# **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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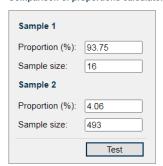
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Tampa, Florida

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

|                                   |                                       |   |   |  | re with non-neurolog<br>cant; dbGaP = datal  |  |           |  |
|-----------------------------------|---------------------------------------|---|---|--|--|--|-----------|--|
| Disease                           | blood or other<br>tissue<br>processed | Fraction V9 of<br>all TRG<br>recombination<br>reads | Fraction JP<br>of all TRG<br>recombination<br>reads | Fraction V9JP<br>recombination<br>of all TRG<br>recombination<br>reads | n-proportion test<br>comparing V9JP<br>percentages, for<br>ALS/PD; note,<br>WXS compared<br>to WXS,<br>RNAseq<br>compared to<br>RNAseq | Fraction<br>retention<br>of JP<br>KKIK motif | SOM file  | Project (phs<br>numbers<br>can be<br>accessed at<br>dbGaP<br>below<br>acronyms<br>defined at<br>the<br>genomic<br>data<br>commons) |
|                                   |                                       | TRG   | recombination r                                     | eads mined fron  |  | I  | I         |  |
| 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<br>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-<br>ESCA  |
| Lung squamous cell carcinoma      | blood                                 | 74/493  | 23/493  | 20/493   | <0.0001/<0.0001  | 22/23  | Table S4  | TCGA-<br>LUSC  |
| Colon cancer                      | blood                                 | 55/239  | 23/239  | 21/239   | <0.0001/<0.0001  | 20/23  | Table S5  | TCGA-<br>COAD  |
| Stomach adenocarcinoma            | blood                                 | 102/449   | 41/449  | 30/449   | <0.0001/<0.0001  | 40/41  | Table S6  | TCGA-<br>STAD  |
| Melanoma                          | blood                                 | 223/953   | 81/953  | 72/953   | <0.0001/<0.0001  | 81/81  | Table S7  | TCGA-<br>SKCM  |
| Multiple<br>myeloma               | blood                                 | 1007/9081   | 223/9081  | 134/9081   | <0.0001/<0.0001  | 207/223                                      | Table S8  | COMPASS-<br>MMRF   |
| Wilms tumor                       | blood                                 | 113/620   | 19/620  | 11/620   | <0.0001/<0.0001  | 17/19  | Table S9  | TARGET-<br>WT  |
| Neuroblastoma                     | blood                                 | 283/725   | 138/725   | 129/725  | <0.0001/<0.0001  | 135/138                                      | Table S10 | TARGET-<br>NBL   |
| 1                                 |                                       | TRG   | ecombination re                                     | eads mined from  |  |  |           |  |
| 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-<br>WT  |
| Diffuse large B-<br>cell lymphoma | lymph node                            | 2169/9911   | 253/9911  | 211/9911   | <0.0001  | 233/253                                      | Table S13 | NCICCR-<br>DLBCL   |
| Neuroblastoma                     | tumor                                 | 456/1799  | 99/1799   | 98/1799  | <0.000   | 98/99  | Table S14 | TARGET-<br>NBL   |

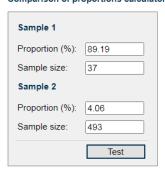
| Lung squamous  | blood | 74/493 | 23/493 | 20/493 | <0.0001/<0.0001 | 22/23 | Table S4 | TCGA-<br>LUSC |
|----------------|-------|--------|--------|--------|-----------------|-------|----------|---------------|
| cell carcinoma |       |        |        |        |                 |       |          | LUSC          |



### Results

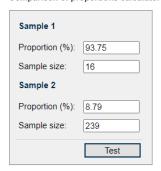
| Difference         | 89.69 %              |
|--------------------|----------------------|
| 95% CI             | 67.5091% to 95.0197% |
| Chi-squared        | 194.219              |
| DF                 | 1                    |
| Significance level | P < 0.0001           |

## Comparison of proportions calculator



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

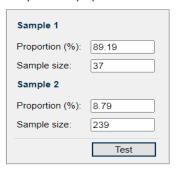
| Colon cancer | blood | 55/239 | 23/239 | 21/239 | 20/23 | Table S5 | TCGA-<br>COAD |
|--------------|-------|--------|--------|--------|-------|----------|---------------|
|              |       |        |        |        |       |          | COAD          |



## Results

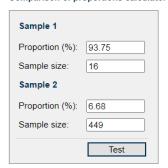
| Difference         | 84.96 %              |
|--------------------|----------------------|
| 95% CI             | 62.4717% to 90.8940% |
| Chi-squared        | 88.910               |
| DF                 | 1                    |
| Significance level | P < 0.0001           |

### Comparison of proportions calculator



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

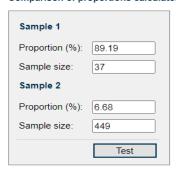
| Stomach        | blood | 102/449 | 41/449 | 30/449 | 40/41 | Table S6 | TCGA- |
|----------------|-------|---------|--------|--------|-------|----------|-------|
| adenocarcinoma | blood | 102/449 | 41/449 | 30/449 | 40/41 | Table S6 | STAD  |



### 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

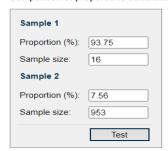


| Difference         | 82.51 %              |
|--------------------|----------------------|
| 95% CI             | 68.3533% to 89.3237% |
| Chi-squared        | 205.854              |
| DF                 | 1                    |
| Significance level | P < 0.0001           |

| Melanoma | blood | 223/953 | 81/953 | 72/953 |  | 81/81 | Table S7 | TCGA-<br>SKCM |  |
|----------|-------|---------|--------|--------|--|-------|----------|---------------|--|
|----------|-------|---------|--------|--------|--|-------|----------|---------------|--|

### Free statistical calculators

### Comparison of proportions calculator

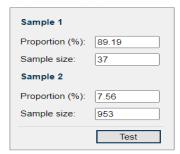


#### Results

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

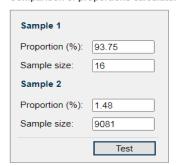
## Free statistical calculators

#### Comparison of proportions calculator



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

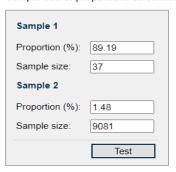
| Multiple | blood | 1007/9081 | 223/9081 | 134/9081 | 207/223 | Table S8 | COMPASS- |
|----------|-------|-----------|----------|----------|---------|----------|----------|
| myeloma  |       |           |          |          |         |          | MMRF     |



### Results

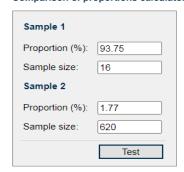
| Difference         | 92.27 %              |
|--------------------|----------------------|
| 95% CI             | 70.1896% to 97.4131% |
| Chi-squared        | 841.727              |
| DF                 | 1                    |
| Significance level | P < 0.0001           |

#### Comparison of proportions calculator



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

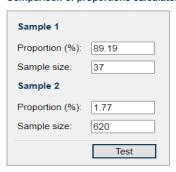
| Wilms tumor         blood         113/620         19/620         11/620         17/19         Table S9         TARG<br>WI |
|---|
|---|



### Results

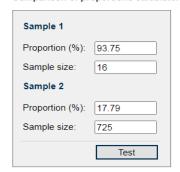
| Difference         | 91.98 %              |
|--------------------|----------------------|
| 95% CI             | 69.8586% to 97.1769% |
| Chi-squared        | 336.345              |
| DF                 | 1                    |
| Significance level | P < 0.0001           |

# Comparison of proportions calculator



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

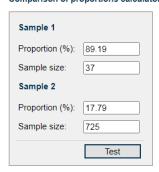
| Neuroblastoma | blood | 283/725 | 138/725 | 129/725 |  | 135/138 | Table S10 | TARGET-<br>NBL |  |
|---------------|-------|---------|---------|---------|--|---------|-----------|----------------|--|
|---------------|-------|---------|---------|---------|--|---------|-----------|----------------|--|



### Results

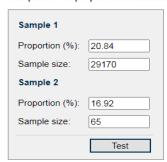
| Difference         | 75.96 %              |
|--------------------|----------------------|
| 95% CI             | 53.6849% to 81.7238% |
| Chi-squared        | 57.620               |
| DF                 | 1                    |
| Significance level | P < 0.0001           |

## Comparison of proportions calculator



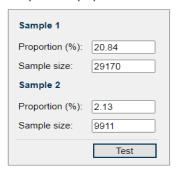
| Difference         | 71.40 %              |
|--------------------|----------------------|
| 95% CI             | 57.1925% to 78.4286% |
| Chi-squared        | 107.077              |
| DF                 | 1                    |
| Significance level | P < 0.0001           |

| Wilms tumor | tumor | 28/65 | 11/65 | 11/65 |  | 11/11 | Table S12 | TARGET-<br>WT |  |
|-------------|-------|-------|-------|-------|--|-------|-----------|---------------|--|
|-------------|-------|-------|-------|-------|--|-------|-----------|---------------|--|



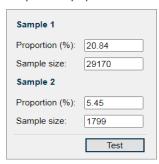
| Difference         | 3.92 %               |
|--------------------|----------------------|
| 95% CI             | -6.9827% to 11.1364% |
| Chi-squared        | 0.604                |
| DF                 | 1                    |
| Significance level | P = 0.4370           |

| Diffuse large B-<br>cell lymphoma lymph node | 2169/9911 | 253/9911 | 211/9911 |  | 233/253 | Table S13 | NCICCR-<br>DLBCL |  |
|--|-----------|----------|----------|--|---------|-----------|------------------|--|
|--|-----------|----------|----------|--|---------|-----------|------------------|--|



| 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-<br>NBL |  |
|---------------|-------|----------|---------|---------|--|-------|-----------|----------------|--|
|---------------|-------|----------|---------|---------|--|-------|-----------|----------------|--|



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