

Table S1. The predicted protein sequence of AAAP transporters identified in *Nilaparvata lugens* and *Helicoverpa armigera*.

Gene	Amino acid sequences
<i>NlAAAP01</i> (<i>Nlug16008-TA</i>)	MEVSSEGKDNSSSCGTLPI SARSTDKLELGKLEKNGKTQD KNIRTMQLATTDLDALLHVAKSSLGTGLLAMPFAFKHAG VIEGLISTIIVGLICAHGTHLLVKTSQRM CQTLKKTSLGYA DTVEAVFSSSRHTRLQSKASLVRKTVNMFLFTYYGAEM SYVVFIAATLKEVTYHNLGYDMNIRLYMIMAIPPLLIIGTV RSMKYLVPF SMLANMLLLSGVVFISYYVLQDLPLSSRPN YIPITKFPIFFSTVICGLEGIGTVTYHNLGYDMNIRLYMIM AIPPLLIIGTVRSMKYLVPF SMLANMLLLSGVVFISYYVLQ DLPLSSRPNIYIPITKFPIFFSTVICGLEGIGTILPVENSMRN PHHFLGCPGVLNIAMSIVVSLFTTVGFFGYWKYGD A VRD TITLSLPEGYVASTVKLLVALAIMFTYGLQMSAVMEV VW SAIEKKFESKNLDVAYYSTRASFVIVTVLSSIAVPQLGPILS LVGAVGFSTLGLFIPA AVDTILLSHFSTNWLWVKNMG MMALAVFALITGSYLSIETIIVDYS
<i>NlAAAP02</i> (<i>Nlug07328-TA</i>)	MASTINMKNSGALDIRNTGSTESFNTSSQIELAPASTLDQ DQKKKKEVLQSRDH SKATSDFGALLHVIKSSLGAGILASP DAFKHGG LIFSIFGTIFMGIVSTHCTHLVVKASQDLCFML KKPKLCYPETAEGAFQEGAGKRLRRYARLFRKMVDFSQF ITYYGINTAYVLISSSAKEVVEYHFGVSYNIRWYSLASTL LVVPIGCVKHKMYLVPF SAMANFLLGIGITISFYI FQDLP PIDSRPAIQSPSSISLFLSTVLLGMEGIGTIMPIENSMRHP SH FLGCPGVLNFAMLVVSLITLAESIKICVALAILFTYSLQLT ASIEVLWDNVKHNFNKENQGKAYYVIRVLLIIGTVLLAIA VPNLSPVISLIGAVGFAVLGITIPVIIDTILYWDEGFGMG NW VLWKNGVLFLISLYAMIAGGITSKKISVTEKNGTNFSTSVN VCDAKNAKQSGNGVFNEANTRTMHLATTDLDALLHVIK SSLGTGLLAMPFAFKHAGIIEGLFATIFVGLLC SHGTHLLV KVSQQMCTVLKKPSLT YSETVEAVFQTSPHGRLKAQSSL VRKIVNAFLFLTYYGSNTAYIVIVAATLKEIAKDDLGYDY NVRWYMLISTLPLLLIGTIRSMKYLVPF SMLANALLTGIV FIFYYLQDLPPITSRNEFKPISNFPIFFSTVICGLEGIGTILPV ENSMKKPQHFLGCPGVLNIAMTIVVSLFTSVGFFGYWKY GDNVRDSITLNLPPGYIGSTVKLLVALAILFTFGLQMTAV MEV VWFSAEKKFTPPNRDIAYYVIRGILVVITVLC A VAVP QLGPVISLVGAVGFSTLGLFIPA AVDLICASDRGINWKSFS VWKNLLMMALSIFALITGSFTSMRTIITQYT
<i>NlAAAP03</i> (<i>Nlug13074-TA</i>)	TFTEIMDQNGLDNKGFEKGYENGMEKTPSILTLQNNDNN FDTSSRLKLT KD SFPEKNGKKYPSKEESYDPFSNRDKSHA TSSMGAFVHMKSSLGTGILAMP GAFKNGGLIFGVIGTLL TGLICTHCVHMMVYCSQILSIRVKRPTLSFAETA EVSFQTG

	PPKYRFLASFAREMINVTLFCTYFFGNTVYIIFIARTFEQVI EGHAHFGWDVRVYIVLLAFVLVPLGIIRTLKYLVPFSAIAT AFISFGLALTLYYTFSEMPSDVSNRDFIGTPLKIPLFFSTVL FAMEGIGTVLPIENSMNKPQQFLGCPGVNLGAMSIVVILY VVVGFFGYLRFGNATQATVTLNLPDSALAESVKILVALSV LLTYGLQFTVPSEIVWKRLGPRVSEDKQDMGYIIMRGSM IIGTVIVAIMLPSLAPIISLVGAICFSILGLFCPAVIEIITFWEE GYGKYQWKFYKNVFLIFLSIFSLVSGSYASILEILDAIKHG EL
<i>NIAAAP04</i> (<i>Nlug04460-TA</i>)	MGTNGHVMTLANSIIGVSVLAMPFCFKQCGIMLSILVLL MSGVMTRLACHYLLKSAINARRRNFEILAFHTFGPTGKLI VELSIIGFMLGTCIAYFVVMGDLGPAIIGPVFNIDSTPSLRP SVLMGLGLLVVLPLGLLKNVDSLSTICTATIAFYLCVLK VMAEATTHLLSWDWVDKVNLRPAGISQCIPIFAMALSC QTQLFEVFDSVPNTPLDKMNAVVRSAVNMCTAVYISVGF FGYIAYCTQNFSGNLLMSFSPTVMSEIVKLGFVLSVAVSFP LVIFPCRASLHSLFRRHGHTPHHELLSGGGNYIPELRFKC LTVCIVLVSLGTGLLIPSIEVVLGLVGSTIGIVICIIFPALTFC LSNKKNNERLLAQMLIGIGLFIMVLGTYSNLFATEEAITKP DVDKQGTSIDLNQAGSPQLPEEAAAIKEKSEGVAVAGIPE IKQQANDVLLQIKKVIDAEDSDKRKEPPVPVAPGDNIVKD SNVNSPISSAVKQMKEEMEKENEDMKPTEKGEGIQKETNI LKEPIKNDVLIKEDQLKKLYKIEVNSPIKSETLEKSPNAE VKEIKKPKRHKEDVLKIMAKVGNSDRDQEKNVPPYENN KNNIDKEDEISNPKVNNIIKLDDTAKQNDEKSIKLSDTLK VPRQEIELKTASDSDLGNKKLGDNQEKNGV DITPDLEKNI IKGVPLPIAVRNNMNKNSVELDKPFLDIEADKQKIGGVRD ILSEKEKFVKEEREKRDLETVEKEDMNNFEKDVVPEKPE VESTIDKQNVIEKEKSNSIKGEVEKPVEHKDVVPSSGSHL GTV DSEAKCSKDSKNQFKEDENGLQASILKMELKKIPQE SEKDMEMPVTDKQVLQTSVEPLIKTPKFMSPPETVLNAV ELKPEELIRTAQDVKPM SRDLKSVNNDQGNTKNTRQQDR ITEIT
<i>NIAAAP05</i> (<i>Nlug00688-TA</i>)	MTEPPKPDEKSYILNAHKAVLEQQSSGESPEGRSGTHQDT EQLFVDKKERTTGLGFASFNYINSILGSGVIGIPFALHQAG FGFGFLLLGFMALVTDYSLILMVRS AHISGSFSYQGLMEA AYGQPGFYLLTFLQFTYPIAMVSYNVVVGDTVTKVLIRI FDLRPWSLLARRDFVLLATVFVTVPLCLLKDMARLAKA SLLSLFFVVFILVAIVVRLFTFSSVPTTSNAWQLYNWGV PAIGIMAFAFMCHHNVFLLYGSIEQADQKSWETVTHYSVF ASFIVACLFGLTGYATFTGFVQGDLENYCRDDDLNMMA RVAFSASILLTYPIECMVTRAVVDQVVNITNATMRHYGVT LIISV TYFLSVTTDCLALVLELNGVMSAVPLAFILPAASYL KLEEGSVLSRKKL PALGLALFGTVVAVMGAFMIFRHFSSV

	ERCAHGRVMEYCLPSFANKTHSF
<i>NIAAAP06</i> (<i>Nlug19955-TA</i>)	VPPLAAQLDNSDSNVAIPGPEVSDPTPPVGGKASKAVGT PNSDYNPLNNRDLEHPTSNLDTMIHLLKGNI GTGILAMPD AFRNAGLVVGT VGTLLMGIIC THCMHMLVSCSHEL CIRH QIPALGFAEVADHAFRSGPNRLRN LASYARKIVNTFLVITQ LGFCCVYFVFVAANLHEVIKHYYMSISVPWLLLILLIPMIL LNWVKNLKYLT PVS LVAALLTGTGIVISFMYMLQGLPRTS SVNAFASWHQLPLYFGTAIYAFEGIGVVLPLENNMKTPQD FGGLAGVLNTSMVIVACLYTAVGFFGYLKYGDRAVLGSIT LYLPQRDLLAQLVRLMMALAIFLSYCLQFYVPM SIIWPPI KRRINDESYQKVAELSLRTFLVCLTFLLAVAVPNLSAVISLV GAVSSSMLALIFPPIIEMVTFWDKGLSPALI IKDIFILLFGIF GFIFGT YVSMYNI VTK
<i>NIAAAP07</i> (<i>Nlug15355-TA</i>)	MYQII GLNLGTGNVKCAHEL Y YRTRVT SMSFADVGEIAFA NGPPWARRFSGLARVSIIVGLFAAYFATCSVYTVIIATNFQ QVIEFYTG DDEATSGERIRLYIAALMIPLVLISWVPNLKKL APISMVANAFMGVGLLITFY YLSIDLPSVAERAYVAPFEA MPQFFSITIFAMEAIGVVMPL ENAMKTPQHFIGICGVLNQ GMGGVTMIYIFLGLGYLKYGAETKGSITLNLPIEDYAAQ AVKILVGLAVFCTYGLQYFVCLEIVWNSLKD RFQKNSAL AEYVVRTILTVAAVLLAVAVPTIGPFLGLIGALCFSLGLIIP VFIEFVTYWEKGFGPGNWIVWKNILVLICGFLALVFGSYT SLLEIINVKDLPSPLETFTNESSLLGNETMTHLNATLQQLG E VVNSTLEAAVDKLT
<i>NIAAAP08</i> (<i>Nlug12813-TA</i>)	MTASSPKELQQNRSLEKDAELEKGKGGGHGLPPNKHPTS FIETLVHLLKGFVGS GFALGEGFKNVGLILGT VLT VFIGI ACVYCEHILLKCSTTLKRRKLSYYPDFAETVEMCFEEGP QSLRKFAKFTGSITYFMIIFMQFGFC CVYILFISNTSKYISD SYGLNLDLRVHMCIMMVPLILSSLVRSLKYIVPISLTANLC MIFGIASTMYIVMQDLPPVSSRRYIGDLGNVPLFFGTAVYS FEGIGLVLP LKREMKNPKHFD RPLGVLNLGLVIIVSIFLMM GFFSYLKYGDDIQASVTLNLPEKLAITDGESGNRNWNIVH ICTHVLCANRTDLAEDRSQVR SSEQATPLRTHISNIHG FCH KLSQMVRVAIGIGILFTYALMFYVPIELIWPRIAARFGPLSK PLLSELIFRIFMV FVTIFIAECIPHLGLFISLIGAFCSAFLSLV VPTVCDLILRWPSTFGTMKWRLALDIIALFLSVIGVTSGT YYSLEAIVLAFIGESS
<i>NIAAAP09</i> (<i>Nlug01999-TA</i>)	MVKENTLNCQNLKLQLRYVPVALGGSSASTCDKQQLSN NREFKRKVIALSRPPGTPVTPKSPHPTDCLPQCRDANPGIS LFEKIWKTP IARIGY EYYACIPMRLTRRPKSGGGWGGDRQ LKQCGSDHCDGW HGNAKANALHTPQYKQPPLQYYETFR KIECTNNLIQLYVFRFTVWNTMVGTSLLAMPWGMWESG PLLGTLLCLVMASVCLYTAYLNVSIYSKNGKPGEGAELFV LIKDLIGPWAEIIAKLFSVLVLAGAAIIYWILLSNFFYHNVY

	FIFYYLNRNDSNMQPTWSTTVLCPNHENFTSAESRAEEAH DTFNSIWNLHRTVPLYLILILFPVLNFKSPTFFTKFTSLGTM AVMYIMFFALVKFFVFGVNVSHDPESEYYTSFAHWTTFP KMSGMLTSLFIHNIINLMKCNEKQENNKRDLSIAYILVC TTYAFVGLVIYVSFPAAKSCIQDNILNNFLTGFDMTLFARF FLFFQLITVYPLILFMLRNQVLTMIQSNYPSVSSVVGfNA VIVSLCVFFAIVFPQIGHIIRFTGAIAGFIHVYSMPCLLKIMS EKADGSLTTTSMIIHVAIPILGFINIIAQFIV
<i>NIAAAP10</i> (<i>Nlug07975-TA</i>)	MSKGDSIGLQKVNGNKGSNYSVESGSPGPPYDPHAHREL ANPTTDRETLIHILKGS LGTGILAMPNAFYNSGLIVGT VAT FVIGFICTYCLHVLYYFCFRPIVDGFLIYQLGICVCYIMFV AQSIKQVADIYATPLDVRLHMLIILVPLMLITYIRNLKLLAP FSQLANIITFIGIGITLYYIFDDLPPVNSVPYVGVLRNFVLY MGTTLFALEAVGVILALENNMKTPKSFGGYTGVLNQGMI VIVILYVLVGFFGYVKY GKGALGSVTLNLPSTDILAQVVK LIFAVAFITYALQCYVPVDIVWNTYMKKNISTKHLFW EY VLRTAAVLITFVLAVAVPRLELFISXFGAFCLSALGIAFP AI EICVMWPDNLGTGYIYILFRNFLILFGIAGLLVGTYTSISDI ITSFSK
<i>NIAAAP11</i> (<i>Nlug10573-TA</i>)	MSCQPSLLNITNESFKNELNKS AVADPGLNLNIFVIGSDIK DGNRSTLKLVEKSKEELNEEEYDPFSFRQVQHPTTYGETL VNFLKSLVGTGVLAMPYGFQNTGMIIGILGT CIIGFISAYC GNTLVRCSHILLKRRKIPILDFAGVAEQ AFLSGPQRFRKYS MFVGKFIDLFIVLGTIGGNGCYIVFIASNLKQLLDPMVGE HSSRIYMVAMLPVILVMNLVRNLKYIAPFSMFANAVLGSG LVIIFFYYIVQDLPAVSTMPLYASASQLPLFFGTAVFAYGMIG VVLPLENDMKKPTQFLGVGGVLSIGVCFTAVLYTTMGFL GYLKYGEKTEASITLNLPLDEPIAKSVKLLYSVAVLFTYP MASYPAMQILQSYS AKSFKSLSVLYFFRVLMDVLTVLLAI LIPNLGAFVSLVGAVSSCLFGLIFPPVIELLTY YEDFN YGRF YSRIWKNIFIIFGALGFITGTYFSILDIINFDK
<i>NIAAAP12</i> (<i>Nlug01820-TA</i>)	MALGPHKTTEPATKMTRDTLSIALHNSGKNDKSEKNGLD NPALVMGSKTSINPPEMYSAPPYSEKGMSKDVLQSVYVV PANGTKTEKEEEYDPYLN RNVKHPTTYWETLIH MWKAS LGTGILAMPNAFH NAGFAVGTIGTLVIGFLCSYCIHILISTQ YELCRRRKTPSMTYPATAEAAAFQDGPTWTRRIAPYAPGIC NAFLLAYQLGSCCIYVVFVASNIKSV MDDYIEPMDVRVY MVILLVPLILINWVRNLKY LAPFSSLANILT VISFAITAFYV FQDLPDLSTRAAVGSFKGMPLFFGT VLFAMEAIGVVMDD YIEPMDVRVY MVILLVPLILINWVRNLKY LAPFSSLANILT VISFAITAFYVFQDLPDLSTRAAVGSFKGMPLFFGT VLFAM EAIGVVMPL ENEMDNPKRFGSAFGVLNCAML PITILYTIV GFFGYLKYGENAAGSITLNLPGDQLLAQSVKLM LALSIFV THALACYVAFDITWNQYMGPRVESKKMFWEFFCRTMLV

	VVTFGFAVAIPNLELFISLIGALCLSTMGLSLPAVINMLTFW DQYRGVGFILFISKNMCIILISVLGFAVGTSTSLHEIIEKFFH
<i>NIAAAP13</i> (<i>Nlug01818-TA</i>)	MVQKISSDGAPLHKSTTISVAVSGRNGHPMISEYDQKKGS SRTELADLVIVKYKCESNGVPMKLTNGSTLPLVPGSSKEA EEGEGYNPFAHRVLEHPTTDLETLIHLLKGS LGTGILAMP LAFANAGLLFGLIATFLIGFLCTYCIHVLVNCAHILLKRMK IPSLGFADVAEVAFLAGPQSTRKFAGFARGMINSFLVLDLL GCCCCVYIVFVAENLKQVVDTKAGVDWDLRFYMILILPFL LLVNLVRNLKY LAPFSMVANIFIGVGMGITFYIYIFDDLPPV SSQPQFSSWHQLPLFFGTIFALEGIGVVMPLNNMKTPA HFIGCPSVLNIGMFLVILLYTGVGFFGYLKYGADTAPSITL NLPRHLALAQS VKTMIAVAIFLTALQFYVPMEIWKNTK HRFTSHPIAAEYAIRISLVCLTSKYIRYSSFASDIM
<i>NIAAAP14</i> (<i>Nlug01815-TA</i>)	MTTKSDRVSYHDDNKTDTPAVPEKIPLLLPTIKQAGIGDIE TLVHLLKSSLGTGILAMPMAFKNAGLIFGLLGNIFHRIHL HLLCPHVKCAQILCERKTIQKIGFQKVVELSFLEGP KATT KFSTAAGKTVMAALLMELLGCCAYVVFVAKSMKQLVD HYGGHEMDVRFYMLLLVPCLITTNMGKSLRFITPISVISNS LFMGGVGVSYYYIFDDLPSVRERPWAVSWHHWPKFFGT AIFAMEGIGTIMPIENSMKTPKHFIGCPGVNLNIGMIILVTLY SITGFFGFLKYGAATDDSITFNLPTGAPLAQVLKIVIALGIF LSYSLFFASIDLLRDNLQRYAENSIRIWLIVLTVVIAALF PNLGPFLT LVGALSLSIVGLIFPPICEVLVYWHSPGLGRFN WRLWKNILIVCFGIVGLITGTMTSISEFARAYRR
<i>NIAAAP15</i> (<i>Nlug01817-TA</i>)	MEISEGEKGRDYFGESGLEKVCMLEYSDVIDPPELIPKPM KDIWRNGISAIACSGQEKKAAIAKNVISQKDQEAAFYD PFMNRNVAHPTSDFETFVHLLKGS LGTGMLAMPMAFKN SGLFVGLVGSIVVGYVCTYCVHMFVRASHVLCHRHQLPA IGFQKIVELSFLEGPECLKKFSKAAGYVINFGLLTELLGVC SAYVLFVAKSMKQIVEHYWHVDM SVQVYMAIMLPVLITI NLTRNLRHLTPLSMISNVLFLLGVFVSFYIYIFEDLPPISSRP ASFSSWGQLPLFFGTIFALEGIGVVMPLNNMKNP KHFI SCPGVLHIGMVFLIILYAITGFFGYLKYGDKVEASITLNL P VETMLGQFLKTIVAI AVFLTYFLLFYAAMDLLGIVNGRRF KTRPLLKENIVRILT VIGTVV VAGLFPNLGPFLSLIGAFSLC VVGLIFPPIIDTLIYYREGLGRLKWRLWKNGVILACGV LG LVTGTMISLQEFVESMGGA
<i>NIAAAP16</i> (<i>Nlug01797-TA</i>)	MADSGYEPGDHRQHLKHPTNYMETLIHFYKACIGTGIMA MPYAFKEVGWASGLAITIVIGSLCVYMTNRLAISSRMCI LEQKPTMSYVNTANACLKYGP ELTKNFKYFGSTANMFLI LYQFGCSCIYVVFVSGNLKHVWDYCYPETNPDIRLFMLIV MIPQCIVGLVDNYKHL SYFSLADICTISGFVLMFACYLLV DTKSLSEISPSNNGVYRFPMFVATVFFSMEAVAILALENE MKTPKH YTG YFGIVNMAMIPAVVLYTAFGFCGYLKYGED

	VKSSATFNLPGVDRIAQVILFSMSFAIFVTYHLSVFVTYDL IWKTYLGGPDESKNTETHVEINFFRHYMIRLAILGTNLCA MGIPNLSLFIVLLGALTLSVTGFIVMMWVCIYWNQYSG VKFAIFIAYNAFLFLAGCVAVFGLGQAIYDIAIFYDGEETF D
<i>NIAAAP17</i> (<i>Nlug07143-TA</i>)	MERDEIKVNLNGDSYSTEKCMITHQSELPLLMSSSENDGK LQKEEGDDLHPGVKHPTSYVETLINLIKNTGAGMFAM GDAFKNAGLLVGPILTVILGIICVYGNHILVNCSVAIREKK KMKKPLAFAETVQICFEEGPKFARPWANTVRICTYVFITIT QLGFCSVYFVFISSTLVKILVPYGINIAAHTYMTMILLPILA TALIRNLKFLTPISLANLSLGSGLVLLTLFFASRDLPLATR RMAADWKQLPLFFGTTVYAFEGISLVPLQNEMKNAKKF DTKFGVLNMGMTVVCAILISIGFVGYLKYGDDVKGSRTL NLEGTGLFSEIVQLNICFGILLSYTLQFYVPIKIIWPHVERK FAPMKHPVLCEKLFRTAFVIGTYFVALTVPHLGHFISLIGA VCGTTLALIFPPICDLVIRWPSDFGKLKWRLILDIFSLLVAA IGLVTGVYYSLEAIFDAYSNTT
<i>NIAAAP18</i> (<i>Nlug10388-TA</i>)	MPDEKLSVNSSMGRSVNYQSTSSSREPIWTRVANDPLSGS CSGYESNESYDRSLTSCTSSEPCKGKGLNVFNAAVFVAGE MAGSGILALPKAVVDCGWIGLVLVVVFCLNACYGGCRL GKCWTILEERYPEHRASSRNPYSTIAYRAYGRWCSLLVSG CIQVTLFGAGVVYLLAAQIFQELLRTIVPEIGYCMWFLIF AVLTIPVMWLGSPPKDFSFAGIGALLTTILSCFLIIAQIATEGL ELKHPPQHAPHTFKEFFLAFGVILFAYGGASTFTPTIQNDMT HREKFPKSVAIGFAVIFLLYLPVSFGGYFVYGDVNSNILL SLQRGPFELVANILMAMHLLLAFFIVVNPVSQEIEEIFDIPH SFCWKRCIIRTLMVVAMIVVGETIPKFGMILALVGGSTITL TTFVLPSLLYMKLCDQKSVDWPDRIPLYERVYMWELIVI GLLGGAASTYSAMTAIFSADALTKPCYWPDVK
<i>NIAAAP19</i> (<i>Nlug10180-TA</i>)	MEETYSLWTGLIYVFNLIIVGTGALTLPAAVLKAGWIVGIA MLCFLAIVSYITLTFVVEAMATANAITQWYKMKRLKRVS QNLCMVINQGIGDDDDDDHDNVDDDDDDVERINDNDEN DSMLSSDAPLYSAGTLRNFPMPVTFFSIDEK VEMGQM ARLFFPKVGQFLFYLTFCLYLFGDLSIYSA AISKSLVDVVC EADRNSSLLKDNEPCFENYNITQKTAYRLFLSAFLVVFGP FVFFNVQKTKYLQILTSLTRWLAFTSMIALAIRRLSPSLP HGDPTPAHLHGVP TLFGACIYSFMCHHSLPGLLAPIHATS KRRLLPGLAADYLLILLFYLT LVLTGIFAFPDLQPLYTLNFT PRPGDSGYLRAVDYFLALFPVFTLSTSFPVIAVTLRSNLQA LLSPSTPYCIRQIIVPAFGVIAPVLLAVVDDVNTLVGFTGS YAGTGIQYLIPAFLLISAKSAVPPELARYRNPFPASPFRSTTW LVLVICWSIVCITFVSINLIK Y
<i>NIAAAP20</i> (<i>Nlug02695-TA</i>)	MAAHLFNFQLIINEKPKRGMMDEERVPLLWKAPTTEKQY NEGSRREGSKSSSIQGLSLLSATLCIVDLFGVFPVVTMPR

	<p> IIINCGWFGFPLVLGVILQVYTALLLGRCWIMAERLQPSI VKQSRRPYAALAEMTYGESFARLVTFILDITVFGAGVPNLI VVVSSMTVTTVSLLTWHCFMASDVATPPPLPSISWEAIAI GYGVLAFAQFDIHPTILTIQVDMADKGKIGCAVIIGFLVTGT LFLTTSVLGAIYYSTELDYNVMQTLQPSLVMDINVLLVIL QICLSTVIGATPLFQDLEDKLGVDKEFNLKRILLRSGLVML SLALAEMVPRFDLIMGLIGGTLMGPLMFVLPPLFYARLRA MEPQPQLRPVATRNTETATIITVAFAPQPPDQIEYSMKQTH YTNPRRSQKPRRSKQTFEGKSSYNLIPKEKYLDLPSPTS QPNFFTKIKSNFLNLATLDDYPKIGPMTAWERLKTAVVVI AGVSATLISTYYSVRGTIRYARFAPPCLFNVTAATLAIED </p>
<i>NlAAP21</i> (Nlug04947-TA)	<p> MFKWKYKRIYQMIEYKHYLKKKIQKDTVFKSVTIKLNPG KNVNLGDSENCFRKAITYSCAYLQESRAADKNLVTYLQS TQDTGSYQMSRGGTFSMGESTDDFGGEFGGEGKSRHKIN EWQAAWNVTNAIQGMFIVSLPFAVLRGGYWAIFAMIGIA YICCYTGKILVECLYELDTSTGQRIRVRDSYVGIARECFGP VWGARA VNC AQMIELLMTCILYVVVCGDLMGGTFPDGSI DTRSWMMLTGILLIPLGFLKSLHHVSLLSFWCTMAHLVIN AVILGYCLLEIGDWGWSKVKWTLDLENFISLGIVVFSYT SQIFLPSLEGNLIDRSKFSWMLDWSHIAAAIFKSLFGYVCF LTFQNDTQQVITNNLPSAGLRGLVNFVLVIKAILSYPYPY AACELLEKSFFRGKPEPFPFSIWHLDGELKVWG LAFRIGI VFFTIMMAIFIPHFAILMGFIGSFTGTMLSFIWPCYFHLKLK GDSLDFGT VAYDCFVIFLG VVFGVIGVYDSGSALIKAFEIG LPF </p>
<i>HaAAP01</i> (rna- XM_021337951.1)	<p> MPRRFWGLRRLIRMPLTEAGDQYSVWVGLIYVFNLIVGT GALTLPAAAFARAGWGLSTISLMFLAFMSFLNATYVIETMA CANAVFKWKRLQTIKRESIQDHESDEDPSTSQNNHGDLE EPLVCGDNIPSRYSLDRRVELGEMANLFFNKIGRTTFYC SLCIYLYGDLSIYSA AVAKSIMDVVCTPIPPNMTDSKVWD ELPCFNISSTDRTGYTRFD TYRVALLTFVAAMGPFVFFNV QKTKYLQLFTSGMRWLAFTIMISMAIHLLVGRGAQGHPP AFDVTGLPTLFGACVYSFMCHHSLPGLIAPIRGKSRLGLH LFFDYAIIAMFYLLLAFTGAFAFAHLNDLYTLNFIPADNDN IFLEVVEYFLALFPVFTLSTSFPIIAITLRNNLQSLFLDTTRL ESYNFVLRKVLFPITVPPVLLTYFLEDISILIEFTGSYAGT GIQYFIPTFLVVSARRHCTNLLGLGVVNKYKSPFSHVAWA IFVLLWSFMCIILVSVNIFEKNL </p>
<i>HaAAP02</i> (rna- XM_021327065.1)	<p> MNLNMENGSVRSSIENVPSTTQSTITLDRKDDDKDEKND YNPFEHRDVVHPTSTLGAFFHLLKSSLGSGLLAMPAAFR NTGLIPGCIGTVLVGVIA THCVHILVSTSRAVSKNCRAPSL SYTDTCEEVFKQGPKKLQQYSKHIRHFVDAAMAGVCLG GTSVYVIFIASSLKDICDHFVPSKKFEVEVYCGILLPLILIT QIRHLKFLVPFSVLANVCLVVTFGITCFYTFTDLKPLENIE </p>

	MVASVEKWPLFLSTAIFAMEGINVVMMPVENEMAKPQHFL GCPSVLNVTMVFVTILYGVVGIFGYMKYGEGVLGSITLN LPEGENLALTAKILVAVAVFFTYCLQMYAPMDIIWTRIKCR ISKNYFNFSQITLRTLSTVTLTVVLAVAVPDLELLIGLVGAIF FSTLGLLIPVVVQTVHLWEKGLGKFSYILWKNALLLIFYFI VLVSGCYTAVSEILKFR
<i>HaAAAP03</i> (<i>rna-</i> <i>XM_021327047.1</i>)	MAKAKESMEIDNFKSTADLTSNPGFQSSLSIASKNVDEKP YNPFEHRTVEHPNSTIGSIVHLLKCCLGSGILAMPAAFKNS GLIVGAIGTLIAGFVCTHTVHILVKTSQEVCVDAKKPSLSF AETCGAAFTYGPKKLQSWGNSIKVIVDYSMVVITYFSVLC VYVVFISGSSMKEVMDVYMPDNPISIQACCAITLVPLVLIC QIRNLKYLVPFSALANILLVFVITLYYVFVDLPPLKERE MVASITQWPLFLSTVIFAMEGIGVVMMPVENEMAKPQQFL GCPGVLNVAMVIVISLYGFVGFFGYVQYGDMVKGSITLN LPEEDVIAQVAKALMAFVIFLSFALQFYVPMEMITRKRKG KESKYENFVQIAIRTMVTVAVAIAAAFPNLELVISFVGAV FFSTLGLLIPAVVDTVYHWDSGLGPFNYVLWKNLLIGIISII ALVSGAYVSVQGMIEDFGSSSHEAFDNATLT
<i>HaAAAP04</i> (<i>rna-</i> <i>XM_021327029.1</i>)	MGNDEKKGSIVLENFNSTANLASNPGFQSTLSLGSKEVIN EKAYNPFEHRKVEHPNSTIGSLVHLLKSSLGSGILAMPAAF KNAGLAAGAIGTLVVGFICTHCYVVLVKTSQEVCVDAKK PSMGFAETCGAAFEFGPKRLRPWANFARTFVDYAMTCTY LAALCVYIVFIAENFKEVLDEYIPEYKLSVEAYCALTLPPL VLICQIRNLKWLVPFSAIANVFLVICFAITMYIYFSDLPKPE GRVVVASVTQWPLFISTVIFAMEGIGVVMMPVENEMAKPQ QFLGCPGVLNVAMTIVISLYGIVGFFGYMKYGDDVRGSV TLNLPQDEVLAQSAKILMALAILFTYSLQFYVPMEMIWR QLHNKVSRYHNITQIAIRTTAVVGSVALAAAFPDLELFIN LSGAIFLSTLGLLTPAIIDTVHKWDRGLGPFKWILWKNIFI AMISLVALFAGSYTSIRSMVDKIFYETPVLEIVANVTSVSM NDTLSV
<i>HaAAAP05</i> (<i>rna-</i> <i>XM_021327054.1</i>)	MSTRYGRALKMFGDVCEQITAFGLGIELAYNGSKEDLE PYIPSQHRPIASNTSSFGALAHLLKASLGSGVLAMPLAFK NAGLAVGSGVGTLIIGLICCHVIHVLVKTSQKLCVEVRKPA LGYADTCDLVFQHGPKPVRKVAPFIRELADWALAVTHMG ACCVYVVVIAESFRQVSMVYGGPDWSVTVYCALSLVVL LPLTQITKLKYLVPFSALANFVWLGSICICLYYCLKDHPKV SERKLATSISGIPTFISTSLFAMEGIGVVMPIENEMRKPQDF LGCPGVLNAAFTVIAMVYAFVGFVGYLRFGEDEVGRSLTL NLPQEEVLAQTAKLLVGCVLLLSFTLVYYVPIDVIWRRLE HRIPLSGRRWGLAGVRFVGCLLLVGIAAAMPKLELFMELV GAVCLSVMGLLLPAIVETVFRWNRDIVPCSFVWKNVIIG FFSIAMGSGVTYAILAIVNTM
<i>HaAAAP06</i>	MRKSSLAQDTSSRRLPGQEARRLSGQEARRLSGQEARRL

<p>(<i>rna-</i> <i>XM_021327435.1</i>)</p>	<p>SGQETRRLSGQESRRLFGDEPLSTIDFRRTRLPSMRPDLDD YDPRDHRKPVHKKVWMAYSNLFRATTGVGMLAMPFIIS TTGILLGPILCLLTGILMIHAHSLLLDTLYEVARQLKMPYIS YRYAFRLALLHGPPIFHGIANYGPIIIATCLFVSQLGICSVIV IFTTDCLRDLMDWQASQTALISLIFPYFVMEFFMRNFTIVS YVAVIGTILNLLGIALVFEQLIEEAQGETIRFSAMLNYVLFS FGVMQFNLCAGVVMMAVDKHLENPRVMRARFGVINVGI MIPTIITLIFGTVGWYWGFGTMEENILRCLPFQERTSLATVCI YMLAMILTYPLQSAPAIHAILEVVKYYEKPWWPQPS EDTL FAIENISKPIFVVL SFLICYIVPFQAPFLAFVGNLCASMLAL VFPVMDLCLRYPHYYGKHNHLHFKDMAMIFVGIASILF GCIFTTELINIRLKT KYSPNSY GFF</p>
<p><i>HaAAAP07</i> (<i>rna-</i> <i>XM_021328263.1</i>)</p>	<p>MNVEKAEKREYNPF EHRQVEKPTSDIRSCANLIKSSLGS GLLAGPLAFANAGWGVGLFGTLLVGVICGHCIHILVRTSQ KCCVLDKKPSLGYAETCKSAFMNGPKGIRRFANIASVFAE FALFCTYTGVCCIYTVLISDSVKQLVDYAPSTILPVEYYC LIFLVPIILLCQIKYLKFLAIFSGLANILLTVYIVCLYYIFG GDITFAGKHAAGNPARYPAFLSTVIFAMEGVGVVMPIENT MKKPQNFLGCPSVLVVAMSAIVFLYGTLMFGYLRYGDI LRGSITLNLPTDEWPAILAKVSIALSIFLTYPLQFYVVIDIFT RYTQHRIKENYRQITQVVARTIGVCCCVGIGMALPMLEQI LNIVGALFY SILGLIIPSVIETVFRWENLGKWNWILWKNTF IALFGLLSLVSGCTVTIMDIIEILNRKTE</p>
<p><i>HaAAAP08</i> (<i>rna-</i> <i>XM_021328232.1</i>)</p>	<p>MIEKKEKSKNVEDYNPF EHRDVVKPNSDMRSLANLIKAS LGSGLLAMPLAFANAGWGVGIVGTVIVAFICGHCVHIFVE TSRGCCRAERKPLITYSETCGAAFANGPKCVRPFANFAH MFAEFSLCFTYLGVCIFTLLIATSIKQLFD TYLSTPPIPVG QYCLFLLLPLCLLCQIRHLKWLAPFSLIANVLLFATFAICL YYIFREPLTFSDKQIVGDMSRLPAFLSTVIFAMEGIGVVMP VENTMKKPQHFLGCP SVMVIAMTLVMLLYIMLG VFGYL RYGEALRG TITLNLPMDAWPAICAKVFISITIFLTYPLHFFV VIDIFTRYVEPRVQKKYHNVMQICVRIFIVCF CGGIGIALP LLEQIINLVGALFY SILGLIIPGIVETVFRWEDLGKYNWILY KNILIVFCGMFSLVSGCTVTISDAIEMIHKQME</p>
<p><i>HaAAAP09</i> (<i>rna-</i> <i>XM_021328152.1</i>)</p>	<p>MTNSYNMKEFSSTAVITENGLYPSTISISTINTKCKDNDLE CNAYDPFQNRKLEHPNSDMR SFANLLKSSLGSGILAMPA AFKNAGTLVGIVGTIILGYICTHCVYLLVKTSQEVS RVTRV PSLGYAETVEAVFATGPPPLRKISRGARIFIDWAMAFTILG ACAVYVILLVESVQQIVDFYFVDNEISK TMYCLMFLVPILI FTQIKNLKYLAPFSGFANVLLVLTFLICLYYICSDFPPI SDK PMAVDIGKLPLFIGTVIFAMEGIGVVL PVENTMAKPNHFL GCPGVLNITMSVVVLLYMFMGFLGYVRYGDLA QGSITLN LDTSEIPALTAKVFIIFAIFFTYTLQFYVPMEIVWRNTKGYV TQKYHNIAQGVIRAVFAVLTVIAAATLPRLEQVIGLEGAFF</p>

	YSFLGLIAPSLMDVIFKWNRLGLGKYNWILVKDVILIAFGS FVLVAGVTQSIREIIKTN
<i>HaAAAP10</i> (<i>rna-</i> <i>XM_021328488.1</i>)	MGTTGQSITLANSIIGVGILAMPFCFQQCGVLLATLILLFM GLVSRLCCHFLKLSALLARRRNFEFLAFHVFGQAGKIAVE VGIIIGFLMGTCIAYFVVVGDLGPQIIAKMFNINQSDILRTSI MVIVSIVCVLPLGLLRNVDSLSNVSAATIAFYFCLVMKVI EAAGVMLTSDWNQVRVEMWRPAGLLQCVPIFSMALFCQT QLFEIFESLPTLSLEKMNIIVTKXXXXXCTAVYFTLGMFGY VAFASRDISGNILMSLSPTMASDVIKLGFMVMSLAFSFLIIF PCRASLYSFLYKKVHSSSHDHIINHSIPETTFRCITVGIVGV EIKKDIRKDSEIQPPNPVPPESQSNEKLPQTKKIIKTEEKIL KPEIKEALDKVSETHPRNLKNKLESKLANGISNGEAQKTN EVK PQSNEDKIDMIKQQKLIETIKQHGEEQKELIKEQKEIL DEILKTKKELQQNKNEAEGAIEAKKIAVESIKQIADMAIKS IGGVSEKPDVKDEVKAERLEKLTNDVQEIAKKAVETIEA IQEIKEKPEQPIAAPQNNLPNVQVQNIPAQNVPAQNVQPAI PVNPQVIQGANDLVKPKDQAPNNVAANVLPQVNGAVVN QNGAAVQNNANQQLKREVKPAIEIAKENAQVPNIQPKIP ENNAQNQPKVDNVNKPVLNAEVGAEKPHSHSPDEPQSY KQGEDTQAKVPENKVVQNVPIVSNELANNQMKINRQPA AIQPNKDDIKVNVPPKVQNNGAKPNLQANVPPNSNLQQ IVNQA HARQKREVVDCTKKVTLKPEDKAICRNLDGNGK DSQEILKSVDLNEVALPKSLPLDVNVLHHISRALKSFDKDE R
<i>HaAAAP11</i> (<i>rna-</i> <i>XM_021329232.1</i>)	MSKKHLHNQA AIP LAPAVFKKPQMRPMIVEYDPKKKGV KNDLSDVVMVYKYNPNEIPVEQEAGSTLPLMEIPGRDIE ADEDYNPFHRKLAHPTSDMDTLIHLLKGS LGSGILAMP MAFRNAGLYFGLIATFAIGGICTYCVHVLVKT AHEL CRRL QKPSLGFAETA EA A FL SGPPAVHKFSRLAKAMINWFLVID LLGCCCVYIVFVAKNVKQVVD FYATGSDWYDV DVRIYM AVLLPLLILMNLIRNLKY LAPFSMIANLLVGTGMGITFYYL FQEVPSLSERLPFTSVDR LPTFFGT AIFALEGIGVVMPLN NMKTPTHFIGCPGV LNTGMFFVVS LYAFTGFFGYLKYGP DTKSSITLNL PQDEV LGQC VKLMIAVAIFFTYSLQFYVPM EIIWK NVRHWF GAKKNLAEYSIRIGI IILTLGT AIAIPNLGPF ISLVGAVCLSFLGLIFPAVIETV TYWDRPNGLGRFNWVLW KNLFLVSFGILGFLT GAYVSVLDIIHGEE
<i>HaAAAP12</i> (<i>rna-</i> <i>XM_021331270.1</i>)	MVNEANGNAPAPQELETFLSQDEKKKEKVVS KYNMTKD LESADFPDPTERKLENPTSNMDTLTHLLKAS LGTGILAMP KAFKCAGLVSGIFFTMLVALICTHCSYVLICAHVLYKKT KRTQMTFPEVGQTAFENGPEKFRPWGN AFRIFILVSLFLTY FGTCSVYTVIIAKNIVQVVAH HMGVEEDKVDIRLFILALL LPLIFMAWIRNLKY LAPVSMVANVFMGIGLGITFY YLVGT GSLQTDKINSMLIKAPVEWPEFFSLSIFAMEAIGVVMPL

	NAMKTPKAMLGLCGVLNKGMSGVTLVYILLGFLGYLRY GEDVKDSITLNLSENSEYPAQIVKISIAIAVYCTYGLQFFVC VEIMWNSIKDKFTKRPDLDYIMRTILVTACVLLAVAVPTI GPFMGVIGAFCSILGLIAPALIEVITYWDIGFGPTKYLIWK NIIVVIFGLFALVFGTKDAIKEIIRVYSQ
<i>HaAAAP13</i> (<i>rna-</i> <i>XM_021332347.1</i>)	MPKNILAEMGSQVGLTPRQNKKEAEEWARRQSGPMVNP SFEPDDFLPQSLSPVKDEKKRPGDKSIFLVNMKEKNIPEVE EYEPYDNRVVDHPTTNMETFLHLMKGS LGTGILAMPKAF SNAGYVVGSGVTVIIIGVLCTYCIHILIDSCYVLCKRRKVPS LSYTA AA EAALLEGPDWCKACAPYAAHV VNAFLLVYQI GTCCVYVVFVSDNIYFVLTKHFGIEITVFQVMLCVLLPLIL INWVRDLKYLAPFSAIANAVTIVSFGMILYYIFRDTPTLEG KVPAGKLANFPLFFGTVLFALFAIGVILPLENEMKTPRDF VGKFGVLNCSMISIIIVLYVGMGLFGYLQYGDESAGSITLN LPNTEILANVVQCLLAFAIFITHGLACYVAIDILWNEYIGIR MLNNKHRLIWEYLLRTVIVLLTFGIAAAVPALELFISLFGA LCLSALGLAFPALIQSCTYWYYVSRSERIRMIVKNAIVVL FGALGLVVGTWTSLERIIATFGTSVIETASNHTMAQNETLT P
<i>HaAAAP14</i> (<i>rna-</i> <i>XM_021334515.1</i>)	MNDEKQPLLTGPSNSIDSIEQPVELVTAPVATSATSGKPKS DYHPAAERRLEHPTSNFDTLIHLLKGNIGTGILAMPDAFK NAGLIIGVFGTLLMG TIC THCMHMLIKCAHELCIRSQKPA LGFSEVVEDSFALGPISVRPYAKTMKNIVSVFLVITQLGFC CVYFLFVATNLQDTMHFFHINLSVHAYLALLFPPIALAM VKNLKYLTVPVSLVASIMTAWGLVITFYIYLQDLPATNTVDA FSSWHQLPLYFGTAIYAFEGIGVILPLENNMKTPEDFGGW NGVLNTGMVIVAALYTAIGFFGYLKYGDHVLGSITLNLPN TLAQSVRAVMAASIFLSYGLQFYVPMNIVWPYVKS KLT SEQALKHGEAVTRFVLISITFLAAALIPNLSGIISLVGAFSSS ALALIFPPVIEIMTFWPDQLGRYQWMLYKDIFIFFGFTGF VFGTFINVKNIFF
<i>HaAAAP15</i> (<i>rna-</i> <i>XM_021336598.1</i>)	MPSILENIWPTSVISHHEDYTVGETTGGLSVLFTILCIVDLF GVFPVITLPKSVISCGIYGLPLVLSVFGLQLYTAVLLGKSW LLAQKITPDIKEKNRFPYAAIAELAFGPSAKTLVTF LIDAA VFGSGVPNFIIASQTLQIFWWKISGGEIGITYCVWMVILAL LLCPVMWL GSPKDMKPLAISSVLIVATVAVTIWT CILRDY TSPTPVDNMVALEPQLEDFLIAYGILAFQFDIHPMLLT LQV DMKDSKKINA AVLGGFGVTGCMFAVTTILA AVRYGTALD NNILQSIPSSIPLYLVSLLVTLQLCLSSAVSHSALFQHFEDIL KIPRDFCFRRCLLRSSVVALAVVLAESVPRFDLVMGLVGS TLTGPLMFICPPVFFLKL CYMKSKTPSNFFKLSEKRNGTQ NGGFKNGDLSKSP LILDALQPRYRTFTEYAVEVTEDDDYS IRWYDIIFALIVMTLGIVATIVATYSSWSNSIAYATFSPCLM NATAAARSFLEIPMAI

<i>HaAAAP16</i> (<i>rna-XM_021337064.1</i>)	MNEGLFFSLFCFQRSPTPSLYTLDRDIKNYIHKRESHSEY YPGTERTVYDYIEERNDMYNTNLIESTAHLIKGSLGAGAL SMHEAYMYGGLWTSLVVTIVIGITISYTMLMLIRSAQKM YRRLRISKLSYPDLAEAAACATSPWRFVRKLSKPFYRLVDA CIIFEMCGTCCYQIMIGSSIKQMFEGIDYEFKRVMGIRLY ILISAPILLPLCQIRSLKFLAPFSMLADVVALCVLTTLYYS LITLNANITDRYAWKNIHGFFRIAGICMYTTSGICVALPVE NNMKRPRYFPQAVRLGMFLTIVVLTTLVTGTFVGYWAW GESCKSPITVHMPLNIFTTILQFLLIMMLSTSFAVQFWVPF RIIWHYLVRRYKRKQAIWERVHRLIMGLIVMAFTMLFPN VISVMIFLGQFFMGLVALVFPATIEIMVDWEEAYSHRARVR LCQHVKNFTLITMGLMLSLSLTLYSVMDT
<i>HaAAAP17</i> (<i>rna-XM_021337048.1</i>)	MELKPNEGRPGHTTHSTHVRHHTTPERRFVDRSAEGEYN YVAARNNAKPTNVLESTGHLLIKGCLGGGILGIHEAYMKC GLWTSFFMTIMFGFYISYCVHILVSSAHKLYGRLHLATLS YPDVAEAAALAIGPFPKLRKYSKMFYAVDVIICIDLFGACC VYQIIIAKTIQQLTSLGQDSTSISYLRLFIALLVPILLCMIT TLKYLAPFSLVADFFIVACVIATIAYSKLIAPPIEDVPGWKN AMGFFEFSGVVVFVSMGVGVALPIENNMKEPKRFIVVLC AGMSVVVTFVLLVGFFGYWGFGEKCSIPVTLNFPSEIFPTI LKVLIALMIFVXFALNYWAPFNLVWYYLAKRHDSSKHWI WERVYRAVFIIITHISVIFPNIGNLMGLLGAFCLSNMGFIFP ALIDLLVVWENPGLGTLKWRLWKNVILIAGFMLFVAGT YSNAKGLLFTTYE
<i>HaAAAP18</i> (<i>rna-XM_021337340.1</i>)	MMEESNKSETVHLQPVGEGAGEGFKDSASEYYDPHEHR QLPKPTNNWETLVHLLKCSLGTGILAMPQAFARAGLVGTI LATIIVGALVTHCLHVLVRSQYAACKRLRVPLLTYPQSMS AALEAGPPPLRRFAGSLATTVDVFLVVYQLGICCVYIVFIA DNIKKMVDPPYYTMAVEIHMLIILLPLIAFNLIPLSKLLAPFS AVANVLTFVGLGIVVYYLLTNKKSDAPLDLWGPSTFPLF FGTILFALTAVGVVIALENMMPKAFGAPCGVLNSGMVII VLLYVAVGALGYVFCVSECSDSVTLDPQALANSVIAM FAIAIFISYGLHCYVPVEVVWRGYLLPRLQRSCTPPARLRV AEYALRVVLCLLTFVLAVAVPRLGLFISLFGALCLSALGICF PALMEMCVSFPDKFGPGRVRLKDVLLFIVGVVGMVAGT YTALLSIVRSFMPPDTEPLHA
<i>HaAAAP19</i> (<i>rna-XM_021337359.1</i>)	MFDVFRLASPGGQPLQPPEFDASFDPHKHKRVPHPTSY GETMTHMLKACFGAGMLAMPNAFARLGLIFGIVGIIFLG VFATYCIQILVLGQYQICKKWRVGYMSYPKSMRLAVQSG PPCLRWSAAIFENAVDGILLFWQIGVCAIFLVFAENLKQV CLYAGHELRLVLIICLYPILVILVLDLKLAPLSTFANG CTIIGLVLIFFYLVEDDVQVDESHFALKSLTDIPIFIGIVLYA LEAVGVILALEYNMDNPADFTGLFGLFSIGMSIIVLIYTAL GVCGYLKYGMDSKASITLNLQDQKKSHAAKMAFTLAV

	FSSFPLQNFVAWQILWQNYLEKKYKGTKKEKVADYGLRI LCTTIPFVMALIAPALGPFIGLIGSFCLSMVAILFPAVVDISV WYPDKYGP GK YKLFTDIFIIFGIFCCCSGVYTSLLEMVET LSK
<i>HaAAAP20</i> (<i>rna-</i> <i>XM_021337338.1</i>)	MFIYKFVGF GFDDTATDESTDAYDPHAHRIVAKPCTYGET MMHMLKGCLGAGLLAMPNAVARMGIVLGALGIIFIGAF TYCIQILVLAQYQLCKRHRRGY MAYTKSIRVAILGGPPQL HWSANCFANLVDFFLVFWQIGICAIYFVFVAENVKQVVEF IGYEVTVRRVICYSYPPLLICSLVKDLKLLTPFSTISNACVL VGLVLVFFYLVEDDVVLDEDKYKVKGLEDIPIFIGITL FAL EAVGVILALEYNMEKPREFTGFCGLFSVGMMIILATYIAL GVFGYLKYGNECKGSITLNL PQDEKKAQVAKLTFTIALFL SYPLQNFVAWQIVWRKTHKKVSDKWKRTVDYALRVILAT IPFGMAAAAPSLGAFMGLLGALCLTMVAILFPALMDLCV YYPNRYGFMRWKLWSDIFIIVFGMVCCASGVYTSVLEMV ETYDL
<i>HaAAAP21</i> (<i>rna-</i> <i>XM_021337468.1</i>)	MISRNLKELVEGDENLSDDGNPPLRVYILSMMLPCMVC MVSNLKYLAPFALIAVIYCVAVMVM TVWYACKNDKLMP WDRPSYKNMMGFVKLIGMCIFVTETASVALPIENNMNTP KKFHYVMVSAMPIVTLLMMTIGFCGYWNYGEIAFSPITV HFPDPFSIQLKVFLCILLYVMIAIYSYCAFDVEWFYFKRL HKPANYWFWERVYRSLHVVIDLIAAAPT VSGTMSIIGC MFTNPVFFYPQLIEMLCWDYPGLGRHNWRLVKCIFIMF ISLVIMLGGTGLNVYRMIYDMYIKPRGRVVS NATTESNFF DITGRLRSFNGDY
<i>HaAAAP22</i> (<i>rna-</i> <i>XM_021337469.1</i>)	MGLFEFMSVCTFVLEPVS YALPVENNMNEPKKFHNVM AMSINTVAMITVGFVGF WHYGNFAVSPITIHLPFSPFALT KVGLCIILYVIYSMCFYVAFDIEWFYLKRHHQMSNYWFW ERLYRTIHVILIMVSYCLPNVTRLMGIIGALCTSPAVFIYPY FIELLDWEHPGLGRCKWRLRFIVMLTFGLVL FVAGTY NGLGMYLELENRPKANISFDPENQMPELERKEINFEIGTE LSVDPKKRLNLTDEGKHNYDLNVALPYEVPYNLFDQNLN ANYSTKKANIVFDHTM
<i>HaAAAP23</i> (<i>rna-</i> <i>XM_021339027.1</i>)	MSKKVLEPRAKAGVSSENVSETTPLVGKKGEGDEEGRGL TTQQTAILIAGEMAGSGVLALPRALSKTGWFGVPLLLLVA LVAAFSGKRLGDCWSILEARDPEMRTRKRNPYAIIVEQAL GKPWSVVVSMAMIVTLFGASVVYLLLA AQIIEAVLLSLVP TLTICTWYLIVVGAMTPLLFFGTPKDFHLMGILAFGSSLVA CILYFIEMMNEVSPFTYRYGIHGFMDFLATGTMMFAFGG ASTFPTIQNDMADKTKFGKSVQYGF LAVLILYLLVAIAGY AVYGERVLPNVALSMSATPLTLAANILMAVHLLSAFIIINP VCQEVEELYNVPRDSTGWRMIVRVSIMLGILFIGESIPRFY TLLALVGATTIALLT YILPSVCYLKLIGQPAGEGQTPVEVP SWMKMVCYEVI ALGVVGCIAATISAVSAIFSTSM AVPCYL

<i>HaAAP24</i> (<i>rna-XM_021341781.1</i>)	MRFVEKIAKQAREPDSAASSVRSVDSYEIFGSACSDFTDC EYCEDRRKRYKKYNKYHSPSITSHSYYSAMSRAEAEPLL QGAVTPTYRAVSVESIDSLGPAELSSDAVLETFNKTFEKT KPDTKKQSSLVTIFSVWNTIMGSSLLTMAWGVERAGLPA ALVLVAFMAALCLYTAYVLLRVNKHGSDSCEVPALCRT LLGQWAEVVAHIFSLLVLLGANIVYWILITNFLYFTVNYF VDLNSSNETIYNTSLLCPRHLNESLLIAEPEADSAYWGLH TTVPIYVALIVFPLLNFKNVSFFTKFNSLGTLSVAYLLIFVL VKGYAWGIHIGELFTQTHAIRNAAVLSGMLALSFYIHNI TIMSNNARQDKNGRDLTIAFLLVTVTYTLVGAVFYICFPL AKSCIEDNLLNFMHDMTAVARMLLLFQVVTVYPLVA FMLRSEAILLLPFKETRGLTIINISIMAMCILVACFCPSIGT RYTGAVSGLVHIFALPSLLQIRSLQFRGKLTWWKTVFYCSI MVFGAVNLLMQFFIDE
<i>HaAAP25</i> (<i>rna-XM_021342544.1</i>)	MINLGKFKLPPLRNVLDVTMQTVRQQIPEKPGAPPRPPQN VRFANLDNMGESCELSTMNETTSPSYQSTNPTNPFLSGAL QAEDSFTSYQNTYPQQDGAPRTQSMQSVDFYASSEEGGG FEEGGGPPGAKINEYQAAWNVTNAIQGMFVVSLPFAVLQ GGYWAIAMIGIAHICCYTGKILVECLYEDDPVSGQRVRV RDSYVSIKECFGRKYGARIVNLAQIHELLMTCILYVVVC GDLMIGTFPDGAIDARSWMMLTGIFLLPLAFLKSLKSVM LSFWCTMSHLIINAIVLGYCILNIGDWGWSKVWTLDFE NFPISLGIVFSYTSQIFLPTLEGNMEDRSKFEWMLDWSHI AAAAFKSIFGYLCFLTFQNDTQQVITNNLRSAGFKGLVNF FLVIKAVLSYPLPYAACDLLERALFRGKPKTIFPVIYALD GELKVVWGLAWRLGVIMFTILMAIFIPHFAILMGFIGSFTGT MLSFIWPAYFHLKLKGNTLESTRIAYDYFIIALGVLFVIG MYDSGSALIKAFKIGLPF
<i>HaAAP26</i> (<i>rna-XM_021343518.1</i>)	MVDKKMQHEINITHISGSVSDIHEINSLSGTLPETKKQEA HNGGHHVVTHTPSYADTMLHLFRGNIGTGLLAMGDAFK NGGIVFSPIVTALLGIICVHAQHLLLCSEEMHRKSKRDR APGFAETVYLVFASGPVSCRSMATTMKILVNGFLCVTQLG FCCVYIVFIANNVKMICDQYNIHISLSIHMLFVVLPIMLAC MVRNLKYLTPFSTIANIMMAFGVAVVIYAATQDLPVETR VYMASWQQPLPYFGTAIYAFEGIGLVPLKNEMSNPESFQ KPLGVNLVGMVVVGSIFITVGFLGYLKWGDEVLSLTN LQPGEVLSNVVQSLIALAILFTYPLQFYVPIAITWPAIEKK YGATHPVAKELGYRALLVILTFILAESIPELGLFISLVGAVS STALALMFPPLELVSTSQKPGGIPTILIKNCFIILLGLFIFS TGTYESVASIVRAFQV

Table S2. TPM values of putative AAAP transporter genes in BPH at 15 different developmental stages.

Gene	egg24h	egg48h	Egg5D	1st24h	1st48h	2nd24h	2nd48h	3rd24h	3rd48h	4th24h	4th48h	5th24h	5th48h	A24h	A72h
<i>NIAAAP01</i>	4.12	0.24	2.36	36.75	37.39	29.38	39.39	33.54	30.57	32.18	32.92	32.60	35.34	54.68	44.89
<i>NIAAAP02</i>	0.62	0.42	16.33	30.62	26.59	25.55	21.34	22.02	20.13	18.55	14.00	18.63	13.17	18.54	13.98
<i>NIAAAP03</i>	5.27	5.99	4.65	7.95	12.73	13.23	17.94	16.39	17.04	15.49	15.41	16.18	18.97	20.36	12.14
<i>NIAAAP04</i>	13.09	8.41	12.01	7.45	7.11	8.32	6.95	8.12	8.24	7.39	6.96	6.54	8.12	8.73	10.00
<i>NIAAAP05</i>	2.48	1.30	15.63	12.82	15.20	16.90	9.88	16.62	17.16	8.23	12.14	9.21	11.58	6.61	5.50
<i>NIAAAP06</i>	2.69	3.05	13.14	13.34	10.01	9.02	8.20	6.95	8.24	7.90	9.43	12.15	11.97	14.20	17.08
<i>NIAAAP07</i>	40.90	36.28	16.00	26.77	39.94	22.17	43.77	27.89	46.15	34.97	21.82	32.64	48.92	145.48	115.50
<i>NIAAAP08</i>	0.37	0.47	5.30	9.13	9.23	8.65	9.16	8.20	7.90	14.97	10.74	11.43	10.89	8.39	7.20
<i>NIAAAP09</i>	6.26	9.37	24.64	13.67	11.81	12.77	11.57	19.67	7.17	28.77	37.17	29.61	24.89	14.39	15.31
<i>NIAAAP10</i>	5.14	1.41	17.60	21.66	27.31	17.76	21.99	14.59	15.27	12.55	8.39	11.92	12.24	18.44	12.67
<i>NIAAAP11</i>	1.47	0.30	3.53	5.95	9.30	5.07	12.98	4.74	7.15	2.64	2.24	3.42	2.38	4.75	2.90
<i>NIAAAP12</i>	24.34	7.09	14.54	62.70	88.38	109.02	100.15	102.77	99.55	96.26	84.80	117.09	114.71	103.03	93.25
<i>NIAAAP13</i>	30.11	25.18	7.09	48.46	45.23	39.11	43.84	40.05	23.25	37.52	23.36	41.29	40.44	39.61	39.74
<i>NIAAAP14</i>	1.48	1.74	5.27	10.48	6.62	5.50	5.69	7.73	4.13	12.16	7.94	9.50	10.46	6.72	3.71
<i>NIAAAP15</i>	1.51	0.96	8.29	22.56	20.05	19.48	13.90	28.63	15.08	24.41	12.97	19.91	26.32	26.25	15.45
<i>NIAAAP16</i>	0.06	0.14	0.03	0.05	0.00	0.03	0.08	0.03	0.18	7.98	13.35	12.75	4.50	0.00	0.00
<i>NIAAAP17</i>	5.12	5.19	3.39	5.34	4.62	3.70	3.97	4.12	4.02	5.89	4.73	7.85	6.29	6.72	6.84
<i>NIAAAP18</i>	6.44	4.99	15.29	8.18	10.30	8.58	10.56	8.27	10.46	10.64	7.89	10.64	14.64	20.03	23.31
<i>NIAAAP19</i>	5.33	6.47	6.34	5.04	5.34	6.08	4.14	6.30	5.03	5.87	5.28	5.20	8.60	10.27	10.13
<i>NIAAAP20</i>	3.44	2.87	7.86	6.71	6.07	5.56	5.65	7.94	4.49	5.49	3.21	4.23	3.44	1.86	1.51
<i>NIAAAP21</i>	5.28	3.99	5.79	12.81	8.92	7.78	6.42	7.41	6.19	6.19	5.16	7.00	6.85	3.31	2.91

Table S3. TPM values of putative AAAP transporter genes in BPH at six different tissues.

Gene	Head	Salivary Gland	Integument	Gut	Fat Body	Ovary
<i>NIAAAP01</i>	4.86	0.09	49.08	76.12	39.64	1.86
<i>NIAAAP02</i>	16.21	6.02	3.37	352.84	3.63	6.19
<i>NIAAAP03</i>	3.73	2.52	3.14	91.03	0.44	4.96
<i>NIAAAP04</i>	3.33	5.00	9.76	7.93	9.67	13.80
<i>NIAAAP05</i>	8.20	1.22	3.39	19.39	3.74	7.97
<i>NIAAAP06</i>	0.31	0.87	3.73	0.93	6.58	17.37
<i>NIAAAP07</i>	12.17	10.18	83.48	6.20	29.57	70.85
<i>NIAAAP08</i>	2.10	0.57	1.11	100.51	1.07	1.68
<i>NIAAAP09</i>	26.78	5.07	12.78	93.08	22.02	4.79
<i>NIAAAP10</i>	2.12	0.19	1.20	0.39	0.06	0.31
<i>NIAAAP11</i>	10.41	1.60	3.49	0.55	0.68	2.22
<i>NIAAAP12</i>	42.72	9.02	87.94	1362.75	28.37	53.34
<i>NIAAAP13</i>	15.41	7.34	8.12	211.23	7.95	39.97
<i>NIAAAP14</i>	8.02	4.39	7.48	2.39	1.02	1.32
<i>NIAAAP15</i>	18.30	5.23	13.26	44.71	15.57	18.75
<i>NIAAAP16</i>	0.00	0.00	0.00	0.00	0.08	0.05
<i>NIAAAP17</i>	3.01	0.63	6.49	4.68	5.45	10.81
<i>NIAAAP18</i>	8.34	8.47	15.74	9.35	17.34	8.85
<i>NIAAAP19</i>	0.94	1.73	5.61	6.72	3.07	7.96
<i>NIAAAP20</i>	11.91	0.56	0.51	0.98	1.41	1.08
<i>NIAAAP21</i>	1.39	0.35	1.93	0.72	2.67	2.47

Table S4. The primers used for qPCR and RNAi experiments in this study.

Primer	Primer sequence (5'-3')	Purpose
<i>NIAAAP01-F</i>	ATGGAAGTGGTGTGGTCTGC	Quatitative real-time PCR
<i>NIAAAP01-R</i>	GAACGGCTATGCTGCTCAGA	Quatitative real-time PCR
<i>NIAAAP02-F</i>	GAATTGGCTCCAGCATCAACG	Quatitative real-time PCR
<i>NIAAAP02-R</i>	GCGCCCAAACCTGCTTTTGAT	Quatitative real-time PCR
<i>NIAAAP06-F</i>	CCTCGATGGTGATCGTAGCC	Quatitative real-time PCR
<i>NIAAAP06-R</i>	CCAATAAATCGCGCTGAGGC	Quatitative real-time PCR
<i>NIAAAP07-F</i>	TGGGAACAGGAAACGTGAAA	Quatitative real-time PCR
<i>NIAAAP07-R</i>	AAGTAGGCAGCGAACAGTCC	Quatitative real-time PCR
<i>NIAAAP09-F</i>	ACTACGTTACGTTCCGGTCG	Quatitative real-time PCR
<i>NIAAAP09-R</i>	TACCTGGGTTGGCGTCTCTA	Quatitative real-time PCR
<i>NIAAAP12-F</i>	CGTTGGGTCCGCACAAGA	Quatitative real-time PCR
<i>NIAAAP12-R</i>	TAACCAAGGCAGGGTTGTCC	Quatitative real-time PCR
<i>NIAAAP13-F</i>	TGAGATATCACGAGAATAAGGGTCG	Quatitative real-time PCR
<i>NIAAAP13-R</i>	CTCTTCGGCCTCCTTACTGG	Quatitative real-time PCR
<i>NIAAAP16-F</i>	AGCCATCACAAATTGCTATAAGTTCT	Quatitative real-time PCR
<i>NIAAAP16-R</i>	TTCTTCGTCAATTCGGGACCA	Quatitative real-time PCR
<i>NIAAAP18-F</i>	CTGAAGCATCCACCTCAGCA	Quatitative real-time PCR
<i>NIAAAP18-R</i>	GTTCTGGATGGTGGGGAAGG	Quatitative real-time PCR
<i>NIAAAP20-F</i>	GGCGCACCTGTTCAACTTTC	Quatitative real-time PCR
<i>NIAAAP20-F</i>	CCGTTGTTGGTGCTTTCCAC	Quatitative real-time PCR
<i>dsNIAAAP07-F</i>	TTGGGAACAGGAAACGTGAA	synthesis of dsRNA for <i>NIAAAP07</i>
<i>dsNIAAAP07-R</i>	GCTAATCAGCACCAGTGGGA	synthesis of dsRNA for <i>NIAAAP07</i>
<i>T7- dsNIAAAP07-F</i>	GGATCCTAATACGACTCACTATAGG TTGGGAACAGGAAACGTGAA	synthesis of dsRNA for <i>NIAAAP07</i>
<i>T7- dsNIAAAP07-R</i>	GGATCCTAATACGACTCACTATAGG GCTAATCAGCACCAGTGGGA	synthesis of dsRNA for <i>NIAAAP07</i>
<i>dsGFP-F</i>	AAGGGCGAGGAGCTGTTACCG	synthesis of dsRNA for <i>GFP</i>
<i>dsGFP-R</i>	CAGCAGGACCATGTGATCGCGC	synthesis of dsRNA for <i>GFP</i>
<i>T7- dsGFP-F</i>	GGATCCTAATACGACTCACTATAGG AAGGGCGAGGAGCTGTTACCG	synthesis of dsRNA for <i>GFP</i>
<i>T7- dsGFP-R</i>	GGATCCTAATACGACTCACTATAGG CAGCAGGACCATGTGATCGCGC	synthesis of dsRNA for <i>GFP</i>