

**Identification of a novel stereotypic *IGHV4-59/IGHJ5*-encoded B-cell receptor subset expressed by various B-cell lymphomas with high affinity rheumatoid factor activity**

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## Supplementary Figure 1

### (A) HCV-related lymphoma 121 expresses a stereotypic V1-69-RF BCR

	IGHV	IGHV-CDR3 region	Homology	Genbank
Case 121 V1-69-RF, BOR-RF	V1-69/JH4	C AREGQRAATNPFDY WGQG C AREGRRMAINPFDY WGQG	79%	AHI97221 1313976A
Case 121 HCV-expanded B cell clone 1446_B6	V1-69/JH4	C AREGQRAA-TNPFDY WGQG C AREG-RATVTNPFDY WGQG	86%	AHI97221 ABV71008
Case 121 Gastric MALT L (1H1)	V1-69/JH4	C AREGQRAATNPFDY WGQG C AREGLAAVTNPFDY WGQG	79%	AHI97221 ACX35537
Case 121 V1-69-RF, MR1-RF	V1-69/JH4	C AREGQRAATNPFDY WGQG C AREGRRMAANPYDY WGQG	79%	AHI97221 CAA84416
Case 121 HCV cryoglobulinemia	V1-69/JH4	C AREGQRAATNPFDY WGQG C AREGRLTIVTNPFDY WGQG	71%	AHI97221 AAL17963
Case 121 Salivary gland MALT-L (M11)	V1-69/JH4	C AREGQRAATNPFDY WGQG C AREGIAAAVNPFDY WGQG	79%	AHI97221 AAP34734
Case 121 HCV cryoglobulinemia LDU125_G4	V1-69/JH4	C AREGQRAATNPFDY WGQG C AREGIAAAVNPFDY WGQG	79%	AHI97221 ACX46929
Case 121 ABC-type DLBCL (1370)	V1-69/JH4	C AREGQRAA--TNPFDY WGQG C AREG-RGSVTNPFDY WGQG	79%	AHI97221 AEB71133
Case 121 Salivary gland MALT-L (Iso 3)	V1-69/JH4	C AREGQRAA--TNPFDY WGQG C AREG-RGTEYTNPFDY WGQG	79%	AHI97221 AAF61677
Case 121 HCV cryoglobulinemia (TR)	V1-69/JH4	C AREGQRAATNPFDY WGQG C AREGMRLPRNPFDY WGQG	71%	AHI97221 AAR01023

### (B) HCV-related lymphomas 105 and 126 express stereotypic WOL-RF BCRs

	IGHV	IGHV-CDR3 region	Homology	Genbank
Case 105 WOL-RF	V1-69/JH4	C ARVFGYE-SNSYFY Y WGQG C AREYGFDTSDY YYY WGQG	86%	AHI97205 0707281C
Case 105 HCV LDU 125 (D12)	V1-69/JH4	C ARVFGYESNSYFY-Y WGQG C AREFNVDSSGY YFY WGQG	71%	AHI97205 ACX46924
Case 105 Lymphoma Ma cryoglobulinemia	V1-69/JH4	C ARVFGYESNS-YFY Y WGQG C ARELGYDSSAY YYY WGQG	71%	AHI97205 AAU84886
Case 105 Gastric MALT L (ML16)	V1-69/JH4	C ARVFGYE-SNSYFY Y WGQG C AREFSYDRSGY YYY WGQG	71%	AHI97205 AAC52055

Case 126 WOL-RF	V1-69/JH4	C <b>AREADYDSSDYFFY</b> WGQG C <b>AREYGFDTSDYYYY</b> WGQG	87%	AHI97231 0707281C
Case 126 HCV LDU 125 (D12)	V1-69/JH4	C <b>AREADYDSSDYFFY</b> WGQG C <b>AREFNVDSSGYYFFY</b> WGQG	80%	AHI97231 ACX46924
Case 126 Lymphoma Ma cryoglobulinemia	V1-69/JH4	C <b>AREADYDSSDYFFY</b> WGQG C <b>ARELGYDSSAYYYY</b> WGQG	80%	AHI97231 AAU84886
Case 126 HCV-related lymphoma	V1-69/JH4	C <b>AREADYDSSDYFFY</b> WGQG C <b>AREQDYDTSYYGY</b> WGQG	73%	AHI97231 AAG33828
Case 126 Gastric MALT L (ML16)	V1-69/JH4	C <b>AREADYDSSDYFFY</b> WGQG C <b>AREFSYDRSGYYFY</b> WGQG	73%	AHI97231 AAC52055
Case 126 HCV-related MALT-L cryoglobulinemia	V1-69/JH4	C <b>AREADYDSSDYFFY</b> WGQG C <b>ARGTD--SSNYFFY</b> WGQG	73%	AHI97231 AAG33831

### (C) HCV-related lymphomas 103 and 110 express stereotypic V4-59-RF BCRs

	IGHV	IGHV-CDR3 region	Homology	Genbank
Case 103 V4-59-RF, MR20-RF	V4-59/JH2	C <b>ARDSYCSGGSCFDWYFDL</b> WGRG C <b>ARDSYCSGGSCFDWYFDL</b> WGRG	100%	AHI97201 AAB58436
Case 103 Clone in Sjögren's syndrome salivary gland	V4-59/JH2	C <b>ARDSYCSGGSCFDWYFDL</b> WGRG C <b>ARDRYCSGGSCFDWYFDL</b> WGQG	94%	AHI97201 AAG40824
Case 103 Hepatic lymphoma HCV cryoglobulinemia	V4-59/JH2	C <b>ARDSYCSGGSCFDWYFDL</b> WGRG C <b>ARDRFCGGSCFDWYFDL</b> WGQG	94%	AHI97201 AAG33822
Case 103 Case 110	V4-59/JH2 V4-59/JH2	C <b>ARDSY-CSGGSCFDWYFDL</b> WGRG C <b>ARD-YWCSGGSCFDWYFDL</b> WGRG	94% 94%	AHI97201 AHI97216
Case 103 CLL (N28H)	V4-59/JH2	C <b>ARDSYCSGGSCFDWYFDL</b> WGRG C <b>ARDRYCSGGSCFDWYFDF</b> WGQG	89%	AHI97201 AAZ08734
Case 103 HCV-related lymphoma	V4-59/JH2	C <b>ARDSYCSGGSCFDWYFDL</b> WGRG C <b>ARDSFCTGGSCFDWYFD-</b> WGQG	89%	AHI97201 AAG02407
Case 110 V4-59-RF, MR20-RF	V4-59/JH2	C <b>ARD-YWCSGGSCFDWYFDL</b> WGRG C <b>ARDSY-CSGGSCFDWYFDL</b> WGRG	94%	AHI97216 AAB58436
Case 110 Clone in Sjögren's syndrome salivary gland	V4-59/JH2	C <b>ARD-YWCSGGSCFDWYFDL</b> WGRG C <b>ARDRY-CSGGSCFDWYFDL</b> WGQG	94%	AHI97216 AAG40824
Case 110 Hepatic lymphoma HCV cryoglobulinemia	V4-59/JH2	C <b>ARDYWCSGGSCFDWYFDL</b> WGRG C <b>ARDRFCGGSCFDWYFDL</b> WGQG	89%	AHI97216 AAG33822
Case 110 CLL (N28H)	V4-59/JH2	C <b>ARD-YWCSGGSCFDWYFDL</b> WGRG C <b>ARDRY-CSGGSCFDWYFDF</b> WGQG	89%	AHI97216 AAZ08734

Case 110	V4-59/JH2	C	ARDYWCSSGGSCFDWYFDL	WGRG	78%	AHI97216
HCV-related lymphoma		C	ARDSFCTGGSCFDWYFD-	WGQG		AAG02407

**(D) HCV-related lymphoma 101 shows IGHV-CDR3 stereotypy with an ABC-type DLBCL**

	IGHV		IGHV-CDR3 region		Homology	Genbank
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Case 101	V1-69/JH4	C	ARGSSDCRTVNCPFNY	WGQG	69%	AHI97197
ABC-type DLBCL (562)		C	ARGSSDSSTVVTPFY	WGQG		AEB71118

**Supplementary Figure 1 IGHV-CDR3 amino acid sequence stereotypy of HCV-related B-cell lymphomas with (A) stereotypic V1-69-RFs, with (B) stereotypic WOL-RFs, with (C) stereotypic V4-59-RFs and (D) with a ABC-type DLBCL.**

Red color amino acids indicates identical amino acids, blue color indicates homologous amino acids. IGHV-CDR3 regions are flanked by a Cysteine (C) and a Tryptophan (W).

**Supplementary Table 1**

**IGHV sequences used to search for the new IGHV4-59/IGHJ5-encoded stereotypic VH-CDR3 aa sequence**

		number of	stereotypic
B-cell lymphoma	source of the IGHV sequences	IGHV sequences	IGHV4-59/IGHJ5
MALT lymphoma	NCBI protein database release 211.0, 15 december 2015	170	1
Splenic MZBCL	NCBI protein database release 211.0, 15 december 2015	57	0
CLL	NCBI protein database release 211.0, 15 december 2015	1505	0
CLL	Donisi PM et al. <i>Diagn.Mol.Pathol.</i> (2006)15:206	55	0
CLL	Irons RD et al. <i>Leuk.Res.</i> (2009)33:1599	46	0
CLL	Karan-Djurasevic et al. <i>Clin.Lymphoma,Myeloma.Leuk.</i> (2012)12:252	88	0
DLBCL	NCBI protein database release 211.0, 15 december 2015	32	1
DLBCL	Young RM et al. <i>PNAS</i> (2015)112:13447	357	0
DLBCL cell lines	Young RM et al. <i>PNAS</i> (2015)112:13447	41	0
DLBCL	Ruminy P et al. <i>Leukemia</i> (2011)25:681	53	0
FL	NCBI protein database release 211.0, 15 december 2015	63	0
FL	Aarts WM et al. <i>Blood</i> (2000)95:2922	28	0
FL	Sachen KL et al. <i>Blood</i> (2012)120:4182	466	nd*

nd\* The IGHV sequences were not included in the publication of Sachen et al., however there was only one IGHV4-59/IGHJ5 rearrangement present of the 466 IGHVs of FL