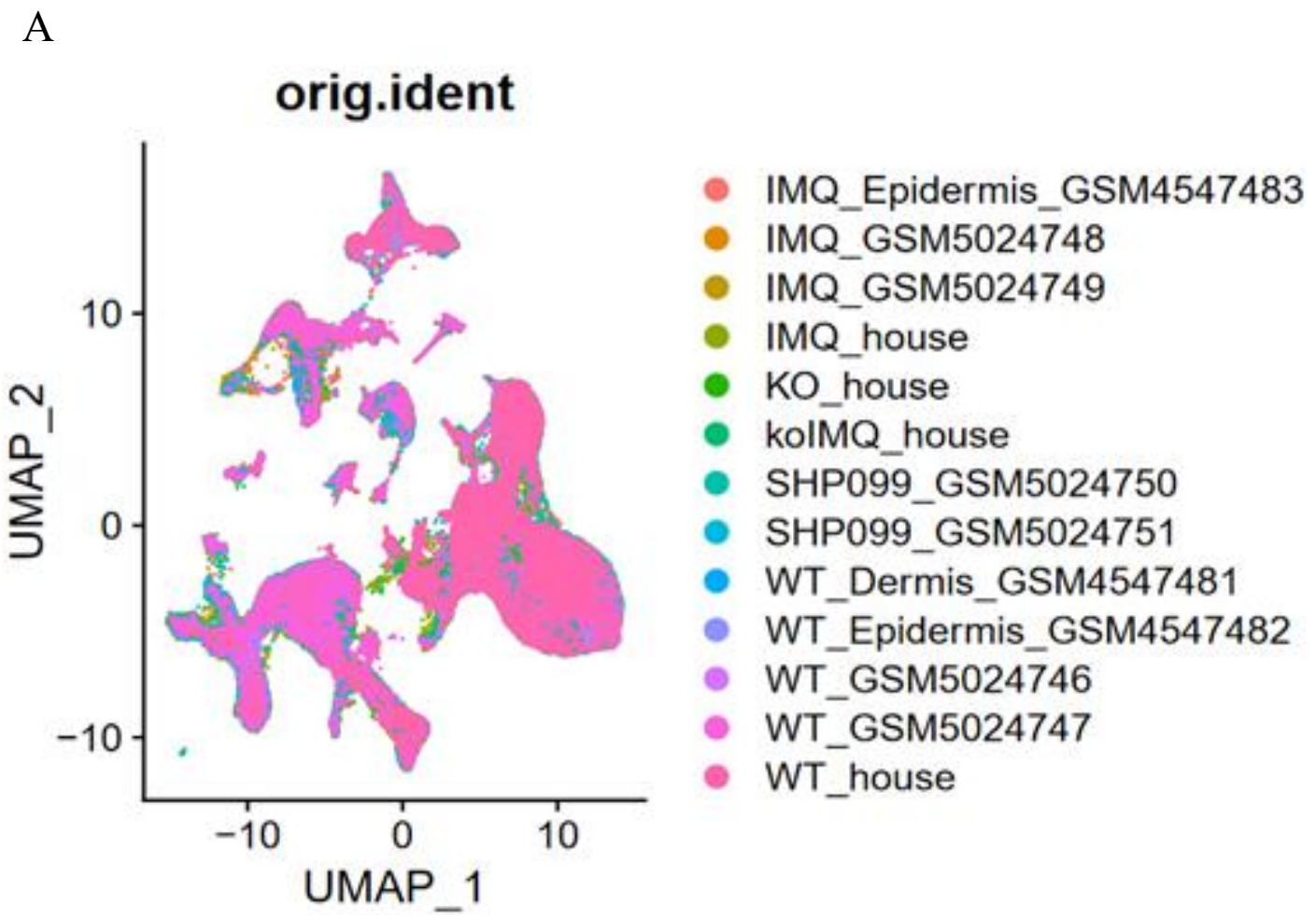
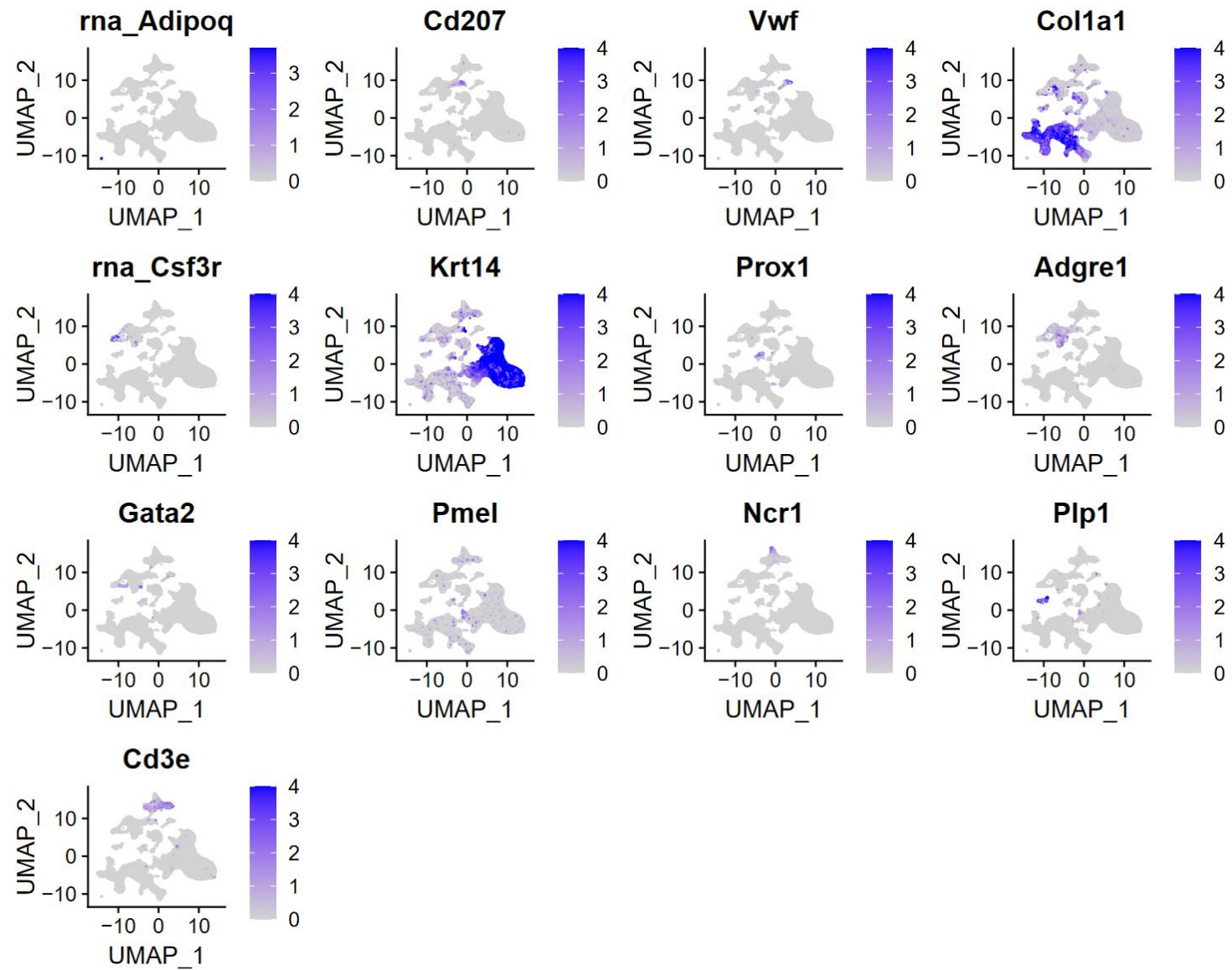


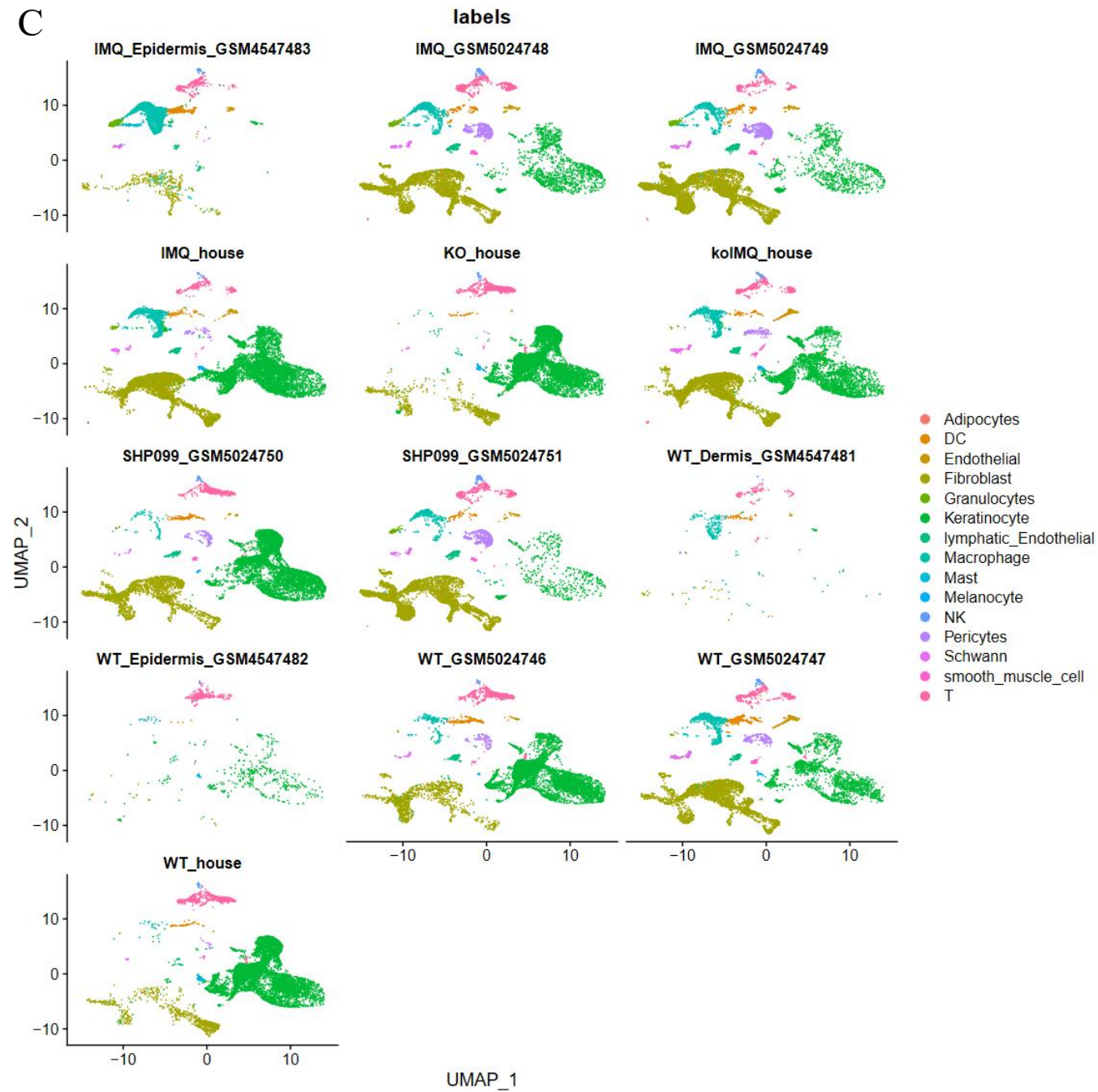
Figure S1



B



C



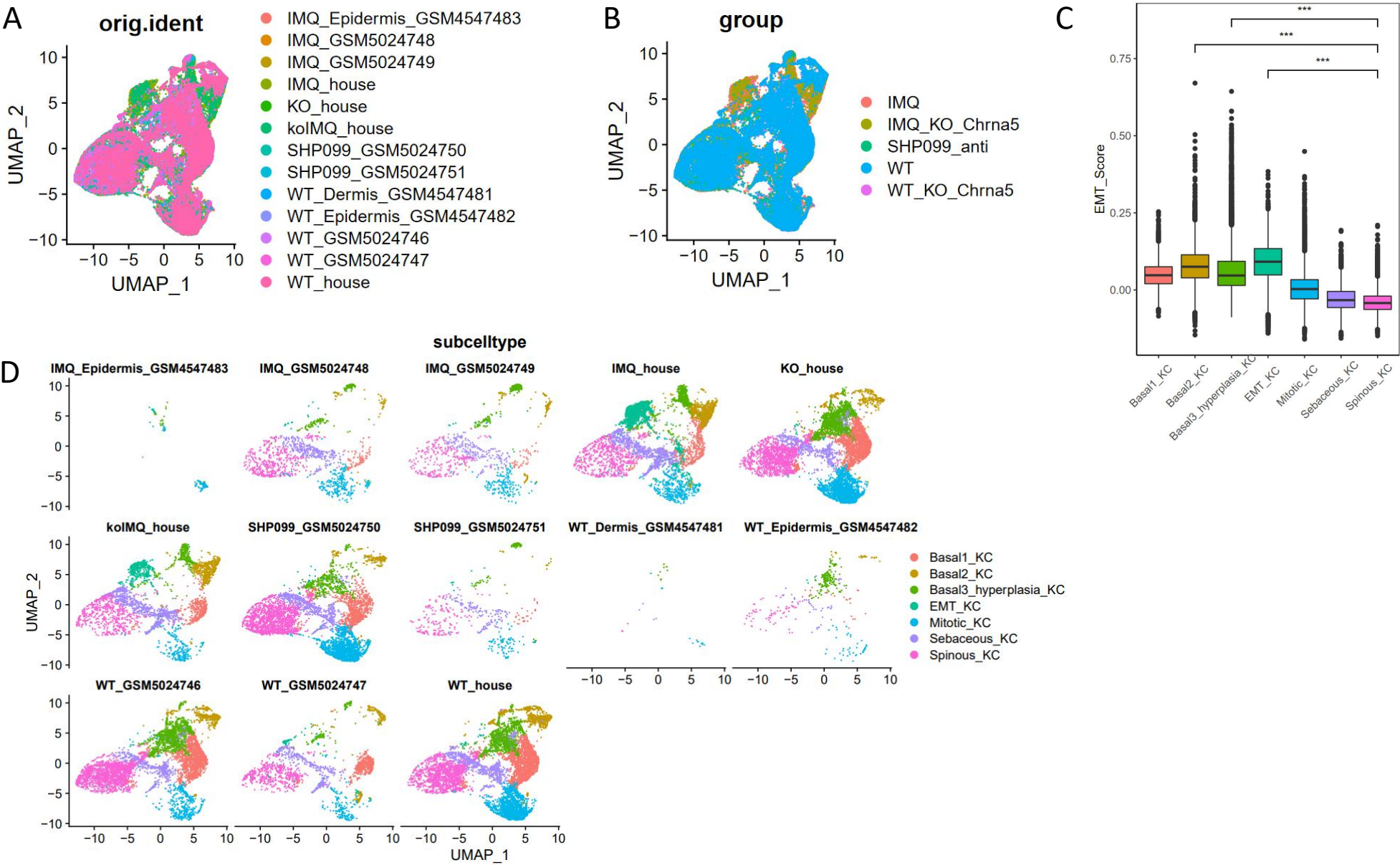
FigureS1

(A) UMAP plot of the 94,759 cells from 13 samples in the skin of mice, colored by sample. Each dot denotes a single cell.

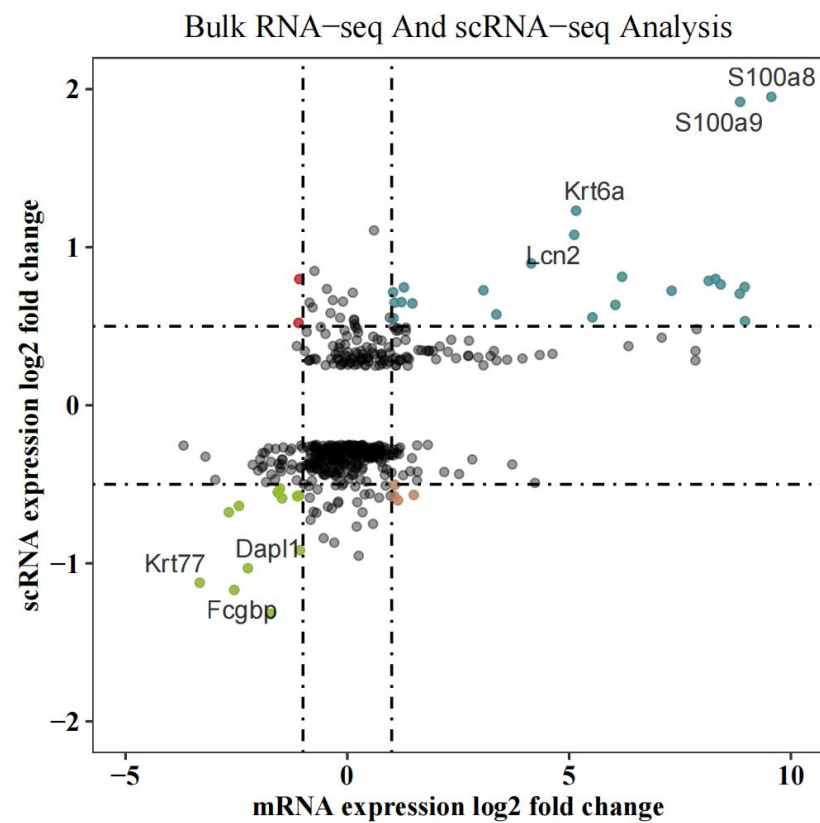
(B) UMAP plots illustrating key marker genes to identify cell types as shown in (figure1A), including adipocytes(*Adipoq*), DC(*Cd207*), Endothelial(*Vwf*), Fibroblast(*Coll1a1*), Granulocytes(*Csf3r*), Keratinocyte(*Krt14*), lymphatic-Endothelial(*Prox1*), Macrophage(*Adgre1*), Mast(*Gata2*), Melanocyte(*Pmel*), NK(*Ncr1*), Schwann(*Plp1*), T(*Cd3e*).

(C) UMAP plot of the cells from the skin of mice in 13 samples , colored by cell type.

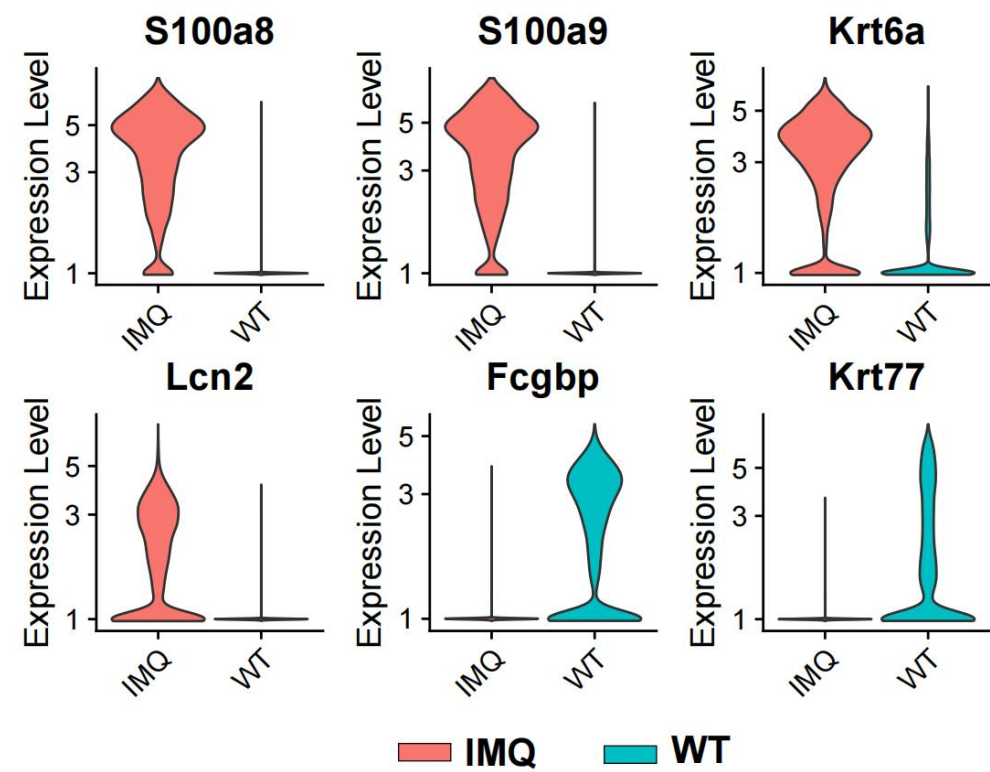
Figure S2



E



F



FigureS2

(A,B) UMAP plot of 42073 keratinocyte coloured by sample(A) and group(B). Each dot denotes a single cell.

(C) Box plot of the scores of keratinocyte subtypes. The boxes show lower quartile, middle quartile and upper quartile. Whiskers represent 1.5 times the interquartile range (IQR). P value was calculated by Wilcoxon test (*, $p < 0.05$; **, $p < 0.01$; ***, $p < 0.001$).

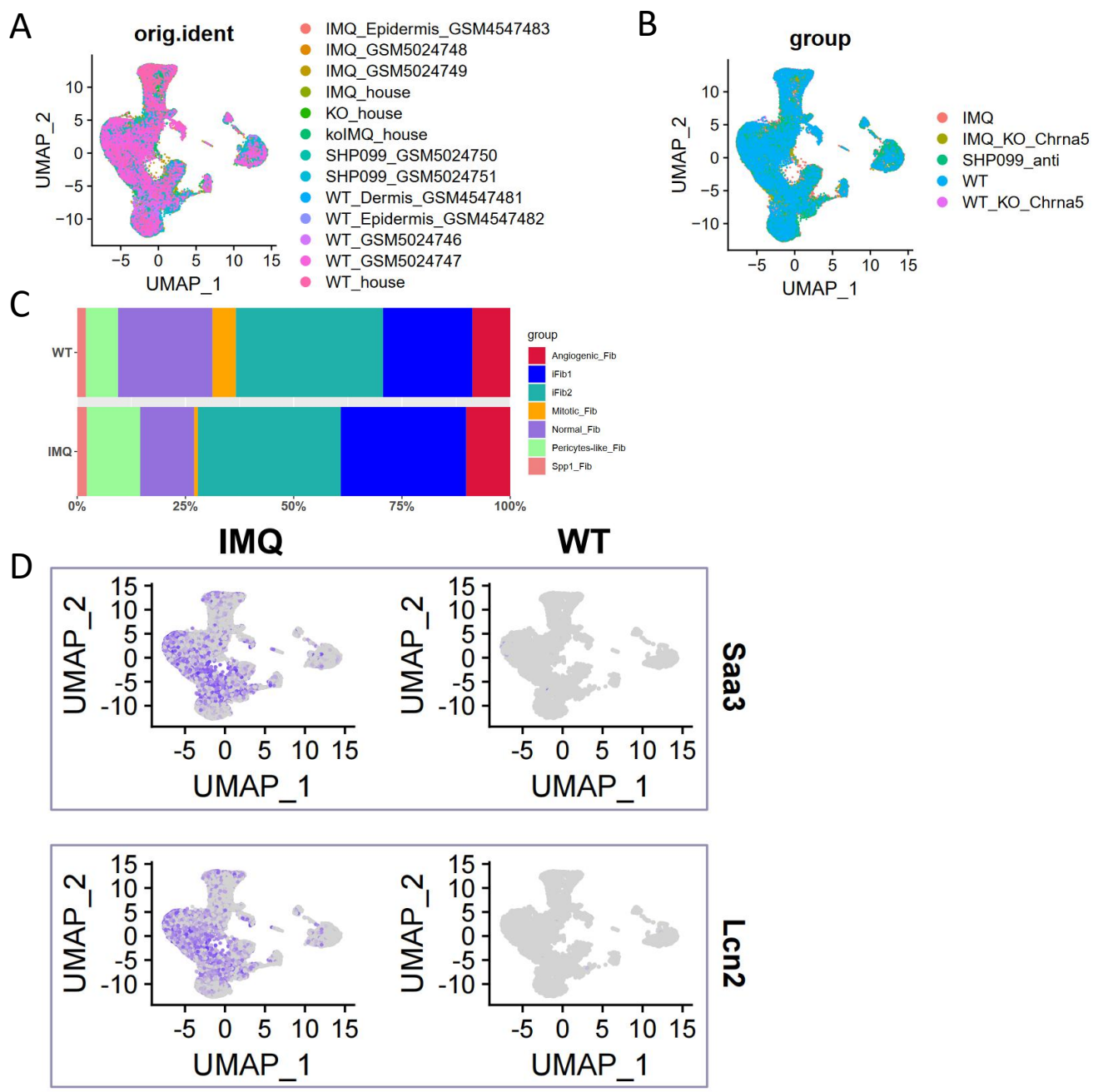
(D) UMAP of all keratinocyte subtypes from 13 different samples.

(E) Bulk RNA-seq and scRNA-seq analysis of the DEGs of the KCs in the IMQ group and WT group. Bulk RNA-seq data source: IMQ

(GSM2299982,GSM2299983) vs WT (GSM2299980,GSM2299981)

(F) Violin plots illustrating the DEGs of the KCs in the IMQ group and WT group.

FigureS3 A



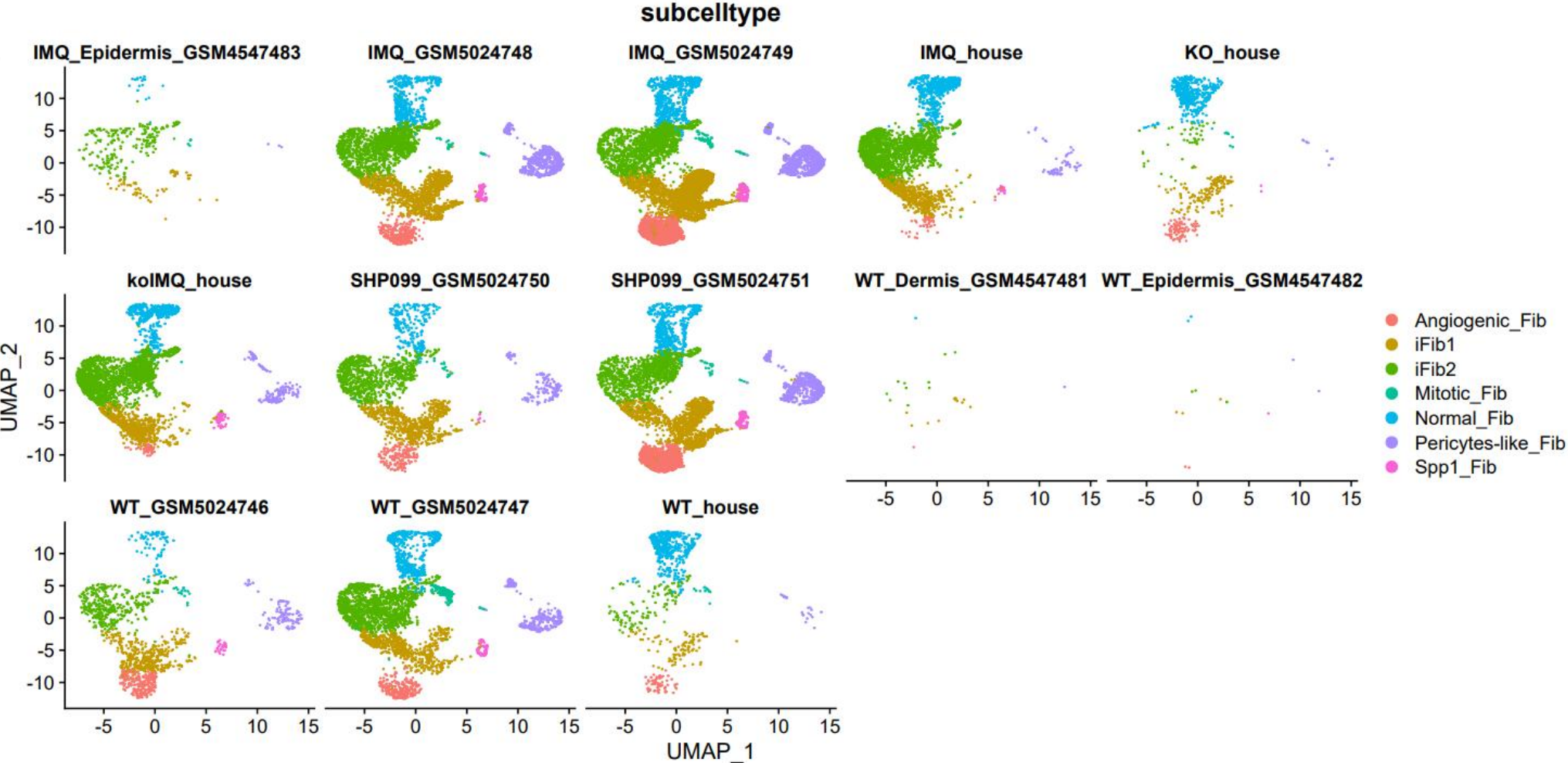
FigureS3

(A,B) UMAP plot of 33118 fibroblast colored by sample(A) and group(B). Each dot denotes a single cell.

(C) Proportions of fibroblast subtypes in the skin of IMQ group and WT group.

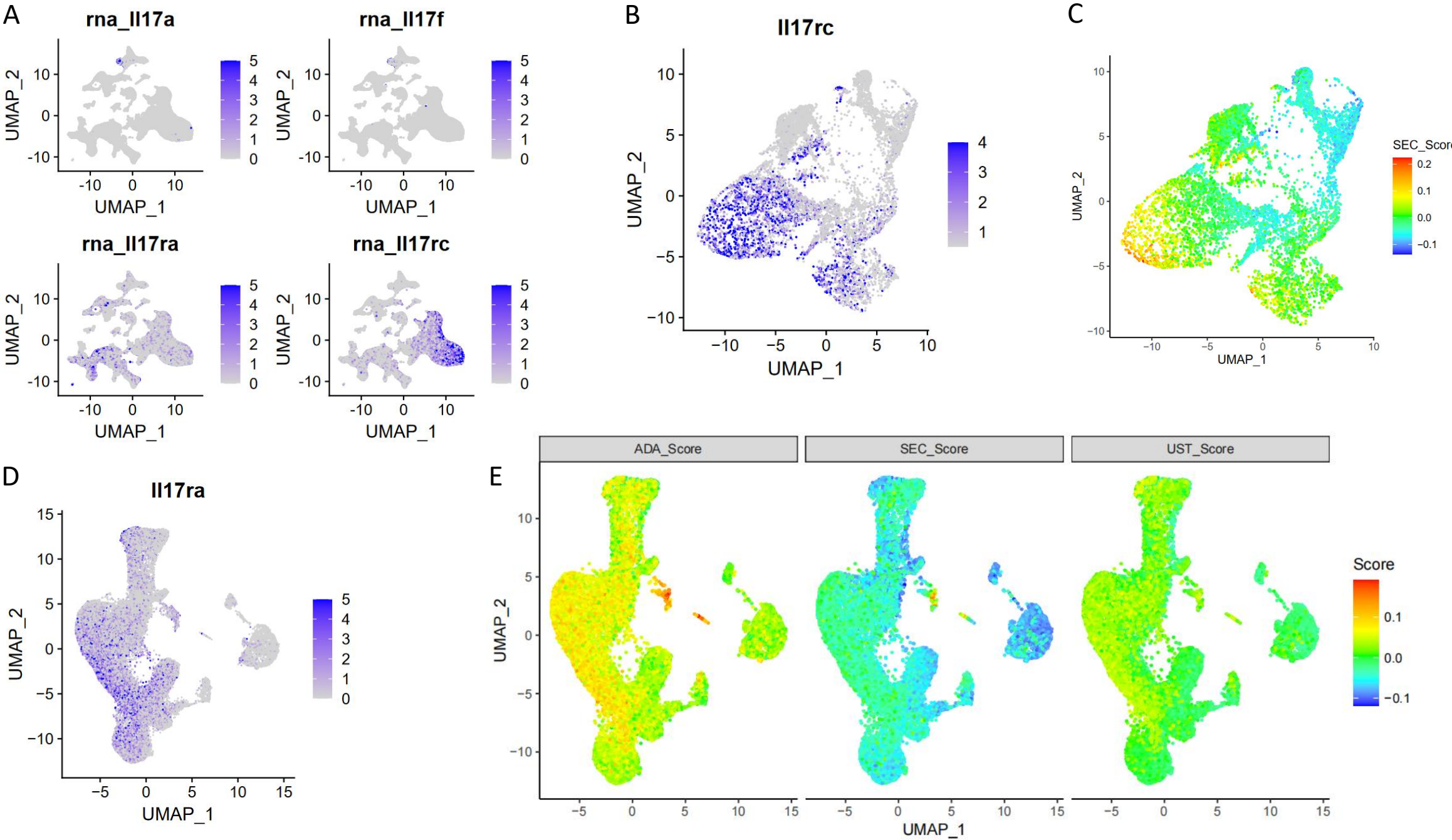
(D) UMAP plots illustrating the two key marker genes(Saa3 and Lcn2) which show the biggest expression difference in IMQ and WT group.

FigureS4



FigureS4 UMAP of all fibroblast subtypes from 13 different samples.

FigureS5



FigureS5

(A) UMAP plot of IL-17 and its receptor expression in the skin of mice.

(B) UMAP plot of IL-17rc expression in keratinocyte.

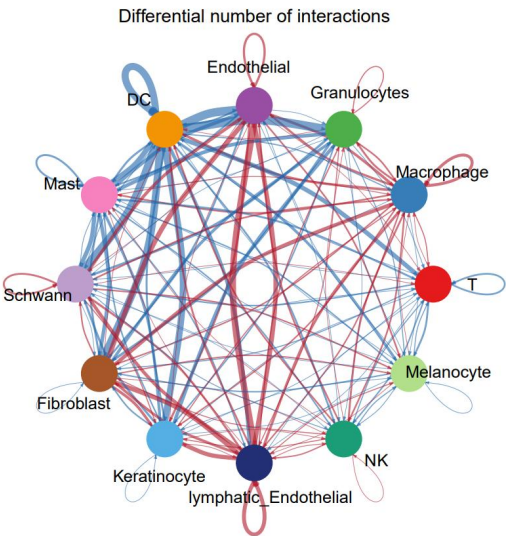
(C) UMAP plot showing the distribution of downregulated genes affected by SEC in keratinocyte . Each dot denotes a single cell, the higher the cell score, the better the effect of the drug.

(D) UMAP plot of IL-17ra expression in fibroblast.

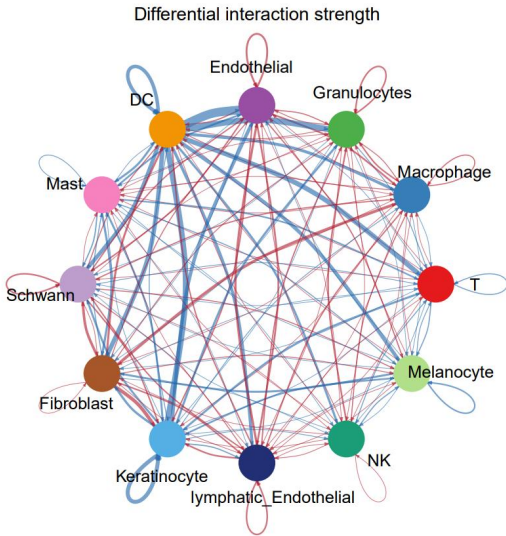
(E) UMAP plot showing the distribution of downregulated genes affected by SEC, UST and ADA in fibroblast .

FigureS6

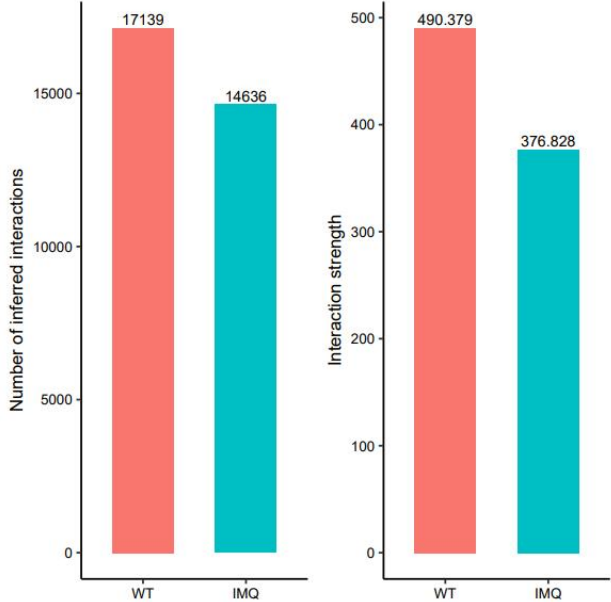
A



B



C

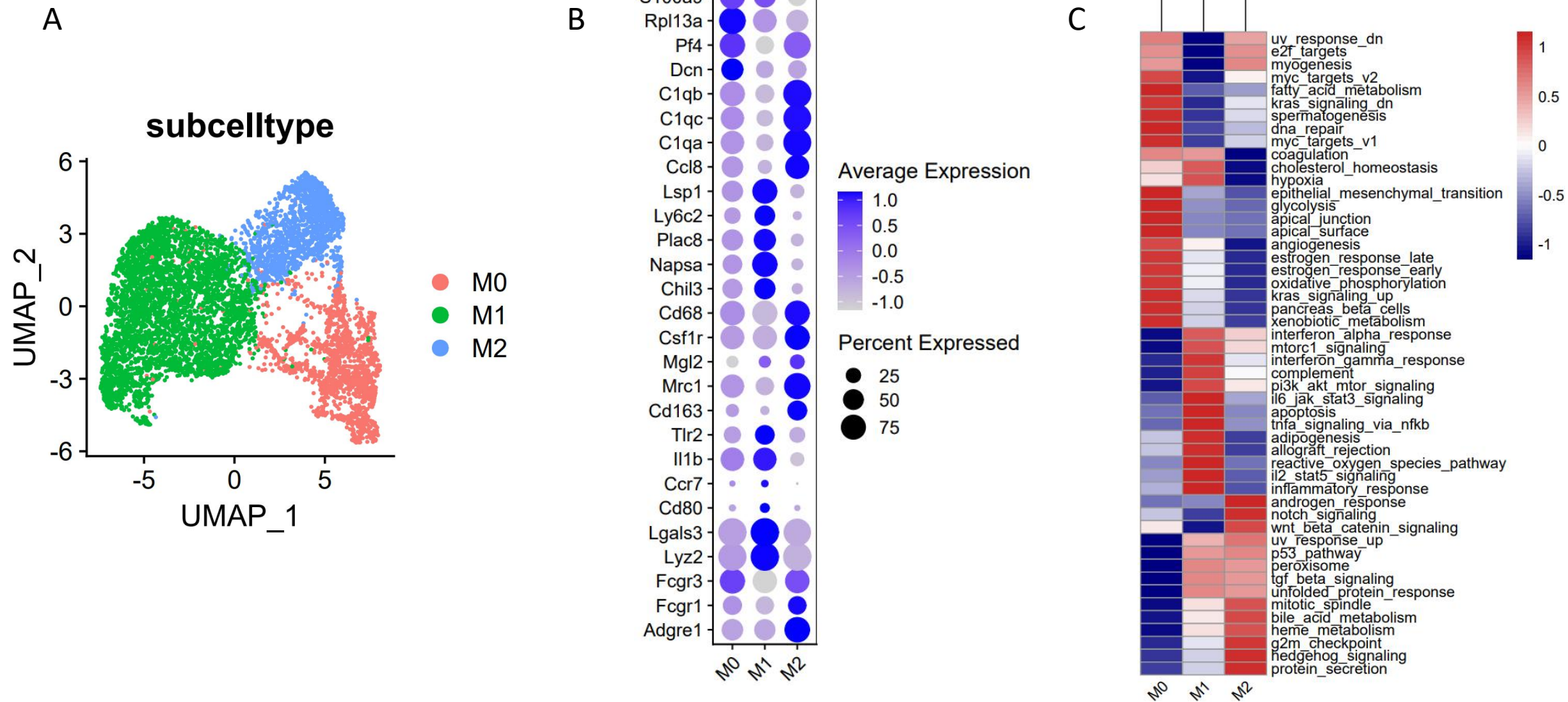


FigureS6

(A-B) Calculate the aggregated cell-cell communication network, the number of interactions(A) and the total interaction strength or weights(B) between any two cell groups were displayed.

(C) the number of interactions and the total interaction strength or weights between IMQ and WT group in in KCs, FBs, T and macrophage cell type.

FigureS7



FigureS7

(A) UMAP plot of macrophage colored by cell subtype. Each dot denotes a single cell.

(B) Dot plot of the expression levels of marker genes for macrophage subtypes defined in(a)Dot size corresponds to the percent of expressing cells, and dot color indicates the average expression levels.

(C) Heatmap showing differences in hallmark pathway activities scored per cell with GSVA among different macrophage subtypes.

Supplementary table 1 Details about the 13 samples used in scRNA-seq

Mice model/Tissue	ID	Group
Chrna5 KO mice/skin (KO house)	GSM5795803	KO group
Chrna5 KO IMQ mice/skin (koIMQ house)	GSM5795801	KO IMQ group
IMQ mice /skin (IMQ house)	GSM5795800	IMQ group
IMQ mice /dermis	GSM4547483	IMQ group
IMQ mice /skin	GSM5024748	IMQ group
IMQ mice/ skin	GSM5024749	IMQ group
IMQ mice treated with SHP099/skin	GSM5024750	SHP099 group
IMQ mice treated with SHP099/skin	GSM5024751	SHP099 group
WT mice/skin (WT house)	GSM5795802	WT group
WT mice/dermis	GSM4547481	WT group
WT mice/epidermis	GSM4547482	WT group
WT mice/skin	GSM5024746	WT group
WT mice/skin	GSM5024747	WT group

Supplementary table 2 Antibodies used in Fluorescence immunohistochemistry

Antibodies	Company	Cat No.	Dilution ratio
E-cadherin Monoclonal antibody	roteintech	0335-1-Ig	1:400
Vimentin Polyclonal antibody	Proteintech	0336-1-Ap	1:200
-conjugated Goat Anti-Rabbit IgG(H+L)	Proteintech	SA00013-2	1:500
– conjugated Goat Anti-Mouse IgG(H+L)	Proteintech	SA00013-3	1:500
Mounting Medium With DAPI	Abcam	ab104139	
Normal Goat Serum For Blocking	CWBio	CW0130	

Supplementary table 3 The primer sequences of qRT-PCR

Target	Forward Sequence (5'–3')	Reverse Sequence (5'–3 ')	Size (bp)
Human-Vim	TGCCGTTGAAGC TGCTAACTA	CCAGAGGGAGT GAATCCAGATTA	248
Human-E-cad	AAAGGCCCATTT CCTAAAAACCT	TGCGTTCTCTATC CAGAGGCT	172
Human-GAPDH	GGAGCGAGATCC CTCCAAAAT	GGCTGTTGTCAT ACTTCTCATGG	197