

# Package ‘svaRetro’

December 6, 2024

**Type** Package

**Title** Retrotransposed transcript detection from structural variants

**Version** 1.12.0

**Date** 2022-02-10

**Description** svaRetro contains functions for detecting retrotransposed transcripts (RTs) from structural variant calls. It takes structural variant calls in GRanges of breakend notation and identifies RTs by exon-exon junctions and insertion sites. The candidate RTs are reported by events and annotated with information of the inserted transcripts.

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**Depends** GenomicRanges, rtracklayer, BiocGenerics,  
StructuralVariantAnnotation, R (>= 4.0)

**Imports** VariantAnnotation, assertthat, Biostrings, stringr, dplyr,  
methods, rlang, GenomicFeatures, GenomeInfoDb, S4Vectors, utils

**Suggests** TxDb.Hsapiens.UCSC.hg19.knownGene, ggplot2, devtools,  
testthat (>= 2.1.0), roxygen2, knitr, BiocStyle, plyranges,  
circlize, tictoc, IRanges, stats, SummarizedExperiment,  
rmarkdown

**RoxygenNote** 7.1.1

**Encoding** UTF-8

**VignetteBuilder** knitr

**biocViews** DataImport, Sequencing, Annotation, Genetics,  
VariantAnnotation, Coverage, VariantDetection

**BugReports** <https://github.com/PapenfussLab/svaRetro/issues>

**git\_url** <https://git.bioconductor.org/packages/svaRetro>

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.combineMatchingTranscripts  
*Combining matching transcripts*

---

### Description

Combining matching transcripts

### Usage

```
.combineMatchingTranscripts(gr, names)
```

### Arguments

gr	A GRanges object
names	A vector of granges names.

### Details

This is an internal function used to merge all overlapping transcripts of a breakpoint into one vector.

### Value

A list of vectors. Each vector is named with the name of the corresponding granges.

---

.scoreByTranscripts *Ranking matching transcripts*

---

### Description

Ranking matching transcripts

### Usage

```
.scoreByTranscripts(genes, transcripts.col)
```

### Arguments

genes TxDb object of genes. hg19 and hg38 are supported in the current version.  
transcripts.col A vector of transcript names.

### Details

This is an internal function which returns overlapping transcript names with ranking scores. The ranking score is the proportion of exon-exon fusions (intronic deletion events) detected for a given transcript.

### Value

A dataframe with two columns, tx\_name and score.

---

.txs2genesym *Adding gene symbol annotations*

---

### Description

Adding gene symbol annotations

### Usage

```
.txs2genesym(txs, unique.genesyms = TRUE)
```

### Arguments

txs A list of transcript ids in UCSC format.  
unique.genesyms TRUE or FALSE. If TRUE, the converted gene symbols will remove duplicates.

### Details

This is an internal function which takes a list of txs in UCSC id format as input and convert the txs to gene symbol.

### Value

A list of names in gene symbols

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`rtDetect`*Detecting retrotranscript insertion in nuclear genomes.*

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## Description

Detecting retrotranscript insertion in nuclear genomes.

## Usage

```
rtDetect(gr, genes, maxgap = 100, minscore = 0.4)
```

## Arguments

<code>gr</code>	A GRanges object
<code>genes</code>	TxDb object of genes. hg19 and hg38 are supported in the current version.
<code>maxgap</code>	The maximum distance allowed on the reference genome between the paired exon boundaries.
<code>minscore</code>	The minimum proportion of intronic deletions of a transcript should be identified.

## Details

This function searches for retroposed transcripts by identifying breakpoints supporting intronic deletions and fusions between exons and remote loci. Only BND notations are supported at the current stage.

## Value

A GRangesList object, named `insSite` and `rt`, reporting breakpoints supporting insert sites and retroposed transcripts respectively. 'exon' and 'txs' in the metadata columns report `exon_id` and `transcript_name` from the 'genes' object.

## Examples

```
library(TxDb.Hsapiens.UCSC.hg19.knownGene)
genes <- TxDb.Hsapiens.UCSC.hg19.knownGene
vcf.file <- system.file("extdata", "diploidSV.vcf",
                        package = "svaRetro")
vcf <- VariantAnnotation::readVcf(vcf.file, "hg19")
gr <- breakpointRanges(vcf, nominalPosition=TRUE)
rt <- rtDetect(gr, genes, maxgap=30, minscore=0.6)
```

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svaRetro	<i>svaRetro: a package for retrotransposed transcript detection</i>
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**Description**

svaRetro contains functions for detecting retrotransposed transcripts from structural variant calls.

**Details**

For more details on the features of StructuralVariantAnnotation, read the vignette: ‘browseVignettes(package = "svaRetro")‘

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%na%	<i>Replaces the NA values in a with corresponding values in b</i>
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**Description**

Replaces the NA values in a with corresponding values in b

**Usage**

```
a %na% b
```

**Arguments**

a, b                    objects to be tested or coerced.

**Value**

The altered object.

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%null%	<i>Uses b if a is NULL</i>
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**Description**

Uses b if a is NULL

**Usage**

```
a %null% b
```

**Arguments**

a, b                    objects to be tested or coerced.

**Value**

An un-null object.

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