High-throughput analysis of the T-cell receptor gene repertoire in low-count monoclonal B-cell lymphocytosis reveals a distinct profile from chronic lymphocytic leukemia

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Supplementary Methods

Sample group

Forty-eight individuals were diagnosed with LC-MBL belonging to all 3 immunophenotypic subtypes: 41 (85.4%) displayed a 'CLL-like' phenotype, 3 (6.3%) had 'atypical' MBL and 4 (8.3%) were assigned to the 'non CLL-like' (CD5-) subtype. Due to small sample numbers, we grouped together samples from the 2 latter subtypes; this group will herein be referred to as 'other' LC-MBL. Mean ages were 69 years for 'CLL-like' LC-MBL and 74 years for 'other' LC-MBL subtypes. Seventeen samples from age-matched healthy individuals without MBL (mean age: 69 years) from the same geographical region were also collected as controls.

The mean age for CLL patients included in the comparisons was 68 years. None of the CLL patients had received treatment prior to the study or had evidence of infection at sampling. The vast majority were classified as Binet A/Rai 0. No case had evidence of infection at sampling.

Cell staining, and FACS analysis

An established flow cytometry protocol was used according to a gating strategy described previously.[1] Cases diagnosed with LC-MBL[2] were divided into "CLL-like" MBL, "atypical" MBL, and "non CLL-like" ($CD5^-$), based on the immunophenotypic profile, as previously reported.[1]

PCR amplification of TRBV-TRBD-TRBJ gene rearrangements, library preparation and high-throughput sequencing

Mononuclear cells were isolated using Lymphoprep (Stemcell Technologies, Canada) as density gradient medium. Total RNA was isolated from blood and cDNA was synthesized with the SuperScript II RT kit (Invitrogen Life technologies, USA) using 1 μg of RNA. PCR products were separated on a 3% low melting agarose gel, excised and purified with the QIAGEN DNA purification kit (QIAGEN, Germany).

Sequencing libraries were prepared using the TruSeq DNA LT Sample Preparation Kit. Size distribution was assessed on an Agilent Bioanalyzer using the Agilent High Sensitivity DNA kit (Agilent Technologies, USA). Sequencing libraries were quantified with the use of the dsDNA HS Assay Kit on a Qubit 3.0 fluorometer (ThermoFisher Scientific, USA). Paired-end sequencing took place on the MiSeq Benchtop Sequencer using the MiSeq Reagent Kit v2 (2x250bp) (Illumina, USA). Raw NGS data are available at the European Nucleotide Archive (ENA) under the Primary Accession identifier PRJEB29437.

Bioinformatics data analysis

Filtering was based on the following parameters: (i) length and sequencing quality of raw reads, (ii) length of overlap between the forward and reverse sequence reads for each amplified TRBV-TRBD-TRBJ gene rearrangement sequence for the production of full-length sequences with high quality complementarity determining region 3 (CDR3) and, finally, (iii) length and quality of full-length sequences. Filtered-in data were annotated with the use of the IMGT/HighV-QUEST tool, supported by the International ImMunoGeneTics information system.[3]

Metadata analysis

Only productive, in-frame TRBV-TRBD-TRBJ gene rearrangements with functional TRBV genes and a >95% germline identity were analyzed. Clonotypes were computed as unique pairs of TRBV genes and CDR3 amino acid sequences within each sample. Single-read clonotypes were characterized as singletons and those with ≥2 reads as expanded.

Assessment of TRB clonality

Clonality comparisons were performed and, to ensure a more accurate analysis, TRB clonotypes rather than single rearrangements were considered, as previously described.[4] The relative frequency of each clonotype per sample and the average numbers of the cumulative frequencies of both types of expanded clonotypes for each entity were estimated. Subsequently, comparative analyses between the 3 different entities of the present study cohort and CLL were performed.

HLA typing

Typing of the HLA-A, -B, -C loci for low resolution and HLA-DRB1 locus for allelic level high resolution determination was performed by reverse PCR-SSOP (sequence specific oligonucleotide probe) using a commercially available kit (LABtype® RSSO, One Lambda, Canoga Park, CA).

Statistical analysis

ANOVA was applied to evaluate the mean differences between the different entity/sample groups and/or age groups regarding the individual/sample: (i) mean relative frequencies (reads/total) within expanded clonotypes (with percentage>1%),

(ii) sum of percentages of the 10 most expanded clonotypes, (iii) sum of percentages within expanded clonotypes, and (iv) individual TRBV gene usage. When necessary, more robust tests (Brown-Forsythe, Welch) were applied. In the (iv) case, to account for multiple ANOVA applications, we used the Bonferroni correction and subsequently selected the TRBV genes that survived the correction for further analysis. Post-hoc analysis was performed with multiple pairwise comparisons between groups (based on the Bonferroni correction) when appropriate.

References

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Supplemental Tables

Supplemental Table 1. Basic characteristics for all cases of the present cohort.

Sample ID	Sex	Age	Category	Light chain	Clone size (cells/μl)	CMV serostatus* (IgG antibodies, U/ml)	EBV serostatus* (IgG antibodies against VCA, U/ml)
TR01	M	74	"CLL-like" LC-MBL	kappa	6.56	-	-
TR02	F	67	"CLL-like" LC-MBL	kappa	7.26	>500	489
TR03	M	62	"CLL-like" LC-MBL	negative	9.03	-	-
TR06	F	61	"CLL-like" LC-MBL	kappa	1.50	-	-
TR10	M	59	"CLL-like" LC-MBL	negative	0.50	-	-
TR11	M	84	"CLL-like" LC-MBL	kappa	0.06	-	-
TR12	M	60	"CLL-like" LC-MBL	polyclonal	0.84	298	142
TR14	F	70	"CLL-like" LC-MBL	kappa	3.39	197	176
TR15	M	48	"CLL-like" LC-MBL	lambda	1.10	20.7	437
TR16	M	83	"CLL-like" LC-MBL	kappa	2.84	-	-
TR17	F	66	"CLL-like" LC-MBL	kappa	0.46	>500	210
TR19	M	53	"CLL-like" LC-MBL	negative	1.21	-	-
TR20	M	66	"CLL-like" LC-MBL	kappa	0.74	-	-
TR22	M	69	"CLL-like" LC-MBL	kappa	0.96	-	-
TR23	M	75	"CLL-like" LC-MBL	kappa	0.41	>500	484
TR24	M	62	"CLL-like" LC-MBL	negative	0.35	-	-
TR25	F	71	"CLL-like" LC-MBL	lambda	0.67	-	-
TR26	M	75	"CLL-like" LC-MBL	kappa	0.51	0.47	253
TR29	F	61	"CLL-like" LC-MBL	kappa	4.72	106	214
TR31	M	48	"CLL-like" LC-MBL	kappa	0.68	-	-
TR33	M	85	"CLL-like" LC-MBL	kappa	0.19	-	-
TR34	M	65	"CLL-like" LC-MBL	kappa	0.24	-	-
TR35	F	83	"CLL-like" LC-MBL	kappa	0.61	-	-
TR36	F	70	"CLL-like" LC-MBL	negative	0.56	-	-
TR37	F	56	"CLL-like" LC-MBL	kappa	0.41	-	-
TR38	M	55	"CLL-like" LC-MBL	polyclonal	4.36	-	-
TR39	F	92	"CLL-like" LC-MBL	polyclonal	0.29	-	-
TR41	F	87	"CLL-like" LC-MBL	kappa	0.89	-	-
TR49	M	64	"CLL-like" LC-MBL	kappa	50.38	117	394
TR50	M	64	"CLL-like" LC-MBL	polyclonal	0.25	437	350
TR51	M	77	"CLL-like" LC-MBL	kappa	0.20	-	-
TR54	F	72	"CLL-like" LC-MBL	kappa	1.43	>500	145
TR55	M	40	"CLL-like" LC-MBL	kappa	0.88	178	524
TR56	M	74	"CLL-like" LC-MBL	kappa	1.79	-	-
TR58	F	103	"CLL-like" LC-MBL	lambda	0.77	170	>750
TR60	M	83	"CLL-like" LC-MBL	kappa	0.62	-	-
TR63	F	75	"CLL-like" LC-MBL	kappa	0.55	443	>750
TR64	M	83	"CLL-like" LC-MBL	kappa	0.96	-	-
TR66	M	49	"CLL-like" LC-MBL	kappa	0.88	>500	422
TR68	F	67	"CLL-like" LC-MBL	kappa	4.23	>500	741
TR69	M	69	"CLL-like" LC-MBL	kappa	1.54	-	-
TR08	M	67	"atypical" LC-MBL	kappa	0.88	-	-
TR09	F	71	"atypical" LC-MBL	kappa	0.46	-	-

TR40	F	90	"atypical" LC-MBL	lambda	0.10	-	-
TR42	F	93	"non CLL-like" LC-MBL	kappa	0.20	>500	>750
TR43	M	76	"non CLL-like" LC-MBL	kappa	8.35	-	-
TR44	M	65	"non CLL-like" LC-MBL	lambda	0.43	95.5	12.8
TR45	M	56	"non CLL-like" LC-MBL	kappa	8.42	-	-
TR04	F	50	"healthy"	-	-	-	-
TR07	F	70	"healthy"	-	-	-	-
TR21	F	41	"healthy"	-	-	-	-
TR27	F	80	"healthy"	-	-	-	-
TR28	M	75	"healthy"	-	-	-	-
TR32	F	69	"healthy"	-	-	-	-
TR46	F	73	"healthy"	-	-	-	-
TR47	F	65	"healthy"	-	-	-	-
TR48	M	50	"healthy"	-	-	-	-
TR57	F	74	"healthy"	-	-	-	-
TR67	M	51	"healthy"	-	-	-	-
HE1	M	79	"healthy"	-	-	-	-
HE2	M	70	"healthy"	-	-	-	-
HE3	M	71	"healthy"	-	-	-	-
HE4	F	81	"healthy"	-	-	-	-
HE5	F	66	"healthy"	-	-	-	-
HE6	F	80	"healthy"	-	-	-	-

CMV serostatus. No patient tested positive for IgM anti-CMV antibodies. Regarding IgG antibodies, measured values correspond to the following results: <0.5 U/ml = absence, 0.5-15.0 U/ml = weak presence, >15 U/ml = strong presence. EBV serostatus: no patient tested positive for IgM antibodies. Regarding IgG antibodies against the viral capside antigen (VCA), measured values correspond to the following results: <20 U/ml = absence of antibodies, ≥20 U/ml = presence of antibodies.

Supplemental Table 2. List of the 10 most dominant clonotypes from each sample of the study cohort.

Sample ID	TRBV gene	CDR3 sequence	CDR3 length	Frequency %	Category
TR01	TRBV7-8	ASSLARGYTQPQH	13	2.2	"CLL-like" LC-MBL
TR01	TRBV6-2/6-3	ASKTVSTGELF	11	1.8	"CLL-like" LC-MBL
TR01	TRBV19	ASSTSLGSYEQY	12	1.8	"CLL-like" LC-MBL
TR01	TRBV7-9	ASSLGSQPQH	10	1.6	"CLL-like" LC-MBL
TR01	TRBV6-1	ASRAGQGGEQY	11	1.6	"CLL-like" LC-MBL
TR01	TRBV28	ASSPHTGEAYGYT	13	1.5	"CLL-like" LC-MBL
TR01	TRBV7-2	ASSDRWSGPQH	11	1.4	"CLL-like" LC-MBL
TR01	TRBV6-5	ASKNVRVPTGELF	13	1.4	"CLL-like" LC-MBL
TR01	TRBV7-9	ASRLTGDSGNTIY	13	1.4	"CLL-like" LC-MBL
TR01	TRBV6-5	ASSFEGQDTGELF	13	1.3	"CLL-like" LC-MBL
TR02	TRBV24-1	ATSDFVSGYTGELF	14	20.1	"CLL-like" LC-MBL
TR02	TRBV4-2	ASSQDRGLIVEGYT	14	15.1	"CLL-like" LC-MBL
TR02	TRBV13	ASSRGLGALNTEAF	14	1.2	"CLL-like" LC-MBL
TR02	TRBV10-2	ASSVHHRVLDQPQH	14	0.6	"CLL-like" LC-MBL
TR02	TRBV5-4	ASSALGVAF	9	0.5	"CLL-like" LC-MBL
TR02	TRBV18	ASSPGRNEKLF	11	0.5	"CLL-like" LC-MBL
TR02	TRBV29-1	SVAPPGGGYT	10	0.4	"CLL-like" LC-MBL
TR02	TRBV4-1	ASSETGNYGYT	11	0.4	"CLL-like" LC-MBL
TR02	TRBV29-1	SGSTGEASPLH	11	0.4	"CLL-like" LC-MBL
TR02	TRBV20-1	SAREKGVLNYGYT	13	0.4	"CLL-like" LC-MBL
TR03	TRBV12-3	ASTNNYSNQPQH	12	3.9	"CLL-like" LC-MBL
TR03	TRBV5-4	ASSLAAVVSGELF	13	3.7	"CLL-like" LC-MBL
TR03	TRBV29-1	SVEEDGTSGANVLT	14	3.3	"CLL-like" LC-MBL
TR03	TRBV11-2	ASSWGSGSNYGYT	13	2.7	"CLL-like" LC-MBL
TR03	TRBV7-2	ASSPWGTANYGYT	13	1.7	"CLL-like" LC-MBL
TR03	TRBV29-1	SVGHLNQPQH	10	1.6	"CLL-like" LC-MBL
TR03	TRBV5-6	ASSLGSYGGNGYT	13	1.6	"CLL-like" LC-MBL
TR03	TRBV6-2/6-3	ATRTVNYGYT	10	1.5	"CLL-like" LC-MBL
TR03	TRBV29-1	SGGSSLYGYT	10	1.5	"CLL-like" LC-MBL
TR03	TRBV29-1	SVRGLGYGYT	10	1.4	"CLL-like" LC-MBL
TR06	TRBV24-1	ATSDWAGQGYT	11	10.3	"CLL-like" LC-MBL
TR06	TRBV6-1	ASSESAGRSPYEQY	14	5.0	"CLL-like" LC-MBL
TR06	TRBV20-1	SARPKLGQPYEQY	13	3.8	"CLL-like" LC-MBL
TR06	TRBV27	ASSRFGGTGELF	12	3.5	"CLL-like" LC-MBL
TR06	TRBV5-6	ASSLTGTGNLPQH	13	1.1	"CLL-like" LC-MBL
TR06	TRBV14	ASSQDRVEQY	10	0.8	"CLL-like" LC-MBL

TR06	TRBV6-2/6-3	ASRDGSDNSPLH	12	0.7	"CLL-like" LC-MBL
TR06	TRBV5-4	ASSLVTGGVYGYT	13	0.7	"CLL-like" LC-MBL
TR06	TRBV11-3	ASSPHGGPSYEQY	13	0.7	"CLL-like" LC-MBL
TR06	TRBV6-1	ASSEGQGEVGPQY	13	0.6	"CLL-like" LC-MBL
TR10	TRBV6-5	ASSLWETGELF	11	7.5	"CLL-like" LC-MBL
TR10	TRBV19	ASSIDWPGVVYGYT	14	4.3	"CLL-like" LC-MBL
TR10	TRBV5-1	ASGVDYGYT	9	2.8	"CLL-like" LC-MBL
TR10	TRBV28	ASSYPGELF	9	2.4	"CLL-like" LC-MBL
TR10	TRBV18	ASSPLPVDSGNTIY	14	2.1	"CLL-like" LC-MBL
TR10	TRBV7-2	ASSLGSSLGELF	12	2.0	"CLL-like" LC-MBL
TR10	TRBV2	ASSPGTEQY	9	1.8	"CLL-like" LC-MBL
TR10	TRBV4-3	ASSQDHSTNEKLF	13	1.3	"CLL-like" LC-MBL
TR10	TRBV29-1	SVEEADRGDTGELF	14	1.1	"CLL-like" LC-MBL
TR10	TRBV18	ASSPGIGLYGYT	12	1.0	"CLL-like" LC-MBL
TR11	TRBV15	ATSLQGAPDEKLF	13	19.0	"CLL-like" LC-MBL
TR11	TRBV28	ASSPEQGSNEKLF	13	16.6	"CLL-like" LC-MBL
TR11	TRBV20-1	SARDLREVDGYT	12	2.4	"CLL-like" LC-MBL
TR11	TRBV28	ASTTGGSVSGNTIY	14	1.7	"CLL-like" LC-MBL
TR11	TRBV19	ASSQQGDGELF	11	1.5	"CLL-like" LC-MBL
TR11	TRBV12-3	ASSSANYGYT	10	0.7	"CLL-like" LC-MBL
TR11	TRBV29-1	SAEVLGGELF	10	0.7	"CLL-like" LC-MBL
TR11	TRBV5-6	ASSLSGYVGGYT	12	0.6	"CLL-like" LC-MBL
TR11	TRBV7-9	ASSRQTAYEQY	11	0.5	"CLL-like" LC-MBL
TR11	TRBV29-1	SVESTNYGYT	10	0.4	"CLL-like" LC-MBL
TR12	TRBV19	ASSMPGTNTVELF	13	44.5	"CLL-like" LC-MBL
TR12	TRBV7-9	ASSLAGGYPYGYT	13	1.4	"CLL-like" LC-MBL
TR12	TRBV27	ASRPPMTGFYGANVLT	16	1.4	"CLL-like" LC-MBL
TR12	TRBV6-1	ASSGYPLREPQH	12	1.3	"CLL-like" LC-MBL
TR12	TRBV20-1	SAGEAGQKANYGYT	14	0.5	"CLL-like" LC-MBL
TR12	TRBV13	ASSLSPWHEQY	11	0.4	"CLL-like" LC-MBL
TR12	TRBV13	ASSWGDTEAF	10	0.3	"CLL-like" LC-MBL
TR12	TRBV12-5	ASVGVPNTEAF	11	0.3	"CLL-like" LC-MBL
TR12	TRBV29-1	SVGDGTNSPLH	11	0.3	"CLL-like" LC-MBL
TR12	TRBV28	ASYREMGTGELF	12	0.3	"CLL-like" LC-MBL
TR14	TRBV27	ASSSTGSYSGANVLT	15	9.8	"CLL-like" LC-MBL
TR14	TRBV27	ASSSWVRAF	9	2.6	"CLL-like" LC-MBL
TR14	TRBV25-1	ASSTWGDVGSPLH	13	1.4	"CLL-like" LC-MBL
TR14	TRBV28	ASSLEQGAGPAEAF	14	1.2	"CLL-like" LC-MBL
TR14	TRBV27	ASKGSTEAF	9	0.5	"CLL-like" LC-MBL
TR14	TRBV28	ASRLYAGGGSPQH	13	0.5	"CLL-like" LC-MBL
TR14	TRBV4-3	ASSQRYGGRSGNTIY	15	0.5	"CLL-like" LC-MBL

TR14	TRBV29-1	SVVIQSYGYT	10	0.4	"CLL-like" LC-MBL
TR14	TRBV7-6	ASSQVGTGELF	11	0.4	"CLL-like" LC-MBL
TR14	TRBV7-2	ASSLGRGHQPQH	12	0.4	"CLL-like" LC-MBL
TR15	TRBV6-2/6-3	ASSYSAFSGELF	12	6.7	"CLL-like" LC-MBL
TR15	TRBV28	ASSQDRGLGGYT	12	2.0	"CLL-like" LC-MBL
TR15	TRBV6-4	ASSATSGSSGELF	13	0.8	"CLL-like" LC-MBL
TR15	TRBV5-6	ASSLEGDPGQPQH	13	0.7	"CLL-like" LC-MBL
TR15	TRBV2	ASSEGTGALGELF	13	0.6	"CLL-like" LC-MBL
TR15	TRBV6-2/6-3	ASSYRSGVANTGELF	15	0.3	"CLL-like" LC-MBL
TR15	TRBV19	ASSRQGPNTEAF	12	0.2	"CLL-like" LC-MBL
TR15	TRBV29-1	SVTPRGGNYGYT	12	0.2	"CLL-like" LC-MBL
TR15	TRBV2	ASSDDRADYNSPLH	14	0.2	"CLL-like" LC-MBL
TR15	TRBV2	ASSLTSGPDPLYEQY	15	0.2	"CLL-like" LC-MBL
TR16	TRBV28	ASSFHDTGELF	11	24.9	"CLL-like" LC-MBL
TR16	TRBV12-3	ASSLSGGAGELF	12	16.2	"CLL-like" LC-MBL
TR16	TRBV19	ASSMDAYGNQPQH	13	5.7	"CLL-like" LC-MBL
TR16	TRBV6-2/6-3	ASSYQGATEAF	11	3.4	"CLL-like" LC-MBL
TR16	TRBV19	ASSPTGTDQPQH	12	2.1	"CLL-like" LC-MBL
TR16	TRBV5-4	ASSPGEGGDEKLF	13	1.8	"CLL-like" LC-MBL
TR16	TRBV29-1	SVDTAAYGYT	10	1.1	"CLL-like" LC-MBL
TR16	TRBV24-1	ATKPTGYYGYT	11	1.1	"CLL-like" LC-MBL
TR16	TRBV29-1	SAEGSSGANVLT	12	0.9	"CLL-like" LC-MBL
TR16	TRBV19	ARLGGEKLF	9	0.8	"CLL-like" LC-MBL
TR17	TRBV29-1	SVEGGPFYEQY	11	3.0	"CLL-like" LC-MBL
TR17	TRBV29-1	SVSQLGYT	8	2.3	"CLL-like" LC-MBL
TR17	TRBV7-9	ASSLLPGREAF	11	1.3	"CLL-like" LC-MBL
TR17	TRBV29-1	STGTGVNGYT	10	0.6	"CLL-like" LC-MBL
TR17	TRBV19	ASSPRGYDEQY	11	0.6	"CLL-like" LC-MBL
TR17	TRBV24-1	ATSGSSGANVLT	12	0.6	"CLL-like" LC-MBL
TR17	TRBV7-8	ASSLVTEDTGELF	13	0.6	"CLL-like" LC-MBL
TR17	TRBV6-1	ASSAGTRETGELF	13	0.5	"CLL-like" LC-MBL
TR17	TRBV29-1	SVVHANGYT	9	0.4	"CLL-like" LC-MBL
TR17	TRBV29-1	SVAGTGQDYGYT	12	0.4	"CLL-like" LC-MBL
TR19	TRBV27	ASSPWVNSPLH	11	10.8	"CLL-like" LC-MBL
TR19	TRBV29-1	SASGQIGYT	9	10.0	"CLL-like" LC-MBL
TR19	TRBV6-5	ASSYGAPGTANYGYT	15	8.7	"CLL-like" LC-MBL
TR19	TRBV12-5	ASGRDGFDGYT	11	3.9	"CLL-like" LC-MBL
TR19	TRBV29-1	SVAGTWSRYGYT	12	1.2	"CLL-like" LC-MBL
TR19	TRBV5-4	ASSLEKALNEKLF	13	1.1	"CLL-like" LC-MBL
TR19	TRBV19	ASSGPEKAGANVLT	14	0.9	"CLL-like" LC-MBL
TR19	TRBV24-1	ATSDRTAGELF	11	0.7	"CLL-like" LC-MBL

TR19	TRBV12-3	ASSLSDRVDGYT	12	0.7	"CLL-like" LC-MBL
TR19	TRBV12-3	ASSKLGEIYGYT	12	0.4	"CLL-like" LC-MBL
TR20	TRBV14	ASSQDARVYSYNSPLH	16	7.9	"CLL-like" LC-MBL
TR20	TRBV18	ASSPGLAPTYEQY	13	2.7	"CLL-like" LC-MBL
TR20	TRBV6-2/6-3	ASSYTGYGTGELF	13	2.4	"CLL-like" LC-MBL
TR20	TRBV20-1	SANLPGETMRKT	12	1.2	"CLL-like" LC-MBL
TR20	TRBV10-2	ASSGGPGQSPLH	12	0.9	"CLL-like" LC-MBL
TR20	TRBV19	ASSTEDREGEAF	12	0.8	"CLL-like" LC-MBL
TR20	TRBV29-1	SVEVSRQDRYGYT	13	0.6	"CLL-like" LC-MBL
TR20	TRBV12-3	ASTPGPGNYGYT	12	0.5	"CLL-like" LC-MBL
TR20	TRBV29-1	SVAVGQALNEQY	12	0.5	"CLL-like" LC-MBL
TR20	TRBV6-6	ASSYNQGASYGYT	13	0.4	"CLL-like" LC-MBL
TR22	TRBV7-8	ASSLNSGTDDTGELF	15	13.2	"CLL-like" LC-MBL
TR22	TRBV6-5	ASSATNTGELF	11	2.5	"CLL-like" LC-MBL
TR22	TRBV24-1	ATSAPGQDTGELF	13	2.0	"CLL-like" LC-MBL
TR22	TRBV29-1	SVVLAESNTGELF	13	1.2	"CLL-like" LC-MBL
TR22	TRBV10-2	ASSEPGTAGQPQH	13	1.1	"CLL-like" LC-MBL
TR22	TRBV29-1	SVPGGFGELF	10	0.6	"CLL-like" LC-MBL
TR22	TRBV12-3	ASSLWDQPQH	10	0.5	"CLL-like" LC-MBL
TR22	TRBV10-2	ASSPTGTAHSPLH	13	0.5	"CLL-like" LC-MBL
TR22	TRBV10-3	AISEEQLYEQY	11	0.4	"CLL-like" LC-MBL
TR22	TRBV7-2	ASSLNSGTDDTGELF	15	0.3	"CLL-like" LC-MBL
TR23	TRBV5-4	ASSLDRGTGERYGYT	15	1.3	"CLL-like" LC-MBL
TR23	TRBV10-3	ATRDRASNQPQH	12	1.2	"CLL-like" LC-MBL
TR23	TRBV6-1	ASPVDRAPGNTIY	13	0.6	"CLL-like" LC-MBL
TR23	TRBV5-1	ASSREGDQPQH	11	0.4	"CLL-like" LC-MBL
TR23	TRBV12-3	ASSPSGGGQEKLF	13	0.4	"CLL-like" LC-MBL
TR23	TRBV5-1	ASSSPPGRDYEDGYT	15	0.3	"CLL-like" LC-MBL
TR23	TRBV12-3	ASSLMTGELF	10	0.2	"CLL-like" LC-MBL
TR23	TRBV19	ASTRASSGNTIY	12	0.2	"CLL-like" LC-MBL
TR23	TRBV12-3	ASSPPGQSGNQPQH	14	0.2	"CLL-like" LC-MBL
TR23	TRBV27	ASSLSEIAYEQY	12	0.1	"CLL-like" LC-MBL
TR24	TRBV10-2	ASSPGTGTYGYT	12	12.9	"CLL-like" LC-MBL
TR24	TRBV28	ASSLGIHYEQY	11	3.5	"CLL-like" LC-MBL
TR24	TRBV20-1	SASRTGSNSPLH	12	0.9	"CLL-like" LC-MBL
TR24	TRBV6-6	ASSPAGSNQPQH	12	0.6	"CLL-like" LC-MBL
TR24	TRBV28	ASSLGLHYEQY	11	0.5	"CLL-like" LC-MBL
TR24	TRBV28	ASSPLLESADGYT	13	0.4	"CLL-like" LC-MBL
TR24	TRBV29-1	SVVESGGYT	9	0.3	"CLL-like" LC-MBL
TR24	TRBV28	ASNRDRGNYGYT	12	0.3	"CLL-like" LC-MBL
TR24	TRBV10-3	ASSPGTGTYGYT	12	0.3	"CLL-like" LC-MBL

TR24	TRBV6-1	ASSEAGGSGANVLT	14	0.3	"CLL-like" LC-MBL
TR25	TRBV2	ASGGDRNPPKDEKLF	15	11.3	"CLL-like" LC-MBL
TR25	TRBV28	ASSFSHYSNQPQH	13	7.0	"CLL-like" LC-MBL
TR25	TRBV2	ATGGGFDQPQH	11	2.3	"CLL-like" LC-MBL
TR25	TRBV30	AWNPPIIGNYGYT	13	1.6	"CLL-like" LC-MBL
TR25	TRBV4-3	ASSQGGRSSGANVLT	15	1.1	"CLL-like" LC-MBL
TR25	TRBV6-2/6-3	ASSYTAYEQY	10	0.7	"CLL-like" LC-MBL
TR25	TRBV4-1	ASSQDPGLDYGYT	13	0.6	"CLL-like" LC-MBL
TR25	TRBV19	ASRWYEGTGELF	12	0.4	"CLL-like" LC-MBL
TR25	TRBV7-8	ASSSNLQPQH	10	0.3	"CLL-like" LC-MBL
TR25	TRBV6-2/6-3	ASSYLEYSPLH	11	0.3	"CLL-like" LC-MBL
TR26	TRBV20-1	SARGRLNSLSGNTIY	15	2.2	"CLL-like" LC-MBL
TR26	TRBV28	ASSLGVHYEQY	11	1.8	"CLL-like" LC-MBL
TR26	TRBV6-2/6-3	ASSYQGHQPQH	11	1.7	"CLL-like" LC-MBL
TR26	TRBV19	ASSSGVSQPQH	11	0.8	"CLL-like" LC-MBL
TR26	TRBV5-4	ASSFRQNTEAF	11	0.5	"CLL-like" LC-MBL
TR26	TRBV27	ASSLSGGGGQPQH	13	0.4	"CLL-like" LC-MBL
TR26	TRBV6-4	ASSLVESGELF	11	0.3	"CLL-like" LC-MBL
TR26	TRBV19	ASSGVTGNQPQH	12	0.3	"CLL-like" LC-MBL
TR26	TRBV28	ASRVGTQPQH	10	0.2	"CLL-like" LC-MBL
TR26	TRBV28	ASSPGTYNYGYT	12	0.2	"CLL-like" LC-MBL
TR29	TRBV10-3	AAKGTGGNQPQH	12	8.5	"CLL-like" LC-MBL
TR29	TRBV28	ASNMGSDQPQH	11	3.7	"CLL-like" LC-MBL
TR29	TRBV28	ASSPGQSDSPLH	12	0.5	"CLL-like" LC-MBL
TR29	TRBV27	ASKLMGGSSGYT	12	0.4	"CLL-like" LC-MBL
TR29	TRBV29-1	SVGDPTGYT	9	0.3	"CLL-like" LC-MBL
TR29	TRBV7-8	ASSLDNSPLH	10	0.3	"CLL-like" LC-MBL
TR29	TRBV5-6	ASSPLITYGYT	11	0.3	"CLL-like" LC-MBL
TR29	TRBV29-1	SVGQGKGEKLF	11	0.3	"CLL-like" LC-MBL
TR29	TRBV5-1	ASSWTANPRAANYGYT	16	0.3	"CLL-like" LC-MBL
TR29	TRBV19	ASSARPATWYGYT	13	0.2	"CLL-like" LC-MBL
TR31	TRBV2	ASGGDRNPPKDEKLF	15	2.7	"CLL-like" LC-MBL
TR31	TRBV12-3	ASSLGVSGANVLT	13	2.2	"CLL-like" LC-MBL
TR31	TRBV28	ASSFSHYSNQPQH	13	1.8	"CLL-like" LC-MBL
TR31	TRBV10-3	AAKGTGGNQPQH	12	0.9	"CLL-like" LC-MBL
TR31	TRBV10-3	AISTAGTGYGYT	12	0.8	"CLL-like" LC-MBL
TR31	TRBV2	ATGGGFDQPQH	11	0.6	"CLL-like" LC-MBL
TR31	TRBV10-3	AISDVFAWNYGYT	13	0.6	"CLL-like" LC-MBL
TR31	TRBV7-8	ASSLSGSYEQY	11	0.5	"CLL-like" LC-MBL
TR31	TRBV20-1	SARPRRTTNTGELF	14	0.5	"CLL-like" LC-MBL
TR31	TRBV20-1	SALDPRGLYYGYT	13	0.4	"CLL-like" LC-MBL

TR33	TRBV6-5	ASSYRGDRGYT	11	4.2	"CLL-like" LC-MBL
TR33	TRBV12-3	ASSLLFFRRP	10	2.0	"CLL-like" LC-MBL
TR33	TRBV7-8	ASSLGNNQPQH	11	1.5	"CLL-like" LC-MBL
TR33	TRBV6-5	ASSYRWDRGYT	11	1.4	"CLL-like" LC-MBL
TR33	TRBV29-1	SVARGLNYGYT	11	1.1	"CLL-like" LC-MBL
TR33	TRBV28	ASSVRGADGYT	11	1.0	"CLL-like" LC-MBL
TR33	TRBV20-1	SASTLRGNQPQH	12	0.8	"CLL-like" LC-MBL
TR33	TRBV29-1	SVEPGRSWGYT	11	0.6	"CLL-like" LC-MBL
TR33	TRBV29-1	SVSWGSLGGYT	11	0.5	"CLL-like" LC-MBL
TR33	TRBV5-5	ASSWGLEERVSNQPQH	16	0.5	"CLL-like" LC-MBL
TR34	TRBV2	ASSGSGLQPQH	11	2.6	"CLL-like" LC-MBL
TR34	TRBV12-3	ASSFANLNEVELF	13	2.6	"CLL-like" LC-MBL
TR34	TRBV12-3	ASSFSGKNQPQH	12	1.6	"CLL-like" LC-MBL
TR34	TRBV12-3	ASSLGQGNSGELF	13	1.2	"CLL-like" LC-MBL
TR34	TRBV27	ASSSGTAFYGYT	12	1.0	"CLL-like" LC-MBL
TR34	TRBV18	ASSPTGVLVGYT	12	0.7	"CLL-like" LC-MBL
TR34	TRBV12-3	ASSPGEDYGYT	11	0.4	"CLL-like" LC-MBL
TR34	TRBV12-3	ASSLDSSGPFHQQY	14	0.3	"CLL-like" LC-MBL
TR34	TRBV10-2	ASSVGDFNT	9	0.2	"CLL-like" LC-MBL
TR34	TRBV29-1	SVEGLAGAGTGELF	14	0.2	"CLL-like" LC-MBL
TR35	TRBV13	ASSFLGSYTGELF	13	12.9	"CLL-like" LC-MBL
TR35	TRBV6-2/6-3	ASLFRMGELF	10	3.2	"CLL-like" LC-MBL
TR35	TRBV6-5	ASSYSGNDEQY	11	2.1	"CLL-like" LC-MBL
TR35	TRBV28	ASSLTGGNSPLH	12	1.3	"CLL-like" LC-MBL
TR35	TRBV2	ASSGDSYGYT	10	1.0	"CLL-like" LC-MBL
TR35	TRBV12-3	ASSLSRKNSPLH	12	0.7	"CLL-like" LC-MBL
TR35	TRBV6-2/6-3	ASSYSSFSGELF	12	0.6	"CLL-like" LC-MBL
TR35	TRBV7-9	ASSSGSQPQH	10	0.4	"CLL-like" LC-MBL
TR35	TRBV29-1	SVEQATGNTIY	11	0.4	"CLL-like" LC-MBL
TR35	TRBV27	ASSLDYLGYGYT	12	0.4	"CLL-like" LC-MBL
TR36	TRBV6-2/6-3	ASSYSSFSGELF	12	52.6	"CLL-like" LC-MBL
TR36	TRBV7-8	ASSSSGQGDYGYT	13	2.3	"CLL-like" LC-MBL
TR36	TRBV5-1	ASSLESRDQPQH	12	1.2	"CLL-like" LC-MBL
TR36	TRBV5-5	ASSLKGFDQPQH	12	0.9	"CLL-like" LC-MBL
TR36	TRBV6-5	ASSYSSFSGELF	12	0.3	"CLL-like" LC-MBL
TR36	TRBV5-4	ASSWETDVLGYT	12	0.2	"CLL-like" LC-MBL
TR36	TRBV6-2/6-3	ASSYSGFSGELF	12	0.2	"CLL-like" LC-MBL
TR36	TRBV6-6	ASSYSSFSGELF	12	0.2	"CLL-like" LC-MBL
TR36	TRBV12-3	ASSYSSFSGELF	12	0.2	"CLL-like" LC-MBL
TR36	TRBV7-2	ASSSSGQGDYGYT	13	0.2	"CLL-like" LC-MBL
TR37	TRBV12-3	ASSPNYSNQPQH	12	9.4	"CLL-like" LC-MBL

TR37	TRBV12-3	ASSRPGQGVTEAF	13	1.0	"CLL-like" LC-MBL
TR37	TRBV20-1	SARDQVVANYGYT	13	0.6	"CLL-like" LC-MBL
TR37	TRBV27	ASSLGGGAWAF	11	0.5	"CLL-like" LC-MBL
TR37	TRBV6-5	ASSGGSSYTGELF	13	0.4	"CLL-like" LC-MBL
TR37	TRBV29-1	SAGTPNYGYT	10	0.2	"CLL-like" LC-MBL
TR37	TRBV19	ASSVEAGANVLT	12	0.2	"CLL-like" LC-MBL
TR37	TRBV6-5	ASSYSGVNSPLH	12	0.2	"CLL-like" LC-MBL
TR37	TRBV29-1	SVEVSRNTGELF	12	0.1	"CLL-like" LC-MBL
TR37	TRBV7-9	ASSWGQERDSPLH	13	0.1	"CLL-like" LC-MBL
TR38	TRBV6-4	ASSDEAASPLH	11	1.4	"CLL-like" LC-MBL
TR38	TRBV29-1	SVGRTGQRHGYT	12	0.6	"CLL-like" LC-MBL
TR38	TRBV7-8	ASSLQGSGEKLF	12	0.5	"CLL-like" LC-MBL
TR38	TRBV29-1	SVEGSDSGNTIY	12	0.4	"CLL-like" LC-MBL
TR38	TRBV12-3	ASRAGTGINQPQH	13	0.4	"CLL-like" LC-MBL
TR38	TRBV20-1	SAQEETGGSQPQH	13	0.4	"CLL-like" LC-MBL
TR38	TRBV4-1	ASSFGTANSPLH	12	0.3	"CLL-like" LC-MBL
TR38	TRBV6-8	ASSYPTPAPGF	11	0.2	"CLL-like" LC-MBL
TR38	TRBV28	ASRSTRGRKPQH	12	0.1	"CLL-like" LC-MBL
TR38	TRBV29-1	SARGVENTGELF	12	0.1	"CLL-like" LC-MBL
TR39	TRBV11-3	ASSLAGTAWLGYT	13	1.1	"CLL-like" LC-MBL
TR39	TRBV29-1	SVGGGLGQPQH	11	0.5	"CLL-like" LC-MBL
TR39	TRBV27	ASSPFTGELF	10	0.3	"CLL-like" LC-MBL
TR39	TRBV15	ATSRVGGEKLF	11	0.3	"CLL-like" LC-MBL
TR39	TRBV28	ASARGFGNQPQH	12	0.3	"CLL-like" LC-MBL
TR39	TRBV20-1	SARGWDSNYGYT	12	0.3	"CLL-like" LC-MBL
TR39	TRBV11-2	ASSLAGTAWLGYT	13	0.3	"CLL-like" LC-MBL
TR39	TRBV29-1	STYGGGELF	9	0.2	"CLL-like" LC-MBL
TR39	TRBV29-1	SVVGSNEKLF	10	0.2	"CLL-like" LC-MBL
TR39	TRBV7-2	ASSWDSGNSPLH	12	0.2	"CLL-like" LC-MBL
TR41	TRBV29-1	SVTGGVGYT	9	19.6	"CLL-like" LC-MBL
TR41	TRBV28	ASRPDRGSSPLH	12	2.9	"CLL-like" LC-MBL
TR41	TRBV6-5	ASSYRTGFSNGYT	13	0.7	"CLL-like" LC-MBL
TR41	TRBV28	ASSLFGIPSYGYT	13	0.6	"CLL-like" LC-MBL
TR41	TRBV28	ASSTTRQGPNYGYT	14	0.5	"CLL-like" LC-MBL
TR41	TRBV28	ASPTSPLH	8	0.4	"CLL-like" LC-MBL
TR41	TRBV27	ASSTGTVEKLF	11	0.4	"CLL-like" LC-MBL
TR41	TRBV29-1	SVDAGSAYGYT	11	0.4	"CLL-like" LC-MBL
TR41	TRBV19	ASSSTGQGKFLSGYT	15	0.4	"CLL-like" LC-MBL
TR41	TRBV29-1	SVPGESGYTGELF	13	0.3	"CLL-like" LC-MBL
TR49	TRBV28	ASSWANTGELF	11	3.7	"CLL-like" LC-MBL
TR49	TRBV6-5	ASSLQTGAIYGYT	13	1.7	"CLL-like" LC-MBL

TR49	TRBV29-1	SVGDQPQH	8	0.3	"CLL-like" LC-MBL
TR49	TRBV27	ASGSGQYGYT	10	0.3	"CLL-like" LC-MBL
TR49	TRBV27	ASSSEGNYGYT	11	0.3	"CLL-like" LC-MBL
TR49	TRBV12-3	ASSSGTPYDYT	11	0.2	"CLL-like" LC-MBL
TR49	TRBV29-1	SVDSDGYQGYT	11	0.2	"CLL-like" LC-MBL
TR49	TRBV29-1	SVEVGNNYGYT	11	0.2	"CLL-like" LC-MBL
TR49	TRBV6-4	ASSDGAGNEKLF	12	0.2	"CLL-like" LC-MBL
TR49	TRBV19	ASSLSRGNQPQH	12	0.2	"CLL-like" LC-MBL
TR50	TRBV28	ASSERGTGELF	11	1.8	"CLL-like" LC-MBL
TR50	TRBV27	ASSHTQGGSNQPQH	14	1.7	"CLL-like" LC-MBL
TR50	TRBV10-3	AISHTGTSPDYGYT	14	1.0	"CLL-like" LC-MBL
TR50	TRBV5-1	ASNSWGEAF	9	0.8	"CLL-like" LC-MBL
TR50	TRBV5-5	ASSFFLTGPTTNEKLF	16	0.8	"CLL-like" LC-MBL
TR50	TRBV28	ASMFRATGELF	11	0.6	"CLL-like" LC-MBL
TR50	TRBV13	ASSLGRDFNTEAF	13	0.5	"CLL-like" LC-MBL
TR50	TRBV10-3	AISESTLARGNTEAF	15	0.5	"CLL-like" LC-MBL
TR50	TRBV25-1	ASSGEQGYNSPLH	13	0.4	"CLL-like" LC-MBL
TR50	TRBV10-3	AISESRTGNNQPQH	14	0.4	"CLL-like" LC-MBL
TR51	TRBV4-3	ASSQRRRSLWVEKLF	15	0.4	"CLL-like" LC-MBL
TR51	TRBV12-3	ASADALWGYT	10	0.3	"CLL-like" LC-MBL
TR51	TRBV25-1	ASQPHTGNPQPQH	13	0.3	"CLL-like" LC-MBL
TR51	TRBV28	ASSPAAGEIRNTIY	14	0.3	"CLL-like" LC-MBL
TR51	TRBV29-1	SVDTGGYGYT	10	0.2	"CLL-like" LC-MBL
TR51	TRBV12-3	ASSYTATGELF	11	0.2	"CLL-like" LC-MBL
TR51	TRBV29-1	SVEEDRYYGYT	11	0.2	"CLL-like" LC-MBL
TR51	TRBV6-2/6-3	ASSPTGTGDQPQH	13	0.2	"CLL-like" LC-MBL
TR51	TRBV2	ASSPRMGPFNQPQH	14	0.2	"CLL-like" LC-MBL
TR51	TRBV6-5	ASSYSSWGYPYGYT	14	0.2	"CLL-like" LC-MBL
TR54	TRBV2	ASSERGNGYT	10	6.3	"CLL-like" LC-MBL
TR54	TRBV7-2	ASSARAYSGNTIY	13	4.8	"CLL-like" LC-MBL
TR54	TRBV29-1	SVVPADSFTYEQY	13	1.9	"CLL-like" LC-MBL
TR54	TRBV18	ASSPGQGSYGYT	12	1.3	"CLL-like" LC-MBL
TR54	TRBV27	ASSPNRGANEKLF	13	1.2	"CLL-like" LC-MBL
TR54	TRBV28	ASSVVQGEKLF	11	0.7	"CLL-like" LC-MBL
TR54	TRBV7-8	ASSARAYSGNTIY	13	0.5	"CLL-like" LC-MBL
TR54	TRBV27	ASSLAPEDAGELF	13	0.4	"CLL-like" LC-MBL
TR54	TRBV29-1	SVEDWTNKGGRGYT	14	0.4	"CLL-like" LC-MBL
TR54	TRBV29-1	SVELPQGYPNTGELF	15	0.4	"CLL-like" LC-MBL
TR55	TRBV12-3	ASNGLGPNQPQH	12	3.9	"CLL-like" LC-MBL
TR55	TRBV29-1	SVEDRCPSSYNSPLH	15	0.8	"CLL-like" LC-MBL
TR55	TRBV7-9	ASSFWGQGDNSPLH	14	0.6	"CLL-like" LC-MBL

TR55	TRBV12-3	ASSFGQPPNTEAF	13	0.5	"CLL-like" LC-MBL
TR55	TRBV7-9	ASSLQGDGYT	10	0.4	"CLL-like" LC-MBL
TR55	TRBV6-5	ASSYYSGYEQY	11	0.4	"CLL-like" LC-MBL
TR55	TRBV6-8	ASYRGLGQPQH	11	0.4	"CLL-like" LC-MBL
TR55	TRBV28	ASSLEQGAGDSPLH	14	0.4	"CLL-like" LC-MBL
TR55	TRBV4-3	ASSQEWPGYQPQH	13	0.3	"CLL-like" LC-MBL
TR55	TRBV6-2/6-3	ASSYSSWGAYEQY	13	0.3	"CLL-like" LC-MBL
TR56	TRBV29-1	SVHTTSYGYT	10	1.2	"CLL-like" LC-MBL
TR56	TRBV2	ASGWGPGNQPQH	12	0.9	"CLL-like" LC-MBL
TR56	TRBV29-1	SVYGGSSGYT	10	0.6	"CLL-like" LC-MBL
TR56	TRBV7-8	ASSLVLYSGTGRPGELF	17	0.5	"CLL-like" LC-MBL
TR56	TRBV29-1	SVRGAGNTIY	10	0.4	"CLL-like" LC-MBL
TR56	TRBV29-1	SVESGAVTGELF	12	0.4	"CLL-like" LC-MBL
TR56	TRBV13	ASSLGPGSPF	10	0.3	"CLL-like" LC-MBL
TR56	TRBV29-1	SATGAGNTIY	10	0.3	"CLL-like" LC-MBL
TR56	TRBV19	ASSMWRPSGNTIY	13	0.3	"CLL-like" LC-MBL
TR56	TRBV29-1	SVSMGTGRTGELF	13	0.3	"CLL-like" LC-MBL
TR58	TRBV27	ASSLSVSSSVYGYT	14	41.3	"CLL-like" LC-MBL
TR58	TRBV18	ASSPLSGDVLT	11	3.6	"CLL-like" LC-MBL
TR58	TRBV12-3	ASSPNYSNQPQH	12	2.4	"CLL-like" LC-MBL
TR58	TRBV11-3	ASSLDESLAGGHTGELF	17	0.8	"CLL-like" LC-MBL
TR58	TRBV27	ASSYQRGSYEQY	12	0.4	"CLL-like" LC-MBL
TR58	TRBV29-1	SVASRAGTGELF	12	0.4	"CLL-like" LC-MBL
TR58	TRBV6-6	ASRGTANTGELF	12	0.2	"CLL-like" LC-MBL
TR58	TRBV6-5	ASSTGQKNEKLF	12	0.2	"CLL-like" LC-MBL
TR58	TRBV29-1	SVVATGYPGELF	12	0.2	"CLL-like" LC-MBL
TR58	TRBV12-3	ASSLSVSSSVYGYT	14	0.2	"CLL-like" LC-MBL
TR60	TRBV5-6	ASSLLTRANTGELF	14	14.2	"CLL-like" LC-MBL
TR60	TRBV13	ASRIQGAGELF	11	13.1	"CLL-like" LC-MBL
TR60	TRBV6-1	ASSERSANTGELF	13	11.6	"CLL-like" LC-MBL
TR60	TRBV29-1	SVATGGQFNEKLF	13	6.0	"CLL-like" LC-MBL
TR60	TRBV12-3	ASSKGQGGVSNTGELF	16	3.3	"CLL-like" LC-MBL
TR60	TRBV10-3	AISESASGTEKGYT	14	1.4	"CLL-like" LC-MBL
TR60	TRBV7-8	ASSSPQWHTGELF	13	1.2	"CLL-like" LC-MBL
TR60	TRBV29-1	SVGRTGQFNEKLF	13	0.8	"CLL-like" LC-MBL
TR60	TRBV29-1	SVGAGGTNEKLF	12	0.7	"CLL-like" LC-MBL
TR60	TRBV7-8	ASSLYGGTNEKLF	13	0.7	"CLL-like" LC-MBL
TR63	TRBV28	ASIQAPGSGIWYYEQY	16	1.2	"CLL-like" LC-MBL
TR63	TRBV29-1	SVEGGPFYEQY	11	0.7	"CLL-like" LC-MBL
TR63	TRBV29-1	SVESGDSYGYT	11	0.4	"CLL-like" LC-MBL
TR63	TRBV12-3	ASSLQAVNYGYT	12	0.3	"CLL-like" LC-MBL

TR63	TRBV28	ASSSDTAGGYT	11	0.2	"CLL-like" LC-MBL
TR63	TRBV6-5	ASGEAGYTYGYT	12	0.2	"CLL-like" LC-MBL
TR63	TRBV12-3	ASSFSPGGHYGYT	13	0.2	"CLL-like" LC-MBL
TR63	TRBV12-3	ASSLRQGIVYGYT	13	0.2	"CLL-like" LC-MBL
TR63	TRBV28	ASSLYTSYSGNTIY	14	0.2	"CLL-like" LC-MBL
TR63	TRBV10-3	AISESTGGATTRNGYT	16	0.2	"CLL-like" LC-MBL
TR64	TRBV6-1	ASSDQTGHGGELF	13	3.0	"CLL-like" LC-MBL
TR64	TRBV20-1	SARALEGPGELF	12	1.1	"CLL-like" LC-MBL
TR64	TRBV10-2	ASSEGEQY	8	0.7	"CLL-like" LC-MBL
TR64	TRBV7-2	ASSPGPNYGYT	11	0.4	"CLL-like" LC-MBL
TR64	TRBV20-1	SAIQGAVNTEAF	12	0.3	"CLL-like" LC-MBL
TR64	TRBV4-3	ASSQLADLNTEAF	13	0.3	"CLL-like" LC-MBL
TR64	TRBV12-3	ASSLAEGQGATGELF	15	0.3	"CLL-like" LC-MBL
TR64	TRBV4-1	ASSQDPCRQGDNYGYT	16	0.3	"CLL-like" LC-MBL
TR64	TRBV15	ATSRDQETSPLN	12	0.2	"CLL-like" LC-MBL
TR64	TRBV6-4	ASSALAGGYETGELF	15	0.2	"CLL-like" LC-MBL
TR66	TRBV28	ASSYAPYEQY	10	2.7	"CLL-like" LC-MBL
TR66	TRBV15	ATSRGQGANYGYT	13	2.4	"CLL-like" LC-MBL
TR66	TRBV29-1	SVEASTGGNGYT	12	2.1	"CLL-like" LC-MBL
TR66	TRBV6-5	ASSYSPPLDSPLH	13	0.6	"CLL-like" LC-MBL
TR66	TRBV6-1	ASSDQTGHGGELF	13	0.5	"CLL-like" LC-MBL
TR66	TRBV6-4	ASSTGWHSNQPQH	13	0.5	"CLL-like" LC-MBL
TR66	TRBV28	ASILDRYSNQPQH	13	0.4	"CLL-like" LC-MBL
TR66	TRBV6-2/6-3	ASSYSSGELF	10	0.3	"CLL-like" LC-MBL
TR66	TRBV10-3	ATVGLGTGELF	11	0.3	"CLL-like" LC-MBL
TR66	TRBV6-5	ASSSSLSGTANSPLH	15	0.3	"CLL-like" LC-MBL
TR68	TRBV15	ATSSSTGGRNSPLH	14	6.2	"CLL-like" LC-MBL
TR68	TRBV12-3	ASSSSVYGYT	10	3.5	"CLL-like" LC-MBL
TR68	TRBV10-2	ASSEGLGSYEQY	12	2.7	"CLL-like" LC-MBL
TR68	TRBV29-1	SVEGWGYGYT	10	2.1	"CLL-like" LC-MBL
TR68	TRBV12-5	ASAGTGGTHYYGYT	14	2.1	"CLL-like" LC-MBL
TR68	TRBV12-3	ASSTRSGDGYT	11	1.9	"CLL-like" LC-MBL
TR68	TRBV12-3	ASSLSGTSYEQY	12	1.9	"CLL-like" LC-MBL
TR68	TRBV29-1	SVTLGSNYGYT	11	1.7	"CLL-like" LC-MBL
TR68	TRBV29-1	SVDREAGYT	9	1.5	"CLL-like" LC-MBL
TR68	TRBV6-5	ASSYHGQPQH	10	1.4	"CLL-like" LC-MBL
TR69	TRBV6-5	ASSPGLAGELF	11	18.7	"CLL-like" LC-MBL
TR69	TRBV12-3	ASGSLQPQH	9	3.2	"CLL-like" LC-MBL
TR69	TRBV12-3	ASSFRNYYGYT	11	3.0	"CLL-like" LC-MBL
TR69	TRBV29-1	SVAWGQGSST	10	1.5	"CLL-like" LC-MBL
TR69	TRBV29-1	SVRGQNYGYT	10	1.3	"CLL-like" LC-MBL

TR69	TRBV6-2/6-3	ASSFGGGYGYT	11	1.2	"CLL-like" LC-MBL
TR69	TRBV12-3	ASSLARAVYEQY	12	1.1	"CLL-like" LC-MBL
TR69	TRBV12-3	ASRSIRGYGYT	11	1.0	"CLL-like" LC-MBL
TR69	TRBV12-3	ASSLRTYEQY	10	0.9	"CLL-like" LC-MBL
TR69	TRBV6-5	ASSGLAASYEQY	12	0.9	"CLL-like" LC-MBL
TR08	TRBV12-3	ASSPNYSNQPQH	12	15.2	"other" LC-MBL
TR08	TRBV15	ATSRENIEGTTLH	13	4.2	"other" LC-MBL
TR08	TRBV28	ASSFHDTGELF	11	3.3	"other" LC-MBL
TR08	TRBV12-3	ASSLSGGAGELF	12	1.0	"other" LC-MBL
TR08	TRBV12-3	ASSENYSNQPQH	12	0.6	"other" LC-MBL
TR08	TRBV29-1	SARLGVYGYT	10	0.5	"other" LC-MBL
TR08	TRBV19	ASSMDAYGNQPQH	13	0.4	"other" LC-MBL
TR08	TRBV27	ASSVSTGMNSPLH	13	0.4	"other" LC-MBL
TR08	TRBV10-3	AISTSVLNYGYT	12	0.3	"other" LC-MBL
TR08	TRBV6-5	ASRDPRGPGELF	12	0.2	"other" LC-MBL
TR09	TRBV28	ASSLGLPNNQPQH	13	1.6	"other" LC-MBL
TR09	TRBV20-1	SARALRPGADGYT	13	1.6	"other" LC-MBL
TR09	TRBV7-8	ASTLNSADYGYT	12	1.0	"other" LC-MBL
TR09	TRBV27	ASSHTGNQPQH	11	0.5	"other" LC-MBL
TR09	TRBV20-1	SARDRGIGNTIY	12	0.4	"other" LC-MBL
TR09	TRBV27	ASSLGHSYEQY	11	0.3	"other" LC-MBL
TR09	TRBV20-1	SARGATNEKLF	11	0.3	"other" LC-MBL
TR09	TRBV10-3	AIRDREYSPLH	11	0.2	"other" LC-MBL
TR09	TRBV5-1	ASSKEGDQPQH	11	0.2	"other" LC-MBL
TR09	TRBV10-3	AISETSEGSGANVLT	15	0.2	"other" LC-MBL
TR40	TRBV29-1	SVGDSVNYGYT	11	7.3	"other" LC-MBL
TR40	TRBV19	ASSIGFIHQAGELF	14	5.5	"other" LC-MBL
TR40	TRBV12-3	ASSSANYGYT	10	3.9	"other" LC-MBL
TR40	TRBV12-5	ASGTTDSGNTIY	12	1.7	"other" LC-MBL
TR40	TRBV6-5	ASYAPGLAWSGANVLT	16	1.0	"other" LC-MBL
TR40	TRBV6-5	ASSRQGITEAF	11	0.8	"other" LC-MBL
TR40	TRBV29-1	SVAGSGYGYT	10	0.7	"other" LC-MBL
TR40	TRBV29-1	SVDSGANVLT	10	0.7	"other" LC-MBL
TR40	TRBV6-2/6-3	ASSRDITTEAF	11	0.7	"other" LC-MBL
TR40	TRBV27	ASSSQIHEKLF	11	0.7	"other" LC-MBL
TR42	TRBV11-2	ASSEVQGWTRVTEAF	15	3.3	"other" LC-MBL
TR42	TRBV12-3	ASSTGVASNQPQH	13	1.3	"other" LC-MBL
TR42	TRBV6-4	ASSRDSTGELF	11	1.0	"other" LC-MBL
TR42	TRBV29-1	SVAGQEMTGELF	12	0.8	"other" LC-MBL
TR42	TRBV7-2	ASSLGSAGVSPLH	13	0.7	"other" LC-MBL
TR42	TRBV29-1	SVVRDRQGSGYT	12	0.4	"other" LC-MBL

TR42	TRBV6-5	ASSSLDSVGEKLF	13	0.4	"other" LC-MBL
TR42	TRBV29-1	SAGENYGYT	9	0.3	"other" LC-MBL
TR42	TRBV29-1	SGRDTDQPQH	10	0.3	"other" LC-MBL
TR42	TRBV5-1	ASSFGTGSSPLH	12	0.3	"other" LC-MBL
TR43	TRBV13	ASSLMGAPYGYT	12	28.1	"other" LC-MBL
TR43	TRBV10-3	AISGQGDQPQH	11	2.7	"other" LC-MBL
TR43	TRBV7-6	ASSLTPLGGDTGELF	15	2.1	"other" LC-MBL
TR43	TRBV28	ASSLMEWNQPQH	12	1.6	"other" LC-MBL
TR43	TRBV28	ASSLISLTLGEKLF	14	1.4	"other" LC-MBL
TR43	TRBV15	ATSEQATELF	10	0.6	"other" LC-MBL
TR43	TRBV6-5	ASSYSITQPQH	11	0.6	"other" LC-MBL
TR43	TRBV20-1	SASSEKNTGELF	12	0.5	"other" LC-MBL
TR43	TRBV7-2	ASSLVGGQAHSPLH	14	0.4	"other" LC-MBL
TR43	TRBV19	ASSQAQASGANVLT	14	0.4	"other" LC-MBL
TR44	TRBV2	ASSESVGPQH	10	8.9	"other" LC-MBL
TR44	TRBV12-3	ASSQQNDVGYT	11	8.0	"other" LC-MBL
TR44	TRBV6-2/6-3	ASLGTDYGYT	10	4.5	"other" LC-MBL
TR44	TRBV6-2/6-3	ASTPILGTGSPLH	13	3.0	"other" LC-MBL
TR44	TRBV29-1	SAREDSTNEKLF	12	1.9	"other" LC-MBL
TR44	TRBV10-3	ATRTSGTYEQY	11	1.0	"other" LC-MBL
TR44	TRBV15	ATSSEGLRGMNTEAF	15	1.0	"other" LC-MBL
TR44	TRBV29-1	SVWVDRYPWEQY	12	0.4	"other" LC-MBL
TR44	TRBV12-3	ASSLGWGVKQPQH	13	0.4	"other" LC-MBL
TR44	TRBV7-9	ASSLSGTGTQPQH	13	0.3	"other" LC-MBL
TR45	TRBV10-3	AISEMGAEAF	10	2.6	"other" LC-MBL
TR45	TRBV10-3	AGSEGRAYEQY	11	2.2	"other" LC-MBL
TR45	TRBV19	ATEGQAPNYGYT	12	1.4	"other" LC-MBL
TR45	TRBV27	ASSFGQANEKLF	12	1.0	"other" LC-MBL
TR45	TRBV5-6	ASSFGTFGGDYGYT	14	0.8	"other" LC-MBL
TR45	TRBV7-8	ASSLDGIGNQPQH	13	0.5	"other" LC-MBL
TR45	TRBV7-9	ASSLFRDSLYGYT	13	0.5	"other" LC-MBL
TR45	TRBV19	ASSRRADKTNTGELF	15	0.5	"other" LC-MBL
TR45	TRBV29-1	SVEEDGTSGANVLT	14	0.4	"other" LC-MBL
TR45	TRBV29-1	SVDANGRDSNTGELF	15	0.4	"other" LC-MBL
TR04	TRBV29-1	SVATGPYGYT	10	1.7	"healthy"
TR04	TRBV11-2	ASSLSGGSSYT	11	1.7	"healthy"
TR04	TRBV29-1	SVLRTDNYGYT	11	1.2	"healthy"
TR04	TRBV7-8	ASSLDRSHEQY	11	1.0	"healthy"
TR04	TRBV7-8	ASSLNTGELF	10	0.8	"healthy"
TR04	TRBV6-1	ASSDGAGNTGELF	13	0.7	"healthy"
TR04	TRBV29-1	SVENGPYGYT	10	0.6	"healthy"

TR04	TRBV29-1	SVEDEYRGLGYT	12	0.6	"healthy"
TR04	TRBV6-1	ASSEVPSGANVLT	13	0.6	"healthy"
TR04	TRBV5-1	ASSREGDQPQH	11	0.5	"healthy"
TR07	TRBV5-6	ASTVHSPYEQY	11	12.1	"healthy"
TR07	TRBV27	ASSHASGYYGYT	12	7.5	"healthy"
TR07	TRBV6-5	ASRRQGATEAF	11	2.2	"healthy"
TR07	TRBV6-5	ASSPGQNTEAF	11	1.8	"healthy"
TR07	TRBV29-1	SVANFGQLKSWST	13	1.7	"healthy"
TR07	TRBV13	ASSFRTGHWTGELF	14	1.2	"healthy"
TR07	TRBV5-1	ASSDRVNYGYT	11	0.8	"healthy"
TR07	TRBV19	ASSIGTGGFYEQY	13	0.6	"healthy"
TR07	TRBV6-5	ASRPSGGSTSTGELF	15	0.6	"healthy"
TR07	TRBV27	ASSFSTGELF	10	0.5	"healthy"
TR21	TRBV27	ASSPGTVPGELF	12	4.1	"healthy"
TR21	TRBV27	ASSTDYGTVNTEAF	14	3.7	"healthy"
TR21	TRBV14	ASSQLSFNYGYT	12	2.6	"healthy"
TR21	TRBV10-3	AIADSLEGEAF	11	2.2	"healthy"
TR21	TRBV7-2	ASSLERGLYQPQH	13	1.0	"healthy"
TR21	TRBV5-6	ASSLGGGFSRQPQH	14	0.8	"healthy"
TR21	TRBV30	AWSDQEGYGYT	11	0.7	"healthy"
TR21	TRBV7-9	ASSTHDRSGVNSPLH	15	0.7	"healthy"
TR21	TRBV20-1	SASMDSATNEKLF	13	0.6	"healthy"
TR21	TRBV12-3	ASSPLDSATGELF	13	0.4	"healthy"
TR27	TRBV20-1	SARPRRTTNTGELF	14	6.9	"healthy"
TR27	TRBV29-1	SVEDPERGDTGELF	14	2.8	"healthy"
TR27	TRBV6-6	ASSYGGDYGAEAF	13	1.1	"healthy"
TR27	TRBV10-2	ASTGHLNEKLF	11	0.5	"healthy"
TR27	TRBV27	ASKEGNTIY	9	0.4	"healthy"
TR27	TRBV12-3	ASRPDRVAGYT	11	0.4	"healthy"
TR27	TRBV25-1	ASTAGWAGELF	11	0.2	"healthy"
TR27	TRBV6-6	ASRGTANTGELF	12	0.2	"healthy"
TR27	TRBV28	ASSSPGYSGANVLT	14	0.2	"healthy"
TR27	TRBV18	ASSPGEEHPMNTEAF	15	0.2	"healthy"
TR28	TRBV12-3	ASSLGVSGANVLT	13	21.3	"healthy"
TR28	TRBV12-3	ASSFRGLLNTGELF	14	2.1	"healthy"
TR28	TRBV19	ASRPSHRDSNQPQH	14	1.4	"healthy"
TR28	TRBV6-6	ASSYGAGELF	10	0.5	"healthy"
TR28	TRBV24-1	ATSGLAANTGELF	13	0.5	"healthy"
TR28	TRBV5-6	ASSLRFSGTVPYGYT	15	0.5	"healthy"
TR28	TRBV29-1	SASEGSSHGYT	11	0.4	"healthy"
TR28	TRBV28	ASSLGAAGNEKLF	13	0.4	"healthy"

TR28	TRBV6-5	ASSYYPQGSGKPQH	14	0.4	"healthy"
TR28	TRBV29-1	SVDHAGGYT	9	0.3	"healthy"
TR32	TRBV10-3	AISTAGTGYGYT	12	4.7	"healthy"
TR32	TRBV10-3	AISDVFAWNYGYT	13	3.4	"healthy"
TR32	TRBV7-9	ASSLASGTGDEKLF	14	2.2	"healthy"
TR32	TRBV20-1	SALDPRGLYYGYT	13	1.9	"healthy"
TR32	TRBV5-6	ASSWDRDLNSPLH	13	1.5	"healthy"
TR32	TRBV19	ASSITGHHQPQH	12	1.3	"healthy"
TR32	TRBV27	ASSLYGGEGQPQH	13	1.1	"healthy"
TR32	TRBV24-1	ATSDGLRDPNTGELF	15	0.9	"healthy"
TR32	TRBV27	ASMRAGWGANVLT	13	0.8	"healthy"
TR32	TRBV25-1	ASSEGLWDTGELF	13	0.7	"healthy"
TR46	TRBV19	ASSGGTGDQPQH	12	4.3	"healthy"
TR46	TRBV19	ASRSGGDSMKTQH	13	2.3	"healthy"
TR46	TRBV10-2	ASRGLYGYT	9	0.8	"healthy"
TR46	TRBV29-1	SVTSGWENGYT	11	0.5	"healthy"
TR46	TRBV4-2	ASSQVLDLVGELF	13	0.4	"healthy"
TR46	TRBV5-1	ASSSTGPPRY	10	0.3	"healthy"
TR46	TRBV6-2/6-3	ASSYGVNEKLF	11	0.3	"healthy"
TR46	TRBV10-1	ASSENEEGNYGYT	13	0.3	"healthy"
TR46	TRBV20-1	SAPITGAPGDGYT	13	0.3	"healthy"
TR46	TRBV5-1	ASSPDSQSSGNTIY	14	0.2	"healthy"
TR47	TRBV28	ASSSGQKNEKLF	12	11.2	"healthy"
TR47	TRBV10-2	ASSELQGGNQPQH	13	10.5	"healthy"
TR47	TRBV7-8	ASLRTSAPTGELF	13	2.1	"healthy"
TR47	TRBV27	ASSFGSLSTEAF	12	1.8	"healthy"
TR47	TRBV5-6	ASSLATGGDGYT	12	1.2	"healthy"
TR47	TRBV6-5	ASSYQGTQPQH	11	1.1	"healthy"
TR47	TRBV30	AWSPPGLESGELF	13	1.1	"healthy"
TR47	TRBV4-3	ASSQDLSSAGELF	13	0.8	"healthy"
TR47	TRBV6-4	ASSDGDTGELF	11	0.7	"healthy"
TR47	TRBV19	ASSIVPGEGTGELF	14	0.6	"healthy"
TR48	TRBV7-2	ASSFRDNYGYT	11	14.9	"healthy"
TR48	TRBV29-1	RPLCQPQH	8	0.6	"healthy"
TR48	TRBV12-3	ASSLGGAGTEAF	12	0.6	"healthy"
TR48	TRBV7-8	ASSFRDNYGYT	11	0.4	"healthy"
TR48	TRBV18	ASSPGGSYGYT	11	0.4	"healthy"
TR48	TRBV29-1	SVRAETNYGYT	11	0.4	"healthy"
TR48	TRBV7-8	ASRHRPRSYGYT	12	0.3	"healthy"
TR48	TRBV7-2	ASSREGQGSYGYT	13	0.3	"healthy"
TR48	TRBV7-9	ASSFRDNYGYT	11	0.2	"healthy"

TR48	TRBV11-2	ASSFRDNYGYT	11	0.2	"healthy"
TR57	TRBV27	ASSFSTGELF	10	14.5	"healthy"
TR57	TRBV2	ASSVKGGSGELF	12	5.4	"healthy"
TR57	TRBV19	ASMGTGGNTIY	11	2.2	"healthy"
TR57	TRBV18	ASSPGGLADLTGELF	15	1.9	"healthy"
TR57	TRBV29-1	SVFSDRADYGYT	12	1.6	"healthy"
TR57	TRBV27	ASSSEYGELF	10	1.0	"healthy"
TR57	TRBV10-3	ASGAGGNNSPLH	12	0.9	"healthy"
TR57	TRBV27	ASSYSTGELF	10	0.7	"healthy"
TR57	TRBV6-5	ASSSGQKNTEAF	12	0.7	"healthy"
TR57	TRBV28	ASSLFSGQYVEQY	13	0.6	"healthy"
TR67	TRBV6-5	ASSYPRGAGTGELF	14	5.5	"healthy"
TR67	TRBV29-1	SADRWTGGAEADGYT	15	3.4	"healthy"
TR67	TRBV29-1	SVGGAASNYGYT	12	2.6	"healthy"
TR67	TRBV12-3	ASNLRGGQPQH	11	2.3	"healthy"
TR67	TRBV12-3	ASSPPTGANYGYT	13	2.3	"healthy"
TR67	TRBV12-3	ASSFLFNYGYT	11	1.6	"healthy"
TR67	TRBV29-1	SVEGGQGVYGYT	12	1.6	"healthy"
TR67	TRBV12-3	ASSTGYNQPQH	11	1.4	"healthy"
TR67	TRBV29-1	SVEQAETNEQY	11	1.4	"healthy"
TR67	TRBV12-3	ASSLQGASQPQH	12	1.3	"healthy"
HE1	TRBV6-2/6-3	ASTRQGSHSPLH	12	5.7	"healthy"
HE1	TRBV12-3	ASRWRGPGANVLT	13	1.0	"healthy"
HE1	TRBV27	ASSLDRDRGNTEAF	14	0.9	"healthy"
HE1	TRBV29-1	SVVGSGANVLT	11	0.7	"healthy"
HE1	TRBV12-3	ASSLRQELAQH	11	0.4	"healthy"
HE1	TRBV6-2/6-3	ASSYQGQVRYT	11	0.4	"healthy"
HE1	TRBV10-3	AISDLTDSSYEQY	13	0.3	"healthy"
HE1	TRBV20-1	SASRRGHQPQH	11	0.2	"healthy"
HE1	TRBV28	ASSSVGSGANVLT	13	0.2	"healthy"
HE1	TRBV19	ASTLAPPPTSGANVLT	16	0.2	"healthy"
HE2	TRBV12-3	ASSARQGGGNEKLF	14	1.3	"healthy"
HE2	TRBV18	ASSRESSGPQH	11	0.6	"healthy"
HE2	TRBV29-1	SAPGTGLSYT	10	0.5	"healthy"
HE2	TRBV5-6	ASSSETGEKYGYT	13	0.4	"healthy"
HE2	TRBV7-6	ASSGPGLKNTGELF	14	0.4	"healthy"
HE2	TRBV6-2/6-3	ASTGRGYEQY	10	0.3	"healthy"
HE2	TRBV12-3	ASSLEGVGQQPQH	13	0.3	"healthy"
HE2	TRBV24-1	ATETSGANTGELF	13	0.3	"healthy"
HE2	TRBV29-1	SWTGANQPQH	10	0.2	"healthy"
HE2	TRBV12-3	ASSLGDRGRKLF	12	0.2	"healthy"

HE3	TRBV28	ASSPRGGGELF	11	10.9	"healthy"
HE3	TRBV15	ATSRDYSPLH	10	7.9	"healthy"
HE3	TRBV7-6	ASSGPGLKNTGELF	14	1.9	"healthy"
HE3	TRBV6-2/6-3	ASTGRGYEQY	10	1.8	"healthy"
HE3	TRBV5-4	ASSSGQGAGEKLF	13	1.8	"healthy"
HE3	TRBV30	AWSGETGELF	10	1.6	"healthy"
HE3	TRBV4-1	ASRSSDGLYNSPLH	14	1.6	"healthy"
HE3	TRBV28	ASSFRGPTEAF	11	1.4	"healthy"
HE3	TRBV30	ARGQGAGGYT	10	0.9	"healthy"
HE3	TRBV24-1	ATSPGQYLYT	10	0.9	"healthy"
HE4	TRBV7-8	ASSLFGQGPHGANVLT	16	3.1	"healthy"
HE4	TRBV5-6	ASSLDQTGGRGYT	13	2.9	"healthy"
HE4	TRBV10-2	ASSESGSNQPQH	12	1.5	"healthy"
HE4	TRBV28	ASSPSSGAVTGELF	14	0.8	"healthy"
HE4	TRBV6-5	ASRRGRPDNTIY	12	0.4	"healthy"
HE4	TRBV29-1	SVTGPLSGANVLT	13	0.3	"healthy"
HE4	TRBV29-1	SVGYSKDYT	9	0.2	"healthy"
HE4	TRBV7-2	ASSLFGQGPHGANVLT	16	0.2	"healthy"
HE4	TRBV5-5	ASSLDQTGGRGYT	13	0.1	"healthy"
HE4	TRBV5-4	ASSLDQTGGRGYT	13	0.1	"healthy"
HE5	TRBV7-9	ASSSHEGQGYRSPLH	15	5.2	"healthy"
HE5	TRBV10-3	AISQGPGQPQH	11	3.2	"healthy"
HE5	TRBV20-1	SLGTDYGYT	9	2.1	"healthy"
HE5	TRBV14	ASSYGTGGTGELF	13	1.4	"healthy"
HE5	TRBV11-2	ASSLPGQSPQH	11	1.3	"healthy"
HE5	TRBV14	ASSQLRVGELF	11	0.7	"healthy"
HE5	TRBV30	AWTSDPSGANVLT	13	0.5	"healthy"
HE5	TRBV29-1	SVEGDGYT	8	0.4	"healthy"
HE5	TRBV7-9	ASSSGSNQPQH	11	0.4	"healthy"
HE5	TRBV29-1	SVVLQDGNQPQH	12	0.4	"healthy"
HE6	TRBV29-1	SVVLQDGNQPQH	12	2.0	"healthy"
HE6	TRBV20-1	SAREQLGNQPQH	12	0.8	"healthy"
HE6	TRBV29-1	SVEGDGYT	8	0.6	"healthy"
HE6	TRBV12-3	ASSLGGTGANVLT	13	0.6	"healthy"
HE6	TRBV10-3	AISQGPGQPQH	11	0.3	"healthy"
HE6	TRBV29-1	SVERVSTGELF	11	0.3	"healthy"
HE6	TRBV14	ASSQTLRGTKLF	12	0.3	"healthy"
HE6	TRBV14	ASSRPGLPAELF	12	0.3	"healthy"
HE6	TRBV30	AWTSDPSGANVLT	13	0.3	"healthy"
HE6	TRBV15	ATSGDSPLH	9	0.2	"healthy"

Supplemental Table 3. List of all expanded clonotypes with an individual frequency of >1% from each sample of the study cohort.

Sample ID	TRBV gene	CDR3 sequence	CDR3 length	Frequency %	Category
TR01	TRBV7-8	ASSLARGYTQPQH	13	2.2	"CLL-like" LC-MBL
TR01	TRBV6-2/6-3	ASKTVSTGELF	11	1.8	"CLL-like" LC-MBL
TR01	TRBV19	ASSTSLGSYEQY	12	1.8	"CLL-like" LC-MBL
TR01	TRBV7-9	ASSLGSQPQH	10	1.6	"CLL-like" LC-MBL
TR01	TRBV6-1	ASRAGQGGEQY	11	1.6	"CLL-like" LC-MBL
TR01	TRBV28	ASSPHTGEAYGYT	13	1.5	"CLL-like" LC-MBL
TR01	TRBV7-2	ASSDRWSGPQH	11	1.4	"CLL-like" LC-MBL
TR01	TRBV6-5	ASKNVRVPTGELF	13	1.4	"CLL-like" LC-MBL
TR01	TRBV7-9	ASRLTGDSGNTIY	13	1.4	"CLL-like" LC-MBL
TR01	TRBV6-2/6-3	ASVGSSYNSPLH	12	1.3	"CLL-like" LC-MBL
TR01	TRBV6-5	ASSFEGQDTGELF	13	1.3	"CLL-like" LC-MBL
TR01	TRBV6-5	ASSYLRTSGYEQY	13	1.3	"CLL-like" LC-MBL
TR01	TRBV7-2	ASSLERVSEKLF	12	1.2	"CLL-like" LC-MBL
TR01	TRBV6-2/6-3	ASSYRGGNQPQH	12	1.2	"CLL-like" LC-MBL
TR01	TRBV7-2	ASIGGDRGHSPLH	13	1.2	"CLL-like" LC-MBL
TR01	TRBV29-1	SARELNGYT	9	1.1	"CLL-like" LC-MBL
TR01	TRBV6-5	ASSPGTLEQY	10	1.1	"CLL-like" LC-MBL
TR01	TRBV29-1	SSGFNTGELF	10	1.1	"CLL-like" LC-MBL
TR01	TRBV10-3	AITEGGHTGELF	12	1.1	"CLL-like" LC-MBL
TR01	TRBV6-2/6-3	ASSLRHVNSPLH	12	1.1	"CLL-like" LC-MBL
TR01	TRBV6-5	ASSAGGTYNSPLH	13	1.1	"CLL-like" LC-MBL
TR01	TRBV5-6	ASSLVQGDTGELF	13	1.1	"CLL-like" LC-MBL
TR01	TRBV6-2/6-3	ASSSGGSGTGELF	13	1.1	"CLL-like" LC-MBL
TR01	TRBV4-3	ASSQDRSGFLYGYT	14	1.1	"CLL-like" LC-MBL
TR01	TRBV6-2/6-3	ASSYWGETGELF	12	1.0	"CLL-like" LC-MBL
TR01	TRBV30	AWSDLGRDTGELF	13	1.0	"CLL-like" LC-MBL
TR01	TRBV27	ASSATGLSGANVLT	14	1.0	"CLL-like" LC-MBL
TR02	TRBV24-1	ATSDFVSGYTGELF	14	20.1	"CLL-like" LC-MBL
TR02	TRBV4-2	ASSQDRGLIVEGYT	14	15.1	"CLL-like" LC-MBL
TR02	TRBV13	ASSRGLGALNTEAF	14	1.2	"CLL-like" LC-MBL
TR03	TRBV12-3	ASTNNYSNQPQH	12	3.9	"CLL-like" LC-MBL
TR03	TRBV5-4	ASSLAAVVSGELF	13	3.7	"CLL-like" LC-MBL
TR03	TRBV29-1	SVEEDGTSGANVLT	14	3.3	"CLL-like" LC-MBL
TR03	TRBV11-2	ASSWGSGSNYGYT	13	2.7	"CLL-like" LC-MBL
TR03	TRBV7-2	ASSPWGTANYGYT	13	1.7	"CLL-like" LC-MBL
TR03	TRBV29-1	SVGHLNQPQH	10	1.6	"CLL-like" LC-MBL
TR03	TRBV5-6	ASSLGSYGGNGYT	13	1.6	"CLL-like" LC-MBL
TR03	TRBV6-2/6-3	ATRTVNYGYT	10	1.5	"CLL-like" LC-MBL
TR03	TRBV29-1	SGGSSLYGYT	10	1.5	"CLL-like" LC-MBL

TR03	TRBV29-1	SVRGLGYGYT	10	1.4	"CLL-like" LC-MBL
TR03	TRBV28	ASSRHPPGGGPQH	13	1.4	"CLL-like" LC-MBL
TR03	TRBV29-1	SARGDYGYT	9	1.3	"CLL-like" LC-MBL
TR03	TRBV12-3	ASSFGRGQNYEQY	13	1.3	"CLL-like" LC-MBL
TR03	TRBV4-2	ASSRGDRGPYGYT	13	1.3	"CLL-like" LC-MBL
TR03	TRBV7-9	ASSPHAATGELF	12	1.2	"CLL-like" LC-MBL
TR03	TRBV6-5	ASRTSGRLTGELF	13	1.2	"CLL-like" LC-MBL
TR03	TRBV4-1	ASSPGAGVDYGYT	13	1.2	"CLL-like" LC-MBL
TR03	TRBV2	ASSVRPGLNQPQH	13	1.2	"CLL-like" LC-MBL
TR03	TRBV6-9	ASRTPGQRNNSPLH	14	1.2	"CLL-like" LC-MBL
TR03	TRBV29-1	SVDAGANVLT	10	1.1	"CLL-like" LC-MBL
TR03	TRBV29-1	SVRGRGTGELF	11	1.1	"CLL-like" LC-MBL
TR03	TRBV29-1	SVVPGGNQPQH	11	1.1	"CLL-like" LC-MBL
TR03	TRBV12-3	ATRWSAGANVLT	12	1.1	"CLL-like" LC-MBL
TR03	TRBV29-1	SVDSPWANYGYT	12	1.1	"CLL-like" LC-MBL
TR03	TRBV29-1	SARTARNQPQH	11	1.0	"CLL-like" LC-MBL
TR03	TRBV29-1	SVEARENYGYT	11	1.0	"CLL-like" LC-MBL
TR06	TRBV24-1	ATSDWAGQGYT	11	10.3	"CLL-like" LC-MBL
TR06	TRBV6-1	ASSESAGRSPYEQY	14	5.0	"CLL-like" LC-MBL
TR06	TRBV20-1	SARPKLGQPYEQY	13	3.8	"CLL-like" LC-MBL
TR06	TRBV27	ASSRFGGTGELF	12	3.5	"CLL-like" LC-MBL
TR06	TRBV5-6	ASSLTGTGNLPQH	13	1.1	"CLL-like" LC-MBL
TR10	TRBV6-5	ASSLWETGELF	11	7.5	"CLL-like" LC-MBL
TR10	TRBV19	ASSIDWPGVVYGYT	14	4.3	"CLL-like" LC-MBL
TR10	TRBV5-1	ASGVDYGYT	9	2.8	"CLL-like" LC-MBL
TR10	TRBV28	ASSYPGELF	9	2.4	"CLL-like" LC-MBL
TR10	TRBV18	ASSPLPVDSGNTIY	14	2.1	"CLL-like" LC-MBL
TR10	TRBV7-2	ASSLGSSLGELF	12	2.0	"CLL-like" LC-MBL
TR10	TRBV2	ASSPGTEQY	9	1.8	"CLL-like" LC-MBL
TR10	TRBV4-3	ASSQDHSTNEKLF	13	1.3	"CLL-like" LC-MBL
TR10	TRBV29-1	SVEEADRGDTGELF	14	1.1	"CLL-like" LC-MBL
TR10	TRBV18	ASSPGIGLYGYT	12	1.0	"CLL-like" LC-MBL
TR11	TRBV15	ATSLQGAPDEKLF	13	19.0	"CLL-like" LC-MBL
TR11	TRBV28	ASSPEQGSNEKLF	13	16.6	"CLL-like" LC-MBL
TR11	TRBV20-1	SARDLREVDGYT	12	2.4	"CLL-like" LC-MBL
TR11	TRBV28	ASTTGGSVSGNTIY	14	1.7	"CLL-like" LC-MBL
TR11	TRBV19	ASSQQGDGELF	11	1.5	"CLL-like" LC-MBL
TR12	TRBV19	ASSMPGTNTVELF	13	44.5	"CLL-like" LC-MBL
TR12	TRBV7-9	ASSLAGGYPYGYT	13	1.4	"CLL-like" LC-MBL
TR12	TRBV27	ASRPPMTGFYGANVLT	16	1.4	"CLL-like" LC-MBL
TR12	TRBV6-1	ASSGYPLREPQH	12	1.3	"CLL-like" LC-MBL
TR14	TRBV27	ASSSTGSYSGANVLT	15	9.8	"CLL-like" LC-MBL
TR14	TRBV27	ASSSWVRAF	9	2.6	"CLL-like" LC-MBL
TR14	TRBV25-1	ASSTWGDVGSPLH	13	1.4	"CLL-like" LC-MBL

TR14	TRBV28	ASSLEQGAGPAEAF	14	1.2	"CLL-like" LC-MBL
TR15	TRBV6-2/6-3	ASSYSAFSGELF	12	6.7	"CLL-like" LC-MBL
TR15	TRBV28	ASSQDRGLGGYT	12	2.0	"CLL-like" LC-MBL
TR16	TRBV28	ASSFHDTGELF	11	24.9	"CLL-like" LC-MBL
TR16	TRBV12-3	ASSLSGGAGELF	12	16.2	"CLL-like" LC-MBL
TR16	TRBV19	ASSMDAYGNQPQH	13	5.7	"CLL-like" LC-MBL
TR16	TRBV6-2/6-3	ASSYQGATEAF	11	3.4	"CLL-like" LC-MBL
TR16	TRBV19	ASSPTGTDQPQH	12	2.1	"CLL-like" LC-MBL
TR16	TRBV5-4	ASSPGEGGDEKLF	13	1.8	"CLL-like" LC-MBL
TR16	TRBV29-1	SVDTAAYGYT	10	1.1	"CLL-like" LC-MBL
TR16	TRBV24-1	ATKPTGYYGYT	11	1.1	"CLL-like" LC-MBL
TR17	TRBV29-1	SVEGGPFYEQY	11	3.0	"CLL-like" LC-MBL
TR17	TRBV29-1	SVSQLGYT	8	2.3	"CLL-like" LC-MBL
TR17	TRBV7-9	ASSLLPGREAF	11	1.3	"CLL-like" LC-MBL
TR19	TRBV27	ASSPWVNSPLH	11	10.8	"CLL-like" LC-MBL
TR19	TRBV29-1	SASGQIGYT	9	10.0	"CLL-like" LC-MBL
TR19	TRBV6-5	ASSYGAPGTANYGYT	15	8.7	"CLL-like" LC-MBL
TR19	TRBV12-5	ASGRDGFDGYT	11	3.9	"CLL-like" LC-MBL
TR19	TRBV29-1	SVAGTWSRYGYT	12	1.2	"CLL-like" LC-MBL
TR19	TRBV5-4	ASSLEKALNEKLF	13	1.1	"CLL-like" LC-MBL
TR20	TRBV14	ASSQDARVYSYNSPLH	16	7.9	"CLL-like" LC-MBL
TR20	TRBV18	ASSPGLAPTYEQY	13	2.7	"CLL-like" LC-MBL
TR20	TRBV6-2/6-3	ASSYTGYGTGELF	13	2.4	"CLL-like" LC-MBL
TR20	TRBV20-1	SANLPGETMRKT	12	1.2	"CLL-like" LC-MBL
TR22	TRBV7-8	ASSLNSGTDDTGELF	15	13.2	"CLL-like" LC-MBL
TR22	TRBV6-5	ASSATNTGELF	11	2.5	"CLL-like" LC-MBL
TR22	TRBV24-1	ATSAPGQDTGELF	13	2.0	"CLL-like" LC-MBL
TR22	TRBV29-1	SVVLAESNTGELF	13	1.2	"CLL-like" LC-MBL
TR22	TRBV10-2	ASSEPGTAGQPQH	13	1.1	"CLL-like" LC-MBL
TR23	TRBV5-4	ASSLDRGTGERYGYT	15	1.3	"CLL-like" LC-MBL
TR23	TRBV10-3	ATRDRASNQPQH	12	1.2	"CLL-like" LC-MBL
TR24	TRBV10-2	ASSPGTGTYGYT	12	12.9	"CLL-like" LC-MBL
TR24	TRBV28	ASSLGIHYEQY	11	3.5	"CLL-like" LC-MBL
TR25	TRBV2	ASGGDRNPPKDEKLF	15	11.3	"CLL-like" LC-MBL
TR25	TRBV28	ASSFSHYSNQPQH	13	7.0	"CLL-like" LC-MBL
TR25	TRBV2	ATGGGFDQPQH	11	2.3	"CLL-like" LC-MBL
TR25	TRBV30	AWNPPIIGNYGYT	13	1.6	"CLL-like" LC-MBL
TR25	TRBV4-3	ASSQGGRSSGANVLT	15	1.1	"CLL-like" LC-MBL
TR26	TRBV20-1	SARGRLNSLSGNTIY	15	2.2	"CLL-like" LC-MBL
TR26	TRBV28	ASSLGVHYEQY	11	1.8	"CLL-like" LC-MBL
TR26	TRBV6-2/6-3	ASSYQGHQPQH	11	1.7	"CLL-like" LC-MBL
TR29	TRBV10-3	AAKGTGGNQPQH	12	8.5	"CLL-like" LC-MBL
TR29	TRBV28	ASNMGSDQPQH	11	3.7	"CLL-like" LC-MBL
TR31	TRBV2	ASGGDRNPPKDEKLF	15	2.7	"CLL-like" LC-MBL

TR31	TRBV12-3	ASSLGVSGANVLT	13	2.2	"CLL-like" LC-MBL
TR31	TRBV28	ASSFSHYSNQPQH	13	1.8	"CLL-like" LC-MBL
TR33	TRBV6-5	ASSYRGDRGYT	11	4.2	"CLL-like" LC-MBL
TR33	TRBV12-3	ASSLLFFRRP	10	2.0	"CLL-like" LC-MBL
TR33	TRBV7-8	ASSLGNNQPQH	11	1.5	"CLL-like" LC-MBL
TR33	TRBV6-5	ASSYRWDRGYT	11	1.4	"CLL-like" LC-MBL
TR33	TRBV29-1	SVARGLNYGYT	11	1.1	"CLL-like" LC-MBL
TR34	TRBV2	ASSGSGLQPQH	11	2.6	"CLL-like" LC-MBL
TR34	TRBV12-3	ASSFANLNEVELF	13	2.6	"CLL-like" LC-MBL
TR34	TRBV12-3	ASSFSGKNQPQH	12	1.6	"CLL-like" LC-MBL
TR34	TRBV12-3	ASSLGQGNSGELF	13	1.2	"CLL-like" LC-MBL
TR35	TRBV13	ASSFLGSYTGELF	13	12.9	"CLL-like" LC-MBL
TR35	TRBV6-2/6-3	ASLFRMGELF	10	3.2	"CLL-like" LC-MBL
TR35	TRBV6-5	ASSYSGNDEQY	11	2.1	"CLL-like" LC-MBL
TR35	TRBV28	ASSLTGGNSPLH	12	1.3	"CLL-like" LC-MBL
TR35	TRBV2	ASSGDSYGYT	10	1.0	"CLL-like" LC-MBL
TR36	TRBV6-2/6-3	ASSYSSFSGELF	12	52.6	"CLL-like" LC-MBL
TR36	TRBV7-8	ASSSSGQGDYGYT	13	2.3	"CLL-like" LC-MBL
TR36	TRBV5-1	ASSLESRDQPQH	12	1.2	"CLL-like" LC-MBL
TR37	TRBV12-3	ASSPNYSNQPQH	12	9.4	"CLL-like" LC-MBL
TR38	TRBV6-4	ASSDEAASPLH	11	1.4	"CLL-like" LC-MBL
TR39	TRBV11-3	ASSLAGTAWLGYT	13	1.1	"CLL-like" LC-MBL
TR41	TRBV29-1	SVTGGVGYT	9	19.6	"CLL-like" LC-MBL
TR41	TRBV28	ASRPDRGSSPLH	12	2.9	"CLL-like" LC-MBL
TR49	TRBV28	ASSWANTGELF	11	3.7	"CLL-like" LC-MBL
TR49	TRBV6-5	ASSLQTGAIYGYT	13	1.7	"CLL-like" LC-MBL
TR50	TRBV28	ASSERGTGELF	11	1.8	"CLL-like" LC-MBL
TR50	TRBV27	ASSHTQGGSNQPQH	14	1.7	"CLL-like" LC-MBL
TR54	TRBV2	ASSERGNGYT	10	6.3	"CLL-like" LC-MBL
TR54	TRBV7-2	ASSARAYSGNTIY	13	4.8	"CLL-like" LC-MBL
TR54	TRBV29-1	SVVPADSFTYEQY	13	1.9	"CLL-like" LC-MBL
TR54	TRBV18	ASSPGQGSYGYT	12	1.3	"CLL-like" LC-MBL
TR54	TRBV27	ASSPNRGANEKLF	13	1.2	"CLL-like" LC-MBL
TR55	TRBV12-3	ASNGLGPNQPQH	12	3.9	"CLL-like" LC-MBL
TR56	TRBV29-1	SVHTTSYGYT	10	1.2	"CLL-like" LC-MBL
TR58	TRBV27	ASSLSVSSSVYGYT	14	41.3	"CLL-like" LC-MBL
TR58	TRBV18	ASSPLSGDVLT	11	3.6	"CLL-like" LC-MBL
TR58	TRBV12-3	ASSPNYSNQPQH	12	2.4	"CLL-like" LC-MBL
TR60	TRBV5-6	ASSLLTRANTGELF	14	14.2	"CLL-like" LC-MBL
TR60	TRBV13	ASRIQGAGELF	11	13.1	"CLL-like" LC-MBL
TR60	TRBV6-1	ASSERSANTGELF	13	11.6	"CLL-like" LC-MBL
TR60	TRBV29-1	SVATGGQFNEKLF	13	6.0	"CLL-like" LC-MBL
TR60	TRBV12-3	ASSKGQGGVSNTGELF	16	3.3	"CLL-like" LC-MBL
TR60	TRBV10-3	AISESASGTEKGYT	14	1.4	"CLL-like" LC-MBL

TR60	TRBV7-8	ASSSPQWHTGELF	13	1.2	"CLL-like" LC-MBL
TR63	TRBV28	ASIQAPGSGIWYYEQY	16	1.2	"CLL-like" LC-MBL
TR64	TRBV6-1	ASSDQTGHGGELF	13	3.0	"CLL-like" LC-MBL
TR64	TRBV20-1	SARALEGPGELF	12	1.1	"CLL-like" LC-MBL
TR66	TRBV28	ASSYAPYEQY	10	2.7	"CLL-like" LC-MBL
TR66	TRBV15	ATSRGQGANYGYT	13	2.4	"CLL-like" LC-MBL
TR66	TRBV29-1	SVEASTGGNGYT	12	2.1	"CLL-like" LC-MBL
TR68	TRBV15	ATSSSTGGRNSPLH	14	6.2	"CLL-like" LC-MBL
TR68	TRBV12-3	ASSSSVYGYT	10	3.5	"CLL-like" LC-MBL
TR68	TRBV10-2	ASSEGLGSYEQY	12	2.7	"CLL-like" LC-MBL
TR68	TRBV29-1	SVEGWGYGYT	10	2.1	"CLL-like" LC-MBL
TR68	TRBV12-5	ASAGTGGTHYYGYT	14	2.1	"CLL-like" LC-MBL
TR68	TRBV12-3	ASSTRSGDGYT	11	1.9	"CLL-like" LC-MBL
TR68	TRBV12-3	ASSLSGTSYEQY	12	1.9	"CLL-like" LC-MBL
TR68	TRBV29-1	SVTLGSNYGYT	11	1.7	"CLL-like" LC-MBL
TR68	TRBV29-1	SVDREAGYT	9	1.5	"CLL-like" LC-MBL
TR68	TRBV6-5	ASSYHGQPQH	10	1.4	"CLL-like" LC-MBL
TR68	TRBV6-5	ASSRDRANYGYT	12	1.4	"CLL-like" LC-MBL
TR68	TRBV29-1	SVEGQGAFYGYT	12	1.4	"CLL-like" LC-MBL
TR68	TRBV29-1	SVIRDGGYGYT	11	1.1	"CLL-like" LC-MBL
TR68	TRBV12-3	ASRRTGPLLRGGYGYT	16	1.1	"CLL-like" LC-MBL
TR68	TRBV12-3	ASRTGTGAAYEPQH	14	1.0	"CLL-like" LC-MBL
TR69	TRBV6-5	ASSPGLAGELF	11	18.7	"CLL-like" LC-MBL
TR69	TRBV12-3	ASGSLQPQH	9	3.2	"CLL-like" LC-MBL
TR69	TRBV12-3	ASSFRNYYGYT	11	3.0	"CLL-like" LC-MBL
TR69	TRBV29-1	SVAWGQGSST	10	1.5	"CLL-like" LC-MBL
TR69	TRBV29-1	SVRGQNYGYT	10	1.3	"CLL-like" LC-MBL
TR69	TRBV6-2/6-3	ASSFGGGYGYT	11	1.2	"CLL-like" LC-MBL
TR69	TRBV12-3	ASSLARAVYEQY	12	1.1	"CLL-like" LC-MBL
TR08	TRBV12-3	ASSPNYSNQPQH	12	15.2	"other" LC-MBL
TR08	TRBV15	ATSRENIEGTTLH	13	4.2	"other" LC-MBL
TR08	TRBV28	ASSFHDTGELF	11	3.3	"other" LC-MBL
TR09	TRBV28	ASSLGLPNNQPQH	13	1.6	"other" LC-MBL
TR09	TRBV20-1	SARALRPGADGYT	13	1.6	"other" LC-MBL
TR09	TRBV7-8	ASTLNSADYGYT	12	1.0	"other" LC-MBL
TR40	TRBV29-1	SVGDSVNYGYT	11	7.3	"other" LC-MBL
TR40	TRBV19	ASSIGFIHQAGELF	14	5.5	"other" LC-MBL
TR40	TRBV12-3	ASSSANYGYT	10	3.9	"other" LC-MBL
TR40	TRBV12-5	ASGTTDSGNTIY	12	1.7	"other" LC-MBL
TR42	TRBV11-2	ASSEVQGWTRVTEAF	15	3.3	"other" LC-MBL
TR42	TRBV12-3	ASSTGVASNQPQH	13	1.3	"other" LC-MBL
TR43	TRBV13	ASSLMGAPYGYT	12	28.1	"other" LC-MBL
TR43	TRBV10-3	AISGQGDQPQH	11	2.7	"other" LC-MBL
TR43	TRBV7-6	ASSLTPLGGDTGELF	15	2.1	"other" LC-MBL

TR43	TRBV28	ASSLMEWNQPQH	12	1.6	"other" LC-MBL
TR43	TRBV28	ASSLISLTLGEKLF	14	1.4	"other" LC-MBL
TR44	TRBV2	ASSESVGPQH	10	8.9	"other" LC-MBL
TR44	TRBV12-3	ASSQQNDVGYT	11	8.0	"other" LC-MBL
TR44	TRBV6-2/6-3	ASLGTDYGYT	10	4.5	"other" LC-MBL
TR44	TRBV6-2/6-3	ASTPILGTGSPLH	13	3.0	"other" LC-MBL
TR44	TRBV29-1	SAREDSTNEKLF	12	1.9	"other" LC-MBL
TR44	TRBV15	ATSSEGLRGMNTEAF	15	1.0	"other" LC-MBL
TR45	TRBV10-3	AISEMGAEAF	10	2.6	"other" LC-MBL
TR45	TRBV10-3	AGSEGRAYEQY	11	2.2	"other" LC-MBL
TR45	TRBV19	ATEGQAPNYGYT	12	1.4	"other" LC-MBL
TR04	TRBV29-1	SVATGPYGYT	10	1.7	"healthy"
TR04	TRBV11-2	ASSLSGGSSYT	11	1.7	"healthy"
TR04	TRBV29-1	SVLRTDNYGYT	11	1.2	"healthy"
TR04	TRBV7-8	ASSLDRSHEQY	11	1.0	"healthy"
TR07	TRBV5-6	ASTVHSPYEQY	11	12.1	"healthy"
TR07	TRBV27	ASSHASGYYGYT	12	7.5	"healthy"
TR07	TRBV6-5	ASRRQGATEAF	11	2.2	"healthy"
TR07	TRBV6-5	ASSPGQNTEAF	11	1.8	"healthy"
TR07	TRBV29-1	SVANFGQLKSWST	13	1.7	"healthy"
TR07	TRBV13	ASSFRTGHWTGELF	14	1.2	"healthy"
TR21	TRBV27	ASSPGTVPGELF	12	4.1	"healthy"
TR21	TRBV27	ASSTDYGTVNTEAF	14	3.7	"healthy"
TR21	TRBV14	ASSQLSFNYGYT	12	2.6	"healthy"
TR21	TRBV10-3	AIADSLEGEAF	11	2.2	"healthy"
TR27	TRBV20-1	SARPRRTTNTGELF	14	6.9	"healthy"
TR27	TRBV29-1	SVEDPERGDTGELF	14	2.8	"healthy"
TR27	TRBV6-6	ASSYGGDYGAEAF	13	1.1	"healthy"
TR28	TRBV12-3	ASSLGVSGANVLT	13	21.3	"healthy"
TR28	TRBV12-3	ASSFRGLLNTGELF	14	2.1	"healthy"
TR28	TRBV19	ASRPSHRDSNQPQH	14	1.4	"healthy"
TR32	TRBV10-3	AISTAGTGYGYT	12	4.7	"healthy"
TR32	TRBV10-3	AISDVFAWNYGYT	13	3.4	"healthy"
TR32	TRBV7-9	ASSLASGTGDEKLF	14	2.2	"healthy"
TR32	TRBV20-1	SALDPRGLYYGYT	13	1.9	"healthy"
TR32	TRBV5-6	ASSWDRDLNSPLH	13	1.5	"healthy"
TR32	TRBV19	ASSITGHHQPQH	12	1.3	"healthy"
TR32	TRBV27	ASSLYGGEGQPQH	13	1.1	"healthy"
TR46	TRBV19	ASSGGTGDQPQH	12	4.3	"healthy"
TR46	TRBV19	ASRSGGDSMKTQH	13	2.3	"healthy"
TR47	TRBV28	ASSSGQKNEKLF	12	11.2	"healthy"
TR47	TRBV10-2	ASSELQGGNQPQH	13	10.5	"healthy"
TR47	TRBV7-8	ASLRTSAPTGELF	13	2.1	"healthy"
TR47	TRBV27	ASSFGSLSTEAF	12	1.8	"healthy"

TR47	TRBV5-6	ASSLATGGDGYT	12	1.2	"healthy"
TR47	TRBV6-5	ASSYQGTQPQH	11	1.1	"healthy"
TR47	TRBV30	AWSPPGLESGELF	13	1.1	"healthy"
TR48	TRBV7-2	ASSFRDNYGYT	11	14.9	"healthy"
TR57	TRBV27	ASSFSTGELF	10	14.5	"healthy"
TR57	TRBV2	ASSVKGGSGELF	12	5.4	"healthy"
TR57	TRBV19	ASMGTGGNTIY	11	2.2	"healthy"
TR57	TRBV18	ASSPGGLADLTGELF	15	1.9	"healthy"
TR57	TRBV29-1	SVFSDRADYGYT	12	1.6	"healthy"
TR57	TRBV27	ASSSEYGELF	10	1.0	"healthy"
TR67	TRBV6-5	ASSYPRGAGTGELF	14	5.5	"healthy"
TR67	TRBV29-1	SADRWTGGAEADGYT	15	3.4	"healthy"
TR67	TRBV29-1	SVGGAASNYGYT	12	2.6	"healthy"
TR67	TRBV12-3	ASNLRGGQPQH	11	2.3	"healthy"
TR67	TRBV12-3	ASSPPTGANYGYT	13	2.3	"healthy"
TR67	TRBV12-3	ASSFLFNYGYT	11	1.6	"healthy"
TR67	TRBV29-1	SVEGGQGVYGYT	12	1.6	"healthy"
TR67	TRBV12-3	ASSTGYNQPQH	11	1.4	"healthy"
TR67	TRBV29-1	SVEQAETNEQY	11	1.4	"healthy"
TR67	TRBV12-3	ASSLQGASQPQH	12	1.3	"healthy"
TR67	TRBV6-5	ASSSSPGGNNQPQH	14	1.3	"healthy"
HE1	TRBV6-2/6-3	ASTRQGSHSPLH	12	5.7	"healthy"
HE2	TRBV12-3	ASSARQGGGNEKLF	14	1.3	"healthy"
HE3	TRBV28	ASSPRGGGELF	11	10.9	"healthy"
HE3	TRBV15	ATSRDYSPLH	10	7.9	"healthy"
HE3	TRBV7-6	ASSGPGLKNTGELF	14	1.9	"healthy"
HE3	TRBV6-2/6-3	ASTGRGYEQY	10	1.8	"healthy"
HE3	TRBV5-4	ASSSGQGAGEKLF	13	1.8	"healthy"
HE3	TRBV30	AWSGETGELF	10	1.6	"healthy"
HE3	TRBV4-1	ASRSSDGLYNSPLH	14	1.6	"healthy"
HE3	TRBV28	ASSFRGPTEAF	11	1.4	"healthy"
HE4	TRBV7-8	ASSLFGQGPHGANVLT	16	3.1	"healthy"
HE4	TRBV5-6	ASSLDQTGGRGYT	13	2.9	"healthy"
HE4	TRBV10-2	ASSESGSNQPQH	12	1.5	"healthy"
HE5	TRBV7-9	ASSSHEGQGYRSPLH	15	5.2	"healthy"
HE5	TRBV10-3	AISQGPGQPQH	11	3.2	"healthy"
HE5	TRBV20-1	SLGTDYGYT	9	2.1	"healthy"
HE5	TRBV14	ASSYGTGGTGELF	13	1.4	"healthy"
HE5	TRBV11-2	ASSLPGQSPQH	11	1.3	"healthy"
HE6	TRBV29-1	SVVLQDGNQPQH	12	2.0	"healthy"

Supplemental Table 4. Distribution of individuals in the present cohort into 3 age groups representing middle-aged, aged, and long-lived donors.

Sample ID	Age	Age group	Total frequency of clonos >1%	Category
TR55	40	middle-aged	3,9	"CLL-like" LC-MBL
TR15	48	middle-aged	8,7	"CLL-like" LC-MBL
TR31	48	middle-aged	6,8	"CLL-like" LC-MBL
TR66	49	middle-aged	7,2	"CLL-like" LC-MBL
TR19	53	middle-aged	35,6	"CLL-like" LC-MBL
TR38	55	aged	1,4	"CLL-like" LC-MBL
TR37	56	aged	9,4	"CLL-like" LC-MBL
TR10	59	aged	26,3	"CLL-like" LC-MBL
TR12	60	aged	48,6	"CLL-like" LC-MBL
TR06	61	aged	23,8	"CLL-like" LC-MBL
TR29	61	aged	12,2	"CLL-like" LC-MBL
TR03	62	aged	41,5	"CLL-like" LC-MBL
TR24	62	aged	16,5	"CLL-like" LC-MBL
TR49	64	aged	5,4	"CLL-like" LC-MBL
TR50	64	aged	3,5	"CLL-like" LC-MBL
TR34	65	aged	8	"CLL-like" LC-MBL
TR20	66	aged	14,3	"CLL-like" LC-MBL
TR17	66	aged	6,5	"CLL-like" LC-MBL
TR02	67	aged	36,4	"CLL-like" LC-MBL
TR68	67	aged	31,1	"CLL-like" LC-MBL
TR69	69	long-lived	30	"CLL-like" LC-MBL
TR22	69	long-lived	19,9	"CLL-like" LC-MBL
TR36	70	long-lived	56	"CLL-like" LC-MBL
TR14	70	long-lived	15,1	"CLL-like" LC-MBL
TR25	71	long-lived	23,3	"CLL-like" LC-MBL
TR30	72	long-lived	9,4	"CLL-like" LC-MBL
TR54	72	long-lived	15,4	"CLL-like" LC-MBL
TR01	74	long-lived	35,1	"CLL-like" LC-MBL
TR56	74	long-lived	1,2	"CLL-like" LC-MBL
TR26	75	long-lived	5,6	"CLL-like" LC-MBL
TR23	75	long-lived	2,5	"CLL-like" LC-MBL
TR63	75	long-lived	1,2	"CLL-like" LC-MBL
TR51	77	long-lived	0	"CLL-like" LC-MBL
TR35	83	long-lived	20,5	"CLL-like" LC-MBL
TR64	83	long-lived	4,1	"CLL-like" LC-MBL
TR16	83	long-lived	56,4	"CLL-like" LC-MBL
TR60	83	long-lived	50,7	"CLL-like" LC-MBL
TR11	84	long-lived	41,3	"CLL-like" LC-MBL
TR33	85	long-lived	10,1	"CLL-like" LC-MBL
TR41	87	long-lived	22,5	"CLL-like" LC-MBL
TR39	92	long-lived	1,1	"CLL-like" LC-MBL

TR58	103	long-lived	47,4	"CLL-like" LC-MBL
TR45	56	aged	6,2	"other" LC-MBL
TR44	65	aged	27,3	"other" LC-MBL
TR08	67	aged	22,7	"other" LC-MBL
TR09	71	long-lived	4,2	"other" LC-MBL
TR43	76	long-lived	36	"other" LC-MBL
TR40	90	long-lived	18,4	"other" LC-MBL
TR42	93	long-lived	4,6	"other" LC-MBL
TR27	41	middle-aged	10,8	"healthy"
TR04	50	middle-aged	5,7	"healthy"
TR67	51	middle-aged	24,8	"healthy"
TR48	65	aged	14,9	"healthy"
HE5	66	aged	13,2	"healthy"
TR46	69	long-lived	6,6	"healthy"
TR07	70	long-lived	26,5	"healthy"
TR21	70	long-lived	12,6	"healthy"
HE2	70	long-lived	1,3	"healthy"
HE3	71	long-lived	29	"healthy"
TR47	73	long-lived	29	"healthy"
TR57	74	long-lived	26,6	"healthy"
TR32	75	long-lived	16	"healthy"
HE1	79	long-lived	5,7	"healthy"
TR28	80	long-lived	24,7	"healthy"
HE6	80	long-lived	2	"healthy"
HE4	81	long-lived	7,5	"healthy"
P4	43	middle-aged	16,8	CLL
P11	44	middle-aged	24,9	CLL
P9	45	middle-aged	9,4	CLL
P3	48	middle-aged	11,3	CLL
P2	50	middle-aged	19,3	CLL
P6	51	middle-aged	11,7	CLL
P12	52	middle-aged	10,8	CLL
P20	53	middle-aged	20,5	CLL
P15	53	middle-aged	23,1	CLL
P5	54	middle-aged	25,4	CLL
P13	54	middle-aged	5	CLL
P23	57	aged	39,6	CLL
P1	59	aged	32	CLL
P21	60	aged	41,5	CLL
P14	68	aged	11,6	CLL
P7	70	long-lived	85	CLL
P24	71	long-lived	13,2	CLL
P25	72	long-lived	29,3	CLL
P29	78	long-lived	4,3	CLL
P31	78	long-lived	22,1	CLL
P16	79	long-lived	27	CLL

P27	80	long-lived	34,5	CLL
P32	86	long-lived	41,2	CLL
P19	72	long-lived	51,1	CLL
P26	NA	-	36,1	CLL
P30	NA	-	14,4	CLL
P22	NA	-	11,3	CLL

Supplemental table 5. Post-hoc analysis based on Bonferroni correction revealed distinct TRBV gene expression biases. The Bonferroni corrected p-values of the pairwise comparisons between all sample groups are displayed for the 12 selected TRBV genes. These genes were selected after performing ANOVA, separately for all genes, to evaluate the gene expression overall differences among groups, and subsequently selecting those genes which maintained statistically significant results after Bonferroni correction.

Comparisons between sample groups		TRBV28	TRBV19	TRBV20-1	TRBV27	TRBV5-4	TRBV5-5	TRBV4-1	TRBV25-1	TRBV5-1	TRBV11-1	TRBV2	TRBV7-9
"CLL-like" LC-MBL	"other" LC-MBL	1	1	0,743	1	1	1	1	1	1	1	1	1
"CLL-like" LC-MBL	healthy	0,007	0,078	0,022	0,009	0,319	0,296	0,047	1	1	1	0,128	1
"CLL-like" LC-MBL	CLL	0	0	0	0	0	0	0	0	0	0	0,001	0,002
"other" LC-MBL	healthy	1	1	1	0,027	0,911	0,807	0,165	1	1	1	0,195	0
"other" LC-MBL	CLL	0,03	0,001	0,063	0	0,001	0	0	0,017	0,534	0,175	0,019	0,068
healthy	CLL	0,177	0,001	0,034	0,001	0,013	0,004	0	0	0,016	0,014	1	0,005

Supplemental Table 6. Shared clonotypes between different categories of the present cohort and available CLL data.

Sample ID	TRBV gene	CDR3 sequence	Frequency %	Category
"CLL-like" LC-MBL				
TR29	TRBV10-3	AAKGTGGNQPQH	8.5	"CLL-like" LC-MBL
TR31			0.9	
TR64	TRBV6-1	ASSDQTGHGGELF	3.0	"CLL-like" LC-MBL
TR66			0.5	
TR30	TRBV7-8	ASSLSGSYEQY	2.3	"CLL-like" LC-MBL
TR31			0.5	
TR17	TRBV29-1	SVEGGPFYEQY	3.0	"CLL-like" LC-MBL
TR63			0.7	
TR25	TRBV2	ASGGDRNPPKDEKLF	11.3	"CLL-like" LC-MBL
TR31			2.7	
TR25	TRBV28	ASSFSHYSNQPQH	7.0	"CLL-like" LC-MBL
TR31			1.8	
TR35	TRBV6-2/6-3	ASSYSSFSGELF	0.6	"CLL-like" LC-MBL
TR36			52.6	
TR25	TRBV2	ATGGGFDQPQH	2.3	"CLL-like" LC-MBL
TR31			0.6	
"healthy"				
HE5	TRBV10-3	AISQGPGQPQH	3.2	"healthy"
HE6			0.3	
HE2	TRBV7-6	ASSGPGLKNTGELF	0.4	"healthy"
HE3			1.9	
HE2	TRBV6-2/6-3	ASTGRGYEQY	0.3	"healthy"
HE3			1.8	
HE5	TRBV30	AWTSDPSGANVLT	0.5	"healthy"
HE6			0.3	
HE5	TRBV29-1	SVEGDGYT	0.4	"healthy"
HE6			0.6	
HE5	TRBV29-1	SVVLQDGNQPQH	0.4	"healthy"
HE6			2.0	
TR07	TRBV27	ASSFSTGELF	0.5	"healthy"
TR57			14.5	
"CLL-like" LC-MBL | "other" LC-MBL				
TR16	TRBV28	ASSFHDTGELF	24.9	"CLL-like" LC-MBL
TR08			3.3	"other" LC-MBL
TR16	TRBV19	ASSMDAYGNQPQH	5.8	"CLL-like" LC-MBL

TR08			0.5	"other" LC-MBL
TR11	TRBV12-3	ASSSANYGYT	0.7	"CLL-like" LC-MBL
TR40			3.9	"other" LC-MBL
TR16	TRBV12-3	ASSLSGGAGELF	16.2	"CLL-like" LC-MBL
TR08			1.0	"other" LC-MBL
"CLL-like" LC-MBL | "healthy"				
TR31	TRBV10-3	AISDVFAWNYGYT	0.6	"CLL-like" LC-MBL
TR32			3.4	"healthy"
TR31	TRBV10-3	AISTAGTGYGYT	0.8	"CLL-like" LC-MBL
TR32			4.7	"healthy"
TR58	TRBV6-6	ASRGTANTGELF	0.2	"CLL-like" LC-MBL
TR27			0.2	"healthy"
TR31	TRBV12-3	ASSLGVSGANVLT	2.2	"CLL-like" LC-MBL
TR28			21.3	healthy
TR23	TRBV5-1	ASSREGDQPQH	0.4	"CLL-like" LC-MBL
TR04			0.5	"healthy"
TR31	TRBV20-1	SALDPRGLYYGYT	0.4	"CLL-like" LC-MBL
TR32			1.9	"healthy"
TR31	TRBV20-1	SARPRRTTNTGELF	0.5	"CLL-like" LC-MBL
TR27			6.9	"healthy"
"CLL-like" LC-MBL | CLL				
TR60	TRBV29-1	SVGAGGTNEKLF	0.7	"CLL-like" LC-MBL
P9			1.2	CLL
"healthy" | CLL				
P23	TRBV10-2	ASSESGSNQPQH	2.6	CLL
HE4			1.5	"healthy"
"CLL-like" LC-MBL | "other" LC-MBL | CLL				
P5	TRBV12-3	ASSLSGGAGELF	8.0	CLL
TR16			16.2	"CLL-like"

				LC-MBL
TR08			1.0	"other" LC-MBL

Supplemental Table 7. HLA-typing results for 8 shared clonotypes from LC-MBL cases.

Sample ID	TRBV gene	CDR3 sequence	Category	HLA restrictions
TR29	TRBV10-3	AAKGTGGNQPQH	"CLL-like" LC-MBL	HLA-B*35, HLA-B*44, HLA-C*4, HLA-DR*7:01
TR31				
TR64	TRBV6-1	ASSDQTGHGGELF	"CLL-like" LC-MBL	HLA-DR*13:02
TR66				
TR30	TRBV7-8	ASSLSGSYEQY	"CLL-like" LC-MBL	HLA-DR*7:01
TR31				
TR17	TRBV29-1	SVEGGPFYEQY	"CLL-like" LC-MBL	HLA-A*2, HLA-C*7
TR63				
TR31	TRBV2	ASGGDRNPPKDEKLF	"CLL-like" LC-MBL	HLA-B*35
TR25				
TR31	TRBV28	ASSFSHYSNQPQH	"CLL-like" LC-MBL	HLA-B*35
TR25				
TR31	TRBV2	ATGGGFDQPQH	"CLL-like" LC-MBL	HLA-B*35
TR25				
TR16	TRBV28	ASSFHDTGELF	"CLL-like" LC-MBL	HLA-A*2
TR08			"other" LC-MBL	

Supplemental Table 8. Shared clonotypes between different categories of the present cohort, CLL and sequences deposited in IMGT/LIGM-DB.

Sample ID	Sample category	TRBV gene	CDR3 sequence	Frequency %	Entity description	Genbank accession number
TR10	"CLL-like" LC-MBL	TRBV19	CASSTGDSNQPQHF	0,012	EBV infection	AM041171
TR11	"CLL-like" LC-MBL			0,049		
TR33	"CLL-like" LC-MBL			0,003		
TR06	"CLL-like" LC-MBL	TRBV12-3 or TRBV12-4	CASSSANYGYTF	0,001	CMV infection	FJ795367
TR11	"CLL-like" LC-MBL			0,002		
TR40	"other" LC-MBL			0,008		
TR09	"other" LC-MBL	TRBV2	CASRAGTSNTGELFF	0,015	HCV infection	HM568279
HE4	"healthy"	TRBV5-1	CASSPRQGGTGELFF	0,002	HCV infection	HM568167
TR11	"CLL-like" LC-MBL	TRBV19	CASDTRDSNQPQHF	0,025	Rasmussen encephalitis	KU749226
TR32	"healthy"			0,019		
TR16	"CLL-like" LC-MBL	TRBV29-1	CSVGTGGTNEKLFF	0,274	Rasmussen encephalitis	KU749041
TR23	"CLL-like" LC-MBL			0,010		
TR25	"CLL-like" LC-MBL			0,004		
TR31	"CLL-like" LC-MBL			0,018		
TR37	"CLL-like" LC-MBL			0,079		
TR49	"CLL-like" LC-MBL			0,157		
TR54	"CLL-like" LC-MBL			0,003		
TR56	"CLL-like" LC-MBL			0,005		
TR66	"CLL-like" LC-MBL			0,013		
TR08	"other" LC-MBL			0,021		
TR09	"other" LC-MBL			0,012		
TR42	"other" LC-MBL			0,009		
TR43	"other" LC-MBL			0,071		
TR44	"other" LC-MBL			0,111		
TR32	"healthy"			0,038		
HE1	"healthy"			0,041		
TR39	"CLL-like" LC-MBL	TRBV20-1	CSARTGGYGYTF	0,010	Folliculotropic mycosis fungoides	KT878532
TR64	"CLL-like" LC-MBL			0,009		
HE2	"healthy"			0,001		
HE6	"healthy"			0,001		
P20	CLL			0,001		
P29	CLL			0,002		
TR48	"healthy"	TRBV25-1	CASSESGSGEKLFF	0,003	Multiple sclerosis	AJ405783
TR14	"CLL-like" LC-MBL	TRBV27	CASSFGGSGELFF	0,001	Pediatric human immunodeficiency virus infection	AF189589
TR42	"other" LC-MBL	TRBV27	CASSFTSAGELFF	0,007	Early Phase of Pediatric Human Immunodeficiency Virus Infection	AF189574
P24	CLL			0,003		
P26	CLL			0,001		
P31	CLL			0,003		
P32	CLL			0,729		
P27	CLL			0,001		

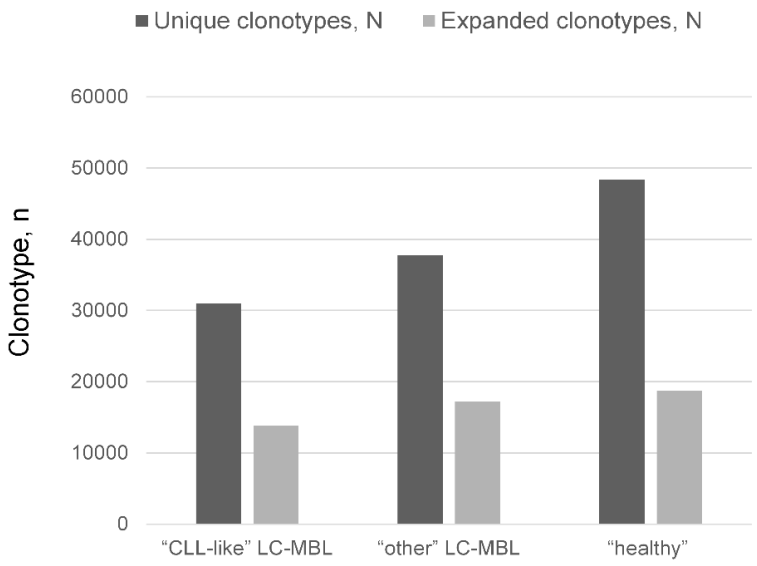
TR29	"CLL-like" LC-MBL	TRBV28	CASSLGDQPQHF	0,002	Beryllium-Induced Lung Disease	AF079054
TR34	"CLL-like" LC-MBL			0,007		
TR32	"healthy"			0,002		
HE1	"healthy"	TRBV5-6	CASSLGDEQYF	0,002	Psoriatic Arthritis	AY123161
TR02	"CLL-like" LC-MBL	TRBV5-8	CASSPWTGAEQYF	0,002	Calcific aortic stenosis	EF415472

Supplemental Figures

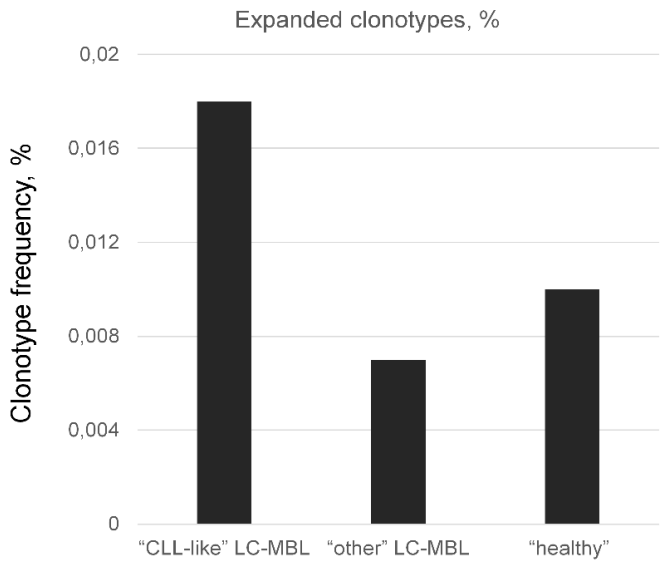
Supplemental Figure 1. (A) Average values of unique and expanded clonotypes and (B) mean relative frequencies of expanded clonotypes for each sample category of the present study.

Supplemental Figure 1

A.

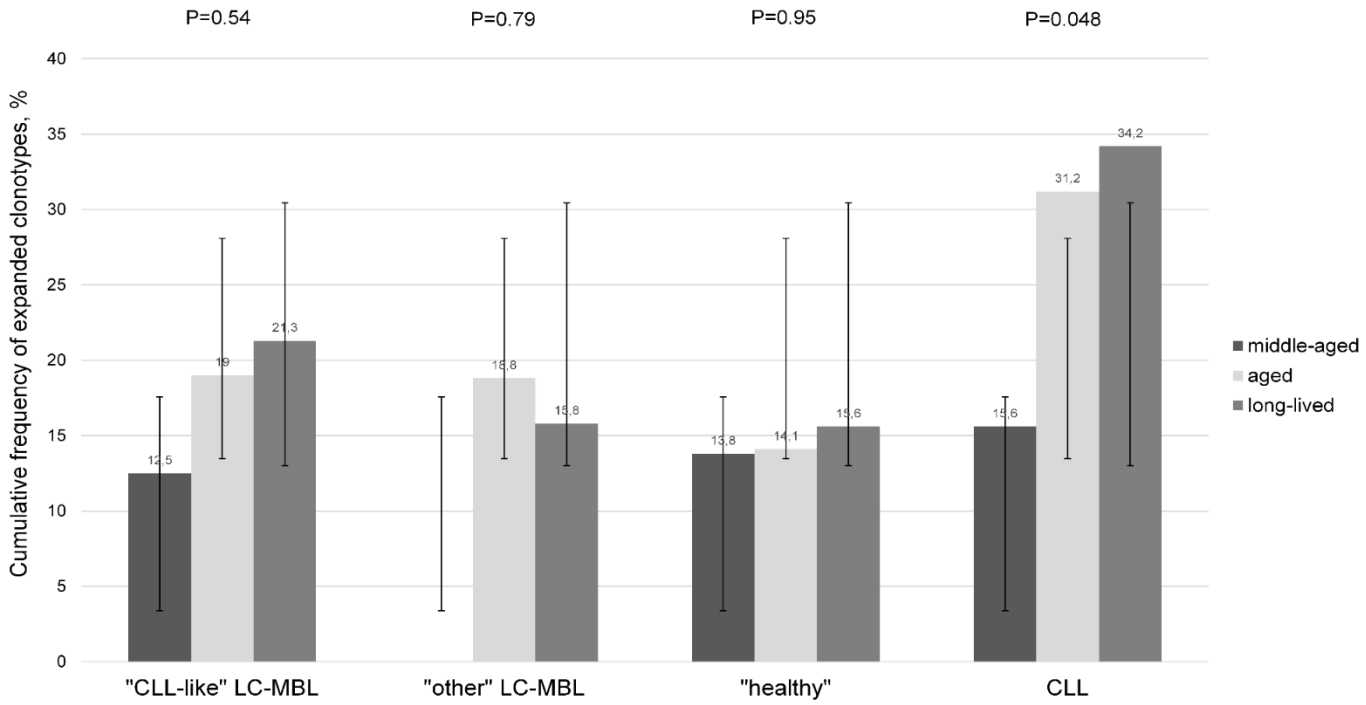


B.



Supplemental Figure 2. TRB diversity drops with age in all categories of the present study as well as CLL. Bars represent the distribution of all expanded clonotypes (individual frequency: >1%) from each entity among groups of different age. Bar values represent the average values of the cumulative frequencies of expanded clonotypes of samples in each age group. Standard deviation is shown for each age group of all sample categories. CLL data derived from our previous publication (*Vardi et al.* Leukemia 2017).

Supplemental Figure 2



Supplemental Figure 3. TRBV gene repertoire is characterized by biases in all different sample categories of the present study. Analysis revealed significant restrictions in the expression of TRBV genes with just a few individual genes accounting for a significant fraction of the total repertoire. (A) Five TRBV genes in “CLL-like” LC-MBL had an individual frequency of >5% and accounted for a total of 35% of the entire repertoire. (B) Similar findings were obtained in “other” LC-MBL where the 5 most frequent TRBV genes accounted for 34% of the entire repertoire. (C) The “healthy” category was characterized by a similar scenario: here frequent TRBV genes (>5%) were 4 and altogether accounted for 27% of the entire repertoire.

Supplemental Figure 3