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Identification and characterization of circular RNAs regulating genes responsible for drought stress tolerance in chickpea and soybean

Tanwy Dasmandal, A. R. Rao[1]* and Sarika Sahu

ICAR-Indian Agricultural Statistics Research Institute, New Delhi 110 012; [1]Indian Council of Agricultural Research, New Delhi 110 001

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Abstract

With the development of efficient algorithms, it has become feasible to unravel complex drought stress tolerance mechanism in leguminous crops. Even though the role of coding genes in drought stress tolerance mechanism is known to certain extent, the role of non-coding RNAs (ncRNAs) like circular RNAs (circRNAs) is unknown in leguminous crops like chickpea and soybean. Hence, a study has been taken up to predict the circular RNAs from the transcriptomes of chickpea and soybean and to study the circRNA-miRNA-mRNA interactions thereby identify the endogenous target mimics (eTMs). The *in silico* results revealed the presence of circRNAs in both the crop transcriptomes and their differential expressions under drought stress and control conditions. Besides, our findings showed three predicted eTMs where circRNAs acted as sponge for miRNAs that target genes like Glyma.18G065200.1 in soybean and XM_004517122, XM_027336693 in chickpea. The targeted genes are involved in various drought stress responsive mechanism through their activities in hormone signal transduction, response to stress, response to auxin and transcription factor activity.

Key words: Circular RNAs, drought stress, chickpea, soybean, *Insilico* prediction

Introduction

Legumes, one of the largest families of flowering plants, are rich source of proteins, dietary fibre, carbohydrates and different dietary minerals. Worldwide about 12-15% of the Earth's arable surface is used in the production of grains and forage legumes (Morel et al*.* 2012). Soybean is one of the most widely cultivated legumes which accounts for about 50% of the total world production of grain legumes, while chickpea provides about 7% of the production (Singh et al. 1992). But the production of chickpea and soybean is highly affected by drought stress resulting in reduction of total biomass, pod number, seed number, seed weight and quality, and seed yield per plant (Toker et al. 2007).

In the recent past, the roles of non-coding RNAs in regulating stress tolerance in various leguminous crops have been studied by a galaxy of researchers. Kulcheski et al. (2011) found that in soybean a majority of miRNAs were up-regulated during water deficit stress in the sensitive plants. But circular RNAs (circRNAs) have been found to be a new class of non coding RNAs whose existence was first reported in 1970s in plant viroid (potato spindle tuber viroid) and yeast mitochondria and later on reported in higher eukaryotes (Panda et al. 2018). CircRNAs are a special class of non-coding RNAs that are produced by the formation of covalent linkage between the 5' and 3' ends of an RNA molecule. They vary in size from 100 nucleotides to several kilobases in length and might have originated from coding as well as non-coding genes (Chu et al. 2018). Based on their genomic origin, circRNAs are broadly of three kinds : exonic circRNAs, intronic circRNAs and intergenic circRNAs and are found in almost all eukaryotic clades like animals, insects, plants, fungi, etc. (Ebbesen et al. 2016). Recently, Chu et al. (2018) reported that circRNAs may act as miRNA sponges in both plants and animals because of presence of one or more miRNA binding sites in them. Further they reported that these circRNAs may also regulate the function of the mRNAs. Such an action between circRNAs, miRNAs and mRNAs are referred as circRNA-miRNA-mRNA interaction.

*Corresponding author's e-mail: ar.rao@icar.gov.in; rao.cshl.work@gmail.com

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The potential role of circRNAs in developmental/ stress-specific biological processes in plants was given by Li et al. (2018). It has been found that differentially expressed circRNAs acted as an important functional regulators involved in stress-specific biological processes in plants. Ye et al. (2015) have identified 27 differentially expressed exonic circRNAs under phosphate-sufficient or -starvation conditions in rice. In response to cold and heat treatment, 163 and 1583 circRNAs were identified to be differentially expressed in tomato (Zuo et al. 2016) and Arabidopsis (Pan et al. 2018), respectively. Further, the differentially expressed circRNAs were also found to act as miRNA sponges in different crops. Wang et al. (2017) reported that in wheat 6 dehydration responsive circRNAs may be targeted by 26 miRNAs and the gene ontology study of the mRNAs revealed the involvement of the circRNAs in dehydration responsive processes. The study on deciphering the role of circRNAs on chilling injury in tomato (Zuo et al. 2016) also revealed the interaction of 102 circRNAs with 24 miRNAs whose target mRNAs were found to be involved in chilling responsive process.

To the best of our knowledge, no studies have been made regarding the identification of circRNAs in leguminous crop species like chickpea and soybean and their involvement in trait like drought stress tolerance. Therefore, a study was conducted to identify and characterize circRNAs *in silico* from the transcriptome data of soybean and chickpea through bioinformatic approaches and also their roles in regulating the genes involved in drought stress tolerance. Besides, the identification of circRNAs as miRNA sponges and the circRNAs acting as eTMs were also studied.

Materials and methods

RNA-seq data of chickpea and soybean under control and drought conditions were downloaded from the public domain (https://www.ncbi.nlm.nih.gov/) with the chickpea accession numbers *viz*., SRR5927135 (control) and SRR5927136 (drought stress), and soybean accessions, SRR2545896 (control) and SRR2545900 (drought stress).

The whole genome data for chickpea was downloaded from https://www.ncbi.nlm.nih.gov/ whereas, for soybean it was downloaded from http://plants.ensembl.org/index.html. Data of all the miRNAs for chickpea were taken from the Supplementary Table S3 of Jain et al. (2014) whereas for soybean they were downloaded from the public database: http://www.mirbase.org/.

Data preparation

The raw data downloaded from the public databases were processed to get quality reads using FastQC (Andrews 2010), which outputs summary graphs and tables to quickly assess the poor quality reads. Subsequently, such reads were discarded. On the other hand the poor quality segments of the reads were trimmed by the Trimmomatic tool (Bolger et al. 2014) to obtain quality reads for downstream analysis. Trimmomatic tool performs useful trimming tasks for paired-ended and single ended RNA-Seq data using parameters like phred score 33, minimum length of 36 bases, and sliding window of 4:15.

Identification and characterization of circRNAs

For the identification of circRNAs and their characterization, initially the trimmed reads in fastq format were mapped onto the reference genome by using BWA-MEM (Li 2013). The mapped reads were given as input to CircRNA Identifier (CIRI) (Gao et al. 2015) for the identification of circRNAs. Two files, namely, the SAM file generated by BWA-MEM and the reference genome in FASTA formatted file were given as input to the CIRI. The systematic filtering in the CIRI algorithm ensures a quite low false positive rate without sacrificing the sensitivity of detecting small circRNAs and non-exonic circRNAs. Finally, the expression levels of the identified circRNAs were calculated using RSEM (Li and Dewey, 2011), which is an user-friendly software package used for quantifying gene and isoform abundances from single-end or paired-end RNA-Seq data. As a next step an R package DESeq2 (Love et al. 2014) was used to detect the differentially expressed circRNAs.

CircRNA-miRNA-mRNA interaction

Prediction of miRNAs targeting the circRNAs and also regulating the mRNAs are of importance in studying the circRNA-miRNA-mRNA interaction. Such interaction may help in identifying circRNAs that mimics the mRNAs from the view point of miRNAs. The miRNA targets of the differentially expressed circRNAs were predicted using TargetFinder (Zuo et al. 2016). Subsequently, these miRNA sequences were then used to predict their mRNA targets using the online tool psRNATarget (http://plantgrn.noble.org/psRNATarget/) (Dai and Zhao 2018). The identified mRNAs were then annotated by Blast2GO tool (https://www.blast2go.com/) which performs BLAST, mapping and annotation. The default parameters of Blast2GO

Table 1. List of differentially expressed circRNAs in chickpea-drought

circRNA_ID	base Mean	log_2FC	$SE(log_2FC)$	Wald statistic
Downregulated circRNAs				
NC_021163.1:48301112-48330263	415.680	-0.000170241	0.00011947	-1.4249
NC_021163.1:8647041-8666318	229.664	-0.000162285	0.00014092	-1.1516
NC_021163.1:3742204-3742359	918.366	-0.000125897	0.00009690	-1.2991
NC_021164.1:17855071-17863795	153.926	-0.000119225	0.00017529	-0.6801
NC_021165.1:15094820-15095896	83.941	-0.000118885	0.00012976	-0.9162
NC_021160.1:882975-883213	166.353	-0.000115118	0.00007970	-1.4452
NC_021163.1:38962677-38965979	1100.881	-0.000114849	0.00013391	-0.8577
NC_021163.1:14092578-14092810	98433.486	-0.000088500	0.00025819	-0.3426
NW_004516369.1:383261-383416	1365.080	-0.000084800	0.00012440	-0.6815
NC_021162.1:8535399-8536263	12.817	-0.000073300	0.00007280	-1.0074
NC_021165.1:135464-141284	1037.384	-0.000069000	0.00018789	-0.3671
NC_021160.1:6878045-6878272	57141.595	-0.000062800	0.00006920	-0.9076
NC_021165.1:17714024-17738537	91.987	-0.000034200	0.00017150	-0.1997
NC_021166.1:4382294-4382476	33799.899	-0.000030600	0.00003170	-0.9669
NC_021164.1:37736425-37736621	23219.937	-0.000029100	0.00003510	-0.8277
NW_004516020.1:4076-15829	177.848	-0.000028700	0.00021125	-0.1357
NC_021163.1:3057553-3057762	19063.879	-0.000027400	0.00003240	-0.8442
NC_021166.1:4382447-4382608	10892.642	-0.000025100	0.00002810	-0.8917
NC_021161.1:3642891-3643045	98816.952	-0.000015900	0.00002120	-0.7514
NC_021166.1:4382369-4382608	26613.372	-0.000013100	0.00001900	-0.6907
NC_021160.1:9487726-9497857	1400.076	-0.000008360	0.00001520	-0.5517
NC_021160.1:13966080-14003928	189.047	-0.000007350	0.00021716	-0.0338
Upregulated circRNAs				
NC_021165.1:41831549-41836044	24097.560	0.00000552	0.0000502	0.1098
NC_021165.1:17714024-17738439	435.982	0.00006510	0.0002900	0.2246
NC_021162.1:451283-452967	22.398	0.00007230	0.0000974	0.7427
NC_021162.1:26213382-26221978	33.477	0.00007960	0.0001100	0.7214
NC_021165.1:58830645-58842270	1526.392	0.00008500	0.0000981	0.8661
NC_021165.1:4441168-4458979	1074.688	0.00008960	0.0001710	0.5255
NC_021162.1:32406943-32431029	35.804	0.00009260	0.0000726	1.2761
NW_004515823.1:299669-350369	46.246	0.00009540	0.0001160	0.8240
NC_021167.1:9169457-9169972	67.339	0.00010400	0.0000775	1.3398
NC_021163.1:25254569-25286975	57.805	0.00011100	0.0001100	1.0017
NC_021160.1:43850404-43854172	123.763	0.00011200	0.0001660	0.6739
NC_021164.1:10826352-10915704	66.546	0.00011600	0.0001120	1.0354
NC_021164.1:41677974-41701939	196.575	0.00011700	0.0000796	1.4749
NC_021165.1:58265166-58265346	86895.450	0.00011900	0.0001620	0.7372
NC_021162.1:37942779-37956143	99.663	0.00012700	0.0001320	0.9604
NC_021165.1:58831729-58843385	845.917	0.00013100	0.0000975	1.3475
NC_021165.1:59150102-59150852	383.191	0.00013400	0.0002630	0.5096
NC_021166.1:38655845-38656106	229.484	0.00015700	0.0001240	1.2589
NC_021162.1:15669142-15674247	254.084	0.00016900	0.0001790	0.9432
NC_021164.1:41798703-41814114	323.423	0.00018300	0.0002030	0.9035
NC_021165.1:23492486-23492644	138713.200	0.00030400	0.0002000	1.5219
NC_021161.1:6381136-6381276	304571.500	0.00362200	0.0040530	0.8937

tool were considered for annotating the mRNAs.

Results

Identification of CircRNAs under drought stress condition

In chickpea, under control condition (CT) 200 circRNAs were identified out of which 164 (82%) were intergenic circRNAs, 28 (14%) were exonic circRNAs and 8 (4%) were intronic circRNAs (Fig. 1). Whereas under drought stress condition, 285 circRNAs were identified, out of which 228 (80%), 46 (16%) and 11 (4%) were found to be intergenic, exonic and intronic circRNAs respectively (Fig. 1). Similarly, in soybean 57 circRNAs were identified under control condition, out of which 50 (87.7%) were intergenic circRNAs, 5 (8.7%) were exonic circRNAs and 2 (3.5%) were intronic circRNAs (Fig. 2). Whereas, 66 circRNAs were identified under drought stress condition, out of which 53 (80.3%) were intergenic circRNAs, 11 (16.6%) were exonic circRNAs

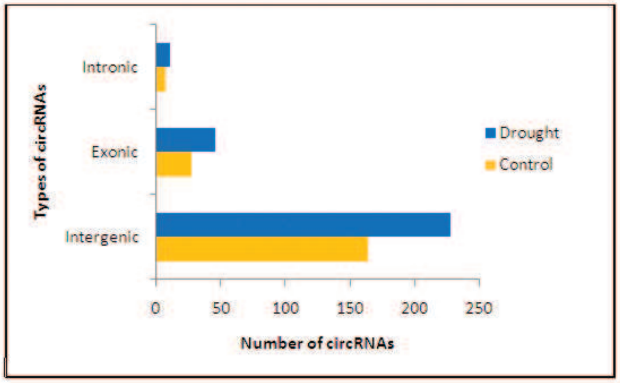

Fig. 1. Distribution of various types of circRNAs under control and drought stress conditions in chickpea

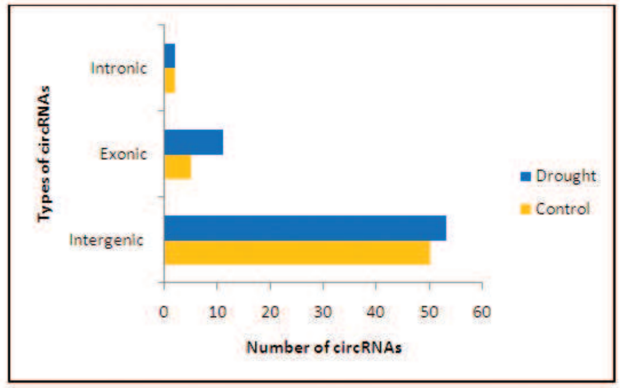

Fig. 2. Distribution of different types of circRNAs under control and drought stress conditions in soybean

and 2 (3%) were intronic circRNAs (Fig. 2). In both the crops and under each of the two conditions, highest number of circRNAs were found to be of intergenic type followed by exonic type.

Differentially expressed circRNAs

The differentially expressed circRNAs between drought stress and control conditions were identified based on (i) basemean (mean of normalized counts for all samples), (ii) $\log_2$FC-$\log_2$FoldChange, (iii) S.E. ($\log_2$FC) (standard error of $\log_2$FoldChange) and (iv) Wald Statistic. In chickpea a total of 44 differentially expressed circRNAs were found and are given in Table 1. Among the 44 identified differentially expressed circRNAs in chickpea, 22 were found to be down regulated ($\log_2FC<0$) (Table 1), and 22 were found to be upregulated ($\log_2FC>0$) (Table 1). Whereas, in case of soybean, 12 circRNAs were found to be downregulated and 11 upregulated (Table 2) out of 23 identified differentially expressed circRNAs.

CircRNA-miRNA-mRNA interactions for drought stress tolerance

The number of unique miRNAs and their targeted differentially expressed circRNAs in chickpea and soybean are presented in Supplementary Table S1 and Supplementary Table S2 respectively. It can be seen from Supplementary Table S1 that there are in total 40 unique miRNAs targeting 21 differentially expressed circRNAs in chickpea. Whereas, in soybean, 17 unique miRNAs were found to be targeting 7 differentially expressed circRNAs (Supplementary Table S2). Most of circRNAs in both the crops were found to have more than one target binding sites of miRNAs. The mRNAs being regulated by the identified unique miRNAs are given in Supplementary Table S3 and Supplementary Table 4 for chickpea and soybean respectively. It can be seen from the Supplementary Table S3 that there are 145 genes regulated by the miRNAs in chickpea, whereas, Supplementary Table S4 shows that in soybean 281 genes are regulated by the miRNAs. It was observed that in both the crops the potential energy for all the interactions between the miRNAs and target mRNAs is -1 indicating the interactions as stable. The targeted mRNAs were subjected to Blast2GO and subsequently the gene ontology (GO) functional categorization generated 136 annotations in chickpea, out of which, 57, 64, and 15 mRNAs were classified as the first level classification of biological processes, molecular functions, and cellular components, respectively (Fig. 3). Among the genes involved in biological process, 38 and 42 mRNAs were classified into the categories of "metabolic process (GO: 0008152)" and "cellular process (GO: 0009987)", respectively. Besides, 13 and 20 mRNAs were categorized under "biological

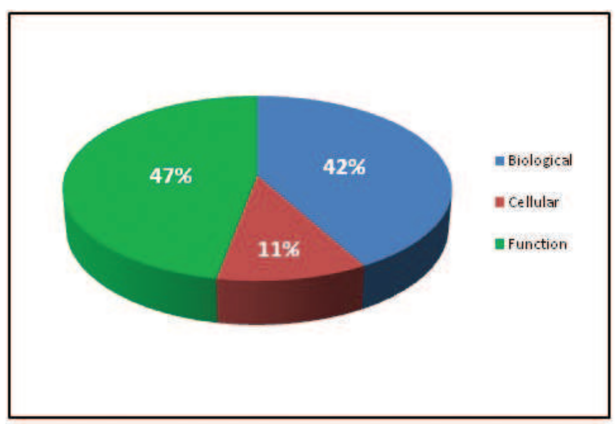

Fig. 3. Percentage of differentially expressed circRNAs of chickpea under drought stress condition involved in GO terms: biological processes, cellular component and molecular functions

regulation (GO: 0065007)" and "response to stimulus (GO: 0050896)", respectively (Fig. 4a). In the classification of molecular functions, two main classes: "binding (GO: 0005488)" and "catalytic activity (GO: 0003824)" had 54 and 34 predicted mRNAs, respectively (Fig. 4b). When the predicted mRNAs were classified according to the cellular component classification, the categories "cell (GO: 0005623)" and "cell part (GO: 0044464)" both made up the largest proportion of 16 predicted mRNAs, followed by "organelle (GO: 0043226)" that had 6 predicted mRNAs (Fig. 4c). In soybean the GO functional categorization generated 16 annotations which are presented in Fig. 5 and 6.

Prediction of eTMs

The results suggest that there is a chance when the miRNAs responsible for silencing/regulating the mRNAs get bind to the circRNAs, they remain no more available to regulate the mRNAs and hence the genes become free to carry out their functions such as signal transduction, response to stress, defense response, response to auxin, protein kinase activity, oxidoreductase activity, glycogen phosphorylase activity, zinc ion binding, hydrolase activity, transcription factor activity in chickpea, whereas transcription initiation factor TFIID subunit 1 activity, probable polygalacturonase At3g15720 activity, itogen-activated kinase 3 activity, sugar transportation in soybean. Thus, the differentially expressed circRNAs listed in Tables 1 and 2 may be the probable eTMs for the mRNAs.

Discussion

CircRNAs in chickpea and soybean

Although the role of circRNAs has been reported in some plant species like *Arabidopsis thaliana* (Sablok et al. 2016), rice (Lu et al. 2015), etc., hardly there exist any reports available in legumes under drought stress condition. In the present study, circRNAs in chickpea as well as soybean under drought stress conditions were identified. Previously, by analyzing the publically available RNA-seq data 12,037 (6074 exons) and 6012 (5152 exons) circRNAs were identified from *Oryza sativa* and *Arabidopsis thaliana*, respectively (Ye et al. 2015). Recently, deep sequencing research in tomato identified 854 circRNAs (615 exons), in which 163 exhibited role in chilling responsive mechanism (Zuo et al. 2016). Also 88 circRNAs were identified in wheat under dehydration stress condition (Wang et al. 2017). In our study the number of circRNAs identified was lesser as compared to *Oryza sativa* and *Arabidopsis thaliana*, i.e., 200 and 285 in chickpea under control and drought stress conditions respectively, and 57 and 66 in soybean

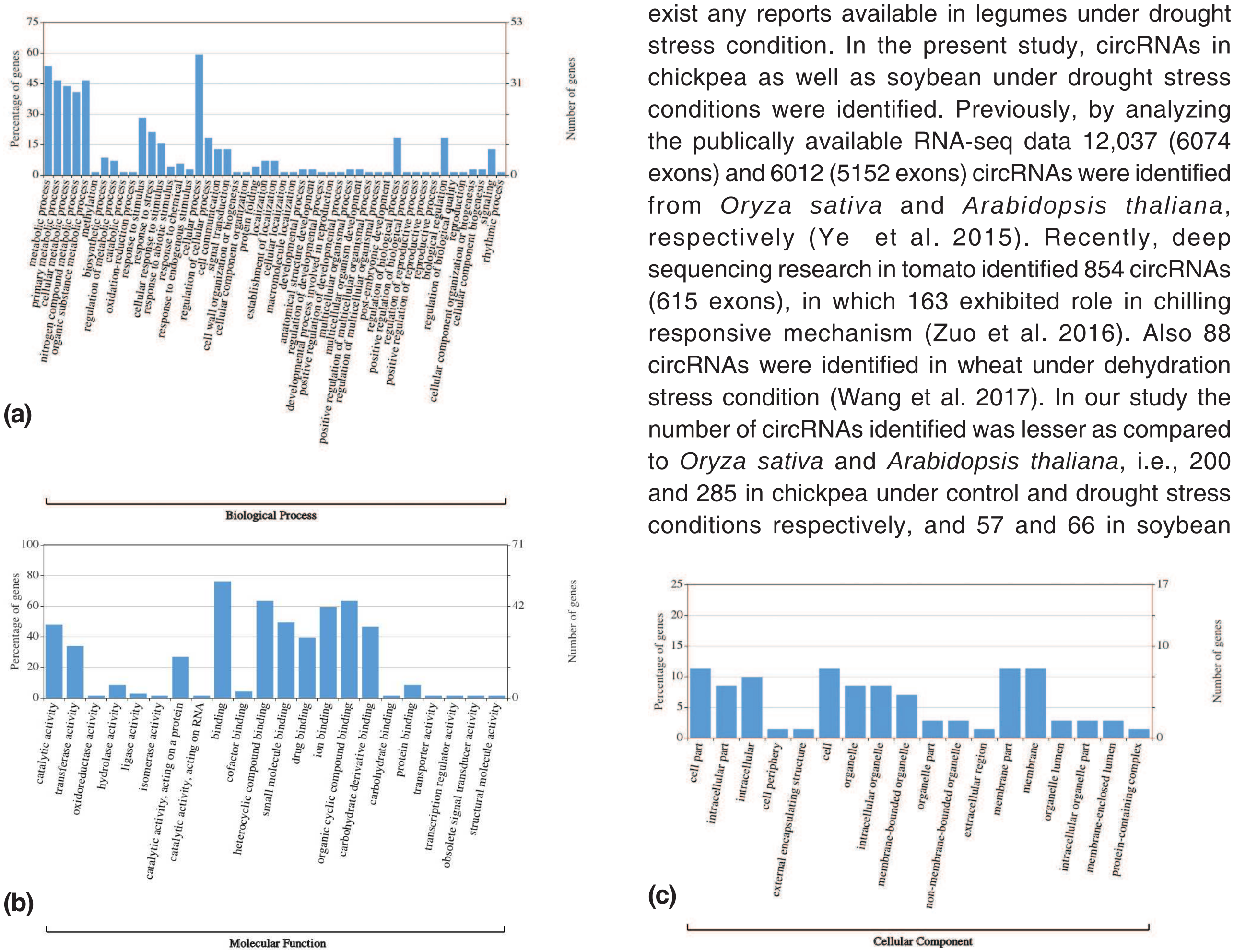

Fig. 4. Classification of targeted mRNAs under drought stress condition in chickpea based on their involvement in (a) biological processes, (b) molecular functions and (c) cellular components

Table 2. List of differentially expressed circRNAs in soybean-drought

circRNA_ID	base Mean	log_2FC	$SE(log_2FC)$	Wald Statistic
Downregulated circRNAs				
9_dna:chromosome_chromosome: Glycine_max_v2.1:9:1:50189764:1	9529.181	-0.83249	0.539896	-1.54195
11_dna:chromosome_chromosome: Glycine_max_v2.1:11:1:34766867:1	1819.102	-0.57176	0.572327	-0.99901
11_dna:chromosome_chromosome: Glycine_max_v2.1:11:1:34766867:1	10669.97	-0.43604	0.568929	-0.76643
7_dna:chromosome_chromosome: Glycine_max_v2.1:7:1:44630646:1	50.57804	-0.37181	0.521193	-0.71338
6_dna:chromosome_chromosome: Glycine_max_v2.1:6:1:51416486:1	7037.381	-0.31657	0.33307	-0.95046
3_dna:chromosome_chromosome: Glycine_max_v2.1:3:1:45779781:1	291.7359	-0.21156	0.457823	-0.46211
3_dna:chromosome_chromosome: Glycine_max_v2.1:3:1:45779781:1	148.8626	-0.19174	0.432247	-0.44358
16_dna:chromosome_chromosome: Glycine_max_v2.1:16:1:37887014:1	37.48779	-0.11287	0.551929	-0.20451
6_dna:chromosome_chromosome: Glycine_max_v2.1:6:1:51416486:1	251.9423	-0.10082	0.43966	-0.2293
8_dna:chromosome_chromosome: Glycine_max_v2.1:8:1:47837940:1	5290.868	-0.03237	0.226943	-0.14263
16_dna:chromosome_chromosome: Glycine_max_v2.1:16:1:37887014:1	1536.754	-0.00012	0.515587	-0.00023
7_dna:chromosome_chromosome: Glycine_max_v2.1:7:1:44630646:1	3731.402	-1.47E-09	0.202503	-7.28E-09
Upregulated circRNAs				
18_dna:chromosome_chromosome: Glycine_max_v2.1:18:1:58018742:1	199.8348	0.029378	0.426544	0.068874
18_dna:chromosome_chromosome: Glycine_max_v2.1:18:1:58018742:1	2644.338	0.080553	0.26412	0.304986
7_dna:chromosome_chromosome: Glycine_max_v2.1:7:1:44630646:1	112.2723	0.2024	0.44148	0.458458
18_dna:chromosome_chromosome: Glycine_max_v2.1:18:1:58018742:1	1178.889	0.402468	0.425409	0.946074
6_dna:chromosome_chromosome: Glycine_max_v2.1:6:1:51416486:1	769.5786	0.436837	0.56057	0.779273
15_dna:chromosome_chromosome: Glycine_max_v2.1:15:1:51756343:1	984.7337	0.44729	0.48195	0.928084
12_dna:chromosome_chromosome: Glycine_max_v2.1:12:1:40091314:1	604.6443	0.555032	0.572764	0.969042
9_dna:chromosome_chromosome: Glycine_max_v2.1:9:1:50189764:1	2225.065	0.596924	0.554285	1.076928
6_dna:chromosome_chromosome: Glycine_max_v2.1:6:1:51416486:1	561.5029	0.634257	0.569996	1.11274
8_dna:chromosome_chromosome: Glycine_max_v2.1:8:1:47837940:1	255.5519	0.682063	0.472056	1.444877
18_dna:chromosome_chromosome: Glycine_max_v2.1:18:1:58018742:1	147.868	0.846455	0.474612	1.783468

under control and drought stress conditions respectively. The percentages of exonic circRNAs (<20% in both the crops under drought stress condition) were also not as many as reported earlier in other crops. The results may be attributed to the following possible reasons: (i) The amount of available sequence data is one of the important factor influencing the number of identified circRNAs, because more number of reads denotes not only the high detection rate of circRNAs, but also could eliminate the false positives (Szabo and Salzman 2016). The sequencing data size in present study is only 42M reads for chickpea-control, 47M reads for chickpea-drought, 26.5M reads for soybean-control and 28M reads for soybean-drought, while it was 710 million paired-end reads of size 100 bp in rice (Lu et al. 2015); (ii) The available chickpea genome sequences are limited in public domain (http://plants.ensembl.org and http://ncbi.nlm.nih); (iii) The

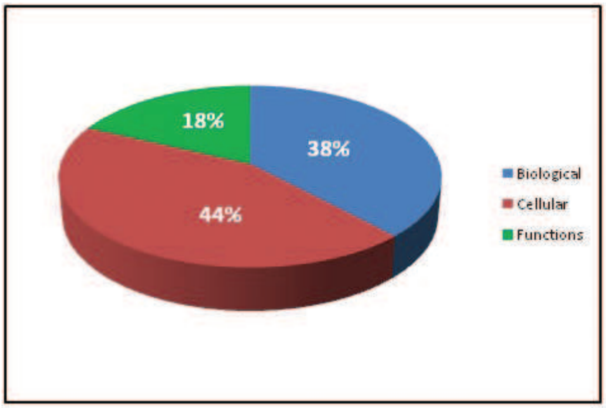

Fig. 5. Percentage of differentially expressed circRNAs of soybean under drought stress condition involved in GO terms: biological processes, cellular components and molecular functions

software used for the circRNAs prediction was not specific for legumes since the differences between organization of genomes might influence the results. Moreover, Wang et al. in 2017 reported 6.8% exonic circRNAs, 60.2% intergenic circRNAs and 2.3% intronic circRNAs in wheat under dehydration stress, which are falling in line with present findings.

CircRNA-miRNA-mRNA interactions in chickpea and soybean

The functions of the predicted mRNAs as reported by Blast2GO in chickpea and soybean under drought stress conditions showed that the mRNAs were involved in plant hormone signal transduction, response to stress, defence response mechanism, transcription factor activity, response to auxin as well as in various enzymatic activities like oxidoreductase activity, GTPase activity, hydrolase activity. While in soybean under drought stress condition the predicted mRNAs were found to be involved in activity of transcription initiation factor, polygalacturonase activity, mitogen-activated kinase activity and carbonic anhydrase activity. Those plant enzymes were found to participate in drought stress tolerance by mediating growth, development, nutrient allocation and gene expression. Recently, the role of auxins in drought tolerance was postulated by Peleg and Blumwald (2011). Our present finding also supports the expression of genes/mRNAs involved in response to auxins, as miRNAs fail to regulate them probably due to their binding with circRNAs. Wang et al. (2017) identified circRNAs along with their targets in wheat leaves under dehydration stress. They also explained

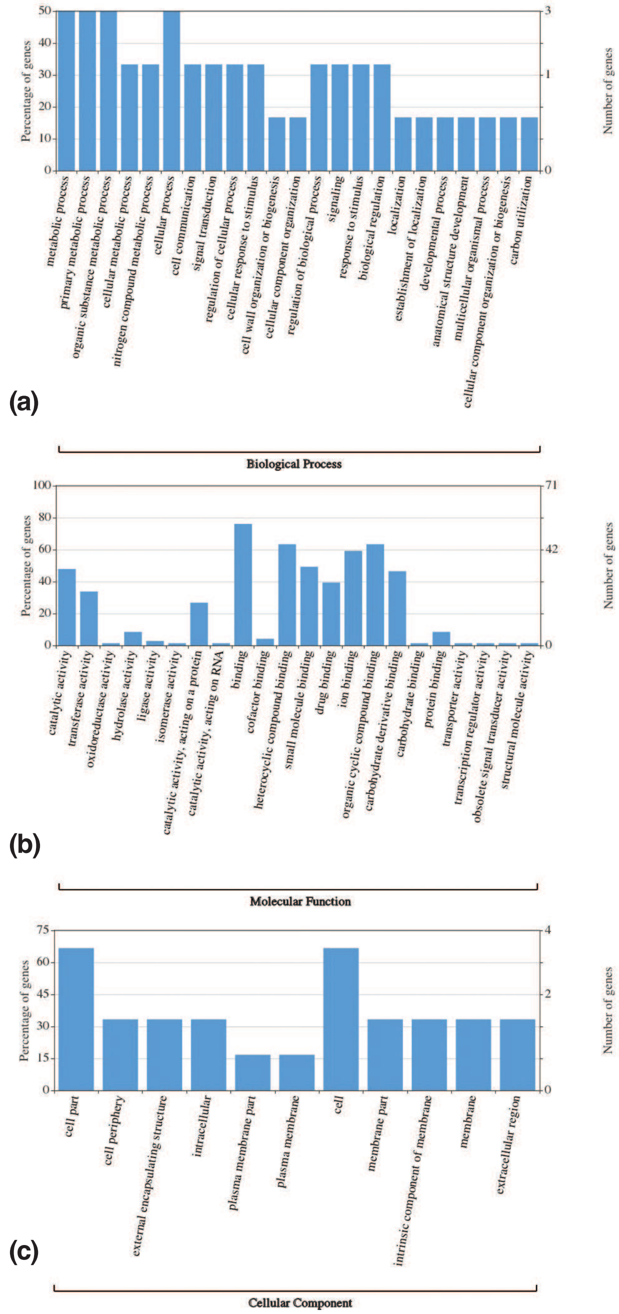

Fig. 6. Classification of targeted mRNAs under drought stress condition in soybean based on their involvement in (a) biological processes, (b) molecular functions and (c) cellular components

the involvement of these predicted circRNAs in plant hormone signal transduction involving auxins etc. under dehydration stress. In a similar way we have also found the possible involvement of circRNAs, *in silico*, in drought stress tolerance mechanism. The *in silico* analysis performed on RNA Seq data of chickpea and soybean under control and drought stress conditions revealed the presence of circRNAs in the two crops as well as their drought stress specific expression patterns. Further, the functional enrichment analysis of the circRNA-host genes also revealed their behaviour to act as sponges for miRNAs that may fail to regulate the genes involved in drought stress tolerance mechanisms.

Authors' contribution

Conceptualization of research (TD, ARR); Designing of the experiments (TD, SS); Contribution of experimental materials (reported from Public domain); Execution of field/lab experiments and data collection (TD, SS); Analysis of data and interpretation (TD, ARR, SS); Preparation of manuscript (TD, ARR, SS).

Declaration

The authors declare no conflict of interest.

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Supplementary Table S1. List of miRNAs targeting circRNAs in chickpea-drought

miRNA ID	circRNA ID	Target start	Target end	circRNA aligned fragment	miRNA aligned fragment
Cat-miR1509a	NC_021163.1:8647041-8666318	4276	4295	GAUGUGAUUUCUUUGAUUAG	UGACACUAAAGGGACUAAUU
Cat-miR1509a	NC_021164.1:10826352-10915704	46000	46019	GUUCUUAUUUCCUUGAUUAA	UGACACUAAAGGGACUAAUU
Cat-miR1520e	NC_021165.1:17714024-17738537	14236	14255	GUAUCAUAUGUUACGUUAUU	GAUAGUAUACAGUGCAAUAA
Cat-miR1520e	NC_021165.1:17714024-17738439	14236	14255	GUAUCAUAUGUUACGUUAUU	GAUAGUAUACAGUGCAAUAA
Cat-miR166g-5p	NC_021162.1:32406943-32431029	194	214	CCACGGUCCAAGCAACAUUCC	GGAGCUCGGUUUGUUGUAAGG
Cat-miR171c-5p.2	NC_021165.1:17714024-17738537	20122	20142	UAUUGAGAUGGACCAAUGUCC	AUAACUUGGCCUGGUUAUAGG
Cat-miR171c-5p.2	NC_021165.1:17714024-17738439	20122	20142	UAUUGAGAUGGACCAAUGUCC	AUAACUUGGCCUGGUUAUAGG
Cat-miR172h-5p.1	NC_021163.1:48301112-48330263	24933	24951	GUGGAA-UUGAUGAUGUUCU	CACUUAGAACUNCNACGAGG
Cat-miR1878	NC_021164.1:41677974-41701939	21286	21305	UUUAUUCUGAACGAGAUAAA	GAGUUAGACUUGUUCUGUUU
Cat-miR2081	NC_021165.1:17714024-17738537	1840	1858	AUCA-ACAUAUAACUCUAGC	UAGUCUGUGUAUUGAGGUCA
Cat-miR2081	NC_021165.1:17714024-17738439	1840	1858	AUCA-ACAUAUAACUCUAGC	UAGUCUGUGUAUUGAGGUCA
Cat-miR2661	NC_021164.1:10826352-10915704	39053	39074	UUGACUCAUUUUCUCAAAUUAU	GAC-GGGUAAAAGAGUUUAGUU
Cat-miR395h	NC_021162.1:451283-452967	672	691	AUUUCACCAAAACACAUAAU	UCAAGAGGUUUUGUGUAGUA
Cat-miR408-3p	NC_021164.1:37736425-37736621	141	162	GCCAGGACAGAGGCAGUGCUAU	CGGUCCCUUCUCCGUCACG-UA
Cat-miR408-5p.2	NC_021160.1:9487726-9497857	6703	6722	CAU-CGCAGCCUGUUUCUUGU	GUACGAGUCGGACAAGGGACA
Cat-miR408-5p.3	NC_021160.1:9487726-9497857	6703	6721	CAU-CGCAGCCUGUUUCUUG	GUACGAGUCGGACAAGGGAC
Cat-miR408b	NC_021160.1:9487726-9497857	6703	6722	CAU-CGCAGCCUGUUUCUUGU	GUACGAGUCGGACAAGGGACA
Cat-miR419	NC_021163.1:48301112-48330263	26069	26088	AAACAUCAACAUCAUGCAUC	UAUGUAGUAGUAGUAUGUAG
Cat-miR529	NW_004515823.1:299669-350369	34860	34879	ACCUGAGCUUUCUAUCUUCU	UAGACACGAGAGAUAGAAGA
Cat-miR530a.1	NC_021165.1:17714024-17738537	16342	16362	ACAGGUGCAGGUGCAGGUGCA	AUUCCACGUCCACGUUUACGU
Cat-miR530a.1	NC_021165.1:17714024-17738439	16342	16362	ACAGGUGCAGGUGCAGGUGCA	AUUCCACGUCCACGUUUACGU
Cat-miR5554a-5p	NC_021164.1:10826352-10915704	79297	79315	AUCAU-GUUCAAAAGGUAUG	UGGUAACAAGUUUUCCGUGU
Cat-miR774b-3p	NC_021165.1:4441168-4458979	4667	4686	UAGAAGAUAAAAAUAUGAAG	AAGCUCUAUUUUUAUACUUA
Cat-NovmiR100a	NC_021165.1:4441168-4458979	15255	15273	GUUUUAUUCCAUCA-UCAAA	UAAAAUGAGGUAGUUAGUUU
Cat-NovmiR100b	NC_021165.1:4441168-4458979	15255	15273	GUUUUAUUCCAUCA-UCAAA	UAACAUGAGGUAGUUAGUUU
Cat-NovmiR105a	NC_021164.1:17855071-17863795	3472	3492	GGUGAAAAUUUAGUCAAUAAA	UCUCUUUUAACUCAGUUAUUU
Cat-NovmiR107a	NC_021165.1:4441168-4458979	10654	10674	GAAAUAUAAACAAAAAUGAUA	CUUUAUAUUCGUUUUUAUUAU
Cat-NovmiR107a	NC_021163.1:48301112-48330263	14976	14996	UAACUAUGAGCAAAAAUAAUU	CUUUAUAUUCGUUUUUAUUAU
Cat-NovmiR107b	NC_021160.1:13966080-14003928	29239	29259	AAAAUAUUAACAAAAAUUGUA	CUUUAUAUUCGUUUUUAACAU

Cat-NovmiR107c	NC_021165.1:4441168-4458979	10654	10674	GAAAUAUAAACAAAAAUGAUA	CUUUAUAUUCGUUUUUACCAU
Cat-NovmiR107f	NC_021165.1:41831549-41836044	3446	3465	AAAUUAAAAG-AAAAAUAGUA	UUUUAUAUUCGUUUUUAUCAU
Cat-NovmiR107g	NC_021165.1:41831549-41836044	3446	3465	AAAUUAAAAG-AAAAAUAGUA	UUUUAUAUUCGUUUUUAUCAU
Cat-NovmiR107h	NC_021165.1:41831549-41836044	3446	3465	AAAUUAAAAG-AAAAAUAGUA	CUUUAUUUUCGUUUUUAUCAU
Cat-NovmiR107i	NC_021165.1:4441168-4458979	10654	10674	GAAAUAUAAACAAAAAUGAUA	CUUUAUAUUUGUUUUUAUCAU
Cat-NovmiR107i	NC_021160.1:13966080-14003928	29239	29259	AAAAUAUUAACAAAAAUUGUA	CUUUAUAUUUGUUUUUAUCAU
Cat-NovmiR107j	NC_021165.1:4441168-4458979	10654	10674	GAAAUAUAAACAAAAAUGAUA	CUUUAUAUUUGUUUUUAUCAU
Cat-NovmiR107j	NC_021160.1:13966080-14003928	29239	29259	AAAAUAUUAACAAAAAUUGUA	CUUUAUAUUUGUUUUUAUCAU
Cat-NovmiR107k	NW_004516020.1:4076-15829	7554	7573	GAAAUUUAAGAAAAAA-AGUC	CUUUAUAUUCUUUUUUAUCAU
Cat-NovmiR16	NC_021163.1:25254569-25286975	5903	5922	AUCUUAUCUCUUUAUUUAUU	AAGAAGAGAGAAGUAAAUAC
Cat-NovmiR19	NC_021164.1:41677974-41701939	14801	14820	GUUUUGAAUAAUUAAUUAAU	UAAAAUGUAUUAGUUAAUUA
Cat-NovmiR19	NC_021165.1:58831729-58843385	3123	3143	UUUUUAAAUAAUCACAUUAAU	UAAAAUGUAUUAGU-UAAUUA
Cat-NovmiR19	NC_021165.1:58830645-58842270	4207	4227	UUUUUAAAUAAUCACAUUAAU	UAAAAUGUAUUAGU-UAAUUA
Cat-NovmiR23	NC_021165.1:58831729-58843385	7533	7552	AUUAAUUAAAAUAUACUUCU	CAGUUAGUUUUAUAAGAAGA
Cat-NovmiR23	NC_021165.1:58830645-58842270	8617	8636	AUUAAUUAAAAUAUACUUCU	CAGUUAGUUUUAUAAGAAGA
Cat-NovmiR23	NW_004516020.1:4076-15829	2707	2727	CUUAACUUAAAAUAUUUUUCU	CAGUU-AGUUUUAUAAGAAGA
Cat-NovmiR23	NC_021160.1:13966080-14003928	22032	22050	GUCAAU-AAAAUAUUUUUUA	CAGUUAGUUUUAUAAGAAGA
Cat-NovmiR25	NC_021160.1:13966080-14003928	33394	33413	AGUUCUUAAACCAACUACUG	UUGAGAGUUUGGUUGAUGAA
Cat-NovmiR29	NC_021162.1:15669142-15674247	4591	4610	AUCACA-AUUUUAUCCAUAAA	UUGUGGAUAAAAUAGGUAUUU
Cat-NovmiR38	NC_021160.1:9487726-9497857	4489	4509	UGAACAGUAACAUUAAUUCCA	ACUUGUCAUUGUAAUUAAUGU
Cat-NovmiR46	NC_021165.1:4441168-4458979	10654	10674	GAAAUAUAAACAAAAAUGAUA	CUUUAUAUUUGUUUAUAUUAU
Cat-NovmiR46	NC_021162.1:37942779-37956143	10914	10933	AAAAUA-AAAUAAAUAUAAUA	CUUUAUAUUUGUUUAUAUUAU
Cat-NovmiR54	NC_021165.1:4441168-4458979	6148	6168	UCAAAUCAAACAAUCCAUUUC	AGAUUGGUUUGUUGGGUAAGG
Cat-NovmiR68	NC_021160.1:13966080-14003928	10854	10874	AUGAUUUUUAAUUUCAAUUAU	UACUGAAAGUUAUAGUUAAUA
Cat-miR1509a	NC_021163.1:8647041-8666318	4276	4295	GAUGUGAUUUCUUUGAUUAG	UGACACUAAAGGGACUAAUU

Supplementary Table S2. List of miRNAs targeting circRNAs in soybean-drought

miRNA_ID	circRNA ID	Target start	Target end	miRNA_aligned fragment	circRNA_alignedfragment
gma-miR1514a-5p	7_dna:chromosome_chromosome: Glycine_max_v2.1:7:1:44630646:1	1184	1204	UUCAUUUUUAAAAUAGGCAUU	AAUGCCUAUUUUAGAAAUGAA
gma-miR4378b	18_dna:chromosome_chromosome: Glycine_max_v2.1:18:1:58018742:1	54833	54856	UAGAACUGUCUUAGAAUGUGCUAC	ACACACAUUCUAAGACGGUUCUA
gma-miR1514b-5p	7_dna:chromosome_chromosome: Glycine_max_v2.1:7:1:44630646:1	1184	1204	UUCAUUUUUAAAAUAGACAUU	AAUGCCUAUUUUAGAAAUGAA
gma-miR10193a	18_dna:chromosome_chromosome: Glycine_max_v2.1:18:1:58018742:1_	26899	26920	UCUGAAACCGAUGUUAACUACU	AUUAGUUAACAUCGGUUUUUGA
gma-miR10193b	18_dna:chromosome_chromosome: Glycine_max_v2.1:18:1:58018742:1	26899	26920	UCUGAAACCGAUGUUAACUACU	AUUAGUUAACAUCGGUUUUUGA
gma-miR10193c	18_dna:chromosome_chromosome: Glycine_max_v2.1:18:1:58018742:1	26899	26920	UCUGAAACCGAUGUUAACUACU	AUUAGUUAACAUCGGUUUUUGA
gma-miR10193d	18_dna:chromosome_chromosome: Glycine_max_v2.1:18:1:58018742:1	26899	26920	UCUGAAACCGAUGUUAACUACU	AUUAGUUAACAUCGGUUUUUGA
gma-miR10200	18_dna:chromosome_chromosome: Glycine_max_v2.1:18:1:58018742:1	26544	26564	AGGUUUUAAAGAAAUUAAAUG	CUUGUAAUUUUUUUAAAACUU
gma-miR10407a	3_dna:chromosome_chromosome: Glycine_max_v2.1:3:1:45779781:1	16858	16881	AGUUAACGGAUGAAUGAAUUUGUC	GAUAAAUUUAUUUAUCUGUUAAUU
gma-miR10407a	3_dna:chromosome_chromosome: Glycine_max_v2.1:3:1:45779781:1	93765	93788	AGUUAACGGAUGAAUGAAUUUGUC	GAUAAAUUUAUUUAUCUGUUAAUU
gma-miR10407b	3_dna:chromosome_chromosome: Glycine_max_v2.1:3:1:45779781:1	16858	16881	AGUUAACGGAUGAAUGAAUUUGUC	GAUAAAUUUAUUUAUCUGUUAAUU
gma-miR10407b	3_dna:chromosome_chromosome: Glycine_max_v2.1:3:1:45779781:1	93765	93788	AGUUAACGGAUGAAUGAAUUUGUC	GAUAAAUUUAUUUAUCUGUUAAUU
gma-miR1513a-5p	7_dna:chromosome_chromosome: Glycine_max_v2.1:7:1:44630646:1	4198	4218	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGCUUUUUCACA
gma-miR1513b	7_dna:chromosome_chromosome: Glycine_max_v2.1:7:1:44630646:1	4198	4218	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGCUUUUUCACA
gma-miR1533	3_dna:chromosome_chromosome: Glycine_max_v2.1:3:1:45779781:1	54784	54802	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU
gma-miR1533	3_dna:chromosome_chromosome: Glycine_max_v2.1:3:1:45779781:1_	54805	54823	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU

gma-miR1533	3_dna:chromosome_chromosome: Glycine_max_v2.1:3:1:45779781:1	88405	88423	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU
gma-miR1533	8_dna:chromosome_chromosome: Glycine_max_v2.1:8:1:47837940:1	4107	4125	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU
gma-miR169l-3p	18_dna:chromosome_chromosome: Glycine_max_v2.1:18:1:58018742:1	53270	53291	CGGGCAAGUUGUUUUUGGCUAC	GAUGUCAAAAACAAUUUGCUUG
gma-miR6299	3_dna:chromosome_chromosome: Glycine_max_v2.1:3:1:45779781:1	10325	10346	AUUUAAAAUUAUUGAUUUGUCA	UAUCAAAUUAAUUAUUUUAAAU
gma-miR9722	18_dna:chromosome_chromosome: Glycine_max_v2.1:18:1:58018742:1	2901	2921	UAAUAGAGGGAAGAAGAUGAA	GACAUUUUUUUCUCUCUGUUA

Supplementyary Table S3.

miRNA_Acc.	mRNA_Acc.	UPE$	miRNA start	mRNA end	mRNA start		miRNA aligned_fragment	mRNA_aligned_fragment	Inhibition
Cat-NovmiR107a	XM_004494079.3	-1	1	21	1115	1135	CUUUAUAUUCGUUUUU	AUUAUACAAUAGAAAUGGAU AUAAAG	Cleavage
Cat-NovmiR107a	XM_012716994.2	-1	1	21	106	126	CUUUAUAUUCGUUUUUAUUAU	UAAAUAAACACGAAUAUAAAG	Cleavage
Cat-NovmiR107a	XM_027335624.1	-1	1	21	106	126	CUUUAUAUUCGUUUUUAUUAU	UAAAUAAACACGAAUAUAAAG	Cleavage
Cat-NovmiR107a	XM_012716993.2	-1	1	21	106	126	CUUUAUAUUCGUUUUUAUUAU	UAAAUAAACACGAAUAUAAAG	Cleavage
Cat-NovmiR107a	XM_004504586.3	-1	1	21	105	125	CUUUAUAUUCGUUUUUAUUAU	UAAAUAAACACGAAUAUAAAG	Cleavage
Cat-NovmiR107a	XM_012716992.2	-1	1	21	106	126	CUUUAUAUUCGUUUUUAUUAU	UAAAUAAACACGAAUAUAAAG	Cleavage
Cat-NovmiR107a	XM_027335623.1	-1	1	21	106	126	CUUUAUAUUCGUUUUUAUUAU	UAAAUAAACACGAAUAUAAAG	Cleavage
Cat-NovmiR107a	XM_027335622.1	-1	1	21	106	126	CUUUAUAUUCGUUUUUAUUAU	UAAAUAAACACGAAUAUAAAG	Cleavage
Cat-NovmiR107a	XM_027335621.1	-1	1	21	106	126	CUUUAUAUUCGUUUUUAUUAU	UAAAUAAACACGAAUAUAAAG	Cleavage
Cat-NovmiR107a	XR_003473317.1	-1	1	21	99	119	CUUUAUAUUCGUUUUUAUUAU	UGAAUGAAAAUGAAUAUGAAG	Cleavage
Cat-NovmiR107h	XM_004516942.3	-1	1	21	210	230	CUUUAUUUUCGUUUUUAUCAU	AAGAUCAAAACGAAGAUAAAG	Cleavage
Cat-NovmiR107h	XM_004498752.3	-1	1	21	511	531	CUUUAUUUUCGUUUUUAUCAU	AAGAAAAAAACGAAAAUGAAG	Cleavage
Cat-NovmiR107i	XM_004506168.3	-1	1	21	1112	1132	CUUUAUAUUUGUUUUUAUCAU	AAGAUGAAGACAAAUAUGAAG	Cleavage
Cat-NovmiR107j	XM_004506168.3	-1	1	21	1112	1132	CUUUAUAUUUGUUUUUAUCAU	AAGAUGAAGACAAAUAUGAAG	Cleavage
Cat-NovmiR107k	XM_004509994.3	-1	1	21	358	378	CUUUAUAUUCUUUUUUAUCAU	AAGAUAAGAAAGAAUAUGAGG	Cleavage
Cat-NovmiR16	XM_004508782.3	-1	1	20	342	361	AAGAAGAGAGAAGUAAAUAC	GUAGUUACUUCUUUCUUCUU	Cleavage
Cat-NovmiR16	XM_004488672.3	-1	1	20	1452	1471	AAGAAGAGAGAAGUAAAUAC	GUAUUUUUUUCUCUCUUCUU	Cleavage
Cat-NovmiR16	XM_027336693.1	-1	1	20	345	364	AAGAAGAGAGAAGUAAAUAC	GUAGUUACUUCUUUCUUCUU	Cleavage
Cat-NovmiR16	XM_004491220.3	-1	1	20	51	70	AAGAAGAGAGAAGUAAAUAC	AUAUUUGCUUCUCUCUUCUG	Cleavage
Cat-NovmiR16	XM_004493632.3	-1	1	20	1761	1780	AAGAAGAGAGAAGUAAAUAC	UUAUUUAUUUUUCUCUUUUU	Cleavage
Cat-NovmiR16	XM_004497042.3	-1	1	20	935	954	AAGAAGAGAGAAGUAAAUAC	UUAUUUAUUUCUUUCUUUUU	Cleavage
Cat-NovmiR16	XM_004509176.3	-1	1	20	988	1007	AAGAAGAGAGAAGUAAAUAC	AUAUUUCCUUUUCUCUUCUU	Cleavage
Cat-NovmiR16	XM_004514250.3	-1	1	20	267	286	AAGAAGAGAGAAGUAAAUAC	AUGUUUUCUUCUCUCUUCUU	Cleavage
Cat-NovmiR16	XM_012719838.2	-1	1	20	268	287	AAGAAGAGAGAAGUAAAUAC	AUGUUUUCUUCUCUCUUCUU	Cleavage
Cat-NovmiR25	XM_004488935.3	-1	1	20	254	273	UUGAGAGUUUGGUUGAUGAA	CUCAUUAGCCAAAUUCUCAA	Cleavage
Cat-NovmiR38	XM_004500163.3	-1	1	21	2825	2845	ACUUGUCAUUGUAAUUAAUGU	AUAUUAAAUAUAAUGACAAGU	Cleavage
Cat-NovmiR38	XM_004500162.3	-1	1	21	2830	2850	ACUUGUCAUUGUAAUUAAUGU	AUAUUAAAUAUAAUGACAAGU	Cleavage
Cat-miR5554a-5p	XR_003471530.1	-1	1	20	1098	1117	UGGUAACAAGUUUUCCGUGU	GCUCGGAAAACUUGUUGCCA	Cleavage

Cat-miR5554a-5p	XM_027331863.1	-1	1	20	1098	1117	UGGUAACAAGUUUUCCGUGU	GCUCGGAAAACUUGUUGCCA	Cleavage
Cat-miR5554a-5p	XM_027331862.1	-1	1	20	1098	1117	UGGUAACAAGUUUUCCGUGU	GCUCGGAAAACUUGUUGCCA	Cleavage
Cat-miR5554a-5p	XR_003471523.1	-1	1	20	1098	1117	UGGUAACAAGUUUUCCGUGU	GCUCGGAAAACUUGUUGCCA	Cleavage
Cat-miR5554a-5p	XR_003471527.1	-1	1	20	1098	1117	UGGUAACAAGUUUUCCGUGU	GCUCGGAAAACUUGUUGCCA	Cleavage
Cat-miR5554a-5p	XR_003471522.1	-1	1	20	1098	1117	UGGUAACAAGUUUUCCGUGU	GCUCGGAAAACUUGUUGCCA	Cleavage
Cat-miR5554a-5p	XR_003471528.1	-1	1	20	1098	1117	UGGUAACAAGUUUUCCGUGU	GCUCGGAAAACUUGUUGCCA	Cleavage
Cat-miR5554a-5p	XR_003471525.1	-1	1	20	1098	1117	UGGUAACAAGUUUUCCGUGU	GCUCGGAAAACUUGUUGCCA	Cleavage
Cat-miR5554a-5p	XR_003471518.1	-1	1	20	1098	1117	UGGUAACAAGUUUUCCGUGU	GCUCGGAAAACUUGUUGCCA	Cleavage
Cat-miR5554a-5p	XR_003471524.1	-1	1	20	1098	1117	UGGUAACAAGUUUUCCGUGU	GCUCGGAAAACUUGUUGCCA	Cleavage
Cat-miR5554a-5p	XR_003471520.1	-1	1	20	1098	1117	UGGUAACAAGUUUUCCGUGU	GCUCGGAAAACUUGUUGCCA	Cleavage
Cat-miR5554a-5p	XR_003471526.1	-1	1	20	1098	1117	UGGUAACAAGUUUUCCGUGU	GCUCGGAAAACUUGUUGCCA	Cleavage
Cat-miR5554a-5p	XR_003471519.1	-1	1	20	1098	1117	UGGUAACAAGUUUUCCGUGU	GCUCGGAAAACUUGUUGCCA	Cleavage
Cat-miR5554a-5p	XR_003471517.1	-1	1	20	1098	1117	UGGUAACAAGUUUUCCGUGU	GCUCGGAAAACUUGUUGCCA	Cleavage
Cat-miR5554a-5p	XR_003471521.1	-1	1	20	1098	1117	UGGUAACAAGUUUUCCGUGU	GCUCGGAAAACUUGUUGCCA	Cleavage
Cat-miR5554a-5p	XM_027331861.1	-1	1	20	1098	1117	UGGUAACAAGUUUUCCGUGU	GCUCGGAAAACUUGUUGCCA	Cleavage
Cat-miR5554a-5p	XR_003471529.1	-1	1	20	1098	1117	UGGUAACAAGUUUUCCGUGU	GCUCGGAAAACUUGUUGCCA	Cleavage
Cat-miR5554a-5p	XM_012712955.2	-1	1	20	1545	1564	UGGUAACAAGUUUUCCGUGU	GCUCGGAAAACUUGUUGCCA	Cleavage
Cat-miR5554a-5p	XM_004490397.3	-1	1	20	1545	1564	UGGUAACAAGUUUUCCGUGU	GCUCGGAAAACUUGUUGCCA	Cleavage
Cat-NovmiR100a	XM_004515886.3	-1	1	20	355	374	UAAAAUGAGGUAGUUAGUUU	GAACCAACUACUUCAUUUUG	Cleavage
Cat-NovmiR105a	XM_004493013.3	-1	1	21	415	435	UCUCUUUUAACUCAGUUAUUU	GGAUAACGGAGUUGAAAGAGG	Cleavage
Cat-NovmiR105a	XM_004512018.3	-1	1	21	1677	1697	UCUCUUUUAACUCAGUUAUUU	GCAUGGCUGAGUUGGAAGAGA	Cleavage
Cat-NovmiR105a	XM_027337549.1	-1	1	21	1677	1697	UCUCUUUUAACUCAGUUAUUU	GCAUGGCUGAGUUGGAAGAGA	Cleavage
Cat-NovmiR105a	XM_004495137.3	-1	1	21	1417	1437	UCUCUUUUAACUCAGUUAUUU	CCAAAACAGAGUUAAAAGAGA	Cleavage
Cat-NovmiR105a	XM_004495137.3	-1	1	21	1483	1503	UCUCUUUUAACUCAGUUAUUU	CCAAAACAGAGUUAAAAGAGA	Cleavage
Cat-NovmiR107a	XR_003471855.1	-1	1	21	1454	1474	CUUUAUAUUCGUUUUUAUUAU	AAAAUAAAAAUGAAUCUAAAG	Cleavage
Cat-NovmiR107a	XM_004485797.3	-1	1	21	848	868	CUUUAUAUUCGUUUUUAUUAU	UAAAUAAAAACGAAGAUAGAG	Cleavage
Cat-NovmiR107a	XM_004512859.3	-1	1	21	59	79	CUUUAUAUUCGUUUUUAUUAU	AAAAAAAAAAUGAAUAUGAAG	Cleavage
Cat-NovmiR107c	XM_012713430.2	-1	1	21	793	813	CUUUAUAUUCGUUUUUACCAU	AUGGUGAAAGCGAGUAUGAAG	Cleavage
Cat-NovmiR107c	XM_012713429.2	-1	1	21	898	918	CUUUAUAUUCGUUUUUACCAU	AUGGUGAAAGCGAGUAUGAAG	Cleavage
Cat-NovmiR107c	XM_004517039.1	-1	1	21	224	244	CUUUAUAUUCGUUUUUACCAU	AAGGUAGAGGUGAAUAUAAAG	Cleavage
Cat-NovmiR107f	XM_004514243.3	-1	1	21	554	574	UUUUAUAUUCGUUUUUAUCAU	GAGAUGGAAACGAAUAUAAAU	Cleavage
Cat-NovmiR107g	XM_004514243.3	-1	1	21	554	574	UUUUAUAUUCGUUUUUAUCAU	GAGAUGGAAACGAAUAUAAAU	Cleavage

Cat-NovmiR107h	XM_012713974.2	-1	1	21	1960	1980	CUUUAUUUUCGUUUUUAUCAU	AUGAUGAAAAUGAAAAUGAGG	Cleavage
Cat-NovmiR107h	XM_004499226.3	-1	1	21	1059	1079	CUUUAUUUUCGUUUUUAUCAU	CUGAUAAAGAUGAAGAUGAAG	Cleavage
Cat-NovmiR107h	XM_004499224.3	-1	1	21	1059	1079	CUUUAUUUUCGUUUUUAUCAU	CUGAUAAAGAUGAAGAUGAAG	Cleavage
Cat-NovmiR107h	XM_004490001.3	-1	1	21	1029	1049	CUUUAUUUUCGUUUUUAUCAU	AAGAUAGUAACGAAAAUGAAG	Cleavage
Cat-NovmiR107h	XM_004485797.3	-1	1	21	848	868	CUUUAUUUUCGUUUUUAUCAU	UAAAUAAAAACGAAGAUAGAG	Cleavage
Cat-NovmiR107h	XR_189855.3	-1	1	21	99	119	CUUUAUUUUCGUUUUUAUCAU	AAAAUAAAAAUGGAAAUAAAG	Cleavage
Cat-NovmiR107h	XM_004501673.3	-1	1	21	820	840	CUUUAUUUUCGUUUUUAUCAU	AAGAUGAAGACGAAGAUGAAG	Cleavage
Cat-NovmiR107h	XM_004508210.1	-1	1	21	338	358	CUUUAUUUUCGUUUUUAUCAU	AAGAUGAAGACGAAGAUGAAG	Cleavage
Cat-NovmiR107h	XM_004506168.3	-1	1	21	1136	1156	CUUUAUUUUCGUUUUUAUCAU	AAGAUGAAGACGAAGAUGAAG	Cleavage
Cat-NovmiR107h	XM_012716228.2	-1	1	21	804	824	CUUUAUUUUCGUUUUUAUCAU	AAGAUGAAGACGAGGAUAAAG	Cleavage
Cat-NovmiR107h	XR_003473391.1	-1	1	21	2081	2101	CUUUAUUUUCGUUUUUAUCAU	AAGAUAGGAGCGGAAAUAAAG	Cleavage
Cat-NovmiR107h	XR_003473390.1	-1	1	21	2081	2101	CUUUAUUUUCGUUUUUAUCAU	AAGAUAGGAGCGGAAAUAAAG	Cleavage
Cat-NovmiR107h	XM_004516808.3	-1	1	21	3416	3436	CUUUAUUUUCGUUUUUAUCAU	AAGGUAAAAACGAAAAUCAAG	Cleavage
Cat-NovmiR107h	XM_004488953.3	-1	1	21	1025	1045	CUUUAUUUUCGUUUUUAUCAU	CAGAUGAAGACGAAGAUGAAG	Cleavage
Cat-NovmiR107h	XM_004488952.3	-1	1	21	1028	1048	CUUUAUUUUCGUUUUUAUCAU	CAGAUGAAGACGAAGAUGAAG	Cleavage
Cat-NovmiR107h	XM_004499100.3	-1	1	21	747	767	CUUUAUUUUCGUUUUUAUCAU	GAGAUGGAAAUGAAAAUGAAG	Cleavage
Cat-NovmiR107h	XM_012715378.2	-1	1	21	762	782	CUUUAUUUUCGUUUUUAUCAU	GAGAUGGAAAUGAAAAUGAAG	Cleavage
Cat-NovmiR107i	XM_004501308.2	-1	1	21	1585	1605	CUUUAUAUUUGUUUUUAUCAU	UUGAUGAUAACAAAUGUAAAG	Cleavage
Cat-NovmiR107j	XM_004501308.2	-1	1	21	1585	1605	CUUUAUAUUUGUUUUUAUCAU	UUGAUGAUAACAAAUGUAAAG	Cleavage
Cat-NovmiR107k	XM_004507433.3	-1	1	21	480	500	CUUUAUAUUCUUUUUUAUCAU	AUGAUAAAAAAGAUUAUGAAG	Cleavage
Cat-NovmiR107k	XM_027331078.1	-1	1	21	740	760	CUUUAUAUUCUUUUUUAUCAU	UUGGUAAGGAAGAAUAUGAAG	Cleavage
Cat-NovmiR107k	XM_027331077.1	-1	1	21	740	760	CUUUAUAUUCUUUUUUAUCAU	UUGGUAAGGAAGAAUAUGAAG	Cleavage
Cat-NovmiR107k	XM_004516166.3	-1	1	21	740	760	CUUUAUAUUCUUUUUUAUCAU	UUGGUAAGGAAGAAUAUGAAG	Cleavage
Cat-NovmiR107k	XM_004507400.3	-1	1	21	2409	2429	CUUUAUAUUCUUUUUUAUCAU	AGGAUGAAGAAGGAUAUAAGG	Cleavage
Cat-NovmiR107k	XM_012720046.2	-1	1	21	185	205	CUUUAUAUUCUUUUUUAUCAU	AAUAUAAGAAAGGAUAUAAAG	Cleavage
Cat-NovmiR107k	XM_012720056.2	-1	1	21	268	288	CUUUAUAUUCUUUUUUAUCAU	AAUAUAAGAAAGGAUAUAAAG	Cleavage
Cat-NovmiR107k	XM_012720053.2	-1	1	21	283	303	CUUUAUAUUCUUUUUUAUCAU	AAUAUAAGAAAGGAUAUAAAG	Cleavage
Cat-NovmiR107k	XM_012720049.2	-1	1	21	306	326	CUUUAUAUUCUUUUUUAUCAU	AAUAUAAGAAAGGAUAUAAAG	Cleavage
Cat-NovmiR107k	XM_027334072.1	-1	1	21	283	303	CUUUAUAUUCUUUUUUAUCAU	AAUAUAAGAAAGGAUAUAAAG	Cleavage
Cat-NovmiR107k	XM_012717019.2	-1	1	21	533	553	CUUUAUAUUCUUUUUUAUCAU	UGGAUAAGAAAGAGUGUGAAG	Cleavage
Cat-NovmiR107k	XM_004503287.3	-1	1	21	119	139	CUUUAUAUUCUUUUUUAUCAU	GAGAUAAAAAAGAAGAUGAAG	Cleavage
Cat-NovmiR107k	XM_012713003.2	-1	1	21	1484	1504	CUUUAUAUUCUUUUUUAUCAU	AAGACAAGAAAGAAUAUGAAG	Cleavage

Cat-NovmiR107k	XM_012713004.2	-1	1	21	1484	1504	CUUUAUAUUCUUUUUUAUCAU	AAGACAAGAAAGAAUAUGAAG	Cleavage
Cat-NovmiR16	XM_012715575.2	-1	1	20	1559	1578	AAGAAGAGAGAAGUAAAUAC	GUGUUUAUUUUUUUCUUCUU	Cleavage
Cat-NovmiR16	XM_027335185.1	-1	1	20	1261	1280	AAGAAGAGAGAAGUAAAUAC	GUGUUUAUUUUUUUCUUCUU	Cleavage
Cat-NovmiR16	XM_004510592.3	-1	1	20	1133	1152	AAGAAGAGAGAAGUAAAUAC	UUAUUUAUUUUUCUUUUUUU	Cleavage
Cat-NovmiR16	XM_012718677.2	-1	1	20	1087	1106	AAGAAGAGAGAAGUAAAUAC	UUAUUUAUUUUUCUUUUUUU	Cleavage
Cat-NovmiR16	XM_004510591.3	-1	1	20	1051	1070	AAGAAGAGAGAAGUAAAUAC	UUAUUUAUUUUUCUUUUUUU	Cleavage
Cat-NovmiR16	XM_004512961.2	-1	1	20	72	91	AAGAAGAGAGAAGUAAAUAC	UUGUUUAUUUUUUUCUUCUU	Cleavage
Cat-NovmiR16	XM_004500702.3	-1	1	20	693	712	AAGAAGAGAGAAGUAAAUAC	UUGUUUGCUUCUCUUUUUUU	Cleavage
Cat-NovmiR16	XM_004517122.3	-1	1	20	531	550	AAGAAGAGAGAAGUAAAUAC	UUGUUUGCUUCUCUUUUUUU	Cleavage
Cat-NovmiR16	XM_004513547.3	-1	1	20	539	558	AAGAAGAGAGAAGUAAAUAC	AUGUUUAUUUUUCUUUUCUU	Cleavage
Cat-NovmiR16	XM_004512311.3	-1	1	20	57	76	AAGAAGAGAGAAGUAAAUAC	AUCUUUACUUUUCUCUUUUU	Cleavage
Cat-NovmiR16	XM_004512310.2	-1	1	20	69	88	AAGAAGAGAGAAGUAAAUAC	AUCUUUACUUUUCUCUUUUU	Cleavage
Cat-NovmiR16	XR_003470004.1	-1	1	20	361	380	AAGAAGAGAGAAGUAAAUAC	GAAUUUUCUUCUCUCUUCUU	Cleavage
Cat-NovmiR16	XM_004507329.3	-1	1	20	929	948	AAGAAGAGAGAAGUAAAUAC	AUGUGUACUUCUCUUUUCUU	Cleavage
Cat-NovmiR16	XM_004498127.2	-1	1	20	1050	1069	AAGAAGAGAGAAGUAAAUAC	AUGUGUACUUCUCUUUUCUU	Cleavage
Cat-NovmiR16	XM_004490556.3	-1	1	20	97	116	AAGAAGAGAGAAGUAAAUAC	AUAUUUUCUUCUUUCUUUUU	Cleavage
Cat-NovmiR16	XM_004487965.3	-1	1	20	132	151	AAGAAGAGAGAAGUAAAUAC	UUUUUUAUUUCUUUCUUCUU	Cleavage
Cat-NovmiR16	XM_004496214.3	-1	1	20	39	58	AAGAAGAGAGAAGUAAAUAC	CUAUUAAUUUCUCUCUUUUU	Cleavage
Cat-NovmiR16	XM_004493727.3	-1	1	20	107	126	AAGAAGAGAGAAGUAAAUAC	UUAUUUCUUUCUUUCUUCUU	Cleavage
Cat-NovmiR23	XM_004507938.3	-1	1	20	1	20	CAGUUAGUUUUAUAAGAAGA	UUUUCUUAUAAGAUUAAUUG	Cleavage
Cat-NovmiR23	XM_004510807.3	-1	1	20	1733	1752	CAGUUAGUUUUAUAAGAAGA	ACCUCUUAUAAGACUAAUUG	Cleavage
Cat-NovmiR23	XM_004510808.3	-1	1	20	940	959	CAGUUAGUUUUAUAAGAAGA	ACCUCUUAUAAGACUAAUUG	Cleavage
Cat-NovmiR25	XM_004504210.3	-1	1	20	1576	1595	UUGAGAGUUUGGUUGAUGAA	AACAUUAACCAAGCUCUCAA	Cleavage
Cat-NovmiR25	XM_027336065.1	-1	1	20	1417	1436	UUGAGAGUUUGGUUGAUGAA	AACAUUAACCAAGCUCUCAA	Cleavage
Cat-NovmiR25	XM_027336064.1	-1	1	20	1272	1291	UUGAGAGUUUGGUUGAUGAA	AACAUUAACCAAGCUCUCAA	Cleavage
Cat-NovmiR25	XM_012713836.2	-1	1	20	704	723	UUGAGAGUUUGGUUGAUGAA	GUCAUCAACCAAGCUGUCAA	Cleavage
Cat-NovmiR25	XM_004495686.3	-1	1	20	553	572	UUGAGAGUUUGGUUGAUGAA	AUCAUCAACAAAACUUUCAA	Translation
Cat-NovmiR29	XM_004506773.3	-1	1	21	1819	1839	UUGUGGAUAAAAUAGGUAUUU	CUGAACCUAUUUUAUCCACAA	Cleavage
Cat-NovmiR29	XM_004506774.3	-1	1	21	1816	1836	UUGUGGAUAAAAUAGGUAUUU	CUGAACCUAUUUUAUCCACAA	Cleavage
Cat-NovmiR38	XM_027332528.1	-1	1	21	1086	1106	ACUUGUCAUUGUAAUUAAUGU	CAAAUAAUUACAAUGGCGAGU	Cleavage
Cat-NovmiR38	XM_027332529.1	-1	1	21	1088	1108	ACUUGUCAUUGUAAUUAAUGU	CAAAUAAUUACAAUGGCGAGU	Cleavage
Cat-NovmiR38	XM_012714178.2	-1	1	21	1305	1325	ACUUGUCAUUGUAAUUAAUGU	CAAAUAAUUACAAUGGCGAGU	Cleavage

Cat-NovmiR46	XM_004490976.3	-1	1	21	129	149	CUUUAUAUUUGUUUAUAUUAU	AUGAUAUAAAUAAAUAUAAAU	Cleavage
Cat-NovmiR46	XM_004502408.3	-1	1	21	274	294	CUUUAUAUUUGUUUAUAUUAU	ACAAUAUAAAUAAAUAAAAAG	Cleavage
Cat-NovmiR46	XM_012711940.2	-1	1	21	1334	1354	CUUUAUAUUUGUUUAUAUUAU	AAAAUGGAAACAAAUAUAGAG	Cleavage
Cat-NovmiR46	XM_004501122.2	-1	1	21	652	672	CUUUAUAUUUGUUUAUAUUAU	ACAGUACAAACAAGUAUAAAG	Cleavage
Cat-NovmiR46	XM_004511375.3	-1	1	21	2572	2592	CUUUAUAUUUGUUUAUAUUAU	CAAUUGUAAAUAAAUAUAAAG	Cleavage
Cat-NovmiR54	XR_003472819.1	-1	1	21	1528	1548	AGAUUGGUUUGUUGGGUAAGG	CUUCACCCAACAAACCGAUUU	Cleavage
Cat-NovmiR68	XM_004499863.3	-1	1	21	125	145	UACUGAAAGUUAUAGUUAAUA	AAUUAAUUAUGACUUUCAGUC	Cleavage
Cat-miR1509a	XM_027331621.1	-1	1	20	742	761	UGACACUAAAGGGACUAAUU	AAUUAGUUUUUUUGGUGUCA	Cleavage
Cat-miR1520e	XM_004488511.3	-1	1	20	971	990	GAUAGUAUACAGUGCAAUAA	UUAUUGCAUUGUAUACAAUC	Cleavage
Cat-miR1520e	XM_027334388.1	-1	1	20	689	708	GAUAGUAUACAGUGCAAUAA	UUAUUGCAUUGUAUACAAUC	Cleavage
Cat-miR1520e	XM_027334386.1	-1	1	20	689	708	GAUAGUAUACAGUGCAAUAA	UUAUUGCAUUGUAUACAAUC	Cleavage
Cat-miR1520e	XM_027334504.1	-1	1	20	743	762	GAUAGUAUACAGUGCAAUAA	UUAUUGCACUGGAUAUUAUC	Cleavage
Cat-miR1520e	XM_027337549.1	-1	1	20	160	179	GAUAGUAUACAGUGCAAUAA	GUAUUGUAUUGUAUAUUAUU	Cleavage
Cat-miR1520e	XM_004512018.3	-1	1	20	160	179	GAUAGUAUACAGUGCAAUAA	GUAUUGUAUUGUAUAUUAUU	Cleavage
Cat-miR1520e	XM_004508254.3	-1	1	20	1148	1167	GAUAGUAUACAGUGCAAUAA	CUAUUACACUGUAUAUUAUU	Cleavage
Cat-miR166g-5p	XM_004497991.3	-1	1	21	1681	1701	GGAGCUCGGUUUGUUGUAAGG	UCAUACAACAAACUGAGCUCU	Cleavage
Cat-miR166g-5p	XM_012715060.2	-1	1	21	1682	1702	GGAGCUCGGUUUGUUGUAAGG	UCAUACAACAAACUGAGCUCU	Cleavage
Cat-miR2081	XM_004508225.3	-1	1	20	1308	1327	UAGUCUGUGUAUUGAGGUCA	UGAACUUGAUACACAGACUA	Cleavage
Cat-miR408-5p.2	XM_027331780.1	-1	1	21	2567	2587	GUACGAGUCGGACAAGGGACA	AUUUCCUUGUUUGACUUGUAC	Cleavage
Cat-miR408-5p.3	XM_027331780.1	-1	1	20	2568	2587	GUACGAGUCGGACAAGGGAC	UUUCCUUGUUUGACUUGUAC	Cleavage
Cat-miR408b	XM_027331780.1	-1	1	21	2567	2587	GUACGAGUCGGACAAGGGACA	AUUUCCUUGUUUGACUUGUAC	Cleavage
Cat-miR419	XM_012714691.2	-1	1	20	4103	4122	UAUGUAGUAGUAGUAUGUAG	CUACAUUCUACUGUUACAUA	Cleavage
Cat-miR419	XM_004496727.3	-1	1	20	4012	4031	UAUGUAGUAGUAGUAUGUAG	CUACAUUCUACUGUUACAUA	Cleavage
Cat-miR419	XR_003471482.1	-1	1	20	770	789	UAUGUAGUAGUAGUAUGUAG	CUACAUUCUACUGUUACAUA	Cleavage
Cat-miR419	XR_003473405.1	-1	1	20	770	789	UAUGUAGUAGUAGUAUGUAG	CUACAUUCUACUGUUACAUA	Cleavage
Cat-miR419	XR_190082.3	-1	1	20	686	705	UAUGUAGUAGUAGUAUGUAG	CUACAUUCUACUGUUACAUA	Cleavage
Cat-miR419	XR_189392.3	-1	1	20	686	705	UAUGUAGUAGUAGUAUGUAG	CUACAUUCUACUGUUACAUA	Cleavage
Cat-miR419	XM_004511263.3	-1	1	20	338	356	UAUGUAGUAGUAGUAUGUAG	CUAC-UACUACUACUACAUA	Cleavage
Cat-miR530a.1	XM_004512532.2	-1	1	21	674	694	AUUCCACGUCCACGUUUACGU	UCCUAAAUGUGGAUGUGGAAU	Cleavage
Cat-miR774b-3p	XR_001144442.2	-1	1	20	543	562	AAGCUCUAUUUUUAUACUUA	AAAGUAUGAGAAUGGAGUUU	Cleavage

Supplementary Table S4.

miRNA_Acc.	mRNA_Acc.	UPE$	miRNA start	miRNA end	mRNA start	mRNA end	miRNA_aligned_fragment	mRNA_aligned_fragment	Inhibition
gma-miR10407a	Glyma.11G180700.3	-1	1	24	2605	2628	AGUUAACGGAUGAAUGAAUUUGUC	GACAAAUUCAUUCAUCCGUUAACU	Cleavage
gma-miR10407a	Glyma.11G180700.2	-1	1	24	2624	2647	AGUUAACGGAUGAAUGAAUUUGUC	GACAAAUUCAUUCAUCCGUUAACU	Cleavage
gma-miR10407a	Glyma.11G180700.1	-1	1	24	2669	2692	AGUUAACGGAUGAAUGAAUUUGUC	GACAAAUUCAUUCAUCCGUUAACU	Cleavage
gma-miR10407a	Glyma.11G180700.4	-1	1	24	3258	3281	AGUUAACGGAUGAAUGAAUUUGUC	GACAAAUUCAUUCAUCCGUUAACU	Cleavage
gma-miR10407b	Glyma.11G180700.3	-1	1	24	2605	2628	AGUUAACGGAUGAAUGAAUUUGUC	GACAAAUUCAUUCAUCCGUUAACU	Cleavage
gma-miR10407b	Glyma.11G180700.2	-1	1	24	2624	2647	AGUUAACGGAUGAAUGAAUUUGUC	GACAAAUUCAUUCAUCCGUUAACU	Cleavage
gma-miR10407b	Glyma.11G180700.1	-1	1	24	2669	2692	AGUUAACGGAUGAAUGAAUUUGUC	GACAAAUUCAUUCAUCCGUUAACU	Cleavage
gma-miR10407b	Glyma.11G180700.4	-1	1	24	3258	3281	AGUUAACGGAUGAAUGAAUUUGUC	GACAAAUUCAUUCAUCCGUUAACU	Cleavage
gma-miR1533	Glyma.14G016600.1	-1	1	19	267	285	AUAAUAAAAAUAAUAAUGA	UCAUUAUUAUUUUUAUUAU	Cleavage
gma-miR1533	Glyma.14G016600.2	-1	1	19	267	285	AUAAUAAAAAUAAUAAUGA	UCAUUAUUAUUUUUAUUAU	Cleavage
gma-miR1533	Glyma.14G016600.4	-1	1	19	267	285	AUAAUAAAAAUAAUAAUGA	UCAUUAUUAUUUUUAUUAU	Cleavage
gma-miR1533	Glyma.14G016600.3	-1	1	19	267	285	AUAAUAAAAAUAAUAAUGA	UCAUUAUUAUUUUUAUUAU	Cleavage
gma-miR1533	Glyma.14G016600.5	-1	1	19	267	285	AUAAUAAAAAUAAUAAUGA	UCAUUAUUAUUUUUAUUAU	Cleavage
gma-miR10200	Glyma.13G143500.1	-1	1	21	621	641	AGGUUUUAAAGAAAUUAAAUG	AUUUUAAUUUUUUUAAAACCU	Cleavage
gma-miR1513a-5p	Glyma.07G187200.1	-1	1	21	104	124	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGUUUUCUCUCA	Cleavage
gma-miR1513a-5p	Glyma.07G148300.1	-1	1	21	89	109	UGAGAGAAAGCCAUGACUUAC	GCAAGUCAUGGUUUUCUCUCA	Cleavage
gma-miR1513b	Glyma.07G187200.1	-1	1	21	104	124	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGUUUUCUCUCA	Cleavage
gma-miR1513b	Glyma.07G148300.1	-1	1	21	89	109	UGAGAGAAAGCCAUGACUUAC	GCAAGUCAUGGUUUUCUCUCA	Cleavage
gma-miR1514a-5p	Glyma.07G048000.2	-1	1	21	874	894	UUCAUUUUUAAAAUAGGCAUU	AAUGCCUAUUUUAGAAAUGAA	Cleavage
gma-miR1514a-5p	Glyma.07G048100.1	-1	1	21	839	859	UUCAUUUUUAAAAUAGGCAUU	AAUGCCUAUUUUAGAAAUGAA	Cleavage

gma-miR1514a-5p	Glyma.07G048000.1	-1	1	21	874	894	UUCAUUUUUAAAAUAGGCAUU	AAUGCCUAUUUUAGAAAUGAA	Cleavage
gma-miR1514a-5p	Glyma.16G016700.1	-1	1	21	851	871	UUCAUUUUUAAAAUAGGCAUU	AAUGCCUAUUUUAGAAAUGAA	Cleavage
gma-miR1514a-5p	Glyma.16G016600.1	-1	1	21	834	854	UUCAUUUUUAAAAUAGGCAUU	AAUGCCUAUUUUAGAAAUGAA	Cleavage
gma-miR1533	Glyma.05G103400.2	-1	1	19	2164	2182	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUUUUAUUAU	Cleavage
gma-miR1513a-5p	Glyma.16G202600.1	-1	1	21	107	127	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGUUUUCU CUUA	Cleavage
gma-miR1513a-5p	Glyma.01G232700.1	-1	1	21	107	127	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGUUUUCU CUUA	Cleavage
gma-miR1513a-5p	Glyma.06G197000.1	-1	1	21	113	133	UGAGAGAAAGCCAUGACUUAC	GUAAGUCGUGGCUUUCU CUUA	Cleavage
gma-miR1513b	Glyma.06G197000.1	-1	1	21	113	133	UGAGAGAAAGCCAUGACUUAC	GUAAGUCGUGGCUUUCU CUUA	Cleavage
gma-miR1513b	Glyma.01G232700.1	-1	1	21	107	127	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGUUUUCU CUUA	Cleavage
gma-miR1513b	Glyma.16G202600.1	-1	1	21	107	127	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGUUUUCU	Cleavage CUUA
gma-miR1533	Glyma.08G287400.1	-1	1	19	19	37	AUAAUAAAAAUAAUAAUGA	UUGUUAUUAUUUUUAUUAU	Cleavage
gma-miR1533	Glyma.08G287400.2	-1	1	19	19	37	AUAAUAAAAAUAAUAAUGA	UUGUUAUUAUUUUUAUUAU	Cleavage
gma-miR1533	Glyma.13G083300.4	-1	1	19	2756	2774	AUAAUAAAAAUAAUAAUGA	UCAUCAUUAUUUUUAUUAU	Cleavage
gma-miR1533	Glyma.13G083300.1	-1	1	19	2754	2772	AUAAUAAAAAUAAUAAUGA	UCAUCAUUAUUUUUAUUAU	Cleavage
gma-miR1533	Glyma.13G161700.1	-1	1	19	162	180	AUAAUAAAAAUAAUAAUGA	UAAUUAUUAUUUUUAUUAU	Cleavage
gma-miR4378b	Glyma.15G221200.1	-1	1	24	340	363	UAGAACUGUCUUAGAAUGUGCUAC	AACACACAUUCUAAGACGG UUUUA	Cleavage
gma-miR10200	Glyma.06G029000.7	-1	1	21	1661	1681	AGGUUUUAAAGAAAUUAAAUG	AUUUUAGUUUUUUUAAAACUU	Cleavage
gma-miR10200	Glyma.06G029000.6	-1	1	21	1918	1938	AGGUUUUAAAGAAAUUAAAUG	AUUUUAGUUUUUUUAAAACUU	Cleavage
gma-miR1513a-5p	Glyma.08G252300.1	-1	1	21	183	203	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGCUUUCUCUGA	Cleavage
gma-miR1513a-5p	Glyma.08G252300.2	-1	1	21	179	199	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGCUUUCUCUGA	Cleavage
gma-miR1513a-5p	Glyma.08G252300.3	-1	1	21	179	199	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGCUUUCUCUGA	Cleavage
gma-miR1513a-5p	Glyma.17G017600.1	-1	1	21	254	274	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGCUUUCUCACA	Cleavage
gma-miR1513a-5p	Glyma.08G251800.1	-1	1	21	89	109	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGCUUUCUAUCA	Cleavage
gma-miR1513a-5p	Glyma.06G197200.1	-1	1	21	86	106	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGCUUUCCCUCA	Cleavage
gma-miR1513a-5p	Glyma.16G202900.1	-1	1	21	107	127	UGAGAGAAAGCCAUGACUUAC	GUAAGUUAUGGUUUUCUCUUA	Cleavage
gma-miR1513a-5p	Glyma.16G203000.1	-1	1	21	98	118	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGUUUUUUCUUA	Cleavage
gma-miR1513a-5p	Glyma.16G202800.1	-1	1	21	65	85	UGAGAGAAAGCCAUGACUUAC	GUAAGUUAUGGUUUUCUCUUA	Cleavage

gma-miR1513a-5p	Glyma.06G197100.1	-1	1	21	92	112	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGCUUUCUCUAA	Cleavage
gma-miR1513a-5p	Glyma.17G018300.1	-1	1	21	125	145	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGCUUUCUCACA	Cleavage
gma-miR1513a-5p	Glyma.08G251600.1	-1	1	21	121	141	UGAGAGAAAGCCAUGACUUAC	GUAAGACAUGGCUUUCUCUUA	Cleavage
gma-miR1513a-5p	Glyma.08G252200.1	-1	1	21	161	181	UGAGAGAAAGCCAUGACUUAC	GUAAGGCAUGGCUUUCUCUUA	Cleavage
gma-miR1513a-5p	Glyma.07G255600.1	-1	1	21	231	251	UGAGAGAAAGCCAUGACUUAC	CUAAGUCAUGGCUUUCUCACA	Cleavage
gma-miR1513b	Glyma.17G018300.1	-1	1	21	125	145	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGCUUUCUCACA	Cleavage
gma-miR1513b	Glyma.06G197100.1	-1	1	21	92	112	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGCUUUCUCUAA	Cleavage
gma-miR1513b	Glyma.16G202800.1	-1	1	21	65	85	UGAGAGAAAGCCAUGACUUAC	GUAAGUUAUGGUUUUCUCUUA	Cleavage
gma-miR1513b	Glyma.16G203000.1	-1	1	21	98	118	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGUUUUUUCUUA	Cleavage
gma-miR1513b	Glyma.16G202900.1	-1	1	21	107	127	UGAGAGAAAGCCAUGACUUAC	GUAAGUUAUGGUUUUCUCUUA	Cleavage
gma-miR1513b	Glyma.06G197200.1	-1	1	21	86	106	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGCUUUCCCUCA	Cleavage
gma-miR1513b	Glyma.08G251800.1	-1	1	21	89	109	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGCUUUCUAUCA	Cleavage
gma-miR1513b	Glyma.17G017600.1	-1	1	21	254	274	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGCUUUCUCACA	Cleavage
gma-miR1513b	Glyma.08G252300.3	-1	1	21	179	199	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGCUUUCUCUGA	Cleavage
gma-miR1513b	Glyma.08G252300.2	-1	1	21	179	199	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGCUUUCUCUGA	Cleavage
gma-miR1513b	Glyma.08G252300.1	-1	1	21	183	203	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGCUUUCUCUGA	Cleavage
gma-miR1513b	Glyma.08G252200.1	-1	1	21	161	181	UGAGAGAAAGCCAUGACUUAC	GUAAGGCAUGGCUUUCUCUUA	Cleavage
gma-miR1513b	Glyma.08G251600.1	-1	1	21	121	141	UGAGAGAAAGCCAUGACUUAC	GUAAGACAUGGCUUUCUCUUA	Cleavage
gma-miR1513b	Glyma.07G255600.1	-1	1	21	231	251	UGAGAGAAAGCCAUGACUUAC	CUAAGUCAUGGCUUUCUCACA	Cleavage
gma-miR1514b-5p	Glyma.07G048000.2	-1	1	21	874	894	UUCAUUUUUAAAAUAGACAUU	AAUGCCUAUUUUAGAAAUGAA	Cleavage
gma-miR1514b-5p	Glyma.07G048100.1	-1	1	21	839	859	UUCAUUUUUAAAAUAGACAUU	AAUGCCUAUUUUAGAAAUGAA	Cleavage
gma-miR1514b-5p	Glyma.07G048000.1	-1	1	21	874	894	UUCAUUUUUAAAAUAGACAUU	AAUGCCUAUUUUAGAAAUGAA	Cleavage
gma-miR1514b-5p	Glyma.16G016700.1	-1	1	21	851	871	UUCAUUUUUAAAAUAGACAUU	AAUGCCUAUUUUAGAAAUGAA	Cleavage
gma-miR1514b-5p	Glyma.16G016600.1	-1	1	21	834	854	UUCAUUUUUAAAAUAGACAUU	AAUGCCUAUUUUAGAAAUGAA	Cleavage
gma-miR1514b-5p	Glyma.15G245800.1	-1	1	21	3360	3380	UUCAUUUUUAAAAUAGACAUU	UUUGUCUAUUUUAGAAAUGAU	Cleavage
gma-miR1514b-5p	Glyma.13G261000.1	-1	1	21	3354	3374	UUCAUUUUUAAAAUAGACAUU	UUUGUCUAUUUUAGAAAUGAU	Cleavage
gma-miR1533	Glyma.09G168000.1	-1	1	19	84	102	AUAAUAAAAAUAAUAAUGA	AUAUUAUUAUUUUUAUUAU	Cleavage
gma-miR1533	Glyma.09G168000.2	-1	1	19	84	102	AUAAUAAAAAUAAUAAUGA	AUAUUAUUAUUUUUAUUAU	Cleavage
gma-miR1533	Glyma.14G128900.1	-1	1	19	248	266	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUUUUAUUAA	Cleavage
gma-miR1533	Glyma.U038900.2	-1	1	19	1348	1366	AUAAUAAAAAUAAUAAUGA	ACAUUGUUAUUUUUAUUAU	Cleavage
gma-miR1533	Glyma.U038900.1	-1	1	19	1326	1344	AUAAUAAAAAUAAUAAUGA	ACAUUGUUAUUUUUAUUAU	Cleavage
gma-miR1533	Glyma.04G003200.1	-1	1	19	1076	1094	AUAAUAAAAAUAAUAAUGA	ACAUUAUUGUUUUUAUUAU	Cleavage

gma-miR1533	Glyma.04G231700.3	-1	1	19	1413	1431	AUAAUAAAAAUAAUAAUGA	UCAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.09G074300.2	-1	1	19	3683	3701	AUAAUAAAAAUAAUAAUGA	UCAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.09G074300.1	-1	1	19	2969	2987	AUAAUAAAAAUAAUAAUGA	UCAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.11G212700.1	-1	1	19	153	171	AUAAUAAAAAUAAUAAUGA	UCAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.U016300.4	-1	1	19	923	941	AUAAUAAAAAUAAUAAUGA	UCAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.02G129100.1	-1	1	19	31	49	AUAAUAAAAAUAAUAAUGA	UCAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.03G069600.1	-1	1	19	1388	1406	AUAAUAAAAAUAAUAAUGA	UCAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.U019900.1	-1	1	19	46	64	AUAAUAAAAAUAAUAAUGA	UCAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.03G166900.1	-1	1	19	1355	1373	AUAAUAAAAAUAAUAAUGA	UCAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.03G069600.2	-1	1	19	1163	1181	AUAAUAAAAAUAAUAAUGA	UCAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G153700.1	-1	1	19	1312	1330	AUAAUAAAAAUAAUAAUGA	UCAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.01G017100.1	-1	1	19	1209	1227	AUAAUAAAAAUAAUAAUGA	UCAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.17G132500.1	-1	1	19	1051	1069	AUAAUAAAAAUAAUAAUGA	UCAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.19G106400.1	-1	1	19	187	205	AUAAUAAAAAUAAUAAUGA	UCAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.15G192000.1	-1	1	19	41	59	AUAAUAAAAAUAAUAAUGA	UCAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.13G124800.1	-1	1	19	2485	2503	AUAAUAAAAAUAAUAAUGA	UUAAUAUUAUUUUUAUUAU	Cleavage
gma-miR1533	Glyma.13G124800.6	-1	1	19	2355	2373	AUAAUAAAAAUAAUAAUGA	UUAAUAUUAUUUUUAUUAU	Cleavage
gma-miR1533	Glyma.02G280000.1	-1	1	19	1071	1089	AUAAUAAAAAUAAUAAUGA	UUAUUUUUAUUUUUAUUAU	Cleavage
gma-miR169l-3p	Glyma.03G120200.1	-1	1	22	1202	1223	CGGGCAAGUUGUUUUUGGCUACCCCG	UCAGACAAAAGCAACUUG	Cleavage
gma-miR169l-3p	Glyma.03G120200.2	-1	1	22	1260	1281	CGGGCAAGUUGUUUUUGGCUACCCCG	UCAGACAAAAGCAACUUG	Cleavage
gma-miR4378b	Glyma.14G124500.1	-1	1	24	1883	1906	UAGAACUGUCUUAGAAUGUGCUACUUUUU	UUACAACAUUCUAAGACAG	Cleavage
gma-miR4378b	Glyma.13G226300.1	-1	1	24	2027	2050	UAGAACUGUCUUAGAAUGUGCUACUUUUA	AUUUUAUAUUUUAAGACAG	Cleavage
gma-miR6299	Glyma.06G085600.1	-1	1	22	274	295	AUUUAAAAUUAUUGAUUUGUCAAAAU	UCAAAAAUCAAUGAUUUU	Cleavage
gma-miR6299	Glyma.06G201900.1	-1	1	22	76	97	AUUUAAAAUUAUUGAUUUGUCAAGAU	GCCCCAAUCAAUAAUUUU	Cleavage
gma-miR9722	Glyma.11G195900.2	-1	1	21	30	50	UAAUAGAGGGAAGAAGAUGAAAUUG	CUAAUCUUCUUCCCUCU	Cleavage
gma-miR9722	Glyma.11G195900.3	-1	1	21	26	46	UAAUAGAGGGAAGAAGAUGAAAUUG	CUAAUCUUCUUCCCUCU	Cleavage

gma-miR9722	Glyma.18G270800.1	-1	1	21	289	309	UAAUAGAGGGAAGAAGAUGAAGUUG	GCCAUCUUCUUCCUUCU	Cleavage
gma-miR10200	Glyma.13G228900.1	-1	1	21	1737	1757	AGGUUUUAAAGAAAUUAAAUG	UAUAUAGUUUUUUUAAAACCU	Cleavage
gma-miR10200	Glyma.05G123300.3	-1	1	21	1546	1566	AGGUUUUAAAGAAAUUAAAUG	AUUUUUAUUUUUUUAAAAUCU	Cleavage
gma-miR10200	Glyma.05G123300.2	-1	1	21	1619	1639	AGGUUUUAAAGAAAUUAAAUG	AUUUUUAUUUUUUUAAAAUCU	Cleavage
gma-miR10200	Glyma.05G123300.1	-1	1	21	2084	2104	AGGUUUUAAAGAAAUUAAAUG	AUUUUUAUUUUUUUAAAAUCU	Cleavage
gma-miR10407a	Glyma.05G202500.1	-1	1	24	63	86	AGUUAACGGAUGAAUGAAUUUGUCUAAUC	CAUUGAUUCAUUCAUUCGU	Cleavage
gma-miR10407a	Glyma.04G119900.1	-1	1	24	398	421	AGUUAACGGAUGAAUGAAUUUGUCAAUC	UUUUUAUUCAUUCAUUCGUU	Cleavage
gma-miR10407b	Glyma.05G202500.1	-1	1	24	63	86	AGUUAACGGAUGAAUGAAUUUGUCAAUC	CAUUGAUUCAUUCAUUCGUU	Cleavage
gma-miR10407b	Glyma.04G119900.1	-1	1	24	398	421	AGUUAACGGAUGAAUGAAUUUGUCAAUC	UUUUUAUUCAUUCAUUCGUU	Cleavage
gma-miR1513a-5p	Glyma.17G162200.1	-1	1	21	86	106	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGCUUUUUCUAA	Cleavage
gma-miR1513a-5p	Glyma.06G016300.1	-1	1	21	98	118	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGCUUUCUUUAA	Cleavage
gma-miR1513a-5p	Glyma.17G021300.1	-1	1	21	664	684	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGCUUUCCUUCA	Cleavage
gma-miR1513a-5p	Glyma.18G274900.1	-1	1	21	134	154	UGAGAGAAAGCCAUGACUUAC	GUAAAUCAUGGUUUUCUCUUA	Cleavage
gma-miR1513a-5p	Glyma.08G098000.1	-1	1	21	186	206	UGAGAGAAAGCCAUGACUUAC	GCAAGUCAUGGCUUUUUCUGA	Cleavage
gma-miR1513a-5p	Glyma.08G098000.2	-1	1	21	216	236	UGAGAGAAAGCCAUGACUUAC	GCAAGUCAUGGCUUUUUCUGA	Cleavage
gma-miR1513a-5p	Glyma.08G098000.3	-1	1	21	186	206	UGAGAGAAAGCCAUGACUUAC	GCAAGUCAUGGCUUUUUCUGA	Cleavage
gma-miR1513a-5p	Glyma.10G132100.1	-1	1	21	92	112	UGAGAGAAAGCCAUGACUUAC	GCAAGUCAUGGCUUUUUCUAA	Cleavage
gma-miR1513b	Glyma.17G021300.1	-1	1	21	664	684	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGCUUUCCUUCA	Cleavage
gma-miR1513b	Glyma.06G016300.1	-1	1	21	98	118	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGCUUUCUUUAA	Cleavage
gma-miR1513b	Glyma.17G162200.1	-1	1	21	86	106	UGAGAGAAAGCCAUGACUUAC	GUAAGUCAUGGCUUUUUCUAA	Cleavage
gma-miR1513b	Glyma.18G274900.1	-1	1	21	134	154	UGAGAGAAAGCCAUGACUUAC	GUAAAUCAUGGUUUUCUCUUA	Cleavage
gma-miR1513b	Glyma.10G132100.1	-1	1	21	92	112	UGAGAGAAAGCCAUGACUUAC	GCAAGUCAUGGCUUUUUCUAA	Cleavage
gma-miR1513b	Glyma.08G098000.3	-1	1	21	186	206	UGAGAGAAAGCCAUGACUUAC	GCAAGUCAUGGCUUUUUCUGA	Cleavage
gma-miR1513b	Glyma.08G098000.2	-1	1	21	216	236	UGAGAGAAAGCCAUGACUUAC	GCAAGUCAUGGCUUUUUCUGA	Cleavage
gma-miR1513b	Glyma.08G098000.1	-1	1	21	186	206	UGAGAGAAAGCCAUGACUUAC	GCAAGUCAUGGCUUUUUCUGA	Cleavage
gma-miR1514a-5p	Glyma.15G245800.1	-1	1	21	3360	3380	UUCAUUUUUAAAAUAGGCAUU	UUUGUCUAUUUUAGAAAUGAU	Cleavage
gma-miR1514a-5p	Glyma.13G261000.1	-1	1	21	3354	3374	UUCAUUUUUAAAAUAGGCAUU	UUUGUCUAUUUUAGAAAUGAU	Cleavage
gma-miR1514a-5p	Glyma.15G226100.1	-1	1	21	3381	3401	UUCAUUUUUAAAAUAGGCAUU	AUUGCAUAUUUUAAAAGUGGA	Cleavage

gma-miR1514b-5p	Glyma.06G182700.1	-1	1	21	1238	1258	UUCAUUUUUAAAAUAGACAUU	UAAGUAUAUUUUAAAAAUGAA	Cleavage
gma-miR1514b-5p	Glyma.11G246800.1	-1	1	21	160	179	UUCAUUUUUAAAAUAGACAUU	AUUGUC-AUUUUAAAAAUGAA	Cleavage
gma-miR1533	Glyma.09G074300.2	-1	1	19	3704	3722	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.09G074300.1	-1	1	19	2990	3008	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.U016300.4	-1	1	19	944	962	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.U016300.4	-1	1	19	965	983	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.05G148100.1	-1	1	19	579	597	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUUUUAUUGA	Cleavage
gma-miR1533	Glyma.01G216000.1	-1	1	19	7796	7814	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.01G216000.1	-1	1	19	7817	7835	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.19G037200.1	-1	1	19	138	156	AUAAUAAAAAUAAUAAUGA	UCAUUAUUGUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.19G037200.2	-1	1	19	122	140	AUAAUAAAAAUAAUAAUGA	UCAUUAUUGUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.11G109800.1	-1	1	19	262	280	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.11G109800.4	-1	1	19	262	280	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.11G109800.3	-1	1	19	262	280	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.08G268900.1	-1	1	19	368	386	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.09G228100.1	-1	1	19	182	200	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.09G101100.1	-1	1	19	4585	4603	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.09G101100.1	-1	1	19	4606	4624	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.09G101100.1	-1	1	19	4627	4645	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.09G101100.1	-1	1	19	4648	4666	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.09G228100.2	-1	1	19	182	200	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.17G197300.1	-1	1	19	3839	3857	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.17G197300.1	-1	1	19	3860	3878	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.11G251500.1	-1	1	19	1892	1910	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.17G197300.2	-1	1	19	3714	3732	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.17G197300.2	-1	1	19	3735	3753	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.07G233500.1	-1	1	19	3542	3560	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.13G073500.6	-1	1	19	37	55	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.13G073500.6	-1	1	19	58	76	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.13G287000.2	-1	1	19	3979	3997	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.11G251500.8	-1	1	19	1709	1727	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.06G267000.1	-1	1	19	234	252	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage

gma-miR1533	Glyma.11G251500.5	-1	1	19	1709	1727	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.11G251500.11	-1	1	19	1709	1727	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.12G136000.1	-1	1	19	236	254	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.11G251500.9	-1	1	19	1709	1727	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.11G251500.6	-1	1	19	1709	1727	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.13G287000.1	-1	1	19	3806	3824	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.11G251500.16	-1	1	19	1892	1910	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.13G114600.3	-1	1	19	3524	3542	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.13G114600.2	-1	1	19	3521	3539	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.13G114600.1	-1	1	19	3533	3551	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.13G114600.4	-1	1	19	3530	3548	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G217800.1	-1	1	19	3652	3670	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.06G056400.1	-1	1	19	329	347	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.06G056400.3	-1	1	19	329	347	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.04G125500.1	-1	1	19	2785	2803	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.04G125500.1	-1	1	19	2806	2824	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.04G125500.1	-1	1	19	2827	2845	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.18G225800.1	-1	1	19	2881	2899	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.20G014300.1	-1	1	19	2935	2953	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.20G014300.1	-1	1	19	2956	2974	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.13G032500.3	-1	1	19	214	232	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.13G032500.3	-1	1	19	235	253	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.13G032500.2	-1	1	19	214	232	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.13G032500.2	-1	1	19	235	253	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.20G014300.2	-1	1	19	2929	2947	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.20G014300.2	-1	1	19	2950	2968	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.13G032500.5	-1	1	19	214	232	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.13G032500.5	-1	1	19	235	253	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.13G032500.4	-1	1	19	214	232	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.13G032500.4	-1	1	19	235	253	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.08G183400.1	-1	1	19	178	196	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.06G056400.2	-1	1	19	329	347	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage

gma-miR1533	Glyma.12G019400.1	-1	1	19	2793	2811	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.10G243900.2	-1	1	19	2519	2537	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUUUUAUGAU	Cleavage
gma-miR1533	Glyma.18G225800.2	-1	1	19	2821	2839	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.13G032500.1	-1	1	19	146	164	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.13G032500.1	-1	1	19	167	185	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.13G032500.8	-1	1	19	146	164	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.13G032500.8	-1	1	19	167	185	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.08G183400.8	-1	1	19	178	196	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.08G183400.6	-1	1	19	178	196	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G116000.1	-1	1	19	261	279	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G116000.1	-1	1	19	282	300	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.08G183400.2	-1	1	19	178	196	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G179900.1	-1	1	19	2721	2739	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.08G183400.10	-1	1	19	178	196	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.18G225800.3	-1	1	19	2751	2769	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.13G032500.7	-1	1	19	169	187	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.13G032500.7	-1	1	19	190	208	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.13G032500.6	-1	1	19	169	187	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.13G032500.6	-1	1	19	190	208	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.08G183400.9	-1	1	19	178	196	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.08G183400.5	-1	1	19	178	196	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.08G183400.7	-1	1	19	178	196	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.08G183400.4	-1	1	19	178	196	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.08G183400.3	-1	1	19	178	196	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.09G195100.2	-1	1	19	193	211	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUUUUACUAU	Cleavage
gma-miR1533	Glyma.06G230400.1	-1	1	19	2998	3016	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.09G085200.1	-1	1	19	70	88	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.08G167300.1	-1	1	19	2114	2132	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.09G195100.1	-1	1	19	193	211	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUUUUACUAU	Cleavage
gma-miR1533	Glyma.07G130500.1	-1	1	19	206	224	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUAUUUAUUAU	Cleavage
gma-miR1533	Glyma.04G173100.1	-1	1	19	194	212	AUAAUAAAAAUAAUAAUGA	UUGUUGUUGUUUUUAUUAU	Cleavage
gma-miR1533	Glyma.13G274500.1	-1	1	19	2797	2815	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage

gma-miR1533	Glyma.13G274500.1	-1	1	19	2818	2836	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.12G103900.2	-1	1	19	25	43	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.17G051300.1	-1	1	19	2815	2833	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.20G047800.5	-1	1	19	112	130	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.15G269600.2	-1	1	19	2618	2636	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.15G145200.1	-1	1	19	130	148	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.15G145200.1	-1	1	19	151	169	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.12G166500.1	-1	1	19	411	429	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.15G213600.1	-1	1	19	2876	2894	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.15G145200.3	-1	1	19	130	148	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.15G145200.3	-1	1	19	151	169	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G217800.2	-1	1	19	2887	2905	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.08G299900.1	-1	1	19	217	235	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.04G173100.2	-1	1	19	194	212	AUAAUAAAAAUAAUAAUGA	UUGUUGUUGUUUUUAUUAU	Cleavage
gma-miR1533	Glyma.09G134700.1	-1	1	19	2523	2541	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.09G134700.1	-1	1	19	2555	2573	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.15G269600.1	-1	1	19	2517	2535	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.09G092700.1	-1	1	19	52	70	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.09G092700.1	-1	1	19	73	91	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.09G092700.1	-1	1	19	94	112	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.10G158800.1	-1	1	19	554	572	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.02G039400.1	-1	1	19	118	136	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.15G213600.2	-1	1	19	2696	2714	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.02G237000.1	-1	1	19	30	48	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.08G044000.2	-1	1	19	1730	1748	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.08G316500.1	-1	1	19	503	521	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.04G117400.1	-1	1	19	2611	2629	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.13G274500.2	-1	1	19	2441	2459	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.13G274500.2	-1	1	19	2462	2480	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G017100.1	-1	1	19	2601	2619	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.02G297000.1	-1	1	19	194	212	AUAAUAAAAAUAAUAAUGA	UUAUUAUUCUUUUUAUUAU	ranslation
gma-miR1533	Glyma.04G117400.4	-1	1	19	2578	2596	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage

gma-miR1533	Glyma.04G117400.3	-1	1	19	2575	2593	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G005700.3	-1	1	19	2375	2393	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G005700.3	-1	1	19	2396	2414	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.07G107700.1	-1	1	19	2531	2549	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.04G117400.5	-1	1	19	2543	2561	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G005700.2	-1	1	19	2363	2381	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G005700.2	-1	1	19	2384	2402	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.04G117400.2	-1	1	19	2542	2560	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.10G294800.2	-1	1	19	1160	1178	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G005700.8	-1	1	19	2360	2378	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G005700.8	-1	1	19	2381	2399	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G005700.7	-1	1	19	2359	2377	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G005700.7	-1	1	19	2380	2398	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.15G145200.2	-1	1	19	130	148	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.15G145200.2	-1	1	19	151	169	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G005700.6	-1	1	19	2348	2366	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G005700.6	-1	1	19	2369	2387	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.19G098600.2	-1	1	19	192	210	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.14G189100.1	-1	1	19	2394	2412	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUGUUAUUAU	Cleavage
gma-miR1533	Glyma.11G251500.19	-1	1	19	172	190	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.06G134200.1	-1	1	19	2084	2102	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUGUUAUUAU	Cleavage
gma-miR1533	Glyma.06G134200.1	-1	1	19	2114	2132	AUAAUAAAAAUAAUAAUGA	UCGUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.10G294800.6	-1	1	19	1160	1178	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G005700.5	-1	1	19	2272	2290	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G005700.5	-1	1	19	2293	2311	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G005700.4	-1	1	19	2260	2278	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G005700.4	-1	1	19	2281	2299	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.15G145200.4	-1	1	19	130	148	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.15G145200.4	-1	1	19	151	169	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.19G098600.1	-1	1	19	192	210	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G111400.1	-1	1	19	257	275	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.03G153300.1	-1	1	19	104	122	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage

gma-miR1533	Glyma.16G005700.1	-1	1	19	2210	2228	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G005700.1	-1	1	19	2231	2249	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G151100.1	-1	1	19	2391	2409	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUUUUUUUAU	Cleavage
gma-miR1533	Glyma.05G115700.1	-1	1	19	162	180	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.05G115700.1	-1	1	19	183	201	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.05G115700.1	-1	1	19	204	222	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G151100.2	-1	1	19	2377	2395	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUUUUUUUAU	Cleavage
gma-miR1533	Glyma.16G135000.1	-1	1	19	25	43	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G017100.3	-1	1	19	2367	2385	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.10G294800.4	-1	1	19	1160	1178	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.14G059200.2	-1	1	19	2117	2135	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G017100.2	-1	1	19	2361	2379	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.18G065200.1	-1	1	19	2035	2053	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.U019600.2	-1	1	19	2159	2177	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.17G016800.1	-1	1	19	2209	2227	AUAAUAAAAAUAAUAAUGA	UCAUUAUUAUUAUUGUUAU	Cleavage
gma-miR1533	Glyma.16G151100.3	-1	1	19	2349	2367	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUUUUUUUAU	Cleavage
gma-miR1533	Glyma.17G051300.2	-1	1	19	2182	2200	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.08G218700.1	-1	1	19	466	484	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.20G023500.1	-1	1	19	2222	2240	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.08G218700.2	-1	1	19	466	484	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.01G111900.1	-1	1	19	2232	2250	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.14G059200.1	-1	1	19	2034	2052	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G019500.1	-1	1	19	1601	1619	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G135000.6	-1	1	19	25	43	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.13G184500.1	-1	1	19	255	273	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G111400.2	-1	1	19	257	275	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.01G053600.1	-1	1	19	2131	2149	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.10G206600.1	-1	1	19	249	267	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.10G206600.2	-1	1	19	249	267	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.20G023500.3	-1	1	19	2167	2185	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.14G116000.1	-1	1	19	1181	1199	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.14G059900.1	-1	1	19	1873	1891	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage

gma-miR1533	Glyma.18G077500.1	-1	1	19	1643	1661	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.04G228700.1	-1	1	19	427	445	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.20G023500.2	-1	1	19	2140	2158	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.U021800.3	-1	1	19	1854	1872	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUUUUAUUUU	Cleavage
gma-miR1533	Glyma.13G184500.2	-1	1	19	255	273	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G046600.2	-1	1	19	55	73	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.12G212000.3	-1	1	19	13	31	AUAAUAAAAAUAAUAAUGA	UUAUUAUUGUUUUUGUUGU	Cleavage
gma-miR1533	Glyma.03G009100.8	-1	1	19	68	86	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.09G197900.1	-1	1	19	239	257	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G017100.4	-1	1	19	2160	2178	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.03G260600.1	-1	1	19	2033	2051	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.05G168200.1	-1	1	19	168	186	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.14G059900.2	-1	1	19	1758	1776	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G046600.3	-1	1	19	10	28	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.09G098300.1	-1	1	19	1990	2008	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.08G035300.3	-1	1	19	90	108	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUGUUAUUAU	Cleavage
gma-miR1533	Glyma.U021800.1	-1	1	19	1714	1732	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUUUUAUUUU	Cleavage
gma-miR1533	Glyma.11G223000.1	-1	1	19	40	58	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR1533	Glyma.16G020900.1	-1	1	19	1024	1042	AUAAUAAAAAUAAUAAUGA	UUAUUAUUAUUAUUAUUAU	Cleavage
gma-miR169l-3p	Glyma.04G191800.2	-1	1	22	271	292	CGGGCAAGUUGUUUUUGGCUAC	CGAGUCAAAAACAACUGGCCCG	Cleavage
gma-miR169l-3p	Glyma.04G191800.1	-1	1	22	271	292	CGGGCAAGUUGUUUUUGGCUAC	CGAGUCAAAAACAACUGGCCCG	Cleavage
gma-miR169l-3p	Glyma.10G263200.1	-1	1	22	608	629	CGGGCAAGUUGUUUUUGGCUAC	CUCGCUGAAAACAACUUGUUCG	Cleavage
gma-miR4378b	Glyma.14G124500.1	-1	1	24	1926	1949	UAGAACUGUCUUAGAAUGUGCUAC	GGGUCACAUUCUAAGACGAUUCUA	Cleavage
gma-miR4378b	Glyma.15G159400.1	-1	1	24	1250	1273	UAGAACUGUCUUAGAAUGUGCUAC	ACGUGAUAUUCUAAGGCAGUUCUC	Cleavage
gma-miR6299	Glyma.14G077900.1	-1	1	22	31	52	AUUUAAAAUUAUUGAUUUGUCA	AACCAGGUCAAUAAUUUUAAAA	Cleavage
gma-miR6299	Glyma.06G116300.2	-1	1	22	1270	1291	AUUUAAAAUUAUUGAUUUGUCA	UAUUAAAUCAAUAAUUUUAUAU	Cleavage
gma-miR6299	Glyma.06G116300.1	-1	1	22	1338	1359	AUUUAAAAUUAUUGAUUUGUCA	UAUUAAAUCAAUAAUUUUAUAU	Cleavage
gma-miR6299	Glyma.18G140200.1	-1	1	22	706	727	AUUUAAAAUUAUUGAUUUGUCA	CACAAAACCAAUAAUUUUAAAU	Cleavage
gma-miR9722	Glyma.04G017900.1	-1	1	21	294	314	UAAUAGAGGGAAGAAGAUGAA	AUCUUCUUCUUCUCUCUGUUA	Cleavage
gma-miR9722	Glyma.04G017900.3	-1	1	21	294	314	UAAUAGAGGGAAGAAGAUGAA	AUCUUCUUCUUCUCUCUGUUA	Cleavage

gma-miR9722	Glyma.11G085500.1	-1	1	21	307	327	UAAUAGAGGGAAGAAGAUGAA	CUCAUUCUCUUCCUUCUAUUA	Cleavage
gma-miR9722	Glyma.05G127800.1	-1	1	21	20	40	UAAUAGAGGGAAGAAGAUGAA	GGCAUUUUCUUCCUUCUAUUU	Cleavage
gma-miR9722	Glyma.12G001300.2	-1	1	21	56	76	UAAUAGAGGGAAGAAGAUGAA	UACUUUUUCUUUCCUCUAUUA	Cleavage
gma-miR9722	Glyma.13G346300.1	-1	1	21	152	172	UAAUAGAGGGAAGAAGAUGAA	AACCUCUUCUUCUCUCUGUUA	Cleavage
gma-miR9722	Glyma.13G346300.3	-1	1	21	157	177	UAAUAGAGGGAAGAAGAUGAA	AACCUCUUCUUCUCUCUGUUA	Cleavage
gma-miR9722	Glyma.13G346300.7	-1	1	21	152	172	UAAUAGAGGGAAGAAGAUGAA	AACCUCUUCUUCUCUCUGUUA	Cleavage
gma-miR9722	Glyma.13G346300.5	-1	1	21	152	172	UAAUAGAGGGAAGAAGAUGAA	AACCUCUUCUUCUCUCUGUUA	Cleavage
gma-miR9722	Glyma.13G346300.6	-1	1	21	152	172	UAAUAGAGGGAAGAAGAUGAA	AACCUCUUCUUCUCUCUGUUA	Cleavage
gma-miR9722	Glyma.13G346300.4	-1	1	21	156	176	UAAUAGAGGGAAGAAGAUGAA	AACCUCUUCUUCUCUCUGUUA	Cleavage
gma-miR9722	Glyma.13G346300.8	-1	1	21	152	172	UAAUAGAGGGAAGAAGAUGAA	AACCUCUUCUUCUCUCUGUUA	Cleavage
gma-miR9722	Glyma.13G346300.2	-1	1	21	157	177	UAAUAGAGGGAAGAAGAUGAA	AACCUCUUCUUCUCUCUGUUA	Cleavage