

# Package ‘GenRank’

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**Title** Candidate gene prioritization based on convergent evidence

**Version** 1.10.0

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**Description** Methods for ranking genes based on convergent evidence obtained from multiple independent evidence layers. This package adapts three methods that are popular for meta-analysis.

**Depends** R (>= 3.2.3)

**License** Artistic-2.0

**biocViews** GeneExpression, SNP, CopyNumberVariation, Microarray, Sequencing, Software, Genetics

**Suggests** knitr, rmarkdown, testthat

**Imports** matrixStats, reshape2, survcomp

**VignetteBuilder** knitr

**LazyData** true

**RoxygenNote** 5.0.1

**URL** <https://github.com/chakri9/GenRank>

**BugReports** <https://github.com/chakri9/GenRank/issues>

**NeedsCompilation** no

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CombP *Convergent evidence based on combined p-values.*

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### Description

CombP returns ranks of the genes based on p-values combined using the famous 'fisher' or 'z-transform' methods.

### Usage

```
CombP(file, weight, method = c("fisher", "z.transform", "logit"),
      na.remove = FALSE)
```

### Arguments

|           |  |
|-----------|--|
| file      | A tab-delimited text file with a minimum of 3 columns. First column should contain gene names, second column should indicate the evidence type and third column should contain non-negative numeric values (p-values). |
| weight    | A numeric vector containing weights of evidence types. For example, sample sizes of various evidence types. If not provided, equal weight is given to all evidence types.  |
| method    | A character string among 'fisher', 'z.transform' or 'logit'.   |
| na.remove | An optional argument, defaults to FALSE. Set this argument to TRUE if all the genes were not detected across all evidence types.   |

### Value

If all the inputs are in the correct format as suggested, then the output will be a dataframe containing genes, their combined p-values and corresponding ranks.

### Examples

```
cus.weights <- c(100,50,200,300,150,400)
input_file_P <- system.file("extdata", "CombP_toydata.txt", package="GenRank")
CP_ranking <- CombP(input_file_P, method = "fisher", na.remove = TRUE)
CP_ranking_z <- CombP(input_file_P, method = "z.transform", na.remove = TRUE, weight = cus.weights)
```

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ComputeCE *Convergent Evidence (CE) scores of genes.*

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### Description

ComputeCE returns ranks of the genes based on CE scores.

### Usage

```
ComputeCE(file, PC = c("equal", "ngene", "custom"), cust.weights = NULL)
```

**Arguments**

|              |   |
|--------------|---|
| file         | A tab-delimited text file with a minimum of 2 columns. First column should contain gene names and second column should indicate the evidence type.                                    |
| PC           | A character string among 'equal', 'ngene' or 'custom' indicating the prior credibility.   |
| cust.weights | An optional argument required when the PC='custom'. A numeric vector containing weights reflecting prior credibility. Should contain as many weights as the number of evidence types. |

**Value**

If all the inputs are in the correct format as suggested, then the output will be a dataframe containing genes and their ranks based on CE scores.

**Examples**

```
input_file <- system.file("extdata", "CE_toydata.txt", package="GenRank")
CE_ranks <- ComputeCE(input_file, PC = "equal")
evid.weight <- c(1, 1, 0.8, 0.8, 0.5, 1)
CE_ranks_cust <- ComputeCE(input_file, PC = "custom", cust.weights = evid.weight)
```

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 ComputeRP

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*Convergent evidence based on rank product method.*


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**Description**

ComputeRP returns ranks of the genes based on rank product method.

**Usage**

```
ComputeRP(file, signif.type, n.perm = 100, setseed = NULL)
```

**Arguments**

|             |  |
|-------------|--|
| file        | A tab-delimited text file with a minimum of 3 columns. First column should contain gene names, second column should indicate the evidence type and third column should contain non-negative numeric values (e.g. p-values or effect size).                     |
| signif.type | A vector containing letters 'L' or 'H' or both. Length of the vector should be the same as the number of evidence types. 'L' or 'H' indicate whether the evidence type contains a low numeric value (e.g. p-value) or a high numeric value (e.g. effect size). |
| n.perm      | A number indicating number of permutations used to calculate null density. Defaults to 100 permutations.   |
| setseed     | An optional argument. If provided a numeric value, sampling will be put in a reproducible state using the setseed value as seed.   |

**Value**

If all the inputs are in the correct format as suggested, then the output will be a dataframe containing genes, their ranks based on RP and corresponding pfp (equivalent to FDR).

**Examples**

```
input_file <- system.file("extdata", "RP_toydata.txt", package="GenRank")
signif.val <- c('L', 'L', 'H', 'L', 'H', 'L')
RP_ranks <- ComputeRP(input_file, signif.type = signif.val)
RP_ranks_cust <- ComputeRP(input_file, signif.type = signif.val, n.perm=200, setseed=1234)
```

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