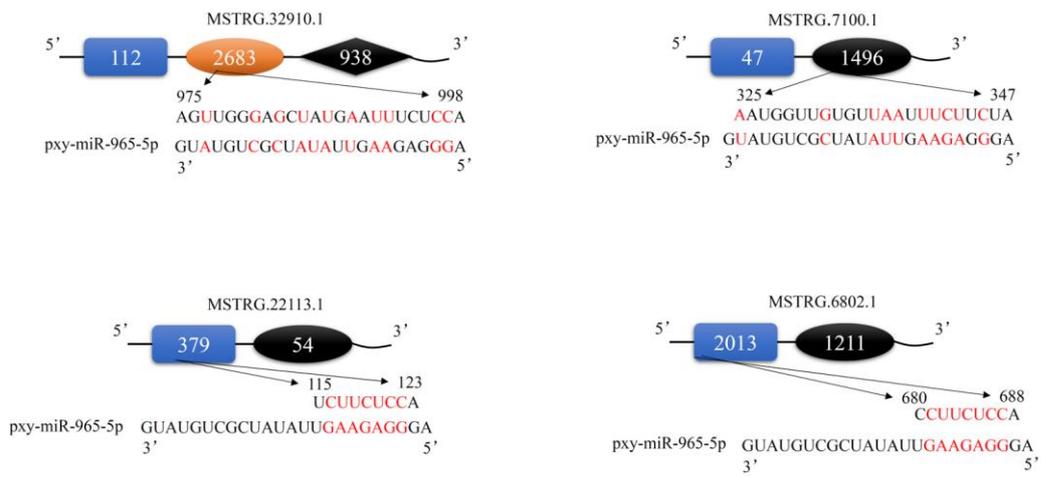


**Figure S1** The target sites verification of pxy-miR-965-5p to PAP1. The column represented the RFU (hRluc/hluc+) fold change of miRNA mimic treatment groups comparing to negative control groups, data were shown as mean  $\pm$  SEM (Two-tailed Student's t-tests:  $\alpha = 0.05$ , asterisks indicated significant differences between treatment and control groups, \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ , NS = no significant differences).



**Fig. S2** The interaction modules of LncRNAs with pxy-miR-965-5p.

**Table S1** Primers for protein expression in the *E. coli* expression system

<b>Name</b>	<b>Primer sequence (5'-3')</b>
PAP1-RCP-F	CGGAATTC TGGATGGCTCTGCTGGGATA
PAP1-RCP-R	CCCTCGAG CTTGTCTGTTAATGCTGCTC
PAP1 <sub>Xa</sub> -mt-F	C ATTGAAGGCCGC ATCTATGGAGGACAGTTCACTGACC
PAP1 <sub>Xa</sub> -mt-R	TAGAT GCGGCCTTCAAT GGTGTCCACTCCACATTTTCCT

**Table S2** The sequences of miRNA predicted to target PAP1.

<b>microRNA name</b>	<b>Target region</b>	<b>Sequence (5'-3')</b>
pxy-miR-375-5p	ORF	ACCCGAGCGGUUUGAGCAAACUA
pxy-miR-4448-3p	ORF	AUGGCUCGUUGGUCUAGGGGUA
pxy-miR-279a-3p	ORF	UGACUAGA UCCACACUCAUCA
pxy-miR-3286-3p	ORF	CUUGUGCGUGUUCUAAUAGUU
pxy-miR-965-5p	3' UTR	AGGGAGAAGUUAUAUCGCUGUAUG
pxy-miR-8799-3p	3' UTR	GGCAUCGCGCUCCUAGCC
pxy-miR-14b-5p	3' UTR	CGGGGGGAGAGAUUGACUUGACU

**Table S3** Primers for Dual-luciferase assay (miRNAs to PAP1)

Name	Primer sequence (5'-3')
PAP1-CHECK2-1-F	AATTCTAGGCGATCGCTCGAG
PAP1-CHECK2-1-R	TCGCATTTATCGCCTCAA
PAP1-CHECK2-2-F	CAGCGGCCGCTCTAGGTTTAAAC
PAP1-CHECK2-2-R	TTGCTAGGGTGCCGACTT
PAP1-CHECK2-3-F	AATTCTAGGCGATCGCTCGAG
PAP1-CHECK2-3-R	AATCCCCACCCCGGCTT
PAP1-CHECK2-3-mt2-F	CAGCGGCCGCTCTAGGTTTAAAC
PAP1-CHECK2-3-mt2-R	ATTTGTGTAGACTCCAGGCCAGC
PAP1-CHECK2-3-mt3-F	AATTCTAGGCGATCGCTCGAG
PAP1-CHECK2-3-mt3-R	TGTGAGGGATAATGGATG
PAP1-CHECK2-3-mt4-F	CAGCGGCCGCTCTAGGTTTAAAC
PAP1-CHECK2-3-mt4-R	GAGATAACTGCGGGCTGA
PAP1-CHECK2-3-mt5-F	TCTCCATGCCAAGAATCAAAAGTATAAACCAA
PAP1-CHECK2-3-mt5-R	GATTCTTGGCATGGAGAATATTCCGCATATAGGTTTC
PAP1-CHECK2-3-mt6-F	GGAATATTCTCACTGCCAAGAATCAAAAGTATAAACCA
PAP1-CHECK2-3-mt6-R	ACCA
PAP1-CHECK2-3-mt7-F	GGCAGTGAGAATATTCCGCATATAGGTTTCTTT
PAP1-CHECK2-3-mt7-R	GGAATATTCTACCTGCCAAGAATCAAAAGTATAAAC
PAP1-CHECK2-3-mt8-F	ACC
PAP1-CHECK2-3-mt8-R	GGCAGGTAGAATATTCCGCATATAGGTTTCTTTC
PAP1-CHECK2-3-mt9-F	GAATATTGCCCTGCCAAGAATCAAAAGTATAAAC
PAP1-CHECK2-3-mt9-R	TGGCAGGGCGAATATTCCGCATATAGGTTTCTTTC
PAP1-CHECK2-3-mt10-F	G
PAP1-CHECK2-3-mt10-R	GGAATATTATCCCTGCCAAGAATCAAAAGTAT
PAP1-CHECK2-3-mt11-F	GGCAGGGATAAATATTCCGCATATAGGTTTCTTTTCG
PAP1-CHECK2-3-mt11-R	TGCGGAATATGCTCCCTGCCAAGAATCAAAAGT
PAP1-CHECK2-3-mt12-F	AGGGAGCATATTCCGCATATAGGTTTCTTTTCG
PAP1-CHECK2-3-mt12-R	TGCGGAATAGTCTCCCTGCCAAGAATCAAAAG
PAP1-CHECK2-3-mt13-F	AGGGAGACTATTCCGCATATAGGTTTCTTTTCG

**Table S4** Primers for Dual-luciferase assay (pxy-miR-965-5p to LncRNAs)

<b>Name</b>	<b>Primer sequence (5'-3')</b>
MSTRG.32910.1-CHECK2-F	AATTCTAGGCGATCGCTCGAGGGTCCTGTTC CGAACGAAGTG
MSTRG.32910.1-CHECK2-R	CAGCGGCCGCTCTAGGTTTAAACGACCAAGG CTATCGAGGCAA
MSTRG.7100.1-CHECK2-F	AATTCTAGGCGATCGCTCGAGTACACGGTTC AAGGGTGCTCC
MSTRG.7100.1-CHECK2-R	CAGCGGCCGCTCTAGGTTTAAACGAGAAGAA CGGGGGCAAGAA
MSTRG.6802.1-CHECK2-F	AATTCTAGGCGATCGCTCGAGTGACAAAAG TTAAGCTCCCA
MSTRG.6802.1-CHECK2-R	CAGCGGCCGCTCTAGGTTTAAACGACTGTGA AATAGTGGCGGGG
MSTRG.22113.1-CHECK2-F	AATTCTAGGCGATCGCTCGAGGGAGCAAGGG GGAAGTTTGA
MSTRG.22113.1-CHECK2-R	CAGCGGCCGCTCTAGGTTTAAACGGTCAAGG AACTTCGTGGGT

**Table S5** Primers for RT-qPCR

<b>Name</b>	<b>Primer sequence (5'-3')</b>
RPS13-q-F	TCAGGCTTATTCTCGTCG
RPS13-q-R	GCTGTGCTGGATTCGTAC
PAP1-q-F	TGAGTATAAATGCCAGTCC
PAP1-q-R	AACGCTGAACAGTCGTAG
U6-q-F	CGCAAGGATGACACGCAA
U6-q-R	GAATCGAGCACCAGTTACGC
pxy-miR-965-5p-q-F	AGGGAGAAGTTATATCGCTGTATG
miRNA-R	TAACGAGACGACGACAGAC
MSTRG.32910.1-qPCR-F	GCAACAAGGTATGGGCACAA
MSTRG.32910.1-qPCR-R	CGAGGCAATGATTTTGTGAAGC
MSTRG.7100.1-qPCR-F	GGGTGCTCCCGATATCTGTTC
MSTRG.7100.1-qPCR-R	CATTTCCCGGTTGTGCCAAT
MSTRG.6802.1-qPCR-F	CACCAATGGGGCTTCATCCT
MSTRG.6802.1-qPCR-R	GCAGCGAACCAACATTGCTA
MSTRG.22113.1-qPCR-F	GTCGTTGAGGTGGCAGATGA
MSTRG.22113.1-qPCR-R	GGTCAAGGAACTTCGTGGGT

**Table S6** The sequences of ASO for LncRNAs

<b>Name</b>	<b>Primer sequence (5'-3')</b>
MSTRG.32910.1ASO	UCAAC TATTGTCTCT CCAGC
MSTRG.7100.1 ASO	GUUUA ATTGGGTATA CAAGC
MSTRG.6802.1ASO	GUUAA TTTGCTATAT ACACC
MSTRG.22113.1ASO	ACUAG CTGTCATCTG CCACC