bulk-org figures (AB) V1.34

Raphael Kubler

02/09/2024

Contents

PCA IFNy, LPS, ctr **2**

CO vs COiMG in control samples **3**

PCA plots . . . 3
Volcano plot . . . 4
DEG table . . . 5
Boxplot CO vs COiMg in CTR . . . 5
Patir microglia genes heatmap . . . 7
Enrichment heatmap (gene sets of interest) . . . 8
GO enrichment . . . 9

Stimulation (IFNy) samples **11**

PCA plots . . . 11
Volcano plot . . . 12
DEG table . . . 13
Boxplot genes of interest . . . 13
Top 40 DEGs heatmap . . . 14
Enrichment heatmap (gene sets of interest) . . . 15
GO enrichment . . . 16

IFNy in COiMG **18**

PCA plots . . . 18
Volcano plot . . . 19
DEG table . . . 20
Boxplot genes of interest . . . 20
Top 40 DEGs heatmap . . . 21
Enrichment heatmap (gene sets of interest) . . . 22
GO enrichment . . . 23

CO vs COiMg under IFNy **25**

Phagocytosis: CO vs COiMg under IFNy 25

Gene set heatmap 26

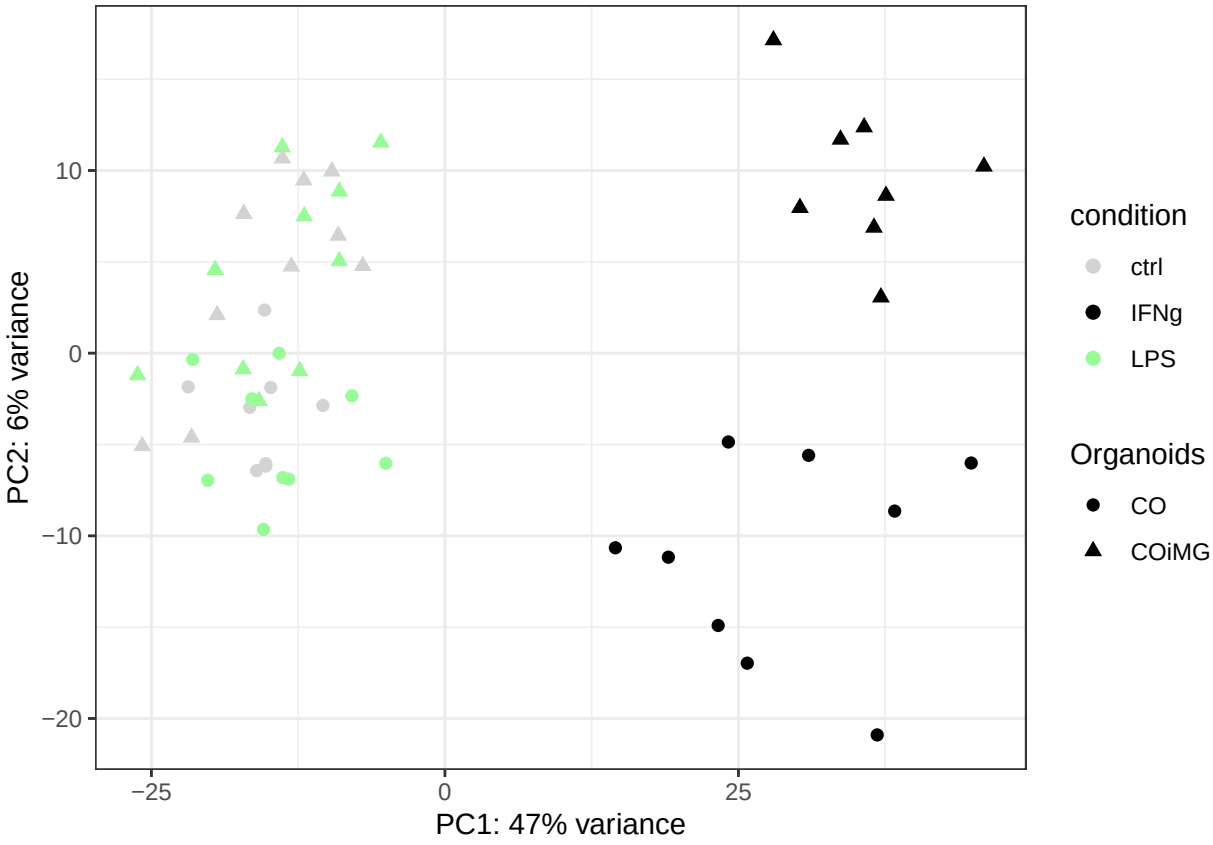
IFNy CO vs COiMG 27

CO vs COiMg lFC correlation plot 30

SFARI response to IFNy **31**

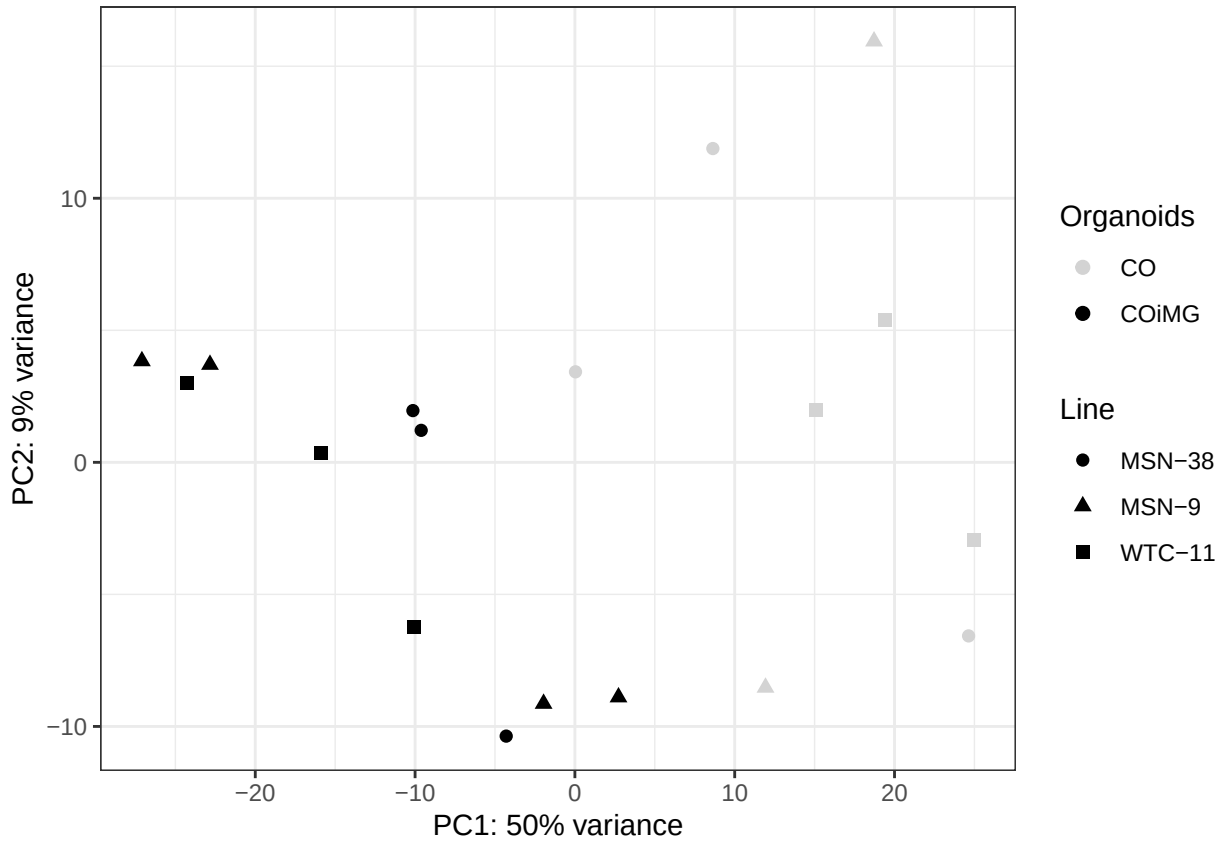
iMG vs ocMG **33**

PCA IFNy, LPS, ctr

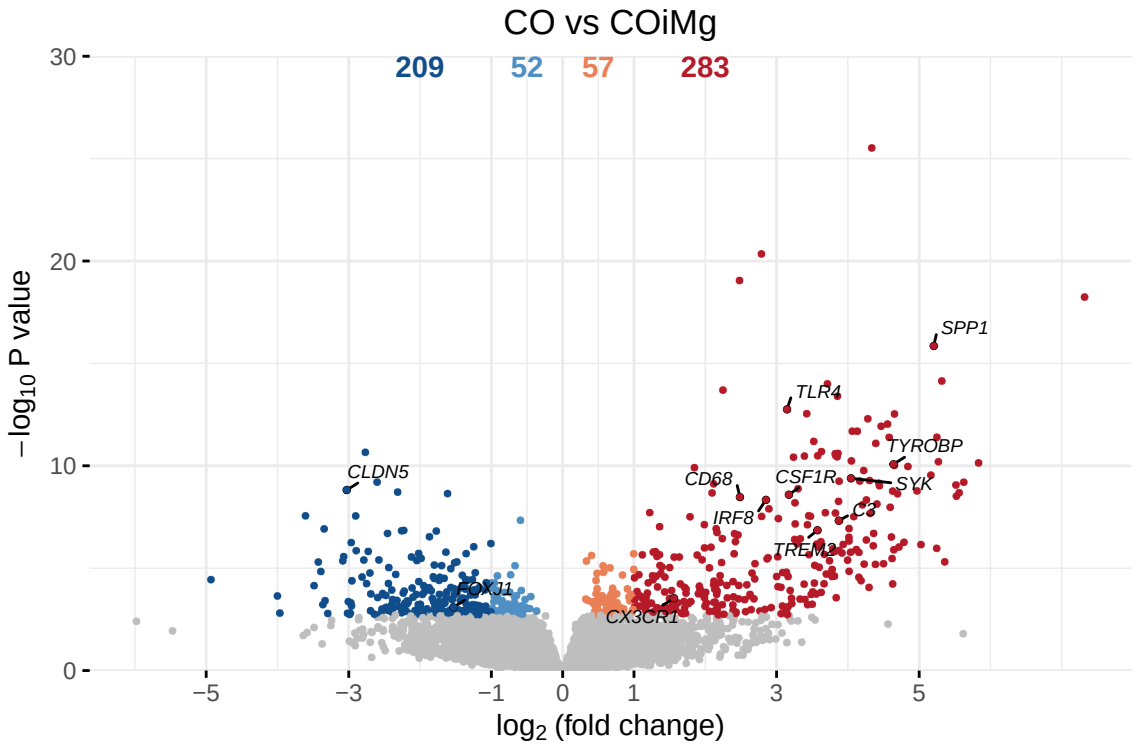


CO vs COiMG in control samples

PCA plots

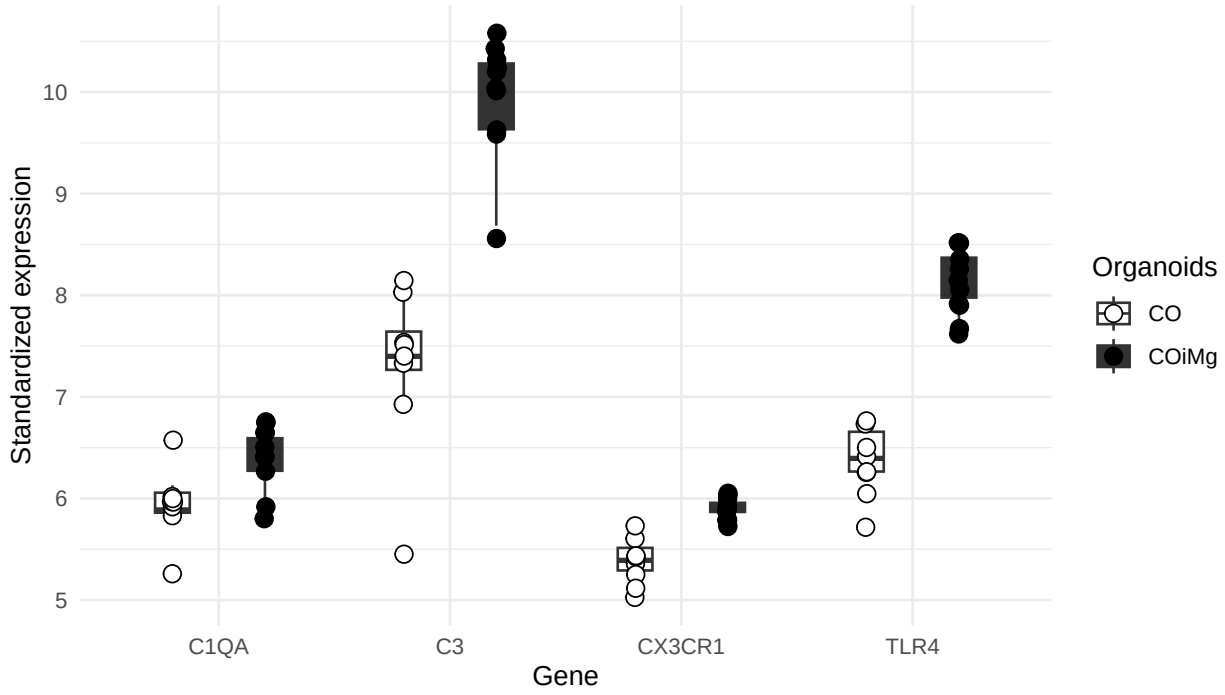


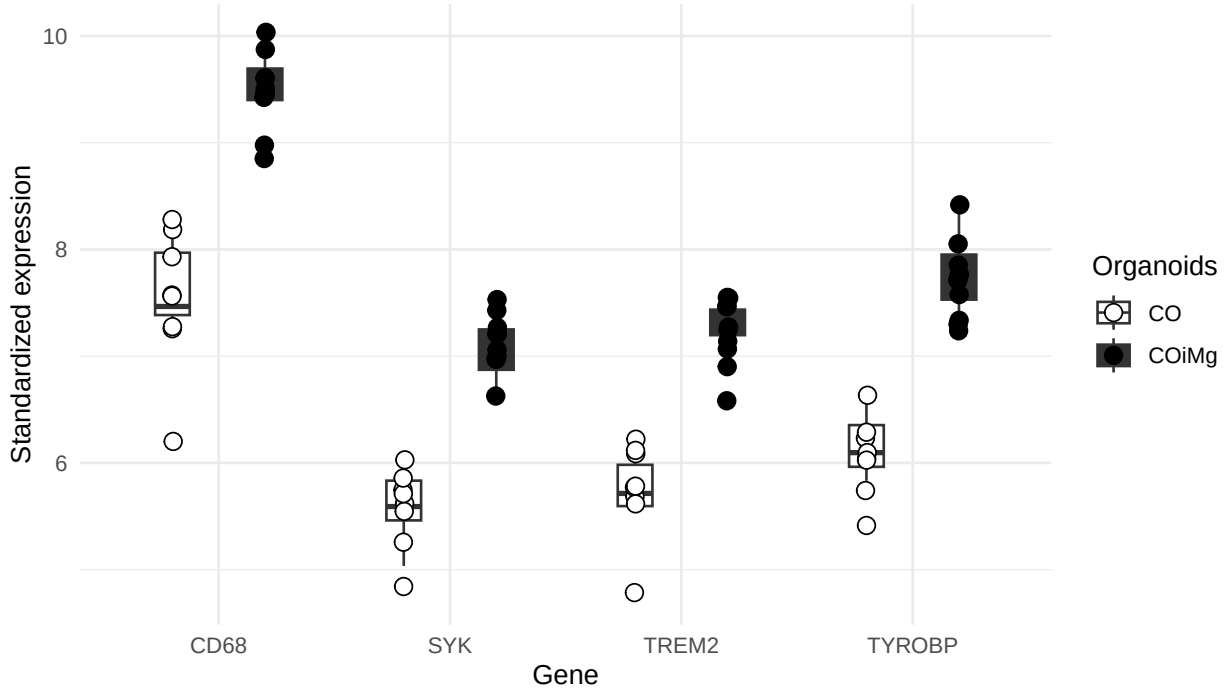
Volcano plot

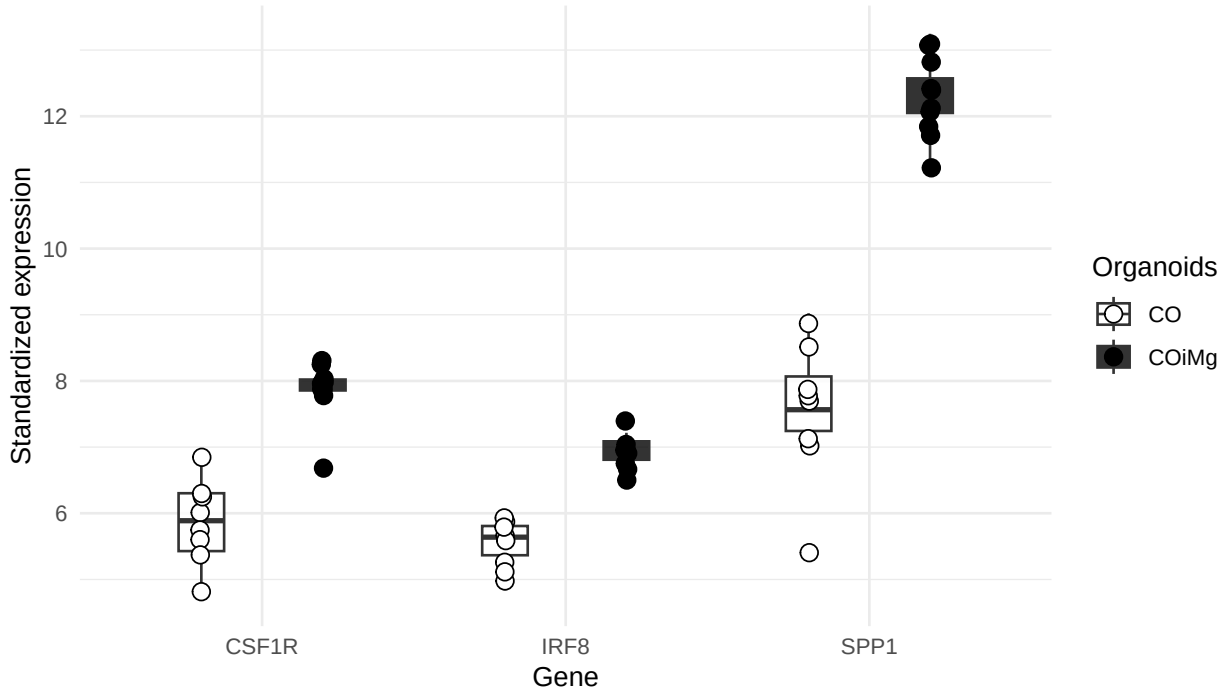


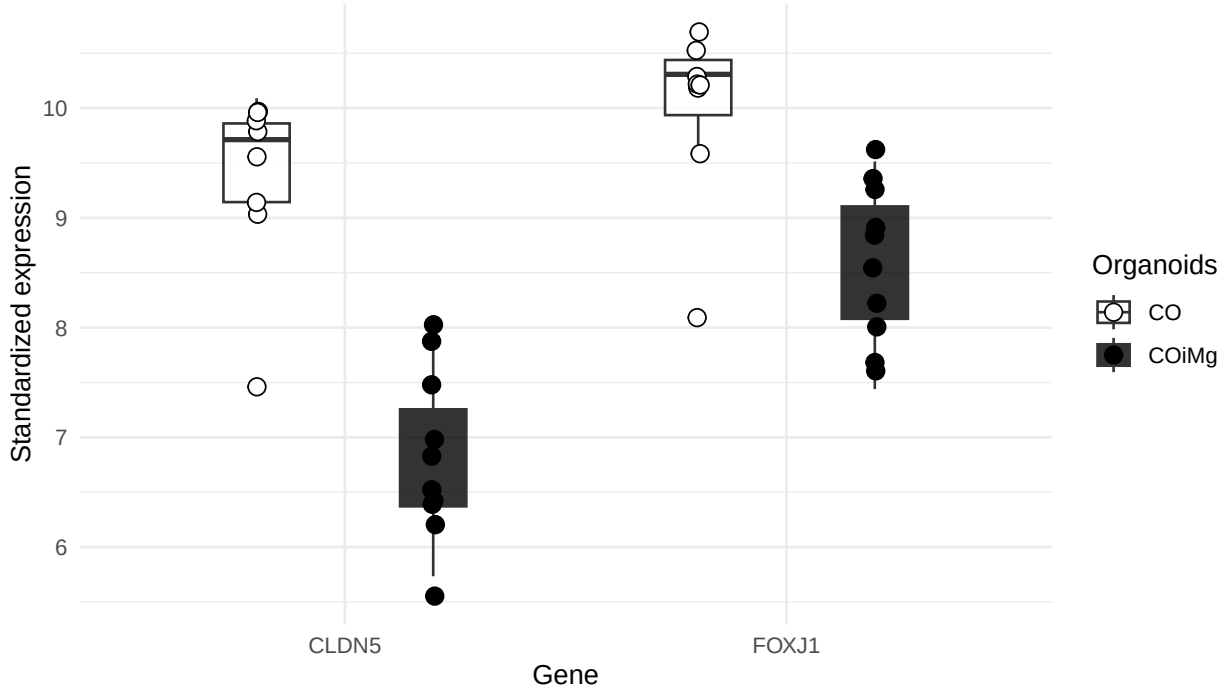
DEG table

Boxplot CO vs COiMg in CTR

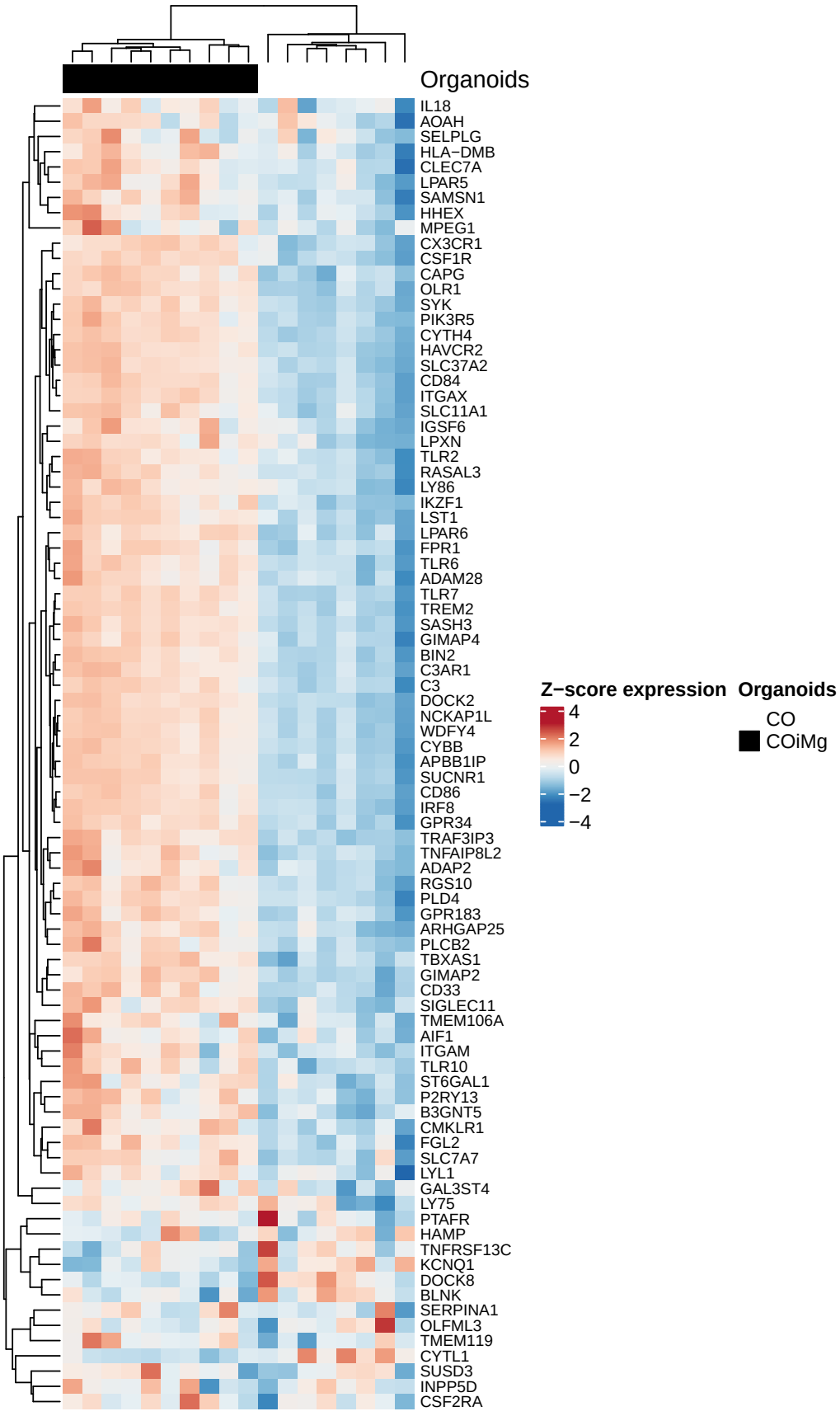




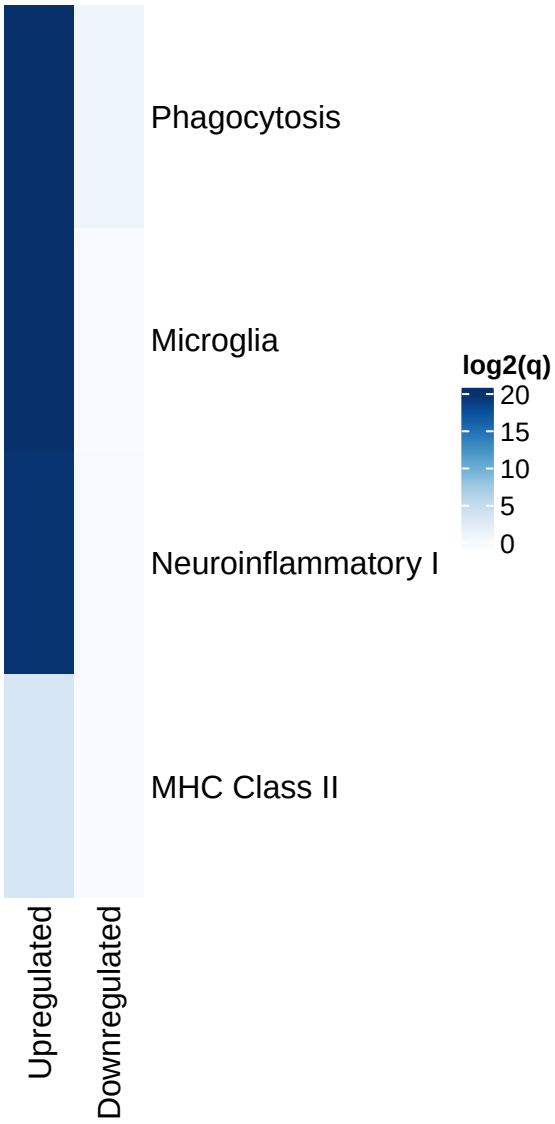

Standardized expression
12
10
8
6
CSF1R
IRF8
SPP1
Gene
Organoids
CO
COiMg


Standardized expression
10
9
8
7
6
CLDN5
FOXJ1
Gene
Organoids
CO
COiMg

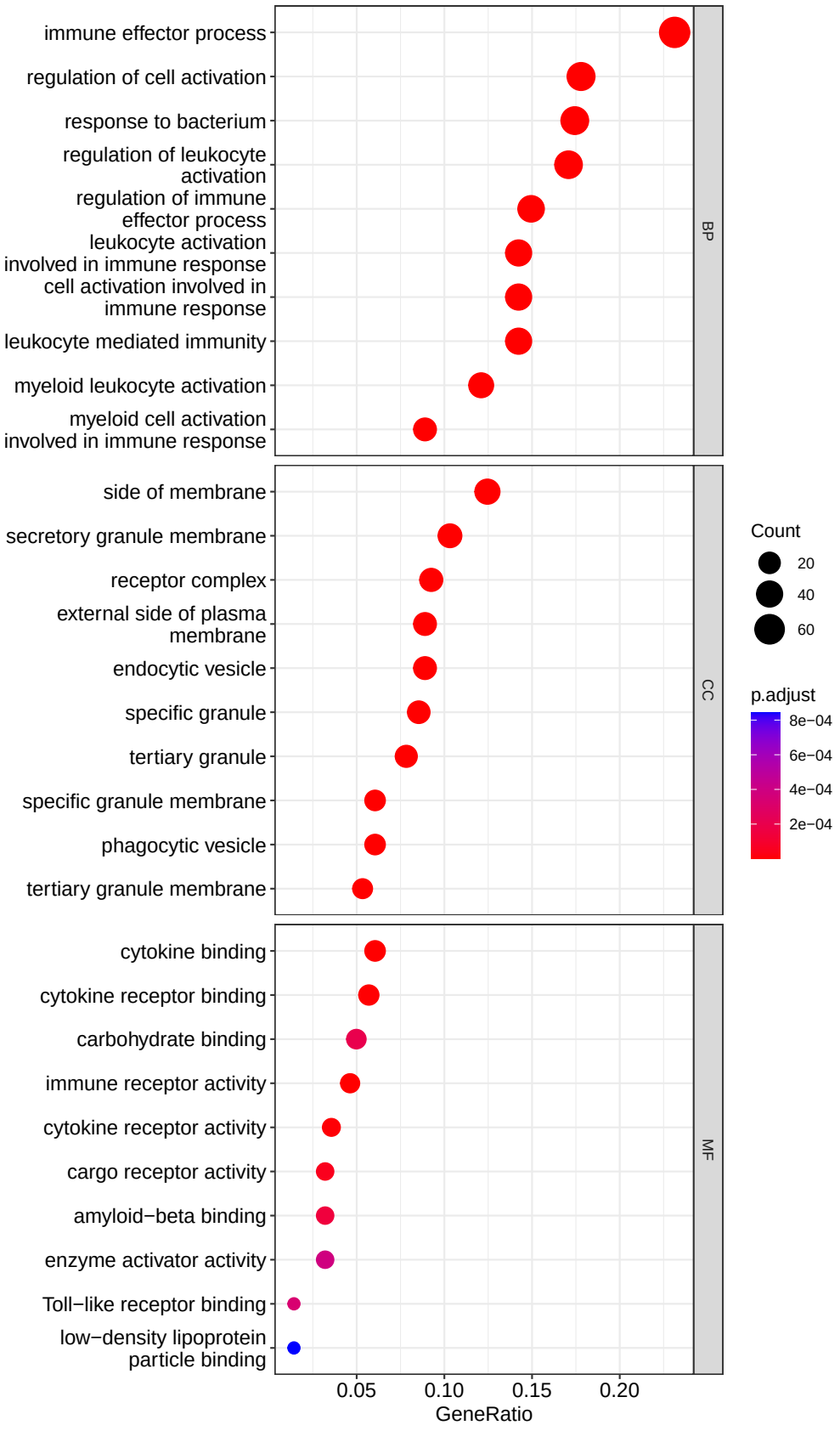
Patir microglia genes heatmap

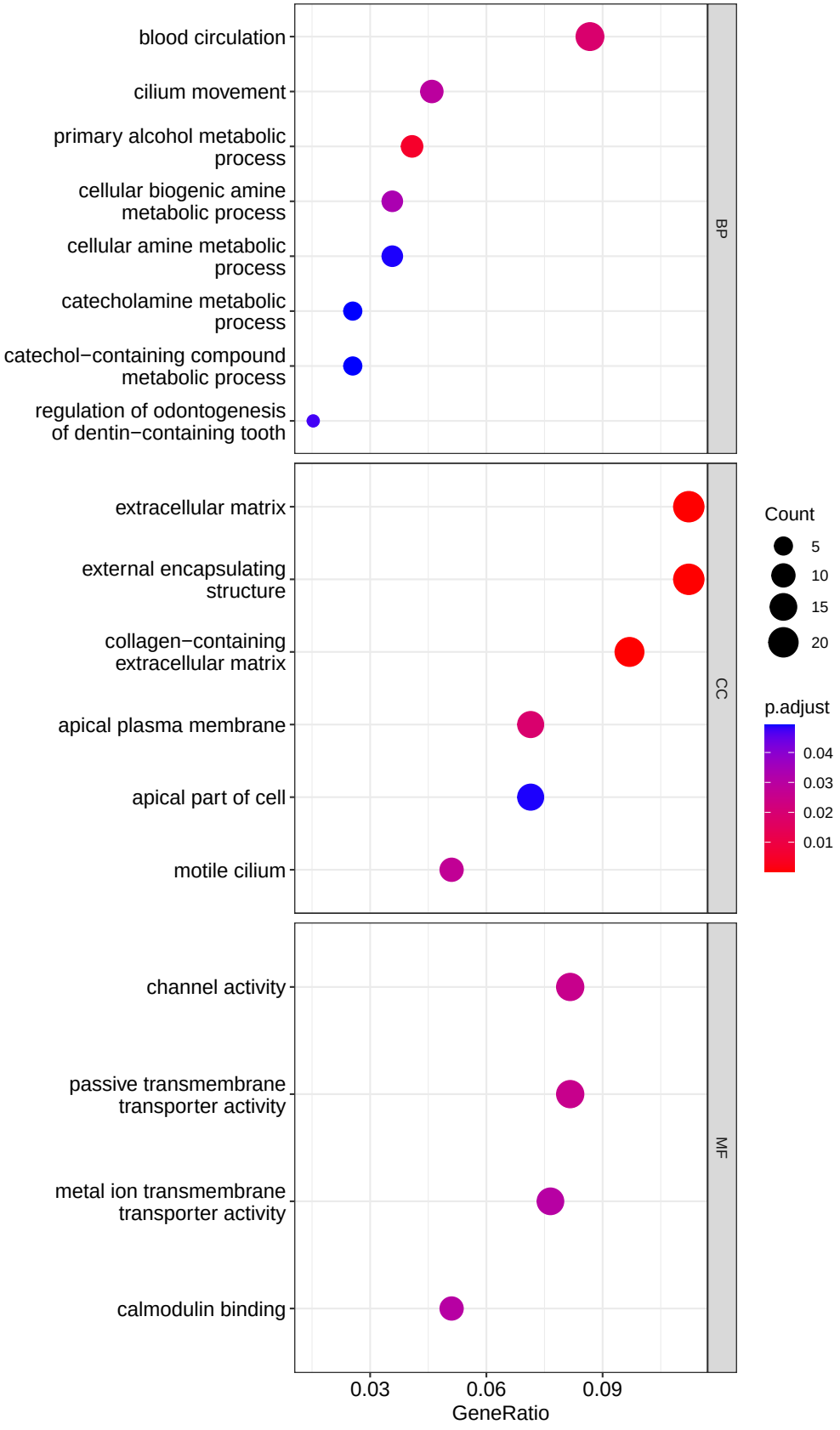


Enrichment heatmap (gene sets of interest)



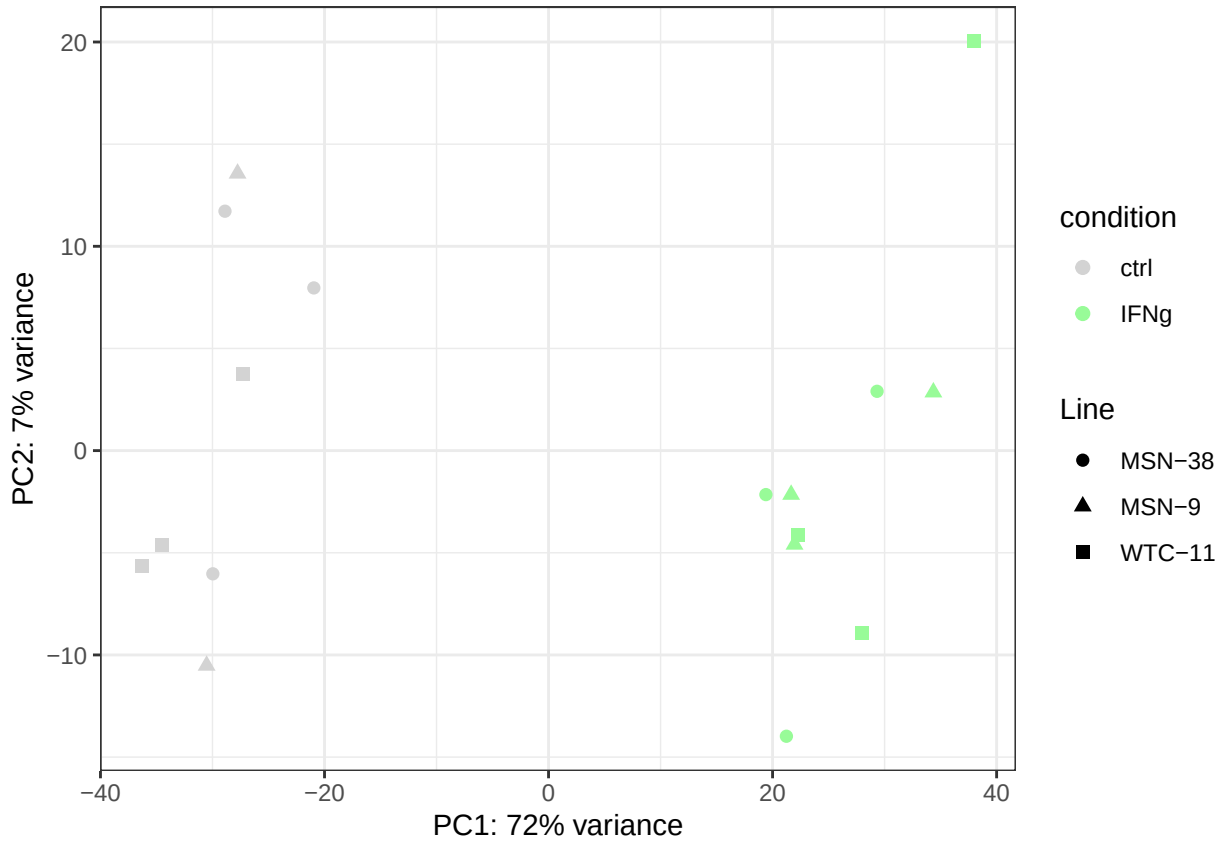
GO enrichment



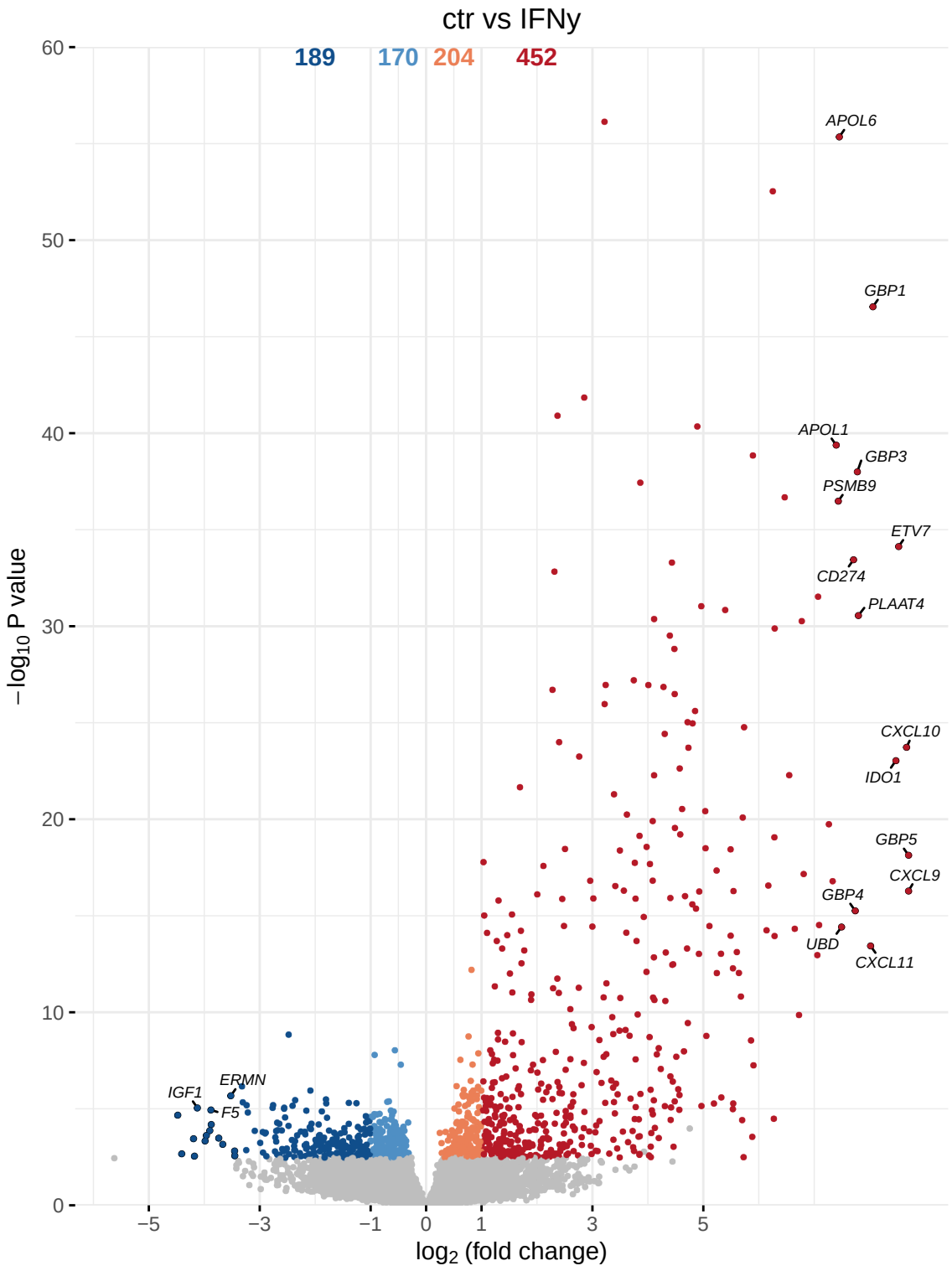

blood circulation
cilium movement
primary alcohol metabolic process
cellular biogenic amine metabolic process
cellular amine metabolic process
catecholamine metabolic process
catechol−containing compound metabolic process
regulation of odontogenesis of dentin−containing tooth
BP
extracellular matrix
external encapsulating structure
collagen−containing extracellular matrix
apical plasma membrane
apical part of cell
motile cilium
CC
channel activity
passive transmembrane transporter activity
metal ion transmembrane transporter activity
calmodulin binding
MF
0.03
0.06
0.09
GeneRatio
Count
5
10
15
20
p.adjust
0.04
0.03
0.02
0.01

Stimulation (IFNy) samples

PCA plots

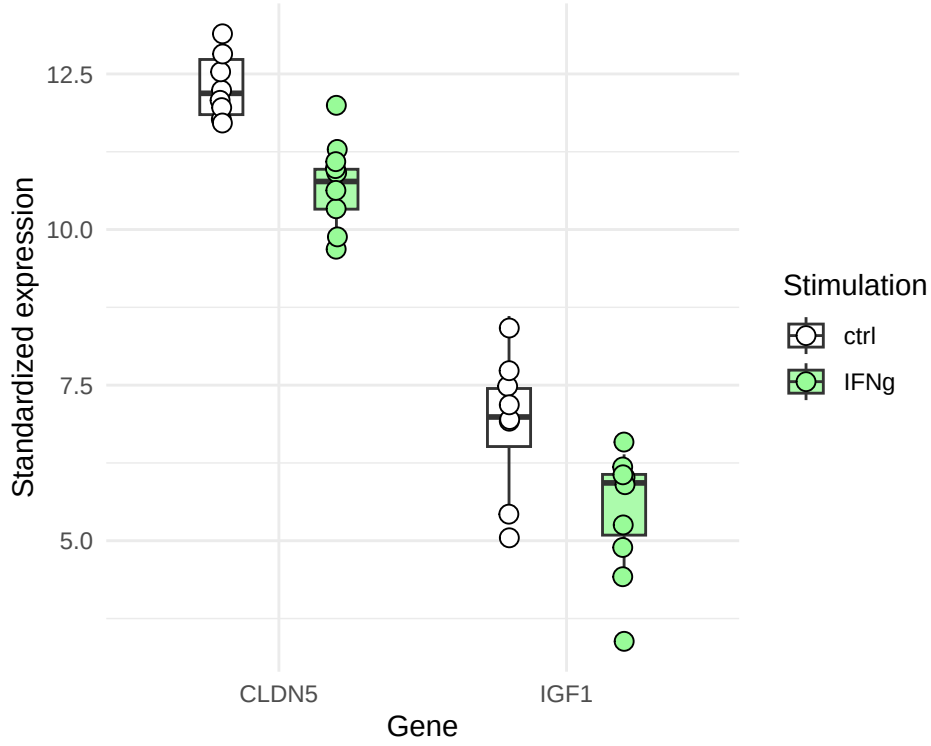


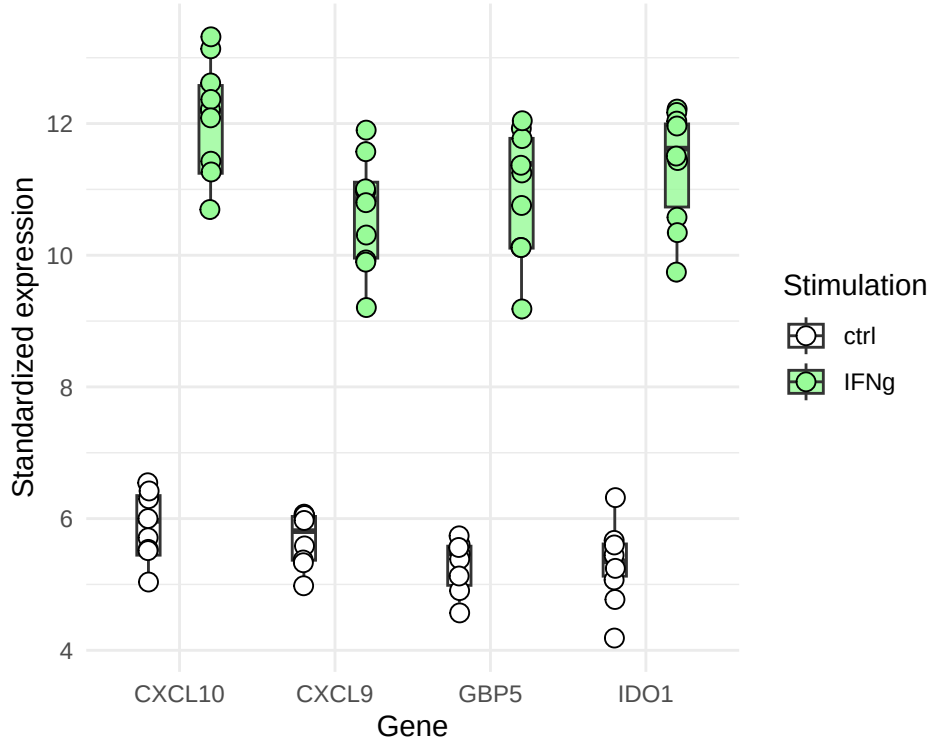
Volcano plot



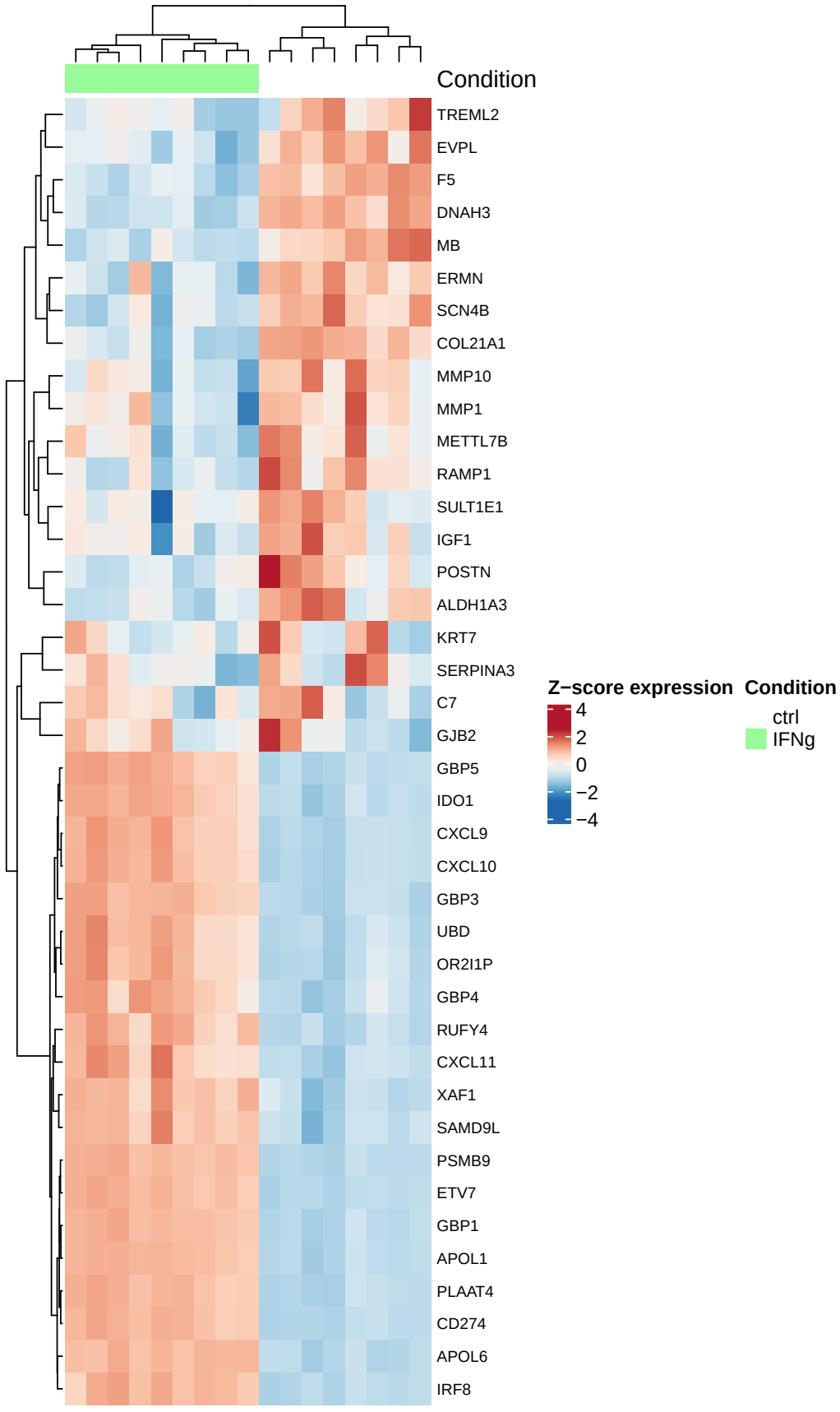
DEG table

Boxplot genes of interest

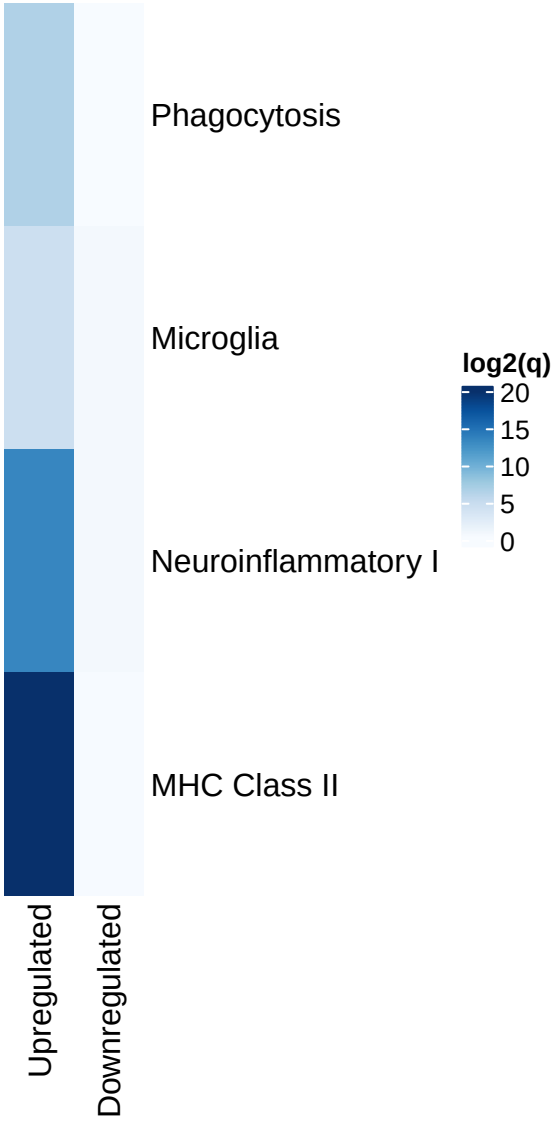




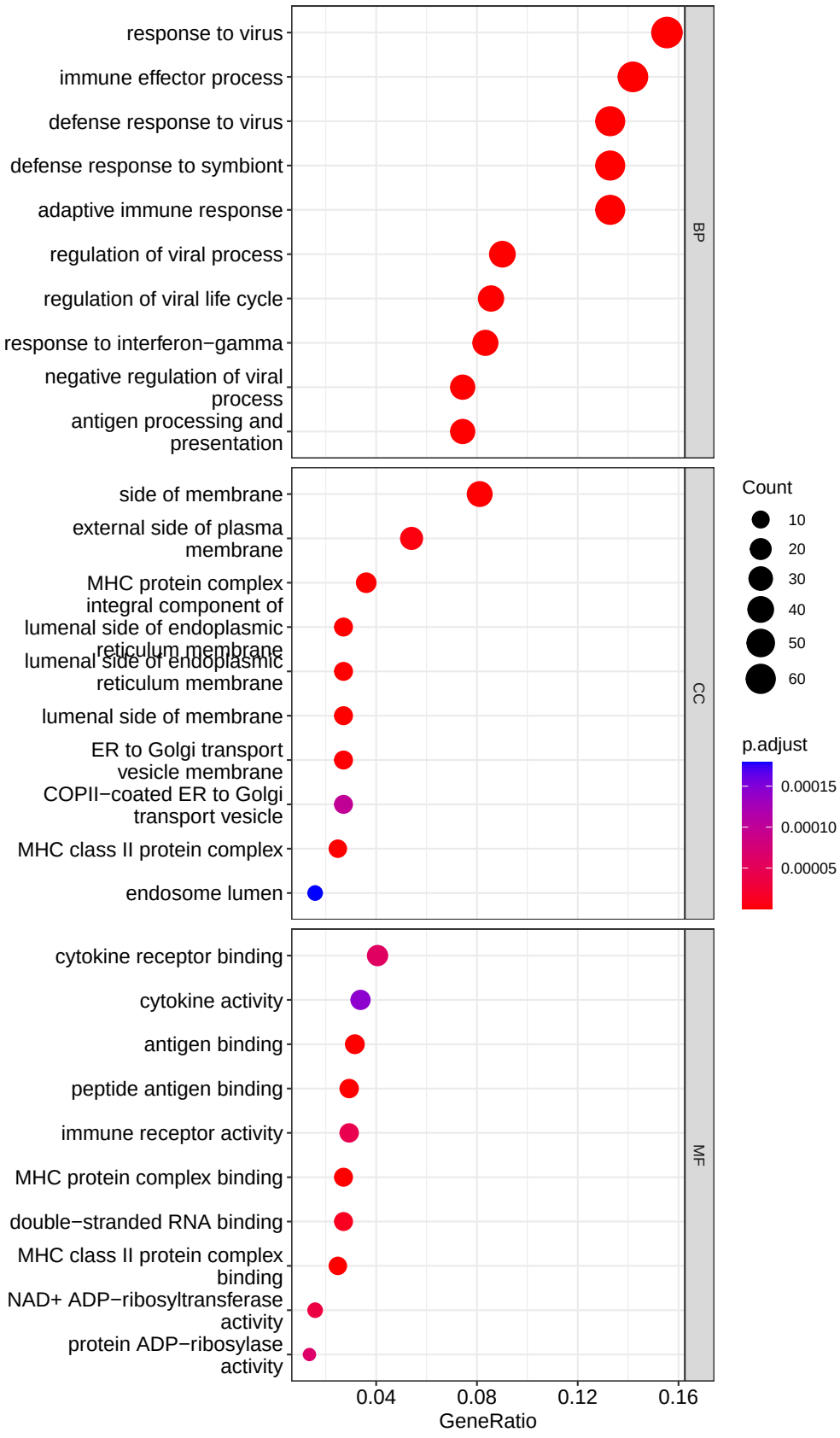
Top 40 DEGs heatmap

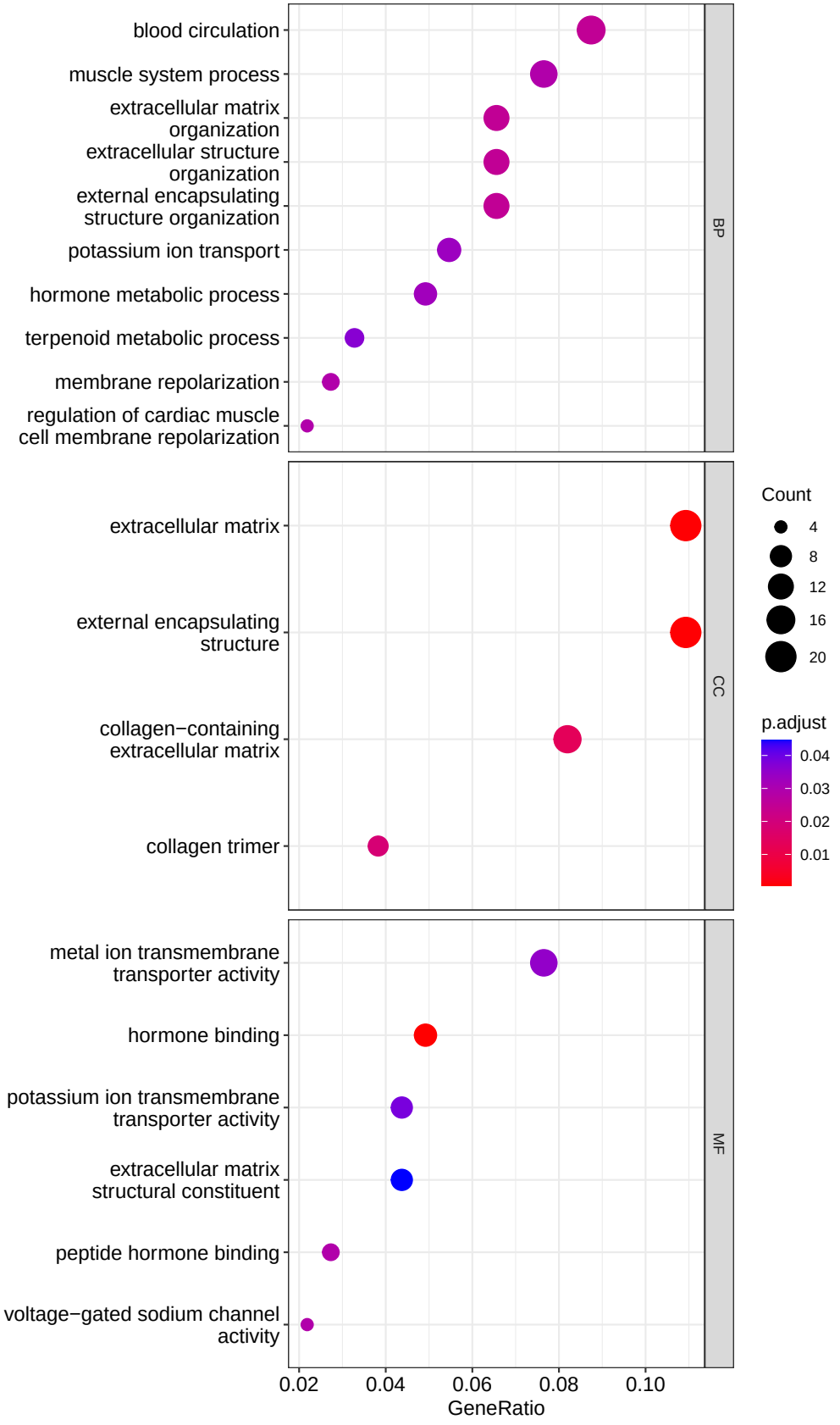


Enrichment heatmap (gene sets of interest)



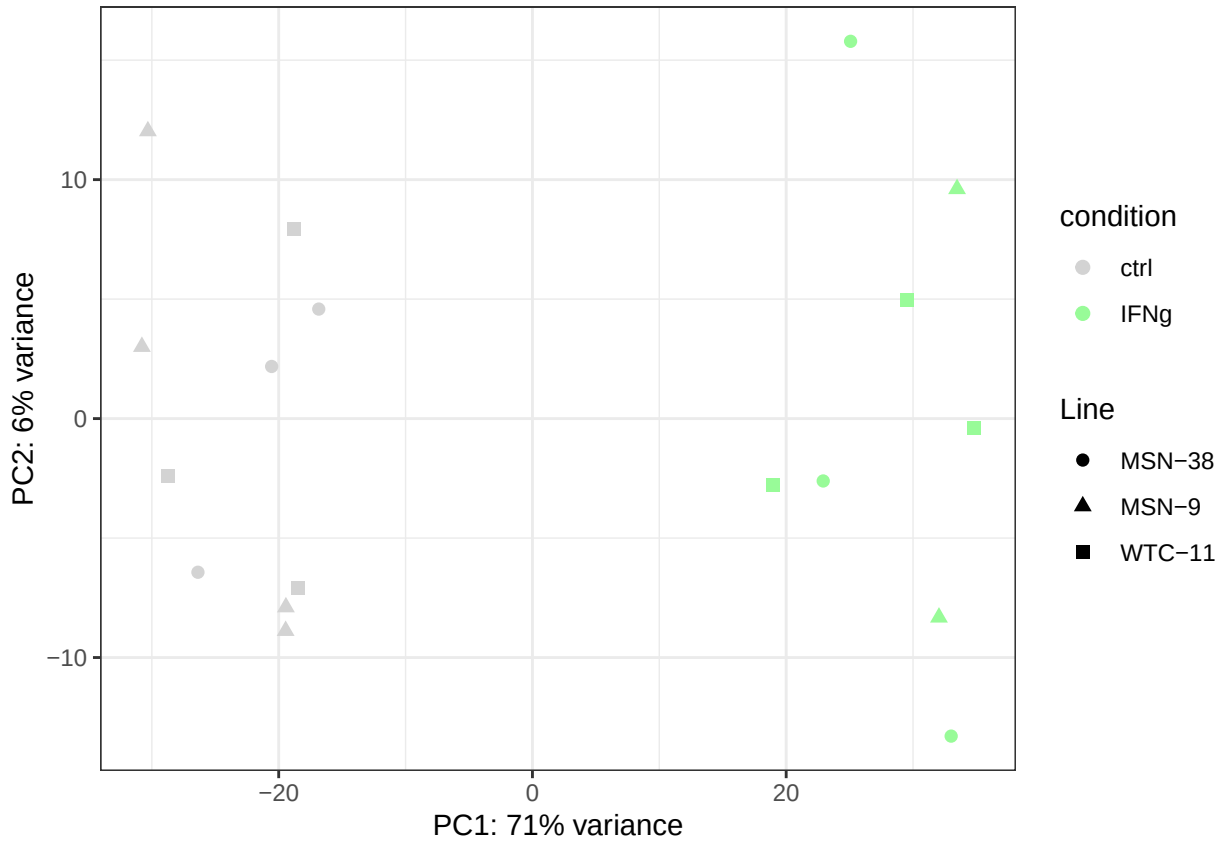
GO enrichment



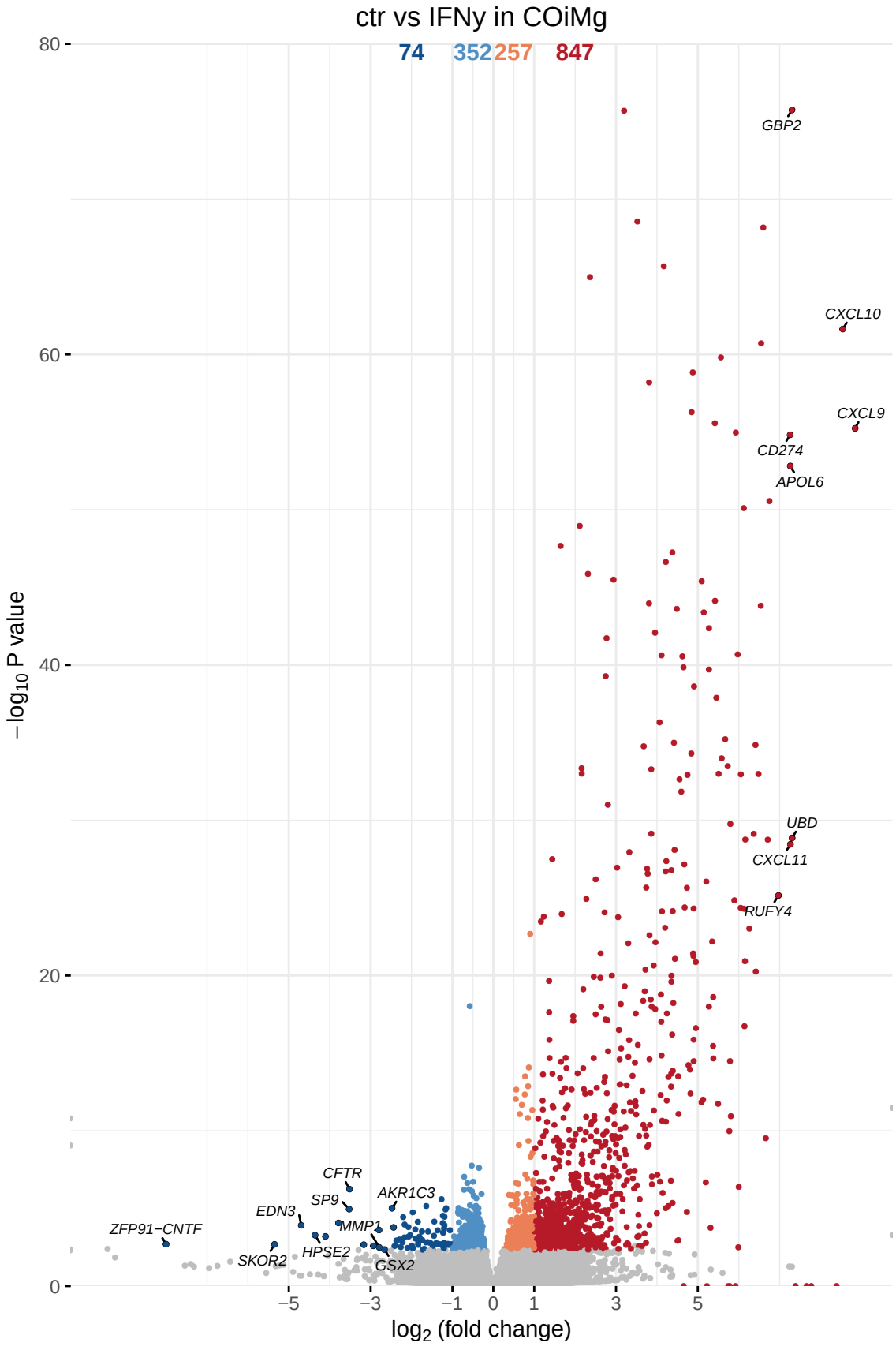

blood circulation
muscle system process
extracellular matrix organization
extracellular structure organization
external encapsulating structure organization
potassium ion transport
hormone metabolic process
terpenoid metabolic process
membrane repolarization
regulation of cardiac muscle cell membrane repolarization
BP
extracellular matrix
external encapsulating structure
collagen−containing extracellular matrix
collagen trimer
CC
metal ion transmembrane transporter activity
hormone binding
potassium ion transmembrane transporter activity
extracellular matrix structural constituent
peptide hormone binding
voltage−gated sodium channel activity
MF
0.02
0.04
0.06
0.08
0.10
GeneRatio
Count
4
8
12
16
20
p.adjust
0.04
0.03
0.02
0.01

IFNy in COiMG

PCA plots

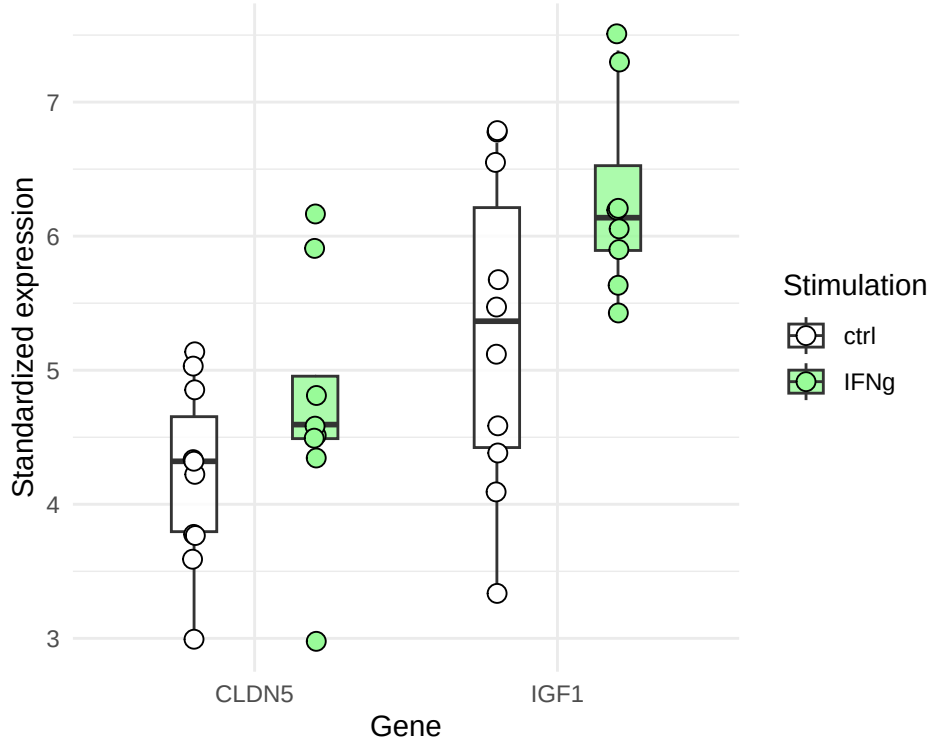


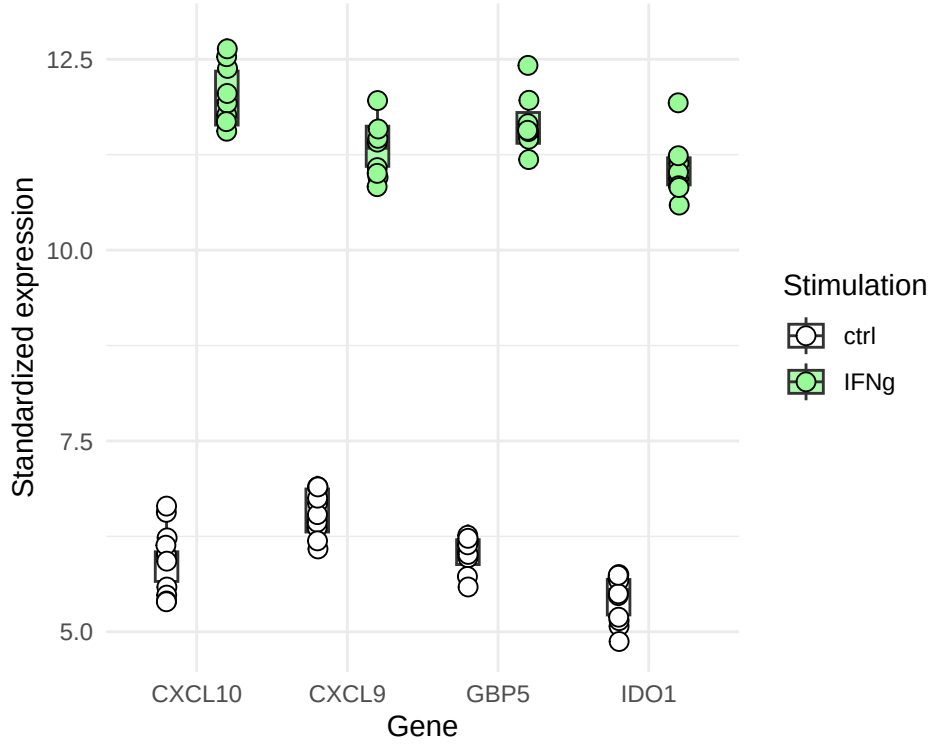
Volcano plot



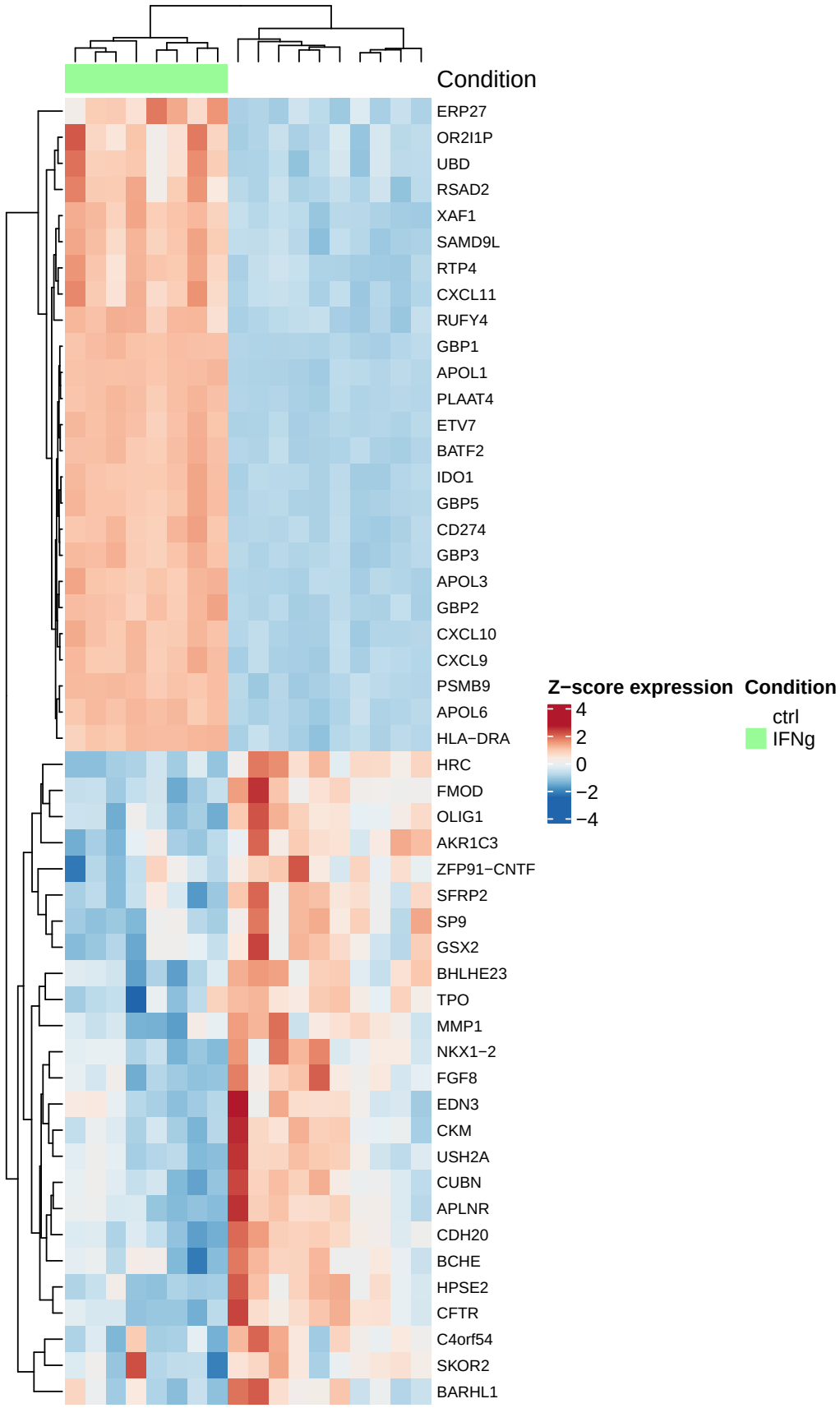
DEG table

Boxplot genes of interest

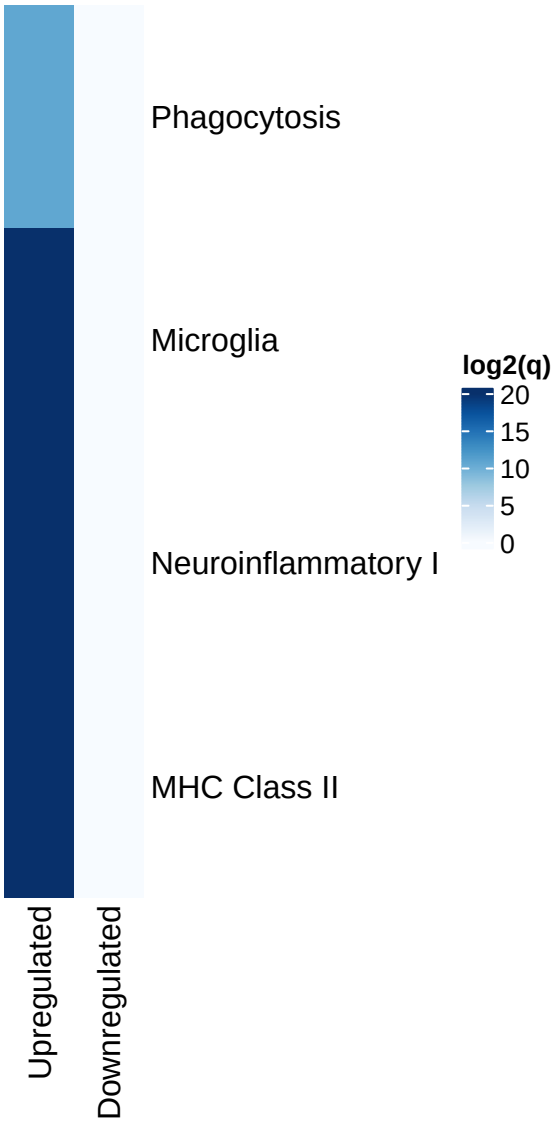




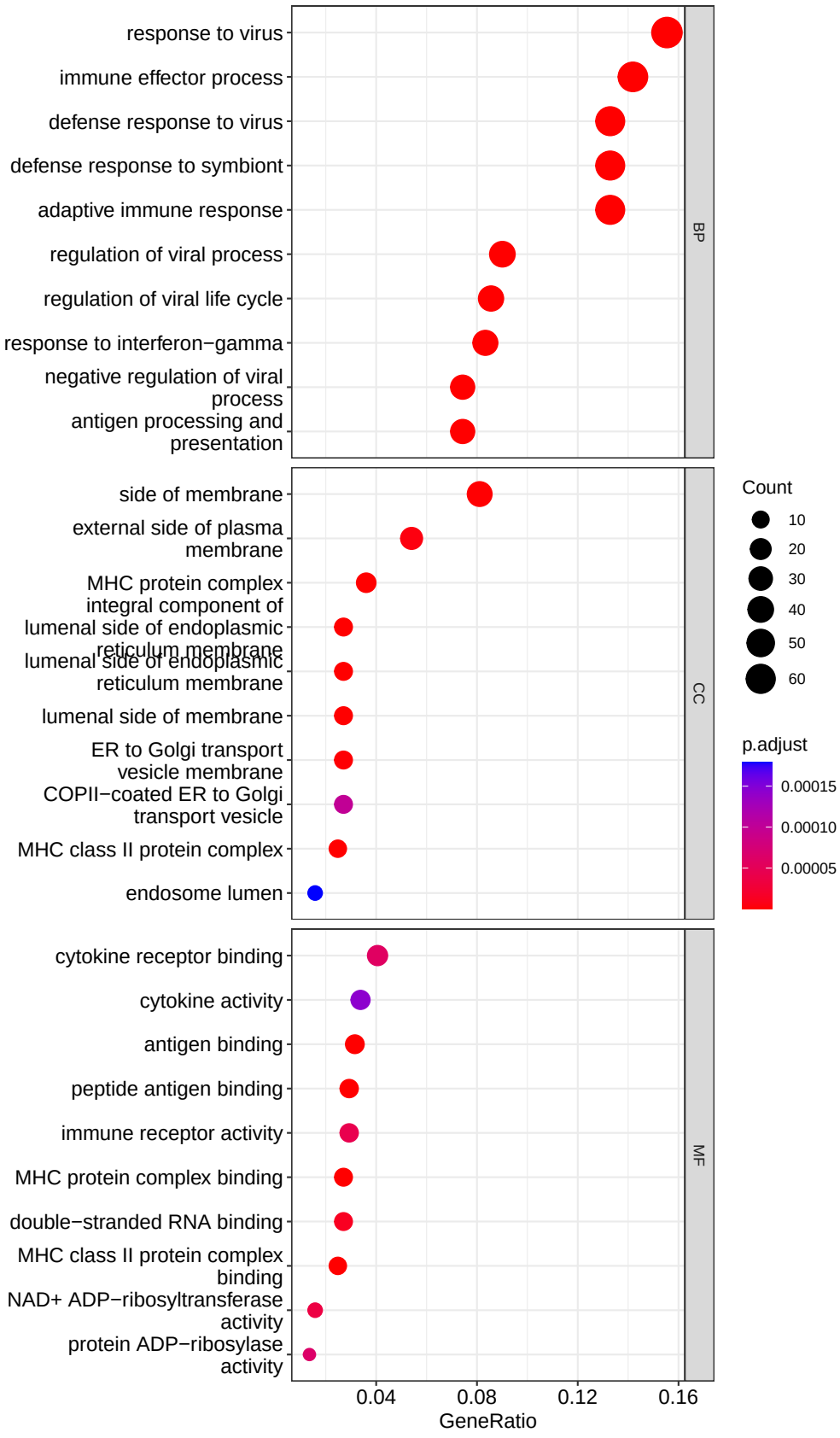
Top 40 DEGs heatmap

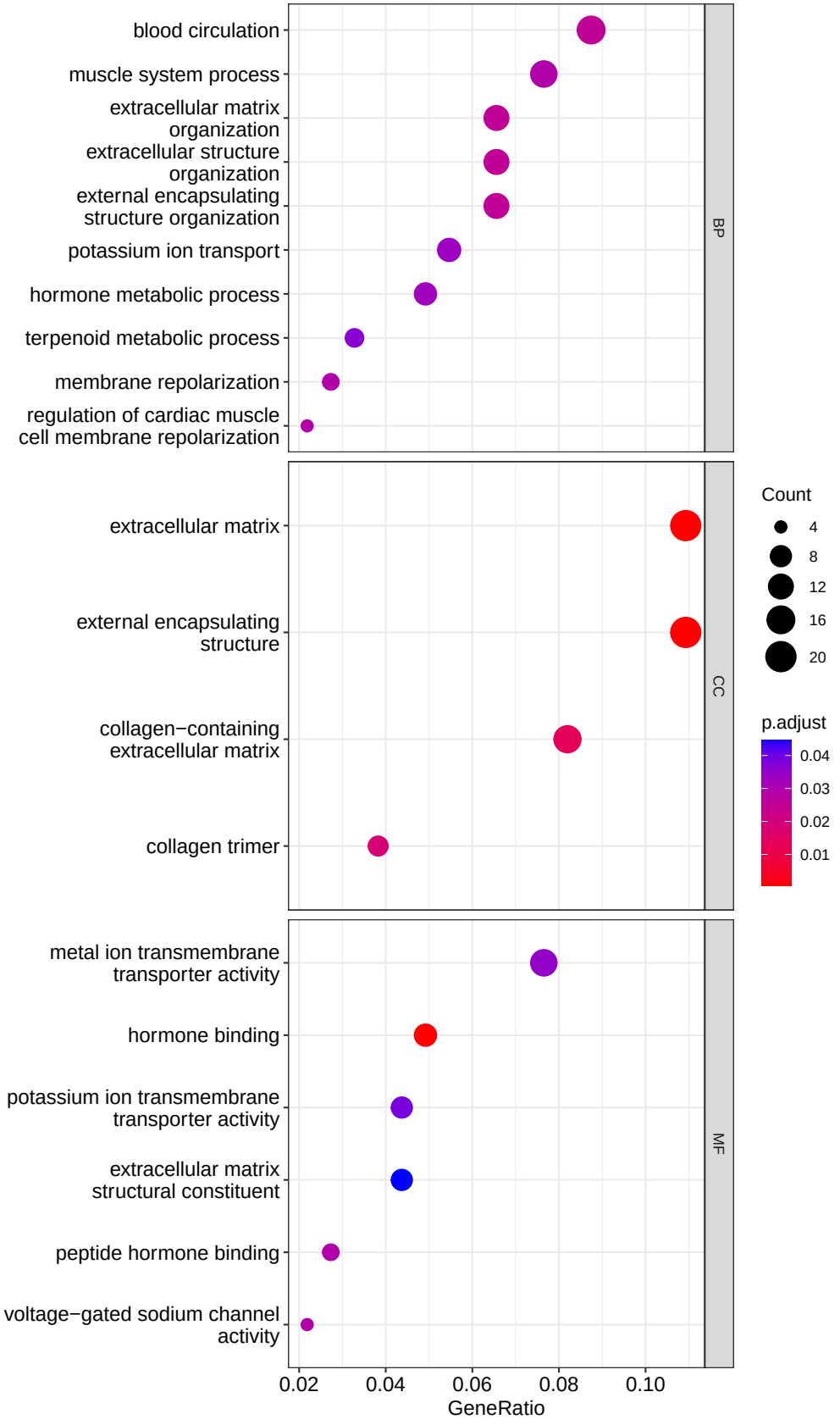


Enrichment heatmap (gene sets of interest)



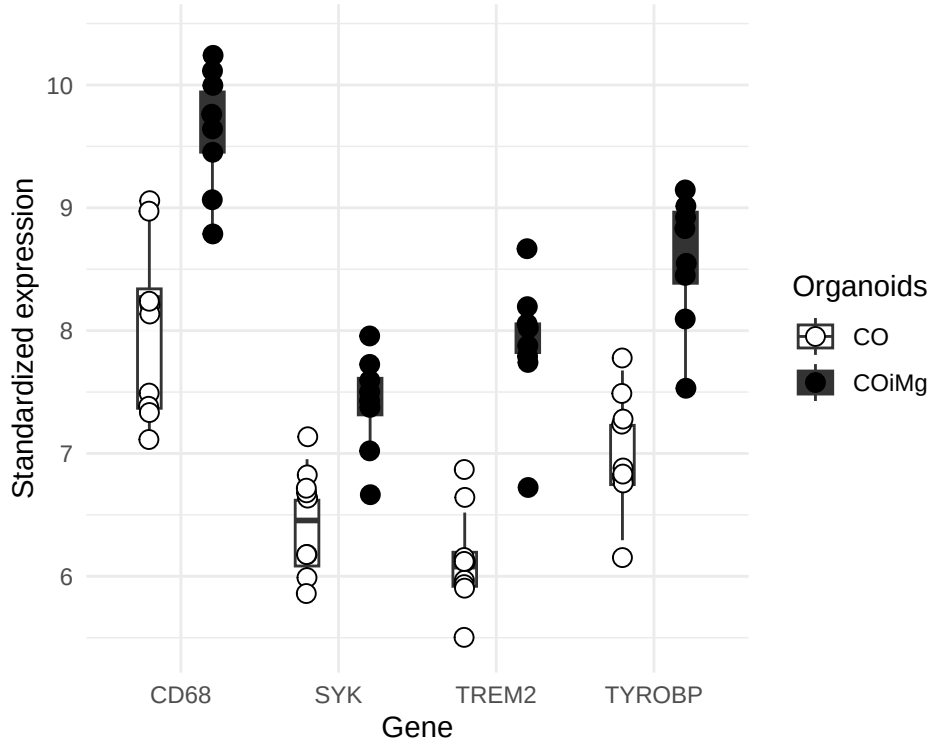
GO enrichment

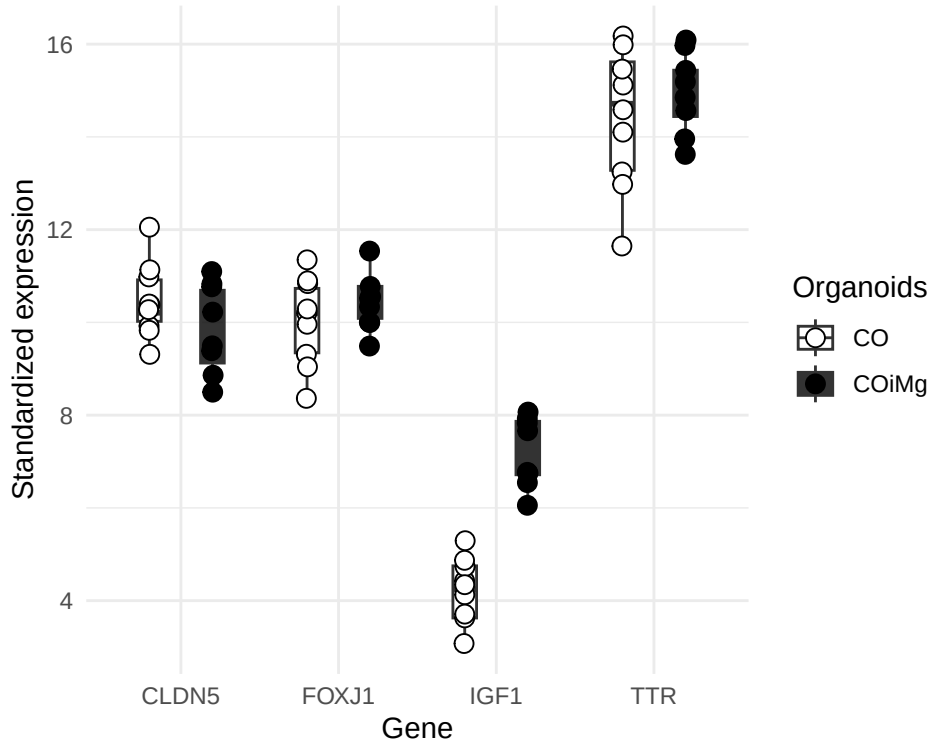



blood circulation
muscle system process
extracellular matrix organization
extracellular structure organization
external encapsulating structure organization
potassium ion transport
hormone metabolic process
terpenoid metabolic process
membrane repolarization
regulation of cardiac muscle cell membrane repolarization
BP
extracellular matrix
external encapsulating structure
collagen−containing extracellular matrix
collagen trimer
CC
metal ion transmembrane transporter activity
hormone binding
potassium ion transmembrane transporter activity
extracellular matrix structural constituent
peptide hormone binding
voltage−gated sodium channel activity
MF
0.02
0.04
0.06
0.08
0.10
GeneRatio
Count
4
8
12
16
20
p.adjust
0.04
0.03
0.02
0.01

CO vs COiMg under IFNy

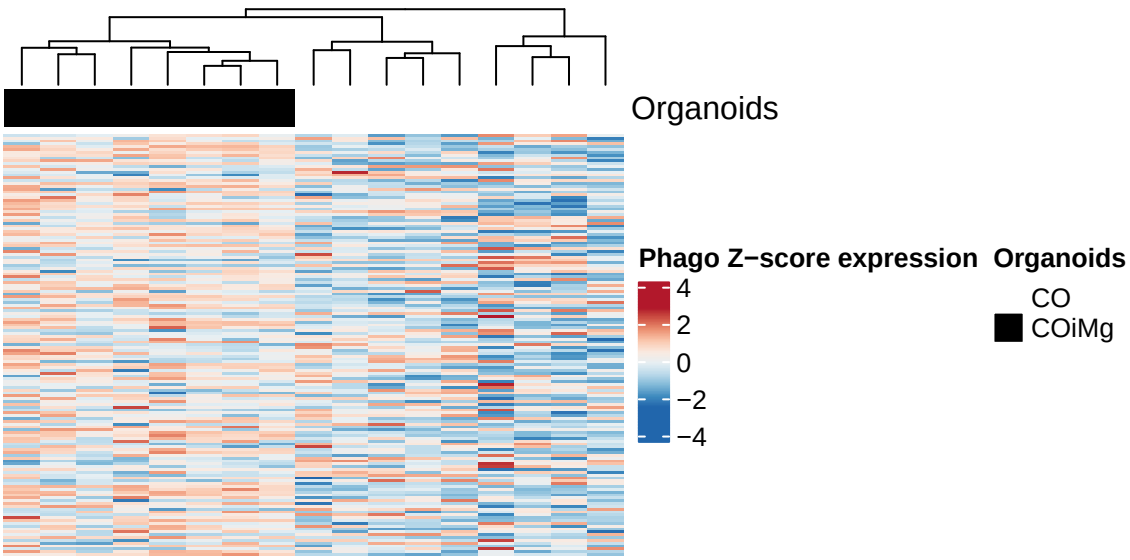
Phagocytosis: CO vs COiMg under IFNy



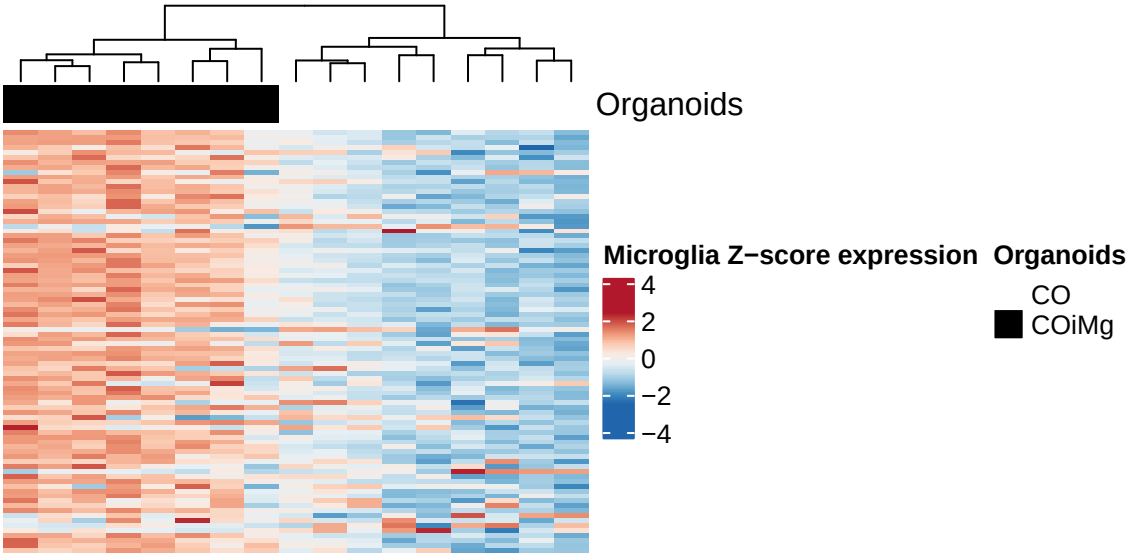


Gene set heatmap

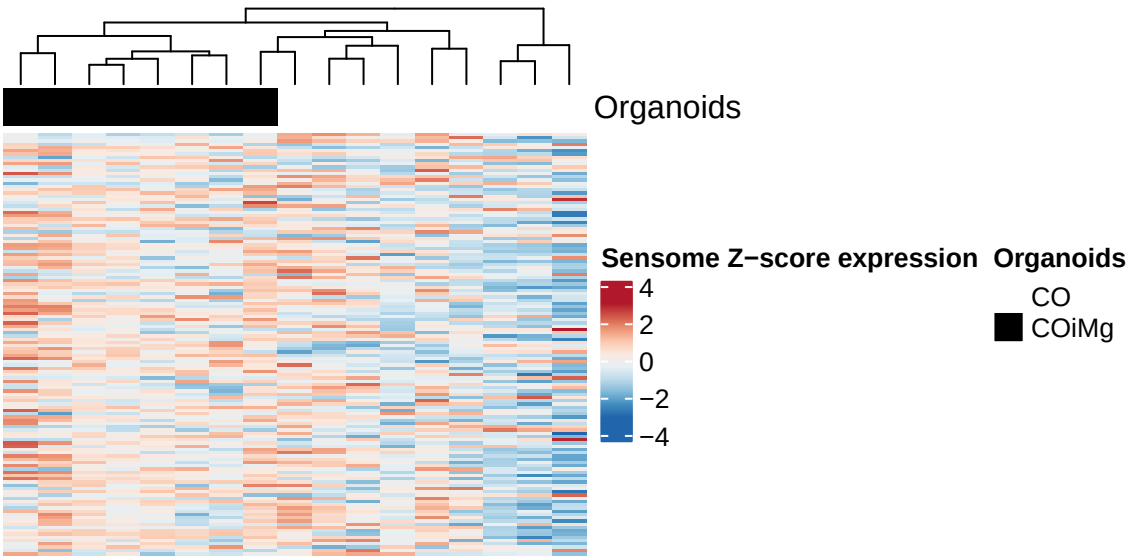
```
## [1] "Phagocytic heatmap"
```



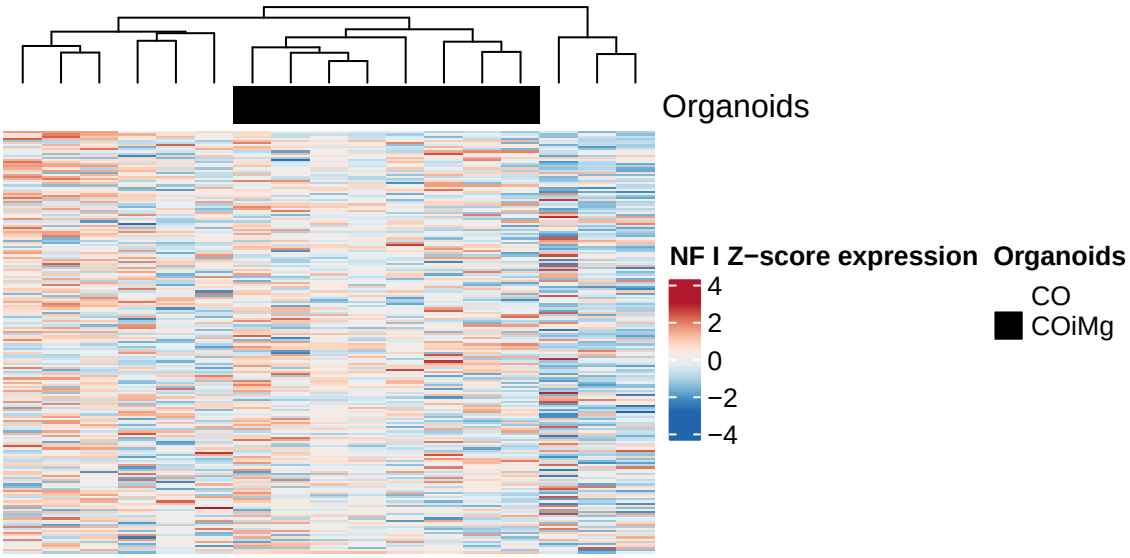

```
## [1] "Microglia heatmap"
```




```
## [1] "Sensome heatmap"
```




```
## [1] "Neuroinflammatory I heatmap"
```



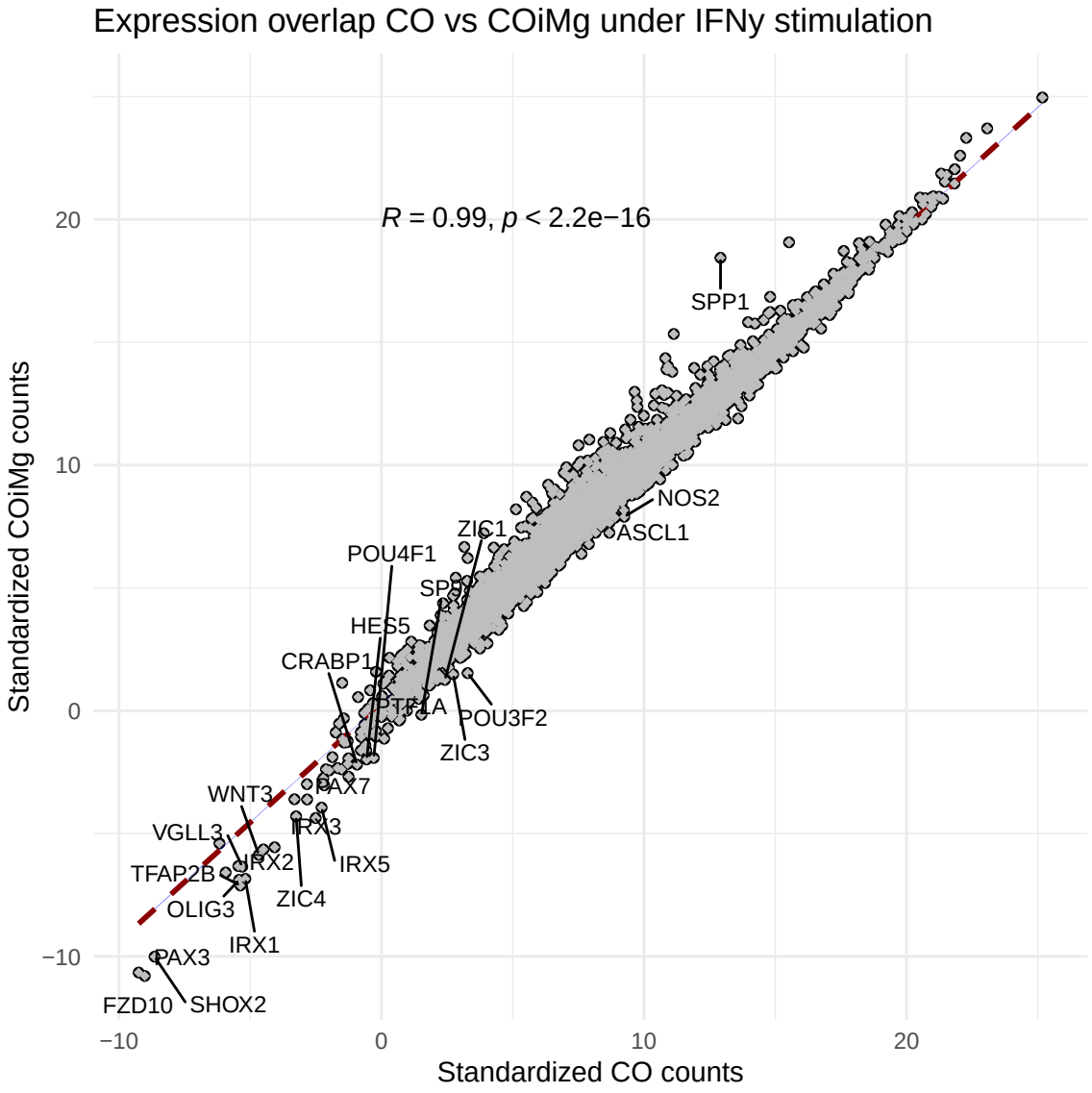
IFNy CO vs COiMG

```
##           M13       M14       M15       M21       M27       M33       F9
## M16 0.9888853 0.9750494 0.9854099 0.9860980 0.9844882 0.9665080 0.9772695
## M17 0.9882932 0.9689689 0.9821487 0.9803589 0.9830655 0.9582293 0.9703453
## M18 0.9853977 0.9796923 0.9773084 0.9801409 0.9848437 0.9628487 0.9773172
## M24 0.9893057 0.9799679 0.9870001 0.9855227 0.9831987 0.9708646 0.9793361
## M30 0.9839439 0.9849775 0.9782459 0.9812581 0.9760353 0.9881220 0.9857833
## M36 0.9808666 0.9739084 0.9819043 0.9848451 0.9726188 0.9723869 0.9735683
## F15 0.9896431 0.9848594 0.9858859 0.9880105 0.9875725 0.9839841 0.9898616
## F16 0.9736695 0.9781072 0.9730415 0.9772165 0.9707696 0.9863550 0.9842931
## F17 0.9837642 0.9760274 0.9815035 0.9841363 0.9823853 0.9590486 0.9744931
```

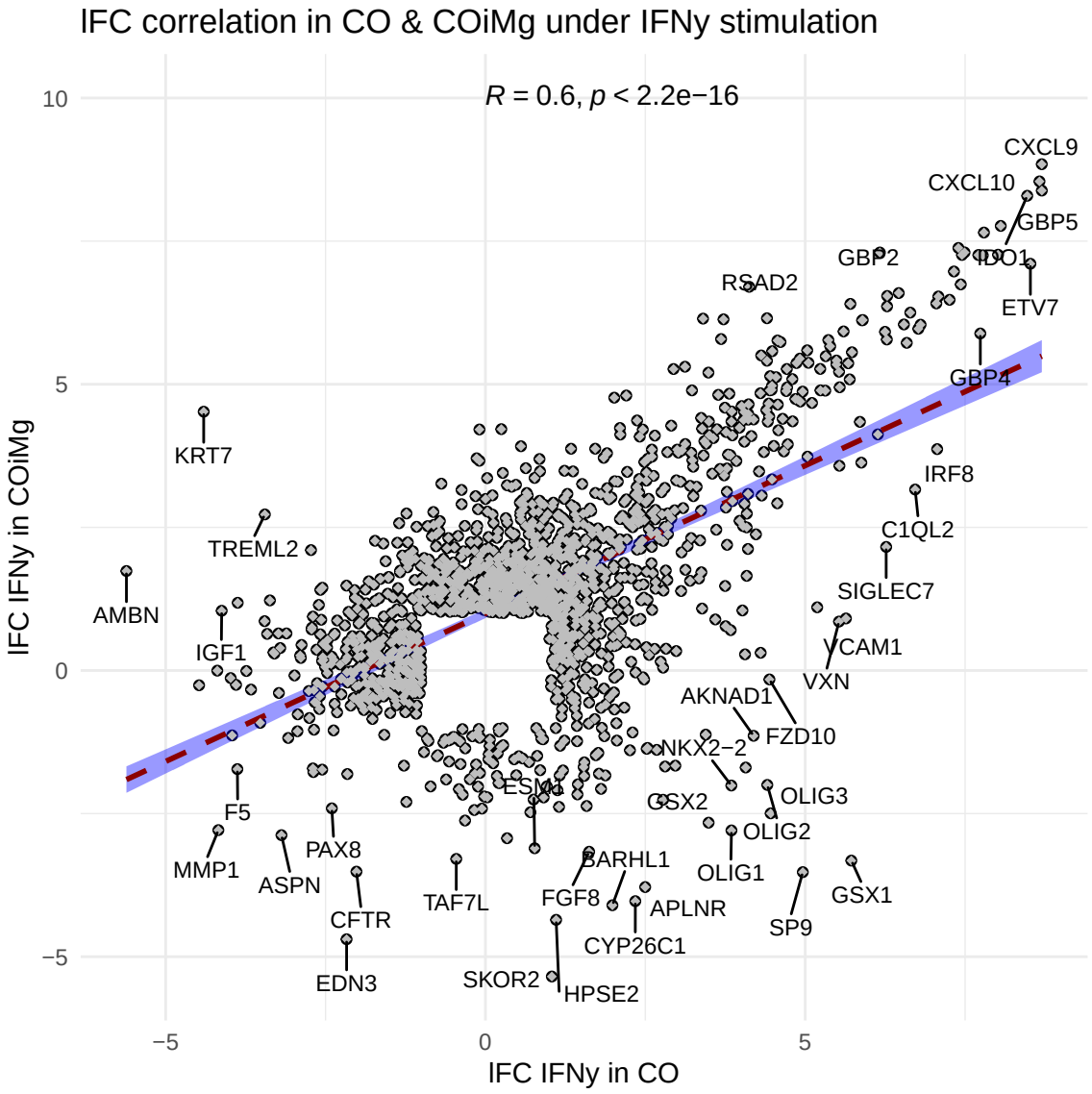
```
##           F10
## M16 0.9820133
## M17 0.9788688
## M18 0.9814824
## M24 0.9853527
## M30 0.9823925
## M36 0.9794674
## F15 0.9870064
## F16 0.9753547
## F17 0.9794916
```

```
##          0%         25%         50%         75%        100%
## -5.52300947 -0.16864063  0.01132637  0.16271150  1.86109744
```

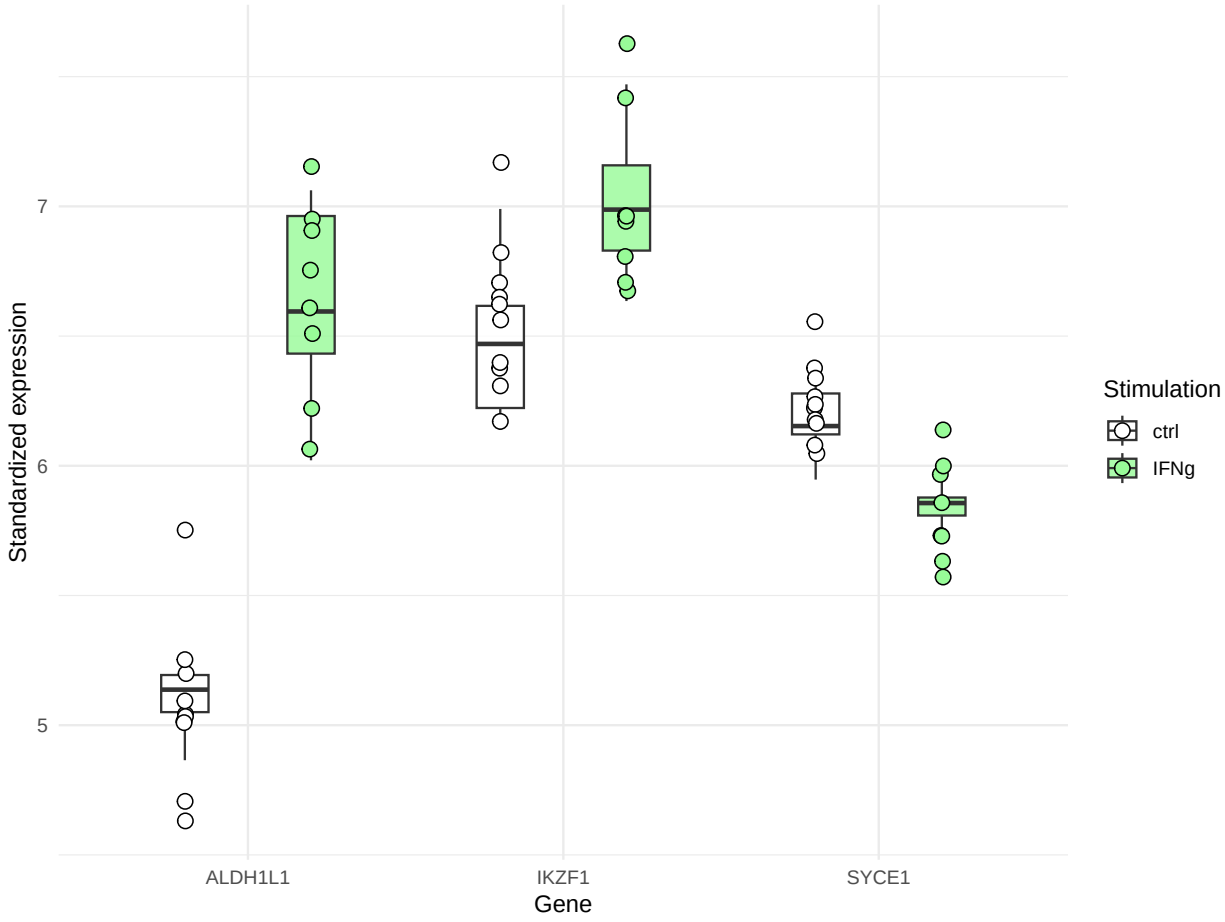
```
##  [1] "DLX6"    "NOS2"    "TFAP2B"  "MGST1"   "PAX7"    "KITLG"   "ASIC4"
##  [8] "NAALAD2" "MOXD1"   "LRP2"    "SLC32A1" "TOX3"    "WNT3"    "FZD10"
## [15] "SPP1"    "ONECUT2" "PAX3"    "GAD2"    "ASCL1"   "ZFHX3"   "GREB1L"
## [22] "C1QL2"   "DLX1"    "SFRP2"   "TENM2"   "CDH8"    "POU4F1"  "ZIC1"
## [29] "ROBO3"   "WNT7A"   "ZIC3"    "H4C8"    "VCAM1"   "NDST3"   "CRABP1"
## [36] "PTF1A"   "GBX2"    "SHOX2"   "IRX1"    "IRX2"    "HSPA6"   "LRRN3"
## [43] "WFIKKN2" "ZIC4"    "PRIMA1"  "IRX5"    "OLIG3"   "IRX3"    "GSX2"
## [50] "FIGN"    "BGN"     "SOX1"    "POU3F2"  "PCDH18"  "GREB1"   "POU3F4"
## [57] "HES5"    "TOX"     "HSPA1B"  "HSPA1A"  "VGLL3"   "TRIM71"  "UBD"
## [64] "SP9"     "OR2I1P"  "H4C14"   "H2BC8"
```

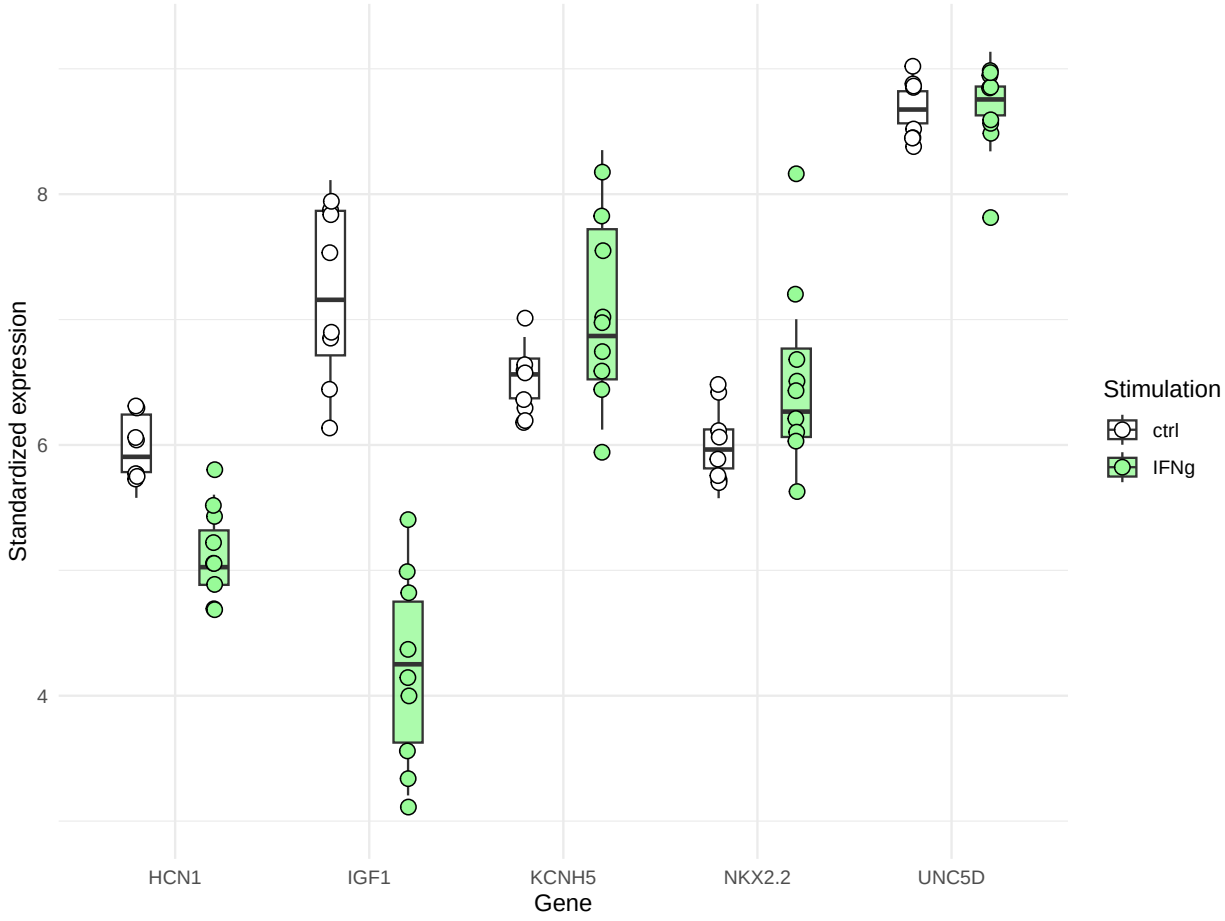

Expression overlap CO vs COiMg under IFNy stimulation
R = 0.99, p < 2.2e−16
Standardized COiMg counts
Standardized CO counts
20
10
0
−10
−10
0
10
20
SPP1
NOS2
ASCL1
ZIC1
POU4F1
SP8
HES5
CRABP1
STC1
POU3F2
ZIC3
PAX7
WNT3
IRX3
VGLL3
IRX2
IRX5
TFAP2B
ZIC4
OLIG3
IRX1
PAX3
FZD10
SHOX2

CO vs COiMg lFC correlation plot

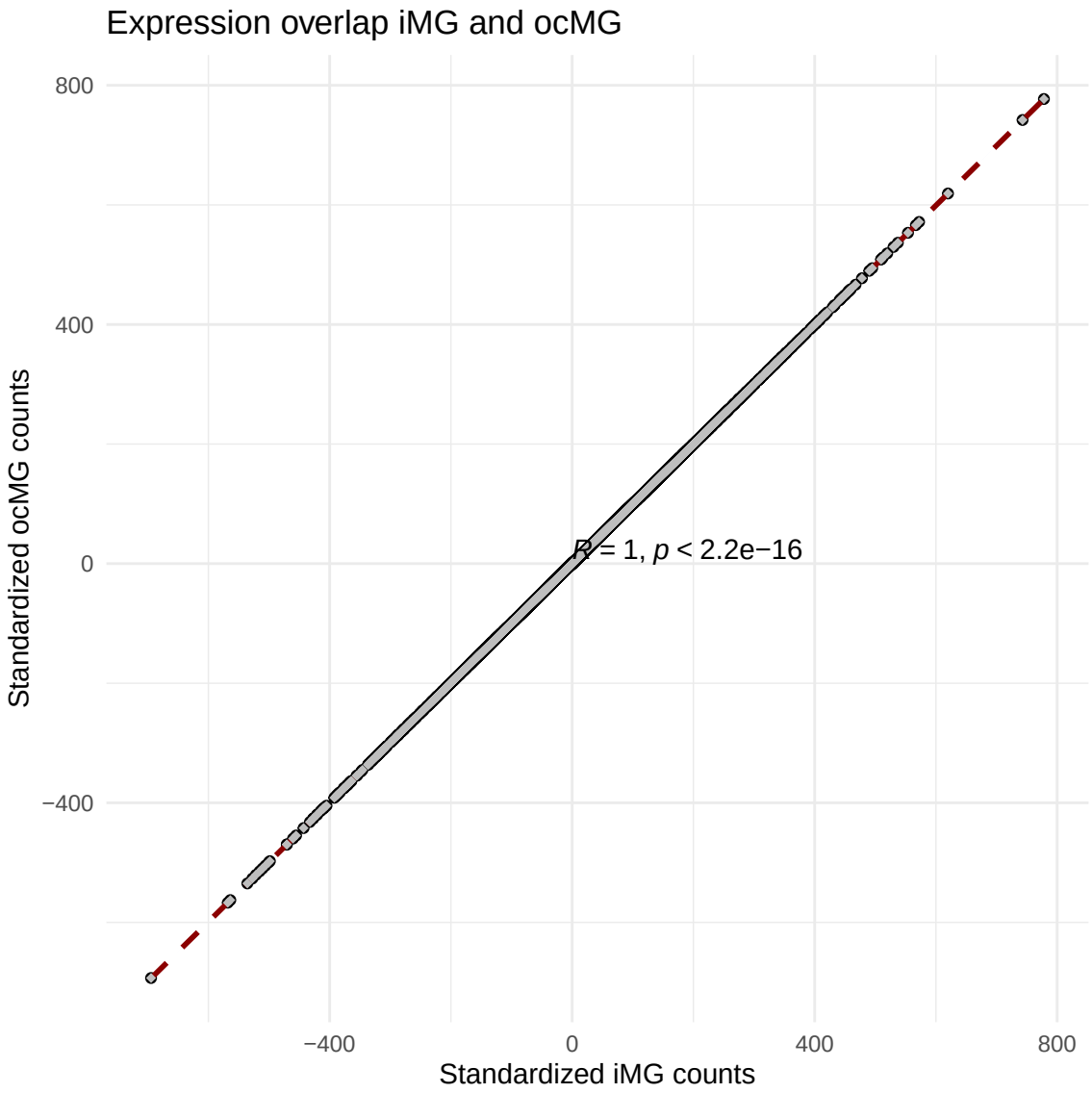


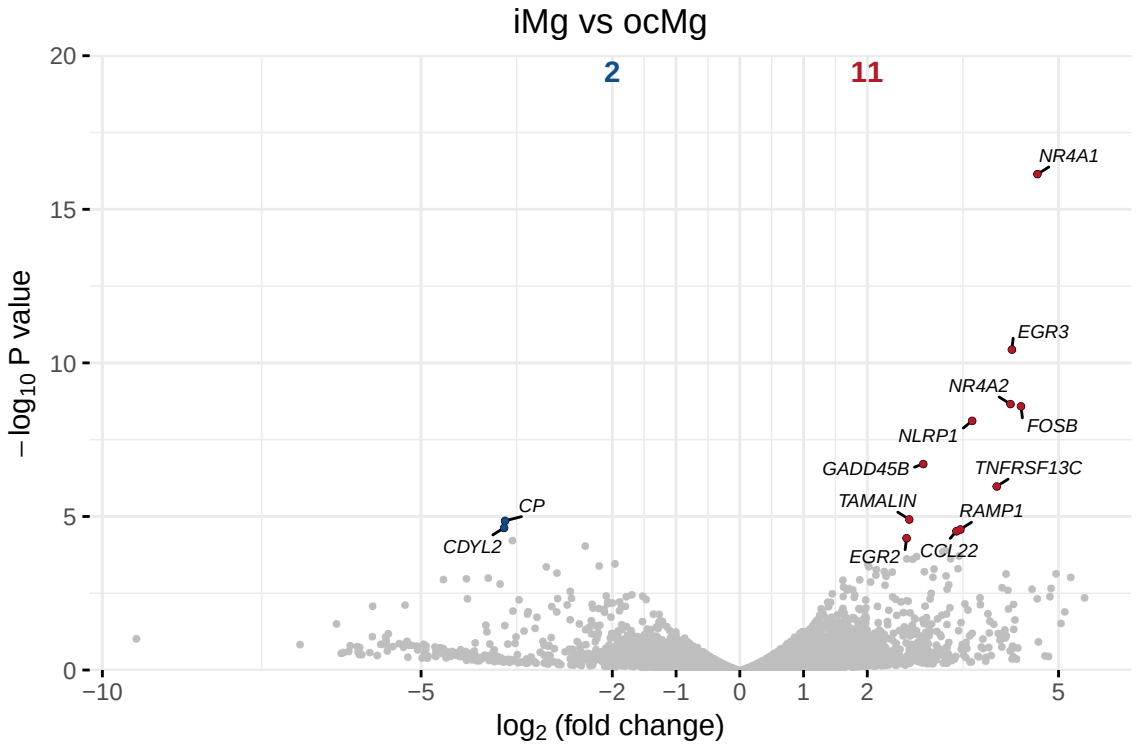
SFARI response to IFNy




Standardized expression
8
6
4
HCN1
IGF1
KCNH5
NKX2.2
UNC5D
Gene
Stimulation
ctrl
IFNg

iMG vs ocMG


Expression overlap iMG and ocMG
800
400
0
−400
Standardized ocMG counts
R = 1, p < 2.2e−16
−400
0
400
800
Standardized iMG counts


iMg vs ocMg
2
11
NR4A1
EGR3
NR4A2
FOSB
NLRP1
GADD45B
TNFRSF13C
TAMALIN
RAMP1
CP
CDYL2
EGR2
CCL22
20
15
10
5
0
−10
−5
−2
−1
0
1
2
5
$-\log_{10}$ P value
$\log_2$ (fold change)