

SF3B1-mutated chronic lymphocytic leukemia shows evidence of NOTCH1 pathway activation including CD20 downregulation

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Supplementary Information for

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Supplementary Information:

- **Supplemental Materials and Methods**
- **Supplemental Figure Legends**
- **Supplemental Figures**
 - Supplemental Figure 1. Distributions of recurrent mutations in the *NOTCH1* gene and analysis of Time-to-First-treatment.
 - Supplemental Figure 2. *SF3B1* mutations induce alternative splicing.
 - Supplemental Figure 3. Gene expression profile.
 - Supplemental Figure 4. GSEA analysis of *NOTCH1*-related datasets.
 - Supplemental Figure 5. Analysis of CD20 expression.
- **Supplemental Tables**
 - Supplemental Table 1. Characteristics of the study cohort.
 - Supplemental Table 2. Association between *SF3B1* mutations and other prognosticators.
 - Supplemental Table 3. Differentially expressed probes between *SF3B1*-mut and WT CLL cases.
 - Supplemental Table 4. Differentially expressed probes between *NOTCH1*-mut and WT CLL cases.
 - Supplemental Table 5. Gene Set Enrichment Analysis of *NOTCH1*-related datasets.

Supplementary Methods

Next Generation Sequencing

For targeted sequencing, specific PCR primers were designed and modified according to Illumina (San Diego, CA). Multiplex PCR products were a high fidelity Taq polymerase (Phusion High-Fidelity DNA Polymerase, ThermoFisher Scientific, Waltham, MA) and subsequently tagged with specific index according to modified procedures for NexteraXT (Illumina). Purified libraries were pooled, and paired-end sequenced in a MiSeq instrument (Illumina). For NexteraXT-based sequencing, PCR amplicons were generated using a high fidelity Taq polymerase (Phusion High-Fidelity DNA Polymerase, ThermoFisher Scientific), fragmented and subjected to NGS on a MiSeq sequencer (Illumina). Data were analyzed with MiSeq Reporter (Illumina) or aligned using HISAT2¹ against human genome assembly hg19, analyzed with custom pipelines and visualized with IGV software². Results were expressed as Variant Allele Frequency (VAF). Variants with a “Strand Bias” or “LowGQ” flag were discarded.

Targeted splicing variant analysis

Target genes *DVL2*, *GCC2* and *MAP3K7* were selected among the highest-scoring alternatively-spliced transcripts identified by Wang et al.³. For determination of alternative splicing variant abundance by NGS, single amplicons spanning the alternative splice site were sequenced by ultradeep NGS and the coverage across the spliced and not spliced regions was computed using the SAMtools *depth* command. A “percent spliced-in” (PSI) metric was defined as the ratio between the abundance of the alternative spliced isoform and the abundance of the total transcript. Alternative splicing of *DVL2* (*altDVL2*) by RT-qPCR was evaluated using the reported³ hydrolysis assay and normalized against total *DVL2*.

Quantitative Real-Time PCR

RNA for Quantitative Real-Time PCR (RT-qPCR) was extracted with TRIZOL Reagent (ThermoFisher Scientific) or the RNeasy MicroKit (Qiagen, Hilden, Germany) with DNaseI digestion; reverse transcription was carried out using oligodT primers and ImpromII reverse transcriptase with RNaseIn RNase inhibitors (all from Promega, Madison, WI). Transcript expression of genes of interest was assessed on a CFX96 Real-Time PCR system (Bio-Rad, Hercules, CA) using FastStart Universal PCR Master Mix (Roche, Basel, Switzerland) using hydrolysis probe-based assays (total *DVL2* Hs.PT.58.40551087, *DTX1* Hs.PT.58.26105230, *HES1* Hs.PT.58.4181121, *HEY1* Hs.PT.58.4299267, *MS4A1* Hs.PT.56a.24784282 IDT Integrated DNA Technologies, Leuven, Belgium; *CD300A* Hs00381974_m1, *IL1R2* Hs00174759_m1, *HES4* Hs00368353_g1 ThermoFisher Scientific) and normalized against total beta-2-microglobulin (forward primer, CCTGAATCTTGGAGTACGCT; reverse primer, GGCATTCTGAAGCTGACA; probe, CTAAGGCCACGGAGCGAGACATC, IDT). Abundance of the alternatively spliced *DVL2* was evaluated using the reported assay³ and normalized against total *DVL2*.

Gene expression profiling (GEP) and data mining tools

CLL cases for GEP experiments were selected among those with a CD5+ purity >90%, unmutatedIGHV status and absence of trisomy 12. Total RNA for GEP was extracted using the TRIZOL Reagent (Thermo Fisher Scientific) and validated for integrity using the 2200 Tapestation system (Agilent Technologies, Santa Clara, CA). RNA samples were labeled with the Low Input Quick Amp Gene Expression Labeling Kits, hybridized on oligonucleotide microarray slides (SurePrint G3 Human GE v2 8x60K Microarray 8x60K, Agilent design ID 039494, <https://earray.chem.agilent.com/earray/>) and acquired with a microarray scanner (all reagents and instruments from Agilent Technologies) as previously described⁴. The hybridization signal values for the multiple probes were generated with the use of Agilent Feature Extraction Software 10.7.3 (Agilent Technologies, Santa Clara, CA). Microarray data are available at GEO (<http://www.ncbi.nlm.nih.gov/geo/>) under accession number GSE137024.

Bioinformatic analyses were performed using GeneSpringGX 11.5 software (Agilent Technologies). Differentially expressed genes were selected by moderated t-test with Bonferroni-Holm correction for multiple testing for a p value <0.05 and a fold change >1.5. For clustering purposes, only known genes were employed, excluding unannotated probes, generic ORFs, antisense RNAs, long intergenic RNAs and uncharacterized loci. Unsupervised hierarchical clustering was performed using Cluster3 (<http://bonsai.hgc.jp/~mdehoon/software/cluster/>),⁵ applying complete-linkage method with Euclidean distance.

Gene Set Enrichment Analysis (GSEA, <http://www.broad.mit.edu/gsea/index.jsp>) was performed with GSEA-3 and 1000 phenotype permutations on all detected probes. In presence of multiple probes per gene, the one with the greatest difference in fold change between phenotypes was included. NOTCH1-related gene sets were either collected from the Molecular Signature Database v6.2 (<http://software.broadinstitute.org/gsea/> msigdb) or manually loaded from published signatures.⁶ Gene sets were assessed as significantly enriched in one of the phenotypes if the nominal p value was less than 0.05 and, for multiple hypothesis correction, a FDR-q value less than 0.1.

Western blot (WB)

Total proteins were extracted in RIPA lysis buffer (Santa Cruz Biotechnology, Heidelberg, Germany), quantified through Bradford assay (Bio-Rad) and ran in 4-20% SDS-PAGE precast gels (Bio-Rad) prior to transfer to nitrocellulose membranes (Trans-Blot Turbo pack, Bio-Rad). Immunoblotting was performed with anti-NICD (cleaved NOTCH1 Val1744 D3B8, Cell Signaling Technology, Leiden, The Netherlands), anti-DVL2 (30D2, Cell Signaling Technology) and anti-β-actin (AC15, Sigma-Aldrich, Milan, Italy) as loading control. Detection was performed with HRP -conjugated antibodies (Bethyl Labs, Montgomery, TX) and ClarityECL (Bio-Rad) on a ChemiDoc Touch Imaging System (Bio-Rad). Image analysis and quantification was performed with ImageLab software (Bio-Rad).

Cell Sorting

CD19+/CD5+ CLL cells from selected *SF3B1*-mutated cases were sorted according to CD20 expression using a PE-conjugated anti-CD20 antibody (clone L27, BD Biosciences, Milan, Italy) utilizing a FACSAriaIII cell sorter (BD Biosciences). High and low gates were set on the distribution tails to include about 15% and no more than 20% of the entire population.

Mantle Cell Lymphoma samples and Cell lines

Mantle Cell Lymphoma samples (CD19+/CD5+/CD23-/BCL1^{t(11;14)}) used for CD20 expression comparison derive from diagnostic routine. CLL-like MEC1 cells were obtained by DSMZ and maintained in RPMI1640 medium (Sigma-Aldrich) supplemented with 10% heat-inactivated fetal bovine serum (FBS Superior; Merck). The Notch CSL reporter HEK293 cell line was obtained by BPS Bioscience (San Diego, CA) and maintained according to manufacturer's protocol.

DVL2 expression vectors generation

DVL2 and altDVL2 expression vectors were generated as previously reported⁴ by PCR amplification of *DVL2* from a CLL sample bearing the *SF3B1* K700E mutation and subsequent cloning in a pCR3.1-NT/GFP backbone (ThermoFisher Scientific).

Transfection of RBPJ (CSL) reporter- HEK293 cell line and luciferase assay

RBPJ (CSL) reporter- HEK293 cells were seeded at 30% confluence; the day after were transfected using calcium phosphate and 8μg of DVL2 vector. After 48 hours, luciferase was detected using the ONE-Glo Luciferase Assay System (Promega) on a Infinite 1000Pro (TECAN, Männedorf, CH). For western blot analyses, 25μL were taken and subjected to SDS-PAGE as previously reported. For control of NOTCH1

inhibition, cells were treated with 10 μ M DAPT (D5942, Sigma-Aldrich). Experimental transfections were performed three times in triplicate, while controls were performed three times in duplicate.

Transfection with small interfering RNA (siRNA)

CLL-like MEC1 cells were transfected with siRNA for *DVL2* (TriFECTa DsiRNA kit hs.Ri.DVL2.13, IDT) using Amaxa Nucleofector, L kit and program C-005(Lonza, Basel, Switzerland). Cells were resuspended in 0.5mL of pre-warmed RPMI+20%FBS, let stand for 15 minutes and seeded in the appropriate volume.

Complement-dependent cytotoxicity (CDC) assay

For CDC assay, 2x10⁵ primary CLL cells were incubated with rituximab (5 μ g/ml) in a final volume of 150 μ l for 10 min at room temperature prior to the addition of pooled normal human serum (25%) and a further incubation at 37° C for 1 hour.

Statistical analyses

For clinical evaluation, TTFT was defined as the time between diagnosis and initiation of first therapy. Patients who did not receive any treatment were censored at their last confirmed treatment-free follow-up date. Probability of treatment was estimated by the Kaplan–Meier method, and patients alive and untreated were censored at the last follow-up. The log-rank test was used to compare probabilities between subgroups.

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Supplementary Figure Legends.

Supplementary Figure 1. Analysis of Time-to-First-treatment.

(A) Upper panel: Kaplan-Meyer survival analysis for Time-to-First-Treatment in 180 CLL cases with unmutated (UM) IGHV status and mutations of *SF3B1* (n= 24), *NOTCH1* (n=46) or none of them (WT, n=110; p=0.0244, Log-rank test); Lower panel: Kaplan-Meyer survival analysis for Time-to-First-Treatment in 195 CLL cases with mutated (M) IGHV status and mutations of *SF3B1* (n= 10), *NOTCH1* (n=5) or none of them (WT, n=180; p=0.0285, Log-rank test). (B) Kaplan-Meyer survival analysis for Time-to-First-Treatment in 382 CLL cases, as from Figure 1C, dissecting the contribution of cases with concomitant mutations of *SF3B1* and *NOTCH1* (n=3; p<0.0001, Log-rank test).

Supplementary Figure 2: Analysis of CD20 expression.

(A) Box-and-whiskers plots showing CD20 expression in Mantle Cell Lymphoma cells (MCL, n=13), normal B cells (n=26) or CLL (n=537), further dissected for the presence (n=121) or absence (n=416) trisomy 12. (B) Pie plot showing frequency of *SF3B1* and *NOTCH1* mutations in 537 CLL cases with respect of trisomy 12. Percentages are relative to the number of cases within the trisomy 12/non-trisomy 12 categories. (C) Gating strategy for analysis of the CD20dim population. P1 denotes a linear gate from peak value comprising the whole CD20-bright population (black area); dashed line indicates subtraction of P1 from residual population, mirrored from the right side of the histogram; grey area indicates the differential area between the left and the right sides corresponding to the CD20dim population. (D) Prototypical CD20 expression of two CLL cases with a homogeneous (left panel) or heterogeneous (right panel) CD20 expression. The histogram within the P1 gate is indicated in black, the CD20dim fraction is indicated in grey. The corresponding CD19/CD20 dot-plot is reported below. (E) Stability of CD20dim fraction in consecutive samples of 10 untreated CLL cases; upper panel: absolute CD20dim fraction values; lower panel: absolute difference of CD20dim fraction at each timepoint from initial sample, black line represents the mean value at each timepoint, error bars represent standard deviation. (F) Expression of CD20 MFI and CD20dim fraction as determined by flow cytometry in *SF3B1*-mut (*SF3B1*, n=42), *NOTCH1*-mut (*NOTCH1*, n=41), *SF3B1/NOTCH1*-mut (*SF3B1+NOTCH1*, n=6) or unmutated (WT, n=327) CLL cases. (G) Expression of CD20 MFI and CD20dim fraction as determined by flow cytometry or RT-qPCR in *SF3B1*-mut (*SF3B1*, n=6), *NOTCH1*-mut (*NOTCH1*, n=36) or unmutated (WT, n=79) CLL cases with trisomy 12. MFI, mean fluorescence intensity. Data are shown by Tukey's box and whisker plots. Outliers indicate data outside the 1.5 interquartile range. * p≤0.05, ** p≤0.01, *** p≤0.001, n.s. not significant, as determined by two-sided Mann-Whitney rank-test.

Supplementary Figure 3: Gene expression profile. (A) Heat map generated with 1274 known genes (see Table S4) found to be differentially expressed between *NOTCH1*-mut (n=6) and WT (n=13) cases and applied to all cases including *SF3B1*-mut cases (n=9) for unsupervised clustering. (B) Heat map generated with 443 known genes (see Table S3) found to be differentially expressed between *SF3B1*-mut (n=9) and WT (n=13) cases and applied to all cases including *NOTCH1*-mut cases (n=6) for unsupervised clustering. Color codes for gene expression values refer to mean centered log-ratio values. (C) Validation of microarray results: log₂ ratios of array data of selected genes are plotted in comparison with log₂ of Efficiency^-ΔCt values obtained from RT-qPCR using hydrolysis probes. (D) *MS4A1* expression as determined by RT-qPCR in the GEP samples; data are shown by Tukey's box and whisker plots. *** p≤0.001, n.s. not significant, as determined by two-sided Mann-Whitney rank-test.

Supplementary Figure 4: GSEA analysis of NOTCH1-related datasets. (A-B) GSEA enrichment plots of NOTCH1-related datasets depicting a significant enrichment of the NOTCH1 pathway in *NOTCH1*-mut cases (A) and *SF3B1*-mut cases (B). A brief description of each datasets is provided in Table S5. Reported are the heatmaps relative to the FABBRI_NOTCH_SIGNALING gene set.

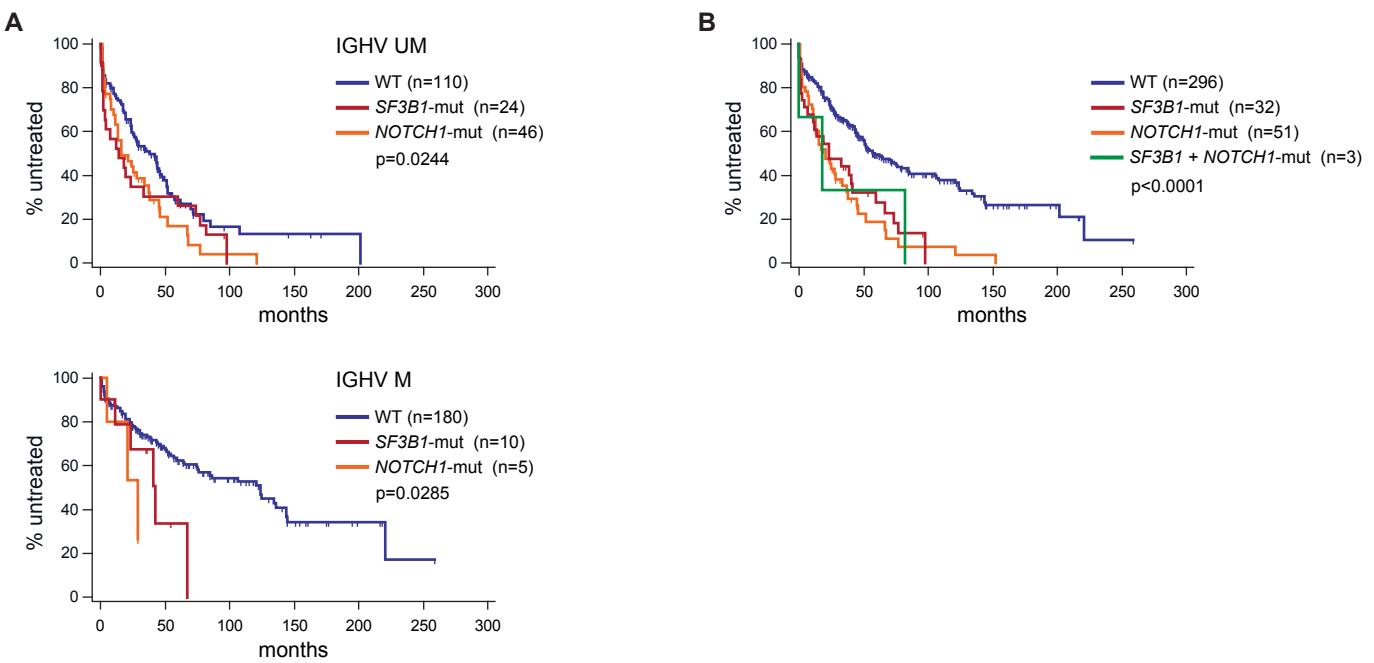
Supplementary Figure 5. Analysis of NICD expression. (A) Immunoblot of the NOTCH1 intracytoplasmic domain (NICD) in WT (n=15), *SF3B1*-mut (n=13) and *NOTCH1*-mut (n=7) cases. β-actin was used as loading control. Plus symbols indicate NICD staining positivity according to densitometric evaluation. Asterisk denotes a *NOTCH1*-mut sample loaded in both gels to normalize densitometric signals. Letter T denotes the *NOTCH1*-mut sample with the lowest normalized NICD intensity used as threshold for positivity. (B) Transcript expression of the NOTCH1 target genes *DTX1* and *CD300A* in the WB cohort, according to NICD staining positivity.

Supplementary Figure 6: *SF3B1* mutations induce alternative splicing. (A) Depiction of alternative splicing events triggered by *SF3B1* mutations on *GCC2* and *MAP3K7* as from IGV software. Gapped alignments are presented in light blue. Blue and red arches represent canonical and alternative splicing events, respectively. (B) Fraction of alternatively spliced isoforms in *SF3B1*-mut (n=34) or WT (n=39) cases. (C) Correlation of *altDVL2* fraction determined either by NGS or RT-qPCR. The Spearman's rank correlation coefficient (rho) and p-value are reported for *SF3B1*-mut (n=34) cases. WT cases (n=39) are reported for comparison. (D) *altDVL2* expression in relation with *SF3B1* mutations according to the mutated amino-acid residue and burden (n=35). WT cases (n=155) are reported for comparison. See also Figure 4D. (E) Expression of total *DVL2* transcript expression in *SF3B1*-mut (*SF3B1*, n=35), *NOTCH1*-mut (*NOTCH1*, n=32) or unmutated (WT, n=155) CLL cases. Data are shown by Tukey's box and whisker plots. Outliers indicate data outside the 1.5 interquartile range. *** p≤0.001, n.s. not significant, as determined by two-sided Mann-Whitney rank-test.

Supplementary Figure 7: Correlation between NOTCH1 signaling, *DVL2* expression and CD20 downregulation. (A) Activity of the NOTCH1 pathway in a HEK293-CSL reporter cell line with constitutively active signaling, transfected with either a wild-type *DVL2* or *altDVL2*. Controls include transfection with no DNA (Mock), treatment with the gamma-secretase inhibitor DAPT, no transfection (Pos ctrl) and no luciferase reagent (No Luc). Mock vs. *DVL2*, p=0.0244; Mock vs. *altDVL2*, p=0.96; *DVL2* vs. *altDVL2*, p= 0.0040. RLU: Relative Luciferase Units. Transfections were performed three times in triplicate, while controls were performed three times in duplicate. Data are shown by Tukey's box and whisker plots. Outliers indicate data outside the 1.5 interquartile range. Right panel: western blot analyses for transfection of *DVL2*/*altDVL2* in transfected cells. (B) Density plots (log10 density) of *DTX1* expression versus CD20dim fraction for WT (n=155), *SF3B1*-mut (n=35) and *NOTCH1*-mut (n=32) cases. Quadrant gates were set at the modal value of each parameter for WT cases; population frequency of each quadrant is reported. (C) Transcript expression of *MS4A1* determined by RT-qPCR (left panel) and *SF3B1* variant allele frequency determined by NGS in the CD20-High and CD20-Low subpopulations of sorted samples (n=9). Data are shown as dot-and-line diagrams. (D) Correlation between CD20 expression and percentage of relative lysis by complement-dependent cytotoxicity in *SF3B1*-mut, *NOTCH1*-mut and WT CLL cases. The Spearman's rank correlation coefficient (rho) and p-value are reported.

* p≤0.05, ** p≤0.01, *** p≤0.001, n.s. not significant, as determined by two-sided Mann-Whitney rank-test.

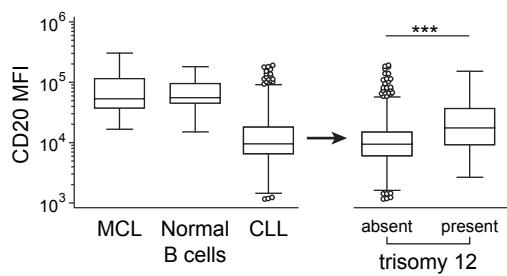
Supplementary Figure 1



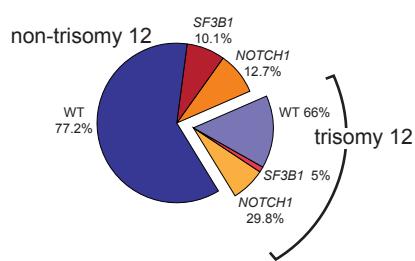
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Supplementary Figure 2

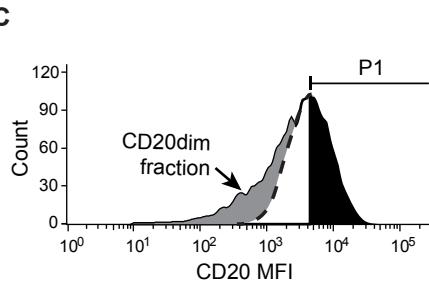
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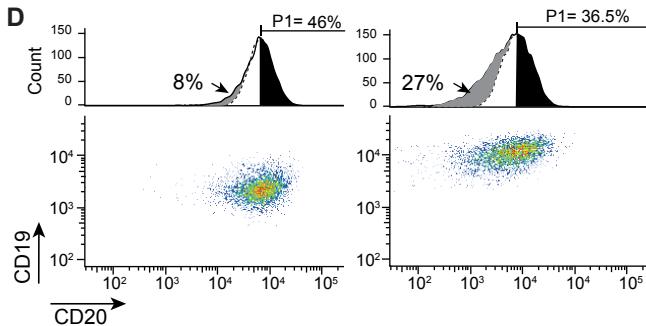
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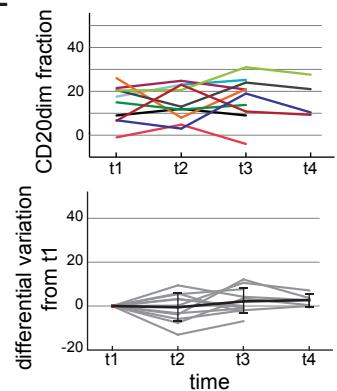
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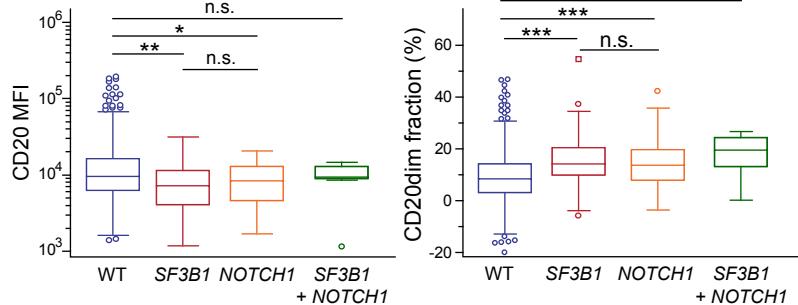
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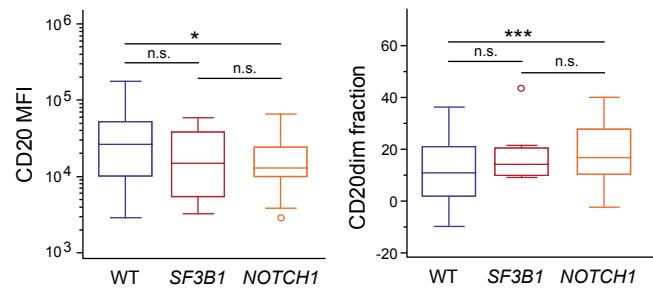
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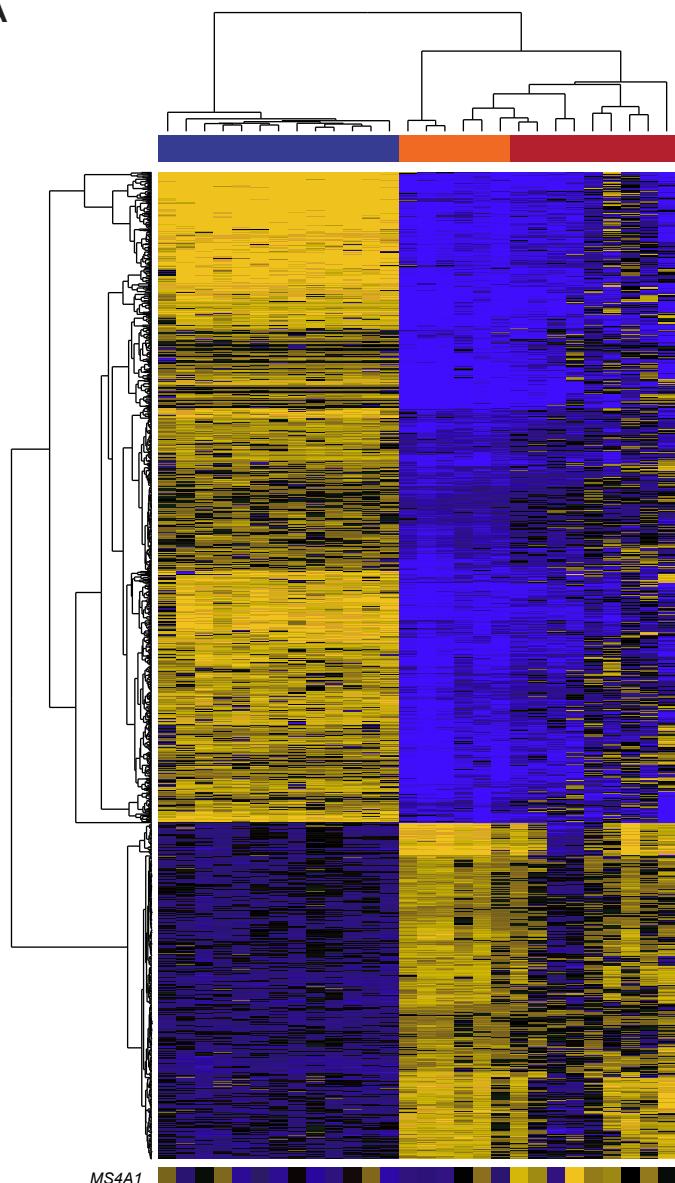
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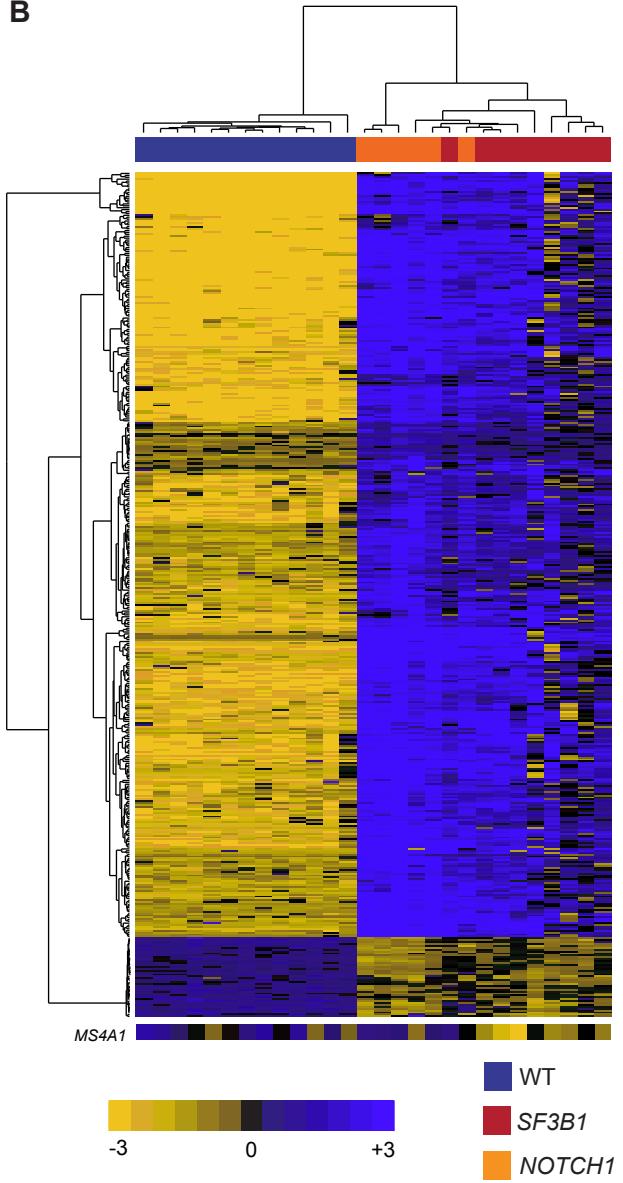
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Supplementary Figure 3

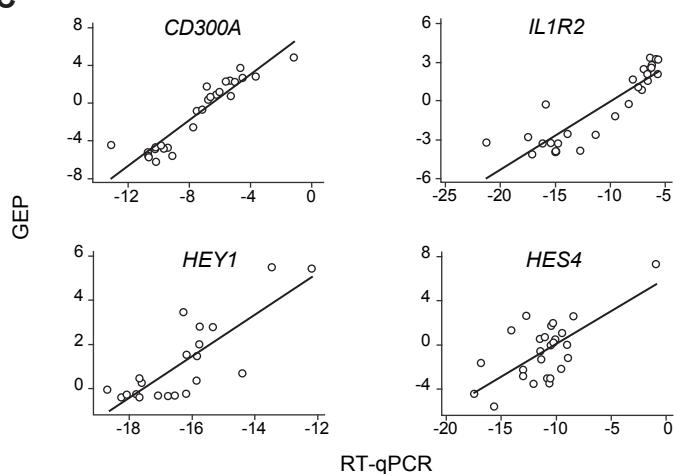
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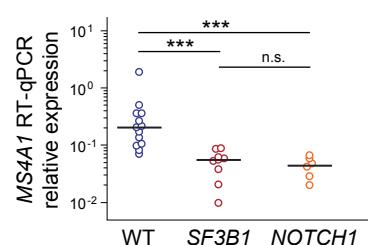
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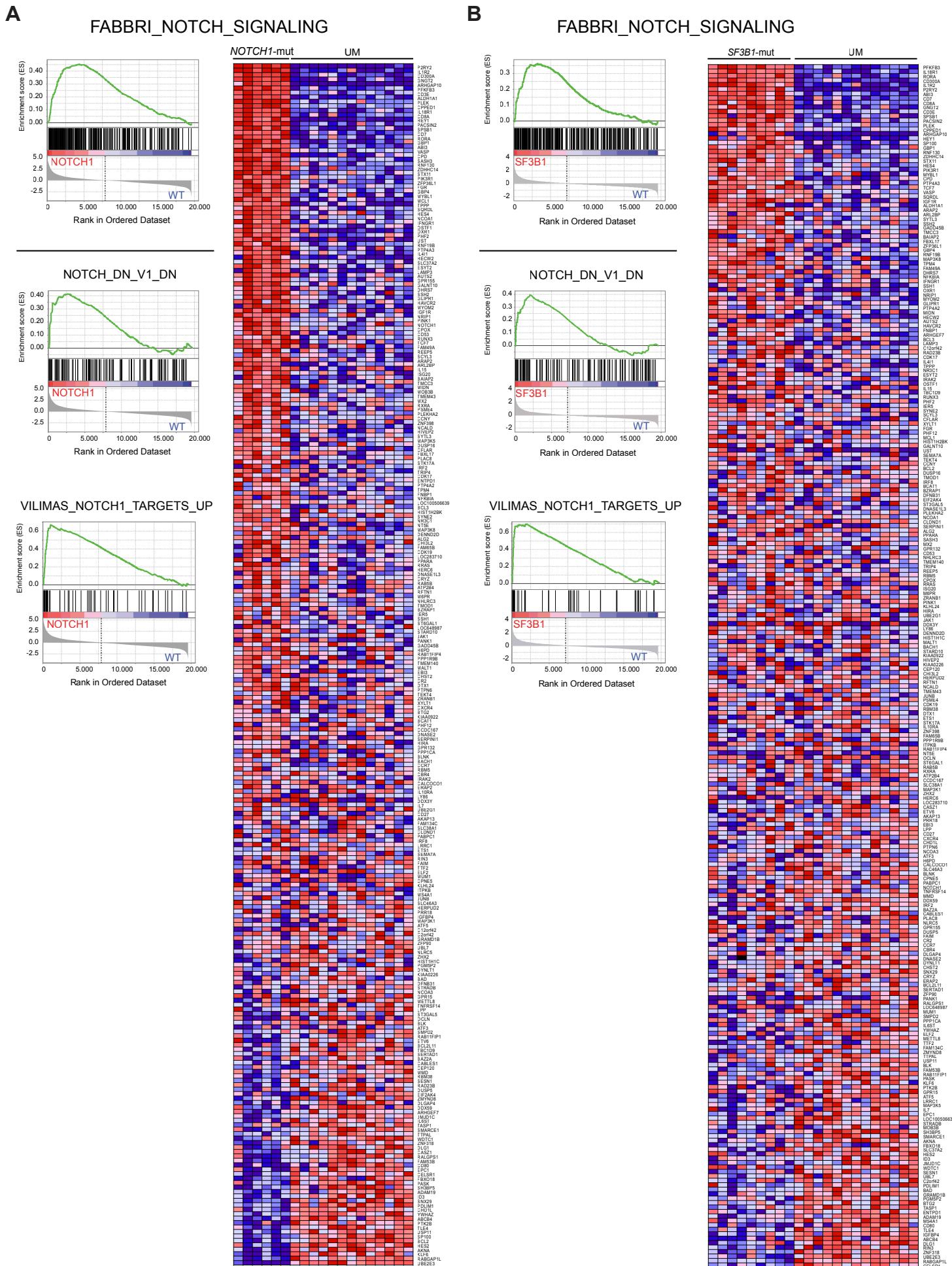


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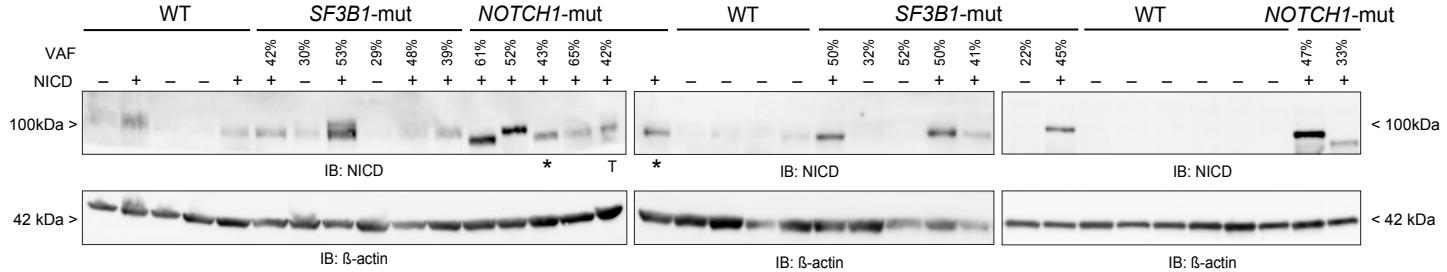
Supplementary Figure 4



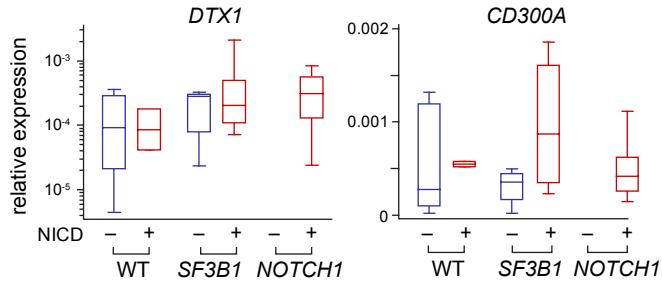
Supplementary Figure 4: GSEA analysis of NOTCH1-related datasets. (A-B) GSEA enrichment plots of NOTCH1-related datasets depicting a significant enrichment of the NOTCH1 pathway in *NOTCH1*-mut cases (A) and *SF3B1*-mut cases (B). A brief description of each datasets is provided in Table S5. Reported are the heatmaps relative to the FABBRI_NOTCH_SIGNALING gene set.

Supplementary Figure 5

A



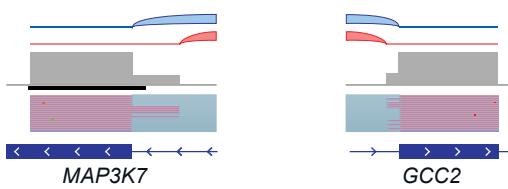
B



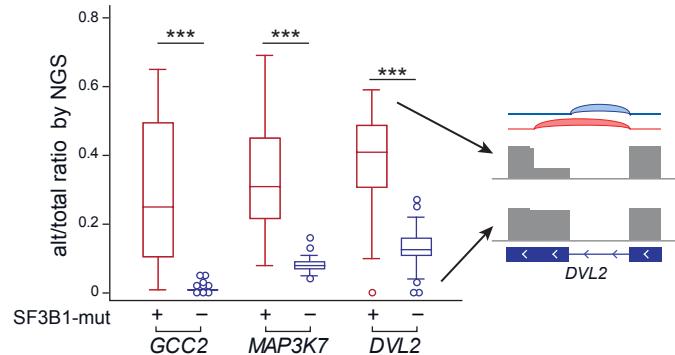
Supplementary Figure 5. Analysis of NICD expression. (A) Immunoblot of the NOTCH1 intracytoplasmic domain (NICD) in WT (n=15), SF3B1-mut (n=13) and NOTCH1-mut (n=7) cases. β-actin was used as loading control. Plus symbols indicate NICD staining positivity according to densitometric evaluation. Asterisk denotes a NOTCH1-mut sample loaded in both gels to normalize densitometric signals. Letter T denotes the NOTCH1-mut sample with the lowest normalized NICD intensity used as threshold for positivity. (B) Transcript expression of the NOTCH1 target genes *DTX1* and *CD300A* in the WB cohort, according to NICD staining positivity.

Supplementary Figure 6

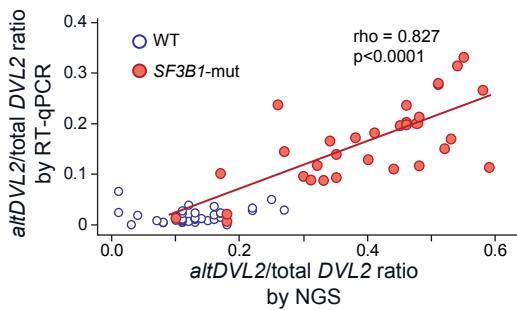
A



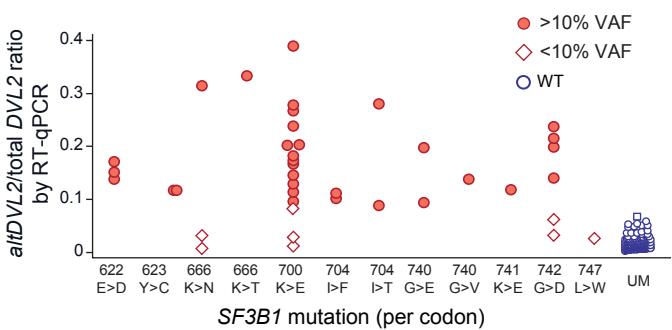
B



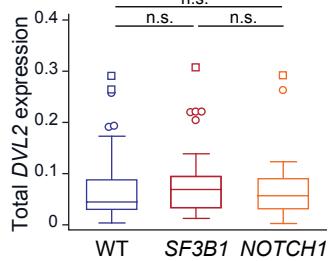
C



D

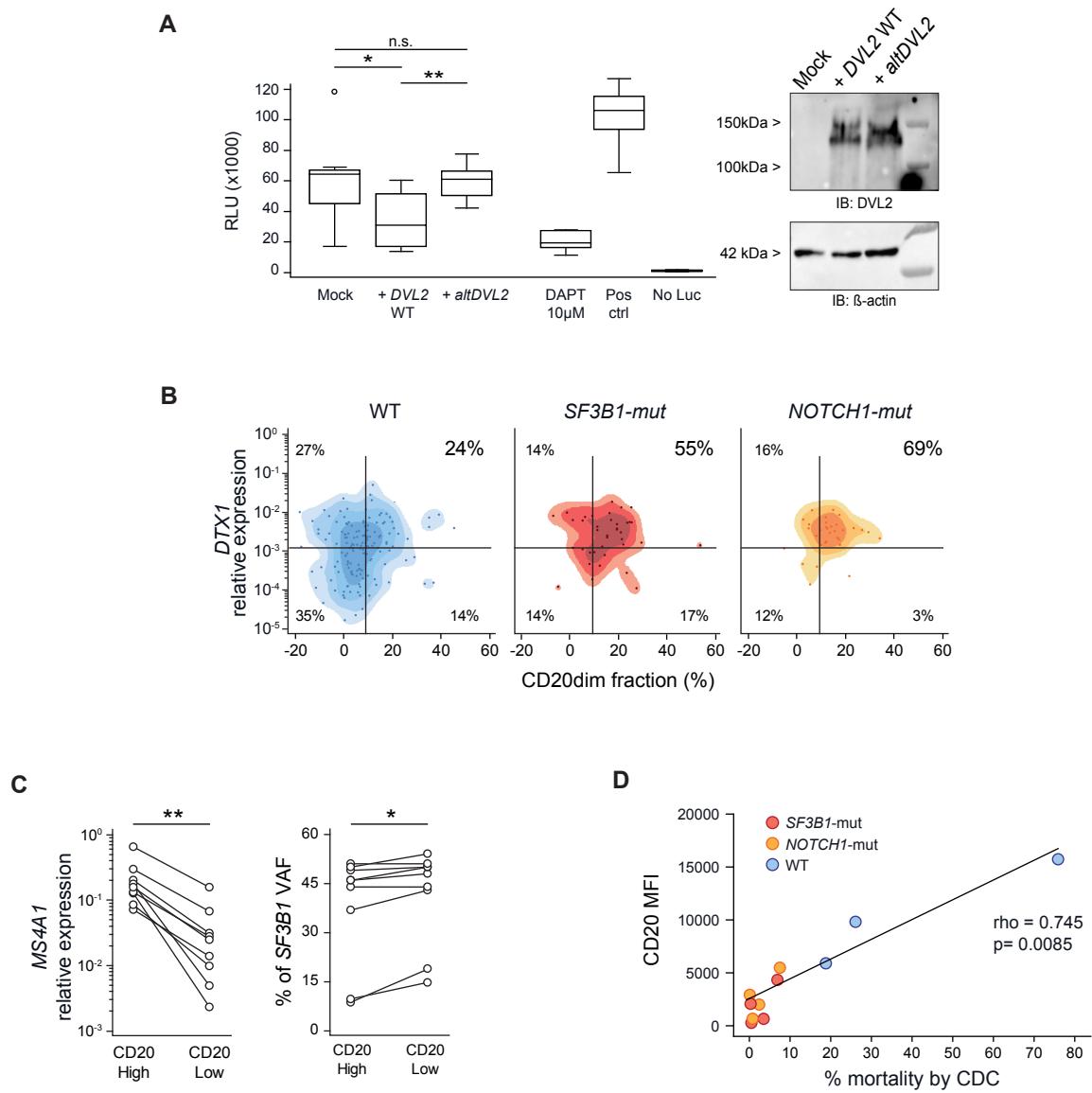


E



Supplementary Figure 6: SF3B1 mutations induce alternative splicing. (A) Depiction of alternative splicing events triggered by *SF3B1* mutations on *GCC2* and *MAP3K7* as from IGV software. Gapped alignments are presented in light blue. Blue and red arches represent canonical and alternative splicing events, respectively. (B) Fraction of alternatively spliced isoforms in *SF3B1*-mut (n=34) or WT (n=39) cases. (C) Correlation of alt*DVL2* fraction determined either by NGS or RT-qPCR. The Spearman's rank correlation coefficient (ρ) and p-value are reported for *SF3B1*-mut (n=34) cases. WT cases (n=39) are reported for comparison. (D) alt*DVL2* expression in relation with *SF3B1* mutations according to the mutated amino-acidic residue and burden (n=35). WT cases (n=155) are reported for comparison. Horizontal line represents the median. See also Figure 2D. (E) Expression of total *DVL2* transcript expression in *SF3B1*-mut (*SF3B1*, n=35), *NOTCH1*-mut (*NOTCH1*, n=32) or unmutated (WT, n=155) CLL cases. Data are shown by Tukey's box and whisker plots. Outliers indicate data outside the 1.5 interquartile range. * $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$, n.s. not significant, as determined by two-sided Mann-Whitney rank-test.

Supplementary Figure 7



Supplementary Figure 7: Correlation between NOTCH1 signaling, DVL2 expression and CD20 downregulation. (A) Activity of the NOTCH1 pathway in a HEK293-CSL reporter cell line with constitutively active signaling, transfected with either a wild-type *DVL2* or *altDVL2*. Controls include transfection with no DNA (Mock), treatment with the gamma-secretase inhibitor DAPT, no transfection (Pos ctrl) and no luciferase reagent (No Luc). Mock vs. *DVL2*, $p=0.0244$; Mock vs. *altDVL2*, $p=0.96$; *DVL2* vs. *altDVL2*, $p=0.0040$. RLU: Relative Luciferase Units. Transfections were performed three times in triplicate, while controls were performed three times in duplicate. Data are shown by Tukey's box and whisker plots. Outliers indicate data outside the 1.5 interquartile range. Right panel: western blot analyses for transfection of *DVL2/altDVL2* in transfected cells. (B) Density plots (\log_{10} density) of *DTX1* expression versus CD20dim fraction for WT (n=155), *SF3B1*-mut (n=35) and *NOTCH1*-mut (n=32) cases. Quadrant gates were set at the modal value of each parameter for WT cases; population frequency of each quadrant is reported. (C) Transcript expression of *MS4A1* determined by RT-qPCR (left panel) and *SF3B1* variant allele frequency determined by NGS in the CD20-High and CD20-Low subpopulations of sorted samples (n=9). Data are shown as dot-and-line diagrams. (D) Correlation between CD20 expression and percentage of relative lysis by complement-dependent cytotoxicity in *SF3B1*-mut, *NOTCH1*-mut and WT CLL cases. The Spearman's rank correlation coefficient (ρ) and p -value are reported. * $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$, n.s. not significant, as determined by two-sided Mann-Whitney rank-test.

Supplementary Table 1. Biological characterization of the CLL cohort (537 cases).

ID	FISH ^A	Trisomy 12	IGHV ^B	SF3B1 status ^C	NOTCH1 status ^C	TP53 status ^C	CD20 MFI	CD20dim fraction (%)
2469	del11q	absent	UM	wt	wt	mut	76203	2,4
2473	del17p	present	UM	wt	p.P2514Rfs*4 17%; p.L2457V 2.7%	wt	6619	19,2
2476	tris12	present	M	wt	wt	wt	84636	1
2480	del11q	absent	UM	wt	wt	wt	5243	27
2483	del17p	absent	UM	wt	wt	wt	10456	28,2
2495	del11q	present	UM	wt	p.P2514Rfs*4 3.3%	n.a.	16262	7,4
2496	del17p	absent	M	wt	wt	mut	1397	12,6
2499	del13q	absent	M	wt	wt	wt	14526	11,2
2521	del11q	absent	n.a.	p.G742D 17%	p.P2514Rfs*4 30%	wt	9828	29,4
2526	del13q	absent	M	wt	wt	wt	6530	8,6
2528	tris12	present	M	wt	wt	wt	113087	3,2
2530	tris12	present	n.a.	wt	p.P2514Rfs*4 37.5%	wt	10013	16
2548	del13q	absent	M	wt	wt	wt	5284	13,6
2561	del13q	absent	M	wt	wt	wt	14899	14,2
2581	tris12	present	UM	wt	wt	wt	2820	33
2586	del11q	absent	UM	wt	p.Q2444* 17%	wt	4240	50,4
2598	normal	absent	M	wt	p.P2514Rfs*4 35%	wt	7576	34,4
2601	tris12	present	M	wt	p.P2514Rfs*4 11,8%	wt	27337	12,8
2604	del13q	absent	UM	p.K700E 22%	wt	wt	2606	31,4
2607	tris12	present	M	wt	wt	wt	25350	8,4
2612	del17p	absent	UM	wt	wt	wt	7421	14
2621	del13q	absent	UM	wt	wt	wt	7695	4,4
2622	del17p	absent	UM	wt	p.P2514Rfs*4 1.59%	mut	1738	41,6
2623	tris12	present	UM	wt	wt	wt	32150	10,4
2630	tris12	present	UM	p.K666R 7%	wt	wt	4796	9,8
2631	normal	absent	UM	wt	wt	wt	6094	17,2
2635	tris12	present	UM	wt	wt	mut	7961	20,8
2649	tris12	present	UM	wt	p.P2514Rfs*4 18,5%	n.a.	11168	36
2655	del11q	absent	UM	wt	wt	wt	7687	12,6
2660	del13q	absent	M	wt	wt	wt	6779	9,6
2663	del11q	absent	UM	wt	wt	wt	3590	45,6
2674	tris12	present	M	wt	wt	wt	4957	11,8
2682	normal	absent	UM	p.K700E 21%	p.P2514Rfs*4 20,9%	wt	1182	58,8
2685	del11q	absent	UM	wt	wt	wt	4994	35
2688	del13q	absent	M	wt	wt	wt	15304	15
2690	tris12	present	M	wt	wt	wt	102820	9,4
2692	tris12	present	UM	wt	wt	wt	13203	21
2703	del17p	absent	UM	wt	wt	mut	6574	21,6
2707	tris12	present	UM	wt	p.P2514Rfs*4 61%	wt	31230	7
2710	del11q	absent	UM	wt	wt	wt	7030	44,8
2714	del17p	absent	M	wt	wt	mut	53604	5,4
2715	del13q	absent	n.a.	wt	wt	wt	6432	12,6
2717	del13q	absent	UM	wt	wt	wt	4279	26,4
2719	del13q	absent	UM	wt	wt	wt	12289	13,2
2723	del13q	absent	M	wt	wt	wt	4949	13,6
2730	del11q	absent	UM	wt	wt	n.a.	9421	16,8
2731	tris12	present	M	wt	wt	mut	13518	13
2735	tris12	present	UM	wt	wt	wt	3110	36
2738	tris12	present	UM	wt	wt	wt	6401	22
2741	tris12	present	UM	wt	wt	wt	3125	24
2749	normal	absent	M	wt	wt	wt	9620	9,8
2750	normal	absent	M	wt	wt	wt	4694	30
2757	del13q	absent	M	wt	wt	wt	13437	13,4
2759	normal	absent	n.a.	wt	wt	wt	11252	12
2763	del17p	absent	M	wt	wt	mut	54336	7,8
2764	normal	absent	UM	wt	p.P2514Rfs*4 6%	wt	4177	33,4
2766	normal	absent	M	wt	wt	wt	6637	5,6
2768	del13q	absent	UM	wt	p.P2514Rfs*4 15%	n.a.	19128	25,6
2769	tris12	present	M	wt	wt	wt	73263	0,2
2770	del13q	absent	UM	wt	wt	wt	8403	20,4
2774	tris12	present	M	wt	wt	wt	17437	9,4
2778	del13q	absent	UM	p.K741N 35%	p.P2514Rfs*4 23%	wt	9971	12,2
2782	tris12	present	UM	wt	wt	wt	21315	27
2786	normal	absent	M	wt	wt	wt	4530	22,2
2787	tris12	present	UM	wt	wt	wt	8040	24
2795	del17p	present	UM	wt	wt	mut	29372	14,2
2798	del13q	absent	UM	wt	wt	wt	22855	25,4
2799	del11q	absent	M	wt	wt	mut	27842	6
2803	tris12	present	M	wt	wt	wt	76416	1,4
2823	del11q	absent	UM	wt	p.P2514Rfs*4 48%	wt	4708	34,6
2825	del17p	present	UM	wt	p.P2514Rfs*4 68%	mut	49530	28
2832	del13q	absent	M	p.K700E 6%	wt	wt	2749	25
2833	normal	absent	M	wt	wt	wt	3808	36,2
2836	del13q	absent	UM	wt	wt	wt	13427	9
2837	del11q	absent	UM	wt	p.P2514Rfs*4 42%; p.Q2444* 2%	wt	9679	24,2
2839	del13q	absent	M	wt	wt	wt	7264	10,4
2840	tris12	present	M	wt	wt	wt	6049	21,6
2841	normal	absent	M	wt	wt	wt	13788	13,6
2842	del13q	absent	M	wt	wt	wt	15781	16,8
2843	del17p	absent	M	wt	wt	mut	43564	10,2
2845	normal	absent	UM	wt	p.P2514Rfs*4 15%	wt	7602	25

ID	FISH ^A	Trisomy 12	IGHV ^B	SF3B1 status ^C	NOTCH1 status ^C	TP53 status ^C	CD20 MFI	CD20dim fraction (%)
2846	del13q	absent	UM	wt	wt	wt	6120	9,2
2848	del11q	absent	UM	wt	p.P2514Rfs*4 43%	wt	4471	19,8
2849	tris12	present	UM	wt	c.*7668+371A>G 52%	wt	3887	28
2850	del13q	absent	M	wt	wt	wt	2698	8,6
2851	tris12	present	UM	wt	wt	wt	33202	10,8
2854	del13q	absent	UM	wt	wt	wt	8389	14,4
2859	normal	absent	M	wt	wt	wt	32455	15
2862	tris12	present	UM	wt	wt	wt	11938	4,2
2863	normal	absent	UM	wt	wt	mut	3520	38,8
2866	del13q	absent	M	wt	wt	mut	10020	31
2867	normal	absent	M	wt	wt	wt	43074	9,2
2868	normal	absent	UM	p.K700E 18%	c.*7668+371A>G 25%; p.P2514Rfs*4 1%	wt	13350	9
2869	del13q	absent	M	wt	wt	mut	3877	44,6
2872	del13q	absent	M	wt	p.P2514Rfs*4 3% p.F2296fs*56 2%	wt	2625	38,8
2874	del13q	absent	UM	wt	p.P2514Rfs*4 54%	mut	4605	22
2876	del13q	absent	M	wt	wt	wt	35267	0,6
2877	del13q	absent	UM	wt	p.S2274Pfs*79 50%	mut	17125	21,8
2878	tris12	present	UM	wt	wt	wt	11674	17,6
2879	del13q	absent	M	wt	wt	wt	8222	11,6
2880	del17p	present	UM	wt	p.P2514Rfs*4 81%	mut	36080	21,8
2881	del13q	absent	M	wt	wt	wt	7512	8
2883	del17p	absent	UM	p.E622D 30%	wt	mut	9424	30,2
					c.*7668+378A>G 16%; p.Q2503* 2%; p.Q2501* 22%; n.Y2490* 11%			
2884	normal	absent	UM	wt		wt	9325	18,8
2887	del13q	absent	M	wt	wt	wt	34485	5,4
2888	del13q	absent	M	wt	wt	wt	2620	15,2
2889	del13q	absent	M	wt	wt	wt	39914	-5,6
2890	normal	absent	M	wt	wt	wt	6418	14,2
2891	del13q	absent	M	wt	wt	wt	21087	19,4
2892	del13q	absent	M	wt	wt	wt	7999	4
2893	normal	absent	UM	p.G742D 41%	wt	wt	8263	31
2895	del13q	absent	M	wt	wt	wt	8198	29,4
2896	normal	absent	UM	wt	wt	wt	6138	26,6
2898	del13q	absent	M	wt	wt	wt	10856	5,2
2899	del13q	absent	M	wt	wt	wt	14242	9,6
2900	del17p	absent	UM	wt	wt	mut	45539	9,8
2901	normal	absent	M	wt	wt	wt	7920	13,6
2902	del13q	absent	M	wt	wt	wt	36261	-4,8
2905	tris12	present	UM	wt	c.*7668+371A>G 45,9%	wt	13843	11,8
2906	del11q	absent	M	wt	wt	wt	13146	32
2907	del17p	absent	M	wt	wt	mut	65039	3,8
2908	del13q	absent	UM	wt	wt	mut	3737	26,4
2909	del11q	absent	UM	wt	wt	wt	8731	13,8
2912	del17p	absent	UM	wt	c.*7668+378A>G 33,3%	mut	8438	13,2
2913	del13q	absent	UM	wt	wt	wt	3372	37,4
2914	del13q	absent	M	wt	wt	wt	51540	9,8
2915	del13q	absent	M	wt	wt	wt	8365	14
2917	tris12	present	UM	wt	wt	wt	7886	4,6
2921	del13q	absent	UM	wt	c.*7668+371A>G 47,4%	wt	7314	34,2
2923	del13q	absent	UM	wt	wt	wt	6293	16,6
2925	normal	absent	M	wt	wt	wt	2619	-14
2926	del17p	absent	M	wt	wt	mut	54015	2,2
2928	normal	absent	M	wt	wt	wt	178310	3,2
2929	del13q	absent	M	wt	wt	wt	66826	5,8
2933	del11q	absent	UM	p.K700E 40%	wt	n.a.	1219	71,2
2934	del13q	absent	M	wt	wt	wt	8025	23,2
2935	normal	absent	M	wt	wt	wt	9782	5,2
2936	normal	absent	M	wt	wt	wt	4880	27,6
2937	normal	absent	M	wt	wt	wt	4420	10
2938	tris12	present	n.a.	wt	wt	wt	43153	-4,8
2941	del13q	absent	UM	wt	wt	wt	3115	23,4
2942	del11q	absent	UM	wt	wt	wt	5019	25,2
2943	normal	absent	M	wt	wt	wt	79864	8,4
2944	del13q	absent	M	wt	wt	wt	5630	3
2945	del13q	absent	M	wt	wt	wt	5255	14
2948	normal	absent	UM	wt	c.*7668+378A>G 9%	n.a.	7366	10,6
2950	del17p	absent	UM	wt	wt	mut	28641	-2,2
2956	normal	absent	M	wt	wt	wt	1837	31
2957	tris12	present	M	wt	wt	wt	28679	12
2959	del11q	absent	UM	wt	wt	wt	9912	-6,2
2960	del13q	absent	M	wt	wt	wt	3939	27,2
2964	del13q	absent	UM	p.G740E 44%	wt	wt	9078	11
2966	tris12	present	UM	wt	p.P2514Rfs*4 24%	wt	12268	25
2971	del17p	absent	UM	wt	wt	mut	36347	17,4
2972	del13q	absent	M	wt	wt	wt	6158	4
2973	del13q	absent	UM	wt	wt	wt	6592	13,2
2974	normal	absent	M	wt	wt	mut	5148	16,4
2975	del17p	absent	UM	p.K666N 53%	wt	mut	10524	1
2976	normal	absent	M	wt	wt	wt	9756	4,2
2977	tris12	present	UM	wt	wt	wt	6571	22,8
2979	normal	absent	M	wt	wt	wt	108669	15,6
2982	tris12	present	UM	wt	wt	wt	7133	8,4

ID	FISH ^A	Trisomy 12	IGHV ^B	SF3B1 status ^C	NOTCH1 status ^C	TP53 status ^C	CD20 MFI	CD20dim fraction (%)
2983	del13q	absent	M	p.G742D 34%	wt	mut	1144	62,8
2984	del13q	absent	UM	wt	wt	mut	5124	23,6
2985	tris12	present	UM	wt	p.P2514Rfs*4 18.9%	wt	10735	18,2
2986	tris12	present	UM	wt	p.P2514Rfs*4 48%	mut	19725	15,8
2987	del13q	absent	UM	wt	wt	wt	4787	34
2989	del17p	absent	M	wt	wt	wt	42545	1
2994	tris12	present	M	wt	wt	wt	39813	-3,4
2995	normal	absent	UM	wt	wt	wt	5853	19,2
2996	tris12	present	M	p.I704T 10.4%	wt	wt	34410	12,6
2997	tris12	present	M	wt	wt	wt	98101	-4
3001	tris12	present	UM	wt	p.Q2444* 36%	wt	11025	11,6
3002	normal	absent	M	wt	wt	wt	2396	10,2
3003	del13q	absent	M	wt	wt	wt	9991	21,8
3004	del13q	absent	M	wt	wt	wt	12499	53,2
3007	tris12	present	M	wt	wt	wt	32394	13
3009	del13q	absent	UM	wt	wt	wt	7423	16,8
3011	tris12	present	UM	wt	wt	mut	16756	7,8
3012	tris12	present	M	wt	wt	wt	29959	2,6
3013	del17p	absent	M	wt	wt	mut	34423	4,4
3015	del17p	absent	UM	wt	wt	mut	16545	12,4
3016	normal	absent	UM	wt	wt	wt	6649	-2,4
3019	tris12	present	M	wt	p.Q2501* 22%; p.P2514Rfs*4 0.9%	wt	23162	15,6
3020	normal	absent	UM	wt	wt	wt	63697	5,6
3021	del11q	absent	UM	wt	wt	wt	9164	26,4
3026	tris12	present	M	wt	wt	wt	27775	15
3027	tris12	present	M	wt	wt	wt	93672	3
3028	normal	absent	UM	wt	wt	wt	183025	2,6
3029	del13q	absent	M	wt	wt	wt	51176	-4,2
3030	normal	absent	UM	wt	wt	wt	8274	15
3033	del17p	absent	UM	wt	wt	mut	10145	1,4
3034	del13q	absent	M	wt	wt	wt	12252	9,4
3035	tris12	present	UM	wt	wt	wt	9427	-7,8
3038	normal	absent	M	wt	wt	wt	3706	23
3040	del11q	present	UM	wt	wt	wt	4063	29,8
3043	del17p	absent	UM	wt	wt	wt	22232	23,4
3044	del17p	absent	UM	wt	wt	mut	2048	54,6
3045	del13q	absent	UM	wt	wt	wt	6248	19,6
3049	tris12	present	M	wt	wt	wt	52716	2
3050	del11q	absent	UM	p.G742D 46%	wt	wt	10855	46,2
3051	del13q	absent	UM	wt	wt	wt	5158	17,8
3053	del13q	absent	UM	wt	p.P2514Rfs*4 13%	mut	17841	12,6
3055	del13q	absent	UM	wt	p.P2514Rfs*4 5%; p.Q2404* 2%	wt	4128	18,2
3059	del17p	absent	M	wt	wt	mut	11960	17,2
3060	del17p	absent	UM	p.G742D 45%	wt	mut	1971	39,8
3061	normal	absent	UM	wt	p.P2514Rfs*4 37%	wt	7197	15,8
3062	normal	absent	UM	wt	wt	wt	44954	-23,2
3065	del11q	absent	UM	wt	p.Q2409* 58%	wt	6104	22
3066	tris12	present	M	p.E768K 34%	wt	wt	26463	16,4
3072	del13q	absent	UM	wt	wt	wt	10648	17
3081	normal	absent	M	wt	wt	wt	8792	26,6
3082	normal	absent	M	wt	wt	wt	8372	12
3083	normal	absent	UM	wt	wt	wt	64332	22,2
3086	del17p	absent	M	wt	wt	mut	36362	-6,2
3088	del17p	absent	UM	wt	wt	mut	13341	21,8
3090	normal	absent	UM	wt	c.*7668+371A>G 38.7%; p.P2514Rfs*4 3.5%	wt	12396	19,6
3092	tris12	present	UM	wt	p.Q2440* 48%	wt	7297	39,6
3094	del13q	absent	M	wt	wt	wt	9368	21,8
3096	del13q	absent	UM	wt	wt	wt	3994	41,8
3097	del13q	absent	UM	wt	wt	wt	9536	16,6
3099	del17p	absent	M	wt	wt	mut	113557	1,4
3100	del11q	absent	M	wt	p.P2514Rfs*4 43%	wt	6303	29
3101	del13q	absent	M	wt	p.P2514Rfs*4 6%	wt	11223	26,8
3102	del11q	absent	M	p.K700E 42%	wt	wt	27553	25,2
3103	tris12	present	M	wt	wt	wt	91161	5,2
3104	del13q	absent	M	wt	wt	n.a.	6736	15,6
3106	del13q	absent	M	wt	wt	wt	53586	20
3107	del11q	absent	UM	wt	wt	wt	4264	25,4
3108	del11q	absent	UM	wt	wt	wt	21291	23,4
3109	tris12	present	M	wt	wt	wt	153103	0,6
3110	tris12	present	UM	wt	p.P2514Rfs*4 51%	mut	2646	36
3114	normal	absent	UM	p.K700E 41%	p.P2514Rfs*4 3%	n.a.	9840	35,8
3118	normal	absent	UM	wt	p.P2514Rfs*4 84%	wt	11504	15,6
3119	normal	absent	M	wt	wt	wt	45932	20,6
3120	del11q	absent	UM	wt	wt	mut	6582	14,4
3124	normal	absent	M	wt	wt	wt	13672	26,8
3125	normal	absent	UM	wt	p.V2278Gfs*75 21%; c.*7668+371A>G 4%; p.P2514Rfs*4 0.47%	wt	4292	20,2
3126	del13q	absent	M	wt	wt	wt	6732	9
3127	normal	absent	UM	p.I704T 11%	wt	wt	4839	1,6
3132	tris12	present	M	wt	p.P2514Rfs*4 33%	wt	15891	8
3133	normal	absent	M	wt	wt	wt	5346	29,8
3134	del13q	absent	M	wt	wt	wt	8547	18,6
3136	normal	absent	M	wt	wt	wt	9995	-10,4

ID	FISH ^A	Trisomy 12	IGHV ^B	SF3B1 status ^C	NOTCH1 status ^C	TP53 status ^C	CD20 MFI	CD20dim fraction (%)
3137	del17p	absent	M	wt	wt	mut	80419	-12,6
3138	del13q	absent	M	wt	wt	wt	9981	17,2
3140	del11q	absent	UM	wt	wt	wt	5821	30,6
3142	tris12	present	UM	wt	wt	mut	13529	21
3143	tris12	present	n.a.	wt	p.S2274Pfs*79 12%; p.P2514Rfs*4 29.5%	wt	10378	26,2
3144	tris12	present	UM	wt	wt	wt	19867	6,6
3146	del13q	absent	M	wt	wt	wt	6895	31
3147	del17p	present	M	wt	wt	wt	8746	15,2
3148	normal	absent	M	wt	wt	wt	138107	6,2
3155	del17p	absent	M	wt	wt	mut	2566	29,4
3156	tris12	present	UM	wt	p.L2482* 25.2%; p.P2514Rfs*4 1.8%	wt	15753	18
3157	normal	absent	M	wt	wt	wt	4310	14,8
3159	del13q	absent	M	wt	wt	wt	7378	-2,2
3160	del13q	absent	M	wt	wt	wt	7149	15,4
3161	del13q	absent	M	wt	wt	wt	6175	18,2
3164	tris12	present	UM	wt	p.P2465Afs*13 51%	wt	33004	19
3165	del11q	absent	M	wt	wt	wt	35776	5
3166	normal	absent	M	wt	wt	wt	5270	10
3167	normal	absent	M	p.K700E 9%	wt	wt	11548	15,6
3168	tris12	present	M	wt	wt	wt	47828	16,8
3169	normal	absent	M	wt	wt	wt	6777	35,8
3170	del11q	absent	UM	wt	wt	wt	6009	35,6
3171	del13q	absent	M	wt	wt	wt	7574	22,6
3172	del13q	absent	M	p.Y623C 50%	wt	mut	5880	43,4
3175	tris12	present	M	wt	wt	wt	47103	2
3176	del13q	absent	M	wt	wt	wt	10014	13,8
3177	del11q	absent	UM	wt	p.P2514Rfs*4 46%	wt	13341	29,4
3178	del13q	absent	M	wt	wt	wt	36822	-3,4
3179	del13q	absent	M	wt	wt	wt	43479	-6,8
3180	normal	absent	M	wt	wt	wt	75008	-7
3182	del13q	absent	M	wt	wt	wt	15251	14,4
3184	del17p	absent	UM	wt	wt	mut	58079	-1,2
3185	tris12	present	UM	wt	wt	mut	4327	19,2
3186	del11q	absent	UM	wt	wt	wt	57210	12,6
3189	normal	absent	M	wt	wt	wt	94075	20,2
3190	del13q	absent	M	wt	wt	wt	21073	30
3191	del13q	absent	M	wt	wt	wt	16663	15,4
3192	del11q	absent	UM	wt	c.*7668+378A>G 51%	wt	12949	16
3193	normal	absent	M	wt	p.P2514Rfs*4 5.1%	wt	13449	7,2
3195	del11q	absent	M	wt	wt	wt	7662	12
3196	del11q	absent	M	wt	wt	wt	7293	-7,6
3202	del11q	absent	UM	wt	wt	wt	12511	17,8
3203	normal	absent	M	wt	wt	wt	4761	22,4
3205	del13q	absent	n.a.	wt	wt	wt	17715	9,6
3206	tris12	present	UM	wt	wt	wt	17978	21
3211	del13q	absent	UM	wt	wt	wt	19140	14,4
3212	del17p	absent	M	wt	wt	mut	8652	18,4
3213	tris12	present	UM	wt	p.P2514Rfs*4 37.7%	wt	16932	6
3214	del11q	absent	UM	p.K700E 5%	wt	wt	1406	14,4
3215	del13q	absent	UM	p.delQ699 41%	p.P2514Rfs*4 53%	wt	14358	33
3220	del17p	absent	M	wt	wt	mut	15215	29,4
3221	del13q	absent	M	wt	wt	wt	36365	15,6
3222	del17p	absent	M	wt	wt	mut	9271	11,2
3223	del13q	absent	UM	wt	wt	wt	7435	25,2
3225	del17p	absent	M	wt	wt	wt	23590	12,8
3226	del13q	absent	M	wt	wt	mut	9915	11,2
3228	normal	absent	M	wt	wt	wt	10044	15,8
3230	normal	absent	M	wt	wt	wt	7867	12,8
3234	tris12	present	M	wt	wt	wt	41445	3,56
3236	del11q	present	UM	wt	p.P2514Rfs*4 42%	wt	21319	4,4
3237	del17p	absent	UM	p.I704T 46%	wt	mut	6933	58,8
3239	del11q	absent	M	wt	wt	wt	7684	29,6
3240	del13q	absent	M	wt	wt	wt	5289	8,8
3241	del11q	absent	UM	wt	wt	wt	5028	34,8
3244	del13q	absent	M	wt	wt	wt	6043	7,6
3245	normal	absent	UM	wt	p.S2432Rfs*4 45%	wt	6774	9,8
3246	tris12	present	n.a.	wt	wt	wt	25438	21,4
3249	normal	absent	UM	wt	wt	mut	3945	29
3250	del17p	absent	M	wt	wt	mut	51333	12
3251	del13q	absent	M	wt	wt	wt	9270	17,6
3252	del13q	absent	UM	p.I704F 18%	wt	wt	22427	41,2
3253	normal	absent	UM	wt	wt	wt	19442	6,6
3254	del13q	absent	M	wt	wt	wt	8323	10,8
3255	normal	absent	M	wt	wt	wt	10560	20,4
3257	del17p	absent	M	wt	wt	mut	12849	14,4
3258	del13q	absent	M	wt	wt	wt	17172	10,2
3259	del17p	absent	M	wt	wt	mut	66120	1,4
3260	del13q	absent	M	wt	wt	wt	7795	23,2
3261	del13q	absent	UM	wt	wt	wt	8030	13,4
3264	del13q	absent	M	wt	wt	wt	14941	12,6
3266	tris12	present	UM	wt	wt	wt	31291	32,8
3267	del11q	absent	UM	p.G742D 29%	wt	wt	9567	14,4
3268	del17p	absent	UM	wt	wt	mut	6273	27,4
3269	tris12	present	M	wt	wt	wt	47057	2,8

ID	FISH ^A	Trisomy 12	IGHV ^B	SF3B1 status ^C	NOTCH1 status ^C	TP53 status ^C	CD20 MFI	CD20dim fraction (%)
3270	del13q	absent	UM	wt	wt	wt	9461	12,8
3271	tris12	present	UM	wt	p.P2514Rfs*4 45%	wt	12255	13,2
3276	del11q	absent	UM	p.K700E 18%	wt	mut	2346	36,8
3278	normal	absent	UM	wt	p.P2514Rfs*4 22%; p.Q2519* 7%	wt	11428	23,4
3280	del11q	absent	UM	wt	p.P2514Rfs*4 23%	wt	2316	33,6
3281	normal	absent	M	wt	wt	wt	191301	5,4
3282	normal	absent	n.a.	wt	p.P2514Rfs*4 50%	wt	1653	28,2
3284	normal	absent	M	wt	wt	wt	7499	7,4
3286	del13q	absent	UM	wt	wt	wt	13877	11,4
3287	tris12	present	n.a.	wt	p.P2514Rfs*4 23%; p.Q2487* 9%; p.Q2459* 8%	wt	9695	31,6
3289	normal	absent	n.a.	wt	wt	wt	12598	18,8
3290	normal	absent	M	wt	wt	wt	16477	9,2
3293	del11q	present	UM	wt	p.S2492* 23%	wt	9571	35,4
3294	normal	absent	UM	wt	p.P2514Rfs*4 4%; p.S2471Rfs*6 9%	wt	15503	10,4
3296	del17p	absent	UM	wt	wt	mut	4875	51,2
3297	normal	absent	UM	wt	p.P2514Rfs*4 7,9%	wt	4362	29
3299	del17p	absent	M	wt	wt	mut	58621	3
3300	del13q	absent	UM	wt	wt	mut	4432	35,4
3301	normal	absent	UM	p.R625C 10%; p.G740E 6%; p.G742D 13%	wt	mut	3525	36,8
3302	tris12	present	UM	wt	wt	wt	6833	15,8
3303	tris12	present	UM	wt	wt	wt	31358	29
3304	normal	absent	M	wt	wt	wt	11012	10,4
3308	del13q	absent	M	wt	wt	wt	10761	9,6
3309	normal	absent	n.a.	wt	wt	wt	165113	-7,8
3320	normal	absent	M	wt	wt	wt	10621	11,2
3322	normal	absent	M	p.K700E 46%	wt	wt	4787	13,2
3324	tris12	present	M	wt	wt	wt	12353	19,6
3325	del13q	absent	M	wt	wt	wt	23375	12,6
3329	normal	absent	M	wt	wt	wt	5319	12,8
3330	del17p	present	UM	wt	wt	mut	4063	29,6
3333	normal	absent	UM	wt	wt	wt	16171	11,4
3336	normal	absent	n.a.	wt	wt	mut	19655	37
3337	del13q	absent	M	wt	wt	wt	3212	15,2
3338	tris12	present	UM	wt	wt	wt	11085	-5,6
3339	del13q	absent	UM	p.E622D 39,2%	wt	wt	11165	12
3340	del13q	absent	M	wt	wt	wt	10099	9,6
3349	del13q	absent	M	wt	wt	wt	11305	10,4
3352	normal	absent	M	wt	wt	wt	137364	11,4
3353	del11q	absent	M	wt	wt	wt	9147	23,8
3355	tris12	present	M	wt	wt	wt	32676	-5
3356	normal	absent	UM	wt	wt	wt	5052	37
3357	del13q	absent	UM	wt	p.Q2501* 48%	wt	13661	1,8
3362	normal	absent	M	wt	wt	wt	10791	14,4
3363	normal	absent	UM	wt	wt	wt	47956	40,4
3365	tris12	present	n.a.	wt	wt	wt	80283	-3,6
3366	tris12	present	UM	wt	p.P2514Rfs*4 65%	wt	14135	8,4
3368	normal	absent	M	wt	wt	wt	41776	2,6
3369	normal	absent	UM	wt	wt	wt	54740	4,6
3371	del13q	absent	M	wt	wt	wt	8323	14
3372	normal	absent	UM	wt	p.P2514Rfs*4 12%	wt	9901	18,2
3373	tris12	present	UM	wt	p.P2514Rfs*4 16,6%	wt	8773	13,6
3374	normal	absent	n.a.	wt	wt	mut	1445	-7,4
3375	tris12	present	n.a.	wt	wt	wt	19646	9,8
3380	tris12	present	M	wt	p.P2514Rfs*4 19%; p.L2482* 4%	wt	47388	4
3381	del17p	absent	UM	wt	p.P2514Rfs*4 47,3%	mut	15085	27,2
3383	tris12	present	M	wt	wt	wt	127962	-1,4
3384	del13q	absent	M	wt	wt	wt	11186	44
3385	normal	absent	M	wt	wt	wt	42965	6
3386	del11q	absent	UM	wt	wt	wt	2470	50,4
3387	del13q	absent	UM	wt	wt	wt	7244	36
3388	normal	absent	UM	p.I704F 28%	wt	wt	4870	31,8
3390	del11q	absent	UM	wt	wt	wt	9958	20,4
3391	normal	absent	M	p.K700E 36%	wt	wt	6657	10,8
3393	del13q	absent	UM	p.G740E 46%	wt	mut	1753	35,2
3396	del11q	absent	UM	wt	wt	wt	9149	18,8
3398	normal	absent	UM	wt	p.Q2391* 42%	wt	10514	30,8
3399	del17p	absent	M	wt	wt	mut	53018	10,2
3400	del11q	absent	UM	wt	c.*7668+378A>G 12%	wt	9927	23,4
3401	del13q	absent	DISC	wt	wt	wt	12064	11,8
3402	del13q	absent	UM	wt	p.L2482* 33%	wt	10563	33,4
3405	tris12	present	UM	wt	c.*7668+378A>G 36%	wt	5686	28,6
3406	del17p	absent	UM	wt	p.P2514Rfs*4 48%	mut	15128	8,8
3407	del13q	absent	UM	wt	wt	wt	8577	24,6
3409	del17p	absent	M	wt	wt	mut	7065	19,2
3410	del11q	absent	UM	wt	wt	wt	12609	39,4
3411	normal	absent	M	wt	wt	wt	9422	8,2
3413	tris12	present	M	wt	p.Q2403fs*19 25%	wt	58794	8,4
3414	tris12	present	M	wt	wt	wt	92236	-2,2
3415	normal	absent	M	wt	wt	wt	10087	36,2
3417	tris12	present	UM	wt	wt	wt	12961	11,6

ID	FISH ^A	Trisomy 12	IGHV ^B	SF3B1 status ^C	NOTCH1 status ^C	TP53 status ^C	CD20 MFI	CD20dim fraction (%)
3423	del13q	absent	M	wt	wt	wt	4209	43,6
3424	normal	absent	n.a.	wt	wt	wt	6928	15
3425	normal	absent	UM	wt	wt	mut	13039	21,4
3426	tris12	present	UM	wt	wt	wt	30250	10,8
3428	n.a.	absent	M	wt	p.Q2503* 8%	wt	9264	13,2
3430	normal	absent	UM	wt	wt	mut	4550	21,8
3431	del13q	absent	M	wt	wt	wt	15428	2,6
3432	del13q	absent	n.a.	wt	wt	wt	11261	15
3433	tris12	present	M	wt	wt	wt	13376	16,2
3435	normal	absent	UM	p.K741E 34%	wt	wt	15079	20
3436	del17p	absent	UM	wt	wt	mut	6640	43,8
3437	tris12	present	n.a.	p.Y765del 26%	wt	wt	53227	10,4
3438	del13q	absent	M	wt	wt	wt	22640	8,8
3439	del13q	absent	M	wt	wt	wt	8779	25
3440	tris12	present	M	wt	wt	wt	44450	4,4
3442	normal	absent	M	wt	wt	wt	11329	9,4
3443	del13q	absent	M	wt	wt	wt	10431	16,6
3444	normal	absent	UM	wt	wt	wt	4214	19,2
3447	normal	absent	UM	wt	p.P2514Rfs*4 42%	wt	3486	32,2
3449	tris12	present	M	wt	wt	wt	55293	5,4
3450	normal	absent	M	wt	wt	wt	8641	9,6
3452	del13q	absent	M	wt	wt	wt	15241	14,8
3453	del13q	absent	UM	wt	wt	wt	6561	11
3454	tris12	present	M	wt	wt	wt	5627	27
3455	normal	absent	M	wt	wt	wt	9988	23,2
3458	del13q	absent	UM	wt	wt	wt	10130	57,6
3460	normal	absent	M	wt	wt	wt	5603	18,8
3461	del13q	absent	UM	wt	wt	wt	15498	41,6
3462	tris12	present	UM	wt	wt	wt	3419	36
3465	del13q	absent	M	wt	wt	wt	9538	12
3467	del13q	absent	M	wt	wt	wt	11223	24
3468	del17p	absent	M	wt	wt	mut	11846	19,8
3469	normal	absent	M	wt	wt	wt	16280	10,6
3473	del13q	absent	UM	wt	wt	wt	16283	13,2
3475	tris12	present	n.a.	wt	wt	wt	17849	-7,2
3477	normal	absent	UM	p.E622D 32%	wt	wt	9251	9,2
3478	normal	absent	M	wt	wt	wt	71946	16,4
3479	normal	absent	UM	wt	wt	mut	7471	26,4
3480	del11q	absent	UM	wt	wt	wt	9144	20,4
3489	del13q	absent	M	wt	wt	wt	12546	15,8
3490	del13q	absent	M	wt	wt	wt	7249	17,6
3491	tris12	present	M	wt	wt	wt	47591	1
3492	normal	absent	M	wt	wt	wt	7389	12
3494	tris12	present	UM	wt	p.P2514Rfs*4 49,5%; p.R2104H 2%	wt	12031	-2,4
3499	normal	absent	M	wt	wt	wt	37639	6,6
3501	del13q	absent	M	wt	wt	mut	16624	5,4
3503	del13q	absent	M	wt	wt	wt	10190	26,8
3505	del13q	absent	M	wt	wt	wt	9844	11
3510	del13q	absent	M	wt	wt	wt	6177	26,2
3512	del13q	absent	M	wt	wt	wt	6753	27,4
3513	del13q	absent	M	wt	wt	wt	13778	14,6
3514	del17p	absent	UM	p.K666N 33%	wt	mut	16616	21,8
3515	tris12	present	UM	wt	wt	wt	8823	33,8
3518	del13q	absent	UM	wt	wt	wt	5220	17
3525	normal	absent	M	wt	wt	wt	5736	35,6
3526	normal	absent	M	wt	wt	wt	5199	27,6
3527	normal	absent	M	wt	wt	wt	48900	21,6
3528	del17p	absent	M	wt	wt	mut	8561	18,6
3529	normal	absent	M	wt	wt	wt	113648	1
3531	normal	absent	M	wt	wt	wt	5257	24,8
3532	normal	absent	M	wt	wt	wt	4417	21,6
3533	normal	absent	M	wt	wt	wt	5140	18,4
3536	tris12	present	M	wt	wt	wt	66702	1,4
3537	del13q	absent	M	wt	wt	wt	24774	11,8
3538	normal	absent	M	wt	wt	wt	101582	10,4
3539	normal	absent	M	wt	wt	wt	8034	4,4
3541	del13q	absent	n.a.	wt	wt	wt	14740	39,2
3543	tris12	present	UM	wt	wt	wt	22322	27,2
3544	tris12	present	UM	wt	p.P2514Rfs*4 37,8%	wt	19970	17,8
3550	tris12	present	M	wt	wt	wt	14278	11,2
3551	del13q	absent	M	wt	wt	wt	7497	16
3552	tris12	present	M	wt	wt	wt	43002	-9,8
3555	normal	absent	M	wt	wt	n.a.	11511	11,6
3558	tris12	present	UM	wt	p.P2514Rfs*4 47%	wt	3643	27,2
3559	normal	absent	UM	p.K666T 48%	wt	mut	7836	20,2
3560	normal	absent	UM	wt	p.P2514Rfs*4 8%	wt	5293	22,8
3561	del13q	absent	M	p.K700E 39%	wt	wt	4846	28,4
3564	normal	absent	UM	wt	wt	wt	81317	14
3565	del13q	absent	M	wt	wt	wt	1603	56,8
3566	normal	absent	UM	p.K700E 45%	wt	mut	6043	25,4
3569	normal	absent	M	wt	wt	wt	8004	15,6
3570	del13q	absent	UM	wt	wt	wt	10067	13,8
3571	del13q	absent	n.a.	wt	wt	wt	7925	11,2
3572	del13q	absent	UM	wt	wt	wt	5481	18,6
3574	del11q	absent	UM	wt	wt	wt	8333	15,6

ID	FISH ^A	Trisomy 12	IGHV ^B	SF3B1 status ^C	NOTCH1 status ^C	TP53 status ^C	CD20 MFI	CD20dim fraction (%)
3575	normal	absent	UM	wt	wt	wt	12195	34,2
3576	tris12	present	UM	p.G740E 38%	wt	wt	7370	42,8
3584	tris12	present	M	wt	wt	wt	34757	5,6
3585	del13q	absent	M	wt	p.P2235Gfs*12 38%	wt	15547	8,2
3586	normal	absent	M	wt	wt	wt	18592	4,2
3589	del13q	absent	M	wt	wt	wt	10174	8,4
3590	del11q	absent	UM	wt	wt	wt	16561	12,6
3593	tris12	present	UM	wt	p.P2514Rfs*4 37,4%	wt	5031	30
3594	normal	absent	M	p.K700E 42%	wt	wt	12915	20,2
3597	del11q	absent	UM	wt	wt	wt	10509	23,2
3598	del17p	absent	UM	wt	wt	n.a.	5460	31,6
3599	tris12	present	UM	wt	p.Q2503Gfs*3 33%; p.V2504L 39%	wt	11337	14,8
3603	del13q	absent	M	wt	wt	wt	9844	12
3606	normal	absent	M	wt	wt	wt	5890	9,2
3610	normal	absent	M	wt	wt	wt	39747	32,8
3613	normal	absent	M	wt	wt	mut	5298	23,2
3614	del13q	absent	M	wt	wt	wt	12301	7,6
3617	del13q	absent	M	wt	wt	wt	4891	9,2
3620	del13q	absent	M	p.G740V 44%	wt	wt	17401	7,4
3621	del13q	absent	UM	wt	p.R2431Gfs*4 23%; p.P2514Rfs*4 3,6%	wt	9507	15,4
3622	del13q	absent	M	wt	wt	wt	3701	32,8
3624	del11q	absent	UM	wt	wt	wt	11965	29,8
3625	tris12	present	M	wt	wt	wt	123166	28,6
3626	normal	absent	M	wt	wt	wt	9170	4,6
3627	tris12	present	UM	wt	wt	mut	15166	17,4
3628	normal	absent	UM	p.K700E 34%	wt	wt	6957	16
3632	normal	absent	UM	wt	p.P2514Rfs*4 34%; p.Q2395K 3%	wt	4808	25
3647	del13q	absent	UM	p.K700E 41,5%; p.G742D 12%	wt	wt	4025	40,8
3652	del13q	absent	M	wt	wt	wt	7764	13,2
3655	normal	absent	M	wt	wt	wt	4570	21,2
3657	del13q	absent	DISC	wt	wt	wt	1944	-2,8
3658	normal	absent	M	wt	wt	wt	9496	21
3663	normal	absent	M	wt	wt	mut	20812	18,6
3664	del13q	absent	UM	wt	wt	wt	13276	11,2
3667	tris12	present	M	wt	wt	wt	49583	-4,8
3674	del13q	absent	M	wt	wt	wt	11143	23,8
3675	tris12	present	UM	p.P780R 50%	wt	wt	3164	21,2
3678	del13q	absent	M	wt	wt	wt	11063	25,4
3684	normal	absent	M	wt	wt	wt	2606	21,6
3699	del11q	absent	UM	wt	wt	wt	11944	21,6
3700	del11q	absent	UM	wt	wt	wt	7616	10,2
3701	del11q	absent	UM	wt	wt	mut	6373	51
3702	del13q	absent	UM	p.G740E 37%	wt	mut	6629	16,6
3704	del17p	absent	M	wt	wt	mut	11640	15,2

A: FISH status was determined according to Dal Bo et al., Leukemia 2016.

B: IGHV status was established according to the conventional cut-off, as reported in Dal Bo et al., Leukemia 2016.

C: as determined by Next Generation Sequencing.

ID: identification number; FISH: norm, normal karyotype; n.a., not available; IGHV status: UM, IGHV unmutated, M, IGHV mutated, DISC, Discordant.

Supplementary Table 2. Association between SF3B1 mutations and biological prognosticators for CLL.

		SF3B1 [n (%)]		Chi-squared
		unmutated	mutated	
del11q	absent	432 (80.4)	41 (7.6)	p=0.5507
	present	57 (10.6)	7 (1.3)	
del13q	absent	251 (46.7)	29 (5.4)	p=0.2295
	present	238 (44.3)	19 (3.5)	
tris12	absent	374 (69.6)	42 (7.8)	p=0.0815
	present	115 (21.4)	6 (1.1)	
del17p	absent	437 (81.4)	43 (8)	p=0.9628
	present	52 (9.7)	5 (0.9)	
IGHV	M	260 (50.7)	12 (2.3)	p=0.0006
	UM	207 (40.4)	34 (6.6)	
NOTCH1	unmutated	406 (75.6)	42 (7.8)	p=0.4268
	mutated	83 (15.5)	6 (1.1)	
TP53	unmutated	405 (76.9)	33 (6.3)	p=0.0313
	mutated	76 (14.4)	13 (2.5)	

Supplementary Table 3. Differentially expressed probes between SF3B1-mut and WT CLL cases.

Gene Symbol	Description	Feature Type	p-value	Corrected p-value	Regulation in NOTCH1-mut	Fold change (Mut vs WT)	Position in Heatmap
A_19_P00317504	Homo sapiens cDNA FLJ42830 fis, clone BRCAN2017905. [AK124820]	miscellaneous	1.25E-02	4.17E-07	down	-2.14	Not used
A_21_P0005204	not provided	unannotated probe	3.42E-02	1.14E-06	down	-2.31	Not used
A_21_P0006753	AGENCOURT_8058623 NIH_MGC_102 Homo sapiens cDNA clone IMAGE:6213075 5', mRNA sequence [BU146091]	miscellaneous	3.04E-02	1.02E-06	down	-2.88	Not used
A_21_P0008460	numb homolog (Drosophila) [Source:HGNC Symbol;Acc:HGNC:8060] [ENST00000557577]	miscellaneous	3.70E-02	1.24E-06	up	6.38	Not used
A_21_P0008678	not provided	unannotated probe	1.39E-02	4.64E-07	down	-1.92	Not used
A_21_P0011295	hect domain and RLD 2 pseudogene 3 [Source:HGNC Symbol;Acc:HGNC:4871] [ENST00000429926]	pseudogene	1.80E-02	5.99E-07	down	-3.03	Not used
A_21_P0013340	CC21 vacuolar protein trafficking and biogenesis associated homolog (S. cerevisiae) [Source:HGNC Symbol;Acc:HGNC:21691] [ENST00000478672]	miscellaneous	5.57E-03	1.85E-07	down	-2.05	Not used
A_21_P0014281	BX096603 Soares_testis_NHT Homo sapiens cDNA clone IMAGp99H151782, mRNA sequence [BX096603]	miscellaneous	1.03E-02	3.41E-07	up	3.72	Not used
A_21_P0014386	not provided	unannotated probe	2.50E-02	8.34E-07	down	-3.29	Not used
A_21_P0014540	not provided	unannotated probe	2.43E-02	8.11E-07	down	-3.51	Not used
A_21_P0014591	Q25199_MACFA (Q25199) Brain cDNA, clone: Qfia-19334, partial (47%) [THC2602892]	miscellaneous	2.08E-02	6.92E-07	down	-2.50	Not used
A_24_P126741	glutaredoxin (thioltransferase) pseudogene 3 [Source:HGNC Symbol;Acc:HGNC:34049] [ENST00000470810]	pseudogene	1.23E-06	4.05E-11	up	16.09	Not used
A_24_P357468	T cell receptor alpha variable 8-2 [Source:HGNC Symbol;Acc:HGNC:12147] [ENST00000390434]	miscellaneous	4.61E-03	1.53E-07	up	3.90	Not used
A_33_P3232688	colony stimulating factor 2 receptor, alpha, low-affinity (granulocyte-macrophage) [Source:HGNC Symbol;Acc:HGNC:2435] [ENST00000381524]	miscellaneous	3.28E-04	1.08E-08	up	8.20	Not used
A_33_P3243230	HSINTL8M interleukin 8 (Homo sapiens) (exp=1; wgp=0; cg=0), partial (97%) [THC2544321]	miscellaneous	3.72E-08	1.22E-12	up	225.52	Not used
A_33_P3269019	Homo sapiens cDNA FLJ13275 fis, clone OVARC101032. [AK023337]	miscellaneous	4.86E-03	1.61E-07	down	-3.14	Not used
A_33_P3321372	contactin associated protein-like 3B [Source:HGNC Symbol;Acc:HGNC:32035] [ENST00000276974]	miscellaneous	3.30E-06	1.09E-09	up	33.00	Not used
A_33_P331791	not provided	unannotated probe	2.36E-02	7.88E-07	down	-2.26	Not used
A_33_P3338292	not provided	unannotated probe	1.63E-02	5.43E-07	down	-3.06	Not used
A_33_P3347503	not provided	unannotated probe	2.86E-02	9.56E-07	up	11.63	Not used
A_33_P3352980	not provided	unannotated probe	6.83E-03	2.27E-07	down	-2.39	Not used
A_33_P3397127	Homo sapiens mRNA for T cell receptor beta variable 6, partial cds, clone: un 226. [AB306238]	miscellaneous	1.06E-03	3.52E-08	up	3.47	Not used
A_33_P3421907	nitric oxide synthase 2 pseudogene 1 [Source:HGNC Symbol;Acc:HGNC:7875] [ENST000005087080]	pseudogene	4.52E-02	1.51E-06	down	-2.73	Not used
AAK1	Homo sapiens AP2 associated kinase 1 (AAK1), mRNA [NM_014911]	gene	1.74E-07	5.71E-12	up	9.53	1
AAK1	Homo sapiens AP2 associated kinase 1 (AAK1), mRNA [NM_014911]	gene	9.82E-03	3.27E-07	up	4.37	Not used
AAK1	Homo sapiens cDNA clone IMAGE:522625. [BC090950]	miscellaneous	4.07E-02	1.36E-06	up	2.32	Not used
ABP3	Homo sapiens ABI family, member 3 (ABP3), transcript variant 1, mRNA [NM_016428]	gene	6.03E-04	1.99E-08	up	3.01	2
ACPP	Homo sapiens acid phosphatase, prostate (ACPP), transcript variant 1, mRNA [NM_001099]	gene	2.11E-03	6.98E-08	up	8.37	3
ACSL6	Homo sapiens acyl-CoA synthetase long-chain family member 6 (ACSL6), transcript variant 2, mRNA [NM_001099185]	gene	1.29E-02	4.28E-07	up	4.30	5
ACTL8	Homo sapiens actin-like 8 (ACTL8), mRNA [NM_0030812]	gene	3.68E-03	1.22E-07	down	-2.29	6
ACTN1	Homo sapiens actinin, alpha 1 (ACTN1), transcript variant 2, mRNA [NM_001102]	gene	9.36E-07	3.08E-11	up	24.29	7
ACVR1C	Homo sapiens activin A receptor, type IC (ACVR1C), transcript variant 1, mRNA [NM_145259]	gene	1.90E-03	6.31E-08	up	4.39	8
ADAMTS10	Homo sapiens ADAM metallopeptidase with thrombospondin type 1 motif, 10 (ADAMTS10), transcript variant 1, mRNA [NM_030957]	gene	1.14E-03	3.78E-08	up	7.19	9
ADM	Homo sapiens adrenomedullin (ADM), mRNA [NM_001124]	gene	1.10E-02	3.66E-07	up	43.98	10
AGPAT9	Homo sapiens 1-acetylcerol-3-phosphate O-acetyltransferase 9 (AGPAT9), transcript variant 1, mRNA [NM_032717]	gene	7.72E-03	2.56E-07	up	10.08	11
AI1F1	Homo sapiens allograft inflammatory factor 1 (AI1F1), transcript variant 2, mRNA [NM_004847]	gene	5.70E-05	1.88E-09	up	10.63	12
AKR1C3	Homo sapiens aldo-keto reductase family 1, member C3 (AKR1C3), transcript variant 1, mRNA [NM_003739]	gene	1.51E-05	4.99E-10	up	12.46	13
AMPD2	Homo sapiens adenosine monophosphate deaminase 2 (AMPD2), transcript variant 1, mRNA [NM_004037]	gene	4.72E-03	1.57E-07	up	3.16	14
ANPEP	Homo sapiens arylalanyl (membrane) aminopeptidase (ANPEP), mRNA [NM_001150]	gene	4.43E-03	1.47E-07	up	5.62	15
ANXA1	Homo sapiens annexin A1 (ANXA1), mRNA [NM_000700]	gene	4.17E-05	1.38E-09	up	52.11	16
ANXA3	Homo sapiens annexin A3 (ANXA3), mRNA [NM_005139]	gene	9.63E-08	3.16E-12	up	70.79	17
AOAH	Homo sapiens acyloxyacyl hydrolase (neutrophil) (AOAH), transcript variant 1, mRNA [NM_001637]	gene	9.30E-03	3.09E-07	up	9.53	18
APBA2	amyloid beta (A4) precursor protein-binding, family A, member 2 [Source:HGNC Symbol;Acc:HGNC:579] [ENST00000382938]	gene	8.79E-03	2.92E-07	up	7.57	19
APOBEC3A	Homo sapiens apolipoprotein B mRNA editing enzyme, catalytic polypeptide-like 3A (APOBEC3A), transcript variant 1, mRNA [NM_145699]	gene	8.93E-12	2.93E-16	up	238.50	20
APOBEC3B	Homo sapiens apolipoprotein B mRNA editing enzyme, catalytic polypeptide-like 3B (APOBEC3B), transcript variant 1, mRNA [NM_004900]	gene	3.01E-05	9.94E-10	up	15.88	21
APORB	Homo sapiens apolipoprotein B receptor (APOB), mRNA [NM_018690]	gene	1.45E-05	4.78E-10	up	28.85	22
APQ9	Homo sapiens aquaporin 9 (APQ9), mRNA [NM_020980]	gene	1.99E-14	6.52E-19	up	722.10	23
ARAP3	Homo sapiens ArfGAP with RhoGAP domain, ankyrin repeat and PH domain 3 (ARAP3), mRNA [NM_022481]	gene	4.39E-09	1.44E-13	up	61.91	24
ARG1	Homo sapiens arginase 1 (ARG1), transcript variant 1, mRNA [NM_001244438]	gene	1.52E-05	5.00E-10	up	48.07	25
ARG1	Homo sapiens arginase 1 (ARG1), transcript variant 1, mRNA [NM_001244438]	gene	1.25E-05	4.11E-10	up	38.38	Not used
ARHGAP26	Homo sapiens Rho GTPase activating protein 26 (ARHGAP26), transcript variant 1, mRNA [NM_015071]	gene	5.31E-03	1.77E-07	up	8.22	26
ARP2C2	Homo sapiens actin related protein 2/3 complex, subunit 2, 34kDa (ARP2C2), transcript variant 1, mRNA [NM_152862]	gene	3.27E-03	1.09E-07	up	1.73	27
ARRB2	Homo sapiens arrestin, beta 2 (ARRB2), transcript variant 1, mRNA [NM_004313]	gene	5.30E-03	1.76E-07	up	2.78	28
ASAH1	Homo sapiens N-acylsphingosine amidohydrolase (acid ceramidase) 1 (ASAH1), transcript variant 1, mRNA [NM_177924]	gene	3.77E-02	1.26E-06	up	2.12	29
ASGR1	Homo sapiens asialoglycoprotein receptor 1 (ASGR1), transcript variant 1, mRNA [NM_001671]	gene	2.10E-02	7.00E-07	up	8.16	30
ASPH	Homo sapiens aspartate beta-hydroxylase (ASPH), transcript variant 4, mRNA [NM_032467]	gene	1.17E-06	3.85E-11	up	48.12	31
ASPH	Homo sapiens aspartate beta-hydroxylase (ASPH), transcript variant 1, mRNA [NM_004318]	gene	1.81E-02	6.02E-07	up	3.76	Not used
ASRL1	Homo sapiens asparaginase like 1 (ASRL1), transcript variant 1, mRNA [NM_001083926]	gene	2.24E-04	7.42E-09	down	-2.67	32
ATF7	Homo sapiens activating transcription factor 7 (ATF7), transcript variant 4, mRNA [NM_001206682]	gene	4.22E-02	1.41E-06	up	2.00	33
ATP9A	Homo sapiens ATPase, class I, type A9 (ATP9A), mRNA [NM_006045]	gene	7.41E-04	2.45E-08	up	8.51	34
B3GNT5	Homo sapiens UDP-GlcNAc-betaGal beta 1-3-N-acetylglucosaminyltransferase 5 (B3GNT5), mRNA [NM_032047]	gene	1.30E-10	4.28E-15	up	73.62	35
BAIAP2L2	Homo sapiens BAI1-associated protein 2-like 2 (BAIAP2L2), mRNA [NM_025045]	gene	4.30E-02	1.44E-06	down	-2.82	36
BASP1	Homo sapiens brain abundant, membrane associated signal protein 1 (BASP1), transcript variant 1, mRNA [NM_006317]	gene	2.52E-03	8.36E-08	up	6.17	37
BCL11B	Homo sapiens B-cell CLL/lymphoma 11 zinc finger protein (BCL11B), transcript variant 1, mRNA [NM_138576]	gene	3.73E-05	1.23E-09	up	20.73	38
BCL2A1	Homo sapiens BCL2-related protein A1 (BCL2A1), transcript variant 1, mRNA [NM_004049]	gene	2.43E-05	8.01E-10	up	26.03	39
BID	Homo sapiens BH3 interacting domain death agonist (BID), transcript variant 1, mRNA [NM_197966]	gene	2.46E-04	8.12E-09	up	8.81	40
BID	Homo sapiens BH3 interacting domain death agonist (BID), transcript variant 1, mRNA [NM_197966]	gene	2.85E-04	9.42E-09	up	8.16	Not used
BPI	Homo sapiens bactericidal/permeability-increasing protein (BPI), mRNA [NM_001725]	gene	2.71E-04	8.96E-09	up	40.03	41
BR13	Homo sapiens brain protein 13 (BR13), transcript variant 1, mRNA [NM_015379]	gene	4.07E-02	1.36E-06	up	3.18	42
BTST1	Homo sapiens bone marrow stromal cell antigen 1 (BTST1), mRNA [NM_004334]	gene	4.27E-05	1.41E-09	up	12.76	43
BTNL8	Homo sapiens butyrylhydrolase 8 (BTNL8), transcript variant 2, mRNA [NM_001040462]	gene	4.43E-03	1.47E-07	up	17.88	44
C10orf105	Homo sapiens chromosome 10 open reading frame 105 (C10orf105), transcript variant 1, mRNA [NM_001164375]	generic ORF	2.90E-02	9.69E-07	up	6.90	Not used
C10orf54	Homo sapiens chromosome 10 open reading frame 54 (C10orf54), mRNA [NM_022153]	generic ORF	3.36E-06	7.77E-11	up	8.14	Not used
C12orf75	Homo sapiens chromosome 12 open reading frame 75 (C12orf75), mRNA [NM_001145199]	generic ORF	2.47E-02	8.25E-07	up	9.05	Not used
C19orf38	Homo sapiens chromosome 19 open reading frame 38 (C19orf38), mRNA [NM_001136482]	generic ORF	2.38E-05	7.86E-10	up	3.50	Not used
C4orf21	Homo sapiens chromosome 1 open reading frame 21 (C4orf21), mRNA [NM_030806]	generic ORF	2.88E-05	9.50E-10	up	15.21	Not used
C4orf50	chromosome 4 open reading frame 50 [Source:HGNC Symbol;Acc:HGNC:3736] [ENST00000531445]	generic ORF	8.67E-03	2.88E-07	up	3.93	Not used
CSAR1	Homo sapiens complement component 5a receptor 1 (CSAR1), mRNA [NM_001736]	gene	6.09E-08	2.00E-12	up	116.92	45
CSAR2	Homo sapiens complement component 5a receptor 2 (CSAR2), transcript variant 1, mRNA [NM_001271749]	gene	4.45E-02	1.49E-06	up	2.66	46
C8orf60	Homo sapiens cDNA FLJ212193 fis, clone MAMMA1000856. [AK022255]	miscellaneous	2.04E-03	6.76E-08	up	22.83	Not used
C4A	Homo sapiens carbonic anhydrase IV (C4A), mRNA [NM_000717]	gene	9.78E-05	3.23E-09	up	9.27	47
CACNA1I	Homo sapiens calcium channel, voltage-dependent, T type, alpha 1 subunit (CACNA1I), transcript variant 1, mRNA [NM_021096]	gene	1.38E-03	4.56E-08	up	6.19	48
CADM1	Homo sapiens cell adhesion molecule 1 (CADM1), transcript variant 3, mRNA [NM_001301043]	gene	2.86E-04	9.45E-09	up	6.78	49
CAMP	Homo sapiens cathepsin L antimicrobial peptide (CAMP), mRNA [NM_004345]	gene	8.99E-05	2.97E-09	up	128.82	50
CATSPER1	Homo sapiens catenation channel, sperm associated 1 (CATSPER1), mRNA [NM_030504]	gene	1.60E-03	5.29E-08	up	6.32	51
CCDC129	coiled-coil domain containing 129 [Source:HGNC Symbol;Acc:HGNC:27363] [ENST00000409717]	gene	1.12E-02	3.72E-07	down	-2.11	52
CCDC147-AS1	Homo sapiens CCDC147 antisense RNA 1 (head to head) (CCDC147-AS1), long non-coding RNA [NR_108036]	ncRNA	2.25E-02	7.52E-07	up	15.22	Not used
CCDC149	Homo sapiens coiled-coil domain containing 149 (CCDC149), transcript variant 1, mRNA [NM_173463]	gene	1.58E-03	5.22E-08	up	6.10	53
CCDC149	Homo sapiens coiled-coil domain containing 149 (CCDC149), transcript variant 1, mRNA [NM_173463]	gene	3.10E-03	1.03E-07	up	5.09	Not used
CCL4L2	Homo sapiens chemokine (C-C motif) ligand 4-like 2 (CCL4L2), transcript variant CCL4L2b2, mRNA [NM_001291470]	gene	8.68E-03	2.89E-07	up	20.07	54
CCL4L2	Homo sapiens chemokine (C-C motif) ligand 4-like 2 (CCL4L2), transcript variant CCL4L2b2, mRNA [NM_001291470]	gene	3.02E-03	1.00E-07	up	8.85	Not used
CCL4L2	Homo sapiens chemokine (C-C motif) ligand 4-like 2 (CCL4L2), transcript variant CCL4L2b2, mRNA [NM_001291470]	gene	1.97E-02	6.57E-07	up	5.62	Not used
CCL5	Homo sapiens chemokine (C-C motif) ligand 5 (CCL5), transcript variant 1, mRNA [NM_002985]	gene	4.15E-04	1.37E-08	up	14.99	55
CCNL1	Homo sapiens cyclin J-like (CCNL1), mRNA [NM_024565]	gene	1.80E-03	5.95E-08	up	11.94	56
CCNL2	Homo sapiens cyclin L2 (CCNL2), transcript variant 1, mRNA [NM_030937]	gene	1.63E-02	5.42E-07	down	-1.93	57
CCR1	Homo sapiens chemokine (C-C motif) receptor 1 (CCR1), mRNA [NM_001295]	gene	5.28E-12	1.73E-16	up	161.86	58
CCR3	Homo sapiens chemokine (C-C motif) receptor 3 (CCR3), transcript variant 1, mRNA [NM_001837]	gene	1.76E-02	5.87E-07	up	8.67	59
CCR5	Homo sapiens chemokine (C-C motif) receptor 5 (gene/pseudogene) (CCR5), transcript variant A, mRNA [NM_000579]	gene	2.78E-03	9.23E-08	up	2.70	60
CD14	Homo sapiens CD14 molecule (CD14), transcript variant 3, mRNA [NM_00174104]	gene	2.35E-08	7.73E-13	up	37.46	61
CD163	Homo sapiens CD163 molecule (CD163), transcript variant 1, mRNA [NM_004244]	gene	3.43E-02	1.15E-06	up	22.03	62
CD2	Homo sapiens CD2 molecule (CD2), mRNA [NM_001767]	gene	4.01E-05	1.32E-09	up	15.35	63
CD226	CD226 molecule [Source:HGNC Symbol;Acc:HGNC:16961] [ENST00000280200]	gene	1.58E-06	5.22E-11	up	3.61	

Gene Symbol	Description	Feature Type	p-value	Corrected p-value	Regulation in NOTCH1-mut	Fold change (Mut vs WT)	Position in Heatmap
CD8A	Homo sapiens CD8a molecule (CD8A), transcript variant 1, mRNA [NM_001768]	gene	4.80E-03	1.59E-07	up	17.86	77
CD8B	Homo sapiens CD8b molecule (CD8B), transcript variant 5, mRNA [NM_004931]	gene	1.16E-02	3.87E-07	up	22.55	78
CD8B	Homo sapiens CD8b molecule (CD8B), transcript variant 4, mRNA [NM_172102]	gene	9.35E-05	3.09E-09	up	9.51	Not used
CD8B	Homo sapiens CD8b molecule (CD8B), transcript variant 5, mRNA [NM_004931]	gene	1.77E-02	5.91E-07	up	7.02	Not used
CD93	Homo sapiens CD93 molecule (CD93), mRNA [NM_012072]	gene	3.89E-06	1.28E-10	up	24.05	79
CDA	Homo sapiens cytidine deaminase (CDA), mRNA [NM_001785]	gene	3.97E-06	1.31E-10	up	15.81	80
CDK5RAP3	Homo sapiens CDK5 regulatory subunit associated protein 3 (CDK5RAP3), transcript variant 5, mRNA [NM_001278198]	gene	2.70E-02	9.01E-07	down	-2.04	81
CEACAM8	Homo sapiens carcinoembryonic antigen-related cell adhesion molecule 8 (CEACAM8), mRNA [NM_001816]	gene	5.86E-06	1.93E-10	up	84.75	82
CEBPBA	Homo sapiens CCAAT/enhancer binding protein (C/EBP), alpha (CEBPBA), transcript variant 1, mRNA [NM_004364]	gene	1.04E-03	3.44E-08	up	16.25	83
CEBPB	Homo sapiens CCAAT/enhancer binding protein (C/EBP), beta (CEPB), transcript variant 1, mRNA [NM_005194]	gene	2.21E-04	7.31E-09	up	10.75	84
CEBPE	Homo sapiens CCAAT/enhancer binding protein (C/EBP), epsilon (CEBPE), mRNA [NM_0031805]	gene	2.36E-02	7.88E-07	up	8.20	85
CECR2	PREDICTED: Homo sapiens cat eye syndrome chromosome region, candidate 2 (CECR2), transcript variant X3, mRNA [XM_006724079]	gene	2.23E-02	7.43E-07	down	-1.90	86
CECR7	Homo sapiens cat eye syndrome chromosome region, candidate 7 (non-protein coding) (CECR7), long non-coding RNA [NR_015352]	gene	2.30E-02	7.69E-07	down	-1.88	87
CES1	Homo sapiens carboxylesterase 1 (CES1), transcript variant 1, mRNA [NM_00125195]	gene	1.41E-04	4.66E-09	up	33.28	88
CFD	Homo sapiens complement factor D (adipsin) (CFD), mRNA [NM_001928]	gene	6.01E-04	1.99E-08	up	45.97	89
CFP	Homo sapiens complement factor properdin (CFP), transcript variant 1, mRNA [NM_002621]	gene	2.22E-03	7.37E-08	up	11.07	90
CHI3L1	Homo sapiens chitinase 3-like 1 (cartilage glycoprotein-39) (CHI3L1), mRNA [NM_001276]	gene	3.19E-05	1.05E-09	up	67.08	91
CHN2	Homo sapiens chimerin 2 (CHN2), transcript variant 4, mRNA [NM_001293070]	gene	8.56E-04	2.83E-08	up	7.68	92
CIC	capicua transcriptional repressor [Source:HGNC Symbol;Acc:HGNC:14214] [ENST000000572681]	gene	7.06E-03	2.35E-07	down	-1.88	93
CLC	Homo sapiens Charcot-Leyden crystal galectin (CLC), mRNA [NM_001828]	gene	8.84E-09	2.90E-13	up	71.75	94
CLEC11A	Homo sapiens C-type lectin domain family 11, member A (CLEC11A), mRNA [NM_002975]	gene	1.24E-02	4.13E-07	up	6.69	95
CLEC4A	Homo sapiens C-type lectin domain family 4, member A (CLEC4A), transcript variant 1, mRNA [NM_016184]	gene	2.98E-02	9.95E-07	up	3.66	96
CLEC4D	Homo sapiens C-type lectin domain family 4, member D (CLEC4D), mRNA [NM_080387]	gene	5.79E-08	1.90E-12	up	36.35	97
CLEC4D	Homo sapiens C-type lectin domain family 4, member D (CLEC4D), mRNA [NM_080387]	gene	1.52E-06	4.99E-11	up	28.80	Not used
CLEC7A	Homo sapiens C-type lectin domain family 7, member A (CLEC7A), transcript variant 6, mRNA [NM_197954]	gene	5.51E-11	1.81E-15	up	61.46	98
CMTM2	Homo sapiens CKLF-like MARVEL transmembrane domain containing 2 (CMTM2), transcript variant 1, mRNA [NM_144673]	gene	4.63E-04	1.53E-08	up	38.46	99
CREB5	Homo sapiens cAMP responsive element binding protein 5 (CREB5), transcript variant 1, mRNA [NM_182898]	gene	1.20E-04	3.95E-09	up	22.22	100
CRISPLD2	Homo sapiens cysteine-rich secretory protein LCLL domain containing 2 (CRISPLD2), mRNA [NM_031476]	gene	2.15E-05	7.09E-10	up	3.26	101
CRTAM	Homo sapiens cytotoxic and regulatory T cell molecule (CRTAM), mRNA [NM_019604]	gene	1.94E-02	6.48E-07	up	8.29	102
CSF2RA	Homo sapiens colony stimulating factor 2 receptor, alpha, low-affinity (granulocyte-macrophage) (CSF2RA), transcript variant 6, mRNA [NM_172249]	gene	1.53E-05	5.05E-10	up	11.86	103
CSF3R	Homo sapiens colony stimulating factor 3 receptor (granulocyte) (CSF3R), transcript variant 3, mRNA [NM_156039]	gene	4.23E-10	1.39E-14	up	88.29	104
CSGALNACT1	Homo sapiens chondroitin sulfate N-acetylgalactosaminyltransferase 1 (CSGALNACT1), transcript variant 2, mRNA [NM_018371]	gene	1.11E-04	3.66E-09	up	14.42	105
CSGALNACT1	Homo sapiens chondroitin sulfate N-acetylgalactosaminyltransferase 1 (CSGALNACT1), transcript variant 1, mRNA [NM_001130518]	gene	1.13E-02	3.76E-07	up	9.39	Not used
CST7	Homo sapiens cystatin F (leukocystatin) (CST7), mRNA [NM_003650]	gene	2.56E-06	8.42E-11	up	27.24	106
CSTA	Homo sapiens cystatin A (stefin A) (CSTA), mRNA [NM_005213]	gene	1.50E-08	4.93E-13	up	64.31	107
CTSG	Homo sapiens cathepsin G (CTSG), mRNA [NM_001911]	gene	1.42E-02	4.72E-07	up	30.68	108
CX3CR1	Homo sapiens chemokine (C-X3-C motif) receptor 1 (CX3CR1), transcript variant 4, mRNA [NM_001337]	gene	4.80E-02	1.60E-06	up	16.15	109
CXL1	Homo sapiens chemokine (C-X-C motif) ligand 1 (melanoma growth stimulating activity, alpha) (CXL1), transcript variant 1, mRNA [NM_001511]	gene	2.28E-06	7.49E-11	up	151.17	110
CXL8	Homo sapiens chemokine (C-X-C motif) ligand 8 (CXL8), mRNA [NM_000584]	gene	1.13E-07	3.73E-12	up	395.16	111
CXCR1	Homo sapiens chemokine (C-X-C motif) receptor 1 (CXCR1), mRNA [NM_000634]	gene	2.19E-05	7.22E-10	up	22.32	112
CXCR2	Homo sapiens chemokine (C-X-C motif) receptor 2 (CXCR2), transcript variant 1, mRNA [NM_001557]	gene	8.97E-08	2.95E-12	up	85.88	113
CXorf57	Homo sapiens chromosome X open reading frame 57 (CXorf57), transcript variant 1, mRNA [NM_018015]	gene	3.72E-03	1.24E-07	up	5.62	114
CYP1B1	Homo sapiens cytochrome P450, family 1, subfamily B, polypeptide 1 (CYP1B1), mRNA [NM_000104]	gene	5.43E-06	1.79E-10	up	14.51	115
CYP27A1	Homo sapiens cytochrome P450, family 27, subfamily A, polypeptide 1 (CYP27A1), mRNA [NM_000784]	gene	2.34E-06	7.72E-11	up	53.24	116
CYP4F3	Homo sapiens cytochrome P450, family 4, subfamily F, polypeptide 3 (CYP4F3), transcript variant 1, mRNA [NM_000896]	gene	2.05E-03	6.78E-08	up	25.53	117
CYTH1	cytohesin 1 [Source:HGNC Symbol;Acc:HGNC:9501] [ENST000005862299]	gene	3.65E-04	1.21E-08	down	-1.98	118
CYTH3	Homo sapiens cytohesin 3 (CYTH3), mRNA [NM_004227]	gene	1.03E-03	3.40E-08	up	4.19	119
DACH1	Homo sapiens dachshund family transcription factor 1 (DACH1), transcript variant 1, mRNA [NM_080759]	gene	1.18E-05	3.90E-10	up	6.72	120
DEFA3	Homo sapiens defensin, alpha 3, neutrophil-specific (DEFA3), mRNA [NM_005217]	gene	6.07E-06	2.00E-10	up	1252.22	121
DEF4A	Homo sapiens defensin, alpha 4, corticotatin (DEF4A), mRNA [NM_001925]	gene	1.20E-06	3.96E-11	up	191.87	122
DENN3D	DENN/MADD domain containing 3 [Source:HGNC Symbol;Acc:HGNC:29134] [ENST00000520482]	gene	1.88E-04	6.22E-09	up	31.25	123
DENN3D	Homo sapiens DENN/MADD domain containing 3 (DENN3D), mRNA [NM_014957]	gene	1.01E-05	3.31E-10	up	12.08	Not used
DGAT2	Homo sapiens diacylglycerol O-acyltransferase 2 (DGAT2), transcript variant 1, mRNA [NM_032564]	gene	3.51E-03	1.16E-07	up	8.08	124
DHRS3	Homo sapiens dehydrogenase/reductase (SDR family) member 3 (DHRS3), mRNA [NM_004753]	gene	6.03E-04	2.00E-08	up	16.56	125
DLGS	Homo sapiens discs, large homolog 5 (Drosophila) (DLGS), mRNA [NM_004747]	gene	3.19E-02	1.07E-06	up	4.16	126
DNMT1	Homo sapiens DNA (cytosine-5-)methyltransferase 1 (DNMT1), transcript variant 1, mRNA [NM_001130823]	gene	1.50E-02	4.99E-07	up	2.12	127
DOCK5	Homo sapiens dedicator of cytokinesis 5 (DOCK5), mRNA [NM_024940]	gene	2.23E-06	7.33E-11	up	9.02	128
EIF4E3	Homo sapiens eukaryotic translation initiation factor 4E family member 3 (EIF4E3), transcript variant 2, mRNA [NM_173359]	gene	1.09E-04	3.60E-09	up	11.79	129
EMR2	Homo sapiens egf-like module containing, mucin-like, hormone receptor-like 2 (EMR2), transcript variant 1, mRNA [NM_013447]	gene	1.98E-10	6.51E-15	up	50.75	130
EMR3	Homo sapiens egf-like module containing, mucin-like, hormone receptor-like 3 (EMR3), transcript variant 1, mRNA [NM_032571]	gene	6.95E-06	2.29E-10	up	26.45	131
EOMES	Homo sapiens esomesodermin (EOMES), transcript variant 2, mRNA [NM_005442]	gene	3.05E-03	1.01E-07	up	11.79	132
EPAS1	Homo sapiens endothelial PAS domain protein 1 (EPAS1), mRNA [NM_001430]	gene	1.58E-07	5.19E-12	up	16.04	133
ETS2	Homo sapiens v-ets avian erythroblastosis virus E26 oncogene homolog 2 (ETS2), transcript variant 1, mRNA [NM_005239]	gene	2.23E-10	7.31E-15	up	25.44	134
F2R	Homo sapiens coagulation factor II (thrombin) receptor, mRNA [cDNA clone IMAGE:4849569], with apparent retained intron, [BC016059]	miscellaneous	2.38E-03	7.88E-08	up	16.32	135
F2R	Homo sapiens coagulation factor II (thrombin) receptor (F2R), mRNA [NM_001992]	gene	1.81E-04	5.97E-09	up	7.57	Not used
FAM101B	Homo sapiens family with sequence similarity 101, member B (FAM101B), mRNA [NM_182705]	gene	5.05E-08	1.66E-12	up	91.55	136
FAM105A	Homo sapiens family with sequence similarity 105, member A (FAM105A), mRNA [NM_019018]	gene	1.41E-02	4.68E-07	up	12.11	137
FAM129A	Homo sapiens family with sequence similarity 129, member A (FAM129A), mRNA [NM_052966]	gene	1.40E-06	4.61E-11	up	77.21	138
FAM13A	Homo sapiens family with sequence similarity 13, member A (FAM13A), transcript variant 1, mRNA [NM_014883]	gene	1.46E-04	4.82E-09	up	7.30	139
FAM169A	Homo sapiens family with sequence similarity 169, member A (FAM169A), transcript variant 1, mRNA [NM_015566]	gene	1.28E-03	4.25E-08	up	13.65	140
FAM212A	Homo sapiens family with sequence similarity 212, member A (FAM212A), mRNA [NM_203370]	gene	2.87E-02	9.57E-07	up	6.22	Not used
FAM49B	Homo sapiens family with sequence similarity 49, member B (FAM49B), transcript variant 2, mRNA [NM_016623]	gene	1.64E-02	5.46E-07	down	-1.67	141
Far2	Homo sapiens fatty acyl CoA reductase 2 (FAR2), transcript variant 2, mRNA [NM_018099]	gene	1.37E-04	4.53E-09	up	2.76	142
FAS	Homo sapiens Fas cell surface death receptor (FAS), transcript variant 1, mRNA [NM_000043]	gene	3.09E-02	1.03E-06	up	4.07	144
FAS	Homo sapiens Fas cell surface death receptor (FAS), transcript variant 1, mRNA [NM_000043]	gene	1.90E-02	6.34E-07	up	3.70	Not used
FCAR	Homo sapiens Fc fragment of IgA, receptor for (FCAR), transcript variant 3, mRNA [NM_133271]	gene	4.89E-02	1.63E-06	up	3.50	Not used
FCAR	Homo sapiens Fc fragment of IgA, receptor for (FCAR), transcript variant 1, mRNA [NM_002000]	gene	6.63E-08	2.18E-12	up	106.78	145
FCER1G	Homo sapiens Fc fragment of IgE, high affinity I, receptor for gamma polypeptide (FCER1G), mRNA [NM_004106]	gene	1.52E-06	5.00E-11	up	32.62	Not used
FGFR1B	Homo sapiens Fc fragment of IgG, high affinity IIb, receptor (CD64) (FGFR1B), transcript variant 1, mRNA [NM_001017986]	gene	2.75E-05	9.08E-10	up	11.80	146
FGFR1B	Homo sapiens Fc fragment of IgG, high affinity IIb, receptor (CD64) (FGFR1B), transcript variant 3, mRNA [NM_001244910]	gene	8.33E-05	2.75E-09	up	41.87	147
FGFR1B	Homo sapiens Fc fragment of IgG, high affinity Ib, receptor (CD64) (FGFR1B), transcript variant 3, mRNA [NM_001244910]	gene	5.56E-04	1.84E-08	up	14.10	Not used
FGFR2C	Homo sapiens Fc fragment of IgG, low affinity IIc, receptor for (CD32) (gene/pseudogene) (FGFR2C), transcript variant 1, mRNA [NM_201563]	gene	3.26E-03	1.08E-07	up	11.48	148
FGGR3A	Homo sapiens Fc fragment of IgG, low affinity IIIa, receptor (CD16a) (FGGR3A), transcript variant 1, mRNA [NM_000569]	gene	2.46E-07	8.08E-12	up	201.74	149
FCN1	Homo sapiens ficolin (collagen/fibronectin domain containing) 1 (FCN1), mRNA [NM_002003]	gene	1.54E-06	5.08E-11	up	84.34	150
FCN1	Homo sapiens ficolin (collagen/fibronectin domain containing) 1 (FCN1), mRNA [NM_002003]	gene	1.28E-06	4.20E-11	up	43.63	Not used
FEZ1	Homo sapiens fasciculation and elongation protein zeta 1 (zyuin 1) (FEZ1), transcript variant 1, mRNA [NM_005103]	gene	1.72E-02	5.73E-07	up	2.74	151
FFAR2	Homo sapiens free fatty acid receptor 2 (FFAR2), mRNA [NM_005306]	gene	4.68E-04	1.55E-08	up	15.90	152
FGD4	Homo sapiens FYVE, RhoGEF and PH domain containing 4 (FGD4), mRNA [NM_139241]	gene	4.08E-06	1.34E-10	up	19.70	153
FGD4	Homo sapiens FYVE, RhoGEF and PH domain containing 4 (FGD4), mRNA [NM_139241]	gene	7.12E-06	2.35E-10	up	9.98	Not used
FGD4	FYVE, RhoGEF and PH domain containing 4 [Source:HGNC Symbol;Acc:HGNC:19125] [ENST00000472289]	gene	4.29E-05	1.41E-09	up	9.08	Not used
FGFBP2	Homo sapiens fibroblast growth factor binding protein 2 (FGFBP2), mRNA [NM_031950]	gene	2.07E-04	6.84E-09	up	21.69	154
FJU36777	uncharacterized LOC730971 [Source:EntrezGene;Acc:730971] [ENST00000501888]	uncharacterized locus	2.69E-02	8.99E-07	down	-1.78	Not used
FNDC3B	Homo sapiens fibronectin type III domain containing 3B (FNDC3B), transcript variant 1, mRNA [NM_022763]	gene	1.32E-02	4.39E-07	up	7.25	155
FNDC3B	Homo sapiens fibronectin type III domain containing 3B (FNDC3B), transcript variant 1, mRNA [NM_022763]	gene	7.83E-04	2.59E-08	up	4.77	Not used
FNIP2	Homo sapiens follicular interacting protein 2 (FNIP2), mRNA [NM_028404]	gene	3.25E-02	1.09E-06	up	14.77	156
FOLR3	Homo sapiens folate receptor 3 (gamma) (FOLR3), mRNA [NM_000804]	gene	6.96E-10	2.28E-14	up	19.76	157
FOSL2	Homo sapiens FOS-like antigen 2 (FOSL2), mRNA [NM_005253]	gene	6.63E-04	2.19E-08	up	31.32	158
FPR1	Homo sapiens formyl peptide receptor 1 (FPR1), transcript variant 2, mRNA [NM_002029]	gene	3.52E-12	1.16E-16	up	377.81	159
FPR2	Homo sapiens formyl peptide receptor 2 (FPR2), transcript variant 1, mRNA [NM_001462]	gene	8.09E-10	2.65E-14	up	43.69	160
FTH1	Homo sapiens ferritin, heavy polypeptide 1 (FTH1), mRNA [NM_002032]	gene	4.04E-03	1.34E-07	up	1.78	161
FYB	Homo sapiens FYN binding protein (FYB), transcript variant 1, mRNA [NM_001465]	gene	5.05E-08	1.66E-12	up	98.07	162
G0S2	Homo sapiens G0/G1 switch 2 (G0S2), mRNA [NM_015714]	gene	4.97E-10	1.63E-14	up	857.35	163
GALC	Homo sapiens galactos						

Gene Symbol	Description	Feature Type	p-value	Corrected p-value	Regulation in NOTCH1-mut	Fold change (Mut vs WT)	Position in Heatmap
WDFY3	Homo sapiens WD repeat and FYVE domain containing 3 (WDFY3), mRNA [NM_014991]	gene	6.47E-04	2.14E-08	up	10.33	Not used
WDR6	Homo sapiens WD repeat domain 6 (WDR6), mRNA [NM_018031]	gene	9.37E-05	3.09E-09	down	-2.13	438
XCL1	Homo sapiens chemokine (C motif) ligand 1 (XCL1), mRNA [NM_002995]	gene	3.65E-02	1.22E-06	up	8.27	439
XLOC_12_005415	BROAD Institute lncRNA (XLOC_12_005415), lncRNA [TCONS_12_00010039]	lncRNA	1.13E-02	3.76E-07	down	-1.85	Not used
YY2	Homo sapiens YY2 transcription factor (YY2), mRNA [NM_206923]	gene	2.98E-03	9.87E-08	down	-1.87	440
ZBTB32	Homo sapiens zinc finger and BTB domain containing 32 (ZBTB32), mRNA [NM_014383]	gene	1.87E-02	6.22E-07	down	-1.98	441
ZMIZ1	Homo sapiens zinc finger, MIZ-type containing 1 (ZMIZ1), mRNA [NM_020338]	gene	3.78E-03	1.25E-07	up	11.98	442
ZNF700	Homo sapiens zinc finger protein 700 (ZNF700), transcript variant 1, mRNA [NM_144566]	gene	4.49E-02	1.50E-06	down	-2.78	443

Supplementary Table 5. Gene Set Enrichment Analysis of *Notch*-related datasets.

Name	Description	Collection	Total size	NOTCH1-mut vs. WT					SF3B1-mut vs. WT			
				Size	NES	p-value	FDR q-value	Colonn Size2	NES3	p-value4	FDR q-value5	
PID_NOTCH_PATHWAY	Notch signaling pathway	C2-CP	61	51	1	0.429	0.384	51	-0.89	0.669	1	
KEGG_NOTCH_SIGNALING_PATHWAY	Notch signaling pathway	C2-CP KEGG	49	43	1.17	0.214	0.235	43	0.71	0.916	0.858	
REACTOME_ACTIVATED_NOTCH1_TRANSMITS_SIGNAL_TO_THE_NUCLEUS	Genes involved in Activated NOTCH1 Transmits Signal to the Nucleus	C2-CP Reactome	29	20	1.43	0.044	0.074	20	1.06	0.369	0.388	
REACTOME_NOTCH1_INTRACELLULAR_DOMAIN_REGULATES_TRANSCRIPTION	Genes involved in NOTCH1 Intracellular Domain Regulates Transcription	C2-CP Reactome	48	40	1.04	0.397	0.38	40	1.17	0.204	0.258	
REACTOME_SIGNALING_BY_NOTCH1	Genes involved in Signaling by NOTCH1	C2-CP Reactome	72	58	1.3	0.099	0.145	58	1.29	0.085	0.158	
NGUYEN_NOTCH1_TARGETS_DN	Genes down-regulated in primary keratinocytes by expression of constantly active NOTCH1	C2-CPG	88	74	1.69	0.01	0.016	74	1.75	0.002	0.016	
NGUYEN_NOTCH1_TARGETS_UP	Genes up-regulated in primary keratinocytes by expression of constantly active NOTCH1	C2-CPG	31	24	1.27	0.156	0.157	24	-0.88	0.689	0.943	
VILIMAS_NOTCH1_TARGETS_DN	Genes down-regulated in bone marrow progenitors by constitutively active NOTCH1	C2-CPG	22	18	1.73	<0,001	0.019	18	1.83	0.006	0.016	
VILIMAS_NOTCH1_TARGETS_UP	Genes up-regulated in bone marrow progenitors by constitutively active NOTCH1	C2-CPG	54	48	2.04	<0,001	<0,001	48	2.12	<0,001	<0,001	
GO_NEGATIVE_REGULATION_OF_NOTCH_SIGNALING_PA	Any process that stops, prevents, or reduces the frequency, rate or extent of the Notch signaling pathway	C5-BP	30	18	1.53	0.046	0.043	18	1.67	0.03	0.023	
GO_NOTCH_SIGNALING_PATHWAY	A series of molecular signals initiated by the binding of an extracellular ligand to the receptor Notch on the surface of a target cell, and ending with regulation of a downstream cellular process, e.g. transcription.	C5-BP	116	82	1.03	0.369	0.367	82	0.73	0.912	0.895	
GO_POSITIVE_REGULATION_OF_NOTCH_SIGNALING_PA	Any process that activates or increases the frequency, rate or extent of the Notch signaling pathway	C5-BP	36	24	1.46	0.043	0.066	24	1.64	0.012	0.023	
GO_REGULATION_OF_NOTCH_SIGNALING_PATHWAY	Any process that modulates the frequency, rate or extent of the Notch signaling pathway	C5-BP	69	46	1.59	<0,001	0.028	46	1.72	0.006	0.019	
NOTCH_DN_V1_DN	Genes down-regulated in MOLT4 cells (T-ALL) by DAPT [PubChem=16219261], an inhibitor of NOTCH signaling pathway	C6	191	125	1.88	<0,001	0.006	125	1.78	<0,001	0.015	
NOTCH_DN_V1_UP	Genes up-regulated in MOLT4 cells (T-ALL) by DAPT [PubChem=16219261], an inhibitor of NOTCH signaling pathway.	C6	195	119	1.68	<0,001	0.015	119	1.47	0.018	0.06	
FABBRI_NOTCH_SIGNALING	NOTCH1-dependent CLL signature from Fabbri et al.	Custom	293	270	1.71	<0,001	0.019	270	1.57	0.016	0.038	
Hallmark_NOTCH_signaling	Genes up-regulated by activation of Notch signaling	H	34	26	1.65	0.002	0.019	26	1.49	0.037	0.062	