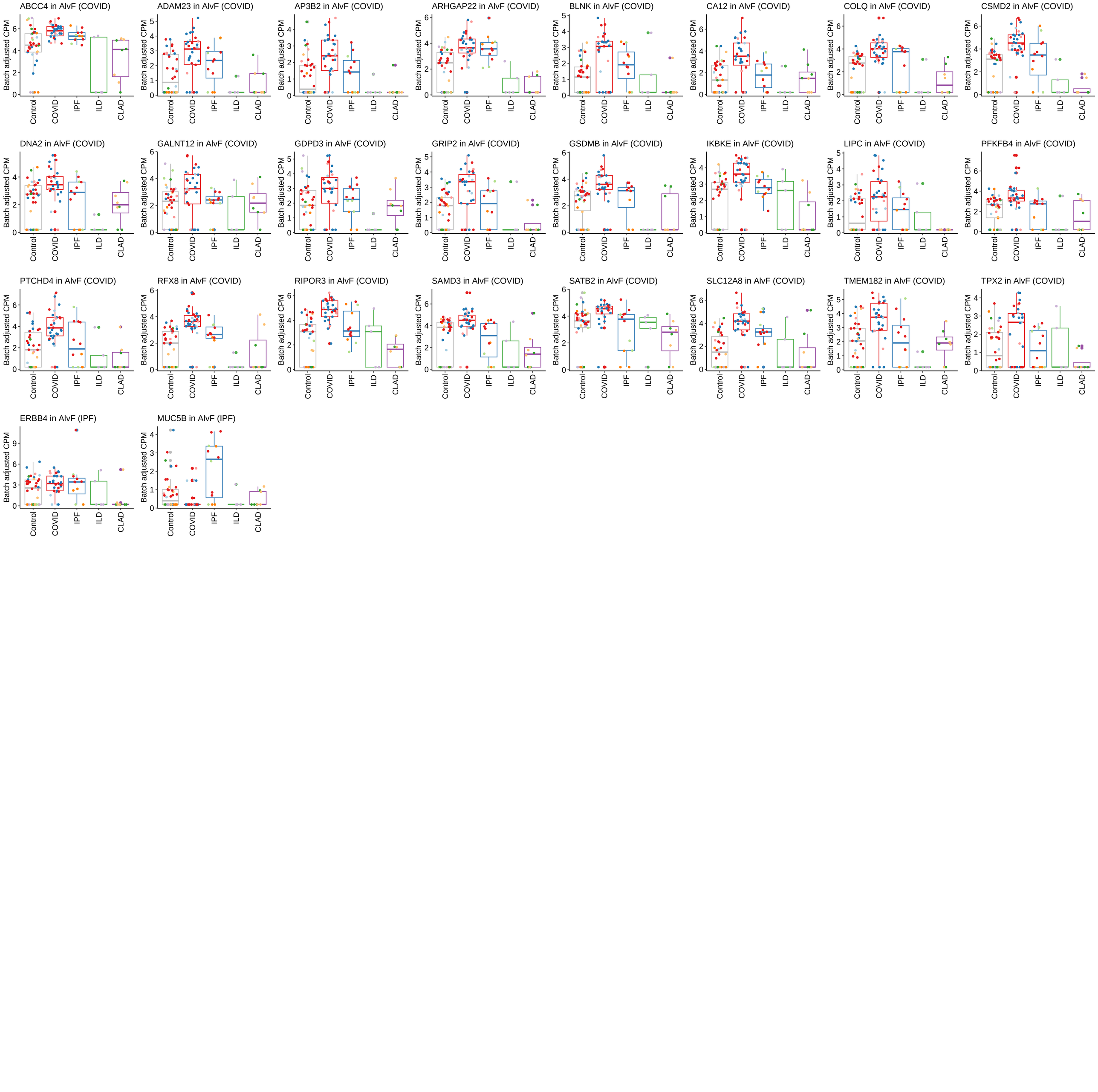

PLVAP in Cap−a (COVID)
Batch adjusted CPM
Control
IPF
COVID
ILD
CLAD

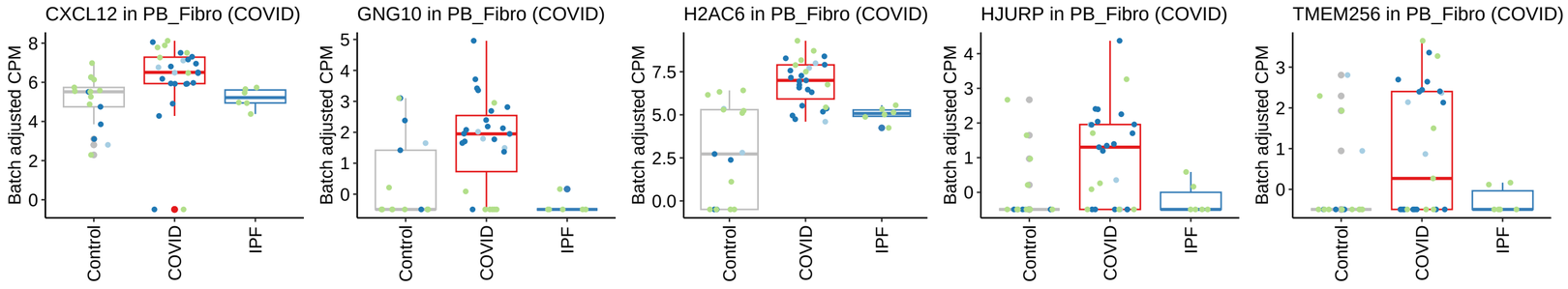

TBC1D2 in Cap−a (COVID)
Batch adjusted CPM
Control
IPF
COVID
ILD
CLAD

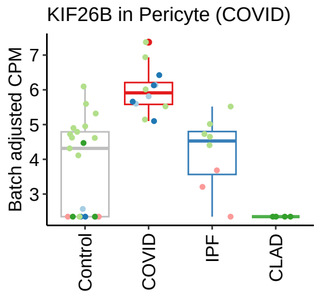

ZNF496 in Cap−a (COVID)
Batch adjusted CPM
Control
IPF
COVID
ILD
CLAD


SFRP2 in Lymphatic (IPF)
PBX4 in Lymphatic (COPD)
MAZ in Lymphatic (COVID)
MDGA1 in Lymphatic (COVID)
MEX3B in Lymphatic (COVID)
NDC80 in Lymphatic (COVID)
SEMA3F in Lymphatic (COVID)
STRIP2 in Lymphatic (COVID)
Batch adjusted CPM
Control
IPF
COPD
COVID
ILD
CLAD

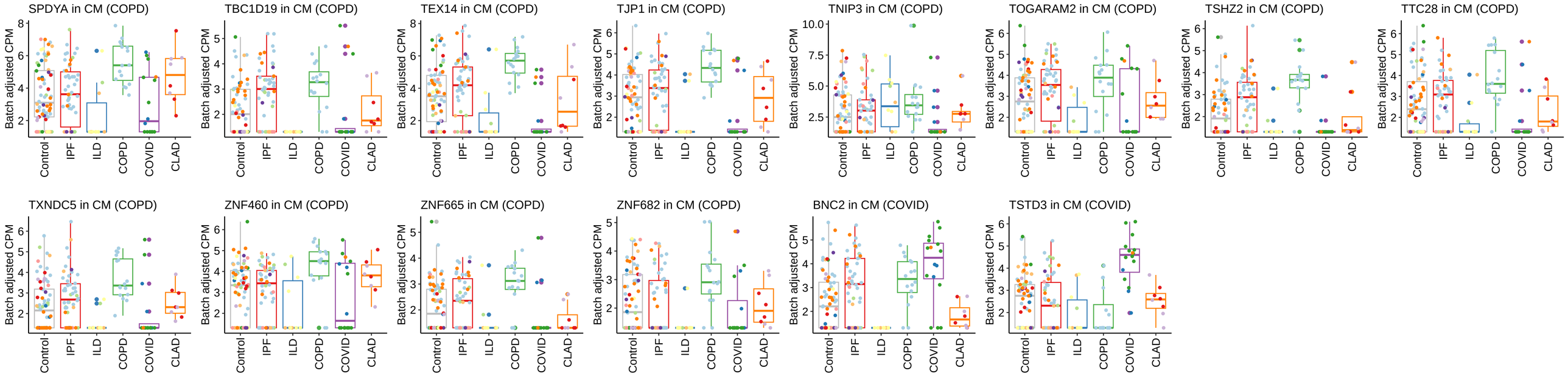

CFAP144 in AdvF (IPF)
MSMB in AdvF (IPF)
BPI in AdvF (COPD)
FAM222A in AdvF (COPD)
IL1A in AdvF (COPD)
MCMDC2 in AdvF (COPD)
WDR74 in AdvF (COPD)
ADORA1 in AdvF (COVID)
ANKRD37 in AdvF (COVID)
BNIP3L in AdvF (COVID)
DCBLD1 in AdvF (COVID)
GSDMB in AdvF (COVID)
GYG2 in AdvF (COVID)
KLHL17 in AdvF (COVID)
PANX2 in AdvF (COVID)
PFKFB4 in AdvF (COVID)
SLC6A6 in AdvF (COVID)
SLC6A9 in AdvF (COVID)
SNX32 in AdvF (COVID)
SYNGAP1 in AdvF (COVID)
WDR6 in AdvF (COVID)
Batch adjusted CPM
Control
IPF
COPD
COVID
CLAD

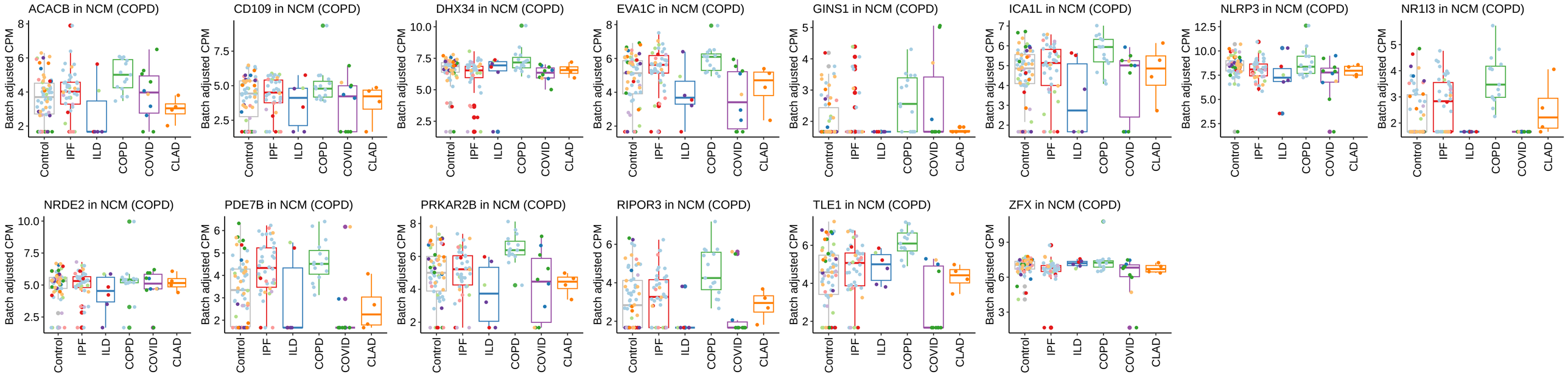

ABCC4 in AlvF (COVID)
ADAM23 in AlvF (COVID)
AP3B2 in AlvF (COVID)
ARHGAP22 in AlvF (COVID)
BLNK in AlvF (COVID)
CA12 in AlvF (COVID)
COLQ in AlvF (COVID)
CSMD2 in AlvF (COVID)
DNA2 in AlvF (COVID)
GALNT12 in AlvF (COVID)
GDPD3 in AlvF (COVID)
GRIP2 in AlvF (COVID)
GSDMB in AlvF (COVID)
IKBKE in AlvF (COVID)
LIPC in AlvF (COVID)
PFKFB4 in AlvF (COVID)
PTCHD4 in AlvF (COVID)
RFX8 in AlvF (COVID)
RIPOR3 in AlvF (COVID)
SAMD3 in AlvF (COVID)
SATB2 in AlvF (COVID)
SLC12A8 in AlvF (COVID)
TMEM182 in AlvF (COVID)
TPX2 in AlvF (COVID)
ERBB4 in AlvF (IPF)
MUC5B in AlvF (IPF)
Batch adjusted CPM
Control
COVID
IPF
ILD
CLAD


CXCL12 in PB_Fibro (COVID)
GNG10 in PB_Fibro (COVID)
H2AC6 in PB_Fibro (COVID)
HJURP in PB_Fibro (COVID)
TMEM256 in PB_Fibro (COVID)
Batch adjusted CPM
Control
COVID
IPF


KIF26B in Pericyte (COVID)
Batch adjusted CPM
7
6
5
4
3
Control
COVID
IPF
CLAD

CFAP276 in CM (IPF)
DRC3 in CM (IPF)
PPBP in CM (IPF)
ABLIM1 in CM (COPD)
ADGRD1 in CM (COPD)
ALPK2 in CM (COPD)
ANO7 in CM (COPD)
ATAD3C in CM (COPD)
BMX in CM (COPD)
CACNA1F in CM (COPD)
CD226 in CM (COPD)
CD247 in CM (COPD)
CD7 in CM (COPD)
CD96 in CM (COPD)
CENPA in CM (COPD)
CEP112 in CM (COPD)
CEP126 in CM (COPD)
CMSS1 in CM (COPD)
CROCC in CM (COPD)
CYB5D1 in CM (COPD)
CYSLTR2 in CM (COPD)
DNAH14 in CM (COPD)
ETS1 in CM (COPD)
EVA1C in CM (COPD)
FARP1 in CM (COPD)
GNLY in CM (COPD)
GZMB in CM (COPD)
HOMER2 in CM (COPD)
ICA1L in CM (COPD)
IL18RAP in CM (COPD)
IL1RL2 in CM (COPD)
IL23A in CM (COPD)
IQCK in CM (COPD)
ITK in CM (COPD)
KAZN in CM (COPD)
L2HGDH in CM (COPD)
LCK in CM (COPD)
MAGI1 in CM (COPD)
MECOM in CM (COPD)
MORN1 in CM (COPD)
MYH10 in CM (COPD)
NCS1 in CM (COPD)
NPIPA1 in CM (COPD)
OSBPL10 in CM (COPD)
P4HA2 in CM (COPD)
PARP16 in CM (COPD)
PIM2 in CM (COPD)
PITPNC1 in CM (COPD)
PLEKHG6 in CM (COPD)
PLIN4 in CM (COPD)
PLPP1 in CM (COPD)
PLS1 in CM (COPD)
PPP2R2B in CM (COPD)
PRICKLE1 in CM (COPD)
PRKAR1B in CM (COPD)
PRKCH in CM (COPD)
PXT1 in CM (COPD)
RIC3 in CM (COPD)
SCUBE1 in CM (COPD)
SHE in CM (COPD)
SIK1 in CM (COPD)
SLAMF1 in CM (COPD)
SLC24A1 in CM (COPD)
SLC41A2 in CM (COPD)
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD


SPDYA in CM (COPD)
TBC1D19 in CM (COPD)
TEX14 in CM (COPD)
TJP1 in CM (COPD)
TNIP3 in CM (COPD)
TOGARAM2 in CM (COPD)
TSHZ2 in CM (COPD)
TTC28 in CM (COPD)
TXNDC5 in CM (COPD)
ZNF460 in CM (COPD)
ZNF665 in CM (COPD)
ZNF682 in CM (COPD)
BNC2 in CM (COVID)
TSTD3 in CM (COVID)
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD


ACACB in NCM (COPD)
CD109 in NCM (COPD)
DHX34 in NCM (COPD)
EVA1C in NCM (COPD)
GINS1 in NCM (COPD)
ICA1L in NCM (COPD)
NLRP3 in NCM (COPD)
NR1I3 in NCM (COPD)
NRDE2 in NCM (COPD)
PDE7B in NCM (COPD)
PRKAR2B in NCM (COPD)
RIPOR3 in NCM (COPD)
TLE1 in NCM (COPD)
ZFX in NCM (COPD)
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

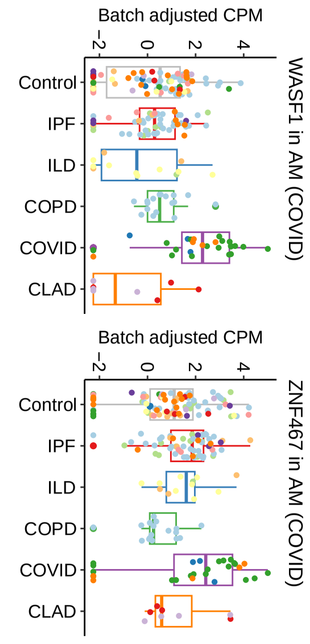
AGR2 in AM (IPF)
ATG9B in AM (IPF)
BPIFB1 in AM (IPF)
CCDC78 in AM (IPF)
CCL13 in AM (IPF)
CCL14 in AM (IPF)
CCR2 in AM (IPF)
CD164L2 in AM (IPF)
CD1C in AM (IPF)
CD1E in AM (IPF)
CD200R1 in AM (IPF)
CFAP276 in AM (IPF)
CFAP57 in AM (IPF)
CFAP90 in AM (IPF)
CFAP95 in AM (IPF)
CHST9 in AM (IPF)
CIBAR2 in AM (IPF)
CLDN3 in AM (IPF)
COL22A1 in AM (IPF)
CRIP2 in AM (IPF)
CST6 in AM (IPF)
CTSK in AM (IPF)
CXCL14 in AM (IPF)
CYTL1 in AM (IPF)
DTX3 in AM (IPF)
ECRG4 in AM (IPF)
ENHO in AM (IPF)
ERICH3 in AM (IPF)
FAIM2 in AM (IPF)
FAM216B in AM (IPF)
FOXJ1 in AM (IPF)
GATD3 in AM (IPF)
GEM in AM (IPF)
GPR27 in AM (IPF)
HOATZ in AM (IPF)
IBSP in AM (IPF)
IGFBP7 in AM (IPF)
KEL in AM (IPF)
KRT15 in AM (IPF)
LCN2 in AM (IPF)
LRRC46 in AM (IPF)
MATK in AM (IPF)
MMP1 in AM (IPF)
MMP10 in AM (IPF)
MMP12 in AM (IPF)
MMP7 in AM (IPF)
MMP8 in AM (IPF)
MMP9 in AM (IPF)
MORN5 in AM (IPF)
MUC5B in AM (IPF)
PLPP2 in AM (IPF)
PPBP in AM (IPF)
RIIAD1 in AM (IPF)
S100B in AM (IPF)
SCGB1A1 in AM (IPF)
SCGB3A1 in AM (IPF)
SCN9A in AM (IPF)
SHOX2 in AM (IPF)
SNTN in AM (IPF)
SPP1 in AM (IPF)
TACSTD2 in AM (IPF)
TIMP3 in AM (IPF)
TMEM190 in AM (IPF)
TP73 in AM (IPF)

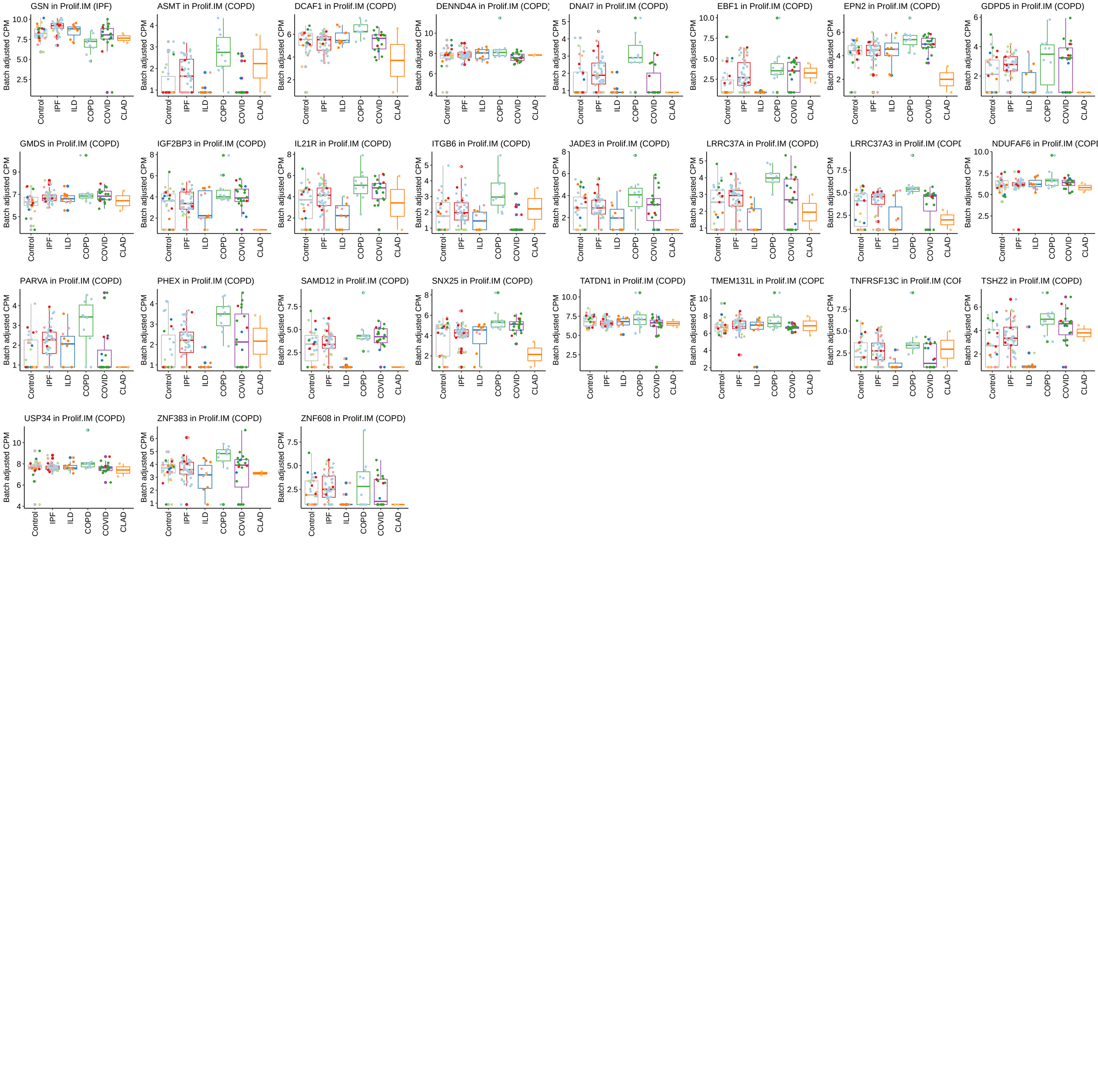
Batch adjusted CPM

Control
IPF
ILD
COPD
COVID
CLAD

TPPP3 in AM (IPF)
TRNP1 in AM (IPF)
TSPAN1 in AM (IPF)
TSPAN19 in AM (IPF)
TUBA4B in AM (IPF)
WFDC2 in AM (IPF)
ZNF462 in AM (IPF)
ADAM19 in AM (COPD)
ADAMTS17 in AM (COPD)
ANKRD33B in AM (COPD)
AP1M2 in AM (COPD)
BAIAP2L1 in AM (COPD)
BCHE in AM (COPD)
BEND6 in AM (COPD)
BVES in AM (COPD)
CACNA1A in AM (COPD)
CCDC102A in AM (COPD)
CD247 in AM (COPD)
CD3G in AM (COPD)
CD40LG in AM (COPD)
CD7 in AM (COPD)
CD79A in AM (COPD)
CDK15 in AM (COPD)
CEACAM19 in AM (COPD)
CEACAM5 in AM (COPD)
CENPO in AM (COPD)
CFAP206 in AM (COPD)
CLIC5 in AM (COPD)
CRB1 in AM (COPD)
CTLA4 in AM (COPD)
CXorf58 in AM (COPD)
CYB5D1 in AM (COPD)
DMPK in AM (COPD)
DNAH2 in AM (COPD)
FAM72C in AM (COPD)
FCRL3 in AM (COPD)
GIPR in AM (COPD)
GNLY in AM (COPD)
GSDMC in AM (COPD)
HAS1 in AM (COPD)
HIPK4 in AM (COPD)
ITIH4 in AM (COPD)
JCHAIN in AM (COPD)
KHDRBS3 in AM (COPD)
KLRB1 in AM (COPD)
LZTS1 in AM (COPD)
MECOM in AM (COPD)
MT1A in AM (COPD)
MUC4 in AM (COPD)
MZB1 in AM (COPD)
NRDE2 in AM (COPD)
PIM2 in AM (COPD)
PLCH2 in AM (COPD)
PLSCR2 in AM (COPD)
POU2AF1 in AM (COPD)
PRRT2 in AM (COPD)
RAD51AP2 in AM (COPD)
RIPOR3 in AM (COPD)
S1PR5 in AM (COPD)
SFRP4 in AM (COPD)
SH2D2A in AM (COPD)
SIRPG in AM (COPD)
SLC2A12 in AM (COPD)
SORCS2 in AM (COPD)
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

STON1 in AM (COPD)
TGFBR3 in AM (COPD)
TJP1 in AM (COPD)
TMEM150C in AM (COPD)
TNFRSF13C in AM (COPD)
WDR93 in AM (COPD)
WNT7A in AM (COPD)
ZNF239 in AM (COPD)
ZNF385C in AM (COPD)
ADARB1 in AM (COVID)
ALDH1L2 in AM (COVID)
BAHCC1 in AM (COVID)
C16orf74 in AM (COVID)
C18orf54 in AM (COVID)
CARD11 in AM (COVID)
CCDC65 in AM (COVID)
CCDC8 in AM (COVID)
CDC7 in AM (COVID)
CLDN14 in AM (COVID)
CLTCL1 in AM (COVID)
CMTM4 in AM (COVID)
CNNM3 in AM (COVID)
CSGALNACT1 in AM (COVID)
DNMT3B in AM (COVID)
ECM2 in AM (COVID)
EFCAB11 in AM (COVID)
EPHB1 in AM (COVID)
FBXL14 in AM (COVID)
GASK1A in AM (COVID)
GDPD3 in AM (COVID)
GIMAP5 in AM (COVID)
GLCCI1 in AM (COVID)
GSDMB in AM (COVID)
HSF4 in AM (COVID)
HTR2B in AM (COVID)
IER5L in AM (COVID)
ITGA9 in AM (COVID)
KIF4A in AM (COVID)
KIFC2 in AM (COVID)
KITLG in AM (COVID)
LYG1 in AM (COVID)
MACIR in AM (COVID)
MCF2 in AM (COVID)
MCOLN3 in AM (COVID)
MMP24 in AM (COVID)
NCAM1 in AM (COVID)
NMNAT2 in AM (COVID)
NRBP2 in AM (COVID)
OSBPL7 in AM (COVID)
PRELID3A in AM (COVID)
PRR16 in AM (COVID)
PXYLP1 in AM (COVID)
RAB15 in AM (COVID)
RGL4 in AM (COVID)
SLAIN1 in AM (COVID)
SLC15A2 in AM (COVID)
SLFNL1 in AM (COVID)
SPDYE1 in AM (COVID)
ST6GAL1 in AM (COVID)
STX19 in AM (COVID)
TESK1 in AM (COVID)
TRMT9B in AM (COVID)
TSHZ3 in AM (COVID)
TSPAN5 in AM (COVID)
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD


Batch adjusted CPM
−2
0
2
4
Control
IPF
ILD
COPD
COVID
CLAD
WASF1 in AM (COVID)
Batch adjusted CPM
−2
0
2
4
Control
IPF
ILD
COPD
COVID
CLAD
ZNF467 in AM (COVID)

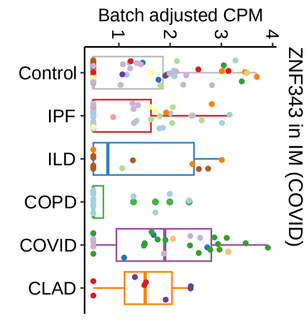

GSN in Prolif.IM (IPF)
ASMT in Prolif.IM (COPD)
DCAF1 in Prolif.IM (COPD)
DENND4A in Prolif.IM (COPD)
DNAI7 in Prolif.IM (COPD)
EBF1 in Prolif.IM (COPD)
EPN2 in Prolif.IM (COPD)
GDPD5 in Prolif.IM (COPD)
GMDS in Prolif.IM (COPD)
IGF2BP3 in Prolif.IM (COPD)
IL21R in Prolif.IM (COPD)
ITGB6 in Prolif.IM (COPD)
JADE3 in Prolif.IM (COPD)
LRRC37A in Prolif.IM (COPD)
LRRC37A3 in Prolif.IM (COPD)
NDUFAF6 in Prolif.IM (COPD)
PARVA in Prolif.IM (COPD)
PHEX in Prolif.IM (COPD)
SAMD12 in Prolif.IM (COPD)
SNX25 in Prolif.IM (COPD)
TATDN1 in Prolif.IM (COPD)
TMEM131L in Prolif.IM (COPD)
TNFRSF13C in Prolif.IM (COPD)
TSHZ2 in Prolif.IM (COPD)
USP34 in Prolif.IM (COPD)
ZNF383 in Prolif.IM (COPD)
ZNF608 in Prolif.IM (COPD)
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

ABCA6 in IM (IPF)
CAPS in IM (IPF)
CAVIN3 in IM (IPF)
CCN2 in IM (IPF)
CD28 in IM (IPF)
CFAP73 in IM (IPF)
CFAP90 in IM (IPF)
CLDN3 in IM (IPF)
COL3A1 in IM (IPF)
CRYM in IM (IPF)
DPYSL3 in IM (IPF)
DYNLRB2 in IM (IPF)
F2R in IM (IPF)
FXYD3 in IM (IPF)
GPX7 in IM (IPF)
KRT17 in IM (IPF)
LCN2 in IM (IPF)
MAPK15 in IM (IPF)
MATK in IM (IPF)
MMP10 in IM (IPF)
MMP7 in IM (IPF)
NT5E in IM (IPF)
PDLIM4 in IM (IPF)
POSTN in IM (IPF)
PPBP in IM (IPF)
RSPH1 in IM (IPF)
SCGB1A1 in IM (IPF)
SCGB3A1 in IM (IPF)
SHISAL2A in IM (IPF)
SNTN in IM (IPF)
SPP1 in IM (IPF)
TIMP3 in IM (IPF)
TMEM190 in IM (IPF)
TPPP3 in IM (IPF)
TSPAN1 in IM (IPF)
S100A2 in IM (ILD)
ADAMTS17 in IM (COPD)
ADAMTS6 in IM (COPD)
AFF3 in IM (COPD)
ANKRD33B in IM (COPD)
ARHGEF28 in IM (COPD)
BEND3 in IM (COPD)
CAMK4 in IM (COPD)
CATSPERD in IM (COPD)
CAVIN2 in IM (COPD)
CD1E in IM (COPD)
CD247 in IM (COPD)
CD6 in IM (COPD)
CD8B in IM (COPD)
CFAP210 in IM (COPD)
CR1L in IM (COPD)
CSGALNACT1 in IM (COPD)
CTLA4 in IM (COPD)
CTTN in IM (COPD)
CUBN in IM (COPD)
CXCL12 in IM (COPD)
DNMT3B in IM (COPD)
ESCO2 in IM (COPD)
FAM72B in IM (COPD)
FAM72D in IM (COPD)
FN3K in IM (COPD)
FUT1 in IM (COPD)
GATA3 in IM (COPD)
GPR153 in IM (COPD)

Batch adjusted CPM

Control
IPF
ILD
COPD
COVID
CLAD

GPR171 in IM (COPD)
GZMB in IM (COPD)
HCAR2 in IM (COPD)
HSD11B1 in IM (COPD)
IFT140 in IM (COPD)
IGSF21 in IM (COPD)
IL2RB in IM (COPD)
KHDRBS3 in IM (COPD)
KIAA0825 in IM (COPD)
KIF17 in IM (COPD)
KLRB1 in IM (COPD)
LAMP3 in IM (COPD)
LIPH in IM (COPD)
MCMDC2 in IM (COPD)
MORN1 in IM (COPD)
MT1A in IM (COPD)
MTCL1 in IM (COPD)
MTSS2 in IM (COPD)
MYO15A in IM (COPD)
MYO5C in IM (COPD)
NET1 in IM (COPD)
NPIPB11 in IM (COPD)
NRDE2 in IM (COPD)
OSBP2 in IM (COPD)
P2RY14 in IM (COPD)
PDE7B in IM (COPD)
PHYHD1 in IM (COPD)
PLA1A in IM (COPD)
PLA2G6 in IM (COPD)
PLAAT4 in IM (COPD)
PLAC9 in IM (COPD)
PLXDC1 in IM (COPD)
PRF1 in IM (COPD)
PRICKLE1 in IM (COPD)
RASIP1 in IM (COPD)
RIPOR3 in IM (COPD)
SCG3 in IM (COPD)
SEZ6L2 in IM (COPD)
SH2D2A in IM (COPD)
SIDT1 in IM (COPD)
SKA3 in IM (COPD)
SLC22A23 in IM (COPD)
SLC47A1 in IM (COPD)
SLC4A4 in IM (COPD)
SLFN12L in IM (COPD)
SPNS3 in IM (COPD)
SRGAP1 in IM (COPD)
SYTL4 in IM (COPD)
TAF4B in IM (COPD)
TCEA3 in IM (COPD)
TENM4 in IM (COPD)
TIMD4 in IM (COPD)
TIMELESS in IM (COPD)
TLE1 in IM (COPD)
TMC5 in IM (COPD)
TMEM217 in IM (COPD)
TRABD2A in IM (COPD)
TTLL9 in IM (COPD)
WDR49 in IM (COPD)
WFDC3 in IM (COPD)
ZMYND12 in IM (COPD)
ZNF221 in IM (COPD)
SPRY3 in IM (COVID)
TXK in IM (COVID)
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD


Batch adjusted CPM
1
2
3
4
Control
IPF
ILD
COPD
COVID
CLAD
ZNF343 in IM (COVID)

ABCB5 in MoM (IPF)
ACKR1 in MoM (IPF)
ADIRF in MoM (IPF)
AKR7A3 in MoM (IPF)
ALOX15 in MoM (IPF)
ARHGEF16 in MoM (IPF)
ARL4D in MoM (IPF)
ASS1 in MoM (IPF)
BAALC in MoM (IPF)
BPIFB1 in MoM (IPF)
C22orf15 in MoM (IPF)
C6orf118 in MoM (IPF)
C9 in MoM (IPF)
CAPN13 in MoM (IPF)
CAPS in MoM (IPF)
CCL22 in MoM (IPF)
CCL24 in MoM (IPF)
CCN1 in MoM (IPF)
CCN3 in MoM (IPF)
CCND1 in MoM (IPF)
CD164L2 in MoM (IPF)
CD1A in MoM (IPF)
CD24 in MoM (IPF)
CD28 in MoM (IPF)
CFAP144 in MoM (IPF)
CFAP276 in MoM (IPF)
CFAP95 in MoM (IPF)
CHST9 in MoM (IPF)
CIBAR2 in MoM (IPF)
CKB in MoM (IPF)
CLDN3 in MoM (IPF)
CLXN in MoM (IPF)
COL1A1 in MoM (IPF)
COL1A2 in MoM (IPF)
COL22A1 in MoM (IPF)
COL3A1 in MoM (IPF)
CRABP2 in MoM (IPF)
CRIP2 in MoM (IPF)
CSF1 in MoM (IPF)
CTSK in MoM (IPF)
CTTN in MoM (IPF)
CTXN1 in MoM (IPF)
CXCL14 in MoM (IPF)
CYP27B1 in MoM (IPF)
CYTL1 in MoM (IPF)
DDIT4L in MoM (IPF)
DMKN in MoM (IPF)
DYDC2 in MoM (IPF)
DYNLRB2 in MoM (IPF)
ECRG4 in MoM (IPF)
ERICH3 in MoM (IPF)
FAM111B in MoM (IPF)
FAM216B in MoM (IPF)
FLRT2 in MoM (IPF)
FOXJ1 in MoM (IPF)
GEM in MoM (IPF)
GPC4 in MoM (IPF)
GREM1 in MoM (IPF)
GSTA1 in MoM (IPF)
GSTA2 in MoM (IPF)
HOATZ in MoM (IPF)
HTR2A in MoM (IPF)
IGFBP6 in MoM (IPF)
KLHDC9 in MoM (IPF)

Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

KLK1 in MoM (IPF)
KRT15 in MoM (IPF)
KRT17 in MoM (IPF)
KRT19 in MoM (IPF)
LCN2 in MoM (IPF)
LDLRAD1 in MoM (IPF)
LGI2 in MoM (IPF)
LRRIQ1 in MoM (IPF)
MAPK15 in MoM (IPF)
MATK in MoM (IPF)
MMP1 in MoM (IPF)
MMP12 in MoM (IPF)
MMP7 in MoM (IPF)
MMP8 in MoM (IPF)
MMP9 in MoM (IPF)
MRGPRF in MoM (IPF)
MS4A1 in MoM (IPF)
MUC4 in MoM (IPF)
NDP in MoM (IPF)
NOS1AP in MoM (IPF)
PBX4 in MoM (IPF)
PDLIM4 in MoM (IPF)
PDPN in MoM (IPF)
PERP in MoM (IPF)
PIP in MoM (IPF)
PLEKHF1 in MoM (IPF)
PLPP2 in MoM (IPF)
POSTN in MoM (IPF)
PPBP in MoM (IPF)
PRSS22 in MoM (IPF)
RASL11B in MoM (IPF)
RGS20 in MoM (IPF)
RHBDF1 in MoM (IPF)
RSPH1 in MoM (IPF)
S100A2 in MoM (IPF)
SCG5 in MoM (IPF)
SCGB1A1 in MoM (IPF)
SCGB3A1 in MoM (IPF)
SFRP2 in MoM (IPF)
SHOX2 in MoM (IPF)
SLC28A3 in MoM (IPF)
SNTN in MoM (IPF)
SOX9 in MoM (IPF)
SPATA4 in MoM (IPF)
SPP1 in MoM (IPF)
TACSTD2 in MoM (IPF)
TGFB1I1 in MoM (IPF)
TIE1 in MoM (IPF)
TIMP3 in MoM (IPF)
TINAGL1 in MoM (IPF)
TMEM190 in MoM (IPF)
TPPP3 in MoM (IPF)
TRIM29 in MoM (IPF)
TSPAN1 in MoM (IPF)
TSPAN2 in MoM (IPF)
UBXN10 in MoM (IPF)
UTS2 in MoM (IPF)
WFDC2 in MoM (IPF)
ZNF385D in MoM (IPF)
A4GNT in MoM (COPD)
ABCA8 in MoM (COPD)
ABI3BP in MoM (COPD)
ACACB in MoM (COPD)
ACSS3 in MoM (COPD)
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

ADAMTS10 in MoM (COPD)
ADAMTS6 in MoM (COPD)
ADGRA3 in MoM (COPD)
ADGRG1 in MoM (COPD)
ADPRHL1 in MoM (COPD)
AFDN in MoM (COPD)
AGAP1 in MoM (COPD)
AKAP14 in MoM (COPD)
ALPK2 in MoM (COPD)
ANK1 in MoM (COPD)
ANKDD1B in MoM (COPD)
ANO9 in MoM (COPD)
AP1M2 in MoM (COPD)
APBA2 in MoM (COPD)
APOBEC3A in MoM (COPD)
AQP7 in MoM (COPD)
ARHGEF4 in MoM (COPD)
ASB11 in MoM (COPD)
ASTL in MoM (COPD)
AXL in MoM (COPD)
B4GALNT3 in MoM (COPD)
BCAS1 in MoM (COPD)
BCL11B in MoM (COPD)
BEND6 in MoM (COPD)
BEST4 in MoM (COPD)
BFSP1 in MoM (COPD)
BICDL1 in MoM (COPD)
BNIPL in MoM (COPD)
C22orf23 in MoM (COPD)
C2orf92 in MoM (COPD)
C8B in MoM (COPD)
C9orf152 in MoM (COPD)
CACHD1 in MoM (COPD)
CACNA1A in MoM (COPD)
CACNA2D1 in MoM (COPD)
CADPS2 in MoM (COPD)
CAMK4 in MoM (COPD)
CAPN8 in MoM (COPD)
CATSPERD in MoM (COPD)
CAVIN2 in MoM (COPD)
CBS in MoM (COPD)
CCDC102A in MoM (COPD)
CCDC148 in MoM (COPD)
CCDC181 in MoM (COPD)
CCDC190 in MoM (COPD)
CCL5 in MoM (COPD)
CD1E in MoM (COPD)
CD3D in MoM (COPD)
CD3G in MoM (COPD)
CD96 in MoM (COPD)
CDH20 in MoM (COPD)
CDKL2 in MoM (COPD)
CES3 in MoM (COPD)
CFAP53 in MoM (COPD)
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CFAP74 in MoM (COPD)
CFAP92 in MoM (COPD)
CFAP99 in MoM (COPD)
CHST6 in MoM (COPD)
CLDN10 in MoM (COPD)
CLEC4E in MoM (COPD)
CLEC9A in MoM (COPD)
CLIC5 in MoM (COPD)
CNKSR1 in MoM (COPD)
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

CNN1 in MoM (COPD)
CNTNAP1 in MoM (COPD)
COL12A1 in MoM (COPD)
COL6A6 in MoM (COPD)
COLQ in MoM (COPD)
CPA6 in MoM (COPD)
CPLANE2 in MoM (COPD)
CREG2 in MoM (COPD)
CRLF2 in MoM (COPD)
CRYBG2 in MoM (COPD)
CSGALNACT1 in MoM (COPD)
CTRC in MoM (COPD)
CTTNBP2 in MoM (COPD)
CXorf58 in MoM (COPD)
CYSLTR2 in MoM (COPD)
DCDC1 in MoM (COPD)
DLG2 in MoM (COPD)
DLG3 in MoM (COPD)
DLGAP1 in MoM (COPD)
DNAH2 in MoM (COPD)
DNAH3 in MoM (COPD)
DPF3 in MoM (COPD)
ECT2L in MoM (COPD)
ENKUR in MoM (COPD)
ENPP3 in MoM (COPD)
EPHA4 in MoM (COPD)
EXOC3L4 in MoM (COPD)
F10 in MoM (COPD)
F2R in MoM (COPD)
FAAH2 in MoM (COPD)
FAM169A in MoM (COPD)
FAM227B in MoM (COPD)
FAM72B in MoM (COPD)
FAM72C in MoM (COPD)
FAM72D in MoM (COPD)
FAM81B in MoM (COPD)
FAM83F in MoM (COPD)
FBLN7 in MoM (COPD)
FBXL2 in MoM (COPD)
FCER1A in MoM (COPD)
FGD1 in MoM (COPD)
FGF13 in MoM (COPD)
FGF14 in MoM (COPD)
FN3K in MoM (COPD)
GDF9 in MoM (COPD)
GFPT2 in MoM (COPD)
GLIS2 in MoM (COPD)
GML in MoM (COPD)
GNLY in MoM (COPD)
GPR153 in MoM (COPD)
GPR176 in MoM (COPD)
HAS2 in MoM (COPD)
HCN3 in MoM (COPD)
HECW2 in MoM (COPD)
HEPH in MoM (COPD)
HLA.DOB in MoM (COPD)
HLA.DQB2 in MoM (COPD)
HLF in MoM (COPD)
HOMER1 in MoM (COPD)
HROB in MoM (COPD)
HSPA12B in MoM (COPD)
ICA1L in MoM (COPD)
IDO1 in MoM (COPD)
IGSF21 in MoM (COPD)

Batch adjusted CPM

Control
IPF
ILD
COPD
COVID
CLAD

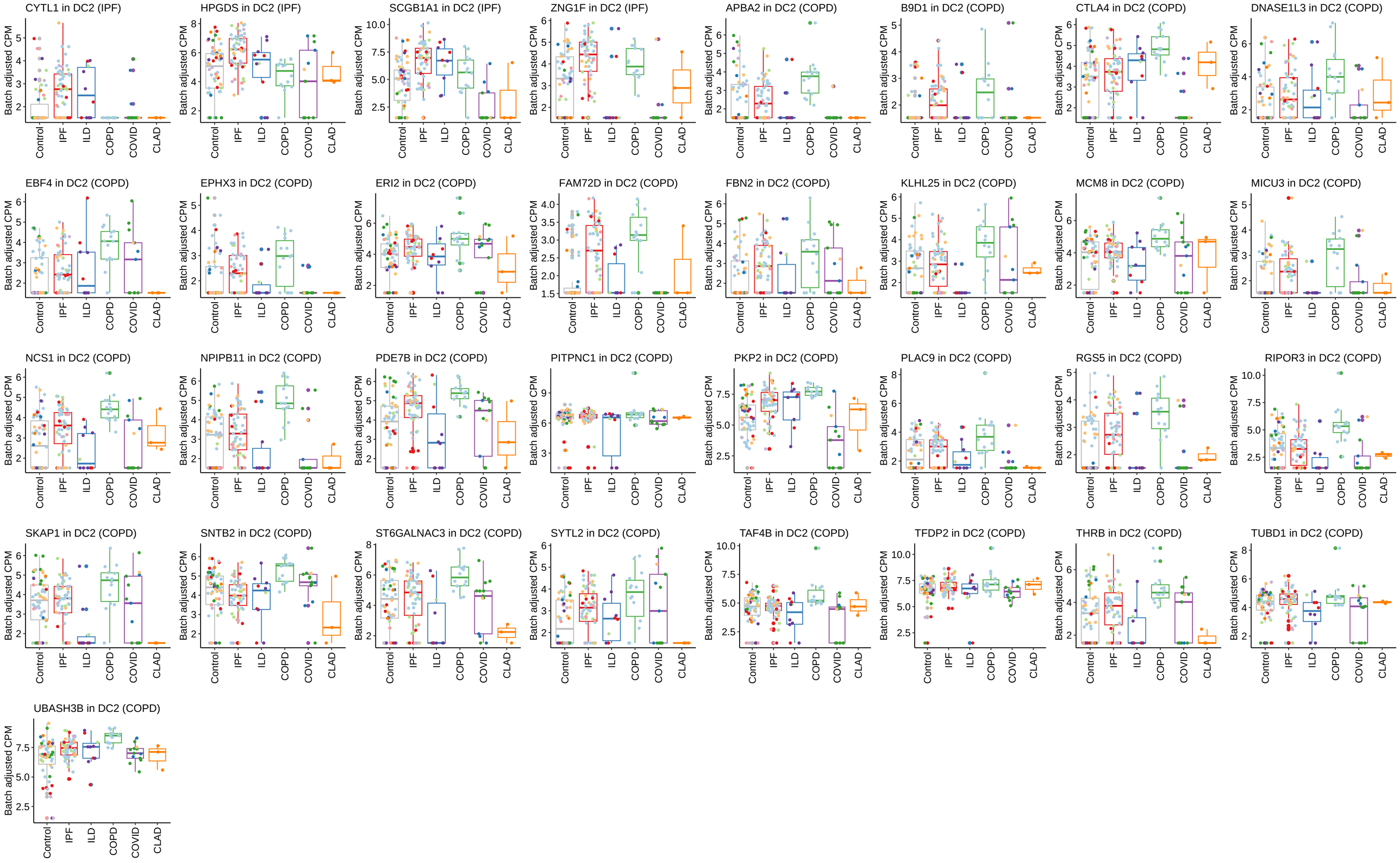
IHO1 in MoM (COPD)
IL12RB2 in MoM (COPD)
IL1RL2 in MoM (COPD)
IL32 in MoM (COPD)
IL34 in MoM (COPD)
ILDR1 in MoM (COPD)
INPP5J in MoM (COPD)
ISG20 in MoM (COPD)
ITGA8 in MoM (COPD)
ITK in MoM (COPD)
JSRP1 in MoM (COPD)
KCNAB1 in MoM (COPD)
KCNE4 in MoM (COPD)
KCNG2 in MoM (COPD)
KCNJ14 in MoM (COPD)
KCTD14 in MoM (COPD)
KIAA2012 in MoM (COPD)
KIF24 in MoM (COPD)
KLHL25 in MoM (COPD)
KLRB1 in MoM (COPD)
LAMA2 in MoM (COPD)
LAX1 in MoM (COPD)
LGALS4 in MoM (COPD)
LMOD1 in MoM (COPD)
LOXL2 in MoM (COPD)
LRRC2 in MoM (COPD)
LRRTM2 in MoM (COPD)
LTBP1 in MoM (COPD)
LZTS1 in MoM (COPD)
MAP4K1 in MoM (COPD)
MAP6 in MoM (COPD)
MCF2L in MoM (COPD)
MCOLN2 in MoM (COPD)
MDGA1 in MoM (COPD)
MED18 in MoM (COPD)
MEIS2 in MoM (COPD)
MID1 in MoM (COPD)
MIPOL1 in MoM (COPD)
MMP11 in MoM (COPD)
MORN5 in MoM (COPD)
MOXD1 in MoM (COPD)
MSANTD1 in MoM (COPD)
MT1A in MoM (COPD)
MTSS2 in MoM (COPD)
MYBL2 in MoM (COPD)
MZB1 in MoM (COPD)
NECTIN3 in MoM (COPD)
NEURL1 in MoM (COPD)
NFKB1 in MoM (COPD)
NLRC3 in MoM (COPD)
NME5 in MoM (COPD)
NPIPB6 in MoM (COPD)
NR1I3 in MoM (COPD)
NSG1 in MoM (COPD)
NT5DC4 in MoM (COPD)
NTN4 in MoM (COPD)
NWD1 in MoM (COPD)
ODAD1 in MoM (COPD)
ODAD4 in MoM (COPD)
OMD in MoM (COPD)
OSBP2 in MoM (COPD)
OSBPL6 in MoM (COPD)
OSMR in MoM (COPD)
PACRG in MoM (COPD)
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

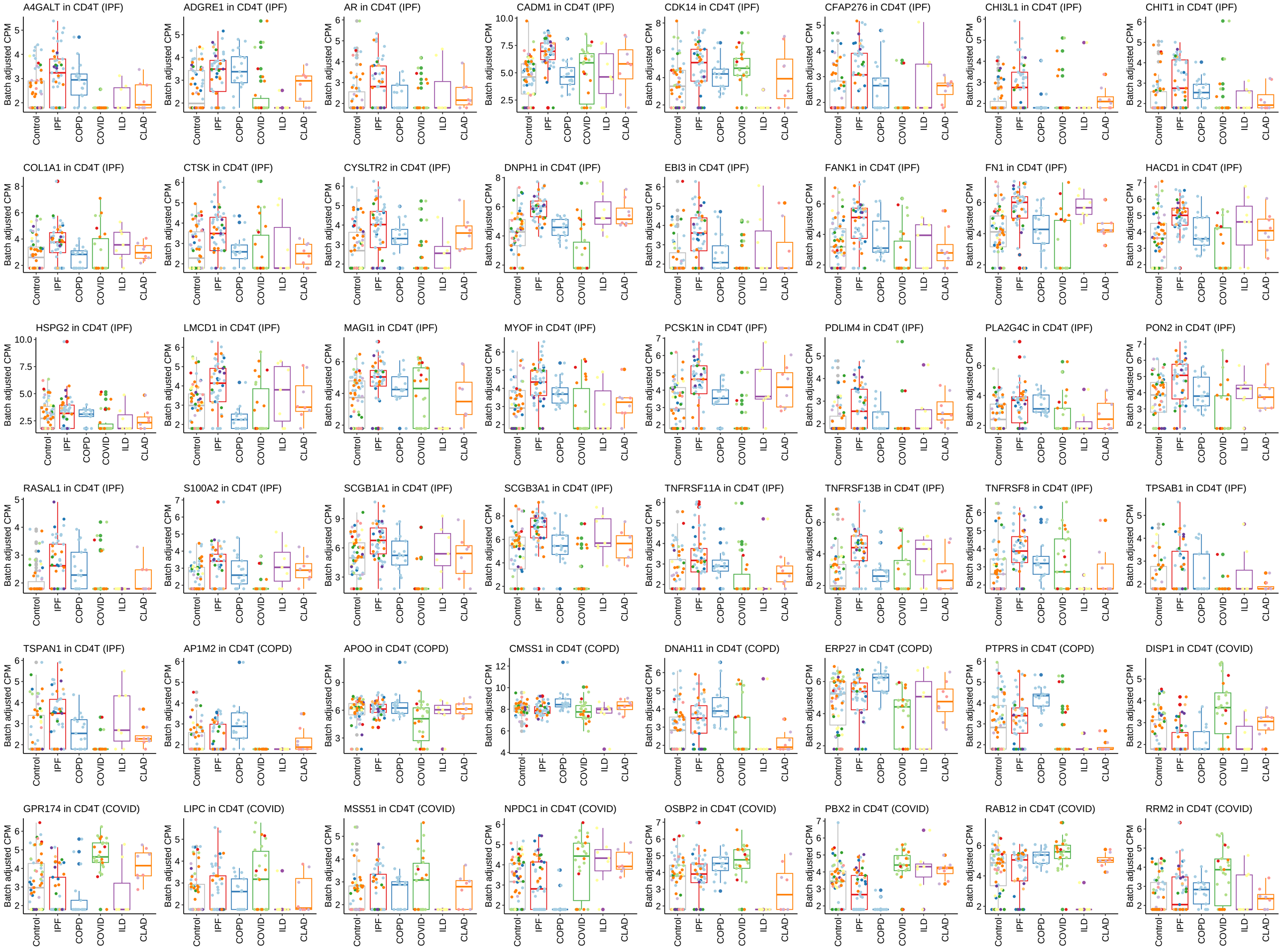
PALD1 in MoM (COPD)
PBX1 in MoM (COPD)
PDE6A in MoM (COPD)
PDE7B in MoM (COPD)
PDE8B in MoM (COPD)
PELI1 in MoM (COPD)
PER2 in MoM (COPD)
PGAP4 in MoM (COPD)
PGBD5 in MoM (COPD)
PHEX in MoM (COPD)
PKIA in MoM (COPD)
PLCE1 in MoM (COPD)
PLEKHG4B in MoM (COPD)
PLIN5 in MoM (COPD)
PLPP1 in MoM (COPD)
PLS1 in MoM (COPD)
PON3 in MoM (COPD)
POPDC2 in MoM (COPD)
POU2AF1 in MoM (COPD)
PPM1E in MoM (COPD)
PPP1R13B in MoM (COPD)
PPP1R9A in MoM (COPD)
PRF1 in MoM (COPD)
PRKCQ in MoM (COPD)
PRKN in MoM (COPD)
PROM1 in MoM (COPD)
PRRT4 in MoM (COPD)
PRTFDC1 in MoM (COPD)
PTPRS in MoM (COPD)
RAB6B in MoM (COPD)
RAD54B in MoM (COPD)
RAD54L in MoM (COPD)
RAD9B in MoM (COPD)
RAPSN in MoM (COPD)
RASGRF2 in MoM (COPD)
RBP5 in MoM (COPD)
REEP6 in MoM (COPD)
RFX8 in MoM (COPD)
RGS22 in MoM (COPD)
RHCE in MoM (COPD)
RHEX in MoM (COPD)
RIPOR3 in MoM (COPD)
RNF207 in MoM (COPD)
RNF32 in MoM (COPD)
RP1 in MoM (COPD)
SBK1 in MoM (COPD)
SCUBE1 in MoM (COPD)
SERHL2 in MoM (COPD)
SERP2 in MoM (COPD)
SERPINF1 in MoM (COPD)
SERPINI2 in MoM (COPD)
SGSM1 in MoM (COPD)
SHBG in MoM (COPD)
SHC3 in MoM (COPD)
SHISA4 in MoM (COPD)
SIGLEC8 in MoM (COPD)
SIRPG in MoM (COPD)
SLAMF1 in MoM (COPD)
SLC12A5 in MoM (COPD)
SLC22A23 in MoM (COPD)
SLC26A8 in MoM (COPD)
SLC47A2 in MoM (COPD)
SLC6A9 in MoM (COPD)
SLCO5A1 in MoM (COPD)

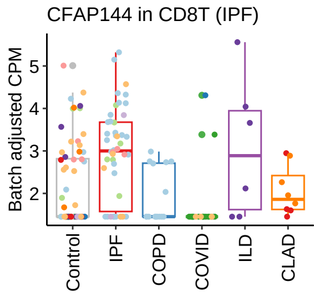
Batch adjusted CPM

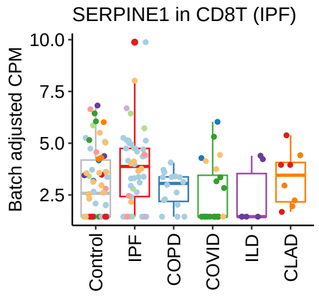
Control
IPF
ILD
COPD
COVID
CLAD

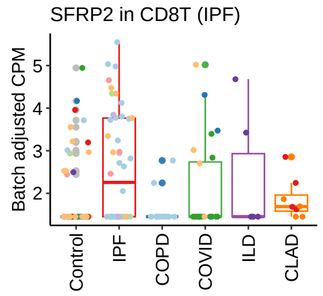
SMAD9 in MoM (COPD)
SMPDL3B in MoM (COPD)
SNX25 in MoM (COPD)
SPAG6 in MoM (COPD)
SPATA21 in MoM (COPD)
SRSF12 in MoM (COPD)
ST6GALNAC3 in MoM (COPD)
ST8SIA6 in MoM (COPD)
SYN1 in MoM (COPD)
SYTL2 in MoM (COPD)
SYTL4 in MoM (COPD)
TBX21 in MoM (COPD)
TCEA3 in MoM (COPD)
TCF7L1 in MoM (COPD)
TCP10L in MoM (COPD)
TEKT5 in MoM (COPD)
TET1 in MoM (COPD)
TGFB2 in MoM (COPD)
TGFBR3 in MoM (COPD)
THEMIS in MoM (COPD)
THSD1 in MoM (COPD)
TIGIT in MoM (COPD)
TIMD4 in MoM (COPD)
TJP3 in MoM (COPD)
TLE2 in MoM (COPD)
TMC7 in MoM (COPD)
TMEM132A in MoM (COPD)
TMEM150C in MoM (COPD)
TMEM217 in MoM (COPD)
TMEM229B in MoM (COPD)
TMIGD2 in MoM (COPD)
TNFRSF19 in MoM (COPD)
TOGARAM2 in MoM (COPD)
TRPM6 in MoM (COPD)
TTC16 in MoM (COPD)
TTLL9 in MoM (COPD)
TVP23A in MoM (COPD)
USP44 in MoM (COPD)
VASH2 in MoM (COPD)
VWCE in MoM (COPD)
WASHC2A in MoM (COPD)
WDR49 in MoM (COPD)
WDR93 in MoM (COPD)
WNK2 in MoM (COPD)
ZBP1 in MoM (COPD)
ZDHHC11 in MoM (COPD)
ZDHHC15 in MoM (COPD)
ZMYND12 in MoM (COPD)
ZNF208 in MoM (COPD)
ZNF367 in MoM (COPD)
ZNF492 in MoM (COPD)
ZNF541 in MoM (COPD)
ZNF681 in MoM (COPD)
ZNF793 in MoM (COPD)
ZNF831 in MoM (COPD)
CLIP3 in MoM (COVID)
ECM2 in MoM (COVID)
ERCC6L in MoM (COVID)
NOXRED1 in MoM (COVID)
RAB15 in MoM (COVID)
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

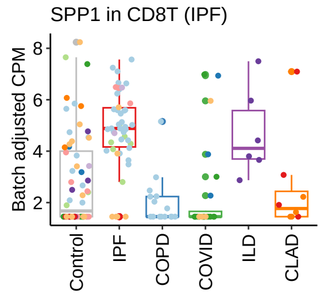

CYTL1 in DC2 (IPF)
HPGDS in DC2 (IPF)
SCGB1A1 in DC2 (IPF)
ZNG1F in DC2 (IPF)
APBA2 in DC2 (COPD)
B9D1 in DC2 (COPD)
CTLA4 in DC2 (COPD)
DNASE1L3 in DC2 (COPD)
EBF4 in DC2 (COPD)
EPHX3 in DC2 (COPD)
ERI2 in DC2 (COPD)
FAM72D in DC2 (COPD)
FBN2 in DC2 (COPD)
KLHL25 in DC2 (COPD)
MCM8 in DC2 (COPD)
MICU3 in DC2 (COPD)
NCS1 in DC2 (COPD)
NPIPB11 in DC2 (COPD)
PDE7B in DC2 (COPD)
PITPNC1 in DC2 (COPD)
PKP2 in DC2 (COPD)
PLAC9 in DC2 (COPD)
RGS5 in DC2 (COPD)
RIPOR3 in DC2 (COPD)
SKAP1 in DC2 (COPD)
SNTB2 in DC2 (COPD)
ST6GALNAC3 in DC2 (COPD)
SYTL2 in DC2 (COPD)
TAF4B in DC2 (COPD)
TFDP2 in DC2 (COPD)
THRB in DC2 (COPD)
TUBD1 in DC2 (COPD)
UBASH3B in DC2 (COPD)
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

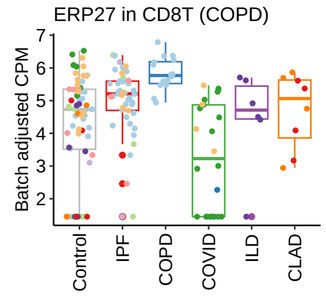

A4GALT in CD4T (IPF)
ADGRE1 in CD4T (IPF)
AR in CD4T (IPF)
CADM1 in CD4T (IPF)
CDK14 in CD4T (IPF)
CFAP276 in CD4T (IPF)
CHI3L1 in CD4T (IPF)
CHIT1 in CD4T (IPF)
COL1A1 in CD4T (IPF)
CTSK in CD4T (IPF)
CYSLTR2 in CD4T (IPF)
DNPH1 in CD4T (IPF)
EBI3 in CD4T (IPF)
FANK1 in CD4T (IPF)
FN1 in CD4T (IPF)
HACD1 in CD4T (IPF)
HSPG2 in CD4T (IPF)
LMCD1 in CD4T (IPF)
MAGI1 in CD4T (IPF)
MYOF in CD4T (IPF)
PCSK1N in CD4T (IPF)
PDLIM4 in CD4T (IPF)
PLA2G4C in CD4T (IPF)
PON2 in CD4T (IPF)
RASAL1 in CD4T (IPF)
S100A2 in CD4T (IPF)
SCGB1A1 in CD4T (IPF)
SCGB3A1 in CD4T (IPF)
TNFRSF11A in CD4T (IPF)
TNFRSF13B in CD4T (IPF)
TNFRSF8 in CD4T (IPF)
TPSAB1 in CD4T (IPF)
TSPAN1 in CD4T (IPF)
AP1M2 in CD4T (COPD)
APOO in CD4T (COPD)
CMSS1 in CD4T (COPD)
DNAH11 in CD4T (COPD)
ERP27 in CD4T (COPD)
PTPRS in CD4T (COPD)
DISP1 in CD4T (COVID)
GPR174 in CD4T (COVID)
LIPC in CD4T (COVID)
MSS51 in CD4T (COVID)
NPDC1 in CD4T (COVID)
OSBP2 in CD4T (COVID)
PBX2 in CD4T (COVID)
RAB12 in CD4T (COVID)
RRM2 in CD4T (COVID)
Batch adjusted CPM
Control
IPF
COPD
COVID
ILD
CLAD

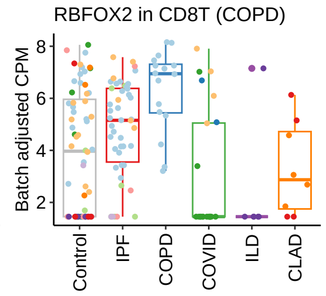

CFAP144 in CD8T (IPF)
Batch adjusted CPM
Control
IPF
COPD
COVID
ILD
CLAD

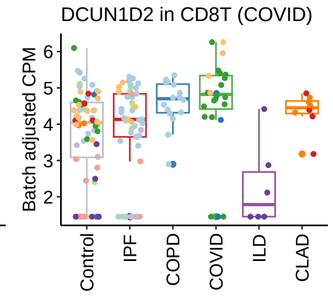

SERPINE1 in CD8T (IPF)
Batch adjusted CPM
Control
IPF
COPD
COVID
ILD
CLAD

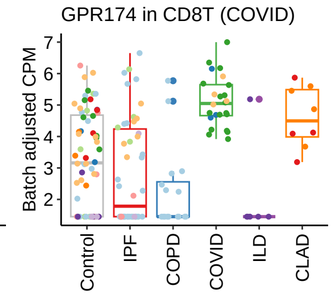

SFRP2 in CD8T (IPF)
Batch adjusted CPM
Control
IPF
COPD
COVID
ILD
CLAD

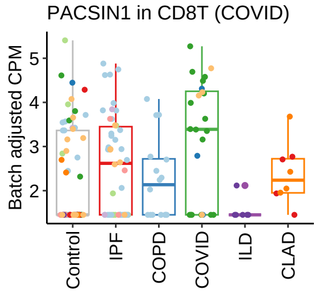

SPP1 in CD8T (IPF)
Batch adjusted CPM
Control
IPF
COPD
COVID
ILD
CLAD

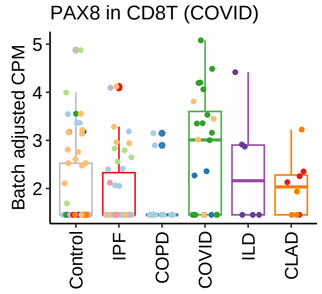

ERP27 in CD8T (COPD)
Batch adjusted CPM
Control
IPF
COPD
COVID
ILD
CLAD


RBFOX2 in CD8T (COPD)
Batch adjusted CPM
Control
IPF
COPD
COVID
ILD
CLAD


DCUN1D2 in CD8T (COVID)
Batch adjusted CPM
Control
IPF
COPD
COVID
ILD
CLAD


GPR174 in CD8T (COVID)
Batch adjusted CPM
Control
IPF
COPD
COVID
ILD
CLAD


PACSIN1 in CD8T (COVID)
Batch adjusted CPM
Control
IPF
COPD
COVID
ILD
CLAD


PAX8 in CD8T (COVID)
Batch adjusted CPM
Control
IPF
COPD
COVID
ILD
CLAD

BCKDK in NK (IPF)
FN1 in NK (IPF)
LMNA in NK (IPF)
MMP7 in NK (IPF)
RHOB in NK (IPF)
SCGB3A1 in NK (IPF)
SERPINE1 in NK (IPF)
SPP1 in NK (IPF)
WFDC2 in NK (IPF)
BAIAP2L1 in NK (COPD)
ERP27 in NK (COPD)
HSD17B13 in NK (COPD)
ME1 in NK (COPD)
ODAD3 in NK (COPD)
PLXNA4 in NK (COPD)
PTPRS in NK (COPD)
SH3D19 in NK (COPD)
SIK1 in NK (COPD)
SLC5A6 in NK (COPD)
STON1 in NK (COPD)
ARHGAP11A in NK (COVID)
ATF7 in NK (COVID)
B3GNTL1 in NK (COVID)
CDK1 in NK (COVID)
DPP4 in NK (COVID)
GPR174 in NK (COVID)
GSTCD in NK (COVID)
HJURP in NK (COVID)
KIF23 in NK (COVID)
MAK in NK (COVID)
NCAPG in NK (COVID)
RAB15 in NK (COVID)
SATB1 in NK (COVID)
TTK in NK (COVID)
ZMYM6 in NK (COVID)
Batch adjusted CPM
Control
IPF
COPD
COVID
ILD
CLAD


FN1 in B (IPF)
NBPF15 in B (IPF)
PTPRK in B (IPF)
RAD51B in B (IPF)
SCGB1A1 in B (IPF)
SPP1 in B (IPF)
AP4E1 in B (COPD)
BMAL1 in B (COPD)
GAB2 in B (COPD)
IQGAP2 in B (COPD)
MTMR1 in B (COPD)
PPP4R1 in B (COPD)
RUNX2 in B (COPD)
SLC5A6 in B (COPD)
SMURF1 in B (COPD)
SNED1 in B (COPD)
TOX2 in B (COPD)
ULK4 in B (COPD)
ZFYVE16 in B (COPD)
ATP2B4 in B (COVID)
DISP1 in B (COVID)
TMEM135 in B (COVID)
ZCCHC2 in B (COVID)
Batch adjusted CPM
Control
IPF
COPD
COVID
ILD
CLAD

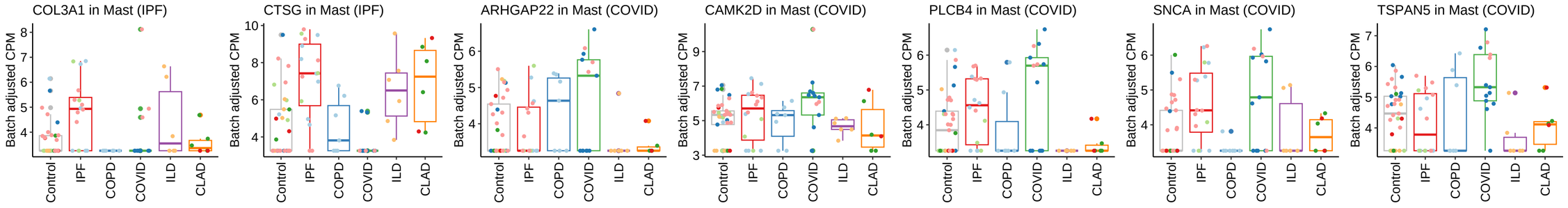
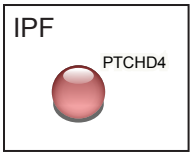
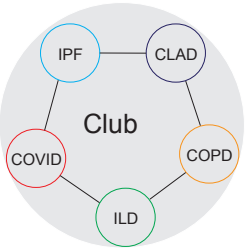

COL3A1 in Mast (IPF)
CTSG in Mast (IPF)
ARHGAP22 in Mast (COVID)
CAMK2D in Mast (COVID)
PLCB4 in Mast (COVID)
SNCA in Mast (COVID)
TSPAN5 in Mast (COVID)
Batch adjusted CPM
Control
IPF
COPD
COVID
ILD
CLAD

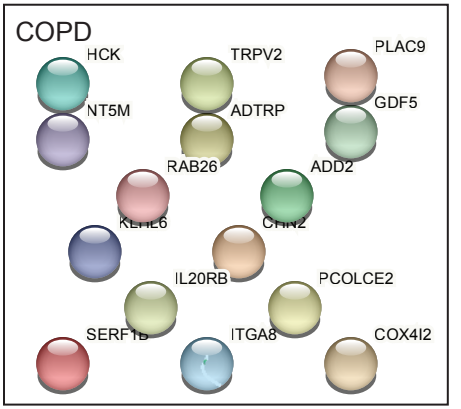
Fig.S9

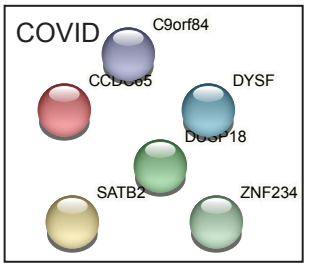
	IPF	ILD	COPD	COVID	CLAD
AT2	1	0	25	19	0
AT1	0	19	1	7	0
Ciliated	0	0	1	0	0
Differentiating_Ciliated	0	0	NA	NA	NA
Basal	0	NA	NA	0	NA
Club	0	0	10	4	0
Goblet	0	0	NA	0	NA
Artery	0	1	1	6	0
Vein	0	0	NA	6	0
Bronchial	0	0	NA	0	0
Cap	0	0	1	7	0
Cap-a	0	0	NA	6	0
Lymphatic	0	4	1	3	0
AdvF	0	NA	21	9	6
AlvF	0	0	NA	2	0
PB_Fibro	0	NA	NA	28	NA
Pericyte	0	NA	NA	0	0
ASM	0	1	NA	0	0
CM	0	1	1	13	0
NCM	0	0	0	0	0
AM	7	3	41	2	0
Prolif.IM	0	0	8	0	1
Eryth.macro	0	0	NA	NA	0
IM	0	5	15	6	0
MoM	10	1	26	0	0
DC2	0	0	7	1	0
DC1	0	NA	0	NA	NA
CD4T	0	1	3	9	0
CD8T	0	0	0	4	0
NK	0	0	0	5	0
NKT	0	NA	0	NA	0
B	0	36	0	14	0
Plasma	0	4	1	0	0
Mast	0	5	0	4	0

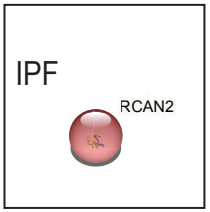
Fig.S10

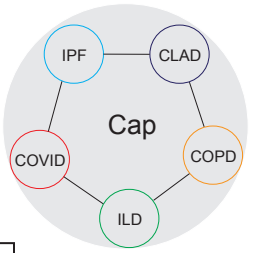

IPF
PTCHD4

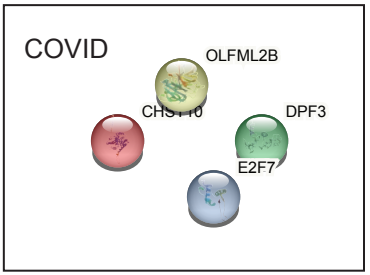

IPF
CLAD
Club
COVID
COPD
ILD

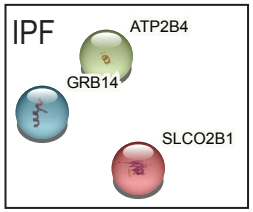

COPD
HCK
TRPV2
PLAC9
NT5M
ADTRP
GDF5
RAB26
ADD2
IL20RB
PCOLCE2
ITGA8
COX4I2

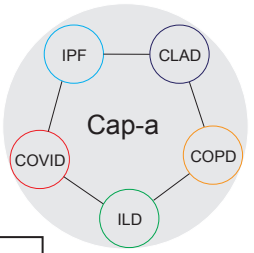

COVID
C9orf84
DYSF
SATB2
ZNF234

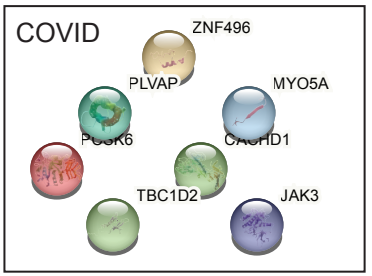

IPF
RCAN2

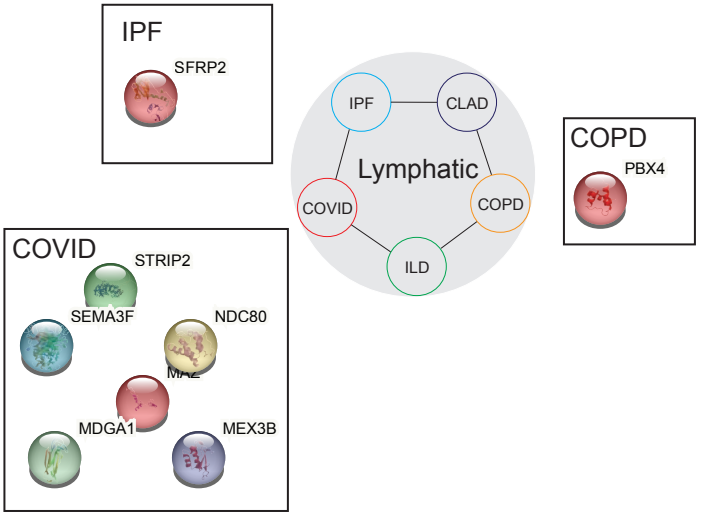

IPF
CLAD
Cap
COVID
COPD
ILD

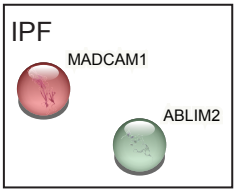

COVID
OLFML2B
DPF3
E2F7

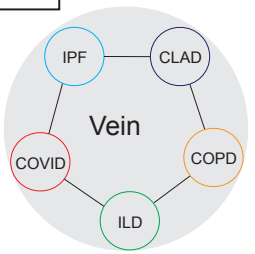

IPF
ATP2B4
GRB14
SLCO2B1

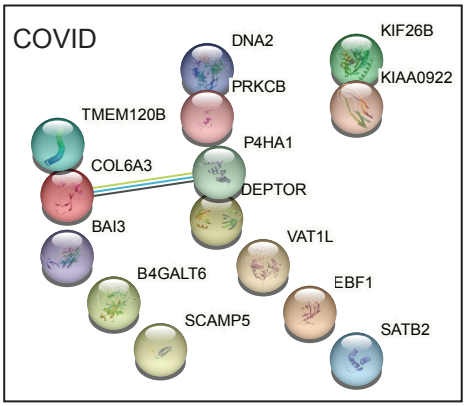

IPF
CLAD
Cap-a
COVID
COPD
ILD

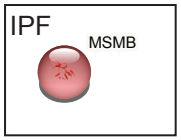

COVID
ZNF496
PLVAP
MYO5A
TBC1D2
JAK3

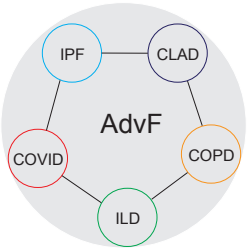

IPF
SFRP2
IPF
CLAD
Lymphatic
COVID
COPD
ILD
COPD
PBX4
COVID
STRIP2
SEMA3F
NDC80
MDGA1
MEX3B

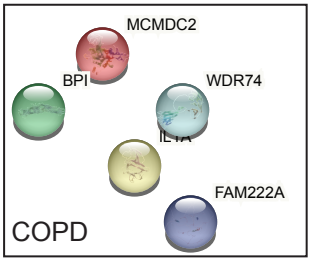

IPF
MADCAM1
ABLIM2


IPF
CLAD
Vein
COVID
COPD
ILD


COVID
DNA2
KIF26B
PRKCB
KIAA0922
TMEM120B
P4HA1
COL6A3
DEPTOR
BAI3
VAT1L
B4GALT6
EBF1
SCAMP5
SATB2


IPF
MSMB


IPF
CLAD
AdvF
COVID
COPD
ILD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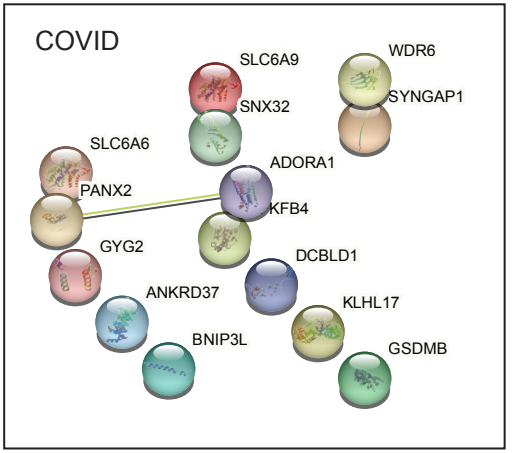
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WDR6
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ADORA1
PANX2
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KLHL17
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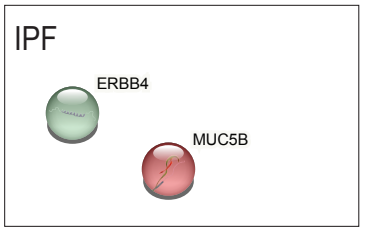
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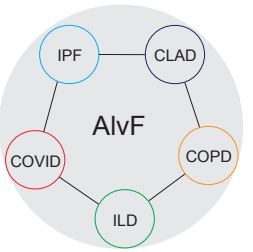
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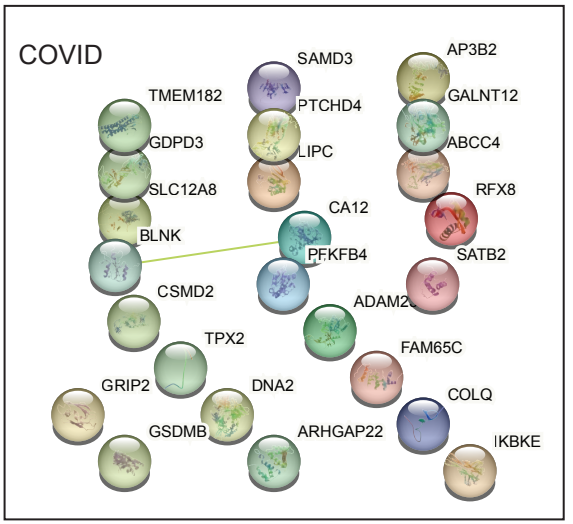
AlvF
COVID
COPD
ILD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GDPD3
LIPC
ABCC4
SLC12A8
RFX8
CA12
BLNK
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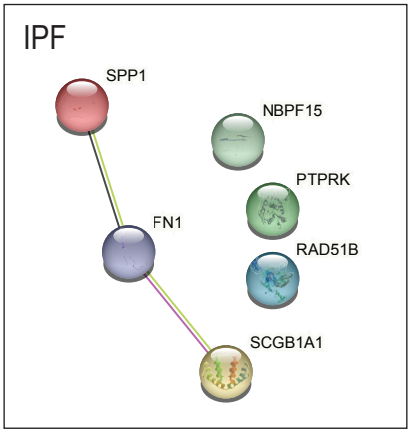
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FN1
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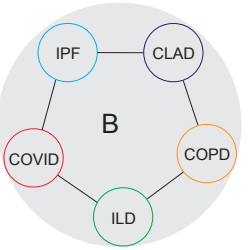
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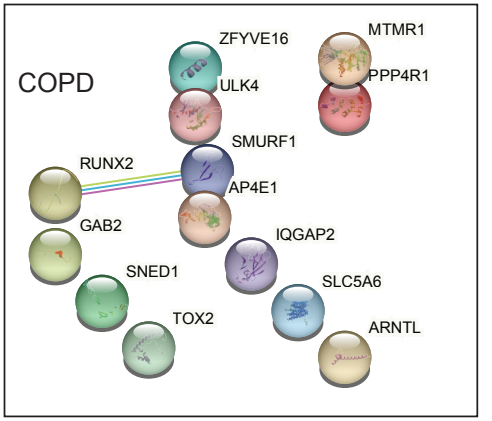
CLAD
B
COVID
COPD
ILD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TOX2
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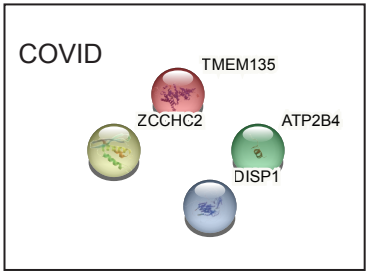
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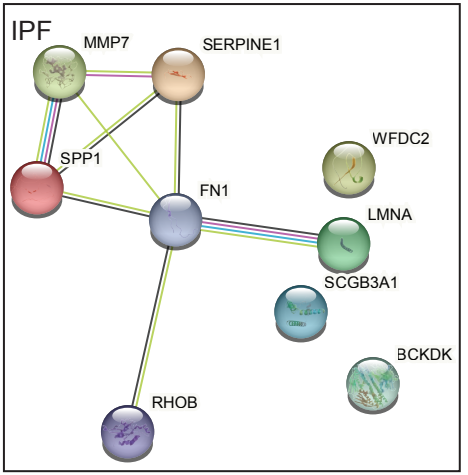
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LMNA
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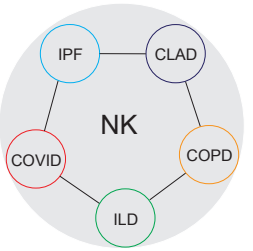
BCKDK
RHOB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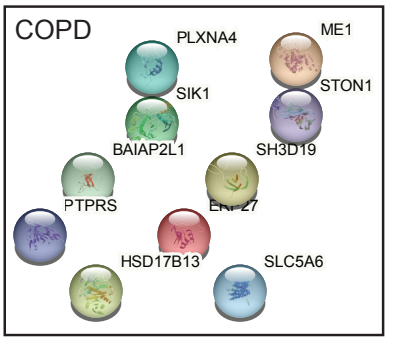
CLAD
NK
COVID
COPD
ILD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BAIAP2L1
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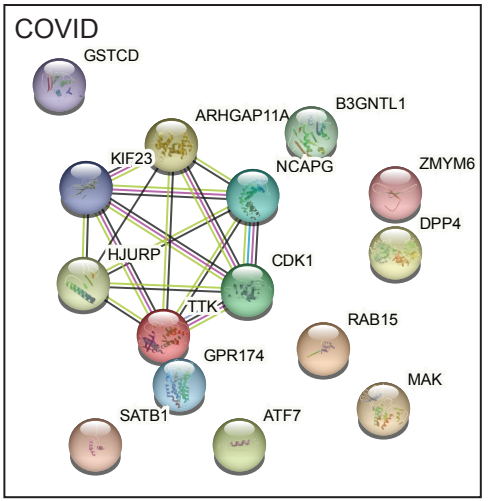
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B3GNTL1
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CDK1
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MAK
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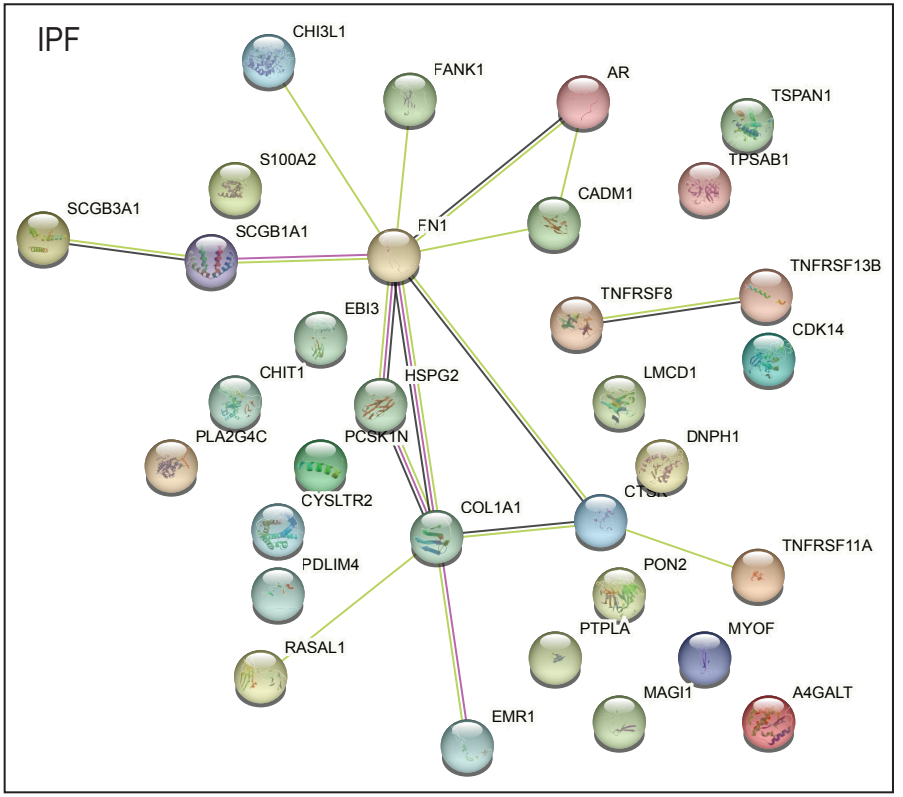
ATF7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CHI3L1
FANK1
AR
TSPAN1
TPSAB1
S100A2
SCGB3A1
SCGB1A1
FN1
CADM1
TNFRSF13B
TNFRSF8
CDK14
EBI3
CHIT1
HSPG2
LMCD1
PLA2G4C
PCSK1N
DNPH1
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MAGI1
A4GALT
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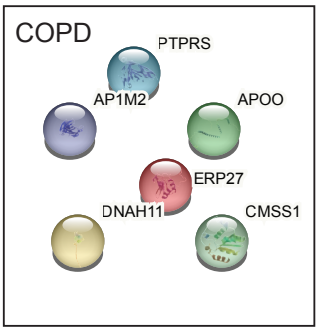
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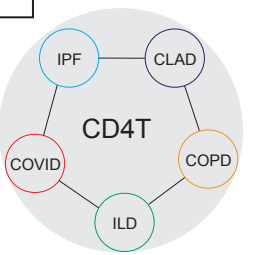
CMSS1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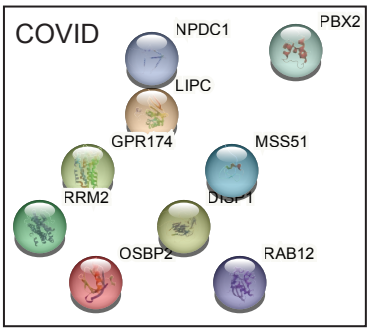
IPF
CLAD
COVID
COPD
ILD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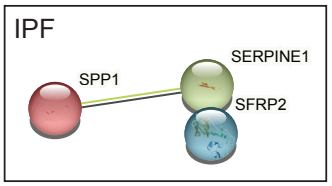
GPR174
MSS51
RRM2
OSBP2
RAB12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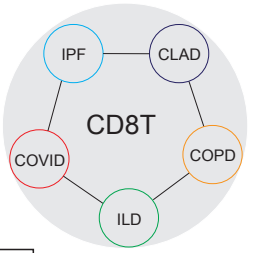
SERPINE1
SPP1
SFRP2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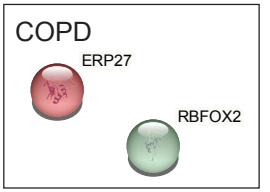
COPD
ILD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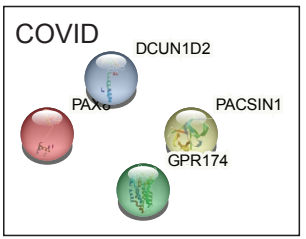
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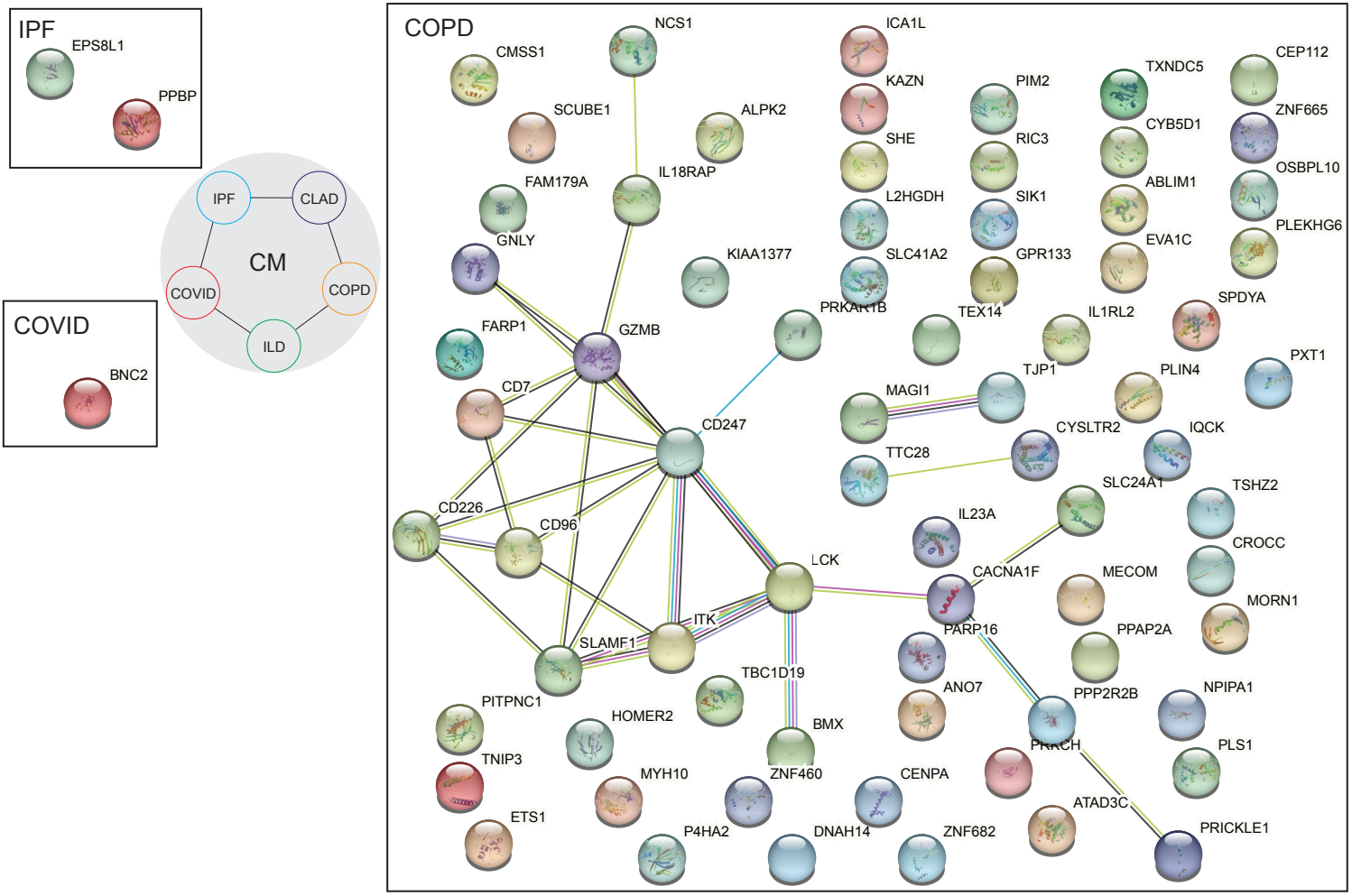
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PPBP
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CLAD
CM
COVID
COPD
ILD
COVID
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COPD
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CMSS1
SCUBE1
ALPK2
IL18RAP
FAM179A
GNLY
KIAA1377
FARP1
GZMB
PRKAR1B
CD7
CD247
CD226
CD96
LCK
ITK
SLAMF1
PITPNC1
TNIP3
ETS1
HOMER2
MYH10
P4HA2
TBC1D19
BMX
ZNF460
DNAH14
CENPA
ZNF682
ICA1L
KAZN
SHE
L2HGDH
SLC41A2
PIM2
RIC3
SIK1
GPR133
TEX14
TXNDC5
CYB5D1
ABLIM1
EVA1C
IL1RL2
CEP112
ZNF665
OSBPL10
PLEKHG6
SPDYA
PXT1
TJP1
MAGI1
TTC28
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PARP16
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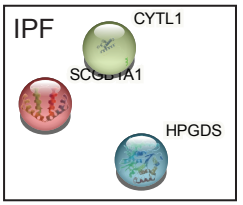
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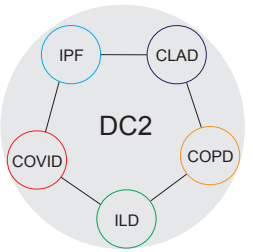
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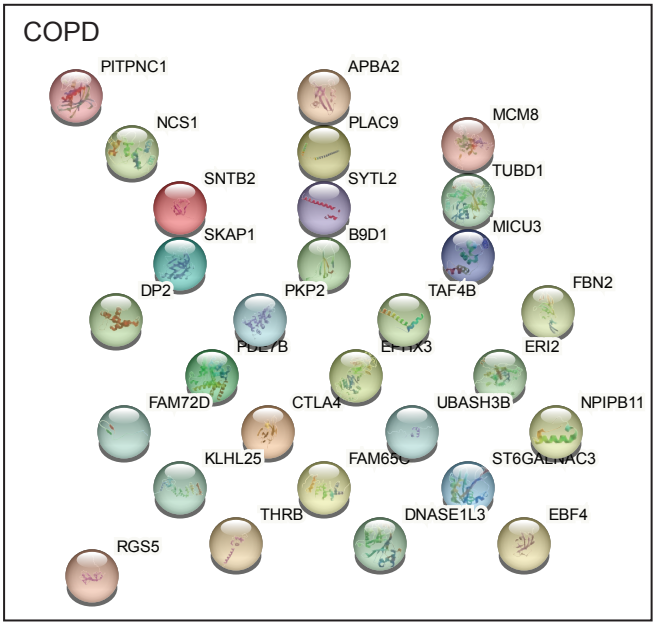
COPD
ILD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SYTL2
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SKAP1
B9D1
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DP2
PKP2
TAF4B
FBN2
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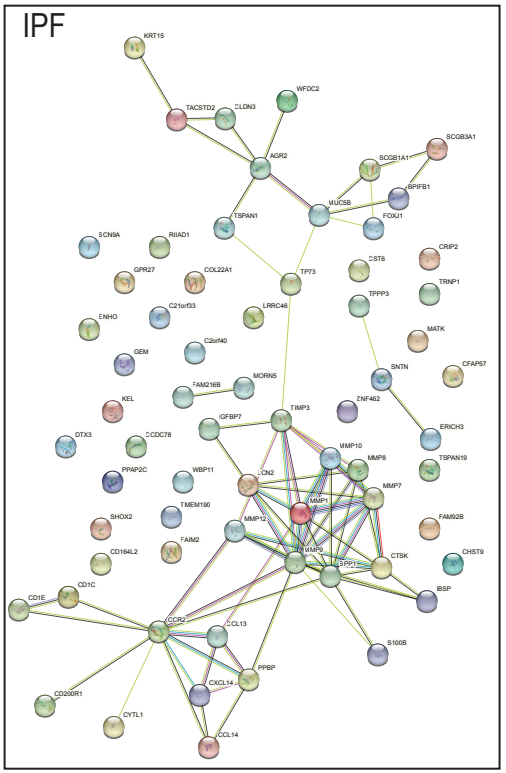
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AGR2
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SCGB1A1
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MUC5B
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TSPAN1
SCN9A
RIIAD1
CRIP2
GPR27
COL22A1
TP73
CST6
TRNP1
TPPP3
C21orf33
LRRC46
ENHO
MATK
C2orf40
GEM
SNTN
CFAP57
FAM216B
MORN5
KEL
ZNF462
TIMP3
IGFBP7
ERICH3
DTX3
CDC78
MMP10
MMP8
TSPAN19
PPAP2C
WBP11
CCN2
MMP7
MMP1
TMEM190
SHOX2
MMP12
FAM92B
FAIM2
MMP9
CD164L2
CTSK
CHST9
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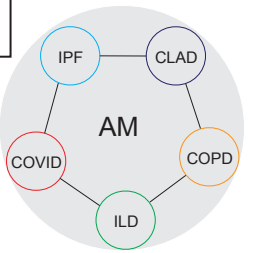
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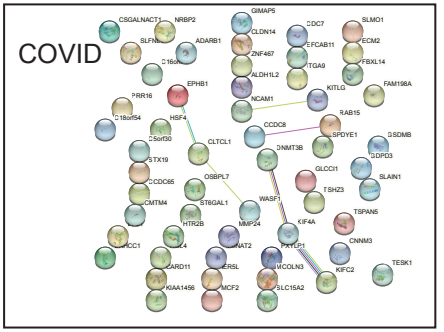
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NRBP2
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CDC7
SLMO1
SLFN5
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ZNF467
TGA9
FBXL14
EPHB1
ALDH1L2
KITLG
FAM198A
PRR16
NCAM1
C18orf54
HSF4
CCDC8
RAB15
C5orf30
CLTCL1
SPDYE1
GSDMB
DNMT3B
GDPD3
STX19
GLCCI1
CDC65
OSBPL7
SLAIN1
TSHZ3
CMTM4
ST6GAL1
WASF1
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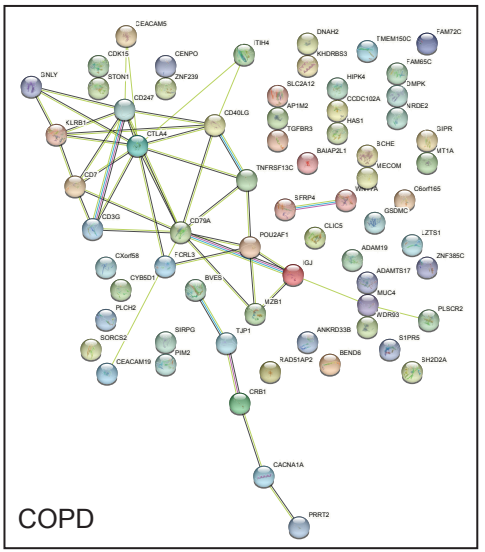
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FAM72C
CDK15
ITIH4
CENPO
KHDRBS3
FAM65C
GNLY
STON1
ZNF239
HIPK4
DMPK
CD247
SLC2A12
CCDC102A
CD40LG
AP1M2
NRDE2
KLRB1
TGFBR3
HAS1
CTLA4
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MT1A
TNFRSF13C
MECOM
CD7
SFRP4
C6orf165
CD3G
CD79A
GSDMC
CLICS
POU2AF1
ZTSTS1
ADAM19
FCRL3
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CXorf58
IGJ
ADAMTS17
CYB5D1
BVES
MUC4
PLCH2
MZB1
WDR93
PLSCR2
SIRPG
TJP1
ANKRD33B
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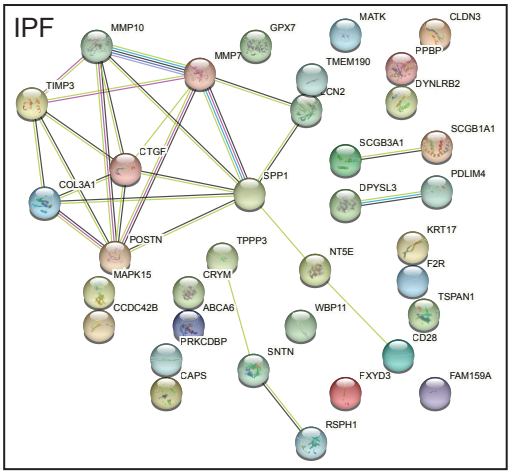
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GPX7
MATK
CLDN3
MMP7
PPBP
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TIMP3
DYNLRB2
SCGB1A1
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CTGF
SPP1
COL3A1
DPYSL3
PDLIM4
KRT17
TPPP3
NT5E
POSTN
F2R
MAPK15
CRYM
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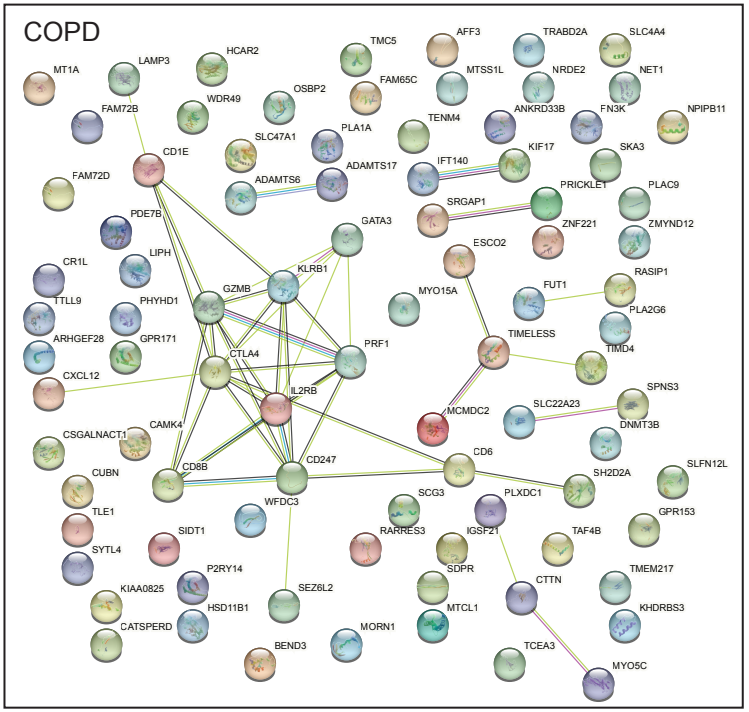
RSPH1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TRABD2A
SLC4A4
MT1A
LAMP3
HCAR2
MTSS1L
NRDE2
NET1
FAM65C
OSBP2
WDR49
FAM72B
ANKRD33B
FN3K
NPIPB11
TENM4
PLA1A
SLC47A1
KIF17
SKA3
CD1E
IFT140
ADAMTS17
FAM72D
ADAMTS6
PRICKLE1
PLAC9
SRGAP1
PDE7B
GATA3
ZNF221
ZMYND12
ESCO2
LIPH
CR1L
KLRB1
RASIP1
GZMB
MYO15A
FUT1
TTLL9
PHYHD1
PLA2G6
ARHGEF28
GPR171
TIMELESS
PRF1
TIMD4
CTLA4
CXCL12
IL2RB
SPNS3
MCMDC2
SLC22A23
CAMK4
DNMT3B
CSGALNACT1
CD6
CD8B
CD247
SLFN12L
CUBN
SH2D2A
PLXDC1
SCG3
WFDC3
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TLE1
RARRES3
IGSF21
TAF4B
SIDT1
SYTL4
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TMEM217
P2RY14
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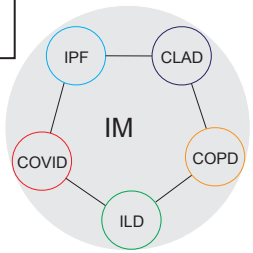
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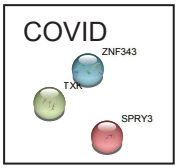
CLAD
IM
COVID
COPD
ILD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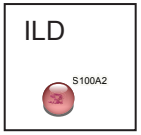
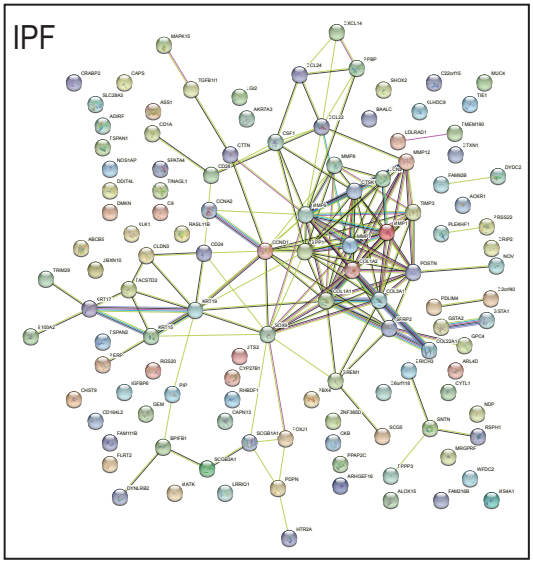

ILD
S100A2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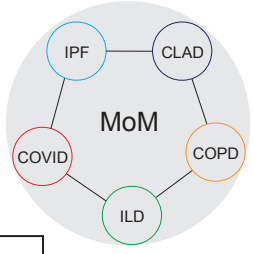
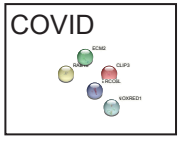
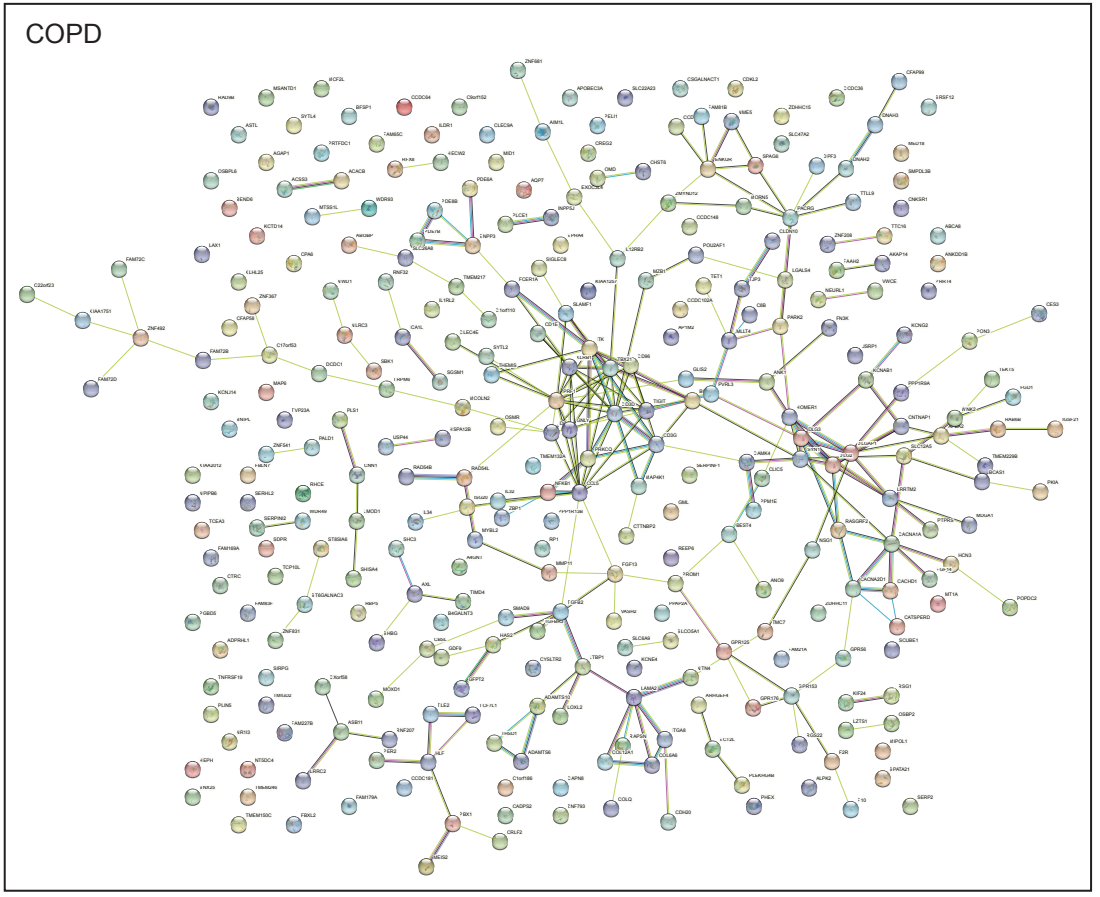

IPF
CLAD
MoM
COVID
COPD
ILD


COVID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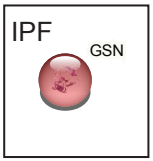
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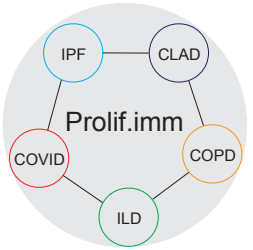
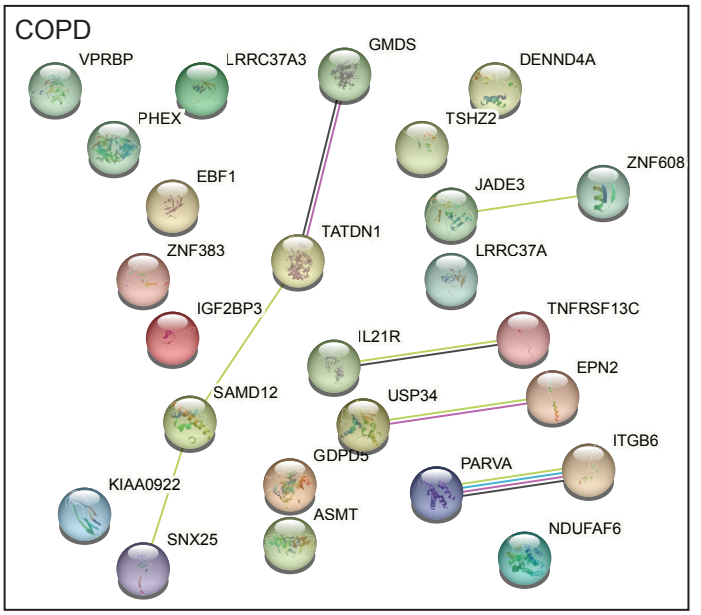
GSN


IPF
CLAD
Prolif.imm
COVID
COPD
ILD


COPD
VPRBP
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GMDS
DENND4A
PHEX
TSHZ2
ZNF608
EBF1
JADE3
TATDN1
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IGF2BP3
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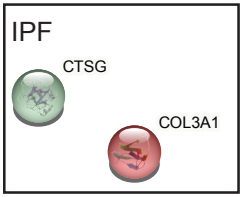
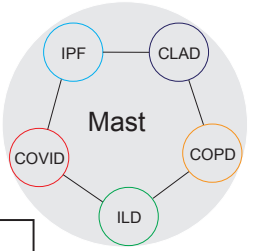
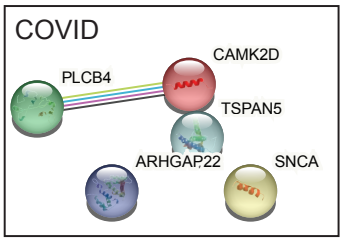

IPF
CTSG
COL3A1


IPF
CLAD
Mast
COVID
COPD
ILD


COVID
CAMK2D
PLCB4
TSPAN5
ARHGAP22
SNCA

ABI3BP in COPD_CLAD | ACSS3 in COPD_CLAD | ADAM12 in COPD_CLAD | ADAMTS10 in COPD_CLAD | ADGRG1 in COPD_CLAD | ALDH1A3 in COPD_CLAD | ALG1 in COPD_CLAD | ANO9 in COPD_CLAD

AP1M2 in COPD_CLAD | APBA2 in COPD_CLAD | B4GALNT3 in COPD_CLAD | BEND6 in COPD_CLAD | BFSP1 in COPD_CLAD | CACHD1 in COPD_CLAD | CALHM2 in COPD_CLAD | CAMK4 in COPD_CLAD

CAPN13 in COPD_CLAD | CAPN8 in COPD_CLAD | CATSPERD in COPD_CLAD | CCDC102A in COPD_CLAD | CCDC181 in COPD_CLAD | CCR1 in COPD_CLAD | CD36 in COPD_CLAD | CD96 in COPD_CLAD

CDH20 in COPD_CLAD | CDKL2 in COPD_CLAD | CFAP74 in COPD_CLAD | CFAP99 in COPD_CLAD | CHTOP in COPD_CLAD | CLDN10 in COPD_CLAD | CNN1 in COPD_CLAD | COL6A6 in COPD_CLAD

CREB3L2 in COPD_CLAD | CREG2 in COPD_CLAD | CRYBG2 in COPD_CLAD | CSTB in COPD_CLAD | CTSL in COPD_CLAD | CXorf58 in COPD_CLAD | CXXC5 in COPD_CLAD | CYP39A1 in COPD_CLAD

DAB2 in COPD_CLAD | DLG3 in COPD_CLAD | DLGAP1 in COPD_CLAD | DNAH2 in COPD_CLAD | DNAH3 in COPD_CLAD | EEPD1 in COPD_CLAD | ENKUR in COPD_CLAD | ENPP3 in COPD_CLAD

EPHA4 in COPD_CLAD | ERI2 in COPD_CLAD | F10 in COPD_CLAD | F2R in COPD_CLAD | FAM72C in COPD_CLAD | FAM81B in COPD_CLAD | FAM83F in COPD_CLAD | FERMT1 in COPD_CLAD

FGD1 in COPD_CLAD | FGF14 in COPD_CLAD | FPR3 in COPD_CLAD | FZD5 in COPD_CLAD | GFPT2 in COPD_CLAD | GLMP in COPD_CLAD | GPC3 in COPD_CLAD | GPR153 in COPD_CLAD

GPR176 in COPD_CLAD
HAS2 in COPD_CLAD
HEPH in COPD_CLAD
HK2 in COPD_CLAD
HSPA12B in COPD_CLAD
IL12RB2 in COPD_CLAD
IL34 in COPD_CLAD
ILDR1 in COPD_CLAD
INCENP in COPD_CLAD
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ITK in COPD_CLAD
JADE2 in COPD_CLAD
KIAA0825 in COPD_CLAD
KIAA0930 in COPD_CLAD
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LRRC2 in COPD_CLAD
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MANF in COPD_CLAD
MDGA1 in COPD_CLAD
MED18 in COPD_CLAD
METTL21A in COPD_CLAD
MGLL in COPD_CLAD
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MOSPD2 in COPD_CLAD
MOXD1 in COPD_CLAD
NAGK in COPD_CLAD
NARS1 in COPD_CLAD
NBPF15 in COPD_CLAD
NLRC3 in COPD_CLAD
NPIPB6 in COPD_CLAD
NRDE2 in COPD_CLAD
NSG1 in COPD_CLAD
NTN4 in COPD_CLAD
NUP50 in COPD_CLAD
ODAD1 in COPD_CLAD
OSMR in COPD_CLAD
P2RX4 in COPD_CLAD
PACRG in COPD_CLAD
PBX1 in COPD_CLAD
PELI1 in COPD_CLAD
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PLEKHG4B in COPD_CLAD
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PON3 in COPD_CLAD
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PPP1R18 in COPD_CLAD
PRELID2 in COPD_CLAD
PRG4 in COPD_CLAD
PROM1 in COPD_CLAD
PRPSAP1 in COPD_CLAD
PTPRS in COPD_CLAD
RAB6B in COPD_CLAD
RAD54L in COPD_CLAD
RAD9B in COPD_CLAD
RBP5 in COPD_CLAD
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

RFX8 in COPD_CLAD
RGS22 in COPD_CLAD
RHEX in COPD_CLAD
RNF32 in COPD_CLAD
SBK1 in COPD_CLAD
SCUBE1 in COPD_CLAD
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SERP2 in COPD_CLAD
SERPINI2 in COPD_CLAD
SHBG in COPD_CLAD
SIGLEC9 in COPD_CLAD
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SLCO5A1 in COPD_CLAD
SPAG6 in COPD_CLAD
SPP1 in COPD_CLAD
ST6GALNAC3 in COPD_CLA
ST8SIA6 in COPD_CLAD
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TCIRG1 in COPD_CLAD
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TIMD4 in COPD_CLAD
TIMELESS in COPD_CLAD
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TMIGD2 in COPD_CLAD
TOGARAM2 in COPD_CLAD
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VASH2 in COPD_CLAD
WASHC2C in COPD_CLAD
WDR93 in COPD_CLAD
WIPF1 in COPD_CLAD
WNK2 in COPD_CLAD
ZDHHC11 in COPD_CLAD
ZDHHC15 in COPD_CLAD
ZMYND12 in COPD_CLAD
ZNF254 in COPD_CLAD
ZNF541 in COPD_CLAD
ZNF681 in COPD_CLAD
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

ABL2 in COPD_COVID
ACACB in COPD_COVID
ACSS3 in COPD_COVID
ACVR1 in COPD_COVID
ACYP1 in COPD_COVID
ADAM10 in COPD_COVID
ADAM19 in COPD_COVID
ADAM9 in COPD_COVID
ADGRA3 in COPD_COVID
ADGRE5 in COPD_COVID
ADGRG1 in COPD_COVID
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AKT3 in COPD_COVID
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ALPK2 in COPD_COVID
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APOBEC3A in COPD_COVID
AQP7 in COPD_COVID
ARHGEF4 in COPD_COVID
ARMT1 in COPD_COVID
ASTL in COPD_COVID
AXL in COPD_COVID
B4GALNT3 in COPD_COVID
BCAS1 in COPD_COVID
BFSP1 in COPD_COVID
BIRC3 in COPD_COVID
BTBD19 in COPD_COVID
BTBD7 in COPD_COVID
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C8B in COPD_COVID
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CCR1 in COPD_COVID
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CD3G in COPD_COVID
CD4 in COPD_COVID
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CDKL2 in COPD_COVID
CFAP99 in COPD_COVID
CHD7 in COPD_COVID
CHKA in COPD_COVID
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

CHST6 in COPD_COVID
CLDN10 in COPD_COVID
CLEC4E in COPD_COVID
CLEC9A in COPD_COVID
CLIC5 in COPD_COVID
CLN3 in COPD_COVID
CLPB in COPD_COVID
CMTM2 in COPD_COVID
CNN1 in COPD_COVID
CNOT6L in COPD_COVID
CPOX in COPD_COVID
CREB3L2 in COPD_COVID
CREG2 in COPD_COVID
CRLF2 in COPD_COVID
CRYBG1 in COPD_COVID
CSTB in COPD_COVID
CTRC in COPD_COVID
CTSF in COPD_COVID
CTSL in COPD_COVID
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CYTIP in COPD_COVID
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DGKZ in COPD_COVID
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DLGAP1 in COPD_COVID
EEPD1 in COPD_COVID
ELMO1 in COPD_COVID
ELMO2 in COPD_COVID
ENPP3 in COPD_COVID
ENTPD1 in COPD_COVID
EPHA4 in COPD_COVID
ERI2 in COPD_COVID
ESYT2 in COPD_COVID
F10 in COPD_COVID
F2R in COPD_COVID
FAM72B in COPD_COVID
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FZD5 in COPD_COVID
GATM in COPD_COVID
GBE1 in COPD_COVID
GCH1 in COPD_COVID
GDF9 in COPD_COVID
GLCE in COPD_COVID
GLE1 in COPD_COVID
GLIS2 in COPD_COVID
GLMP in COPD_COVID
GNLY in COPD_COVID
GPC3 in COPD_COVID
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

GPR132 in COPD_COVID
H2AC6 in COPD_COVID
HAS1 in COPD_COVID
HAS2 in COPD_COVID
HECW2 in COPD_COVID
HEPH in COPD_COVID
HLA.DOA in COPD_COVID
HLA.DPA1 in COPD_COVID
HLA.DPB1 in COPD_COVID
HLA.DQA1 in COPD_COVID
HLA.DQB1 in COPD_COVID
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HLA.F in COPD_COVID
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MDM2 in COPD_COVID
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METTL21A in COPD_COVID
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MITD1 in COPD_COVID
MMP11 in COPD_COVID
MORN5 in COPD_COVID

Batch adjusted CPM

Control IPF ILD COPD COVID CLAD

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MTHFD1L in COPD_COVID
MTSS2 in COPD_COVID
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NCLN in COPD_COVID
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NEURL1 in COPD_COVID
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NFKB1 in COPD_COVID
NHSL1 in COPD_COVID
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NRDE2 in COPD_COVID
NSG1 in COPD_COVID
NSL1 in COPD_COVID
NTN4 in COPD_COVID
NUDT16 in COPD_COVID
NWD1 in COPD_COVID
OLFML2B in COPD_COVID
OSMR in COPD_COVID
P2RX4 in COPD_COVID
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PAPSS1 in COPD_COVID
PARP10 in COPD_COVID
PCID2 in COPD_COVID
PCNX1 in COPD_COVID
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PELI1 in COPD_COVID
PER2 in COPD_COVID
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PON3 in COPD_COVID
POPDC2 in COPD_COVID
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RDX in COPD_COVID
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REL in COPD_COVID
RGS22 in COPD_COVID
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RILPL2 in COPD_COVID
RIPOR3 in COPD_COVID
RNASE1 in COPD_COVID
RP1 in COPD_COVID
RTL5 in COPD_COVID
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

SAMD1 in COPD_COVID
SBK1 in COPD_COVID
SCUBE1 in COPD_COVID
SDC2 in COPD_COVID
SEC14L1 in COPD_COVID
SELL in COPD_COVID
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SRGAP2B in COPD_COVID
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ST6GALNAC3 in COPD_COV
STAT3 in COPD_COVID
STOM in COPD_COVID
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TAF5L in COPD_COVID
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TCP10L in COPD_COVID
TDP2 in COPD_COVID
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TGDS in COPD_COVID
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TGFBR3 in COPD_COVID
THSD1 in COPD_COVID
TIMD4 in COPD_COVID
TIMELESS in COPD_COVID
TJP2 in COPD_COVID
TLCD2 in COPD_COVID
TLR1 in COPD_COVID
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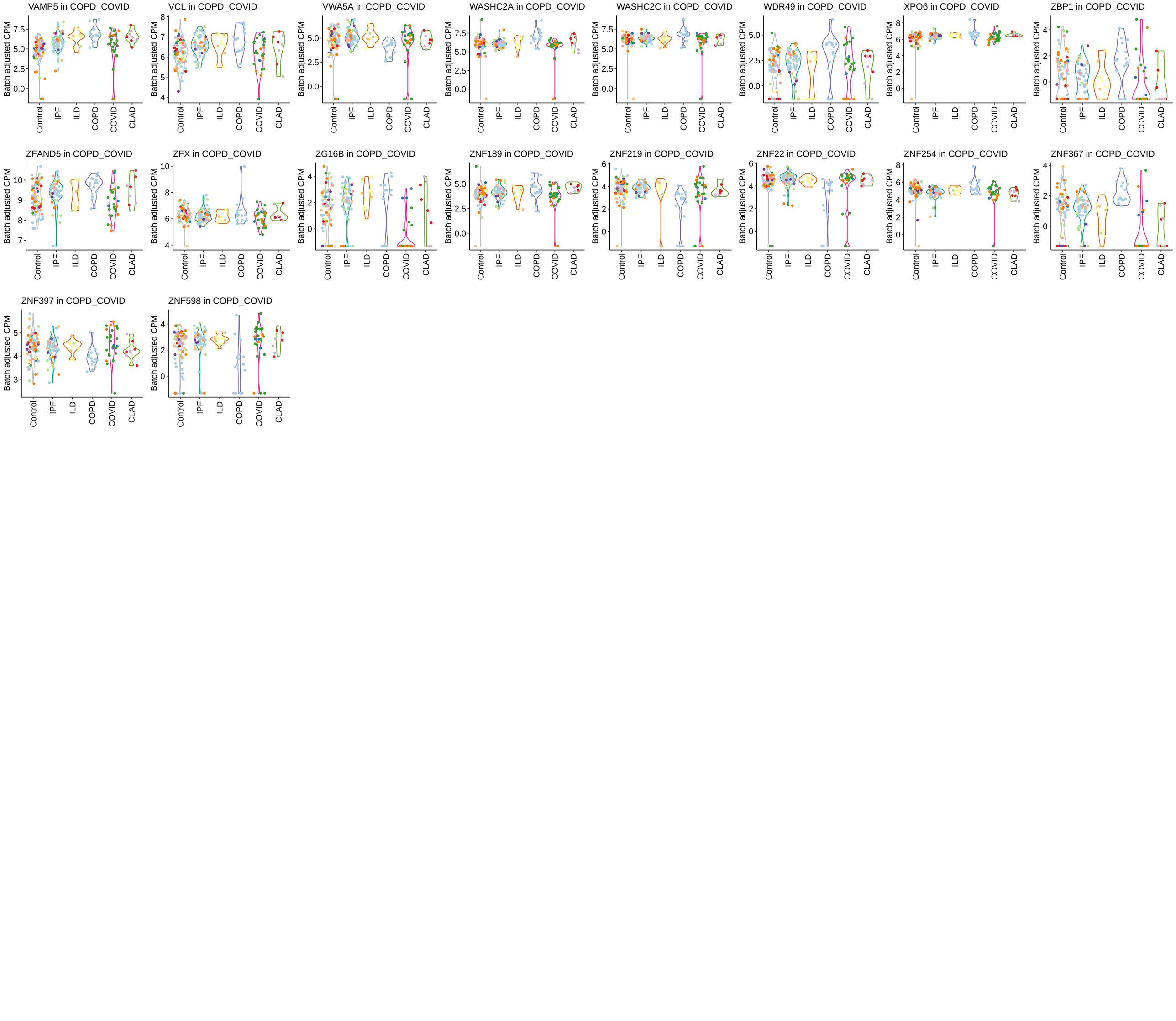
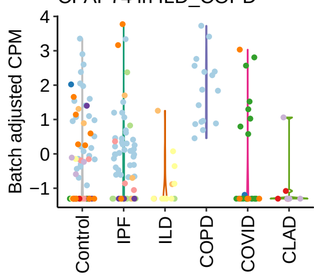
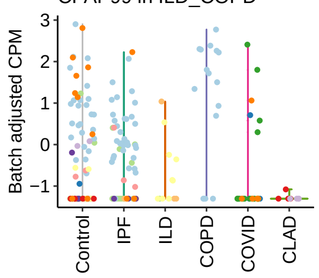
TMIGD2 in COPD_COVID
TRIM22 in COPD_COVID
TRIM52 in COPD_COVID
TRMO in COPD_COVID
TRPM6 in COPD_COVID
TTC16 in COPD_COVID
UAP1L1 in COPD_COVID
USP11 in COPD_COVID
USP44 in COPD_COVID
UTP4 in COPD_COVID
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD


VAMP5 in COPD_COVID
VCL in COPD_COVID
VWA5A in COPD_COVID
WASHC2A in COPD_COVID
WASHC2C in COPD_COVID
WDR49 in COPD_COVID
XPO6 in COPD_COVID
ZBP1 in COPD_COVID
ZFAND5 in COPD_COVID
ZFX in COPD_COVID
ZG16B in COPD_COVID
ZNF189 in COPD_COVID
ZNF219 in COPD_COVID
ZNF22 in COPD_COVID
ZNF254 in COPD_COVID
ZNF367 in COPD_COVID
ZNF397 in COPD_COVID
ZNF598 in COPD_COVID
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

A4GNT in ILD_COPD
ABCA8 in ILD_COPD
ABI3BP in ILD_COPD
ACP2 in ILD_COPD
ACSS3 in ILD_COPD
ACVR1 in ILD_COPD
ACYP1 in ILD_COPD
ADAM10 in ILD_COPD
ADAM9 in ILD_COPD
ADAMTS10 in ILD_COPD
ADGRA3 in ILD_COPD
ADGRG1 in ILD_COPD
ADPRHL1 in ILD_COPD
AFDN in ILD_COPD
AKAP8 in ILD_COPD
AKR1C2 in ILD_COPD
ALG1 in ILD_COPD
ALPK2 in ILD_COPD
ANKRD29 in ILD_COPD
ANO9 in ILD_COPD
ANXA4 in ILD_COPD
AP1M2 in ILD_COPD
AP2S1 in ILD_COPD
AP3M2 in ILD_COPD
APBA2 in ILD_COPD
AQP7 in ILD_COPD
ARHGEF4 in ILD_COPD
ARMT1 in ILD_COPD
ASB11 in ILD_COPD
ASTL in ILD_COPD
B4GALNT3 in ILD_COPD
BCAP31 in ILD_COPD
BCAS1 in ILD_COPD
BCL11B in ILD_COPD
BEND6 in ILD_COPD
BEST4 in ILD_COPD
BFSP1 in ILD_COPD
BICDL1 in ILD_COPD
BIRC3 in ILD_COPD
C14orf119 in ILD_COPD
C22orf23 in ILD_COPD
C2orf92 in ILD_COPD
C9orf152 in ILD_COPD
CACHD1 in ILD_COPD
CACNA1A in ILD_COPD
CACNA2D1 in ILD_COPD
CALHM2 in ILD_COPD
CALM3 in ILD_COPD
CAMK4 in ILD_COPD
CBS in ILD_COPD
CCDC102A in ILD_COPD
CCDC148 in ILD_COPD
CCDC181 in ILD_COPD
CCDC85C in ILD_COPD
CCL2 in ILD_COPD
CCND1 in ILD_COPD
CCR1 in ILD_COPD
CD276 in ILD_COPD
CD36 in ILD_COPD
CD3D in ILD_COPD
CD3G in ILD_COPD
CDH20 in ILD_COPD
CDKL2 in ILD_COPD
CES3 in ILD_COPD
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

CFAP74 in ILD_COPD


CFAP99 in ILD_COPD


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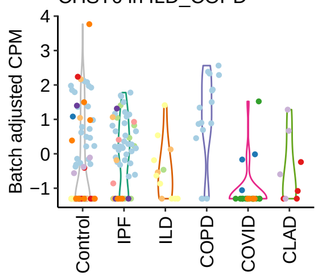

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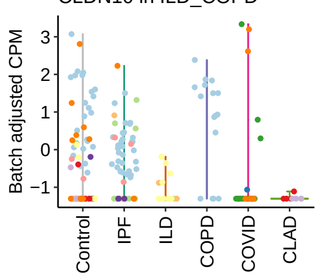

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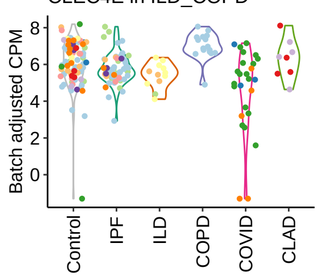

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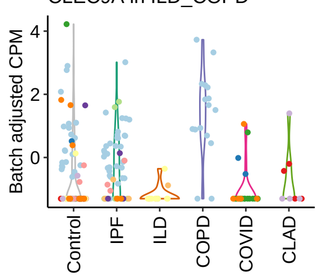

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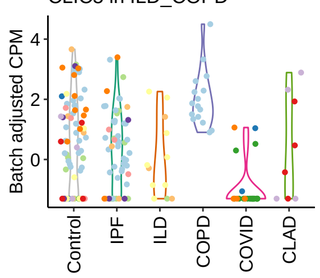

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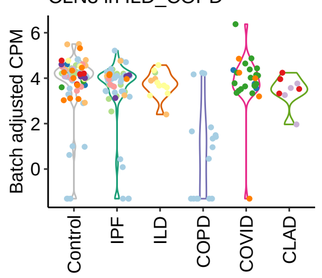

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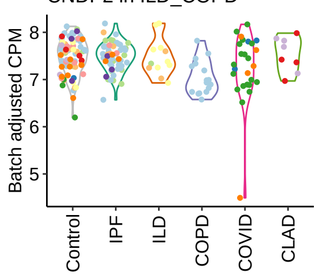

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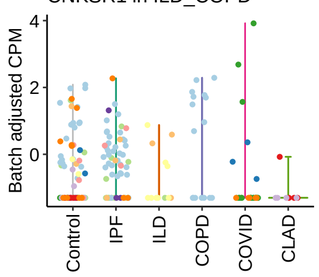

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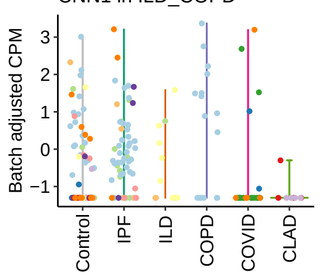

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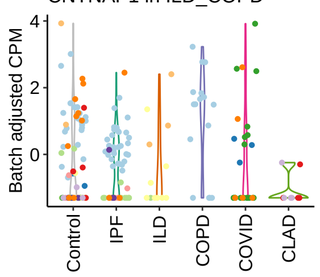

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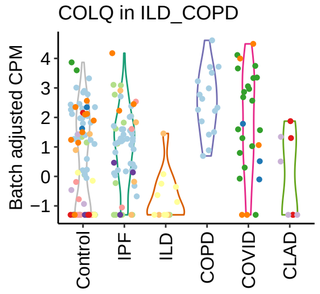

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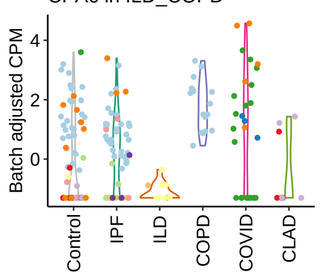

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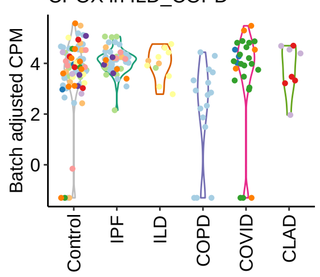

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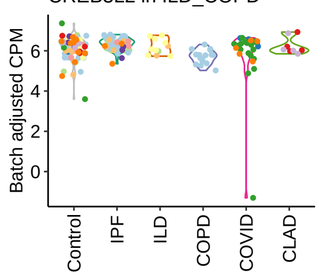

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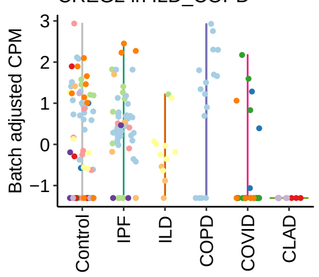

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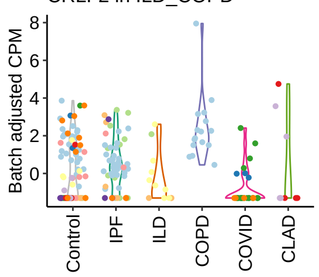

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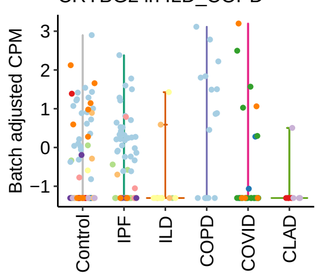

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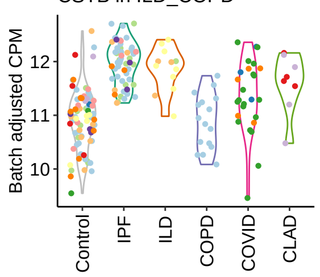

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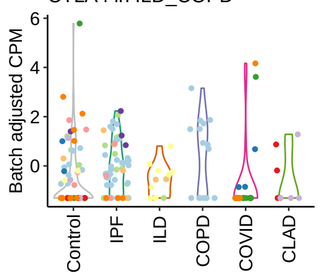

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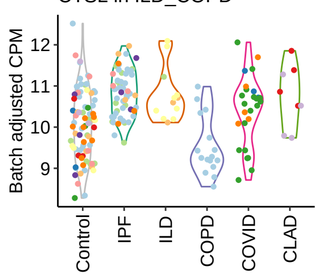

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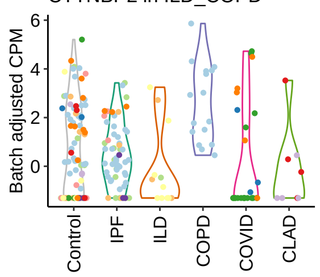

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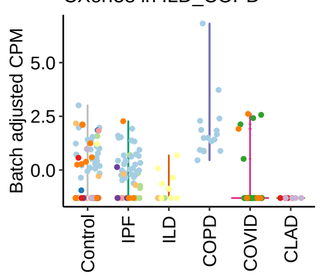

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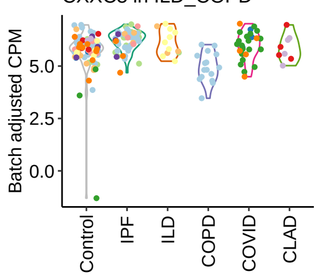

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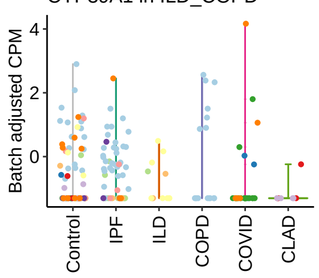

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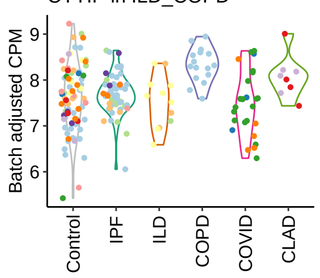

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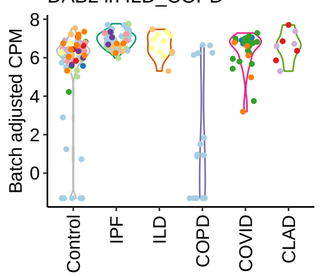

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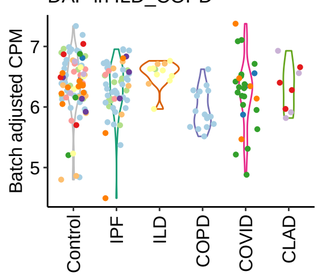

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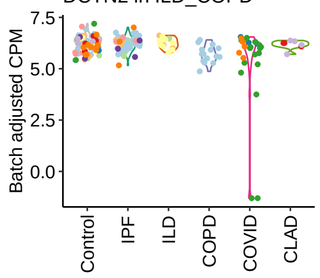

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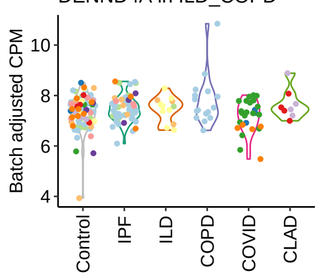

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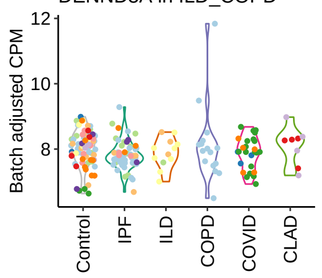

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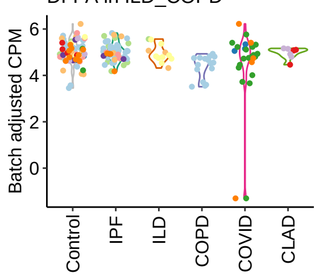

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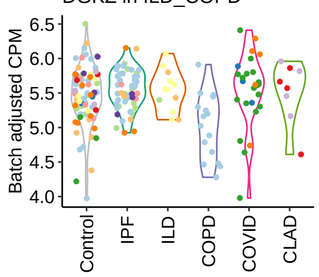

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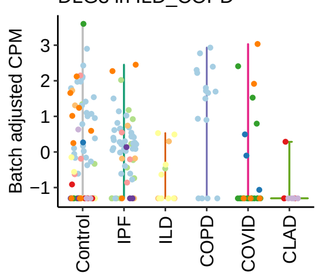

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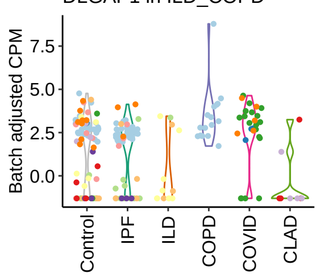

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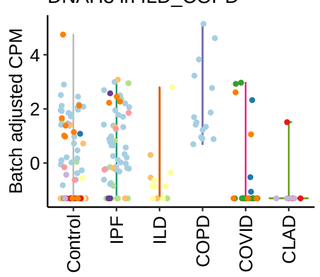

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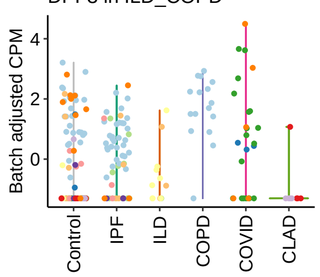

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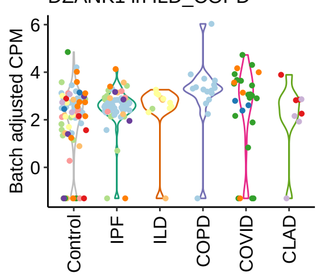

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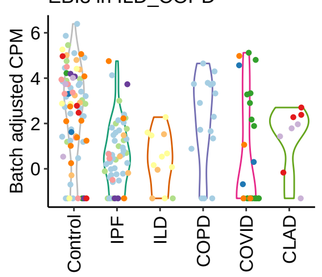


ECT2L in ILD_COPD

EEPD1 in ILD_COPD

ELMO2 in ILD_COPD

EPHA4 in ILD_COPD

ERI2 in ILD_COPD

ESYT2 in ILD_COPD

EXOC3L4 in ILD_COPD

F10 in ILD_COPD

F2R in ILD_COPD

FAAH2 in ILD_COPD

FAM169A in ILD_COPD

FAM20C in ILD_COPD

FAM227B in ILD_COPD

FAM72B in ILD_COPD

FAM72C in ILD_COPD

FAM83F in ILD_COPD

FBLN7 in ILD_COPD

FGD1 in ILD_COPD

FGF13 in ILD_COPD

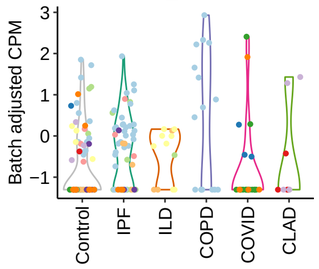
FGL2 in ILD_COPD

FUT1 in ILD_COPD

FZD5 in ILD_COPD

GARS1 in ILD_COPD

GCH1 in ILD_COPD

GDF9 in ILD_COPD

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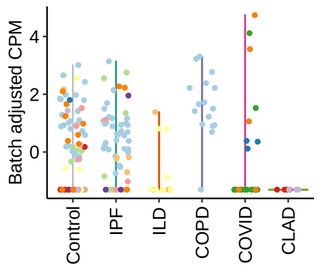
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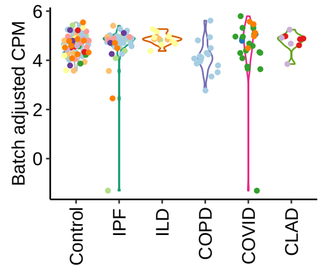
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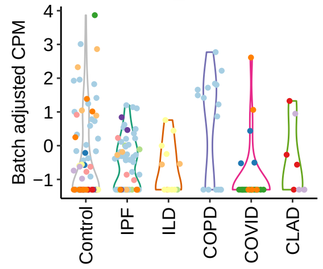
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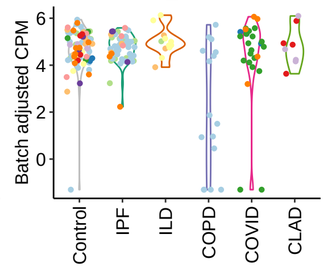
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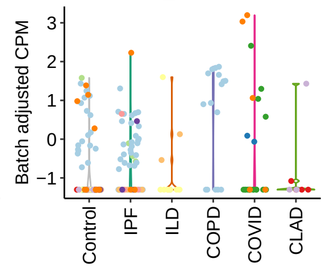
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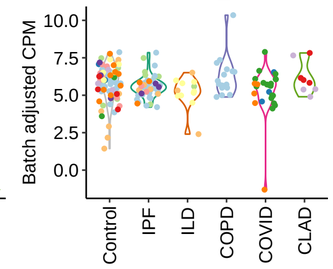
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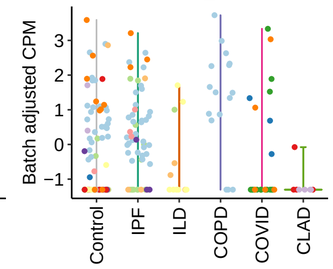
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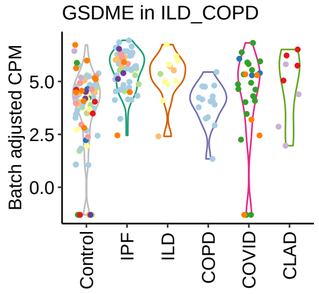
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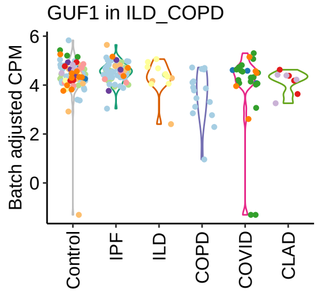
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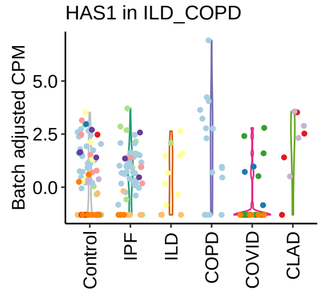
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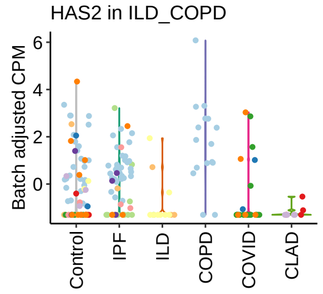
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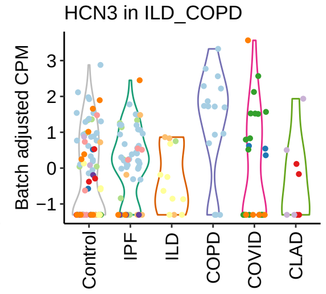
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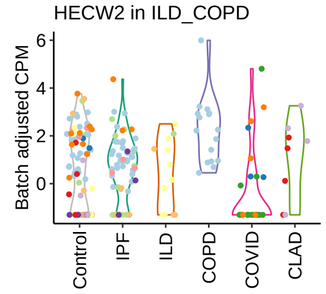
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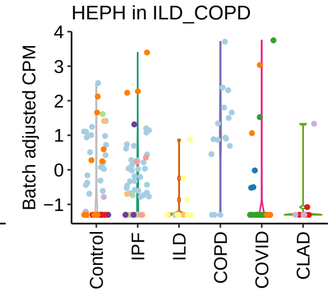
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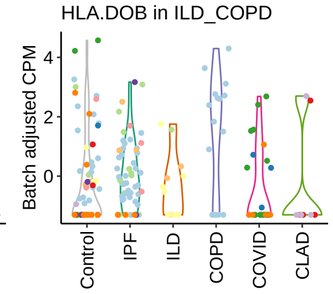
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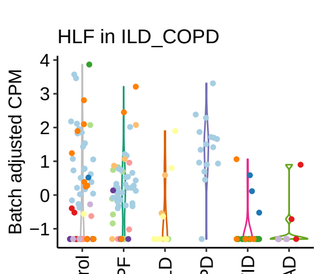
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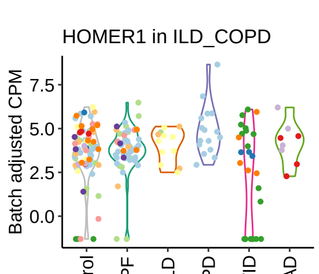
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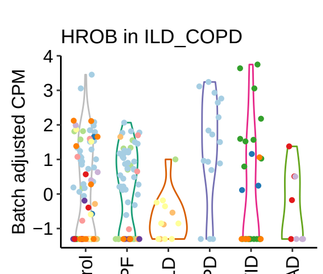
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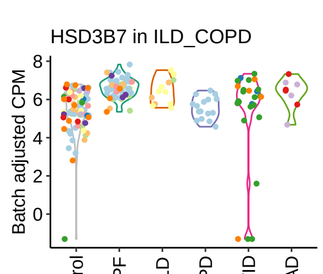
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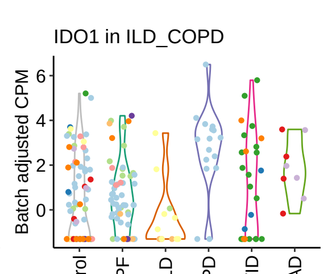
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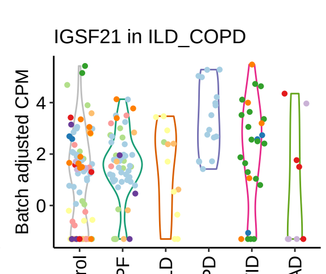
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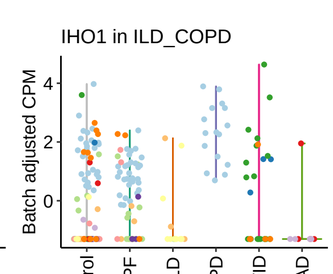
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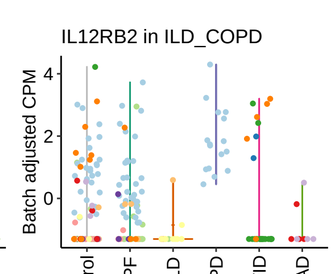
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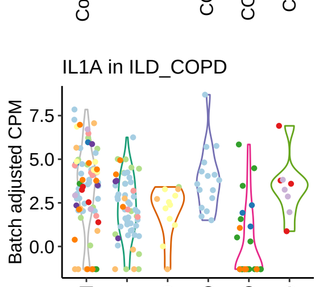
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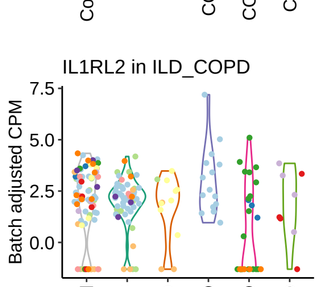
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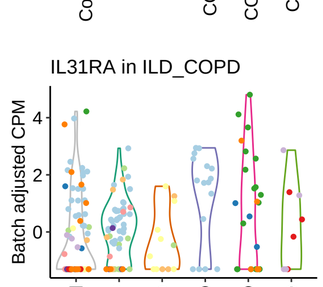
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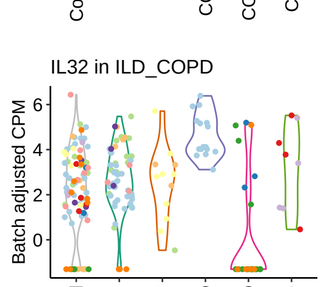
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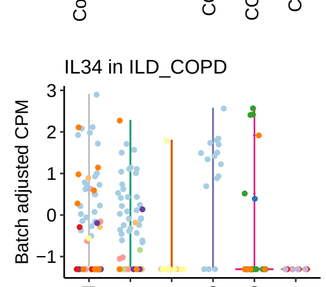
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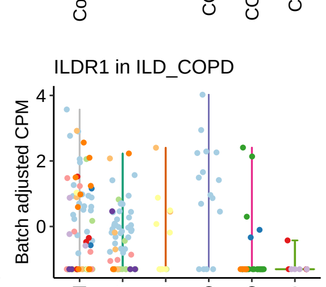
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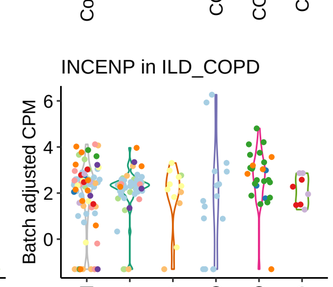
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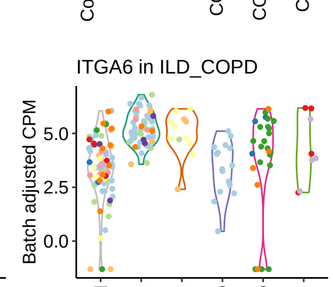
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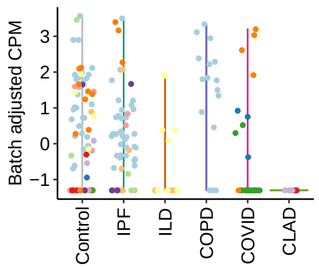
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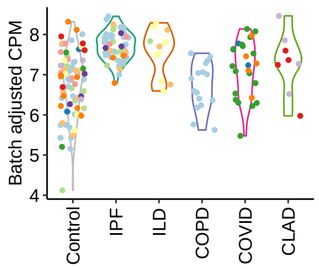
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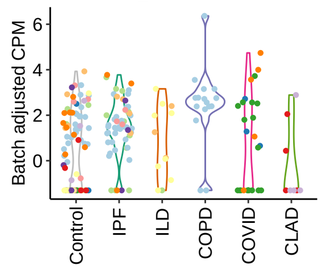
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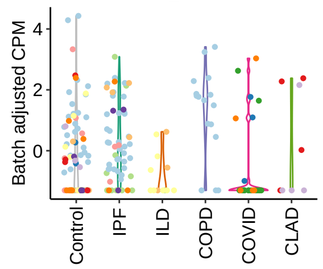
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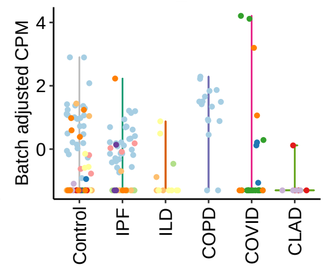
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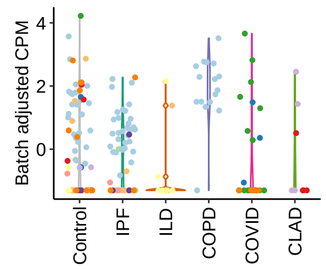
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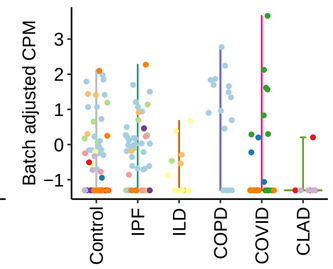
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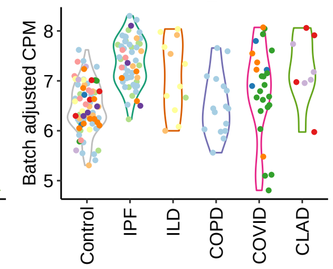
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KLRB1 in ILD_COPD

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LAX1 in ILD_COPD

LBR in ILD_COPD

LMO2 in ILD_COPD

LMOD1 in ILD_COPD

LOXL2 in ILD_COPD

LRRC2 in ILD_COPD

LRRK2 in ILD_COPD

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LSM1 in ILD_COPD

LZTS1 in ILD_COPD

MANF in ILD_COPD

MAP4K1 in ILD_COPD

MAPK13 in ILD_COPD

MCRIP2 in ILD_COPD

MDGA1 in ILD_COPD

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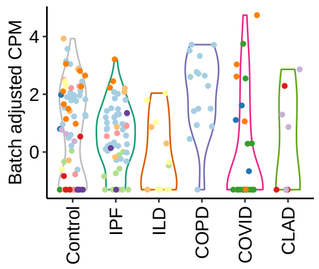

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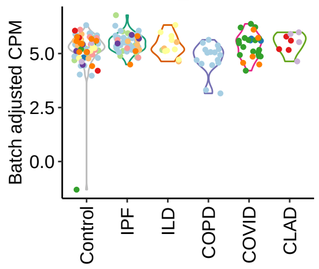

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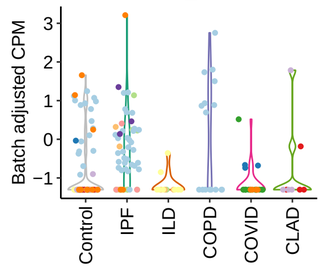

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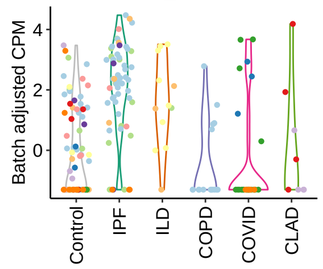

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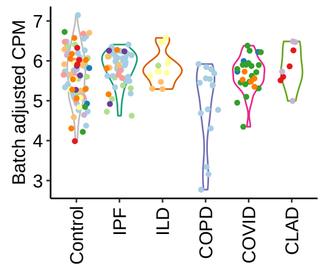

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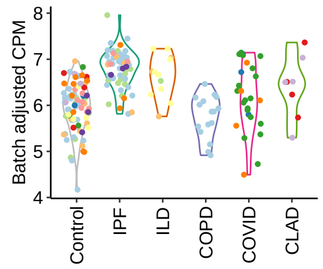

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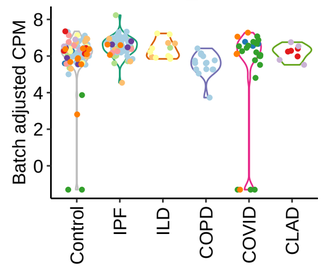

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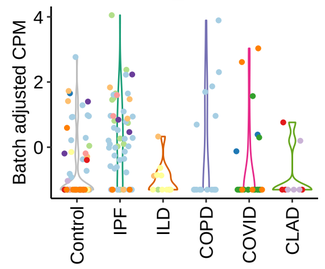

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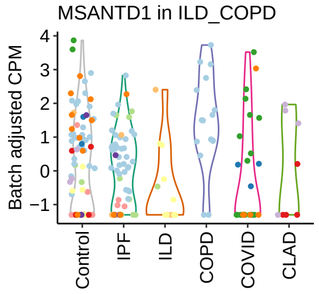

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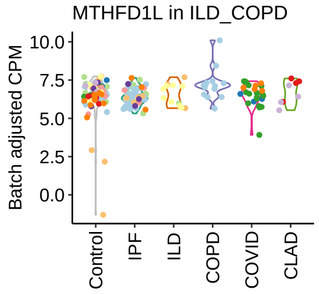

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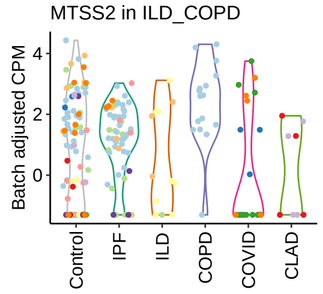

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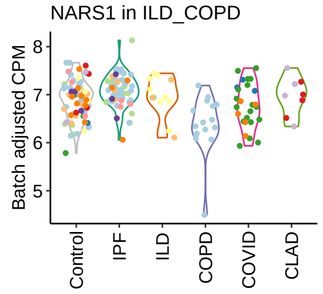

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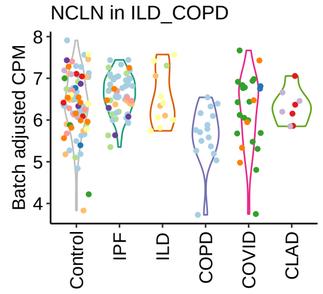

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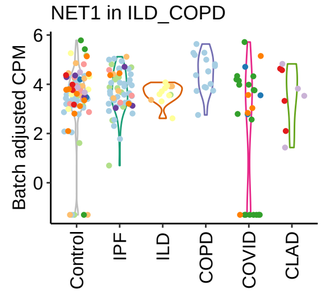

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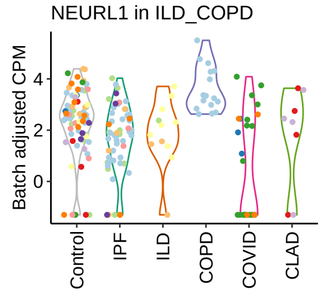

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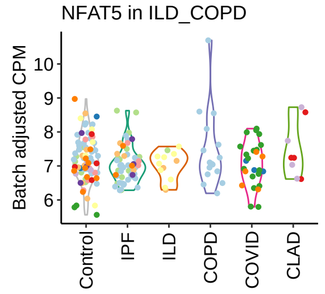

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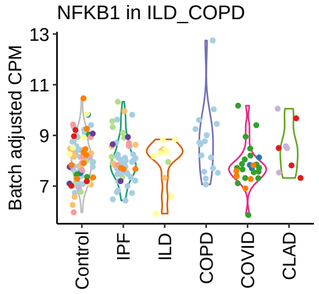

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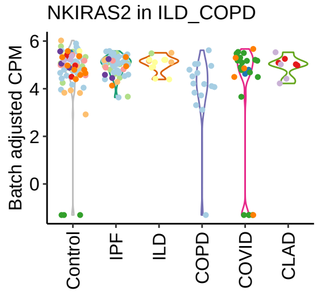

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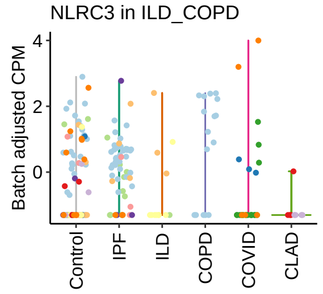

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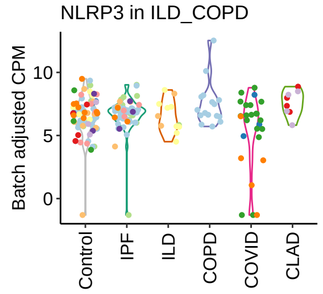

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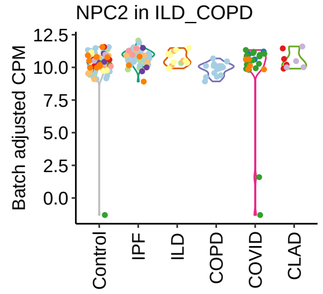

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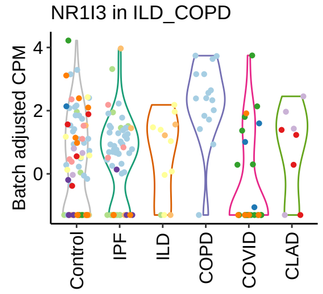

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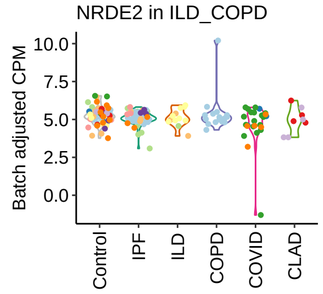

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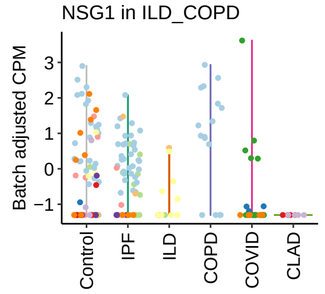

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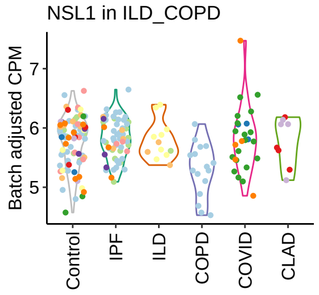

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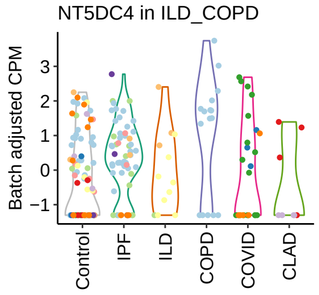

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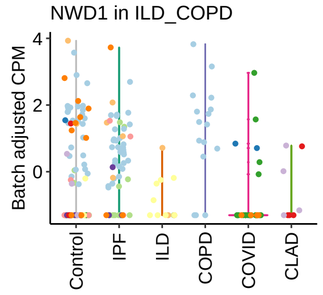

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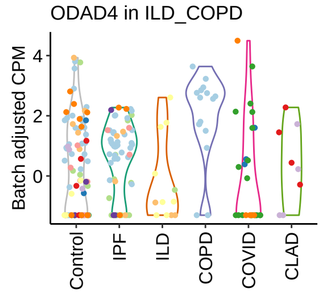

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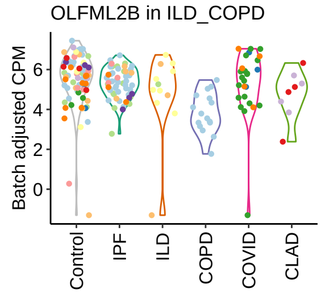

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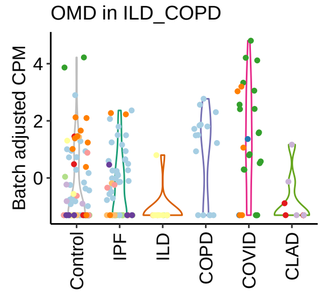

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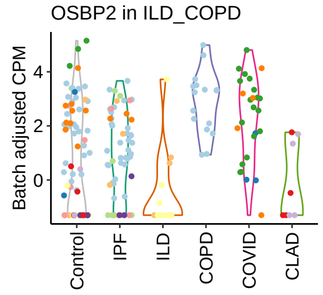
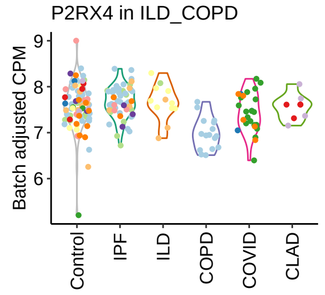
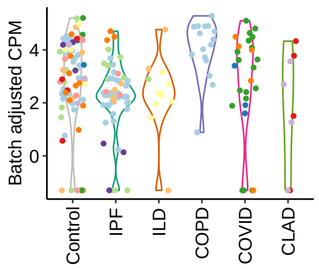


P2RX4 in ILD_COPD


PALD1 in ILD_COPD


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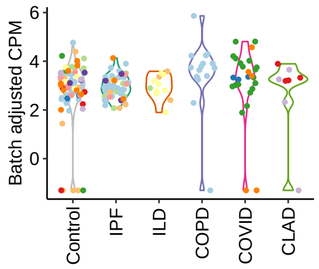
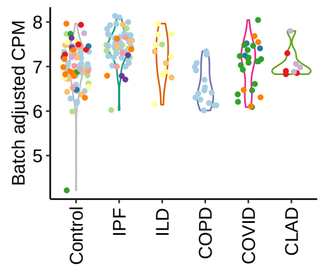
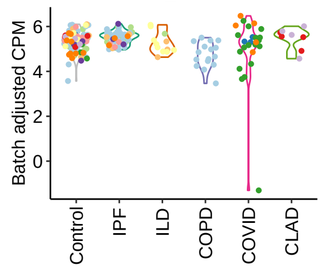


PAPSS1 in ILD_COPD


PCID2 in ILD_COPD


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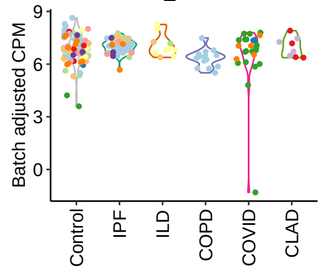

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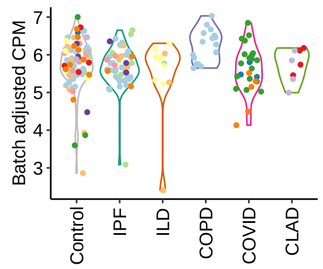
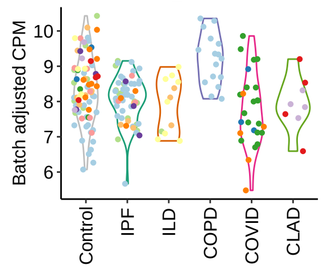


PELI1 in ILD_COPD


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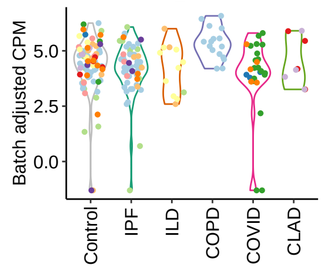

PGAP4 in ILD_COPD

PGBD5 in ILD_COPD

PHEX in ILD_COPD

PIM2 in ILD_COPD

PJA1 in ILD_COPD

PLEKHG2 in ILD_COPD

PLEKHG4B in ILD_COPD

PLIN5 in ILD_COPD

PNPLA1 in ILD_COPD

PON3 in ILD_COPD

POSTN in ILD_COPD

PPM1E in ILD_COPD

PPP1R18 in ILD_COPD

PPP1R9A in ILD_COPD

PRF1 in ILD_COPD

PRG4 in ILD_COPD

PRKAR2B in ILD_COPD

PRKCQ in ILD_COPD

PRRT4 in ILD_COPD

PTPRS in ILD_COPD

RAD54B in ILD_COPD

RAD54L in ILD_COPD

RAD9B in ILD_COPD

RAPSN in ILD_COPD

RASGRF2 in ILD_COPD
RBP5 in ILD_COPD
RDH11 in ILD_COPD
RFX8 in ILD_COPD
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RIC1 in ILD_COPD
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RNASE1 in ILD_COPD
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RP1 in ILD_COPD
RRAGD in ILD_COPD
SBK1 in ILD_COPD
SCUBE1 in ILD_COPD
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SDSL in ILD_COPD
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TET1 in ILD_COPD
TFDP2 in ILD_COPD
TGFBR3 in ILD_COPD
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TIGIT in ILD_COPD
TIMELESS in ILD_COPD
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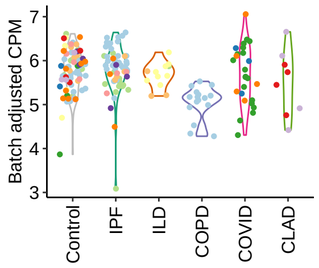
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

TLR1 in ILD_COPD


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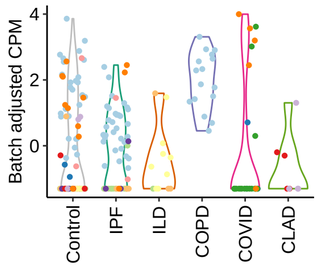

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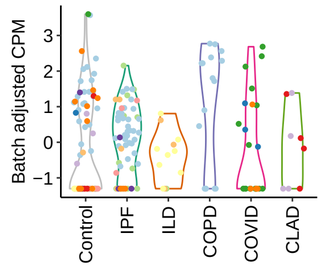

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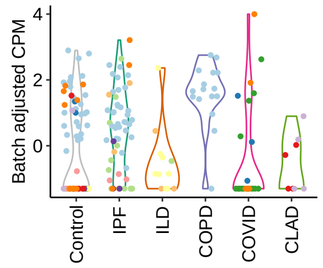
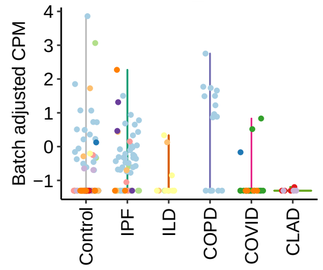


TMIGD2 in ILD_COPD


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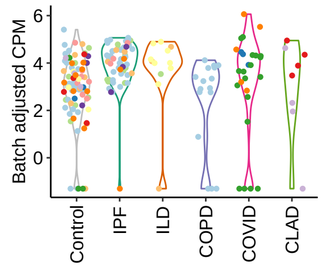

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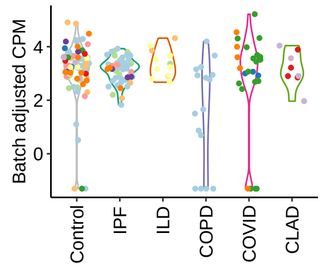

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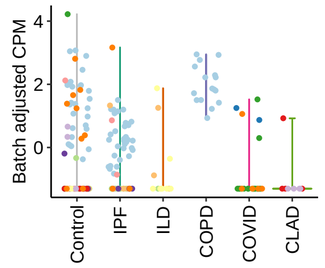

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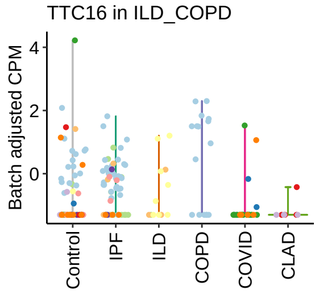

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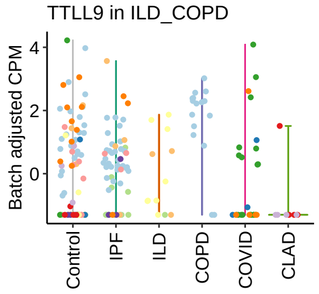

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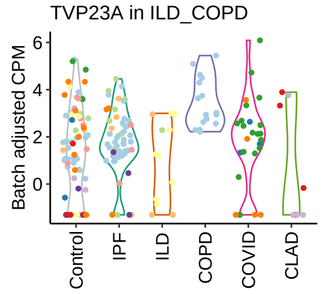
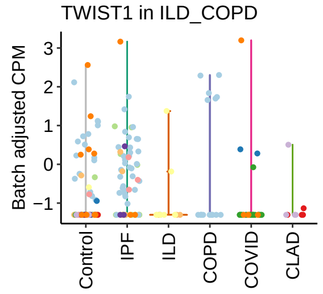
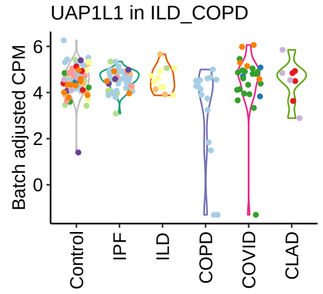


TWIST1 in ILD_COPD


UAP1L1 in ILD_COPD


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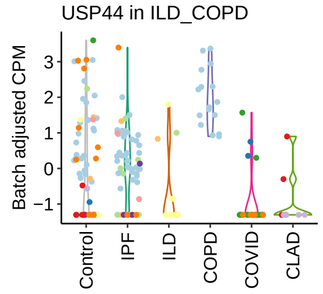

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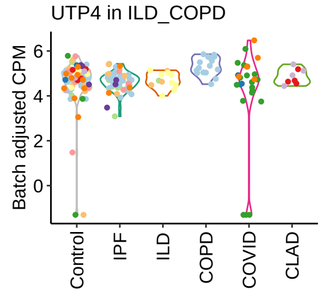
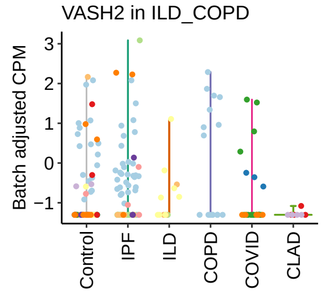
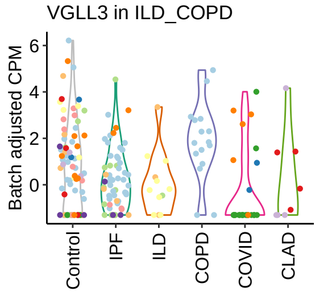


VASH2 in ILD_COPD


VGLL3 in ILD_COPD


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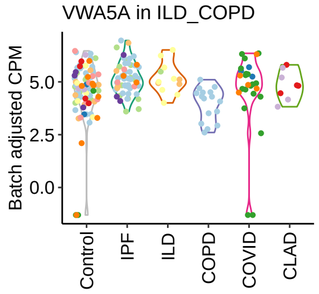
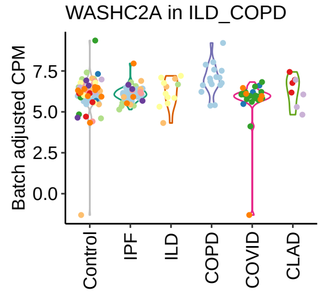
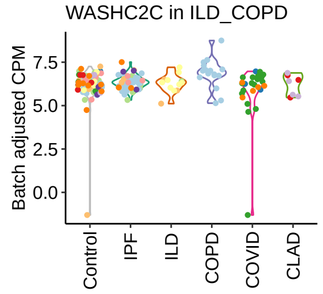


WASHC2A in ILD_COPD


WASHC2C in ILD_COPD


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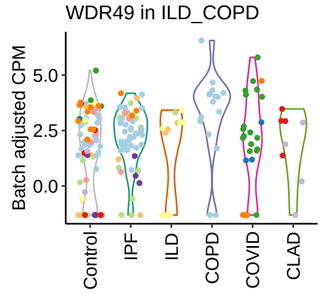
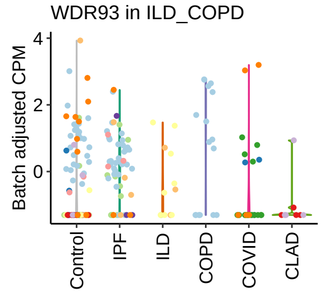
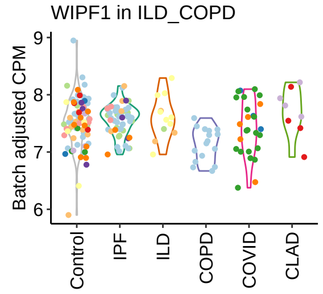
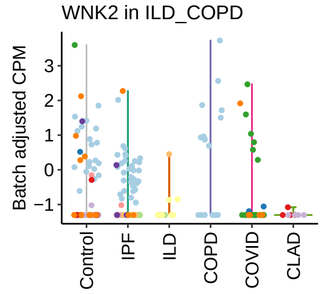
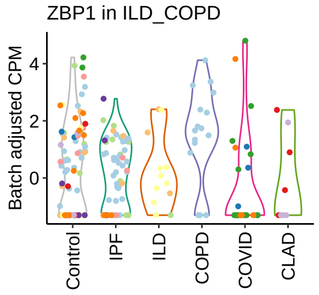
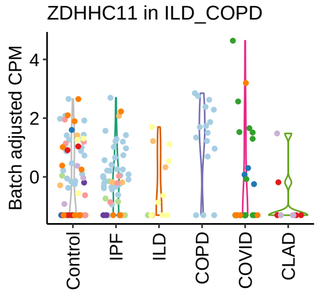


WDR93 in ILD_COPD


WIPF1 in ILD_COPD


WNK2 in ILD_COPD


ZBP1 in ILD_COPD


ZDHHC11 in ILD_COPD


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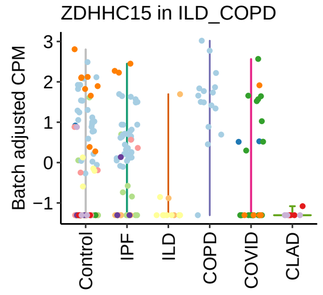
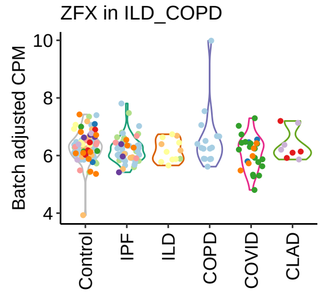


ZFX in ILD_COPD


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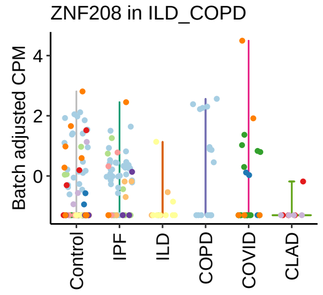

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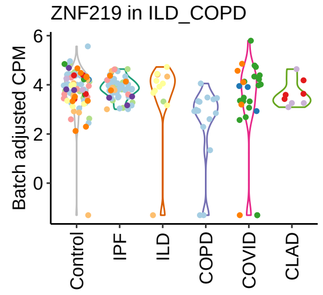

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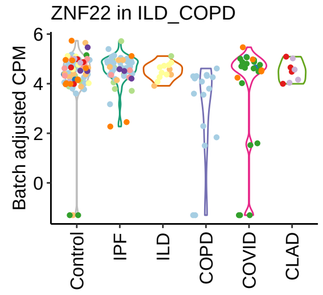

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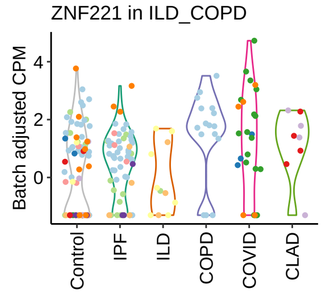

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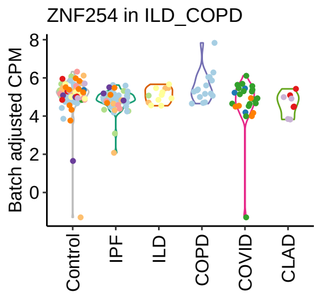

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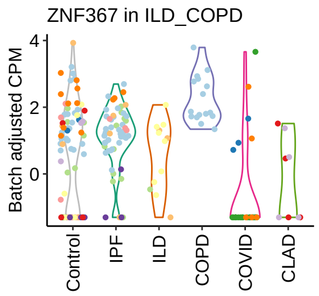

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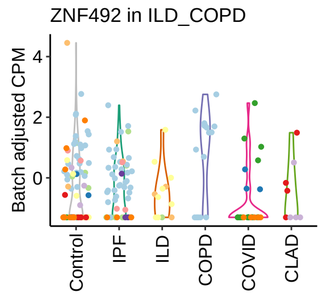

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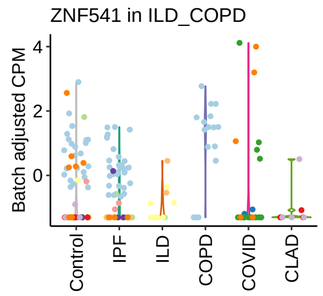

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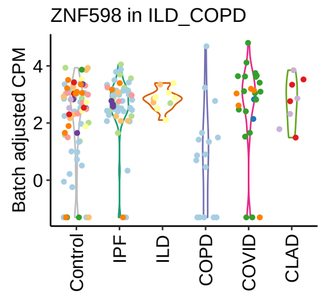

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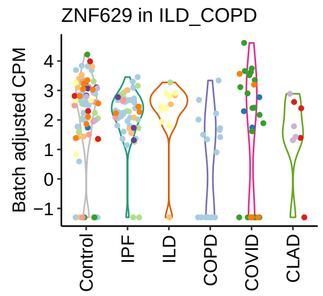

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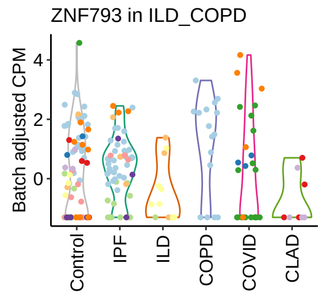

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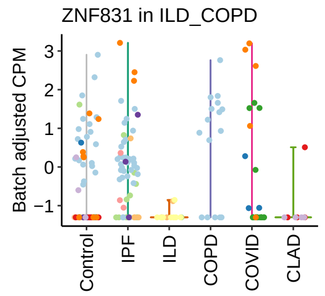
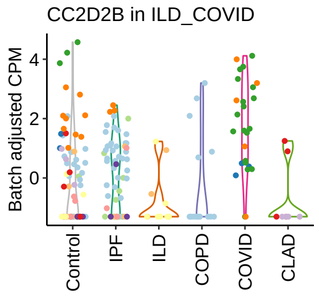
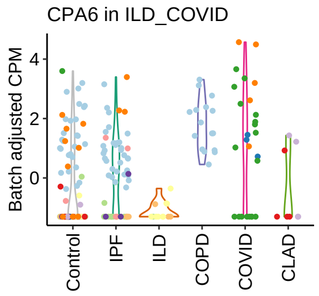



CC2D2B in ILD_COVID
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD


CPA6 in ILD_COVID
Batch adjusted CPM
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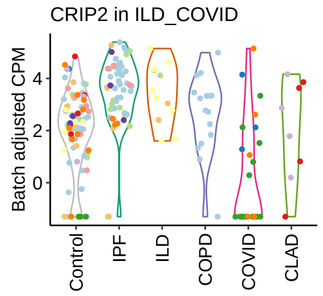
COVID
CLAD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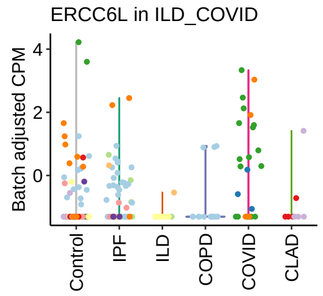
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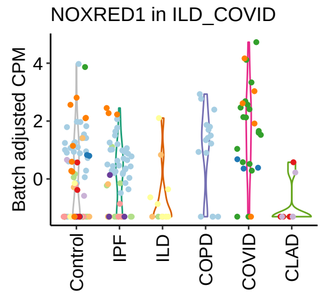
NOXRED1 in ILD_COVID
Batch adjusted CPM
Control
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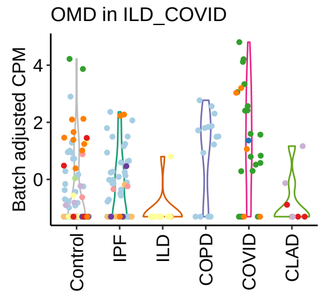
COPD
COVID
CLAD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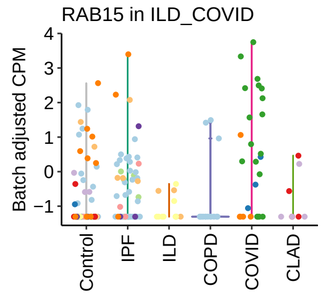
COVID
CLAD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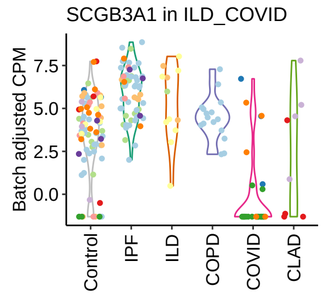
COPD
COVID
CLAD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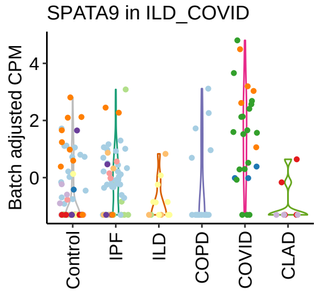
COVID
CLAD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IPF
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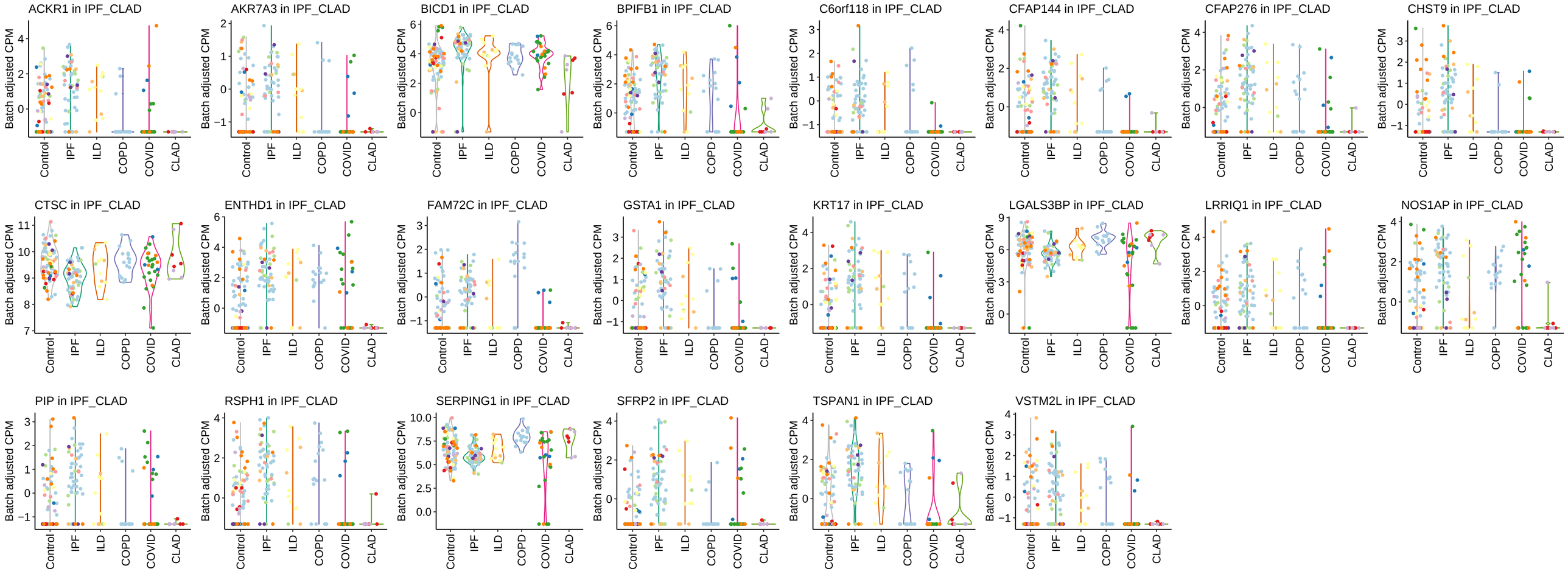
COPD
COVID
CLAD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BICD1 in IPF_CLAD
BPIFB1 in IPF_CLAD
C6orf118 in IPF_CLAD
CFAP144 in IPF_CLAD
CFAP276 in IPF_CLAD
CHST9 in IPF_CLAD
CTSC in IPF_CLAD
ENTHD1 in IPF_CLAD
FAM72C in IPF_CLAD
GSTA1 in IPF_CLAD
KRT17 in IPF_CLAD
LGALS3BP in IPF_CLAD
LRRIQ1 in IPF_CLAD
NOS1AP in IPF_CLAD
PIP in IPF_CLAD
RSPH1 in IPF_CLAD
SERPING1 in IPF_CLAD
SFRP2 in IPF_CLAD
TSPAN1 in IPF_CLAD
VSTM2L in IPF_CLAD
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

A4GNT in IPF_COPD
AASS in IPF_COPD
ABCA3 in IPF_COPD
ABCA7 in IPF_COPD
ABCA8 in IPF_COPD
ABI3BP in IPF_COPD
ABL2 in IPF_COPD
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ANXA4 in IPF_COPD
ANXA5 in IPF_COPD
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AOC3 in IPF_COPD
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

AP1M2 in IPF_COPD
AP2S1 in IPF_COPD
AP3M2 in IPF_COPD
APBA1 in IPF_COPD
APBA2 in IPF_COPD
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ATP6V0D2 in IPF_COPD
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BEX5 in IPF_COPD
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BICDL1 in IPF_COPD
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BTG2 in IPF_COPD
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BTN3A2 in IPF_COPD
BTN3A3 in IPF_COPD
C14orf119 in IPF_COPD
C15orf39 in IPF_COPD
C15orf40 in IPF_COPD
C17orf58 in IPF_COPD
C17orf99 in IPF_COPD
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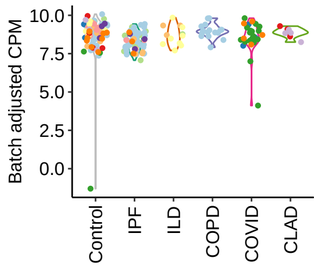
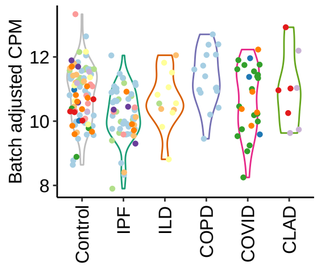
C1orf162 in IPF_COPD


C1QA in IPF_COPD


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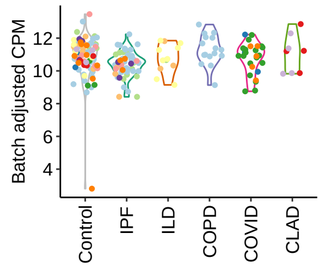

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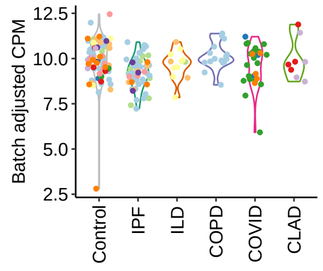
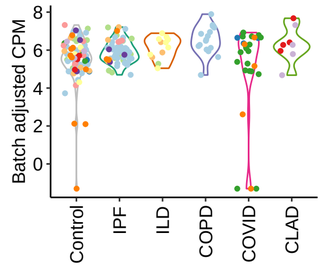
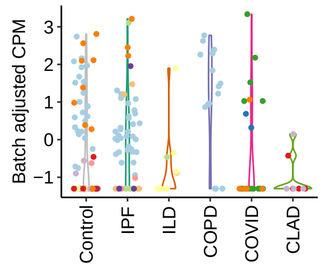
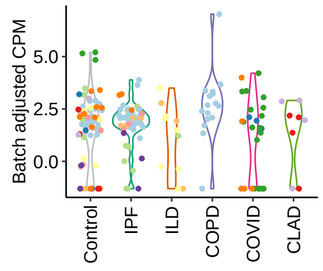
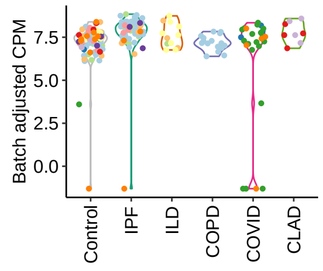
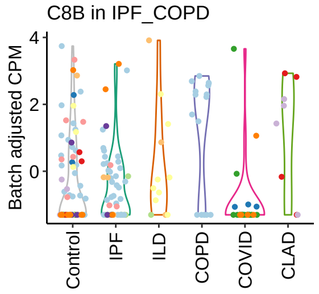


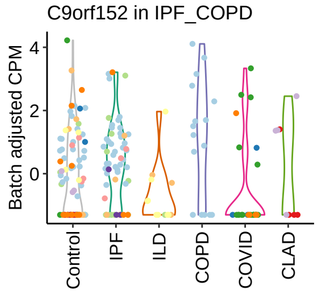
C2 in IPF_COPD


C22orf23 in IPF_COPD


C2orf92 in IPF_COPD


C4orf3 in IPF_COPD


C8B in IPF_COPD


C9orf152 in IPF_COPD


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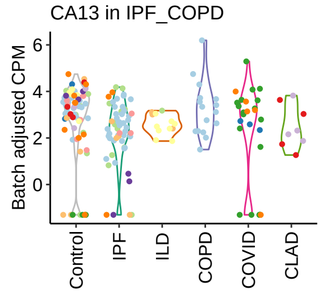
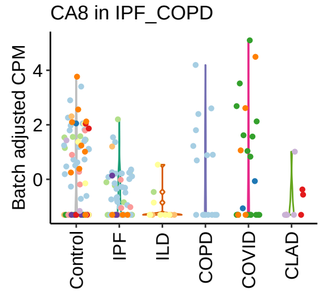


CA8 in IPF_COPD


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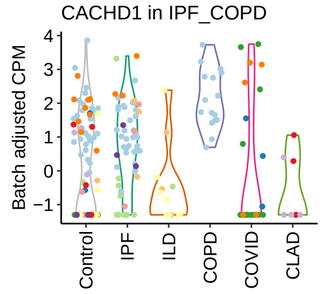

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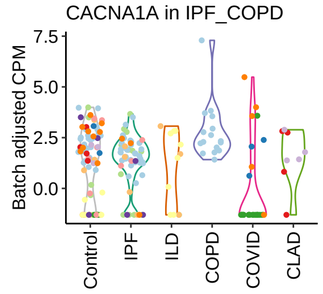
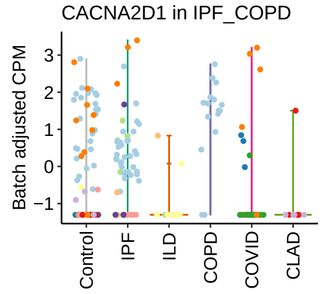


CACNA2D1 in IPF_COPD


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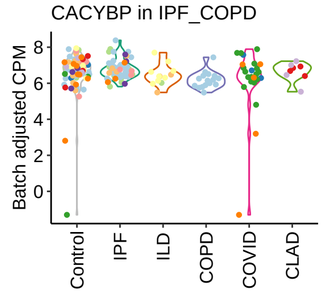
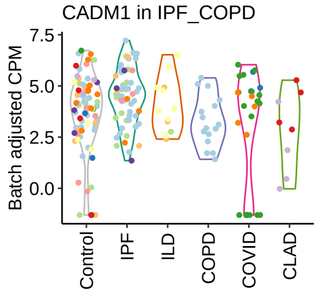
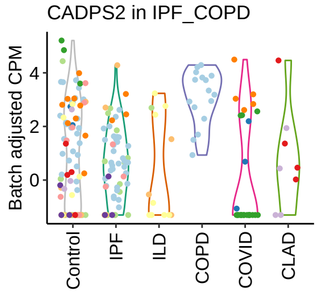
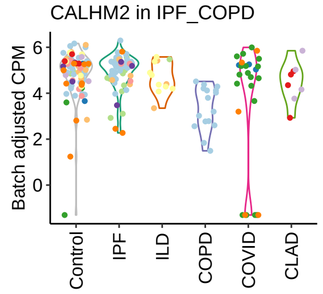


CADM1 in IPF_COPD


CADPS2 in IPF_COPD


CALHM2 in IPF_COPD


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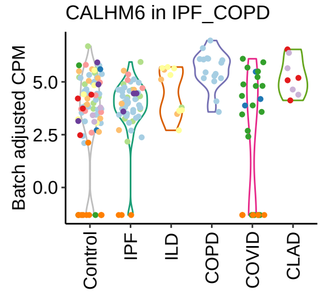

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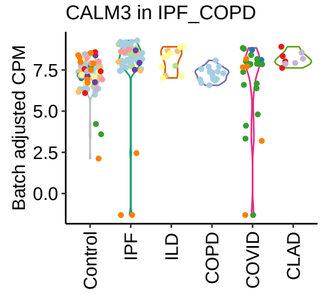

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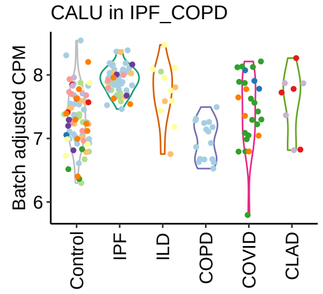

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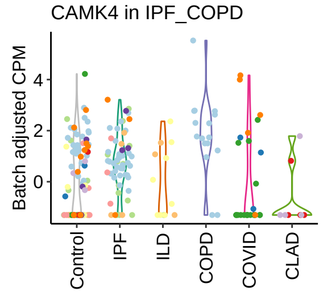

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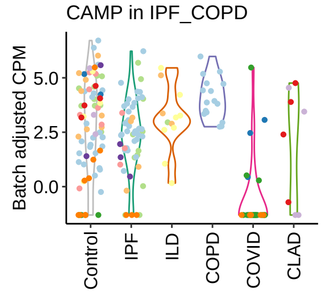

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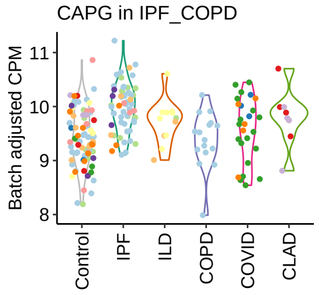

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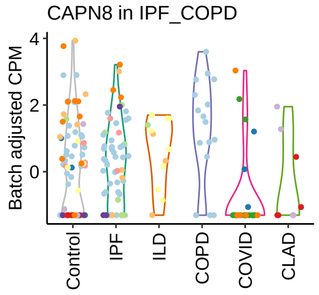

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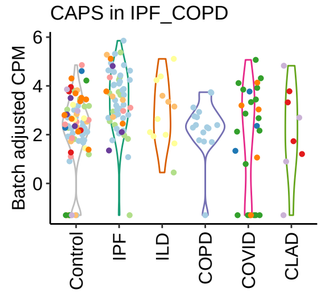

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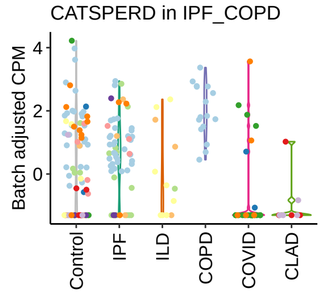

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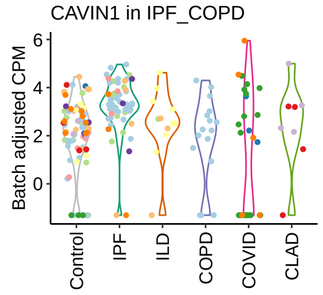

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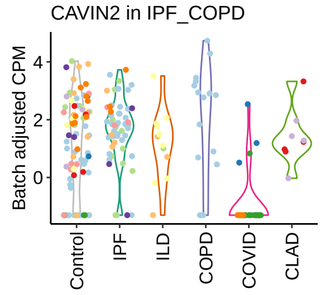

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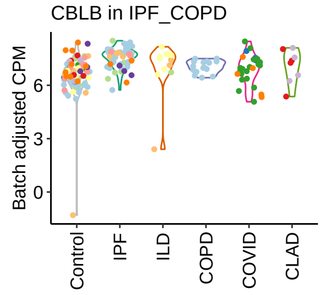

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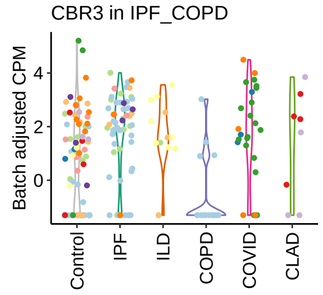
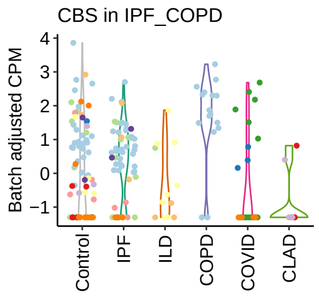


CBS in IPF_COPD


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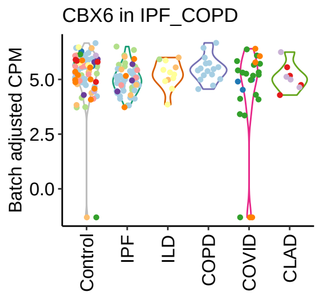

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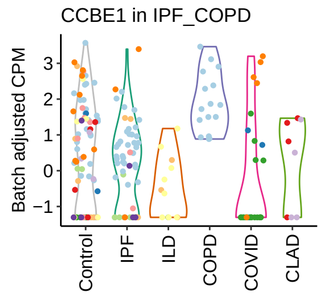

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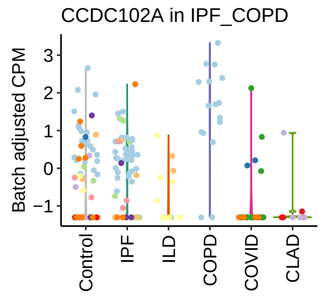

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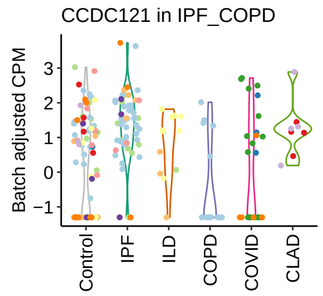

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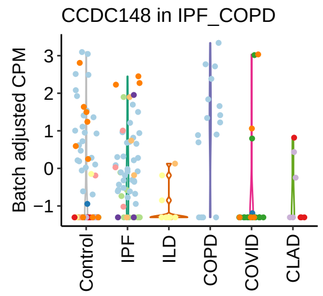

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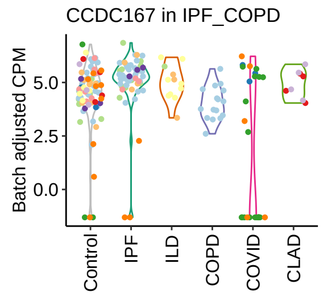

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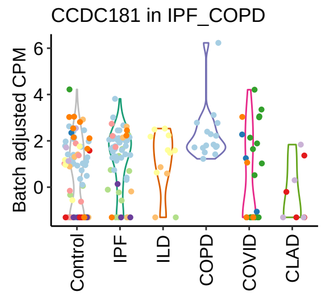

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CCDC85B in IPF_COPD

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CCL2 in IPF_COPD

CCN3 in IPF_COPD

CCND1 in IPF_COPD

CCR1 in IPF_COPD

CCR5 in IPF_COPD

CD101 in IPF_COPD

CD164 in IPF_COPD

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CD276 in IPF_COPD

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CD302 in IPF_COPD

CD36 in IPF_COPD

CD38 in IPF_COPD

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COL22A1 in IPF_COPD
COL3A1 in IPF_COPD
COL6A6 in IPF_COPD
COL8A2 in IPF_COPD
COL9A2 in IPF_COPD
COLQ in IPF_COPD
COMMD2 in IPF_COPD
CPA6 in IPF_COPD
CPE in IPF_COPD
CPLANE1 in IPF_COPD
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

CPLANE2 in IPF_COPD
CPOX in IPF_COPD
CRABP2 in IPF_COPD
CREB3L2 in IPF_COPD
CREG2 in IPF_COPD
CRIM1 in IPF_COPD
CRLF2 in IPF_COPD
CRY1 in IPF_COPD
CRYBG2 in IPF_COPD
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DNAAF1 in IPF_COPD
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DNAH3 in IPF_COPD

Batch adjusted CPM

Control IPF ILD COPD COVID CLAD

DNAJB11 in IPF_COPD
DNAJC10 in IPF_COPD
DNPH1 in IPF_COPD
DPCD in IPF_COPD
DPF3 in IPF_COPD
DPM2 in IPF_COPD
DPP4 in IPF_COPD
DUSP23 in IPF_COPD
DUSP7 in IPF_COPD
DYNLL1 in IPF_COPD
DYRK2 in IPF_COPD
DYRK3 in IPF_COPD
DYSF in IPF_COPD
DZANK1 in IPF_COPD
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ECE1 in IPF_COPD
ECM1 in IPF_COPD
ECT2L in IPF_COPD
EDA in IPF_COPD
EEPD1 in IPF_COPD
ELANE in IPF_COPD
ELMO1 in IPF_COPD
ELMO2 in IPF_COPD
EMILIN1 in IPF_COPD
EMP1 in IPF_COPD
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ENTPD1 in IPF_COPD
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ERI2 in IPF_COPD
ESYT2 in IPF_COPD
ETV3 in IPF_COPD
EVA1C in IPF_COPD
EXOC3L4 in IPF_COPD
EXTL3 in IPF_COPD
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FCGR2A in IPF_COPD
FCHSD2 in IPF_COPD
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

FCMR in IPF_COPD
FDX1 in IPF_COPD
FES in IPF_COPD
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FPR3 in IPF_COPD
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GPD1 in IPF_COPD
GPNMB in IPF_COPD
GPR132 in IPF_COPD
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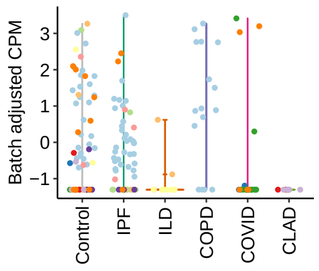
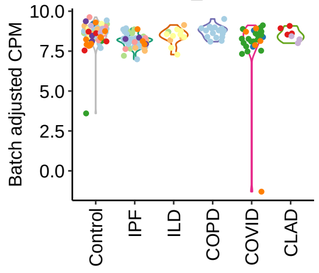
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

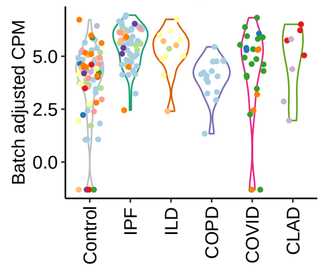
GRIN2A in IPF_COPD



GRINA in IPF_COPD



GSDME in IPF_COPD



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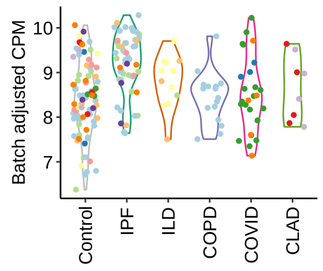

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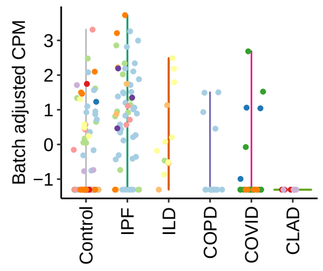
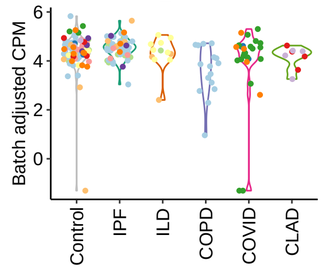


GUF1 in IPF_COPD



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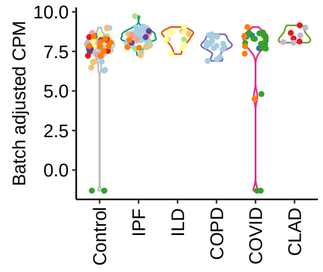
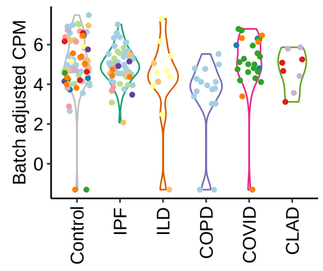
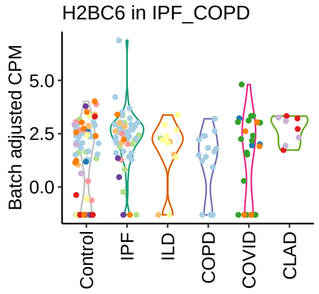


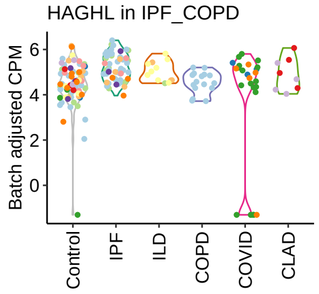
H2AC6 in IPF_COPD



H2BC6 in IPF_COPD



HAGHL in IPF_COPD



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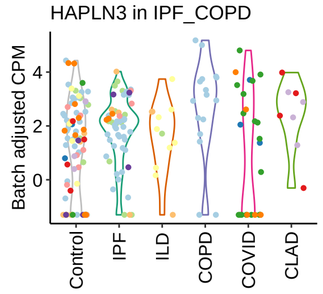
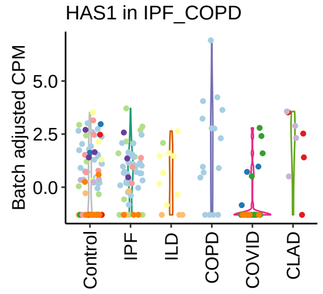
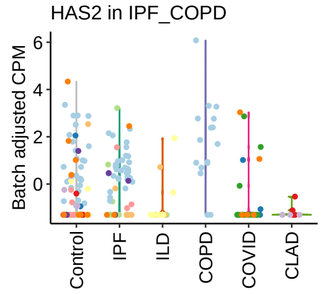


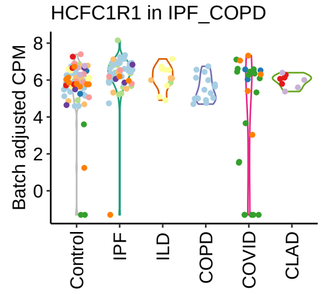
HAS1 in IPF_COPD



HAS2 in IPF_COPD



HCFC1R1 in IPF_COPD



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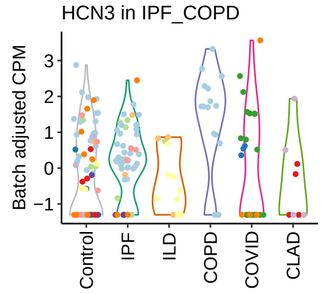

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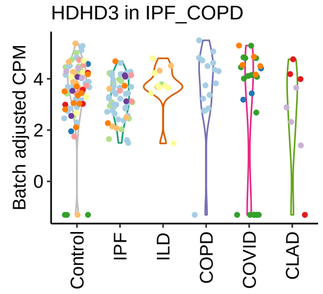

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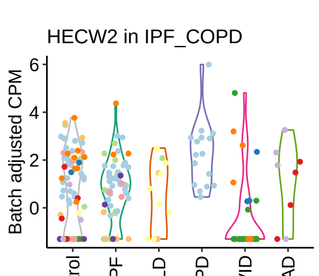

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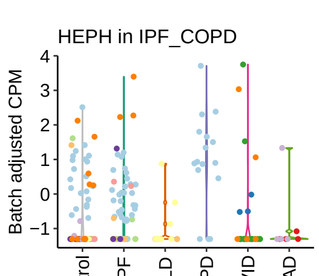

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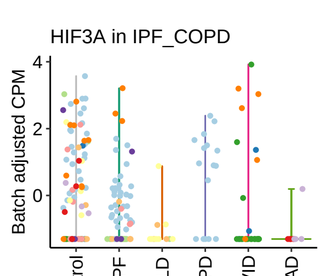

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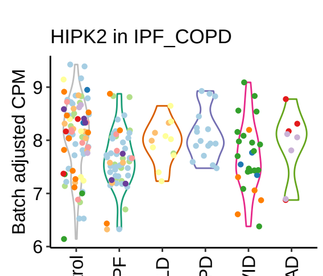

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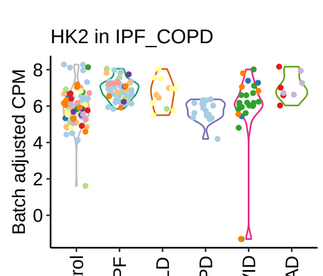

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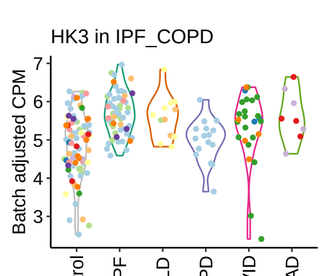

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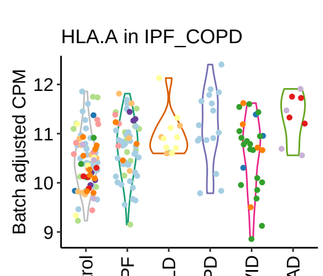

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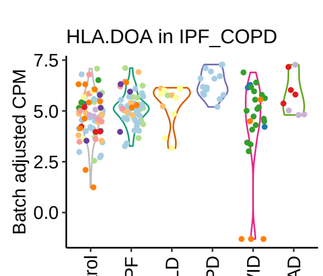

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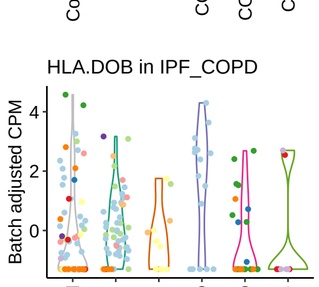

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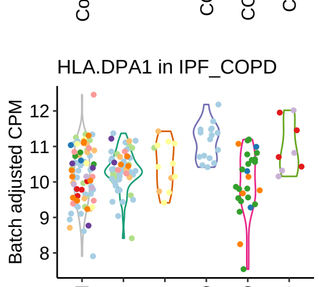

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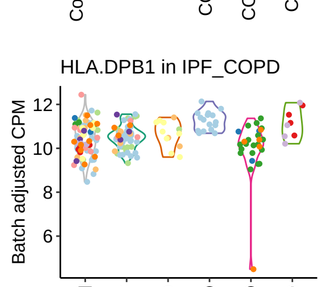

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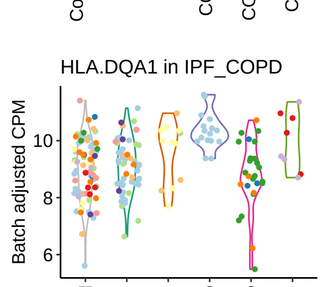

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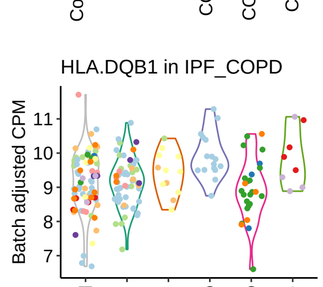

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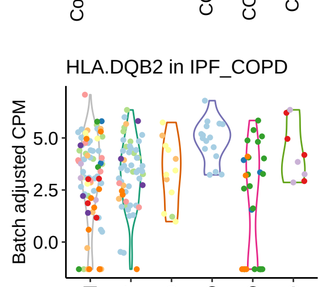

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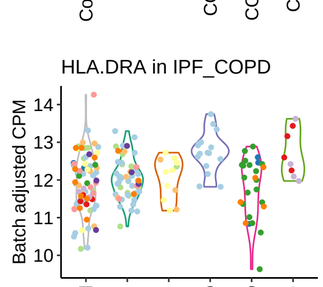

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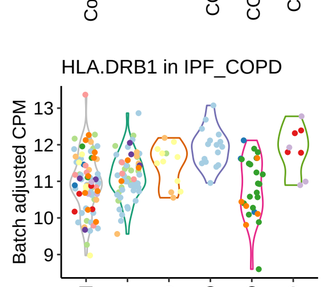

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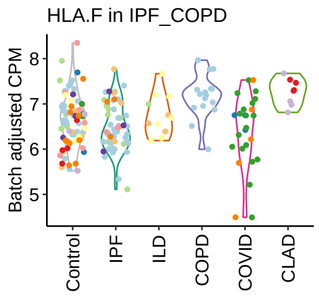

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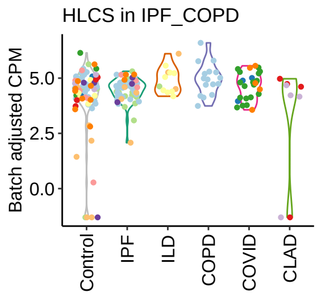

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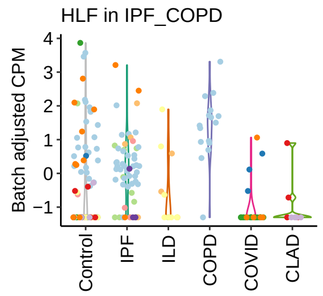

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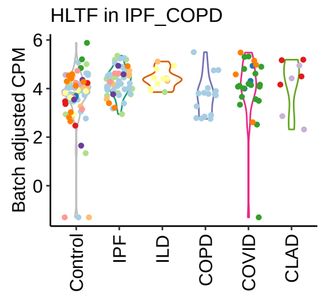

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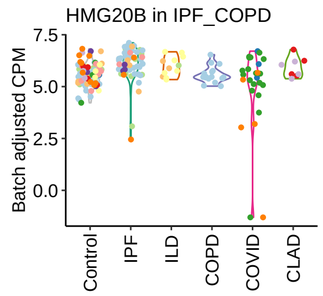

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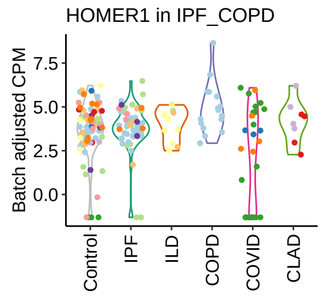

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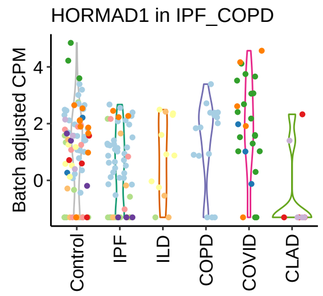

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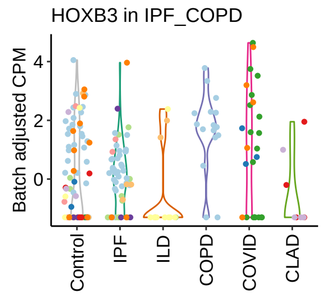

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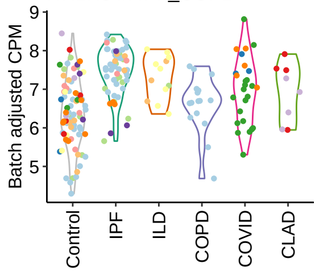
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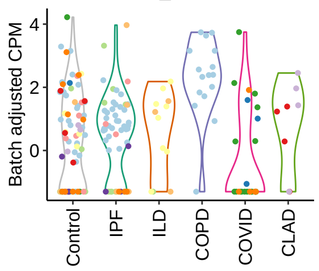
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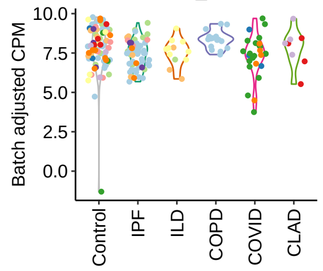
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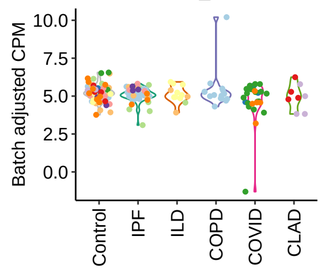
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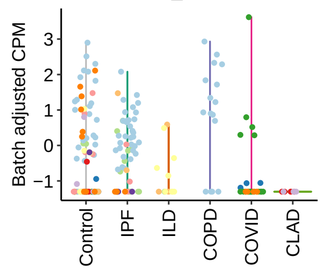
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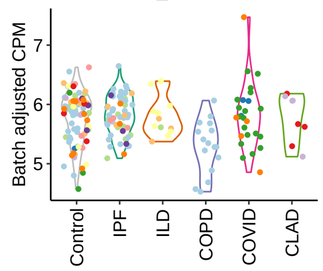
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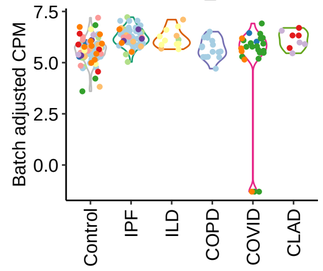
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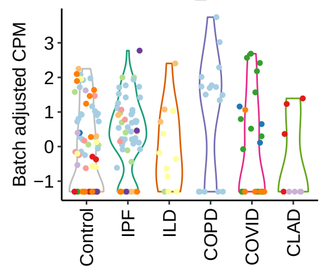
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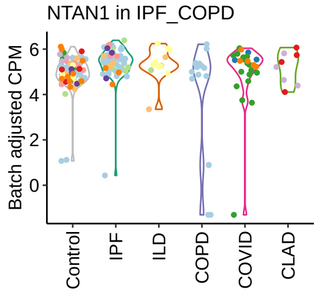
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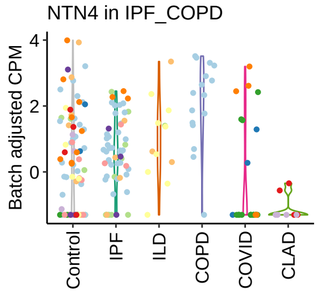
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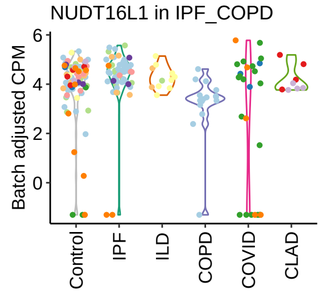
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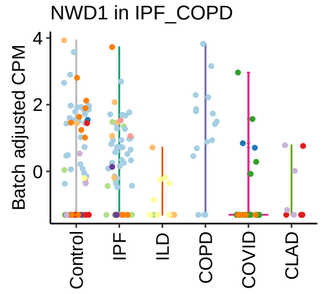
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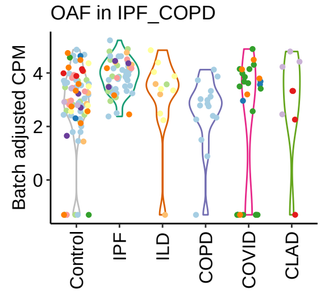
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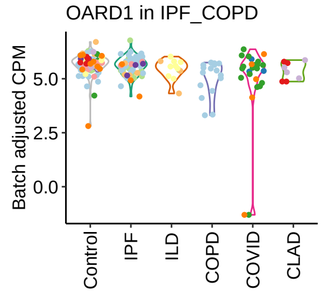
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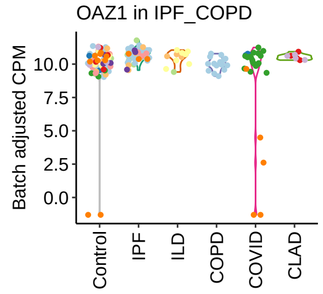
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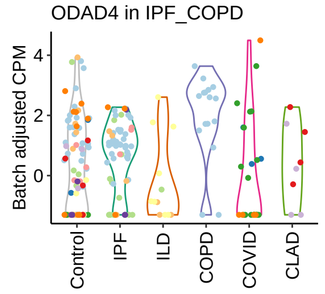
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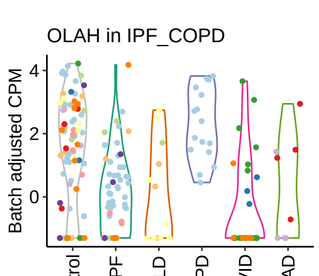
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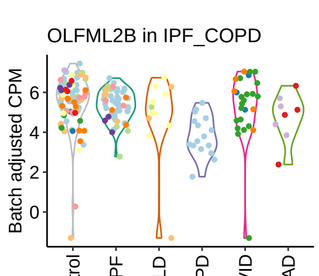
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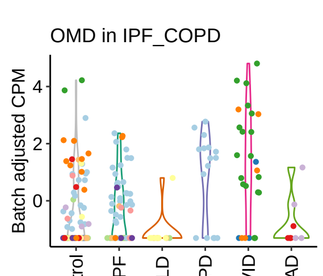
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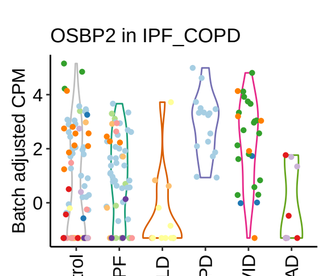
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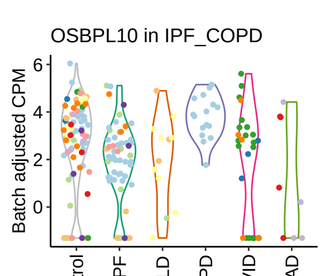
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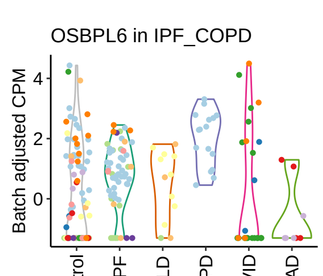
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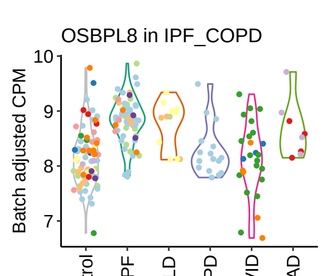
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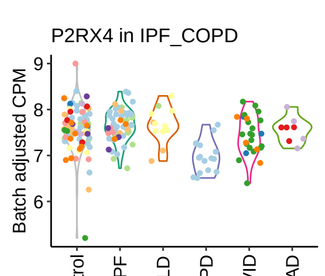
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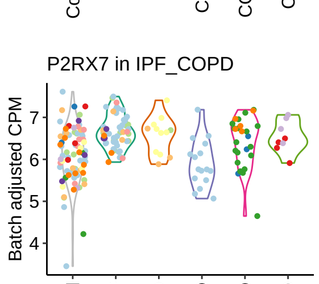
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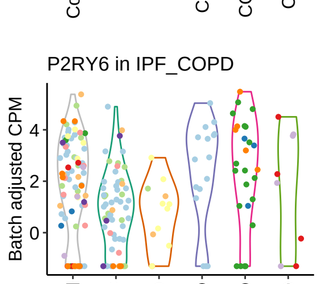
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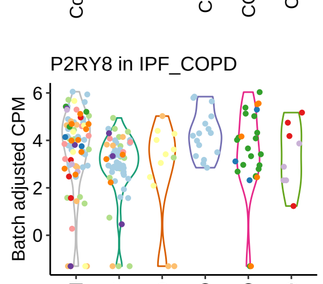
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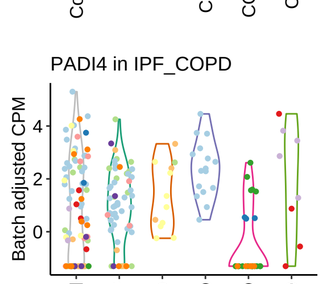
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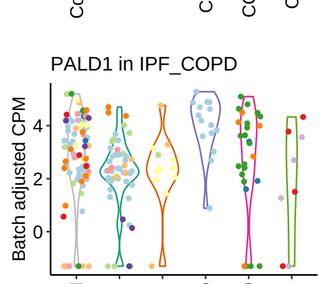
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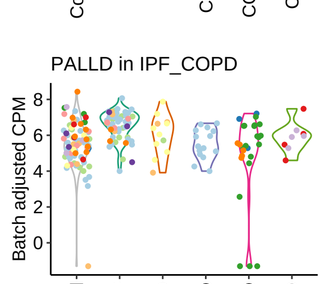
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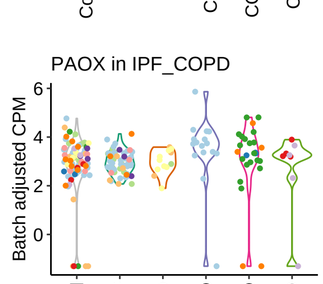
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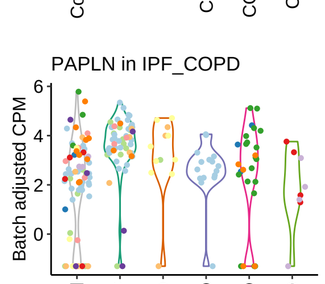
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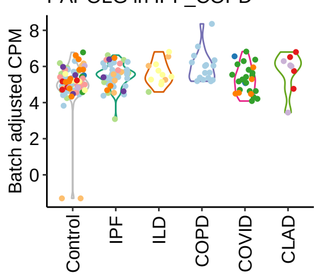
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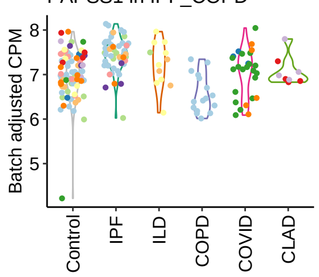
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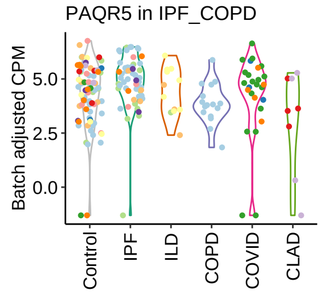
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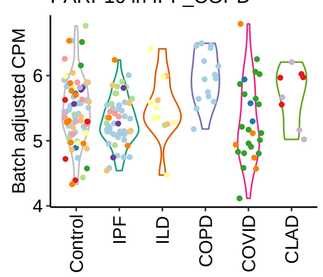
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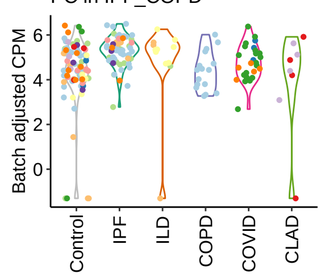
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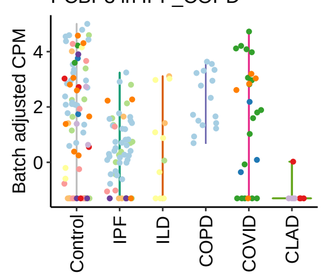
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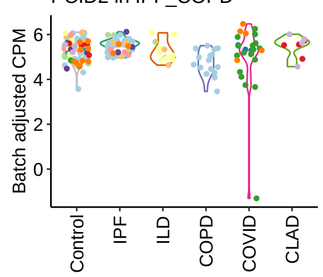
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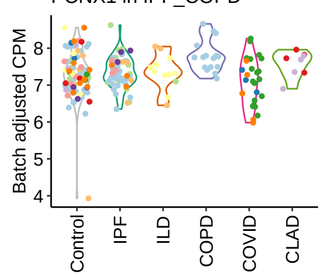
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PDE8B in IPF_COPD

PDGFB in IPF_COPD

PDIA4 in IPF_COPD

PDLIM4 in IPF_COPD

PDLIM7 in IPF_COPD

PDZD8 in IPF_COPD

PEA15 in IPF_COPD

PELI1 in IPF_COPD

PER2 in IPF_COPD

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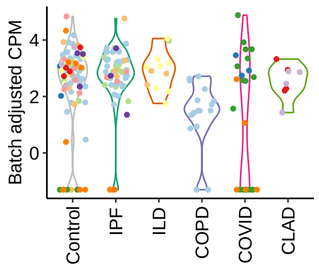

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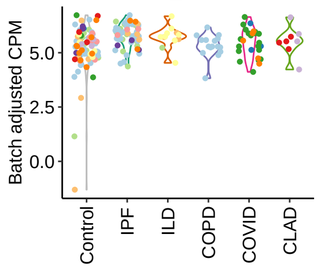

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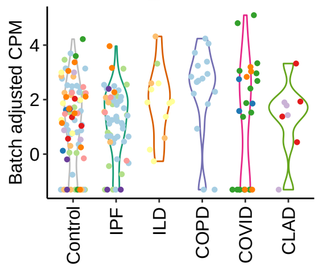

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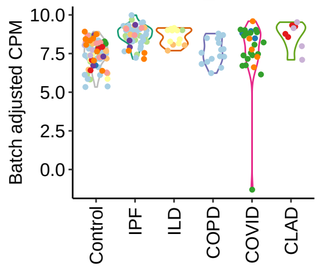

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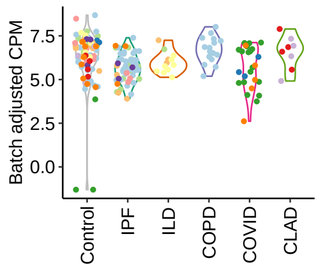

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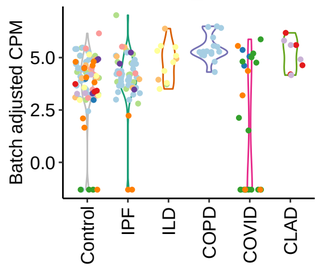

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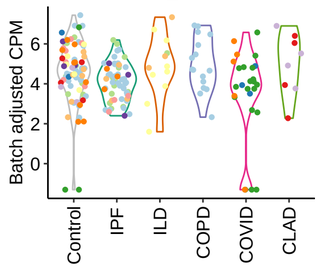

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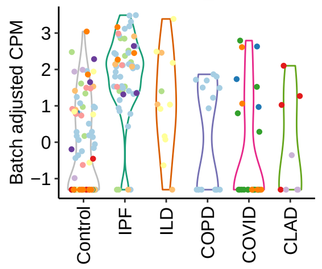

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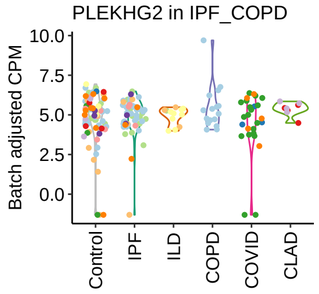

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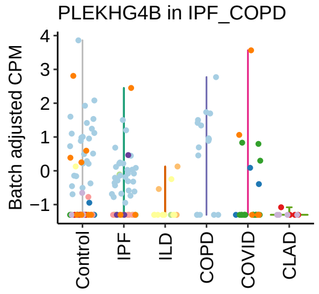

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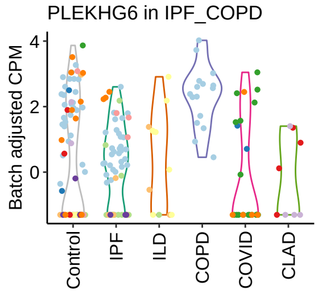

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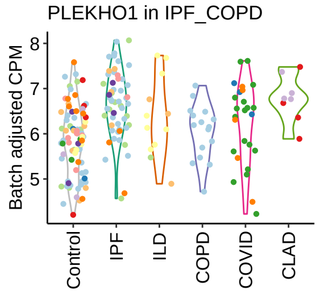

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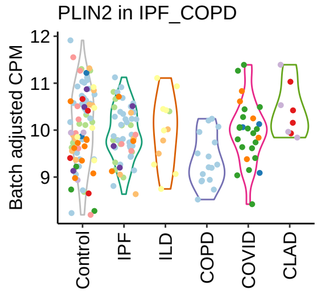

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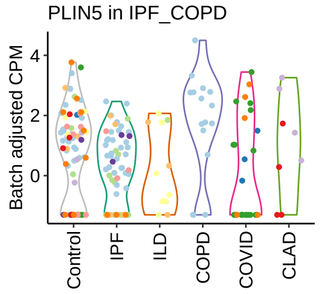

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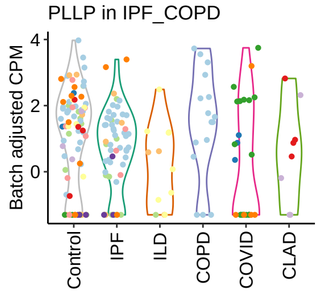

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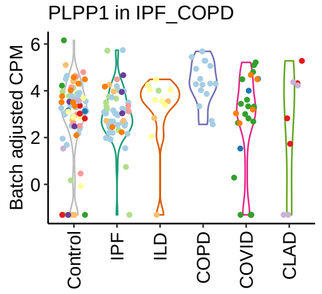

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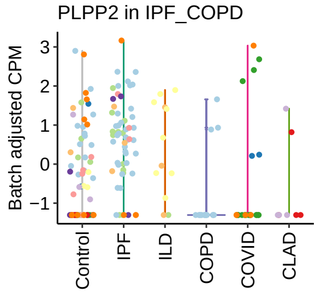

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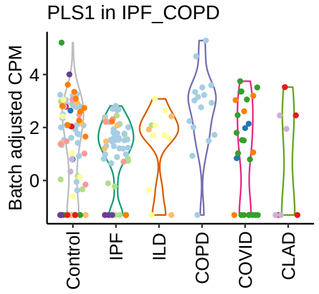

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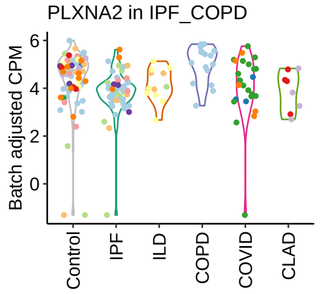

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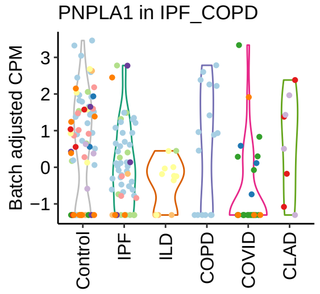

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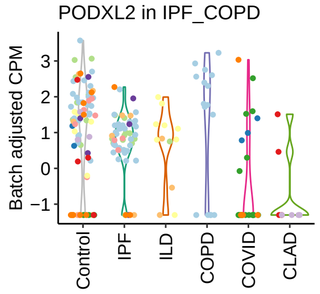

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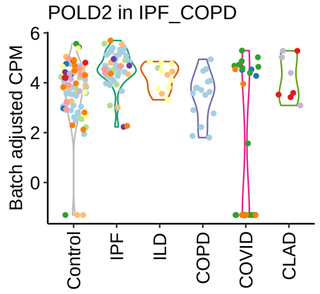

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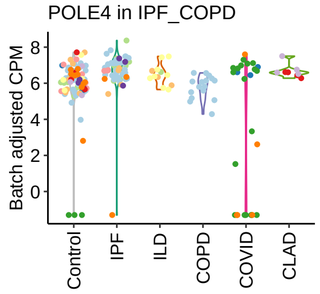

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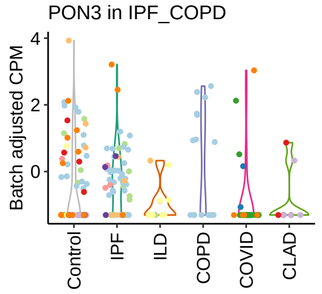

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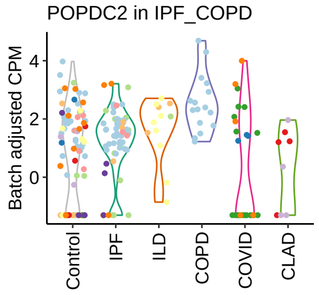

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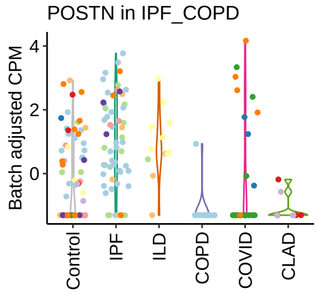

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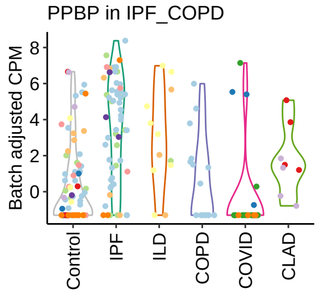

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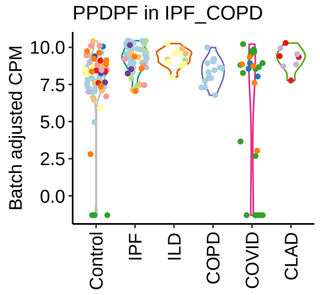

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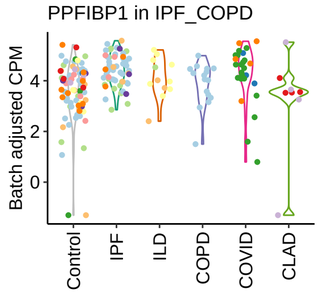

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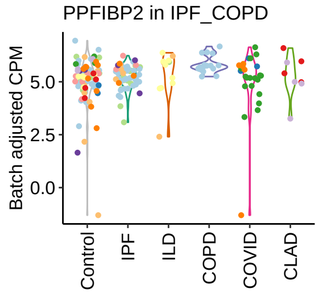

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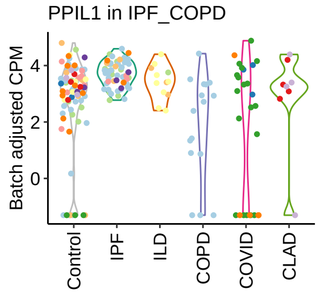

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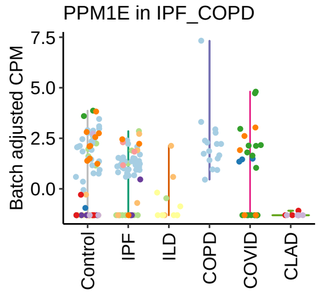

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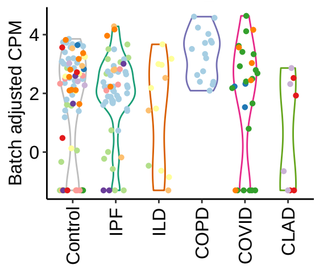

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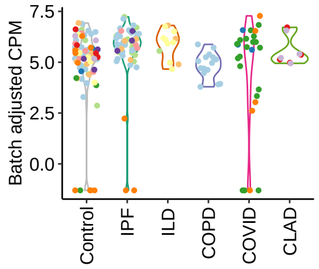

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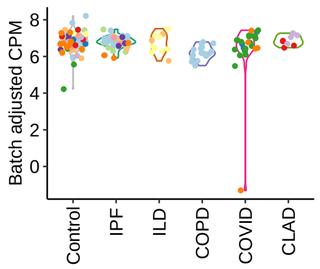

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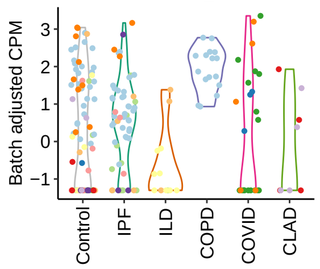

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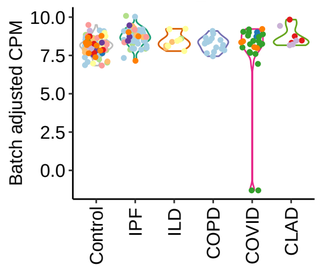

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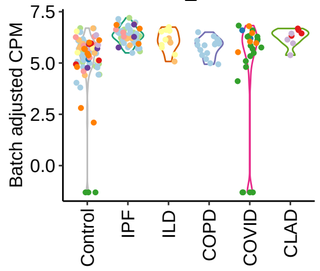

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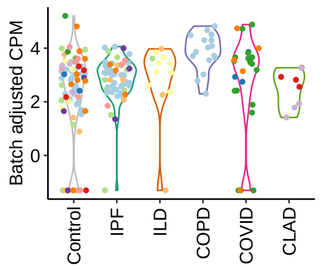

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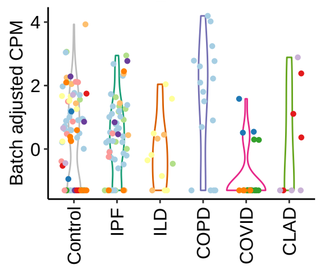

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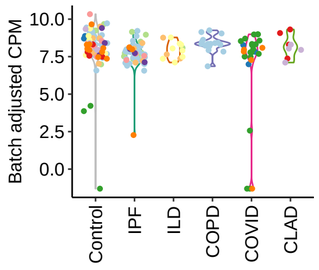

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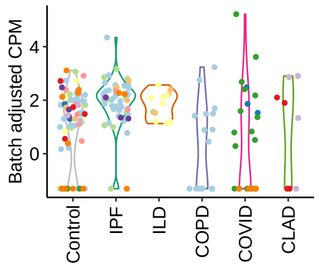

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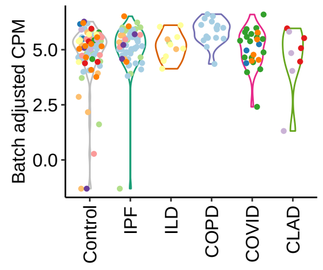

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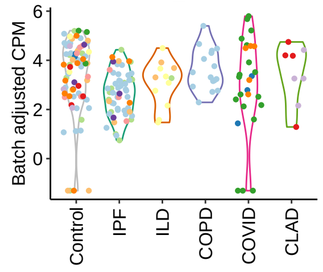

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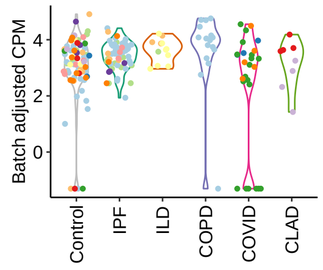

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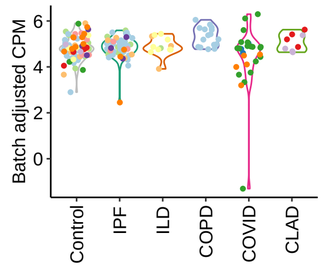

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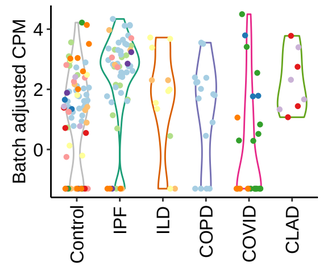

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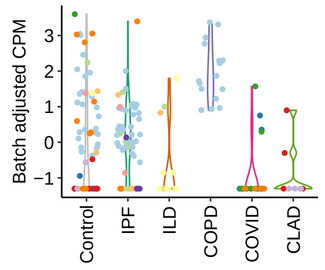

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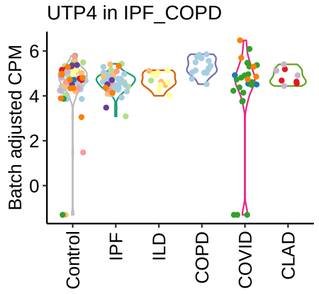

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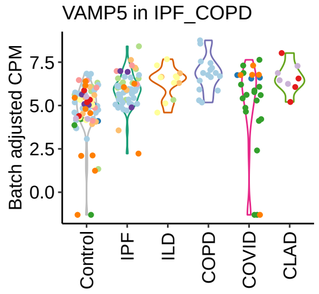

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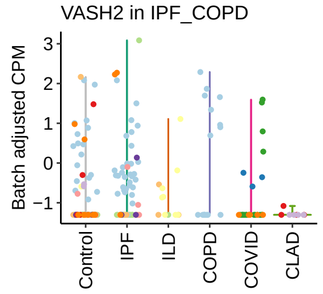

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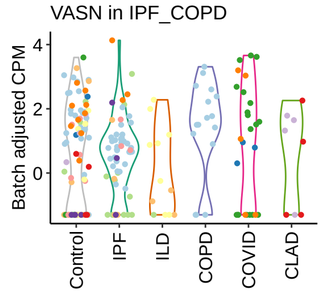

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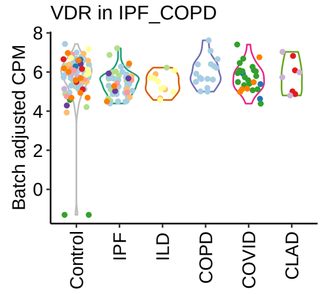

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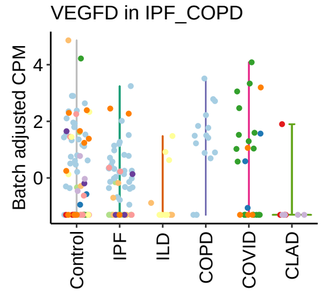
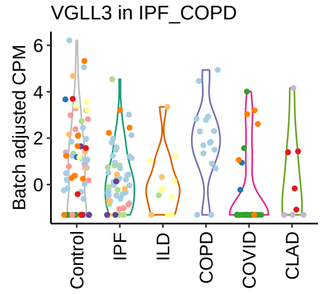


VGLL3 in IPF_COPD


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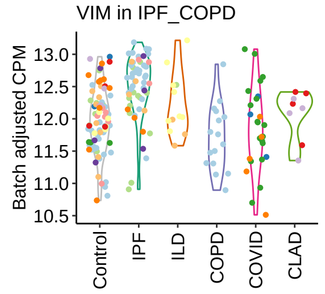

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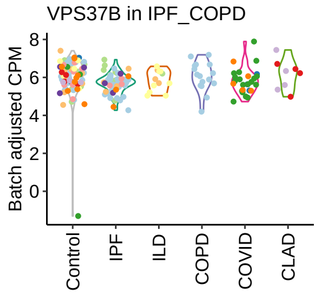
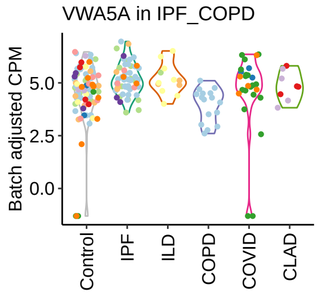
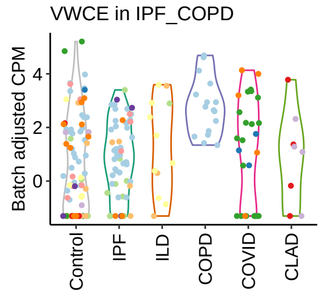
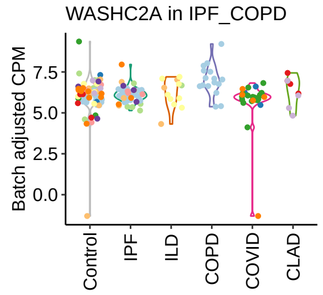
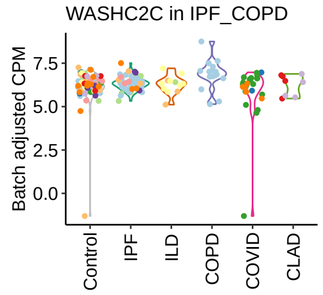


VWA5A in IPF_COPD


VWCE in IPF_COPD


WASHC2A in IPF_COPD


WASHC2C in IPF_COPD


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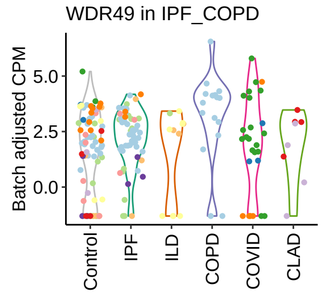

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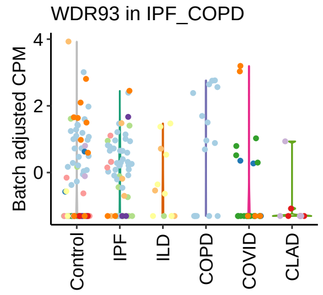

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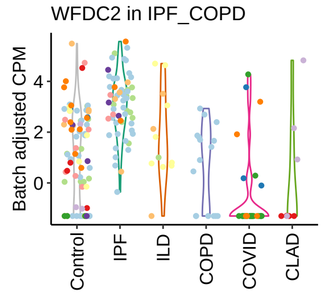

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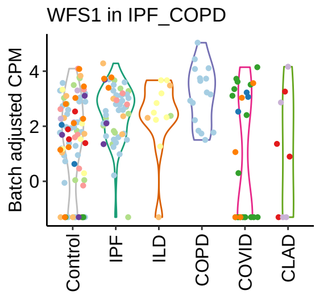

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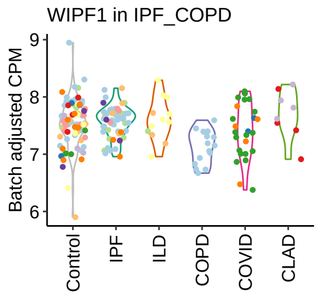

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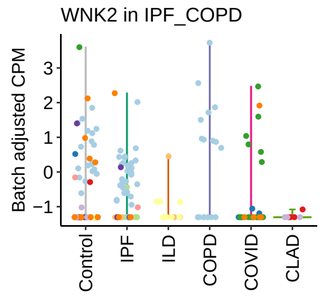
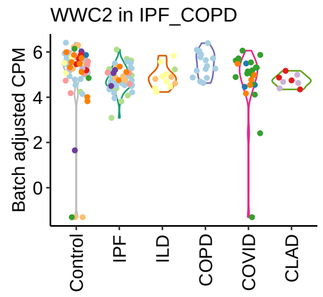


WWC2 in IPF_COPD


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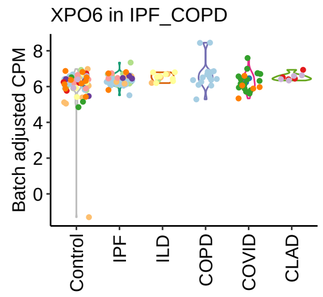
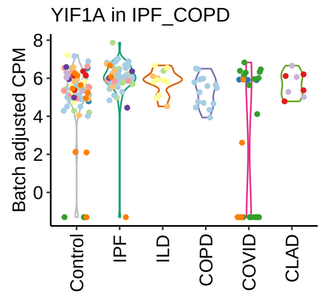
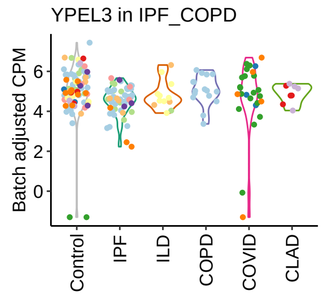


YIF1A in IPF_COPD


YPEL3 in IPF_COPD


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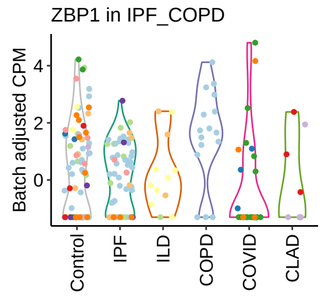

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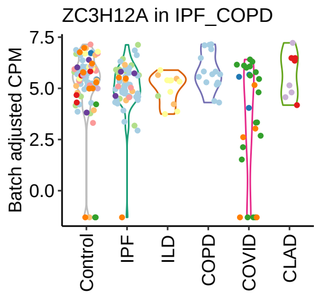

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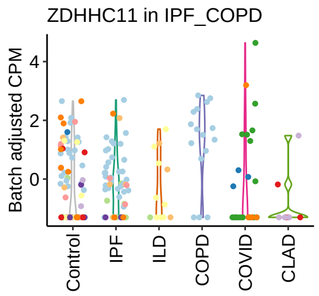

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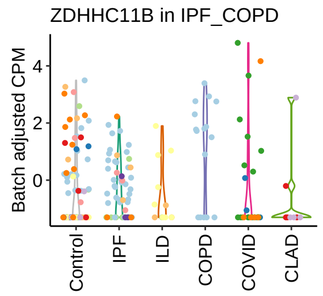

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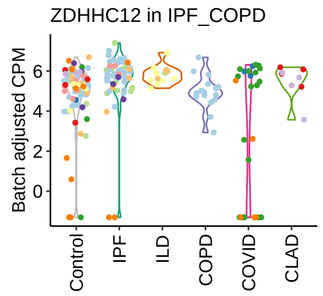

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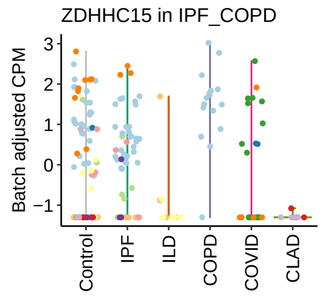

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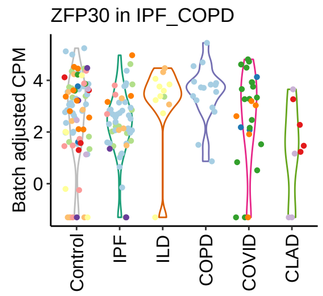

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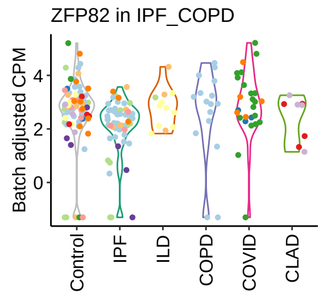

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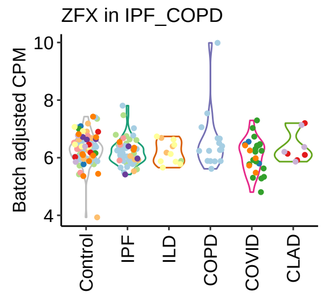

ZHX2 in IPF_COPD

ZMYM6 in IPF_COPD

ZMYND10 in IPF_COPD

ZMYND12 in IPF_COPD

ZNF117 in IPF_COPD

ZNF184 in IPF_COPD

ZNF189 in IPF_COPD

ZNF208 in IPF_COPD

ZNF219 in IPF_COPD

ZNF22 in IPF_COPD

ZNF221 in IPF_COPD

ZNF254 in IPF_COPD

ZNF366 in IPF_COPD

ZNF367 in IPF_COPD

ZNF385B in IPF_COPD

ZNF385D in IPF_COPD

ZNF396 in IPF_COPD

ZNF397 in IPF_COPD

ZNF462 in IPF_COPD

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ZNF540 in IPF_COPD

ZNF541 in IPF_COPD

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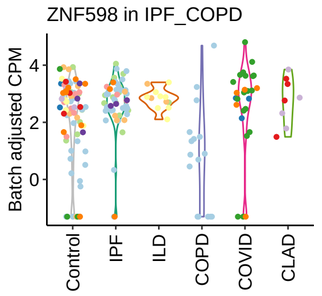
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IPF
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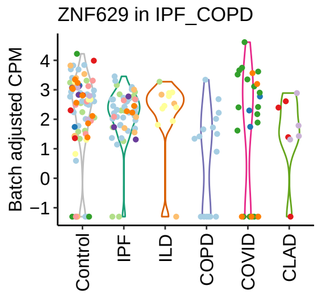
COPD
COVID
CLAD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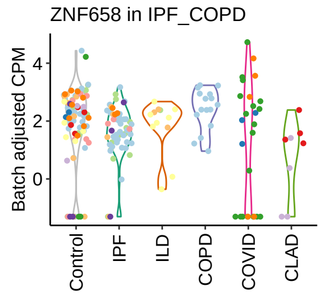
COPD
COVID
CLAD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Batch adjusted CPM
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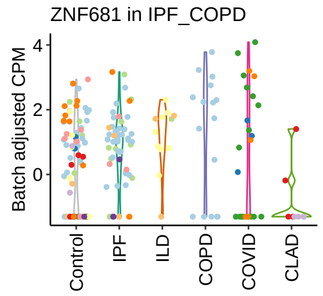
COPD
COVID
CLAD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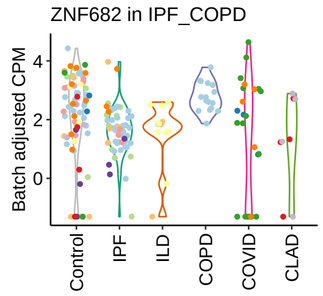
COPD
COVID
CLAD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Batch adjusted CPM
Control
IPF
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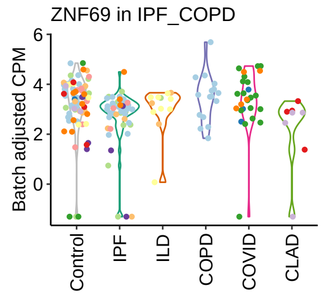
COPD
COVID
CLAD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Batch adjusted CPM
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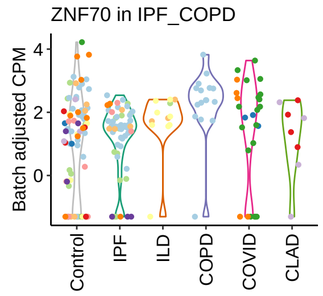
COPD
COVID
CLAD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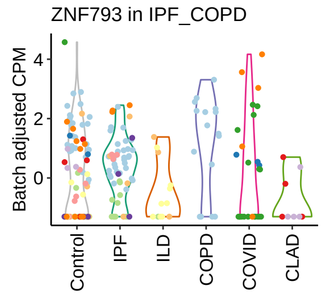
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD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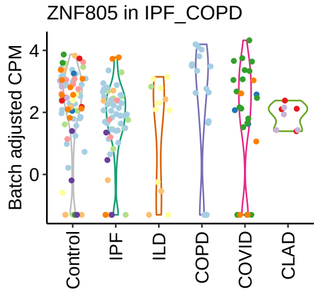
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD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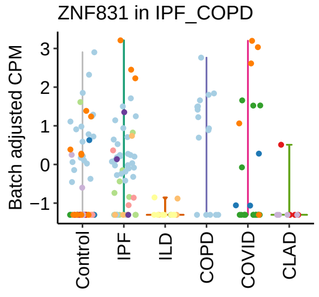
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD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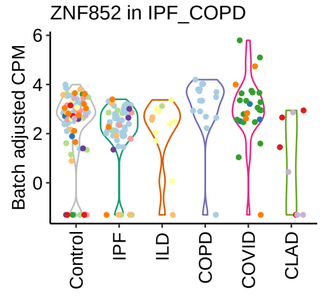
COPD
COVID
CLAD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Batch adjusted CPM
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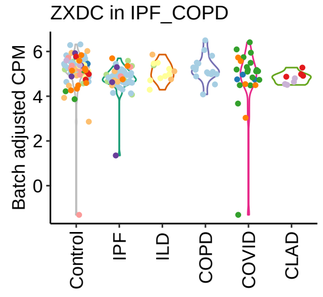
COPD
COVID
CLAD


ZXDC in IPF_COPD
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

ABCA7 in IPF_COVID
AGR3 in IPF_COVID
ALOX15 in IPF_COVID
ANGPTL1 in IPF_COVID
ANXA2 in IPF_COVID
ANXA4 in IPF_COVID
AP1S2 in IPF_COVID
ARL4D in IPF_COVID
ASAP1 in IPF_COVID
ATP6AP2 in IPF_COVID
BOLA3 in IPF_COVID
C16orf54 in IPF_COVID
C17orf58 in IPF_COVID
C22orf15 in IPF_COVID
C6orf118 in IPF_COVID
CAPN13 in IPF_COVID
CAVIN3 in IPF_COVID
CCN2 in IPF_COVID
CD1C in IPF_COVID
CD1E in IPF_COVID
CD24 in IPF_COVID
CD276 in IPF_COVID
CD99 in IPF_COVID
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CFAP95 in IPF_COVID
CHIT1 in IPF_COVID
CHST2 in IPF_COVID
CIR1 in IPF_COVID
CLCN4 in IPF_COVID
CLXN in IPF_COVID
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CYTL1 in IPF_COVID
DAD1 in IPF_COVID
DHRS4 in IPF_COVID
DNASE2B in IPF_COVID
DPCD in IPF_COVID
DYNLRB2 in IPF_COVID
EBI3 in IPF_COVID
ECM2 in IPF_COVID
EMP3 in IPF_COVID
FAIM in IPF_COVID
FCER1A in IPF_COVID
FCRLB in IPF_COVID
FDX1 in IPF_COVID
FES in IPF_COVID
FLT3 in IPF_COVID
FOXJ1 in IPF_COVID
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GPNMB in IPF_COVID
GSTA1 in IPF_COVID
HMG20B in IPF_COVID
HORMAD1 in IPF_COVID
HSBP1 in IPF_COVID
HSD17B8 in IPF_COVID
IFI27L2 in IPF_COVID
IL18R1 in IPF_COVID
IQCN in IPF_COVID
ITGB1BP1 in IPF_COVID
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

KIFC2 in IPF_COVID
KLHDC9 in IPF_COVID
KLK1 in IPF_COVID
KRT17 in IPF_COVID
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LCN2 in IPF_COVID
LILRB4 in IPF_COVID
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MEFV in IPF_COVID
MMP1 in IPF_COVID
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PDPN in IPF_COVID
PERP in IPF_COVID
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PLD4 in IPF_COVID
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SPTBN1 in IPF_COVID
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TMIGD3 in IPF_COVID
TPPP3 in IPF_COVID
TRIM29 in IPF_COVID
UBXN10 in IPF_COVID
VIM in IPF_COVID
WEE1 in IPF_COVID
WFDC2 in IPF_COVID
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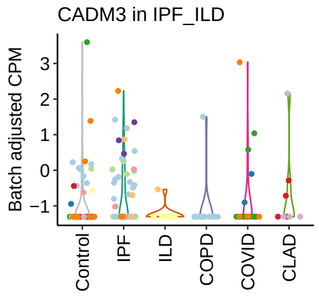
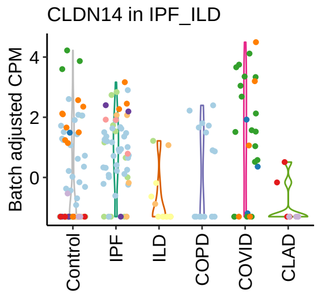
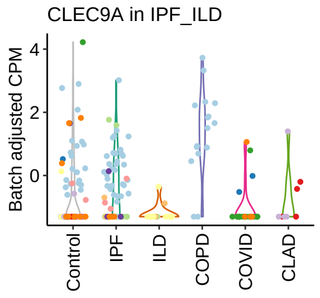
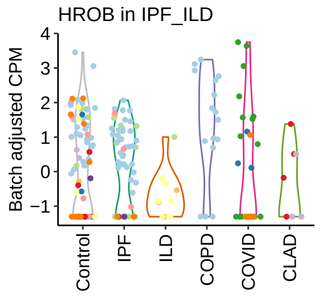
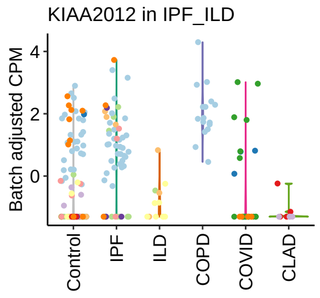
ZNF385A in IPF_COVID
Batch adjusted CPM
Control
IPF
ILD
COPD
COVID
CLAD

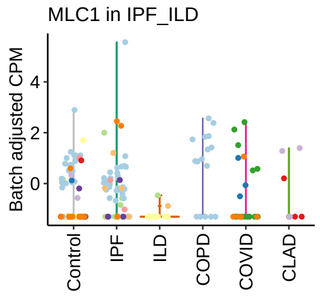

CADM3 in IPF_ILD
Batch adjusted CPM
3
2
1
0
−1
Control
IPF
ILD
COPD
COVID
CLAD

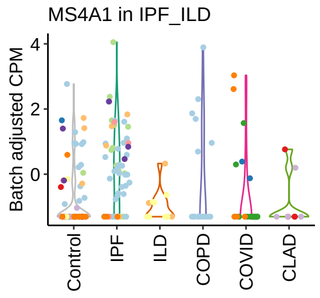

CLDN14 in IPF_ILD
Batch adjusted CPM
4
2
0
Control
IPF
ILD
COPD
COVID
CLAD

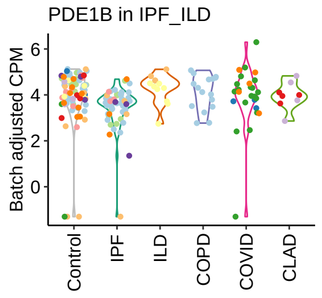

CLEC9A in IPF_ILD
Batch adjusted CPM
4
2
0
Control
IPF
ILD
COPD
COVID
CLAD


HROB in IPF_ILD
Batch adjusted CPM
4
3
2
1
0
−1
Control
IPF
ILD
COPD
COVID
CLAD


KIAA2012 in IPF_ILD
Batch adjusted CPM
4
2
0
Control
IPF
ILD
COPD
COVID
CLAD


MLC1 in IPF_ILD
Batch adjusted CPM
4
2
0
Control
IPF
ILD
COPD
COVID
CLAD


MS4A1 in IPF_ILD
Batch adjusted CPM
4
2
0
Control
IPF
ILD
COPD
COVID
CLAD


PDE1B in IPF_ILD
Batch adjusted CPM
6
4
2
0
Control
IPF
ILD
COPD
COVID
CLAD

PRG4 in IPF_ILD
Batch adjusted CPM
3
2
1
0
−1
Control
IPF
ILD
COPD
COVID
CLAD

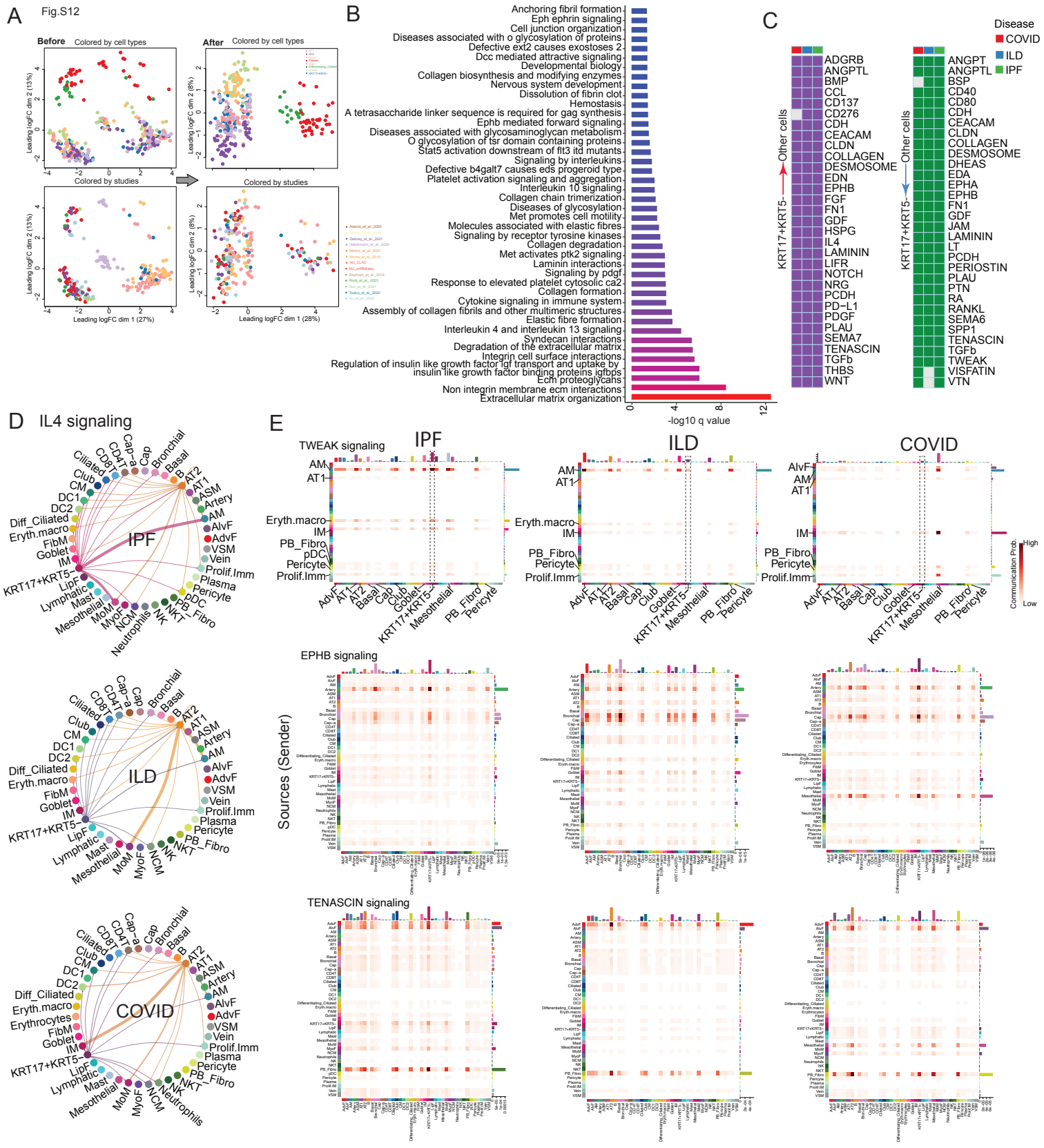
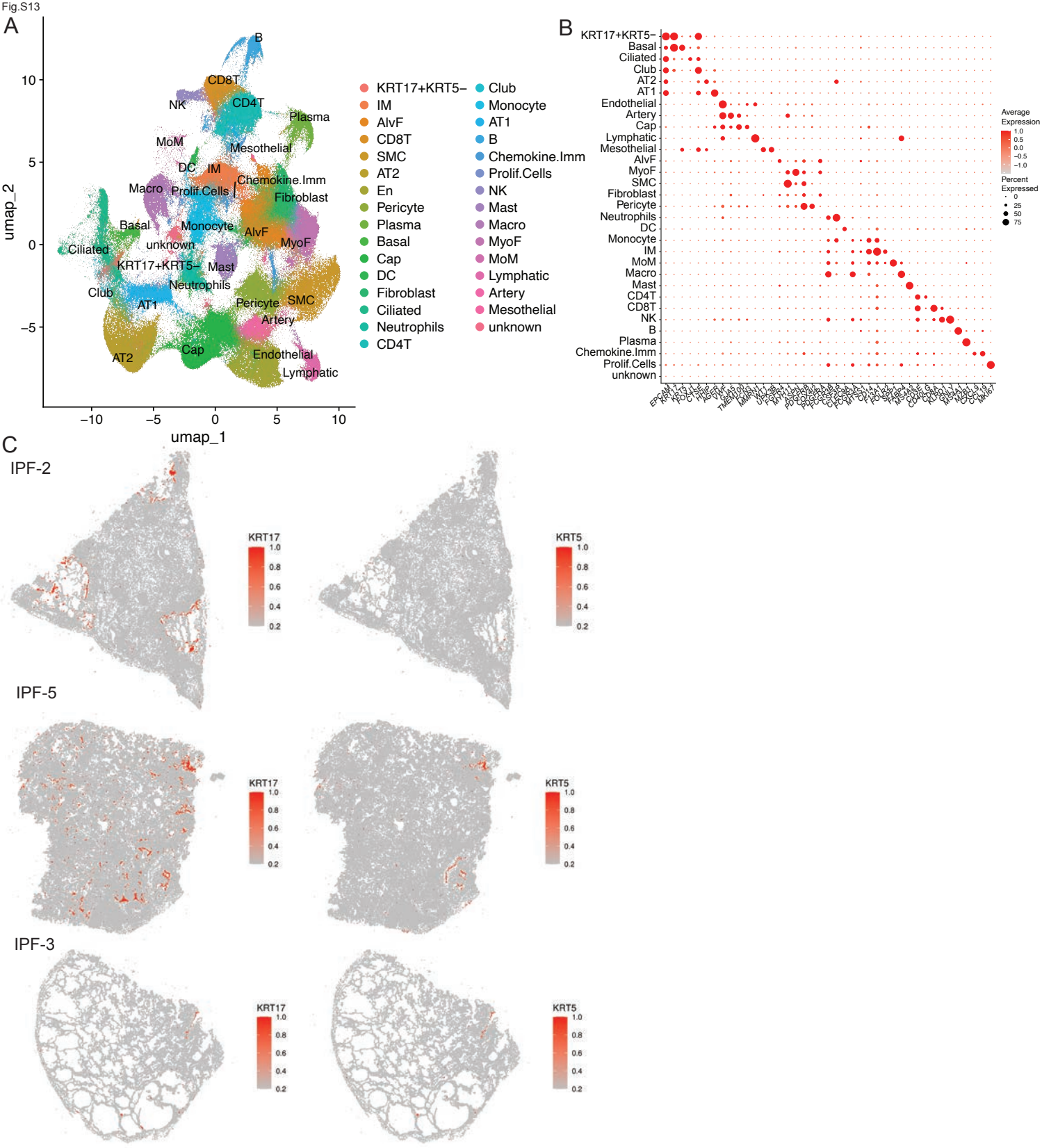


Fig.S12
A
Before
Colored by cell types
After
Colored by cell types
Colored by studies
Colored by studies
Leading logFC dim 1 (27%)
Leading logFC dim 2 (13%)
Leading logFC dim 1 (28%)
Leading logFC dim 2 (8%)
B
Anchoring fibril formation
Eph ephrin signaling
Cell junction organization
Diseases associated with o glycosylation of proteins
Defective ext2 causes exostoses 2
Dcc mediated attractive signaling
Developmental biology
Collagen biosynthesis and modifying enzymes
Nervous system development
Dissolution of fibrin clot
Hemostasis
A tetrasaccharide linker sequence is required for gag synthesis
Ephb mediated forward signaling
Diseases associated with glycosaminoglycan metabolism
O glycosylation of tsr domain containing proteins
Stat5 activation downstream of flt3 itd mutants
Signaling by interleukins
Defective b4galt7 causes eds progeroid type
Platelet activation signaling and aggregation
Interleukin 10 signaling
Collagen chain trimerization
Diseases of glycosylation
Met promotes cell motility
Molecules associated with elastic fibres
Signaling by receptor tyrosine kinases
Collagen degradation
Met activates ptk2 signaling
Laminin interactions
Signaling by pdgf
Response to elevated platelet cytosolic ca2
Collagen formation
Cytokine signaling in immune system
Assembly of collagen fibrils and other multimeric structures
Elastic fibre formation
Interleukin 4 and interleukin 13 signaling
Syndecan interactions
Degradation of the extracellular matrix
Integrin cell surface interactions
Regulation of insulin like growth factor igf transport and uptake by insulin like growth factor binding proteins igfbps
Ecm proteoglycans
Non integrin membrane ecm interactions
Extracellular matrix organization
-log10 q value
C
Disease
COVID
ILD
IPF
KRT17+KRT5- Other cells
ADGRB
ANGPTL
BMP
CCL
CD137
CD276
CDH
CEACAM
CLDN
COLLAGEN
DESMOSOME
EDN
EPHB
FGF
FN1
GDF
HSPG
IL4
LAMININ
LIFR
NOTCH
NRG
PCDH
PD−L1
PDGF
PLAU
SEMA7
TENASCIN
TGFb
THBS
WNT
ANGPT
ANGPTL
BSP
CD40
CD80
CDH
CEACAM
CLDN
COLLAGEN
DESMOSOME
DHEAS
EDA
EPHA
EPHB
FN1
GDF
JAM
LAMININ
LT
PCDH
PERIOSTIN
PLAU
PTN
RA
RANKL
SEMA6
SPP1
TENASCIN
TGFb
TWEAK
VISFATIN
VTN
D
IL4 signaling
IPF
ILD
COVID
E
TWEAK signaling
EPHB signaling
TENASCIN signaling
Sources (Sender)
Communication Prob.
High
Low

Fig.S13


A
B
C
umap_1
umap_2
KRT17+KRT5−
IM
AlvF
CD8T
SMC
AT2
En
Pericyte
Plasma
Basal
Cap
DC
Fibroblast
Ciliated
Neutrophils
CD4T
Club
Monocyte
AT1
B
Chemokine.Imm
Prolif.Cells
NK
Mast
Macro
MyoF
MoM
Lymphatic
Artery
Mesothelial
unknown
Average Expression
Percent Expressed
IPF-2
IPF-5
IPF-3
KRT17
KRT5

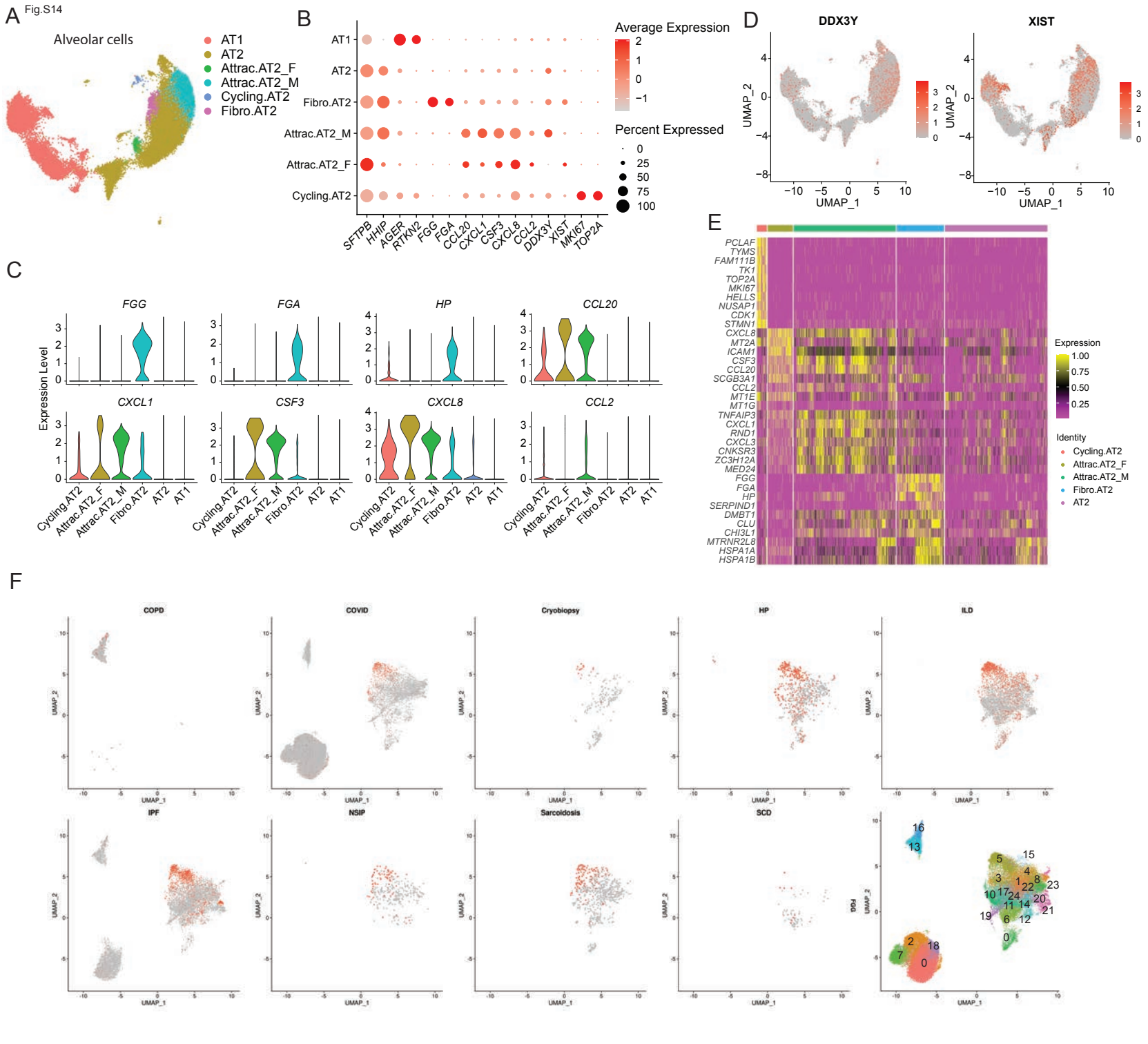
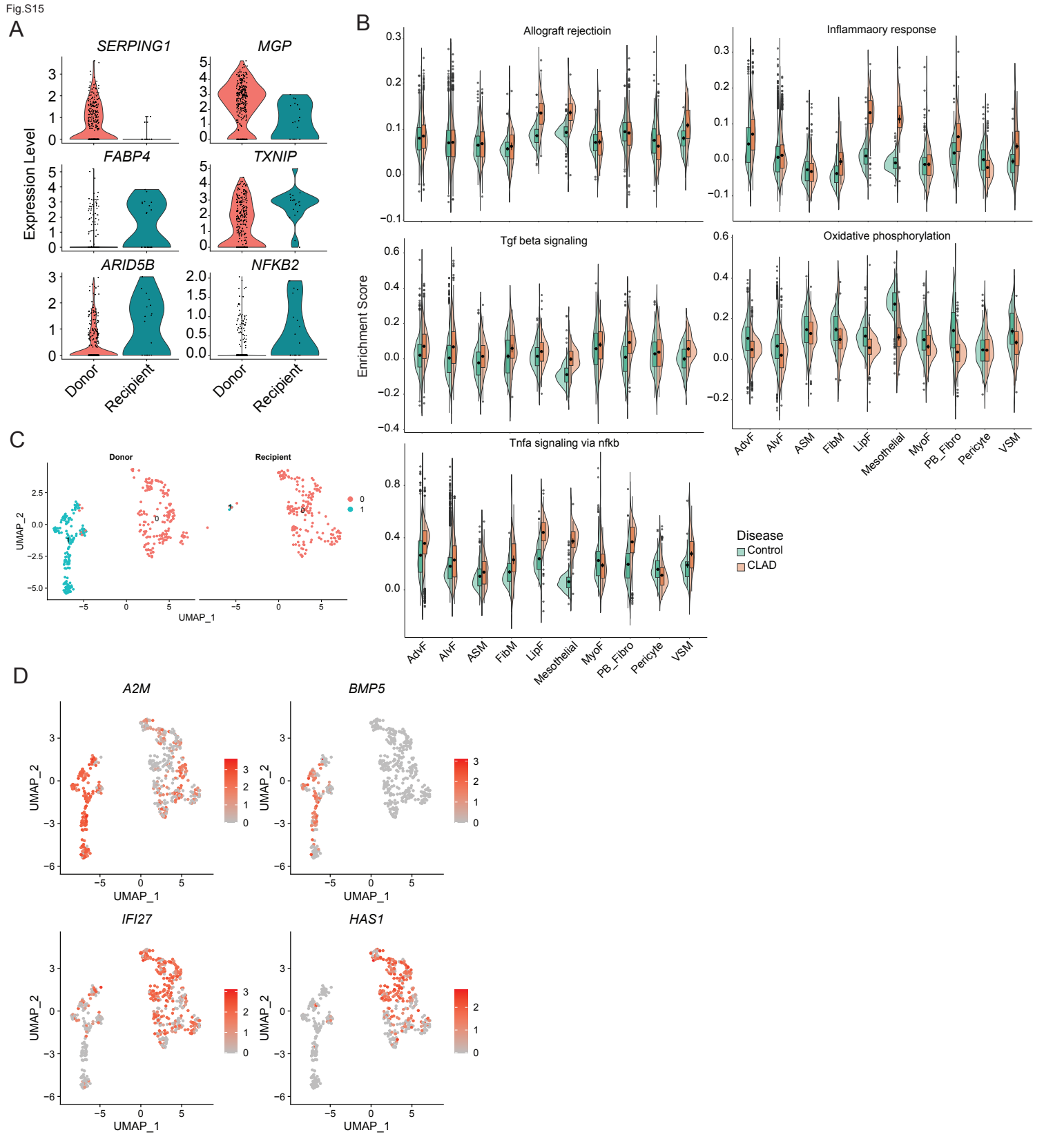

A
Fig.S14
Alveolar cells
AT1
AT2
Attrac.AT2_F
Attrac.AT2_M
Cycling.AT2
Fibro.AT2
B
AT1
AT2
Fibro.AT2
Attrac.AT2_M
Attrac.AT2_F
Cycling.AT2
SFTPB
HHIP
AGER
RTKN2
FGG
FGA
CCL20
CXCL1
CSF3
CXCL8
CCL2
DDX3Y
XIST
MKI67
TOP2A
Average Expression
Percent Expressed
D
DDX3Y
XIST
UMAP_1
UMAP_2
C
FGG
FGA
HP
CCL20
CXCL1
CSF3
CXCL8
CCL2
Expression Level
Cycling.AT2
Attrac.AT2_F
Attrac.AT2_M
Fibro.AT2
AT2
AT1
E
PCLAF
TYMS
FAM111B
TK1
TOP2A
MKI67
HELLS
NUSAP1
CDK1
STMN1
CXCL8
MT2A
ICAM1
CSF3
CCL20
SCGB3A1
CCL2
MT1E
MT1G
TNFAIP3
CXCL1
RND1
CXCL3
CNKSR3
ZC3H12A
MED24
FGG
FGA
HP
SERPIND1
DMBT1
CLU
CHI3L1
MTRNR2L8
HSPA1A
HSPA1B
Expression
Identity
Cycling.AT2
Attrac.AT2_F
Attrac.AT2_M
Fibro.AT2
AT2
F
COPD
COVID
Cryobiopsy
HP
ILD
IPF
NSIP
Sarcoidosis
SCD
UMAP_1
UMAP_2

Fig.S15


A
SERPING1
MGP
FABP4
TXNIP
ARID5B
NFKB2
Expression Level
Donor
Recipient
B
Allograft rejectioin
Inflammaory response
Tgf beta signaling
Oxidative phosphorylation
Tnfa signaling via nfkb
Enrichment Score
AdvF
AlvF
ASM
FibM
LipF
Mesothelial
MyoF
PB_Fibro
Pericyte
VSM
Disease
Control
CLAD
C
Donor
Recipient
UMAP_1
UMAP_2
D
A2M
BMP5
IFI27
HAS1

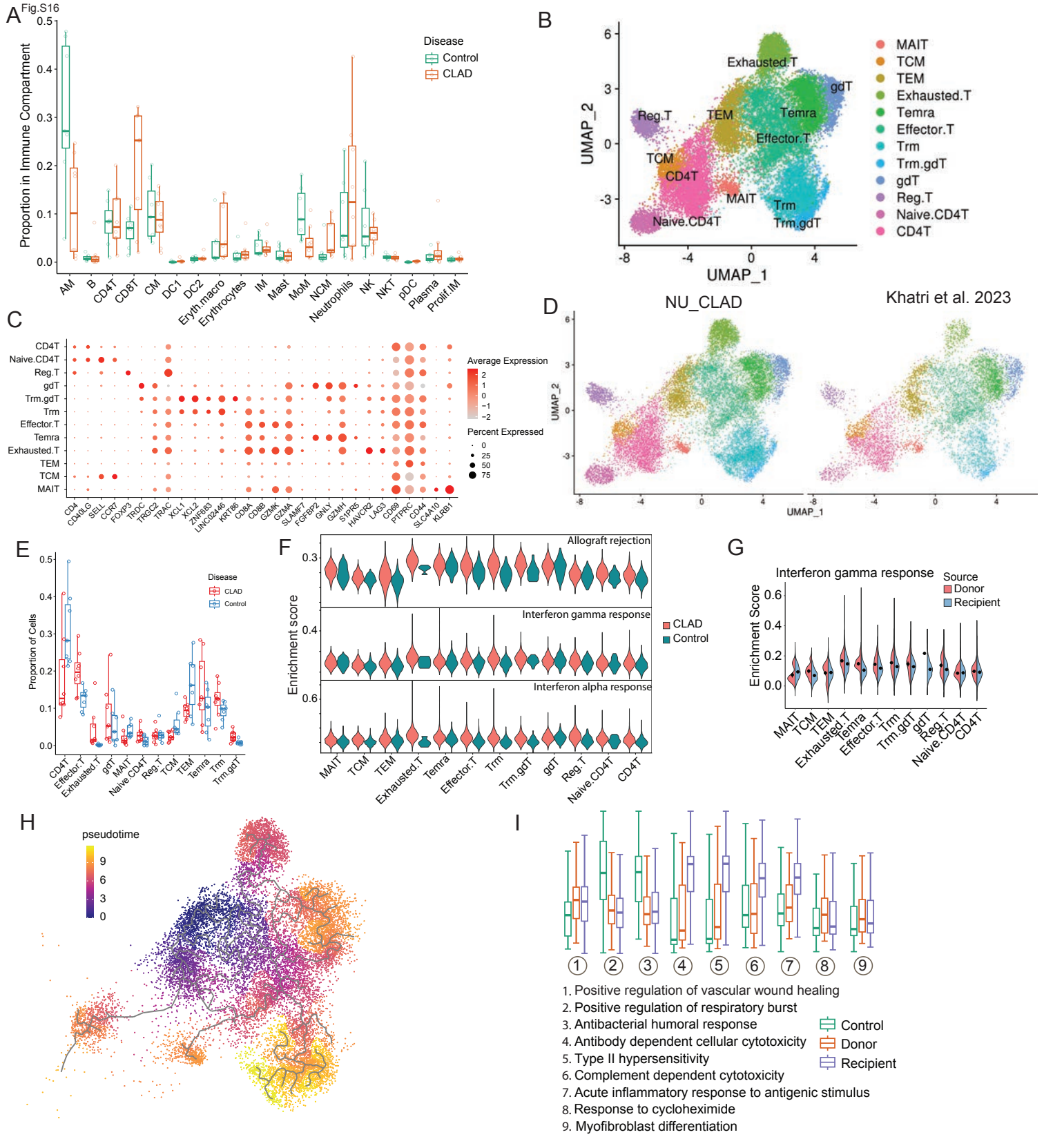


Fig.S16
A
Proportion in Immune Compartment
Disease
Control
CLAD
AM
B
CD4T
CD8T
CM
DC1
DC2
Eryth.macro
Erythrocytes
IM
Mast
MoM
NCM
Neutrophils
NK
NKT
pDC
Plasma
Prolif.IM
B
UMAP_2
UMAP_1
MAIT
TCM
TEM
Exhausted.T
Temra
Effector.T
Trm
Trm.gdT
gdT
Reg.T
Naive.CD4T
CD4T
C
Average Expression
Percent Expressed
D
NU_CLAD
Khatri et al. 2023
E
Proportion of Cells
F
Allograft rejection
Interferon gamma response
Interferon alpha response
Enrichment score
G
Interferon gamma response
Source
Donor
Recipient
Enrichment Score
H
pseudotime
I
1. Positive regulation of vascular wound healing
2. Positive regulation of respiratory burst
3. Antibacterial humoral response
4. Antibody dependent cellular cytotoxicity
5. Type II hypersensitivity
6. Complement dependent cytotoxicity
7. Acute inflammatory response to antigenic stimulus
8. Response to cycloheximide
9. Myofibroblast differentiation
Control
Donor
Recipient

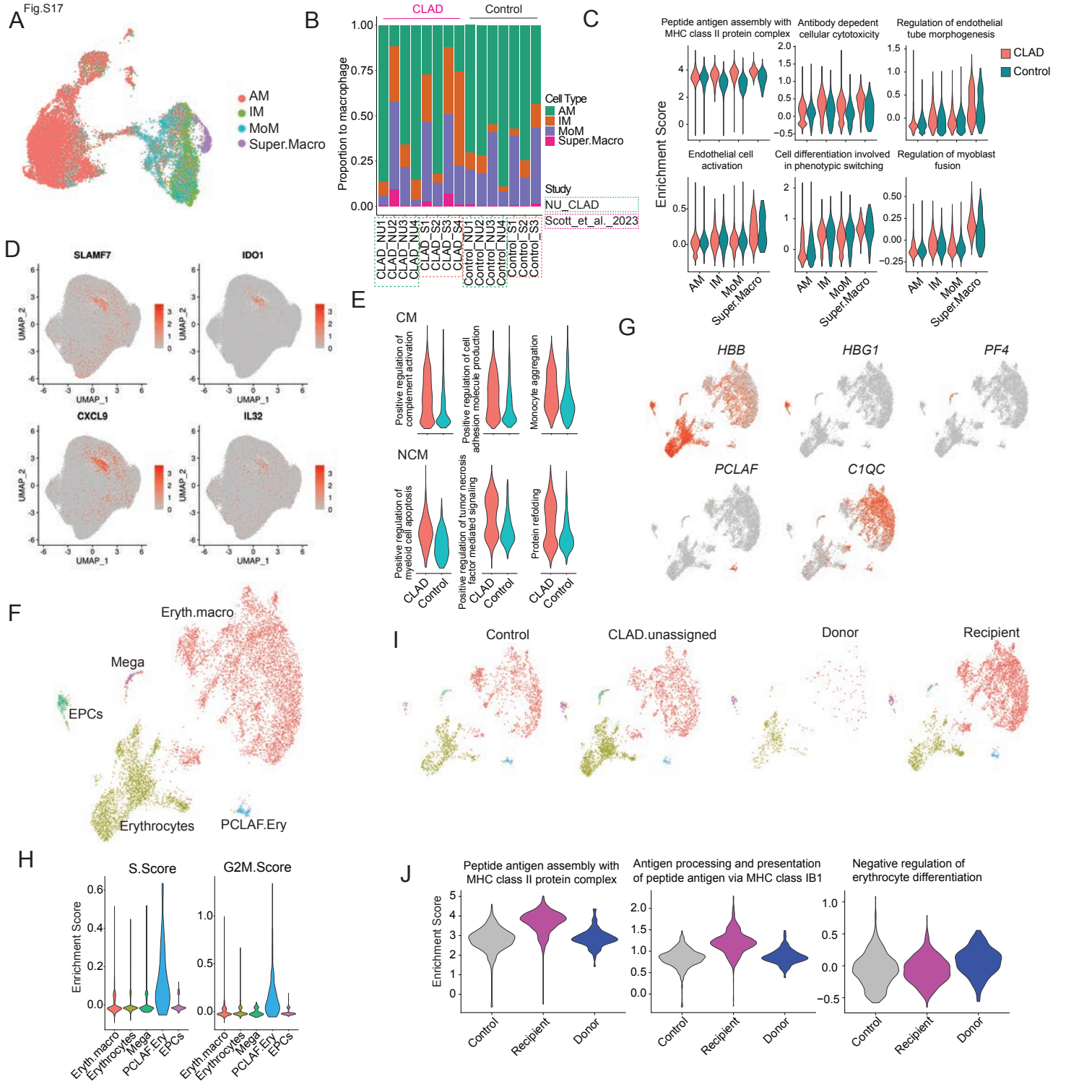
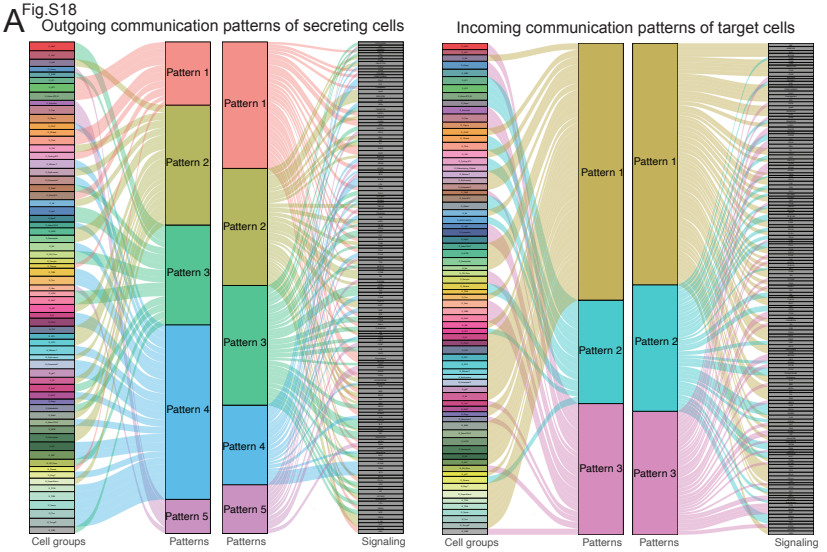
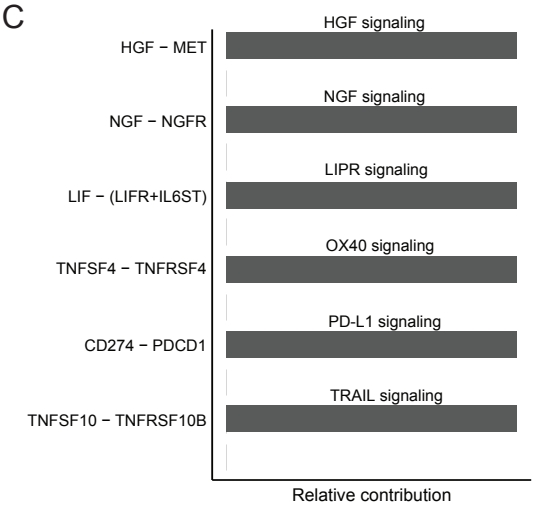
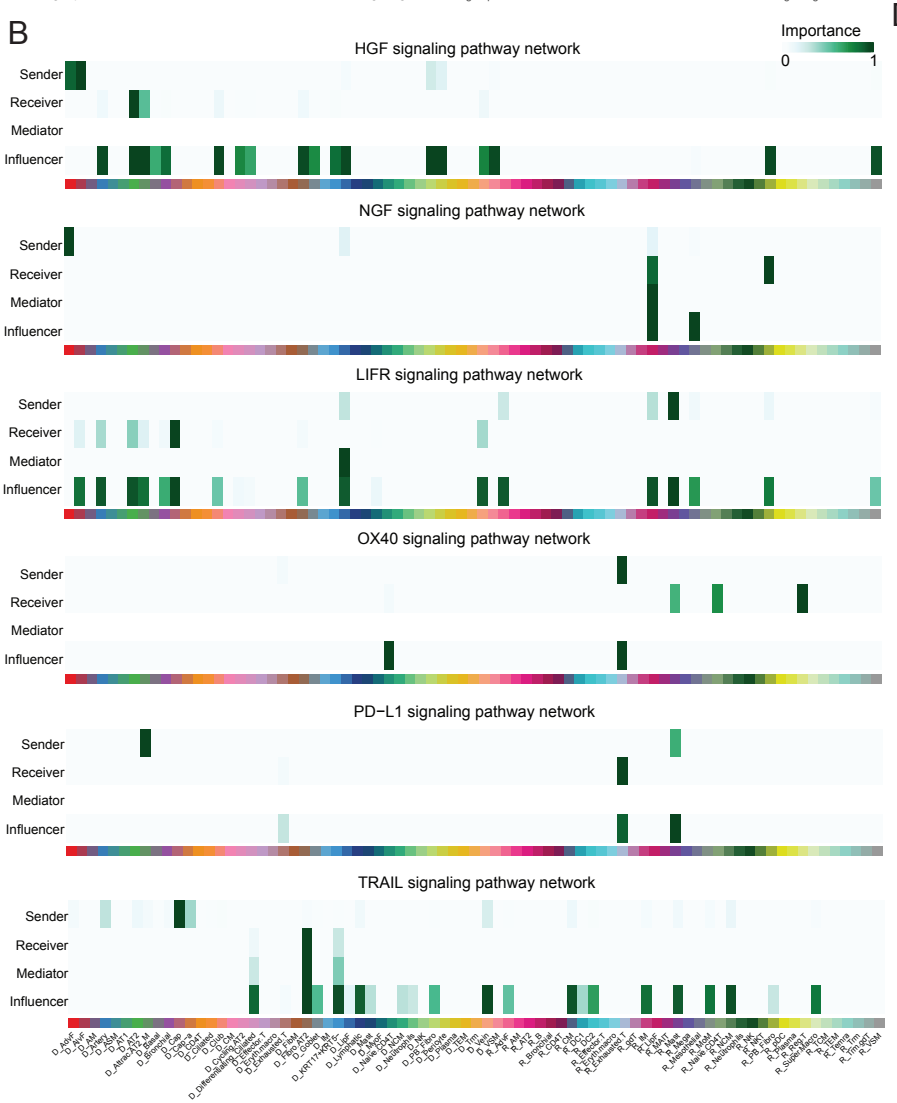


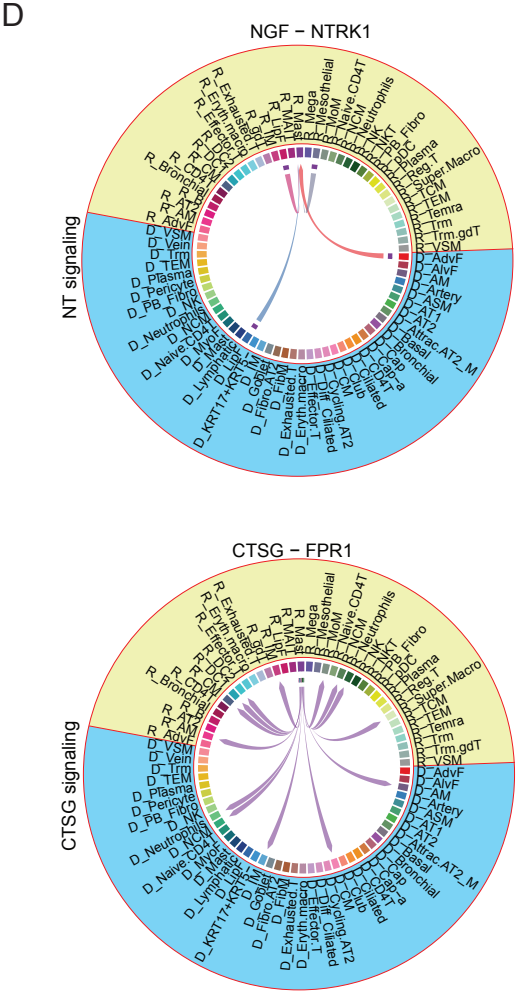
Fig.S17
A
AM
IM
MoM
Super.Macro
B
CLAD
Control
Proportion to macrophage
Cell Type
AM
IM
MoM
Super.Macro
Study
NU_CLAD
Scott_et_al._2023
CLAD_NU1
CLAD_NU2
CLAD_NU3
CLAD_NU4
CLAD_S1
CLAD_S2
CLAD_S3
CLAD_S4
Control_NU1
Control_NU2
Control_NU3
Control_NU4
Control_S1
Control_S2
Control_S3
C
Peptide antigen assembly with MHC class II protein complex
Antibody depedent cellular cytotoxicity
Regulation of endothelial tube morphogenesis
Endothelial cell activation
Cell differentiation involved in phenotypic switching
Regulation of myoblast fusion
Enrichment Score
CLAD
Control
AM
IM
MoM
Super.Macro
D
SLAMF7
IDO1
CXCL9
IL32
UMAP_1
UMAP_2
E
CM
NCM
Positive regulation of complement activation
Positive regulation of cell adhesion molecule production
Monocyte aggregation
Positive regulation of myeloid cell apoptosis
Positive regulation of tumor necrosis factor mediated signaling
Protein refolding
CLAD
Control
F
Eryth.macro
Mega
EPCs
Erythrocytes
PCLAF.Ery
G
HBB
HBG1
PF4
PCLAF
C1QC
H
S.Score
G2M.Score
Enrichment Score
Eryth.macro
Erythrocytes
Mega
PCLAF.Ery
EPCs
I
Control
CLAD.unassigned
Donor
Recipient
J
Peptide antigen assembly with MHC class II protein complex
Antigen processing and presentation of peptide antigen via MHC class IB1
Negative regulation of erythrocyte differentiation
Enrichment Score
Control
Recipient
Donor

Fig.S18


A
Outgoing communication patterns of secreting cells
Incoming communication patterns of target cells
Pattern 1
Pattern 2
Pattern 3
Pattern 4
Pattern 5
Cell groups
Patterns
Signaling


C
HGF signaling
HGF − MET
NGF signaling
NGF − NGFR
LIPR signaling
LIF − (LIFR+IL6ST)
OX40 signaling
TNFSF4 − TNFRSF4
PD-L1 signaling
CD274 − PDCD1
TRAIL signaling
TNFSF10 − TNFRSF10B
Relative contribution


B
Importance
0
1
HGF signaling pathway network
NGF signaling pathway network
LIFR signaling pathway network
OX40 signaling pathway network
PD−L1 signaling pathway network
TRAIL signaling pathway network
Sender
Receiver
Mediator
Influencer


D
NGF − NTRK1
CTSG − FPR1
NT signaling
CTSG signaling