

Table S1 Primers used in this study

Primer	Sequence (5'-3')	Relevant characteristics
FfATPh-UF	GAGGAGTTGTCAGCCATGTTC	PCR primers to amplify FfATPh upstream fragment
FfATPh-UR	CTTCAATATCATCTTCTGTTTTG AATGGCTGGTGGTG	
FfATPh-DF	AGGAGACAATACCGGAAGGAAC AGCGTTTTTCTTAACCTTTGGG	PCR primers to amplify FfATPh downstream fragment
FfATPh-DR	CATGTGGGTACGGATGTCT	
FfATPh-inF	TGTTTCTCGTGTCGCCAGA	PCR primers to verify the target fragment of FfATPh
FfATPh-inR	CCTCAAGCCAGTCAGCAA	
FfATPh-csF	ACTGCGTACATCATCGCAT	PCR primers to amplify FfATPh mutant vector
FfATPh-csR	TGCATTGATCGTCGAACTGT	
FfATPh-TZ-F	CAACATTGATGCAACAACCTGT A	PCR primers to amplify FfATPh probe
FfATPh-TZ-R	CGATGGTGCATGTAACCAAGGA TTTCGTAGGAACCCAATCTTCAA	
FfATPh-RP-F	AATGCTCATTCAACTCTCCAGG GTGAACAGCTCCTCGCCCTTGCT	Constructed FfATPh-GFP fusion vector
FfATPh-RP-R	CACGTGGTGAGGCTCATCCTC GCGAATTGGGTACTCAAATTGG	
FfATPh-65-F	TGCACTTGCTATCACATCTTCT GCTCACCATCGTGGCGATGGAG	Constructed FfATPh-PHZ65 fusion vector
FfATPh-65-R	CGGTGGTGAGGCTCATCCTC GCGAATTGGGTACTCAAATTGG	
FfATPh-68-F	TGCACTTGCTATCACATCTTCT GTTCTGGGATCTTGACAGGCAGGG	Constructed FfATPh-PHZ68 fusion vector
FfATPh-68-R	CGGTGGTGAGGCTCATCCTC ACAGAAGATGATATTGAAGGAG	
SS-F	C	PCR primers to amplify Double sieve fragment
SS-R	G TTCCTTCCGGTATTGTCTCCT TTTCGTAGGAACCCAATCTTCAA	
FfATPh-NFlag-F	AATGGATTACAAGGATGACGAC GATA	PCR primers to constructe FfATPh-3xflag fusion vector
FfATPh-NFlag-F1	GATTACAAGGATGACGACGATA AGGACTATAAGGACGATGATGA	
FfATPh-NFlag-F2	CAAG GACTATAAGGACGATGATGACA AGGACTACAAAGATGATGACGA	
FfATPh-NFlag-F3	TAAA GACTACAAAGATGATGACGATA AACTCATTCAACTCTCCAGG	
FfATPh-NFlag-R	GTGAACAGCTCCTCGCCCTTGCT	

Primer	Sequence (5'-3')	Relevant characteristics
	CACTTAGTGGTGAGGCTCATCCT C	
FfATP5-UF	ATCACCGAGTTCTGCTCACC	PCR primers to amplify FfATP5 upstream fragment
FfATP5-UR	CTTCAATATCATCTTCTGTGACG GCGGCTTCTTTGAC	
FfATP5-DF	AGGAGACAATACCGGAAGGAAC AACCACCAACATAGTATAC	PCR primers to amplify FfATP5 downstream fragment
FfATP5-DR	GCCGCCTTCCTCATACTCCT	
FfATP5-inF	GTTGATGGCACTTATGCTAC	PCR primers to verify the target fragment of FfATP5
FfATP5-inR	GATGGTATGGTCTAGACATA	
FfATP5-csF	CAACTCATGTCATGGGTGCA	PCR primers to amplify FfATP5 mutant vector
FfATP5-csR	ACTCTGGTATGCCTCGCATC	
FfATP5-TZ-R	GACTACTTGGATTGCTGGATGA	PCR primers to amplify FfATP5 probe
FfATP5-TZ-R	CTGATTGCTCGCATGATTCATG	
FfATP5-65-F	GCGAATTGGGTACTCAAATTGG GTTTGACCAGCCATGAAATTC	Constructed FfATP5-PHZ65 fusion vector
FfATP5-65-R	GCTCACCATCGTGGCGCAGAGT GTCCGTGAGGAG	
FfATP5-68-F	GCGAATTGGGTACTCAAATTGG GTTTGACCAGCCATGAAATTC	Constructed FfATPh-PHZ68 fusion vector
FfATP5-68-R	GTTTCGGGATCCTGCAGGCAGGG CGCAGAGTGTCCTGAGGAG	
FfATP5-RP-F	TTTCGTAGGAACCCAATCTTCAA AATGTTCTCGCGACAGGTTCT	Constructed FfATP5-GFP fusion vector
FfATP5-RP-R	GTGAACAGCTCCTCGCCCTTGCT CACCAGAGTGTCCTGAGGAG	
FfATPb-UF	AATCAGAGGCGACTTACTTG	PCR primers to amplify FfATPb upstream fragment
FfATPb-UR	CTTCAATATCATCTTCTGTTGTG GGATGGTTCGTGAT	
FfATPb-DF	AGGAGACAATACCGGAAGGAAC ATAATTAAACGCCGCCGC	PCR primers to amplify FfATPb downstream fragment
FfATPb-DR	AGTACTGGGTAGACTTGCCA	
FfATPb-inF	CTCCTTATATGTAGGCGCTC	PCR primers to verify the target fragment of FfATPb
FfATPb-inR	CTCTCAATATCCGCAACACT	
FfATPb-csF	TGTGTACTCGTCCTTGTCAT	PCR primers to amplify FfATPb mutant vector
FfATPb-csR	AGCAATGTTCGAACCAGTCAG	
FfATPb-TZ-F	GTGTCATAACAACACCTGTGC	PCR primers to amplify FfATPb probe
FfATPb-TZ-R	TCGTCAAGTATCCTGCTTTACG	

Primer	Sequence (5'-3')	Relevant characteristics
FfATPb-RP-F	TTTCGTAGGAACCCAATCTTCAA	Constructed FfATPb-GFP fusion vector
	AATGGCGTCACGCTTGGTAC	
FfATPb-RP-R	GTGAACAGCTCCTCGCCCTTGCT	
	CACTTGGGCCTTGGAGGCAAC	
	GGCGAATTGGGTACTCAAATTG	
FfATPb-Flag-ZS-F	GTTGATGTTGTAGGAATGCTTCG	
	TG	
	CTTATCGTCGTCATCCTTGTAAT	
FfATPb-3xflag-UR1	CTTGGGCCTTGGAGGCAACGAT	
	C	
	CTTGTCATCATCGTCCTTATAGT	PCR primers to constructe FfATPb-3xflag fusion vector
FfATPb-3xflag-UR2	CCTTATCGTCGTCATCCTTGTA	
	TC	
	CTATTATCGTCATCATCTTTGT	
FfATPb-3xflag-UR3	AGTCCTTGTCATCATCGTCCTTA	
	TAG	
	ACAGCTCCTCGCCCTTGCTC	
FfATPb-3xflag-UR4	ACCTATTTATCGTCATCATCTTT	
	G	
FfATPb-56-F	GCGAATTGGGTACTCAAATTGG	Constructed FfATPb-PHZ65 fusion vector
	GATGTTGTAGGAATGCTTCGTG	
FfATPb-65-R	GCTCACCATCGTGGCGTTGGGCC	
	TTGGAGGCAAC	
	GCGAATTGGGTACTCAAATTGG	Constructed FfATPb-PHZ68 fusion vector
FfATPb-56-F	GATGTTGTAGGAATGCTTCGTG	
	GTTTCGGGATCTTGCAGGCAGGG	
FfATPb-68-R	CGTTGGGCCTTGGAGGCAAC	