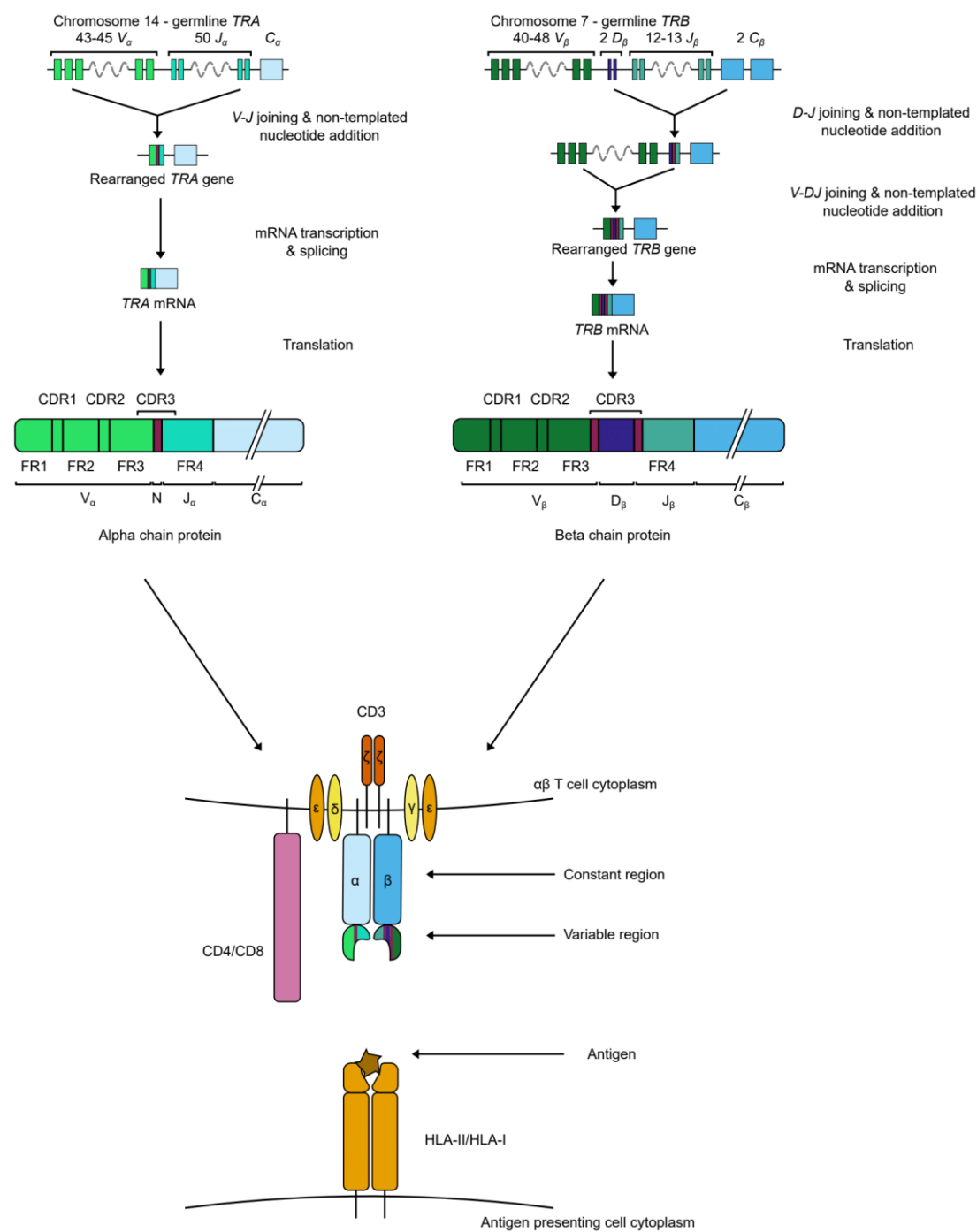


## 1 Supplementary Figures

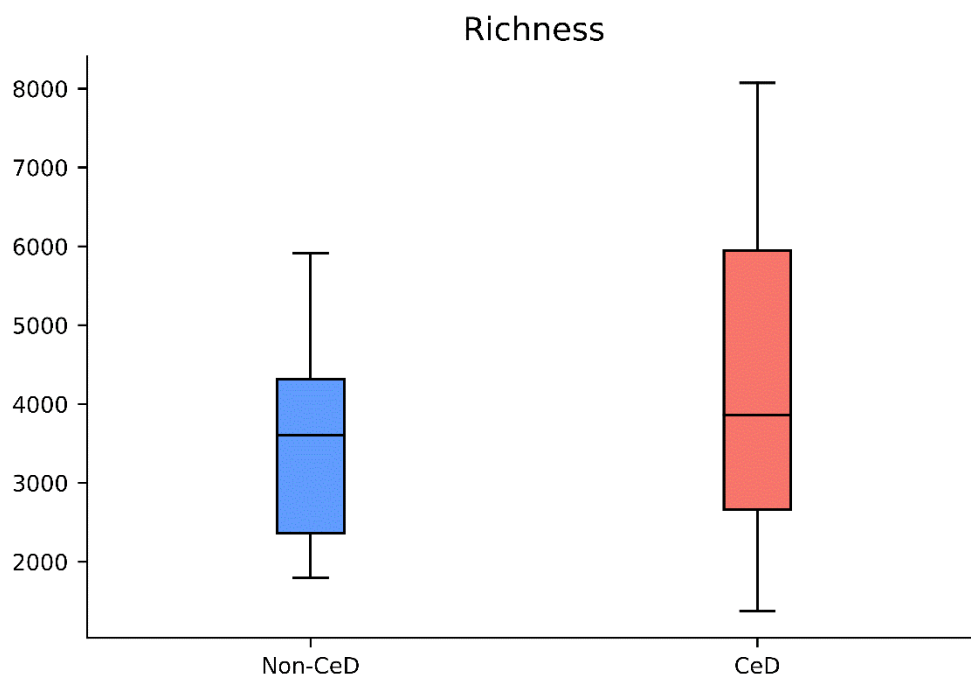
### 1.1 **Supplementary Figure S1:** T cell receptors have 2 chains, according to which T cells can be categorized. Each TCR chain has a constant region and a variable region made up of V (D) and J segments

During T cell maturation/selection, T cells undergo somatic recombination, where the TCR gene segments are rearranged, leaving a few select gene segments, while the rest are deleted. During gene rearrangement the V-J segments are joined in TRA genes. In TRB genes, the D-J segments are joined first, followed by the joining of the selected V gene to the rearranged DJ segments. In the case of TRA and TRB genes, additional junctional diversity is generated at each joining step through the addition of random, non-templated nucleotides.

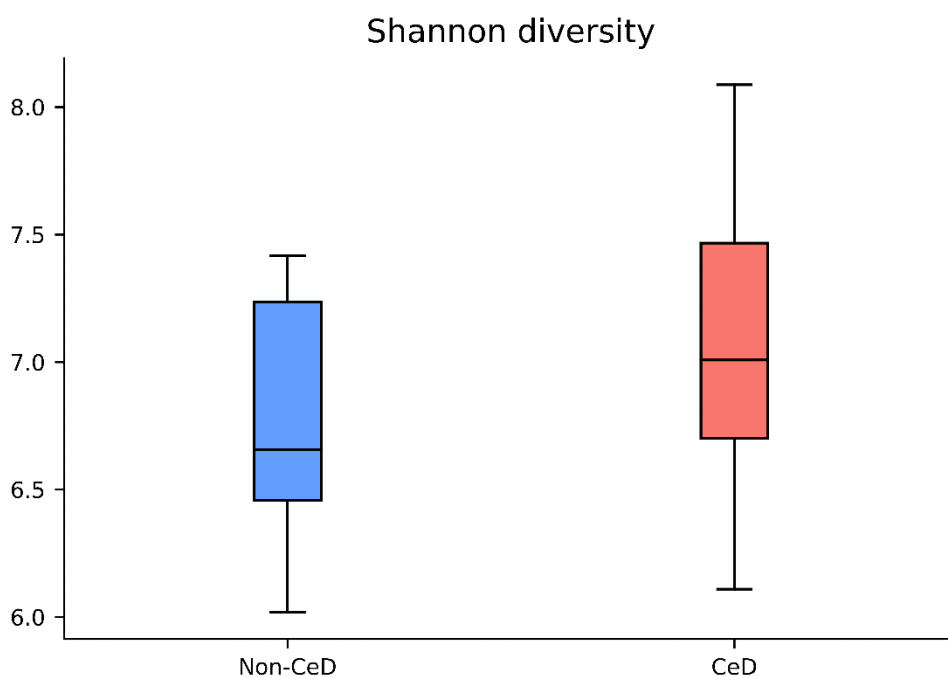
The complementarity-determining region 3 (CDR3) is crucial in antigen recognition. CDR3 of T cells is highly variable, and is located at the V(D)J junction for each TCR chain.



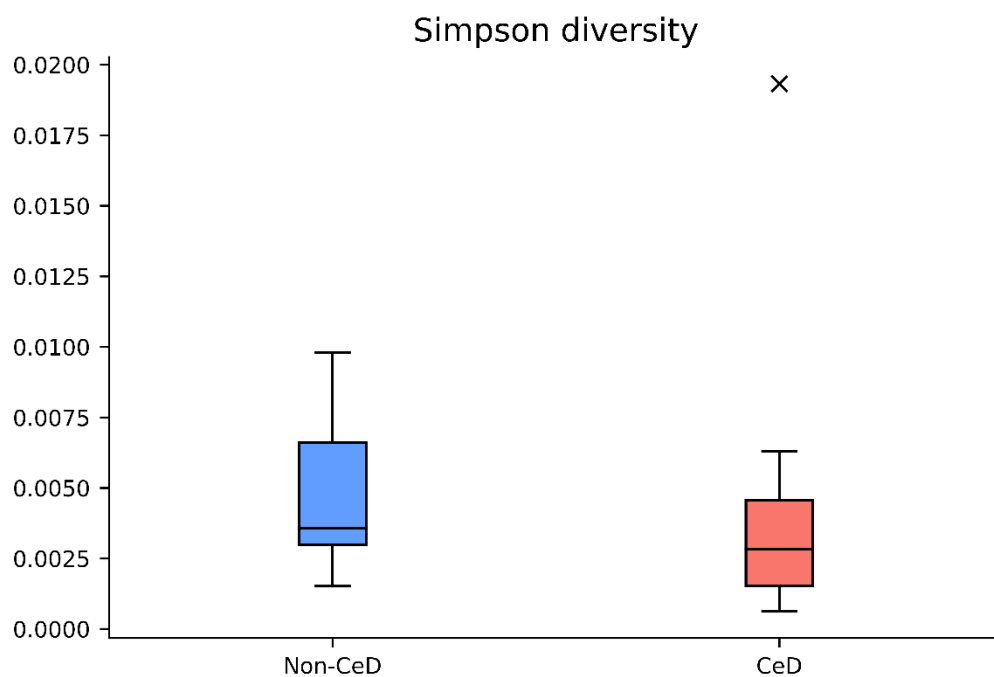
## 1.2 Supplementary Figure S2: Training TCR- $\alpha$ dataset summary



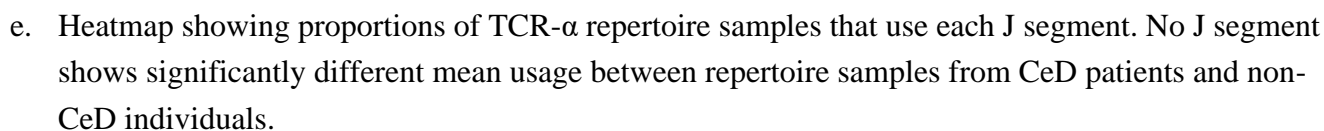
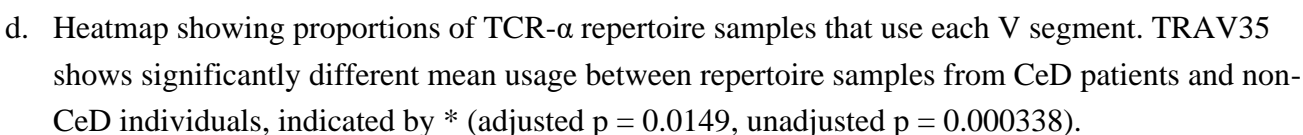
- a. Boxplot indicating richness (number of unique sequences) in TCR- $\alpha$  repertoire samples from CeD patients and non-CeD individuals. No significant difference in mean between the two groups was found (adjusted  $p = 1.00$ , unadjusted  $p = 0.402$ ).



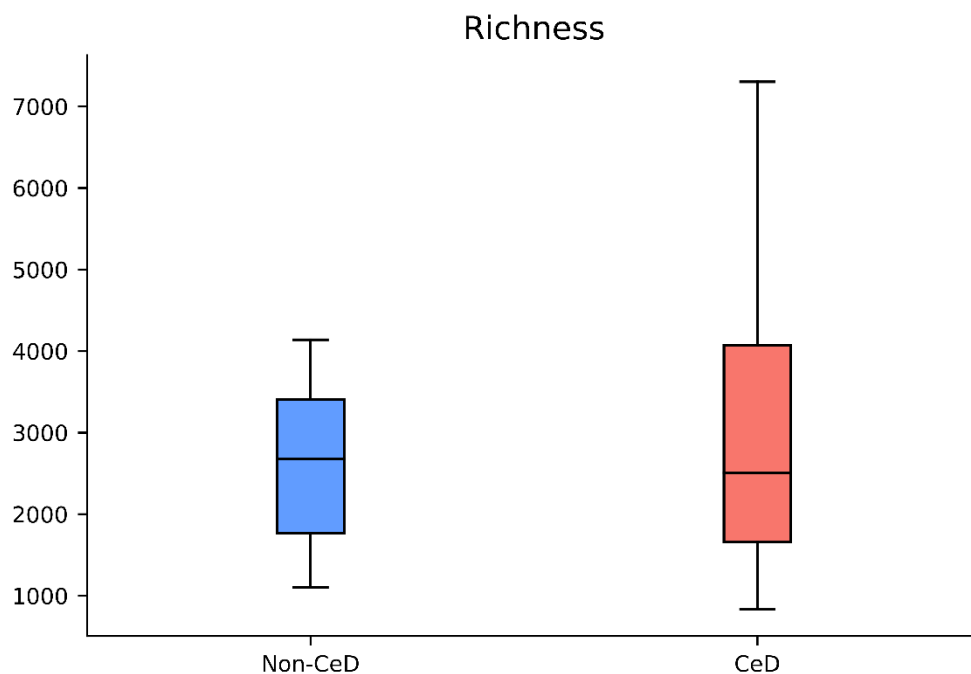
- b. Boxplot indicating Shannon diversity in TCR- $\alpha$  repertoire samples from CeD patients and non-CeD individuals. No significant difference in mean between the two groups was found (adjusted  $p = 0.663$ , unadjusted  $p = 0.221$ ).



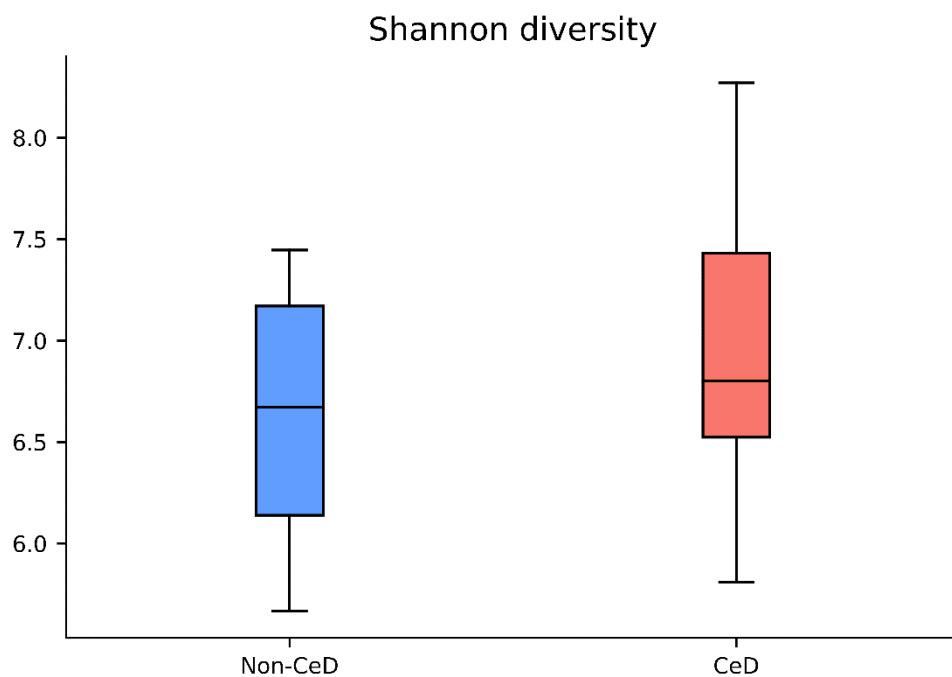
- c. Boxplot indicating Simpson diversity in TCR- $\alpha$  repertoire samples from CeD patients and non-CeD individuals. No significant difference in mean between the two groups was found (adjusted  $p = 1.00$ , unadjusted  $p = 0.776$ ).



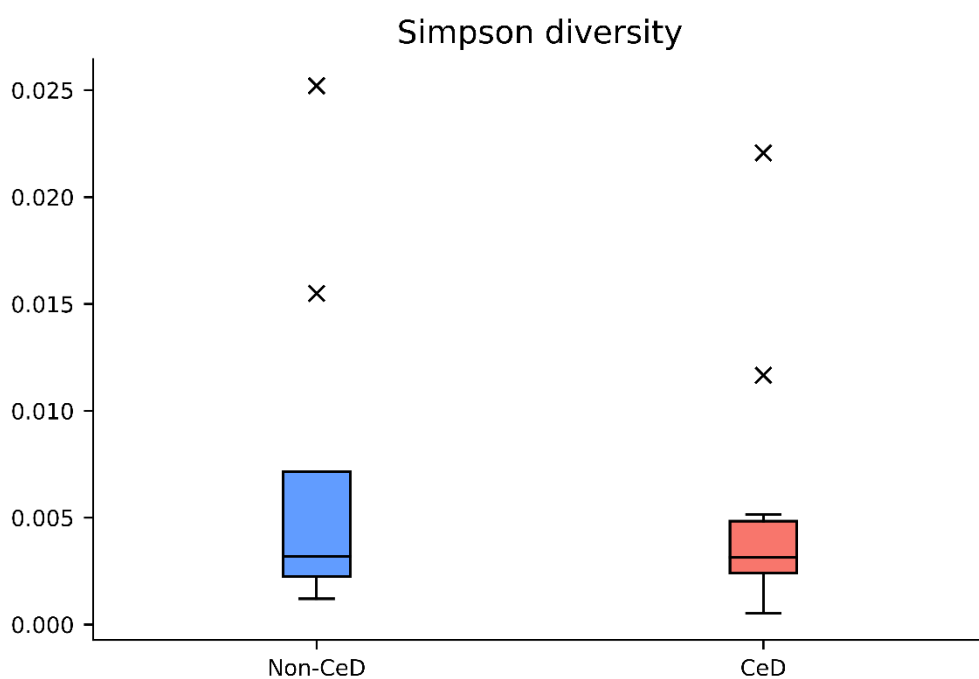
### 1.3 Supplementary Figure S3: Training TCR- $\beta$ dataset summary.



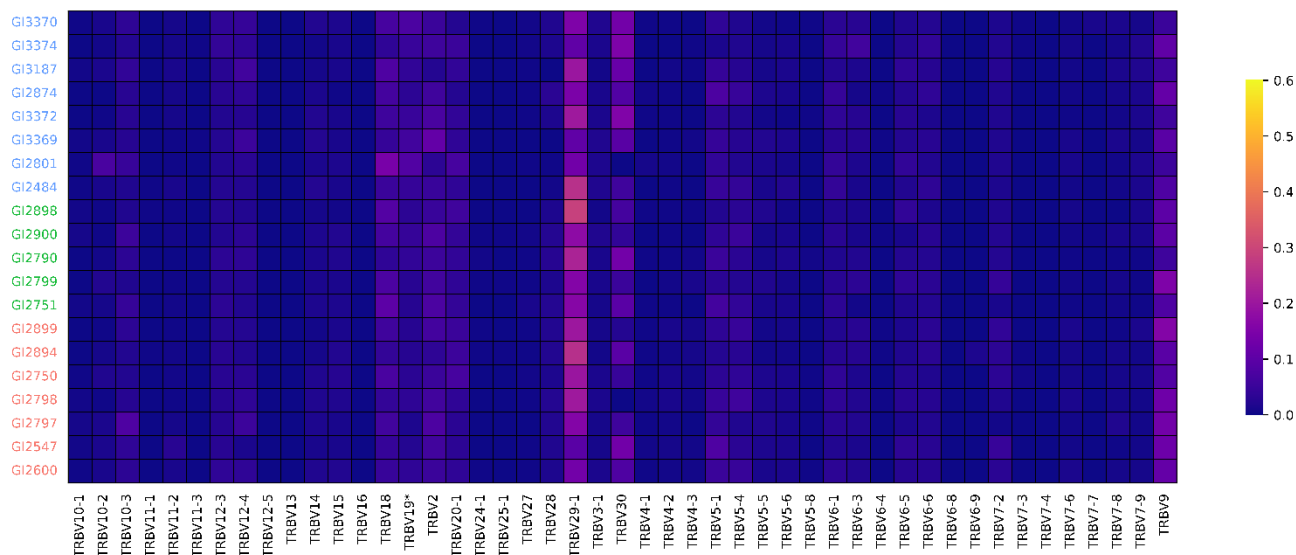
- a. Boxplot indicating richness (number of unique sequences) in TCR- $\beta$  repertoire samples from CeD patients and non-CeD individuals. No significant difference in mean between the two groups was found (adjusted  $p = 1.00$ , unadjusted  $p = 0.483$ ).



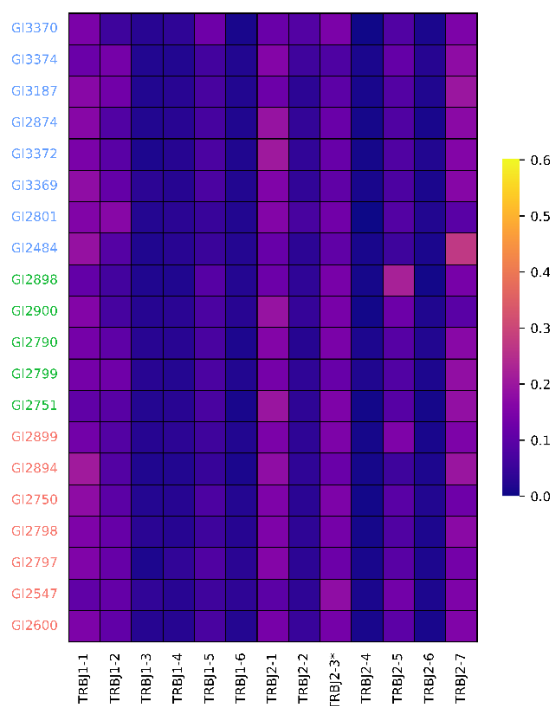
- b. Boxplot indicating Shannon diversity in TCR- $\beta$  repertoire samples from CeD patients and non-CeD individuals. No significant difference in mean between the two groups was found (adjusted  $p = 1.00$ , unadjusted  $p = 0.382$ ).



- c. Boxplot indicating Simpson diversity in TCR- $\beta$  repertoire samples from CeD patients and non-CeD individuals. No significant difference in mean between the two groups was found (adjusted  $p = 1.00$ , unadjusted  $p = 0.568$ ).



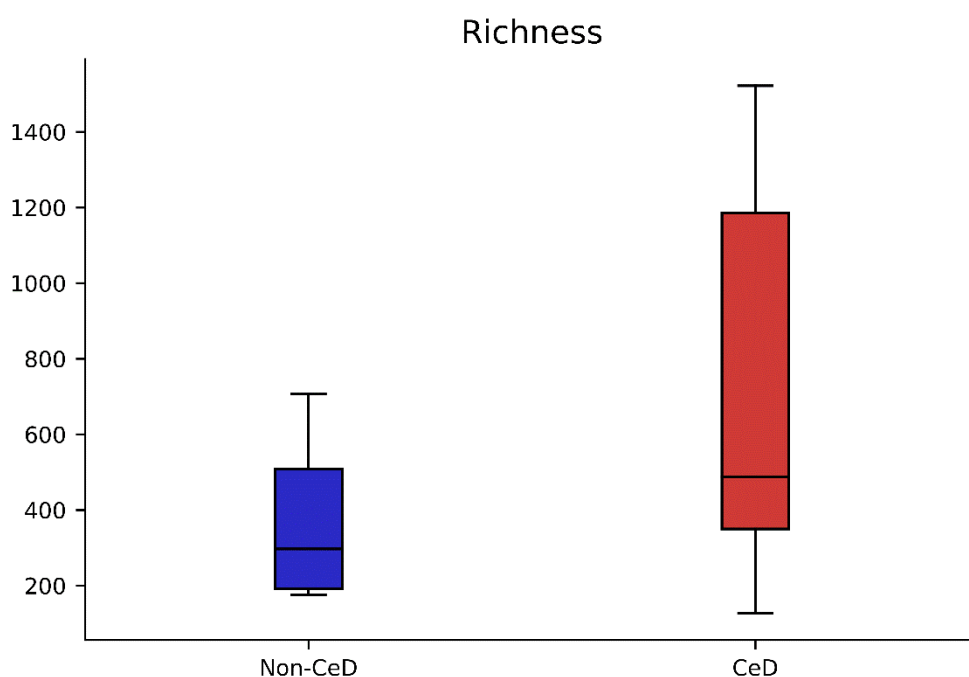
- d. Heatmap showing proportions of TCR- $\beta$  repertoire samples that use each V segment. We observed significantly lower usage of segment TRBV19 (adjusted  $p = 0.0340$ , unadjusted  $p = 0.000724$ ), indicated by \*, in CeD patient samples compared to non-CeD samples.



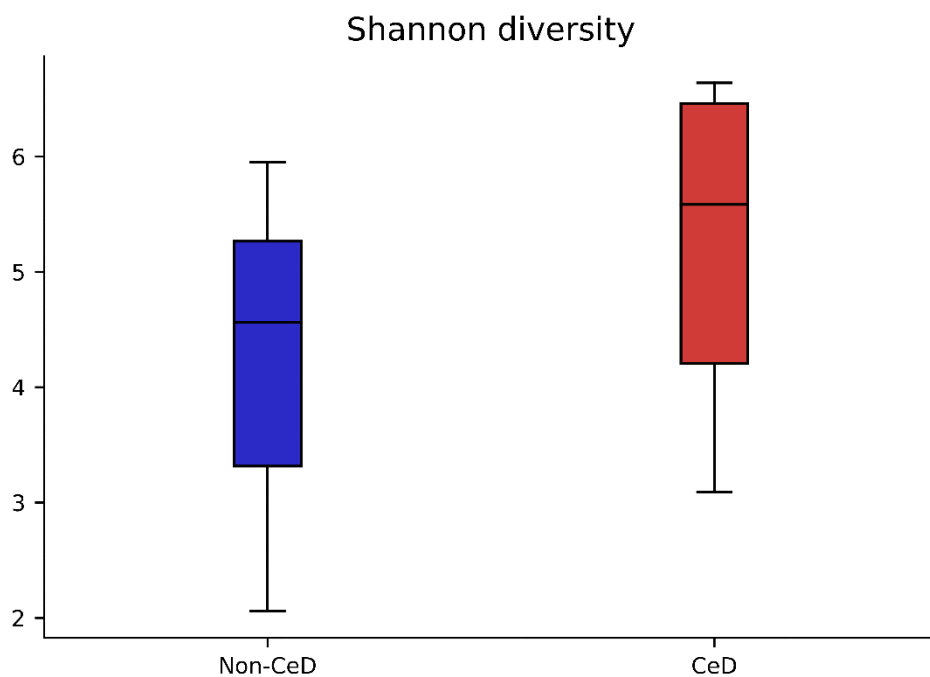


- e. Heatmap showing proportions of TCR- $\beta$  repertoire samples that use each J segment. We observed significantly higher usage of segment TRBJ2-3 (adjusted  $p = 0.0422$ , unadjusted  $p = 0.00325$ ), indicated by \*, in CeD patient samples compared to non-CeD samples, see S2h.

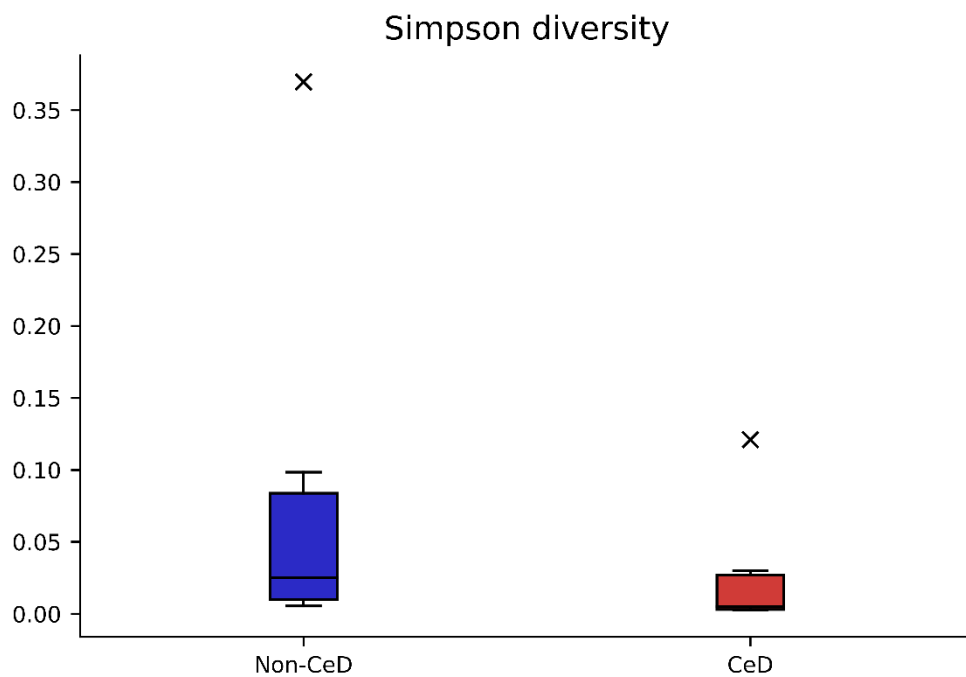
#### 1.4 Supplementary Figure S4: Testing TCR- $\alpha$ dataset summary.



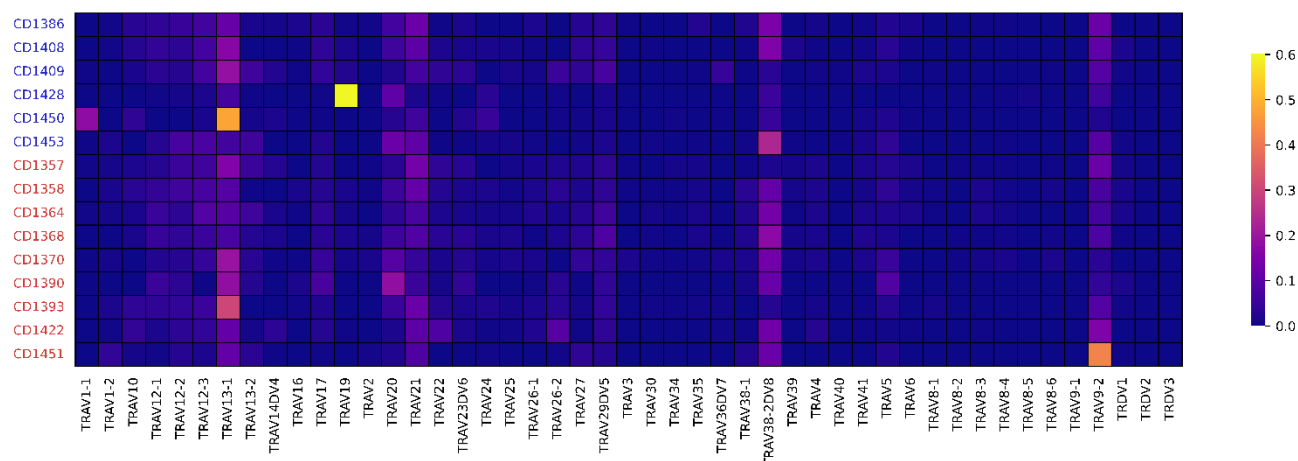
- a. Boxplot indicating richness (number of unique sequences) in TCR- $\alpha$  repertoire samples from CeD patients and non-CeD individuals. No significant difference in mean between the two groups was found (adjusted  $p = 0.464$ , unadjusted  $p = 0.155$ ).



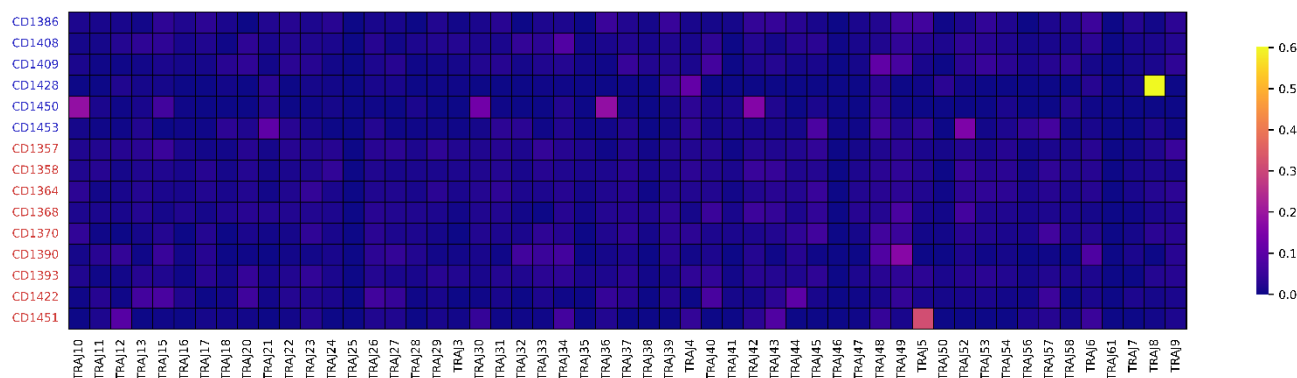
- b. Boxplot indicating Shannon diversity in TCR- $\alpha$  repertoire samples from CeD patients and non-CeD individuals. No significant difference in mean between the two groups was found (adjusted  $p = 0.475$ , unadjusted  $p = 0.158$ ).



- c. Boxplot indicating Simpson diversity in TCR- $\alpha$  repertoire samples from CeD patients and non-CeD individuals. No significant difference in mean between the two groups was found (adjusted  $p=0.598$ , unadjusted  $p=0.199$ ).

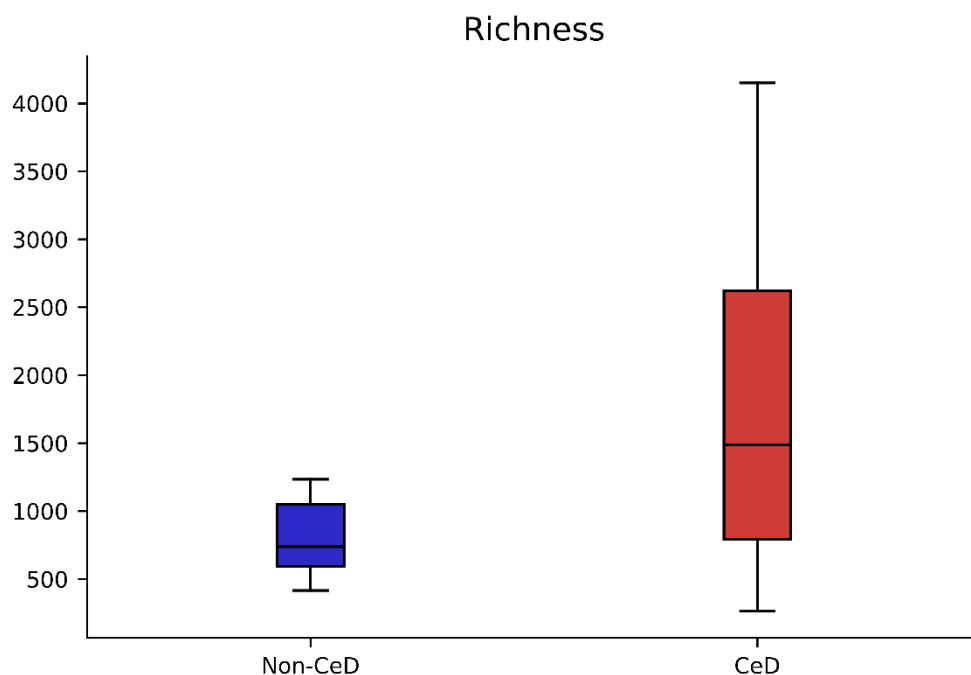


- d. Heatmap showing proportions of TCR- $\alpha$  repertoire samples that use each V segment. No V segment shows significantly different mean usage between repertoire samples from CeD patients and non-CeD individuals.

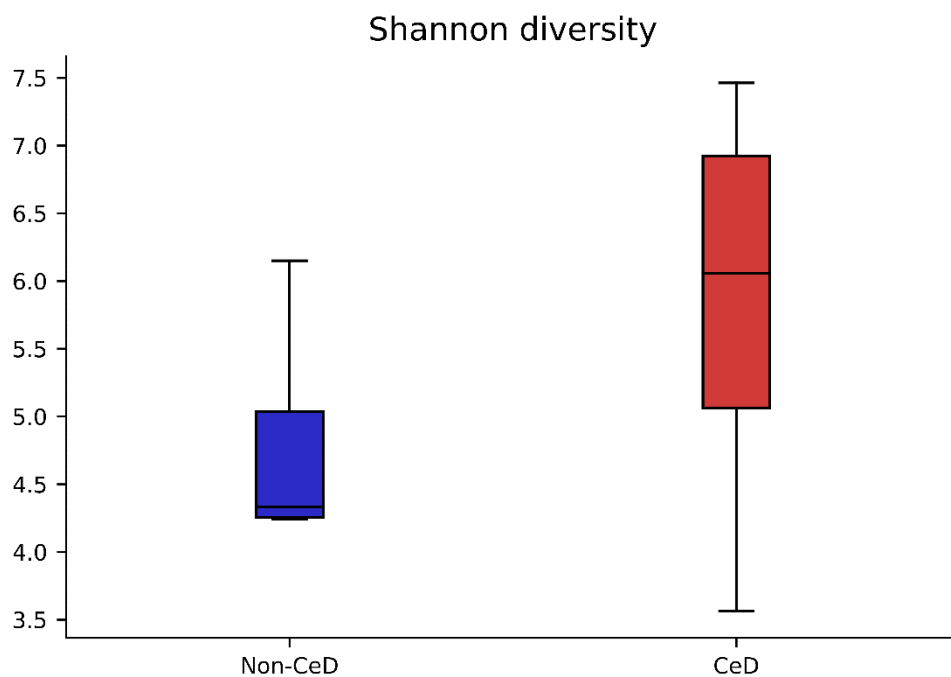


- e. Heatmap showing proportions of TCR- $\alpha$  repertoire samples that use each J segment. No V segment shows significantly different mean usage between repertoire samples from CeD patients and non-CeD individuals.

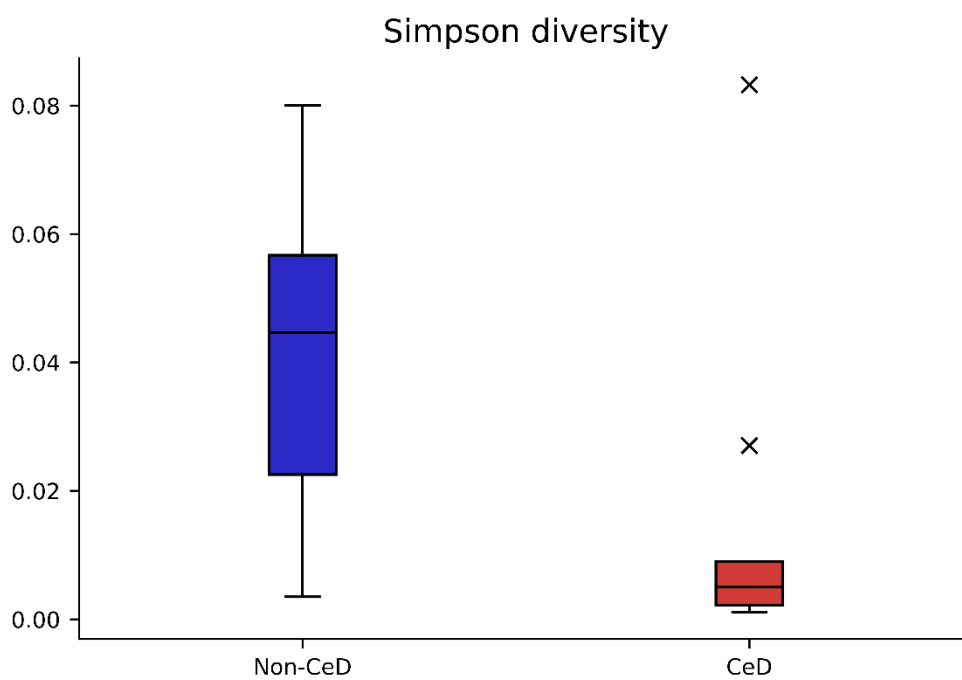
### 1.5 Supplementary Figure S5: Testing TCR- $\beta$ dataset summary.



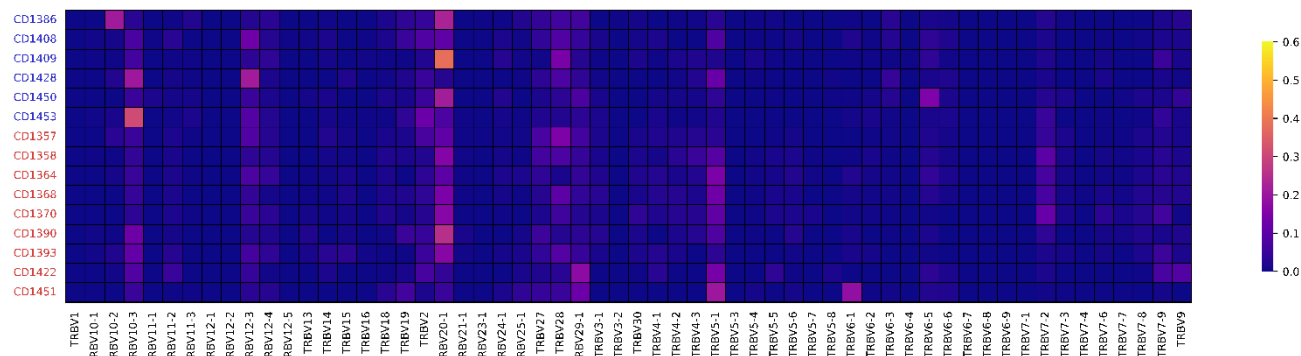
- a. Boxplot indicating richness (number of unique sequences) in TCR- $\beta$  repertoire samples from CeD patients and non-CeD individuals. No significant difference in mean between the two groups was found (adjusted  $p = 0.313$ , unadjusted  $p = 0.104$ ).



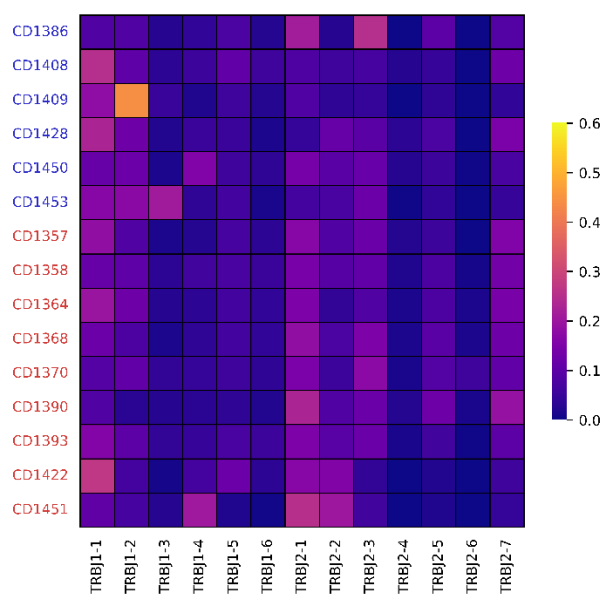
- b. Boxplot indicating Shannon diversity in TCR- $\beta$  repertoire samples from repertoire samples from CeD patients and non-CeD individuals. No significant difference in mean between the two groups was found (adjusted  $p = 0.294$ , unadjusted  $p = 0.0981$ )



- c. Boxplot indicating Simpson diversity in TCR- $\beta$  repertoire samples from CeD patients and non-CeD individuals. No significant difference in mean between the two groups was found (adjusted  $p = 0.272$ , unadjusted  $p = 0.0908$ ).

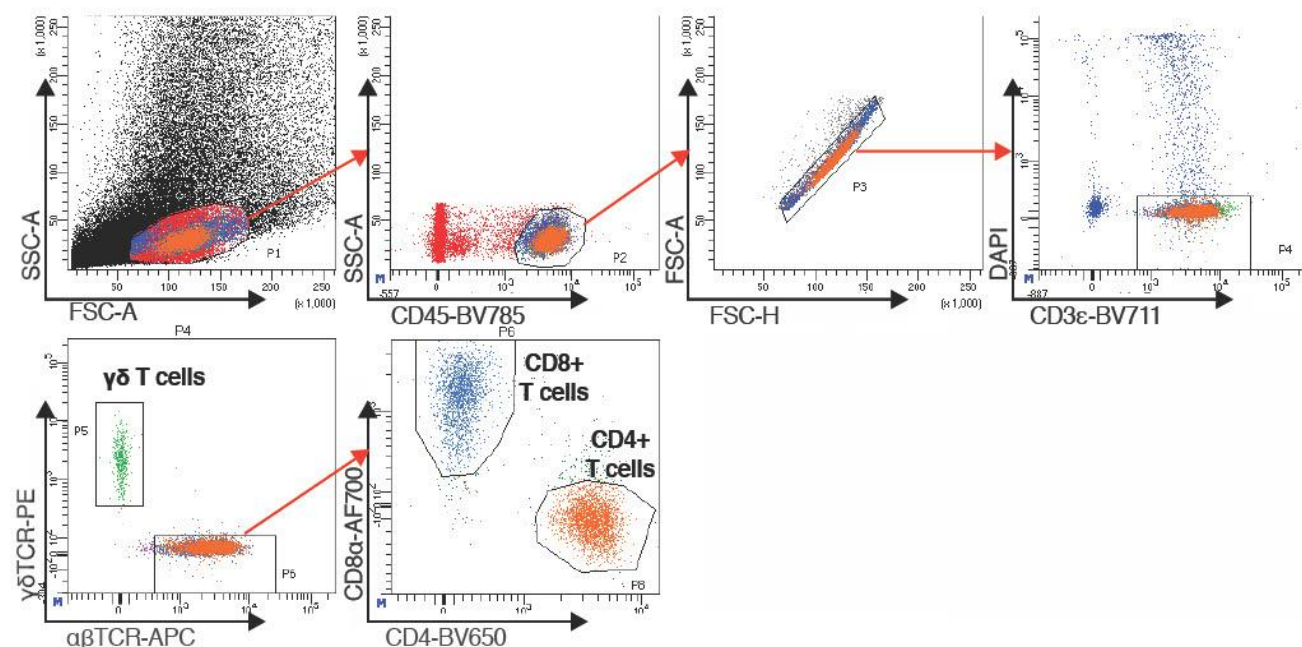


- d. Heatmap showing proportions of TCR- $\beta$  repertoire samples that use each V segment. No V segment shows significantly different mean usage between repertoire samples from CeD patients and non-CeD individuals.



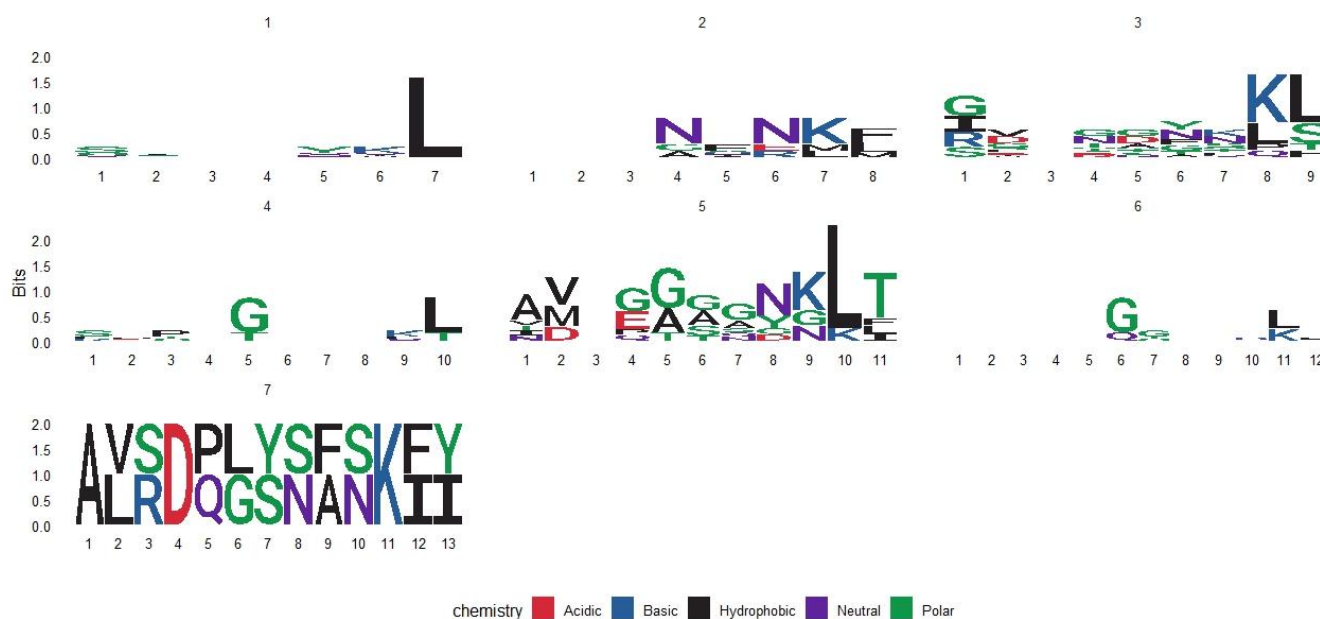
- e. Heatmap showing proportions of TCR- $\beta$  repertoire samples that use each J segment. No V segment shows significantly different mean usage between repertoire samples from CeD patients and non-CeD individuals.

## 1.6 Supplementary Figure S6: CD4<sup>+</sup> T cell sorting gate



Representative gating strategy for FACS-sorting of intestinal T cell subsets (CD4<sup>+</sup>, CD8<sup>+</sup> and  $\gamma\delta$ <sup>+</sup>).

## 1.7 Supplementary Figure S7: Logo plots of TCR-alpha sequences included in the model



## 1.8 Supplementary Figure S8: Logo plots of TCR-beta sequences included in the model





## 2 Supplementary Tables

### 2.1 Supplementary Table S1

	Age	Sex	Cohort	IgA-TTG	Marsh classification	HLA type
GI2547	19	F	CeD	356	Marsh 3	NA
GI2600	26	F	CeD	867	Marsh 3	NA
GI2750	33	F	CeD	831	Marsh 3	DQ2
GI2797	45	F	CeD	1301	Marsh 3	DQ2
GI2798	27	F	CeD	789	Marsh 3	DQ2
GI2894	20	F	CeD	1621	Marsh 3	DQ2
GI2899	62	F	CeD	879	Marsh 3	DQ2
GI2751	30	F	CeD-GFD	16	Marsh 1	DQ2
GI2799	41	M	CeD-GFD	296	Marsh 1	DQ2
GI2790	30	F	CeD-GFD	17	Marsh 1	DQ2
GI2898	57	M	CeD-GFD	<1.9	Marsh 0	DQ2
GI2900	60	F	CeD-GFD	83	Marsh 0	DQ8
GI2484	63	F	Control	Not tested	Marsh 0	NA
GI2801	23	M	Control	Not tested	Marsh 0	NA
GI2874	33	F	Control	Not tested	Marsh 0	DQ2
GI3187	25	F	Control	Not tested	Marsh 0	NA
GI3369	25	F	Control	<1.9	Marsh 0	NA
GI3370	26	F	Control	Not tested	Marsh 0	DQ8
GI3372	68	F	Control	<1.9	Marsh 0	DQ2
GI3374	17	F	Control	<1.9	Marsh 0	DQ8

**Supplementary Table S1:** Patient characteristics for cohort 1 (training data set). All patients on a gluten free diet did not consume gluten for at least 6 months.

## 2.2 Supplementary Table S2

Sequence	Publication	Loci	Pair (If provided)
YYCILRDGRGGADGLTFG	Broughton; 2012; Biased	alpha	CASSVAVSAGTYEQYFG
YYCILRDSRAQKLVFG	Broughton; 2012; Biased	alpha	CASSAGTSGEYEQYFG
YYCILRDRSNQFYFG	Broughton; 2012; Biased	alpha	CASSTTPGTGTETQYFG
YFCAYRSARGARLMFG	Broughton; 2012; Biased	alpha	CAS SVAVSAGTYEQ YFG
YFCAGGSNTGKLIFG	Broughton; 2012; Biased	alpha	CAS SQDIRNTGEL FFG
YFCATDFPGTASKLTFG	Broughton; 2012; Biased	alpha	CAS SEALPGRSGNTI YFG
YFCAVGETGANNLFFG	Broughton; 2012; Biased	alpha	CAS SEARRYNEQ FGP
YLCAVQASGGSYIPTFG	Broughton; 2012; Biased	alpha	CAS SNRGLGTDQ YFG
YFCAASAYPGNQFYFG	Broughton; 2012; Biased	alpha	CAS SVYDGRGETQ YFG
CASSVAVSAGTYEQYFG	Broughton; 2012; Biased	beta	YYC ILRDGRGGADGLT FG
CASSAGTSGEYEQYFG	Broughton; 2012; Biased	beta	YYC ILRDSRAQKLV FG
CASSTTPGTGTETQYFG	Broughton; 2012; Biased	beta	YYC ILRDRSNQFY FG
CASSVAVSAGTYEQYFG	Broughton; 2012; Biased	beta	YFC AYRSARGARLM FG
CASSQDIRNTGELFFG	Broughton; 2012; Biased	beta	YFC AGGSNTGKLI FG
CASSEALPGRSGNTIYFG	Broughton; 2012; Biased	beta	YFC ATDFPGTASKLT FG
CASSEARRYNEQFGP	Broughton; 2012; Biased	beta	YFC AVGETGANNLF FG
CASSNRGLGTDQYFG	Broughton; 2012; Biased	beta	YLC AVQASGGSYIPT FG
CASSVYDGRGETQYFG	Broughton; 2012; Biased	beta	YFC AASAYPGNQFY FG
AVEAGSGGGADGLT	Dahal-Koirala, 2019, immune	alpha	SASRTSGRAGDEQF
AGQDYKYI	Dahal-Koirala, 2019, immune	alpha	SASRTGGTDTQY
AVIYQGGKLI	Dahal-Koirala, 2019, immune	alpha	NO RESULTS
AVRVEYNFNKFY	Dahal-Koirala, 2019, immune	alpha	ASSQEGLADSYNEQF
CLVGDSM#GATNKLIF	Dahal-Koirala, 2019, immune	alpha	CSASRTSGRAGDEQFF
AVESSWGKLO	Dahal-Koirala, 2019, immune	alpha	SAARTSGRAGDTQY
AVEAGSGGGADGLT	Dahal-Koirala, 2019, immune	alpha	SASRTSGRAGDEQF
AVGGEGFKTI	Dahal-Koirala, 2019, immune	alpha	ASSEVGGPSHEQY
ALNQGGKLI	Dahal-Koirala, 2019, immune	alpha	SAARTSGRAGDTQY
ALVARGYGNNRLA	Dahal-Koirala, 2019, immune	alpha	SAARTSGRAGDTQY
AVGGTDKLI	Dahal-Koirala, 2019, immune	alpha	SASRTSGRAGDEQF
AMSLTGANSKLT	Dahal-Koirala, 2019, immune	alpha	ASSHIAGAGTDTQY
SASRTSGRAGDEQF	Dahal-Koirala, 2019, immune	beta	AVEAGSGGGADGLT
SASRTGGTDTQY	Dahal-Koirala, 2019, immune	beta	AGQDYKYI
ASSQEGLADSYNEQF	Dahal-Koirala, 2019, immune	beta	AVRVEYNFNKFY
CSASRTSGRAGDEQFF	Dahal-Koirala, 2019, immune	beta	CLVGDSM#GATNKLIF
SAARTSGRAGDTQY	Dahal-Koirala, 2019, immune	beta	AVESSWGKLO
SASRTSGRAGDEQF	Dahal-Koirala, 2019, immune	beta	AVEAGSGGGADGLT
ASSEVGGPSHEQY	Dahal-Koirala, 2019, immune	beta	AVGGEGFKTI
SAARTSGRAGDTQY	Dahal-Koirala, 2019, immune	beta	ALVARGYGNNRLA ALNQGGKLI

SASRTSGRAGDEQF	Dahal-Koirala, 2019, immune	beta	AVGGTDKLI
ASSHIAGAGTDTQY	Dahal-Koirala, 2019, immune	beta	AMSLTGANSKLT
IVYGGFKTI	Dahal-Koirala; 2016;TCR	alpha	ASSLRSTDTQY
LVGHGSSNTGKLI	Dahal-Koirala; 2016;TCR	alpha	ASSLRWGDGGKL
IEYNFNKFY	Dahal-Koirala; 2016;TCR	alpha	ASRPVAG
ALSELSIQGAQKLV	Dahal-Koirala; 2016;TCR	alpha	ASSIVDRGGETQY
AGDSGYALN	Dahal-Koirala; 2016;TCR	alpha	ATSSRMGGDTQY
IVPANTGGFKTI	Dahal-Koirala; 2016;TCR	alpha	ASSFRSTDTQY
LVGGGADGLT	Dahal-Koirala; 2016;TCR	alpha	ASSVRTLDTGELF
ALSESGANSKLT	Dahal-Koirala; 2016;TCR	alpha	ASSLRAWETQY
AVRDPLYNFNKFY	Dahal-Koirala; 2016;TCR	alpha	ASSQGGDRGESEAF
VVNSWAGNQFY	Dahal-Koirala; 2016;TCR	alpha	ASSLGYGVTGELF
ASSLRSTDTQY	Dahal-Koirala; 2016;TCR	beta	IVYGGFKTI
ASSLRWGDGGKL	Dahal-Koirala; 2016;TCR	beta	LVGHGSSNTGKLI
ASRPVAG	Dahal-Koirala; 2016;TCR	beta	IEYNFNKFY
ASSIVDRGGETQY	Dahal-Koirala; 2016;TCR	beta	ALSELSIQGAQKLV
ATSSRMGGDTQY	Dahal-Koirala; 2016;TCR	beta	AGDSGYALN
ASSFRSTDTQY	Dahal-Koirala; 2016;TCR	beta	IVPANTGGFKTI
ASSVRTLDTGELF	Dahal-Koirala; 2016;TCR	beta	LVGGGADGLT
ASSLRAWETQY	Dahal-Koirala; 2016;TCR	beta	ALSESGANSKLT
ASSQGGDRGESEAF	Dahal-Koirala; 2016;TCR	beta	AVRDPLYNFNKFY
ASSLGYGVTGELF	Dahal-Koirala; 2016;TCR	beta	VVNSWAGNQFY
CILRDGRGGADGLTF	Peterson; 2015; determinants	alpha	CASSVAVSAGTYEQYF
CILRDSRAQKLVF	Peterson; 2015; determinants	alpha	CASSAGTSGEYEYQF
CILRDSRAQKLVF	Peterson; 2015; determinants	alpha	CASSVG VAGEYEYQF
CILRDRSNQFYF	Peterson; 2015; determinants	alpha	CASSTPGTGTETQYF
CILRDDRGGKLIF	Peterson; 2015; determinants	alpha	CASSAGPQAGTQYF
CILRGRDNYGQNFVF	Peterson; 2015; determinants	alpha	CASSVESGISNNEQFF
CIVTGRGSTLGRLYF	Peterson; 2015; determinants	alpha	CASSVEVSGNTIYF
CIVHGRQTGANNLFF	Peterson; 2015; determinants	alpha	CASSVEVSGNTIYF
CIVRGRNAGMLTF	Peterson; 2015; determinants	alpha	CASSETLGNEQYF

CIVRANLVGNTGKLIF	Peterson; determinants	2015;	alpha	CASSEGPLAKNIQY
CAVGETGANNLFF	Peterson; determinants	2015;	alpha	CASSEARRYNEQFF
CAVGDTGANNLFF	Peterson; determinants	2015;	alpha	CASSELRRYNEQFF
CAVVNTGTASKLTF	Peterson; determinants	2015;	alpha	CASSEGPTGRAGNTIYF
CATDFPGTASKLTF	Peterson; determinants	2015;	alpha	CASSEALPGRSGNTIYF
CLVGDISGGYNKLIF	Peterson; determinants	2015;	alpha	CASSEGLAVAKNIQYF
CAVMVQGAQKLVF	Peterson; determinants	2015;	alpha	CSASRAGDFSTDTQYF
CAYRSARGARLMF	Peterson; determinants	2015;	alpha	CASSVAVSAGTYEQYF
CAGSSNTGKLIF	Peterson; determinants	2015;	alpha	CASSQDIRNTGELFF
CASSVAVSAGTYEQYF	Peterson; determinants	2015;	beta	CILRDGRGGADGLTF
CASSAGTSGEYEYF	Peterson; determinants	2015;	beta	CILRDSRAQKLVF
CASSVGVAGEYEYF	Peterson; determinants	2015;	beta	CILRDSRAQKLVF
CASSTPGTGTETQYF	Peterson; determinants	2015;	beta	CILRDRSNQYF
CASSAGPQAGTQYF	Peterson; determinants	2015;	beta	CILRDDRGGKLIF
CASSVESGISNNEQFF	Peterson; determinants	2015;	beta	CILGRDNYGQNFVF
CASSVEVSGNTIYF	Peterson; determinants	2015;	beta	CIVTGRGSTLGRLYF
CASSVEVSGNTIYF	Peterson; determinants	2015;	beta	CIVHGRQTGANNLFF
CASSETLGNEQYF	Peterson; determinants	2015;	beta	CIVRGRNAGMLTF
CASSEGPLAKNIQY	Peterson; determinants	2015;	beta	CIVRANLVGNTGKLIF
CASSEARRYNEQFF	Peterson; determinants	2015;	beta	CAVGETGANNLFF
CASSELRRYNEQFF	Peterson; determinants	2015;	beta	CAVGDTGANNLFF

CASSEGPTGRAGNTIYF	Peterson; 2015; determinants	beta	CAVVNTGTASKLTF
CASSEALPGRSGNTIYF	Peterson; 2015; determinants	beta	CATDFPGTASKLTF
CASSEGLAVAKNIQYF	Peterson; 2015; determinants	beta	CLVGDGISGGYNKLIF
CSASRAGDFSTDTQYF	Peterson; 2015; determinants	beta	CAVMVQGAQKLVF
CASSVAVSAGTYEQYF	Peterson; 2015; determinants	beta	CAYRSARGARLMF
CASSQDIRNTGELFF	Peterson; 2015; determinants	beta	CAGGSNTGKLIF
LGDDTGfQKLv	Rinses; 2018; disease-driving	alpha	
IAFNdyKLS	Rinses; 2018; disease-driving	alpha	
ISFNdyKLS	Rinses; 2018; disease-driving	alpha	
IVFNdyKLS	Rinses; 2018; disease-driving	alpha	
IAYNdyKLS	Rinses; 2018; disease-driving	alpha	
ISYNdyKLS	Rinses; 2018; disease-driving	alpha	
IVYNdyKLS	Rinses; 2018; disease-driving	alpha	
LVGGAGgYNkLI	Rinses; 2018; disease-driving	alpha	
LVGGSGgYNkLI	Rinses; 2018; disease-driving	alpha	
AMIEAAGNkLT	Rinses; 2018; disease-driving	alpha	
AMLEAAGNkLT	Rinses; 2018; disease-driving	alpha	
AMSEAAGNkLT	Rinses; 2018; disease-driving	alpha	
AMIQAAGNkLT	Rinses; 2018; disease-driving	alpha	
AMLQAAGNkLT	Rinses; 2018; disease-driving	alpha	
AMQEAAGNkLT	Rinses; 2018; disease-driving	alpha	
ASSxRxTDTQY	Rinses; 2018; disease-driving	beta	
SAGQGGTGELF	Rinses; 2018; disease-driving	beta	
SVGQGGTGELF	Rinses; 2018; disease-driving	beta	
SAGAGGTGELF	Rinses; 2018; disease-driving	beta	
SVGAGGTGELF	Rinses; 2018; disease-driving	beta	
SAGQGGSGELF	Rinses; 2018; disease-driving	beta	
SVGQGGSGELF	Rinses; 2018; disease-driving	beta	
SAGAGGSGELF	Rinses; 2018; disease-driving	beta	
SVGAGGSGELF	Rinses; 2018; disease-driving	beta	
LGQGVAGEL	Hardy; 2019; Characterisation	beta	
GGTGAGETQ	Hardy; 2019; Characterisation	beta	

SHIAGAGTDTQ	Hardy; Characterisation	2019;	beta	
SFGSPHNEQ	Hardy; Characterisation	2019;	beta	
KESGLADVNEQ	Hardy; Characterisation	2019;	beta	
SLRGKGGHEQ	Hardy; Characterisation	2019;	beta	
SLEITYRWDTQ	Hardy; Characterisation	2019;	beta	
STQWGIDEKL	Hardy; Characterisation	2019;	beta	
SESDDRVTDTQ	Hardy; Characterisation	2019;	beta	
SGQGDNEQ	Hardy; Characterisation	2019;	beta	
SLSLRNSGNTI	Hardy; Characterisation	2019;	beta	
REQGWTEA	Hardy; Characterisation	2019;	beta	
GREQGWTEA	Hardy; Characterisation	2019;	beta	
NRGPDYGY	Hardy; Characterisation	2019;	beta	
TRDYRSNQPPQ	Hardy; Characterisation	2019;	beta	
TRTYRYNEQ	Hardy; Characterisation	2019;	beta	
TTSWDEQ	Hardy; Characterisation	2019;	beta	
EGGNYGY	Hardy; Characterisation	2019;	beta	
SEVAGNTI	Hardy; Characterisation	2019;	beta	
NEVAGNTI	Hardy; Characterisation	2019;	beta	
SRTPGQGAYEQ	Hardy; Characterisation	2019;	beta	
SRFPGIGVSEQ	Hardy; Characterisation	2019;	beta	
SRTPGRGAYEQ	Hardy; Characterisation	2019;	beta	

SPTTSEGR IQ	Hardy; Characterisation	2019;	beta	
SPTASEGR IQ	Hardy; Characterisation	2019;	beta	
SQVYNFSPL	Hardy; Characterisation	2019;	beta	
SQVVAYEQ	Hardy; Characterisation	2019;	beta	
SQVYMYEQ	Hardy; Characterisation	2019;	beta	
SRTSENTGEL	Hardy; Characterisation	2019;	beta	
SHLAGAGTDTQ	Hardy; Characterisation	2019;	beta	
SQVLFYEQ	Hardy; Characterisation	2019;	beta	
S RTPW	Hardy; Characterisation	2019;	beta	
SFGIDTQ	Hardy; Characterisation	2019;	beta	
GGDAKNIQ	Hardy; Characterisation	2019;	beta	
SAQWVEQ	Hardy; Characterisation	2019;	beta	
SLWPPGQGSETQ	Hardy; Characterisation	2019;	beta	
GTSGRVITDTQ	Hardy; Characterisation	2019;	beta	
SQDLAWTLGGRGHNEQ	Hardy; Characterisation	2019;	beta	
SPLGLAGAYEQ	Hardy; Characterisation	2019;	beta	
SITGSGEL	Hardy; Characterisation	2019;	beta	
KTPAPTYEQ	Hardy; Characterisation	2019;	beta	
SREWETQ	Hardy; Characterisation	2019;	beta	
GRLTDTQ	Hardy; Characterisation	2019;	beta	
SIVTGGWGIQ	Hardy; Characterisation	2019;	beta	

SRTSGRAGDEQ	Hardy; Characterisation	2019;	beta	
ARTSGRAGDEQ	Hardy; Characterisation	2019;	beta	
SLLAGGFYEQ	Hardy; Characterisation	2019;	beta	
GKLGLDTQ	Hardy; Characterisation	2019;	beta	
SLAKQGVYEQ	Hardy; Characterisation	2019;	beta	
SFWSQDTI	Hardy; Characterisation	2019;	beta	
EAGAYEQ	Hardy; Characterisation	2019;	beta	
RWPLTGLPFLDTQ	Hardy; Characterisation	2019;	beta	
DRLTDTQ	Hardy; Characterisation	2019;	beta	
QDRPGEQ	Hardy; Characterisation	2019;	beta	
SEAYRYEQ	Hardy; Characterisation	2019;	beta	
TRSGTIGDTQ	Hardy; Characterisation	2019;	beta	
SQVYMYEQ	Hardy; Characterisation	2019;	beta	
SVGAQGGEQ	Hardy; Characterisation	2019;	beta	
SPPDRNTEA	Hardy; Characterisation	2019;	beta	
EGGNYGY	Hardy; Characterisation	2019;	beta	
AQGWGYEQ	Hardy; Characterisation	2019;	beta	
SKQGGTATNEKL	Hardy; Characterisation	2019;	beta	
SFGQGSTEa	Hardy; Characterisation	2019;	beta	
SLQGGETQ	Hardy; Characterisation	2019;	beta	
SPPXGGAAEA	Hardy; Characterisation	2019;	beta	



HGIERGPEETQ	Hardy; Characterisation	2019;	beta	
EAGTAYAYNSPL	Hardy; Characterisation	2019;	beta	
ARTSGRAGDTQ	Hardy; Characterisation	2019;	beta	
SSLGPDQPQ	Hardy; Characterisation	2019;	beta	
GLAKNIQ	Hardy; Characterisation	2019;	beta	
SEAYRYEQ	Hardy; Characterisation	2019;	beta	
SLNVVTYNSPL	Hardy; Characterisation	2019;	beta	
SQAGGLFNSPL	Hardy; Characterisation	2019;	beta	
SFSAGTTEA	Hardy; Characterisation	2019;	beta	
VDSVTYEQ	Hardy; Characterisation	2019;	beta	
EGGGYEQ	Hardy; Characterisation	2019;	beta	
ILWGIGTGTDTQ	Hardy; Characterisation	2019;	beta	
SHIAGAGTDTQ	Hardy; Characterisation	2019;	beta	
SSGQPTTDTQ	Hardy; Characterisation	2019;	beta	
SFGGPYNEQ	Hardy; Characterisation	2019;	beta	
SWLAGGPEETQ	Hardy; Characterisation	2019;	beta	
SSDAYTGEL	Hardy; Characterisation	2019;	beta	
SPRAGASGHTGEL	Hardy; Characterisation	2019;	beta	
SIFLGIRNQPP	Hardy; Characterisation	2019;	beta	
SEWGLQGNEQ	Hardy; Characterisation	2019;	beta	
SLGTVSNYGY	Hardy; Characterisation	2019;	beta	

RRAGWETEA	Hardy; Characterisation	2019;	beta	
ARTSGRAGDEQ	Hardy; Characterisation	2019;	beta	
SQSRGTFTHHSEA	Hardy; Characterisation	2019;	beta	
TPRGGNQPQ	Hardy; Characterisation	2019;	beta	
RVAGYNEQ	Hardy; Characterisation	2019;	beta	
TVMDSSYKL	Hardy; Characterisation	2019;	alpha	
SIVGYQL	Hardy; Characterisation	2019;	alpha	
DYGGATNKL	Hardy; Characterisation	2019;	alpha	
SDNWWYGGATNKL	Hardy; Characterisation	2019;	alpha	
RAFGNEKL	Hardy; Characterisation	2019;	alpha	
NGGNYGQNF	Hardy; Characterisation	2019;	alpha	
TPRGYAL	Hardy; Characterisation	2019;	alpha	
NPGGAGGTSYGKL	Hardy; Characterisation	2019;	alpha	
IILTGGGNKL	Hardy; Characterisation	2019;	alpha	
SRTSGSARQL	Hardy; Characterisation	2019;	alpha	
SIGNYQL	Hardy; Characterisation	2019;	alpha	
NRKTSYDKV	Hardy; Characterisation	2019;	alpha	
SLTGANSKL	Hardy; Characterisation	2019;	alpha	
SADQTGANNL	Hardy; Characterisation	2019;	alpha	
KTNDYKL	Hardy; Characterisation	2019;	alpha	
SGGTGGFKT	Hardy; Characterisation	2019;	alpha	

RASEYGNKL	Hardy; Characterisation	2019;	alpha	
SARSGSNYKL	Hardy; Characterisation	2019;	alpha	
QLPMNRDDKI	Hardy; Characterisation	2019;	alpha	
GDPYTGGGNKL	Hardy; Characterisation	2019;	alpha	
EGNYGQNF	Hardy; Characterisation	2019;	alpha	
EGNTGFQKL	Hardy; Characterisation	2019;	alpha	
SANFGFGNEKL	Hardy; Characterisation	2019;	alpha	
SSVYSGGGADGL	Hardy; Characterisation	2019;	alpha	
NAPHGGSQGNL	Hardy; Characterisation	2019;	alpha	
DINAGNML	Hardy; Characterisation	2019;	alpha	
PLNTGFQKL	Hardy; Characterisation	2019;	alpha	
SGTGTASKL	Hardy; Characterisation	2019;	alpha	
KGGTNQF	Hardy; Characterisation	2019;	alpha	
SEAGYGGATNKL	Hardy; Characterisation	2019;	alpha	
YQGGKL	Hardy; Characterisation	2019;	alpha	
RLVEYGNKL	Hardy; Characterisation	2019;	alpha	
RVPNTGFQKL	Hardy; Characterisation	2019;	alpha	
RFPVYGGNQGNL	Hardy; Characterisation	2019;	alpha	
SSRSDGQKL	Hardy; Characterisation	2019;	alpha	
RPPTQGGSEKL	Hardy; Characterisation	2019;	alpha	
MNYGGGTNKL	Hardy; Characterisation	2019;	alpha	

FMPPGNQF	Hardy; Characterisation	2019;	alpha	
RTGANNL	Hardy; Characterisation	2019;	alpha	
SVRTSGTYKY	Hardy; Characterisation	2019;	alpha	
SAGTGTASKL	Hardy; Characterisation	2019;	alpha	
ENTSYGKL	Hardy; Characterisation	2019;	alpha	
MKHRGFGNKL	Hardy; Characterisation	2019;	alpha	
MKQRGFGNVL	Hardy; Characterisation	2019;	alpha	
RPYNAGNML	Hardy; Characterisation	2019;	alpha	
WNTDKL	Hardy; Characterisation	2019;	alpha	
SITGYAL	Hardy; Characterisation	2019;	alpha	
GPGTASKL	Hardy; Characterisation	2019;	alpha	
SERGSNDYKL	Hardy; Characterisation	2019;	alpha	
NPGGAGGTSYGKL	Hardy; Characterisation	2019;	alpha	
NDAGGTSYGKL	Hardy; Characterisation	2019;	alpha	
FILTGGGNKL	Hardy; Characterisation	2019;	alpha	
ETGFQKL	Hardy; Characterisation	2019;	alpha	
GYNKL	Hardy; Characterisation	2019;	alpha	
SNDYKL	Hardy; Characterisation	2019;	alpha	
RPSEYGNKL	Hardy; Characterisation	2019;	alpha	
RASEYGNKL	Hardy; Characterisation	2019;	alpha	
EKL	Hardy; Characterisation	2019;	alpha	

AQXRGGATNKL	Hardy; Characterisation	2019;	alpha	
AQLRGGATNKL	Hardy; Characterisation	2019;	alpha	
DPGGFKT	Hardy; Characterisation	2019;	alpha	
PPPVGRL	Hardy; Characterisation	2019;	alpha	
DPQGAQKL	Hardy; Characterisation	2019;	alpha	
NTGKL	Hardy; Characterisation	2019;	alpha	
RSDPPNFGNEKL	Hardy; Characterisation	2019;	alpha	
GDGGATNKL	Hardy; Characterisation	2019;	alpha	
ALDSNYQL	Hardy; Characterisation	2019;	alpha	
SALIGGGADGL	Hardy; Characterisation	2019;	alpha	
ADKL	Hardy; Characterisation	2019;	alpha	
NEGRL	Hardy; Characterisation	2019;	alpha	
PSGSSASKI	Hardy; Characterisation	2019;	alpha	
SLTGGGADGL	Hardy; Characterisation	2019;	alpha	
RWSTGTASKL	Hardy; Characterisation	2019;	alpha	
NPWKAGGSEKL	Hardy; Characterisation	2019;	alpha	
DGSTLGRL	Hardy; Characterisation	2019;	alpha	
DNDM	Hardy; Characterisation	2019;	alpha	
PNNAGNML	Hardy; Characterisation	2019;	alpha	
RLPTSGSARQL	Hardy; Characterisation	2019;	alpha	
PGPGTYKY	Hardy; Characterisation	2019;	alpha	

RLPEYGNKL	Hardy; Characterisation	2019;	alpha	
RRTSGSRL	Hardy; Characterisation	2019;	alpha	
GVNTGGFKT	Hardy; Characterisation	2019;	alpha	
TDYNARL	Hardy; Characterisation	2019;	alpha	
IQGAQKL	Hardy; Characterisation	2019;	alpha	
SEHLLRTEA	Hardy; Characterisation	2019;	beta	
SRNRDRGL	Hardy; Characterisation	2019;	beta	
SRGLDLLGEQ	Hardy; Characterisation	2019;	beta	
SRLGVGQETQ	Hardy; Characterisation	2019;	beta	
SQGWASGFGNTGEL	Hardy; Characterisation	2019;	beta	
SLGHS GTIDGY	Hardy; Characterisation	2019;	beta	
SFFQLGDTQ	Hardy; Characterisation	2019;	beta	
STNGGNYEQ	Hardy; Characterisation	2019;	beta	
SLQPHLTATYEQ	Hardy; Characterisation	2019;	beta	
SLAREYSGNTI	Hardy; Characterisation	2019;	beta	
SFFLRDGY	Hardy; Characterisation	2019;	beta	
SEANGEL	Hardy; Characterisation	2019;	beta	
KESGLADVNEQ	Hardy; Characterisation	2019;	beta	
SQWGQGEGEQ	Hardy; Characterisation	2019;	beta	
SFSASDSYEQ	Hardy; Characterisation	2019;	beta	
SLSFDYEQ	Hardy; Characterisation	2019;	beta	

SPGQGGYNEQ	Hardy; Characterisation	2019;	beta	
SLAGSYEQ	Hardy; Characterisation	2019;	beta	
SPGQGPYGY	Hardy; Characterisation	2019;	beta	
SLAGTLPNEQ	Hardy; Characterisation	2019;	beta	
SLLAGGDTQ	Hardy; Characterisation	2019;	beta	
SWAVGSNEQ	Hardy; Characterisation	2019;	beta	
GSIAGGTIEQ	Hardy; Characterisation	2019;	beta	
SPWGGGTQ	Hardy; Characterisation	2019;	beta	
SSTGLYQETQ	Hardy; Characterisation	2019;	beta	
SESDDRVTDTQ	Hardy; Characterisation	2019;	beta	
SFSPAGGGTQ	Hardy; Characterisation	2019;	beta	
SISWTIEQ	Hardy; Characterisation	2019;	beta	
GRLGPYNEQ	Hardy; Characterisation	2019;	beta	
GGASRGYGY	Hardy; Characterisation	2019;	beta	
SPGGEKL	Hardy; Characterisation	2019;	beta	
NPGGGAVG	Hardy; Characterisation	2019;	beta	
EEGADSPL	Hardy; Characterisation	2019;	beta	
SGRRGTDQ	Hardy; Characterisation	2019;	beta	
GRPDSPL	Hardy; Characterisation	2019;	beta	
SVGPGGEQ	Hardy; Characterisation	2019;	beta	
WRSYGY	Hardy; Characterisation	2019;	beta	

SLRGAVLAPYEQ	Hardy; Characterisation	2019;	beta	
TPIQGAGGY	Hardy; Characterisation	2019;	beta	
SSLQRHEQ	Hardy; Characterisation	2019;	beta	
SLLQRYEQ	Hardy; Characterisation	2019;	beta	
SLVGQGRSEQ	Hardy; Characterisation	2019;	beta	
RTGEWETQ	Hardy; Characterisation	2019;	beta	
SPSGGSTDTQ	Hardy; Characterisation	2019;	beta	
EFWGGNTEA	Hardy; Characterisation	2019;	beta	
RTGEWETQ	Hardy; Characterisation	2019;	beta	
SVSLGSVNTEA	Hardy; Characterisation	2019;	beta	
STLTGDYEQ	Hardy; Characterisation	2019;	beta	
SSVPGGEQ	Hardy; Characterisation	2019;	beta	
SLAGLYEQ	Hardy; Characterisation	2019;	beta	
SISAVSTDQ	Hardy; Characterisation	2019;	beta	
SISAVSTDQ	Hardy; Characterisation	2019;	beta	
SLRVSQPQ	Hardy; Characterisation	2019;	beta	
RRGTGDYEQ	Hardy; Characterisation	2019;	beta	
SLGQGTTQ	Hardy; Characterisation	2019;	beta	
STRTGNEQ	Hardy; Characterisation	2019;	beta	
SPSGQGEYEQ	Hardy; Characterisation	2019;	beta	
SPSGQGEYEQ	Hardy; Characterisation	2019;	beta	



SLEGTDTQ	Hardy; Characterisation	2019;	beta	
SLVGAGDGTDTQ	Hardy; Characterisation	2019;	beta	
STGDPGEL	Hardy; Characterisation	2019;	beta	
SVGGGAGDTQ	Hardy; Characterisation	2019;	beta	
SPTLGCEL	Hardy; Characterisation	2019;	beta	
YAGLPGDEQ	Hardy; Characterisation	2019;	beta	
SYAGLPGDEQ	Hardy; Characterisation	2019;	beta	
SPGTTRSGEL	Hardy; Characterisation	2019;	beta	
SQVNRHTEA	Hardy; Characterisation	2019;	beta	
SRLGVGQETQ	Hardy; Characterisation	2019;	beta	
SFGLRDTGEL	Hardy; Characterisation	2019;	beta	
TLLAGGGGDTQ	Hardy; Characterisation	2019;	beta	
SLGGDSYEQ	Hardy; Characterisation	2019;	beta	
SFGTTNEKL	Hardy; Characterisation	2019;	beta	
SKGQGALLSSYEQ	Hardy; Characterisation	2019;	beta	
SLIPYNEQ	Hardy; Characterisation	2019;	beta	
SRS GGAWADTQ	Hardy; Characterisation	2019;	beta	
SIAWTGHVDGY	Hardy; Characterisation	2019;	beta	
TTGGSEKL	Hardy; Characterisation	2019;	beta	
GPGGDSYEQ	Hardy; Characterisation	2019;	beta	
ILGGDSYEQ	Hardy; Characterisation	2019;	beta	

GGAQKGYGY	Hardy; Characterisation	2019;	beta	
AGTGIGY	Hardy; Characterisation	2019;	beta	
GSQGDTEA	Hardy; Characterisation	2019;	beta	
REGIDTEA	Hardy; Characterisation	2019;	beta	
EQGWDSAEA	Hardy; Characterisation	2019;	beta	
SSNEKL	Hardy; Characterisation	2019;	beta	
RGWDTEA	Hardy; Characterisation	2019;	beta	
GQADTEA	Hardy; Characterisation	2019;	beta	
GEALGETQ	Hardy; Characterisation	2019;	beta	
ETSRGHEQ	Hardy; Characterisation	2019;	beta	
SEVAGGEQ	Hardy; Characterisation	2019;	beta	
SQEAPGQGYGQPQ	Hardy; Characterisation	2019;	beta	
SRTGIWDEQ	Hardy; Characterisation	2019;	beta	
SQDLTDSPL	Hardy; Characterisation	2019;	beta	
SQDLTDSPL	Hardy; Characterisation	2019;	beta	
SFGPLGSEA	Hardy; Characterisation	2019;	beta	
RGSDYEQ	Hardy; Characterisation	2019;	beta	
SVGGGAGDTQ	Hardy; Characterisation	2019;	beta	
SVGGPYNEQ	Hardy; Characterisation	2019;	beta	
SPWTSGYNQDTQ	Hardy; Characterisation	2019;	beta	
SLLGQAGY	Hardy; Characterisation	2019;	beta	

SLTGARTDTQ	Hardy; Characterisation	2019;	beta	
SAGISEEAG	Hardy; Characterisation	2019;	beta	
SIAWVETQ	Hardy; Characterisation	2019;	beta	
GGTAGSNYGY	Hardy; Characterisation	2019;	beta	
FKGGDTEA	Hardy; Characterisation	2019;	beta	
RDLRTEA	Hardy; Characterisation	2019;	beta	
GRLTDTQ	Hardy; Characterisation	2019;	beta	
RRTFGQETQ	Hardy; Characterisation	2019;	beta	
AVGGDSYEQ	Hardy; Characterisation	2019;	beta	
SQGVEA	Hardy; Characterisation	2019;	beta	
RAGVDTEA	Hardy; Characterisation	2019;	beta	
SALQGASYEQ	Hardy; Characterisation	2019;	beta	
NSGWDGEL	Hardy; Characterisation	2019;	beta	
GYGLGETQ	Hardy; Characterisation	2019;	beta	
GGGYDQPQ	Hardy; Characterisation	2019;	beta	
SAGGWDTGEL	Hardy; Characterisation	2019;	beta	
SGQGGRA	Hardy; Characterisation	2019;	beta	
SSLQGRDGY	Hardy; Characterisation	2019;	beta	
SLFLAGNRSYEQ	Hardy; Characterisation	2019;	beta	
RNRGQASYEQ	Hardy; Characterisation	2019;	beta	
SVGLQVSAETQ	Hardy; Characterisation	2019;	beta	

SSWGQGESPL	Hardy; Characterisation	2019;	beta	
SLRGGQGGETQ	Hardy; Characterisation	2019;	beta	
SSFRNTEA	Hardy; Characterisation	2019;	beta	
SLAYSGYGY	Hardy; Characterisation	2019;	beta	
SHGQDTEA	Hardy; Characterisation	2019;	beta	
SLRGGQGGEKL	Hardy; Characterisation	2019;	beta	
SPGQGAYGY	Hardy; Characterisation	2019;	beta	
AREGTDQ	Hardy; Characterisation	2019;	beta	
SSRGTDQ	Hardy; Characterisation	2019;	beta	
SQGQDTEA	Hardy; Characterisation	2019;	beta	
SLLAGGDTQ	Hardy; Characterisation	2019;	alpha	
SERVGGFGY	Hardy; Characterisation	2019;	alpha	
SELSSVWDEKL	Hardy; Characterisation	2019;	alpha	
SPVGAYEQ	Hardy; Characterisation	2019;	alpha	
TRQSPADTQ	Hardy; Characterisation	2019;	alpha	
REESGYSTL	Hardy; Characterisation	2019;	alpha	
RAVISGGYNKL	Hardy; Characterisation	2019;	alpha	
RAVLSSGGYNKL	Hardy; Characterisation	2019;	alpha	
SRVQAGTAL	Hardy; Characterisation	2019;	alpha	
RSISGNTPL	Hardy; Characterisation	2019;	alpha	
GDDTGFQKL	Hardy; Characterisation	2019;	alpha	

GDSRGGKL	Hardy; Characterisation	2019;	alpha	
GDVDYNQGGKL	Hardy; Characterisation	2019;	alpha	
GDGAAGNKL	Hardy; Characterisation	2019;	alpha	
SSQLGGKL	Hardy; Characterisation	2019;	alpha	
AVGVEDSGNTPL	Hardy; Characterisation	2019;	alpha	
SVYSSASKI	Hardy; Characterisation	2019;	alpha	
APNQAGTAL	Hardy; Characterisation	2019;	alpha	
REDTGRRAL	Hardy; Characterisation	2019;	alpha	
TGGFKT	Hardy; Characterisation	2019;	alpha	
SDNWWYGGATNKL	Hardy; Characterisation	2019;	alpha	
GGYGGSQGNL	Hardy; Characterisation	2019;	alpha	
SIGNYQL	Hardy; Characterisation	2019;	alpha	
DANYGQNF	Hardy; Characterisation	2019;	alpha	
SGAGANSKL	Hardy; Characterisation	2019;	alpha	
SRSYNTDKL	Hardy; Characterisation	2019;	alpha	
GPTGANNL	Hardy; Characterisation	2019;	alpha	
TTDSWGKL	Hardy; Characterisation	2019;	alpha	
SGGTGGFKT	Hardy; Characterisation	2019;	alpha	
NVVYEKL	Hardy; Characterisation	2019;	alpha	
SLAYTSGTYKY	Hardy; Characterisation	2019;	alpha	
LNYYGGSQGNL	Hardy; Characterisation	2019;	alpha	

EKDSGYSTL	Hardy; Characterisation	2019;	alpha	
PHNAGNML	Hardy; Characterisation	2019;	alpha	
SGTYKY	Hardy; Characterisation	2019;	alpha	
RSGDYTGANSKL	Hardy; Characterisation	2019;	alpha	
ESGSARQL	Hardy; Characterisation	2019;	alpha	
RDLYNFKF	Hardy; Characterisation	2019;	alpha	
RTDYLTGTASKL	Hardy; Characterisation	2019;	alpha	
GRPYTDKL	Hardy; Characterisation	2019;	alpha	
SMWGTSYGKL	Hardy; Characterisation	2019;	alpha	
SDYNFKF	Hardy; Characterisation	2019;	alpha	
SEVPGGGNKL	Hardy; Characterisation	2019;	alpha	
RGSAGGTSYGKL	Hardy; Characterisation	2019;	alpha	
SLSGGYNKL	Hardy; Characterisation	2019;	alpha	
ILPXSWGKL	Hardy; Characterisation	2019;	alpha	
SEGGTYGNKL	Hardy; Characterisation	2019;	alpha	
QGTDSWGKL	Hardy; Characterisation	2019;	alpha	
SSAKTSYDKV	Hardy; Characterisation	2019;	alpha	
NRGSNYKL	Hardy; Characterisation	2019;	alpha	
SWGKL	Hardy; Characterisation	2019;	alpha	
QLGGQGAQKL	Hardy; Characterisation	2019;	alpha	
QSTGKL	Hardy; Characterisation	2019;	alpha	

VTSGSRL	Hardy; Characterisation	2019;	alpha	
MEENAGNML	Hardy; Characterisation	2019;	alpha	
SAKEYGNKL	Hardy; Characterisation	2019;	alpha	
RETSGSRL	Hardy; Characterisation	2019;	alpha	
SARWRAL	Hardy; Characterisation	2019;	alpha	
IAQPGTYNQGGKL	Hardy; Characterisation	2019;	alpha	
TGGGNKL	Hardy; Characterisation	2019;	alpha	
HPADSYDKV	Hardy; Characterisation	2019;	alpha	
MNIGYAL	Hardy; Characterisation	2019;	alpha	
GDSSYKL	Hardy; Characterisation	2019;	alpha	
EAGSYQL	Hardy; Characterisation	2019;	alpha	
SEGSTSGTYKY	Hardy; Characterisation	2019;	alpha	
SEGGNNFNKF	Hardy; Characterisation	2019;	alpha	
SEASGGKL	Hardy; Characterisation	2019;	alpha	
VGPSGSARQL	Hardy; Characterisation	2019;	alpha	
IGGGATNKL	Hardy; Characterisation	2019;	alpha	
FTSGTYKY	Hardy; Characterisation	2019;	alpha	
SAGGSARQL	Hardy; Characterisation	2019;	alpha	
SEAAGNKL	Hardy; Characterisation	2019;	alpha	
SAGSGGYNKL	Hardy; Characterisation	2019;	alpha	
KNTGFQKL	Hardy; Characterisation	2019;	alpha	

SDPTGANSKL	Hardy; Characterisation	2019;	alpha	
SDPTGTASKL	Hardy; Characterisation	2019;	alpha	
SGLRGSSTLGRL	Hardy; Characterisation	2019;	alpha	
GPSTLAGNKL	Hardy; Characterisation	2019;	alpha	
SSLGGGGNKL	Hardy; Characterisation	2019;	alpha	
RERGNNDM	Hardy; Characterisation	2019;	alpha	
QVSGSGNTGKL	Hardy; Characterisation	2019;	alpha	
GDDTGFQKL	Hardy; Characterisation	2019;	alpha	
GDETGGYNKL	Hardy; Characterisation	2019;	alpha	
GEGDSNYQL	Hardy; Characterisation	2019;	alpha	
GPDNQGGKL	Hardy; Characterisation	2019;	alpha	
GDGGGGYNKL	Hardy; Characterisation	2019;	alpha	
TSGTYKY	Hardy; Characterisation	2019;	alpha	
RGVFSGGYNKL	Hardy; Characterisation	2019;	alpha	
RDPGGKL	Hardy; Characterisation	2019;	alpha	
RGVFSGGYNKL	Hardy; Characterisation	2019;	alpha	
LFDSWGKL	Hardy; Characterisation	2019;	alpha	
GDDTGFQKL	Hardy; Characterisation	2019;	alpha	
GDTGFTGGGNKL	Hardy; Characterisation	2019;	alpha	
VGYSSASKI	Hardy; Characterisation	2019;	alpha	
RPSGYNKL	Hardy; Characterisation	2019;	alpha	



NRPTGFQKL	Hardy; Characterisation	2019;	alpha	
SGNDYKL	Hardy; Characterisation	2019;	alpha	
TGGTSYGKL	Hardy; Characterisation	2019;	alpha	
SEGNFNKF	Hardy; Characterisation	2019;	alpha	
SEGYNFNKF	Hardy; Characterisation	2019;	alpha	
SEATSGTYKY	Hardy; Characterisation	2019;	alpha	
TLGNFGNEKL	Hardy; Characterisation	2019;	alpha	
NSGFQKL	Hardy; Characterisation	2019;	alpha	
SEGLTGGGNKL	Hardy; Characterisation	2019;	alpha	
SEAAGNKL	Hardy; Characterisation	2019;	alpha	
SKGSSASKI	Hardy; Characterisation	2019;	alpha	
TTDSWGKL	Hardy; Characterisation	2019;	alpha	
SEAGANSKL	Hardy; Characterisation	2019;	alpha	
PNFGNEKL	Hardy; Characterisation	2019;	alpha	
QSFAGGTSYGKL	Hardy; Characterisation	2019;	alpha	
YTGTASKL	Hardy; Characterisation	2019;	alpha	
EGTTDSWGKL	Hardy; Characterisation	2019;	alpha	
NNNARL	Hardy; Characterisation	2019;	alpha	
GSGFQKL	Hardy; Characterisation	2019;	alpha	
APTEYGKNKL	Hardy; Characterisation	2019;	alpha	
SGLAGGGADGL	Hardy; Characterisation	2019;	alpha	

ATYNFNKF	Hardy; 2019; Characterisation	alpha	
RINARL	Hardy; 2019; Characterisation	alpha	
QGATNKL	Hardy; 2019; Characterisation	alpha	
REAYNQGGKL	Hardy; 2019; Characterisation	alpha	
MGEYGGATNKL	Hardy; 2019; Characterisation	alpha	
NEWEGNKL	Hardy; 2019; Characterisation	alpha	
REGGFGQF	Hardy; 2019; Characterisation	alpha	
DADSWGKL	Hardy; 2019; Characterisation	alpha	
TGGGNKL	Hardy; 2019; Characterisation	alpha	
MYSSYKL	Hardy; 2019; Characterisation	alpha	
RVAAVTGRRAL	Hardy; 2019; Characterisation	alpha	
RDPMNYGGSQGNL	Hardy; 2019; Characterisation	alpha	
FTGTASKL	Hardy; 2019; Characterisation	alpha	
ALSDHYSSGSARQLT	Gunnarsen; 2017; TCRalpha	alpha	ASSTAVLAGGPQY
IVTNNNDMR	Gunnarsen; 2017; TCRalpha	alpha	ASSIRSTDTQY
AESPGPGKLI	Gunnarsen; 2017; TCRalpha	alpha	ASSLRADTQY
AVDPP	Gunnarsen; 2017; TCRalpha	alpha	ASSFRSTDQY
AVTRNSGGYQKVT	Gunnarsen; 2017; TCRalpha	alpha	ASSIRSTDTQY
APDPSTSGTYKYI	Gunnarsen; 2017; TCRalpha	alpha	ASSLRFTDTQY
AEGITGANSKLT	Gunnarsen; 2017; TCRalpha	alpha	ASSIRATDTQY
AESGYSTLT	Gunnarsen; 2017; TCRalpha	alpha	ASSVRSTDQY
AMKEYGNKLV	Gunnarsen; 2017; TCRalpha	alpha	ASSLRSTDQY
ASSTAVLAGGPQY	Gunnarsen; 2017; TCRalpha	beta	ALSDHYSSGSARQLT
ASSIRSTDTQY	Gunnarsen; 2017; TCRalpha	beta	IVTNNNDMR
ASSLRADTQY	Gunnarsen; 2017; TCRalpha	beta	AESPGPGKLI
ASSFRSTDQY	Gunnarsen; 2017; TCRalpha	beta	AVDPP
ASSIRSTDTQY	Gunnarsen; 2017; TCRalpha	beta	AVTRNSGGYQKVT
ASSLRFTDTQY	Gunnarsen; 2017; TCRalpha	beta	APDPSTSGTYKYI

ASSIRATDTQY	Gunnarsen; 2017; TCRalpha	beta	AEGITGANSKLT
ASSVRSTDTQY	Gunnarsen; 2017; TCRalpha	beta	AESGYSTLT
ASSLRSTDTQY	Gunnarsen; 2017; TCRalpha	beta	AMKEYGNKLV
CASSQVTLPTETQYF	cook; 2020; circulating	beta	
CASGQVTLPTETQYF	cook; 2020; circulating	beta	
CASSSLNTQYF	cook; 2020; circulating	beta	
CTSSQVTLPTETQYF	cook; 2020; circulating	beta	
CASSQVTLPTGTQYF	cook; 2020; circulating	beta	
CASGQVILPTETQYF	cook; 2020; circulating	beta	
CASSFGVEDEQYF	cook; 2020; circulating	beta	
CASSSLNTQYF	cook; 2020; circulating	beta	
CASSIRSTDTQYF	cook; 2020; circulating	beta	
CASSQVTLPTETQYF	cook; 2020; circulating	beta	
CASNFGVEDEQYF	cook; 2020; circulating	beta	
CASSLGVEDEQYF	cook; 2020; circulating	beta	
CTSSSLNTQYF	cook; 2020; circulating	beta	
CASSQVTLPTETQYF	cook; 2020; circulating	beta	
CASSLGGSTDTQYF	cook; 2020; circulating	beta	
CSASSSGGASYNEQFF	cook; 2020; circulating	beta	
CASSRTGQGGETQYF	cook; 2020; circulating	beta	
CASSFGVEDEQYF	cook; 2020; circulating	beta	
CASSLSFDSPLHF	cook; 2020; circulating	beta	
CASSRSYGYTF	cook; 2020; circulating	beta	
CASSLSGADNSPLHF	cook; 2020; circulating	beta	
CASSVQGITNEKLFF	cook; 2020; circulating	beta	
CASSQVTLPTETRYF	cook; 2020; circulating	beta	
CASSQVTLPTETQHf	cook; 2020; circulating	beta	
CASSWGQGYQPQHF	cook; 2020; circulating	beta	
CPSFRGDIQYF	cook; 2020; circulating	beta	
CASSPLSFGGGQETQYF	cook; 2020; circulating	beta	
CAMTLNTDKLIF	Ting; 2020; molecular	alpha	CASSLQGGDYGYTF
CAFMKEDGGATNKLIF	Ting; 2020; molecular	alpha	CSASPGNTGVAQYF
CIVYLSNFGNEKLTF	Ting; 2020; molecular	alpha	CASSLIGGGELFF
CAASAHYGGSQGNLIF	Ting; 2020; molecular	alpha	CASGPGTATEAFF
CAYRSQETSGSRLTF	Ting; 2020; molecular	alpha	CSASWLGFGGETQYF
CAYTPLETSGSRLTF	Ting; 2020; molecular	alpha	CSARAPITGRFYEQYF
CAVRPGGSQGNLIF	Ting; 2020; molecular	alpha	CASSLTSEETQYF
CAASADLTNRDDKIIF	Ting; 2020; molecular	alpha	CASSLTSEETQYF
CAFMKGSYGGSQGNLIF	Ting; 2020; molecular	alpha	CASSRTANYEQYF
FLLGITSGETYKYIF	Ting; 2020; molecular	alpha	CASSRTANYEQYF
CIVRVAEGAQKLVF	Ting; 2020; molecular	alpha	CSATKETQYF

CIVRVAEGAQKLVF	Ting; 2020; molecular	alpha	CSATKETQYF
CAVHTGARLMF	Ting; 2020; molecular	alpha	CASSHGASTDTQYF
CIVRVAEGAQKLVF	Ting; 2020; molecular	alpha	CSATKETQYF
CALVRDYGQNFVF	Ting; 2020; molecular	alpha	CASSTSGGGARSYEQYF
CAWTGGGGFKTIF	Ting; 2020; molecular	alpha	CASRKPGGDYEQYF
CAVIGTSGSRLTF	Ting; 2020; molecular	alpha	CASSSGAATDTQYF
CIVRPAQGAQKLVF	Ting; 2020; molecular	alpha	CSVSSGGEENGNYTF
CASPQGGSEKLVF	Ting; 2020; molecular	alpha	CASSSGGWGGGTEAFF
CAGRDDFNKFYF	Ting; 2020; molecular	alpha	CASSSGGWGGGTEAFF
CALGLNNNAGNMLTF	Ting; 2020; molecular	alpha	CAISPRQAETQYF
CAASGYSTLTF	Ting; 2020; molecular	alpha	CASTHGAGSDTQYF
CAVSGNTGFQKLVF	Ting; 2020; molecular	alpha	CASTSRGGNSNQPHF
CALGATVMDSSYKLI	Ting; 2020; molecular	alpha	CASTSRGGNSNQPHF
CASSLQGGDYGTYF	Ting; 2020; molecular	beta	CAMTLNTDKLIF
CSASPGNTGVAQYF	Ting; 2020; molecular	beta	CAFMKEDGGATNKLIF
CASSLIGGGELFF	Ting; 2020; molecular	beta	CIVYLSNFGNEKLTF
CASGPGTATEAFF	Ting; 2020; molecular	beta	CAASAHYGGSQGNLIF
CSASWLGFGETQYF	Ting; 2020; molecular	beta	CAYRSQETSGSRLTF
CSARAPITGRFYEQYF	Ting; 2020; molecular	beta	CAYTPLETSGSRLTF
CASSLTSEETQYF	Ting; 2020; molecular	beta	CAVRPGGSQGNLIF
CASSLTSEETQYF	Ting; 2020; molecular	beta	CAASADLTNRDDKIIF
CASSRTANYEQYF	Ting; 2020; molecular	beta	CAFMKGSYGGSQGNLIF
CASSRTANYEQYF	Ting; 2020; molecular	beta	FLLGITSGETYKYIF
CSATKETQYF	Ting; 2020; molecular	beta	CIVRVAEGAQKLVF
CSATKETQYF	Ting; 2020; molecular	beta	CIVRVAEGAQKLVF
CASSHGASTDTQYF	Ting; 2020; molecular	beta	CAVHTGARLMF
CSATKETQYF	Ting; 2020; molecular	beta	CIVRVAEGAQKLVF
CASSTSGGGARSYEQYF	Ting; 2020; molecular	beta	CALVRDYGQNFVF
CASRKPGGDYEQYF	Ting; 2020; molecular	beta	CAWTGGGGFKTIF
CASSSGAATDTQYF	Ting; 2020; molecular	beta	CAVIGTSGSRLTF
CSVSSGGEENGNYTF	Ting; 2020; molecular	beta	CIVRPAQGAQKLVF
CASSSGGWGGGTEAFF	Ting; 2020; molecular	beta	CASPQGGSEKLVF
CASSSGGWGGGTEAFF	Ting; 2020; molecular	beta	CAGRDDFNKFYF
CAISPRQAETQYF	Ting; 2020; molecular	beta	CALGLNNNAGNMLTF
CASTHGAGSDTQYF	Ting; 2020; molecular	beta	CAASGYSTLTF
CASTSRGGNSNQPHF	Ting; 2020; molecular	beta	CAVSGNTGFQKLVF
CASTSRGGNSNQPHF	Ting; 2020; molecular	beta	CALGATVMDSSYKLI
IVTNNNDMR	qiao; 2013; biased	alpha	IRSTDT
IAWANDMR	qiao; 2013; biased	alpha	LRSTD
IGFNDKLS	qiao; 2013; biased	alpha	LRSTD
TDSGGGADGLT	qiao; 2013; biased	alpha	LRFTDT

IVFGGYQKVT	qiao; 2013; biased	alpha	LRATDT
IVTGGADGLT	qiao; 2013; biased	alpha	IRTTDT
IAPYGGATNKLI	qiao; 2013; biased	alpha	IRWTD
IDFGGSQGNLI	qiao; 2013; biased	alpha	IRATDT
IVTNGQNFV	qiao; 2013; biased	alpha	LRTSDT
ISLNGAQKLV	qiao; 2013; biased	alpha	RRSTD
IANYGGSQGNLI	qiao; 2013; biased	alpha	MRFTDT
IVNGGANNLF	qiao; 2013; biased	alpha	IRHTDT
IVYGGGSQGNLI	qiao; 2013; biased	alpha	FRNTDT
IVFNDYKLS	qiao; 2013; biased	alpha	FRSTD
IAYGKLT	qiao; 2013; biased	alpha	VRFTDT
IALNARLM	qiao; 2013; biased	alpha	LRATDT
IVYNDYKLS	qiao; 2013; biased	alpha	LRTTDT
IVHQGKLI	qiao; 2013; biased	alpha	IRFTDT
IVMGGADGLT	qiao; 2013; biased	alpha	FRSTD
IVYNDYKLS	qiao; 2013; biased	alpha	LRTTDT
IAPFGNDR	qiao; 2013; biased	alpha	IRETDT
IAFNDYKLS	qiao; 2013; biased	alpha	LRSTD
IAYNDYKLS	qiao; 2013; biased	alpha	FRSTD
IGDYGGGSQGNLI	qiao; 2013; biased	alpha	LRFTDT
IVYNNARLM	qiao; 2013; biased	alpha	VRHTDT
IGNYGGGSQGNLI	qiao; 2013; biased	alpha	LRYTDT
IVFGGSQGNLI	qiao; 2013; biased	alpha	IRATDT
IVLSQNFV	qiao; 2013; biased	alpha	LRYTDT
IAPDNAGNMLTF	qiao; 2013; biased	alpha	IRFTDT
IAWGGYQNFV	qiao; 2013; biased	alpha	IRATDT
IRSTDT	qiao; 2013; biased	beta	IVTNNNDMR
LRSTD	qiao; 2013; biased	beta	IAWANDMR
LRSTD	qiao; 2013; biased	beta	IGFNDKLS
LRFTDT	qiao; 2013; biased	beta	TDSGGGADGLT
LRATDT	qiao; 2013; biased	beta	IVFGGYQKVT
IRTTDT	qiao; 2013; biased	beta	IVTGGADGLT
IRWTD	qiao; 2013; biased	beta	IAPYGGATNKLI
IRATDT	qiao; 2013; biased	beta	IDFGGSQGNLI
LRTSD	qiao; 2013; biased	beta	IVTNGQNFV
RRSTD	qiao; 2013; biased	beta	ISLNGAQKLV
MRFTDT	qiao; 2013; biased	beta	IANYGGSQGNLI
IRHTDT	qiao; 2013; biased	beta	IVNGGANNLF
FRNTDT	qiao; 2013; biased	beta	IVYGGGSQGNLI
FRSTD	qiao; 2013; biased	beta	IVFNDYKLS
VRFTDT	qiao; 2013; biased	beta	IAYGKLT

LRATDT	qiao; 2013; biased	beta	IALNARLM
LRTTDT	qiao; 2013; biased	beta	IVYNDYKLS
IRFTDT	qiao; 2013; biased	beta	IVHQGKLI
FRSTDT	qiao; 2013; biased	beta	IVMGGADGLT
LRTTDT	qiao; 2013; biased	beta	IVYNDYKLS
IRETDT	qiao; 2013; biased	beta	IAPFGNDRM
LRSTDT	qiao; 2013; biased	beta	IAFNDYKLS
FRSTDT	qiao; 2013; biased	beta	IAYNDYKLS
LRFTDT	qiao; 2013; biased	beta	IGDYGGSQGNLI
VRHTDT	qiao; 2013; biased	beta	IVYNNARLM
LRYTDT	qiao; 2013; biased	beta	IGNYGGSQGNLI
IRATDT	qiao; 2013; biased	beta	IVFGGSQGNLI
LRYTDT	qiao; 2013; biased	beta	IVLSQNFV
IRFTDT	qiao; 2013; biased	beta	IAPDNAGNMLTF
IRATDT	qiao; 2013; biased	beta	IAWGGYGQNFV
ASSIRSTDTQY	Qiao; 2011; posttranslational	beta	
ASSLRYTDTQY	Qiao; 2011; posttranslational	beta	
ASSLRSTDTQY	Qiao; 2011; posttranslational	beta	
ASSFRSTDTQY	Qiao; 2011; posttranslational	beta	
ASSLRFTDTQY	Qiao; 2011; posttranslational	beta	
ASSIRATDTQY	Qiao; 2011; posttranslational	beta	
CAASEGDSGTQYIF	Dahal-Koirala; 2019; discrim	alpha	CASSINALVGEQFF
CAVKFASGTQYIF	Dahal-Koirala; 2019; discrim	alpha	CASSPAFSTDTQYF
CAMREGWQAGNTLIF	Dahal-Koirala; 2019; discrim	alpha	CASSLDGLTNTTEAFF
CAVVDASSKLIF	Dahal-Koirala; 2019; discrim	alpha	CSATLGGDYGYTF
CLVGGYNNNDMRF	Dahal-Koirala; 2019; discrim	alpha	CSAQLAGGGGDTQYF
CAESRYSGYSTLTF	Dahal-Koirala; 2019; discrim	alpha	CSAFPGGDTEAFF
CALSEYGNKLVF	Dahal-Koirala; 2019; discrim	alpha	CASSYVGGDTDTQYF
CASSINALVGEQFF	Dahal-Koirala; 2019; discrim	beta	CAASEGDSGTQYIF
CASSPAFSTDTQYF	Dahal-Koirala; 2019; discrim	beta	CAVKFASGTQYIF
CASSLDGLTNTTEAFF	Dahal-Koirala; 2019; discrim	beta	CAMREGWQAGNTLIF
CSATLGGDYGYTF	Dahal-Koirala; 2019; discrim	beta	CAVVDASSKLIF
CSAQLAGGGGDTQYF	Dahal-Koirala; 2019; discrim	beta	CLVGGYNNNDMRF
CSAFPGGDTEAFF	Dahal-Koirala; 2019; discrim	beta	CAESRYSGYSTLTF
CASSYVGGDTDTQYF	Dahal-Koirala; 2019; discrim	beta	CALSEYGNKLVF
SLRTSGSHEQ	Hardy; 2015; consistency	beta	
STRTYGGNIQ	Hardy; 2015; consistency	beta	
SLRWTDQ	Hardy; 2015; consistency	beta	
SLRSSGSHEQ	Hardy; 2015; consistency	beta	
SIRSTDTQ	Hardy; 2015; consistency	beta	
SIRLADEGEQ	Hardy; 2015; consistency	beta	

SLRFTDTQ	Hardy; 2015; consistency	beta	
SLRAAGENIQ	Hardy; 2015; consistency	beta	
SLRTSGGHEQ	Hardy; 2015; consistency	beta	
SLIGAETQ	Hardy; 2015; consistency	beta	
SRRSTDTQ	Hardy; 2015; consistency	beta	
SVRALGADTQ	Hardy; 2015; consistency	beta	
IDPRGPGYGY	Hardy; 2015; consistency	beta	
SFRVLAQETQ	Hardy; 2015; consistency	beta	
SIRATDTQ	Hardy; 2015; consistency	beta	
SLRDYETQ	Hardy; 2015; consistency	beta	
SPRTSGGLFTYEQ	Hardy; 2015; consistency	beta	
SLRSTDTQ	Hardy; 2015; consistency	beta	
SLAPLTSTDTQ	Hardy; 2015; consistency	beta	
SLVARDHEQ	Hardy; 2015; consistency	beta	
SFRFTDTQ	Hardy; 2015; consistency	beta	
SVRTSGSHEQ	Hardy; 2015; consistency	beta	
STRWGDEGEQ	Hardy; 2015; consistency	beta	
SLRAGGGTQ	Hardy; 2015; consistency	beta	
SIRSTDTQ	Hardy; 2015; consistency	beta	
SLRYTDTQ	Hardy; 2015; consistency	beta	
SLRTGGENEQ	Hardy; 2015; consistency	beta	
SIRAGDGNTQ	Hardy; 2015; consistency	beta	
SFRTTDTQ	Hardy; 2015; consistency	beta	
SLRSTDTQ	Hardy; 2015; consistency	beta	
SLAASEPGY	Hardy; 2015; consistency	beta	
SLKWDYEQ	Hardy; 2015; consistency	beta	
CAYRSGYMEYGNKLV	Peterson; 2014; T-cell	alpha	CSVSGGPSTDTQYF
CLVGDNNDYKLSF	Peterson; 2014; T-cell	alpha	CSVGQTDSPHF
CAVELGDSWGKFQF	Peterson; 2014; T-cell	alpha	CSAGQGGTGELFF
CAAPGGATNKLIF	Peterson; 2014; T-cell	alpha	CSVAALAGFQETQYF
CAVGWEDGTASKLTF	Peterson; 2014; T-cell	alpha	CSASRWRSTDTQYF
CLVGDDGSFSGGYNKLIF	Peterson; 2014; T-cell	alpha	CSAGVGGQETQYF
CAVQADGNTGKLIF	Peterson; 2014; T-cell	alpha	CSAYRTWDQETQYF
CAFIGGSNYKLTF	Peterson; 2014; T-cell	alpha	CSAREPDNTGELFF
ND (not determined)	Peterson; 2014; T-cell	alpha	CSARGYGLANPYEQY
CAGPYNTDKLIF	Peterson; 2014; T-cell	alpha	CASSLASAGGTDQYF
CAASANYGGATNKLIF	Peterson; 2014; T-cell	alpha	CASSLNWDTEAFF
CAVTLGGGSEKLVF	Peterson; 2014; T-cell	alpha	CASSFSPAGSEAFF
CAVGAGSANYQLIW	Peterson; 2014; T-cell	alpha	CASSLEGQGASEQFF
CLVAGAGGYNKLIF	Peterson; 2014; T-cell	alpha	CASSQGLAGVQETQYF
CAGPSGATNKLIF	Peterson; 2014; T-cell	alpha	CASSPTALGTDTQYF

CIVLGGADGLTF	Peterson; 2014; T-cell	alpha	CASSFRFTDTQYF
CIVWGGATNKLIF	Peterson; 2014; T-cell	alpha	CASSVRSTDTQYF
CIAFQGAQKLVF	Peterson; 2014; T-cell	alpha	CASSFRALAADTQYF
CLVGEAAGNKLTF	Peterson; 2014; T-cell	alpha	CASSIRTSGDHEQYF
CAVGRGGSQGNLIF	Peterson; 2014; T-cell	alpha	CASSQYQSLVRGNNEQFF
CAMREGRGAGSYQLTF	Peterson; 2014; T-cell	alpha	CASSFPQVTDQYF
CAMSVLSGTYKYIF	Peterson; 2014; T-cell	alpha	CASSHVDRGGETQYF
CSVSGGPSTDTQYF	Peterson; 2014; T-cell	beta	CAYRSGYMEYGNKLV
CSVGQTDSPH	Peterson; 2014; T-cell	beta	CLVGDNDYKLSF
CSAGQGGTGELFF	Peterson; 2014; T-cell	beta	CAVELGDSWGKFQF
CSVAALAGFQETQYF	Peterson; 2014; T-cell	beta	CAAPGGATNKLIF
CSASRWRSTDTQYF	Peterson; 2014; T-cell	beta	CAVGWEDGTASKLTF
CSAGVGGQETQYF	Peterson; 2014; T-cell	beta	CLVGDGGSFSGGYNKLIF
CSAYRTWDQETQYF	Peterson; 2014; T-cell	beta	CAVQADGNTGKLIF
CSAREPDNTGELFF	Peterson; 2014; T-cell	beta	CAFIGGSNYKLTF
CSARGYGLANPYEQY	Peterson; 2014; T-cell	beta	ND (not determined)
CASSLASAGGTDQYF	Peterson; 2014; T-cell	beta	CAGPYNTDKLIF
CASSLNWDTEAFF	Peterson; 2014; T-cell	beta	CAASANYGGATNKLIF
CASSFPAGSEAFF	Peterson; 2014; T-cell	beta	CAVTLGGGSEKLVF
CASSLEGQGASEQFF	Peterson; 2014; T-cell	beta	CAVGAGSANYQLIW
CASSQGLAGVQETQYF	Peterson; 2014; T-cell	beta	CLVAGAGGYNKLIF
CASSPTALGTDQYF	Peterson; 2014; T-cell	beta	CAGPSGATNKLIF
CASSFRFTDTQYF	Peterson; 2014; T-cell	beta	CIVLGGADGLTF
CASSVRSTDTQYF	Peterson; 2014; T-cell	beta	CIVWGGATNKLIF
CASSFRALAADTQYF	Peterson; 2014; T-cell	beta	CIAFQGAQKLVF
CASSIRTSGDHEQYF	Peterson; 2014; T-cell	beta	CLVGEAAGNKLTF
CASSQYQSLVRGNNEQFF	Peterson; 2014; T-cell	beta	CAVGRGGSQGNLIF
CASSFPQVTDQYF	Peterson; 2014; T-cell	beta	CAMREGRGAGSYQLTF
CASSHVDRGGETQYF	Peterson; 2014; T-cell	beta	CAMSVLSGTYKYIF
CASSPGTDTQYF	Han; 2013; dietary	beta	
CASSFGGELFF	Han; 2013; dietary	beta	
CASAGNYEKLFF	Han; 2013; dietary	beta	
CASSAGHPEQFF	Han; 2013; dietary	beta	
CASSLINTEAFF	Han; 2013; dietary	beta	
CASSNLRQGAAGNTIYF	Han; 2013; dietary	beta	
CASSQEEQGAFYEQFF	Han; 2013; dietary	beta	
CASTEGQAEAFF	Han; 2013; dietary	beta	
CATSGTSGYNEQFF	Han; 2013; dietary	beta	
CSVDGNYLTDTQYF	Han; 2013; dietary	beta	
CASRIQGECSPLHF	Han; 2013; dietary	beta	
CASSPGTNTQYF	Han; 2013; dietary	beta	



CASSQDLGDYGYTF	Han; 2013; dietary	beta	
CSVEMNTEAFF	Han; 2013; dietary	beta	
CAISDPPLATEAFF	Han; 2013; dietary	beta	
CAISSGQVPEQFF	Han; 2013; dietary	beta	
CASEMDANTGELFF	Han; 2013; dietary	beta	
CASKLGGATEAFF	Han; 2013; dietary	beta	
CASNQGQGVETQYF	Han; 2013; dietary	beta	
CASSEGTYEQYF	Han; 2013; dietary	beta	
CASSFGTDTQYF	Han; 2013; dietary	beta	
CASSFGTSDQFF	Han; 2013; dietary	beta	
CASSFLGTYEQYF	Han; 2013; dietary	beta	
CASSFPNPTFEAFF	Han; 2013; dietary	beta	
CASSFRGQGNEQYF	Han; 2013; dietary	beta	
CASSFTGSSYEQYF	Han; 2013; dietary	beta	
CASSGGTVYGYTF	Han; 2013; dietary	beta	
CASSGSGGVGTGELFF	Han; 2013; dietary	beta	
CASSLASVGSTE AFF	Han; 2013; dietary	beta	
CASSLGTGGYNEQFF	Han; 2013; dietary	beta	
CASSLLGLTGELFF	Han; 2013; dietary	beta	
CASSLNLGQNTEAFF	Han; 2013; dietary	beta	
CASSLPLGQGNQPQHF	Han; 2013; dietary	beta	
CASSLPPRGGGYEQYF	Han; 2013; dietary	beta	
CASSPEDPYTDTQYF	Han; 2013; dietary	beta	
CASSPEREVYNEQFF	Han; 2013; dietary	beta	
CASSPFGDYYEQYF	Han; 2013; dietary	beta	
CASSPGTNIQYF	Han; 2013; dietary	beta	
CASSPGTVVYGYTF	Han; 2013; dietary	beta	
CASSPGTYEQYF	Han; 2013; dietary	beta	
CASSPGVYEQYF	Han; 2013; dietary	beta	
CASSPSNTGELFF	Han; 2013; dietary	beta	
CASSQAGALWDYGYTF	Han; 2013; dietary	beta	
CASSQGIRSEYEQYF	Han; 2013; dietary	beta	
CASSQLPVNSPLHF	Han; 2013; dietary	beta	
CASSSGLATDTQYF	Han; 2013; dietary	beta	
CASSTGHMEDTQYF	Han; 2013; dietary	beta	
CASSTGVSGANVLTF	Han; 2013; dietary	beta	
CASSVEGGMGEKLFF	Han; 2013; dietary	beta	
CASSVGAGVNSYEQYF	Han; 2013; dietary	beta	
CASSVRAGTGTYEQYF	Han; 2013; dietary	beta	
CASSVSTGSYEQYF	Han; 2013; dietary	beta	
CASSWDRATNEKLFF	Han; 2013; dietary	beta	

CASSYAPTGNYGTYF	Han; 2013; dietary	beta	
CASSYKRPGELFF	Han; 2013; dietary	beta	
CASSYSMASGGAQETQYF	Han; 2013; dietary	beta	
CASSYTAGSNQPQHF	Han; 2013; dietary	beta	
CASSYWEEGGGAFF	Han; 2013; dietary	beta	
CASSYWGPMNTEAFF	Han; 2013; dietary	beta	
CAWSVKTLRRADTQYF	Han; 2013; dietary	beta	
CSAAGHFYEQYF	Han; 2013; dietary	beta	
CSAMTQEDYAFF	Han; 2013; dietary	beta	
CSARDFSLRTGELFF	Han; 2013; dietary	beta	
CSARDMFGGHVSGNTIYF	Han; 2013; dietary	beta	
CSVDGLAGITDTQYF	Han; 2013; dietary	beta	
CASSPGTDTQYF	Han; 2013; dietary	beta	
CSVEMNTEAFF	Han; 2013; dietary	beta	
CASSLLAGGAEQFF	Han; 2013; dietary	beta	
CASSNLRQGAAGNTIYF	Han; 2013; dietary	beta	
CASSQEEQGAFYEQFF	Han; 2013; dietary	beta	
CASSSSDRATDTQYF	Han; 2013; dietary	beta	
CAWSVKTLRRADTQYF	Han; 2013; dietary	beta	
CASSAGHPEQFF	Han; 2013; dietary	beta	
CASSLASVGSTE AFF	Han; 2013; dietary	beta	
CASSYRQAGYEQYF	Han; 2013; dietary	beta	
CASTEGQAE AFF	Han; 2013; dietary	beta	
CASSLPTAVTE AFF	Han; 2013; dietary	beta	
CASEMDANTGELFF	Han; 2013; dietary	beta	
CASRIQEGGSPLHF	Han; 2013; dietary	beta	
CASSDRGFPSYEQYF	Han; 2013; dietary	beta	
CASSFGGELFF	Han; 2013; dietary	beta	
CASSFGNQPQHF	Han; 2013; dietary	beta	
CASSFSLAGWSYNEQFF	Han; 2013; dietary	beta	
CASSFSNGENTDTQYF	Han; 2013; dietary	beta	
CASSHLGGGNTIYF	Han; 2013; dietary	beta	
CASSLAGDSYNEQFF	Han; 2013; dietary	beta	
CASSLGQGTPTDTQYF	Han; 2013; dietary	beta	
CASSLINTE AFF	Han; 2013; dietary	beta	
CASSLSLAGDTGELFF	Han; 2013; dietary	beta	
CASSLTRQGGEGSPLHF	Han; 2013; dietary	beta	
CASSLVADSYNEQFF	Han; 2013; dietary	beta	
CASSLVGPGDTQYF	Han; 2013; dietary	beta	
CASSPFSGDYEQYF	Han; 2013; dietary	beta	
CASSPGTAL AFF	Han; 2013; dietary	beta	

CASSQDGGARQHF	Han; 2013; dietary	beta	
CASSQDSGGARNNEQFF	Han; 2013; dietary	beta	
CASSQDWALGWGYGYTF	Han; 2013; dietary	beta	
CASSQLTQNTAEFF	Han; 2013; dietary	beta	
CASSQPFVGSNGTIYF	Han; 2013; dietary	beta	
CASSRDWGETQYF	Han; 2013; dietary	beta	
CASSRGLAGESTDTQYF	Han; 2013; dietary	beta	
CASSRPASYEQYF	Han; 2013; dietary	beta	
CASSSGADLYGYTF	Han; 2013; dietary	beta	
CASSSGLSYNEQFF	Han; 2013; dietary	beta	
CASSSGTLETQYF	Han; 2013; dietary	beta	
CASSSSSGSTYEQYF	Han; 2013; dietary	beta	
CASSSWTGTNTEAFF	Han; 2013; dietary	beta	
CASSWLAGGPAGELFF	Han; 2013; dietary	beta	
CASSYATGTPSSYNEQFF	Han; 2013; dietary	beta	
CASSYGSDSYNEQFF	Han; 2013; dietary	beta	
CSARVSGSLYEQYF	Han; 2013; dietary	beta	
CSVDGNYLTDQYF	Han; 2013; dietary	beta	
CSVEMSGGDYEQYF	Han; 2013; dietary	beta	
CASSYDVRSNGYEQYF	Han; 2013; dietary	beta	
CASSPSDPSDTQYF	Han; 2013; dietary	beta	
CASSPGTGSGDEQFF	Han; 2013; dietary	beta	
CASSVGGVQPQHF	Han; 2013; dietary	beta	
CASNLAGGSNEQFF	Han; 2013; dietary	beta	
CASSFGQVTEYEQYF	Han; 2013; dietary	beta	
CASSLGAETQYF	Han; 2013; dietary	beta	
CASSQDWGDYGYTF	Han; 2013; dietary	beta	
CASSSEQDRGSENTIYF	Han; 2013; dietary	beta	
CASSWSGYEQYF	Han; 2013; dietary	beta	
CASSWTGNEQFF	Han; 2013; dietary	beta	
CAIRATGLAGVDTGELFF	Han; 2013; dietary	beta	
CAISEQEYGTAEFF	Han; 2013; dietary	beta	
CAISFGTGEAPRGYTF	Han; 2013; dietary	beta	
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CALGERFPWPHTDKLIF	Han; 2013; dietary	delta	
CALGEPDSAYWGIRGNTDKLIF	Han; 2013; dietary	delta	
CALGEPRAVLGDTLGDKLIF	Han; 2013; dietary	delta	
CALGEPLPSYWGPRGSDKLIF	Han; 2013; dietary	delta	
CALGEPDSTFVRGGYAGNTDKLIF	Han; 2013; dietary	delta	
CALGEPDLPTTWYTDKLIF	Han; 2013; dietary	delta	
CALGEPALQLGVNKLIF	Han; 2013; dietary	delta	

CALGENPPPYLGGYPYTDKLIF	Han; 2013; dietary	delta	
CALGENFPSSWGIHRYTDKLIF	Han; 2013; dietary	delta	
CALGELVYPGGYYGRETAQLFF	Han; 2013; dietary	delta	
CALGELVFLLRAGLIF	Han; 2013; dietary	delta	
CALGELSDLQCVLGDRPTRPLIF	Han; 2013; dietary	delta	
CALGELRRIYWGIRIDKLIF	Han; 2013; dietary	delta	
CALGELLPRYWIGGGTDKLIF	Han; 2013; dietary	delta	
CALGELLASETYTGGSVVLYRARKTDKLIF	Han; 2013; dietary	delta	
CALGEKGNMPLGDIIDKLIF	Han; 2013; dietary	delta	
CALGEHEVHPGGYWYTDKLIF	Han; 2013; dietary	delta	
CALGEGTGDFGRWGILVYTDKLIF	Han; 2013; dietary	delta	
CALGEGPFLRTGGLYTDKLIF	Han; 2013; dietary	delta	
CALGEGPAPIWGIRRRSYTDKLIF	Han; 2013; dietary	delta	
CALGEFYWGILSDKLIF	Han; 2013; dietary	delta	
CALGEEIPTGGYPDKLIF	Han; 2013; dietary	delta	
CALGEDPSFLRLGIRYTDKLIF	Han; 2013; dietary	delta	
CALGDWRSSYFNWGISSPDKLIF	Han; 2013; dietary	delta	
CALGDPSEEHTGGYNTDKLIF	Han; 2013; dietary	delta	
CALGDLLGLPRGPTDKLIF	Han; 2013; dietary	delta	
CALGDFPTWGGVPDKLIF	Han; 2013; dietary	delta	
CALGASLGDNSPDKLIF	Han; 2013; dietary	delta	
CALGALGSLPTHWGIRATDKLIF	Han; 2013; dietary	delta	
CALGALGLRGLGVYRKLIF	Han; 2013; dietary	delta	
CALEAPYTDKLIF	Han; 2013; dietary	delta	
CALAQPSSNLIHWGILDKLIF	Han; 2013; dietary	delta	
CAITGSKGTDKLIF	Han; 2013; dietary	delta	
CAFRHGPNYPLIYWGISKLIF	Han; 2013; dietary	delta	
CAFRGLWGYTDKLIF	Han; 2013; dietary	delta	
CAFLALPMYTDKLIF	Han; 2013; dietary	delta	
CACVKAFLKRGDTPYTDKLIF	Han; 2013; dietary	delta	
CACTFLGLGGSNTDKLIF	Han; 2013; dietary	delta	
CACETWGIKGTDKLIF	Han; 2013; dietary	delta	
CACERGGYAFTDKLIF	Han; 2013; dietary	delta	
CACDTVYGGYWATDKLIF	Han; 2013; dietary	delta	
CACDSRTSTWGIRMADKLIF	Han; 2013; dietary	delta	
CALGELPPPGGYFDKLIF	Han; 2013; dietary	delta	
CAFKGLLGGSVGLIF	Han; 2013; dietary	delta	
CALGDSSLGGWGILSSTDKLIF	Han; 2013; dietary	delta	
CALGVLHWGNSLTAQLFF	Han; 2013; dietary	delta	
CALPFSYWGIRLVGTDKLIF	Han; 2013; dietary	delta	
CASTGAVGKSPKLIF	Han; 2013; dietary	delta	

CAASAGLPGGGLGYTDKLIF	Han; 2013; dietary	delta	
CAASALRGSFDKLIF	Han; 2013; dietary	delta	
CACDHDYGTGGVRKLIF	Han; 2013; dietary	delta	
CACRLPTRWGIGYTDKLIF	Han; 2013; dietary	delta	
CACRPSYGGIVKLIF	Han; 2013; dietary	delta	
CAFILTIYGPGGITDKLIF	Han; 2013; dietary	delta	
CAFPTGGLLGDTDKLIF	Han; 2013; dietary	delta	
CAFVGGPYTDKLIF	Han; 2013; dietary	delta	
CALADLRPGGYSAQLFF	Han; 2013; dietary	delta	
CALEVVHHPIRYTDKLIF	Han; 2013; dietary	delta	
CALGAHLRNYWGPLYTDKLIF	Han; 2013; dietary	delta	
CALGAYPPGGTGRYTDKLIF	Han; 2013; dietary	delta	
CALGDFLPSYWGIRGTDKLIF	Han; 2013; dietary	delta	
CALGDPPFQNYQGPYTDKLIF	Han; 2013; dietary	delta	
CALGEAFLSYWGTNHDKLIF	Han; 2013; dietary	delta	
CALGEGGGVLRNPYTDKLIF	Han; 2013; dietary	delta	
CALGEHGAFLPYWGIRRGKLIF	Han; 2013; dietary	delta	
CALGEIYRGYWGIRAGDKLIF	Han; 2013; dietary	delta	
CALGELHWGTRYTDKLIF	Han; 2013; dietary	delta	
CALGELLRTGGLAQLFF	Han; 2013; dietary	delta	
CALGELMLGRWGEYTDKLIF	Han; 2013; dietary	delta	
CALGELNLPQYWGPLVGTDKLIF	Han; 2013; dietary	delta	
CALGELPPWGIPYTDKLIF	Han; 2013; dietary	delta	
CALGELRLRWMGDTLFLQLTDKLIF	Han; 2013; dietary	delta	
CALGELRRGIRGQRIGTDKLIF	Han; 2013; dietary	delta	
CALGELSRPSYYYDPSYTDKLIF	Han; 2013; dietary	delta	
CALGELSSPHTGGYYTDKLIF	Han; 2013; dietary	delta	
CALGELSYRGGWGIRADKLIF	Han; 2013; dietary	delta	
CALGENKFVFGGLIVLTAQLFF	Han; 2013; dietary	delta	
CALGEPIGPPLLGVYTDKLIF	Han; 2013; dietary	delta	
CALGEPQTFLPRYWGGTYTDKLIF	Han; 2013; dietary	delta	
CALGEPSTGGSDKLIF	Han; 2013; dietary	delta	
CALGEQWILRGDTDKLIF	Han; 2013; dietary	delta	
CALGERLRGYALKTDKLIF	Han; 2013; dietary	delta	
CALGERLSPYYTDKLIF	Han; 2013; dietary	delta	
CALGERPSYGWGFGWTDKLIF	Han; 2013; dietary	delta	
CALGETTLSYWGIRYTDKLIF	Han; 2013; dietary	delta	
CALGGGLPTSGGYRSYTDKLIF	Han; 2013; dietary	delta	
CALGHRAPSRAQPYWGILAYTDKLIF	Han; 2013; dietary	delta	
CALGKPAKSYWGMRYTDKLIF	Han; 2013; dietary	delta	
CALGPLPGGYSSWDTRQMFF	Han; 2013; dietary	delta	

CALGQRIPSYWGIAGSTDKLIF	Han; 2013; dietary	delta	
CALGVISPSYWGPQYTDKLIF	Han; 2013; dietary	delta	
CALGVSSSAGDLLTDKLIF	Han; 2013; dietary	delta	
CALKPGGYSLTDKLIF	Han; 2013; dietary	delta	
CALMAGPYTDKLIF	Han; 2013; dietary	delta	
CASVCYGNHISRLDKLIF	Han; 2013; dietary	delta	
LVGGSGGYNKLI	Christophersen; 2022; Pheno	alpha	
AVEGGSNYKLT	Christophersen; 2022; Pheno	alpha	
ASSIRATDTQY	Christophersen; 2022; Pheno	beta	
ASSIRSTDTQY	Christophersen; 2022; Pheno	beta	
SASRTSGRAGDEQF	Christophersen; 2022; Pheno	beta	
ALSDQGSSASKII	Christophersen; 2022; Pheno	alpha	
ALSDPTGTASKLT	Christophersen; 2022; Pheno	alpha	
VVSGGYYGGSQGNLI	Christophersen; 2022; Pheno	alpha	
VVNPGGGNKLT	Christophersen; 2022; Pheno	alpha	
AVPNAGGTSYGKLT	Christophersen; 2022; Pheno	alpha	
AVEREGAQKLIV	Christophersen; 2022; Pheno	alpha	
AVGQGAQKLIV	Christophersen; 2022; Pheno	alpha	
AYRSEQGAQKLIV	Christophersen; 2022; Pheno	alpha	
ASSQQDTEAF	Christophersen; 2022; Pheno	beta	
ASSLTVTDTQY	Christophersen; 2022; Pheno	beta	
SASDSLNTAF	Christophersen; 2022; Pheno	beta	
SASRQVADTQY	Christophersen; 2022; Pheno	beta	

**Supplementary Table S2:** All published gluten specific TCR sequences.