

## Statistics summary

### **High percentage of blood-based T-cell receptor gamma V9-JP recombinations associated with amyotrophic lateral sclerosis: extensive retention of the JP KKIK amino acid motif**

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**Table S15. TRG gene segment usage as indicated by blood samples, in turn as indicated by the recovery of TRG recombination reads from exome or RNAseq files.** All 2-proportion test comparisons of ALS-1 and PD-1 are with non-neurological diseases and the recovery of all TRG recombination reads are in the supporting online material tables. NS = not significant; dbGaP = database of genotypes and phenotypes.

Disease	blood or other tissue processed	Fraction V9 of all TRG recombination reads	Fraction JP of all TRG recombination reads	Fraction V9JP recombination of all TRG recombination reads	n-proportion test comparing V9JP percentages, for ALS/PD; note, WXS compared to WXS, RNAseq compared to RNAseq	Fraction retention of JP KKIK motif	SOM file	Project (phs numbers can be accessed at dbGaP below acronyms defined at the genomic data commons)
<b>TRG recombination reads mined from exome files</b>								
ALS-1, familial	blood	15/16	16/16	15/16	(the data in preceding column of this row used for below n-proportion tests, left-side value in succeeding rows)	16/16	Table S1	phs000101
Parkinson's disease	blood	33/37	37/37	33/37	(the data of the preceding column of this row used for below n-proportion tests, right-side value in succeeding rows)	35/37	Table S2	phs001172
Esophageal cancer	blood	23/136	5/136	5/136	<0.0001/<0.0001	5/5	Table S3	TCGA-ESCA
Lung squamous cell carcinoma	blood	74/493	23/493	20/493	<0.0001/<0.0001	22/23	Table S4	TCGA-LUSC
Colon cancer	blood	55/239	23/239	21/239	<0.0001/<0.0001	20/23	Table S5	TCGA-COAD
Stomach adenocarcinoma	blood	102/449	41/449	30/449	<0.0001/<0.0001	40/41	Table S6	TCGA-STAD
Melanoma	blood	223/953	81/953	72/953	<0.0001/<0.0001	81/81	Table S7	TCGA-SKCM
Multiple myeloma	blood	1007/9081	223/9081	134/9081	<0.0001/<0.0001	207/223	Table S8	COMPASS-MMRF
Wilms tumor	blood	113/620	19/620	11/620	<0.0001/<0.0001	17/19	Table S9	TARGET-WT
Neuroblastoma	blood	283/725	138/725	129/725	<0.0001/<0.0001	135/138	Table S10	TARGET-NBL
<b>TRG recombination reads mined from RNAseq files</b>								
ALS	blood	11381/29170	6189/29170	6078/29170	(the data of preceding column in this row used for n-proportion tests in succeeding rows)	6014/6189	Table S11	phs002055
Wilms tumor	tumor	28/65	11/65	11/65	NS	11/11	Table S12	TARGET-WT
Diffuse large B-cell lymphoma	lymph node	2169/9911	253/9911	211/9911	<0.0001	233/253	Table S13	NCICCR-DLBCL
Neuroblastoma	tumor	456/1799	99/1799	98/1799	<0.0001	98/99	Table S14	TARGET-NBL

Lung squamous cell carcinoma	blood	74/493	23/493	20/493	<0.0001/<0.0001	22/23	Table S4	TCGA-LUSC
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**Comparison of proportions calculator**

<b>Sample 1</b>	
Proportion (%):	<input type="text" value="93.75"/>
Sample size:	<input type="text" value="16"/>
<b>Sample 2</b>	
Proportion (%):	<input type="text" value="4.06"/>
Sample size:	<input type="text" value="493"/>
<input type="button" value="Test"/>	

**Results**

Difference	89.69 %
95% CI	67.5091% to 95.0197%
Chi-squared	194.219
DF	1
Significance level	P < 0.0001

**Comparison of proportions calculator**

<b>Sample 1</b>	
Proportion (%):	<input type="text" value="89.19"/>
Sample size:	<input type="text" value="37"/>
<b>Sample 2</b>	
Proportion (%):	<input type="text" value="4.06"/>
Sample size:	<input type="text" value="493"/>
<input type="button" value="Test"/>	

**Results**

Difference	85.13 %
95% CI	71.0707% to 91.8072%
Chi-squared	276.540
DF	1
Significance level	P < 0.0001

Colon cancer	blood	55/239	23/239	21/239		20/23	Table S5	TCGA-COAD
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**Comparison of proportions calculator**

**Sample 1**  
 Proportion (%):   
 Sample size:

**Sample 2**  
 Proportion (%):   
 Sample size:

**Results**

Difference	84.96 %
95% CI	62.4717% to 90.8940%
Chi-squared	88.910
DF	1
Significance level	P < 0.0001

**Comparison of proportions calculator**

**Sample 1**  
 Proportion (%):   
 Sample size:

**Sample 2**  
 Proportion (%):   
 Sample size:

**Results**

Difference	80.40 %
95% CI	65.8606% to 87.5688%
Chi-squared	131.113
DF	1
Significance level	P < 0.0001

Stomach adenocarcinoma	blood	102/449	41/449	30/449		40/41	Table S6	TCGA-STAD
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**Comparison of proportions calculator**

**Sample 1**  
 Proportion (%):   
 Sample size:

**Sample 2**  
 Proportion (%):   
 Sample size:

**Results**

Difference	87.07 %
95% CI	64.8272% to 92.5697%
Chi-squared	133.727
DF	1
Significance level	P < 0.0001

**Comparison of proportions calculator**

**Sample 1**  
 Proportion (%):   
 Sample size:

**Sample 2**  
 Proportion (%):   
 Sample size:

**Results**

Difference	82.51 %
95% CI	68.3533% to 89.3237%
Chi-squared	205.854
DF	1
Significance level	P < 0.0001

Melanoma	blood	223/953	81/953	72/953		81/81	Table S7	TCGA-SKCM
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**Free statistical calculators**

**Comparison of proportions calculator**

<b>Sample 1</b>	
Proportion (%):	<input type="text" value="93.75"/>
Sample size:	<input type="text" value="16"/>
<b>Sample 2</b>	
Proportion (%):	<input type="text" value="7.56"/>
Sample size:	<input type="text" value="953"/>
<input type="button" value="Test"/>	

**Results**

Difference	86.19 %
95% CI	64.0336% to 91.5463%
Chi-squared	142.825
DF	1
Significance level	P < 0.0001

**Free statistical calculators**

**Comparison of proportions calculator**

<b>Sample 1</b>	
Proportion (%):	<input type="text" value="89.19"/>
Sample size:	<input type="text" value="37"/>
<b>Sample 2</b>	
Proportion (%):	<input type="text" value="7.56"/>
Sample size:	<input type="text" value="953"/>
<input type="button" value="Test"/>	

**Results**

Difference	81.63 %
95% CI	67.6093% to 88.3285%
Chi-squared	249.969
DF	1
Significance level	P < 0.0001

Multiple myeloma	blood	1007/9081	223/9081	134/9081		207/223	Table S8	COMPASS-MMRF
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**Comparison of proportions calculator**

**Sample 1**

Proportion (%):

Sample size:

**Sample 2**

Proportion (%):

Sample size:

**Results**

Difference	92.27 %
95% CI	70.1896% to 97.4131%
Chi-squared	841.727
DF	1
Significance level	P < 0.0001

**Comparison of proportions calculator**

**Sample 1**

Proportion (%):

Sample size:

**Sample 2**

Proportion (%):

Sample size:

**Results**

Difference	87.71 %
95% CI	73.8099% to 94.2393%
Chi-squared	1572.824
DF	1
Significance level	P < 0.0001

Wilms tumor	blood	113/620	19/620	11/620		17/19	Table S9	TARGET-WT
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**Comparison of proportions calculator**

**Sample 1**  
 Proportion (%):   
 Sample size:   
**Sample 2**  
 Proportion (%):   
 Sample size:

**Results**

Difference	91.98 %
95% CI	69.8586% to 97.1769%
Chi-squared	336.345
DF	1
Significance level	P < 0.0001

**Comparison of proportions calculator**

**Sample 1**  
 Proportion (%):   
 Sample size:   
**Sample 2**  
 Proportion (%):   
 Sample size:

**Results**

Difference	87.42 %
95% CI	73.4548% to 93.9917%
Chi-squared	426.620
DF	1
Significance level	P < 0.0001



Neuroblastoma	blood	283/725	138/725	129/725		135/138	Table S10	TARGET-NBL
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**Comparison of proportions calculator**

**Sample 1**  
 Proportion (%):   
 Sample size:   
**Sample 2**  
 Proportion (%):   
 Sample size:

**Results**

Difference	75.96 %
95% CI	53.6849% to 81.7238%
Chi-squared	57.620
DF	1
Significance level	P < 0.0001

**Comparison of proportions calculator**

**Sample 1**  
 Proportion (%):   
 Sample size:   
**Sample 2**  
 Proportion (%):   
 Sample size:

**Results**

Difference	71.40 %
95% CI	57.1925% to 78.4286%
Chi-squared	107.077
DF	1
Significance level	P < 0.0001

Wilms tumor	tumor	28/65	11/65	11/65		11/11	Table S12	TARGET-WT
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**Comparison of proportions calculator**

**Sample 1**

Proportion (%):

Sample size:

**Sample 2**

Proportion (%):

Sample size:

**Results**

Difference	3.92 %
95% CI	-6.9827% to 11.1364%
Chi-squared	0.604
DF	1
Significance level	P = 0.4370

Diffuse large B-cell lymphoma	lymph node	2169/9911	253/9911	211/9911		233/253	Table S13	NCICCR-DLBCL
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**Comparison of proportions calculator**

**Sample 1**

Proportion (%):

Sample size:

**Sample 2**

Proportion (%):

Sample size:

**Results**

Difference	18.71 %
95% CI	18.1571% to 19.2501%
Chi-squared	1917.535
DF	1
Significance level	P < 0.0001

Neuroblastoma	tumor	456/1799	99/1799	98/1799		98/99	Table S14	TARGET-NBL
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**Comparison of proportions calculator**

**Sample 1**

Proportion (%):

Sample size:

**Sample 2**

Proportion (%):

Sample size:

**Results**

Difference	15.39 %
95% CI	14.1533% to 16.4563%
Chi-squared	251.342
DF	1
Significance level	P < 0.0001