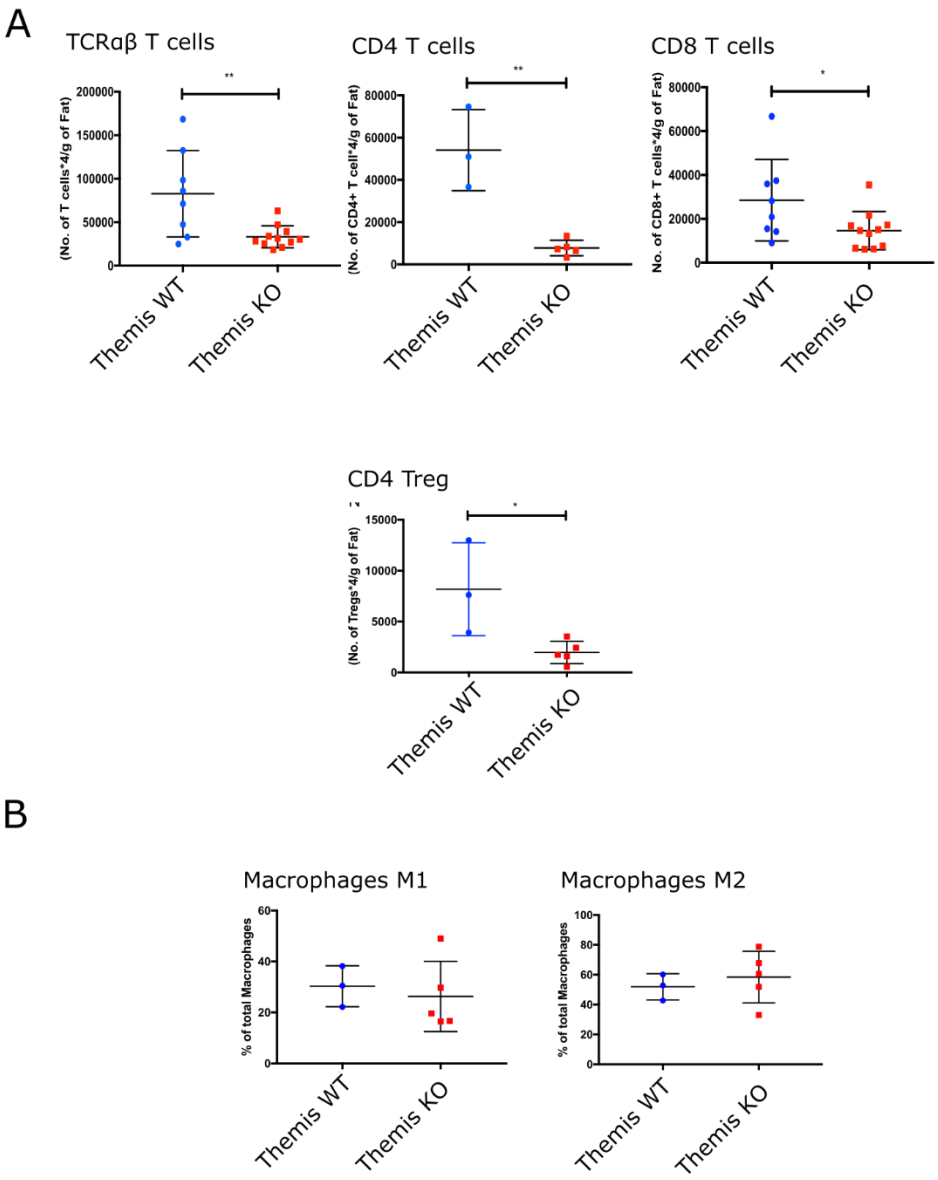
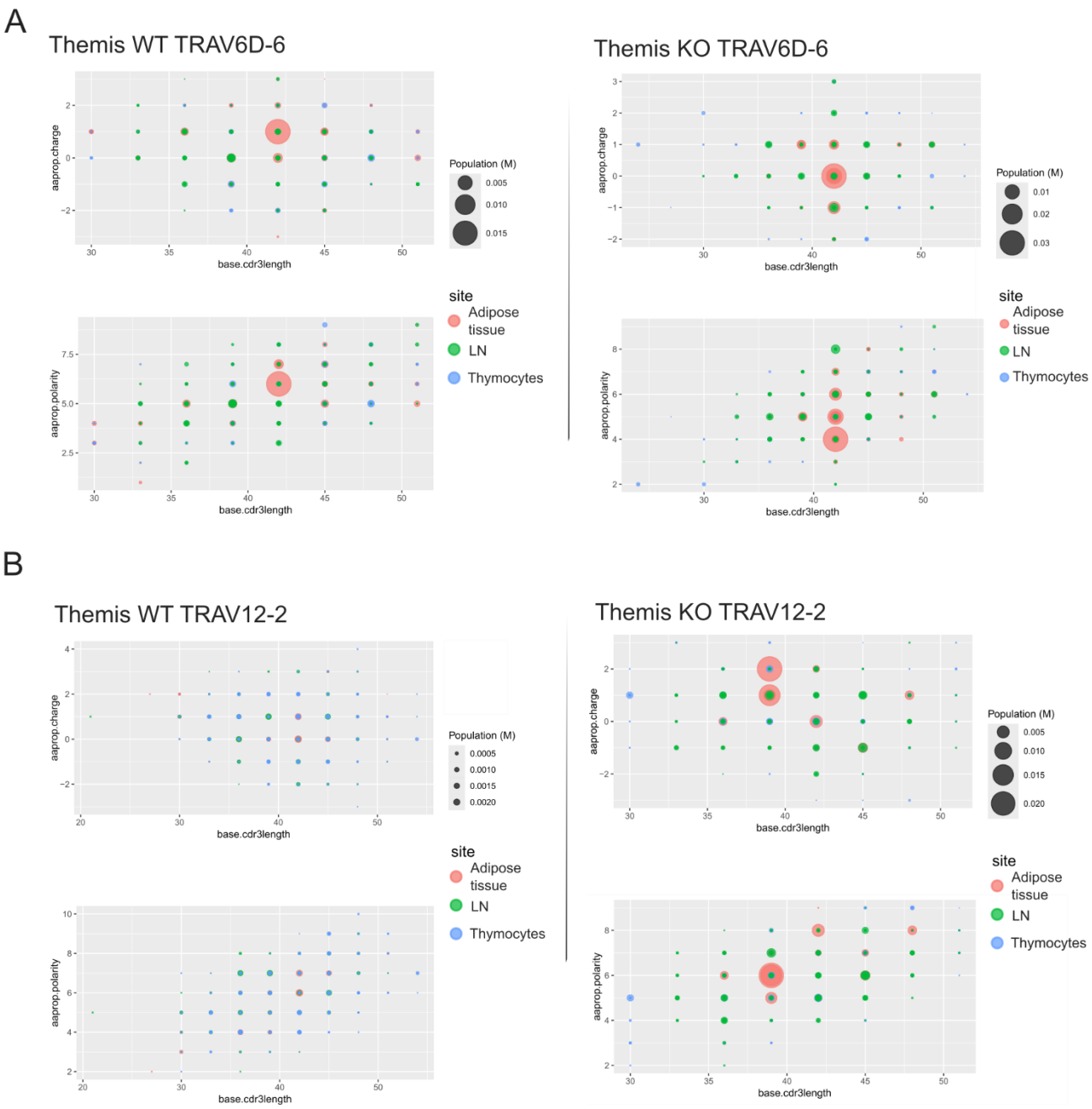
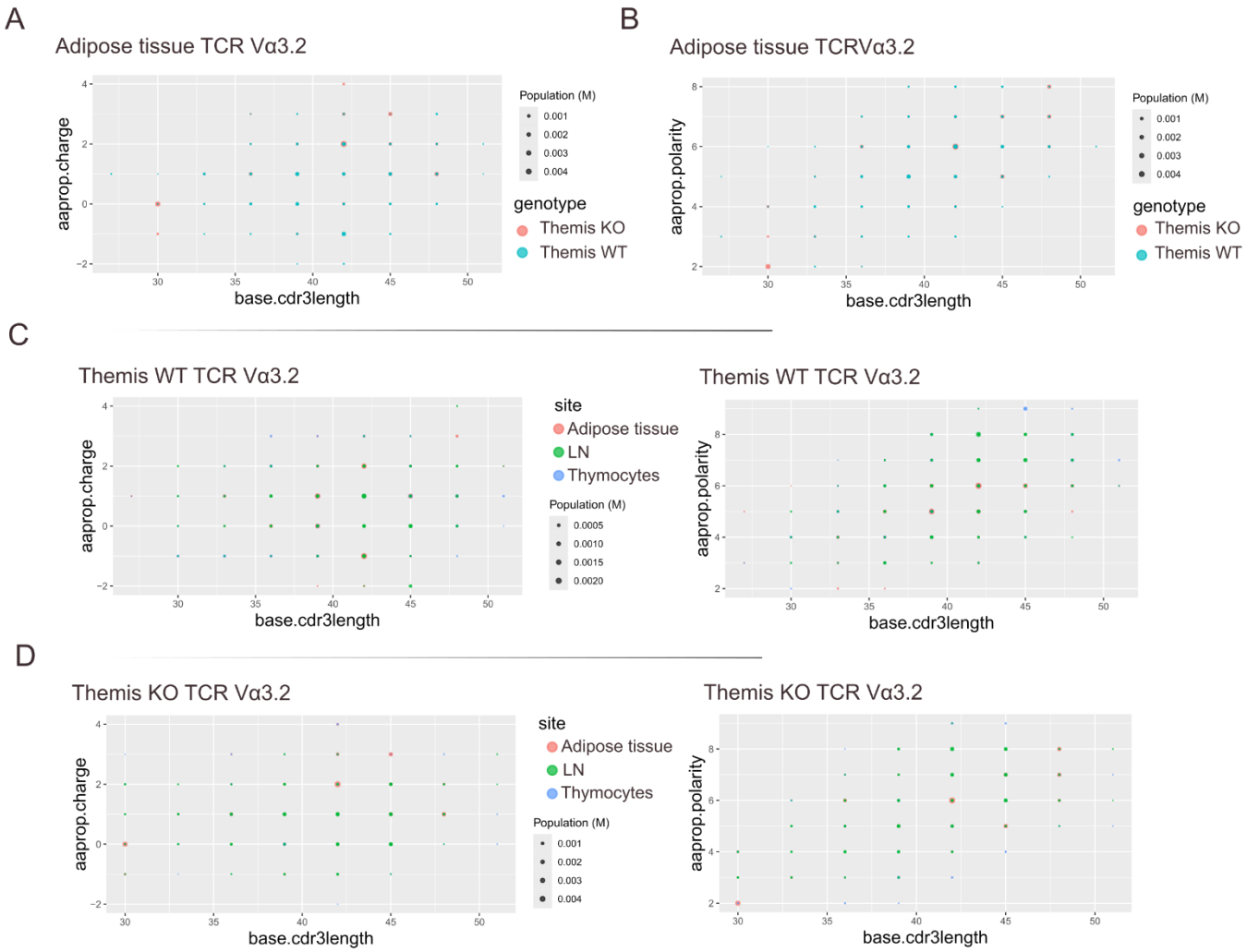


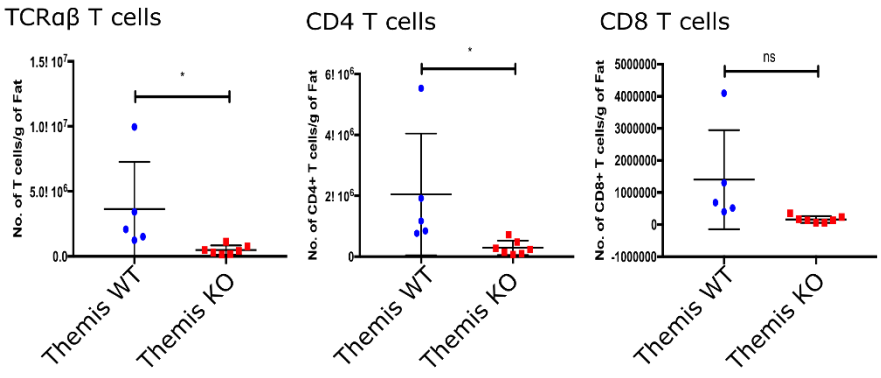
Supplementary Figure 1. A. Numbers of T cells calculated per gram of VAT in *Themis* WT and KO mice on HFD**. B**. Proportions of (F) M1 and (G) M2 macrophages in VAT of *Themis* WT and KO mice on HFD**.**



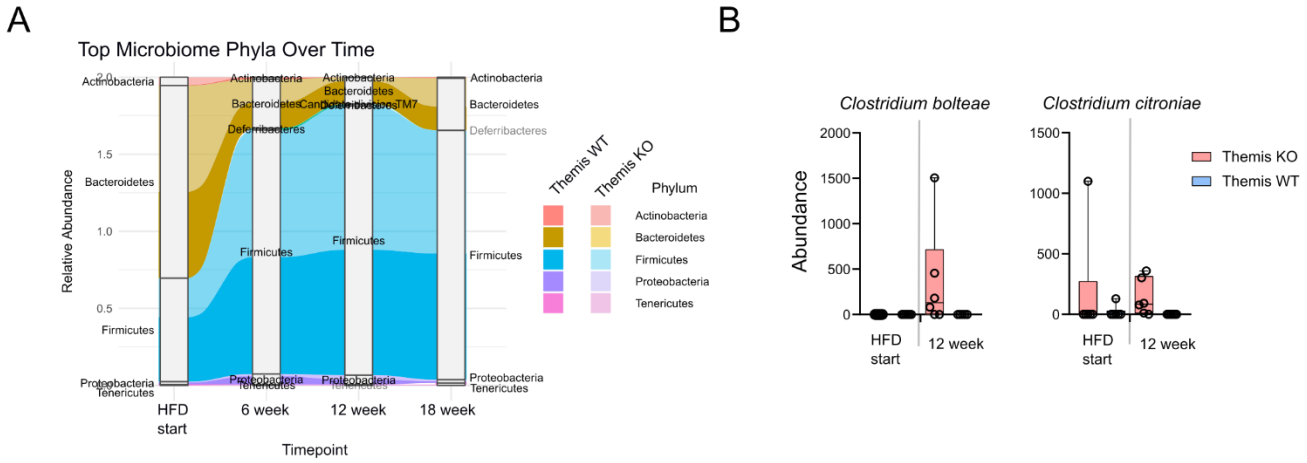
Supplementary Figure 2. A. Physical properties (charge and polarity) and CDR3 length of TRAV6D-6 TCRs from adipose tissue, thymocytes, and lymph nodes, comparing *Themis* WT and KO repertoires. **B.** Physical properties (charge and polarity) and CDR3 length of TRAV12-2 TCRs from adipose tissue, thymocytes, and lymph nodes, comparing *Themis* WT and KO repertoires.



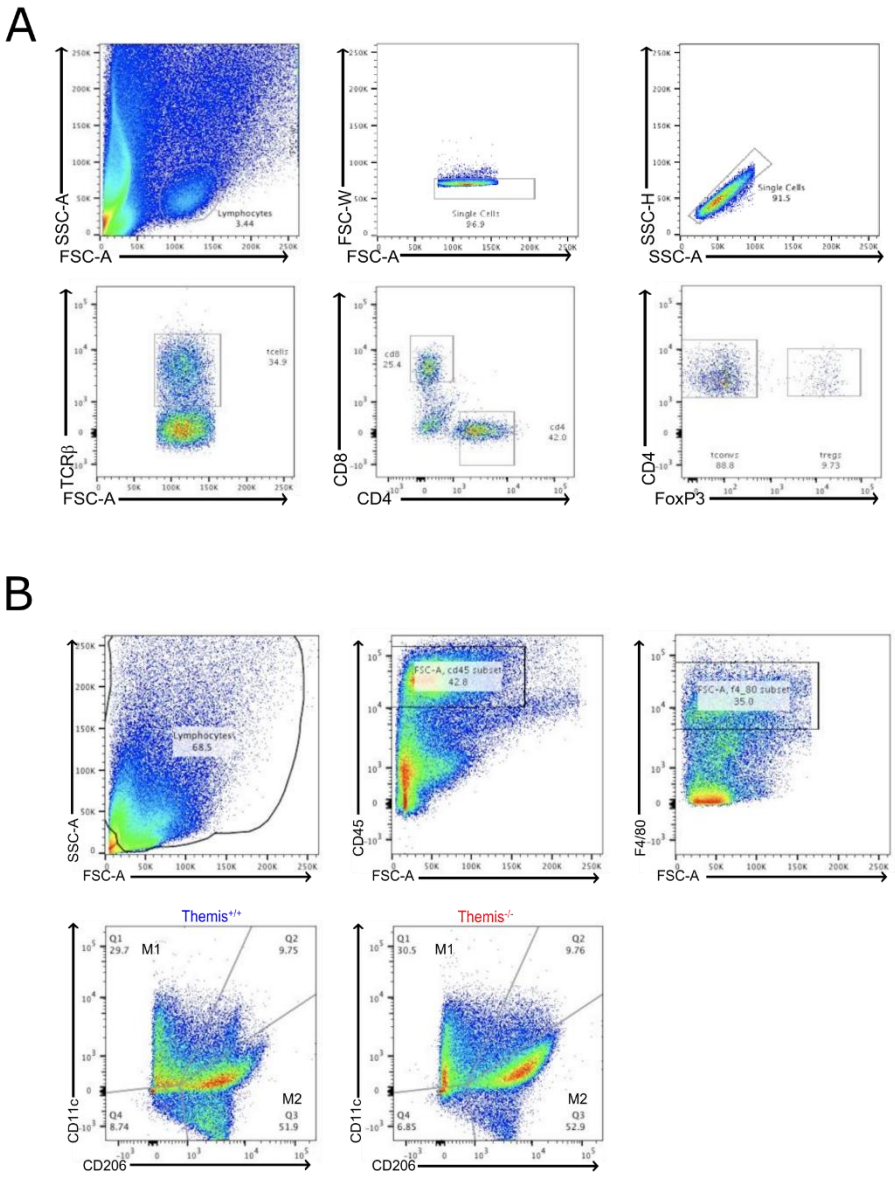
Supplementary Figure 3. A. Charge and **B.** polarity together with CDR3 length distribution of TRAV9N-3/Vα3.2 TCRs from adipose tissue, illustrating the frequency variation between *Themis* WT and KO genotypes. **C.** Physical properties (hydrophobicity and CDR3 length) of TRAV9N-3/Vα3.2 TCRs from adipose tissue, thymocytes, and lymph nodes of *Themis* WT. **D.** Physical properties (hydrophobicity and CDR3 length) of TRAV9N-3/Vα3.2 TCRs from adipose tissue, thymocytes, and lymph nodes of *Themis* KO.



Supplementary Figure 4. The total numbers of TCRαβ T cells, CD4 T cells and CD8 T cells per gram of fat in VAT of germ-free mice conventionalized with microbiomes derived from *Themis* WT and KO mice on HFD.



Supplementary Figure 5. A. Relative abundance of major microbiome Phyla over time. **B.** Abundance of *Clostridium bolteae* and *Clostridium citroniae* at the base line (HFD start) and after 12 weeks of HFD within microbiomes derived from *Themis* WT and KO models.



Supplementary Figure 6. Gating strategy for analyzing VAT-derived **A.** TCRαβ T cells and **B.** Macrophages

		WT	KO	p-value
ORGAN WEIGHT(grams)	Spleen	0.14	0.14	0.98
	Pancreas	0.54	0.95	0.024
	Liver	3.86	2.58	0.04
	Stomach	0.39	0.57	0.029
	VAT	1.23	2.48	0.0031
	Cecum	0.35	0.46	0.17
	Left Kidney	0.25	0.25	0.89
	Right Kidney	0.22	0.25	0.14
	Brain	0.44	0.44	0.99
	Heart	0.17	0.18	0.30
ORGAN SIZE/AREA (cm^2)	Spleen	0.65	0.57	0.55
	Liver	9.84	8.87	0.51
	Stomach	0.77	1.51	0.052
	Small Intestines	38.20	38.86	0.73
	Large Intestines	8.60	7.17	0.0031
	Left Kidney	0.55	0.59	0.68
	Right Kidney	0.50	0.55	0.50
	Heart	0.45	0.57	0.07
BLOOD BIOCHEMISTRY	ALB (g/dL)	3.54	3.45	0.78
	ALP (U/L)	121.8	82.5	0.11
	ALT (U/L)	328.4	52	0.014
	AMY (U/L)	1068.2	1004	0.72
	TBIL (mg/dL)	0.3	0.3	0
	BUN (mg/dL)	16.6	26	0.0041
	CA (mg/dL)	10.68	10.1	0.14
	PHOS (mg/dL)	6.24	6.4	0.73
	CRE (mg/dL)	0.22	0.35	0.20
	Na (mM)	167.8	169.5	0.19
	K (mM)	6.8	6.5	0.50
	TP (g/dL)	6.92	5.75	0.0091
	GLOB (g/dL)	3.4	2.4	0.0008

Supplementary Table 1. Necropsy and blood biochemistry results from germ free conventionalized with Themis$^{-/-}$ and Themis$^{+/+}$ microbiome. Statistically significant differences have been highlighted in yellow.