

# Resource Summary Report

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## ShortStack

RRID:SCR\_010834

Type: Tool

### Proper Citation

ShortStack (RRID:SCR\_010834)

### Resource Information

**URL:** <http://sites.psu.edu/axtell/software/shortstack/>

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**Description:** A software tool developed to process and analyze small RNA-seq data with respect to a reference genome, and output a comprehensive and informative annotation of all discovered small RNA genes. ShortStack discovers small RNA "clusters" de novo, based on user-set thresholds, and annotates clusters with respect to small RNA size, orientation, and repetitiveness. ShortStack also discovers and annotates MIRNA genes, and other Hairpin-associated small RNA genes. In addition, ShortStack includes a robust method to detect genes producing small RNAs in a phased manner. It outputs a descriptive table of all results, useful genome browser tracks, a table describing the results of the hairpin / MIRNA analysis for each cluster, and detailed text-based alignments of all MIRNAs and hairpin-associated clusters. It can also be run in "count" mode, to quantify a set of input loci with genomic coordinates determined a priori by the user. ShortStack is a perl program. Besides perl, ShortStack also requires samtools and the RNALfold and RNAeval programs from the Vienna RNA Package to execute. When used to control the alignment of small RNA data to a reference genome, ShortStack also requires bowtie and bowtie-build. Finally, for optimal results, ShortStack uses a file of inverted repeats produced by the EMBOSS application einverted.

**Synonyms:** ShortStack : Comprehensive annotation and quantification of small RNA genes

**Resource Type:** software resource

**Defining Citation:** [PMID:24139974](#), [PMID:23610128](#)

**Availability:** Acknowledgement requested

**Resource Name:** ShortStack

**Resource ID:** SCR\_010834

**Alternate IDs:** OMICS\_00384

**Old URLs:** <http://axtell-lab-psu.weebly.com/shortstack.html>

**Record Creation Time:** 20220129T080301+0000

**Record Last Update:** 20260912T195724+0000

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## Ratings and Alerts

No rating or validation information has been found for ShortStack.

No alerts have been found for ShortStack.

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## Data and Source Information

**Source:** [SciCrunch Registry](#)

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## Usage and Citation Metrics

We found 235 mentions in open access literature.

**Listed below are recent publications.** The full list is available at [SPARC SAWG](#) .

Hafner A, et al. (2026) Intragenic methylation repatterning is associated with alternative splicing and unique epigenetic phenotypes. bioRxiv : the preprint server for biology.

Martinez-Ugalde I, et al. (2026) Comparative Transcriptomics Reveals an Extracellular Worm Argonaute as an Ancestral Regulator of LTR Retrotransposons. Genome biology and evolution, 18(5).

Lang X, et al. (2026) FungiSNC: An integrated database for fungi small non-coding RNAs based on high-throughput sequencing. Journal of advanced research, 84, 187.

Neophytou K, et al. (2026) An Argonaute protein traffics from nematode to mouse and is a vaccine against parasitic nematodes. EMBO reports, 27(2), 311.

Quan C, et al. (2026) Genome-wide reprogramming of sRNA and lncRNA in the epigenetic regulation following interspecific hybridization in the Brassica species. Molecular horticulture, 6(1), 14.

Lacroix M, et al. (2026) Cell-type-specific ablation of siRNAs by Arabidopsis RTL1 reveals a role of phloem companion cells in systemic post-transcriptional gene silencing. Nucleic acids research, 54(8).

Shin SY, et al. (2026) Genome-wide CG hypomethylation of the Arabidopsis ecotype Cvi linked to structural variation and RNAi at the VIM4-VIM2 locus. Proceedings of the National Academy of Sciences of the United States of America, 123(21), e2603682123.

Whitcomb SJ, et al. (2026) Post-Transcriptional Gene Regulation by MicroRNAs During Barley Malting. *Genes*, 17(6).

A Batista R, et al. (2026) Dominance modifiers at the Arabidopsis self-incompatibility locus retain proto-miRNA features and act through non-canonical pathways. *PLoS genetics*, 22(4), e1012127.

Wang L, et al. (2026) Effector gene silencing coordinated by histone methylation and small RNAs enhances host adaptation in a plant pathogen. *Nucleic acids research*, 54(1).

Jamnik K, et al. (2026) Limitations of Single Prediction Tools in miRNA Profiling of Grapevine Viral Coinfection. *Genes*, 17(2).

Rieger I, et al. (2026) Scavenger Cells Failure to Maintain Systemic RNA Homeostasis Causes Epigenetically Inherited Germline Tumors. *bioRxiv : the preprint server for biology*.

D??ctor MA, et al. (2026) An Exploratory Biomarker Study of First-Trimester Circulating miRNAs Associated with Later Gestational Diabetes Mellitus. *International journal of molecular sciences*, 27(4).

Dautt-Castro M, et al. (2026) Genome-wide analysis of conserved and novel miRNAs in mango mesocarp reveals early regulatory networks involved in postharvest heat stress response. *Scientific reports*, 16(1).

Zhang Y, et al. (2026) Telomere-to-telomere genome assembly and comprehensive mutation library facilitate bitter melon breeding and functional genomics research. *Plant communications*, 7(4), 101779.

Zhu J, et al. (2026) Long-distance transport of siRNAs with functional roles in pollen development. *Nature plants*, 12(2), 386.

Vivek AT, et al. (2026) Integrative multi-omics analysis widens annotation and functional insights into long non-coding RNAs of Arabidopsis thaliana. *Biology direct*, 21(1), 14.

Quan C, et al. (2025) Interspecific hybridization in Brassica species leads to changes in agronomic traits through the regulation of gene expression by chromatin accessibility and DNA methylation. *GigaScience*, 14.

Fang Y, et al. (2025) Epigenetic regulation modulates seasonal temperature-dependent growth of soybean in southern China. *Plant biotechnology journal*, 23(10), 4580.

Kolanchi P, et al. (2025) Genomic exploration of Bemisia tabaci microRNAs using predictive modeling and confirmation through experimental evidence. *Scientific reports*, 15(1), 34006.