Table S1. A summary of Software used for data analysis

Software	Source
R	https://www.r-project.org
Bioconductor	https://www.bioconductor.org
Cell Ranger	https://support.10xgenomics.com/single-cell-gene-expression/software
Seurat	https://satijalab.org/seurat
COATES	https://www.gsea-msigdb.org/gsea/msigdb/cards/COATES_MACROPHAGE_M1_VS_M2_DN

Table S2. Clinical information of 30 patients related to Figure 8A

Patients	Gender	Age(years old)	Tumor types	Maximum tumor size(cm)	AJCC stage
C1	Female	73	CRC	3.5	II
C2	Male	40	CRC	3.5	III
C3	Male	57	CRC	3	III
C4	Male	55	CRC	3	II
C5	Male	63	CRC	4.5	III
C6	Male	66	CRC	2.5	III
C7	Female	37	CRC	4	III
C8	Male	34	CRC	3.5	III
C9	Male	60	CRC	5	III
C10	Male	52	CRC	4.5	II
G1	Female	55	GC	2.5	II
G2	Male	70	GC	6.5	III
G3	Male	58	GC	2.7	III
G4	Male	66	GC	4	III
G5	Male	33	GC	8	III
G6	Male	64	GC	2	I
G7	Male	40	GC	1	III
G8	Male	66	GC	4	III
G9	Female	67	GC	5	III
G10	Male	52	GC	8.5	III
H1	Male	75	HCC	6.5	II
H2	Female	77	HCC	2.3	I
H3	Male	54	HCC	5.5	III
H4	Female	69	HCC	3.5	II
H5	Male	60	HCC	17	III
H6	Male	75	HCC	6.5	II
H7	Female	60	HCC	7	II
H8	Male	57	HCC	2	I
H9	Male	62	HCC	6.5	II
H10	Male	47	HCC	4.6	I

Table S3. Clinical information of 19 patients related to Figure 8D

Patients	Gender	Age(years old)	Tumor types	Maximum tumor size(cm)	AJCC stage	Sensitive (Yes or No)
PC1	Male	72	CRC	4	IV	Yes
PC2	Male	61	CRC	5	IV	Yes
PC3	Male	58	CRC	5.2	IV	Yes
PC4	Female	52	CRC	2.8	IV	Yes
PC5	Male	47	CRC	7	IV	Yes
PC6	Male	65	CRC	5	IV	Yes
PC7	Male	51	CRC	7	IV	No
PC8	Male	66	CRC	2.6	IV	No
PC9	Male	58	CRC	4	IV	No
PC10	Female	39	CRC	5.5	IV	No
PC11	Male	42	CRC	3	IV	No
PC12	Female	61	CRC	4.5	IV	No
PC13	Male	70	CRC	5	IV	No
PC14	Female	67	CRC	5.2	IV	No
PG1	Female	65	GC	3	IV	Yes
PG2	Female	72	GC	2	IV	No
PH1	Male	70	HCC	3.3	II	Yes
PH2	Male	55	HCC	8	III	Yes
PH3	Male	45	HCC	10.1	III	No

Table S4. Correlations of Anti-PD-1 response and clinical characteristics of 19 cancer patients

Variables	Anti-PD-1 sensitive (n = 9)	Anti-PD-1 resistant (n = 10)	p value
Gender			0.40515
Male	7	6	
Female	2	4	
Age			0.80808
≤60	4	5	
＞60	5	5	
Tumor size			0.76418
≤4cm	3	4	
＞4cm	6	6	
TNM stage			0.27879
I/II	1	0	
III/VI	8	10	
Distant metastasis			0.46577
No	2	1	
Yes	7	9	

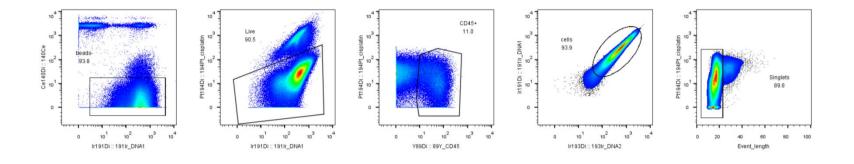Figure S1: Mass spectrometry flow processing steps.

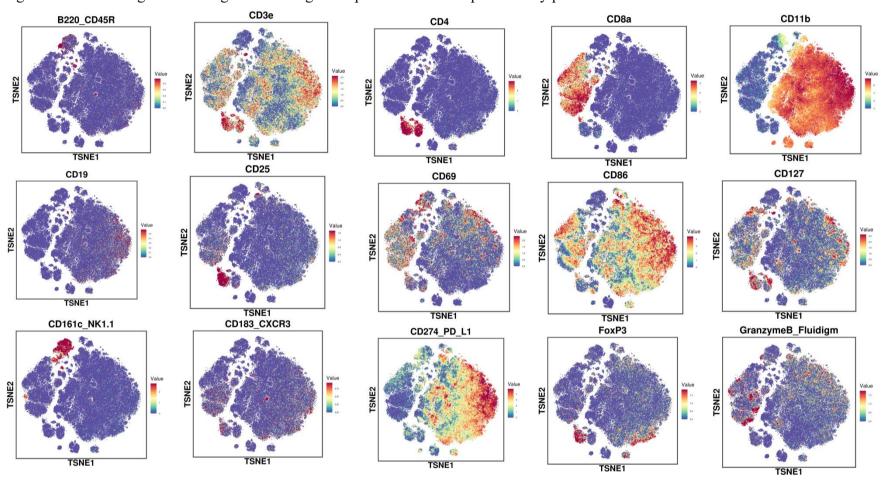Figure S2: TSNE diagram showing the marker gene expression in mass spectrometry process.

Figure S3: (A) Immunohistochemistry was used to confirm the expression of C1QC and CCR2 in tissues of the three cancer models with Apoe$^{+/+}$ and Apoe$^{-/-}$ mice. (B) Immunohistochemistry was used to confirm the expression of CD86, CD206, C1QC and CCR2 in spleens of Apoe$^{+/+}$ and Apoe$^{-/-}$ mice without injection of cancer cells.