

Gene Cluster ID	Atp6v1E			
Drosophila melanogaster gene	Vha26 (CG1088)			
FlyBase ID	FBgn0015324			
Predicted function	ATPase, H ⁺ transporting, V1 subunit E			
Atp6v1E CLEAR element conservation:				
	5' / 5' UTR	intron1	intron1	intron1
Dmel\`	ACTTTCTGTGAAATCATATGATCGATTGCACT	GGATCTCCAGGTCATGTGAACCTTTCACCGC	AATTCGTGCTGGTCATGTGACACGCCCGC	CATGTCCAGTTATCATGTGACACACAGGCAAC
Mdom\`	AAAATTTCCCTTTCACATGATGGGATATTAC	TCATGGATATGTCATGTGAATATTTGTTGTC	CATTAACAGAACAGTCATGTGATCAAAATGTAGG	
Ccap\`	AAATTCCCCAATCATATGATAAAAAAAAAAG	TCATGGGATGTGTCATGTGAATACGAAGTGTA	CAATGGGGCTTGTCATGTGACCAACCGAACGT	GCTTACAACAAATCATGTGATTAAGTTGGA
Gmor\`	TAACCCCTGTTATCATATGACCAAGAGAAAAA	AGATTCGACTAGTCATGTGATCATGGTTGAA		
Llon\`	TACAACCTCAAATCATATGACTGACTTGGTC	TTTTCCCTGAAAGTCATGTGACCTCTCGCCATG		
Ppap\`	TAATACACGAAATCATATGATCACCTGGACA	TTTTCCCTCAAGTCATGTGACTTCGCCCAG		
Agam\`	-----	CGGGTCACGGGACCT--GTCATGTGAAAGTG	ATGCAATATGTGTCACATGACC GACTCTCCCC	TACTGCTGGTAGTCATATGACGGGCTTACAAG
Aara\`	-----	CGGGTCACGGGACCT--GTCATGTGAAAGTG	ATGCAATATGTGTCACATGACC GACTCTCCCC	TACTGCTGGGAGTCATATGACGGGCTTACATG
Aqan\`	-----	CGGGTCACGGGACCT--GTCATGTGAAAGTG	ATGCAATATGTGTCACATGACC GACTCTCCCC	TACTGCTGGGAGTCATATGACGGGCTTACATG
Achr\`	-----	CAGGTCAACGGGACCT--GTCATGTGAAAGTG	ATGCAATATGTGTCACATGACC GACTCTCCCC	TGCTGCTGGGAGTCATATGACAGGCTTATGTT
Aepi\`	-----	CGGGTCACGGGACCT--GTCATGTGAAAGTG	ATGCAATATGTGTCACATGACC AACTCCCC	ATCGTACTTGTGTCATATGACGGGCTTATGTT
Amin\`	-----	CAAGGTCAACGGGACCC--GTCATGTGAAAGTG	ATGCAATATGTGTCACATGACC CTCACGGGCA	CGTACAGGGGTGTCATATGACATGCTCTCGAT
Afun\`	-----	CAAGGTCAACGGGACCC--GTCATGTGAAAGTG	ATGCAATATGTGTCACATGACC CTCACGGGGA	AGGAGGGGGCGGTCATATGACATGCTCAGGAT
Aste\`	-----	TGGGTCAACGGGACCC--GTCATGTGAAAGTG	ATGCAATATGTGTCACATGACC CCCTCCGGACG	CCTATGCTGGTAGTCATATGACGTGCTTAAGAC
Adir\`	-----	CGGGTCACGGGACCTCCGTCATGTGAAAGTG	ACGAAATATGTGTCACATGACC CTCGGTGGAT	TTCGTCTGGTAGTCATATGACATGCTCAGGAG
Aalb\`	-----	TGGGTCAACGGGACCT--GTCATGTGAAAGTG	AAAATATGTTGGTCACATGACTTCCTCCTCCT	CGGGCGCAAGTAGTCATATGACATGCCGAGAG
Adar\`	-----	TGGGTCAACGGGACCT--GTCATGTGAAAGTG	AAAATATGTTGGTCACATGACTTCCTCCTCCT	CGGGCGCAAGTAGTCATATGACATGCCGAGGG
Cqui\`	TTTTACCTTGATCATGTGAGAAGTTGCTCAT	GTGGTCACGGGACCT--GTCATGTGAAAGTGAC	AAAAAAAGAGAGTCACATGACC ACTAGCATCG	-----
Aaeg\`	CTCTTCTGTCTGTCATGTGAGATTTTCCCTT	GAGGTCAACGGGACCT--GTCATGTGAAAGCAAG	AAACAAAAAGTAGTCACATGACC ACTAGTGGCG	-----
Mdes\`	CGAATGATAGAGTCATATGACTTATCAGACTA	TTGTTCAAATGTCATGTGAAATGAAATGATAT	TGTGTGCGAACGTCACATGATCAACATTCAA	-----
	5' / 5' UTR	intron2		
Bmor\`	GCAACACTAAAGTCATATGATTGTTCAATAAA	ACGAACGAAACATCATGTGACCAAGCAGTATT		
Dple\`	TAACATTAAAGTCATATGATTGTTCAATGAA	TATGTAATTATATCACATGACATCTTAGTATC		
Msex\`	GCAACACTGGGATCATATGATTGTTCAATGAA	GGTGTAGGTATGTCACATGAGAATTTCGCACA		
Hmell\`	CAACATTAATGTCATATGATTGTTCAATGAA	-----		
Pxyl\`	CAACACCAAAATCATATGATCGTCAATGAA	GTTGAATAGTGGTCATGTGATTATGTTCAAGG		
Tcas\`	ATAAGGTCAAAATCATATGATCAATCAGTCG	TGCCTTTCATGTCATGTGATCTATTGCAGTC		
Dpon	CACCTGCTCCCATCATATGATCAATCTACAAAC	ATCTCATGCTGGTCATGTGATTCGCATTGAC		
Amel\`	CACACTACTGTGTCATATGATCGTCATTAACT			
Aflo\`	CACACTACTGTGTCATATGATCGTCATTAACT			
Bter\`	ACACTACCTGTGTCATATGATCGTCATTAACT			
Bimp\`	ACACTACCTGTGTCATATGATCGTCATTAACT			
Mrot\`	ACTAGTCTTGTCATATGATCATCATTAACT			
Aech\`	TCACACTTCGGGTCATATGACCGACGTTACGC			
Pbar\`	TCACACTTCGGGTCATATGACCGACGTTACGC			
Hsal\`	TCACATTTCGGGTCATATGATCGACGTTACGC			
Acep\`	TCATGCTTCGGGTCATATGACCGACGTTACGC			
Lhum\`	TCACGCTTGGGTCATATGACCGACGTTACGC			

Sinv\\ TCACACTT~~AGG~~**T**CATATGA CCGACGTTACGC
 Cflo\\ CACATTTCGAG**T**CATATGA CCGACGTTACGC
 Ngir\\ TAAC~~T~~GGCCGG**T**CATATGA TCGTCATGTGAG
 Nlon\\ TAAC~~T~~GGCCGG**T**CATATGA TCGTCATGTGAG
 Nvit\\ TAAC~~T~~GGCTGG**T**CATATGA CCGTCATGTGAG
 Lful\\ CGTTGTACGATA **T**CATATGA TCAACTCGTAAC
 Phum\\ TATGTGAATTGA **T**CATATGA TCGTCTGCAAAG

Dpul\\ CACCCACTGCTGTCACATGAAACCAAATCAGCTGA CACTAGTAAGGA
 Isca\\ ACTCGGCGGACATCACATGACGGCTGTGCGGCC

Atp6v1E gene structure comparison:

Key: UTR region, CDS region, INTRON

Order	Species	Atp6v1E orthologs	5'exon	int	exon	int	exon		int	exon3'		Extended CLEAR region		Position	bps from TSS		
Diptera (Drosophilidae)	<i>Drosophila_melanogaster</i>	Dmel \ Vha26	275	33	529	213	78	327		61	108	1353	actttcgtaaaTCATATGAtcgatttgcgt ggatctccaggTCATGTGAactttcacgc aattcgctggTCATGTGAcacggccccgc catgtccagtaTCATGTGAcacacaggcaac		5'UTR intron1 intron1 intron1	48 447 614 794	
Diptera (Muscidae)	<i>Musca_domestica</i>	Mdom \ Atp6v1E		33	1069	213	74	330		1462	108		aaaatttccctTCACATGAtggatatttc tacaactaccaaTCACTTGActggaaattaa tcatggatgtTCATGTGAatattttgttc cattaaacagaaTCATGTGAtcaaataatgg		5'UTR? 5'UTR? intron1 intron1	>294 >265 >231 >457	
Diptera (Tephritidae)	<i>Ceratitis_capitata</i>	Ccap \ Atp6v1E		33	797	213	62	327		142	108		aaatttcccaaTCATATGAtaaaaaaaag tcatggatgtTCATGTGAtaacaaatgt caatgggcttgTCATGTGAccaaacgaegt gcittacaactaaTCATGTGAttaaagtgg		5'UTR? intron1 intron1 intron1	>305 >198 >390 >717	
Diptera (Glossinidae)	<i>Glossina_morsitans</i>	Gmor \ Atp6v1E	106+88	33	1629	213	64	327 (132+195)		858	108	223	taaccctgttaTCATATGAccaagaaaaaa agattcggatgtTCATGTGAtcatgttgtaa		5'UTR? intron1	-4 517	
Diptera (Psychodidae)	<i>Lutzomyia_longipalpis</i>	Llon \ Atp6v1E	ND	33	669	213	59	132	60	303		ND	tacaactccaaTCATATGActgactttgtc tttcccttgaagTCATGTGActtcgcctat		5'UTR? intron1	>125 >442	
	<i>Phlebotomus_papatasi</i>	Ppat \ Atp6v1E	ND	33	609	213	ND	132	69	303 (195+108)		ND	taaatacacgaaTCATATGAtaccctggaca taaaaatccgacgTCATGTGAttaatgtt ttttccccaTCATGTGActtcgcctat		5'UTR? intron1 intron1	>122 >189 >411	
Diptera (Culicidae)	<i>Anopheles_gambiae</i>	Agam \ Atp6v1E AGAP002401	226+147+33	33	826		345		79	195	74	108	ND	tcacggacctgTCATGTGAAAagtgtcaac atgcaatatgtTCACATGAccgactctccc tactgtggtagTCATATGAcgggcttacaa		intron1 intron1 intron1	440 717 974
	<i>Anopheles_arabiensis</i>	Aara \ Atp6v1E	ND	33	830		345		79	195	74	108	ND	tcacggacctgTCATGTGAAAagtgtcaac atgcaatatgtTCACATGAccgactctccc tactgtggtagTCATATGAcgggcttacatg		intron1 intron1 intron1	>197 >476 >732
	<i>Anopheles_quadriannulatus</i>	Aqan \ Atp6v1E	ND	33	829		345		80	195	74	108	ND	tcacggacctgTCATGTGAAAagtgtcaac atgcaatatgtTCACATGAccgactctccc tactgtggtagTCATATGAcgggcttacatg		intron1 intron1 intron1	>197 >475 >731
	<i>Anopheles_christyi</i>	Achr \ Atp6v1E	ND	33	805		345		81	195	85	108	ND	tcacggacctgTCATGTGAAAagtgtcaac atgcaatatgtTCACATGAccgactctccc tgcgtctggagTCATATGAcagggttatgt		intron1 intron1 intron1	>194 >468 >696
	<i>Anopheles_epiroticus</i>	Aepi \ Atp6v1E	ND	33	809		345		88	195	76	108	ND	tcacggacctgTCATGTGAAAagtgtcaac atgcaatatgtTCACATGAccaactcccc atgcgtctggagTCATATGAcgggcttatgt		intron1 intron1 intron1	>186 >442 >680

	<i>Anopheles_minimus</i>	Amin\Atp6v1E	ND	33	808	345			62	195	65	108	ND	tcacgggaccgc TCATGTGAAaaagtgtcaaac atgeaatatgtTCACATGAccctcagggca cgtacagggtgTCATATGAcatgtctcgat	intron1 intron1 intron1	>190 >463 >695
	<i>Anopheles_funestus</i>	Afun\Atp6v1E	ND	33	796	345			74	195	62	108	ND	tcacgggaccgc TCATGTGAAaaagtgtcaaac atgeaatatgtTCACATGAccctcagggca aggagggggggTCATATGAcatgtcagcat	intron1 intron1 intron1	>193 >459 >674
	<i>Anopheles_stephensi</i>	Aste\Atp6v1E	ND	33	789	345			89	195	74	108	ND	tcacgggaccgc TCATGTGAAaaagtgtcaaac atgeaatatgtTCACATGAccctccgacg cctatgettgTCATATGAcgtgtttagaac	intron1 intron1 intron1	>194 >465 >681
	<i>Anopheles_dirus</i>	Adir\Atp6v1E	ND	33	820	345			69	195	64	108	ND	acgggacctcg TCATGTGAAaaagtgtcaaac acgaaatatgtTCACATGAccctcggtgat ttctgtctgtgTCATATGAcatgtcaggag	intron1 intron1 intron1	>190 >459 >673
	<i>Anopheles_nili</i>	Anil\Atp6v1E	ND	ND	ND	ND			ND	ND	ND	108	ND	ND		
	<i>Anopheles_albimanus</i>	Aalb\Atp6v1E	ND	33	895	345			76	195	80	108	ND	tcacgggacctg TCATGTGAAaaagtgtacaatc aaaaatgttggTCACATGActctctctct cggggcaagtgTCATATGAcatgtccaaagag	intron1 intron1 intron1	>315 >596 >828
	<i>Anopheles_darlingi</i>	Adar\Atp6v1E	ND	33	904	345 (213 + 132)			74	195	78	108	ND	tcacgggacctg TCATGTGAAaaagtgtacaatc aaaaatgttggTCACATGActctcgctct cggggcaagtgTCATATGAcatgtccggaggg	intron1 intron1 intron1	>317 >596 >831
	<i>Aedes_aegypti</i>	Aaeg\Atp6v1E AAEL012035	287	33	7946	213	62	132	66	195	118	108	1928	tcttcgtctgTCATGTGAgatattttctt tcacgggacctg TCATGTGAaggcaatgtatt aaacaaaaatgtTCACATGAccactatggcg	5' intron1 intron1	-8 671 1037
	<i>Culex_pipiens_qui.</i>	Cqui\Atp6v1E CPII006751	64+133+32	33	3758	213	66	132	55	195	65	108	537	ttttacatttgaTCATGTGAgaaatgttcat tcacgggacctg TCATGTGAaggcatcgca caaaaaagagagTCACATGAccactatcgcc ctttgcacaacTCACGTGAattttttctc	5' intron1 intron1 intron1	-27 >567 >870 >1485
Diptera (Cecidomyiidae)	<i>Mayetiola_destructor</i>	Mdes\Atp6v1E	ND	33	548	213	72	327 (132 + 195)			83	108	ND	cgaatgatagTCATATGActtattcgacta ttttccaaatTCATGTGAatgtatgtat ttttgtgtcaacgTCACATGAtcaacattcaa	5' intron1 intron1	>341 >191 >383
Lepidoptera	<i>Bombyx_mori</i>	Bmor\Atp6v1E LOC732990	ND	33	186	176	2169	169	462	195	1422	108	ND	gcaacactaagaTCATATGAttttcaataaa acaaaacaaatTCATGTGAccaaatcgatt	5' intron2	>119 >457
	<i>Manduca_sexta</i>	Msex\Atp6v1E	ND	33	195	176	1821	169	618	195	510	108	ND	gcaacactggtaTCATATGAttttcaatgaa ggtgttagtgc TCACATGAGaaatttgcaca ataaatgttgcatTCATGTGActtcaagggtct	5' intron2 intron2	>121 >572 >832
	<i>Danaus_plexippus</i>	Dple\Atp6v1E	ND	33	201	176	434	169	348	195	149	108	ND	taacattaaagaTCATATGAttttcaatgaa tatgtatataaTCACATGAcattttgtatc	5' intron2	>120 >440
	<i>Heliconius_melpomene</i>	Hmel\Atp6v1E	ND	33	193	176	909	169	308	195	319	108	ND	caacattaatgTCATATGAttttcaatgaa	5'	>121
	<i>Plutella_xylostella</i>	Pxy\Atp6v1E	ND	33	184	176	2072	169	435	195	628	108	ND	caacacaaaaaaTCATATGAttttcaatgaa gttgaatagtggTCATGTGAttatgttcaagg	5' intron2	>119 >665
Strepsiptera	<i>Mengenilla_moldrzyki</i>	Mmol\Atp6v1E	ND	33	54	176	970	169	819	303			ND--			
Coleoptera	<i>Tribolium_castaneum</i>	Tcas\Atp6v1E LOC659201	99	33	111	176	53	169	3968	303			ND	ataagggtcaaaaTCATATGAtcaatcgatctg tgccatttcatTCATGTGAttattcgatc	5' intron2	-16 454
	<i>Dendroctonus_ponderosae</i>	Dpon\Atp6v1E	99	33	117	176	615	169	226	303 (184 + 119)			ND	ataaaaatgggtgTCACATGAcagccaaatgc cacctgtcccaTCATATGAtcaatctacaac atctcatgttgc TCATGTGAttcgcatttgac	5' 5' intron2	>149 >118 >381

Hymenoptera	<i>Apis_mellifera</i>	Amel\Atp6v1E GB12913	194	33	914	176	133	169	202	184	217	119	301	cacactatgtTCATATGAtcgctttaact	5'UTR	64		
	<i>Apis_florea</i>	Aflo\Atp6v1E	ND	33	1021	176	130	169	147	184	181	119	ND	cacactatgtTCATATGAtcgctttaact	5'UTR?	>-124		
	<i>Bombus_terrestris</i>	Bter\Atp6v1E LOC100648858	164	33	617	176	126	169	136	184	138	119	1377	acactacctgtTCATATGAtcgctttaact	5'UTR	16		
	<i>Bombus_impatiens</i>	Bimp\Atp6v1E	ND	33	1413	176	129	169	136	184	138	119	ND	acactacctgtTCATATGAtcgctttaact	5'UTR?	>-140		
	<i>Megachile_rotundata</i>	Mrot\Atp6v1E	ND	33	514	176	104	169	86	184	157	119	ND	actagcttgtTCATATGAtcatcattaact	5'UTR?	>-132		
	<i>Acromyrmex_echinatior</i>	Aech\Atpv1E AECH19756	ND	33	451	176	5279	169	101	184	195	119	ND	tcacacttcgggTCATATGAccgacgttacgc	5'	>-134		
	<i>Atta_cephalotes</i>	Acep\Atp6v1E ACEPI5444	ND	33	469	176	4706	169	103	184	291	119	ND	tcatgttcgggTCATATGAccgacgttacgc	5'	>-126		
	<i>Solenopsis_invicta</i>	Sinv\Atp6v1E	88	33	590	176	194	169	97	184	140	119	486	tcacactttaggTCATATGAccgacgttacgc	5'	-46		
	<i>Camponotus_floridanus</i>	Cflo\Atp6v1E	ND	33	555	176	169	169	141	184	195	119	ND	cacatttcgagTCATATGAccgacgttacgc	5'	>-136		
	<i>Harpegnathos_saltator</i>	Hsal\Atp6v1E	ND	33	563	176	208	169	129	184	245	119	ND	tcacatttcgggTCATATGAtcgacgttacgc	5'	>-144		
	<i>Pogonomyrmex_barbatus</i>	Pbar\Atp6v1E	ND	33	512	176	199	169	95	184	215	119	ND	tcacacttcgggTCATATGAccgacgttacgc	5'	>-132		
	<i>Linepithema_humile</i>	Lhum\Atp6v1E	ND	33	566	176	174	169	129	184	74	119	ND	tcacgcttgggTCATATGAccgacgttacge	5'	>-147		
	<i>Nasonia_vitripennis</i>	Nvit\Atp6v1E NV10403	>127	33	333	176	86	169	80	184	78	119	539	taactcggtggTCATATGAtcgctatgtgag	5'	144		
	<i>Nasonia_giraulti</i>	Ngir\Atp6v1E	ND	33	333	176	84	169	80	184	78	119	ND	taactggccggTCATATGAtcgctatgtgag	5'	ND		
	<i>Nasonia_longicornis</i>	Nlon\Atp6v1E	ND	33	333	176	84	169	80	184	78	119	ND	taactggccggTCATATGAtcgctatgtgag	5'	ND		
Hemiptera	<i>Acyrtosiphon_pisum</i>	Apis\Atp6v1E	ND	33	156	176	705	169	1177	303			ND	ND				
	<i>Rhodnius_prolixus</i>	Rpro\Atp6v1E	175	33	2126	176	1220	169	94	303			75	ND				
Phthiraptera	<i>Pediculus_humanus</i>	Phum\Atp6v1E PHUM598510	ND	33	279	176	87	169	88	303 (152 + 151)			ND	tatgtgaattgaTCATATGAtcgctgtcaaag	5'	>-94		
Odonata	<i>Ladona_fulva</i>	Lful\Atp6v1E		33	156	176	384	169	188	152	329	151		aacagaatcatTCATATGAaccacttcgtgcgtgtacataCTATGAtcaactcgtaac	5'	>-141		
Crustacea	<i>Daphnia_pulex</i>	Dpul\Atp6v1E	128	33	72	176(66+110)	64	169	59	152	71	151 (88+63)	275	cacccactgtgtTCACATGAcacaacaaaTCAGCTGAcactgtaaagg	5'/5'UTR	-16/2		
Ixodida	<i>Ixodes_scapularis</i>	Iscs\Atp6v1E	98	33	122	66	244	110	ND	184+2187+276			93	actcgccgacacTCACATGAcggctgtccgc	5'	-1		
	<i>Homo_sapiens</i>	ATP6V1E1	127	33	9076	66	6140	110	332	67+11630+90	996	69+1738+95	3577	88+1792+63		ttccccccgcggTCATGTGActttgtcgccc	intron1-2	333
Cnidaria	<i>Nematostella_vectensis</i>	Nvec\Atp6v1E	65	33	158	66	543	110	245	67+562+90	193	69+1053+95	875	88+875+63	409	ccaatattccaTCACATGAAAattttattac	5'UTR	19
Placozoa	<i>Trichoplax_adhaerens</i>	Tadh\Atp6v1E	129	33	115	66	98	110	206	67+155+90	83	69+146+95	193	151	405	tacaatttatcTCACGTGAcgtcgcttgat	5'	-21