

Supporting Figures

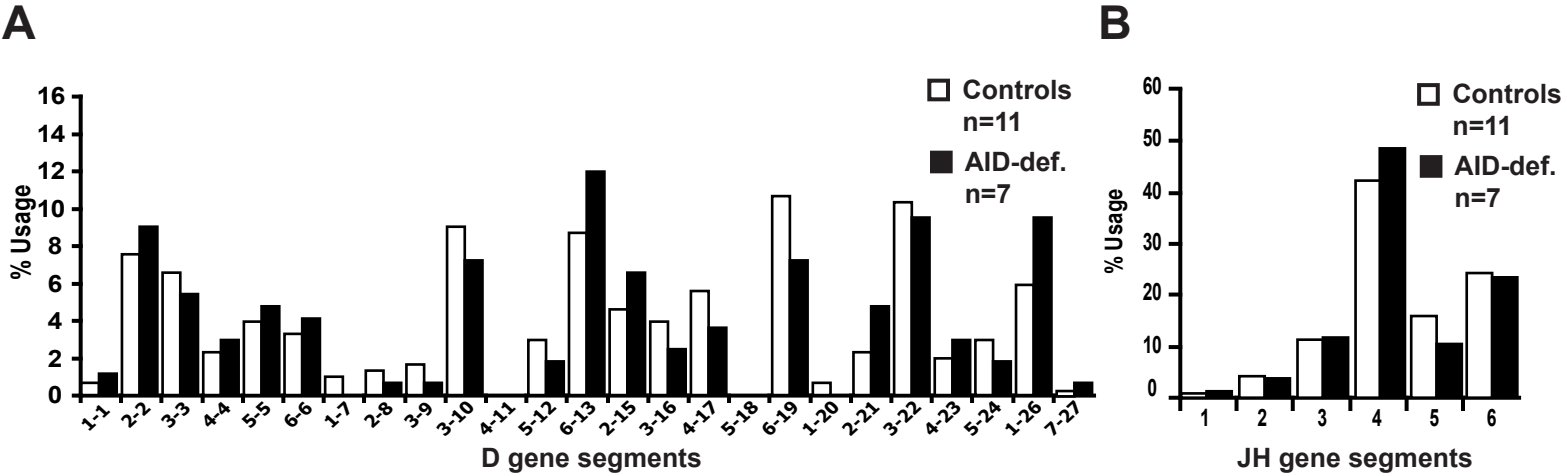


Fig. S1. D and JH gene segment usage for AID-deficient and healthy donor transitional B cells. **(A)** D gene usage frequencies in new emigrant/transitional B cells are represented for 11 healthy controls and 7 AID-deficient patients. Sequences from 353 healthy control and 189 AID-deficient single B cells were pooled. JH gene frequencies are represented in **(B)**.

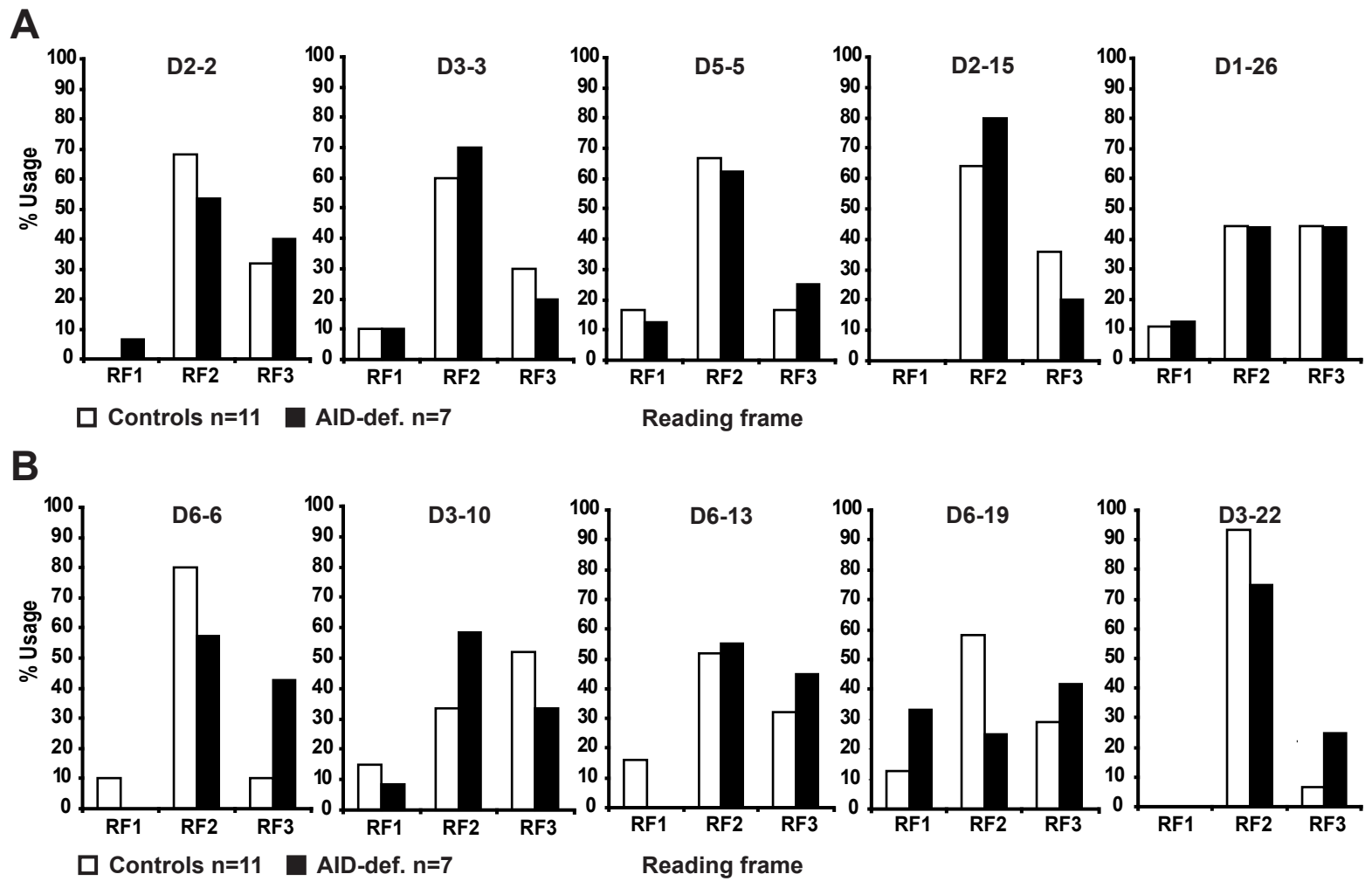


Fig. S2. Reading frame (RF) usages for frequently-used D genes are compared between new emigrant/transitional B cells from 11 healthy controls (open rectangles) and 7 AID-deficient patients (solid rectangles). **(A)** Half of the most-used D1, D2, D3 and D5 genes utilize similar reading frames in controls and patients. **(B)** In contrast, D6 and some D3 family members mostly utilize RF3 encoding hydrophobic residues favoring autoreactivity.

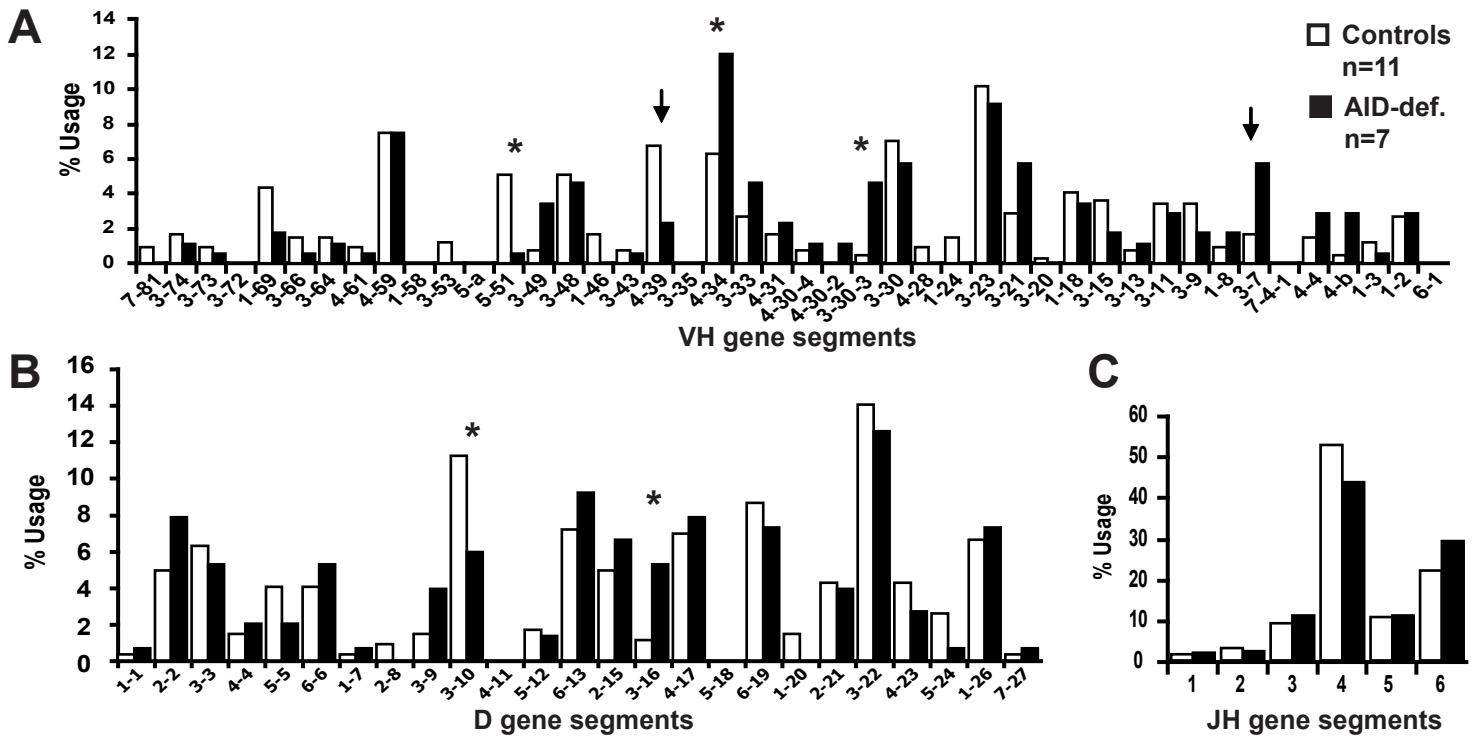


Fig. S3. VH, D and JH gene segment usage for AID-deficient and healthy donor mature naïve B cells. **(A)** V heavy chain gene usage frequencies in mature naïve B cells are represented for 11 healthy controls and 7 AID-deficient patients. Sequences from 409 healthy control and 172 AID-deficient single B cells were pooled. D and JH gene frequencies are represented in **(B)** and **(C)**, respectively. Statistically significant differences between patients and controls are indicated with stars. Nearly statistically significant differences are indicated with arrows.

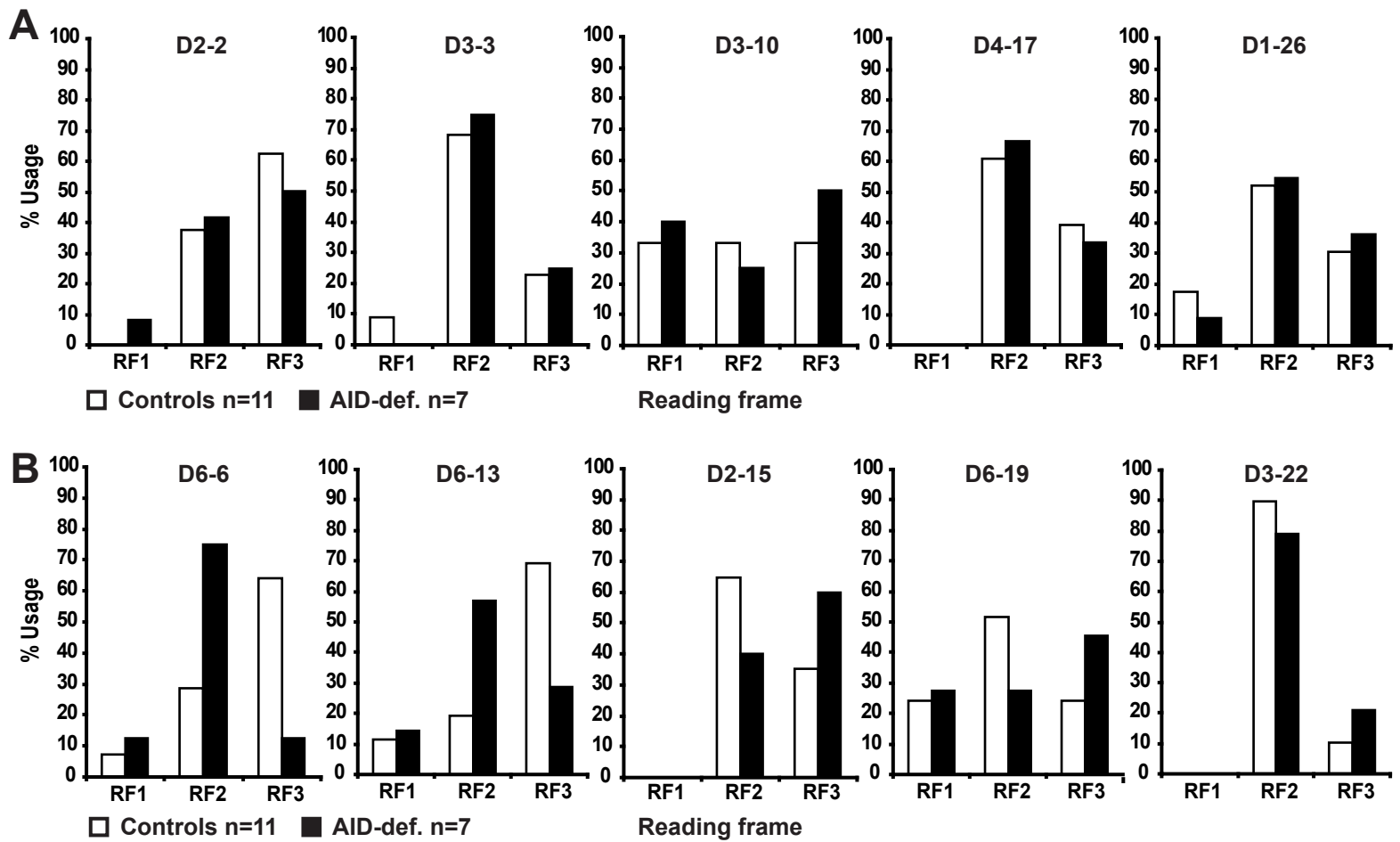


Fig. S4. Reading frame (RF) usages for frequently-used D genes are compared between mature naïve B cells from 11 healthy controls (open rectangles) and 7 AID-deficient patients (solid rectangles). **(A)** Half of the most-used D1, D2, D3 and D4 genes utilize similar reading frames in controls and patients. **(B)** In contrast, D6 and some D2 and D3 family members mostly utilize RF3 encoding hydrophobic residues favoring autoreactivity.

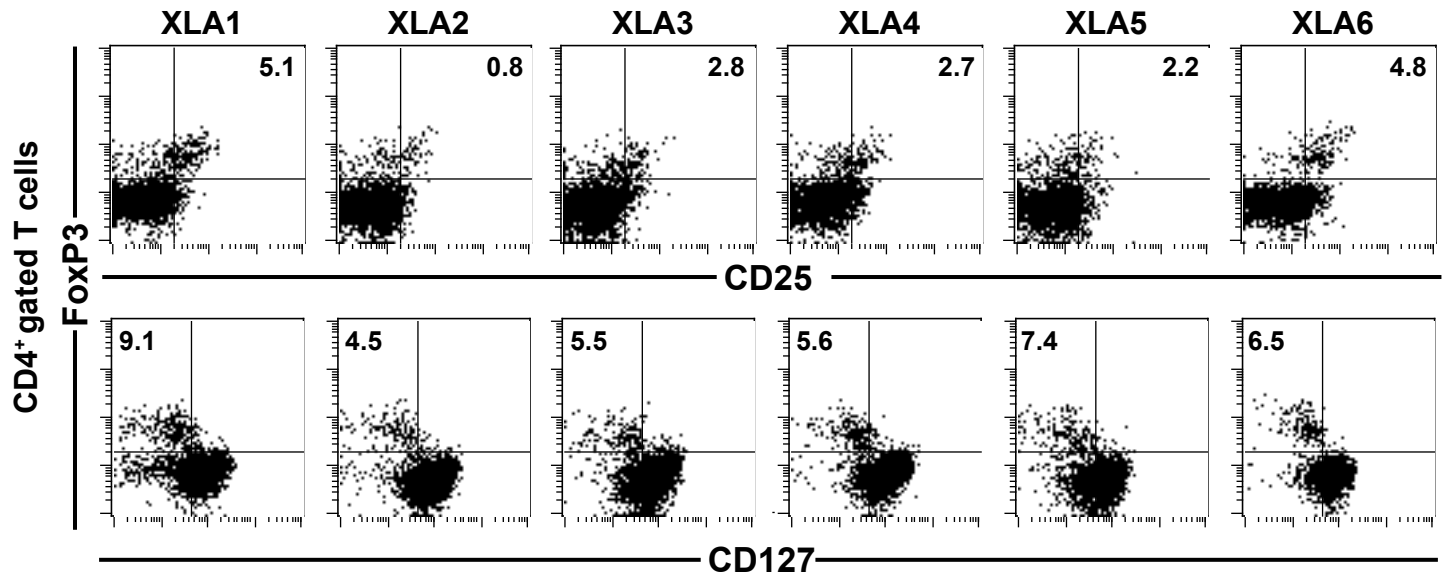


Fig. S5. Low Treg cell frequency in XLA patients. Treg cell frequencies among peripheral CD4⁺ T cells were assessed by analyzing the proportion of CD25⁺ FoxP3⁺ (top) and CD127^{-/-} FoxP3⁺ (bottom) T cells from 6 XLA patients.

Supporting Tables

Table S1. Characteristics of AID-deficient patients.

Patient number	Ethnic group	Sex	Age at diagnosis	Current age	Serum immunoglobins in mg/dl			Clinical Manifestations	Mutation in AICDA gene	Mutation in AID
					IgM	IgA	IgG			
1	Moroccan	M	5	22	240	<7	40	lymphoid hyperplasia, recurrent infections	203G>A / 175-184 del	W68X / H25 - E58 del insV
2	Moroccan	M	1	16	150	<7	<6	recurrent infections	203G>A / 175-184 del	W68X / H25 - E58 del insV
3	Turkish	M	45	51	1220	42	170	ITP, splenectomy, lymphoid hyperplasia, lymphoma	522A>C / 522A>C	R174S / R174S
4	Moroccan	M	1	20	100	<7	<6	lymphoid hyperplasia, recurrent infections	203G>A / del	W68X / 0
5	Turkish	M	11	21	1150	<5.8	264	lymphoid hyperplasia, recurrent infections	415A>G / 415A>G	M139V / M139V
6	Pakistani	M	4	4	4000	<7	<7	recurrent infections	394G>C / 394G>C	A132P / A132P
7	French Canadian	F	2	22	479	<20	na	lymphoid hyperplasia, mild ITP	334C>T / 334C>T	R112C / R112C
8	French Canadian	F	28	60	8830	<60	na	lymphoid hyperplasia, recurrent infections	334C>T / 334C>T	R112C / R112C
9	French Canadian	F	5	26	451	<30	178	lymphoid hyperplasia, recurrent infections	334C>T / 334C>T	R112C / R112C
10	French Canadian	F	3	22	621	40	60	recurrent infections	334C>T / 334C>T	R112C / R112C
11	French Canadian	M	2	50	6800	<60	na	recurrent infections	334C>T / 334C>T	R112C / R112C

na - not available

Table S2. Repertoire of antibodies from new emigrant B cells of AID-deficient patient 1.

Ig	HEAVY					
	VH	D	RF	JH	CDR3 (aa)	Length
neAID1 03	3-30	6-13	3	6	DLNSGIAAAATSYYYGMDV	19
neAID1 04	4-34	2-2	3	4	GSIVVVPAQVAAPFDY	16
neAID1 05	3-33	6-19	2	2	DFAEDSSGWYPPSLGWYFDL	20
neAID1 06	3-15	5-5	3	4	AVDTALDY	8
neAID1 07	3-9	6-19	3	4	GIHFVAPTRYFDY	14
neAID1 08	4-61	5-24	2	4	DNYNCPDY	8
neAID1 09	4-39	1-26	2	3	RGYSGSYSFFGDAFDI	16
neAID1 11	3-15	3-10	3	4	TTDPAIPLRGVSPWDY	16
neAID1 12	4-39	2-15	2	6	HFRVGGGSGTGYYYMDV	17
neAID1 13	3-23	2-21	3	4	SHIVVVTAIWELDY	14
neAID1 15	5-a	2-2	3	5	GPDIVVVPAIGWWFDP	17
neAID1 16	4-61	1-26	3	6	ERGSIVGAHYYYGMDV	17
neAID1 17	3-23	5-24	1	4	DGLVERWLRNYFDY	14
neAID1 19	3-23	3-3	2	6	AVADDFWSGNYYYYGMDV	18
neAID1 21	3-15	6-19	3	4	DREAVAGTGHY	11
neAID1 24	4-59	6-13	2	6	VGYSWYDYYYGMDV	16
neAID1 25	3-66	/	/	6	HPPAGPFQANYYYYMDV	18
neAID1 27	1-8	6-6	3	6	QSARLYYYGMDV	13
neAID1 28	4-31	2-15	2	3	EGLWDCSGGSCYQIDAFDI	20
neAID1 29	1-2	2-2	2	6	GYCSSTSCFLSHTRYYYGMDV	21
neAID1 30	4-34	2-21	3	4	GGRKGVVTAITY	12
neAID1 31	3-53	5-12	3	6	AVFVATIRETYGMDV	15
neAID1 32	3-66	2-21	2	4	GALPYCGGDCYSHY	14
neAID1 35	3-30	5-5	2	6	GSDGYSYGSPYYYYGMDV	19
neAID1 36	1-24	6-19	3	4	VPRIAVAGYYFDY	13
neAID1 37	4-39	3-22	3	3	RTPTMIVVVDKDSPPDAFDI	20
neAID1 38	4-39	/	/	4	HGGLDPFDY	9
neAID1 39	4-39	4-23	3	4	LREAWATVTPYYFDY	17
neAID1 40	3-15	5-5	2	3	DYSPEPPYSYGTIDAFDI	18
neAID1 41	3-9	1-26	3	5	GSVGGRLGNWFDP	13
		4-23	1			
neAID1 42	4-34	2-2	2	6	KGNCSTSCSPYGMDV	16
neAID1 43	3-49	1-26	1	4	VDTWELLRN	9
neAID1 44	4-39	3-22	2	4	HRTYYDSSGYPPFDY	15
neAID1 45	1-2	/	/	5	DLDRDWFDP	9
neAID1 46	3-7	/	/	5	DLVPVGVYSPRVGATSRESNWFDP	25
neAID1 47	3-23	3-3	2	5	DPVRHTYYDFWSGYQNWFDP	20
neAID1 48	3-11	3-22	2	3	DGPYYYDRSAFDI	13

RF, reading frame

Table S3. Repertoire of antibodies from mature naïve B cells of AID-deficient patient 1.

Ig	HEAVY					
	VH	D	RF	JH	CDR3 (aa)	Length
mAID1 01	4-59	6-13	2	5	QREGSSSWYKRAWFDP	17
mAID1 02	3-74	2-15	3	4	DLEDIVVVVAATTFGY	16
mAID1 03	3-48	/	/	6	ANAGGRNYYYYGMDV	15
mAID1 04	3-64	3-3	2	6	GWAGGGYPHDYYMDV	15
mAID1 06	4-34	3-22	2	4	SLYDSSGTRGGFDY	15
mAID1 07	3-48	6-13	2	4	GGSSRA	6
mAID1 08	4-59	/	/	6	SPVADYYYYMDV	12
mAID1 09	4-34	6-13	3	6	GEAAAGNYYYYYMDV	16
mAID1 10	4-34	2-2	3	6	DLGTADIVVPAAMMEDYYGMDV	23
mAID1 11	4-34	3-3	3	6	AITIFGVVIPTYYYYYMDV	19
mAID1 14	3-23	3-22	2	4	EYYDSSGYREPEIDY	15
mAID1 21	3-49	2-2	2	4	LQYEYCSSTSCLYFFDY	17
mAID1 22	4-34	4-17	2	5	THDDYGDSNWFDP	13
mAID1 25	3-30-3	2-2	2	6	DLYQLLPGYYYYYYMDV	17
mAID1 27	3-21	/	/	6	EGEGYYYGMDV	11
mAID1 32	3-11	3-9	2	5	DILTGASSLDP	11
mAID1 36	3-33	1-7	3	5	SGITGTTDRCWFDP	14
mAID1 37	4-30-2	3-10	3	5	RSITMVRGVISNWFDP	16
mAID1 40	1-8	2-2	1	6	TPENRYQLFPFASFSDPAYYYYGMDV	26
mAID1 41	3-23	6-6	1	6	AGFKQLVPHLYYYGMDV	17
mAID1 43	4-39	6-6	2	4	LNEYSSSTFDY	11
mAID1 46	4-59	2-2	3	6	DRGVVPAAMHMDV	13
mAID1 48	3-21	3-22	3	4	GRTMIVVVTNPFDY	14

RF, reading frame

Table S4. Repertoire and reactivity of antibodies from new emigrant B cells of AID-deficient patient 2.

Ig	HEAVY						LIGHT						REACTIVITY		
	VH	D	RF	JH	CDR3 (aa)	Length	Vκ	Jκ	CDR3 (aa)	Length	Poly	Hep2	Staining		
neAID2 02	4-34	6-6	2	4	SWEYSSSRCCLDY	13	3-20	1	QQYGKT	6	-	+	c		
neAID2 08 #	4-30-4	6-13	2	4	SGYSSSWLLFDY	12	1-5	4	QQYNSYSLT	9					
neAID2 12	3-11	2-2	3	5	DVGGLVVVPAASWFDP	16	1-39	2	QQSYSTPGYT	10	+	+	c		
neAID2 19	3-7	3-22	2	3	EGRDYDSSGPRNAFDI	17	3-20	2	QQYGSSPRYT	10	-	-	-		
neAID2 20	4-61	2-21	3	5	ELMVVTAYHNWFDP	14	1-8	4	QQYYSYPLT	10	+	+	c		
neAID2 28	4-30-4	/	/	6	EALTLRRAIYMDV	14	3-20	1	QQYGSSPRT	9	+	+	-		
neAID2 29	3-23	1-26	2	4	IPGRVSDDSGGH	12	1-39	2	QQSYSTPLGYT	11	-	-	-		
neAID2 31	1-18	3-22	2	4	DKDSSGYGY	10	1-5	4	QQYNSL	6	-	-	-		
neAID2 35	4-34	3-16	1	4	LMTGLGELS	9	3-11	2	QQRSNWSYT	9	+	+	-		
neAID2 36	4-34	3-3	1	4	ATSVLRFLEWLSTYYFDY	18	3-11	3	QQRSNWPL	8	+	+2	-		
neAID2 37	3-21	3-22	2	4	LRGSGYYYASYFDY	15	3-11	2	QQRSNWPPGYT	11	+2	+2	F		
neAID2 38	3-11	2-2	2	4	DPNPLYCSSTSCYVVDY	17	1-5	5	QQYNSYSIT	9	-	-	-		
neAID2 41	1-3	/	/	4	DKGDETLDSYFDY	13	1-12	3	QQANSFPFT	9	-	-	-		
neAID2 42	4-34	3-22	2	6	VGDYDSSGNYMDV	14	1-5	2	QQYNSYSYT	9	-	-	-		
neAID2 43	1-18	4-17	2	2	DALRRYGDYHYLYWYFDL	19	3-20	1	QQYGSSLWT	9	-	+	-		
neAID2 45	3-23	3-10	2	4	GGLDYYGSGSYFDY	14	1-8	3	QQYYSYPT	9	+	+	F		
neAID2 01							1-39	1	QQSYSTPWT	9					
neAID2 03							2-28	1	MQALQTPGTWT	11					
neAID2 07							1-5	5	QQYNSYSQIT	10					
neAID2 10							4-1	4	QQYYSTPLT	9					
neAID2 15							1-5	1	QQYNSYSPWT	10					
neAID2 26							3-20	1	QQYGSSPPWT	10					
neAID2 32							1-5	2	QQYNSYLHT	9					
neAID2 34							3D-20	4	QQYGSSPLT	9					
neAID2 40							3-15	2	QQYNNWPHT	9					
neAID2 46							1-39	3	QQSYSTPIT	9					
	VH	D	RF	JH	CDR3 (aa)	Length	Vλ	Jλ	CDR3 (aa)	Length	Poly	Hep2	Staining		
neAID2 14 #	3-23	3-22	2	4	DRDLQHYSYGYYPEYFDY	19	3-10	3	YSTDSSGSV	9					
neAID2 17	3-43	1-26	2	4	DFTTSGSYEVPDY	14	1-47	3	AAWDDNLSGWV	11	-	-	-		
neAID2 22	1-2	6-19	1	4	QQWLVRGVGNFDY	13	1-44	3	AAWDDSLNGPV	11	+	+	-		
neAID2 23	4-34	4-4	2	5	GGRNYVPPSEWFDP	15	2-11	2	CSYAGSYTFV	10	-	-	-		
neAID2 47	4-31	4-4	3	3	AGSTTVTTGYAFDI	14	3-21	2	QVWDDSSDHVV	11	-	-	-		
	VH	D	RF	JH	CDR3 (aa)	Length	V	J	CDR3 (aa)	Length	Poly	Hep2	Staining		
neAID2 11	3-21	3-22	3	4	DNTMIVVVIDY	11									

RF, reading frame; #, antibody failed to be expressed

-, non-reactive; +, reactive; +2, highly reactive

c, diffuse cytoplasmic staining; A, actin staining; G, Golgi staining; M, mitochondria staining; MS, mitotic spindle staining; N, nuclear staining; F, cytoplasmic fibers

Table S5. Repertoire and reactivity of antibodies from mature naïve B cells of AID-deficient patient 2.

Ig	HEAVY					LIGHT					REACTIVITY		
	VH	D	RF	JH	CDR3 (aa)	Length	Vκ	Jκ	CDR3 (aa)	Length	Poly	Hep2	Staining
mAID2 01 #	3-23	3-3	2	4	RFDYDFWSGYTDDY	14	1-6	5	LQDYNYPPIT	10			
mAID2 02	4-31	2-21	2	4	APSLAYCGGDCYSMVSHFDY	20	1-39	4	QQSYSTPLT	9	-	-	-
mAID2 04	1-18	6-13	2	6	DLRAVETHDPYSSSWYLGPFYGMVDV	25	3-11	5	QQRGNT	6	+	+	-
mAID2 07	4-34	1-26	1	4	GGQELLRRRQTKGGFDY	17	1-27	1	QKYNSAPRT	9	+2	+2	N
mAID2 11 #	3-30-3	2-21	3	6	GVVTEYYYYYMDV	13	3-15	4	QQYNNWPPL	9			
mAID2 15	3-30	3-3	2	6	DGNYDFWSGYTWPVYYYYMDV	22	3-15	3	QQYNNWPL	8	+2	+	N
mAID2 17	3-49	3-16	3	4	VDMITFGGVRGEDY	14	3-11	4	QQRSNWPLT	9	-	+	-
mAID2 18	4-59	4-17	2	2	PLDGDYWFYDL	11	4-1	4	QQYYSTPLT	9	-	-	-
mAID2 24	3-11	2-21	2	1	DTCGGNCYSGSVEYFQH	17	1-5	1	QQYNSYLRT	9	-	-	-
mAID2 29 #	4-34	3-10	1	4	AIGYKLWFGELSLSTPYFFDY	21	1-27	5	QKYNSAPLT	9			
mAID2 40	3-15	1-1	2	6	TSRNWNDGYYYYYMDV	16	3-20	1	QQYGSSRWT	9	-	-	-
mAID2 45	3-43	3-22	2	4	DAVGGYYYVFDY	12	1-5	3	QQYNSYPIT	9	-	-	-
mAID2 48	4-59	6-13	2	3	DQHSSSWYDAFDI	13	1-8	1	QQYYSPRT	9	+	+	c
	VH	D	RF	JH	CDR3 (aa)	Length	Vλ	Jλ	CDR3 (aa)	Length	Poly	Hep2	Staining
mAID2 01					see kappa		1-40	1	QSYDSSLGSEV	12	-	-	-
mAID2 10	4-34	6-6	2	3	RTSEYSSSGGAFDI	14	1-44	3	AAWDDSLNGPV	11	-	-	-
mAID2 13	3-7	/	/	2	ITAAWGLTWYFDL	13	3-21	3	QVWDDSSDHPWV	12	-	-	-
mAID2 16	4-34	6-19	1	4	KAEWLAKIDY	10	1-51	2	GTWDSSLSAVV	11	+	+	-
mAID2 28	4-34	6-19	2	4	ASSGWYADY	9	6-57	3	QSYDSSNPWV	10	+	+	-
mAID2 29 #					see kappa		1-47	1	AAWDDSLSGPGV	12			
mAID2 37	3-11	5-12	3	4	AGGRLATRFDY	11	2-14	2	SSYTSSSTL	9	+2	-	-
mAID2 43	3-30-3	3-3	2	6	EHGDFWSGYSTRYYYYMDV	17	2-23	1	CSYAGSSTSLYV	12	+	+	-
mAID2 46	1-18	4-17	2	4	DQDYGDYFYY	10	2-11	3	CSYAGSYTWW	10	-	-	-

RF, reading frame; #, antibody failed to be expressed

-, non-reactive; +, reactive; +2, highly reactive

c, diffuse cytoplasmic staining; A, actin staining; G, Golgi staining; M, mitochondria staining; MS, mitotic spindle staining; N, nuclear staining; F, cytoplasmic fibers

Table S6. Repertoire of antibodies from new emigrant B cells of AID-deficient patient 3.

Ig	HEAVY						LIGHT									
	VH	D	RF	JH	CDR3 (aa)	Length	Vκ	Jκ	CDR3 (aa)	Length						
neAID3 3	3-30	4-17	3	4	GGGTVTTWGGFDY	13	2-28	4	MQALQTPLT	9						
neAID3 6	3-66	6-13	3	6	ERGLGIAAAGNYYYGMDV	18	1-39	2	QQSYSTPYT	9						
neAID3 07	1-2	2-15		4			3-15	1	QQYNNWPPWT	10						
neAID3 08	3-30	4-23	2	6	NGPPGSHGGMDYYGMDV	17	2-28	1	MQALQTPT	8						
neAID3 12	4-34	1-26	2	4	GGGSPIDY	8	3-20	1	QQYGSSPPWT	10						
neAID3 15	3-15	/	/	4	DAPSQFYFDY	10	1-39	1	QQSYSTPQT	9						
neAID3 20	3-30	6-13	3	4	GGQAAAGTRGGLDDY	15	1-17	1	LQHNSYPWT	9						
neAID3 23	4-34	6-13	3	4	ALGIAAAEFFDY	12	3-20	3	QQYGSSSFT	9						
neAID3 31	3-30	3-22	2	4	DGPIYDSSVYTPVAEPRRIDY	21	1-5	1	QQYNSEWT	8						
neAID3 33	3-72	/	/	6	HVGGVGHYYYGMDV	14	2D-29	4	MQSIQLPLT	9						
neAID3 34	3-15	4-4	3	6	DISTVTNKNNYYYGMDV	17	3-15	2	QQYNNWPPYT	10						
neAID3 38	4-34	/	/	6	RSRRGLTLRQYYYGMDV	17	2-28	2	MQALQTLT	8						
neAID3 41	4-34	5-5	3	4	GVDTAMVWGYFDY	13	1-5	2	QQYNSYYT	8						
neAID3 45	1-18	3-10	2	4	AQYYYGSGSYPSDY	14	3-20	2	QQYGSSPET	9						
neAID3 48	1-69	5-24	3	4	AATTEYEAGFDY	12	2-28	2	MQALQTPQT	9						
neAID3 01							1-39	1	QQSYSTPWT	9						
neAID3 10							3-15	2	QQYNNWPLT	9						
neAID3 13							4-1	1	QQYYSTPRT	9						
neAID3 16							1-16	4	QQYNSYPLT	9						
neAID3 17							3-20	1	QQYGSSRWT	9						
neAID3 18							3-11	4	QQRSNWPLT	9						
neAID3 24							1-27	4	QKYNAPLT	9						
neAID3 39							1-9	3	QQLNSYLFT	9						
							VH	D	RF	JH	CDR3 (aa)	Length	Vλ	Jλ	CDR3 (aa)	Length
neAID3 04							1-46	3-22	3	1	DLISGIVPPRGVCYFQH	18	2-14	1	SSYSSSSTP	9
neAID3 09	3-23	/	/	5	DGGVAELDP	9	2-8	1	SSYAGSNLGV	11						
neAID3 21	3-21	6-13	2	6	DLNSSWYEEEEYGGMDV	17	2-8	1	SSYAGSNHYV	10						
neAID3 35	3-23	6-13	2	6	DLDEGRSLSLPEDSSTWDYYYYGMDV	26	3-1	2	QAWDSSIVV	9						
neAID3 42	3-7	2-15	2	3	GYCSGGSCYSVDAFDI	16	3-21	2	QVWDSSSDHVV	11						
neAID3 44	4-39	1-1	3	4	HGTTGTTRYIDY	12	1-40	3	QSYDSSLGWW	11						
neAID3 22							1-44	3	AAWDDSLNGRV	11						
neAID3 36							3-1	2	QAWDSSTVV	9						
	VH	D	RF	JH	CDR3 (aa)	Length	V	J	CDR3 (aa)	Length						
neAID3 05	4-59	6-13	2	3	SYSSSGDAFDI	12										
neAID3 11	3-30-3	1-26	3	3	DYTRRSIVGARGAFDI	16										
neAID3 25	3-11	3-3	2	6	AGYDFWSAHYKASDGMDV	18										
neAID3 26	3-48	6-6	2	4	GLDYSSSSAVGY	12										
neAID3 28	3-15	5-5	2	4	GGYSYDKTRSLTGDSN	16										
		7-27	3													
neAID3 43	3-23	2-21	1	4	DRLFQPAYYFDY	12										
neAID3 46	4-34	6-13	2	5	DYSSRRWFDP	11										
neAID3 47	3-30-3	6-13	3	6	DDAAAAGKSPSPYYYYGMDV	20										

RF, reading frame

Table S7. Repertoire of antibodies from mature naïve B cells of AID-deficient patient 3.

Ig	HEAVY					Length
	VH	D	RF	JH	CDR3 (aa)	
mAID3 04	3-30-3	/	/	4	DRGAVIGLVDY	11
mAID3 05	3-48	3-22	2	3	VGFYDDAFDI	10
mAID3 06	1-18	2-2	2	6	DLGYCSSTSCSPPDYYYYGMDV	22
mAID3 07	3-64	/	/	6	SLEDRNPYYYYGMDV	15
mAID3 09	3-21	2-2	2	5	EGYCSSTSCNWGNWFDP	17
mAID3 10	3-23	6-6	3	6	NERIAAPPPDGMDV	14
mAID3 12	3-7	3-10	3	4	AVTMDGWGYFDY	12
mAID3 13	3-49	/	/	4	DVEDY	5
mAID3 14	3-23	3-22	2	4	AGNYDSSGPTGGY	14
mAID3 15	3-30	2-15	3	5	EGVVAAYSSYNWFDP	15
mAID3 16	4-4	2-2	3	6	AIAAIGNYYYYGMDV	15
mAID3 17	3-30	6-13	3	5	DWLIAAAQRFNWFDP	15
mAID3 18	4-34	6-13	1	6	GWVRSRQLVEHYGMDV	18
mAID3 19	3-30	3-22	3	4	GAKTTRLRSMIVEDYFDY	18
mAID3 21	3-7	4-17	3	4	ATVTTSFDY	9
mAID3 22	3-66	4-23	3	4	EAGTVGPTRREGYFDY	16
mAID3 23	3-30-3	4-23	3	4	GEVSVVTRSHFDY	13
mAID3 24	1-69	3-10	1	6	ASEGFGELLPRHSDYGMDV	19
mAID3 25	3-48	2-15	2	4	YYCSGGSCYSAFDY	14
mAID3 27	4-34	6-13	1	5	IRQQLPSGGVWFDP	15
mAID3 34	3-15	/	/	4	VFGETVSTSPG	11
mAID3 35	4-34	2-21	3	4	GHIVVTARRYFDY	15
mAID3 36	3-7	6-19	3	4	GGAVAGTGY	9
mAID3 37	3-15	6-13	2	4	AVSSWFDY	8
mAID3 38	4-34	6-13	2	4	GPTQYSSSWYIFPD	14
mAID3 39	4-34	3-16	1	6	GVRGLRLGELSPPAYGMDV	19
mAID3 42	4-4	3-22	2	4	RSYYDSSIGTLDY	13
mAID3 44	3-33	3-22	2	3	SRNYDSSGPMGAFDI	16
mAID3 45	3-23	4-17	2	6	YGDYVYDYYYYGMDV	14
mAID3 46	3-7	1-26	2	4	YRYSGSYDYFDY	13
mAID3 48	4-b	1-26	2	4	VWPYSGSYSTTKDDY	15

RF, reading frame

Table S8. Repertoire and reactivity of antibodies from new emigrant B cells of AID-deficient patient 4.

Ig	HEAVY					Length	LIGHT			Length	REACTIVITY		
	VH	D	RF	JH	CDR3 (aa)		V _κ	J _κ	CDR3 (aa)		Poly	Hep2	Staining
neAID4 01	4-59	6-13	2	4	GYSSSWYFGY	10	4-1	1	QQYYSTPWT	9	-	+	-
neAID4 08	4-59	2-2	3	3	VGGPAVPASVAFDI	14	3-20	2	QQYGSSPYT	9	-	+	-
neAID4 16 #	3-23	1-26	3	6	GVGATETIYYYYGMDV	16	2-40	4	MQRIEFPST	9			
neAID4 17	4-34	3-3	2	6	TDFWSGYFPIRYGMDV	16	3-15	1	QQYNNWPRT	9	+		-
neAID4 18	3-23	3-3	2	4	QPHLEGVWSGYSFYFDY	18	4-1	1	QQYYSTPPWT	10	-	-	-
neAID4 19	4-34	6-13	2	4	GRYSSSFDY	9	1-17	1	LQHNSYPWT	9	-	+	c
neAID4 20	4-61	2-15	3	6	SPVVVAAITNYYYGMDV	18	1-39	1	QQSYSLPVT	9	+	+	c
neAID4 21	3-23	6-13	2	4	HSSSWYSDY	9	1-39	1	QQSYSTRWT	9	-	-	-
neAID4 22 #	3-23	1-26	2	6	DIGGSYPENV	10	2-30	2	MQGTHWPPYT	10			
neAID4 31	4-34	4-17	2	4	VSQRYGDDANDY	12	1-16	2	QQYNSYPYT	9	-	-	-
neAID4 33	3-23	5-5	2	4	DLLGYGFFDY	10	1-8	1	QQYYSYPGT	9	-	-	-
neAID4 43	4-34	4-17	1	5	VSPRLRLSPHFWD	15	3-11	1	QQRSNWPWT	9	+2	+	c
neAID4 45	4-34	4-4	3	6	VRVTLLDYYGMDV	14	3-15	1	QQYNNWPRT	9	-	+	-
neAID4 47	3-7	3-22	2	6	DTYSSNYYYYGMDV	15	3-20	1	QQYGSSPSSPLANGVGV	17	-	-	-
neAID4 06							3-11	4	QQRSNWLP	8			
neAID4 26							1-39	1	QQSYSTPWT	9			
neAID4 28							2-28	1	MQALQTPWT	9			
neAID4 36							2-28	2	MQALQTPYT	9			
neAID4 40							1-8	4	QQYYSYPLT	9			
neAID4 44							3-11	1	QQRSNWPPWT	10			
neAID4 46							1-39	5	QQSYSTPQVT	10			
	VH	D	RF	JH	CDR3 (aa)	Length	V _λ	J _λ	CDR3 (aa)	Length	Poly	Hep2	Staining
neAID4 05	1-46	6-6	2	6	YSSSSGREGGQGVGTPRVSYYYYYGMDV	27	2-14	2	SSYTSSSTLV	10	+	+	-
neAID4 07	3-73	/	/	6	DLRYGMDV	8	2-8	1	SSYAGSNNFV	10	+	+	-
neAID4 13	4-59	6-19	3	4	VWAGTSFVFDY	11	1-51	2	GTWDSLSAVV	11	-	-	-
neAID4 16					see kappa		3-21	1	QVWDSSSDHYV	11	-	-	-
neAID4 23	3-7	2-15	2	3	DEYCSGGSCYPPDAFDI	17	1-44	3	AAWDDSLNGWV	11	-	-	-
neAID4 34	3-9	2-2	1	6	DISGYQLRLYYGMDV	15	1-44	2	AAWDDSLNGFVV	12	-	-	-
neAID4 39	4-39	3-22	2	4	DQVEERYYYDSSGYSRWGY	20	2-14	2	SSYTSSSTLVV	11	-	-	-
neAID4 41	4-b	3-10	2	4	SPGPYYYGSGSYCGY	15	1-47	2	AAWDDSLSGHVV	12	-	+	N+MS
neAID4 14							3-25	3	QSADSSGTYPWV	12			
	VH	D	RF	JH	CDR3 (aa)	Length	V	J	CDR3 (aa)	Length	Poly	Hep2	Staining
neAID4 03	4-34	3-3	2	6	GPHYDFWSGYDYYYYYGMDV	20							
neAID4 09	4-59	3-16	1	4	SLRGLGELSSQYYFDY	15							
neAID4 15	3-15	2-2	2	6	FYCSSTSCYRGYYYGMDV	19							
neAID4 29	4-39	2-2	2	6	ERGGGGYCSSTSCRGHYYYGMDV	24							
neAID4 30	3-30-3	2-21	3	2	AYLRGVVTAITLWYFDL	17							
neAID4 38	4-b	3-3	3	5	AGSGLITIFGVDSQWWFDP	19							
neAID4 48	1-3	2-8	3	6	DIVLMVYASNYYYGMDV	17							

RF, reading frame; #, antibody failed to be expressed

-, non-reactive; +, reactive; +2, highly reactive

c, diffuse cytoplasmic staining; A, actin staining; G, Golgi staining; M, mitochondria staining; MS, mitotic spindle staining; N, nuclear staining; F, cytoplasmic fibers

Table S9. Repertoire and reactivity of antibodies from mature naïve B cells of AID-deficient patient 4.

Ig	HEAVY					LIGHT					REACTIVITY		
	VH	D	RF	JH	CDR3 (aa)	Length	Vκ	Jκ	CDR3 (aa)	Length	Poly	Hep2	Staining
mAID4 01	3-48	4-17	3	4	GSTVTNRLGLTDY	13	4-1	1	QQYYSTPPT	9	-	-	-
mAID4 11 #	4-b	3-9	2	6	EERYFDWFSGMDV	13	1-6	2	LQDYNYPYT	9			
mAID4 14	3-9	3-16	2	4	WGSYRHEVFDY	11	3-15	1	QQYNNWPLTWT	11	+	+	N
mAID4 24	3-13	4-4	2	6	APISDYSATPQVYGMDV	17	3-20	4	QQYGSTQLT	9	-	-	-
mAID4 35	1-2	1-26	2	4	TRYSGSYPDY	10	3-20	2	QQYGSSYT	8	-	+	-
mAID4 36	4-b	2-2	3	6	DTVVPAYYYYGMDV	14	3-20	2	QQYGSSPYT	9	+	+	-
mAID4 37	3-33	6-6	2	6	EYSSSLYYYGMDV	14	1-16	4	QQYNSYPLT	9	-	+	N
mAID4 41	3-49	3-22	2	4	DLSSPDSDSVKVPRHSYFDY	22	1-12	3	QQANSFPFT	9	-	-	-
mAID4 42	3-21	3-10	3	5	DRSVRGDYWFDP	12	3-15	1	QQYNNWPT	8	-	+	-
mAID4 44	3-33	6-19	2	6	DLGSGWYYYYGMDV	15	3-20	4	QQYGSSPPLT	10	+	+	-
	VH	D	RF	JH	CDR3 (aa)	Length	Vλ	Jλ	CDR3 (aa)	Length	Poly	Hep2	Staining
mAID4 02	4-34	5-5	2	6	GHRGYSYYYYGMDV	15	2-23	1	CSYAGSKV	8	+2	+	F
mAID4 04	3-21	6-19	3	3	IAVAGRAFDI	10	8-61	3	VLYMGSLWV	10	-	+	-
mAID4 06	3-48	3-22	2	3	DRVPPYDKGHDAFDI	15	3-1	2	QAWDSSTVV	9	-	-	-
mAID4 08	1-8	3-16	2	6	GGGYDYVWGSYWLDDYGGMDV	22	2-11	3	CSYAGSYTFWV	11	+	+2	M
mAID4 10	3-48	2-15	2	3	WLCSGGSCYRQDAFDI	16	1-47	3	AAWDDSLSGWV	11	-	+	-
mAID4 12	4-59	3-9	2	5	ANILTGYYINNWFDP	15	1-44	3	AAWDDSLNGPV	11	-	-	-
mAID4 16 #	3-23	2-21	3	3	DAVVVVTANDAFDI	14	2-14	1	SSYTSSSTPV	10			
mAID4 19	3-23	/	/	3	AGEAFDI	7	1-51	1	GTWSSLSAYV	11	-	-	-
mAID4 23 #	1-2	/	/	3	ADEALAFDI	9	1-47	2	AAWDDSLSAYVV	12			
mAID4 25	1-18	3-3	2	6	PSFEYDFWGSYEALVYGMDV	21	7-46	3	LLSYSGARV	9	+2	+2	-
mAID4 26	3-23	3-10	3	4	GVTMVRGVVDY	11	1-47	2	AAWDDSLSGVV	11	-	-	-
mAID4 27	3-74	2-2	2	3	WGPCSSTSCQEDAFDI	16	3-25	3	QSADSSGTNWW	11	-	-	-
mAID4 33	3-33	/	/	4	LSPFDY	6	1-44	3	AAWDDSLNGRV	11	-	+	-
mAID4 34	3-23	6-13	3	4	DPENSLVAAAGTGMDY	16	3-1	1	QAWDSSTPYV	10	-	-	-
mAID4 44					see kappa		2-23	2	CSYAGSSTFV	10	+2	+	N
	VH	D	RF	JH	CDR3 (aa)	Length	V	J	CDR3 (aa)	Length	Poly	Hep2	Staining
mAID4 22	5-51	5-24	2	1	CSGRDGYNNRFQH	13							
mAID4 38	4-34	3-9	2	4	GSHTYYDILTGHSYFDY	18							
mAID4 39	3-21	3-10	2	6	KGSDYYGSGSYMDV	15							

RF, reading frame; #, antibody failed to be expressed

-, non-reactive; +, reactive; +2, highly reactive

c, diffuse cytoplasmic staining; A, actin staining; G, Golgi staining; M, mitochondria staining; MS, mitotic spindle staining; N, nuclear staining; F, cytoplasmic fibers

Table S10. Repertoire and reactivity of antibodies from new emigrant B cells of AID-deficient patient 5.

Ig	HEAVY						LIGHT				REACTIVITY		
	VH	D	RF	JH	CDR3 (aa)	Length	Vκ	Jκ	CDR3 (aa)	Length	Poly	Hep2	Staining
neAID5 01	3-30	/	/	4	ERHTDFDY	8	1-12	2	QQANSFPYT	9	-		-
neAID5 03	1-3	/	/	4	SFKSGRGVDY	10	1-39	2	QQSYSTPNT	9	-		N+C
neAID5 04	5-51	3-10	2	2	HKYYYGSGGAWYFDL	15	1-39	2	QQSYSTPYT	9	-		C
neAID5 05	3-15	4-4	2	6	DLTHDYSNYYYYGMDV	16	3-15	3	QQYNNWPT	8	-		-
neAID5 07	4-34	4-23	2	4	SSGGKILIRAGGYFDY	18	1-39	4	QQSYSTPLT	9	+		C
neAID5 12	4-34	/	/	4	GDPDLLRYFDY	12	3-20	1	QQYGSSPKWT	10	-		-
neAID5 16	3-15	3-3	2	4	VRYDFWSGYYEYFDY	15			out				
neAID5 18	4-30-2	/	/	4	GRQGVLKDY	10	1-33	4	QQYDNLPLT	9	-		-
neAID5 20 #	5-51	/	/	3	SPGYAFDI	8	4-1	1	QQYYSTPRT	9			
neAID5 23	3-66	/	/	6	DFVENYYYYGMDV	13	1-39	1	QQSYSTPFT	9	-		-
neAID5 24	3-11	2-2	3	4	ALPRDIVVPAALARGI	17	1-9	1	QQLNSYPRT	9	+		C
neAID5 25	4-39	3-22	2	3	DQYSSGYLNDAFDI	15	3-15	1	QQYNNWPPWT	10	+		-
neAID5 27	3-11	3-22	2	4	DISYDTQSLWYFDY	14	1-5	2	QQYNSYSRT	9	-		-
neAID5 30	4-34	5-5	2	4	EGRGYSYGFNY	11	1-39	3	QQSYSTPFT	9	-		-
neAID5 31 #	1-2	6-13	3	5	TVGAAAGTLDYWFDP	15	3-15	1	QQYNNWPHT	9			
neAID5 02	3-43	/	/	3	GDAFDI	6							
neAID5 17	3-9	5-12	2	4	DREVGYSGSRFDY	14							
neAID5 26	6-1	2-15	3	5	NNVVVAATHRGFNWFDP	18							
neAID5 28	3-7	6-19	2	4	ECRSSGWYFDY	12							
	VH	D	RF	JH	CDR3 (aa)	Length	Vλ	Jλ	CDR3 (aa)	Length	Poly	Hep2	Staining
neAID5 06	3-30	6-13	2	4	WGYSSSWYVPGY	12	1-51	2	GTWDSSLSAVV	11	-		C
neAID5 08	3-7	6-19	3	4	KTWKAGTDY	9	2-14	1	SSYTSSEV	9	-		-
neAID5 20 #					see kappa		2-14	2	SSYTSSTRV	10			
neAID5 21	3-21	/	/	3	VGWDRFEGVGMIVPAAERGIDDAFDI	26	2-14	1	SSYTSSTLYV	11	+		-

RF, reading frame; #, antibody failed to be expressed

-, non-reactive; +, reactive

c, diffuse cytoplasmic staining; A, actin staining; G, Golgi staining; M, mitochondria staining; MS, mitotic spindle staining; N, nuclear staining; F, cytoplasmic fibers

Table S11. Repertoire and reactivity of antibodies from mature naive B cells of AID-deficient patient 5.

Ig	HEAVY						LIGHT				REACTIVITY		
	VH	D	RF	JH	CDR3 (aa)	Length	Vκ	Jκ	CDR3 (aa)	Length	Poly	Hep2	Staining
mAID5 13	3-23	6-13	2	4	ILSSSWYGGDYFDY	14	3-15	1	QQYNNWPQT	9	-	-	-
mAID5 15	1-18	3-16	3	4	EKEGGLRPAFGDY	13	1-5	2	QQYNSYYT	8	-	+	-
mAID5 18	4-30-4	4-23	2	3	AGRYGGNHPLDAFDI	15	1-39	1	QQSYSTPRT	9	-	+	-
mAID5 19	4-b	1-26	3	6	VPTVGATIYGMDV	13	1-39	3	QQSYSLFT	8	+	+	-
mAID5 21 #	1-69	4-17	2	3	DSPPHYGDLYAFDI	14	2-30	2	MQGTHWPPT	9			
mAID5 23	3-49	3-10	1	6	EHPLWFGDPNEGYGMDV	17	3-11	2	QQRSNWPRGT	10	-	-	-
mAID5 27	5-a	/	/	3	HTKHVETNDAFDI	13	1-5	2	QQYNSYSPHT	10	-	-	-
mAID5 29	1-18	4-17	2	4	ENYGDYEH	8	3-11	4	QQRSNWPSLT	10	-	+	-
mAID5 30	3-30	6-13	3	4	DRVNIAAALGY	11	3-20	1	QQYGSSPSWT	10	+	+	C
mAID5 34	3-23	3-22	3	1	KDVQVVTMIVVAPFQH	15	3-20	2	QQYGSSPPYT	10	+	-	-
mAID5 39	1-3	2-21	2	6	APYCGGDCLGYYYGMDV	17	2-28	3	MQALQTPFT	9	-	+	-
mAID5 42	4-4	1-26	2	4	GGEKSGSYPPYFDY	14	1-9	4	QQLNSYPLT	9	-	-	-
mAID5 47	4-61	2-15	3	6	VTATGYYYGMDV	12	3-11	3	QQRSNWPL	8	+	+	N+C
mAID5 01	4-59	3-22	2	4	ANYDSSPLGPFYD	14							
mAID5 03	3-9	/	/	6	DLAPALQQGGGMDV	14							
mAID5 06	3-7	5-5	1	6	ESWIQLDDNYYYYGMDV	17							
mAID5 14	1-2	3-10	1	6	GVLWFGESDYGGMDV	16							
mAID5 45	1-8	3-22	2	4	GGVSSGYHTDY	11							
mAID5 46	3-23	3-22	2	5	DNYYDSSGYRDDLVDP	17							
	VH	D	RF	JH	CDR3 (aa)	Length	Vλ	Jλ	CDR3 (aa)	Length	Poly	Hep2	Staining
mAID5 02 #	1-69	3-3	2	5	DSDENYDFWSGTFDP	15	1-44	2	AAWDDSLNGVV	11			
mAID5 28	4-39	6-6	2	6	DSSSSGLYYYYYGGMDV	17	1-51	2	GTWSSLSAVV	11	-	-	-
mAID5 31	3-7	6-19	1	5	DRRVGQWLVDYD	12	1-40	2	QSYDSSLGGSV	11	-	-	-
mAID5 33	4-34	3-22	2	4	GRGYDSSGYDLDY	15			out				
mAID5 05							2-23	1	CSYAGSSTYV	10			
mAID5 07							2-14	3	SSYTSSSTPWV	11			
mAID5 12							1-47	3	AAWDDSLSGWV	11			
mAID5 20							2-14	2	SSYTSSSTLV	10			

RF, reading frame; #, antibody failed to be expressed

-, non-reactive; +, reactive

c, diffuse cytoplasmic staining; A, actin staining; G, Golgi staining; M, mitochondria staining; MS, mitotic spindle staining; N, nuclear staining; F, cytoplasmic fibers

Table S12. Repertoire and reactivity of antibodies from new emigrant B cells of AID-deficient patient 6.

Ig	HEAVY						LIGHT				REACTIVITY		
	VH	D	RF	JH	CDR3 (aa)	Length	Vκ	Jκ	CDR3 (aa)	Length	Poly	Hep2	Staining
neAID6 01	3-15	3-9	2	4	DWGDYDILTGYQYYFDY	17	1-17	2	LQHNSYPRT	9	+	+	c
neAID6 07	4-4	2-15	2	6	DEGYCSGGSCYINDYYYYGMDV	22	1-39	1	QQSYSTPWT	9	-	-	-
neAID6 11	3-73	3-16	1	6	RGRLGELSQUALYGMVDV	16	1-33	3	QQYDNLPT	9	+	+	c
neAID6 20	3-7	6-6	3	5	DAESIAARYWFDP	13	3-11	1	QQRSNWPPPT	9	-	-	-
neAID6 22 #	1-18	2-2	2	5	GLYCSSTSCYIWNYNWFDP	19	2-28	4	MQALQTPPT	9			
neAID6 23	3-23	5-5	1	4	GTRQLPYPWYFDY	13	3-20	2	QQYGSSPYT	9	-	-	-
neAID6 24	3-23	2-2	2	6	ACSTSCPNNYYGMDV	15	1-13	5	QQFNSTPYT	8	+	+	c
neAID6 27	3-30	1-1	1	4	DSGELTVQLELYAIDC	16	3-11	2	QQRSNWPPYT	10	+	+	-
neAID6 28	3-15	3-22	2	4	EHYDSSGYVDY	12	3-11	3	QQRSNWPPGGLFT	13	-	-	-
neAID6 35	3-21	/	/	4	GADI	4	1-33	4	QQYDNLPLT	9	-	-	-
neAID6 40	4-59	6-13	3	4	EGVAAAGLGY	10	3-20	2	QQYGSSLYT	9	-	+	-
neAID6 42 #	1-18	3-3	3	6	SDWWIFGLPDRMDV	14	4-1	4	QQYYSTPLT	9			
neAID6 45	3-33	3-10	2	4	DAPGYGSGIDY	12	1-6	2	LQDYNPYT	9	-	-	-
neAID6 46	3-21	6-19	2	6	VFRVSSGWYSYYGMDV	17	3-20	4	QQYGSSPLT	10	+2	+2	F
neAID6 47	5-51	6-19	3	1	HSGIAVAERLMVYFQH	16	3-15	2	QQYNNWPPYT	10	-	-	-
neAID6 02							3-20	1	QQYGSSAWT	9			
neAID6 14							2-28	2	MQALQTPYT	9			
neAID6 18							1-5	1	QQYNSYFWT	9			
neAID6 32							3-11	5	QQRSNWPIT	9			
neAID6 39							3-15	1	QQYNNWPKT	9			
neAID6 43							3-20	2	QQYGSSPLT	9			
	VH	D	RF	JH	CDR3 (aa)	Length	Vλ	Jλ	CDR3 (aa)	Length	Poly	Hep2	Staining
neAID6 08 #	1-46	3-10	3	3	VGITMVQGVGTGGAFDI	16	1-44	3	AAWDDSLNGWV	11			
neAID6 12	3-33	/	/	3	DHNEGYPKSAFDI	13	1-51	2	GTWDSLSAVV	11	-	-	-
neAID6 30	4-59	6-6	3	6	DLRSIAAPSYGMDV	14	3-1	1	QAWDSSTAYV	10	-	-	-
neAID6 48	3-23	1-26	2	4	VGGGIGGSYRRGYFDY	16	2-14	1	SSYTSSSTLGV	11	-	-	-
neAID6 06							2-14	3	SSYTSSSTWV	10			
neAID6 36							1-51	1	GTWDSLSAPSIV	13			
neAID6 38							1-51	1	GTWDSLSAFIV	12			
neAID6 44							2-14	3	SSYTSSSTWV	10			
	VH	D	RF	JH	CDR3 (aa)	Length	V	J	CDR3 (aa)	Length	Poly	Hep2	Staining
neAID6 05	3-66	2-15	2	5	ALGCSGGSCYSEQWLANGGGDSNWFDP	27							
		2-21	2										
neAID6 09	3-7	6-19	1	4	DSEQWLGDY	9							
neAID6 13	4-31	3-10	1	5	DCWFRELSANWFDP	14							
neAID6 16	1-46	4-17	2	4	IPDYRDYVLVDY	12							
neAID6 33	3-23	3-22	3	4	VTGGGTMDLLNIRSTDDY	19							
neAID6 34	3-15	1-26	2	4	VGGSY	6							
neAID6 41	3-23	4-17	2	4	DPYGDYIFDY	10							

RF, reading frame; #, antibody failed to be expressed

-, non-reactive; +, reactive; +2, highly reactive

c, diffuse cytoplasmic staining; A, actin staining; G, Golgi staining; M, mitochondria staining; MS, mitotic spindle staining; N, nuclear staining; F, cytoplasmic fibers

Table S13. Repertoire and reactivity of antibodies from mature naïve B cells of AID-deficient patient 6.

Ig	HEAVY					LIGHT					REACTIVITY		
	VH	D	RF	JH	CDR3 (aa)	Length	Vκ	Jκ	CDR3 (aa)	Length	Poly	Hep2	Staining
mAID6 01	1-2	5-12	2	4	PLYSGYGSFDY	11	3D-20	1	QQYGSSQWT	9	-	-	-
mAID6 04	3-21	/	/	6	VKVTHGDDYYYYYGMVDV	17	2-28	3	MQALQTPRT	9	-	+	N
mAID6 05	4-59	3-10	2	4	DGSGSL	5	1-33	5	QQYDNLPIIT	9	-	-	-
mAID6 09	3-11	3-3	3	5	DQRERATIFGVVIAPNHQGNWFDP	24	1-39	1	QQSYSTPRT	9	+2	+2	N
mAID6 10	3-11	3-16	2	4	TFYDYVWGSGLDY	12	1-39	1	QQSYSTPRT	9	-	+	-
mAID6 11	4-59	2-15	2	6	DYFYCSGGSCYPYGMVDV	18	3-11	1	QQRSGWT	7	-	+	-
mAID6 20	4-31	5-24	3	4	VFDREMATGGGDY	14	3-20	3	QQYGSSPLFT	10	-	+	-
mAID6 22	3-7	2-2	3	6	DSSQVVPATYYYYYGMVDV	19	3-15	2	QQYNNWPHLSRLYT	14	+	+	-
mAID6 24	4-4	5-5	3	6	DNVDTAMVGYYYGMDV	17	3-11	4	QQRSNWPLT	9	-	+	-
mAID6 27	3-23	6-19	2	5	SSA	3	1-5	1	QQYNSYLWT	9	-	-	-
mAID6 31	4-59	4-17	2	6	DATQPSNDYGDYGEIYYGMDV	22	1-39	1	QQSYSTRWT	9	-	-	-
mAID6 43	3-49	6-19	1	4	EEGQWLVPDY	10	3-20	3	QQYGSSPFT	9	-	+	-
mAID6 54	4-34	6-6	2	4	VGYSSSGGDY	11	1-13	2	QQFNSYPRT	9	-	+	-
mAID6 61	3-23	3-22	2	3	DLLPKYYYDSSGYTDAFDI	20	4-1	1	QQYYSTRT	8	+	-	-
mAID6 63	3-23	/	/	4	VPSSFAYYFDY	12	3-20	1	QQYGSSPVT	9	-	-	-
mAID6 64	3-7	2-2	3	4	SVVVPAAQFDY	11	3-20	2	QQYGSSPLYT	10	-	-	-
mAID6 82	3-48	3-22	3	4	DLVVVTGY	8	1-17	1	LQHNSYPWT	9	-	+	-
mAID6 62							3-11	1	QQRNSVT	8			
	VH	D	RF	JH	CDR3 (aa)	Length	Vλ	Jλ	CDR3 (aa)	Length	Poly	Hep2	Staining
mAID6 15	3-7	4-17	2	3	DGYGDYEYYAFDI	13	2-14	1	SSYTSSSTNYV	11	-	-	-
mAID6 16	3-30	4-4	2	6	DLYSNYVDYYYGMDV	16	2-23	2	CSYAGSSTFV	10	-	-	-
	VH	D	RF	JH	CDR3 (aa)	Length	V	J	CDR3 (aa)	Length	Poly	Hep2	Staining
mAID6 59	3-33	6-19	3	4	DRSRPSIAVAGTLDY	15							

RF, reading frame; #, antibody failed to be expressed

-, non-reactive; +, reactive; +2, highly reactive

c, diffuse cytoplasmic staining; A, actin staining; G, Golgi staining; M, mitochondria staining; MS, mitotic spindle staining; N, nuclear staining; F, cytoplasmic fibers

Table S14. Repertoire of antibodies from new emigrant B cells of AID-deficient patient 10.

Ig	HEAVY						LIGHT								
	VH	D	RF	JH	CDR3 (aa)	Length	Vκ	Jκ	CDR3 (aa)	Length					
neAID10 01	1-18	2-15	2	5	VGCSGGSCYGGPPLGNWFDP	20	1-39	2	QQSYSTPPT	9					
neAID10 02	3-23	4-23	2	3	VQGYGGNSDDAFDI	14	1-5	1	QQYNSYSGT	9					
neAID10 03	3-9	6-19	1	3	DRRQWLPGGAFDI	13	1-39	2	QQSYSTPYT	9					
neAID10 04	1-18	3-16	3	4	DLTLFWLPDEDRNNMITLGY	21	1-39	4	QQSYSTLLT	9					
neAID10 05	3-30-3	3-10	2	4	ADHGSRSYFYDY	12	1-39	3	QQSYSTPPFT	10					
neAID10 10	1-3	/	/	4	GAPETALDY	9	3-20	1	QQYGSSPWT	9					
neAID10 12	3-15	6-13	2	4	DTGYSSSWYLGGEFDY	16	3-20	4	QQYGSSPLT	9					
neAID10 17	3-30-3	6-19	1	6	IRQQWLGYYYYGMDV	15	1-33	5	QQYDNLPIIT	9					
neAID10 22	3-11	1-26	3	6	DEGDTEGDYNYYYMDV	17	1-39	2	QQSYSTPLYT	10					
neAID10 25	3-48	/	/	4	DPVEEGGRD	9	1-5	1	QQYNSYLRT	9					
neAID10 28	4-39	6-13	3	4	IGAAAGIIDY	10	4-1	4	QQYYSTPLT	9					
neAID10 29	3-7	3-10	3	4	DLTSMVQGVDPDY	12	1-17	1	LQHNSYPWT	9					
neAID10 30	3-23	/	/	4	DALAGK	6	1-16	2	QQYNSYPYT	9					
neAID10 31	3-66	/	/	4	DLNDYGDY	8	2-30	2	MQGTLGGT	8					
neAID10 35	4-34	6-6	2	4	LGFTCPSSSESDFDY	16	2-28	2	MQALQTPRT	9					
neAID10 06							3-20	2	QQYGSSPYT	9					
neAID10 14							3-20	5	QQYGSSPPIT	10					
neAID10 34							3-20	1	QQYGSSRT	8					
neAID10 40							3-20	2	QQYGSSPRT	9					
neAID10 43							1-39	2	QQSYSTPPYT	10					
neAID10 46							3-20	5	QQYGSSPIT	9					
	VH	D	RF	JH	CDR3 (aa)	Length	Vλ	Jλ	CDR3 (aa)	Length					
neAID10 09	4-34	2-2	2	4	EGCSSTSCVDY	11	1-51	2	GTWDSLSAGRV	12					
neAID10 11	1-24	3-10	3	4	PGITMVQGVIIKDAPPAYDAFDI	23	1-44	1	AAWDDSLNGLYV	12					
neAID10 15	4-39	/	/	2	LRIYHKWYFDL	11	1-47	2	AAWDDSLSGPEV	12					
neAID10 16	3-15	2-15	2	6	DGCSGGSCYPLDY	13	6-57	2	QSYDSSNQV	9					
neAID10 18	3-30	1-26	3	3	EIVGATIREMGDAFDI	16	1-36	2	AAWDDSLNGVV	11					
neAID10 21	3-15	2-2	3	5	DGIVVPAAVGYNWFDP	17	1-51	2	GTWDSLSVWV	11					
neAID10 23	3-30-3	2-21	2	4	DHAQDCGGDCLYLDY	15	3-10	2	YSTDSSGNHRV	11					
neAID10 24	3-30	1-26	1	3	DQWELQGAFDI	11	2-14	2	SSYTSSSHVV	10					
neAID10 37	5-51	3-10	2	2	LRDGSYSYYPHWYFDL	17	1-44	2	AAWDDSLNGPV	11					
neAID10 06							1-51	1	GTWDSLSAGV	11					
neAID10 26							7-46	2	LLSYSGAREV	10					
neAID10 38							2-14	2	SSYTSSSTLGV	11					
neAID10 39							1-51	2	GTWDSLSAWV	11					
neAID10 45							3-21	2	QVWDSSSDL	9					
neAID10 47							1-40	2	QSYDSSLSGHVV	11					
neAID10 48							2-14	2	SSYTSSSTRV	10					
							VH	D	RF	JH	CDR3 (aa)	Length	V	J	CDR3 (aa)
neAID10 07	1-3	5-12	2	3	DRDWVRGYSGYDRDAFDI	18									
neAID10 08	3-15	1-26	3	4	DPLSIVGAVEEDLADY	16									
neAID10 27	3-30-3	/	/	4	SSGPFDY	7									
neAID10 32	4-4	2-15	2	4	THLCSGGSCQRGFDY	15									
neAID10 33	3-23	6-13	3	2	DRRIASAGTLPNWFYFDL	17									

RF, reading frame

Table S15. Repertoire of antibodies from mature naïve B cells of AID-deficient patient 10.

Ig	HEAVY					
	VH	D	RF	JH	CDR3 (aa)	Length
mAID10 H07	4-30-2	2-15	3	6	VAVVAATGGYMDV	13
mAID10 H08	4-59	/	/	5	GFDP	4
mAID10 H09	3-30-3	1-26	2	4	SHSKYSGSYQPLDY	14
mAID10 H10	3-13	3-9	2	6	SRSISSYYDILTGYSDDYYGMDV	24
mAID10 H11	4-34	3-16	2	4	GLPYDYVWGSPTGGPED	17
mAID10 H12	3-30-3	2-15	3	6	DFGRSSLVAAAKYYYYGMDV	20
mAID10 H13	3-21	6-6	2	3	VGSSPFPSQIFAFDI	15
mAID10 H15	3-30	7-27	2	4	GDWGLVDY	8
mAID10 H16	1-18	1-26	3	4	EIHHLVGATPWDY	13
mAID10 H17	4-59	3-16	2	4	VWGDPGNFFDY	11
mAID10 H18	4-31	4-17	2	4	LREDYGDYVYFDY	14
mAID10 H19	3-33	3-9	2	4	WFGDILTYIDY	12
mAID10 H21	3-30	2-15	3	4	GVSVVVAASPLIDY	16
mAID10 H22	3-21	1-26	3	4	GVGATFFDY	9
mAID10 H23	4-30-4	3-9	2	5	GFDLHWFDY	10
mAID10 H24	3-73	6-19	3	3	QKKEVAVATGAFDI	15
mAID10 H25	4-59	6-13	2	4	HSLSSFDY	9
mAID10 H26	4-31	/	/	4	DGDPTTYFDY	13
mAID10 H27	4-4	/	/	4	SNPASPLHFDY	12
mAID10 H28	3-21	/	/	3	DQTALGFYQNDAFDI	15
mAID10 H29	4-34	1-26	3	4	KPRKWVGATMTTYPYDY	17
mAID10 H30	3-30	3-22	2	4	GHPHYDSSAAFY	14
mAID10 H31	4-39	4-17	3	2	LKTTRLWYFDL	11
mAID10 H32	3-9	/	/	2	DSGSRNWYFDL	11
mAID10 H33	4-b	2-15	2	4	AGHCSSGSCYSFDY	14
mAID10 H34	3-33	6-19	3	6	DIQAKVAGGEAGMDV	15
mAID10 H36	3-30	1-26	2	4	VHSGSWG	7
mAID10 H37	4-39	/	/	3	QYRVGAFDI	9
mAID10 H39	3-30-3	4-4	2	4	GDYRRIHGPPDY	12
mAID10 H42	1-2	4-17	3	5	TVTTLGFDP	9

RF, reading frame

Table S16. Repertoire of antibodies from new emigrant B cells of healthy donor HD11.

Ig	HEAVY						LIGHT				
	VH	D	RF	JH	CDR3 (aa)	Length	Vκ	Jκ	CDR3 (aa)	Length	
neHD11 02	3-48	6-13	1	3	SQQQVFYAFDI	11	1-39	1	QQSYSTPGT	9	
neHD11 03	3-23	2-2	3	5	APLGSFVVDKWFDP	15	3-20	1	QQYGSSPWT	9	
neHD11 04	3-23	6-13	2	4	DSSSWYDIVAGSFYD	15	1-17	2	LQHNSYPYT	9	
neHD11 15	3-11	3-22	2	4	APDDSSGYSLDY	12	3-20	3	QQYGSSPPFG	10	
neHD11 20	4-59	1-1	1	4	TSELERRLPFDY	12	4-1	1	QQYYSTPRT	9	
neHD11 21	3-23	6-13	3	2	IIRPRPQQLAAAGNWFYDL	19	3-15	4	QQYNNWPLT	9	
neHD11 26	1-69	2-8	2	6	DFWGTGGEYWTPVSINRMDV	20	2-24	1	MQATQFPRT	9	
neHD11 33	3-15	5-5	2	6	DLARTYSYGSGGYGMDV	19	3-20	3	QQYGSSPET	9	
neHD11 34	4-39	5-24	3	4	HVPEMATHGEYFDY	15	1-8	1	QQYYSYPQT	9	
neHD11 39	1-18	2-2	2	6	AVKTTALRYCSSTSCLWGPAGYGMDV	26	2-28	1	MQALQTPQT	9	
neHD11 40	4-34	3-3	1	4	GRSRPSLEWGTDFDY	15	4-1	4	QQYYSTPPLT	10	
neHD11 43	1-69	3-16	3	5	GGEDDSGGDWFPD	13	3-15	1	QQYNNWPLT	9	
neHD11 47	1-46	4-4	2	6	VRSYYSNPHYYYYGMDV	18	1-9	4	QQLNSYPSLT	10	
neHD11 07							1-5	4	QQYNSYPLT	9	
neHD11 08							3-11	2	QQRSNWPYT	9	
neHD11 09							1-33	3	QQYDNLFT	9	
neHD11 10							3-20	1	QQYGSSSWT	9	
neHD11 11							4-1	3	QQYYSTPPT	9	
neHD11 12							1-39	4	QQSYSTPRLT	10	
neHD11 14							1-39	4	QQSYSTPLT	9	
neHD11 22							3-15	3	QQYNNWLFT	9	
neHD11 25							2-28	1	MQALQTPWT	9	
neHD11 29							1-39	2	QQSYSTPRT	9	
	VH	D	RF	JH	CDR3 (aa)	Length	Vλ	Jλ	CDR3 (aa)	Length	
neHD11 03					see kappa		3-1	2	QAWDSSAVV	9	
neHD11 20					see kappa		2-23	1	CSYAGSSTHYV	11	
neHD11 23	3-21	/	/	5	LRGQVGDNWFDP	12	1-44	3	AAWDDSLNGWV	11	
neHD11 27	3-9	6-13	3	5	DIAAAGGRGSFDP	13	2-23	1	CSYAGSSTFYV	11	
neHD11 28	5-51	/	/	5	RGTQRGWFPD	10	2-8	1	SSYAGSNNYV	10	
neHD11 30	4-39	5-24	3	4	VPPEMATIRY	10	2-14	2	SSYTSSSTLVV	11	
neHD11 35	3-33	/	/	5	GARGGQVDWFDP	12	3-21	2	QVWDSSSDQVV	11	
neHD11 44	4-34	/	/	5	GVSNGPNSTWFDP	13	3-1	3	QAWDSSTWV	9	
neHD11 41							3-1	1	QAWDSSTPYV	10	
	VH	D	RF	JH	CDR3 (aa)	Length	V	J	CDR3 (aa)	Length	
neHD11 24	3-11	3-16	2	4	APGSSYYFDY	10					
neHD11 36	3-21	5-5	2	6	DRYSYGPDYYYYGMDV	16					
neHD11 38	4-34	3-22	2	6	GFFNGHDGWYYYDSSGYYYYYYGGMDV	26					
neHD11 45	3-49	2-8	3	4	MLSAGY	6					
neHD11 46	1-18	5-24	3	5	VEMATIRSNWFDP	13					
neHD11 48	1-8	5-5	2	4	GRTYSYGQNDY	11					

RF, reading frame

Table S17. Repertoire of antibodies from mature naive B cells of healthy donor HD11.

Ig	HEAVY						LIGHT				
	VH	D	RF	JH	CDR3 (aa)	Length	Vκ	Jκ	CDR3 (aa)	Length	
mHD11 13	4-59	4-17	2	6	DYDYGDYYGMDV	12	1-39	2	QQSYSTPPYT	10	
mHD11 14	3-21	6-13	3	4	DQSIAAAGGANFDY	14	3-15	1	QQYNNWPPWT	10	
mHD11 15	1-18	4-17	2	6	WHYGDYFYYYYYGMDV	16	3-20	1	QQYGSSPPS	9	
mHD11 16	1-2	3-10	1	5	EGFGEPYTTGWFDP	15	3-15	1	QQYNNWPPERT	11	
mHD11 18	3-23	6-6	3	5	VNIAARVAWFDP	12	1-27	4	QKYNASFT	9	
mHD11 26	4-34	/	/	4	GYLDYYFDY	9	1-39	1	QQSYSTPRT	9	
mHD11 31	4-61	3-3	1	5	GGFLEWLSWFDP	12	1-27	3	QKYNAPPGIT	11	
mHD11 34	3-33	3-22	2	4	DFSYDSSGPFDP	12	1-NL1	4	QQYYSTPLT	9	
mHD11 35	3-23	/	/	6	YPGYYYYYGMDV	12	1-27	1	QKYNASAPQT	9	
mHD11 39	3-7	1-26	2	4	DRPGGSLDY	10	1-NL1	4	QQYYSTLGT	9	
mHD11 46	1-69	3-22	2	4	NNYDSSGYFDPPPTYFDY	18	1-5	1	QQYNSYSPWT	10	
mHD11 305	4-61	6-19	2	4	AQYSSGWGAYMDY	13	1-33	4	QQYDNLFPFT	9	
mHD11 306	3-33	3-22	2	4	DRGYYYDSSGYFFYY	16	1-16	4	QQYNSYPLT	9	
mHD11 312	3-21	2-2	3	4	DIVVVPAADFDP	12	1-39	4	QQSYSTPRS	9	
mHD11 314	3-15	2-2	2	4	DRYCSSTSCSPMRVPDY	17	1-39	2	QQSYSTPRT	9	
mHD11 316	1-2	2-15	3	4	EVVVVAATPTS	12	2-40	1	MQRIFPWT	9	
mHD11 328	1-46	2-15	2	5	VLGSGGSCEFDP	12	3-11	4	QQRSNWPLT	10	
mHD11 333	3-23	2-15	3	4	STLVVVAATLRY	12	1-33	1	QQYDNLPPG	9	
mHD11 344	3-53	1-26	3	4	VGATPPFH	8	1-9	4	QQLNSYHALT	10	
	VH	D	RF	JH	CDR3 (aa)	Length	Vλ	Jλ	CDR3 (aa)	Length	
mHD11 305					see kappa		3-1	2	QAWDSSVV	8	
mHD11 309	1-8	6-6	2	4	GSYSSSSLASY	11	3-1	3	QAWDSSTWV	9	
mHD11 311	3-23	3-3	2	5	DGRFWAGKKFDP	12	2-14	2	SSYTSSSVV	9	
mHD11 318	3-21	3-22	2	2	RKTDYYDSSGYQIYWYFDL	19	2-11	2	CSYAGSYTSDVV	12	
mHD11 326	3-48	4-23	2	4	GLNDYGGNSPDY	12	2-14	2	SSYTSSSTYVV	11	
mHD11 329	3-30	4-23	3	2	VGLPLVTPRTNWWYFDL	17	2-11	2	CSYAGSYVV	9	
mHD11 334	4-59	3-10	2	5	GGSGGS	6	1-44	3	AAWDDSLNALWV	12	

RF, reading frame

Table S18. Repertoire of antibodies from new emigrant B cells of healthy donor HD12.

Ig	HEAVY						LIGHT				
	VH	D	RF	JH	CDR3 (aa)	Length	Vκ	Jκ	CDR3 (aa)	Length	
neHD12 17	3-7	/	/	4	VGGAWLPEYFDY	12	3-15	1	QQYNNWPPWT	10	
neHD12 23	3-7	3-9	2	6	DKDIWDV	7	1-33	2	QQYDNLPTYT	9	
neHD12 33	3-33	3-10	3	6	EAGVVRGVIIHFYYMDV	18	1-9	4	QQLNSYPLT	9	
neHD12 44	3-23	3-22	2	4	DEVYYDSSGYYYGKRGTFDY	21	3-15	1	QQYNNWPPWT	10	
neHD12 45	3-23	2-2	2	6	KTYCSSTSCYFVQEIGYGMDV	21	1-39	1	QQSYSTPRA	9	
neHD12 47	4-39	7-27	2	3	WGDAFDI	7	1-6	1	LQDYNYPRT	9	
neHD12 54	4-59	3-22	2	1	GGKYYDSSGYPPrALQH	18	2-28	1	MQALQTAT	8	
neHD12 58	1-8	6-6	2	4	ALGYSSSSG	9	1-17	1	LQHNSYPQT	9	
neHD12 59	3-23	3-9	1	6	KVLRDWPDPSPAPYYYYGMDV	21	1-39	4	QQSYSTPLT	9	
neHD12 60	3-23	/	/	4	GVTRYFDY	8	3-11	2	QQRSNWYT	8	
neHD12 65	7-4-1	/	/	4	DLRGPEGLDY	10	1-5	1	QQYNSYWT	8	
neHD12 66	3-20	6-13	2	5	DLYSSWSLNFDP	14	3-15	4	QQYNNWSSA	9	
neHD12 67	1-24	2-15	3	3	TLVVGIAKWELRNDAFDI	18	1-5	2	QQYNSYSQYT	10	
		1-26	1								
neHD12 69	4-59	/	/	6	ESAGMDV	7	3-11	2	QQRSNWPPYT	10	
neHD12 70	3-9	3-22	2	3	TSGNYDSSGYSTDAFDI	19	1-17	1	LQHNSYPWT	9	
neHD12 72	3-66	/	/	6	RTSYYYYGMDV	11	1-33	3	QQYDNLGTT	9	
neHD12 79	4-59	6-19	2	4	LVLLGSSGWYLDY	13	1-5	1	QQSLT	5	
neHD12 87	3-15	/	/	4	NEPAIDY	7	2-28	4	MQALQTPLT	9	
neHD12 90	4-59	3-16	2	4	WGGDYVWGSYRYFDY	15	1-39	2	QQSYSTLYT	9	
neHD12 93	1-46	3-3	3	5	DGITFGVWNGPEFDP	16	1-39	2	QQSYSTPPT	9	
neHD12 96	3-33	3-3	3	6	VPDITIFGVVTTTKYYYGMDV	21	1-16	5	QQYNSYP	7	
neHD12 68							3-11	4	QQRSNWPLT	10	
neHD12 83							2-28	4	MQALQTPLT	9	
neHD12 91							1-39	1	QQSYSTPS	8	
	VH	D	RF	JH	CDR3 (aa)	Length	Vλ	Jλ	CDR3 (aa)	Length	
neHD12 19	3-72	5-12	2	6	EPDSGYDPTYYYYYMDV	17	3-9	2	QVWDSSTYVV	10	
neHD12 30	1-18	3-3	2	4	SGWHDFWSGYPLLAYPTEAYYFDY	25	6-57	2	QSYDSSNVV	9	
neHD12 41	3-15	6-13	2	4	AWGSSSWYEGGFDY	14	3-1	2	QAWDSSTVV	9	
neHD12 42	4-59	3-22	2	5	HGFDDLGPDYDSSGEAWWFDP	22	2-23	1	CSYAGSSTYV	10	
neHD12 56	3-21	2-2	2	6	DLGRYCSSTSCYTSGMDV	18	2-23	2	CSYAGSSTYVV	11	
neHD12 80	4-4	4-17	2	2	DRWDYGDYDYWYFDL	14	2-14	1	SSYTSSSTLYV	11	
neHD12 81	4-39	3-9	2	5	LLDYDPYWFDP	11	2-11	1	CSYAGSYTWV	10	
neHD12 88	3-48	5-12	2	4	EGYSGYGDY	9	1-40	2	QSYDSSLQVV	10	
neHD12 89	1-8	3-10	2	4	GISNSHVDYGSFSFY	16	9-49	2	GADHGSGSNFGIVV	14	
neHD12 20							1-44	2	AAWDDSLNGVV	11	
	VH	D	RF	JH	CDR3 (aa)	Length	V	J	CDR3 (aa)	Length	
neHD12 34	1-2	3-10	3	2	GVSRWYDYWYFDL	12					
neHD12 94	4-59	6-19	3	5	RIAVAGTSWFDP	12					

RF, reading frame

Table S19. Repertoire of antibodies from mature naive B cells of healthy donor HD12.

Ig	HEAVY						LIGHT			
	VH	D	RF	JH	CDR3 (aa)	Length	Vκ	Jκ	CDR3 (aa)	Length
mHD12 05	4-61/59	6-6	2	4	DLAAYSMSDY	10	1-17	4	LQHNSYPLT	9
mHD12 07	4-34	4-17	3	4	TLRGTIVTIVGGIYFDY	17	1-39	4	QQSYSTPLT	9
mHD12 09	3-23	6-6	3	5	SIAARRGRGNWFDP	14	3-20	1	QQYGSSWT	8
mHD12 10	3-23	4-17	2	3	DRPVGYGDYGPDAFDI	17	4-1	1	QQYYSTPRT	9
mHD12 12	5-51	6-19	2	6	RGSGWYDEIYYYYGMDV	17	2-28	1	MQALQTPQT	9
mHD12 16	1-18	3-10	3	4	ASPITMVRGASDPPGGY	17	1-27	1	QKYNAPTWT	10
mHD12 17	3-30	2-21	2	4	CGGKYYFDY	10	1-8	4	QQYYSYPLT	10
mHD12 22	3-23	3-22	2	4	SREYYDSSGFGCFDY	16	3-11	3	QQRSNWLFY	9
mHD12 26	3-73	/	/	4	HQGADY	6	4-1	4	QQYYSTPLT	9
mHD12 27	3-33	6-19	1	4	DLAEQWLVSVDY	13	1-5	2	QQYNSYPYT	9
mHD12 34	3-23	/	/	6	DYEPGGYYYYYGMDV	17	1-39	2	QQSYSTPYT	9
mHD12 38	3-74	3-3	2	4	DRDYDFWSGYPSGY	15	1-5	2	QQYNSYPYT	9
mHD12 39	5-51	4-17	2	4	RGDYGDERDYFDY	13	3-20	2	QQYGSSPDT	10
mHD12 40	3-30	6-19	3	6	PIAVAGTVLPDV	12	1-6	2	LQDYNPLT	9
mHD12 41	4-61/59	4-23	3	4	TTVTPDYFDY	11	1-39	3	QQSYSTPFT	9
mHD12 42	3-73	/	/	4	LGVSTPDY	9	3-11	4	QQRSNWPPLT	10
mHD12 50	3-48	5-5	3	4	ELRKTAMAFDY	11	1D-8	2	QQYYSFPRT	9
mHD12 51	3-48	5-12	2	4	VPSVGSYGFYFDY	12	4-1	4	QQYYSTPST	9
mHD12 54	4-34	3-16	2	4	GINDYVWGSYRYSGGSDY	19	3-20	3	QQYGSSPRT	9
mHD12 55	4-59	4-4	2	4	LDYSNSYFDY	10	3-15	4	QQYNWPQLT	10
mHD12 08							1-16	4	QQYNSYPLT	9
	VH	D	RF	JH	CDR3 (aa)	Length	Vλ	Jλ	CDR3 (aa)	Length
mHD12 13	1-18	3-9	2	4	VLKAYDILTGYFFQGPRGGFDY	23	2-14	2	SSYTSSSPVV	10
mHD12 18	3-11	/	/	3	VHQKNRQAWGAFDI	15	3-21	3	QVWDSDDHQV	11
mHD12 20	4-34	3-16	1	4	GIRAYVWGSFSY	12	1-51	2	GTWDSLSAGV	11
mHD12 24	3-23	/	/	5	GEDTWDFP	8	2-14	3	SSYTSSSTLV	10
mHD12 28	4-59	5-24	2	4	RDGYNTHRY	9	3-21	2	QVWDSDDHLVV	12
mHD12 33	3-11	3-22	2	3	DIFGTDYDSSGYLAFDI	19	2-14	1	SSYTSSSTLYV	11
mHD12 36	3-49	3-3	3	6	GDPKQRQATSIQVVFPRPEDPTLGMDV	28	1-40	2	QSYDSSLGGDVV	13
mHD12 46	3-30	1-26	3	3	AGAQTWGAFDI	12	1-44	3	AAWDDSLNGWV	11
mHD12 49	4-39	3-3	3	2	PIFVGVGANYWYFDL	15	2-14	1	SSYTSSSPYV	10
mHD12 56	3-23	3-22	3	4	DNRITTHAEFDY	12	3-1	2	QAWDSSTVV	9
mHD12 70	1-18	3-10	3	6	DPKPVTMVRGVILAYYYYYMDV	22	2-14	2	SSYTSSSTSVV	11
mHD12 74	4-34	/	/	3	LTDAFDI	7	2-8	1	SSYAGSNNAYV	11
mHD12 14							3-1	2	QAWDSSTAYVV	11
mHD12 15							3-21	2	QVWDSDDHPI	11
mHD12 65							3-21	2	QVWDSDDHPHVV	13
	VH	D	RF	JH	CDR3 (aa)	Length	V	J	CDR3 (aa)	Length
mHD12 04	3-33	5-5	1	4	EVPGAQLWEGSYFDY	15				
mHD12 19	3-23	2-21	3	1	LVGWSVTAHPPGYFQH	16				
mHD12 21	3-23	2-21	3	4	VAVVTAIRGFAXDY	15				
mHD12 25	3-11	3-3	3	4	EAGVVIQPFYD	11				
mHD12 44	3-30	2-15	2	4	EPKSHYCSGGSCHRGFFDY	19				
mHD12 45	3-33	1-1	3	6	VGTTDSYYYYYMDV	15				
mHD12 52	5-51	3-22		4						
mHD12 53	3-13	3-3	3	6	ANITIFGVSSAPYYYYGMDV	20				

RF, reading frame

Table S20. Repertoire of antibodies from new emigrant B cells of healthy donor HD13.

Ig	HEAVY						LIGHT				
	VH	D	RF	JH	CDR3 (aa)	Length	Vκ	Jκ	CDR3 (aa)	Length	
neHD13 01	3-35	2-2		1			3-20	2	QQYGRS	6	
neHD13 02	3-15	3-3	2	6	GLVRYDFWSSGGLPYYYYYMDV	22	1-39	1	QSYSTLWT	9	
neHD13 05	3-11	5-5	1	6	GPRIQLWYYGMDV	13	2-28	1	MQALQTPPW	10	
neHD13 06	3-7	/	/	6	LGQTYAGDYYYYYGMDV	17	2-28	4	MQALQTRLT	9	
neHD13 22	4-61	6-13	2	6	VISSSWYDYYYYYMDV	16	2-28	2	MQALQTPS	8	
neHD13 23	4-59	6-19	3	4	AVAGTVYFDY	10	3-20	2	QQYGSSPS	8	
neHD13 27	4-59	1-26	2	4	GSYFDY	7	3-20	4	QQYGSSLT	8	
neHD13 30	3-49	6-13	3	6	GEALAAAGYYGMDV	14	2-28	2	MQALQTPRYT	10	
neHD13 35	3-30-3	3-16	3	3	EGGGGSASLGDAFDI	15	1-39	4	QSYSTPLT	9	
neHD13 38	3-30	3-3	3	6	ASLGIFGVNYYYYGMDV	18	2-28	4	MQALQSLT	8	
neHD13 45	3-23	3-16	1	4	SGLWGLPIDY	10	3-20	1	QQYGSSPPWT	10	
neHD13 47	3-30-3	3-22	2	6	HYDSSGHKGSYYYGMDV	18	1-39	5	QSYSTPIT	9	
	VH	D	RF	JH	CDR3 (aa)	Length	Vλ	Jλ	CDR3 (aa)	Length	
neHD13 03	4-4	2-15	2	6	DLGYCSGGSCPDIYYYYGMDV	20	2-14	3	SSYSSSRRV	10	
neHD13 07	3-15	1-26	3	4	EFGIVGVTPRGAAY	14	3-25	3	QSADSSGTLWV	11	
neHD13 10	4-39	2-21	2	4	YCGGDYSLYFDY	13	2-14	2	SSYSSSTLVV	11	
neHD13 12	4-59	3-22	2	4	LPVCSSGYCYFDY	14	3-21	1	QVWDSSSDHYV	11	
neHD13 15	1-3	3-10	2	6	EESYYGATYYYYGMDV	16	1-47	3	AAWDDSLSGWV	11	
neHD13 19	4-39	2-2	3	4	SPFWVPAADYFDY	14	2-14	2	SSYSSSTVV	10	
neHD13 20	4-61	2-2	2	2	VGVDCSSTSCYTPNWFYDL	19	1-40	2	QSYDSSLSGST	11	
neHD13 28	3-23	3-22	3	4	GSSPMIVVPSGPFYD	15	3-21	2	QVWDSSSDRVV	11	
neHD13 34	4-b	2-15	3	5	IGVVAAGFCFDP	12	1-51	3	GTWDSSLSAGV	11	
neHD13 36	4-4	3-3	2	3	DEDFWKAFDI	10	1-51	2	GTWDSSLSAGV	11	
neHD13 40	4-b	/	/	4	GIPVREGYFDY	12	1-47	2	AAWDDSLSGVV	11	
neHD13 48	4-4	3-10	2	4	SSYYGSGSYFDY	12	3-1	2	QAWDSSTAVV	10	
	VH	D	RF	JH	CDR3 (aa)	Length	V	J	CDR3 (aa)	Length	
neHD13 08	3-21	/	/	5							
neHD13 13	3-49	4-17	2	2	SSGYGDYATYWFYDL	15					
neHD13 14	1-24	1-26	3	5	DLIVGAPHA	9					
neHD13 26	3-30	6-19	2	5	GPYSSGWYRGWFDP	14					
neHD13 33	4-4	2-2	2	6	VKETAGYCSSTSCYSPSHYYYYMDV	25					
neHD13 44	3-30	/	/	5	GGVRFTKQNPLDWFDP	16					

RF, reading frame

Table S21. Repertoire of antibodies from mature naïve B cells of healthy donor HD13.

Ig	HEAVY						LIGHT			
	VH	D	RF	JH	CDR3 (aa)	Length	Vκ	Jκ	CDR3 (aa)	Length
mHD13 01	3-23	/	/	4	GGHFDY	6	1-8	1	QQYYSYPRT	9
mHD13 03	3-11	3-10	3	4	DFSWGVVVDY	9	3-11	1	QQRSNWLWT	9
mHD13 07	3-7	3-3	2	6	DASRYDYDFWSGYPIYYYYGMDV	23	2-28	1	MQALQTRT	8
mHD13 11	4-30-4	3-10	3	5	TQPTMVRGVIFEQGGGFDP	19	1-9	1	QQLNSYPRT	9
mHD13 15	3-11	1-26	2	4	EGFYSGSYSDY	11	1-39	3	QQSYSTPFT	9
mHD13 22	3-23	4-17	3	4	APSPTTVNGFDY	12	3-15	1	QQYNNWPLT	9
mHD13 23	4-4	4-17	3	6	DPDRGTVTDGMDV	13	2-30	2	MQGTHWLYT	9
mHD13 27	4-30-4	2-21	1	3	VNLLWWNAFDI	11	1-39	2	QQSYSILYT	9
mHD13 31	3-9	/	/	3	GTWRAYAYAFDAFDI	15	1-5	3	QQYNGIFT	8
mHD13 34	3-30-3	3-22	2	4	TPDYDSSGYAN	13	4-1	4	QQYYSTPPT	9
mHD13 35	4b	/	/	1	DSGGR	5	1-33	4	QQYDNLPPFT	10
mHD13 36	1-2	3-10	2	6	DEGSGYPPYYYYMDV	16	3-20	4	QQYGSSPRLT	11
mHD13 37	3-9	1-26	3	4	DAIVGAFGLPDY	12	1-5	1	QQYNSYSPWT	10
mHD13 40	3-30-3	6-13	3	3	DVLGAAAPHAFDI	13	3-20	2	QQYGSSPYT	9
mHD13 44	4-30-4	/	/	3	DLSRSGGGGSAFDI	14	1-33	1	QQYDNLPT	8
mHD13 47	1-24	/	/	4	SGILRGPFDY	10	3-20	4	QQYGSSPPLT	10
mHD13 09							1-39	1	QQSYSTPPST	10
	VH	D	RF	JH	CDR3 (aa)	Length	Vλ	Jλ	CDR3 (aa)	Length
mHD13 05	4b	5-24	2	4	RLGRDGYNFPPDY	13	2-23	1	CSYAGSSTDNYV	12
mHD13 10	1-18	2-2	3	6	ALQDIVVPAAPYMDV	16	2-14	3	SSYTSSTLWV	11
mHD13 13	3-30	/	/	3	EQPRLGDDAFDI	12	3-25	2	QSADSSGTYRVV	12
mHD13 16	1-24	3-22	2	5	AVDSSGYYYLTPPGASRWFDP	21	3-21	1	QVWDSSSDHQV	11
mHD13 26	3-30	3-3	3	6	DPMYYLVFGVALPDYYYYMDV	21	1-51	2	GTWDSSLSAVV	11
mHD13 40					see kappa		2-23	2	CSYAGSSTFVV	11
mHD13 41	3-11	2-2	3	4	DSRSDLIVVPAAADY	16	3-21	2	QVWDSSSDHVV	11
mHD13 48	4-39	5-5	2	6	SIHSYSLDLVDYYGMDV	17	3-1	2	QAWDSSTVV	9
mHD13 33							3-1	2	QAWDSSTVV	9

RF, reading frame

Table S22. Repertoire of antibodies from new emigrant B cells of healthy donor HD14.

Ig	HEAVY						LIGHT				
	VH	D	RF	JH	CDR3 (aa)	Length	Vκ	Jκ	CDR3 (aa)	Length	
neHD14 04	4-31	2-2	2	5	GYCSSTSCNQGGNWFDP	17	4-1	4	QQYYSTPLT	9	
neHD14 05	3-23	4-23	2	4	EGDYGGNSLFGGEDY	15	3-11	4	QQRSNWLT	8	
neHD14 06	4-4	4-4	3	5	DIVMSQDMTTVTTVWFDP	18	3-15	1	QQYNNWPQT	9	
neHD14 09	3-23	6-19	1	6	DRQWLVSSEPSARPPWEDWDGMDV	23	2-30	2	MQGTHWPQRT	10	
neHD14 12	3-7	3-22	2	3	HEAIGYYDSSGYYDAFDI	19	4-1	4	QQYYSTPLT	9	
neHD14 14	4-4	/	/	2	DDEYWYFDL	9	3-20	2	QQYGSSLMYT	10	
neHD14 15	1-18	5-24	3	6	EGMATQTADYYYYYGMDV	18	3-20	4	QQYGSSPLT	9	
neHD14 16	3-7	3-22	2	4	YSYYDSRCNFDY	13	1-33	4	QQYDNLPLT	10	
neHD14 17	3-15	3-10	3	4	DPLITMVRGVIIH	12	1D-13	3	QQFNYYPLT	9	
neHD14 18	3-48	3-3	2	4	DSDFWSGWFDY	11	3-15	4	QQYNNWPPLT	10	
neHD14 21	4-39	4-17	2	3	LIDVWRYGDYDHDAFDI	17	3-11	4	QQRSNWPLT	9	
neHD14 22	3-23	6-6	2	3	EYSSSSYGDFAFDI	14	1-39	5	QSYSTPLT	9	
neHD14 24	4-59	2-2	2	4	LHCSSTSCYEMYDY	15	1-39	3	QSYSTPFT	9	
neHD14 25	1-69	6-13	3	5	DPPEAAAGTEVRDFNPGWFDP	21	1-27	5	QKYNAPET	9	
neHD14 27	3-15	6-6	3	4	GIAARPGY	8	1-39	2	QSYSTPMYT	10	
neHD14 28	3-66	4-23	2	4	DRRYGGNSVGFDFY	14	1-39	2	QSYSTPYT	9	
neHD14 30	3-7	3-22	2	4	DLTYYYDSSGPNPYFDY	18	3-11	4	QQRSNWPLT	9	
neHD14 32	3-48	5-12	3	6	DTHIVATYYYYGMDV	14	1-33	3	QQYDNLPT	9	
neHD14 36	3-74	3-3	2	6	NYDFWSGYYYYYGMDV	16	3-20	2	QQYGSSPPYT	10	
neHD14 37	3-9	5-5	1	4	GAQGIQLWFFNY	12	1-5	2	QQYNSYSRYT	10	
neHD14 41	4-34	/	/	5	GPGSPRLNWFDP	12	3-11	2	QQRSNWPPRYT	11	
	VH	D	RF	JH	CDR3 (aa)	Length	Vλ	Jλ	CDR3 (aa)	Length	
neHD14 03	1-2	3-22	2	4	VMGPINYDSSGYLNY	15	2-23	2	CSYAGSSVV	9	
neHD14 07	1-2	2-8	2	4	LGRADCTNGVCYDY	14	2-14	2	SSYSSSTVV	10	
neHD14 10	3-11	5-5	2	6	DKGGYSYGSAYYYGMDV	17	1-51	2	GTWDSSLSAGV	11	
neHD14 14					see kappa		2-8	1	SSYAGSNKLGV	11	
neHD14 23	1-2	6-13	1	4	DEQQLVVAGYYMGY	14	3-25	2	QSADSSGTYVV	11	
neHD14 26	3-23	1-26	1	3	GPEWELPRHAFDI	13	3-21	7	QVWDSSSDHAV	11	
	VH	D	RF	JH	CDR3 (aa)	Length	V	J	CDR3 (aa)	Length	
neHD14 33	3-9	3-3	2	6	DKGFWSGYARVAYYYGMDV	20					
neHD14 38	3-23	2-15	3	4	VADIVVVVAAPPY	14					

RF, reading frame

Table S23. Repertoire of antibodies from mature naive B cells of healthy donor HD14.

Ig	HEAVY						LIGHT				
	VH	D	RF	JH	CDR3 (aa)	Length	Vκ	Jκ	CDR3 (aa)	Length	
mHD14 01	3-53	3-22	2	3	YYYDSFDAFDI	11	1-39	2	QQSYSTPMYT	10	
mHD14 07	3-66	/	/	4	WGNEDGGNY	9	1-39	1	QQSYSTLWT	9	
mHD14 21	1-46	5-5	1	6	GGTWIQPFQMDV	12	2-28	2	MQALQTPYT	9	
mHD14 26	3-7	6-6	1	4	DWGLVKQLWGVDFDY	16	1-39	4	QQSYSTPPRT	10	
mHD14 33	4-59	3-22	2	6	GGPQYYYYDSSGYQYYYYYGMVDV	22	1-33	1	QQYDNLQPWT	10	
mHD14 41	1-69	3-22	2	6	TYDSSGYYYYYYGMVDV	17	1-16	4	QQYNSYPLT	9	
mHD14 44	1-18	2-21	3	4	DVSMGVTAIPVDYDFDY	16	1-5	4	QQYNSYPLT	9	
mHD14 47	3-23	6-19	3	6	GEGAVAGYYYYYGMVDV	16	2-28	3	MQALQTPIT	9	
mHD14 62	4-59	5-12	2	6	DSGYDDPAAMDV	12	3D-15	2	QQYNNWPPYT	10	
mHD14 67	3-9	6-6	3	6	DRGIAAPYYYYGMVDV	14	3-20	5	QQYGSSPIT	9	
mHD14 70	3-21	3-3	2	3	ATVGYDFWVSGLDLAFDI	17	4-1	4	QQYYSTPLT	9	
mHD14 76	5-51	3-10	2	4	HGRIWGSNGY	10	3-11	4	QQRSNWLT	8	
mHD14 77	4-31	3-22	2	4	GGGSSSGSPV	10	2-30	3	MQGTHWPPFT	10	
mHD14 81	4-39	4-4	3	4	RTTVTRNGFDY	11	2-28	4	MQALQTLT	9	
mHD14 08							2-28	1	MQALQTPRT	9	
mHD14 17							1-39	1	QQSYSTPVT	9	
mHD14 23							2D-29	4	MQSIQLPLT	9	
mHD14 25							1-39	2	QQSYSTPYT	9	
mHD14 61							1-5	2	QQYNSYMYT	10	
mHD14 63							3-20	2	QQYGSSPLT	9	
mHD14 78							3-20	4	QQYGSSPPLT	10	
mHD14 82							1-NL1	3	QQYYSTPFT	9	
mHD14 90							1-9	2	QQLNSYLYT	9	
							VH	D	RF	JH	CDR3 (aa)
mHD14 16	4-34	3-3	2	6	SQYYDFWVSGYPERDYMDV	19	3-21	3	QVWDSSSVKV	10	
mHD14 20	3-23	6-13	3	4	MGAIAAGFDY	11	2-8	2	SSYAGSNNWV	10	
mHD14 27	4-34	3-10	2	4	AQGYGSGSYKALGFDY	19	3-21	3	QVWDSSSDHWV	11	
mHD14 29	1-8	/	/	6	VAYDYYYYYYGMVDV	14	1-44	2	AAWDDSLNGVV	11	
mHD14 37	3-11	4-23	2	4	GRYGGNSPMCY	11	6-57	3	QSYDSSNHVV	10	
mHD14 38	3-66	2-2	2	6	DLSTSFYGMVDV	11	1-40	2	QSYDSSLSGVV	11	
mHD14 39	3-64	6-19	1	4	EQWLGGYDFDY	11	2-11	1	CSYAGSYIHVV	11	
mHD14 49	3-66	6-13	3	4	MGLGIAAAGLDY	12	2-14	3	SSYTSSSTWV	10	
mHD14 50	3-64	6-6	2	4	VMGYSSSSGRDY	12	3-21	1	QVWDSSSDHYV	11	
mHD14 53	3-11	3-3	2	4	VDHDFWVSGNIDY	12	1-51	3	GTWDSSLSAGV	11	
mHD14 55	4-34	/	/	4	VPPGGQDY	8	3-21	1	QVWDSSSDHYV	11	
	VH	D	RF	JH	CDR3 (aa)	Length	V	J	CDR3 (aa)	Length	
mHD14 47	3-23	6-19	3	6	GEGAVAGYYYYYGMVDV	16					
mHD14 87	4-34	7-27	3	4	GNPNWGFYY	9					

RF, reading frame

Table S24. Repertoire and reactivity of antibodies from new emigrant B cells of healthy donor HD15.

Ig	HEAVY					LIGHT					REACTIVITY		
	VH	D	RF	JH	CDR3 (aa)	Length	Vκ	Jκ	CDR3 (aa)	Length	Poly	HEp-2	Staining
neHD15 02	1-18	6-19	3	4	VESRAVAGLLRNDY	14	1-39	3	QQSYSTPLFT	10	-	+	-
neHD15 09	3-33	6-19	3	4	DPADYIAVAGTGY	13	1-33	4	QQYDNLPR	9	-	-	-
neHD15 16 #	4-39	/	/	4	KQTIPQLPIDY	11	3-20	2	QQYGSSPQT	9			
neHD15 17	3-23	/	/	4	GIWDDFDY	8	2-30	3	MQGTHWPPRFT	11	-	+	-
neHD15 22	3-66	3-3	1	4	DGGFLETSPFDY	12	1-5	1	QQYNSYPWT	9	-	-	-
neHD15 26 #	3-48	/	/	6	DDWFAGTHKPSQNYYYGMDV	21	3-15	1	QQYNNWPLT	9			
neHD15 30	4-34	6-6	1	6	RKQLGIYYYYGMDV	14	3-15	2	QQYNNWPPMYT	11	+	+	F
neHD15 33	4-59	3-10	2	3	EGSYWDRDAFDI	12	3-20	3	QQYGSSLPYT	10	-	+	-
neHD15 34	7-81	6-13	3	3	ESIAAASKGRGAFDI	15	3-20	1	QQYGSSPRT	9	-	-	-
neHD15 40	4-39	6-19	2	4	GWGSGWYFDY	11	1-5	2	QQYNSYPYT	9	-	-	-
neHD15 44 #	3-43	6-19	3	4	ALSPGIAVAGTEMGY	15	3-15	1	QQYNNWPPRT	10			
neHD15 49	1-69	1-7	1	6	DTLELEQPYYYGMDV	16	2-30	4	MQGTHFLT	8	-	+	-
neHD15 50	4-34	1-26	3	5	GKSLVGAIPWFDP	13	3-15	2	QQYNNWPYT	9	-	+	-
neHD15 54	4-59	1-26	2	3	DGGSHGVDAFDI	13	3-20	1	QQYGSSPWT	9	-	+	-
neHD15 63	1-69	/	/	2	AASVAKAYWYFDL	13	1-8	2	QQYNSYPYT	9	-	-	-
neHD15 69 #	1-2	4-17	3	4	GVGTVTSFDY	10	1-5	1	QQYNSYSRT	9			
neHD15 72	3-23	1-26	2	4	PGTSGSYVGLSYFDY	16	1-27	1	QKYNAPWT	9	-	-	-
neHD15 73	4-59	/	/	4	HRVNTGEAGKFDY	13	3-15	3	QQYNNWPR	8	-	-	-
neHD15 74	5-51	6-6	2	3	LYSSSQGFDAFDI	14	1-8	1	QQYNSYPQT	9	-	-	-
neHD15 76 #	1-24	/	/	4	VSRGIPTDY	9	3-15	4	QQYNNWPGT	9			
neHD15 78	1-18	4-4	3	4	AEGMTVTINDY	12	1-16	4	QQYNSYPLT	9	-	+	-
neHD15 85 #	3-11	3-22	2	4	G GKRYDSSGYGY	14	3-20	1	QQYGSSPET	9			
neHD15 89 #	3-48	/	/	4	DLPLDY	6	3-20	2	QQYGSSLYT	9			
neHD15 92	4-39	/	/	3	HRNLPTGAFDI	11	1-5	1	QQYNSYSPT	9	-	-	-
neHD15 94 #	3-48	4-17	3	3	LMTVTVSWNAFDI	13	1-5	1	QQYNSYSGT	9			
neHD15 20							1-39	2	QQSYSTPPMYT	11			
neHD15 25							4-1	3	QQYSTPFT	9			
neHD15 57							3-20	1	QQYGSSWT	8			
neHD15 58							3-20	2	QQYGSSPGT	9			
neHD15 84							1-39	4	QQSYSTPPT	9			
neHD15 88							3-20	4	QQYGSSPLT	9			
	VH	D	RF	JH	CDR3 (aa)	Length	Vλ	Jλ	CDR3 (aa)	Length	Poly	HEp-2	Staining
neHD15 27 #	1-69	6-13	2	6	IEWKYSSTFYYYYYGMDV	18	2-8	2	SSYAGSNNLV	10			
neHD15 91	3-30	3-10	2	4	EWYSGSFDY	10	1-40	2	QSYDSSLGSGV	12	-	-	-
neHD15 96	3-53	/	/	5	ARPRVDFP	8	2-14	2	SSYSSSTFGV	11	-	-	-
	VH	D	RF	JH	CDR3 (aa)	Length	V	J	CDR3 (aa)	Length	Poly	HEp-2	Staining
neHD15 08	4-31	3-16	2	4	THYDYVWGSSYCFDY	16							
neHD15 37	3-15	3-10	1	4	LWFGELRSDDDV	12							
neHD15 39	4-4	3-22	2	4	SRGIDSSGYLGY	12							
neHD15 47	3-30	3-22	3	4	DFATMIVVAPDY	12							
neHD15 48	4-34	6-19	2	4	GVRSSGWSGSFSTYFDY	18							
neHD15 51	3-43	4-23	2	2	EHGGNLDWYFDL	12							
neHD15 59	3-43	4-17	2	3	AQSQDYGDYGPDAFDI	16							
neHD15 79	4-31	5-12	2	4	LLPYSGYDDGHYFDY	16							
neHD15 80	7-81	6-13	2	3	RLKSCGSSCLLMLFDI	17							
neHD15 81	4-39	/	/	4	LSGPVPDY	8							
neHD15 82	4-39	1-26	3	4	HAVGADADY	9							
neHD15 87	3-21	/	/	4	EEGWVGPSPYFDY	14							
neHD15 90	4-34	6-6	2	6	GNYSSTPDYGMV	15							

RF, reading frame; #, antibody failed to be expressed

-, non-reactive; +, reactive; +2, highly reactive

c, diffuse cytoplasmic staining; A, actin staining; G, Golgi staining; M, mitochondria staining; MS, mitotic spindle staining; N, nuclear staining; F, cytoplasmic fibers

Table S25. Repertoire and reactivity of antibodies from mature naive B cells of healthy donor HD15.

Ig	HEAVY					LIGHT				REACTIVITY			
	VH	D	RF	JH	CDR3 (aa)	Length	Vκ	Jκ	CDR3 (aa)	Length	Poly	Hep2	Staining
mHD15 07	3-64	2-15	2	4	DGRTYCSEGGSCSNPYFDY	18	2D-29	2	MQSIQPPT	8	-	-	-
mHD15 11	1-69	/	/	6	GTLNYYYYGMDV	12	1-6	1	LQDYNYPWT	9	+2	+2	c
mHD15 15	5-51	6-13	3	4	PGIAAAGSFDY	11	3-15	1	QQYNNWPSWT	10	-	-	-
mHD15 23 #	5-51	2-21	2	4	QDGSWETCGGDCYSVGLDY	19	1-39	4	QQSYSTPLT	9			
mHD15 31	4-39	4-23	2	2	RASPEYDYGVIWYFDL	16	1-39	1	QQSYSTPRT	9	-	-	-
mHD15 32	3-73	4-17	2	4	SGYGDYPLFDY	11	2-28	1	MQUALQTPWT	9	-	-	c, MS
mHD15 33 #	1-3	5-12	2	4	VRFDGSGVGY	10	3-11	2	QQRSNWPRYT	10			
mHD15 44	4-55	4-23	2	2	PRRAYGGNSGYWYFDL	16	1-39	1	QQSYSTPWT	9	-	-	-
mHD15 47	1-3	6-19	2	5	PGYSSGLVQNWFDP	14	4-1	4	QQYYSTPT	8	-	+2	N
mHD15 61	4-39	1-26	3	4	QVGARECDY	9	1-33	4	QQSVT	5	-	-	-
mHD15 63 #	1-69	3-22	2	5	EGSGLHYDP	9	3-11	1	QQRSNWPAT	9			
mHD15 65	5-51	/	/	4	HIYGSDY	7	2-28	2	MQUALQTYT	9	-	-	-
mHD15 72	1-46	1-26	2	4	TRARGSGSYFLLDY	15	4-1	4	QQYYSTPPFLT	11	-	-	-
mHD15 75	1-69	2-2	3	6	IVVVPARYGMDV	13	1-17	1	LQHNSYPWT	9	-	+	-
mHD15 89 #	1-18	4-17	2	5	DQPYGDYVNVWFDP	14	4-1	4	QQYYSTPT	8			
mHD15 92	3-23	/	/	4	DRGVAGSTD	9	1-8	1	QQYYSYPT	9	-	-	-
mHD15 94	4-59	/	/	4	IAWDPSGFYFDY	13	1-5	4	QQYNSYST	8	-	-	-
mHD15 96	1-69	4-4	2	4	DEVIPDYGDYVLRQFDY	18	1D-12	5	QQANSFPIT	9	+	+	-
mHD15 02							1-39	4	QQSYSTPPT	9			
mHD15 13							3-15	1	QQYNNWPRT	10			
mHD15 16							3-20	1	QQYGSSPRT	9			
mHD15 27							1-39	1	QQSYSTLWT	9			
mHD15 37							3-15	3	QQYNNWPFT	9			
mHD15 53							1-5	2	QQYNSMYT	9			
mHD15 54							1-39	3	QQSYSTFT	8			
mHD15 67							3-15	1	QQYNNWPRT	10			
mHD15 68							1-33	1	QQYDNLLWT	9			
mHD15 71							1-27	4	QKYNAPFT	9			
mHD15 85							3-15	1	QQYNNWPQT	9			
mHD15 90							3-15	1	QQYNNWPRT	10			
	VH	D	RF	JH	CDR3 (aa)	Length	Vλ	Jλ	CDR3 (aa)	Length	Poly	Hep2	Staining
mHD15 26	3-30	3-3	2	6	GLYDFWSGYADYYYYGMDV	21	1-44	2	AAWDDSLNGLL	11	-	-	-
mHD15 36 #	3-33	6-13	1	6	DGQQLVLGHYYGMDV	16	3-1	1	QAWDSSTAGV	10			
mHD15 61					see kappa		3-1	2	QAWDSSTAV	9	-	-	-
mHD15 62	4-34	6-6	2	4	GRSSAPYFDY	12	2-23	2	CSYAGSSTFGVV	12	-	-	-
mHD15 74	3-33	6-13	2	6	IEGSSWYVLGLDPYGGMDV	20	3-25	2	QADSSGYVYV	11	-	-	-
mHD15 82	4-31	3-22	2	4	DAHYYDEGFDY	11	2-11	1	CSYAGSYFRV	11	-	+	-
mHD15 95	3-21	3-22	2	3	VYYDSSGYWGAFDI	15	1-40	2	QSYDSSLGWVYV	12	-	-	-
	VH	D	RF	JH	CDR3 (aa)	Length	V	J	CDR3 (aa)	Length	Poly	Hep2	Staining
mHD15 38	5-51	2-15	2	4	GLGYCSGGSCYSGQDY	16							
mHD15 52	4-59	3-3	2	2	VETYAFWSGYPYWYFDL	17							
mHD15 59	3-48	/	/	4	GYLFDY	6							
mHD15 77	3-64	6-19	1	4	ANLGLVLPPTFDY	13							
mHD15 79	3-11	6-19	2	4	VGYSWGYYEDY	11							
mHD15 87	3-11	5-24	3	4	VRVEMATITGPSFDY	15							
mHD15 93	1-69	3-3	1	4	RLRFLEWLGFYD	12							

RF, reading frame; #, antibody failed to be expressed

-, non-reactive; +, reactive; +2, highly reactive

c, diffuse cytoplasmic staining; A, actin staining; G, Golgi staining; M, mitochondria staining; MS, mitotic spindle staining; N, nuclear staining; F, cytoplasmic fibers