a

a: clinical data of the enrolled subjects: ERS and LRS

	ERS-1	ERS-2	ERS-3	ERS-4	ERS-5	LRS-1	LRS-2	LRS-3	LRS-4	LRS-5
Gender	male	male	female	female	female	male	male	male	female	female
Smoking History	-	now	-	-	-	once	now	now	now	-
Wuhan Exposure History	+	+	+	+	+	+	+	+	+	+
First Negative Nucleic Acid Transfer	February 16, 2020	February 19, 2020	February 7, 2020	February 14, 2020	February 8, 2020	February 3, 2020	February 8, 2020	February 13, 2020	January 29, 2020	February 1, 2020
Severity	moderate	moderate	severe	severe	moderate	severe	moderate	moderate	severe	severe
Fever	+	+	+	+	+	+	+	+	+	+
Conjunctival Congestion	-	-	-	-	-	-	-	-	-	-
Rhinobyon	-	-	-	-	-	-	+	-	-	-
Cough	+	+	-	+	+	+	-	+	+	+
Sore throat	+	+	-	+	+	+	-	+	+	+
Expectoration	+	+	+	+	+	+	-	+	+	+
Exhaustion	+	+	+	-	+	+	+	+	+	+
Hemoptysis	-	+	-	+	-	-	-	-	+	-
Breathe Hard	-	+	+	+	+	+	+	+	+	+
Emesis	-	+	-	-	-	-	+	-	+	-
Diarrhea	-	-	-	-	-	-	+	-	-	-
Muscle or Joint Pain	-	+	-	+	+	+	+	+	+	+
Chilly	+	+	-	+	+	+	+	+	+	+
Throat Congestion	+	+	+	+	+	+	-	-	+	+
Tonsil Edema	-	+	+	+	-	-	-	-	-	+
Lymphadenovarix	-	-	-	-	-	-	-	-	-	-
Rash	-		-	-	-	-	-	-	-	-
CT Finding	Bilaeral pneumonia	Bilaeral pneumonia	Bilaeral pneumonia	Bilaeral pneumonia	Bilaeral pneumonia	Bilaeral pneumonia	Bilaeral pneumonia	Bilaeral pneumonia	Bilaeral pneumonia	Bilaeral pneumonia
Chronic Basic Disease	coronary heart disease	tumor and gastritis	HBV	diabetes	hypertension	hypertension; coronary heart disease	hypertension; coronary heart disease; HBV	hypertension	hypertension; coronary heart disease; diabetes	-
Ventilator	-	-	-	+	-	-	-	-	-	-
Methylprednisolone	-	-	40mg	80mg	40mg	40mg	-	40mg	40mg	80mg
Antiviral Drug	Oseltamivir	Lopinavir and Ritonavir Tablets;Oseltamivir	Oseltamivir	Ritonavir; Oseltamivir	Oseltamivir	Oseltamivir	Lopinavir and Ritonavir Tablets; Oseltamivir	Oseltamivir	Oseltamivir	Lopinavir and Ritonavir Tablets; Oseltamivir

b

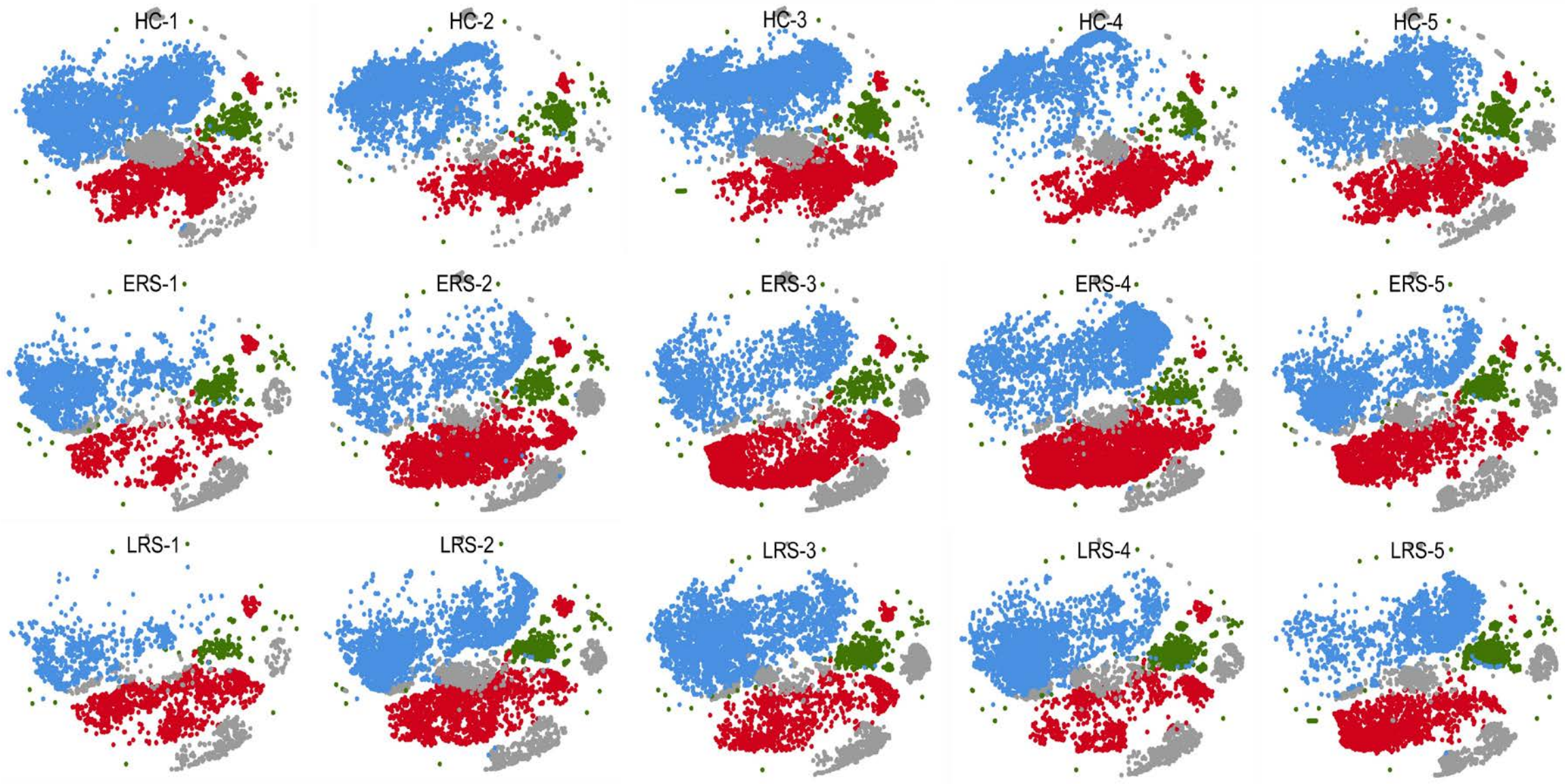
b: clinical data of the enrolled subjects: HC

	HC-1	HC-2	HC-3	HC-4	HC-5
Gender	male	male	female	female	female
Chronic Basic Disease	-	-	-	-	-

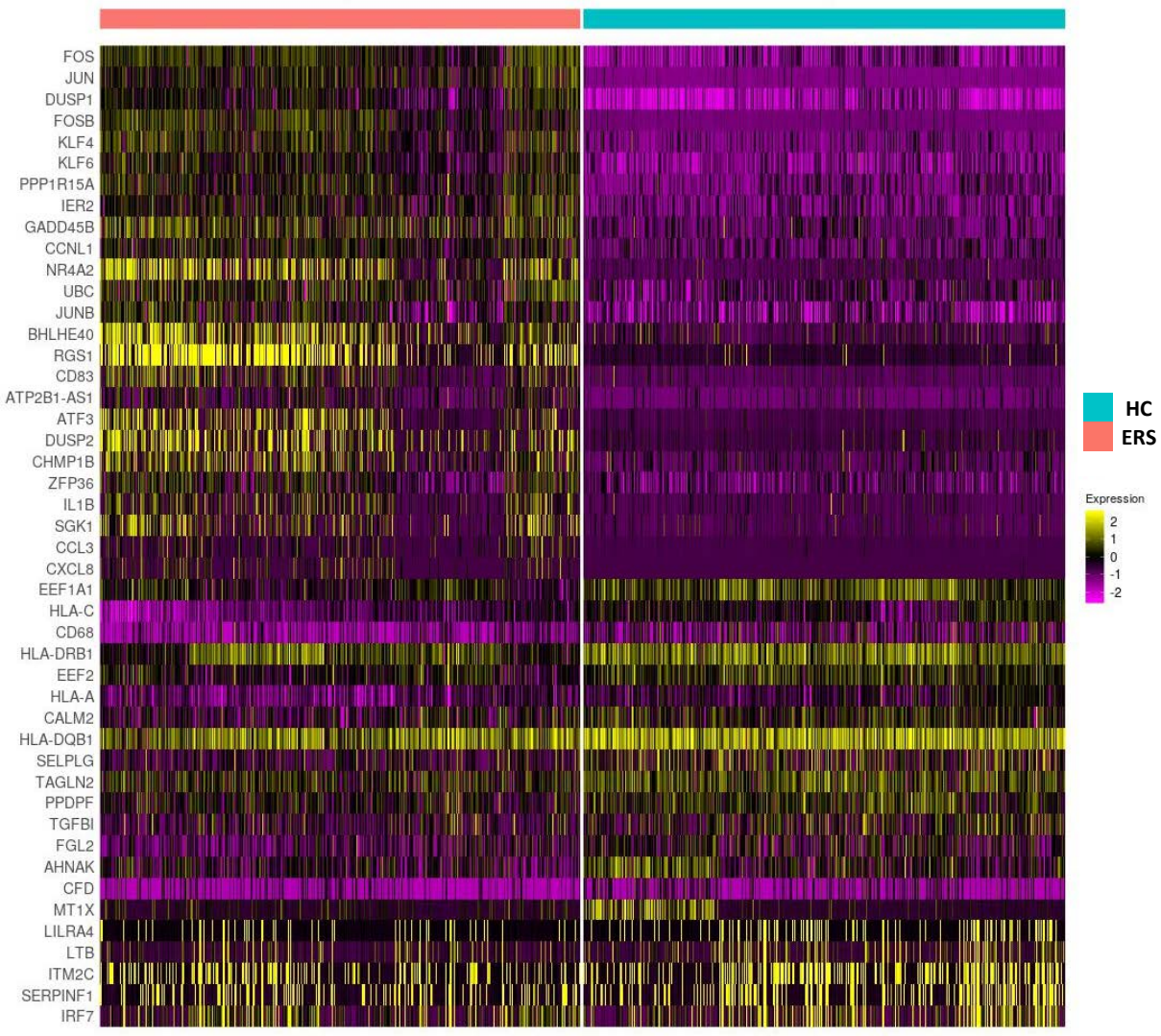
c

c													
	HC				**ERS**				**LRS**				
variable	mean	SD	median	percent	mean	SD	median	percent	mean	SD	median	percent	P value
Age (years)	55.4	14.79	55		58	11.77	58		55.2	17.46	49		0.78
Gender (male, %)				40				40				60	0.76

a

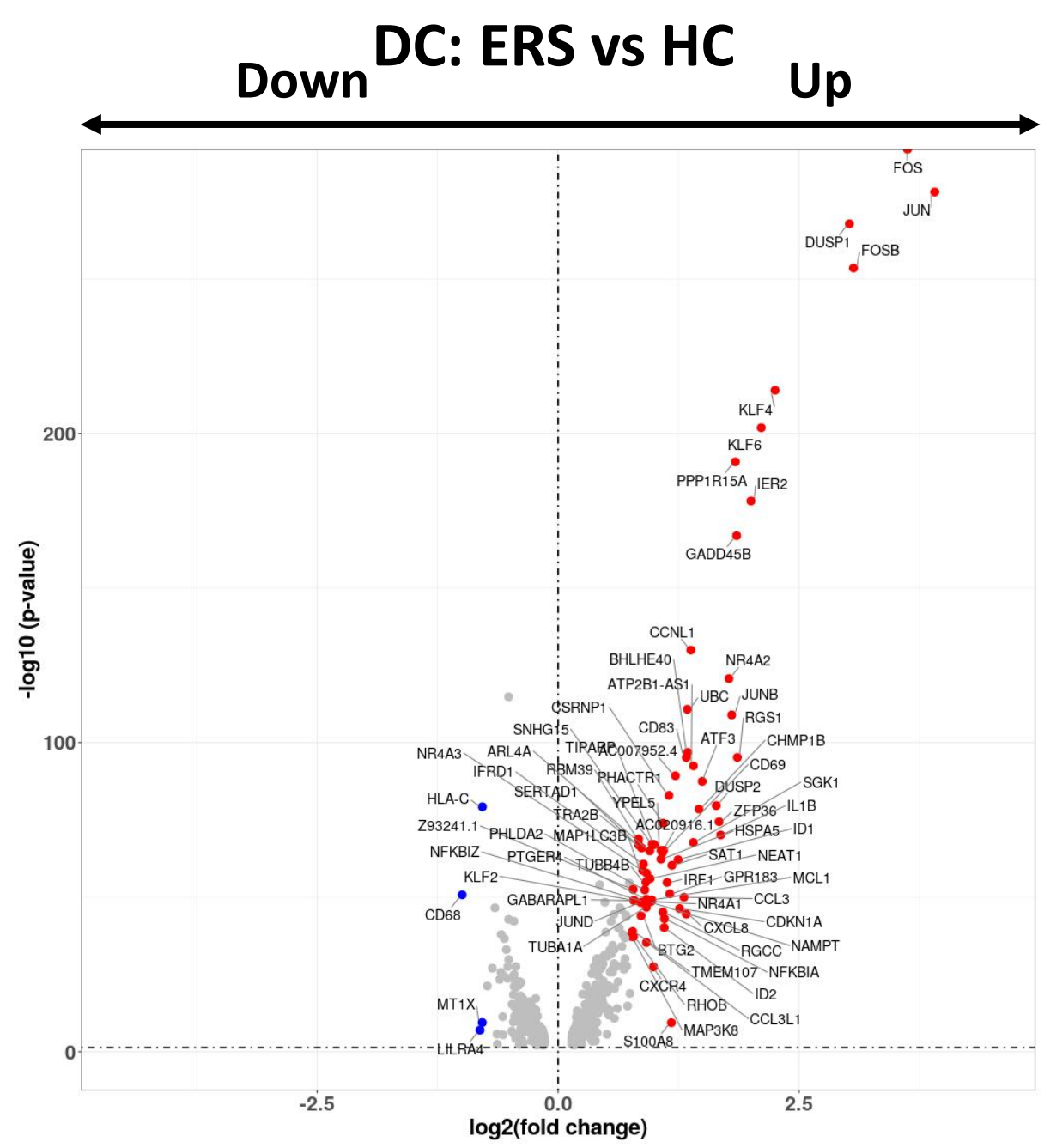

HC-1
HC-2
HC-3
HC-4
HC-5
ERS-1
ERS-2
ERS-3
ERS-4
ERS-5
LRS-1
LRS-2
LRS-3
LRS-4
LRS-5

a

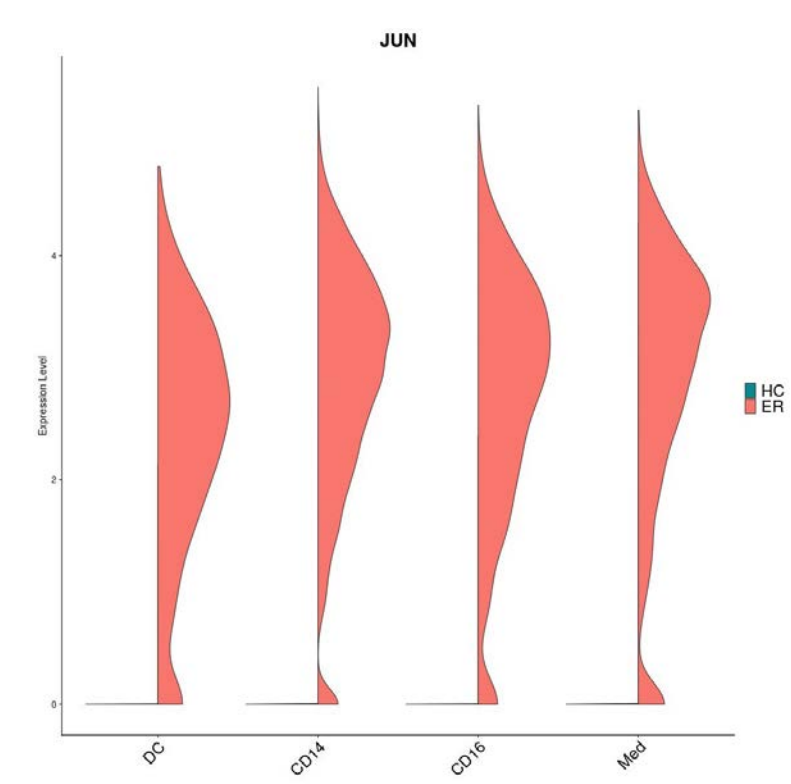


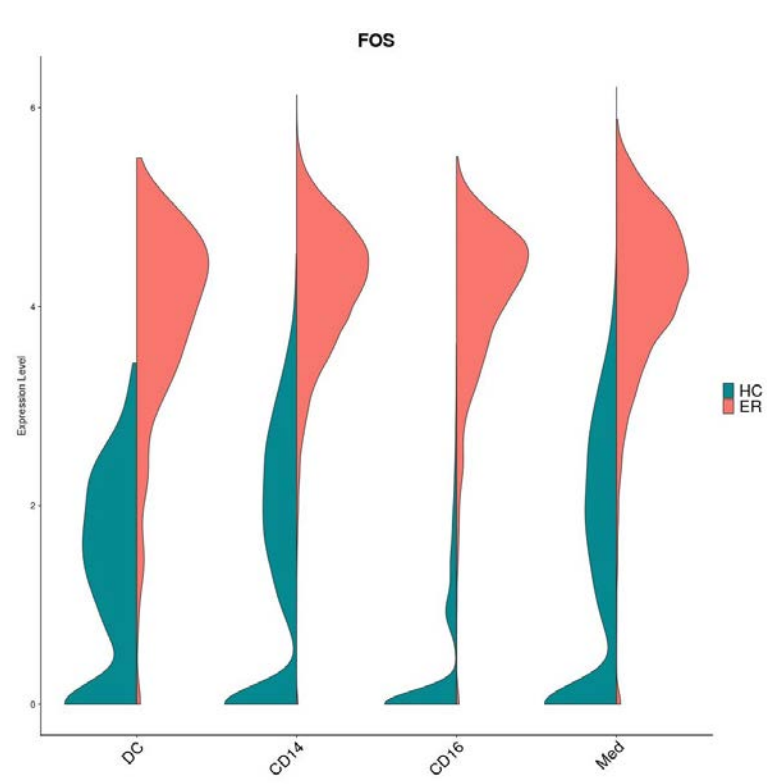
DC heatmap

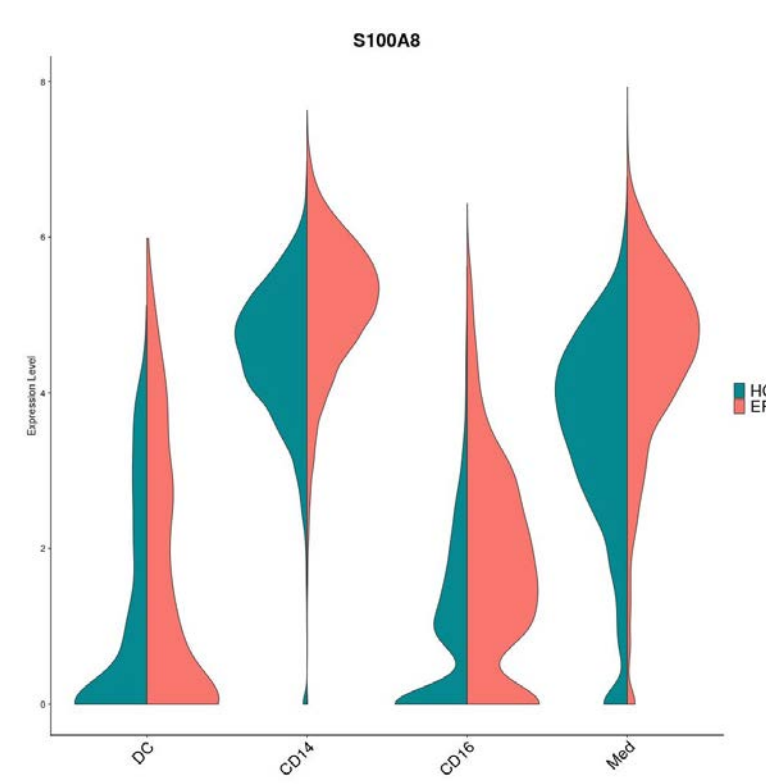
b

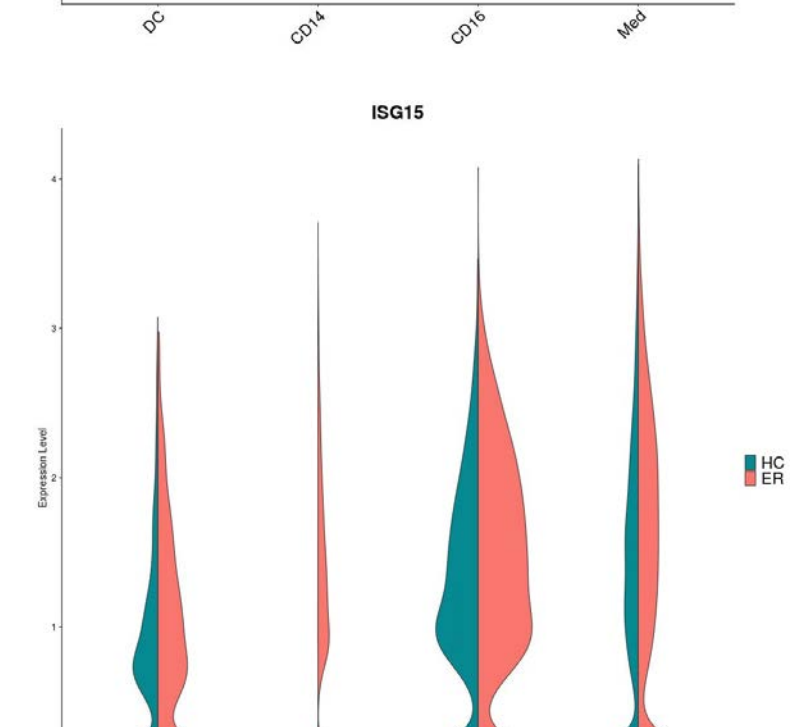


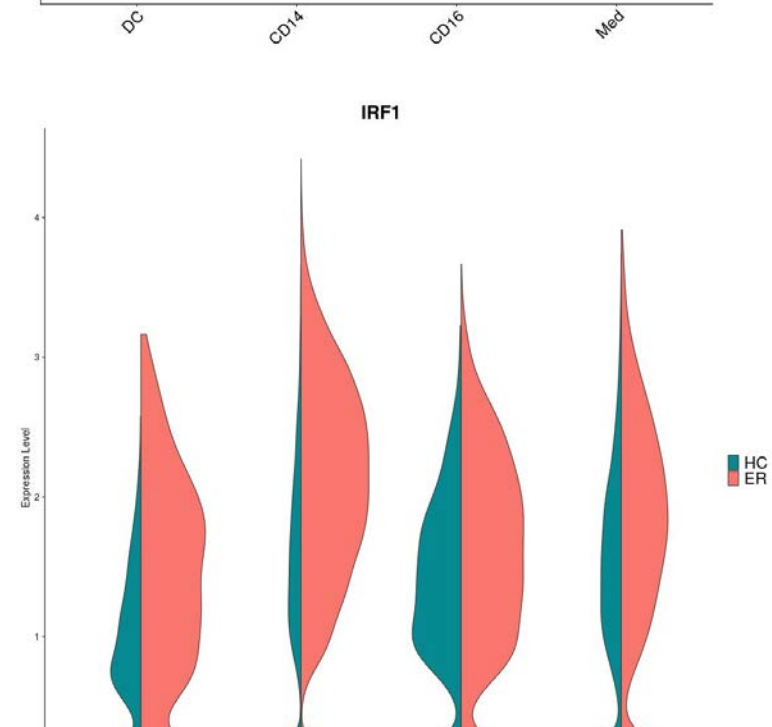
c

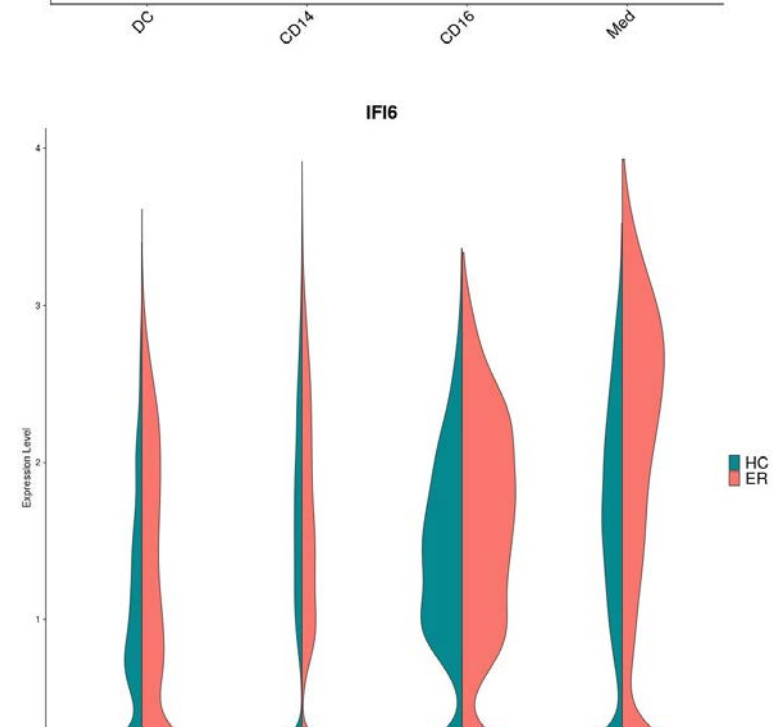


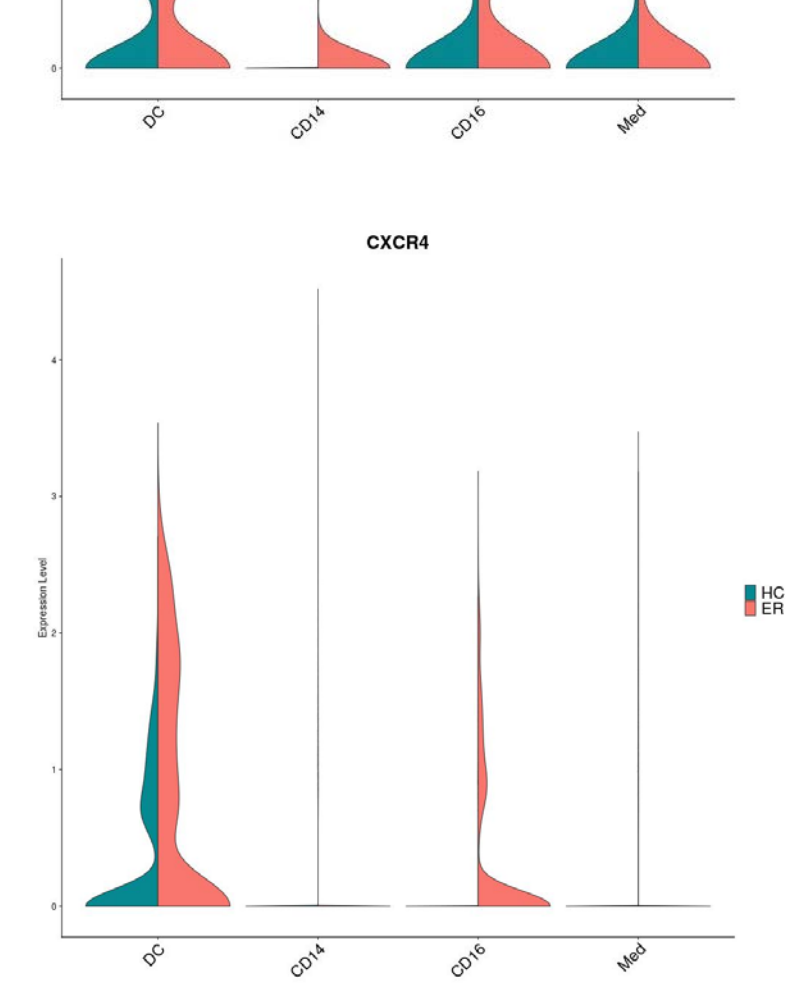


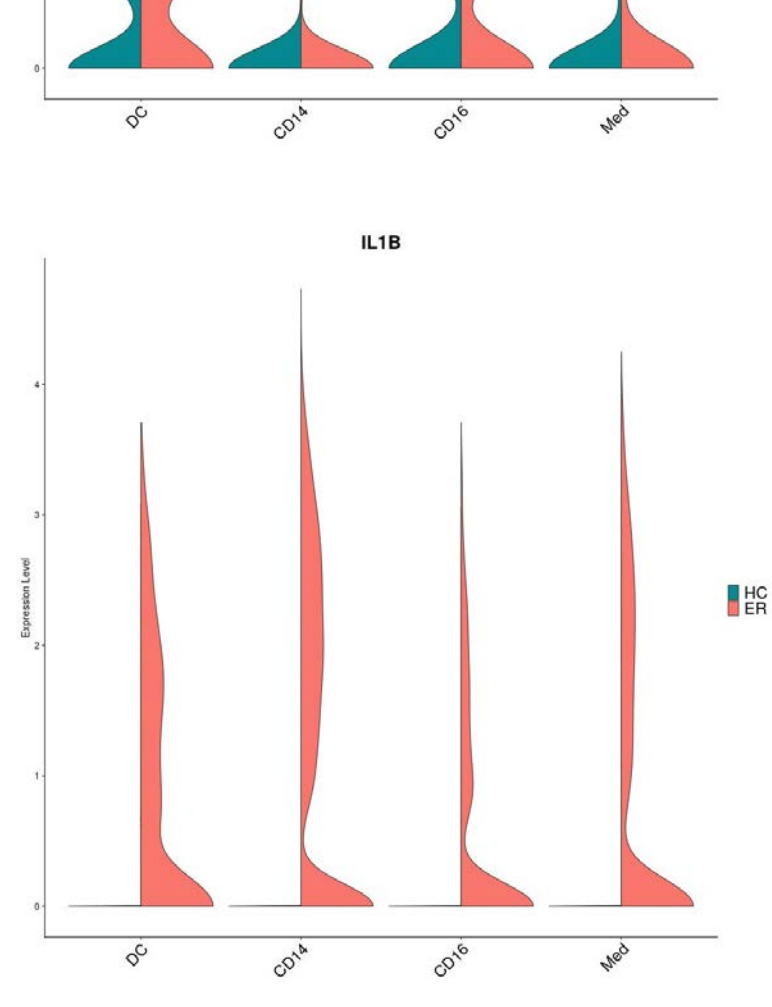


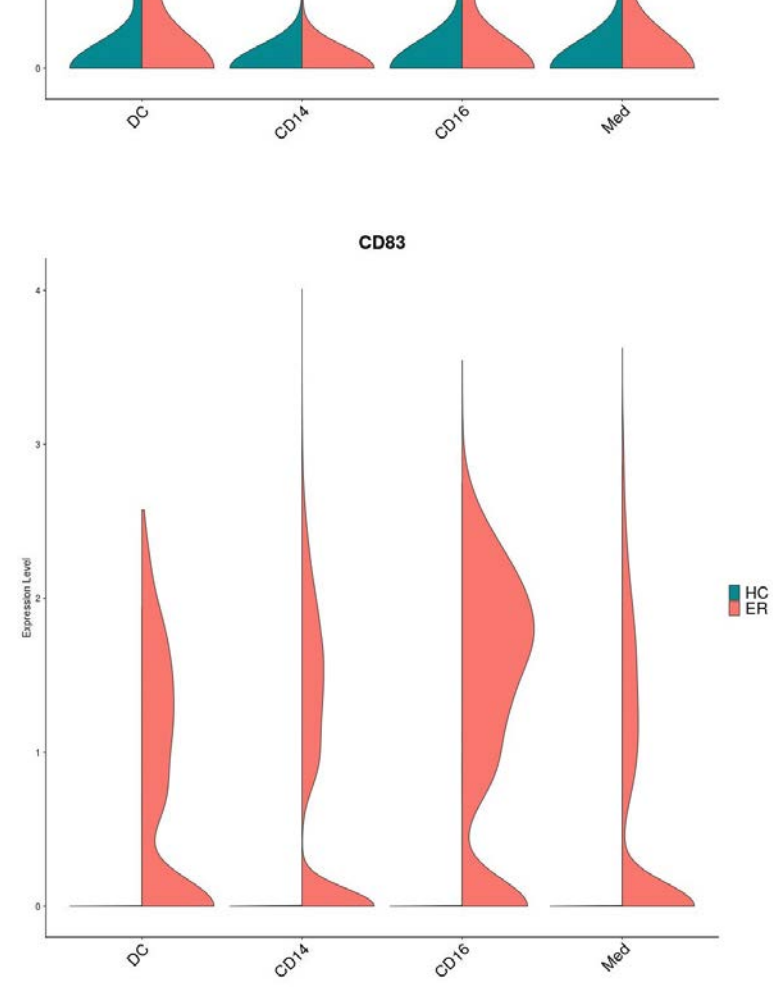




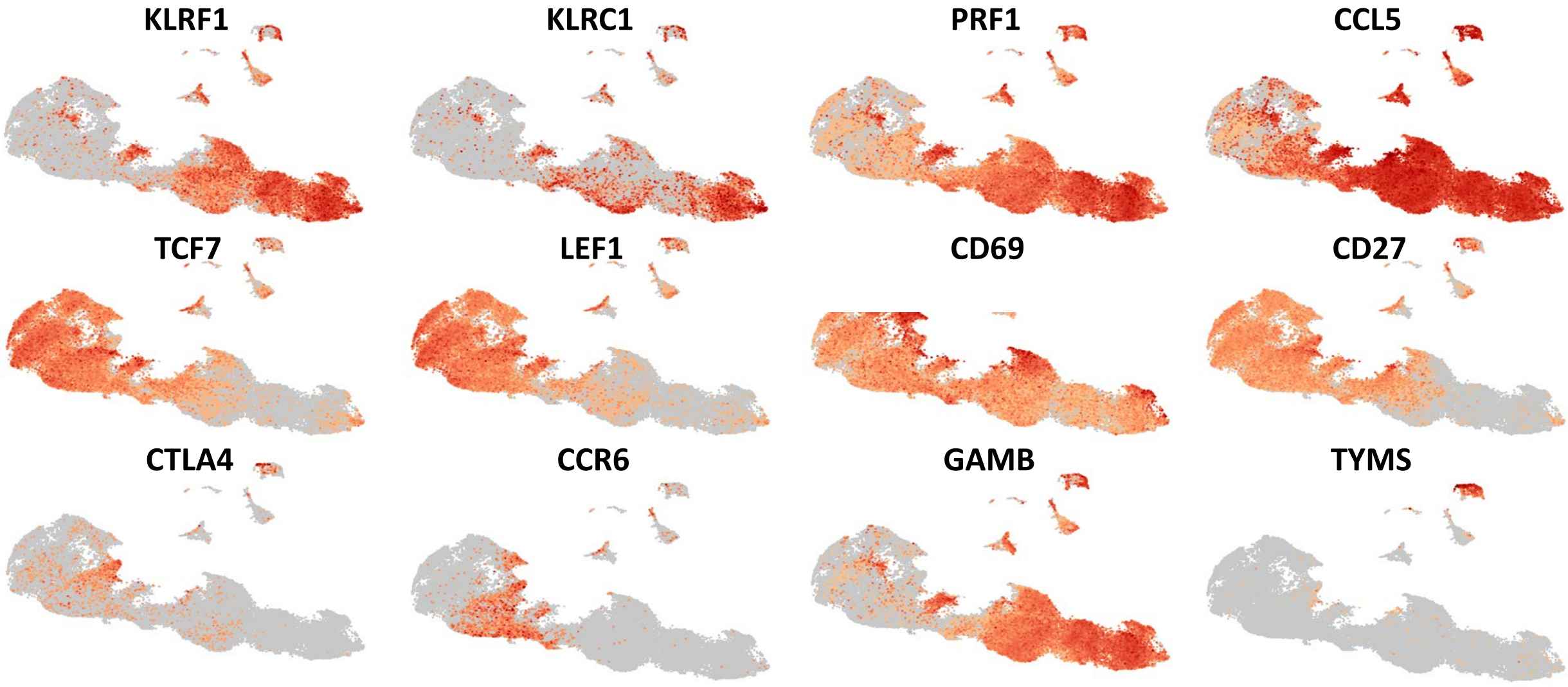




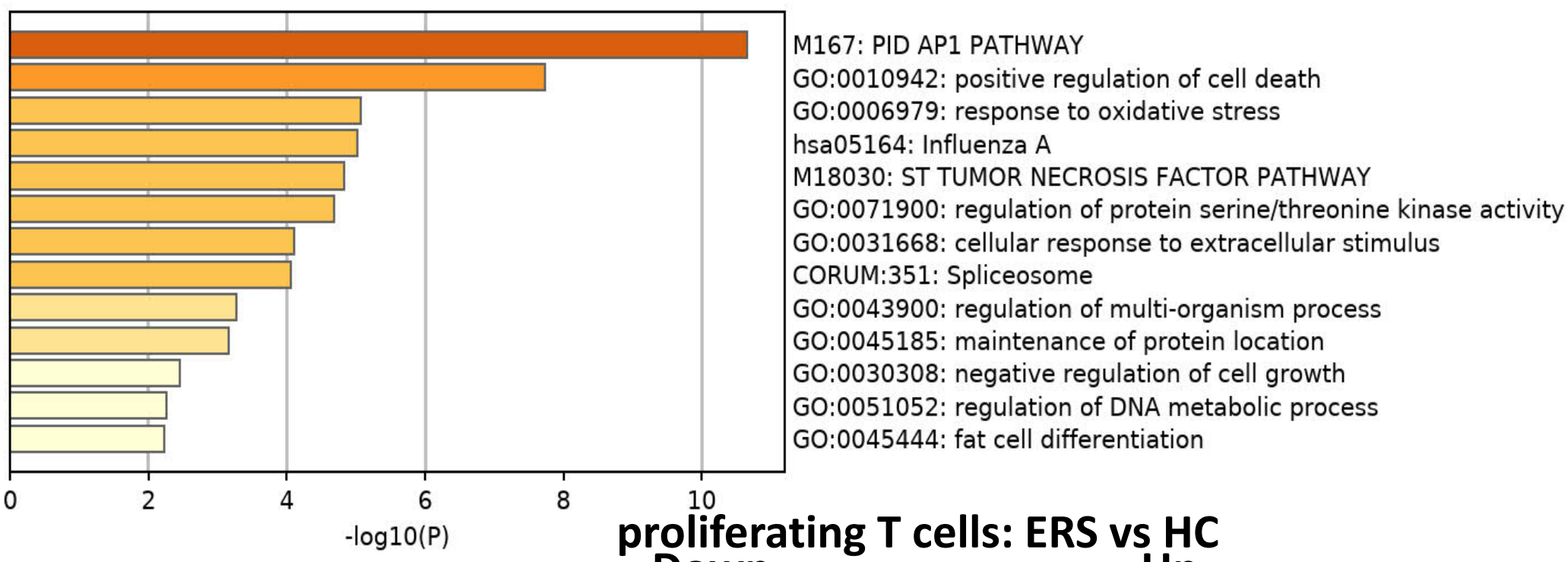




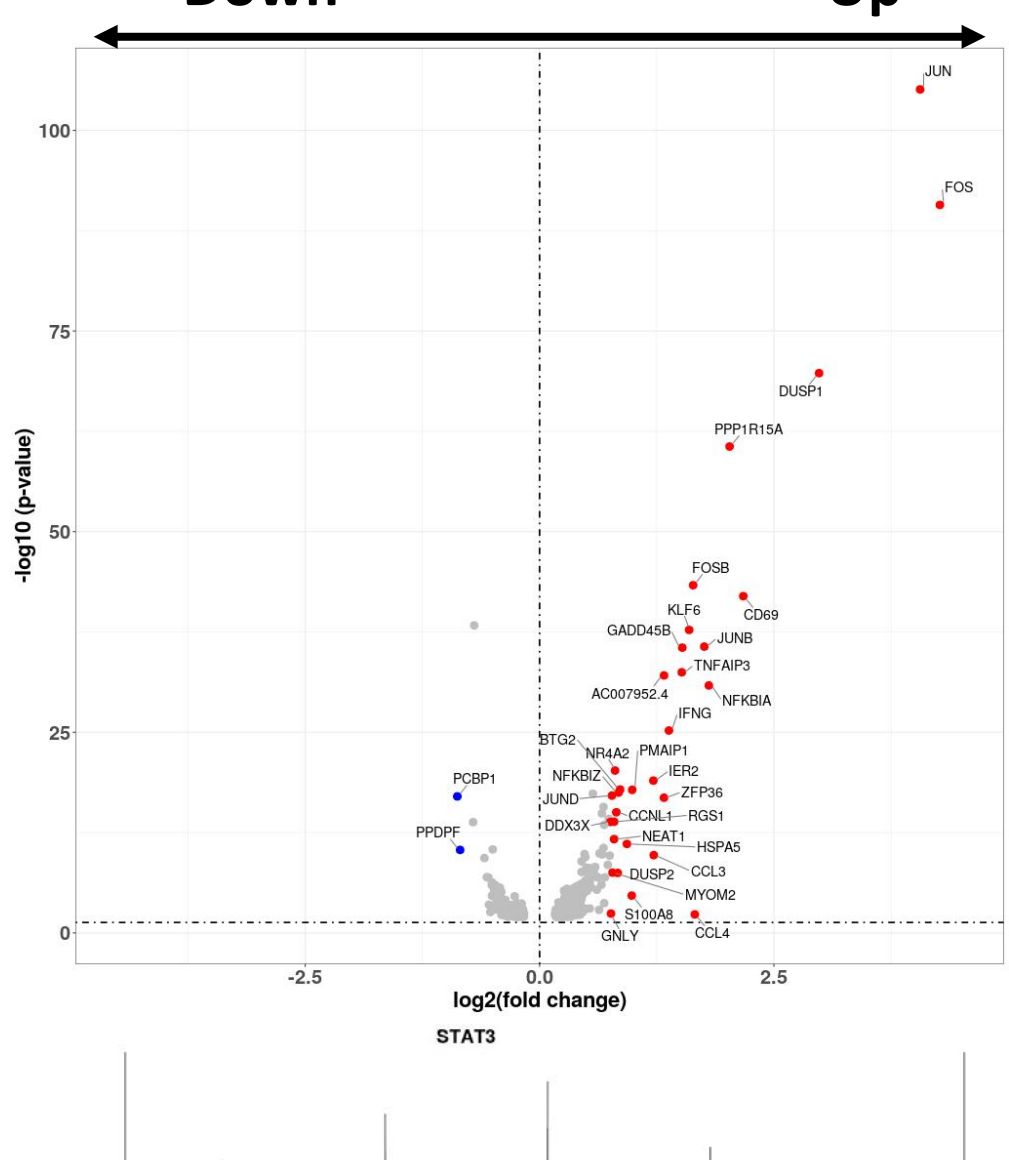
a


KLRF1
KLRC1
PRF1
CCL5
TCF7
LEF1
CD69
CD27
CTLA4
CCR6
GAMB
TYMS

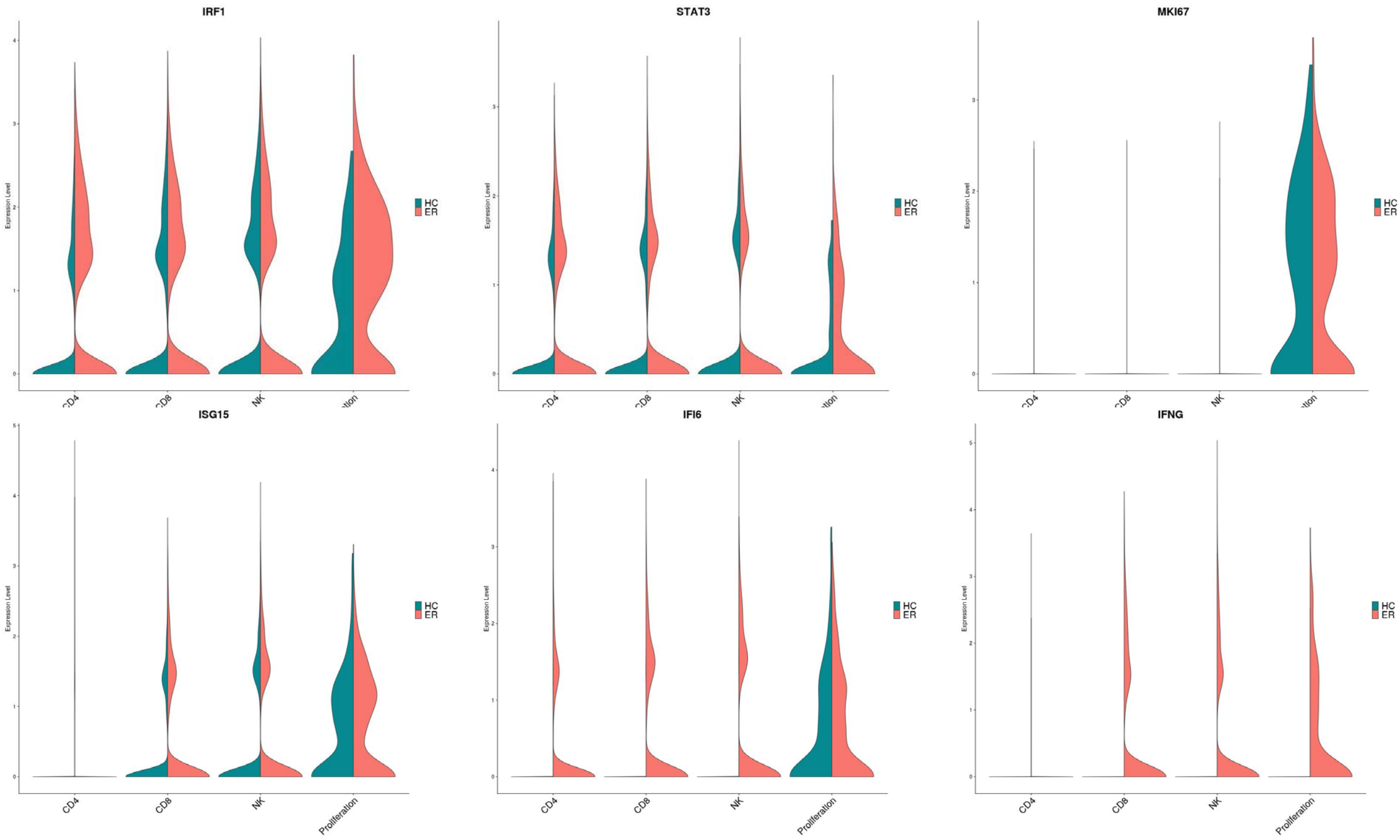
b


Up in CD8+ CTLs of ERS
M167: PID AP1 PATHWAY
GO:0010942: positive regulation of cell death
GO:0006979: response to oxidative stress
hsa05164: Influenza A
M18030: ST TUMOR NECROSIS FACTOR PATHWAY
GO:0071900: regulation of protein serine/threonine kinase activity
GO:0031668: cellular response to extracellular stimulus
CORUM:351: Spliceosome
GO:0043900: regulation of multi-organism process
GO:0045185: maintenance of protein location
GO:0030308: negative regulation of cell growth
GO:0051052: regulation of DNA metabolic process
GO:0045444: fat cell differentiation
0
2
4
6
8
10
-log10(P)

c

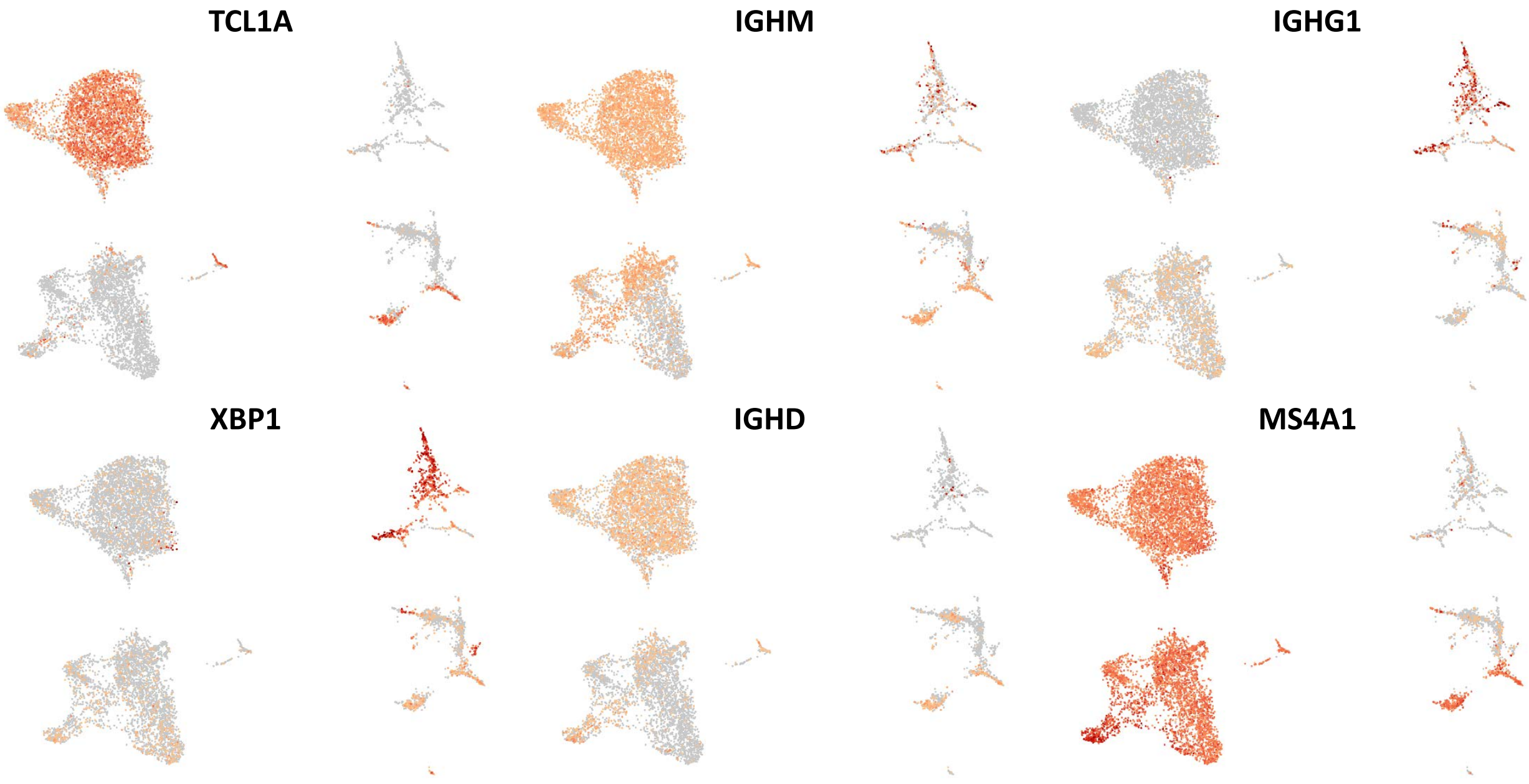

proliferating T cells: ERS vs HC
Down
Up
-log10 (p-value)
log2(fold change)
JUN
FOS
DUSP1
PPP1R15A
FOSB
KLF6
CD69
GADD45B
JUNB
TNFAIP3
AC007952.4
NFKBIA
IFNG
BTG2
NR4A2
PMAIP1
NFKBIZ
IER2
ZFP36
JUND
CCNL1
RGS1
DDX3X
NEAT1
HSPA5
DUSP2
CCL3
MYOM2
S100A8
CCL4
GNLY
PCBP1
PPDPF

d


IRF1
STAT3
MKI67
ISG15
IFI6
IFNG
Expression Level
HC
ER
CD4
CD8
NK
Proliferation

Supplementary Fig. S5

a



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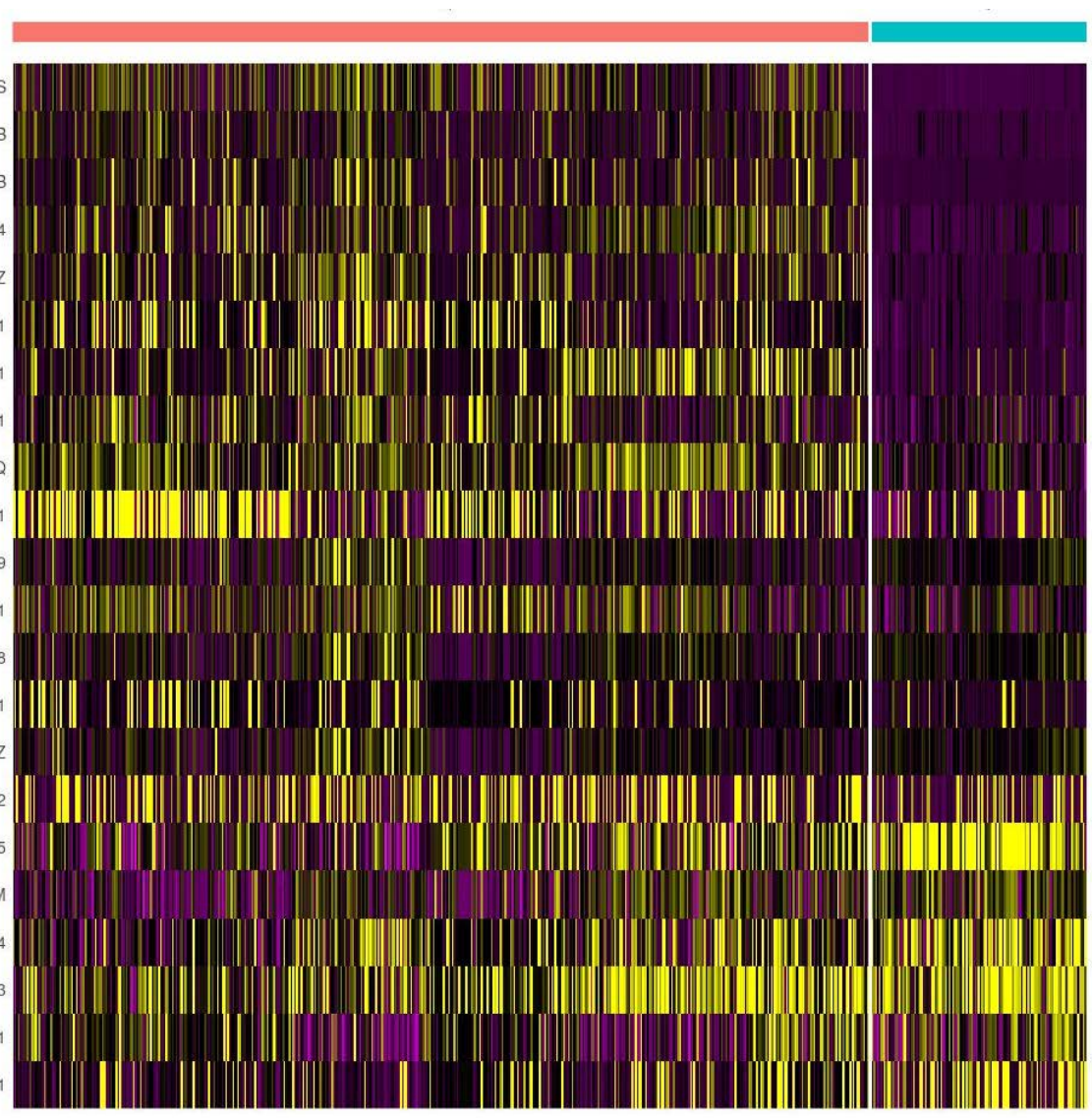
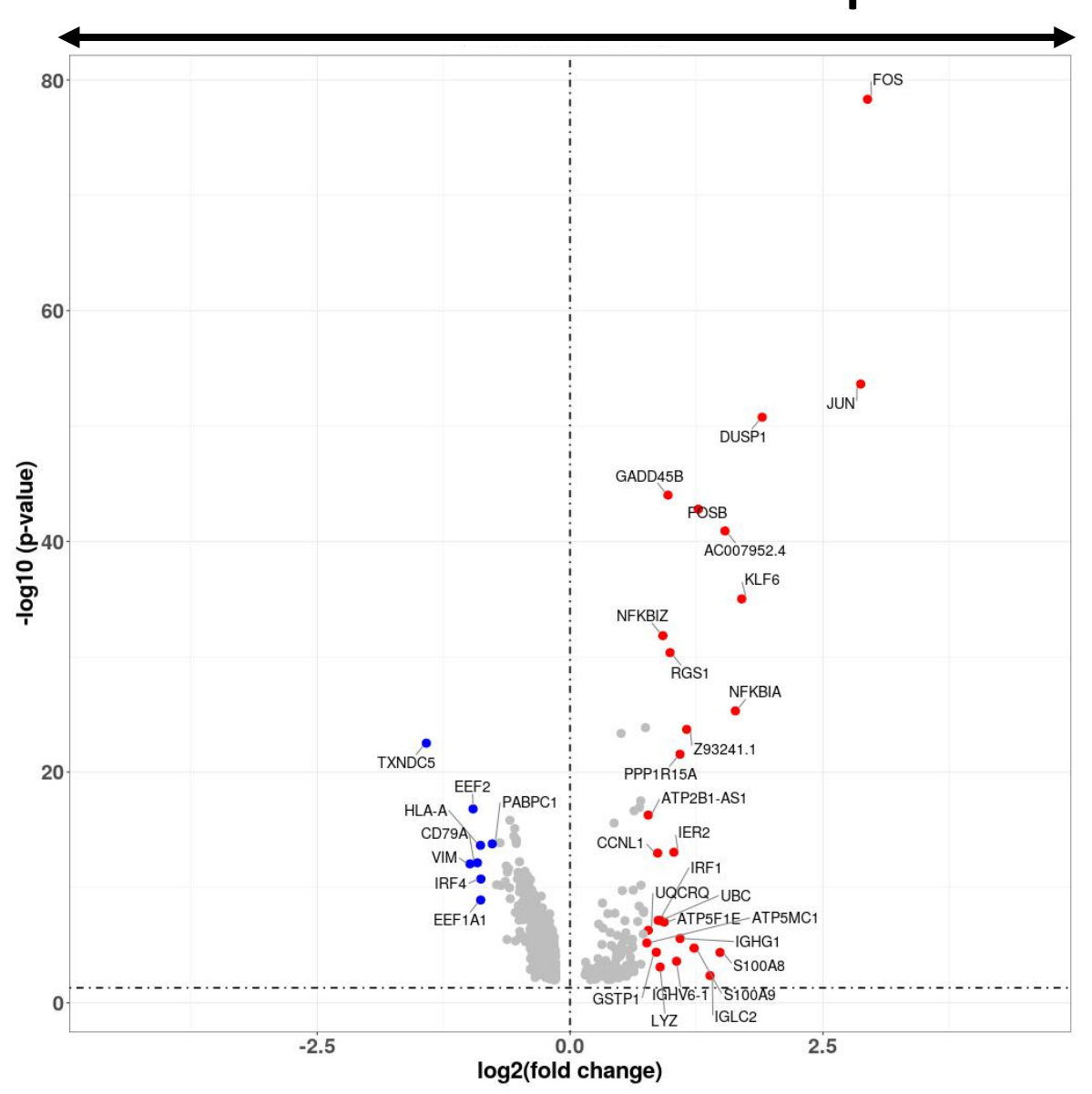
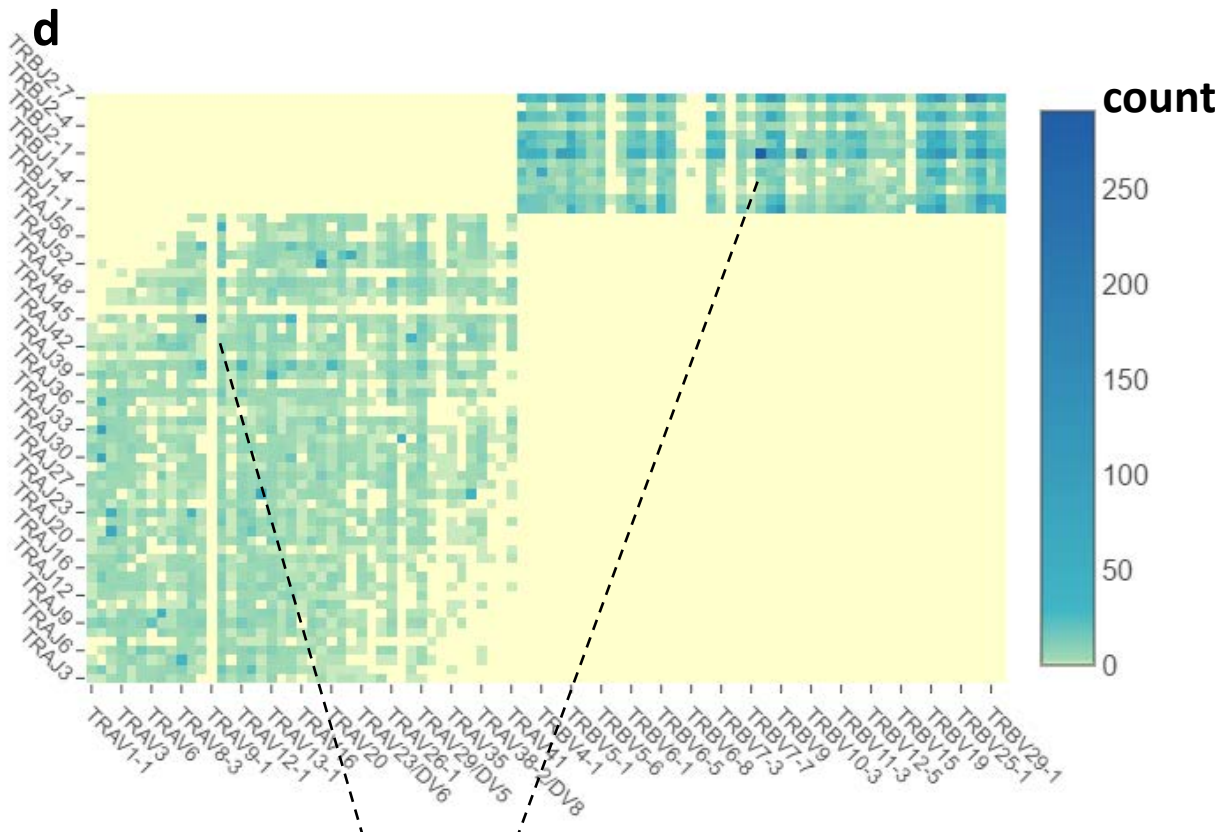


ASC heatmap

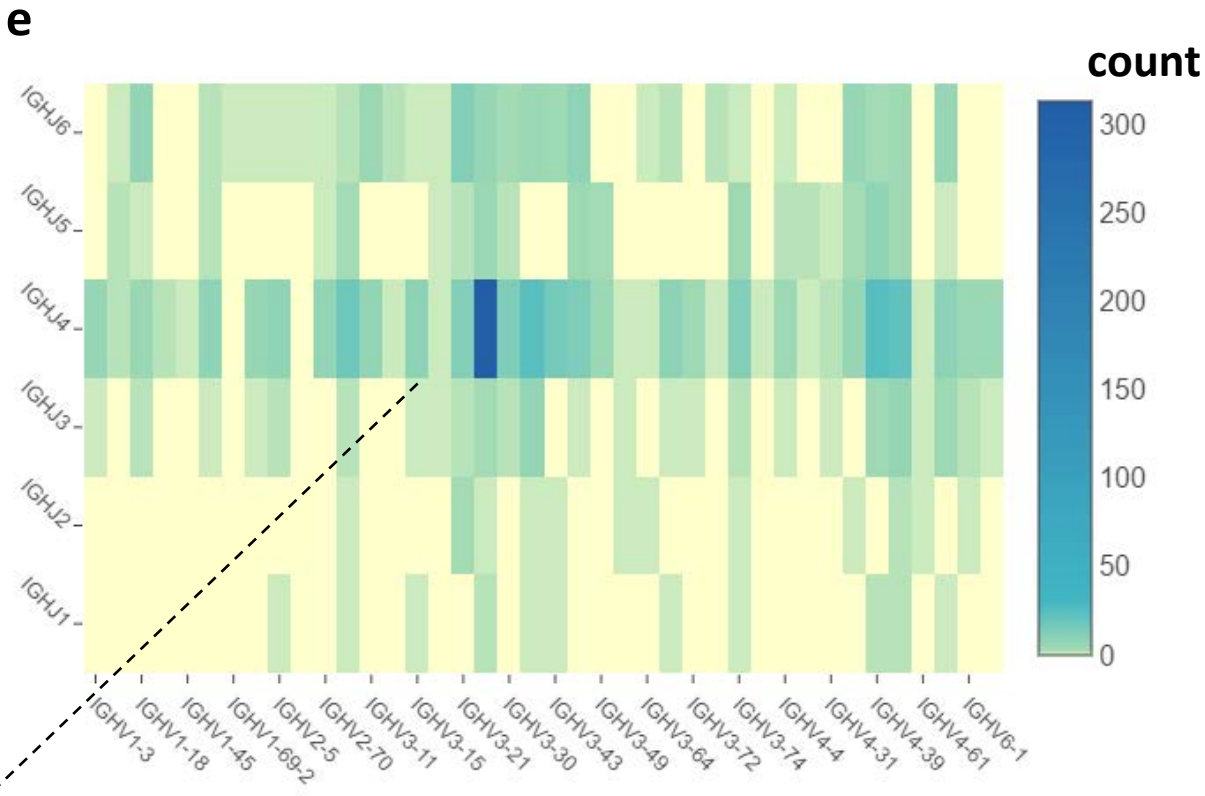
c



d



e



TRAV8-6-TRAJ45 : TRAV7-8-TRBJ2-1

IGHV3-23-IGHJ4 : IGLV1-44-IGLJ3

IGHV3-7- IGHJ6 : IGKV1-17-IGKJ1

f

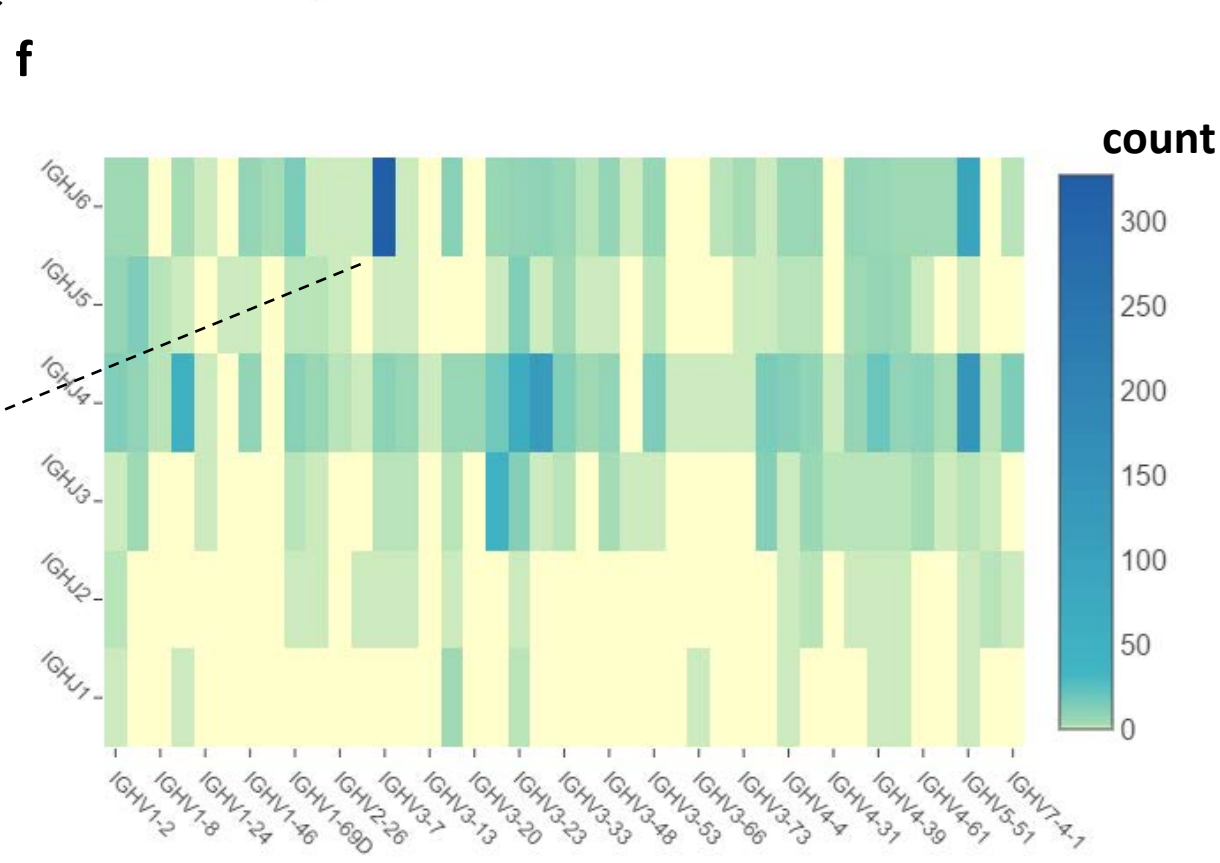


Figure legends

Supplementary figure S1. The detail information of patients and healthy controls.

(a-b) The clinical characteristics of the patients (a) and healthy donors (b) are reported in Supplementary figure S1.

(c) No significant differences were detected between HC, ERS group and LRS group. P-Value for categories were calculated using Chi-square analysis. P-value for numerical values were determined using One-Way ANOVA test.

Supplementary figure S2.

(a) tSNE plot showing the myeloid cells (red), NK&T cells (blue), B cells (green) and other clusters (grey) of PBMCs of each research object.

Supplementary figure S3. Analysis of myeloid cells subsets landscape in COVID-19 patients.

(a) The heatmap of DCs showing the DEGs between COVID-19 patients and HCs.

(b) The volcano plot shows the DEGs of DCs between COVID-19 patients and HCs.

(c) The violin plot shows the *JUNB, FOS, S100A8, ISG15, IRF1, IFI6, CXCR4, IL1β, CD83* were highly expressed in COVID-19 patients vs HCs in myeloid cells. P values were calculated using a paired, two-sided Wilcoxon test and FDR corrected using the Benjamini–Hochberg procedure.

Supplementary figure S4. Analysis of NK and T subsets landscape in COVID-19 patients.

(a) The UAMP plot showing subtype-specific marker genes of NK and T cells including *KLRF1, KLRC1, PRF1, CCL5, TCF7, LEF1, CD69, CD27, CTLA4, CCR6, GZMB and TYMS*.

(b) GO BP enrichment analysis of the DEGs of $CD8^+$ CTLs between the COVID-19 patients vs. the HCs. P value was derived by a hypergeometric test.

(c) The volcano plot shows the DEGs of ERS COVID-19 patients vs. HCs in proliferating T cells. P values were calculated using a paired, two-sided Wilcoxon test and FDR corrected using the Benjamini–Hochberg procedure.

(d) The violin plot shows the *IRF1, STAT3, MKI67, ISG15, IFI6 and IFNG* were highly expressed in ERS COVID-19 patients vs HCs in NK and T sub-clusters.

Supplementary figure S5. Analysis of B cell subsets landscape in COVID-19 patients.

(a) The UAMP plot showing subtype-specific marker genes of B cells including TCL1A, IGHM, IGHG1, XBP1, IGHD and MS4A1.

(b) The heatmap of ASCs showing the DEGs between COVID-19 patients and HCs.

(c) The volcano plot shows the DEGs of COVID-19 patients vs. HCs in ASCs. P values were calculated using a paired, two-sided Wilcoxon test and FDR corrected using the Benjamini–Hochberg procedure.

(d) Heat map showing TRA and TRB rearrangements in peripheral blood samples from ERS group.

(e) Heat map showing IGH rearrangements in peripheral blood samples from ERS-4 sample.

(f) Heat map showing IGH rearrangements in peripheral blood samples from ERS-5 sample.