Supplementary information of https://doi.org/10.1631/jzus.B2400624

Materials and methods

Drosophila culture

Flies were kept on a standard diet at 25 °C under a 12-h light/12-h dark cycle (12L:12D), which consisted of 218.75 g cornmeal, 112.5 g molasses, 75 g yeast, 62.5 g glucose, and 62.5 g sucrose in 3 L of water. *Act5C*-GAL4 (BDSC#4414), *elav*-GAL4 (BDSC#458), and *ppl*-GAL4 (BDSC#58768) flies were obtained from the Bloomington *Drosophila* Stock Center (BDSC). To standardize the genetic background of flies, all were outcrossed with the *iso*^{31} (BDSC#5905) wild-type line for five generations.

Amplification of *mrjp* genes and construction of transgenic *Drosophila*

Total RNA was first extracted from the heads of local *Apis mellifera* using the TRIzol reagent (Vazyme, R401), and then, 1 μg was used for reverse transcription (Vazyme, R312). The *mrjp*1–9 genes were amplified using specific primers (Table 1) and cloned into the pUAST-attB vector after double digestion with *Xho*I and *Xba*I. The constructed plasmids, pUAST-attB-MRJPs, were microinjected into *Drosophila* line P{CaryP}attP2 (BDSC#25710) at the 68A4 site on chromosome III. Positive transgenic offspring were identified and confirmed through red eye marker screening. To standardize the genetic background, all flies were outcrossed with the *iso*^{31} wild-type line for five generations.

Table 1 Primers used for gene amplification

Name	Sequences (5'→3')
mrjp1-f	ccgCTCGAGATGACAAGATTGTTTATGCTGGTATG
mrjp1-r	gcTCTAGATTACAAATGGATTGAAATTTTGAAAG
mrjp2-f	ccgCTCGAGATGACAAGGTGGTTGTTCATG
mrjp2-r	gcTCTAGATTAATTATCATTCTGATTGTTATTCTTTTG
mrjp3-f	ccgCTCGAGATGACAAAGTGGTTGTTGCTG
mrjp3-r	gcTCTAGATTAATGTAATTTTGAAGAATGATGAACTT
mrjp4-f	ccgCTCGAGATGACAAAATGGTTGCTGTTG
mrjp4-r	gcTCTAGATTAATCGTTATTGTTATGCCGATT
mrjp5-f	ccgCTCGAGATGACAACTTGGTTGTTGCTG
mrjp5-r	gcTCTAGATTAATTATTATGCTTATTTTGATTGTTATTCTG
mrjp6-f	ccgCTCGAGATGACAAATTGGTTACTGCTGATAG
mrjp6-r	gcTCTAGACTAATCTAAATGAGCTTGATTCTTATATTTAT
mrjp7-f	ccgCTCGAGATGACAAGGTGGTTGTTTATGG
mrjp7-r	gcTCTAGACTAATTAAATGAAGCGTCTATTGTGAT
mrjp8-f	ccgCTCGAGATGATAAGATGGTTGCTGCTGATG
mrjp8-r	gcTCTAGATCActtatcgtcgtcatccttgtaatcAGGAGATATGCAACGAGTATTCTT
mrjp9-f	ccgCTCGAGATGTCTTTCAATATCTGGTGGTTG
mrjp9-r	gcTCTAGATCAAAGGAAAATTGAGAAAAAATTTG

f: forward; r: reverse.

RNA extraction and sequencing library preparation

Neuron-specific driven *elav*-GAL4 female flies overexpressing MRJPs or the mScarlet-i fluorescent protein as a control were raised at 25 ℃ for 7 d, after which the heads were collected, with 30 flies per group. Total RNA was extracted from the heads using the TRIzol reagent (Vazyme, R401) following the manufacturer's instructions. RNA quality was assessed using the 5300 Bioanalyzer (Agilent Technologies), and quantification was performed with the NanoDrop™ 2000 spectrophotometer (Thermo Scientific). RNA purification, reverse transcription, library construction, and sequencing were conducted at Majorbio Bio-Pharm Technology Co., Ltd. (Shanghai). For transcriptome library preparation, 1 μg of total RNA was processed using Illumina's TruSeq™ RNA Sample Preparation Kit (San Diego, CA). Briefly, mRNA was isolated via polyA selection with oligo(dT) beads, followed by fragmentation using a fragmentation buffer. Double-stranded cDNA was synthesized with the SuperScript Double-Stranded cDNA Synthesis Kit (Invitrogen, CA) using random hexamer primers (Illumina). The synthesized cDNA then underwent end repair, phosphorylation, and the addition of an "A" base while following Illumina's library construction protocol. Library size selection was performed on 2% Low-Range Ultra Agarose to obtain 300-bp cDNA target fragments, followed by 15 cycles of polymerase chain reaction (PCR) amplification with Phusion DNA Polymerase (NEB). Quantified by TBS380, the RNA-seq libraries were loaded onto the Illumina NovaSeq 6000 platform for paired-end sequencing.

Differential expression and functional enrichment analysis

To identify differentially expressed genes (DEGs) between the two groups, gene expression levels were calculated based on transcripts per million reads (TPMs). Gene abundance was quantified using RNA-sequencing (RNA-seq) by Expectation-Maximization (RSEM) (https://deweylab.biostat.wisc.edu/rsem), and differential expression analysis was performed with DESeq2 (Love et al., 2014). Gene Set Enrichment Analysis (GSEA) (Mootha et al., 2003; Subramanian et al., 2005) was conducted using R version 4.1.0, with all DEGs between the groups serving as input. The $\log_2$FoldChange value represented the degree of expression change between the groups and was used to create a gene list sorted by gene names and values in a descending order. The *Drosophila* gene sets were retrieved from the Molecular Signatures Database (MSigDB) using the "msigdbr" package. Enrichment analysis was then performed using the clusterProfiler package (Wu et al., 2021), a versatile tool for interpreting omics data. Weighted gene co-expression network analysis (WGCNA) (Langfelder and Horvath, 2008) was conducted using an online analysis tool provided by Majorbio Bio-Pharm Technology Co., Ltd. (Shanghai, China).

Biological validation experiments

To verify the effects of MRJP expression in different tissues on individual size variation, transgenic upstream activating sequence (UAS)-MRJP flies were crossed with different GAL4 driver lines: *Act5C*-GAL4 (all cells), *elav*-GAL4 (neuronal cells), and *ppl*-GAL4 (fat body cells). As controls, each GAL4 driver line was separately crossed with iso^{31} flies, and different UAS-*mrjp* lines were separately crossed with wild-type iso^{31} flies as another control. After eclosion, the female offspring were reared on standard food for seven days before being used for body size measurement.

Flies were anesthetized on a CO_2 pad and placed on their sides to position the head antennae, balancing organ, and tail tip within the field of view. Photos were taken with a microscopic imaging system set to a uniform focal length. A smooth curve was drawn to connect the antennae, balancing the organ and tail tip, allowing for pixel measurement along the curve to determine its length.

Statistical analysis

Statistical analysis was performed using GraphPad Prism 9 software for Windows (GraphPad Software, San Diego, CA, USA). The data was displayed as the mean±standard deviation (SD), and the figure was shown as a scatter dot plot. Normality was assumed using the Shapiro-Wilk test. Differences between groups were analyzed using ordinary one-way analysis of variance (ANOVA), followed by Dunnett's multiple comparisons test or Kruskal-Wallis test. A *P*-value of less than 0.05 was considered statistically significant.

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Fig. S1 Comparative analysis of genomic structures for different MRJPs.

The images are sourced from the NCBI database(https://www.ncbi.nlm.nih.gov/gene/). For each gene, the upper diagram represents the genomic scale, while the lower diagram shows the gene structure. Rectangular boxes indicate exons, and lines represent introns.

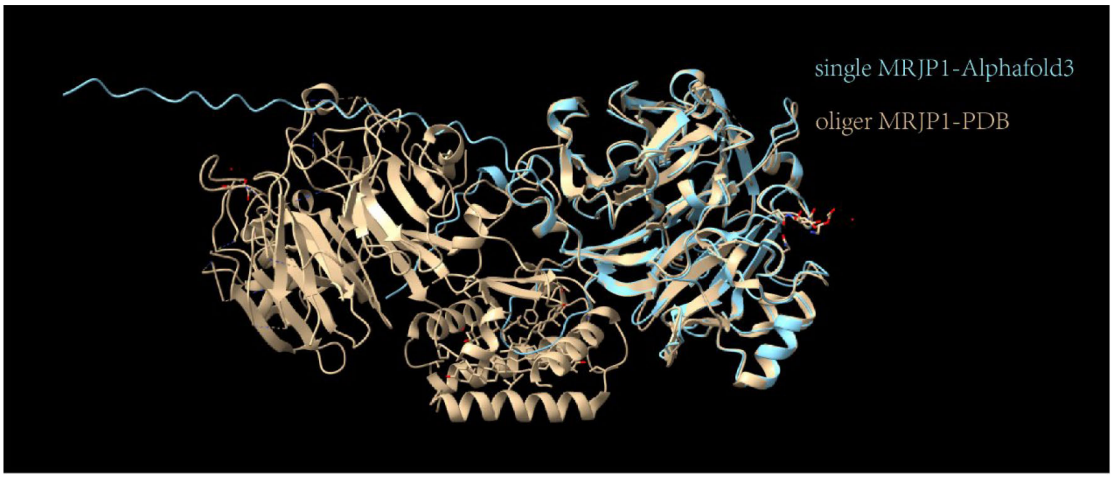

Fig. S2 Comparison of the tertiary structure of monomeric MRJP1 predicted by AlphaFold 3 with the reported tertiary structure of multimeric MRJP1.

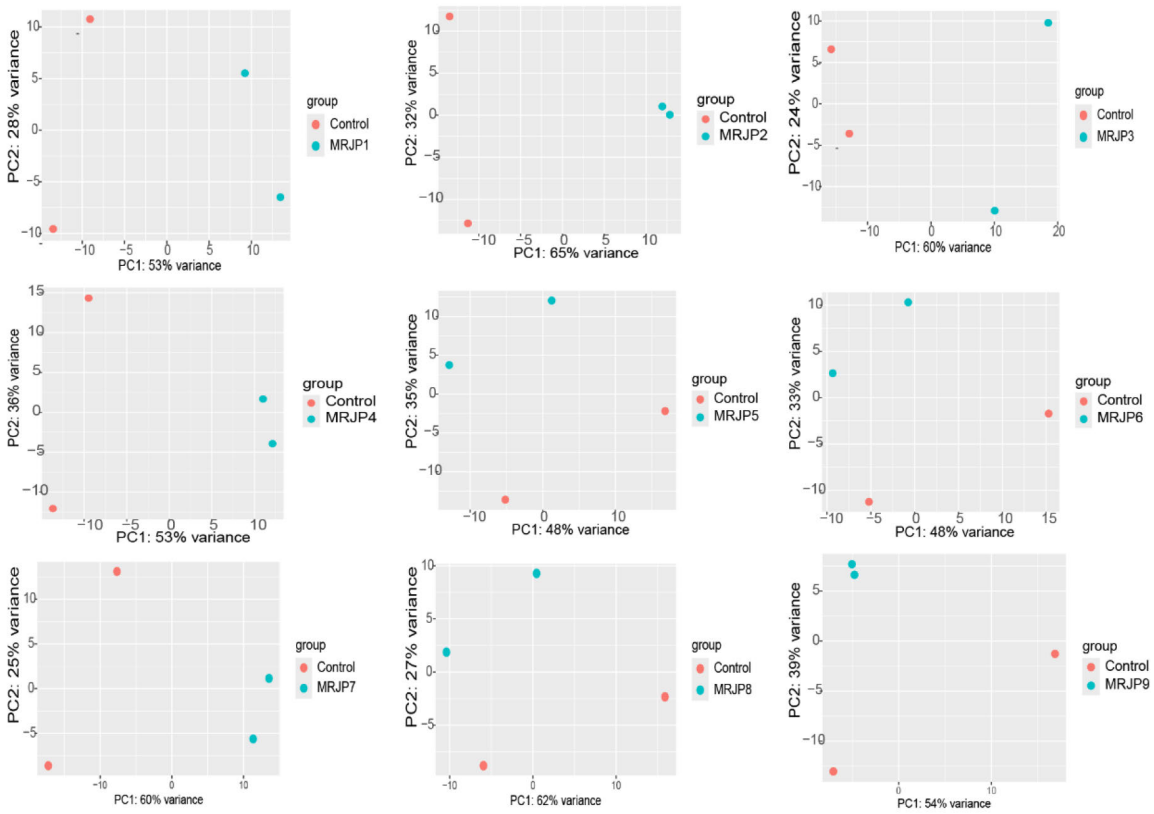

Fig. S3 Principal component analysis of transcriptomic data comparing overexpression of different MRJPs in the brain to the control group.

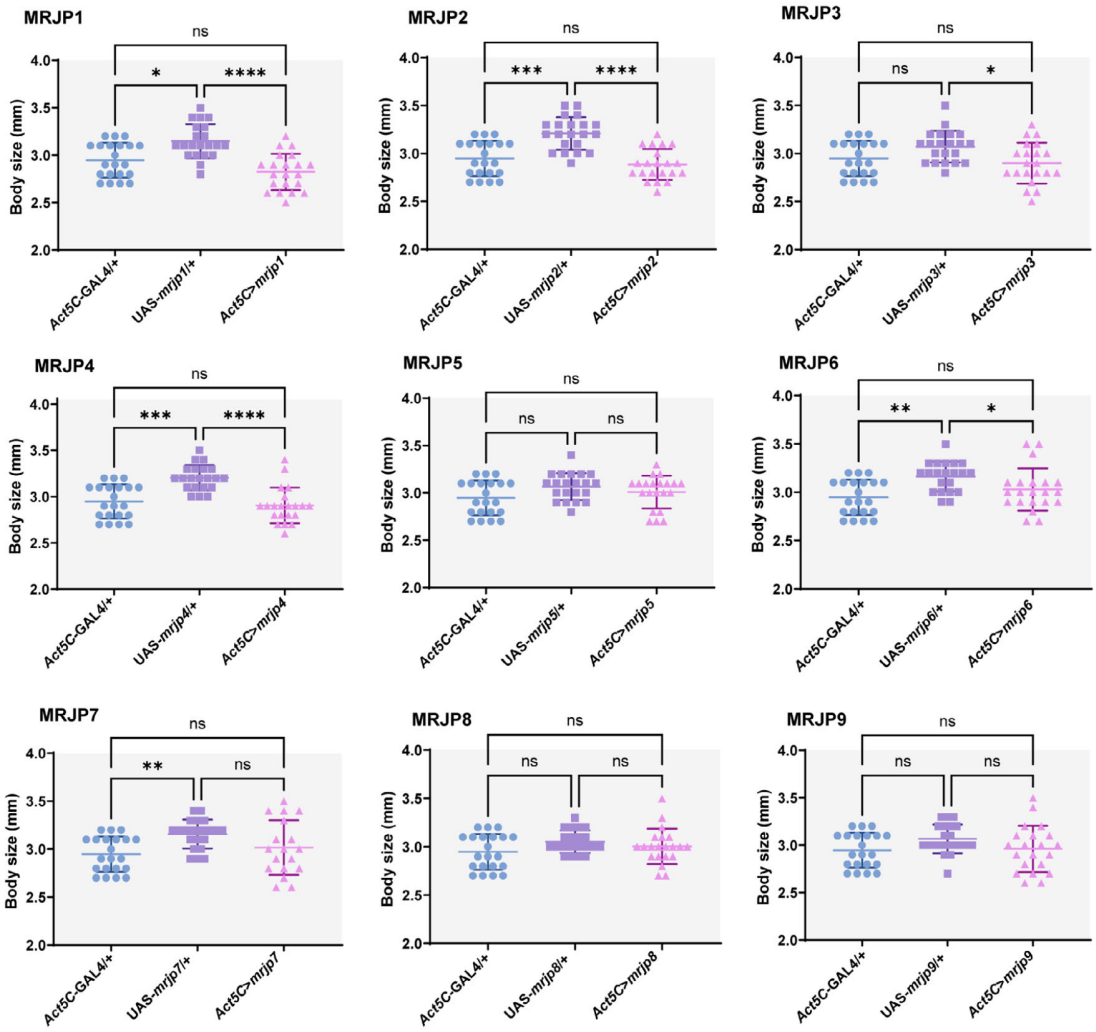

Fig. S4 Changes in body size of *Drosophila* following whole-body overexpression of different MRJPs.

Data are presented as mean±SD, with values displayed in scatter dot plots (n=18–21). *Act5c*-GAL4/+ represents the heterozygous control, and *Act5C>mrjps* indicates the experimental group in which UAS-*mrjps* expression is driven by the ubiquitous driver *Act5C*-GAL4. ns, no significance; $^{*}P$<0.05, $^{**}P$<0.01, $^{***}P$<0.001, and $^{****}P$<0.0001.

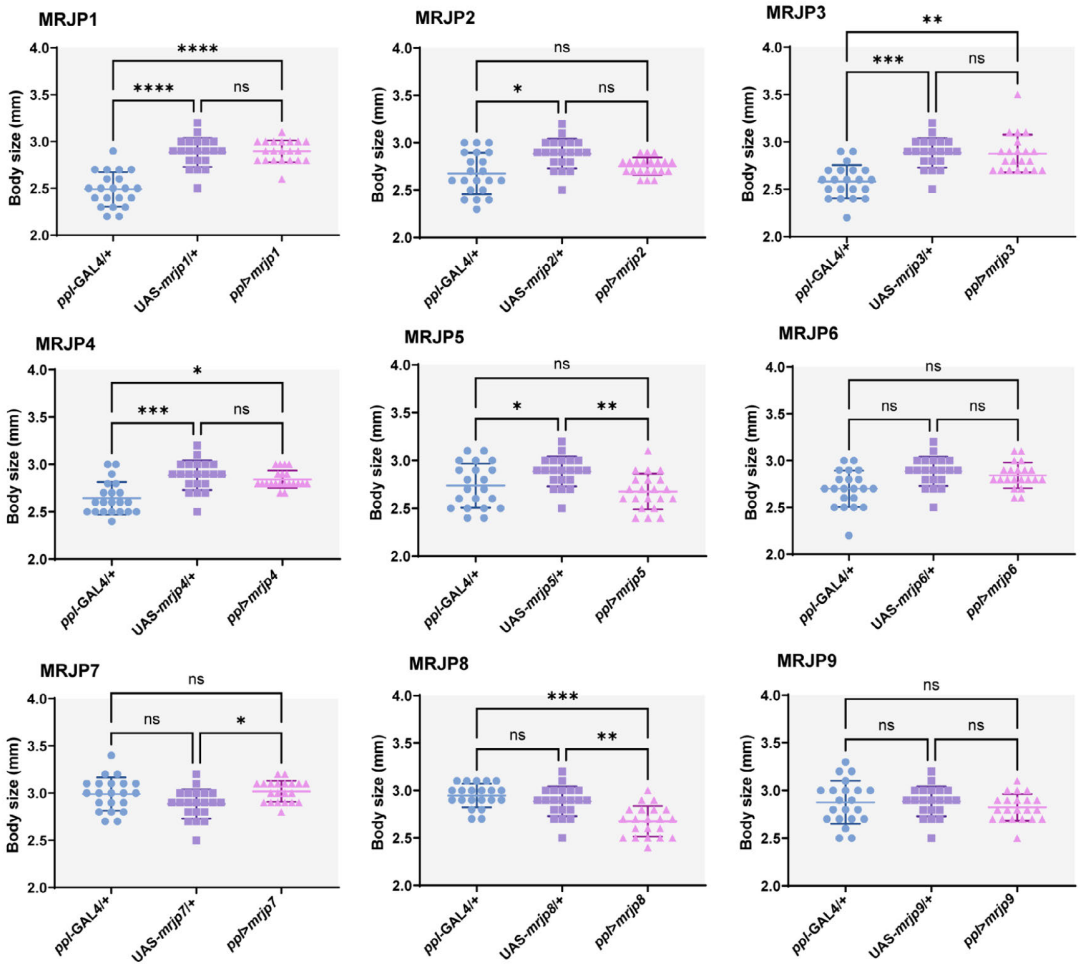

Fig. S5 Changes in body size of *Drosophila* following fat body overexpression of different MRJPs.

Data are presented as mean±SD, with values displayed in scatter dot plots (n=21). *ppl*-GAL4/+ represents the heterozygous control, and *ppl*>*mrjps* indicates the experimental group in which UAS-*mrjps* expression is driven by the fat body driver *ppl*-GAL4. ns, no significance; $^{*}P<0.05$, $^{**}P<0.01$, $^{***}P<0.001$, and $^{****}P<0.0001$.

Table S1 Gene and protein sequences of MRJPs

Name	Sequences (5'→3')
mrjp1	ATGACAAGATTGTTTATGCTGGTATGCCTTGGCATAGTTTGTCAAGGTACGACAGGCAACA TTCTTCGAGGAGAGTCTTTAAACAAATCATTACCCATCCTTCACGAATGGAAATTCTTTGAT TATGATTTCGGTAGCGATGAAAGAAGACAAGATGCAATTCTATCTGGCGAATACGACTACA AGAATAATTATCCATCCGACATTGACCAATGGCATGATAAGATTTTTGTCACCATGCTGAG ATACAATGGCGTACCTTCCTCTTTGAACGTGATATCTAAAAAGGTCGGTGATGGTGGTCCT CTTCTACAACCTTATCCCGATTGGTCGTTTGCTAAATATGACGATTGCTCTGGAATCGTGAG CGCCTCAAAACTTGCGATCGACAAATGCGACAGATTGTGGGTTCTGGACTCAGGTCTTGTC AATAATACTCAACCCATGTGTTCTCCAAAACTGCTCACCTTTGATCTGACTACCTCGCAATT GCTCAAGCAAGTTGAAATACCACATGATGTTGCCGTAAATGCCACTACAGGAAAGGGAAG ATTATCATCTCTAGCTGTTCAATCTTTAGATTGCAATACAAATAGCGATACTATGGTGTACA TAGCAGACGAGAAAGGTGAAGGTTTAATCGTGTATCATAATTCTGATGATTCCTTCCATCG ATTGACTTCCAACACTTTCGATTACGATCCTAAATTTACCAAAATGACGATCGATGGAGAA AGTTACACAGCCCAAGATGGAATTTCTGGAATGGCTCTTAGTCCCATGACTAACAATCTCT ATTACAGTCCTGTAGCTTCCACCAGTTTGTATTATGTTAACACGGAACAATTCAGAACATCC GATTATCAACAGAATGACATACATTACGAAGGAGTCCAAAATATTTTGGATACCCAATCGT CCGCTAAAGTAGTATCAAAGAGTGGCGTTCTCTTCTTCGGATTGGTGGGCGATTCAGCTCTT GGCTGCTGGAACGAACATCGAACACTTGAAAGACACAATATCCGTACCGTCGCTCAAAGT GATGAGACTCTTCAAATGATCGCTAGCATGAAGATTAAGGAAGCTCTTCCACACGTGCCTA TATTCGATAGGTATATAAACCGTGAATACATATTGGTTTTAAGTAACAAAATGCAAAAAAT GGTGAATAATGACTTCAACTTCGACGATGTTAACTTCAGAATTATGAACGCGAATGTAAAC GAATTGATATTGAACACTCGTTGCGAAAATCCCGATAATGATCGAACACCTTTCAAAATTT CAATCCATTTGTAA
MRJP1	MTRLFMLVCLGIVCQGTTGNILRGESLNKSLPILHEWKFFDYDFGSDERRQDAILSGEYDYKNN YPSDIDQWHDKIFVTMLRYNGVPSSLNVISKKVGDGGPLLQPYPDWSFAKYDDCSGIVSASKL AIDKCDRLWVLDSGLVNNTQPMCSPKLLTFDLTTSQLLKQVEIPHDVAVNATTGKGRLSSLAV QSLDCNTNSDTMVYIADEKGEGLIVYHNSDDSFHRLTSNTFDYDPKFTKMTIDGESYTAQDGIS GMALSPMTNNLYYSPVASTSLYYVNTEQFRTSDYQQNDIHYEGVQNILDTQSSAKVVSKSGVL FFGLVGDSALGCWNEHRTLERHNIRTVAQSDETLQMIASMKIKEALPHVPIFDRYINREYILVLS NKMQKMVNNDFNFDDVNFRIMNANVNELILNTRCENPDNDRTPFKISIHL
mrjp2	ATGACAAGGTGGTTGTTCATGGTGGCATGCCTCGGCATAGCTTGTCAAGGCGCCATTGTTC GAGAAAATTCTCCAAGAAACTTGGAAAAATCATTGAACGTAATTCACGAATGGAAGTATTT TGATTATGACTTCGGTAGCGAAGAAAGAAGACAAGCTGCGATTCAATCTGGCGAATATGA CCATACGAAAAATTATCCCTTCGACGTCGATCAATGGCGTGATAAGACTTTTGTCACCATA CTAAGATACGATGGTGTTCCTTCTACTTTGAACGTGATATCTGGTAAAACTGGTAAGGGTG GACGACTTTTAAAACCATATCCTGATTGGTCGTTTGCAGAGTTTAAAGATTGCTCTAAAATT GTGAGCGCTTTCAAAATTGCGATTGACAAATTCGACAGATTGTGGGTTTTGGATTCAGGTC TTGTCAATAGAACTGTACCTGTATGTGCTCCAAAGTTGCACGTCTTTGATCTGAAAACCTCA AATCACCTTAAGCAAATCGAGATACCGCATGATATTGCCGTGAATGCCACCACAGGAAAG GGAGGGCTAGTGTCTTTGGCTGTTCAAGCTATAGATCTTGCAAATACTTTAGTGTACATGGC AGACCATAAAGGTGATGCTTTAATCGTCTACCAAAATGCCGATGATTCCTTCCATCGATTG ACTTCCAACACTTTCGACTACGATCCCAGATATGCCAAAATGACGATCGATGGAGAAAGTT TCACACTGAAAAATGGAATTTGTGGAATGGCTCTTAGTCCCGTGACGAACAATCTTTATTA

	CAGTCCTCTCGCTTCTCACGGTTTGTATTATGTTAACACGGCACCATTTATGAAATCACAAT TTGGAGAAAATAACGTCCAATACCAAGGATCCGAAGATATTTTGAACACGCAATCATTGGC TAAAGCAGTATCGAAAAATGGCGTCCTCTTCGTCGGACTTGTAGGTAATTCAGCTGTTGGC TGCTGGAACGAGCATCAATCACTTCAGAGACAAAATTTAGAAATGGTCGCTCAAAATGAC AGAACACTTCAAATGATCGCAGGTATGAAAATTAAGGAAGAGCTTCCACATTTCGTAGGA AGCAACAAACCTGTAAAGGATGAATATATGTTAGTTTTAAGTAACAGAATGCAGAAAATA GTAAATGATGATTTTAATTTCGACGATGTAAACTTCCGAATTTTGGGTGCAAATGTAAAGG AATTAATAAGAAATACTCATTGCGTAAATAACAATCAGAATGATAACATTCAAAATACTAA CAATCAGAATGATAACAATCAGAAGAATAACAAGAAAAATGCTAACAATCAAAAGAATAA CAATCAGAATGATAATTAA
MRJP2	MTRWLFMVACLGIACQGAIVRENSPRNLEKSLNVIHEWKYFDYDFGSEERRQAAIQSGEYDHT KNYPFDVDQWRDKTFVTILRYDGVPSTLNVISGKTGKGGRLLKPYPDWSFAEFKDCSKIVSAF KIAIDKFDRLWVLDSGLVNRTVPVCAPKLHVFDLKTSNHLKQIEIPHDIAVNATTGKGGLVSLA VQAIDLANTLVYMADHKGDALIVYQNADDSFHRLTSNTFDYDPRYAKMTIDGESFTLKNGICG MALSPVTNNLYYSPLASHGLYYVNTAPFMKSQFGENNVQYQGSEDILNTQSLAKAVSKNGVL FVGLVGNSAVGCWNEHQSLQRQNLEMVAQNDRTLQMIAGMKIKEELPHFVGSNKPVKDEYM LVLSNRMQKIVNDDFNFDDVNFRILGANVKELIRNTHCVNNNQNDNIQNTNNQNDNNQKNNK KNANNQKNNNQNDN
mrjp3	ATGACAAAGTGGTTGTTGCTGGTGGTGTGCCTTGGTATAGCTTGTCAAGATGTAACAAGCG CAGCTGTGAATCATCAAAGAAAATCTGCAAATAATTTGGCACATTCTATGAAAGTGATCTA CGAATGGAAACACATTGATTTTGATTTCGGTAGCGATGAAAGAAGAGATGCTGCGATTAAA TCTGGCGAATTTGATCACACAAAAAATTATCCTTTCGATGTGGACAGATGGCGTGATAAGA CATTTGTCACCATAGAAAGGAACAATGGTGTACCTTCTTCTTTGAACGTGGTAACTAATAA AAAGGGCAAAGGTGGACCTCTTCTACGACCATATCCTGATTGGTCGTTTGCCAAATACGAA GATTGCTCTGGAATTGTGAGCGCTTTCAAAATTGCGGTCGACAAATTTGACAGATTATGGG TTCTGGACTCAGGTCTTGTCAATAATAATCAACCTATGTGCTCTCCAAAATTGTTAACCTTT GATCTGAAAACCTCAAAATTGGTTAAGCAAGTCGAGATACCACATAATATTGCCGTAAACG CCACCACAGGAATGGGAGAATTAGTTTCACTAGCTGTTCAAGCTATAGATCGTACGAATAC TATGGTGTACATAGCAGACGAAAAAGGCGAAGGTTTAATCATGTATCAAAACTCCGACGA TTCCTTCCATCGATTGACTTCCAATACTTTCGATTACGATCCCAGATATACCAAATTGACAG TCGCTGGAGAAAGTTTCACAGTGAAAAATGGAATTTGTGGAATTGCACTTAGTCCCGTGAC GAACAATCTTTATTACAGCCCTCTCTCTTCTCACGGTTTGTATTATGTTGATACGGAACAAT TCAGGAATCCACAATATGAAGAAAATAACGTGCAATATGAAGGATCTCAAGATATTTTGA ACACTCAATCATTCGGTAAAGTAGTATCGAAAAATGGCGTCCTTTTCTTGGGACTCGTGGG TAATTCAGGTATTGCCTGCGTGAATGAACATCAAGTACTTCAGAGAGAAAGTTTTGATGTT GTCGCTCAGAATGAAGAGACACTTCAAATGATCGTTAGTATGAAAATCATGGAAAATCTTC CACAATCCGGCAGAATTAATGATCCTGAAGGCAATGAATATATGTTGGCTTTGAGTAACAG AATGCAAAAAATAATAAACAATGATTTTAATTTCAACGACGTAAATTTCCGAATTTTGGGT GCGAATGTAGATGACTTAATGAGAAACACTCGTTGCGGAAGATATCACAATCAGAATGCT GGCAATCAGAATGCTGACAATCAGAATGCTGACAATCAGAATGCTAACAATCAGAATGCT GATAATCAGAATGCTAACAAACAAAATGGTAATAGACAAAATGATAACAGACAGAATGAT AACAAGCAAAATGGTAACAGACAGAATGATAACAAGCAAAATGGTAACAGACAGAATGA TAACAAGCAAAATGGTAACAGACAAAATGGTAACAAACAGAATGATAACAAGCAAAATG GTAACAGACAGAATGATAACAAGAGGAATGGTAACAGGCAAAATGATAATCAAAATAATC

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MRJP3	MTKWLLLVVCLGIACQDVTSAAVNHQRKSANNLAHSMKVIYEWKHIDFDFGSDERRDAAIKS GEFDHTKNYPFDVDRWRDKTFVTIERNNGVPSSLNVVTNKKGKGGPLLRPYPDWSFAKYEDC SGIVSAFKIAVDKFDRLWVLDSGLVNNNQPMCSPKLLTFDLKTSKLVKQVEIPHNIAVNATTG MGELVSLAVQAIDRTNTMVYIADEKGEGLIMYQNSDDSFHRLTSNTFDYDPRYTKLTVAGESF TVKNGICGIALSPVTNNLYYSPLSSHGLYYVDTEQFRNPQYEENNVQYEGSQDILNTQSFGKVV SKNGVLFLGLVGNSGIACVNEHQVLQRESFDVVAQNEETLQMIVSMKIMENLPQSGRINDPEG NEYMLALSNRMQKIINNDFNFNDVNFRILGANVDDLMRNTRCGRYHNQNAGNQNADNQNAD NQNANNQNADNQNANKQNGNRQNDNRQNDNKQNGNRQNDNKQNGNRQNDNKQNGNRQN GNKQNDNKQNGNRQNDNKRNGNRQNDNQNNQNDNNRNDNQVHHSSKLH
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MRJP4	MTKWLLLMVCLGIACQNIRGGVVRENSSGKNLTNTLNVIHKWKYLDYDFDNDERRQAAIQSG EYDRTKNYPLDVDQWHNKTFLAVIRYNGVPSSLNVVSDKTGNGGRLLQPYPDWSFAKYEDCS GIVSAHKIAIDEYERLWVLDSGLVNNTQPMCSPKLFAFDLNTSQLLKQVEIPHDVATTGKGELV SLTVQAMDSTNTMVYMVDNKNTLIIYQNADDSFHRLSSHTLNHNSDKMSDQQENLTLKKVDN KVYGMALSPVTHNLYYNSPSSENLYYVNTESLMKSENQGNDVQYERVQDVFDSQLTVKAVSK NGVLLFGLANNTLSCWNEHQSLDRQNIDVVARNEDTLQMVVSMKIKQNVPQSGRVNNTQRN EYLLALSDRNQNVLNNDLNLEHVNFQILGANVNDLIRNSRCANFDNQDNNHYNHNHNQARHS SKSDNQNNNQHNDQAHHSSKSNNRHNNND
mrjp5	ATGACAACTTGGTTGTTGCTGGTCGTGTGCCTTGGCATAGCTTGTCAAGGTATCACAAGCGT CACTGTTCGAGAAAATTCTCCGAGAAAGTTGGCAAATTCGATGAACGTGATTCACGAATGG AAGTATCTCGATTATGATTTTGGTAGCGACGAAAGGAGGCAAGCTGCGATTCAATCTGGCG

	AATATGACCATACGAAAAATTATCCCTTCGATGTCGATCAATGGCGTGGTATGACTTTTGT
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	AAATAGAATGGATAGAATGAATAGGATGAATAGACAAATGAATGAATATATGATGGCTTT
	AAGTATGAAATTACAGAAATTTATAAATAATGATTATAATTTCAACGAAGTAAACTTCCGA
	ATTTTGGGTGCAAATGTAAACGATTTAATAATGAATACTCGTTGTGCAAATTCTGACAATC
	AGAATAACAATCAAAATAAGCATAATAATTAA
MRJP5	MTTWLLLVVCLGIACQGITSVTVRENSPRKLANSMNVIHEWKYLDYDFGSDERRQAAIQSGEY
	DHTKNYPFDVDQWRGMTFVTVPRYKGVPSSLNVISEKIGNGGRLLQPYPDWSWANYKDCSGI
	VSAYKIAIDKFDRLWILDSGIINNTQPMCSPKLHVFDLNTSHQLKQVVMPHDIAVNASTGMGGL
	VSLVVQAMDPVNTIVYMADDKGDALIVYQNSDDSFHRLTSNTFDYDPKYIKMMAAGESFTAQ
	DGIFGMALSPMTNNLYYSPLSSRSLYYVNTKPFMKSEYGANNVQYQGVQDIFNTESIAKIMSK
	NGVLFFGLMNNSAIGCWNEHQPLQRENMDMVAQNEETLQTVVAMKMMHLPQSNKMNRMH
	RMNRVNRVNRMDRMDRIDRMDRMDRMDTMDTMDRIDRMDRMDRIDRIDRMDTMDTMDT
	MDRTDKMSSMDRMDRMDRVDRMDTMDRTDKMSSMDRMDRMDRVDTMDTMDTMDRMDR
	MDRMDRMDRMDRMDTMDRTDKMSRIDRMDRIDRMDRMDRTNRMDRMNRMNRQMNEYM
	MALSMKLQKFINNDYNFNEVNFRILGANVNDLIMNTRCANSDNQNNNQNKHNN
mrjp6	ATGACAAATTGGTTACTGCTGATAGTGTGTCTTAGCATAGCTTGTCAAGATGTCACAAGTG
	CGATTCATCAAAGAAAATCTTCAAAAAATTTGGAACATTCGATGAACGTGATTCACGAATG
	GAAATATATCGATTATGATTTTGGTAGTGATGAAAAAAGACAAGCTGCGATTCAATCTGGC
	GAATACGATTATACAAAAAATTATCCCTTCGACGTCGATCAATGGCATAATAAGACTTTTC
	TCGCTGTAATAAGATACGATGGTGTACCTTCCTCTTTGAACGTGATATCTGAGAAAATTGG
	CAACGGTGGATGCCTTCTACAACCGTATCCTGATTGGTCGTGGGCGAACTACAAAGATTGT
	TCTGGAATAGTGAGCGCTTACAAAATTGCGATCGACAAATTTGACAGATTGTGGGTTCTGG

	ACTCGGGTCTTGTTAATAATATTCAACTTATGTGTTCTCCAAAATTACTTGCCTTTGATCTCA ATACCTCAAAGTTGCTTAAACAAATCGAGATACCGCACGATATTGCCGTAAATTCCAGCAC AGGAATGGGAGGACTCGTATCGCTAGTTGTTCAAGCTATGGATCCTATGAATACTACGGTG TATATAGCAGACGACAGAGGTGACGCTTTAATCGTCTATCAAAATTCTGATGATTCTTTCCA TCGATTGACTTCCAAAACTTTTGATAACGATCTCAGATATTCTGAACTGGCCGTCGCGGGA GAAAGTTTCACAGTGCATGATGGAATTTTTGGAATGGCACTTAGTCCTGTGACGAACAATC TTTATTACAGCCCTCTCACTTCTCGCAGTTTGTATTATGTTAACACAGAACCATTCATGAAA TCACAATATGAAGAAAATAATATAGAATATGAAGGAATCCAAGATATTTTCAACACTCAAT CGTCCGCTAAAGTAATGTCGAAAAATGGCGTCCTTTTCTTCGGACTTGTGAATAATTCAGCT ATTGGTTGTTGGAACGAGCATCAACCACTTCAGAGACAAAATATGGATATGGTCGCTCAGA ATGAAAAGACACTTCAAATGATCATTAGCGTGAAAATTATACAAAATCTTGCATATTCCGG AAGGATGAATAGAATTCACAAGAATGAATATATGTTGGCTTTAAGTAACAGAATGCAGAA AATAGTAAACAATGATTTTAATTTCGACGAAATAAACTTTCGAATTTTGGGTGCGAATGTA AATAATTTAATAAAAAACACTCGTTGTGCAAAGTCTAACAATCAGAATAACAATCAAAATA AATATAAGAATCAAGCTCATTTAGATTAG
MRJP6	MTNWLLLIVCLSIACQDVTSAIHQRKSSKNLEHSMNVIHEWKYIDYDFGSDEKRQAAIQSGEYD YTKNYPFDVDQWHNKTFLAVIRYDGVPSSLNVISEKIGNGGCLLQPYPDWSWANYKDCSGIVS AYKIAIDKFDRLWVLDSGLVNNIQLMCSPKLLAFDLNTSKLLKQIEIPHDIAVNSSTGMGGLVSL VVQAMDPMNTTVYIADDRGDALIVYQNSDDSFHRLTSKTFDNDLRYSELAVAGESFTVHDGIF GMALSPVTNNLYYSPLTSRSLYYVNTEPFMKSQYEENNIEYEGIQDIFNTQSSAKVMSKNGVLF FGLVNNSAIGCWNEHQPLQRQNMDMVAQNEKTLQMIISVKIIQNLAYSGRMNRIHKNEYMLA LSNRMQKIVNNDFNFDEINFRILGANVNNLIKNTRCAKSNNQNNNQNKYKNQAHLD
mrjp7	ATGACAAGGTGGTTGTTTATGGTGGCATGCCTTGGCATAGCTTGTCAAGGCGCCATTCTTCG AGAAAATTCTGCAAGAAACTTGAAAAATTCGTTGAAAGTAATGCACGAATGGAAATATAT AGATTATGATTTCGGTAGCGAAGAAAAAAGACAAGCTGCGATTCAATCTGACGAATATGA CCATACGAAAAATTATCCATTCGACGTCGATCAATGGCGTGATAAGACTTTTGTCACCGTA CTAAGATACGATGGTGTGCCTTCTTCTTTGAACGTGATATCCGAGAAAACTGGCAACGGTG GACGACTTCTACAACCGTATCCTGATTGGTCGTGGACGAAGTATAAAGATTGCTCTGGAAT CGTGAGCGCTTACAGTATTGCGATCGACAAGTTCGACAGATTGTGGGTTTTGGACTCAGGT CTTGTCAATAATACTCAACCCATGTGTTTCCCAAAATTGCTTGTCTTTGATCTAAATAGCTC ACAATTGATCAAGCAAGTAGACATACCGCATGAAATTGCCGTAAATACCACCACAGAACA GGGAAGATTAAAATCTTTAGCTGTTCAAGCTATAAGTTCTGTGAATACTCTGGTGTATATA GCAGATAACAAAGGTGATGGTTTAATCGTCTACCAAAATTCCGACGATTCCTTCCATCGAT TGACTTCCAACACTTTCAATTACGATCCCAGATATACCAAAATGACGGTTGAAGGTGAAAG TTTCACTGTGCAAGATGGAATTTATGGAATGGCACTTAGTCCCATGACAAACAATCTTTATT ACAGTCCTCTCGCTTCTCGCGATTTGTATTATGTTAACACAAAACCATTCATAAAATCAGAA TATGGAGAAAATAAAGTCCAATATAATGGAGTCCAAGATGTTTTCAACACTCAAACAACCG CTAAAGCAGTATCGAAAAATGGCATCCTTTTCTTCGGTCTCGTGAATAATACAGCTGTTGGT TGCTGGAACGAGCATCAAACACTTCAGAGAGAAAATACCGATATGGTCGCCCAAAATGAA GAGACACTTCAAATGATCGTTGGTATGAAAATTAAGCAATTGCTCCCACATATCGTCATTA TTGATATAGATAATATAATAAACGATGAATATATGTTAGTTTTAACTAACAGAATGCAAAA GATATTAAACAATGATCTTAATTTCAACGATATTAATTTCCGAATTTTGATTGGAGGTGTGA GCGACTTGTTAGAAAACACTCGTTGCACAAATTTTAATATTCAGAATGATGATAGCGATGA AAATAACGATGACAGCATAAGAATCACAATAGACGCTTCATTTAATTAG

MRJP7	MTRWLFMVACLGIACQGAILRENSARNLKNSLKVMHEWKYIDYDFGSEEKRQAAIQSDEYDH TKNYPFDVDQWRDKTFVTVLRYDGVPSSLNVISEKTGNGGRLLQPYPDWSWTKYKDCSGIVS AYSIAIDKFDRLWVLDSGLVNNTQPMCFPKLLVFDLNSSQLIKQVDIPHEIAVNTTTEQGRLKSL AVQAISSVNTLVYIADNKGDGLIVYQNSDDSFHRLTSNTFNYDPRYTKMTVEGESFTVQDGIYG MALSPMTNNLYYSPLASRDLYYVNTKPFIKSEYGENKVQYNGVQDVFNTQTTAKAVSKNGILF FGLVNNTAVGCWNEHQTLQRENTDMVAQNEETLQMIVGMKIKQLLPHIVIIDIDNIINDEYMLV LTNRMQKILNNDLNFNDINFRILIGGVSDLLENTRCTNFNIQNDDSDENNDDSIRITIDASFN
mrjp8	ATGATAAGATGGTTGCTGCTGATGTATCTTGGCATAGCTTGTCAAGGTGTTACAGACATTC ATTCGAAAAATTTGACAAATTCGTTGAAAGTCATTTACGAATGGAAATATATTGATTACGA TTTCGGTAGTGACGAAAAGAGACAAGCTGCCATTCAATCAGGCGATTACAATTATACAATG AATTATCTTTTGGACACCGATCAATGGGGTGATAAAACTTTTGTCATTATAATGAAATTTAA TGGTGTGCCCTCTTCTTTGAATGTGATAACTAATAAAACTGGCAACGGTGGACCTCTTCTGG CACCGTATCCTGATTGGACGTGGGCGAAAAATGAAAATTGCTCTGGTATCACGAGTGCTTA CAAGATTGAGATCGATATGTGTGACAGATTGTGGGTCCTCGACTCAGGTCTCATCAATAAT GTCCGATCCGTATGCCCTCCACAACTCTTTGTCTTCGATCTGAATACTTCACAATTGTTAAA GCAAGTCAAAATACCGCATGACATTGCTGTGAATACGACCACAGGAAAAGGAGCTCTGGT GACTCTAAGTGTTCAATTGTTGAGTTGCGAAGTGAATGGATCCACTCTTGTGTACATAGGA GACAATGAAGGTTTCGCTTTAATTATCTACAACAATTCAGATAATTCTTTCCAACGATTGAC TTCGAGTACCTTCGCAAGTGATCCTAGATATACCACATTCACGATCAACGGAGAGAGCTTC ACATTGCAAAGTGGAATTTTTGGAATGGCACTAAGTCCTCTGACTCAAAATCTTTATTATAG CGCTCTGAGTTCTCATAACTTGAATTATGTCAACACGGAACAGTTCGTAAAATCACAATAT CAGGCGAATAACGTGCATTATCAAGGGAAAGAAAATATTTTATGGACTCAAGCATCGGCT AAAGGAATATCGGATAATGGTGTTCTCTTCTTCGGACTTGTGGGTGATACATCTCTTGCCTG CTGGAACGAGAATCGATTACTTGACAGAAGAAATATCGAAGTGGTTGCCAAAAATAAAGA AACTCTTCAAGCTATTACTGGTCTTAAAGTTAAAAGAAGAATCTCGTTCATTCTTGTGCATG GATTTCCTCTTGAATATGAATATGTATTGGCTGTAAGTAACAGAATACAAAAAGTAATCTA CGGTTTTGATTTCAATGACGTGAATTTTCGAATTTTAATCGCGAATGTGAACGACTTGATAA AGAATACTCGTTGCATATCTCCTTGA
MRJP8	MIRWLLLMYLGIACQGVTDIHSKNLTNSLKVIYEWKYIDYDFGSDEKRQAAIQSGDYNYTMNY LLDTDQWGDKTFVIIMKFNGVPSSLNVITNKTGNGGPLLAPYPDWTWAKNENCSGITSAYKIEI DMCDRLWVLDSGLINNVRSVCPPQLFVFDLNTSQLLKQVKIPHDIAVNTTTGKGALVTLSVQL LSCEVNGSTLVYIGDNEGFALIIYNNSDNSFQRLTSSTFASDPRYTTFTINGESFTLQSGIFGMALS PLTQNLYYSALSSHNLNYVNTEQFVKSQYQANNVHYQGKENILWTQASAKGISDNGVLFFGL VGDTSLACWNENRLLDRRNIEVVAKNKETLQAITGLKVKRRISFILVHGFPLEYEYVLAVSNRI QKVIYGFDFNDVNFRILIANVNDLIKNTRCISP
mrjp9	ATGTCTTTCAATATCTGGTGGTTGATACTGTATTTTAGTATAGTTTGTCAAGCAAAAGCCCA TTATTCTTTGAGAGATTTCAAGGCAAATATCTTCCAAGTTAAATATCAATGGAAATACTTCG ATTATAATTTTGGTAGTGATGAAAAGAGACAAGCTGCAATTCAATCTGGCGAATACAATTA TAAGAATAATGTTCCAATAGACGTCGATCGATGGAATGGTAAAACTTTTGTCACCATATTA AGAAATGATGGTGTGCCTTCGTCTTTGAACGTGATATCTAACAAAATTGGCAATGGTGGAC CACTTTTGGAACCATATCCAAATTGGTCGTGGGCAAAAAATCAAAACTGTTCTGGTATTAC GAGTGTTTACAGAATTGCGATTGACGAATGGGATAGATTATGGGTTTTAGACAATGGTATT AGCGGTGAGACATCTGTATGCCCTTCGCAGATTGTCGTCTTTGATCTAAAAAATTCAAAATT GTTAAAACAAGTTAAAATACCGCACGATATTGCGATAAACTCTACTACTGGAAAAAGAAA

	TGTAGTAACTCCAATCGTTCAAAGTTTTGATTATAATAATACCTGGGTGTATATAGCAGAC GTCGAAGGTTATGCATTGATTATTTATAACAATGCCGACGATTCTTTCCAACGATTGACTTC GAGCACTTTCGTATACGATCCCAGATACACCAAATACACTATCAATGACGAAAGTTTCTCG TTGCAAGATGGAATTTTGGGTATGGCGCTAAGTCATAAAACGCAAAATCTTTATTACAGTG CTATGTCCTCTCATAATTTGAATTATGTCAACACAAAACAATTTACACAAGGGAAATTTCA GGCTAATGATATACAATATCAAGGAGCCTCAGATATCTTATGGACTCAAGCGAGCGCTAAA GCAATATCGGAAACTGGTGCTCTCTTCTTTGGACTCGTGAGTGACACAGCACTTGGCTGCT GGAACGAGAATCGGCCACTAAAAAGAAGGAATATTGAAATAGTCGCCAAAAATAACGACA CTCTTCAATTCATCAGTGGTATAAAAATTATCAAGCAAATATCTTCAAATATTTATGAACGT CAAAATAACGAGTATATATGGATTGTAAGTAACAAATATCAAAAAATAGCAAATGGAGAT TTAAATTTTAATGAAGTGAATTTTCGAATTTTGAATGCGCCTGTAAATCAATTAATAAGGTA CACTCGTTGCGAAAATCCTAAAACAAATTTTTTCTCAATTTTCCTTTGA
MRJP9	MSFNIWWLILYFSIVCQAKAHYSLRDFKANIFQVKYQWKYFDYNFGSDEKRQAAIQSGEYNYK NNVPIDVDRWNGKTFVTILRNDGVPSSLNVISNKIGNGGPLLEPYPNWSWAKNQNCSGITSVYR IAIDEWDRLWVLDNGISGETSVCPSQIVVFDLKNSKLLKQVKIPHDIAINSTTGKRNVVTPIVQSF DYNNTWVYIADVEGYALIIYNNADDSFQRLTSSTFVYDPRYTKYTINDESFSLQDGILGMALSH KTQNLYYSAMSSHNLNYVNTKQFTQGKFQANDIQYQGASDILWTQASAKAISETGALFFGLVS DTALGCWNENRPLKRRNIEIVAKNNDTLQFISGIKIIKQISSNIYERQNNEYIWIVSNKYQKIANG DLNFNEVNFRILNAPVNQLIRYTRCENPKTNFFSIFL