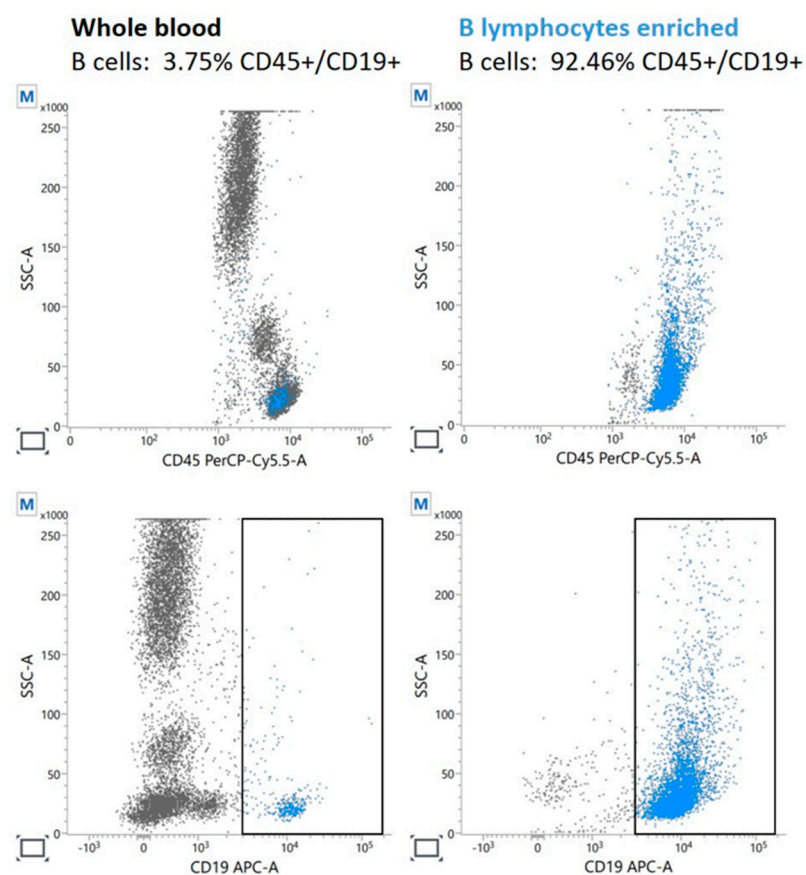


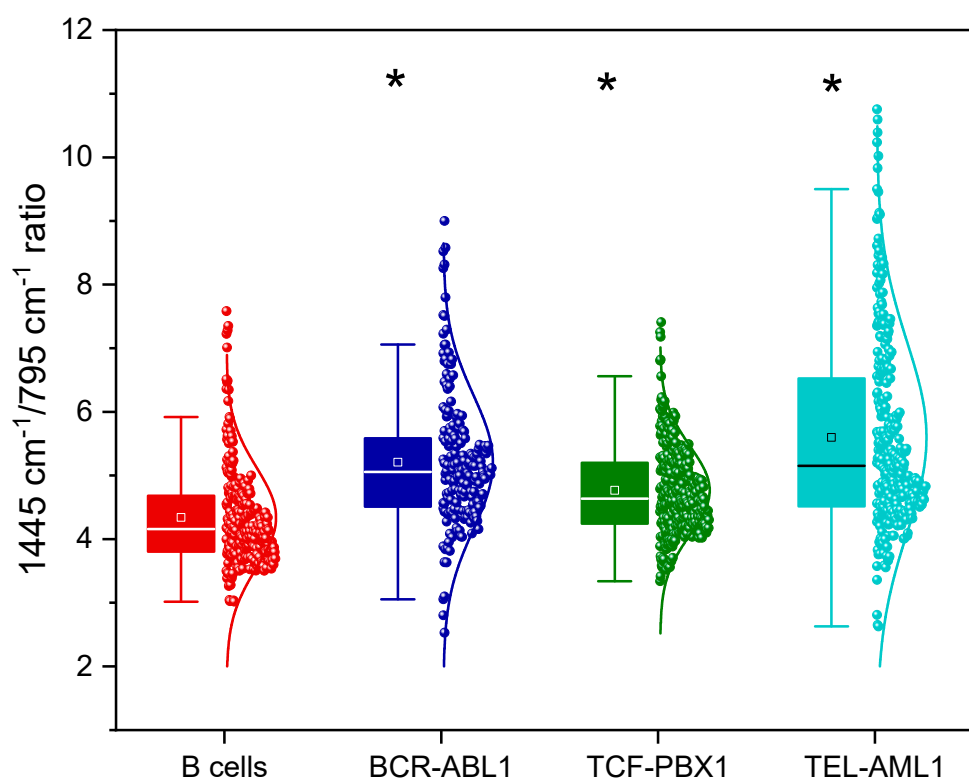
## Supplementary Information

**Supplementary Table S1.** Details of samples used in the study.

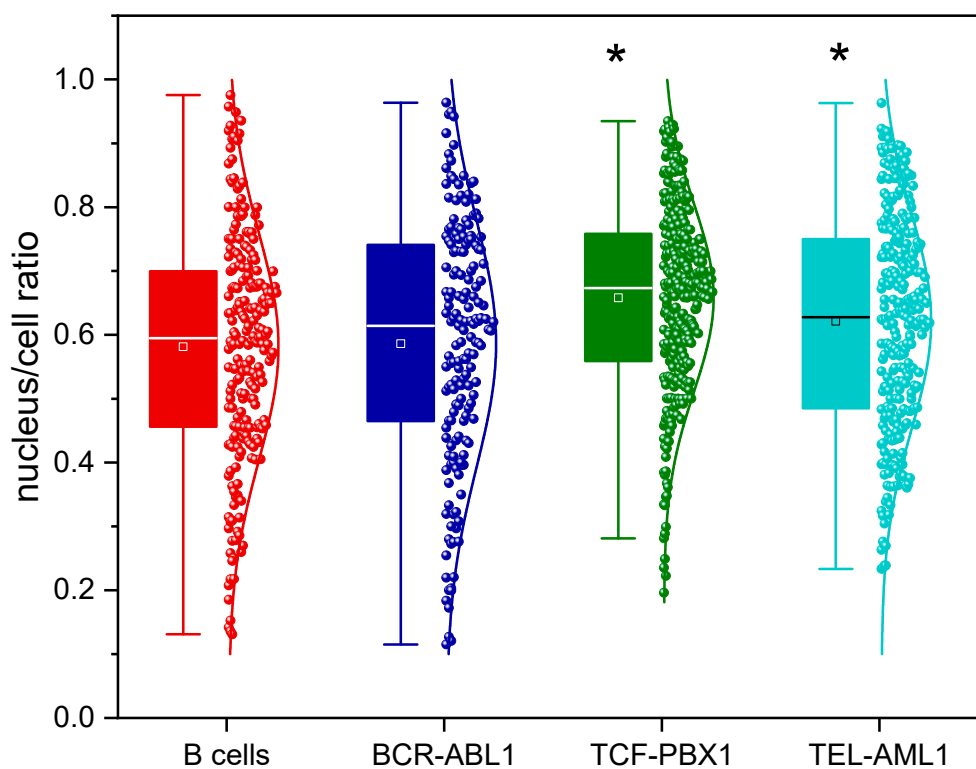
Sample ID	Immunophenotype	Type of gene rearrangements	Blastosis on diagnosis	Cell viability
P1	pre-B common	TEL-AML1	65%	70%
P2	pre-B common	TEL-AML1	98%	81%
P3	pre-B	TEL-AML1	91%	81%
P4	pre-B common	TEL-AML1	93%	73%
P5	pre-B common	BCR-ABL1	83%	56%
P6	ND	BCR-ABL1	ND	43%
P7	pre-B common	BCR-ABL1	91%	55%
P8	pre-B	TCF3-PBX1	95%	88%
P9	pre-B	TCF3-PBX1	86%	50%
P10	pre-B common	TCF3-PBX1	94%	84%
HV1	normal lymphocyte B	-	-	96%
HV2	normal lymphocyte B	-	-	86%
HV3	normal lymphocyte B	-	-	78%
HV4	normal lymphocyte B	-	-	98%
HV5	normal lymphocyte B	-	-	96%



**Supplementary Figure S1.** Purity assessment of the B cell fraction by flow cytometry. Before and directly after the magnetic sorting procedure, B cell fraction was subjected to purity assessment. The lymphocyte population was identified based on side-scatter (SSC) characteristics and CD45 expression. In the whole blood, B cells were defined further as CD19-expressing cells in the CD45-positive population. The initial concentration of CD19+ cells in the blood of one healthy volunteer was 3.75%. After magnetic separation, the purity of enriched lymphocytes was assessed within CD45 positive leucocytes and exceeded 90%. The picture presents the analysis of one sample.



**Supplementary Figure S2.** The  $1445\text{ cm}^{-1}/795\text{ cm}^{-1}$  ratio calculated based on the spectra obtained with the use of 532 nm laser for B cells ( $n=250$ ), and BCR-ABL1 ( $n=180$ ), TCF3-PBX1 ( $n=326$ ), TEL-AML1 ( $n=302$ ) lymphoblasts. Due to the lack of a normal distribution, a non-parametric was used to test the significance of changes with respect to normal cells (Mann-Whitney U test,  $p < 0.05$ ).



**Supplementary Figure S3.** The nucleus/cell ratio calculated based on the KMC maps obtained with the use of 532 nm laser for B cells ( $n=254$ ), and BCR-ABL1 ( $n=183$ ), TCF3-PBX1 ( $n=331$ ), TEL-AML1 ( $n=314$ ) lymphoblasts.

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Due to the lack of a normal distribution, a non-parametric was used to test the significance of changes with respect to normal cells (Mann-Whitney U test,  $p < 0.05$ ).