

Supplementary Table 1. Comparison between CPSS and other tools.

		CPSS	mirTools (7)	miRDeep (1)	MiRExpress (2)	SeqBuster (4)	miRanalyzer (3)	UEA (5)	deepBase (6)	mESadb (36)	DARIO (9)	wapRNA (8)	miRNAkey (41)	MAGIA (42)	DSAP (43)
Package	On-line server	✓	✓			✓	✓	✓		✓	✓	✓		✓	✓
	Stand-alone software			✓	✓	✓	✓					✓	✓		
	Database								✓	✓					
Applicable to	Deep sequencing data	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
	Single or multiple miRNA									✓				✓	
Function analysis for small RNAs	Length distribution of reads	✓	✓								✓	✓	✓		✓
	Genome map	✓	✓								✓				
	Chromosome distribution	✓													
	Annotation of reads	✓	✓				✓	✓	✓		✓	✓			✓
	Upload of user-own annotations										✓				
	Known miRNA detection	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓
	Known other non-coding RNA detection (snRNA, sRNA, rRNA...)	✓									✓				✓
	miRNA editing detection	✓				✓									
	miRNA modification detection	✓				✓									✓
	miRNA expression analysis	✓	✓	✓	✓		✓	✓			✓	✓	✓	✓	✓
	Novel miRNA prediction	✓	✓	✓			✓	✓	✓		✓	✓			
	Novel other non-coding RNA prediction (snRNA, sRNA...)								✓		✓				
	Differentially expressed miRNA identification	✓	✓			✓	✓					✓	✓		✓
	Differentially expressed piRNA identification	✓													
	Differentially expressed other non-coding RNA identification (snRNA, sRNA, rRNA...)	✓													
	Cross-species distribution of miRNA				✓										✓
	miRNA target prediction	✓				✓				✓		✓		✓	
	GO analysis for miRNA targets	✓								✓					
	Pathway analysis for miRNA targets	✓								✓				✓	
	PPI analysis for miRNA targets	✓													
	HUGE analysis for miRNA targets									✓					
	miRNA expression patterns in reported datasets									✓					
Function analysis for miRNA	miRNA expression and GO, Pathway, PPI analysis											✓		✓	

“✓” means the packages, applications, and functions of different tools

Supplementary Table 2. Database and prediction tools used by CPSS

DataBase	Species	Version	Release/Update
Genome	Chicken	galGal3	May. 2006
	Chimpanzee	panTro3	Oct. 2010
	Cow	bosTau5	Apr. 2009
	Dog	canFam2	May. 2005
	Human	hg19	Feb. 2009
	Mouse	mm9	Jul. 2007
	Orangutan	ponAbe2	Jul. 2007
	Pig	susScr2	Nov. 2009
	Rat	rn4	Nov. 2004
	Zebrafish	danRer7	Jul. 2010
miRNA	All species	Release 18	Nov. 2011
Rfam	All species	Release 10	Jan. 2010
Repeats	All species	ker(open-3-2-7)Library	Jan. 2009
mRNA	All species	/	Mar. 2011
piRNA	Human	GRCh37	Nov. 2011
	Mouse	NCBIM37	Nov. 2011
	Rat	Rat RGSC 3.4	Nov. 2011
dbSNPs	Chicken	dbSNP 137	Sep. 2011
	Chimpanzee	125	Sep. 2011
	Cow	dbSNP 133	Sep. 2011
	Dog	dbSNP 126	Sep. 2011
	Human	dbSNP 134	Sep. 2011
	Mouse	dbSNP 128	Sep. 2011
	Orangutan	Ensembl	Sep. 2011
	Pig	dbSNP 128	Sep. 2011
	Rat	dbSNP 130	Sep. 2011
	Zebrafish	dbSNP 130	Sep. 2011
miRNA target prediction tools	microT v3.0	v3.0	/
	miRanda	miRanda-aug2010	Nov. 2011
	miRNAMap	2.0	Jul. 2007
	MirTarget2	/	Aug. 2011
	MicorCosm	Version 5	/
	RNAhybid	Version 2.1	Feb. 2004
	TargetScan	6.0	Nov. 2011
	TargetSpv	1.0	Otc. 2009

**Supplementary Table 3. Primers used for the quantification of miRNAs.**

miRNA	Mature sequence of microRNA	Reverse transcript stem-loop primer	Realtime PCR primer fw	Realtime PCR primer rw
mmu-miR-449a	UGGCGAGUUAUUGUACUGGU	GTGATATCCAGTCCGTGTGCTGGAGTCGGAGTCGGCAATTGCACGTGGATACGACACACGCT	ACGTGGCAGTGTATGTGTAG	CAGTGCCTGTCTGTGGAGT
mmu-miR-34c	AGGCAGUGUAUUGUAGUUGC	GTGCTATCCAGTCCGTGTGCTGGAGTCGGCAATTGCACGTGGATACGACGCAATCA	AGAGGCAGTGTATGTAGCTG	CAGTGCCTGTCTGTGGAGT
mmu-miR-34b-5p	AGGCAGUGUAUUGUAGUUGU	GTGCTATCCAGTCCGTGTGCTGGAGTCGGCAATTGCACGTGGATACGACGCAATCA	CGAGGCAGTGTATATAGCTG	CAGTGCCTGTCTGTGGAGT
mmu-miR-34b-3p	AUUCACUAAUCCACACGCCAUC	GTGCTATCCAGTCCGTGTGCTGGAGTCGGCAATTGCACGTGGATACGACGATTGGCA	GGCAATCACTAACCACACAGT	CAGTGCCTGTCTGTGGAGT
mmu-miR-34c*	AUUCACUAAUCCACACGCCAGG	GTGCTATCCAGTCCGTGTGCTGGAGTCGGCAATTGCACGTGGATACGACCCCTGGCT	GGCAATCACTAACCACACAGT	CAGTGCCTGTCTGTGGAGT
mmu-miR-301a	CAGUGCAUUAUUGUCAAAGC	GTGCTATCCAGTCCGTGTGCTGGAGTCGGCAATTGCACGTGGATACGACGCTTTGA	GGCAGTCCAAATAGTATTGTG	CAGTGCCTGTCTGTGGAGT
mmu-miR-222	AGCUACUUCUGGCUACUGGU	GTGCTATCCAGTCCGTGTGCTGGAGTCGGCAATTGCACGTGGATACGACGCCAGT	CGGAGCTACATCTGGCTAC	CAGTGCCTGTCTGTGGAGT
mmu-miR-497	CAGCAGCACUUGUUGUUA	GTGCTATCCAGTCCGTGTGCTGGAGTCGGCAATTGCACGTGGATACGACCAAAAC	AGACAGCAGCACTGTGG	CAGTGCCTGTCTGTGGAGT
mmu-miR-30b	UGUAAACUCCUACACUACGCU	GTGCTATCCAGTCCGTGTGCTGGAGTCGGCAATTGCACGTGGATACGACAGCTGAG	GCCTGTAAACATCCTACACT	CAGTGCCTGTCTGTGGAGT
mmu-miR-28	AGGAGCUCACAGCUAUUGAG	GTGCTATCCAGTCCGTGTGCTGGAGTCGGCAATTGCACGTGGATACGACCTCAATA	GCTAAGGAGCTCACAGTCTA	CAGTGCCTGTCTGTGGAGT
mmu-miR-221	AGCUACUUGUCUGCGGUGUUC	GTGCTATCCAGTCCGTGTGCTGGAGTCGGCAATTGCACGTGGATACGACGAAACCC	AGAGCTACATTTGCTGCTGG	CAGTGCCTGTCTGTGGAGT
mmu-miR-485a-3p	GAUCAGGCUUUCUAAUGUAGA	GTGCTATCCAGTCCGTGTGCTGGAGTCGGCAATTGCACGTGGATACGACTCTACTT	AGGATCAGGGCCCTTCT	CAGTGCCTGTCTGTGGAGT
mmu-miR-200a*	CAUQUAACCGGACAGUGCUGGA	GTGCTATCCAGTCCGTGTGCTGGAGTCGGCAATTGCACGTGGATACGACTCCAGCA	GCCATCTTACCGGCAGTG	CAGTGCCTGTCTGTGGAGT
mmu-miR-379	UGGUAGACUAGGAACGUAGG	GTGCTATCCAGTCCGTGTGCTGGAGTCGGCAATTGCACGTGGATACGACCCCTACGT	ACGTGGTAGACTATGGAACG	CAGTGCCTGTCTGTGGAGT
mmu-miR-98b	CACCGUAGAACCGACCUUGCG	GTGCTATCCAGTCCGTGTGCTGGAGTCGGCAATTGCACGTGGATACGACCGCAAGG	ACTCACCCGTAGAACCGA	CAGTGCCTGTCTGTGGAGT
mmu-miR-200a	UAACACUGUCUGGUAAACGAUJU	GTGCTATCCAGTCCGTGTGCTGGAGTCGGCAATTGCACGTGGATACGACACATCGT	GGCTAAACACTGTCTGTGTAAAC	CAGTGCCTGTCTGTGGAGT
mmu-miR-125b-5p	UCCUGAGACCCUAAUUGUGA	GTGCTATCCAGTCCGTGTGCTGGAGTCGGCAATTGCACGTGGATACGACTCACAG	ACTTCCCTGAGACCTTAC	CAGTGCCTGTCTGTGGAGT
mmu-miR-541	AAGGGAUUCUGAUUUGGUACACU	GTGCTATCCAGTCCGTGTGCTGGAGTCGGCAATTGCACGTGGATACGACACTGTGA	ACTAAGGATTTCTGATGTTGGTC	CAGTGCCTGTCTGTGGAGT
mmu-miR-196b	UAGGUAGUUCUGUUGUUGGG	GTGCTATCCAGTCCGTGTGCTGGAGTCGGCAATTGCACGTGGATACGACCCACACA	CCGTAGTAGTTTCTCTGTT	CAGTGCCTGTCTGTGGAGT
mmu-miR-322	CAGCAGCAUUCUAGUUUUGGA	GTGCTATCCAGTCCGTGTGCTGGAGTCGGCAATTGCACGTGGATACGACTTCAAAA	ACGACAGACCAATTCATGTT	CAGTGCCTGTCTGTGGAGT
mmu-miR-30d	UGUAAACAUCCCGACUGGAAG	GTGCTATCCAGTCCGTGTGCTGGAGTCGGCAATTGCACGTGGATACGACTTTCCAG	ACTTGTAAACATCCCGACAT	CAGTGCCTGTCTGTGGAGT
mmu-miR-125a-5p	UCCUGAGACCCUUAUACUGUGA	GTGCTATCCAGTCCGTGTGCTGGAGTCGGCAATTGCACGTGGATACGACTCACAGG	CTGTCCCTGAGACCCCTTAA	CAGTGCCTGTCTGTGGAGT
mmu-let-7c	UGAGUGAUGUUGUUGUUGUU	GTGCTATCCAGTCCGTGTGCTGGAGTCGGCAATTGCACGTGGATACGACCAACATA	ACGTGAGGTAGTAGGTTGT	CAGTGCCTGTCTGTGGAGT
mmu-miR-196a	UAGGUAGUUCUAGUUGUUGGG	GTGCTATCCAGTCCGTGTGCTGGAGTCGGCAATTGCACGTGGATACGACCCCAACA	GCTTAGGTATTTCAATGTTGT	CAGTGCCTGTCTGTGGAGT
mmu-miR-1981	GUAAAGCUGGGCUGAAGCUGGGC	GTGCTATCCAGTCCGTGTGCTGGAGTCGGCAATTGCACGTGGATACGACGCCACGT	AGTAAAGGCTGGGCTTAG	CAGTGCCTGTCTGTGGAGT
mmu-let-7b	UGAGGUGUAGUUGUUGUUGUUU	GTGCTATCCAGTCCGTGTGCTGGAGTCGGCAATTGCACGTGGATACGACAAACCAACA	ACGTGAGGTAGTAGGTTGT	CAGTGCCTGTCTGTGGAGT

Supplementary Table 4. Primers used for the quantification of piRNAs.

piRNA	Mature sequence of piRNA	Reverse transcript stem-loop primer	Realtime PCR primer for Gsp	Realtime PCR primer for Universal
piR-142256	TGACATTGTGCAAAACCCTGAACGGCAGGAGG	GTCGTATCCAGTGCGTGTCGTGGAGTCGGCAATTGCACTGGATACGACCCCTCCTGC	TGACATTGTGCAAAACCCCTGAACG	CAGTGCGTGTCGTGGAGT
piR-141851	TGAGAACCGGACTGCAGTGCTCAGGC	GTCGTATCCAGTGCGTGTCGTGGAGTCGGCAATTGCACTGGATACGACGCCTGAGC	TGAGAACCGGACTGCAGTGC	CAGTGCGTGTCGTGGAGT
piR-140652	TGATAGACCAATGTGCCAAGCAGACCAGTC	GTCGTATCCAGTGCGTGTCGTGGAGTCGGCAATTGCACTGGATACGACGACTGGTC	TGATAGACCAATGTGCCAAGCAGA	CAGTGCGTGTCGTGGAGT
piR-138938	TGAGCCGATGTTGAACCACTGAGG	GTCGTATCCAGTGCGTGTCGTGGAGTCGGCAATTGCACTGGATACGACCCCTCAGC	TGAGCCGATGTTGAACCAAGC	CAGTGCGTGTCGTGGAGT
piR-136430	TAGGATCGCGCAGAACTCAAAGCCTTTTT	GTCGTATCCAGTGCGTGTCGTGGAGTCGGCAATTGCACTGGATACGACAAAAGGC	TAGGATCGCGCAGAACTCAAA	CAGTGCGTGTCGTGGAGT
piR-131531	TGTTAAATTTGAGGTGGACGTGGAGAGCC	GTCGTATCCAGTGCGTGTCGTGGAGTCGGCAATTGCACTGGATACGACGGCTCTCC	TGTTAAATTTGAGGTGGACGTGG	CAGTGCGTGTCGTGGAGT
piR-129395	TATGAGACAGTGGACCTAGTTGGGT	GTCGTATCCAGTGCGTGTCGTGGAGTCGGCAATTGCACTGGATACGACACCCCAA	ACTTATGAGACAGTGGACCTAGTTG	CAGTGCGTGTCGTGGAGT
piR-129376	TGCCTCTTCGGATGTATCAGATGATC	GTCGTATCCAGTGCGTGTCGTGGAGTCGGCAATTGCACTGGATACGACGATCATC	ACTTGCCTCTTCGGATGTATCAGA	CAGTGCGTGTCGTGGAGT
piR-126188	TGAGAATCAAAGATGGGACCTTGCT	GTCGTATCCAGTGCGTGTCGTGGAGTCGGCAATTGCACTGGATACGACAGCAAGGT	GCGTGAGAAATCAAAGATGGGACC	CAGTGCGTGTCGTGGAGT
piR-124759	TACTATTCGCCAGTGC GGACTGGAGCCATC	GTCGTATCCAGTGCGTGTCGTGGAGTCGGCAATTGCACTGGATACGACGATGGCTC	TACTATTCGCCAGTGC GGACTG	CAGTGCGTGTCGTGGAGT
piR-117272	TGAGATCTACAGACTGGATGATTAAG	GTCGTATCCAGTGCGTGTCGTGGAGTCGGCAATTGCACTGGATACGACCTTAAATC	GCGTGAGATCTACAGACTGGATGA	CAGTGCGTGTCGTGGAGT
piR-113237	TGGCAAGACGGATGTGGCAAGCTGG	GTCGTATCCAGTGCGTGTCGTGGAGTCGGCAATTGCACTGGATACGACCCAGCTTG	TGGCAAGACGGATGTGGCA	CAGTGCGTGTCGTGGAGT
piR-112956	TAGATGAACCTCATAGGCATAGAGGATCCTG	GTCGTATCCAGTGCGTGTCGTGGAGTCGGCAATTGCACTGGATACGACCCAGGATCC	ACGTAGATGAACCTCATAGGCATAGAG	CAGTGCGTGTCGTGGAGT
piR-112730	TAGCAGTACGCAAAAGATTTCTGAACGG	GTCGTATCCAGTGCGTGTCGTGGAGTCGGCAATTGCACTGGATACGACCCGTTCCAG	TAGCAGTACGCAAAAGATTTCC	CAGTGCGTGTCGTGGAGT
piR-108674	TTCTAAGGGCGTCGGAATGCTCCATCGGC	GTCGTATCCAGTGCGTGTCGTGGAGTCGGCAATTGCACTGGATACGACGCCGATGG	TTCTAAGGGCGTCGGAATGCT	CAGTGCGTGTCGTGGAGT

**Supplementary Table 5. Primers used for the luciferase assay.**

Gene	Forward Primer	Reverse Primer	length
Nhlrc1	GCTCTCGAGTGGGGATCCTGAAGCCAGGAG	GAGCGGCCGCTGTTTATTAAGTACAGTGTGG	1002bp
Efcab4a	ATTCTCGAGCCTCCTCGGTCTCCTACCTCTC	CATGCGGCCGCTACACAGTATACAATGGCC	598bp
Cish	GCTCTCGAGTAACTGCTTGTCAAGACCTCGAAT	ATGCGGCCGCTCTTGTTAGGTGTGTATGTA	1314bp
Gm266	GCGCTCGAGGCTACAAGAAGAAACCAAAT	GTGCGGCCGCAACTTCTAATTTTATCCCAAT	380bp
Dpp3	ATCTCGAGGAAGATCTGTGTGGTCTCTCCCCT	ATGCGGCCGCTCGTCATATTTATTTTCTGG	385bp
B3gat3	ATCTCGAGTGGCAACCTCACCTGACTTCTAC	ATGCGGCCGCCGGGTTGAGATTCTTTATTC	400bp
Fbxw5	ATCTCGAGGCGCTGAAGGCTTCAGTGATTTGA	ATGCGGCCGCTTTGGCTGAATATGAAAGG	353bp
Abcc5	GCCTCGAGAAGAGGTTCAAGGAACCACTACTA	ATGCGGCCGCTTTTATAAGGTATTTAGCAAAC	655bp
Aspdh	ATTTCTCGAGCCCTGGACGGATGGCAGGGA	TTAGCGGCCGCCAGTCTGCTGATGTCTTCA	283bp
Lgdcc3	GCTCTCGAGGCCTGCTGCCCATAGGACTTA	ATGCGGCCGCATTAAGGGGCTTGAGGTA	315bp
Fry	GCTCTCGAGAACTTCACCTAAGCCAGGTAA	GTGCGGCCGCTACTTATTATATGTAAGTACAC	668bp
Gcat	GCTCTCGAGCCACGGATCTCTTCATCCTCAAC	GTGCGGCCGCTTACTACACAATTCCAATTTA	402bp
Gm8113	GCTCTCGAGTTGGCATTGAGTTCTCTGTCTTTTC	GTGCGGCCGCTTACTTCTATATCATATTGAGGTA	671bp
LI16	GCTCTCGAGATGCTTTGCAGAAGTTTAAGCAAG	ATTGCGGCCGCAAGATTCTTCAGTCTCAGT	915bp