Supplementary Material

Elevated detection of dual antibody B cells identifies lupus patients with B cell-reactive VH4-34 autoantibodies

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Content: Figures S1-S5, Tables S1-S4
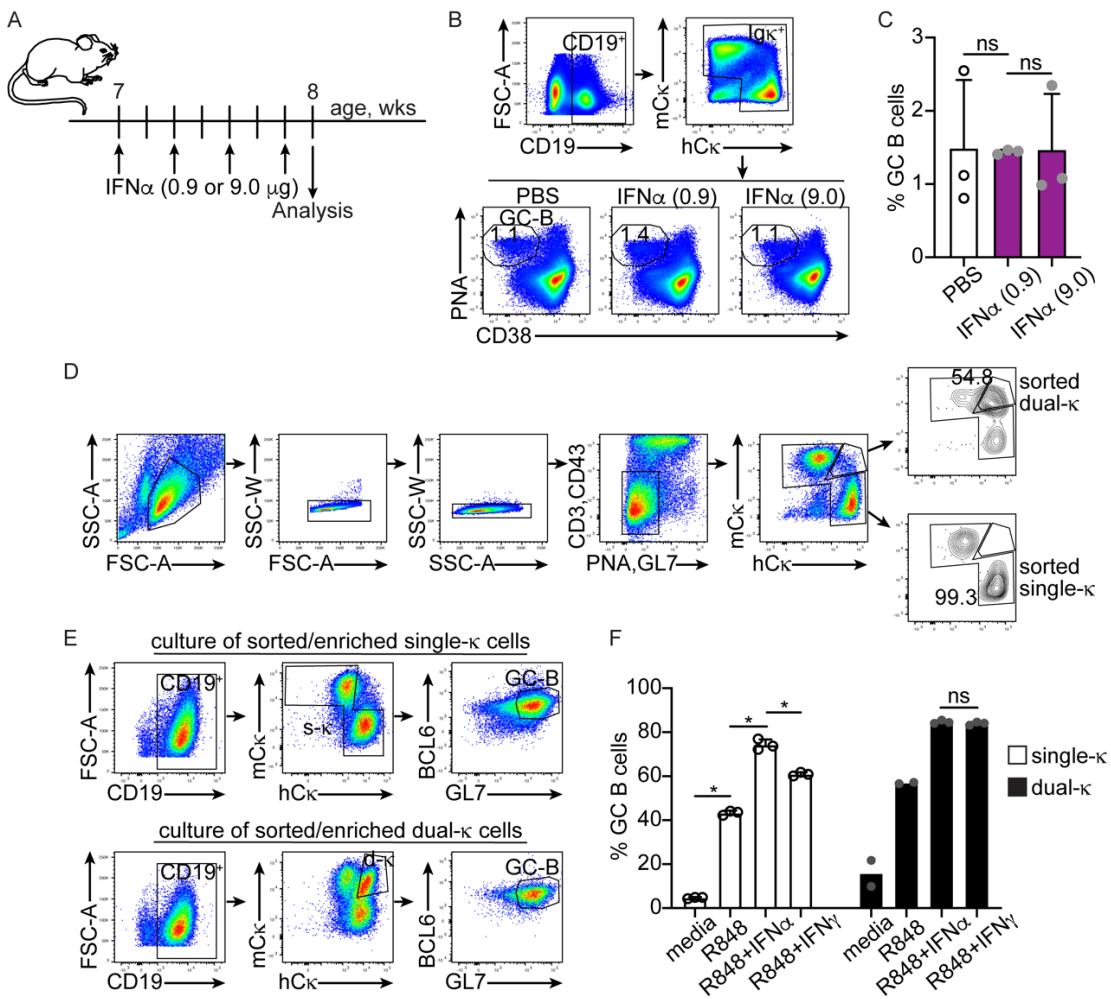
Figure S1: IFNα and IFNγ synergize with TLR7 to promote the differentiation of single-κ and dual-κ MRL/*lpr* B cells into GC B cells.

A) Schematics for the *in vivo* treatment of 7 weeks old MRL/*lpr* mice with PBS or IFNα at two different doses. B) Flow cytometric gating strategy of spleen B cells from MRL/*lpr* mice injected with either PBS or IFNα to measure the frequency of PNA^high CD38^low GC B cells within all κ⁺ B cells. C) Frequency of PNA^high CD38^low GC B cells within all κ⁺ B cells from MRL/*lpr* mice treated with either PBS or IFNα. N=3 per group, analyzed over one experiment. D) Fluorescence activated cell sorting of CD43⁻CD3⁻PNA⁻GL7⁻ single-κ and dual-κ (non-GC) B cells from a combined sample of spleen B cells isolated from a total of 12 MRL/*lpr* mice (11-16 weeks of age). The contour plots show the degree of purity of the sorted populations. E) Representative flow cytometric analysis and gating of the enriched single-κ and dual-κ MRL/*lpr* B cells, sorted as shown in (D), after 60 hours of culture in media alone or with R848, R848+IFNα, or R848+IFNγ. The cells were serially gated to measure BCL6⁺GL7^high GC B cells within the single-κ (s-κ) and dual-κ (d-κ) B cell populations. F) Frequencies of BCL6⁺GL7^high GC B cells within the sorted single-κ and dual-κ MRL/*lpr* B cells cultured as described in (E). N=1 biological sample (mix of 12 mice) cultured in 3 replica wells per condition (except N=2 wells for dual-κ cultured in media alone or with R848), analyzed in one experiment. Data in bar graphs are shown as mean+SD. Statistical analysis was performed with a one-tailed Mann-Whitney *U* test. *p≤0.05; ns=not significant.
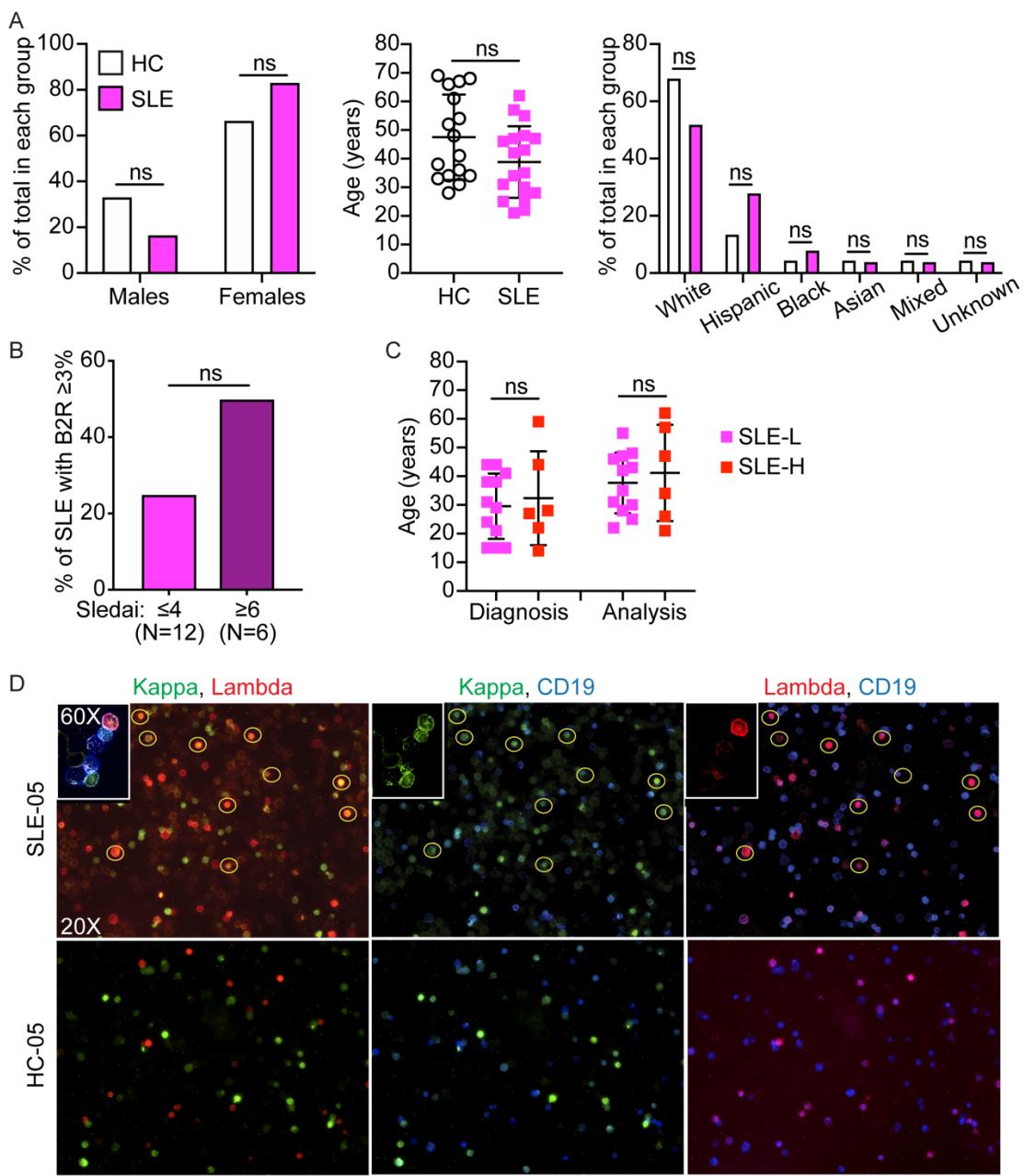
Figure S2: Characteristics of human subjects, and cytospin analysis of $\kappa^+\lambda^+$ B cells.

A) Sex, age (with mean±SD), race and ethnicity distribution of SLE patients and healthy controls. N=18 for both groups. Statistical analysis was performed by either two-tailed Fisher's exact test (sex and race) or t-test (age); ns=not significant. B) Percentage of SLE patients with B_{2R} cells ≥3% within groups with SLEDAI scores ≤4 or ≥6. Statistical analysis was performed by two-tailed Fisher's exact test. C) Age (with mean±SD) of SLE patients at diagnosis and at time of analysis in groups with low B_{2R} cells (SLE-L) and high B_{2R} cells (SLE-H). Statistical analysis was performed by two-tailed Mann-Whitney U test. D) Fluorescent microscopy analysis of PBMCs spun on cytospin slides from one SLE patient (SLE-05) and one healthy control (HC-05). The slides were stained for Igκ (green), Igλ (red), and CD19 (blue), and analyzed at 20X magnification (or 60X in insets). The yellow circles highlight cells positive for both κ and λ light chains.
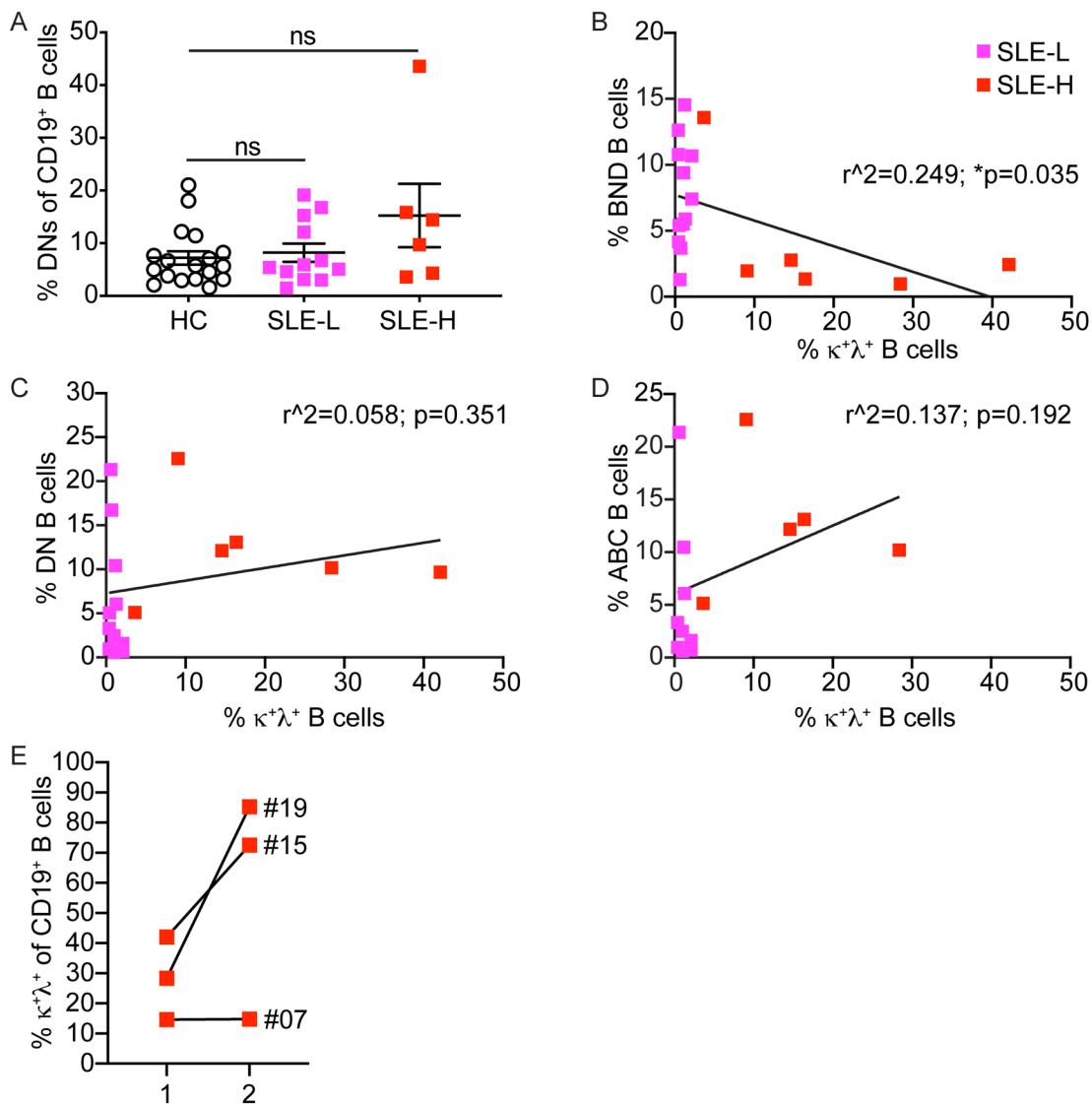
Figure S3: Analysis of B cell subsets and their relationship.

A) Frequency of CD27⁻IgD⁻ DN cells within the CD19⁺ B cell population of healthy controls (HC, N=18), and SLE patients with low B_{2R} (SLE-L, N=12) or high B_{2R} (SLE-H, N=6) cells. DN cells were gated as shown in Figure 3A. Each symbol is a subject, and bars represent mean±SD. Statistical analysis was performed with a Mann-Whitney *U* test; ns=not significant. B-D) Scatter plot analyses of the percentage of $\kappa^+\lambda^+$ B cells (x-axis) relative to the percentage (on y-axis) of BND (B), DN (C), or ABC (D) B cells within the CD19⁺ cell population of SLE-H patients. Data were analyzed by Simple linear regression. E) Frequency of $\kappa^+\lambda^+$ cells within the blood over time. Analyses were performed in two blood samples obtained 6 months to 2 years apart from SLE-H patients # 07, 15, and 19.
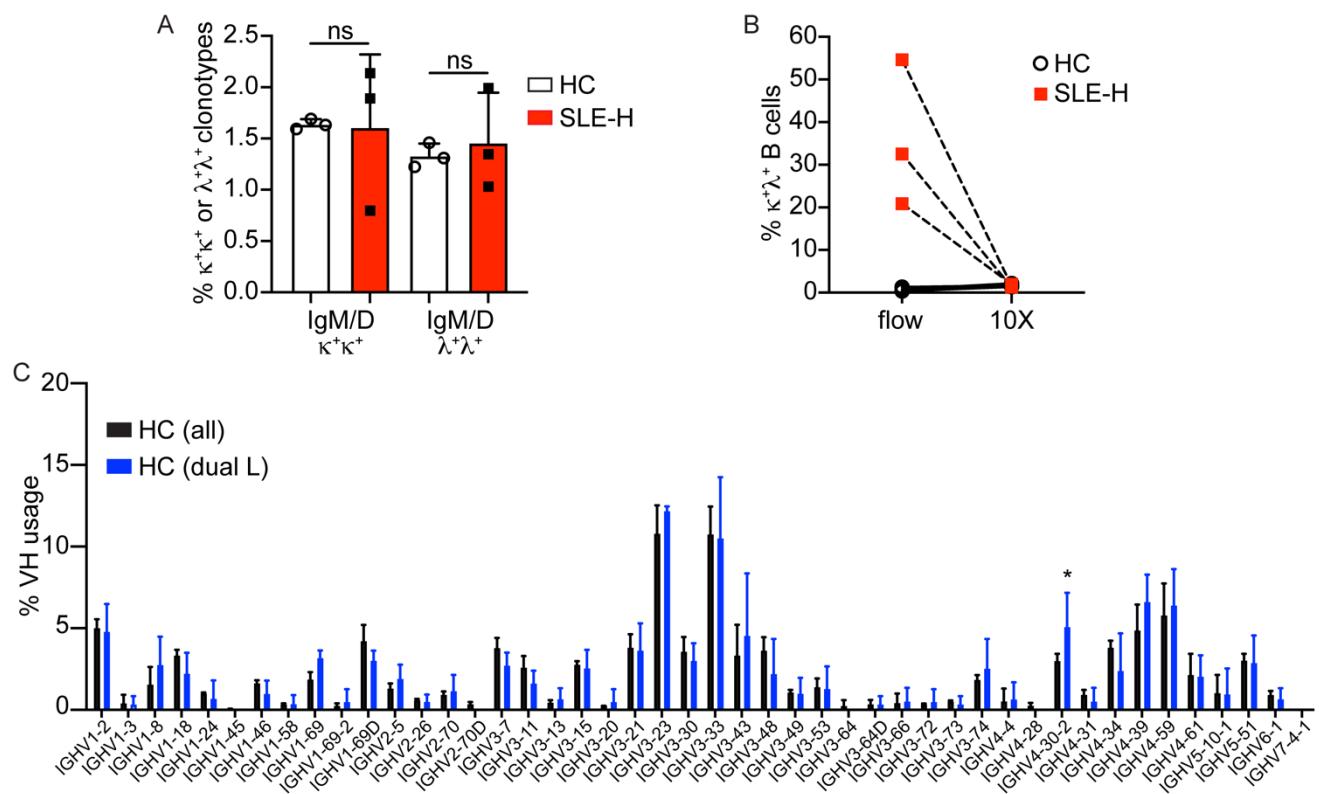
Figure S4: Single cell V(D)J-seq analysis of human B cells.

A) Percentage of unswitched (IgM/D) B cell clonotypes bearing one heavy chain and two κ or two λ genes. Symbols represent individual subjects and bars are mean+SD. Statistical analysis was performed with two-tailed Mann-Whitney U tests. B) Percentage of $κ^+λ^+$ IgM/D B cell clonotypes measured by flow cytometry or 10X in the same SLE-H and healthy control (HC) subjects. Difference was significant only for SLE subjects (p=0.025) as measured by t-test. C) Average (mean+SD) Ig VH usage among either all clonotypes (2,142-5,418 per sample) or dual-light chain ($κ^+κ^+$, $λ^+λ^+$, and $κ^+λ^+$) clonotypes (72-202 per sample) from three healthy controls (HC). Statistical analysis was performed with two-tailed unpaired t-test. *p≤0.05; n.s.=not significant (differences were not significant when lacking asterisks).
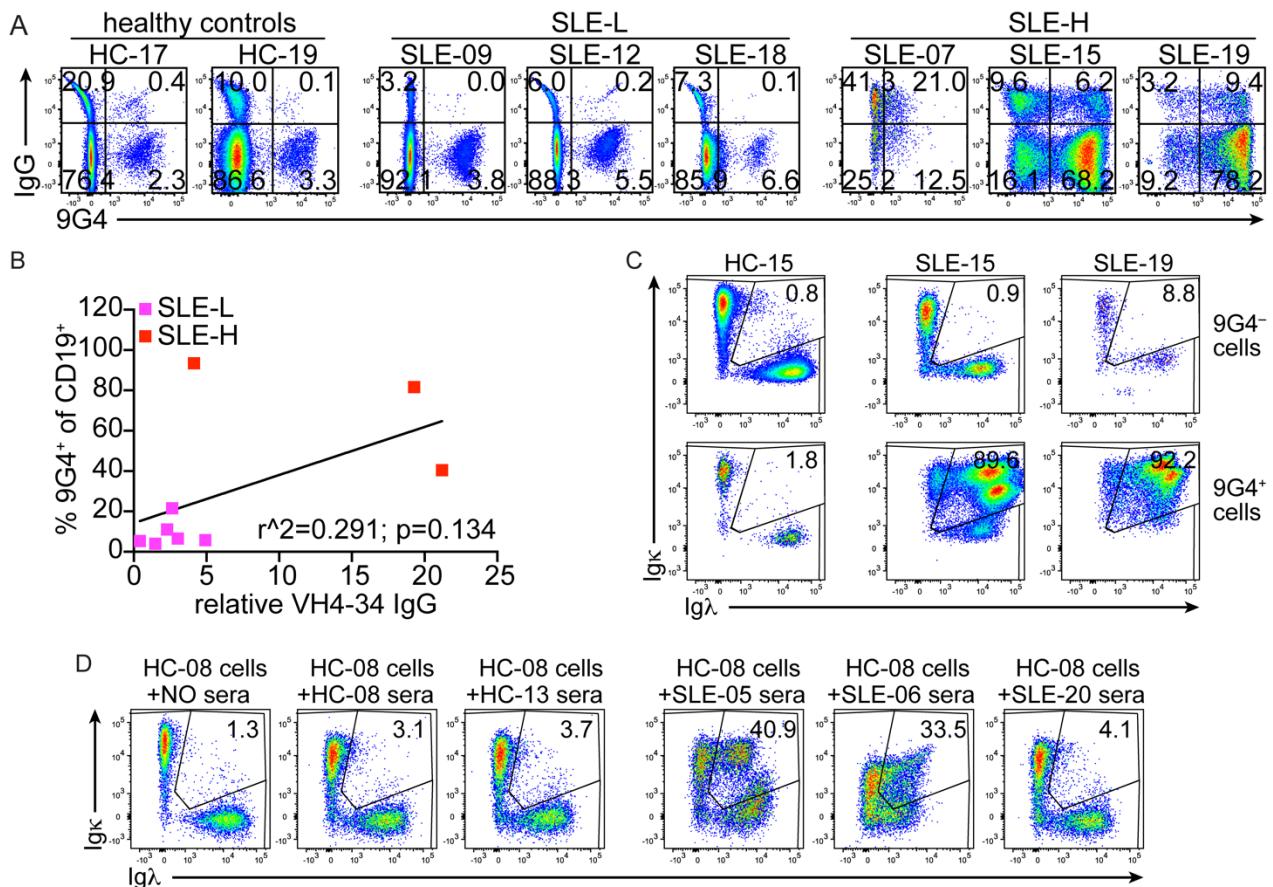
Figure S5: Correlates of VH4-34 secreted antibodies and 9G4+ B cells.

A) Representative flow cytometric analyses of 9G4 (anti-VH4-34) staining vs IgG on CD19+ gated B cells from healthy and SLE subjects. B) Scatter plot analyses of the percentage of 9G4+ B cells (y-axis) relative to VH4-34 IgG relative sera titers (on x-axis) in SLE patients. N=9, 6 SLE-L and 3 SLE-H. Data were analyzed by simple linear regression. C) Representative flow cytometric analyses of Igκ vs Igλ in 9G4− (top) and 9G4+ (bottom) CD19+ gated B cells. D) Flow cytometric analyses of Igκ vs Igλ on CD19+ gated B cells within healthy control HC-08 PBMCs that were incubated for 30 min at 4ºC without or with sera from the same or a different healthy subject, or with sera from SLE-H individuals. All plots are representative of four healthy controls, four SLE-L patients, and three SLE-H patients analyzed over 4 independent analyses.

Table S1: Characteristics of SLE patients and Heathy controls (HC)

*ID #	Sex	**Race& Ethnicity	Age, diagnosis (years)	Age, analysis	Clinical manifestations	***Medications	SLEDAI score	PTPN22 allele	%κ⁺λ⁺ of CD19⁺
SLE-01	M	W/NH	15	30	Demyelinating CNS lupus; Arthritis; Lymphopenia; ANA	HCQ; Triamterene-HCTZ	0	R620	1.19
SLE-02	F	AA/NH	31	35	Discoid rash; Photosensitivity; Oral/nasal ulcers; Pericarditis, Pleuritis; Inflammatory myositis; Raynaud's; Lymphopenia; Lymphadenopathy; ANA; anti-Sm, RNP, SSA	HCQ; Aspirin; MM	4	R620	0.72
SLE-03	M	W/NH	38	42	Pericarditis; Arthritis; Psoriasis; Lymphopenia; Eosinophilic esophagitis; partial IgA deficiency; ANA	HCQ; MTX; Folic acid	0	R620	0.5
SLE-04	F	M/H	29	31	Malar rash; Photosensitivity; Pleuritis; Renal disease WHO III; Arthritis; Raynaud's; Slerodactyly; Retinal vasculitis; Lymphopenia; Lymphadenopathy; ANA; anti-dsDNA, Sm	HCQ; Prednisone; Lisinopril	24	R620	1.25
SLE-05	F	W/NH	44	47	Pericarditis; Lymphopenia; ANA; anti-dsDNA, SSA	HCQ; Colchicine	2	R620	16.4
SLE-06	F	W/NH	59	62	Hemolytic anemia; Arthritis; Lymphopenia; Leukopenia; ANA; lupus anticoagulant; anti-dsDNA, cardiolipin, B2GP1	HCQ; Aspirin; Losartan-HCTZ	2	R620	9.07
SLE-07	F	W/H	28	34	Malar rash; Photosensitivity; Pericarditis; Renal disease WHO IV; Arthritis;	Azathioprine; Prednisone; Metformin; Hydralazine	8	R620	14.6

					Lymphopenia; Leukopenia; ANA; anti-dsDNA, Sm, cardiolipin			
SLE-08	F	W/NH	38	55	Pleuritis; Oral/nasal ulcers; Hypothyroidism; breast cancer; Lymphopenia; Leukopenia; Thrombocytopenia; ANA; lupus anticoagulant	HCQ; Aspirin; Cevimeline; Losartan-HCTZ; Meloxicam	2	R620	0.61
SLE-09	M	U/H	15	28	Malar rash; lupus encephalopathy; Renal disease WHO III; Arthritis; Pancarditis; Pancreatitis; Myositis; Lymphopenia; Leukopenia; Thrombocytopenia; ANA; anti-dsDNA, Sm, histone, SSB	HCQ; Lisinopril; Hydralazine; Prednisone; MA	2	R620	0.41
SLE-10	F	W/H	15	22	Malar rash; Discoid rash; Proteinuria, Hematuria; Arthritis; ANA; anti-dsDNA, cardiolipin, B2GP1, PS; PT	None	6	R620	2.09
SLE-12	F	W/H	24	43	Renal disease WHO IV; Arthritis; Leukopenia; ANA; anti-dsDNA	HCQ	2	R620	2.09
SLE-13	F	W/NH	21	25	Malar rash; Renal disease WHO III; ANA; anti-dsDNA, SM, RNP	HCQ; MM; Ditiazem	2	R620	1.0
SLE-15	F	AA/NH	27	57	Photosensitivity; Oral/nasal ulcers; Pericarditis; Arthritis; Congestive heart failure; Lymphopenia; Leukopenia; ANA; anti-cardiolipin	Metoprolol	4	R620	42.1
SLE-16	F	W/NH	41	46	Arthralgia; Raynaud's; Sjogren's;	HCQ; Aspirin	2	R620	0.43

					Lymphopenia; ANA; anti-SSA, SSB				
SLE-18	F	W/NH	44	48	Malar rash; Photosensitivity; Alopecia; Lymphopenia; ANA; anti-dsDNA, Sm	HCQ	2	R620	1.04
SLE-19	F	W/H	14	21	Pleuritis; Pericarditis; Renal disease WHO III; Arthritis; Pulmonary hypertension; ANA; anti-dsDNA; B2GP1	HCQ; Prednisone; MF; aspirin; Ambrisentan; Ivabradine; Digoxin; Omeprazole; Bactrim; Tadalafil	6	R620	28.4
SLE-20	F	W/H	22	26	Discoid rash; Photosensitivity; Oral/nasal ulcers; Pleuritic chest pain; Arthritis; Leukopenia; Thrombocytopenia; ANA	HCQ; Prednisone; MF	6	R620	3.62
SLE-21	F	A/H	44	47	Malar rash; Oral/nasal ulcers; Inflammatory myositis; Raynaud's; Esophageal dysmotility; Lymphopenia; ANA; anti-dsDNA	HCQ	6	R620	0.39
HC-01	M	W/NH	N/A	54	N/A	N/A	N/A	N/A	1.42
HC-02.2	F	AA/NH	N/A	N/A	N/A	N/A	N/A	N/A	0.14
HC-03	M	W/NH	N/A	N/A	N/A	N/A	N/A	N/A	1.12
HC-04	F	N/A	N/A	66	N/A	N/A	N/A	N/A	0.38
HC-05	F	W/NH	N/A	34	N/A	N/A	N/A	N/A	0.46
HC-06	M	W/NH	N/A	69	N/A	N/A	N/A	N/A	0.6
HC-07	F	W/NH	N/A	41	N/A	N/A	N/A	N/A	0.7
HC-08	F	M/H	N/A	34	N/A	N/A	N/A	N/A	0.36
HC-09	M	W/NH	N/A	31	N/A	N/A	N/A	N/A	1.35
HC-11	F	W/NH	N/A	52	N/A	N/A	N/A	N/A	0.71
HC-12	M	W/NH	N/A	67	N/A	N/A	N/A	N/A	0.64
HC-13	F	W/H	N/A	33	N/A	N/A	N/A	N/A	0.25
HC-14.2	F	W/NH	N/A	61	N/A	N/A	N/A	N/A	1.25

HC-15	M	W/NH	N/A	36	N/A	N/A	N/A	N/A	0.38
HC-17	F	W/NH	N/A	48	N/A	N/A	N/A	N/A	0.91
HC-18	F	W/H	N/A	28	N/A	N/A	N/A	N/A	0.23
HC-19	F	W/NH	N/A	68	N/A	N/A	N/A	N/A	1.76
HC-21	F	A/NH	N/A	38	N/A	N/A	N/A	N/A	0.41

*SLE patients in red are those with abnormally high frequency of $\kappa^+\lambda^+$ B cells and designated SLE-H in the study

**W=White; AA=African American or Black; A=Asian; M=Mixed race; U=Unknown race;

NH=Not Hispanic; H=Hispanic

***HCQ=Hydroxychloquine; MTX=Methotrexate; MM=Mycophenolic mofetil; MA=Mycophenolic acid

Table S2: Characteristics of ALPS patients

ID #	Age	Clinical manifestations	%$\kappa^+\lambda^+$ of CD20$^+$
243.1	3	thrombocytopenia, neutropenia	2.59
243.2	4	anemia, thrombocytopenia	12.03
243.3	10	neutropenia	1.55
243.4	13	uveitis	2.45
243.5	18	thrombocytopenia	1.70
243.6	6	neutropenia, thrombocytopenia, anemia	2.86
243.7	16	uveititis, nephritis	1.17
243.8	19	anemia, thrombocytopenia	0.36
243.9	8	neutropenia, thrombocytopenia, anemia	0.35
243.10	24	anemia	0.49

Table S3: Efficiency of B cell preparation and capture for single cell RNA-seq analyses

*ID #	**% live cells	**% CD19$^+$ of live cells	Total cell #	B cell # (VDJ barcodes)	% B cells of total cells	Unique B cell clonotypes	***B cell clonotypes with H and L
SLE-07	88.6	30.9	3,388	1,239	36.6	1,168	908
SLE-15	93.8	13.1	6,543	951	14.5	887	831
SLE-19	91.7	76.7	5,143	4,510	87.7	4,153	4,005
HC-07	78.1	73.2	4,321	3,439	79.6	3,376	3,310
HC-15	95.6	95.5	5,554	5,431	97.8	5,418	5,316
HC-19	65.8	90.7	2,445	2,189	89.6	2,142	1,916

*HC-07, HC-19, SLE-07, SLE-19 were processed by 10X Genomics and sequenced independently from HC-15 and SLE15 samples.

**% of live cells and of CD19$^+$ cells were measured by flow cytometry after magnetic depletion of dead cells and non-B cells.

***Clonotypes are B cells with unique V(D)J sequence heavy and light chain combinations.

Supplemental Table 4: VH4-34 B cell clonotypes from SLE patients and Heathy controls (HC)

Sample	clonotype_id	igh_cdr3s	igh_v–genes	igh_j	igh_c	igl_v–genes	igl_j	igl_c	igk_v_genes	igk_j	igk_c
SLE-07	clonotype630	CARGSPGSSWPRGYW	IGHV4-34	IGHJ4	IGHM				IGKV1-5	IGKJ2	IGKC
	clonotype12	CARGTGYYGETGRDYYYYYGMDVW	IGHV4-34	IGHJ6	IGHD				IGKV1-9	IGKJ2	IGKC
	clonotype1161	CARGATKGYCTNGVCENGPPFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-27	IGKJ1	IGKC
	clonotype1009	CARGIGGSGPW	IGHV4-34	IGHJ4	IGHM				IGKV1-39	IGKJ2	IGKC
	clonotype289	CARWRRGTNGVHDYW	IGHV4-34	IGHJ4	IGHD				IGKV1D-39	IGKJ3	IGKC
	clonotype24	CARGRTTVTRGAFDIW	IGHV4-34	IGHJ3	IGHD				IGKV3-20	IGKJ1	IGKC
	clonotype343	CARGWSTTYYYGSGIARW	IGHV4-34	IGHJ4	IGHM				IGKV3-20	IGKJ1	IGKC
	clonotype574	CARGRSQHLYYYYYYMDVW	IGHV4-34	IGHJ6	IGHD				IGKV3D-15	IGKJ4	IGKC
	clonotype583	CARRGLRLGELSSYAPFDYW	IGHV4-34	IGHJ4	IGHM				IGKV4-1	IGKJ2	IGKC

Sample	clonotype_id	igh_cdr3s	igh_v–genes	igh_j	igh_c	igl_v–genes	igl_j	igl_c	igk_v_genes	igk_j	igk_c
SLE-15	clonotype258	CAREEDTAMVCAFDIW	IGHV4-34	IGHJ3	IGHM				IGKV1-8	IGKJ3	IGKC
	clonotype807	CARVCIRSSGWYGVIDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-33	IGKJ4	IGKC
	clonotype378	CAGARLGFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1D-13;IGKV2-24	IGKJ5;IGKJ2	IGKC;IGKC
	clonotype886	CASTQYDFWSGYEDYW	IGHV4-34	IGHJ4	IGHM				IGKV1D-17	IGKJ2	IGKC
	clonotype599	CARGPRRIAARRGGWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV1D-33	IGKJ1	IGKC
	clonotype462	CVKNYYDSSGYAFDIW	IGHV4-34	IGHJ3	IGHM				IGKV1D-39	IGKJ3	IGKC
	clonotype115	CARGRYFDWLFFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1D-39	IGKJ1	IGKC
	clonotype729	CARGVLLWFGAIRGNWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV1D-39	IGKJ1	IGKC
	clonotype86	CAREAGIAAAVKRWWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV1D-39	IGKJ1	IGKC
	clonotype659	CARGYDFWSYHMDVW	IGHV4-34	IGHJ6	IGHM				IGKV1D-39	IGKJ1	IGKC
	clonotype193	CARSMIVVVSSYWYFDLW	IGHV4-34	IGHJ2	IGHM				IGKV2-28	IGKJ4	IGKC
	clonotype854	CARGANYYGSGHWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV3-11	IGKJ5	IGKC
	clonotype804	CARGFQSGNGSGIDYW	IGHV4-34	IGHJ4	IGHM				IGKV3-20	IGKJ5	IGKC
	clonotype164	CARAVPEMTTVVDFDYW	IGHV4-34	IGHJ4	IGHM				IGKV3D-15	IGKJ2	IGKC
	clonotype108	CARGIAAAARHYYYYMDVW	IGHV4-34	IGHJ6	IGHM				IGKV3D-20	IGKJ5	IGKC
	clonotype139	CARLGVVVAASIW	IGHV4-34	IGHJ3	IGHM				IGKV4-1	IGKJ1	IGKC
	clonotype263	CARAPSGGSYYNYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV4-1	IGKJ4	IGKC
	clonotype132	CATRAPTGWYFDFW	IGHV4-34	IGHJ2	IGHD	IGLV1-40	IGLJ3	IGLC3			
	clonotype266	CARRDAQTNSGSYFRRNLGHWFDPW	IGHV4-34	IGHJ5	IGHM	IGLV2-11	IGLJ3	IGLC2			

Sample	clonotype_id	igh_cdr3s	igh_v–genes	igh_j	igh_c	igl_v–genes	igl_j	igl_c	igk_v_genes	igk_j	igk_c
SLE-19	clonotype3932	CARGVTAAAAVSPNFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-5	IGKJ4	IGKC
	clonotype1874	CARALSSTSFKYYFDSW	IGHV4-34	IGHJ4	IGHM				IGKV1-5	IGKJ2	IGKC
	clonotype1024	CARGSNTYDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-5	IGKJ1	IGKC
	clonotype660	CARPRYCSGGSCSRALDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-5	IGKJ2	IGKC
	clonotype3856	CARVRYQVGDFLPHGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV1-5	IGKJ1	IGKC
	clonotype28	CARGGGYCSGGSCYSLLDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-6	IGKJ2	IGKC
	clonotype1601	CARGKEAVLRVRGGNSWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV1-8	IGKJ4	IGKC
	clonotype599	CARGQTTVVTYYYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV1-8	IGKJ1	IGKC
	clonotype2292	CARDSGGDYQDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-9	IGKJ4	IGKC
	clonotype4116	CARGITMVRGVPYW	IGHV4-34	IGHJ4	IGHM				IGKV1-9	IGKJ5	IGKC
	clonotype2006	CARNSIAAADHYYYYGMDVW	IGHV4-34	IGHJ6	IGHD				IGKV1-9	IGKJ5	IGKC
	clonotype3990	CARGGGITMIVAPPHYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV1-9;IGKV2D-40	IGKJ1;IGKJ1	IGKC;IGKC
	clonotype3578	CARVDRTYGSGSSSGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV1-9;IGKV4-1	IGKJ3;IGKJ2	IGKC;IGKC
	clonotype2497	CARSYYDSSGHGWYFDLW	IGHV4-34	IGHJ2	IGHM				IGKV1-12	IGKJ5	IGKC
	clonotype3244	CARLRRGYCSGGSCRVERYFDLW	IGHV4-34	IGHJ2	IGHM				IGKV1-12	IGKJ4	IGKC
	clonotype1749	CASLYGSGSYSNHW	IGHV4-34	IGHJ4	IGHM				IGKV1-16	IGKJ2	IGKC
	clonotype1287	CARVKYSSGWYRGWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV1-16	IGKJ2	IGKC
	clonotype3576	CARGRLIAVLLPRAGEFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-16;IGKV1-5	IGKJ4;IGKJ4	IGKC;IGKC

	clonotype2587	CARGRGDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-17	IGKJ2	IGKC
	clonotype511	CARGAGVDTAMVPFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-17	IGKJ2	IGKC
	clonotype682	CARGSRGLRGDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-17	IGKJ2	IGKC
	clonotype3008	CARGGIDIVVVVAANPWYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-17	IGKJ4	IGKC
	clonotype1104	CARGGDRNWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV1-17	IGKJ3	IGKC
	clonotype3855	CARFGRDGYGYW	IGHV4-34	IGHJ4	IGHM				IGKV1-17;IGKV2-30	IGKJ3;IGKJ4	IGKC;IGKC
	clonotype3501	CARSPYYDRHFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-27	IGKJ1	IGKC
	clonotype3130	CARGAHSGYDDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-27	IGKJ1	IGKC
	clonotype3164	CARVRITMVRGSRYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-33	IGKJ2	IGKC
	clonotype1165	CARGLLTEDIVAYYYYGVDVW	IGHV4-34	IGHJ6	IGHD				IGKV1-39	IGKJ1	IGKC
	clonotype3159	CARGRFRDYGLRYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1D-16	IGKJ4	IGKC
	clonotype3572	CARGGPYGGNSGYW	IGHV4-34	IGHJ4	IGHM				IGKV1D-33	IGKJ2	IGKC
	clonotype1064	CATGDSGYVPRW	IGHV4-34	IGHJ4	IGHM				IGKV1D-33	IGKJ4	IGKC
	clonotype1506	CARGPGWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV1D-33	IGKJ4	IGKC
	clonotype1657	CAISSGSKGYFQHW	IGHV4-34	IGHJ1	IGHM				IGKV1D-39	IGKJ2	IGKC
	clonotype3256	CARTSSGYYYDSSGRDAFDIW	IGHV4-34	IGHJ3	IGHM				IGKV1D-39	IGKJ2	IGKC
	clonotype98	CASTGEGQQLAQGYW	IGHV4-34	IGHJ4	IGHM				IGKV1D-39	IGKJ4	IGKC
	clonotype3320	CARSNRGVVTPDYFDYW	IGHV4-34	IGHJ4	IGHD				IGKV1D-39	IGKJ2	IGKC
	clonotype2289	CARGGGADDYGDYRFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1D-39	IGKJ5	IGKC
	clonotype824	CARGGFPGYSYGLDYW	IGHV4-34	IGHJ4	IGHM				IGKV1D-39	IGKJ1	IGKC
	clonotype3308	CARETAVAVNFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1D-39	IGKJ3	IGKC
	clonotype1634	CASIAARRGGSPFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1D-39	IGKJ2	IGKC
	clonotype1757	CARPRYCSGGSCSRALDYW	IGHV4-34	IGHJ4	IGHM				IGKV1D-39	IGKJ5	IGKC
	clonotype1850	CARSLGYCSSTSCSNFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1D-39	IGKJ1	IGKC
	clonotype2590	CARAPRIAAAGTPDW	IGHV4-34	IGHJ4	IGHM				IGKV1D-39	IGKJ4	IGKC
	clonotype3592	CARPTGYSSSWFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1D-39	IGKJ1	IGKC
	clonotype2554	CARDPRLEQQLVRGAFDPW	IGHV4-34	IGHJ5	IGHM				IGKV1D-39	IGKJ1	IGKC
	clonotype3720	CARGRLRSTFRGSTAPAWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV1D-39	IGKJ3	IGKC
	clonotype807	CAREVARCSGGSCYSGVDYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV1D-39	IGKJ1	IGKC
	clonotype830	CARFDYGDQPGYYYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV1D-39;IGKV2-28	IGKJ4;IGKJ2	IGKC;IGKC
	clonotype3926	CARGIPSRHSSGLDAFDIW	IGHV4-34	IGHJ3	IGHM				IGKV2-28	IGKJ1	IGKC
	clonotype3449	CARVKEPGIAAAAAGIAFDIW	IGHV4-34	IGHJ3	IGHM				IGKV2-28	IGKJ1	IGKC
	clonotype9	CARGVVGEKALYYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV2-28	IGKJ1	IGKC
	clonotype1778	CARRALGIAAAFIW	IGHV4-34	IGHJ3	IGHM				IGKV2-28;IGKV2-30	IGKJ2;IGKJ4	IGKC;IGKC
	clonotype979	CAREEVGATVYW	IGHV4-34	IGHJ4	IGHM				IGKV2-30	IGKJ1	IGKC
	clonotype5	CARGRYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV2D-29	IGKJ4	IGKC
	clonotype2137	CARWDGVRGNSRTPFDYW	IGHV4-34	IGHJ4	IGHM				IGKV2D-29	IGKJ2	IGKC
	clonotype143	CARGPTIGLDPW	IGHV4-34	IGHJ5	IGHD				IGKV2D-29	IGKJ2	IGKC
	clonotype371	CARGVFPGPYFDLW	IGHV4-34	IGHJ2	IGHM				IGKV3-11	IGKJ5	IGKC
	clonotype741	CARDNAVHGGAFDIW	IGHV4-34	IGHJ3	IGHM				IGKV3-11	IGKJ1	IGKC
	clonotype2760	CARGPEAAAGTQYYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV3-11	IGKJ4	IGKC
	clonotype2010	CASRFTIWRGADYW	IGHV4-34	IGHJ4	IGHM				IGKV3-11	IGKJ3	IGKC
	clonotype3518	CARGRINTFGGVFDYW	IGHV4-34	IGHJ4	IGHM				IGKV3-11	IGKJ3	IGKC
	clonotype749	CARGLLDTAMVFPYYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV3-11	IGKJ4	IGKC
	clonotype2897	CASRQPSSSWYGNWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV3-11	IGKJ5	IGKC
	clonotype4033	CARVLAAAETGYYYGMDVW	IGHV4-34	IGHJ6	IGHD				IGKV3-11	IGKJ2	IGKC
	clonotype2274	CARVAGTGPVVIDYW	IGHV4-34	IGHJ4	IGHD				IGKV3-11;IGKV3-20	IGKJ4;IGKJ4	IGKC;IGKC
	clonotype3012	CARGVPLGDCIGGSCYSAFDFW	IGHV4-34	IGHJ3	IGHM				IGKV3-15	IGKJ1	IGKC
	clonotype966	CARELGSSEYFQHW	IGHV4-34	IGHJ1	IGHM				IGKV3-20	IGKJ4	IGKC
	clonotype311	CARERWFGESIYWYFDLW	IGHV4-34	IGHJ2	IGHM				IGKV3-20	IGKJ1	IGKC
	clonotype3557	CARGVSLELGHGGDAFDIW	IGHV4-34	IGHJ3	IGHM				IGKV3-20	IGKJ4	IGKC
	clonotype2322	CARETTKEVTTIAPW	IGHV4-34	IGHJ3	IGHM				IGKV3-20	IGKJ1	IGKC
	clonotype1878	CARGNSGSPDPIYAFDIW	IGHV4-34	IGHJ3	IGHM				IGKV3-20	IGKJ2	IGKC
	clonotype1091	CARVSQGTVVEAFDIW	IGHV4-34	IGHJ3	IGHM				IGKV3-20	IGKJ2	IGKC

clonotype2361	CASERITMVRGSFDIW	IGHV4-34	IGHJ3	IGHM				IGKV3-20	IGKJ2	IGKC
clonotype1661	CAKTYDSSGYYYGRAFDIW	IGHV4-34	IGHJ3	IGHM				IGKV3-20	IGKJ1	IGKC
clonotype421	CARGSQEMATAFDYW	IGHV4-34	IGHJ4	IGHD				IGKV3-20	IGKJ2	IGKC
clonotype1096	CARGLGVSGEMAAAGMGYW	IGHV4-34	IGHJ4	IGHM				IGKV3-20	IGKJ1	IGKC
clonotype2805	CARKGIGGVDYW	IGHV4-34	IGHJ4	IGHM				IGKV3-20	IGKJ2	IGKC
clonotype3452	CARGRGSSSFPHDYW	IGHV4-34	IGHJ4	IGHM				IGKV3-20	IGKJ3	IGKC
clonotype1394	CARGRRAARPEVPLDYW	IGHV4-34	IGHJ4	IGHM				IGKV3-20	IGKJ1	IGKC
clonotype740	CARLGRFVGATGVW	IGHV4-34	IGHJ4	IGHM				IGKV3-20	IGKJ1	IGKC
clonotype524	CASSLAPLPGHYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV3-20	IGKJ1	IGKC
clonotype1865	CARGRRGYVVGPTVGPYFDSW	IGHV4-34	IGHJ4	IGHM				IGKV3-20	IGKJ2	IGKC
clonotype2862	CARGGLSDYW	IGHV4-34	IGHJ4	IGHM				IGKV3-20	IGKJ1	IGKC
clonotype2844	CARGQRRAVYYYDSSGLPFDYW	IGHV4-34	IGHJ4	IGHM				IGKV3-20	IGKJ2	IGKC
clonotype121	CARRVELGYCSSTSCLNWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV3-20	IGKJ2	IGKC
clonotype274	CARGLNYYDSSGYIDPW	IGHV4-34	IGHJ5	IGHM				IGKV3-20	IGKJ1	IGKC
clonotype1711	CARPQESKTGIAGRWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV3-20	IGKJ2	IGKC
clonotype1192	CAREGITGTTFFDPW	IGHV4-34	IGHJ5	IGHM				IGKV3-20	IGKJ1	IGKC
clonotype71	CARGVQLWPLGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV3-20	IGKJ2	IGKC
clonotype3239	CARPPPDTVTTPLMDYGMDVW	IGHV4-34	IGHJ6	IGHD				IGKV3-20	IGKJ2	IGKC
clonotype4044	CARVVSDYYYYGMDVW	IGHV4-34	IGHJ6	IGHD				IGKV3-20	IGKJ2	IGKC
clonotype3570	CARNCSSTSCYPDSSSPGGVDVW	IGHV4-34	IGHJ6	IGHM				IGKV3-20	IGKJ2	IGKC
clonotype3441	CARGLGYSSSGYYYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV3-20	IGKJ2	IGKC
clonotype1296	CARVVPAAPDRGWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV3D-15	IGKJ4	IGKC
clonotype1145	CARQEHIVVVTAIGGFDPW	IGHV4-34	IGHJ5	IGHM	IGLV2-14	IGLJ3	IGLC2	IGKV3D-15	IGKJ1	IGKC
clonotype3672	CARGGMITFGGVIVALSYFDLW	IGHV4-34	IGHJ2	IGHM				IGKV4-1	IGKJ1	IGKC
clonotype1476	CARRIAAAYAFDIW	IGHV4-34	IGHJ3	IGHM				IGKV4-1	IGKJ4	IGKC
clonotype1611	CARGRYDFDYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV4-1	IGKJ2	IGKC
clonotype594	CASLSGPGFDYW	IGHV4-34	IGHJ4	IGHM				IGKV4-1	IGKJ1	IGKC
clonotype3073	CARGSTVVTSTLNYW	IGHV4-34	IGHJ4	IGHM	IGLV4-69	IGLJ3	IGLC2	IGKV4-1	IGKJ3	IGKC
clonotype2246	CARAAAGTDGGWFDPW	IGHV4-34	IGHJ5	IGHD				IGKV4-1	IGKJ1	IGKC
clonotype2184	CAKDRNGFDPW	IGHV4-34	IGHJ5	IGHM				IGKV4-1	IGKJ2	IGKC
clonotype518	CASRYGDRPYYYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV4-1	IGKJ3	IGKC
clonotype802	CARGRVLFDYW	IGHV4-34	IGHJ4	IGHM				IGKV6-21	IGKJ1	IGKC
clonotype155	CANLPFGQQLETLYFQHW	IGHV4-34	IGHJ1	IGHM	IGLV1-40	IGLJ3	IGLC2			
clonotype2429	CARGGGQQLVVDAFDIW	IGHV4-34	IGHJ3	IGHM	IGLV1-40	IGLJ3	IGLC2			
clonotype1569	CARKCSSKRWLPNPGYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV1-40	IGLJ2	IGLC2			
clonotype3923	CARIGTHYGDPTEYYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV1-40	IGLJ3	IGLC2			
clonotype671	CARGLGTAMATGGFDYW	IGHV4-34	IGHJ4	IGHM	IGLV1-40	IGLJ3	IGLC2			
clonotype2525	CARGRPEFSTWYYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV1-40	IGLJ1	IGLC1			
clonotype2747	CARLGRFVGATGVW	IGHV4-34	IGHJ4	IGHM	IGLV1-40	IGLJ3	IGLC2			
clonotype3479	CARGPVAAVYYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV1-40	IGLJ1	IGLC1			
clonotype1747	CARLTRSTYYYDSSGYYHFDYW	IGHV4-34	IGHJ4	IGHM	IGLV1-40	IGLJ1	IGLC1			
clonotype3126	CARGVGSSWSGWFDPW	IGHV4-34	IGHJ5	IGHM	IGLV1-40	IGLJ3	IGLC2			
clonotype3977	CARGDSSSSVKWFDPW	IGHV4-34	IGHJ5	IGHM	IGLV1-40	IGLJ3	IGLC2			
clonotype2758	CARALDEYIVATTRGHWFDPW	IGHV4-34	IGHJ5	IGHM	IGLV1-40	IGLJ2	IGLC2			
clonotype462	CARGRSDGADTPRGRFDPW	IGHV4-34	IGHJ5	IGHM	IGLV1-40	IGLJ2	IGLC2			
clonotype2846	CARVRGSGITGTTRYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV1-40;IGLV3-10	IGLJ2;IGLJ3	IGLC2;IGLC3			
clonotype2632	CARASRGAVAGIRDW	IGHV4-34	IGHJ4	IGHM	IGLV1-40;IGLV3-21	IGLJ2;IGLJ3	IGLC2;IGLC2			
clonotype2600	CARAPLGQLAGDWYFDRW	IGHV4-34	IGHJ2	IGHM	IGLV1-44	IGLJ1	IGLC1			
clonotype1728	CASCERGGCSGYW	IGHV4-34	IGHJ4	IGHM	IGLV1-44	IGLJ2	IGLC2			
clonotype1336	CVRNGTKGLDSW	IGHV4-34	IGHJ4	IGHM	IGLV1-44	IGLJ3	IGLC2			
clonotype3899	CAPQGTGDPNYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV1-44	IGLJ3	IGLC2			
clonotype714	CARRTDDSSGYYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV1-44	IGLJ7	IGLC7			
clonotype1664	CASDPPGRVGMDVW	IGHV4-34	IGHJ6	IGHD	IGLV1-44	IGLJ1	IGLC1			
clonotype363	CARDRQQLALGYYGMDVW	IGHV4-34	IGHJ6	IGHM	IGLV1-44	IGLJ1	IGLC1			

	clonotype1421	CARVVETTVTTQHRYGMDVW	IGHV4-34	IGHJ6	IGHM	IGLV1-44	IGLJ1	IGLC1			
	clonotype475	CARGIVVVPAARDGFDIW	IGHV4-34	IGHJ3	IGHM	IGLV1-47	IGLJ3	IGLC2			
	clonotype2263	CASLALRRPRITMVRGVDDAFDIW	IGHV4-34	IGHJ3	IGHM	IGLV1-47	IGLJ1	IGLC1			
	clonotype2547	CASLVTTDLPFDYW	IGHV4-34	IGHJ4	IGHM	IGLV1-47	IGLJ3	IGLC2			
	clonotype1112	CARGGGMVRGGLTFDYW	IGHV4-34	IGHJ4	IGHM	IGLV1-47;IGLV2-23	IGLJ2;IGLJ2	IGLC2;IGLC2			
	clonotype2395	CARRGEDSGDDCFDYW	IGHV4-34	IGHJ4	IGHM	IGLV1-47;IGLV9-49	IGLJ7;IGLJ3	IGLC7;IGLC2			
	clonotype1598	CARALGVAAGYWYFDLW	IGHV4-34	IGHJ2	IGHM	IGLV1-51	IGLJ2	IGLC2			
	clonotype3713	CAREMRQWLRWYFDLW	IGHV4-34	IGHJ2	IGHM	IGLV1-51	IGLJ3	IGLC3			
	clonotype3228	CARWTMNYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV1-51	IGLJ2	IGLC2			
	clonotype1509	CAASIGGNSPRYW	IGHV4-34	IGHJ4	IGHM	IGLV1-51	IGLJ2	IGLC2			
	clonotype1391	CARGLKTVWGSPGYW	IGHV4-34	IGHJ4	IGHM	IGLV1-51	IGLJ3	IGLC3			
	clonotype2318	CARGYPLAATGTVGWFDPW	IGHV4-34	IGHJ5	IGHD	IGLV1-51	IGLJ3	IGLC2			
	clonotype3290	CARGRRGYSSGSNWFDPW	IGHV4-34	IGHJ5	IGHM	IGLV1-51	IGLJ1	IGLC1			
	clonotype244	CARLERGSITIFGGGYYYGMDVW	IGHV4-34	IGHJ6	IGHM	IGLV1-51	IGLJ3	IGLC2			
	clonotype3799	CARASGGGGEPGLGMDVW	IGHV4-34	IGHJ6	IGHD	IGLV1-51	IGLJ1	IGLC1			
	clonotype925	CARGRSSSSEGYYYYGMDVW	IGHV4-34	IGHJ6	IGHM	IGLV1-51	IGLJ2	IGLC2			
	clonotype3170	CAAYSSGQKIDYW	IGHV4-34	IGHJ4	IGHM	IGLV1-51;IGLV2-8	IGLJ1;IGLJ1	IGLC1;IGLC1			
	clonotype2244	CARPGEDW	IGHV4-34	IGHJ4	IGHM	IGLV10-54	IGLJ3	IGLC3			
	clonotype1357	CATLWNSSSWDKDYW	IGHV4-34	IGHJ4	IGHM	IGLV2-11	IGLJ1	IGLC1			
	clonotype809	CARGRRQYYDSSGYYLQHW	IGHV4-34	IGHJ1	IGHM	IGLV2-14	IGLJ2	IGLC2			
	clonotype1584	CARGAGRYSYRFWYFDLW	IGHV4-34	IGHJ2	IGHM	IGLV2-14	IGLJ3	IGLC3			
	clonotype2433	CARNTVGATAFDIW	IGHV4-34	IGHJ3	IGHM	IGLV2-14	IGLJ3	IGLC3			
	clonotype693	CARLVGGLRSSNPYYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV2-14	IGLJ2	IGLC2			
	clonotype2566	CARGPTGRSNLGSDSSGYSLDYW	IGHV4-34	IGHJ4	IGHM	IGLV2-14	IGLJ3	IGLC3			
	clonotype1432	CARRGVDTAMATDFDYW	IGHV4-34	IGHJ4	IGHM	IGLV2-14	IGLJ1	IGLC1			
	clonotype2744	CARGGFITGTTYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV2-14	IGLJ1	IGLC1			
	clonotype3589	CARGGTAAAGTNDYW	IGHV4-34	IGHJ4	IGHM	IGLV2-14	IGLJ2	IGLC2			
	clonotype3203	CARGVRFFDRLSLGHYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV2-14	IGLJ2	IGLC2			
	clonotype2313	CARGWGYSSGWYRGYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV2-14	IGLJ1	IGLC1			
	clonotype2843	CARTEVLLWFGEFPNWFDPW	IGHV4-34	IGHJ5	IGHM	IGLV2-14	IGLJ2	IGLC2			
	clonotype3722	CASWQLRDYYYGMDVW	IGHV4-34	IGHJ6	IGHD	IGLV2-14	IGLJ1	IGLC1			
	clonotype2197	CARGPTLPLTIFYGMDVW	IGHV4-34	IGHJ6	IGHM	IGLV2-14	IGLJ3	IGLC3			
	clonotype2452	CARGGAARLYGMDVW	IGHV4-34	IGHJ6	IGHM	IGLV2-14	IGLJ3	IGLC2			
	clonotype1312	CARGRPMNNYYYYAMDVW	IGHV4-34	IGHJ6	IGHM	IGLV2-14	IGLJ2	IGLC2			
	clonotype1470	CARGHPYCSGGSCDGDGMDVW	IGHV4-34	IGHJ6	IGHM	IGLV2-14	IGLJ3	IGLC3			
	clonotype4076	CARGRGRITMVRGVSDYGMDVW	IGHV4-34	IGHJ6	IGHM	IGLV2-14	IGLJ2	IGLC2			
	clonotype3004	CARGRDDSSGYYYAEVDVW	IGHV4-34	IGHJ6	IGHM	IGLV2-14	IGLJ3	IGLC3			
	clonotype2931	CARGPPTTVTTGFDPW	IGHV4-34	IGHJ5	IGHM	IGLV2-14;IGLV6-57	IGLJ3;IGLJ1	IGLC2;IGLC1			
	clonotype1212	CAREPRGVAVDYW	IGHV4-34	IGHJ4	IGHM	IGLV2-14;IGLV7-43	IGLJ3;IGLJ3	IGLC2;IGLC3			
	clonotype2013	CARRRESSSRYFDLW	IGHV4-34	IGHJ2	IGHM	IGLV2-23	IGLJ3	IGLC2			
	clonotype3748	CARKSRRLPPRWYFDLW	IGHV4-34	IGHJ2	IGHM	IGLV2-23	IGLJ3	IGLC2			
	clonotype1762	CARGSPYSSGWLKSRTWPYFDYW	IGHV4-34	IGHJ4	IGHD	IGLV2-23	IGLJ3	IGLC3			
	clonotype924	CASRGDSVKLYGGGRGWFDPW	IGHV4-34	IGHJ5	IGHM	IGLV2-23	IGLJ3	IGLC2			
	clonotype2054	CARGGGSSSWYGEHW	IGHV4-34	IGHJ1	IGHM	IGLV2-8	IGLJ2	IGLC2			
	clonotype2735	CARGSGVVVVVPVAAFDIW	IGHV4-34	IGHJ3	IGHM	IGLV2-8	IGLJ3	IGLC3			
	clonotype2218	CARGLGGLNDYVWGARAQGAFDIW	IGHV4-34	IGHJ3	IGHM	IGLV2-8	IGLJ2	IGLC2			
	clonotype1083	CARNGGRGYGYYYYGMDVW	IGHV4-34	IGHJ6	IGHM	IGLV2-8	IGLJ1	IGLC1			
	clonotype2495	CGRGSQVFRTRYYGMDVW	IGHV4-34	IGHJ6	IGHM	IGLV2-8	IGLJ2	IGLC2			
	clonotype1675	CARLANWGSGLDYW	IGHV4-34	IGHJ4	IGHM	IGLV2-8;IGLV6-57	IGLJ1;IGLJ3	IGLC1;IGLC2			
	clonotype641	CARGGGITGTTEYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV3-1	IGLJ2	IGLC2			
	clonotype3801	CARLQRVRARSDRGYYYGSGSYDYW	IGHV4-34	IGHJ4	IGHM	IGLV3-10	IGLJ2	IGLC2			
	clonotype3687	CARGDNTYYYGSGAPDYW	IGHV4-34	IGHJ4	IGHM	IGLV3-10	IGLJ3	IGLC2			
	clonotype2954	CARGPVVVITNDAFDIW	IGHV4-34	IGHJ3	IGHM	IGLV3-19	IGLJ3	IGLC3			
	clonotype911	CARGYNTAAAGIDYW	IGHV4-34	IGHJ4	IGHM	IGLV3-19	IGLJ2	IGLC2			

Sample	clonotype_id	igh_cdr3s	igh_v–genes	igh_j	igh_c	igl_v–genes	igl_j	igl_c	igk_v_genes	igk_j	igk_c
	clonotype1841	CARGLLAVAPTGFGYW	IGHV4-34	IGHJ4	IGHM	IGLV3-19	IGLJ1	IGLC1			
	clonotype1758	CARVPSYSSSFFDYW	IGHV4-34	IGHJ4	IGHM	IGLV3-19	IGLJ2	IGLC2			
	clonotype2840	CARGYVLEEGTVIQLWLGYYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV3-19	IGLJ1	IGLC1			
	clonotype1454	CARGRVAAAEYYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV3-19	IGLJ2	IGLC2			
	clonotype1224	CARGSLLYYDFWSGSLFDYW	IGHV4-34	IGHJ4	IGHM	IGLV3-19	IGLJ2	IGLC2			
	clonotype4117	CARRFPAPGIAVAGTGDPFDYW	IGHV4-34	IGHJ4	IGHM	IGLV3-19	IGLJ3	IGLC3			
	clonotype3802	CARGYSGSYEGGDAFDIW	IGHV4-34	IGHJ3	IGHM	IGLV3-25	IGLJ2	IGLC2			
	clonotype1069	CARAQSRSGSYIRGFDYW	IGHV4-34	IGHJ4	IGHM	IGLV3-25	IGLJ2	IGLC2			
	clonotype976	CARVNPDYGGNSRGVDYW	IGHV4-34	IGHJ4	IGHM	IGLV3-9	IGLJ2	IGLC2			
	clonotype194	CARGRSRWLSNGGGDYW	IGHV4-34	IGHJ4	IGHM	IGLV7-43	IGLJ3	IGLC3			
	clonotype11	CASAGRPEYSYGWNW	IGHV4-34	IGHJ4	IGHM	IGLV7-43	IGLJ3	IGLC2			
	clonotype4111	CARGPNYYDSSGSLGYW	IGHV4-34	IGHJ4	IGHM	IGLV7-43	IGLJ3	IGLC3			
	clonotype885	CARGPSRWGDDILTGRPFDIW	IGHV4-34	IGHJ3	IGHM	IGLV7-46	IGLJ3	IGLC3			

Sample	clonotype_id	igh_cdr3s	igh_v–genes	igh_j	igh_c	igl_v–genes	igl_j	igl_c	igk_v_genes	igk_j	igk_c
HC-07	clonotype1744	CATPQGSSGPLGDAFDIW	IGHV4-34	IGHJ3	IGHM				IGKV1-5	IGKJ2	IGKC
	clonotype3110	CARGVPAAPFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-5	IGKJ2	IGKC
	clonotype3081	CARTGSSSWTSIVDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-5	IGKJ2	IGKC
	clonotype2900	CARGSIAAAYYYYYMDVW	IGHV4-34	IGHJ6	IGHD				IGKV1-5	IGKJ4	IGKC
	clonotype3324	CARDRGSMTTVTTSWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV1-6	IGKJ3	IGKC
	clonotype3269	CARGRGSSWVNAFDIW	IGHV4-34	IGHJ3	IGHM				IGKV1-8	IGKJ1	IGKC
	clonotype2804	CARGRYSGSYSLSGYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-8	IGKJ1	IGKC
	clonotype672	CARGPLLWGCSSTSCYTGYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-8	IGKJ1	IGKC
	clonotype2131	CARGYGSGSYYSFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-8	IGKJ1	IGKC
	clonotype2058	CASGFYGGNKRKLGDGYW	IGHV4-34	IGHJ4	IGHM				IGKV1-9	IGKJ5	IGKC
	clonotype3292	CAREGLELLPHYMDVW	IGHV4-34	IGHJ6	IGHM				IGKV1-9	IGKJ1	IGKC
	clonotype2297	CARGRICGYVCSYYYMDVW	IGHV4-34	IGHJ6	IGHM				IGKV1-12	IGKJ5	IGKC
	clonotype2266	CARGGGEQLVLPDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-17	IGKJ2	IGKC
	clonotype2668	CARGLSVAARHRLGAFPYW	IGHV4-34	IGHJ4	IGHM				IGKV1-27	IGKJ1	IGKC
	clonotype2858	CARGGFWSGYYFW	IGHV4-34	IGHJ4	IGHM				IGKV1-27	IGKJ1	IGKC
	clonotype3016	CARVGVPAANW	IGHV4-34	IGHJ4	IGHM				IGKV1-33	IGKJ1	IGKC
	clonotype279	CARGHRYDFWSGYYGPHLGSAWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV1-33	IGKJ2	IGKC
	clonotype2991	CARGSGFRELSLGYW	IGHV4-34	IGHJ4	IGHM				IGKV1D-8	IGKJ2	IGKC
	clonotype2682	CARARAFWSGYSPITGYYYYYMDVW	IGHV4-34	IGHJ6	IGHM				IGKV1D-8	IGKJ4	IGKC
	clonotype2960	CARGKYSSSLYYYYYMDVW	IGHV4-34	IGHJ6	IGHD				IGKV1D-13	IGKJ1	IGKC
	clonotype901	CARGRGEVVPAAPFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1D-17	IGKJ3	IGKC
	clonotype1612	CARGNQLEIVVPGRRGAFDIW	IGHV4-34	IGHJ3	IGHM				IGKV1D-39	IGKJ2	IGKC
	clonotype2233	CARGGFDFWSGYVGYHDAFDIW	IGHV4-34	IGHJ3	IGHM				IGKV1D-39	IGKJ2	IGKC
	clonotype449	CARRRVWFREFLFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1D-39	IGKJ3	IGKC
	clonotype2198	CARVPLRLSTRPYYYYGMDVW	IGHV4-34	IGHJ6	IGHM	IGLV1-47	IGLJ2	IGLC2	IGKV1D-39	IGKJ2	IGKC
	clonotype1221	CARGLSRWISSRGETRRNTRGWFDPW	IGHV4-34	IGHJ5	IGHD				IGKV1D-39	IGKJ4	IGKC
	clonotype293	CARLDYERGYALGYLDVW	IGHV4-34	IGHJ6	IGHD				IGKV1D-39	IGKJ1	IGKC
	clonotype3076	CAREAGRQLWLRGYGYW	IGHV4-34	IGHJ4	IGHM				IGKV2-28	IGKJ1	IGKC
	clonotype2469	CAVRAVIAAAGTRWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV2-28	IGKJ1	IGKC
	clonotype605	CARGPRVENYYDSSGQYYYYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV2-28	IGKJ2	IGKC
	clonotype2450	CAREENYITMVQGVSLRGWFDPW	IGHV4-34	IGHJ5	IGHD				IGKV2-28	IGKJ2	IGKC
	clonotype2673	CARGDRVLVVYAIRAGWYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV2D-29;IGKV3-11	IGKJ3;IGKJ4	IGKC;IGKC
	clonotype614	CARGHGGPFGYW	IGHV4-34	IGHJ4	IGHM				IGKV3-11	IGKJ5	IGKC
	clonotype623	CARGGQQLVPQRFDYW	IGHV4-34	IGHJ4	IGHD				IGKV3-11	IGKJ3	IGKC
	clonotype1811	CARERLSTAGHDYFYYYMDVW	IGHV4-34	IGHJ6	IGHM				IGKV3-11;IGKV3-15	IGKJ5;IGKJ1	IGKC;IGKC
	clonotype488	CARGLTAPSRPSSYSSSWYRSYW	IGHV4-34	IGHJ4	IGHM				IGKV3-15	IGKJ1	IGKC
	clonotype881	CARGKNYYYYYMDVW	IGHV4-34	IGHJ6	IGHM				IGKV3-15	IGKJ4	IGKC
	clonotype3140	CAVRLVTSNIRYYYYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV3-15	IGKJ1	IGKC

Sample	clonotype_id	igh_cdr3s	igh_v-genes	igh_j	igh_c	igl_v-genes	igl_j	igl_c	igk_v_genes	igk_j	igk_c
	clonotype2089	CARGLRT	IGHV4-34	IGHJ6	IGHM				IGKV3-15	IGKJ2	IGKC
	clonotype1043	CARVLRYLRWFDYW	IGHV4-34	IGHJ4	IGHM				IGKV3-20	IGKJ2	IGKC
	clonotype143	CARGPSKISYYYYYMDVW	IGHV4-34	IGHJ6	IGHM				IGKV3-20	IGKJ2	IGKC
	clonotype2313	CARGTFSGYDYWDYW	IGHV4-34	IGHJ4	IGHM				IGKV4-1	IGKJ4	IGKC
	clonotype1416	CARGTYSGYDYWDYW	IGHV4-34	IGHJ4	IGHM				IGKV4-1	IGKJ4	IGKC
	clonotype657	CARGLVSGTNMGPFDYW	IGHV4-34	IGHJ4	IGHM				IGKV4-1	IGKJ2	IGKC
	clonotype2921	CARGRKAIPKYNWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV4-1	IGKJ1	IGKC
	clonotype3182	CARVLTGLMPYYMDVW	IGHV4-34	IGHJ6	IGHM				IGKV4-1	IGKJ2	IGKC
	clonotype1116	CARVGAGTDYW	IGHV4-34	IGHJ4	IGHD				IGKV4-1	IGKJ4	IGKC
	clonotype2962	CARVGSWYGSGSYPFDYW	IGHV4-34	IGHJ4	IGHM	IGLV1-40	IGLJ2	IGLC2			
	clonotype936	CARHPYYDFWSGYSPIHPRYNWFDPW	IGHV4-34	IGHJ5	IGHM	IGLV1-40	IGLJ2	IGLC2			
	clonotype2294	CARGLGATSAFDYW	IGHV4-34	IGHJ4	IGHM	IGLV1-44	IGLJ2	IGLC2			
	clonotype1836	CARVIFCCAPRYADSYFQHW	IGHV4-34	IGHJ1	IGHM	IGLV1-47	IGLJ3	IGLC3			
	clonotype3127	CARDQPPKLFDYW	IGHV4-34	IGHJ4	IGHM	IGLV1-47	IGLJ1	IGLC1			
	clonotype768	CARRGVLGYCSGGSCTYYYGMDVW	IGHV4-34	IGHJ6	IGHM	IGLV1-47	IGLJ2	IGLC2			
	clonotype2909	CASRAYYYGSGSYFPKTGFYYYYGMDVW	IGHV4-34	IGHJ6	IGHM	IGLV1-47	IGLJ2	IGLC2			
	clonotype1535	CARFLGGVISLDYW	IGHV4-34	IGHJ4	IGHM	IGLV1-47;IGLV2-23	IGLJ2;IGLJ2	IGLC2;IGLC2			
	clonotype1919	CARRGPRGRPWLHRNWFDPW	IGHV4-34	IGHJ5	IGHM	IGLV1-51	IGLJ3	IGLC3			
	clonotype1030	CARVVRDLMRTYYYYMDVW	IGHV4-34	IGHJ6	IGHM	IGLV1-51	IGLJ2	IGLC2			
	clonotype1142	CARGPYSSSTPWRAYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV1-51;IGLV6-57	IGLJ2;IGLJ2	IGLC2;IGLC2			
	clonotype2712	CARAQLRFKFDYW	IGHV4-34	IGHJ4	IGHM	IGLV2-11	IGLJ1	IGLC1			
	clonotype3315	CARTPFLGGWFDPW	IGHV4-34	IGHJ5	IGHM	IGLV2-11	IGLJ1	IGLC1			
	clonotype933	CARALTTFSSSGHRLDWHFDLW	IGHV4-34	IGHJ2	IGHM	IGLV2-14	IGLJ2	IGLC2			
	clonotype1204	CARGRFWSGFLW	IGHV4-34	IGHJ4	IGHM	IGLV2-14	IGLJ2	IGLC2			
	clonotype25	CARGSIVVVPAAIIGVSAFDPW	IGHV4-34	IGHJ5	IGHM	IGLV2-14	IGLJ3	IGLC3			
	clonotype2461	CARGRITIFGVASHNWFDPW	IGHV4-34	IGHJ5	IGHM	IGLV2-14	IGLJ2	IGLC2			
	clonotype2742	CARADPYYPEGVRGVRFDPW	IGHV4-34	IGHJ5	IGHM	IGLV3-1	IGLJ2	IGLC2			
	clonotype74	CARGPLCSSTSCYPSYYGMDVW	IGHV4-34	IGHJ6	IGHD	IGLV3-1	IGLJ2	IGLC2			
	clonotype2397	CARAHTLTTVTTRELDYW	IGHV4-34	IGHJ4	IGHM	IGLV3-19	IGLJ2	IGLC2			
	clonotype1034	CARGPGYSGYDFYPNW	IGHV4-34	IGHJ4	IGHM	IGLV3-19	IGLJ2	IGLC3			
	clonotype1911	CARGLYSGSYWGVKGRFDPW	IGHV4-34	IGHJ5	IGHM	IGLV3-19	IGLJ2	IGLC2			
	clonotype1496	CARVSVVVPALSDPW	IGHV4-34	IGHJ5	IGHM	IGLV3-19	IGLJ2	IGLC2			
	clonotype1865	CARGLGNDYGDYDYYYYGMDVW	IGHV4-34	IGHJ6	IGHD	IGLV3-25	IGLJ3	IGLC3			
Sample	clonotype_id	igh_cdr3s	igh_v–genes	igh_j	igh_c	igl_v–genes	igl_j	igl_c	igk_v_genes	igk_j	igk_c
HC-15	clonotype2434	CARERELLRGDAFDIW	IGHV4-34	IGHJ3	IGHM				IGKV1-5	IGKJ1	IGKC
	clonotype3110	CARGHVRKRGGSGSYYKFPFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-5	IGKJ1	IGKC
	clonotype297	CARGFWSKGKRAAILFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-5	IGKJ4	IGKC
	clonotype2251	CARGGYSGSGLYAPLRGW	IGHV4-34	IGHJ4	IGHM				IGKV1-5	IGKJ1	IGKC
	clonotype285	CAGGGGKILPFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-5	IGKJ1	IGKC
	clonotype3198	CARGLGRVVGSYFMFLGAYYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-5	IGKJ1	IGKC
	clonotype947	CARGYFWLMAVAGYYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-5	IGKJ1	IGKC
	clonotype320	CARLRPYGSGSYNLKYYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-5	IGKJ1	IGKC
	clonotype5348	CARGLLITFGGVIAKPIDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-5	IGKJ2	IGKC
	clonotype3346	CARGPLRREGPPRGYSKPW	IGHV4-34	IGHJ5	IGHM				IGKV1-5	IGKJ2	IGKC
	clonotype4683	CARQNDSEYYYYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV1-5	IGKJ2	IGKC
	clonotype4444	CAREHRSLYCSSTSCYRPYYYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV1-5	IGKJ4	IGKC
	clonotype299	CARRYSLYYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-5;IGKV3-11	IGKJ1;IGKJ5	IGKC;IGKC
	clonotype32	CARGRLVTARVEYFQHW	IGHV4-34	IGHJ1	IGHM				IGKV1-6	IGKJ1	IGKC
	clonotype3652	CARKAGHRRITVAANYYYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV1-6	IGKJ2	IGKC
	clonotype4088	CASGLRNWNDVSSRFDPW	IGHV4-34	IGHJ5	IGHM				IGKV1-8	IGKJ4	IGKC
	clonotype1632	CARGDYYGSGSLIWGSGWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV1-8	IGKJ1	IGKC
	clonotype65	CASLPRYSYGYYGVPNYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV1-8	IGKJ4	IGKC
	clonotype64	CARDPRKDGYCSSTSCPKYYYYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV1-8	IGKJ1	IGKC

	clonotype	CDR3	IGHV	IGHJ	IGHM	IGLV	IGLJ	IGLC	IGKV	IGKJ	IGKC
	clonotype2147	CARFRYCSSTSCYTRWDYYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV1-8	IGKJ4	IGKC
	clonotype2114	CARTPNIIARPFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-12	IGKJ1	IGKC
	clonotype1986	CARGTVTEDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-16	IGKJ1	IGKC
	clonotype243	CARGYYTVTSAYW	IGHV4-34	IGHJ4	IGHM				IGKV1-16	IGKJ2	IGKC
	clonotype4584	CARLPWLVRYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-17	IGKJ1	IGKC
	clonotype122	CARSPTGLRDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-17	IGKJ2	IGKC
	clonotype4656	CARGLLGSKDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-17	IGKJ1	IGKC
	clonotype622	CARGSSWLPVNW	IGHV4-34	IGHJ4	IGHM				IGKV1-17	IGKJ4	IGKC
	clonotype3514	CARGRSGYGSGSYDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-17	IGKJ1	IGKC
	clonotype5128	CARVSKWVAYVGFDPW	IGHV4-34	IGHJ5	IGHM				IGKV1-17	IGKJ1	IGKC
	clonotype797	CARGGLSGTIIAARPGGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV1-17	IGKJ2	IGKC
	clonotype2938	CARMSRIQLWLEANYYFYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV1-17	IGKJ1	IGKC
	clonotype3302	CARVGGSGSYQGFHYYYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV1-17	IGKJ3	IGKC
	clonotype3357	CARGPSRPRGVVVVPAAYNAFDIW	IGHV4-34	IGHJ3	IGHM				IGKV1-27	IGKJ4	IGKC
	clonotype5205	CARAAGYDSSQW	IGHV4-34	IGHJ4	IGHM				IGKV1-27	IGKJ1	IGKC
	clonotype865	CARGGRGLLRSPVYW	IGHV4-34	IGHJ4	IGHM				IGKV1-27	IGKJ4	IGKC
	clonotype2897	CASRRSGYSGYW	IGHV4-34	IGHJ4	IGHM				IGKV1-27	IGKJ1	IGKC
	clonotype4040	CAWGFYDILTGPLDAFDIW	IGHV4-34	IGHJ3	IGHM				IGKV1D-39	IGKJ1	IGKC
	clonotype473	CARSSAGGTTVFW	IGHV4-34	IGHJ4	IGHM				IGKV1D-39	IGKJ1	IGKC
	clonotype1398	CARVRLLRKTAMVIYYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1D-39	IGKJ2	IGKC
	clonotype5033	CARGVARRYYDRLHDYW	IGHV4-34	IGHJ4	IGHM				IGKV1D-39	IGKJ1	IGKC
	clonotype3753	CARRPRRDGYKRFRDYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1D-39	IGKJ2	IGKC
	clonotype1894	CARVPRFVYSSSSLYYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1D-39	IGKJ2	IGKC
	clonotype1572	CARGRQYCSSTSCYTGIIDRTYYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1D-39	IGKJ1	IGKC
	clonotype5374	CARPLYYYDSSGYSGW	IGHV4-34	IGHJ4	IGHM				IGKV1D-39	IGKJ2	IGKC
	clonotype864	CARDNYDFWSGYYTSGYDYW	IGHV4-34	IGHJ4	IGHM				IGKV1D-39	IGKJ4	IGKC
	clonotype3445	CARGRAGNGSGKRFDPW	IGHV4-34	IGHJ5	IGHM				IGKV1D-39	IGKJ2	IGKC
	clonotype2430	CARIRCSGGSCYPSWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV1D-39	IGKJ2	IGKC
	clonotype2544	CARVQTYKQVMRTKNWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV1D-39	IGKJ1	IGKC
	clonotype446	CARGRVAPVTFDPW	IGHV4-34	IGHJ5	IGHM				IGKV1D-39	IGKJ5	IGKC
	clonotype2321	CARGQDLRIFGAYYYYYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV1D-39	IGKJ4	IGKC
	clonotype5048	CARVGFLEWLSDDHYYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV1D-39	IGKJ2	IGKC
	clonotype4446	CARGQYDFWSGYYPDYYYYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV1D-39	IGKJ3	IGKC
	clonotype3639	CARGDDFWSGYYLYWYFDLW	IGHV4-34	IGHJ2	IGHM				IGKV1D-39;IGKV4-1	IGKJ4;IGKJ2	IGKC;IGKC
	clonotype1288	CARGRRTARTHFDYW	IGHV4-34	IGHJ4	IGHM	IGLV2-14	IGLJ1	IGLC1	IGKV1D-43	IGKJ4	IGKC
	clonotype1038	CAFRTQKWNGFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1D-8	IGKJ1	IGKC
	clonotype1221	CARGLPGYGSGSLTFSYW	IGHV4-34	IGHJ4	IGHM				IGKV2-24	IGKJ5	IGKC
	clonotype2806	CARSQRWLQVGHGFQHW	IGHV4-34	IGHJ1	IGHM				IGKV2-28	IGKJ5	IGKC
	clonotype3386	CARGLYCSSTSCYPYGFDPW	IGHV4-34	IGHJ5	IGHM				IGKV2-28	IGKJ2	IGKC
	clonotype337	CARVRVAAAYSRPYYYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV2-28	IGKJ2	IGKC
	clonotype5366	CARGSGYDFWSGYTNYYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV2-30	IGKJ1	IGKC
	clonotype5338	CARLKGRYSPAFVYW	IGHV4-34	IGHJ4	IGHM				IGKV2-30;IGKV4-1	IGKJ4;IGKJ4	IGKC;IGKC
	clonotype3160	CAGPNWNYASDDAFDIW	IGHV4-34	IGHJ3	IGHM				IGKV3-11	IGKJ2	IGKC
	clonotype3050	CARGLWLRLGYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV3-11	IGKJ4	IGKC
	clonotype3591	CARGDSTYGPYYYGSGSYGTYW	IGHV4-34	IGHJ4	IGHM				IGKV3-11	IGKJ2	IGKC
	clonotype2323	CARRALLQRGIVVVTKNWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV3-11	IGKJ2	IGKC
	clonotype3778	CARVLFRRSYYGSGSYRPGANWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV3-11	IGKJ1	IGKC
	clonotype4256	CARGKRAYYDFWS	IGHV4-34	IGHJ1	IGHM				IGKV3-15	IGKJ2	IGKC
	clonotype4682	CASVWFLAFDIW	IGHV4-34	IGHJ3	IGHM				IGKV3-15	IGKJ5	IGKC
	clonotype3489	CARPRRKHPLYDSSGFFDYW	IGHV4-34	IGHJ4	IGHM				IGKV3-15	IGKJ2	IGKC
	clonotype2846	CARRLGYSSGWTSRYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV3-15	IGKJ2	IGKC
	clonotype2582	CARSPPRYCSSSSCYKALDYW	IGHV4-34	IGHJ4	IGHM				IGKV3-15	IGKJ2	IGKC
	clonotype4193	CAKRKYGSGSYWLWWPFDYW	IGHV4-34	IGHJ4	IGHM				IGKV3-15	IGKJ2	IGKC
	clonotype2563	CARSKITMVRGVIITSYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV3-15	IGKJ4	IGKC

clonotype789	CARAVRDFWSGYQTTNDYW	IGHV4-34	IGHJ4	IGHM				IGKV3-15	IGKJ1	IGKC
clonotype2096	CARGGRPFVSGVPTATRYWYFDIW	IGHV4-34	IGHJ2	IGHM				IGKV3-20	IGKJ5	IGKC
clonotype2789	CARGLRLFLAAAGIW	IGHV4-34	IGHJ4	IGHM				IGKV3-20	IGKJ2	IGKC
clonotype238	CARGPEQLYAYW	IGHV4-34	IGHJ4	IGHM				IGKV3-20	IGKJ1	IGKC
clonotype5163	CARRGGVRRWLQQTPVDYW	IGHV4-34	IGHJ4	IGHM				IGKV3-20	IGKJ1	IGKC
clonotype3603	CARGRIPDSGSYKDW	IGHV4-34	IGHJ4	IGHM				IGKV3-20	IGKJ1	IGKC
clonotype3808	CARKNGGYYYVKPFDYW	IGHV4-34	IGHJ4	IGHM				IGKV3-20	IGKJ5	IGKC
clonotype3168	CARGLAVVRGVFGYW	IGHV4-34	IGHJ4	IGHM				IGKV3-20	IGKJ3	IGKC
clonotype1678	CARAYGSGSYLFYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV3-20	IGKJ1	IGKC
clonotype3091	CARGPVFGVVMIRPFQPW	IGHV4-34	IGHJ4	IGHM				IGKV3-20	IGKJ5	IGKC
clonotype4405	CARGPIVVVPAAILVSGGVSYYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV3-20	IGKJ4	IGKC
clonotype4219	CARVRPYYYGSGFLKGPFDYW	IGHV4-34	IGHJ4	IGHM				IGKV3-20	IGKJ3	IGKC
clonotype440	CARGGLWFGLRGKANWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV3-20	IGKJ4	IGKC
clonotype4062	CARGVSPWLFYWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV3-20	IGKJ1	IGKC
clonotype4764	CARVSRTTVTTGGWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV3-20	IGKJ1	IGKC
clonotype1862	CARGLRRVSGWYDYW	IGHV4-34	IGHJ5	IGHM				IGKV3-20	IGKJ5	IGKC
clonotype3411	CARGGPQAGTVPVGGDYYYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV3-20	IGKJ4	IGKC
clonotype2263	CARGYPIVVVPAAIDRSLSYYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV3-20	IGKJ1	IGKC
clonotype4669	CARGNLFIRGYTHGGGDYW	IGHV4-34	IGHJ4	IGHM				IGKV3D-15	IGKJ1	IGKC
clonotype4014	CAREVRLQLWLRGGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV3D-15	IGKJ2	IGKC
clonotype5039	CARRSGNSSGWYYPRPRAFDIW	IGHV4-34	IGHJ3	IGHM				IGKV4-1	IGKJ2	IGKC
clonotype1683	CARGPLTPGAFDIW	IGHV4-34	IGHJ3	IGHM				IGKV4-1	IGKJ1	IGKC
clonotype1310	CARVGPRGGYYKRAEFDYW	IGHV4-34	IGHJ4	IGHM				IGKV4-1	IGKJ4	IGKC
clonotype2954	CARGRSRVYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV4-1	IGKJ5	IGKC
clonotype2068	CASTHFGVVTDYW	IGHV4-34	IGHJ4	IGHM				IGKV4-1	IGKJ4	IGKC
clonotype604	CARGHRYNWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV4-1	IGKJ4	IGKC
clonotype2374	CARGRRQQRMGAWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV4-1	IGKJ2	IGKC
clonotype3229	CARGQPHRSWYAPGFDPW	IGHV4-34	IGHJ5	IGHM				IGKV4-1	IGKJ1	IGKC
clonotype3218	CARDKGLGYWARNYYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV4-1	IGKJ4	IGKC
clonotype3247	CARSRSYYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV4-1	IGKJ1	IGKC
clonotype5145	CARGRTRYCSSTSCYRAYYYYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV4-1	IGKJ1	IGKC
clonotype4706	CARDCCLKDGYYVEDYW	IGHV4-34	IGHJ4	IGHM	IGLV1-40	IGLJ2	IGLC2			
clonotype2790	CARGAALGYCSGGSCRHRRHRGWFDPW	IGHV4-34	IGHJ5	IGHM	IGLV1-40	IGLJ3	IGLC3			
clonotype5332	CARGGSLPANPMDVW	IGHV4-34	IGHJ6	IGHM	IGLV1-40	IGLJ2	IGLC2			
clonotype2350	CASLRYRAARYYYYGMDVW	IGHV4-34	IGHJ6	IGHM	IGLV1-40	IGLJ1	IGLC1			
clonotype3983	CARGMVRGVITTPGGMDVW	IGHV4-34	IGHJ6	IGHM	IGLV1-40	IGLJ2	IGLC3			
clonotype2511	CATLLGYCSGGSCYHNWFDPW	IGHV4-34	IGHJ5	IGHM	IGLV1-40;IGLV9-49	IGLJ1;IGLJ2	IGLC1;IGLC2			
clonotype4914	CARSSIVVVAAKNAFDIW	IGHV4-34	IGHJ3	IGHM	IGLV1-44	IGLJ2	IGLC2			
clonotype1843	CAREGYSNYWFDPW	IGHV4-34	IGHJ5	IGHM	IGLV1-44	IGLJ3	IGLC3			
clonotype3232	CARGLKWLVRGGYYGMDVW	IGHV4-34	IGHJ6	IGHM	IGLV1-44	IGLJ2	IGLC2			
clonotype636	CARGVTIFGEGVPFGYW	IGHV4-34	IGHJ4	IGHM	IGLV1-47	IGLJ3	IGLC3			
clonotype4421	CARVSSSWHKDYGMDVW	IGHV4-34	IGHJ6	IGHM	IGLV1-47	IGLJ2	IGLC2			
clonotype2042	CARRPYYDFWSGYYTGLLPLGGMDVW	IGHV4-34	IGHJ6	IGHM	IGLV1-47	IGLJ2	IGLC3			
clonotype42	CARGHRTRGYSYGYRNDAFDIW	IGHV4-34	IGHJ3	IGHM	IGLV1-51	IGLJ2	IGLC2			
clonotype4477	CATSSIAARWLGPSSVGRAAPFDYW	IGHV4-34	IGHJ4	IGHM	IGLV1-51	IGLJ2	IGLC2			
clonotype3331	CARYAPRAAQQWLVRVGYYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV1-51	IGLJ1	IGLC1			
clonotype3216	CASLYGSSAYFYYW	IGHV4-34	IGHJ4	IGHM	IGLV1-51	IGLJ2	IGLC3			
clonotype1508	CARRVVVVAGTNNWFDPW	IGHV4-34	IGHJ5	IGHM	IGLV1-51	IGLJ2	IGLC3			
clonotype4358	CARGGRTMTRRRNWFDPW	IGHV4-34	IGHJ5	IGHM	IGLV1-51	IGLJ3	IGLC3			
clonotype1469	CARGRYGDKNWFDPW	IGHV4-34	IGHJ5	IGHM	IGLV1-51	IGLJ3	IGLC3			
clonotype4462	CARGRGVWATRGYYYGLDVW	IGHV4-34	IGHJ6	IGHM	IGLV1-51	IGLJ1	IGLC1			
clonotype593	CARSPRHFPSYSRPNAFDIW	IGHV4-34	IGHJ3	IGHM	IGLV2-11	IGLJ3	IGLC3			
clonotype5289	CARWHRSHYYDSSGYYSRDYYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV2-11	IGLJ2	IGLC2			
clonotype4115	CAREHYDFWSGYYLVLDYW	IGHV4-34	IGHJ4	IGHM	IGLV2-11	IGLJ1	IGLC1			

	clonotype857	CARGHDFWSGYWGNWFDPW	IGHV4-34	IGHJ5	IGHM	IGLV2-11	IGLJ1	IGLC1			
	clonotype5130	CARNVVGGVAFEIW	IGHV4-34	IGHJ3	IGHM	IGLV2-14	IGLJ2	IGLC3			
	clonotype1614	CARGRYW	IGHV4-34	IGHJ4	IGHM	IGLV2-14	IGLJ2	IGLC2			
	clonotype1728	CARGPVVPAAIHYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV2-14	IGLJ2	IGLC3			
	clonotype3721	CARVAGYYYDSSGYSYYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV2-14	IGLJ1	IGLC1			
	clonotype1690	CARGPLNIGNWNYLPRPLYYYGMDVW	IGHV4-34	IGHJ6	IGHM	IGLV2-14	IGLJ3	IGLC3			
	clonotype2792	CARGSRDHSSGWYRFHYGMDVW	IGHV4-34	IGHJ6	IGHM	IGLV2-14	IGLJ1	IGLC1			
	clonotype4122	CQTRSWRGDPLKVW	IGHV4-34	IGHJ2	IGHM	IGLV2-23	IGLJ2	IGLC3			
	clonotype4798	CARGTAAYYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV2-23	IGLJ1	IGLC1			
	clonotype792	CAGRIAVSEAGAYW	IGHV4-34	IGHJ4	IGHM	IGLV2-23	IGLJ2	IGLC3			
	clonotype784	CARSRGWYSGVRFDPW	IGHV4-34	IGHJ5	IGHM	IGLV2-23	IGLJ2	IGLC2			
	clonotype3989	CARGLVRFRRGGGYW	IGHV4-34	IGHJ4	IGHM	IGLV2-8	IGLJ2	IGLC2			
	clonotype940	CAAGLHARGDDAFDIW	IGHV4-34	IGHJ3	IGHM	IGLV3-1	IGLJ2	IGLC2			
	clonotype539	CARGRGDGYNLDYW	IGHV4-34	IGHJ4	IGHM	IGLV3-1	IGLJ2	IGLC2			
	clonotype920	CARGPWDIVVVPAAPPGWWFDPW	IGHV4-34	IGHJ5	IGHM	IGLV3-1	IGLJ2	IGLC2			
	clonotype4745	CAREPIPSLRVVNFSGFDVW	IGHV4-34	IGHJ6	IGHM	IGLV3-1	IGLJ2	IGLC2			
	clonotype1939	CALPPHRRYYDFWSGYSFQHW	IGHV4-34	IGHJ1	IGHM	IGLV3-19	IGLJ2	IGLC3			
	clonotype2551	CARGNTYDSRYFDLW	IGHV4-34	IGHJ2	IGHM	IGLV3-19	IGLJ2	IGLC2			
	clonotype318	CARAGIGVARPYYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV3-19	IGLJ2	IGLC2			
	clonotype1577	CARPGRGWQQYTFDYW	IGHV4-34	IGHJ4	IGHM	IGLV3-19	IGLJ2	IGLC3			
	clonotype1479	CARGVIGYCSSTSCGLRIQLWLYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV3-19	IGLJ3	IGLC3			
	clonotype383	CARGFYDSSGYYLSLFDYW	IGHV4-34	IGHJ4	IGHM	IGLV3-19	IGLJ1	IGLC1			
	clonotype3549	CARGGRGYDSSGYYGYW	IGHV4-34	IGHJ4	IGHM	IGLV3-19	IGLJ1	IGLC1			
	clonotype4907	CARGRKGVYILTGYLDYW	IGHV4-34	IGHJ4	IGHM	IGLV3-19	IGLJ2	IGLC2			
	clonotype1318	CARLWFTRKILYSYGYNRWFDPW	IGHV4-34	IGHJ5	IGHM	IGLV3-19	IGLJ2	IGLC2			
	clonotype2235	CARAVYYASWFDPW	IGHV4-34	IGHJ5	IGHM	IGLV3-19	IGLJ2	IGLC3			
	clonotype4325	CARAMGIVVVPAAINWFDPW	IGHV4-34	IGHJ5	IGHM	IGLV3-19	IGLJ2	IGLC3			
	clonotype1785	CARGGYSYGYDWFDPW	IGHV4-34	IGHJ5	IGHM	IGLV3-19	IGLJ2	IGLC2			
	clonotype1457	CARGRLWFGELHYYYYGMDVW	IGHV4-34	IGHJ6	IGHM	IGLV3-19	IGLJ2	IGLC2			
	clonotype4234	CARPRQGVW	IGHV4-34	IGHJ6	IGHM	IGLV3-19	IGLJ2	IGLC3			
	clonotype1578	CARDCYYGFYGMDVW	IGHV4-34	IGHJ6	IGHM	IGLV3-25	IGLJ3	IGLC3			
	clonotype715	CARAPRHYYYDSSGYYQGSREYYGMDVW	IGHV4-34	IGHJ6	IGHM	IGLV3-25	IGLJ2	IGLC3			
	clonotype4956	CARRLAVAGTVDYW	IGHV4-34	IGHJ4	IGHM	IGLV7-43	IGLJ3	IGLC3			
	clonotype2914	CARGLGWCSSTSCQPKKAMDVW	IGHV4-34	IGHJ6	IGHM	IGLV7-43	IGLJ3	IGLC3			
	clonotype1117	CARGHYDYVWGSYRNEPSPLRAVW	IGHV4-34	IGHJ6	IGHM	IGLV9-49	IGLJ3	IGLC3			

Sample	clonotype_id	igh_cdr3s	igh_v–genes	igh_j	igh_c	igl_v–genes	igl_j	igl_c	igk_v_genes	igk_j	igk_c
HC-19	clonotype916	CARGRRYCSGGSCYEFRRRLWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV1-5	IGKJ3	IGKC
	clonotype1032	CARGDWLTPNLHNYYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV1-5	IGKJ1	IGKC
	clonotype1026	CARIRVRPHYYVKSSYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-8	IGKJ1	IGKC
	clonotype1400	CARASTYGGNIYYYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV1-8	IGKJ2	IGKC
	clonotype428	CARGPSQETLVGFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-9	IGKJ1	IGKC
	clonotype1185	CARGRPSKTFYDNKYVMDVW	IGHV4-34	IGHJ6	IGHD				IGKV1-9	IGKJ1	IGKC
	clonotype1310	CARGRVVPYVPKYYFDYW	IGHV4-34	IGHJ4	IGHD				IGKV1-16	IGKJ2	IGKC
	clonotype451	CAREKVNPLQSFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1-17	IGKJ1	IGKC
	clonotype1677	CAREVEYCGGDCHWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV1-17	IGKJ4	IGKC
	clonotype1957	CARGLGYGGNSRFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1D-39	IGKJ1	IGKC
	clonotype356	CARGFWYSSPPVDW	IGHV4-34	IGHJ4	IGHM				IGKV1D-39	IGKJ1	IGKC
	clonotype1416	CARGMSPYSGHNNWAFDYW	IGHV4-34	IGHJ4	IGHM				IGKV1D-39	IGKJ2	IGKC
	clonotype38	CARVSGYCSSTSCYRGYYYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV1D-39	IGKJ2	IGKC
	clonotype61	CARGLLGISGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV1D-39	IGKJ1	IGKC
	clonotype189	CARRLPRVVGSSVDAFDIW	IGHV4-34	IGHJ3	IGHD				IGKV1D-39	IGKJ1	IGKC
	clonotype553	CARGEYYYDSSGYYYYYYGMDVW	IGHV4-34	IGHJ6	IGHD				IGKV1D-39	IGKJ1	IGKC
	clonotype81	CARGKMAVAGRNSPDFDYW	IGHV4-34	IGHJ4	IGHM				IGKV2-24	IGKJ4	IGKC

	clonotype	sequence	IGHV	IGHJ	IGHM/D	IGLV	IGLJ	IGLC	IGKV	IGKJ	IGKC
	clonotype1255	CARKNLKIGRGYSYGPTRYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV2-28	IGKJ1	IGKC
	clonotype499	CARSLFDIW	IGHV4-34	IGHJ3	IGHM				IGKV2D-29	IGKJ4	IGKC
	clonotype374	CARSLFDIW	IGHV4-34	IGHJ3	IGHM				IGKV2D-29	IGKJ4	IGKC
	clonotype2094	CARGRRIVSGYSSGWYRPRYYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV2D-29	IGKJ2	IGKC
	clonotype1522	CARGRGDYRTSTTDYYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV2D-29	IGKJ4	IGKC
	clonotype779	CARGLGTTKRRTGFDIW	IGHV4-34	IGHJ3	IGHM				IGKV3-11	IGKJ4	IGKC
	clonotype911	CASLNIAAHGW	IGHV4-34	IGHJ4	IGHM				IGKV3-11	IGKJ4	IGKC
	clonotype243	CARVAIAVSYYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV3-15	IGKJ4	IGKC
	clonotype105	CARGEYYYDSSGYYYYYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV3-15	IGKJ1	IGKC
	clonotype549	CARGFDVDIVATMSTFRAFDIW	IGHV4-34	IGHJ3	IGHD				IGKV3-15	IGKJ5	IGKC
	clonotype608	CARVPGAFDIW	IGHV4-34	IGHJ3	IGHM				IGKV3-20	IGKJ2	IGKC
	clonotype1811	CARGGYYDSSGYPTPGWGFFDYW	IGHV4-34	IGHJ4	IGHM				IGKV3-20	IGKJ2	IGKC
	clonotype102	CARGRRPYYLGVFDPW	IGHV4-34	IGHJ5	IGHM				IGKV3-20	IGKJ1	IGKC
	clonotype391	CARAYCSNISCYPYNWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV3-20	IGKJ1	IGKC
	clonotype330	CASSDVRTVTTRPHYYYYYGMDVW	IGHV4-34	IGHJ6	IGHM				IGKV3-20	IGKJ1	IGKC
	clonotype1585	CARGPGSSSPYRKYYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV3D-15	IGKJ4	IGKC
	clonotype1057	CARGQHQYYYGSGSPGFDYW	IGHV4-34	IGHJ4	IGHM				IGKV3D-15	IGKJ3	IGKC
	clonotype77	CARGRHGSREIGGWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV3D-15	IGKJ1	IGKC
	clonotype1452	CARGYGPRADQMIVVVITGSSWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV3D-15	IGKJ5	IGKC
	clonotype1535	CARRVGYCSSTSCYHPPSNWYFDLW	IGHV4-34	IGHJ2	IGHM				IGKV4-1	IGKJ3	IGKC
	clonotype576	CARGKRGYSYGFWAFDIW	IGHV4-34	IGHJ3	IGHM				IGKV4-1	IGKJ2	IGKC
	clonotype2001	CAGGYSSGWIANLDYW	IGHV4-34	IGHJ4	IGHM				IGKV4-1	IGKJ4	IGKC
	clonotype293	CTRGEDYYKQGYW	IGHV4-34	IGHJ4	IGHM				IGKV4-1	IGKJ1	IGKC
	clonotype1566	CARALPPVEMATISRDGAGYYFDYW	IGHV4-34	IGHJ4	IGHM				IGKV4-1	IGKJ4	IGKC
	clonotype1359	CARAVPQRIAVAGTRVSPVWFDPW	IGHV4-34	IGHJ5	IGHM				IGKV4-1	IGKJ1	IGKC
	clonotype588	CARAPSIRVVVAATGMWFDPW	IGHV4-34	IGHJ5	IGHD				IGKV4-1	IGKJ1	IGKC
	clonotype175	CARESSSSVVDYW	IGHV4-34	IGHJ4	IGHM	IGLV1-40	IGLJ2	IGLC2			
	clonotype2007	CARARDIVVVVAATHFDYW	IGHV4-34	IGHJ4	IGHM	IGLV1-40	IGLJ2	IGLC2			
	clonotype1332	CARGTAGDSTPKDWFDPW	IGHV4-34	IGHJ5	IGHM	IGLV1-40	IGLJ3	IGLC3			
	clonotype669	CARGQADSRIAARPDWVPRGVWFDPW	IGHV4-34	IGHJ5	IGHM	IGLV1-40	IGLJ3	IGLC3			
	clonotype194	CARGVGGIAAANYRMDVW	IGHV4-34	IGHJ6	IGHM	IGLV1-40	IGLJ2	IGLC2			
	clonotype521	CARIIVVVPAAIYGMDVW	IGHV4-34	IGHJ6	IGHM	IGLV1-40	IGLJ3	IGLC3			
	clonotype2098	CARGPVHPEKRGGEDYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV1-44	IGLJ2	IGLC2			
	clonotype1759	CARAIGGYYRFVYYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV1-47	IGLJ3	IGLC3			
	clonotype92	CARDPEYYYDSSGYFGPEYYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV1-47	IGLJ3	IGLC3			
	clonotype1448	CARGGRYYTKEELRRGSRFYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV1-51	IGLJ2	IGLC2			
	clonotype930	CARALQGSSGYYYRCPYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV1-51	IGLJ3	IGLC3			
	clonotype625	CAREGDPGIAVAGFDYW	IGHV4-34	IGHJ4	IGHM	IGLV2-11	IGLJ3	IGLC3			
	clonotype965	CARSIAAAGTSGVRYFDLW	IGHV4-34	IGHJ2	IGHM	IGLV2-14	IGLJ2	IGLC2			
	clonotype1396	CARGKLGPYSYAPPHSFDFDYW	IGHV4-34	IGHJ4	IGHM	IGLV2-14	IGLJ2	IGLC2			
	clonotype734	CARELPYGVVIPHYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV2-14	IGLJ3	IGLC3			
	clonotype895	CARGIAWGYDSSGYHKGYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV2-14	IGLJ3	IGLC3			
	clonotype756	CAGALPELPPYAFDYW	IGHV4-34	IGHJ4	IGHD	IGLV2-18	IGLJ3	IGLC3			
	clonotype1972	CARSWENSSGYYYDYW	IGHV4-34	IGHJ4	IGHM	IGLV2-23	IGLJ2	IGLC2			
	clonotype557	CARVHQLVDIRDWFDPW	IGHV4-34	IGHJ5	IGHM	IGLV3-1	IGLJ2	IGLC2			
	clonotype1717	CARGYIVVVPAATVNYFDYW	IGHV4-34	IGHJ4	IGHM	IGLV3-19	IGLJ2	IGLC2			
	clonotype1466	CARGRVIGLGSRYYDFWSGSHMDVW	IGHV4-34	IGHJ6	IGHM	IGLV3-19	IGLJ2	IGLC2			
	clonotype1549	CARGHFHPLDTSGGSSRSWWFDPW	IGHV4-34	IGHJ5	IGHD	IGLV3-19	IGLJ2	IGLC2			
	clonotype1165	CARGTPPLSSGWYRGWFDPW	IGHV4-34	IGHJ5	IGHM	IGLV3-9	IGLJ2	IGLC2			
	clonotype1550	CARGALNLFVYLNRQTPGKRGIFDYW	IGHV4-34	IGHJ4	IGHM	IGLV9-49	IGLJ3	IGLC3			

Sequences from each sample are organized by VK followed by VL gene expression