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Supplementary Information for

Lifelong CMV infection improves immune defense in old mice by broadening the mobilized TCR repertoire against third-party infection

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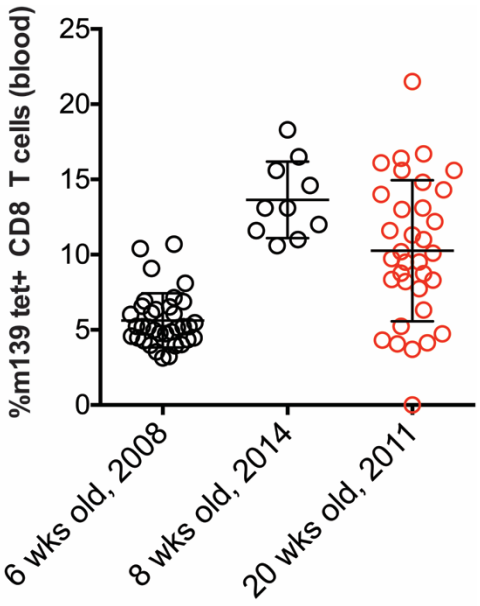

Fig. S1. Age of MCMV infection does not determine the magnitude of memory inflation over the lifespan. Steady state memory inflation in 17 month old mice was monitored in groups that had been infected with MCMV at 6, 8, or 20 weeks of age (n=35, n=10, n=34 respectively). Animals in the red dataset were used for this manuscript.

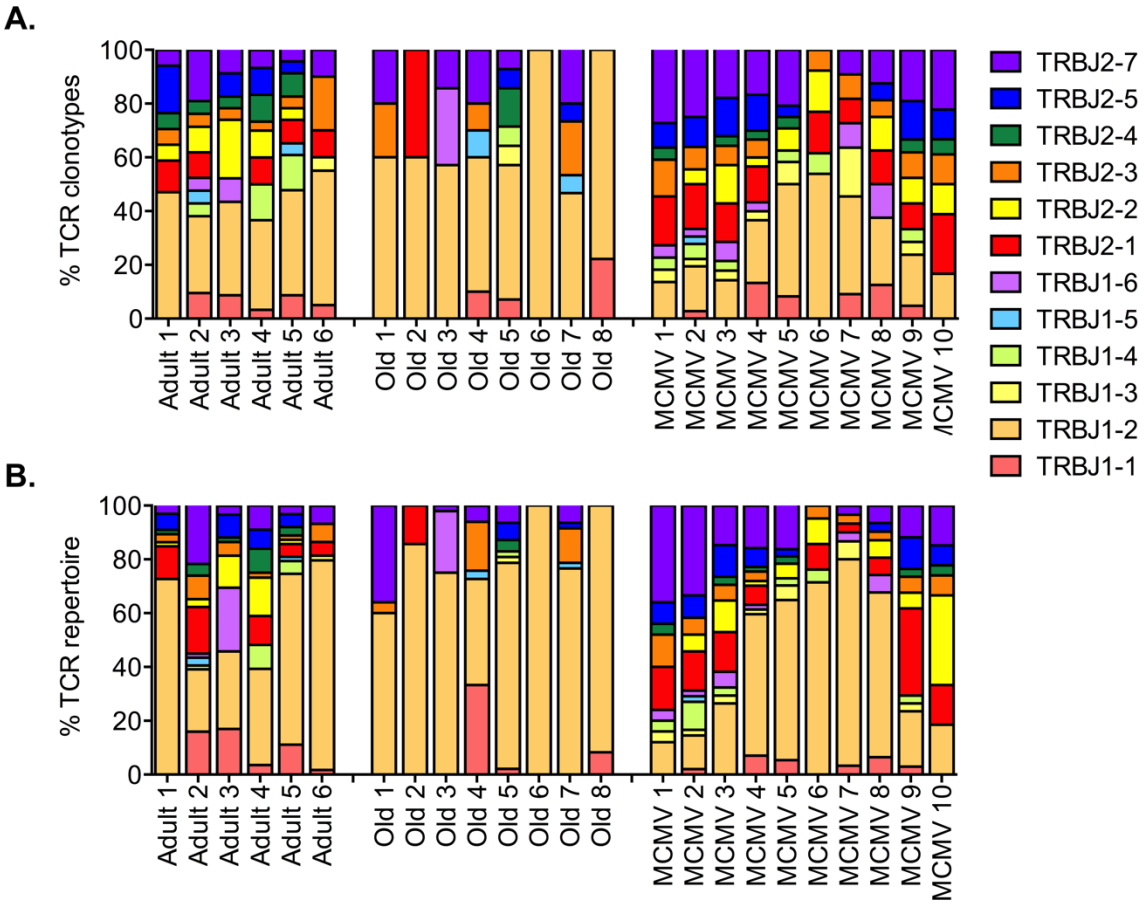

Fig. S2. MCMV+ mice show increased variability in their TRBJ gene choice.

Utilization of different TRBJ genes for the unique clonotypes (A) and the total repertoire (B) for each individual adult, old, and MCMV+ mouse are shown.

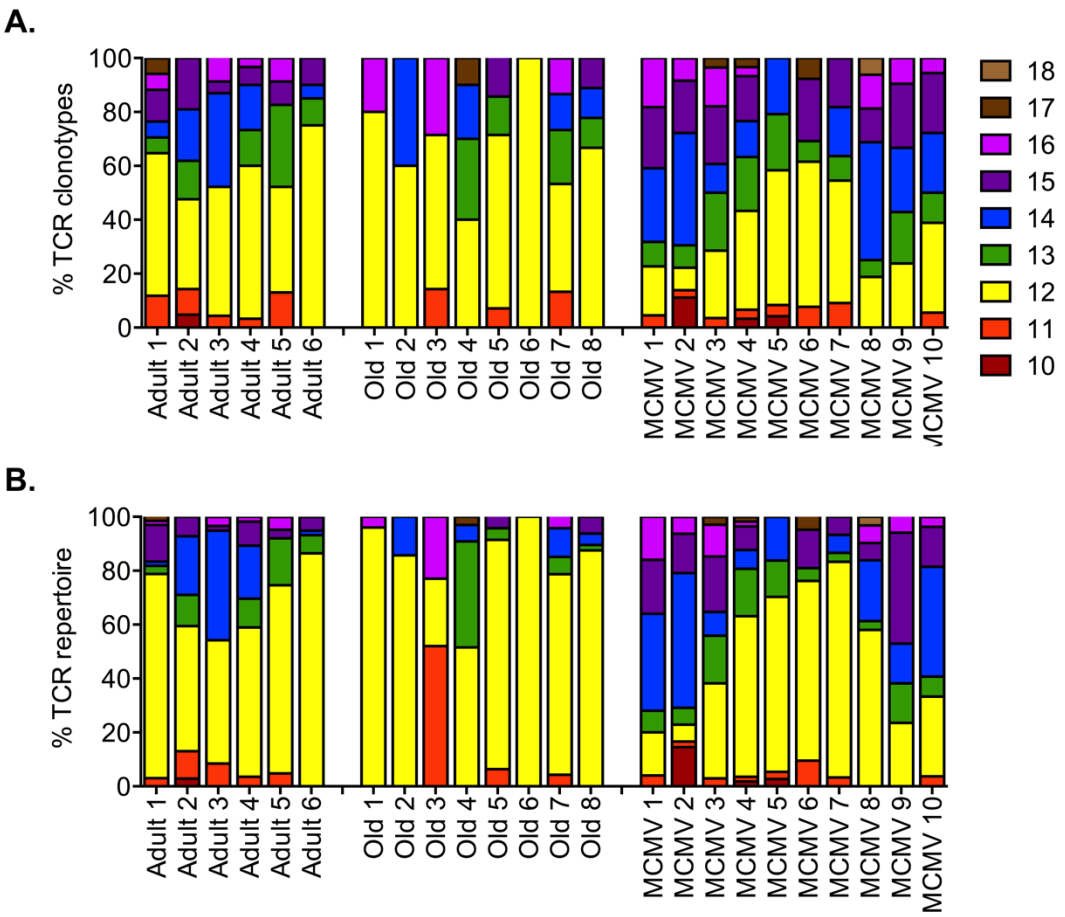

Fig. S3. MCMV+ mice show high variability in their CDR3 lengths in the OVA-specific TRBV12+ repertoire. The CDR3 amino acid length for unique clonotypes (A) and the total repertoire (B) for each individual adult, old, and MCMV+ mouse is shown.

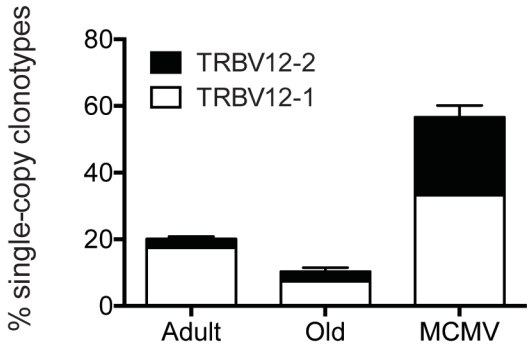

Fig. S4. Aging with MCMV infection results in the recruitment of many "single-copy" clonotypes into the OVA-specific repertoire. The frequency of clonotypes present as "single-copy" within the TRBV12-1+ or TRBV12-2+ OVA-specific CD8 repertoires of adult old, and MCMV+ old mice.

Table S1. Summary of the data used to compare TRBV12+ TCRβ clonotypes (amino acid sequences) for the OVA-specific CD8 T cell response to Lm-OVA infection in adult, old, and old mice with lifelong-MCMV infection ("MCMV").

Parameter	Adult (12 wk old)	Old (20 mo old)	MCMV+ (20 mo old, 15 w/ MCMV)
Number of mice	6	8	10
Total number of TCRβ sequences across all mice	372	325	344
Range of number of TCRβ sequences per mouse	56-69	25-48	21-57
Mean number of TCRβ sequences per mouse	62	40.4	34.4

Table S2. Examples of alignments of TCR sequences with the TCR genes, showing the extent of germline encoding of the PR motif for several shared clonotypes, including some using genes other than TRBJ1-2. Blue =TRBV encoded, green = TRBJ encoded, red = TRBD encoded, black = non-template additions.

													No. of n-additions	No. of mice
	C	A	S	S	**P**	**R**	A	S	D	Y	T	F		10
	tgt	gcc	agc	tcc	ccc	agg	gcc	tcc	gac	tac	acc	ttc	4	4
	tgt	gcc	agc	tct	ccc	agg	gcc	tcc	gac	tac	acc	ttc	2	3
	tgt	gcc	agc	tct	cca	cgg	gcc	tcc	gac	tac	acc	ttc	3	2
	tgt	gcc	agc	tcc	ccc	cgg	gcc	tcc	gac	tac	acc	ttc	5	2
	tgt	gcc	agc	tct	ccc	agg	gcc	tcc	gac	tac	acc	ttc	4	1
	C	A	S	S	**P**	**R**	A	T	D	Y	T	F		9
	tgt	gcc	agc	tct	ccg	cgg	gct	acc	gac	tac	acc	ttc	5	9
	tgt	gcc	agc	tct	ccg	cgg	gcg	acc	gac	tac	acc	ttc	5	1
	C	A	S	S	**P**	**R**	D	S	D	Y	T	F		9
	tgt	gcc	agc	tct	ccc	agg	gac	tcc	gac	tac	acc	ttc	1	4
	tgt	gcc	agc	tct	cca	agg	gac	tcc	gac	tac	acc	ttc	2	3
	tgt	gcc	agc	tcc	ccc	agg	gac	tcc	gac	tac	acc	ttc	3	3
	tgt	gcc	agc	tct	ccc	agg	gat	tcc	gac	tac	acc	ttc	3	1
	tgt	gcc	agc	tcc	ccc	cgg	gac	tcc	gac	tac	acc	ttc	5	1
	tgt	gcc	agc	tcc	ccc	cgg	gac	tcc	gac	tac	acc	ttc	6	1
	C	A	S	S	**P**	**R**	G	P	D	Y	T	F		7
	tgt	gcc	agc	tcc	ccc	aga	ggg	ccc	gac	tac	acc	ttc	7	2
	tgt	gcc	agc	tct	ccc	agg	gga	ccc	gac	tac	acc	ttc	3	1
	tgt	gcc	agc	tct	ccc	cgg	ggg	ccc	gac	tac	acc	ttc	3	1
	tgt	gcc	agc	tct	ccc	cgg	gga	ccc	gac	tac	acc	ttc	4	1
	tgt	gcc	agc	tct	cct	agg	gga	ccc	gac	tac	acc	ttc	4	1
	tgt	gcc	agc	tcc	ccc	agg	gga	ccc	gac	tac	acc	ttc	5	1
	tgt	gcc	agc	tct	ccc	cgc	ggg	ccc	gac	tac	acc	ttc	5	1
	C	A	S	S	**P**	**R**	G	T	D	Y	T	F		5
	tgt	gcc	agc	tct	ccc	cgg	ggg	acc	gac	tac	acc	ttc	4	4
	tgt	gcc	agc	tct	ccg	cgg	ggt	acc	gac	tac	acc	ttc	5	2
	tgt	gcc	agc	tct	ccc	cgg	ggc	acc	gac	tac	acc	ttc	4	1
	tgt	gcc	agc	tct	ccc	cgg	gga	acc	gac	tac	acc	ttc	5	1
	tgt	gcc	agc	tct	ccc	cgg	ggt	acc	gac	tac	acc	ttc	5	1
	C	A	S	S	**P**	**R**	N	S	D	Y	T	F		5
	tgt	gcc	agc	tct	ccc	agg	aac	tcc	gac	tac	acc	ttc	1	3
	tgt	gcc	agc	tcc	ccc	aga	aac	tcc	gac	tac	acc	ttc	3	1
	tgt	gcc	agc	tcg	cca	aga	aac	tcc	gac	tac	acc	ttc	4	1
	tgt	gcc	agc	tct	cca	aga	aac	tcc	gac	tac	acc	ttc	2	1
	C	A	S	S	**P**	**R**	K	T	D	Y	T	F		5
	tgt	gcc	agc	tct	ccc	cga	aag	acc	gac	tac	acc	ttc	7	5
TRBV12-1	**tgt**	**gcc**	**agc**	**tct**	**ctc**									
					TRBD1: gggacaggggc			**TRBD2: gggactgggggggc**						
						ca	**aac**	**tcc**	**gac**	**tac**	**acc**	**ttc**	**TRBJ1-2**	

	C	A	S	S	**P**	**R**	N	T	E	V	T	F		4
	tgt	gcc	agc	tct	cca	cga	aac	aca	gaa	gtc	ttc	ttt	2	3
	tgt	gcc	agc	tcc	ccg	aga	aac	aca	gaa	gtc	ttc	ttt	4	1
TRBV12-1	**tgt**	**gcc**	**agc**	**tct**	**ctc**									
					TRBD1: gggacaggggc			**TRBD2: gggactgggggggc**						
						ca	**aac**	**aca**	**gaa**	**gtc**	**ttc**	**ttt**	**TRBJ1-1**	

	C	A	S	S	**P**	**R**	E	D	T	Q	Y	F		3
	tgt	gcc	agc	tct	ccc	cgg	gaa	gac	acc	cag	tac	ttt	3	1
	tgt	gcc	agc	tcc	ccc	agg	gaa	gac	acc	cag	tac	ttt	3	1
	tgt	gcc	agc	tcc	ccg	cga	gaa	gac	acc	cag	tac	ttt	4	1
TRBV12-1	**tgt**	**gcc**	**agc**	**tct**	**ctc**									
					TRBD1: gggacaggggc			**TRBD2: gggactgggggggc**						
						aac	**caa**	**gac**	**acc**	**cag**	**tac**	**ttt**	**TRBJ2-5**	

Dataset S1. OVA-specific CDR3 sequences recovered from all animals.

Vb	CDR3b region (aa)	Jb	length	Number of copies																							# mice
				Adult_1	Adult_2	Adult_3	Adult_4	Adult_5	Adult_6	Old_1	Old_2	Old_3	Old_4	Old_5	Old_6	Old_7	Old_8	MCMV_1	MCMV_2	MCMV_3	MCMV_4	MCMV_5	MCMV_6	MCMV_7	MCMV_8	MCMV_9	MCMV_10	
TRBV12-1	CASSPRASDYTF	TRBJ1-2	12	1	0	0	5	1	0	4	0	4	1	0	0	0	33	0	0	0	0	0	1	19	3	0	0	10
TRBV12-1	CASSPRATDYTF	TRBJ1-2	12	30	0	0	0	2	26	0	0	0	0	0	0	0	0	1	0	6	18	6	0	1	0	1	0	9
TRBV12-1	CASSPRDSDYTF	TRBJ1-2	12	2	0	4	2	24	0	5	0	0	0	4	3	5	0	0	0	0	0	0	0	0	14	0	0	9
TRBV12-1	CASSPRGPDYTF	TRBJ1-2	12	0	0	0	0	0	2	0	0	0	3	22	0	0	1	0	0	0	0	0	8	2	0	1	0	7
TRBV12-2	CASSLGGSYEQYF	TRBJ2-7	13	2	0	0	0	2	3	0	0	0	0	0	0	0	0	0	1	1	5	1	0	0	0	0	0	7
TRBV12-1	CASSRLGGDYAEQFF	TRBJ2-1	15	7	0	0	4	1	1	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	6
TRBV12-1	CASSPRGTDYTF	TRBJ1-2	12	3	0	0	0	1	10	0	0	0	0	0	0	0	0	0	0	0	7	6	0	0	0	0	0	5
TRBV12-1	CASSPRKTDYTF	TRBJ1-2	12	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	5
TRBV12-1	CASSPRNSDYTF	TRBJ1-2	12	0	5	0	1	1	0	0	0	0	0	0	12	1	0	0	0	0	0	0	0	0	0	0	0	5
TRBV12-1	CASSPRNTEVFF	TRBJ1-1	12	0	10	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	4
TRBV12-1	CASSGRNSDYTF	TRBJ1-2	12	8	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	4
TRBV12-1	CASSSRAETLYF	TRBJ2-3	12	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	4
TRBV12-1	CASSGQNTLYF	TRBJ2-4	11	1	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	4
TRBV12-2	CASSPGLGGYEQYF	TRBJ2-7	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	2	0	0	0	1	0	4
TRBV12-1	CASSPRDTEVFF	TRBJ1-1	12	0	0	0	2	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
TRBV12-1	CASSRANSDYTF	TRBJ1-2	12	0	0	1	0	0	0	0	17	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3
TRBV12-1	CASSRQGPTGQLYF	TRBJ2-2	14	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	3
TRBV12-1	CASSPREDTQYF	TRBJ2-5	12	0	0	0	1	3	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
TRBV12-1	CASPPRATDYTF	TRBJ1-2	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2
TRBV12-1	CASSGRGSDYTF	TRBJ1-2	12	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
TRBV12-1	CASSNRQSDYTF	TRBJ1-2	12	0	0	0	0	0	0	0	0	0	2	0	14	0	0	0	0	0	0	0	0	0	0	0	0	2
TRBV12-1	CASSPRDTDYTF	TRBJ1-2	12	0	0	0	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
TRBV12-1	CASSPRETDYTF	TRBJ1-2	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2
TRBV12-1	CASSPRQSDYTF	TRBJ1-2	12	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	2
TRBV12-1	CASSPRRSDYTF	TRBJ1-2	12	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
TRBV12-1	CASSPRSPDYTF	TRBJ1-2	12	0	0	0	0	0	0	0	18	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	2
TRBV12-1	CASSPYKNSDYTF	TRBJ1-2	13	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
TRBV12-1	CASSRRDSDYTF	TRBJ1-2	12	0	0	1	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	2
TRBV12-1	CASSRRGPDYTF	TRBJ1-2	12	0	0	0	0	0	0	0	0	1	0	0	0	22	0	0	0	0	0	0	0	0	0	0	0	2
TRBV12-1	CASSPRAERLFF	TRBJ1-4	12	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
TRBV12-1	CASSLGQGNYAEQFF	TRBJ2-1	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	2
TRBV12-1	CASSLGQGYAEQFF	TRBJ2-1	14	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
TRBV12-1	CASSPRGDEQYF	TRBJ2-7	12	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
TRBV12-1	CASSPRNYEQYF	TRBJ2-7	12	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
TRBV12-2	CASSLGQGDTQYF	TRBJ2-5	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	2
TRBV12-2	CASSGYEQYF	TRBJ2-7	10	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
TRBV12-1	CASSPRAGTNSDYTF	TRBJ1-2	15	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSSRGPTQYF	TRBJ2-5	12	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRAPDYTF	TRBJ1-2	12	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSLGLGGHYAEQFF	TRBJ2-1	16	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSLEAGGNNQDTQYF	TRBJ2-5	17	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSLRGGQYF	TRBJ2-5	11	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSPRVNYAEQFF	TRBJ2-1	14	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSGAETLYF	TRBJ2-3	11	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRQNTLYF	TRBJ2-4	12	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRKNSDYTF	TRBJ1-2	13	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSLFSGGAREQYF	TRBJ2-7	15	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSLGQGQAPLF	TRBJ1-5	13	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSLGRTTYEQYF	TRBJ2-7	14	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSSANSDYTF	TRBJ1-2	12	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRPGGDERLFF	TRBJ1-4	15	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRTSDYTF	TRBJ1-2	12	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSLGQYNSPLYF	TRBJ1-6	14	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSDNTEVFF	TRBJ1-1	11	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPGTGWNAEQFF	TRBJ2-1	15	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSLSANTGQLYF	TRBJ2-2	14	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSLDWGNTGQLYF	TRBJ2-2	15	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRGDNSPLYF	TRBJ1-6	14	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSRRSDYTF	TRBJ1-2	11	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSRLQDTQYF	TRBJ2-5	12	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPGAATGQLYF	TRBJ2-2	14	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSSRKETLYF	TRBJ2-3	12	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPWVANSDYTF	TRBJ1-2	14	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRDTNYTF	TRBJ1-2	12	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSRRNTEVFF	TRBJ1-1	12	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSLGTGTDALYF	TRBJ1-6	14	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPGAATEQLYF	TRBJ2-2	14	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

TRBV12-1	CASSPGAGTDALYF	TRBJ2-2	14	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRTGESQNTLYF	TRBJ2-4	16	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSLGTGTDTQYF	TRBJ2-5	14	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSEGTYEQYF	TRBJ2-7	12	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSLDSGSNTGQLYF	TRBJ2-2	16	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSLETGGSSDYTF	TRBJ1-2	15	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRGPEQYF	TRBJ2-7	12	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPGAGTGALYF	TRBJ2-2	14	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPQGRTGQLYF	TRBJ2-2	14	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRGNEQYF	TRBJ2-7	12	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSLRNSDYTF	TRBJ1-2	12	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSRQGRSDYTF	TRBJ1-2	13	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSSGQGYSDYTF	TRBJ1-2	14	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSTGRGSDYTF	TRBJ1-2	13	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRENTLYF	TRBJ2-4	12	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRKDTQYF	TRBJ2-5	12	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRASNYTF	TRBJ1-2	12	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRDDDYTF	TRBJ1-2	12	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRAEKLFF	TRBJ1-4	12	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRAESLFF	TRBJ1-4	12	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRAYKLFF	TRBJ1-4	12	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSRTGGARYAEQFF	TRBJ2-1	16	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPQGRNGQLYF	TRBJ2-2	14	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPQGTNWQLYF	TRBJ2-2	14	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRETEFFF	TRBJ2-3	12	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSSTGPNTLYF	TRBJ2-4	13	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSRLGGDQDTQYF	TRBJ2-5	15	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSLGTGTLEQYF	TRBJ2-7	14	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSRTGHAEQFF	TRBJ2-1	13	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASNRNANSDYTF	TRBJ1-2	13	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSRQGGADYTF	TRBJ1-2	13	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSRTGGARDAEQFF	TRBJ2-1	16	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRDTEFFF	TRBJ1-1	12	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSRGANSDYTF	TRBJ1-2	13	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSGNERLFF	TRBJ1-4	11	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSLEPGGNERLFF	TRBJ1-4	15	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPDNYQAPLF	TRBJ1-5	13	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSTANTGQLYF	TRBJ2-2	13	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSSQGHKRCYF	TRBJ2-3	13	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSRRDTLYF	TRBJ2-4	11	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSRDLLISNERLFF	TRBJ1-4	16	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRATDYNF	TRBJ1-2	12	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSRLGGDYAEHFF	TRBJ2-1	15	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSGRDSDYTF	TRBJ1-2	12	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRASDYAF	TRBJ1-2	12	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRDPDYTF	TRBJ1-2	12	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRGADYTF	TRBJ1-2	12	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRGTDYNF	TRBJ1-2	12	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPTNSGYTLYF	TRBJ1-3	14	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRAETLYF	TRBJ2-3	12	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRAKALYF	TRBJ2-3	12	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRATDFYF	TRBJ2-3	12	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRGTHDYF	TRBJ2-3	12	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSLRGTYEQYF	TRBJ2-7	13	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRSSDYTF	TRBJ1-2	12	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSRDRGGSAETLYF	TRBJ2-3	16	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSRANSNYTF	TRBJ1-2	12	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSLGGILAEQFF	TRBJ2-1	14	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASAGRSDYTF	TRBJ1-2	11	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSRGQDSYNSPLYF	TRBJ1-6	16	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSHGQDSYNSPLYF	TRBJ1-6	16	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSLDRYEQYF	TRBJ2-7	12	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRRDEVFF	TRBJ1-1	12	0	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRDNSDYTF	TRBJ1-2	13	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSTSSAETLYF	TRBJ2-3	13	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSTSSAETLYF	TRBJ1-2	13	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSSAGTGPNNQAPLF	TRBJ1-5	17	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSLGGRSYEQYF	TRBJ2-7	14	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSLGTGGREQYF	TRBJ2-7	14	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASAPRNSDYTF	TRBJ1-2	12	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSGRSDYTF	TRBJ1-2	11	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSRASYEQYF	TRBJ2-7	12	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSLADIEVFF	TRBJ1-1	12	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSGRSSDYTF	TRBJ1-2	12	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1

TRBV12-1	CASSPRGTRTTPF	TRBJ1-2	13	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSLGAGNTLYF	TRBJ1-3	13	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSMRPSTNERLFF	TRBJ1-4	15	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRRDTLYF	TRBJ2-4	12	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSLDWGAQNTLYF	TRBJ2-4	15	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CAAQTDRSDYTF	TRBJ1-2	12	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSNRASDYTF	TRBJ1-2	12	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSDKSSAETLYF	TRBJ2-3	14	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRESDYTF	TRBJ1-2	12	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSLYINQAPLF	TRBJ1-5	13	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSTGGQDTQYF	TRBJ2-5	13	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CAGGGAGKQYF	TRBJ2-7	11	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CAGGGAGKTLF	TRBJ2-7	11	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSLLRDFSSYEQYF	TRBJ2-7	16	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSLLGNSDYTF	TRBJ1-2	13	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSHGLGGDAETLYF	TRBJ2-3	16	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSLWDWGETLYF	TRBJ2-3	14	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRKEEVFF	TRBJ1-1	12	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSGRGPDYTF	TRBJ1-2	12	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSLDRTGWTDYTF	TRBJ1-2	15	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSDRSSAETLYF	TRBJ1-2	14	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPSGREEVFF	TRBJ1-1	13	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPQRSDYTF	TRBJ1-2	12	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSPGLGGSEQYF	TRBJ2-7	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSGRNSDYHF	TRBJ1-2	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSLGNSDYTF	TRBJ1-2	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPGTGGPYAEQFF	TRBJ2-1	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSRLGGDSAEQFF	TRBJ2-1	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSGLGGDAETLYF	TRBJ2-3	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSLVGGRAETLYF	TRBJ2-3	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSLVLGATAETLYF	TRBJ2-3	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSLEASQTTLYF	TRBJ2-4	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSLATGGHDTQYF	TRBJ2-5	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSLLGAHAQYF	TRBJ2-7	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPQSYEHYF	TRBJ2-7	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSRDNSGTSLYF	TRBJ1-3	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSLGQGSNERLFF	TRBJ1-4	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSDNSYNSPLYF	TRBJ1-6	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSEGAEQFF	TRBJ2-1	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSQGLGGPYAEQFF	TRBJ2-1	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSLGGAPGQDTQYF	TRBJ2-5	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSLGGSYAQYF	TRBJ2-7	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSPGLGGPEQYF	TRBJ2-7	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPTGPSYEQYF	TRBJ2-7	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSNERLFF	TRBJ1-4	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSLGGRTGQLYF	TRBJ2-2	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSTEANSDYTF	TRBJ1-2	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSLVGGSDYTF	TRBJ1-2	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRAADYHF	TRBJ1-2	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSPRTTNYTF	TRBJ1-2	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSRGGATNERLFF	TRBJ1-4	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSLRGYYAEQFF	TRBJ2-1	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSLWENYAEQFF	TRBJ2-1	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSLLGDAYALYF	TRBJ2-3	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSLFGGEQDTQYF	TRBJ2-5	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSSGTGLDTQYF	TRBJ2-5	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
TRBV12-1	CASSLRQSSYEQYF	TRBJ2-7	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSLNTEVFF	TRBJ1-1	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSTGTANSDYTF	TRBJ1-2	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSVGQDSGNTLYF	TRBJ1-3	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSLGTGVNQAPLF	TRBJ1-5	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSLGTNNSPLYF	TRBJ1-6	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSGGAIYAEQFF	TRBJ2-1	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSPDWGNYAEQFF	TRBJ2-1	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSPNWGGDAEQFF	TRBJ2-1	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSLGLGGTGQLYF	TRBJ2-2	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSLALGRSAETLYF	TRBJ2-3	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSLRDWGGGETLYF	TRBJ2-3	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSLATQYF	TRBJ2-5	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSSGTGVNQDTQYF	TRBJ2-5	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSALGVSYEQYF	TRBJ2-7	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSLDEQYF	TRBJ2-7	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSLGEQYF	TRBJ2-7	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
TRBV12-2	CASSLGLGGREQYF	TRBJ2-7	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1

TRBV12-2	CASSPGQGAYEQYF	TRBJ2-7	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
TRBV12-1	CASSLGWVPDYTF	TRBJ1-2	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
TRBV12-1	CASSSGQGAYERLFF	TRBJ1-4	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
TRBV12-1	CASSLLGDNSPLYF	TRBJ1-6	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
TRBV12-1	CASSPQGGYNSPLYF	TRBJ1-6	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
TRBV12-1	CASSLQGAEHFF	TRBJ2-1	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
TRBV12-1	CASSLQGAEQFF	TRBJ2-1	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
TRBV12-1	CASSLYAEQFF	TRBJ2-1	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
TRBV12-1	CASSPGTGDTGQLYF	TRBJ2-2	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
TRBV12-1	CASSTTGGSNTGQLYF	TRBJ2-2	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
TRBV12-1	CASSPDISQNTLYF	TRBJ2-4	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
TRBV12-1	CASSVRLGGDQDTQYF	TRBJ2-5	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
TRBV12-2	CASSLLDSANSDYTF	TRBJ1-2	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
TRBV12-2	CASSLERVHSGNTLYF	TRBJ1-3	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
TRBV12-2	CASSLDGLGGYTGQLYF	TRBJ2-2	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
TRBV12-2	CASSLDTGQLYF	TRBJ2-2	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
TRBV12-2	CASSLVGGRGAETLYF	TRBJ2-3	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
TRBV12-2	CASSLGNQDTQYF	TRBJ2-5	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
TRBV12-2	CASSLLGGQHTQYF	TRBJ2-5	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
TRBV12-2	CASSLDWGGADEQYF	TRBJ2-7	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
TRBV12-2	CASSLGGSYERYF	TRBJ2-7	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
TRBV12-2	CASSLLGGSEQYF	TRBJ2-7	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
TRBV12-2	CASSPTGNEQYF	TRBJ2-7	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
TRBV12-1	CASSLGDNTYVFF	TRBJ1-1	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
TRBV12-1	CASSLGHNTEVFF	TRBJ1-1	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
TRBV12-1	CASSPRKTEVFF	TRBJ1-1	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
TRBV12-1	CASSPQATDYTF	TRBJ1-2	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
TRBV12-1	CASSPRNSDYSF	TRBJ1-2	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
TRBV12-1	CASSTRDSDYTF	TRBJ1-2	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
TRBV12-1	CASSRAEQFF	TRBJ2-1	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
TRBV12-1	CASSLRTSSAETLYF	TRBJ2-3	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
TRBV12-1	CASSPGTGGAGAETLYF	TRBJ2-3	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
TRBV12-1	CASSILGREDTQYF	TRBJ2-5	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
TRBV12-1	CASSIQDTQYF	TRBJ2-5	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
TRBV12-1	CASSPGTVRPQYF	TRBJ2-5	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
TRBV12-1	CASSSRGPTHYF	TRBJ2-5	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
TRBV12-1	CASSLGTGGYEQYF	TRBJ2-7	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
TRBV12-2	CASSPGTGGSGNTLYF	TRBJ1-3	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
TRBV12-2	CASSPIDRNNSPLYF	TRBJ1-6	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
TRBV12-2	CASSTRDRNNYAEQFF	TRBJ2-1	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
TRBV12-2	CASSLWGGQNTLYF	TRBJ2-4	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
TRBV12-2	CASSLDGYEQYF	TRBJ2-7	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
TRBV12-2	CASSLGGSYDQYF	TRBJ2-7	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
TRBV12-1	CASSPRNTQVFF	TRBJ1-1	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
TRBV12-1	CASSPSNSDYTF	TRBJ1-2	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
TRBV12-1	CASSRTDSGNTLYF	TRBJ1-3	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
TRBV12-2	CASSLEAANSDYTF	TRBJ1-2	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
TRBV12-2	CASSPEGTDFLF	TRBJ1-2	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
TRBV12-2	CASSPGAGNTLYF	TRBJ1-3	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
TRBV12-2	CASSRGGNTGQLYF	TRBJ2-2	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
TRBV12-2	CASIQGNQDTQYF	TRBJ2-5	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
TRBV12-2	CASSLGDSYEQYF	TRBJ2-7	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
TRBV12-2	CASSLGGSYGQYF	TRBJ2-7	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
TRBV12-1	CASSRRGDYTF	TRBJ1-2	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1
TRBV12-1	CARLSAGYRLSF	TRBJ1-2	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
TRBV12-1	CASLPQEGPTTPF	TRBJ1-2	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
TRBV12-1	CASSPRTADYPF	TRBJ1-2	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
TRBV12-1	CASLSRGAERFF	TRBJ2-1	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
TRBV12-1	CASLTRGRGRHTGQLYF	TRBJ2-2	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
TRBV12-1	CASSTRDWGTGQLYF	TRBJ2-2	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
TRBV12-2	CASSRGHLTTQRLFF	TRBJ1-4	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
TRBV12-2	CASSPQGNDACSRFF	TRBJ2-1	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
TRBV12-1	CASGGQGEVFF	TRBJ1-1	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
TRBV12-1	CASSPRTTDYTF	TRBJ1-2	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
TRBV12-1	CASSLSTGGAAEQFF	TRBJ2-1	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
TRBV12-1	CASSRGAETLYF	TRBJ2-3	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
TRBV12-2	CASSLDSGNTLYF	TRBJ1-3	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
TRBV12-2	CASSPGQNSGNTLYF	TRBJ1-3	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
TRBV12-2	CASHRASYNSPLYF	TRBJ1-6	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
TRBV12-2	CASSSGTGGDEQYF	TRBJ2-7	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
TRBV12-1	CASSLGGANTEVFF	TRBJ1-1	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
TRBV12-1	CASSLEGQGSDYTF	TRBJ1-2	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
TRBV12-1	CATSPRDSDYTF	TRBJ1-2	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
TRBV12-1	CASSLMGGNYAEQFF	TRBJ2-1	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1

TRBV12-1	CASSPGDNYAEQFF	TRBJ2-1	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
TRBV12-1	CASSLTGGRNTGQLYF	TRBJ2-2	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
TRBV12-1	CASSLGGGAETLYF	TRBJ2-3	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
TRBV12-1	CASSHGTGGAREQYF	TRBJ2-7	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
TRBV12-2	CASSLGQGNTEVFF	TRBJ1-1	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
TRBV12-2	CASSPGQNNSPLYF	TRBJ1-6	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
TRBV12-2	CASSRKNNSPLYF	TRBJ1-6	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
TRBV12-2	CASSLEDWGGAGTGQLYF	TRBJ2-2	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
TRBV12-2	CASSRDWGFNQDTQYF	TRBJ2-5	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
TRBV12-2	CASSLDRGAGEQYF	TRBJ2-7	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
TRBV12-1	CASSHPGQNYAEQFF	TRBJ2-1	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	1
TRBV12-2	CASFLGLQDTQYF	TRBJ2-5	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1
TRBV12-1	CASSTENTEVFF	TRBJ1-1	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
TRBV12-1	CASSLGTGGAGNTLYF	TRBJ1-3	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
TRBV12-1	CASSLGGSFEQFF	TRBJ2-1	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
TRBV12-1	CASSTDRVRDTGQLYF	TRBJ2-2	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
TRBV12-1	CASSPGTTSAETLYF	TRBJ2-3	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
TRBV12-1	CASSQGQIQNTLYF	TRBJ2-4	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
TRBV12-1	CASSLAQGSYEQYF	TRBJ2-7	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
TRBV12-1	CASSPRRDEQYF	TRBJ2-7	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
TRBV12-1	CASSTGGGYEQYF	TRBJ2-7	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
TRBV12-2	CASSLGVGSDYTF	TRBJ1-2	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
TRBV12-2	CASSPQGANERLFF	TRBJ1-4	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
TRBV12-2	CASSLEGRNTGQLYF	TRBJ2-2	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
TRBV12-2	CASSGTGASAETLYF	TRBJ2-3	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
TRBV12-2	CASSLEGGWDTQYF	TRBJ2-5	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
TRBV12-2	CASSRDWGGQDTQYF	TRBJ2-5	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
TRBV12-1	CASSRQGDTGQLYF	TRBJ2-2	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	1
TRBV12-1	CASSLTQGLNSDYTF	TRBJ1-2	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
TRBV12-1	CASSPRQKDYTF	TRBJ1-2	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
TRBV12-1	CASSHRAEQFF	TRBJ2-1	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
TRBV12-1	CASSLGQGAFAEQFF	TRBJ2-1	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
TRBV12-1	CASSTTGGYAEQFF	TRBJ2-1	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
TRBV12-1	CASSPWDSQNTLYF	TRBJ2-4	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
TRBV12-1	CASSLGQTEQYF	TRBJ2-7	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
TRBV12-2	CASSLSWAQDTGQLYF	TRBJ2-2	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
TRBV12-2	CASSLALGILYF	TRBJ2-3	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
TRBV12-2	CASSLDWGGQDTQYF	TRBJ2-5	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
TRBV12-2	CASSLEGTGYEQYF	TRBJ2-7	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
TRBV12-2	CASSLERGWEQYF	TRBJ2-7	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
				66	69	59	56	63	59	25	42	48	33	47	35	47	48	25	48	34	57	37	21	30	31	34	27	