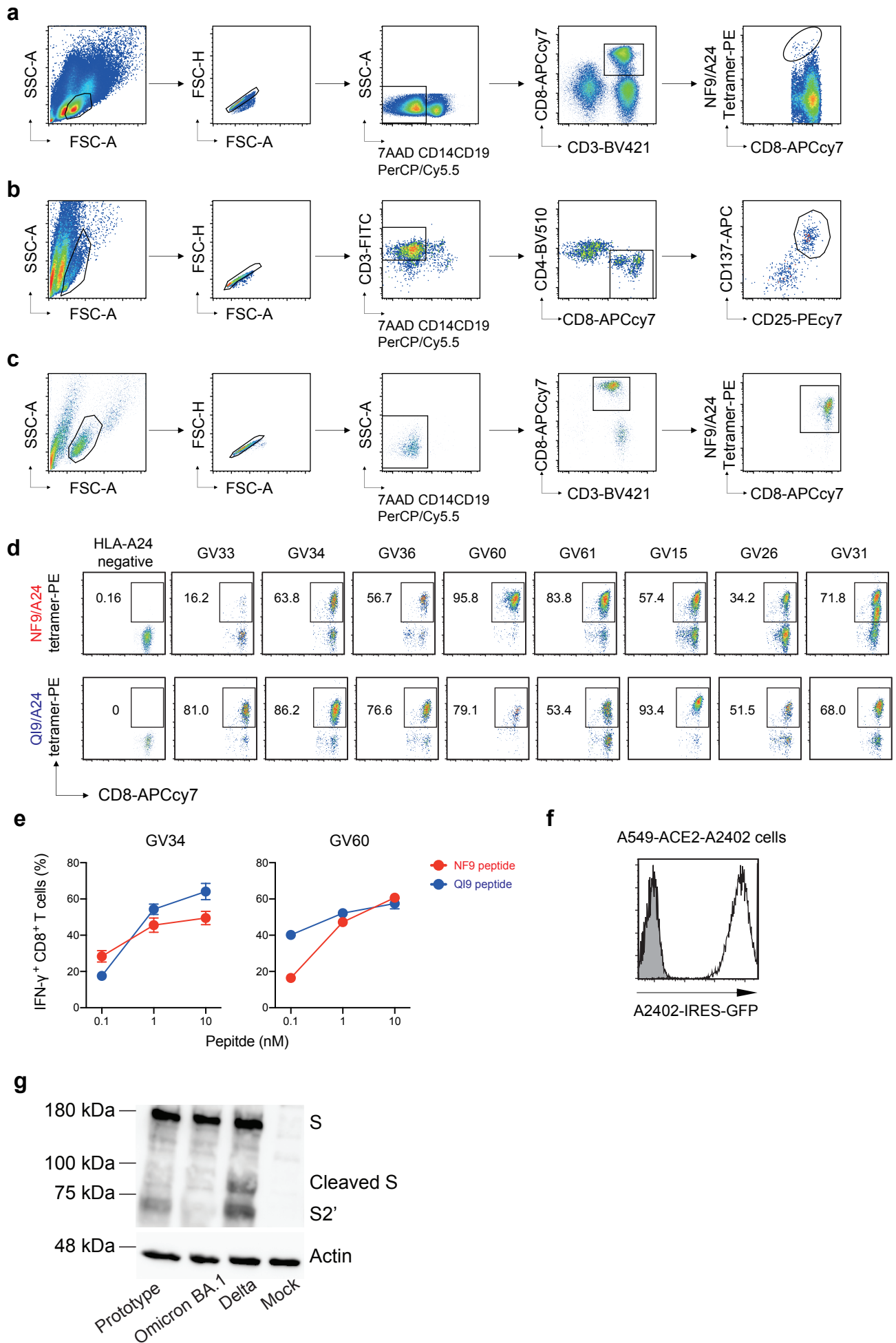
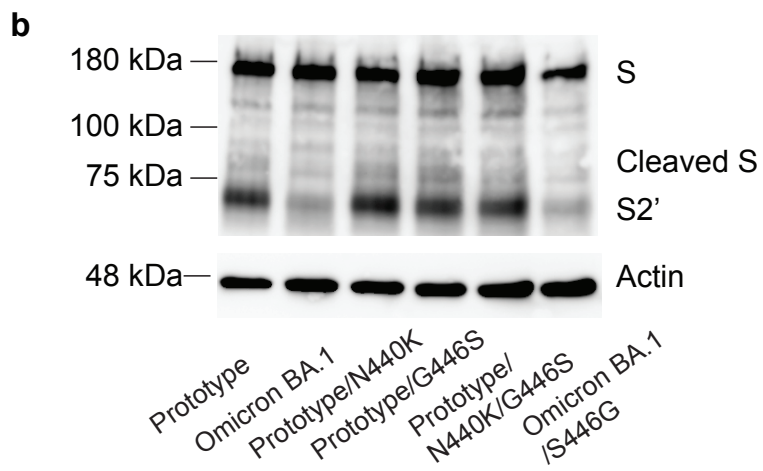
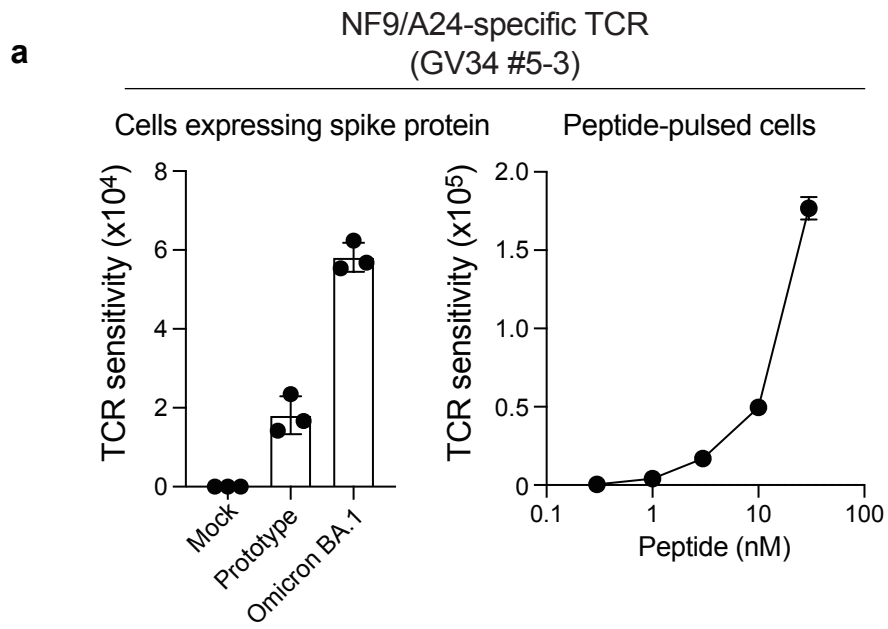


# Extended Data Fig. 1



# Extended Data Fig. 2



**Supplementary Table 1. Human PBMCs used in this study, related to Figure 1**

Donor ID	Sex	Age	HLA-A24?	vaccinated?	Days after two doses of vaccination
Vku19	Female	36	Positive	BNT162b2	21
GV1	Female	28	Positive	BNT162b2	9
GV4	Female	18	Negative	BNT162b2	20
GV5	Female	18	Positive	BNT162b2	20
GV6	Female	79	Positive	BNT162b2	21
GV9	Female	24	Positive	BNT162b2	21
GV10	Male	23	Positive	BNT162b2	22
GV11	Male	23	Positive	BNT162b2	22
GV12	Female	28	Negative	BNT162b2	23
GV13	Male	22	Positive	BNT162b2	21
GV14	Male	23	Positive	BNT162b2	22
GV15	Female	23	Positive	BNT162b2	21
GV16	Male	22	Positive	BNT162b2	22
GV17	Male	24	Negative	BNT162b2	21
GV19	Male	24	Positive	BNT162b2	22
GV20	Female	24	Positive	BNT162b2	22
GV21	Male	22	Positive	BNT162b2	21
GV22	Male	22	Positive	BNT162b2	22
GV23	Male	25	Positive	BNT162b2	22
GV24	Male	23	Positive	BNT162b2	22
GV25	Male	24	Negative	BNT162b2	22
GV26	Male	23	Positive	BNT162b2	22
GV27	Female	23	Negative	BNT162b2	21
GV28	Female	23	Positive	BNT162b2	21
GV29	Male	23	Positive	BNT162b2	21
GV31	Male	23	Positive	BNT162b2	22
GV32	Male	56	Positive	BNT162b2	27
GV33	Male	39	Positive	BNT162b2	24
GV34	Female	38	Positive	BNT162b2	24
GV35	Male	52	Positive	BNT162b2	24
GV36	Male	39	Positive	BNT162b2	24
GV51	Male	34	Positive	BNT162b2	30
GV59	Male	37	Positive	BNT162b2	126
GV60	Male	51	Positive	mRNA-1273	116
GV61	Female	36	Positive	mRNA-1273	107

**Supplementary Table 2. TCR sequences specific for the NF9/A24 and QI9/A24, related to Figure 3**

Specificity	ID	TRAV	TRAJ	CDR3 $\alpha$	TRBV	TRBJ	TRBD	CDR3 $\beta$
NF9/A24	GV34 #2-2	TRAV12-1*01	TRAJ33*01	CVVNALMDSNYQLIW	TRBV5-1*01	TRBJ2-7*01	TRBD1*01	CASSLGQGYEQYF
	GV34 #5-3	TRAV12-1*01	TRAJ33*01	CVVNLFDSDNYQLIW	TRBV2*01	TRBJ2-7*01	TRBD1*01	CASSEGAGYEQYF
	VKU19 #12-3	TRAV12-3*01	TRAJ44*01	CAFTGTASKLTF	TRBV7-8*01	TRBJ2-1*01	TRBD2*02	CASSELNEQFF
QI9/A24	GV33 #57	TRAV3*01	TRAJ8*01	CAGVLFNTGFQKLVF	TRBV20-1*02	TRBJ2-1*01	TRBD2*01	CSASDRGASGSFSNEQFF
	GV34 #43	TRAV21*01	TRAJ43*01	CAAPRYNNNDMRF	TRBV2*01	TRBJ2-2*01	TRBD1*01	CASSEGADAGELFF
	GV36 #10-2	TRAV19*01	TRAJ9*01	CALSEPPSGGKTIF	TRBV20-1*01	TRBJ1-1*01	TRBD1*01	CSARGQGLNTEAFF

**Supplementary Table 3. Primers for the construction of spike derivatives, related to Figures 3**

Product		Primer name	Sequence (5'-to-3')
Prototype spike	N440K	N440K Fwd	CAGCAACAAGCTGGACAGCAAGGTGG
		N440K Rev	CTGTCCAGCTTGTTGCTGTTCCAGGC
	N440K G446S	N440K G446S Fwd	GCAACAAGCTGGACAGCAAGGTGTCCGGCAACTACAAC
		N440K G446S Rev	GTTGCCGGACACCTTGCTGTCCAGCTTGTGCTGTTCC
	G446S	G446S Fwd	CAAGGTGTCCGGCAACTACAACCTCCTC
		G446S Rev	GTAGTTGCCGGACACCTTGCTGTCCAG
Omicron BA.1 spike	S446G	S446G Fwd	GACAGCAAGGTGGAGGCAACTACA
		S446G Rev	GCCTCCACCTTGCTGTCCAGCTTG