# LARVAL HEMOLYMPH PROTEINS AND PHYSIOLOGICAL ROLE OF PROPHENOLOXIDASES IN ANOPHELES GAMBIAE

By

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Bachelor of Science in Biosciences

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Hefei, Anhui

2013

Submitted to the Faculty of the Graduate College of the Oklahoma State University in partial fulfillment of the requirements for the Degree of MASTER OF SCIENCE May, 2016

# LARVAL HEMOLYMPH PROTEINS AND PHYSIOLOGICAL ROLE OF PROPHENOLOXIDASE

## IN ANOPHELES GAMBIAE

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# Title of Study: LARVAL HEMOLYMPH PROTEINS AND PHYSIOLOGICAL ROLE OF PROPHENOLOXIDASES IN ANOPHELES GAMBIAE

#### Major Field: Entomology and Plant Pathology

Abstract: The African mosquito Anopheles gambiae is one of the major vectors for human malaria. Understanding its immune system may provide new means for disrupting the disease transmission. While the Drosophila melanogaster and Manduca sexta immune systems are well studied, most components of the mosquito system remain to be examined. Insect hemolymph contains important factors for humoral and cellular defense responses as well as immune signal transduction, including pattern recognition receptors, serine proteases, serpins, antimicrobial peptides. In the present study, we collected hemolymph samples from water- and E. coli-pricked A. gambiae larvae. The samples were separated on SDS-PAGE and subjected to LC-MS/MS analysis. The detected peptides were searched against A. gambiae proteins from VectorBase. We have identified a total of 1,756 proteins. Most of the abundant proteins contain putative signal peptides. Twenty-five most abundant proteins represent over half of the total protein amount, 109 proteins are up-regulated, 49 are down-regulated, and 235 are considered to be defense-related. After examining the protein distribution in the gel slices, we found that more abundant proteins tend to exist in more of the slices. We also obtained evidence for proteolysis, post-translational modification, serpin-protease complex formation, and high  $M_r$  immune complex formation based on the distribution data. In addition to the proteomic study, we generated monoclonal antibodies against prophenoloxidases PPO2 and PPO7 and found that PPO2 is presented in the adult hemolymph. Lastly, we tried to knockdown PPO gene expression in female adults by injecting double-stranded RNA and examined their survival following an E. coli challenge. No significant difference was observed between the test and control groups.

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#### CHAPTER I

#### INTRODUCTION

Vertebrates rely on their immune system to distinguish self from non-self and defend against invading pathogens. Immunity is divided into two types, innate and adaptive. Innate immunity is fast and can kill a broad spectrum of pathogens but lacks specificity. Adaptive immunity involves production of antibodies and T-cell receptors that recognize specific pathogens and development of immune cells that produce the specific proteins and, hence, is much slower. Only innate immune responses have been demonstrated to take place in most invertebrates including all insects.

In insects, cuticle lining of body surfaces, digestive tract and trachea acts as a physical barrier for exogenous parasites and comprises the first line of defense (Tzou et al., 2000). If microbes cross this line, they may encounter humoral and cellular responses in the hemolymph (Jiravanichpaisal et al., 2006). Cellular responses involve phagocytosis, encapsulation, and nodule formation of pathogens by hemocytes (Lavine and Strand, 2002), while humoral responses are initiated upon recognition of pathogen-associated molecular patterns (PAMPs) by pathogen recognition receptors (PRRs) (Janeway and Medzhitov, 2002). The recognition activates a serine protease cascade in hemolymph, which ultimately leads to the generation of active phenoloxidase (PO) (Ragan et al., 2009). PO catalyzes the melanotic encapsulation of invading parasites and mediates their clearance from the host. Apart from that, at least two signal transduction pathways exist in insects to mediate induced synthesis of antimicrobial peptides (AMPs). The Toll pathway, activated upon Grampositive bacterial and fungal infection, employs transcription factors Dif and Dorsal for AMP production (Leclerc and Reichhart, 2004; Pinheiro and Ellar, 2006). The IMD pathway, responsive to most Gram-negative bacterial infection, employs Relish to induce AMP production (Kurata, 2010; Stoven et al., 2003)

The genome sequence of A. gambiae was reported by Holt et al. (2002), and continuous efforts have been made to improve the gene annotation. Due to rapid development of proteomic methods, proteomic studies have been performed in A. gambiae as good complements to genomic and transcriptomic research. Dinglasan et al. (2009) found 12 peritrophins that contain chitinbinding domains in the peritrophic matrix proteome. They form the matrix and protect mosquito from pathogens in the midgut. A majority of the proteins identified are related to immunity in the hemolymph proteome, including PPO2, CLIPB4 and CLIPA6, TEP15, SRPN2 and SRPN15 (Paskewitz et al., 2005; Pinto et al., 2009). Others participate in iron or lipid metabolism, such as ferritin, apolipophorin III and MD2-related protein. In the proteome of saliva and salivary glands, D7-related proteins with pheromone/odorant binding domains were found to be highly abundant and gSGs were implicated in blood feeding (Francischetti et al., 2002; Kalume et al., 2005). Lefevre et al. (2007) found a wide range of molecules in the head proteome of A. gambiae which indicated an altered energy production in *Plasmodium*-infected mosquitoes. Phosphoglycerate mutase and tropomyosin in the head may be involved in behavioral manipulation. Lastly, two vitelline membrane proteins, seven chorion proteins and seven odorant binding proteins were identified in the eggshell proteome (Amenya et al., 2010). Enzymes involved in cross-linking and stabilizing the chorion, such as peroxidase, laccase 2, PPO9, thioredoxin, were also reported.

Here we employ a new proteomic method and focus on the larval hemolymph proteins of *A*. *gambiae*. The objectives of my research are: 1) obtain a complete profile of proteins present in *A*. *gambiae* larval hemolymph; 2) analyze the distribution patterns of proteins in polyacrylamide gel and explore possible implications in protein function; 3) find out the expression profile and physiological role of prophenoloxidases in *A. gambiae*.

#### CHAPTER II

#### **REVIEW OF LITERATURE**

#### Insect immune system

The first line of insect antimicrobial defense is the cuticle or exoskeleton, which is composed of proteins embedded in chitin and serves as a physical barrier against pathogens in the environment (Tzou et al., 2000; Feldhaar and Gross, 2008). Ingestion of food can introduce microbes to the digestive tract. Midgut cells in many insects produce a peritrophic membrane to protect the gut wall from abrasive food. It is permeable to digestive enzymes and nutrients, but not to microbes.

Some pathogens can bleach the barrier and enter hemocoel, where they will encounter the host cellular and humoral immune responses (Jiravanichpaisal et al., 2006). The cellular responses involve phagocytosis, nodule formation and encapsulation (Lavine and Strand, 2002). Phagocytosis is the engulfment of bacteria and fungi by plasmatocytes. When the size (or number) of microbes is too large to be engulfed, multicellular nodules are formed around the pathogens, which are often melanized subsequently. For parasites (*e.g.* nematodes) and parasitoids (*e.g.* wasp eggs), encapsulation by multi-layer hemocytes is employed to sequestrate them.

Humoral responses are initiated by binding of free pathogen recognition receptors (PRRs) to pathogen associated molecular patterns (PAMPs). PAMPs, like peptidoglycan,  $\beta$ -1,3-glucan, lipopolysaccharide (LPS), and lipoteichoic acid (LTA), are structural features of many bacteria and fungi, which can be used to distinguish non-self from self by the host. Correspondingly, insects use PRRs, such as peptidoglycan recognition proteins (PGRPs),  $\beta$ -1,3-glucan recognition proteins ( $\beta$ GRPs), Gram-negative bacteria binding proteins (GNBPs), and C-type lectins (CTLs) to identify those PAMPs (Janeway and Medzhitov 2002). Binding of PRRs to PAMPs activates a serine protease cascade in the insect hemolymph, which ultimately leads to the activation of prophenoloxidase (PPO) (Ragan et al., 2009). Active PO is a key enzyme for melanization. The protease system is regulated by serine protease inhibitors of the serpin superfamily (Kanost et al., 2004).

Furthermore, recognition of the PAMPs by PRRs directly or indirectly activates two immune signal transduction pathways, which up-regulates the expression of distinct but overlapping sets of antimicrobial peptide (AMP) genes in *Drosophila*. One is the Toll pathway, which responds to Gram-positive bacteria and fungi (Leclerc and Reichhart, 2004). Upon PRR recognition and serine protease activation, pro-Sp azle is processed to form Sp azle, which binds and activates the Toll receptors on cell membrane. The receptor then interacts with intracellular Myd88/Tube/Pelle and leads to the phosphorylation of Cactus. Phosphorylated Cactus dissociates from transcription factors Dif and Dorsal, allowing them to translocate to nucleus and induce AMP expression (Belvin and Anderson, 1996; Pinheiro and Ellar, 2006). The other is the IMD pathway in which most Gramnegative bacteria are recognized by membrane-bound PGRP-LCs (Kurata, 2010). The intracellular domain of PGRP-LC forms complex with Imd/Dredd/Fadd and ultimately cleaves Relish, resulting in a DNA-binding N-terminal fragment (Hu and Yang, 2000; Naitza et al., 2002). This active Relish fragment translocates to nucleus and induce AMP expression (Hoffmann and Reichhart, 2002; Stoven et al., 2003).

#### Phenoloxidase

Phenoloxidase (PO) is an important component of the insect immune system. It is synthesized as a zymogen prophenoloxidase (PPO), which is activated by proteolytic cleavage *in vivo*. PPO is primarily synthesized in insect hemocytes (Ashida and Brey, 1997), but other locations are also reported, like hindgut epidermal cells in the silkworm *Bombyx mori* (Shao et al., 2013) and hind wing of red flour beetle *Tribolium castaneum* (Dittmer et al., 2012).

There are mainly three mechanisms for PPO activation (Lu et al., 2014). In B. mori, direct cleavage at Arg51-Phe52 by PPAE (PPO activating enzyme) is able to generate active PO (Yasuhara et al, 1995). In the tobacco hornworm Manduca sexta, PAP (PPO activating protease) cleavage at the same site (Arg51-Phe52 in MsPPO2) only generates a product with low PO activity. The cleavage has to occur in the presence of a high  $M_{\rm r}$  complex of serine protease homolog-1 and -2 (SPH1 and SPH2) for the cleaved product to exhibit high PO activity (Jiang et al., 2003a, b; Yu et al., 2003; Gupta et al., 2005). In the beetle Holotrichia diomphalia and the fruit fly Drosophila melanogaster, PPO is first processed into a 76 kDa product with no activity, and then further cleaved to a 60 kDa high PO activity fragment (Lee et al., 1998; Kim et al., 2002; Lu et al., 2014a). In each model, the pathway is initiated via the binding of pathogen recognition receptors (PRRs, such as PGRPs,  $\beta$ GRPs) to pathogen associated molecular patterns (PAMPs, like peptidoglycans,  $\beta$ -1,3-glucan). Binding activates a downstream serine protease cascade, which finally leads to the activation of PPO. For example, the binding activates M. sexta hemolymph protease-14 (HP14), which cleaves proHP21 to form HP21. HP21 is responsible for the activation of proPAP2 and proPAP3 into PAP2 and PAP3 that cleave PPO. With the involvement of SPH1 and SPH2, PO is able to kill and melanize pathogens and parasites (Jiang, 2008).

The biological substrate of PO is generally thought to be tyrosine (Clark and Strand, 2013). Under PO catalysis, tyrosine will be converted to L-dopa. After several subsequent steps of chemical transformation, melanin will be produced at last. An important intermediate in the process is 5,6-dihydroxyindole (DHI) which has been demonstrated to be potent antibiotic (Zhao et al., 2007; Charoensapsri et al., 2014).

#### Serpins in Anopheles gambiae

A total of 18 serpin genes have been identified in *A. gambiae*, which are SRPN1-14, 16-19 (Suwanchaichinda and Kanost, 2009). Only two serpins have alternative splicing isoforms, SRPN4 has three and SRPN10 has four. Most of the serpin genes form clusters: (SRPN1, 2, 3) and (SRPN7, 14, 18) on chromosome arm 2L, (SRPN11, 12, 17) on 2R, and (SRPN5, 6, 16) on 3R. Sixteen serpins were predicted to contain secretory signal peptides, indicating they are probably extracellular proteins. The exceptions are SRPN10 and 12. SRPN10 was reported to be intracellular and was translocated from nucleus to cytoplasm upon *Plasmodium* infection (Danielli et al., 2003 & 2005). Molecular mass of mature serpins in *A. gambiae* are generally 42–66 kDa. SRPN4A is unusually large (90.8 kDa). SRPN2 was demonstrated to inhibit CLIPB9 (An et al., 2011). SRPN1 and 6 were shown to inhibit *M. sexta* PAPs (Michel et al., 2006; An et al., 2012), but the exact substrate in mosquito was not yet illustrated. SRPN13 was found to be expressed predominately in eggs and young larvae, pointing to a role in early development (Suwanchaichinda and Kanost, 2009).

#### Quantitative proteomic analysis

Early proteomic studies employed two-dimensional gel electrophoresis to separate proteins from differently treated samples. Proteins of interest, such as differentially expressed gene products, were selected for mass spectrometry (MS) analysis. Although 2D gel is capable of distinguishing more than 1000 proteins, the number of proteins actually identified is far less. Also, it is impossible to resolve all proteins in one sample, and these reasons together prevent the method from high-throughput applications (Schulze and Usadel, 2010). The next generation proteomic method takes advantage of stable isotopes to label proteins from different treatments or tissues. Isotopes can be chemically linked to proteins *in vitro* or metabolically incorporated into proteins *in* vivo. These proteins are then mixed and digested to produce differentially labeled peptides before LC-MS analysis. And peptides from different biological samples can be distinguished in MS due to the different masses of their isotopes (Schulze and Usadel, 2010). For example, in isotope coded affinity tag (ICAT), cysteine residues are covalently linked to the ICAT reagent, thus simplifying the system by focusing only on cysteines (Gygi et al., 1999). While stable isotope labeling approaches are the gold standard in protein detection, they have their limitations. First, they are time-consuming and relatively expensive in regarding to the labeling process and reagents needed. Also, comparisons can only be performed among 2-8 experiments due to technical constraints (Bantscheff et al., 2007). Recent years, label-free quantification (LFQ) methods are becoming more and more popular due to their ease of use (Asara et al., 2008). LFQ methods can be applied to all kinds of samples theoretically, and the number of experiments that can be compared is not limited. LFQ is based on spectral counting or the signal intensity of peptide precursor ions. The highresolution power uncouples the quantification and identification progress, and thus provide higher dynamic range for quantification. Also, LFQ intensities are normalized across the whole experiment, which corrects for technical and biological variations in peptide peak intensities (Cox et al., 2014).

#### **RNA interference**

RNA interference, historically known as post-transcriptional gene silencing (PTGS), was first reported in plants (Fire et al., 1998). The best application of this technology is that exogenously introduced double-stranded RNAs (dsRNAs) can result in down-regulation of target gene expression. Upon introducing into cytoplasm, long dsRNAs will be cleaved by Dicer (Bernstein et al., 2001) to produce 20-25 nucleotide dsRNA duplexes with 2-nucleotide 3' overhangs called small interfering RNAs (siRNAs) (Zamore et al., 2000; Vermeulen et al., 2005). siRNA is then unwound to passenger and guide strands, where only the guide strand is integrated into RNA inducing silencing complex (RISC) (Gregory et al., 2005). RISC is going to take advantage of the single-stranded guide RNA and mediate the cleavage of its complementary mRNA, which leads to PTGS (Ahlquist, 2002). The protein in RISC that mediates mRNA cleavage is called argonaute and it cleaves mRNA at the position corresponding to the middle of the guide RNA (Kupferschmidt, 2013). The RNAi effect can be amplified when siRNAs are taken as templates by RNA-dependent RNA polymerase (RdRP) to produce more siRNAs (Pak et al., 2007; Sijen et al., 2007). Thus, a few dsRNA molecules are able to mediate gene knockdown of whole cell or organism.

Endogenous RNAi can happen when microRNAs (miRNAs) encoded by RNA-coding genes are produced. miRNAs are transcribed firstly as pri-miRNAs with hairpin structures in the nucleus. Here, pri-miRNAs are processed by Drosha, a protein contains RNase III domain and dsRNAbinding domain, to generate pre-miRNAs with stem-loop structures (Lee et al., 2002 & 2003). The pre-miRNA product is then transported via exportin-5 to the cytoplasm (Yi et al., 2003; Bohnsack et al., 2004), where it is further digested by Dicer to generate ~21 nucleotide RNA duplexes (miRNAs) to block translation (Elbashir et al., 2001). Thus, the two pathways (siRNA and miRNA) converges in downstream cascades (Gregory et al., 2006).

#### Melanization and survival

Results varied a lot in the survival tests upon melanization disruption in *Drosophila melanogaster* (see Table below). This may be due to differences in immune challenge and gene manipulation methods. In general, RNAi experiments didn't elicit much change on survival, except that *B. bassiana* on Sp7 knockdown led to lower survival. Most challenges, including Gram-

positive bacteria, yeast and fungi, on PPO1/2 mutants had lower survival rates comparing to the control. For Sp7/MP2 mutants, nearly half had lower survival and the other half remained the same. Only the *S. pneumoniae* challenge in Sp7/MP2 mutants showed higher survival across all experiments. Also, the same challenge under the same mutant and RNAi conditions had consistent or different survival rates (*e.g. S. aureus* in Sp7/MP2 mutants). In *A. gambiae*, the role of melanization in survival is less studied. Schnitger and colleagues reported that the survival of CTL4 and CTLMA2 dsRNA-injected mosquitoes was reduced after Gram-negative bacterial infection, however the hemolymph PO activity of these mosquitoes was not altered (Schnitger et al., 2009). When PO activity and melanization were abolished by CLIPA8 knockdown, the survival of mosquitoes was not hampered after both *E. coli* and *S. aureus* infection (Schnitger et al., 2007).

Tyma	Challange	Sp7/MP2	MP1-	Sp7-	PPO1/2
туре	Chanenge	mutant	RNAi	RNAi	mutant
Wounding	Mild	Lower <sup>3</sup>			Same <sup>5</sup>
wounding	Strong		Same <sup>4</sup>	Same <sup>4</sup>	
	E. coli	Same <sup>1,3</sup>			
	E. carotovora		Same <sup>2</sup>	Same <sup>2</sup>	Lower <sup>5</sup>
Gram-negative	S. typhimurium	Lower <sup>3</sup>			Same <sup>5</sup>
bacteria	E. cloacae				Same <sup>5</sup>
	B. cepacia	Same <sup>3</sup>			
	A. tumefaciens	Same <sup>1</sup>			
	E. faecalis	Same <sup>1,3</sup>	Same <sup>2</sup>	Same <sup>2</sup>	Lower <sup>5</sup>
Gram positivo	S. aureus	Lower <sup>3</sup> +			Lower <sup>5</sup>
(Lys) bacteria		Same <sup>1</sup>			
(Lys) bacteria	S. saprophyticus				Lower <sup>5</sup>
	S. pneumoniae	Higher <sup>3</sup>			
Gram-positive	L. monocytogenes	Lower <sup>3</sup>			Lower <sup>5</sup>
(DAP) bacteria	B. subtilis				Lower <sup>5</sup>
Yeast	C. ablicans		Same <sup>2</sup>	Same <sup>2</sup>	Lower <sup>5</sup>
	B. bassiana	Same <sup>3</sup>	Same <sup>2</sup>	Lower <sup>2</sup>	Lower <sup>5</sup>
Fungi	M. anisopliae				Lower <sup>5</sup>
	A. fumigatus				Lower <sup>5</sup>

\*Survival results of melanization disruption in *D. melanogaster* (modified from reference 5). 1. Leclerc et al., 2005; 2. Tang et al., 2006; 3. Ayres et al., 2008; 4. Nam et al., 2012; 5. Olivier et al., 2014.

#### CHAPTER III

#### METHODOLOGY

#### **Mosquito rearing**

A. gambiae G3 strain colony was maintained in an incubator where temperature, humidity and photoperiod were strictly controlled. Temperature was set to 27.5°C and 80% relatively humidity was achieved by introducing a basin of water into the incubator. A 12h : 12h light-dark cycle with gradual sunset and sunrise transitions was programmed inside the incubator. To collect eggs, mosquito adults of 6 to 10-day-old were given a sheep blood meal (HemoStat Laboratories). Eggs were collected on wet filter papers and then transfer into distilled water to allow hatching. Larvae within first 2 days after hatching were feed on baker's yeast, and the following instars were fed with larvae food (ground fish food plus baker's yeast at a ratio of 2:1 (w/w)). Pupae were picked and concatenated in cups with water for molting. Newly emerged adults were maintained by 10% sucrose solution until a blood meal was taken.

#### Sample preparation for proteomic study

Appropriate number of fourth instar larvae were transferred to new cups with clean water before infection. For infection, they were first dried on a filter paper, and then pricked in the thorax

with a pulled tiny glass needle that was previously dipped into E. coli pellets or distilled water (control). Then the larvae were transferred back to the same cup, and a little bit of larval food was provided. An incubation period of 24 h was allowed before hemolymph extraction, so that the infection would be given enough time to elicit responses. For hemolymph extraction, larvae were first dried and laid down on paraffin film. Then protease inhibitor solution prepared using cOmplete ULTRA Tablets, Mini (Roche) containing 0.1% 1-phenyl-2-thiourea (PTU, phenoloxidase inhibitor) were added onto them (5 µl for 5 larvae), and they were torn slightly with forceps in the thorax in solution. So, bleeding hemolymph would mix with protease inhibitors and PTU immediately, as the abdomen of mosquito larvae were pressed with pipette tips. All samples (approximately 20 µl each tube) were centrifuged 5000 rpm (c.a.  $2000 \times g$ ) for 5 min to remove hemocytes and other contaminating tissues. Protein concentration of all samples were determined by a modified Bradford assay using BSA as a standard. A total of 40 µg total protein (volume adjusted to 20 µl by PBS) was taken from each of control and induced samples (4 biological replicates) and mixed with 4 µl 6×SDS sample buffer. After incubation at 95 °C for 5 min, eight samples were loaded onto 4–15% gradient polyacrylamide gel (Mini-Protein TGX Precast Gels, Bio-Rad) and electrophoresed for 40 min at 25 mA. The gel was stained by Coomassie blue for 20 min and destained for 1 h in 30% methanol and 10% acetic acid. Each lane was divided into 12 gel slices, resulting in 48 gel samples. Proteins in gel slices 1-5 (>80 kDa, 40 samples) were analyzed using a LTQ Orbitrap hybrid mass spectrometer (Thermo Fisher Scientific) without technical replicate. The remaining gel slices (56 samples) were analyzed on an Orbitrap Fusion tribrid mass spectrometer, and at least one technical replicate was performed for each sample.

#### Proteomic data analysis

Software MaxQuant was used to process raw data and perform database searching. Data from Orbitrap and Fusion mass spectrometers were analyzed together. For analysis between biological replicates, gel slices from the same biological replicate were designated as one experiment (8 experiments in total: CH1-4, IH1-4). For analysis across gel slices to look at protein distributions, gel slices were distinguished and designated as different experiments (96 experiments in total: CH(1-4) (1-12), IH(1-4) (1-12). Protein LFQ intensities in each gel slice (CH1-12, IH1-12) were represented by the average intensity in this slice across the biological replicates. Peptides were searched against A. gambiae protein database from VectorBase (Anopheles gambiae PEST PEPTIDES\_AgamP4.2), with trypsin set as the digestion enzyme. Oxidation of methionine, acetylation of the protein N-terminus, iodoacetamide derivative of cysteine, pyro-Glu from glutamine and acrylamide adduct of cysteine were selected as variable modifications. No fixed modification was specified, and all peptides (with or without modifications) were used in searching. In protein search result, contaminants and proteins with one peptide count were not included in subsequent analysis. Here, we used the LFQ (label free quantification) intensity to calculate p value in Student's t-test. Proteins with LFQ intensity of zero in all 8 biological replicates were excluded. For IH/CH ratio, it was calculated by dividing IH group mean over CH group mean. Signal peptides were predicted by SignalP 4.0 (Petersen et al., 2011), and those without SignalP output were predicted using Phobius (Käll et al., 2007) and Signal-3L (Shen and Chou, 2007) again. Hypothetical proteins were searched against NCBI non-redundant protein sequences using BLASTP 2.3.0+ (Camacho et al., 2009), and annotated either by BLAST description annotator in BLAST2GO or manually. Those not identified by BLAST were subjected to domain prediction by InterProScan 5, and representative domains were taken as protein names. Remaining unknown ones not identified by any method were represented with VectorBase IDs.

#### PPO knockdown and mosquito survival

Female mosquito adults within 1-2 days after emergence were anesthetized on ice, and injected with 69 nl (1 ng/nl) dsRNA to the thorax, either targeting *A. gambiae* PPO proteins

(AgPPOs) or GFP as a negative control. AgPPO dsRNA is designed to target a conserved region of *A. gambiae* PPOs, and it is able to knockdown all 9 PPO mRNAs to different extent. MEGAscript RNAi kit (Ambion) was used for dsRNA synthesis and purification, and Nanojet II (Drummond) was utilized for micro-injection. Mosquitoes were allowed to recover for 4 days before microbial infection was performed. For bacterial challenge, *E. coli* strain BL21 was cultured overnight, pelleted, re-suspended in sterilized PBS to a concentration of  $OD_{600} = 0.4$ . Each female mosquito received 69 nl bacteria suspension. Mosquito survival was recorded for a consecutive period of seven days, with dead individuals counted and removed daily.

#### **RNA** analysis

Total RNA of five mosquito adults was isolated using TRIzol Reagent (Ambion) 1 and 12 days after dsRNA injection. Then first-strand cDNA was synthesized from total RNA using iScript Reverse transcription supermix for qRT-PCR (Bio-Rad) containing oligo-dT primers. The cDNA (400 ng) was used in a two-step qPCR protocol with iTaq Universal SYBR Green Supermix (Bio-Rad) and CFX Connect Real-Time System (Bio-Rad). The melting curves of PCR products were examined with non-pure amplification excluded from subsequent analysis. qRT-PCR primers (Table 1, Appendices) were generated to specifically amplify AgPPO1–9 transcripts respectively, taking actin mRNA as an internal reference.

#### Hemolymph PPO analysis

15-20 female adults were decapitated 4 days post injection of dsRNA, and their hemolymph samples were extracted into  $10 \ \mu l \ ddH_2O$  containing 0.1% 1-phenyl-2-thiourea (PTU) and protease inhibitors (cOmplete ULTRA Tablets, Mini, Roche) using QIAshredder (QIAGEN). Hemolymph samples (3  $\mu$ g total protein) were then subjected to western blot analysis. The hemolymph samples were first separated by 6% SDS-PAGE and then transferred onto nitrocellulose membrane under 15 V constant voltage for 80 min. Membrane was then blocked with 3% BSA in Tris-buffered saline (137 mM NaCl, 2.7 mM KCl, 25 mM Tris-HCl, pH 7.4) for 20 min and incubated with 1:500 diluted polyclonal antiserum against *Aedes aegypti* PPO5 (AaPPO5) in TBS with 1% BSA overnight at room temperature. The recognition of AaPPO5 polyclonal antibody against AgPPOs was confirmed previously (Hu et al., unpublished data). After washing, the membrane was further incubated with alkaline phosphatase linked goat-anti-rabbit (GAR-AP) secondary antibody (1:1000 diluted in TBS containing 1% BSA) for 4–6 h. Development was performed in 0.1M Tris-HCl, pH 9.5 with 1% alkaline phosphatase (AP) color reagents A and B (Bio-Rad).

#### PPO monoclonal antibody generation

Antibodies are designed against peptide sequences (Table 2, Appendices) that are predicted to be on the surface of PPO proteins. The company (Ab-Mart, Shanghai, China) manually synthesized the peptides and conjugated them to BSA. Screening was performed using the conjugates across a well-established antibody library containing antibodies against all possible oligo-peptides. Positive hits were sent to us for verification and further examination on PPO proteins. 36 ng of each of the native PPO proteins (PPO1-9) were loaded onto nitrocellulose membranes. The membranes were blocked and cut into strips for probing with different primary antibodies (1:1000). Strips were further incubated in alkaline phosphatase linked goat-anti-mouse (GAM-AP) secondary antibody (1:1000) and developed in 0.1M Tris-HCl, pH 9.5 with 1% alkaline phosphatase (AP) color regent A and B (Bio-Rad).

#### CHAPTER IV

#### FINDINGS

#### **Overview of proteomic results**

There is no clear difference on band patterns between CH and IH lanes in polyacrylamide gel, suggestive of good repeatability and no major protein changes elicited by bacterial challenge (Fig. 1A). Each lane was cut into 12 gel slices in order to achieve comparable protein amounts and appropriate gel volume, as well as separating some intense bands from more diffused ones. By comparing with the protein marker, molecular mass ranges of the gel slices was estimated to be: 500-350, 350-250, 250-230, 230-140, 140-80, 80-70, 70-45, 45-30, 30-22, 22-20, 20-15, <15 kDa from top to bottom, corresponding to slices 1–12, respectively (Fig. 1A). Indeed, the number of proteins identified (LFQ intensity not zero) in each gel slice was consistent across the two groups. For CH, there are 583, 674, 544, 806, 765, 817, 1023, 1197, 1189, 781, 981, 958 proteins in slice 1–12; For IH, there are 687, 744, 698, 859, 742, 864, 1061, 1206, 1178, 890, 949, 907 proteins, confirming a good parallellism between experiments (Fig. 1B). Although slice 7–9 contain more proteins, identified protein numbers are comparable between gel slices, suggesting the gel cutting procedure was properly-designed. In order to further investigate the correlation between biological samples, we did a pairwise Pearson correlation analysis (Table 1). Correlation within groups are high: 0.897-0.978 (mean  $\pm$  SD,  $0.937 \pm 0.029$ ) for CH-CH, and 0.959-0.991

 $(0.976 \pm 0.011)$  for IH-IH, suggesting good consistency among biological replicates. For comparison between CH and IH, the correlation is lower (0.908–0.954; mean  $\pm$  SD: 0.941  $\pm$  0.020), but not well separated from the intragroup correlations, demonstrating that no major protein change was induced by microbial challenge again.

Overall, we have identified 1,756 proteins after excluding those with only one peptide count. After determining their names by BLAST and InterProScan, we divided them into nine categories: immunity-related, metabolism, DNA/RNA & nucleus, ion binding, cytoskeleton/motor, ATP/NAD binding, sensory/cuticle, ribosomal protein and other, and each of them contains 235, 524, 105, 147, 73, 181, 52, 78, and 361 proteins (Fig. 2A), respectively. This includes a wide range of molecules, some of which were not expected to be presented in larval plasma. Among them, 602 proteins were predicted to contain signal peptides, and others were supposed to be intracellular. This may be due to the hemolymph collection procedure. In the procedure, we pressed the larval abdomen in order to extract more hemolymph, which may have led to contamination by gut content. Hemocyte rupture and incomplete removal of hemocytes by centrifugation can also result in the presence of intracellular proteins in MS results. However, the abundance of extracellular proteins are almost two thirds of the total protein abundance (69.7% in CH, 64.6% in IH), which is twice higher than the intracellular ones. That means the contamination is not severe, although there are quite a few number of intracellular proteins.

#### Most abundant proteins

We examined the distribution of proteins based on their abundance (Fig. 3A). There are 61 proteins identified in CH but not in IH (LFQ of IH is zero), and 68 proteins vice versa. Within total LFQ intensity ranges of  $<1 \times 10^{6}$ ,  $1 \times 10^{6}$  to  $1 \times 10^{7}$ ,  $1 \times 10^{7}$  to  $1 \times 10^{8}$ ,  $1 \times 10^{8}$  to  $1 \times 10^{9}$ ,  $1 \times 10^{9}$  to  $1 \times 10^{10}$ , and  $>1 \times 10^{10}$ , we identified 35, 339, 698, 453, 140, 23 proteins in CH, and 48, 340, 702, 444, 140,

21 proteins in IH. They are almost normally distributed. Then we calculated the total abundance of proteins within each LFQ range and represented them as percentage of the total protein abundance of CH or IH (Fig. 3B). Surprisingly, a few molecules represents more than half of the protein abundance in both groups. The 23 and 21 most abundant proteins in CH and IH account for 62.2% and 54.3% of the total protein amounts, respectively. Also, the 140 less abundant proteins in both groups account for 25.5% and 31.1% accordingly.

We closely examined the 23 and 21 (total 25) most abundant proteins (Table 2). Different isoforms of hexamerin compose a large proportion (27.8% for CH and 24.5% for IH in abundance) of the hemolymph proteins. They are also known as storage proteins in insects. Apolipophorin-III alone accounts for 7% of the total protein abundance. It associates with low density lipophorin (LDLp) and facilitates the transport of diacylglycerols in plasma. Also, vitellogenin, an egg yolk precursor, comprises 4–5% of the total protein amount. Actin is an intracellular protein and important component of cytoskeleton. It is a house-keeping gene and usually adopted as internal references. Its presence in the hemolymph probably results from incomplete removal of hemocytes or gut contamination. It is also the case with other intracellular metabolic enzymes, like creatine kinase, fructose-bisphosphate aldolase and glyceraldehyde 3-phosphate dehydrogenase. Gelsolin is a regulatory protein of the actin filament, and here we identified the extracellular form of this protein. Ferritin is a protein that stores and transports iron in the serum. Studies have also shown its role in immune and stress response (Larade and Storey, 2004; Ong et al., 2005). It is quite surprising to find PPO2 and PPO3 are among the most abundant proteins. They probably remain in inactive state in plasma prior to acute activation. TEP15 is a member of the TEP family, which belongs to the complement  $C3/\alpha^2$  macroglobulin superfamily. One family member TEP1 was demonstrated to promote parasite melanization (Blandin et al., 2004) and bacteria phagocytosis (Levashina et al., 2001).

Moreover, we examined the presence of proteins in each gel slice. In the beginning, we divided the gel in a way that the intense bands could be separated (Fig. 1A). Here, we examined the contents of these three bands: slice 3 (250-230 kDa), slice 6 (80-70 kDa) and slice 10 (22-20 kDa). Different isoforms of hexamerin together account for 57% of CH and 47% of IH total protein amounts in slice 3. Similarly, hexamerin isoforms account for 53% of CH and 34% of IH in slice 6. It is much simpler in slice 10 – apolipophorin III alone represents most of the protein abundance (74% of CH and 67% of IH). Therefore, we conclude that the intense bands in slices 3, 6 and 10 are mainly hexamerins, hexamerins and apolipophorin III.

#### Up- and down-regulated proteins

A total of 158 proteins are significantly different (p < 0.05) in abundance between CH and IH. 109 were up-regulated (IH/CH >1, minimum: 1.14) (Table 3) and 49 were down-regulated (IH/CH<1, maximum: 0.85) (Table 4) after *E. coli* challenge. They account for 9% of the total proteins identified. Surprisingly, only twenty are related to immunity. Their IH/CH ratios are close to 1.0 in most cases. 119 out of the 158 proteins (p < 0.05) have IH/CH ratio of 0.5–2, and 144 have IH/CH ratio of 0.3–3. One reason for this unusual phenomenon may be that, after pricking and placing the larvae back into aqueous environment, bacteria can diffuse into water through the wound site. On the other hand, due to wounding and exposure to food-containing water, the control larvae may be infected.

The 109 up-regulated proteins are devided into six groups: immunity-related, cytoskeleton/ motor, DNA/RNA & nucleus, metabolism, ATP/NAD binding, and other functions, with each comprised of 5, 10, 16, 37, 12 and 29 proteins (Table 3), respectively. Only 14 of them were predicted to be extracellular. The five immunity-related proteins are E3 SUMO-protein ligase RanBP2, LRR15, PGRP-LB, SRPN10B and TEP2, and their IH/CH ratios are 2, 1.34, 2.24, 1.93 and 1.51, respectively. Involvement of nucleus and DNA/RNA binding proteins may reflect regulations in transcription and translation in response to bacterial challenge. And indeed, quite a few of them are translation initiation factors. Also, microbial challenge can disturb the metabolism of the host, resulting in metabolic changes partly reflected by enzymes or other related proteins (*e.g.* ATP/NAD binding proteins) to resist invading pathogens. In the "other" group, some heat shock proteins and stress-induced proteins may be induced by injury or infection.

The 49 down-regulated proteins belong to three categories: immunity-related, metabolism and other, with 15, 19 and 15 proteins in each group, and signal peptides were predicted to be present in half (26) of them (Table 4). Interestingly, immunity-related proteins account for 31% of the down-regulated proteins. Indeed, 70% (158) of the 235 immunity-related proteins were found to have IH/CH ratio less than 1. In other words, there is a tendency for immunity-related proteins to be down-regulated in *A. gambiae* larvae after *E. coli* challenge. The 15 significantly downregulated immune proteins were CLIPA7 homolog, CLIPB1, B8, B13, PPO1, PPO2, PPO3,  $\beta$ GBP, LRR1, TEP15, MDL2, lysozyme-4 (c-type), fibrinogen, coagulation factor X, and a chymotrypsinlike protease. Their IH/CH ratios are within 0.34–0.85.

#### **Immunity-related proteins**

A total of 235 immunity-related proteins were identified in our experiment, and 166 (71%) of them were predicted to be secretory (Table 5). Some proteins do not contain signal peptides but actually present in plasma, like PPOs, may result from cell rupture. These immunity-related proteins were further divided into 8 groups: AMP, PPO, TEP, PRR, SP, SPH, Serpin and other, with 9, 7, 8, 40, 63, 37, 15 and 56 proteins in each group (Fig. 2B), respectively. Unlike in *Manduca sexta* (Zhang et al., 2014), we identified only a small number of antimicrobial peptides (AMPs), including defensin, gambicin, transferrin and lysozyme. However, we detected seven

prophenoloxidaes (PPO1–4, 6–8) in the larval hemolymph. PPO2 and PPO3 are most abundant; PPO6 and PPO8 are moderate; PPO1, PPO4 and PPO7 are low. A few members of the thioestercontaining proteins (TEPs), complement-like proteins in insects, were also identified, including TEP1, 2, 4, 6, 9, 12, 14, and 15. The function of TEP1 is well characterized while others remain unclear (Levashina et al., 2001; Blandin et al., 2004). Pathogen recognition receptors (PRRs) are important molecules which distinguish nonself from self in the host. Typical PRRs include  $\beta$ GBPs, CTLs, GNBPs, LRIMs, LRRs, and PGRPs, some of which were identified in this study. Serine proteases (SPs) and serine protease homologs (SPHs) comprise the largest groups, accounting for 43% of the immunity-related proteins. They are (chymo)trypsin-like proteins without or with clipdomains (CLIPs). CLIPs are major components of the hemolymph serine protease cascade which leads to the activation of PPOs or cytokines for signal transduction receptors on cell membrane (Cao et al., 2015), and 31 (including serine protease homologs) of them are found here. Many serpins are serine protease inhibitors that inhibit the activity of hemolymph proteases. There are 19 SRPNs in *A. gambiae*, and we identified 12: SRPN1–4, 7–12, 16, and 17. Other identified immune proteins include FBNs, fibrinogens, thioredoxins, thioredoxin peroxidases and so on.

#### Gel distribution of immune proteins

Theoretically, proteins should migrate to the position corresponding to their calculated molecular masses ( $M_r$ 's) in polyacrylamide gel. However, multiple reasons can lead to irregular distribution patterns from calculated, such as post-translational modifications (*e.g.* glycosylation) (Table 6). We examined the gel distribution patterns of immunity-related proteins (Table 3, Appendices) and identified major discrepancies from theoretical  $M_r$  values. For some proteins, their abundances are very high and they are presented in nearly all 12 gel slices both in CH and IH (data not shown). To explain this, we examined the correlation between protein abundance and number of slices the protein presented. There is a trend for more abundant proteins to be found in more gel

slices (Fig. 4). Other than that, proteins over 160 kDa tend to migrate to lower positions with  $M_{\rm r}$ less than 80 kDa, which may be due to proteolytic cleavage. Proteolytic cleavage can also account for the discrepancies of many serine proteases, since they exist as zymogens and need cleavage to become active (Table 6). Another possibility for the discrepancies of serine proteases is their complex formation with serpins, which results in SDS-stable 70-80 kDa molecules. In M. sexta, serpin-1E was known to form complex with HP1 and HP8 (Ragan et al., 2010). Serpin-3 through 6 were known to associate with PAPs and HP1, 6, 8, 21. In A. gambiae, however, it is not wellunderstood. Only SRPN2 was reported to form complex with CLIPB9 (An et al., 2011). SPRN1 and 6 were shown to inhibit *M. sexta* PAPs (Michel et al., 2006; An et al., 2012), but the substrate in mosquito was not illustrated. Nonetheless, it is likely that many serpins are able to form SDSstable complexes with serine proteases in mosquito. In our results, quite a few CLIPs and serpins were found to form possible serpin-protease complexes in 70-80 kDa (slice 6), especially SRPN10D which exists 100% in slice 6 (Table 7). There is another type of discrepancy that cannot be explained with protein abundance, proteolysis or complex formation. Many proteins migrate to the first few gel slices (>140 kDa) which is far beyond their theoretical molecular mass. These include 4 trypsin-like proteins, 4 LRRs, 4 coagulation factor XI, 5 TEPs and 6 PPOs, and can be interpreted as components of high mass immune complexes (Table 8).

#### **Examination of PPO monoclonal antibodies**

To facilitate the detection of specific PPOs in tissues, we asked a company to develop and screen monoclonal antibodies against 29 unique and 3 common surface peptides of *A. gambiae* PPO2, 6, 7 and 8 (Table 2, Appendices). According to the company, 54 antibodies were generated against 27 peptides, 49 of which have detection limits below 25 ng against BSA-peptide conjugates. However, when all the antibodies were tested against native recombinant *A. gambiae* PPOs, only two (1P5 and 3P35) showed successful recognition at a sensitivity of 36 ng PPO2 and PPO7,

respectively (data not shown). Antibody 3P35 showed some cross-reactivity with BSA. After changing the blocking solution to 3% BSA in TBS and pre-incubating 3P35 with 1% BSA in TBS for 1h, the cross-reactivity was eliminated while the recognition on PPO7 remained unchanged. Antibody 1P5 reacted weakly with PPO7, and both antibodies were able to recognize denatured PPOs at a sensitivity of ~400 ng.

#### **Mosquito hemolymph PPOs**

According the proteomic results, the abundance of PPO2 and 3 are most abundant, PPO6 and 8 are moderate, PPO1, 4 and 7 are low. To confirm this using the monoclonal antibodies, we examined the expression profile of PPOs in hemolymph samples from mosquito larvae, pupae and adults (Fig. 5). In larva and pupa, not much signal was detected by 1P5 (against AgPPO2) and 3P35 (against AgPPO7) at the position of recombinant PPO, while there were proteins identified by the polyclonal antibody that recognizes all AgPPOs. In adult, however, one strong band was detected by 1P5, while no PPO7 was identified by 3P35. Although 1P5 cross-reacts with PPO7, since no PPO7 was detected, the band must be PPO2. There is also one band lower than PPO2/7 under AaPPO5 in adult, which may be other PPO isoforms (Fig. 5). The lack of PPO2 signal in larval hemolymph may be due to the low sensitivity of monoclonal antibodies comparing to mass spectrometry.

#### PPO knockdown and mosquito survival

There has being a long-existing debate about whether PPO is needed or not for mosquito immune response. But till present, direct evidence from PPO knockdown is not reported. In our proteomic result, PPO1–3 was shown to be down-regulated after *E. coli* challenge, indicating a role of PPOs in anti-bacterial response. Here, we tried to knockdown them by dsRNA injection and

examine the survival of mosquitoes upon bacterial challenging. Female mosquitoes (~40 per group) within 1-2 days of emergence were injected with either dsPPO or dsGFP (as negative control). The knockdown efficacy was confirmed by qRT-PCR and immunoblotting (Fig. 6), which demonstrated successful silencing at both mRNA and protein level. After four days of recovery, both groups were injected with *E. coli* of  $OD_{600} = 0.4$  for the survival test. Survival was documented for the following seven days. The result didn't show significant difference between dsPPO and dsGFP groups (Fig. 7). One possible explanation is that the knockdown is not significant enough to elicit observable responses or not long-lasting enough to cover the documenting period. We have examined the PPO mRNA levels 12 day post dsRNA injection, which would be seven days post *E. coli* infection. The qRT-PCR data showed only 2 PPO genes still had significant knockdown (data not shown). Another possibility is that PPOs are not indispensable for mosquito immunity, which had been reported before (Schnitger et al., 2007).

#### CHAPTER V

#### CONCLUSION

In the present study, we identified a total of 1,756 proteins in the hemolymph of A. gambiae larvae. Although 69% of them are predicted to be intracellular, they only constitute a small portion (c.a. 33%) of the total protein amount. Among all these proteins, 109 (14 extracellular) were upregulated and 49 (27 extracellular) down-regulated. IH/CH ratios for 1,577 proteins were not substantially changed (0.33-3) after the immune challenge. This may be related to the aquatic habitat of mosquito larvae, which may have affected the test. PPO1-3 and TEP15 were downregulated. PPO2, PPO3 and TEP15 are among the most abundant proteins, including hexamerins, apolipophorin III, OBP9, ferritin and vitellogenin. We consider 235 proteins (70% extracellular) as defense-related. 100 (42%) of them are serine protease-related, suggesting these proteins play an important role in mediating immune responses in hemolymph. We examined the gel distribution patterns of all the proteins and found that abundant proteins tend to spread to more gel slices. Besides, while distributions of some proteins can be explained by post-translational modifications such as proteolysis, others suggest the existence of serpin-protease complexes and high  $M_{\rm f}$  immune complexes. In addition to the proteomic study, we generated monoclonal antibodies against PPO2 and PPO7, and used them to examine their presence in mosquito hemolymph. Immunoblot analysis showed PPO2 (and not PPO7) is present in hemolymph of the adult mosquitos. We examined the role of PPOs in antibacterial defense in mosquito by knocking down PPO expression in adult females. E. coli infection of the adults did not cause any significant difference in survival between GFP and PPO dsRNA-treated groups.

	CH1	CH2	CH3	CH4	IH1	IH2	IH3	IH4
CH1	1	0.915	0.948	0.897	0.965	0.98	0.965	0.918
CH2		1	0.978	0.956	0.943	0.924	0.921	0.908
CH3			1	0.929	0.938	0.954	0.935	0.918
CH4				1	0.949	0.936	0.942	0.954
IH1					1	0.977	0.984	0.959
IH2						1	0.991	0.967
IH3							1	0.978
IH4								1

Table 1. Pearson correlation between biological replicates

### Table 2. A list of 25 most abundant proteins

Protein IDs	Protein names	MW (kDa)	SP*	CH%	IH%	IH/CH	p-value
AGAP000651-PC	Actin	41.8		0.64	0.84	1.12	0.458
AGAP013365-PA	Apolipophorin-III	21.7	19	7.07	7.16	0.86	0.642
AGAP008054-PD	Chemosensory protein	14.6	17	1.68	1.23	0.63	0.126
AGAP005627-PD	Creatine kinase	39.8		1.09	1.37	1.07	0.643
AGAP002564-PE	Fructose-bisphosphate aldolase, class I	39.2		0.97	1.43	1.26	0.168
AGAP011369-PA	Gelsolin	42.7	20	0.78	0.49	0.54	0.053
AGAP009623-PA	Glyceraldehyde 3-phosphate dehydrogenase	35.5		0.77	0.72	0.8	0.49
AGAP001659-PA	Hexamerin	83.9	19	7.99	6.41	0.69	0.019
AGAP001657-PA	Hexamerin	84.2	18	9.1	6.36	0.6	0.039
AGAP005768-PA	Hexamerin	82.3	18	1.15	2.75	2.04	0.138
AGAP005766-PA	Hexamerin A	38.9	18	2.71	3.7	1.17	0.441
AGAP001345-PA	Hexamerin A	82.8	18	6.8	5.28	0.66	0.05
AGAP008060-PA	Imaginal disc growth factor	48.1	22	0.88	0.94	0.91	0.706
AGAP010657-PA	Larval serum protein 1 beta chain	23.5	18	1.26	1.68	1.14	0.351
AGAP008369-PA	Lipid transport protein vitellogenin	170.4	19	4.71	4.06	0.74	0.294
AGAP001826-PA	Lipophorin	371.3		2.5	1.1	0.38	0.036
AGAP007059-PA	LRR-7059	124		0.72	0.67	0.79	0.106
AGAP000278-PA	OBP9	15.7	17	2.98	1.83	0.52	0.051
AGAP006258-PA	PPO2	78.1		1.19	1.18	0.85	0.045
AGAP004975-PA	PPO3	78.6		2.1	1.96	0.8	0.024
AGAP013400-PA	Probable fatty acid-binding protein	14.7		0.67	1.34	1.72	0.021
AGAP012057-PA	RNA polymerase-associated protein RTF1	88.4		0.93	0.49	0.45	0.008
AGAP002464-PA	Ferritin G subunit	26.2	21	2.05	1.45	0.6	0.082
AGAP002465-PA	Ferritin heavy chain	24.6	26	1.13	0.8	0.61	0.032
AGAP008364-PA	TEP15	163.6	42	1.66	1.41	0.73	0.045

\*SP indicates the predicted signal peptide cleavage site, and TMs indicates the predicted number of transmembrane domains. CH% and IH% indicate the abundance percentage that protein represents out of the total protein abundance of CH and IH.

Group	Protein IDs	Protein names	SP*	TMs	IH/CH	p-value
•	AGAP002982-PA	E3 SUMO-protein ligase RanBP2			2	0.021
	AGAP003878-PA	LRR-15	19	1	1.34	0.013
Immunity-related	AGAP001212-PB	PGRPLB		1	2.24	0.04
	AGAP005246-PD	SRPN10B			1.93	0.044
	AGAP008366-PA	TEP2			1.51	0.021
	AGAP001306-PA	Actin related protein 2/3 complex subunit 4			1.31	0.042
	AGAP002509-PA	Actin-interacting protein 1			1.40	0.042
	AGAP010175-PC	Adenylyl cyclase-associated protein 1			1.4	0.010
	AGAP012185 PA	Erythrocyte membrane protein hand 4.1			1.47	0.009
	AGAD004225 DA	Elythocyte memorane protein band 4.1			1.0	0.008
Cytoskeleton/ motor	AGAI 004555-1 A	Mianotukula associated protein 7 family			2.1	0.017
	AGAP001515-PE	Microtubule-associated protein 7 family			2.1	0.022
	AGAP000749-PA	Muscular protein 20			1.54	0.045
	AGAP010895-PA	Spectrin beta			1.46	0.016
	AGAP001/99-PA				1.52	0.008
	AGAP002130-PA	Tubulin-specific chaperone A			1.43	0.003
	AGAP002945-PA	Bifunctional glutamyl/prolyl-tRNA synthetase			2.61	< 0.001
	AGAP006125-PA	Density-regulated protein			1.78	0.048
	AGAP001883-PA	ELAV-like 1			2.3	0.002
	AGAP002340-PA	Eukaryotic translation initiation factor 3A			1.45	0.039
	AGAP004725-PA	Eukaryotic translation initiation factor 3C			2.16	0.002
	AGAP002337-PA	Eukaryotic translation initiation factor 3D			1.33	0.033
	AGAP003486-PA	General transcriptional corepressor trfa			1.9	0.044
DNA/RNA	AGAP005015-PA	Heterogeneous nuclear ribonucleoprotein K			1.75	0.029
& nucleus	AGAP007299-PA	Importin-7			1.64	0.014
	AGAP012013-PA	Nuclear factor of activated T-cells 5			1.69	0.009
	AGAP002351-PA	Nuclear pore complex protein Nup98-Nup96			4.67	0.005
	AGAP002654-PB	Poly(A)-binding protein 1			1.87	0.04
	AGAP010553-PA	Poly(U)-binding-splicing factor PUF60			1.63	0.035
	AGAP002655-PA	RNA binding protein			2.88	0.045
	AGAP010640-PA	Translation initiation factor			1.68	0.003
	AGAP002502-PA	Translation initiation factor 4G			1.48	0.02
	AGAP011350-PA	4-nitrophenyl phosphatase			1.41	0.029
	AGAP006227-PA	Alpha esterase			8	0.026
	AGAP007809-PA	Aminopeptidase NPEPL1			1.26	0.036
	AGAP004236-PA	Beta-lactamase-like protein 2 homolog			8	0.024
	AGAP001341-PA	Bleomycin hydrolase			1.43	0.045
	AGAP004940-PA	cAMP-dependent protein kinase regulator			1.41	0.028
	AGAP009405-PA	CPAP3-E	24		1.59	0.037
	AGAP005627-PE	Creatine kinase			10.27	0.027
	AGAP003124-PA	Dihydropyrimidinase			2.47	0.047
	AGAP001021-PB	Dihydropyrimidine dehydrogenase			1.32	0.025
	AGAP000513-PB	Dipeptidase E	23		1.81	0.032
	AGAP004394-PA	Dipeptidyl-peptidase III			1.38	0.029
	AGAP013400-PA	Eatty acid-binding protein			1.72	0.021
	AGAP004071-PB	Fimbrin			1.63	0.009
	AGAP006670-PA	Gamma-glutamyl hydrolase	33		1.00	0.049
Metabolism	AGAP001512-PA	Glutamate-cysteine ligase catalytic subunit	55		1.71	0.027
	AGAP003077-PB	Glutamyl aminopentidase		1	1.72	0.05
	AGAP004383-PA	GSTD10		1	3.07	0.03
	AGAP009191_PA	GSTE6			1.35	0.041
	AGAP003257_DA	GSTL0			2.03	0.035
	AGAD006353 DA	Histidine triad nucleotide binding protein 1			1.58	0.033
	AGAP004747_PA	Ion binding and proteolysis			1.50	0.049
	AGAP012008_DA	Na <sup>+</sup> /H <sup>+</sup> exchange regulatory cofactor NHE DE1			2.05	0.047
	AGAP007700 DA	N_acetylneuraminate lyace			1 33	0.005
	AGA P000500 PD	NADPH_ferrihemoprotein reductase			1.55	0.04
	AGAP008305 DC	Phosphoglucomutase			1 1 4	0.001
	AGAD000172 DA	Drolyl oligopontidase	15		1.14	0.05
	AGAP00/758 DD	Protessomal ubiquitin recentor adrm1 homolog	15		1.50	0.000
	AGAP006171 DA	Protein phosphatasa			1.0	<0.047
	AGAP005020 DA	Pyridovine kinase	ł		1/6	0.001
	AUAT 003727-PA	i ynuoxine kindse	1		1.40	0.012

## Table 3. A list of 109 up-regulated proteins

	AGAP004093-PA	Sterol carrier protein-2			2.25	0.036
	AGAP003052-PA	Tetratricopeptide repeat-containing protein alpha			1.62	0.029
	AGAP004870-PA	Tripeptidyl-peptidase II			1.46	0.025
	AGAP011872-PA	Ubiquitin-activating enzyme E1			1.61	0.023
	AGAP001056-PA	Ubiquitin-conjugating enzyme E2 L3			1.32	0.029
	AGAP009841-PA	UBX domain-containing protein 1			1.67	0.039
	AGAP009648-PA	Ureidoimidazoline decarboxylase			1.59	0.013
	AGAP003405-PA	Adenylosuccinate synthase			1.28	0.038
	AGAP005981-PA	DnaJ homolog subfamily A			1.87	0.001
	AGAP000970-PA	DnaJ homolog subfamily C			1.26	0.036
	AGAP012010-PA	Fructose-2,6-bisphosphatase			1.23	0.038
	AGAP007699-PC	GTP-binding nuclear protein Ran			1.43	0.002
	AGAP011208-PA	Hexokinase			1.47	0.012
ATP/NAD binding	AGAP001690-PA	Regulating synaptic exocytosis protein 2			00	0.028
	AGAP003153-PD	V-type proton ATPase catalytic subunit A			1.9	0.006
	AGAP009486-PA	V-type proton transporting ATPase 54 kDa		2	1.97	0.026
	AGAP002884-PA	V-type proton transporting ATPase subunit B			1.76	0.018
	AGAP005845-PA	V-type proton transporting ATPase subunit C			1.41	0.013
	AGAP002401-PA	V-type proton transporting ATPase subunit E			1 41	0.019
-	AGAP001467-PA	AGAP001467-PA			1.11	0.032
	AGAP013060-PA	AGAP013060-PA	20	1	2 71	0.032
	AGAP011762-PA	BAG domain-containing protein Samui	20	1	1 59	0.040
	AGAP010557-PA	B-cell recentor-associated protein 31		3	1.57	0.003
	AGAP005316-PA	Charged multivesicular body protein 4		5	1.00	0.003
	AGAP010251-PA	Costomer protein complex alpha subunit			2 37	0.000
	AGA D004625 DB	Cortactin			1.32	0.038
	AGAP010000 PA	Cuticular protein 1 from fifty one se family	17		1.52	0.027
	AGAP010900-FA	Cuticular protein P 1 family	17		1.72	0.013
	AGAF003997-FA	Europagia agid a mathyi transformaa lilaa	17		1.40	0.021
	AGAP000103-PA	Chateredowin			1.61	0.009
	AGAP009738-PA	hast share metric 110hD			1.00	0.013
	AGAP010551-PA	Heat shock protein 110kDa			1.39	0.012
	AGAP013228-PA	Heat shock protein 6/B2			1.43	0.001
0.1	AGAP000941-PB	Heat shock protein beta-1 isoform x2			1.//	0.012
Other	AGAP000941-PA	Heat shock protein beta-1 isoform x2		2	1.70	0.007
	AGAP00/310-PA	Klaroid		2	1.59	0.005
	AGAP005291-PA	Lupus la ribonucleoprotein			1.63	0.008
	AGAP003238-PC	N-myc downstream regulated protein			1.62	0.022
	AGAP005369-PA	NOLC1-like isoform x2			3.27	0.015
	AGAP008/47-PA	Nsplp			2.02	0.03
	AGAP008046-PA	PACSIN2			3.91	0.004
	AGAP004310-PA	Perq amino acid-rich protein 2			1.59	0.036
	AGAP012746-PA	Phyhd1 protein			1.58	0.029
	AGAP006946-PA	Prefoldin subunit 4			1.41	0.034
	AGAP003612-PA	Protein CDV3 homolog			1.35	0.013
	AGAP004520-PA	Ran-binding protein 3			1.83	0.007
	AGAP010188-PA	Stress-induced-phosphoprotein 1			1.3	0.037
	AGAP004273-PB	Synapse-associated protein			2.96	0.025
	AGAP000626-PA	Vesicle-associated membrane protein B		1	1.67	0.03

\*SP indicates the predicted signal peptide cleavage site, and TMs indicates the predicted number of transmembrane domains.

Group	Protein IDs	Protein names	SP*	TMs	IH/CH	p-value
	AGAP009110-PA	GNBP	24		0.52	0.004
	AGAP005663-PA	Chymotrypsin-like protease	34	1	0.61	0.026
	AGAP011792-PA	CLIPA7 homolog	21		0.52	0.011
	AGAP003251-PA	CLIPB1	25		0.5	0.004
Immunity-related	AGAP004855-PA	CLIPB13	22		0.74	0.036
	AGAP003057-PA	CLIPB8	24	1	0.52	0.048
	AGAP005072-PA	Coagulation factor X	14		0.53	0.002
	AGAP006743-PA	Fibrinogen			0.79	0.042
	AGAP004832-PA	LRR-1		1	0.7	0.03
	AGAP007385-PA	Lysozyme 4 (c-type)	31	1	0.37	0.046
	AGAP002857-PB	MDL2	25	1	0.5	0.02
	AGAP002825-PA	PPO1			0.34	0.031
	AGAP006258-PA	PPO2			0.85	0.045
	AGAP004975-PA	PPO3			0.8	0.024
	AGAP008364-PA	TEP15	42		0.73	0.045
	AGAP000558-PA	1,2-alpha-mannosidase			0.7	0.047
	AGAP003490-PA	Alanine-glyoxylate aminotransferase			0.64	0.032
	AGAP000862-PA	Alpha 1,3-glucosidase	22		0.78	0.03
	AGAP000679-PA	Aminoacylase			0.76	0.033
	AGAP008783-PA	Arginase			0.57	0.004
	AGAP000985-PA	ARP2 actin-related protein 2 homolog			0.81	0.017
	AGAP000756-PB	Carboxypeptidase M	22		0.75	0.026
	AGAP006726-PA	COEAE5G			0.67	0.02
	AGAP000162-PA	Cystathionine beta-synthase			0.71	0.001
Metabolism	AGAP002465-PA	Ferritin heavy chain	26		0.61	0.032
	AGAP011107-PA	Glutaredoxin			0.74	0.021
	AGAP008798-PA	Guanine nucleotide exchange factor MSS4			0.16	0.011
	AGAP007237-PA	Heme peroxidase	37		0	0.024
	AGAP009033-PA	Heme peroxidase	18		0.56	0.015
	AGAP001826-PA	Lipophorin			0.38	0.036
	AGAP004654-PA	Phosphoadenylate 3'-nucleotidase			0.39	0.047
	AGAP008096-PA	Sphingomyelin phosphodiesterase	22	1	0.73	0.02
	AGAP000439-PA	Tetrahydrobiopterin dehydratase			0.63	0.02
	AGAP008064-PA	Uroporphyrinogen-III synthase			0.64	0.032
	AGAP010846-PA	AGAP010846-PA			0.29	0.036
	AGAP028095-PC	AGAP028095-PC	21		0.47	0.005
	AGAP004108-PB	Amalgam	13		0.59	0.02
	AGAP008052-PA	Chemosensory protein	17		0.61	0.039
	AGAP002822-PA	Condensin-2 complex subunit H2			0.16	0.003
	AGAP008013-PA	Filaggrin-2 isoform x1	18		0.63	0.013
	AGAP001768-PB	Gamma-interferon-inducible protein IP-30	32	1	0.49	0.038
Other	AGAP001657-PA	Hexamerin	18		0.6	0.039
	AGAP001659-PA	Hexamerin	19		0.69	0.019
	AGAP005471-PA	Muscle M-line assembly protein unc-89			0.7	0.009
	AGAP001127-PA	P37NB protein	24	1	0.42	0.033
	AGAP012057-PA	RNA polymerase-associated protein RTF1			0.45	0.008
	AGAP001989-PA	Secreted salivary gland protein	24	1	0.41	0.013
	AGAP007532-PA	Vinculin			0.7	0.033
	AGAP003095-PA	Yellow protein	21		0.71	0.003

### Table 4. A list of 49 down-regulated proteins

\*SP indicates the predicted signal peptide cleavage site, and TMs indicates the predicted number of transmembrane domains.

Group	Protein IDs	Protein names	MW (kDa)	SP*	TMs	IH/CH	p-value
F	AGAP004632-PA	Defensin	10	~-	1	27 53	0.356
	AGAP007100 PA	Defensin	7	22	1	27.55	0.341
	AGAF00/199-FA	Cambiain	00	22	1	2.00	0.041
	AGAP008043-PA	Gambiem	0.0	20	1	2.07	0.089
	AGAP00/34/-PA	Lysozyme I (c-type)	15.3	20		0.76	0.64
AMP	AGAP007345-PA	Lysozyme 3 (c-type)	16.6	18		1.12	0.817
	AGAP007385-PA	Lysozyme 4 (c-type)	17.4	31	1	0.37	0.046
	AGAP007344-PA	Lysozyme 8 (c-type)	16.5	18		13.93	0.356
	AGAP011119-PA	Lysozyme 3	18	21		0.98	0.916
	AGAP000376-PA	Transferrin precursor	69.2	18		1.61	0.055
	AGAP002825-PA	PPO1	79.3	-		0.34	0.031
	AGAP006258-PA	PPO2	78.1			0.85	0.045
PPO	AGAP00/1975-PA	PPO3	78.6			0.05	0.043
	AGAD004091 DA	PRO4	78.5			0.0	0.024
	AGAF004981-FA	PROC	78.5			1.04	0.337
	AGAP004977-PA	PPO6	79			1.00	0.827
	AGAP004980-PA	PPO/	/9.6			3.66	0.414
	AGAP004976-PA	PPO8	79.3			1.03	0.914
	AGAP010815-PA	TEP1	152.1	21	1	0.4	0.071
	AGAP008654-PA	TEP12	96.3			0.32	0.127
	AGAP008368-PA	TEP14	139.4			0.17	0.091
TED	AGAP008364-PA	TEP15	163.6	42		0.73	0.045
TEP	AGAP008366-PA	TEP2	154.6			1.51	0.021
	AGAP010812-PA	TFP4	149.4			1	0.993
	AGAP010814 PA	TEDA	151.3	26	1	0.12	0.108
	ACAD010820 DA	TEDO	151.5	20	1	0.12	0.108
	AGAP010830-PA	IEF9	131.3	21	1	0.51	0.357
	AGAP007036-PA	APLIA	49.4	20		0	0.330
	AGAP007035-PA	APLIB	63.9	20		0.74	0.342
	AGAP00/033-PA	APLIC	82.4	22	1	0.55	0.137
	AGAP004811-PA	CILI	21.8	25	1	0.79	0.402
	AGAP004810-PA	CTL3	20.8	22	1	0.72	0.276
	AGAP005335-PA	CTL4	19.8	24	1	0.28	0.103
	AGAP003625-PA	CTL8	21.5	17		0.99	0.981
	AGAP006430-PB	CTLGA2	24.9	17		1.43	0.396
	AGAP010193-PA	CTLGA3	27	17		1.02	0.929
	AGAP007412-PA	CTLMA1	20.1	24	1	0.57	0.097
	AGAP007411-PA	CTLMA3	19.4	21		0.68	0.075
	AGAP002911-PA	CTL MA9	17.5	22		0.89	0.939
	AGAP010021-PA	Dumpy	172.4			4 71	0.414
	AGAP010024-PA	Dumpy	345.1			3.75	0.111
	AGAI 010024-1 A	Dumpy Dumpy lite protein	12.6	21		1.62	0.411
	AGAF003027-FA	CNDD	43.0	20	1	1.05	0.51
	AGAP009106-PA	GNBP	32.1	26	1	0.53	0.064
	AGAP009110-PA	GNBP	42	24		0.52	0.004
	AGAP009146-PA	GNBP	33.5	31		0.33	0.084
PRR	AGAP006761-PA	GNBPA1	55.7	17	1	0.67	0.176
1100	AGAP004455-PA	GNBPB1	44.1	24		0.75	0.338
	AGAP002798-PA	GNBPB2	43.7	19		1.07	0.829
	AGAP002799-PA	GNBPB3	43.1	18		146.34	0.356
	AGAP002796-PA	GNBPB4	46.7		1	1.63	0.232
	AGAP006327-PA	LRIM (Short)	39.6	28		0.71	0.095
	AGAP006348-PA	LRIM1	57.3	22		0.56	0.138
	AGAP005693-PA	LRIMIT	18.8	21		0.63	0.081
	AGAD007020 DA		40.0 50.0	21		0.05	0.001
	AGAF007039-FA		39.9	24	1	0.40	0.172
	AGAP006044-PA	LKK	11	25	1	0.5	0.359
	AGAP011503-PA	LRR	32	23		0.79	0.392
	AGAP005962-PA	LRR shoc-2	90.7	16		0.79	0.242
	AGAP004832-PA	LRR-1	117.8		1	0.7	0.03
	AGAP003878-PA	LRR-15	63.2	19	1	1.34	0.013
	AGAP007030-PA	LRR-7030	115.4	26	1	0	0.356
	AGAP007059-PA	LRR-7059	124			0.79	0.106
	AGAP007060-PA	LRR-7060	132.9	28	1	0.76	0.251
	AGAP009762-PA	Nimrod	141.6	23	1	0.76	0.497
	AGAP001212-PB	PGRPL B	23.3	-	1	2.24	0.04
	AGAP000536-PA	PGRPS1	22.4	26		0.58	0.078

## Table 5. A list of 235 immunity-related proteins
	AGAP006343-PA	PGRPS2	20	20		0	0.356
	AGAP006342-PA	PGRPS3	20	20		0.98	0.942
	AGAP001198-PA	Chymotrypsin	29.4	18		0	0.078
	AGAP011608-PA	Chymotrypsin BI	36.4	22	2	1.38	0.417
	AGAP001365-PA	Chymotrypsin-c-like isoform x1	68.6	21	1	0.68	0.149
	AGAP005663-PA	Chymotrypsin-like protease	33.8	34	1	0.61	0.026
	AGAP005670-PA	Chymotrypsin-like protease	32.2	16	-	0.74	0.020
	AGAD005671 DA	Chymotrypsin-like protease	32.2	16		0.02	0.277
	AGAF005071-FA	Chymotrypsin-like protease	32.2	10		0.92	0.709
	AGAP005080-PA	Chymotrypsin-like protease	31.9	18		0.98	0.95
	AGAP007252-PA	Chymotrypsin-like protease	32.9	1/		0.74	0.200
	AGAP009121-PA	Cnymotrypsin-like protease	27.7	16		0.93	0.785
	AGAP00568/-PA	Chymotrypsin-like protease	32.1	18		1.01	0.968
	AGAP006674-PA	Chymotrypsin-like protease	32.4	21		0.86	0.444
	AGAP006675-PA	Chymotrypsin-like protease	32.1	17		0.41	0.214
	AGAP003686-PA	CLIP	39.8			0.83	0.315
	AGAP003251-PA	CLIPB1	40.9	25		0.5	0.004
	AGAP009214-PA	CLIPB11	39.8	25	1	0.95	0.824
	AGAP004855-PA	CLIPB13	44.8	22		0.74	0.036
	AGAP009844-PA	CLIPB15	40.6	22		0.82	0.182
	AGAP003246-PA	CLIPB2	38.4	19		0.35	0.078
	AGAP003249-PA	CLIPB3	40.1	30		0.68	0.087
	AGAP003250-PA	CLIPB4	39.4	24		0.7	0.076
	AGAP004148-PA	CLIPB5	41.3	30		1.02	0.891
	AGAP003057-PA	CLIPB8	44.8	24	1	0.52	0.048
	AGAP013442-PB	CLIPB9	82.9	26	1	0.67	0.054
	AGAP008835-PA	CLIPC1	42.6	25		0.83	0.182
	AGAP000572-PA	CLIPC10	40.9	27	1	0.96	0.821
	AGAP004317-PA	CLIPC2	41.5	27		0.8	0.346
	AGAP004318-PA	CLIPC3	43.1	32	1	0.87	0.296
	AGAP000573-PB	CLIPC4	39.4	22		0.79	0.086
	AGAP000315-PA	CLIPC6	39.6	22	1	0.81	0.316
	AGAP004719-PA	CLIPC9	40.6		1	0.87	0.354
	AGAP002422-PA	CLIPD1	48.5	21	1	0.94	0.581
SP	AGAP002813-PA	CLIPD6	52.8	19	-	1.51	0.222
51	AGAP001798-PA	Clotting factor C (limulus) homolog	72.6	18	1	1.31	0.464
	AGAP005072-PA	Coagulation factor X	96.4	14		0.53	0.002
	AGAP003960-PA	Coagulation factor XI	64.6	26	1	0.74	0.171
	AGAP012269-PA	Coagulation factor XI	72.3	20	1	1.69	0.139
	AGAP013252-PA	Coagulation factor XI	66.6	26	-	0.94	0.398
	AGAP001245-PA	Eupolytin	28.7	16		0.74	0.326
	AGAP001246-PA	Eupolytin	30.3	26	1	1 14	0.792
	AGAP001248-PA	Fupolytin	28.9	20	1	1.17	0.814
	AGAP001249-PA	Fupolytin	27.1	16		0.89	0.666
	AGAP006539-PA	Eupolytin	28.8	18	1	1.54	0.000
	AGAD011020 DA	Eupolytin	26.3	18	1	0.53	0.307
	AGAP012046 PA	Diasminogen	20.5	24		0.33	0.350
	AGAP012940-1A	Plasminogen	35.5	24		0.63	0.339
	AGAD006486 DA	Dree3	30.8	27	1	0.05	0.005
	AGAP004566 PA	Serine protesse	35.7	20	1	0.95	0.817
	AGA D006672 DA	Serine protease	22.1	10		0.95	0.637
	AGAF000073-FA	Serine protease	20.8	19		0.88	0.333
	AGAP002343-FA	Serine protease	29.0	23	1	0.80	0.142
	AGAP011917-PA	Serine protease	20.2	20	1	0.89	0.012
	AGAP001240-PA	Serine protease (thymus-specific)	55.8	10	1	1.09	0.219
	AGAP003914-PA	Series and the specific)	265		1	1.55	0.572
	AGAP012526-PA	Serine protesse 14	30.3			0.77	0.030
	AGAP012014-PA	Serine protease 14	43.4	20		1.33	0.201
	AGAP01548/-PA	Serine Protesse with CD A	34.2	29	1	1.44	0.002
	AGAP003625-PA	Transis (1, t)	146.8	17	1	1.05	0.903
	AGAP010240-PA	Trypsin (late)	28.2	1/	-	0.59	0.063
	AGAP006485-PA	Irypsin-alpha	30.5	19		0.91	0.858
	AGAP011427-PA	Irypsin-like protein	96.2	10		0.39	0.061
	AGAP012022-PA	I rypsin-like protein	97	18		1.41	0.146
	AGAP012504-PA	Irypsin-like protein	93.9			1.28	0.283
	AGAP02/981-PA	Irypsin-like protein	98			1.91	0.09
	AGAP007043-PA	Urokinase-type plasminogen activator	59.9			0.68	0.166

AGAP011791-PA         CLIPA1 homolog         48.4         20         -0.58         0.112           AGAP011781-PA         CLIPA14 homolog         30.4         21         0.87         0.34           AGAP011790-PR         CLIPA2 homolog         55.9         20         0.82         0.582         0.578           AGAP011790-PR         CLIPA4 homolog         45.9         20         0.84         0.473           AGAP011792-PA         CLIPA4 homolog         45.7         24         0.93         0.561           AGAP011792-PA         CLIPA5 homolog         40.9         25         0.7         0.248           AGAP01791-PA         CLIPE36 homolog         41.5         1         0.9         0.573           AGAP00270-PA         CLIPE36 homolog         63.7         1.02         0.784           AGAP00369-PA         CLIPE76 homolog         28.1         20         0.55         0.401           AGAP00570-PA         Sertire collagense 1 homolog         23.2         1         0.94         0.021           AGAP00570-PA         Sertire collagense 1 homolog         23.6         16         1.09         0.112           AGAP00570-PA         Sertire collagense 1 homolog         23.6         1.0         0.216		AGAP005642-PA	Chymotrypsin-like protease	33	26	1	0.97	0.916
AGAP01781-PA         CLIPA12 homolog         40.9         25         0.88         0.488           AGAP01790-PB         CLIPA2 homolog         55.9         20         0.82         0.508           AGAP011792-PA         CLIPA4 homolog         45.7         24         0.93         0.561           AGAP011792-PA         CLIPA4 homolog         40.9         25         0.7         0.24           AGAP010731-PA         CLIPA5 homolog         40.9         25         0.7         0.24           AGAP010731-PA         CLIPA5 homolog         42.5         1         0.9         0.573           AGAP00270-PA         CLIPE7 homolog         43.6         19         1.12         0.741         0.645           AGAP002899-PA         CLIPE7 homolog         67.7         24         1         0.94         0.655           AGAP000570-PA         Sertic collagenase 1 homolog         22.3         1         0.472         0.672           AGAP000707-PA         Sertic collagenase 1 homolog         22.5         1.0         0.924         0.626           AGAP000707-PA         Sertic collagenase 1 homolog         23.5         1         0         0.356           AGAP000708-PA         Sertic collagenase 1 homolog         23.5		AGAP011791-PA	CLIPA1 homolog	48.4	20		0.58	0.112
AGAP01178-PA         CLIPA14 homolog         50.4         0.81         0.82         0.53           AGAP011780-PA         CLIPA4 homolog         45.9         20         0.84         0.473           AGAP011780-PA         CLIPA4 homolog         45.7         24         0.93         0.53           AGAP01712-PA         CLIPA5 homolog         40.9         25         0.7         0.248           AGAP01711-PA         CLIPA5 homolog         40.9         25         1         0.9         0.57           AGAP00270-PA         CLIPEA5 homolog         43.6         19         1.12         0.741           AGAP002808-PA         CLIPC7 homolog         67         24         1         0.94         0.695           AGAP002808-PA         CLIPC7 homolog         28.2         0.60         0.072         AGAP00730-PA         Eugelytin-like         28.1         20         0.55         0.401           AGAP00730-PA         Sertine collagenase 1 homolog         28.7         17         0.88         0.864           AGAP00730-PA         Sertine collagenase 1 homolog         23.3         21         0.54         0.57           AGAP00730-PA         Sertine collagenase 1 homolog         23.6         16         10.90         0.56		AGAP011781-PA	CLIPA12 homolog	40.9	25		0.88	0.458
AGAP01790-PB         CLIPA2 homolog         55.9         20         0.84         0.037           AGAP01789-PA         CLIPA6 homolog         45.7         24         0.038         0.631           AGAP01732-PA         CLIPA6 homolog         40.9         21         0.52         0.011           AGAP010731-PA         CLIPA5 homolog         40.9         25         0.7         0.248           AGAP00270-PA         CLIPA7 homolog         47.5         1         0.9         0.9           AGAP00270-PA         CLIPC7 homolog         67         24         1         0.94         0.695           AGAP003689-PA         Claggenase I homolog         28.2         0         0.55         0.401           AGAP00730-PA         Exploylin-like         28.1         20         0.55         0.401           AGAP007070-PA         Serine collagenase I homolog         28.5         16         1.09         0.71<0.489		AGAP011788-PA	CLIPA14 homolog	30.4	21		0.87	0.34
AGAP01780-PA         CLIPA4 homolog         45.7         24         0.93         0.561           AGAP01792-PA         CLIPA7 homolog         80.9         21         0.52         0.011           AGAP01713P-PA         CLIPA7 homolog         40.9         25         0.7         0.248           AGAP01318-PA         CLIPA5 homolog         42.5         1         0.9         0.573           AGAP00369-PA         CLIPC7 homolog         67         24         1         0.94         0.656           AGAP003698-PA         CCulPC7 homolog         67.5         1         1.02         0.784           AGAP00730-PA         Eupolytin-like         28.1         20         0.55         0.401           AGAP00770-PA         Serine collagenase 1 homolog         22.8         1         0.049         0.71           AGAP005709-PA         Serine collagenase 1 homolog         23.3         21         0         0.356           AGAP007308-PA         Serine collagenase 1 homolog         33.4         21         0         0.356           AGAP007308-PA         Serine protease homolog         33.5         1         0.79         0.41           AGAP007308-PA         Serine protease homolog         33.5         1		AGAP011790-PB	CLIPA2 homolog	55.9	20		0.82	0.508
AGAP01782-PA         CLIPA6 homolog         45.7         24         0.93         0.561           AGAP010731-PA         CLIPA8 homolog         40.9         25         0.7         0.248           AGAP010731-PA         CLIPA8 homolog         42.5         1         0.9         0.373           AGAP00270-PA         CLIPT8 homolog         67         24         1.0.94         0.695           AGAP003689-PA         Clapediation factor XI         67.5         1         0.20         0.055           AGAP007070-PA         Explaydrin-like         28.1         20         0.55         0.401           AGAP007070-PA         Sertine collagenase 1 homolog         28.2         1         0.69         0.071           AGAP007070-PA         Sertine collagenase 1 homolog         28.6         1.6         1.09         0.201           AGAP0070707-PA         Sertine collagenase 1 homolog         27.8         1.9         0.71         0.488           AGAP0070707-PA         Sertine collagenase 1 homolog         23.3         21         0         0.035           AGAP0070739-PA         Sertine protease homolog         31.4         21         0         0.167           AGAP0070739-PA         Sertine protease homolog         31.4		AGAP011780-PA	CLIPA4 homolog	45.9	20		0.84	0.473
AGAP01792-PA         CLIPA7 homolog         80.9         21         0.52         0.01           AGAP01318-PA         CLIPR36 homolog         42.5         1         10.9         0.57           AGAP0030270-PA         CLIPR75 homolog         43.6         19         1.12         0.741           AGAP003689-PA         CLIPC7 homolog         67         24         1         10.94         0.695           AGAP005808-PA         CCugulation factor XI         67.5         1         10.2         0.784           AGAP005709-PA         Eupolytin-like         28.1         20         0.55         0.401           AGAP005709-PA         Serine collagenase 1 homolog         22.3         21         0.649         0.674           AGAP005709-PA         Serine collagenase 1 homolog         21.4         1         0.0         0.356           AGAP005703-PA         Serine collagenase 1 homolog         21.4         1         0.0         0.4189           AGAP005703-PA         Serine collagenase 1 homolog         31.4         21         0.0         0.456           AGAP005703-PA         Serine protease homolog         33.3         1         0.79         0.41           AGAP004703-PA         Serine protease homolog         33.4		AGAP011789-PA	CLIPA6 homolog	45.7	24		0.93	0.561
AGAP010731-PA         CLIPA8 homolog         40.9         25         0.7         0.248           AGAP00270-PA         CLIPR7 homolog         43.6         19         1.12         0.741           AGAP00369-PA         CLIPR7 homolog         67         24         1         0.94         0.095           AGAP00880-PA         Congulation factor XI         67.5         1         0.02         0.784           AGAP010730-PA         PCD activating factor homolog         28.2         0.69         0.0072           AGAP005707-PA         Serine collagenase I homolog         28.7         17         0.88         0.864           AGAP006707-PA         Serine collagenase I homolog         28.6         16         1.09         0.719           AGAP005708-PA         Serine collagenase I homolog         21.8         19         0.71         0.489           AGAP005708-PA         Serine collagenase I homolog         31.4         21         0         0.356           AGAP005708-PA         Serine collagenase I homolog         33.5         19         0.616         AGAP004430-PA         Serine protease homolog         33.5         19         0.616         AGAP00206-PA         Serine protease homolog         34.2         1         0.077         0.385 <td></td> <td>AGAP011792-PA</td> <td>CLIPA7 homolog</td> <td>80.9</td> <td>21</td> <td></td> <td>0.52</td> <td>0.011</td>		AGAP011792-PA	CLIPA7 homolog	80.9	21		0.52	0.011
AGAP01318+PA         CLIPB7 homolog         42.5         I         0.9         0.573           AGAP003690-PA         CLIPC7 homolog         67         24         1         0.94         0.969           AGAP003690-PA         COLIPC7 homolog         67.5         1         10.2         0.784           AGAP011919-PA         Exploylin-like         28.2         0.69         0.072           AGAP005709-PA         Serine collagenase 1 homolog         28.3         21         0         0.54         0.031           AGAP005709-PA         Serine collagenase 1 homolog         28.7         1.7         0.88         0.864           AGAP005709-PA         Serine collagenase 1 homolog         21.4         0         0.355           AGAP005703-PA         Serine collagenase 1 homolog         23.4         1         0         0.356           AGAP005703-PA         Serine protease homolog         33.3         1         1         0.01         0.356           AGAP005703-PA         Serine protease homolog         33.5         1         1         0.01         0.356           AGAP00463-PA         Serine protease homolog         33.5         1         1         0.07         0.41           AGAP004020-PA         Serine prot		AGAP010731-PA	CLIPA8 homolog	40.9	25		0.7	0.248
AGAP00220-PA         CLIPBT homolog         43.6         19         1.12         0.741           AGAP00880-PA         COugulation factor XI         67.5         24         1         0.945         0.095           AGAP00880-PA         Cougulation factor XI         67.5         24         1         0.945         0.401           AGAP005707-PA         Serine collagenuse 1 homolog         28.2         0.69         0.072           AGAP005707-PA         Serine collagenuse 1 homolog         28.7         1         0.88         0.864           AGAP005707-PA         Serine collagenuse 1 homolog         28.6         1.6         1.09         0.71           SPH         AGAP005708-PA         Serine collagenuse 1 homolog         31.4         21         0         0.356           AGAP005708-PA         Serine protease homolog         31.3         0         1         0.7         0.489           AGAP005708-PA         Serine protease homolog         33.3         16         0         0.355           AGAP00320-PA         Serine protease homolog         33.5         16         0         0.356           AGAP003117-PA         Serine protease homolog         34.4         1         0.54         0.048           AGAP003691-PA </td <td></td> <td>AGAP013184-PA</td> <td>CLIPB36 homolog</td> <td>42.5</td> <td></td> <td>1</td> <td>0.9</td> <td>0.573</td>		AGAP013184-PA	CLIPB36 homolog	42.5		1	0.9	0.573
AGAP00389-PA         CLIPCT homolog         67         24         1         0.94         0.093           AGAP01590-PA         Coupulation factor NI         67.5         1.02         0.65         0.401           AGAP01590-PA         Empolytin-like         28.2         0.69         0.072           AGAP005707-PA         Serine collagenase 1 homolog         28.7         1.7         0.88         0.864           AGAP005707-PA         Serine collagenase 1 homolog         28.6         1.6         1.09         0.719           AGAP005707-PA         Serine collagenase 1 homolog         27.8         19         0.71         0.489           AGAP005703-PA         Serine collagenase 1 homolog         21.4         1         0         0.356           AGAP005703-PA         Serine protease homolog         31.4         1         0         0.356           AGAP003248-PA         Serine protease homolog         33.3         16         0         0.356           AGAP003248-PA         Serine protease homolog         33.3         16         0.64         0.015           AGAP003249-PA         Serine protease homolog         34.2         1         0.67         0.041           AGAP001708-PA         Serine protease homolog         34.2 </td <td></td> <td>AGAP002270-PA</td> <td>CLIPB7 homolog</td> <td>43.6</td> <td>19</td> <td></td> <td>1.12</td> <td>0.741</td>		AGAP002270-PA	CLIPB7 homolog	43.6	19		1.12	0.741
AGAP008808-PA         Coagulation factor XI         67.5         I.02         0.73           AGAP017197-PA         Fupolytin-like         28.1         20         0.65         0.401           AGAP01670-PA         Serine collagenase 1 homolog         32.3         21         0.54         0.201           AGAP005705-PA         Serine collagenase 1 homolog         28.7         17         0.88         0.864           AGAP005708-PA         Serine collagenase 1 homolog         28.6         16         1.09         0.719           SPH         AGAP005708-PA         Serine collagenase 1 homolog         21.4         21         0         0.356           AGAP005708-PA         Serine collagenase 1 homolog         31.4         21         0         0.356           AGAP005708-PA         Serine protease homolog         33.3         16         0         0.356           AGAP00220-PA         Serine protease homolog         33.5         19         1         0.64         0.058           AGAP00320-PA         Serine protease homolog         33.4         25         1         1.07         0.938           AGAP00320-PA         Serine protease homolog         34.2         1         0.54         0.048           AGAP00122-PA         <		AGAP003689-PA	CLIPC7 homolog	67	24	1	0.94	0.695
AGAP01191-P-A         Eupoytin-like         28.2         0.65         0.407           AGAP00570-PA         Serine collagenase 1 homolog         23.3         21         0.64         0.007           AGAP00570-PA         Serine collagenase 1 homolog         28.7         17         0.88         0.864           AGAP00676-PA         Serine collagenase 1 homolog         28.6         16         1.09         0.719           AGAP00570-PA         Serine collagenase 1 homolog         27.8         19         0         0.356           AGAP00570-PA         Serine collagenase 1 homolog         27.8         19         0         0.356           AGAP00570-PA         Serine protease homolog         27.4         10         0         0.356           AGAP00570-PA         Serine protease homolog         31.4         21         0         0         0.356           AGAP00320-PA         Serine protease homolog         33.5         16         0         0.63         0.64         0.010         0.43         0.64         0.013         AGAP00391-PA         Serine protease homolog         34.2         0.7         0.41         0.64         0.013         AGAP001392-PA         Serine protease homolog         34.2         0.6         0.422         AGAP001392-PA		AGAP008808-PA	Coagulation factor XI	67.5			1.02	0.784
AGAP010730-PA         PPO activating factor homolog         28.2         0.69         0.072           AGAP005707-PA         Serine collagenase 1 homolog         28.7         17         0.88         0.864           AGAP005703-PA         Serine collagenase 1 homolog         28.6         16         1.09         0.719           SPH         AGAP004740-PA         Serine collagenase 1 homolog         21.4         21         0         0.356           AGAP005708-PA         Serine collagenase 1 homolog         31.4         21         0         0.356           AGAP004730-PA         Serine protease homolog         33.3         10         0.707         0.41           AGAP001708-PA         Serine protease homolog         33.5         19         1         0.64         0.105           AGAP00216-PA         Serine protease homolog         34.2         1         0.76         0.41           AGAP001708-PA         Serine protease homolog         34.2         1         0.76         0.11           AGAP001708-PA         Serine protease homolog         34.2         1         0.21         0.42           AGAP001708-PA         Serine protease homolog         34.2         1         0.21         0.42           AGAP001708-PA         Ser		AGAP011919-PA	Eupolytin-like	28.1	20		0.55	0.401
AGAP005709-PA         Serine collagenase I homolog         22.3         21         0.54         0.201           AGAP005709-PA         Serine collagenase I homolog         28.6         16         1.09         0.719           AGAP004701-PA         Serine collagenase I homolog         27.8         19         0.71         0.488         0.844           AGAP005703-PA         Serine collagenase I homolog         21.4         21         0         0.354           AGAP005703-PA         Serine protease homolog         23.3         10         0.72         0.488           AGAP003248-PA         Serine protease homolog         33.9         16         0         0.355           AGAP00216-PA         Serine protease homolog         33.5         19         1         0.64         0.055           AGAP003691-PA         Serine protease homolog         34.4         1         0.54         0.088           AGAP001708-PA         Serine protease homolog         34.2         0.76         0.131           AGAP001708-PA         Serine protease homolog         34.2         0.76         0.131           AGAP001708-PA         Serine protease homolog         34.2         0.76         0.131           AGAP000707-PA         Trypsin-like protein         31		AGAP010730-PA	PPO activating factor homolog	28.2			0.69	0.072
AGAP005709-PA         Serine collagenase 1 homolog         28.7         17         0.88         0.864           AGAP00676-PA         Serine collagenase 1 homolog         22.6         16         1.09         0.719           AGAP00703-PA         Serine collagenase 1 homolog         21.4         21         0         0.356           AGAP005708-PA         Serine collagenase 1 homolog         31.4         21         0         0.356           AGAP004740-PA         Serine protease homolog         33.2         26         1         1.02         0.986           AGAP004638-PA         Serine protease homolog         33.3         16         0         0         355           AGAP00220-PA         Serine protease homolog         33.5         19         1         0.64         0.105           AGAP001317-PA         Serine protease homolog         94.4         1         0.54         0.088         0.44           AGAP00179-PA         Serine protease homolog gd-like         30.9         23         0.82         0.44           AGAP00179-PA         Serine protease homolog         29.4         18         1         1.01         0.969           AGAP00179-PA         Serine protease homolog         29.6         18         1         1.0		AGAP005707-PA	Serine collagenase 1 homolog	32.3	21		0.54	0.201
AGAP00676-PA         Serine collagenase 1 homolog         28.6         16         1.09         0.719           AGAP005703-PA         Serine collagenase 1 homolog         21.8         19         0.71         0.489           AGAP005703-PA         Serine collagenase 1 homolog         20.6         2.8         1         0.0         0.354           AGAP005703-PA         Serine collagenase 1 homolog         20.6         2.8         1         0.0         0.165           AGAP003703-PA         Serine protease homolog         37.3         30         1         0.79         0.41           AGAP002016-PA         Serine protease homolog         33.5         19         1         0.64         0.055           AGAP001708-PA         Serine protease homolog         34.2         1         1.0         0.94           AGAP001708-PA         Serine protease homolog         34.2         0.76         0.082         0.44           AGAP001708-PA         Serine protease homolog         34.2         0.76         0.082         0.44         1         0.54         0.082         0.44           AGAP001708-PA         Serine protease homolog         34.2         0.76         0.82         0.44         0.87         0.82         0.44         0.87		AGAP005709-PA	Serine collagenase 1 homolog	28.7	17		0.88	0.864
SPH         AGAP00470-PA         Serine collagenase 1 homolog         27.8         19         0.71         0.489           AGAP005703-PA         Serine collagenase 1 homolog         21.4         21         0         0.356           AGAP005708-PA         Serine collagenase 1 homolog         22.6         2.3         1         0         0.165           AGAP003248-PA         Serine protease homolog         37.3         30         1         0.79         0.41           AGAP003216-PA         Serine protease homolog         33.5         16         0         0.355           AGAP003201-PA         Serine protease homolog         33.5         19         1         0.64         0.0356           AGAP00300-PA         Serine protease homolog         34.4         1         0.54         0.088           AGAP001708-PA         Serine protease homolog         34.2         1         0.62         1         2.21         0.422           AGAP001708-PA         Serine protease homolog         34.4         1         0.42         0.76         0.131           AGAP001708-PA         Serine protease homolog         29.6         18         1         1.01         0.969           AGAP00170-PA         Trypsin-like protein         31.5		AGAP006676-PA	Serine collagenase 1 homolog	28.6	16		1.09	0.719
AGAP005703-PA         Serine collagenase 1 homolog         31.4         21         0         0.356           AGAP005708-PA         Serine protease 14 like         33.2         26         1         1.02         0.986           AGAP00348-PA         Serine protease homolog         37.3         30         1         0.79         0.41           AGAP00438-PA         Serine protease homolog         33.5         19         1         0.64         0.0356           AGAP00309-PA         Serine protease homolog         54         25         1         1.07         0.933           AGAP003091-PA         Serine protease homolog         34.2         0.76         0.131           AGAP001708-PA         Serine protease homolog         34.2         0.76         0.131           AGAP001708-PA         Serine protease homolog         24.4         1         0.042         0.44           AGAP001708-PA         Serine protease homolog         24.4         1         0.162         0.44           AGAP001708-PA         Trypsin flate homolog         29.0         18         1         1.01         0.97           AGAP001708-PA         Trypsin-like protein         30.4         19         0.97         0.945           AGAP001250-PA	SPH	AGAP004740-PA	Serine collagenase 1 homolog	27.8	19		0.71	0.489
AGAP00508-PA         Serine collagenase 1 homolog         29.6         23         1         0         0.165           AGAP003248-PA         Serine protease 14 like         33.2         26         1         1.02         0.986           AGAP003216-PA         Serine protease homolog         33.3         30         1         0.79         0.41           AGAP00216-PA         Serine protease homolog         33.5         19         1         0.64         0.105           AGAP003201-PA         Serine protease homolog         54         25         1         1.07         0.938           AGAP003091-PA         Serine protease homolog         54.4         1         0.541         0.088           AGAP017078-PA         Serine protease homolog dike         30.9         23         0.82         0.44           AGAP001797-PA         Trypsin-lipha like         20.6         1         1         0.422         0.44         0.422         0.44         0.422         0.44         0.422         0.44         0.422         0.421         0.422         0.44         0.422         0.44         0.422         0.46         0.422         0.44         0.422         0.44         0.422         0.44         0.422         0.44         0.424		AGAP005703-PA	Serine collagenase 1 homolog	31.4	21		0	0.356
AGAP00328-PA         Serine protease 14 like         33.2         26         1         1.02         0.986           AGAP004638-PA         Serine protease homolog         37.3         30         1         0.79         0.41           AGAP009216-PA         Serine protease homolog         33.5         19         1         0.64         0.0356           AGAP003691-PA         Serine protease homolog         54         25         1         10.7         0.938           AGAP003691-PA         Serine protease homolog         34.2         0.76         0.131           AGAP001708-PA         Serine protease homolog         24.2         0.76         0.131           AGAP00179-PA         Serine protease homolog with SR-A         226         1         2.21         0.42           AGAP001708-PA         Trypsin II-P29 like         29.2         21         1.62         0.084           AGAP006477-PA         Trypsin-like protein         31.5         24.8         0.356           AGAP00433-PA         Trypsin-like protein         28.2         25         1.18         1.0659           AGAP00326-PA         Vitamin k-dependent protein c         34.5         23         0.71         0.215           AGAP00326-PA         Vitamin k-dependent p		AGAP005708-PA	Serine collagenase 1 homolog	29.6	23	1	0	0.165
AGAP004638-PA         Serine protease homolog         37.3         30         1         0.79         0.41           AGAP009216-PA         Serine protease homolog         33.9         16         0         0.356           AGAP0013117-PA         Serine protease homolog         54         25         1         1.07         0.938           AGAP000390-PA         Serine protease homolog         94.4         1         0.54         0.088           AGAP001708-PA         Serine protease homolog         94.4         1         0.54         0.082           AGAP001708-PA         Serine protease homolog         94.4         1         0.54         0.422           AGAP006708-PA         Serine protease homolog         94.4         1         0.42         0.42           AGAP00677-PA         Trypsin (ate) homolog         29.6         18         1         1.01         0.96           AGAP006487-PA         Trypsin-like protein         92.2         21         1.62         0.084           AGAP006487-PA         Trypsin-like protein         93.5         0.87         0.593           AGAP003164-PA         Trypsin-like protein         92.2         1.18         0.659           AGAP003164-PA         Trypsin-like protein         93		AGAP003248-PA	Serine protease 14 like	33.2	26	1	1.02	0.986
AGAP009216-PA         Serine protease homolog         33.9         16         0         0.356           AGAP013117-PA         Serine protease homolog         33.5         19         1         0.64         0.105           AGAP003691-PA         Serine protease homolog         54         25         1         0.7         0.938           AGAP003691-PA         Serine protease homolog         34.2         0.76         0.131           AGAP001708-PA         Serine protease homolog gd-like         30.9         23         0.82         0.44           AGAP001708-PA         Serine protease homolog gd-like         30.9         23         0.82         0.44           AGAP001708-PA         Serine protease homolog gd-like         30.9         23         0.82         0.44           AGAP006477-PA         Trypsin-like protein         31.5         24.8         0.94         0.94           AGAP006437-PA         Trypsin-like protein         31.5         24.8         0.356         AGAP001250-FA         Trypsin-like protein         28.2         25         1.18         0.659           AGAP003626-PA         Vitamin k-dependent protein c         34.5         23         0.71         0.215           AGAP003626-PA         SRPN10         42.6		AGAP004638-PA	Serine protease homolog	37.3	30	1	0.79	0.41
AGAP013117-PA         Serine protease homolog         33.5         19         1         0.64         0.103           AGAP00030-PA         Serine protease homolog         54         25         1         1.07         0.938           AGAP003601-PA         Serine protease homolog         94.4         1         0.54         0.088           AGAP01708-PA         Serine protease homolog with SR-A         226         1         2.21         0.422           AGAP001677-PA         Serine protease homolog gith SR-A         226         1         2.21         0.422           AGAP00677-PA         Trypsin (ate) homolog         29.6         18         1         1.01         0.969           AGAP006877-PA         Trypsin-like protein         31.5         24.8         0.356           AGAP001205-PA         Trypsin-like protein         31.5         24.8         0.356           AGAP003403-PA         Trypsin-like protein         99.3         0.87         0.593           AGAP003402-PA         Vitamin k-dependent protein         34.5         23         0.71         0.215           AGAP003420-PA         SRPN10         42.2         1.18         0.659         0.344           AGAP005246-PE         SRPN10D         42.2         1		AGAP009216-PA	Serine protease homolog	33.9	16	-	0	0.356
AGAP000290-PA         Serine protease homolog         54         25         1         1.07         0.938           AGAP003691-PA         Serine protease homolog         94.4         1         0.54         0.088           AGAP001132-PA         Serine protease homolog         34.2         0.76         0.131           AGAP001708-PA         Serine protease homolog gd-like         30.9         23         0.82         0.44           AGAP001708-PA         Serine protease homolog         29.6         18         1         1.01         0.969           AGAP001677-PA         Trypsin (late) homolog         29.6         18         1         1.01         0.976           AGAP006477-PA         Trypsin-like protein         31.5         24.8         0.356           AGAP004840-PA         Trypsin-like protein         28.2         25         1.18         0.659           AGAP00326-PA         Vitamin k-dependent protein c         34.5         23         0.71         0.215           AGAP005246-PD         SRPN10         47.7         26         1.56         0.234           AGAP003246-PD         SRPN11         57.1         16         1.04         0.905           AGAP003175-PA         SRPN12         64.8         15<		AGAP013117-PA	Serine protease homolog	33.5	19	1	0.64	0.105
AGAP003691-PA         Serine protease homolog         94.4         1         0.54         0.088           AGAP01782-PA         Serine protease homolog         34.2         0.76         0.131           AGAP001708-PA         Serine protease homolog gd-like         30.9         23         0.82         0.44           AGAP00677-PA         Serine protease homolog gd-like         30.9         22.6         1         2.21         0.422           AGAP00677-PA         Trypsin (late) homolog         29.6         1.8         1         1.02         0.969           AGAP006487-PA         Trypsin-like protein         31.5         24.8         0.356           AGAP005437-PA         Trypsin-like protein         99.3         0.87         0.593           AGAP003626-PA         Tirypsin-like protein         28.2         25         1.18         0.659           AGAP003626-PA         Vitamin k-dependent protein c         34.5         23         0.71         0.215           AGAP003262-PD         SRPN10D         42.2         124.84         0.356           AGAP003262-PE         SRPN10D         42.2         124.84         0.356           AGAP003175-PA         SRPN10D         42.2         124.84         0.356		AGAP000290-PA	Serine protease homolog	54	25	1	1.07	0.938
AGAP011325-PA         Serine protease homolog         34.2         0         0.76         0.131           AGAP011708-PA         Serine protease homolog gd-like         30.9         23         0.82         0.44           AGAP001779-PA         Serine protease homolog gd-like         30.9         23         0.82         0.44           AGAP006677-PA         Trypsin (late) homolog         22.6         18         1         1.01         0.969           AGAP00687-PA         Trypsin-like protein         31.5         1         2.21         0.422           AGAP01364-PA         Trypsin-like protein         31.5         24.8         0.356           AGAP013620-PA         Trypsin-like protein         28.2         25         1.18         0.639           AGAP003626-PA         Vitamin k-dependent protein c         34.5         23         0.71         0.215           AGAP003246-PD         SRPN10         47.7         26         1.56         0.234           AGAP003246-PD         SRPN10         42.2         1.124.84         0.356           AGAP001375-PA         SRPN11         57.1         1.6         1.040         0.905           AGAP001375-PA         SRPN17         53.7         35         1         1.01		AGAP003691-PA	Serine protease homolog	94.4	20	1	0.54	0.088
AGAP001708-PA         Serine protease homolog gd-like         30.9         23         0.82         0.44           AGAP00179-PA         Serine protease homolog with SR-A         226         1         2.21         0.422           AGAP00677-PA         Trypsin II-P29 like         29.6         18         1         1.01         0.969           AGAP006487-PA         Trypsin-alpha like         30.4         19         0.97         0.945           AGAP012505-PA         Trypsin-like protein         31.5         24.8         0.356           AGAP003620-PA         Trypsin-like protein         28.2         1.18         0.687         0.593           AGAP003620-PA         Vitamin k-dependent protein         28.4.5         23         0.71         0.215           AGAP003262-PA         Vitamin k-dependent protein         24.5         1.18         0.659           AGAP005246-PD         SRPN10B         42.6         1.93         0.044           AGAP00375-PA         SRPN11         57.1         16         1.04         0.905           AGAP003137-PA         SRPN12         64.8         15         1.39         0.467           AGAP003137-PA         SRPN17         53.7         35         1         1.01         0.939 <td></td> <td>AGAP011325-PA</td> <td>Serine protease homolog</td> <td>34.2</td> <td></td> <td>-</td> <td>0.76</td> <td>0.131</td>		AGAP011325-PA	Serine protease homolog	34.2		-	0.76	0.131
Instant         Description         Description <thdescription< th=""> <thdescription< th=""> <th< td=""><td></td><td>AGAP001708-PA</td><td>Serine protease homolog gd-like</td><td>30.9</td><td>23</td><td></td><td>0.82</td><td>0.44</td></th<></thdescription<></thdescription<>		AGAP001708-PA	Serine protease homolog gd-like	30.9	23		0.82	0.44
AGAP006677-PA         Trypsin (late) homolog         22.0         1         1         1.01         0.969           AGAP004677-PA         Trypsin (late) homolog         29.2         21         1.62         0.084           AGAP00487-PA         Trypsin-alpha like         30.4         19         0.97         0.945           AGAP0048403-PA         Trypsin-like protein         31.5         24.8         0.356           AGAP0036403-PA         Trypsin-like protein         99.3         0.87         0.593           AGAP003626-PA         Vitamin k-dependent protein         28.2         25         1.18         0.659           AGAP003626-PA         Vitamin k-dependent protein c         34.5         23         0.71         0.215           AGAP005246-PE         SRPN10B         42.6         1.93         0.044           AGAP001377-PA         SRPN11         57.1         16         1.04         0.905           AGAP001375-PA         SRPN12         64.8         15         1.39         0.467           AGAP002137-PA         SRPN16         61.1         28         0.78         0.314           AGAP003176-PA         SRPN17         53.7         35         1         1.01         0.999		AGAP001979-PA	Serine protease homolog with SR-A	226	20	1	2 21	0.422
AGAP00912-PA         Trypsin II-P29 like         29.2         21         1.62         0.084           AGAP006487-PA         Trypsin-Ilke protein         31.5         24.8         0.356           AGAP012505-PA         Trypsin-like protein         31.5         24.8         0.356           AGAP003403-PA         Trypsin-like protein         28.2         25         1.18         0.659           AGAP003626-PA         Vitamin k-dependent protein c         34.5         23         0.71         0.215           AGAP003626-PA         SRPN10B         42.6         1.93         0.044           AGAP003626-PA         SRPN10B         42.6         1.93         0.044           AGAP00377-PA         SRPN10D         42.2         124.84         0.356           AGAP00375-PA         SRPN10D         42.2         124.84         0.356           AGAP003137-PA         SRPN11         57.1         16         1.04         0.905           AGAP003137-PA         SRPN12         64.8         15         1.39         0.467           AGAP006910-PA         SRPN12         64.5         21         0.79         0.199           AGAP006910-PA         SRPN3         47.1         22         1.18         0.373		AGAP006677-PA	Trypsin (late) homolog	220	18	1	1.01	0.969
Horn Park         Trypsin alpha like         2.2         1         1.02         0.034           AGAP006487-PA         Trypsin-alpha like         30.4         19         0.97         0.945           AGAP012505-PA         Trypsin-like protein         99.3         0.87         0.593           AGAP003626-PA         Trypsin-like protein         99.3         0.87         0.593           AGAP003626-PA         Trypsin-like protein         28.2         25         1.18         0.659           AGAP003626-PA         Vitamin k-dependent protein c         34.5         23         0.71         0.215           AGAP003626-PA         SRPN10B         42.6         1.93         0.044           AGAP003626-PD         SRPN10D         42.2         124.84         0.356           AGAP00377-PA         SRPN11         57.1         16         1.04         0.905           AGAP00375-PA         SRPN12         64.8         15         1.39         0.467           AGAP00376-PA         SRPN17         53.7         35         1         1.01         0.933           AGAP006910-PA         SRPN2         46.5         21         0.79         0.199           AGAP006910-PA         SRPN4         61.8		AGAP009122-PA	Trypsin (late) homolog	29.0	21	1	1.62	0.084
AGAP012050-FA         Trypsin-like protein         31.5         24.8         0.356           AGAP002051-PA         Trypsin-like protein         99.3         0.87         0.593           AGAP003164-PA         Trypsin-like protein         28.2         25         1.18         0.659           AGAP003626-PA         Vitamin k-dependent protein c         34.5         23         0.71         0.215           AGAP005246-PD         SRPN10B         47.7         26         1.56         0.234           AGAP005246-PD         SRPN10D         42.2         124.84         0.356           AGAP00377-PA         SRPN10D         42.2         124.84         0.356           AGAP0003137-PA         SRPN11         57.1         16         1.04         0.905           AGAP003137-PA         SRPN12         64.8         15         1.39         0.467           AGAP003137-PA         SRPN16         61.1         28         0.78         0.314           AGAP006911-PA         SRPN3         47.1         22         1.18         0.373           AGAP006910-PA         SRPN3         47.1         22         1.18         0.314           AGAP006970-PA         SRPN4         61.8         25         1 <td></td> <td>AGAP006487-PA</td> <td>Trypsin ii 122 like</td> <td>30.4</td> <td>19</td> <td></td> <td>0.97</td> <td>0.004</td>		AGAP006487-PA	Trypsin ii 122 like	30.4	19		0.97	0.004
Instruct         Instruction         Instruction <thinstruction< th=""> <thinstruction< th=""> <t< td=""><td></td><td>AGAP012505-PA</td><td>Trypsin-like protein</td><td>31.5</td><td>17</td><td></td><td>24.8</td><td>0.356</td></t<></thinstruction<></thinstruction<>		AGAP012505-PA	Trypsin-like protein	31.5	17		24.8	0.356
AGAP013164-PA         Trypsin-like protein         23.2         25         1.18         0.659           AGAP003626-PA         Vitamin k-dependent protein c         34.5         23         0.71         0.215           AGAP003626-PA         SRPN1         47.7         26         1.56         0.234           AGAP005246-PD         SRPN10B         42.6         1.93         0.044           AGAP005246-PE         SRPN10D         42.2         124.84         0.356           AGAP001377-PA         SRPN11         57.1         16         1.04         0.905           AGAP00213-PA         SRPN16         61.1         28         0.78         0.314           AGAP003175-PA         SRPN16         61.1         28         0.78         0.314           AGAP003176-PA         SRPN17         53.7         35         1         1.01         0.939           AGAP006911-PA         SRPN3         47.1         22         1.18         0.373           AGAP006910-PA         SRPN3         47.1         22         1.18         0.364           AGAP006910-PA         SRPN3         47.1         22         1.18         0.373           AGAP00691-PA         SRPN3         47.1         2		AGAP008403-PA	Trypsin-like protein	99.3			0.87	0.593
AGA P003026-PA         Vitamin & dependent protein c         34.5         23         0.71         0.215           AGAP003266-PA         Vitamin & dependent protein c         34.5         23         0.71         0.215           AGAP005266-PD         SRPN10B         42.6         1.93         0.044           AGAP005246-PE         SRPN10D         42.2         124.84         0.356           AGAP001377-PA         SRPN11         57.1         16         1.04         0.905           AGAP001375-PA         SRPN12         64.8         15         1.39         0.467           AGAP001376-PA         SRPN17         53.7         35         1         1.01         0.939           Serpin         AGAP00691-PA         SRPN3         47.1         22         1.18         0.374           AGAP00690-PA         SRPN3         47.1         22         1         0.86         0.596           AGAP00670-PA         SRPN4         68.9         25         1         0.86         0.596           AGAP00670-PA         SRPN4         61.8         25         1         0.86         0.596           AGAP003194-PA         SRPN8         48.8         20         0.88         0.3814		AGAP013164-PA	Trypsin-like protein	28.2	25		1.18	0.659
AGAP066909-PA         SRPN1         47.7         26         1.56         0.234           AGAP066909-PA         SRPN10B         42.6         1.93         0.044           AGAP005246-PE         SRPN10D         42.2         124.84         0.356           AGAP001377-PA         SRPN11         57.1         16         1.04         0.905           AGAP001375-PA         SRPN12         64.8         15         1.39         0.467           AGAP001375-PA         SRPN16         61.1         28         0.78         0.314           AGAP006911-PA         SRPN2         46.5         21         0.79         0.199           AGAP006910-PA         SRPN3         47.1         22         1.18         0.373           AGAP006910-PA         SRPN3         47.1         22         1.8         0.374           AGAP006910-PA         SRPN4         68.9         25         1         0.86         0.596           AGAP006970-PB         SRPN4         61.8         25         1         0.8         0.314           AGAP004631-PA         SRPN8         48.8         20         0.88         0.383           AGAP004631-PA         Cell wall cysteine-rich protein         17.6		AGAP003626-PA	Vitamin k-dependent protein c	34.5	23		0.71	0.215
AGAP005246-PD         SRPN10B         42.6         1.03         0.041           AGAP005246-PE         SRPN10D         42.2         124.84         0.356           AGAP005246-PE         SRPN10D         42.2         124.84         0.356           AGAP005246-PE         SRPN11         57.1         16         1.04         0.905           AGAP001375-PA         SRPN12         64.8         15         1.39         0.467           AGAP00213-PA         SRPN16         61.1         28         0.78         0.314           AGAP006911-PA         SRPN3         47.1         22         1.18         0.373           AGAP006910-PA         SRPN4         68.9         25         1         0.86         0.596           AGAP00670-PA         SRPN4         61.8         25         1         0.86         0.596           AGAP003194-PA         SRPN9         50.4         28         1.26         0.365           AGAP003194-PA         SRPN9         50.4         28         1.26         0.374           AGAP003631-PA         Cell wall cysteine-rich protein         175.6         1         2.35         0.34           AGAP00387-PA         Congulation factor deficiency 2 homolog         26		AGAP006909-PA	SRPN1	47.7	26		1.56	0.234
AGAP005246-PE         SRPN10D         42.2         124.84         0.356           AGAP005246-PE         SRPN10D         42.2         124.84         0.356           AGAP001377-PA         SRPN11         57.1         16         1.04         0.905           AGAP001375-PA         SRPN12         64.8         15         1.39         0.467           AGAP001376-PA         SRPN17         53.7         35         1         1.01         0.939           Serpin         AGAP006911-PA         SRPN3         47.1         22         1.18         0.373           AGAP006910-PA         SRPN4         61.8         25         1         0.86         0.596           AGAP00670-PB         SRPN4         61.8         25         1         0.86         0.314           AGAP00670-PA         SRPN4         61.8         25         1         0.86         0.314           AGAP00670-PA         SRPN4         61.8         25         1         0.86         0.314           AGAP003139-PA         SRPN4         61.8         25         1         0.86         0.314           AGAP003139-PA         SRPN9         50.4         28         1.26         0.365           <		AGAP005246-PD	SRPN10B	42.6	20		1.93	0.044
AGAP001377-PA         SRPN11         57.1         16         1.04         0.905           AGAP001375-PA         SRPN12         64.8         15         1.39         0.467           AGAP00213-PA         SRPN16         61.1         28         0.78         0.314           AGAP001376-PA         SRPN17         53.7         35         1         1.01         0.939           AGAP006911-PA         SRPN2         46.5         21         0.79         0.199           AGAP006910-PA         SRPN3         47.1         22         1.18         0.373           AGAP006910-PA         SRPN4         68.9         25         1         0.86         0.596           AGAP00670-PB         SRPN4         61.8         25         1         0.8         0.314           AGAP003194-PA         SRPN8         48.8         20         0.88         0.383           AGAP003139-PA         SRPN8         48.8         20         0.88         0.383           AGAP003139-PA         SRPN9         50.4         28         1.26         0.365           AGAP003139-PA         Cell wall cysteine-rich protein         175.6         1         2.35         0.34           AGAP002385-PA		AGAP005246-PE	SRPN10D	42.2			124.84	0.356
AGAP001375-PA         SRPN12         64.8         15         1.39         0.467           AGAP001375-PA         SRPN16         61.1         28         0.78         0.314           AGAP001376-PA         SRPN17         53.7         35         1         1.01         0.939           AGAP006911-PA         SRPN2         46.5         21         0.79         0.199           AGAP006910-PA         SRPN3         47.1         22         1.18         0.373           AGAP006910-PA         SRPN4         68.9         25         1         0.86         0.596           AGAP006910-PA         SRPN4         61.8         25         1         0.86         0.596           AGAP006910-PA         SRPN4         61.8         25         1         0.86         0.314           AGAP006910-PA         SRPN7         44.3         25         0.95         0.792           AGAP003139-PA         SRPN9         50.4         28         1.26         0.365           AGAP006813-PA         TIL domain-containing protein         13.4         22         1.5         0.377           AGAP003987-PA         Cell wall cysteine-rich protein         175.6         1         2.35         0.34 <td></td> <td>AGAP001377-PA</td> <td>SRPN11</td> <td>57.1</td> <td>16</td> <td></td> <td>1 04</td> <td>0.905</td>		AGAP001377-PA	SRPN11	57.1	16		1 04	0.905
AGAP009213-PA         SRPN16         61.1         28         0.78         0.314           AGAP009213-PA         SRPN17         53.7         35         1         1.01         0.939           Serpin         AGAP006911-PA         SRPN2         46.5         21         0.79         0.199           AGAP006910-PA         SRPN3         47.1         22         1.18         0.373           AGAP006970-PA         SRPN4         68.9         25         1         0.86         0.596           AGAP009670-PB         SRPN4         61.8         25         1         0.8         0.314           AGAP009670-PB         SRPN4         61.8         25         1         0.8         0.314           AGAP009670-PB         SRPN4         61.8         25         1         0.8         0.314           AGAP003194-PA         SRPN3         48.8         20         0.88         0.383           AGAP003139-PA         SRPN9         50.4         28         1.26         0.365           AGAP002585-PA         Cell wall cysteine-rich protein         175.6         1         2.35         0.34           AGAP002631-PA         Congulation factor deficiencry 2 homolog         26.1         21		AGAP001375-PA	SRPN12	64.8	15		1.01	0.467
AGAP001376-PA         SRPN17         53.7         35         1         1.01         0.931           Serpin         AGAP001376-PA         SRPN2         46.5         21         0.79         0.199           AGAP006911-PA         SRPN3         47.1         22         1.18         0.373           AGAP006910-PA         SRPN4         68.9         25         1         0.86         0.596           AGAP009670-PA         SRPN4         61.8         25         1         0.8         0.314           AGAP003139-PA         SRPN4         61.8         25         1         0.8         0.314           AGAP003139-PA         SRPN7         44.3         25         0.95         0.792           AGAP003139-PA         SRPN9         50.4         28         1.26         0.365           AGAP003139-PA         SRPN9         50.4         28         1.26         0.365           AGAP003139-PA         Cell wall cysteine-rich protein         175.6         1         2.35         0.34           AGAP002585-PA         Cell wall cysteine-rich protein         11.4         0.553         AGAP002878-PA         Cystatin-like protein         21.6         0.48         0.209           AGAP002878-PA		AGAP009213-PA	SRPN16	61.1	28		0.78	0.314
Serpin         AGAP006911-PA         SRPN2         46.5         21         0.79         0.199           AGAP006910-PA         SRPN3         47.1         22         1.18         0.373           AGAP009670-PA         SRPN4         68.9         25         1         0.86         0.596           AGAP009670-PB         SRPN4         61.8         25         1         0.8         0.314           AGAP007693-PA         SRPN7         44.3         25         0.95         0.792           AGAP003194-PA         SRPN8         48.8         20         0.88         0.383           AGAP003194-PA         SRPN9         50.4         28         1.26         0.365           AGAP003194-PA         SRPN9         50.4         28         1.26         0.365           AGAP003194-PA         SRPN9         50.4         28         1.26         0.365           AGAP006813-PA         TIL domain-containing protein         13.4         22         1.5         0.377           AGAP002585-PA         Cell wall cysteine-rich protein         175.6         1         2.35         0.34           AGAP002878-PA         Cysteine-rich protein         11.2         20         0.39         0.11		AGAP001376-PA	SRPN17	53.7	35	1	1.01	0.939
AGAP006910-PA         SRPN3         47.1         22         1.18         0.373           AGAP00960-PA         SRPN4         68.9         25         1         0.86         0.596           AGAP009670-PB         SRPN4         61.8         25         1         0.86         0.596           AGAP007693-PA         SRPN4         61.8         25         1         0.86         0.314           AGAP003194-PA         SRPN7         44.3         25         0.95         0.792           AGAP006813-PA         SRPN8         48.8         20         0.88         0.383           AGAP006813-PA         TIL domain-containing protein         13.4         22         1.5         0.377           AGAP004631-PA         Coagulation factor deficiency 2 homolog         26.1         21         1.4         0.553           AGAP003987-PA         Complement component 1 Q binding protein         11         1.08         0.49           AGAP002878-PA         Cystatin-like protein         11         1.08         0.49           AGAP002878-PA         Cysteine-rich venom protein         9.5         20         1.14         0.761           AGAP002878-PA         Cysteine-rich venom protein         9.5         20         1.14 <td>Sernin</td> <td>AGAP006911-PA</td> <td>SRPN2</td> <td>46.5</td> <td>21</td> <td>1</td> <td>0.79</td> <td>0.199</td>	Sernin	AGAP006911-PA	SRPN2	46.5	21	1	0.79	0.199
AGAP009670-PA         SRPN4         68.9         25         1         0.86         0.596           AGAP009670-PB         SRPN4         61.8         25         1         0.86         0.596           AGAP007693-PA         SRPN7         44.3         25         0.95         0.792           AGAP003194-PA         SRPN8         48.8         20         0.88         0.383           AGAP006813-PA         SRPN9         50.4         28         1.26         0.365           AGAP006813-PA         TIL domain-containing protein         13.4         22         1.5         0.377           AGAP00285-PA         Cell wall cysteine-rich protein         175.6         1         2.35         0.34           AGAP003987-PA         Coagulation factor deficiency 2 homolog         26.1         21         1.4         0.553           AGAP002878-PA         Complement component 1 Q binding protein         29.6         0.48         0.209           AGAP011460-PA         Cystatin-like protein         11         1.08         0.49           AGAP011460-PA         Cysteine-rich venom protein         9.5         20         1.14         0.761           Other         AGAP01822-PA         Death-associated protein         10.3 <td< td=""><td>berpin</td><td>AGAP006910-PA</td><td>SRPN3</td><td>47.1</td><td>22</td><td></td><td>1.18</td><td>0.373</td></td<>	berpin	AGAP006910-PA	SRPN3	47.1	22		1.18	0.373
AGAP009670-PB         SRPN4         61.8         25         1         0.08         0.034           AGAP007693-PA         SRPN7         44.3         25         0.95         0.792           AGAP003194-PA         SRPN8         48.8         20         0.88         0.383           AGAP003139-PA         SRPN9         50.4         28         1.26         0.365           AGAP006813-PA         TIL domain-containing protein         13.4         22         1.5         0.377           AGAP004631-PA         Cell wall cysteine-rich protein         175.6         1         2.35         0.34           AGAP003987-PA         Complement component 1 Q binding protein         29.6         0.48         0.209           AGAP002878-PA         Complement component 1 Q binding protein         29.6         0.48         0.209           AGAP01460-PA         Cysteine-rich protein (salivary)         11.2         20         0.39         0.11           AGAP006253-PA         Cysteine-rich venom protein         9.5         20         1.14         0.761           AGAP011460-PA         Cysteine-rich venom protein         8.8         18         0.64         0.45           AGAP012970-PA         Cysteine-rich venom protein         9.5         20<		AGAP009670-PA	SRPN4	68.9	25	1	0.86	0.596
AGAP007693-PA         SRPN7         44.3         25         0.95         0.792           AGAP007693-PA         SRPN8         48.8         20         0.88         0.383           AGAP003194-PA         SRPN9         50.4         28         1.26         0.365           AGAP006813-PA         TIL domain-containing protein         13.4         22         1.5         0.377           AGAP002585-PA         Cell wall cysteine-rich protein         175.6         1         2.35         0.34           AGAP004631-PA         Coagulation factor deficiency 2 homolog         26.1         21         1.4         0.553           AGAP002878-PA         Complement component 1 Q binding protein         29.6         0.48         0.209           AGAP002878-PA         Cystatin-like protein         11         1.08         0.49           AGAP006253-PA         Cysteine-rich protein (salivary)         11.2         20         0.39         0.11           AGAP01460-PA         Cysteine-rich venom protein         9.5         20         1.14         0.761           Other         AGAP012970-PA         Cysteine-rich venom protein         8.8         18         0.64         0.45           AGAP0182-PA         Death-associated protein 1         10.3		AGAP009670-PB	SRPN4	61.8	25	1	0.8	0.314
India do         Data N1         Inst         Do         On Do <t< td=""><td></td><td>AGAP007693-PA</td><td>SRPN7</td><td>44.3</td><td>25</td><td>1</td><td>0.95</td><td>0.792</td></t<>		AGAP007693-PA	SRPN7	44.3	25	1	0.95	0.792
India do		AGAP003194-PA	SRPN8	48.8	20		0.88	0.383
AGAP006813-PA         TIL domain-containing protein         13.4         22         1.5         0.377           AGAP006813-PA         TIL domain-containing protein         13.4         22         1.5         0.377           AGAP002585-PA         Cell wall cysteine-rich protein         175.6         1         2.35         0.34           AGAP004631-PA         Coagulation factor deficiency 2 homolog         26.1         21         1.4         0.553           AGAP003987-PA         Complement component 1 Q binding protein         29.6         0.48         0.209           AGAP002878-PA         Cystatin-like protein         11         1.08         0.49           AGAP01460-PA         Cysteine-rich venom protein         9.5         20         1.14         0.761           AGAP006253-PA         Cysteine-rich venom protein         9.5         20         1.14         0.761           AGAP012970-PA         Cysteine-rich venom protein         8.8         18         0.64         0.45           AGAP01832-PA         Death-associated protein 1         10.3         0.6         0.395           AGAP01832-PA         Death-associated protein 1         10.3         0.6         0.395           AGAP0108878-PA         Defense protein         17.7         21 <td></td> <td>AGAP003139-PA</td> <td>SRPN9</td> <td>50.4</td> <td>28</td> <td></td> <td>1.26</td> <td>0.365</td>		AGAP003139-PA	SRPN9	50.4	28		1.26	0.365
AGAP002585-PA         Cell wall cysteine-rich protein         175.6         1         2.35         0.37           AGAP002585-PA         Cell wall cysteine-rich protein         175.6         1         2.35         0.34           AGAP004631-PA         Coagulation factor deficiency 2 homolog         26.1         21         1.4         0.553           AGAP003987-PA         Complement component 1 Q binding protein         29.6         0.48         0.209           AGAP002878-PA         Complement component 1 Q binding protein         11         1.08         0.49           AGAP002878-PA         Cystatin-like protein         11         1.08         0.49           AGAP002878-PA         Cysteine-rich venom protein         9.5         20         1.14         0.761           AGAP006253-PA         Cysteine-rich venom protein         9.5         20         1.14         0.761           AGAP012970-PA         Cysteine-rich venom protein         8.8         18         0.64         0.45           AGAP01832-PA         Death-associated protein         17.7         21         1         0.93         0.799           AGAP018878-PA         Defense protein         17.7         21         1         0.47         0.645           AGAP000287-PA         E		AGAP006813-PA	TIL domain-containing protein	13.4	20		1.20	0.377
AGAP004631-PA         Coagulation factor deficiency 2 homolog         26.1         21         1.4         0.553           AGAP004631-PA         Coagulation factor deficiency 2 homolog         26.1         21         1.4         0.553           AGAP003987-PA         Complement component 1 Q binding protein         29.6         0.48         0.209           AGAP002878-PA         Cystatin-like protein         11         1.08         0.49           AGAP011460-PA         Cysteine-rich protein (salivary)         11.2         20         0.39         0.11           AGAP006253-PA         Cysteine-rich venom protein         9.5         20         1.14         0.761           AGAP012970-PA         Cysteine-rich venom protein         8.8         18         0.64         0.45           AGAP01832-PA         Death-associated protein 1         10.3         0.6         0.395           AGAP018878-PA         Defense protein         17.7         21         1         0.93         0.799           AGAP00025-PA         E3 SUMO-protein ligase 2         150.4         0         0.356           AGAP002982-PA         E3 SUMO-protein ligase RanBP2         308.1         2         0.021           AGAP010822-PA         Fasciclin         26.3         0.93		AGAP002585-PA	Cell wall cysteine-rich protein	175.6		1	2 35	0.34
AGAP003987-PA         Complement component 1 Q binding protein         29.6         0.48         0.209           AGAP003987-PA         Complement component 1 Q binding protein         29.6         0.48         0.209           AGAP002878-PA         Cystatin-like protein         11         1.08         0.49           AGAP011460-PA         Cystatin-like protein (salivary)         11.2         20         0.39         0.11           AGAP006253-PA         Cysteine-rich venom protein         9.5         20         1.14         0.761           AGAP012970-PA         Cysteine-rich venom protein         9.5         20         1.14         0.761           AGAP01832-PA         Desth-associated protein         17.7         21         1         0.93         0.799           AGAP018878-PA         Defense protein         17.7         21         1         0.93         0.799           AGAP010884-PA         Down syndrome cell adhesion molecule A         214.7         0.47         0.645           AGAP00025-PA         E3 SUMO-protein ligase 2         150.4         0         0.356           AGAP010282-PA         E3 SUMO-protein ligase RanBP2         308.1         2         0.021           AGAP010822-PA         Fasciclin         26.3         0.93		AGAP004631-PA	Coagulation factor deficiency 2 homolog	26.1	21	-	1.4	0.553
AGAP002878-PA         Cystatin-like protein         11         1.08         0.49           AGAP002878-PA         Cystatin-like protein         11         1.08         0.49           AGAP011460-PA         Cysteine-rich protein (salivary)         11.2         20         0.39         0.11           AGAP006253-PA         Cysteine-rich venom protein         9.5         20         1.14         0.761           Other         AGAP012970-PA         Cysteine-rich venom protein         8.8         18         0.64         0.45           AGAP01832-PA         Death-associated protein         17.7         21         1         0.93         0.799           AGAP0108878-PA         Defense protein         17.7         21         1         0.93         0.799           AGAP010884-PA         Down syndrome cell adhesion molecule A         214.7         0.47         0.645           AGAP00025-PA         E3 SUMO-protein ligase 2         150.4         0         0.356           AGAP002982-PA         E3 SUMO-protein ligase RanBP2         308.1         2         0.021           AGAP010822-PA         Fasciclin         26.3         0.93         0.749		AGAP003987-PA	Complement component 1 0 binding protein	29.6	21		0.48	0.209
AGAP01460-PA         Cysteine-rich protein (salivary)         11.2         20         0.39         0.11           AGAP011460-PA         Cysteine-rich protein (salivary)         11.2         20         0.39         0.11           AGAP006253-PA         Cysteine-rich venom protein         9.5         20         1.14         0.761           AGAP012970-PA         Cysteine-rich venom protein         8.8         18         0.64         0.45           AGAP011832-PA         Death-associated protein 1         10.3         0.6         0.395           AGAP0108878-PA         Defense protein         17.7         21         1         0.93         0.799           AGAP010884-PA         Down syndrome cell adhesion molecule A         214.7         0.47         0.645           AGAP00025-PA         E3 SUMO-protein ligase 2         150.4         0         0.356           AGAP010822-PA         E3 SUMO-protein ligase RanBP2         308.1         2         0.021           AGAP010822-PA         Fasciclin         26.3         0.93         0.749		AGAP002878-PA	Cystatin-like protein	11			1.08	0.49
Other         AGAP006253-PA         Cysteine-rich venom protein         9.5         20 $1.14$ $0.761$ Other         AGAP006253-PA         Cysteine-rich venom protein         9.5         20 $1.14$ $0.761$ AGAP012970-PA         Cysteine-rich venom protein         8.8         18 $0.64$ $0.45$ AGAP01832-PA         Death-associated protein         1 $10.3$ $0.6$ $0.395$ AGAP008878-PA         Death-associated protein         17.7 $21$ $1$ $0.93$ $0.799$ AGAP010884-PA         Down syndrome cell adhesion molecule A $214.7$ $0.47$ $0.645$ AGAP00025-PA         E3 SUMO-protein ligase 2 $150.4$ $0$ $0.356$ AGAP010822-PA         E3 SUMO-protein ligase RanBP2 $308.1$ $2$ $0.021$ AGAP010822-PA         Fasicilin $26.3$ $0.93$ $0.749$		AGAP011460-PA	Cysteine-rich protein (salivary)	11.2	20		0.39	0.11
Other         AGAP012970-PA         Cysteine-rich venom protein         8.8         18         0.64         0.45           AGAP01832-PA         Death-associated protein         10.3         0.6         0.395           AGAP01832-PA         Death-associated protein         17.7         21         1         0.93         0.799           AGAP0108878-PA         Defense protein         17.7         21         1         0.93         0.799           AGAP010884-PA         Down syndrome cell adhesion molecule A         214.7         0.47         0.645           AGAP000025-PA         E3 SUMO-protein ligase 2         150.4         0         0.356           AGAP010822-PA         E3 SUMO-protein ligase RanBP2         308.1         2         0.021           AGAP010822-PA         Fasciclin         26.3         0.93         0.749		AGAP006253-PA	Cysteine-rich venom protein	95	20		1 14	0.761
AGAP011832-PA         Death-associated protein         10.3         0.6         0.395           AGAP01832-PA         Death-associated protein         17.7         21         1         0.93         0.799           AGAP018837-PA         Defense protein         17.7         21         1         0.93         0.799           AGAP010884-PA         Down syndrome cell adhesion molecule A         214.7         0.47         0.645           AGAP000025-PA         E3 SUMO-protein ligase 2         150.4         0         0.356           AGAP010822-PA         E3 SUMO-protein ligase RanBP2         308.1         2         0.021           AGAP010822-PA         Fasciclin         26.3         0.93         0.749	Other	AGAP012970-PA	Cysteine-rich venom protein	8.8	18		0.64	0.45
AGAP008878-PA         Defense protein         10.3         0.0         0.393           AGAP008878-PA         Defense protein         17.7         21         1         0.93         0.799           AGAP010884-PA         Down syndrome cell adhesion molecule A         214.7         0.47         0.645           AGAP000025-PA         E3 SUMO-protein ligase 2         150.4         0         0.356           AGAP002982-PA         E3 SUMO-protein ligase RanBP2         308.1         2         0.021           AGAP010822-PA         Fasciclin         26.3         0.93         0.749	ounci	AGAP011832-DA	Death-associated protein 1	10.3	10		0.04	0.395
AGAP010884-PA         Down syndrome cell adhesion molecule A         214.7         0.47         0.645           AGAP010025-PA         E3 SUMO-protein ligase 2         150.4         0         0.356           AGAP002982-PA         E3 SUMO-protein ligase RanBP2         308.1         2         0.021           AGAP010822-PA         Fasicilin         26.3         0.93         0.749		AGAP008878-PA	Defense protein	17.7	21	1	0.93	0.799
AGAP000025-PA         E3 SUMO-protein ligase 2         150.4         0         0.356           AGAP000025-PA         E3 SUMO-protein ligase 2         150.4         0         0.356           AGAP002982-PA         E3 SUMO-protein ligase RanBP2         308.1         2         0.021           AGAP010822-PA         Fasciclin         26.3         0.93         0.749		AGAP010884_PA	Down syndrome cell adhesion molecule A	214.7		1	0.75	0.645
AGAP002982-PA         E3 SUMO-protein ligase RanBP2         308.1         2         0.021           AGAP010822-PA         Fasciclin         26.3         0.93         0.749		AGAP000025-PA	F3 SUMO-protein ligase 2	150.4			0.47	0.356
AGAP010822-PA Fasciclin 26.3 0.93 0.749		AGAP002982-PA	E3 SUMO-protein ligase RanRP2	308.1			2	0.021
		AGAP010822-PA	Fasciclin	26.3			0.93	0.749

AGAP010823-PA	Fasciclin isoform c	52.4	23	1	0	0.356
AGAP011239-PA	FBN7	30.4			0.81	0.468
AGAP009184-PA	FBN8	35.9	22		0.49	0.146
AGAP010775-PA	FBN8	23.3			0	0.356
AGAP011223-PA	FBN8	24.8			0.53	0.067
AGAP011225-PA	FBN8	34.5	22		0.52	0.084
AGAP009556-PA	FBN8	22.4	18		0.76	0.161
AGAP004918-PA	Fibrinogen	35	19		1.03	0.835
AGAP004996-PA	Fibrinogen	46.8	19		0.7	0.609
AGAP006743-PA	Fibrinogen	37.4			0.79	0.042
AGAP006790-PA	Fibrinogen	30.8			0.29	0.165
AGAP011197-PA	Fibrinogen	32.3			0.98	0.941
AGAP004917-PA	Fibrinogen-related protein 1	34.2	21		0.83	0.251
AGAP006914-PA	Fibrinogen-related protein 1	31.3	18		0.84	0.343
AGAP008797-PA	Immunoglobulin (CD79A) binding protein 1	42.2			14.42	0.356
AGAP000032-PA	Integrin alpha-ps2 isoform x1	166.7	41	1	1.36	0.279
AGAP008968-PA	Kazal domain-containing protein	6.5	18		0.88	0.757
AGAP011482-PA	Kazal domain-containing protein	8.5	22	1	1.25	0.514
AGAP007629-PB	Laminin gamma 1	179.6	28	1	1.01	0.965
AGAP004993-PA	Laminin subunit alpha	412.1	23		0.76	0.207
AGAP002857-PB	MDL2	18.1	25	1	0.5	0.02
AGAP011319-PA	Pacifastin-related peptide	25.3	17		0.73	0.105
AGAP008804-PB	Peroxin-19	33.2			0.36	0.25
AGAP001325-PA	Peroxiredoxin 5, atypical 2-Cys peroxiredoxin	20.6			0.85	0.438
AGAP004674-PA	Phenoloxidase inhibitor protein	36.3	21		0.92	0.727
AGAP010477-PB	Phosducin-like 3	26.3			1.25	0.179
AGAP005531-PA	Programmed cell death 6-interacting protein	94.1			1.26	0.091
AGAP000378-PA	Programmed cell death protein 4	47.4			1.15	0.857
AGAP005432-PA	Programmed cell death protein 5	14.8			1.23	0.642
AGAP003476-PA	Protein BCP1	33.6			0.93	0.772
AGAP004333-PA	Serine-type endopeptidase inhibitor	173.7			0.27	0.125
AGAP003012-PA	SP71 isoform A	78.6	25	1	1.42	0.61
AGAP000305-PA	SPARC	22.2			1.16	0.579
AGAP011765-PA	Spondin-1	87	31		0.81	0.403
AGAP003338-PA	Thioredoxin	15.5			0.32	0.384
AGAP007201-PA	Thioredoxin	15.6			1.27	0.468
AGAP009584-PA	Thioredoxin	12.1			0.64	0.119
AGAP000396-PA	Thioredoxin peroxidase	26			0.82	0.433
AGAP011054-PA	Thioredoxin peroxidase	22			1.09	0.209
AGAP011824-PA	Thioredoxin peroxidase	25			0.95	0.703
AGAP005462-PA	Thioredoxin-like protein 1	31.6			0.89	0.528
AGAP001613-PA	Thioredoxin-related transmembrane protein 1	38.9	22	1	1.38	0.455
AGAP003615-PA	Toll-interacting protein	30.4	1		1 42	0 516

\*SP indicates the predicted signal peptide cleavage site, and TMs indicates the predicted number of transmembrane domains.

Destsing	MW	D 4 *	Slice	1	2	3	4	5	6	7	8	9	10	11	12
Proteins	(kDa)	KA*	MW	500	350	250	230	140	80	70	45	30	22	20	15
AGAP004993-PA	412.1	0.9	СН	0	0	0	0	0	44	24	16	3	0	14	0
alpha	412.1	0.7	IH	0	0	0	0	0	30	27	23	13	0	7	0
AGAP010024-PA	245 1	1.2	CH	0	4	0	0	28	14	12	16	4	5	5	13
Dumpy	545.1	10.8	IH	0	0	0	0	9	7	5	47	17	5	7	3
AGAP002982-PA E3 SUMO-protein	308.1	0.5	CH	0	0	0	0	0	0	0	60	40	0	0	0
ligase RanBP2	508.1	1.5	IH	0	0	0	0	0	0	8	54	21	10	7	0
AGAP001979-PA Serine protease	226	0.1	CH	0	0	0	0	0	0	0	32	23	46	0	0
homolog with SR- A	226	0.5	IH	0	0	0	0	0	0	0	35	6	46	13	0
AGAP007629-PB	170.6	0.2	СН	0	0	0	0	0	0	47	21	32	0	0	0
Laminin gamma 1	179.0	0.1	IH	0	0	0	0	0	47	0	53	0	0	0	0
AGAP002585-PA	175.6	0.1	СН	0	0	0	0	0	0	0	0	100	0	0	0
rich protein	175.0	0.2	IH	0	0	0	0	0	0	0	0	100	0	0	0
AGAP004333-PA Serine-type	152 5	0	СН	0	0	0	0	0	0	0	0	0	0	0	0
endopeptidase inhibitor	173.7	0.1	IH	0	0	0	0	0	0	0	100	0	0	0	0
AGAP010021-PA	172.4	0.8	CH	0	0	0	0	0	14	12	31	20	10	12	0
Dumpy	172.4	6.8	IH	0	0	0	0	1	3	6	41	26	15	8	0
AGAP000032-PA	1// 7	0.8	CH	0	0	0	0	0	0	0	3	31	18	48	0
isoform x1	166./	1.5	IH	0	0	0	0	0	0	0	0	27	32	41	0
AGAP000025-PA	150.4	0	CH	0	0	0	0	0	0	0	0	0	0	0	100
ligase 2	150.4	0	IH	0	0	0	0	0	0	0	0	0	0	0	0
AGAP009762-PA	141.6	40.2	CH	0	0	0	0	0	0	11	47	16	15	8	3
Nimrod	141.0	66.2	IH	0	0	0	0	0	0	14	25	23	24	10	4
AGAP005072-PA	96.4	2.3	CH	0	0	0	13	11	17	15	40	2	3	0	0
X	<i>J</i> 0.4	1.1	IH	0	0	0	27	0	12	5	53	3	0	0	0
AGAP011427-PA Trypsin-like	96.2	1.2	CH	0	0	0	0	0	0	0	39	19	0	42	0
protein	90.2	0.7	IH	0	0	0	0	0	27	0	32	41	0	0	0
AGAP004975-PA	78.6	0.5	СН	0	0	0	0	0	5	10	70	15	0	0	0
PPO3	78.0	1.2	IH	8	9	0	7	0	1	8	46	8	5	3	5
AGAP006644-PA	77	0.2	СН	0	0	0	0	0	0	0	71	29	0	0	0
LRR	11	0.2	IH	0	0	0	0	0	0	0	40	60	0	0	0
AGAP001798-PA	72.6	0	СН	0	0	0	0	0	0	0	0	0	0	0	0
(limulus) homolog	/2.0	0.1	IH	0	0	0	0	0	0	0	0	0	0	100	0
	64.8	103.6	СН	0	0	0	1	1	1	2	7	16	31	37	4

# Table 6. Possible proteolysis and post-translational modifications

AGAP001375-PA SRPN12		191.9	IH	1	0	0	1	0	0	1	5	17	28	42	4
AGAP002799-PA	12.1	0	СН	0	0	0	0	0	0	0	0	0	0	0	0
GNBPB3	45.1	0.1	IH	0	0	0	0	0	100	0	0	0	0	0	0
AGAP005246-PE	12.2	0	CH	0	0	0	0	0	0	0	0	0	0	0	0
SRPN10D	42.2	0.1	IH	0	0	0	0	0	100	0	0	0	0	0	0
AGAP010731-PA	40.9	18.6	CH	3	3	1	2	4	6	4	10	5	8	5	50
CLIPA8 homolog	40.9	15.5	IH	2	3	1	3	4	6	5	8	6	8	4	51
AGAP003686-PA	30.8	0.4	CH	0	0	0	0	0	0	0	34	7	0	0	59
CLIP	39.8	0.6	IH	0	0	0	0	0	0	0	5	0	0	0	95
AGAP012328-PA	36.5	0.9	CH	0	0	0	0	0	0	0	10	0	0	0	90
Serine protease 14	50.5	0.8	IH	0	0	0	0	0	0	0	7	0	0	0	93
AGAP004674-PA	262	176.4	CH	0	0	0	0	1	0	0	2	5	7	49	34
inhibitor protein	30.3	180.1	IH	0	0	0	0	0	0	0	4	5	7	54	28
AGAP005707-PA	22.2	5.5	СН	3	2	0	3	4	0	1	3	8	57	17	3
1 homolog	52.5	3.2	IH	7	4	1	4	0	0	0	5	13	59	7	0
AGAP006486-PA	20.9	0.1	СН	0	0	0	0	0	0	0	82	18	0	0	0
Prss3	50.8	0	IH	0	0	0	0	0	100	0	0	0	0	0	0
AGAP011920-PA	26.2	0.4	СН	0	0	0	0	0	0	5	0	19	0	69	7
Eupolytin	20.3	0.6	IH	0	0	0	0	0	9	21	0	20	0	49	0
AGAP011319-PA Pagifastin related	25.2	207.9	СН	0	0	0	0	0	0	0	1	4	19	63	14
peptide	25.5	166.5	IH	0	0	0	0	0	0	0	1	4	15	58	21
AGAP004810-PA	20.8	23	СН	0	0	0	0	4	0	1	3	6	5	9	71
CTL3	20.8	28.7	IH	0	0	0	0	9	1	2	4	6	4	16	59
AGAP006343-PA	20	0	СН	0	0	0	0	0	0	0	0	0	0	0	0
PGRPS2	20	0	IH	0	0	0	0	0	0	100	0	0	0	0	0
AGAP007344-PA	16.5	0	СН	0	0	0	0	0	0	0	0	0	0	0	0
type)	10.3	0	IH	0	0	0	0	0	0	100	0	0	0	0	0
AGAP006813-PA	12.4	0.2	СН	0	0	0	0	0	0	0	0	100	0	0	0
containing protein	15.4	0.4	IH	0	0	0	0	0	0	0	0	100	0	0	0

\*RA stands for relative abundance, it's represented as [protein abundance \* 10000/total protein abundance of CH or IH]. Molecular weight under each gel slice indicates the upper limit of each slice. The values of each protein in each slice is the percentage of abundance out of the protein's total abundance in CH or IH, so 12 slices of each protein adds up to 100%. Red boxes indicate the calculated positions of the proteins.

# Table 7. Possible serpin-protease complexes

Ductoine	MW	Relative	Slice	1	2	3	4	5	6	7	8	9	10	11	12
Proteins	(kDa)	abundance*	MW	500	350	250	230	140	80	70	45	30	22	20	15
AGAP001376-PA	527	3.6	CH	0	3	0	8	5	13	24	33	9	0	2	3
SRPN17	55.7	5.1	IH	0	4	0	9	0	13	25	25	11	3	0	10
AGAP002813-PA	50.0	2.2	CH	0	4	7	8	12	18	14	16	4	0	5	12
CLIPD6	52.8	3.2	IH	3	7	13	8	13	7	15	16	3	4	2	9
AGAP003139-PA	50.4	157.2	CH	3	3	4	5	11	14	28	29	2	0	1	1
SRPN9	50.4	166.4	IH	2	2	3	4	13	17	44	11	2	1	1	1
AGAP003194-PA	40.0	106.5	CH	7	10	6	18	13	10	28	3	1	0	1	1
SRPN8	48.8	79.4	IH	9	13	8	22	12	8	20	3	1	2	1	1
AGAP006909-PA	177	3.2	CH	0	0	0	14	10	20	28	29	0	0	0	0
SRPN1	47.7	4	IH	4	8	0	11	5	15	40	17	0	0	0	0
AGAP006910-PA	47.1	40.8	CH	5	4	4	7	7	10	18	20	19	2	2	3
SRPN3	47.1	47.2	IH	5	4	4	8	6	11	26	11	18	2	3	3
AGAP006911-PA	165	142	CH	3	3	4	8	7	19	25	24	2	0	1	3
SRPN2	40.5	128.1	IH	3	4	4	10	4	22	34	11	3	2	1	2
AGAP003057-PA	44.0	88	CH	5	5	4	9	6	9	12	29	8	4	5	7
CLIPB8	44.8	72.3	IH	5	6	4	10	6	12	14	17	8	7	6	6
AGAP007693-PA	44.2	23.2	CH	5	5	4	11	12	10	13	31	3	2	4	1
SRPN7	44.5	26	IH	7	9	6	15	9	7	31	11	2	1	1	0
AGAP005246-PD	10.0	5	CH	8	7	6	10	7	10	15	8	5	0	19	4
SRPN10B	42.6	6.2	IH	7	6	5	9	8	10	8	6	6	3	27	3
AGAP008835-PA	10.0	29	CH	2	3	3	6	8	15	23	33	2	2	2	1
CLIPC1	42.6	68.5	IH	2	3	3	5	6	20	30	27	1	1	1	1
AGAP005246-PE	42.2	0	CH	0	0	0	0	0	0	0	0	0	0	0	0
SRPN10D	42.2	0.1	IH	0	0	0	0	0	100	0	0	0	0	0	0
AGAP004317-PA	41.5	4.2	CH	4	3	1	7	9	9	11	19	7	7	5	19
CLIPC2	41.5	3.3	IH	4	2	0	13	11	14	0	16	8	5	5	22
AGAP004148-PA	41.2	9.3	CH	6	8	2	10	7	11	6	15	4	1	4	25
CLIPB5	41.5	11.2	IH	8	12	10	13	7	7	6	9	4	0	4	21
AGAP003251-PA	40.0	8.6	CH	6	5	6	9	14	13	21	25	0	0	0	0
CLIPB1	40.9	7.2	IH	10	9	8	15	12	9	19	17	0	2	0	0
AGAP004719-PA	10 C	1.8	CH	0	4	17	16	36	23	4	0	0	0	0	0
CLIPC9	40.6	2.1	IH	5	10	21	15	27	16	7	0	0	0	0	0
AGAP009214-PA	20.9	11.2	CH	7	7	9	6	12	15	16	6	9	6	4	4
CLIPB11	39.8	10.5	IH	9	8	10	8	9	17	17	7	9	7	0	1
AGAP003250-PA	20.4	12.1	CH	4	5	2	6	10	12	8	29	10	2	3	9
CLIPB4	39.4	11.8	IH	6	8	4	10	11	11	7	27	6	2	2	5
AGAP000573-PB	20.4	396.3	CH	7	6	7	10	9	15	10	13	4	7	5	8
CLIPC4	39.4	330.7	IH	7	7	7	11	8	13	11	10	4	8	5	10
AGAP003246-PA	20 /	1.5	CH	0	0	0	7	9	4	8	55	4	0	1	11
CLIPB2	30.4	0.4	IH	0	0	0	16	0	35	5	45	0	0	0	0

\*Relative abundance is represented as [protein abundance \* 10000/total protein abundance of CH or IH]. Molecular weight under each gel slice indicates the upper limit of each slice. The values of each protein in each slice is the percentage of abundance out of the protein's total abundance in CH or IH, so 12 slices of each protein adds up to 100%. Red boxes indicate the calculated positions of the proteins.

Destains	MW	Relative	Slice	1	2	3	4	5	6	7	8	9	10	11	12
Proteins	(kDa)	abundance	MW	500	350	250	230	140	80	70	45	30	22	20	15
AGAP008366-PA	154.6	0.2	CH	58	34	0	0	8	0	0	0	0	0	0	0
TEP2	134.0	0.4	IH	57	32	8	2	0	0	0	0	0	0	0	0
AGAP010830-PA	1515	0.2	CH	0	100	0	0	0	0	0	0	0	0	0	0
TEP9	151.5	0	IH	0	0	0	0	0	0	0	0	0	0	0	0
AGAP010814-PA	151.2	1.3	CH	30	0	45	0	0	0	11	9	5	0	0	0
TEP6	151.5	0	IH	0	0	0	0	0	0	0	0	0	0	0	0
AGAP008368-PA	120.4	0.2	CH	38	53	0	8	0	0	0	0	0	0	0	0
TEP14	139.4	0.1	IH	57	43	0	0	0	0	0	0	0	0	0	0
AGAP007060-PA	122.0	241.6	CH	17	30	22	22	6	2	1	0	0	0	0	0
LRR-7060	132.9	199.2	IH	20	36	23	16	4	1	1	0	0	0	0	0
AGAP007059-PA	124	387.9	CH	13	27	18	31	4	2	2	1	1	0	0	0
LRR-7059	124	383.5	IH	14	34	20	25	3	1	2	1	1	0	0	0
AGAP004832-PA	117 9	49.8	CH	17	28	21	28	4	1	1	0	0	0	0	0
LRR-1	117.0	38.8	IH	21	31	23	21	2	0	0	0	0	0	0	0
AGAP008403-PA	00.3	6	CH	18	28	18	12	17	1	4	2	0	0	0	0
Trypsin-like protein	<i>99.3</i>	4.8	IH	22	31	24	10	9	1	3	0	0	0	0	0
AGAP027981-PA	08	1.1	CH	14	25	12	14	20	0	0	8	0	0	7	0
Trypsin-like protein	90	2	IH	19	24	15	15	6	0	0	14	3	0	4	0
AGAP012022-PA	07	0.3	CH	0	31	0	32	37	0	0	0	0	0	0	0
Trypsin-like protein	97	0.4	IH	16	53	0	0	32	0	0	0	0	0	0	0
AGAP008654-PA	06.2	3	CH	29	33	15	9	5	2	4	1	1	0	0	0
TEP12	90.5	0.7	IH	36	41	14	5	0	0	4	0	0	0	0	0
AGAP003691-PA		35.4	CH	13	24	16	13	21	6	3	2	1	0	0	2
Serine protease	94.4	16.1	ш	19	25	10	12	14	7	2	1	1	1	0	0
homolog		10.1	ш	10	23	19	12	14	/	2	I	1	1	0	0
AGAP012504-PA	03.0	2.9	CH	10	19	9	13	23	2	8	9	5	0	0	0
Trypsin-like protein	93.9	4.3	IH	15	25	15	12	14	2	1	14	2	0	0	0
AGAP005962-PA	00.7	2.6	CH	11	23	22	22	21	0	0	0	0	0	0	0
LRR shoc-2	90.7	2.1	IH	19	31	24	21	6	0	0	0	0	0	0	0
AGAP004980-PA	70.6	0.1	CH	0	0	61	39	0	0	0	0	0	0	0	0
PPO7	79.0	1.2	IH	15	15	60	11	0	0	0	0	0	0	0	0
AGAP002825-PA	70.2	7	CH	6	12	15	16	8	20	10	5	4	4	0	0
PPO1	19.5	2	IH	0	28	23	13	0	24	10	2	0	0	0	0
AGAP004976-PA	70.3	28.8	CH	5	14	19	22	14	13	4	3	4	0	2	1
PPO8	19.5	35.3	IH	8	16	34	26	5	3	1	1	5	1	0	0
AGAP004977-PA	70	45.9	CH	11	11	25	12	10	16	5	3	2	0	1	4
PPO6	19	57.6	IH	12	13	31	11	9	9	4	3	2	2	1	5
AGAP003012-PA	78.6	1531.9	CH	7	9	21	10	8	24	6	4	3	3	3	2
SP71 isoform A	78.0	1367.7	IH	10	11	23	11	6	16	5	4	3	5	3	2
AGAP004981-PA	78 5	33.4	CH	7	9	19	10	9	19	8	5	4	4	5	3
PPO4	78.5	26.9	IH	11	14	28	15	7	9	5	3	2	4	2	1
AGAP006258-PA	78.1	907.4	CH	11	10	17	9	8	21	6	4	3	3	5	3
PPO2	70.1	826.7	IH	12	12	18	11	7	14	5	4	3	4	6	4
AGAP012269-PA	723	0	CH	0	100	0	0	0	0	0	0	0	0	0	0
Coagulation factor XI	12.5	0.1	IH	0	100	0	0	0	0	0	0	0	0	0	0
AGAP008808-PA	67.5	0.3	CH	0	0	0	100	0	0	0	0	0	0	0	0
Coagulation factor XI	07.5	1	IH	72	0	28	0	0	0	0	0	0	0	0	0
AGAP013252-PA	66.6	6.8	CH	9	7	18	13	13	17	9	5	4	0	4	2
Coagulation factor XI	00.0	8	IH	9	10	27	12	11	8	6	4	3	3	6	3
AGAP003960-PA	64.6	21.8	CH	17	16	14	18	13	4	11	3	3	0	0	1
Coagulation factor XI	0.+0	21	IH	15	17	27	18	9	3	5	2	2	2	0	0
AGAP007035-PA	63.0	0.8	CH	0	0	0	46	14	9	30	0	0	0	0	0
APL1B	03.9	0.5	IH	0	0	0	85	0	0	15	0	0	0	0	0
AGAP006761-PA	55 7	0.2	CH	0	12	0	64	24	0	0	0	0	0	0	0
GNBPA1	55.1	0.1	IH	0	0	25	75	0	0	0	0	0	0	0	0
AGAP006743-PA	37 /	0.9	CH	0	25	0	29	45	0	0	0	0	0	0	0
Fibrinogen	57.4	0.6	IH	0	0	0	52	48	0	0	0	0	0	0	0

# Table 8. Proteins of possible high $M_r$ immune complexes

\*Relative abundance is represented as [protein abundance \* 10000/total protein abundance of CH or IH]. Molecular weight under each gel slice indicates the upper limit of each slice. The values of each protein in each slice is the percentage of abundance out of the protein's total abundance in CH or IH, so 12 slices of each protein adds up to 100%. Red boxes indicate the calculated positions of the proteins.



**Figure 1. Gel cutting and proteins identified in each gel slice.** (A) shows representative lanes of CH and IH. 40 µg total protein of each biological replicate was loaded to each lane and electrophoresed in 4-15% gradient gel. After staining and destaining, each lane was divided into 12 slices, with the molecular mass range of 500-350, 350-250, 250-230, 230-140, 140-80, 80-70, 70-45, 45-30, 30-22, 22-20, 20-15, 15-0kDa respectively. (B) shows the number of proteins identified (LFQ intensity not zero) in each gel slice of CH and IH. CH: 583, 674, 544, 806, 765, 817, 1023, 1197, 1189, 781, 981, 958 proteins from slice 1 to 12. IH: 687, 744, 698, 859, 742, 864, 1061, 1206, 1178, 890, 949, 907 correspondingly.



**Figure 2. Composition of total and immunity-related proteins.** The total 1756 proteins are grouped into 9 categories and their numbers are indicated in (A). The 235 immunity-related proteins are grouped into 6 categories and their numbers are indicated in (B).



**Figure 3. Distribution of protein number and abundance.** (A) Distribution of protein numbers within each LFQ range. (B) shows the relative abundance of all proteins within each LFQ range. The total protein abundance of CH and IH are normalized to 100%.



**Figure 4. Correlation between protein abundance and slices presented.** Correlation between protein abundance and the number of gel slices the protein is presented are indicated in (A) for CH and (B) for IH, respectively. Protein abundance is represented as the logarithm of LFQ intensity with base 2. The number of proteins within each group is indicated above each dot line.



**Figure 5.** Western blot of hemolymph samples using monoclonal antibodies. Purified recombinant PPO2 and PPO7 (400 ng), and 7 µg total hemolymph protein of *A. gambiae* larva, pupa, adult were used. Membranes were blocked with 3% BSA in TBS, probed with the primary antibodies (1P5, 3P35, or AaPPO5 at 1ng/µl) and secondarily with GAM-AP (for 1P5 or 3P35) or GAR-AP (for AaPPO5) at 1:1000 dilution. Antibodies are all in 1% BSA containing TBS, and 3P35 antibody was always pre-mixed with BSA for 1 h to eliminate its cross-reactivity with BSA on the membrane.



**Figure 6. RNA knockdown efficiency at mRNA and protein level.** (A) Total RNA was isolated from 5 female mosquitoes at 24 h after dsRNA injection. Then reverse transcription was performed to generate first strand cDNA, and mRNA level of each PPO gene was examined by qPCR using specific primers (Table 2, Appendices). PPO6 is omitted because of non-pure melting curves. (B) Hemolymph of 15 female mosquitoes was extracted 4 days post dsRNA injection. 3ug total protein was used for western blot analysis with anti- *Aedes aegypti* PPO5 primary antibody (1:1000) and GAR-AP secondary antibody (1:1000). PPO is around 80 kDa, and the lower band is probably PO since no PTU is added.



**Figure 7.** Mosquito survival upon *E. coli* infection after PPO knockdown. *A. gambiae* female adults within 1-2 days after emergence were injected with dsRNA targeting PPO or GFP (control). Then a 4-day interval was allowed for full recovery of mosquitoes before *E. coli* challenge was introduced. Survival rate was recorded for the following 7 days with dead individuals daily counted and removed. Brown dots represent dsPPO injected mosquitoes, and blue dots represent dsGFP. Result here is a summary of three independent replicates, each carried out with ~40 female mosquitoes per treatment group.

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# APPENDICES

Primers	Sequences
Actin-F*	5'- CACACCGTCCCAATCTATGAAGGTTATG -3'
Actin-R	5'- CTTCTCCTTGATGTCACGGACAATTTCAC -3'
AgPPO1-F	5'- AAGAACAAGCTGCCACCGTACA -3'
AgPPO1-R	5'- CAGATGGGTGAACCTTGCAAACAC -3'
AgPPO2-F	5'- ACAAAGATGCGCTGGCTCAGTT -3'
AgPPO2-R	5'- ACGGTGCGTTAGGGTCAAGTTC -3'
AgPPO3-F	5'- CACCGTTAACCTAAACCCTGGTACG -3'
AgPPO3-R	5'- CGTGCTTGGCTCGTTGATGTTAGA -3'
AgPPO4-F	5'- CGTCACACTTAATGCCGGTGCTAAT -3'
AgPPO4-R	5'- TTCGGCCAACCACAGTTACAGAAC -3'
AgPPO5-F	5'- GCCTACACAAGCTCGGAACTTTCA -3'
AgPPO5-R	5'- TCGAACTGTGATCGCTGCCAAA -3'
AgPPO6-F	5'- TCGTAAACAATCAAAGGGATCGGATCACAA -3'
AgPPO6-R	5'- GCTCACCACGGCGATCCTTATT -3'
AgPPO7-F	5'- GTGAATTTAACACCTGGCATTAACAACATC -3'
AgPPO7-R	5'- GCAGAAGCGGAAATTTGCATCAC -3'
AgPPO8-F	5'- TACGATGAGAATGCTGGGTGCGAT -3'
AgPPO8-R	5'- GTCACAGTCGCCAATCGCATGTTT -3'
AgPPO9-F	5'- CGTCAAGTTACATCCTGGCGATAA -3'
AgPPO9-R	5'- ACAGATCGAACGGTTGACCATC -3'

# Table 1. Primers for qRT-PCR targeting PPO genes

\*F for forward primer and R for reverse primer.

Proteins	Epitope sequences	Proteins	Epitope sequences
PPO2	ELLTPYTAEQLGNPG	Common*	QSSVTIPYERTFRN
PPO2	TAEQLGNPGVTVNSV	Common	KDRRGELFYYMHQQL
PPO2	SVGVQLSRPNTPANV	Common	LLTFWQRSQVDLGTG
PPO2	VEVNNESGAVRKGTL	PPO6	SSEADTRIAVRATTL
PPO2	AIGTKSAPTDKDALA	PPO6	EGAVVNNQRDRITID
PPO2	TDFEQDSVAQELDPN	PPO6	NANQIGYAGVQIQSF
PPO2	TLADFVTPNSNMKTA	PPO6	MALSNINLPETEQFR
PPO2	NSNMKTATVQVKFNN	PPO6	SDFTRPNSNMTNIEV
PPO8	GPNSPASSQVSNDTG	PPO7	SAAAAAPAGTSADTP
PPO8	SNDTGVPPTVVTIKD	PPO7	DTPTMNRVSLNNIPD
PPO8	AGFAVSDDGVRVPLD	PPO7	VSLNNIPDPDIKFAE
PPO8	TMAELSNSNVTLEAL	PPO7	NPGVNLLSLETELDR
PPO8	ETQLDRAGGAVNSFV	PPO7	LETELDRRDSVKNTL
PPO8	LRINSTARSNRQDTV	PPO7	LQVAYSGTAKPATLR
PPO8	GNVEQANAGNAQSRF	PPO7	TFRNVANTNIGDANF
PPO8	FEDDNANVNYDENAG	PPO7	HEQDRVNPLFDERTD

Table 2. Peptides for PPO monoclonal antibody generation

\*Common for consensus regions of PPO proteins.

Tabl	le 3.	Gel	distri	bution	of	immunit	t <b>y-re</b> l	lated	protei	ns
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Proteins	MW	RA*	Slice	1	2	3	4	5	6	7	8	9	10	11	12
ACAD004002 DA	(KDa)	0.0		300	330	230	230	140	44	24	45	2	0	14	15
Laminin subunit alpha	412.1	0.9	IH	0	0	0	0	0	30	24	23	13	0	7	0
AGAP010024-PA	245 1	1.2	CH	0	4	0	0	28	14	12	16	4	5	5	13
Dumpy	345.1	10.8	IH	0	0	0	0	9	7	5	47	17	5	7	3
AGAP002982-PA		0.5	CH	0	0	0	0	0	0	0	60	40	0	0	0
E3 SUMO-protein ligase RanBP2	308.1	1.5	IH	0	0	0	0	0	0	8	54	21	10	7	0
AGAP001979-PA		0.1	CH	0	0	0	0	0	0	0	32	23	46	0	0
Serine protease homolog with SR- A	226	0.5	IH	0	0	0	0	0	0	0	35	6	46	13	0
AGAP010884-PA		0.7	CH	0	100	0	0	0	0	0	0	0	0	0	0
Down syndrome cell adhesion molecule A	214.7	0	IH	0	0	0	0	0	0	0	0	0	0	0	0
AGAP007629-PB	170.6	0.2	CH	0	0	0	0	0	0	47	21	32	0	0	0
Laminin gamma 1	1/9.6	0.1	IH	0	0	0	0	0	47	0	53	0	0	0	0
AGAP002585-PA		0.1	CH	0	0	0	0	0	0	0	0	100	0	0	0
Cell wall cysteine- rich protein	175.6	0.2	IH	0	0	0	0	0	0	0	0	100	0	0	0
AGAP004333-PA		0	CH	0	0	0	0	0	0	0	0	0	0	0	0
Serine-type endopeptidase inhibitor	173.7	0.1	IH	0	0	0	0	0	0	0	100	0	0	0	0
AGAP010021-PA	172 4	0.8	CH	0	0	0	0	0	14	12	31	20	10	12	0
Dumpy	172.4	6.8	IH	0	0	0	0	1	3	6	41	26	15	8	0
AGAP000032-PA		0.8	CH	0	0	0	0	0	0	0	3	31	18	48	0
Integrin alpha-ps2 isoform x1	166.7	1.5	IH	0	0	0	0	0	0	0	0	27	32	41	0
	163.6	1128.1	CH	9	12	16	13	12	25	4	3	2	1	2	2

AGAP008364-PA		921.4	ІН	12	15	20	13	8	14	5	3	2	3	2	3
TEP15		0.2	СЦ	59	24		0	0	0	0	0	0	0	0	0
TEP2	154.6	0.2	Ш	57	32	8	2	0	0	0	0	0	0	0	0
AGAP010815-PA	152.1	60.3	СН	18	16	20	16	16	6	2	1	2	0	1	2
TEP1	152.1	22.7	IH	21	18	30	15	8	2	2	1	2	0	0	2
AGAP010830-PA	151.5	0.2	CH	0	100	0	0	0	0	0	0	0	0	0	0
TEP9		0	IH	0	0	0	0	0	0	0	0	0	0	0	0
AGAP010814-PA TEP6	151.3	1.3	Ш	30	0	45	0	0	0	0	9	5	0	0	0
AGAP000025-PA		0	CH	0	0	0	0	0	0	0	0	0	0	0	100
E3 SUMO-protein ligase 2	150.4	0	IH	0	0	0	0	0	0	0	0	0	0	0	0
AGAP010812-PA	140.4	16.3	CH	15	13	28	9	19	11	2	1	0	0	0	1
TEP4	149.4	16.7	IH	18	19	25	15	13	5	2	1	0	1	0	1
AGAP005625-PA	1150	8.5	CH	4	6	5	11	9	3	8	20	10	3	9	12
with SR-A	146.8	13	IH	5	8	7	9	11	3	8	17	14	3	6	9
AGAP009762-PA	141.6	40.2	CH	0	0	0	0	0	0	11	47	16	15	8	3
Nimrod	111.0	66.2	IH	0	0	0	0	0	0	14	25	23	24	10	4
AGAP008368-PA	139.4	0.2	CH	38	53	0	8	0	0	0	0	0	0	0	0
AGAD007060 DA		241.6	СН	17	30	22	22	6	2	1	0	0	0	0	0
LRR-7060	132.9	199.2	IH II	20	36	23	16	4	1	1	0	0	0	0	0
AGAP007059-PA	101	387.9	CH	13	27	18	31	4	2	2	1	1	0	0	0
LRR-7059	124	383.5	IH	14	34	20	25	3	1	2	1	1	0	0	0
AGAP004832-PA	117.8	49.8	CH	17	28	21	28	4	1	1	0	0	0	0	0
LRR-1	117.8	38.8	IH	21	31	23	21	2	0	0	0	0	0	0	0
AGAP007030-PA	115.4	0	CH	0	0	0	100	0	0	0	0	0	0	0	0
LRR-/030		0	IH	10	0	0	0	0	0	0	0	0	0	0	0
AGAP008403-PA Trypsin-like	00.3	6	СН	18	28	18	12	17	1	4	2	0	0	0	0
protein	<i>уу</i> .5	4.8	IH	22	31	24	10	9	1	3	0	0	0	0	0
AGAP027981-PA	08	1.1	СН	14	25	12	14	20	0	0	8	0	0	7	0
protein	98	2	IH	19	24	15	15	6	0	0	14	3	0	4	0
AGAP012022-PA	07	0.3	СН	0	31	0	32	37	0	0	0	0	0	0	0
protein	97	0.4	IH	16	53	0	0	32	0	0	0	0	0	0	0
AGAP005072-PA	0.6.4	2.3	CH	0	0	0	13	11	17	15	40	2	3	0	0
Coagulation factor X	96.4	1.1	IH	0	0	0	27	0	12	5	53	3	0	0	0
AGAP008654-PA	96.3	3	CH	29	33	15	9	5	2	4	1	1	0	0	0
TEP12	70.5	0.7	IH	36	41	14	5	0	0	4	0	0	0	0	0
AGAP011427-PA	06.2	1.2	СН	0	0	0	0	0	0	0	39	19	0	42	0
protein	90.2	0.7	IH	0	0	0	0	0	27	0	32	41	0	0	0
AGAP003691-PA	04.4	35.4	СН	13	24	16	13	21	6	3	2	1	0	0	2
homolog	94.4	16.1	IH	18	25	19	12	14	7	2	1	1	1	0	0
AGAP005531-PA		0.6	СН	0	7	0	32	61	0	0	0	0	0	0	0
death 6-interacting	94.1	1.4	IH	8	26	28	15	23	0	0	0	0	0	0	0
AGAP012504-PA		29	СН	10	19	9	13	23	2	8	9	5	0	0	0
Trypsin-like	93.9	4.3	Ш	15	25	15	12	14	2	1	14	2	0	0	0
		2.6	СН	11	23	22	22	21	0	0	0	0	0	0	0
LRR shoc-2	90.7	2.0	IH	19	31	24	21	6	0	0	0	0	0	0	0
AGAP011765-PA	07	12.9	CH	10	11	7	6	10	6	7	9	7	10	9	7
Spondin-1	87	11.7	IH	10	9	7	6	4	3	5	13	13	15	10	5
AGAP013442-PB	82.9	31.3	CH	5	4	2	5	5	6	6	24	5	25	9	5
CLIPB9	02.7	25.9	IH	3	4	3	6	4	8	8	22	5	20	10	5
AGAP007033-PA APL1C	82.4	103.6 83.4	CH IH	7 8	9	14	9 10	15 10	13 5	3	3	5	8	8	6
AGAP011792-PA	00.0	99.4	CH	8	10	10	11	18	7	8	7	10	4	4	3
CLIPA7 homolog	80.9	75.4	IH	9	11	8	11	12	9	9	9	6	7	5	5

AGAP004980-PA	79.6	0.1	CH	0	0	61	39	0	0	0	0	0	0	0	0
PPO7	77.0	1.2	IH	15	15	60	11	0	0	0	0	0	0	0	0
AGAP002825-PA	793	7	CH	6	12	15	16	8	20	10	5	4	4	0	0
PPO1	17.5	2	IH	0	28	23	13	0	24	10	2	0	0	0	0
AGAP004976-PA	70.3	28.8	CH	5	14	19	22	14	13	4	3	4	0	2	1
PPO8	17.5	35.3	IH	8	16	34	26	5	3	1	1	5	1	0	0
AGAP004977-PA	70	45.9	CH	11	11	25	12	10	16	5	3	2	0	1	4
PPO6	19	57.6	IH	12	13	31	11	9	9	4	3	2	2	1	5
AGAP004975-PA	70 6	0.5	CH	0	0	0	0	0	5	10	70	15	0	0	0
PPO3	/8.0	1.2	IH	8	9	0	7	0	1	8	46	8	5	3	5
AGAP003012-PA	70.6	1531.9	CH	7	9	21	10	8	24	6	4	3	3	3	2
SP71 isoform A	/8.6	1367.7	IH	10	11	23	11	6	16	5	4	3	5	3	2
AGAP004981-PA		33.4	CH	7	9	19	10	9	19	8	5	4	4	5	3
PPO4	78.5	26.9	IH	11	14	28	15	7	9	5	3	2	4	2	1
AGAP006258-PA		907.4	CH	11	10	17	9	8	21	6	4	3	3	5	3
PPO2	78.1	826.7	IH	12	12	18	11	7	14	5	4	3	4	6	4
AGAP006644-PA		0.2	CH	0	0	0	0	0	0	0	71	2.9	0	0	0
IRR	77	0.2	Ш	0	0	0	0	0	0	0	40	60	0	0	0
AGAP001798-PA		0.2	СН	0	0	0	0	0	0	0	0	0	0	0	0
Clotting factor C	72.6	0	CII	0	0	0	0	0	0	0	0	0	0	0	0
(limulus) homlog	72.0	0.1	IH	0	0	0	0	0	0	0	0	0	0	100	0
		0	СН	0	100	0	0	0	0	0	0	0	0	0	0
Cognition factor	723	0	CII	0	100	0	0	0	0	0	0	0	0	0	0
XI	12.3	0.1	IH	0	100	0	0	0	0	0	0	0	0	0	0
		278 7	CЦ	0	0	16	10	12	19	11	5	4	1	2	2
AGAP000570-PA	60.2	278.7	Сп	9	9	10	10	15	10	11	3	4	1	2	3
precursor	09.2	546.5	IH	10	10	21	9	10	15	8	5	5	3	2	2
		22	CU	4	4	2	10	0	6	24	17	4	2	2	17
AGAP009070-PA	68.9	22	Ш	4	4	2	10	0	5	24	17	4	1	2	1/
SKPIN4		24.0	IH	4	5	3	11	/	5	21	24	4	1	1	14
AGAP001303-PA	69 6	1.2	CH	0	0	0	14	15	15	10	33	18	0	0	0
Chymotrypsin-c-	08.0	0.7	IH	0	7	0	23	0	0	18	42	10	0	0	0
		0.2	CU	0	0	0	100	0	0	0	0	0	0	0	0
AGAP008808-PA	675	0.3	CH	0	0	0	100	0	0	0	0	0	0	0	0
	07.5	1	IH	72	0	28	0	0	0	0	0	0	0	0	0
		10	CII	7	11	10	12	7	15	16	16	2	0	2	2
AGAP003089-PA	67	10	п	/	11	10	12	1	13	10	10	2	1	2	2
CLIPC / nomolog		20.3	IH	11	15	13	11	5	11	12	18	2	1	0	2
AGAP013252-PA		6.8	СН	9	/	18	13	13	1/	9	5	4	0	4	2
	00.0	8	IH	9	10	27	12	11	8	6	4	3	3	6	3
		102.6	CU	0	0	0	1	1	1	2	7	10	21	27	4
AGAP0013/5-PA	64.8	103.6	CH	0	0	0	1	1	1	2	/	16	31	37	4
SRPN12		191.9	IH	1	0	0	1	0	0	1	5	1/	28	42	4
AGAP003960-PA	<i>с</i> 1 <i>с</i>	21.8	СН	17	16	14	18	13	4	11	3	3	0	0	1
Coagulation factor	64.6	21	IH	15	17	27	18	9	3	5	2	2	2	0	0
XI		0.0	CII	0	0	0	10	14	0	20	0	0	0	0	0
AGAP007035-PA	63.9	0.8	CH	0	0	0	46	14	9	30	0	0	0	0	0
APLIB		0.5	IH	0	0	0	85	0	0	15	0	0	0	0	0
AGAP0038/8-PA	63.2	3.5	СН	3	6	6	10	6	22	37	9	0	0	0	0
LRR-15		6.5	IH	6	7	11	12	9	30	16	5	0	4	0	0
AGAP009670-PB	61.8	111.1	СН	2	2	3	4	7	4	23	7	4	5	9	30
SRPN4	~ ~ ~ ~ ~	133.8	IH	2	2	2	4	6	3	20	6	5	6	17	28
							0		-	10	5	2	6	18	15
AGAP009213-PA	61.1	109.7	CH	3	4	4	ð	8	1	10	5	3	0		
AGAP009213-PA SRPN16	61.1	109.7 125.4	CH IH	3 3	4 4	4	8	8 5	6	14	5	4	5	26	15
AGAP009213-PA SRPN16 AGAP007043-PA	61.1	109.7 125.4 0.8	CH IH CH	3 3 0	4 4 6	4 5 18	8 18	8 5 21	7 6 17	18 14 20	5 0	3 4 0	5 0	26 0	15 0
AGAP009213-PA SRPN16 AGAP007043-PA Urokinase-type	61.1	109.7 125.4 0.8	CH IH CH	3 3 0	4 4 6	4 5 18	8 18	8 5 21	6 17	14 20	5 0	3 4 0	5 0	26 0	15 0
AGAP009213-PA SRPN16 AGAP007043-PA Urokinase-type plasminogen	61.1 59.9	109.7 125.4 0.8 0.3	CH IH CH IH	3 3 0 20	4 4 6 18	4 5 18 23	8 18 18	8 5 21 0	7 6 17 0	14 20 20	5 0 0	3 4 0 0	0 5 0	26 0 0	15 0 0
AGAP009213-PA SRPN16 AGAP007043-PA Urokinase-type plasminogen activator	61.1 59.9	109.7 125.4 0.8 0.3	CH IH CH IH	3 3 0 20	4 4 6 18	4 5 18 23	8 8 18 18	8 5 21 0	7 6 17 0	18 14 20 20	5 0 0	3 4 0 0	0 5 0	26 0 0	15 0 0
AGAP009213-PA SRPN16 AGAP007043-PA Urokinase-type plasminogen activator AGAP007039-PA	61.1 59.9	109.7 125.4 0.8 0.3 10.9	CH IH CH IH CH	3 3 0 20 12	4 4 6 18 11	4 5 18 23 14	8 8 18 18 18	8 5 21 0 15	7 6 17 0 8	18 14 20 20 10	5 0 0 7	3 4 0 0 6	0 5 0 0	26 0 0	15 0 0
AGAP009213-PA SRPN16 AGAP007043-PA Urokinase-type plasminogen activator AGAP007039-PA LRIM4	61.1 59.9 59.9	$     \begin{array}{r}       109.7 \\       125.4 \\       0.8 \\       0.3 \\       10.9 \\       9.5 \\     \end{array} $	CH IH CH IH CH IH	3 3 0 20 12 12 12	4 6 18 11 11	4 5 18 23 14 21	8 8 18 18 18 16 12	8 5 21 0 15 17	7 6 17 0 8 6	18       14       20       20       10       7	5 0 0 7 10	3 4 0 0 6 4	0 5 0 0 0 2	26 0 0 1 0	15 0 0 0 0
AGAP009213-PA SRPN16 AGAP007043-PA Urokinase-type plasminogen activator AGAP007039-PA LRIM4 AGAP006348-PA	61.1 59.9 59.9	109.7           125.4           0.8           0.3           10.9           9.5           125.4	CH IH CH IH CH IH CH	3 3 0 20 12 12 7	4 6 18 11 11 7	4 5 18 23 14 21 6	8 8 18 18 16 12 11	8 5 21 0 15 17 16	7 6 17 0 8 6 8	18       14       20       20       10       7       25	3       5       0       7       10       5	3 4 0 0 6 4 4	0           0           0           2           2	26 0 0 1 0 5	15 0 0 0 0 3
AGAP009213-PA SRPN16 AGAP007043-PA Urokinase-type plasminogen activator AGAP007039-PA LRIM4 AGAP006348-PA LRIM1	61.1 59.9 59.9 57.3	109.7           125.4           0.8           0.3           10.9           9.5           125.4           98.4	CH IH CH IH CH IH CH IH	3 0 20 12 12 7 7 7	4 6 18 11 11 7 7	4 5 18 23 14 21 6 9	8 8 18 18 18 16 12 11 11 13	8 5 21 0 15 17 16 19	7 6 17 0 8 6 8 8 12	18           14           20           20           10           7           25           12	3       5       0       7       10       5       4	3 4 0 0 6 4 4 4 6	0 5 0 0 0 2 2 3	26 0 0 1 0 5 5	15 0 0 0 3 2
AGAP009213-PA SRPN16 AGAP007043-PA Urokinase-type plasminogen activator AGAP007039-PA LRIM4 AGAP006348-PA LRIM1 AGAP001377-PA	61.1 59.9 59.9 57.3	$     \begin{array}{r}       109.7 \\       125.4 \\       0.8 \\       0.3 \\       \hline       10.9 \\       9.5 \\       125.4 \\       98.4 \\       164.1 \\     \end{array} $	CH IH CH IH CH IH CH IH CH	3 3 0 20 12 12 7 7 3	4 4 6 18 11 11 7 7 4	4 5 18 23 14 21 6 9 4	8 8 18 18 18 16 12 11 13 7	8 5 21 0 15 17 16 19 8	7 6 17 0 8 6 8 6 8 12 7	18           14           20           20           10           7           25           12           38	5 0 0 7 10 5 4 15	3 4 0 0 6 4 4 4 6 6	0 0 0 2 2 3 3 3	26 0 0 1 0 5 5 2	15 0 0 0 0 0 3 2 2 2
AGAP009213-PA SRPN16 AGAP007043-PA Urokinase-type plasminogen activator AGAP007039-PA LRIM4 AGAP006348-PA LRIM1 AGAP001377-PA SRPN11	61.1 59.9 59.9 57.3 57.1	$     \begin{array}{r}       109.7 \\       125.4 \\       0.8 \\       0.3 \\       \hline       10.9 \\       9.5 \\       125.4 \\       98.4 \\       164.1 \\       181.8 \\     \end{array} $	CH IH CH IH CH IH CH IH CH IH IH IH	3 3 0 20 12 12 7 7 3 3 3	4 6 18 11 11 7 7 4 3	4 5 18 23 14 21 6 9 4 4	8 8 18 18 16 12 11 13 7 6	8 5 21 0 15 17 16 19 8 5	7 6 17 0 8 6 8 6 8 12 7 9	18           14           20           20           10           7           25           12           38           44	5 0 0 7 10 5 4 15 13	3 4 0 0 6 4 4 6 6 6 6	0 0 0 2 2 3 3 3 3	26 0 0 1 0 5 5 2 2 2	15 0 0 0 3 2 2 2 2
AGAP009213-PA SRPN16 AGAP007043-PA Urokinase-type plasminogen activator AGAP007039-PA LRIM4 AGAP006348-PA LRIM1 AGAP001377-PA SRPN11 AGAP005914-PA	61.1 59.9 59.9 57.3 57.1	$ \begin{array}{r} 109.7 \\ 125.4 \\ 0.8 \\ 0.3 \\ \hline 0.3 \\ 10.9 \\ 9.5 \\ 125.4 \\ 98.4 \\ 164.1 \\ 181.8 \\ 1.2 \\ \end{array} $	CH IH CH IH CH IH CH IH CH IH CH IH CH	3 3 0 20 12 12 7 7 3 3 0	4 6 18 11 11 7 7 4 3 7	4 5 18 23 14 21 6 9 4 4 4 0	8 8 18 18 16 12 11 13 7 6 31	8 5 21 0 15 17 16 19 8 5 14	7 6 17 0 8 6 8 6 8 12 7 9 15	18       14       20       20       10       7       25       12       38       44       34	5 0 0 7 10 5 4 15 13 0	3 4 0 0 6 4 4 4 6 6 6 6 0	0 0 0 2 2 3 3 3 0	26 0 1 0 5 5 2 2 2 0	15 0 0 0 0 3 2 2 2 2 0
AGAP009213-PA SRPN16 AGAP007043-PA Urokinase-type plasminogen activator AGAP007039-PA LRIM4 AGAP006348-PA LRIM1 AGAP001377-PA SRPN11 AGAP005914-PA Serine protease	61.1 59.9 59.9 57.3 57.1 57	109.7           125.4           0.8           0.3           10.9           9.5           125.4           98.4           164.1           181.8           1.2	CH IH CH IH CH IH CH IH CH IH CH	3 3 0 20 12 12 7 7 3 3 0 8	4 4 6 18 11 11 7 7 4 3 7	4 5 18 23 14 21 6 9 4 4 4 0	8 8 18 18 16 12 11 13 7 6 31	8 5 21 0 15 17 16 19 8 5 14	7 6 17 0 8 6 8 12 7 9 15 0	18       14       20       20       10       7       25       12       38       44       34	5 0 0 7 10 5 4 15 13 0	3 4 0 0 6 4 4 6 6 6 6 0	0 5 0 0 2 2 3 3 3 0	26 0 1 0 5 5 2 2 0	15 0 0 0 3 2 2 2 0

AGAP011790-PB	55.0	62.7	CH	2	3	4	3	13	14	8	10	5	6	19	12
CLIPA2 homolog	33.9	71.6	IH	2	2	3	3	8	16	9	14	5	5	18	16
AGAP001240-PA	55 0	1.1	СН	27	33	20	16	3	0	0	0	0	0	0	0
(thymus-specific)	55.8	2.1	IH	26	26	14	17	16	0	0	0	0	0	0	0
AGAP006761-PA	55 7	0.2	CH	0	12	0	64	24	0	0	0	0	0	0	0
GNBPA1	55.1	0.1	IH	0	0	25	75	0	0	0	0	0	0	0	0
AGAP000290-PA	54	0.1	СН	0	0	0	0	0	0	0	70	30	0	0	0
homolog	54	0	IH	0	0	0	0	0	0	0	100	0	0	0	0
AGAP001376-PA	537	3.6	CH	0	3	0	8	5	13	24	33	9	0	2	3
SRPN17	55.7	5.1	IH	0	4	0	9	0	13	25	25	11	3	0	10
AGAP002813-PA CUPD6	52.8	$\frac{2.2}{3.2}$	CH	0	4	7	8	12	18	14	16 16	4	0	5	12
AGAP010823-PA		0.1	CH	0	0	0	0	0	0	0	100	0	0	0	0
Fasciclin isoform c	52.4	0	IH	0	0	0	0	0	0	0	0	0	0	0	0
AGAP003139-PA	50.4	157.2	CH	3	3	4	5	11	14	28	29	2	0	1	1
SRPN9	50.4	166.4	IH	2	2	3	4	13	17	44	11	2	1	1	1
AGAP007036-PA	49.4	0	CH	0	0	0	0	0	0	0	0	0	0	0	0
APL1A		0	IH	0	0	0	0	0	0	100	0	0	0	0	0
AGAP005693-PA	48.8	5.5		/	6	/	14	16	14	3I 10	5	2	0	0	2
		106.5	СН	9	10	9	14	13	10	28	2	1	0	1	1
SRPN8	48.8	79.4	IH	9	13	8	22	12	8	20	3	1	2	1	1
AGAP002422-PA	40.5	3.2	CH	8	7	4	9	17	9	12	14	0	0	13	6
CLIPD1	48.5	2.9	IH	12	11	10	15	25	3	14	7	0	3	0	0
AGAP011791-PA	18.4	36.8	CH	6	6	7	10	11	8	21	8	3	2	11	8
CLIPA1 homolog	+0.+	29.3	IH	6	5	8	11	12	10	13	8	3	3	13	9
AGAP006909-PA	47.7	3.2	CH	0	0	0	14	10	20	28	29	0	0	0	0
SRPNI		4	IH	4	8	0	11	5	15	40	17	0	0	0	0
AGAP0005/8-PA Programmed cell	17 1	1.2	СН	0	1	4	11	22	0	12	28	11	0	0	0
death protein 4	47.4	2	IH	7	5	11	10	21	7	8	17	8	5	0	0
AGAP006910-PA	47.1	40.8	CH	5	4	4	7	7	10	18	20	19	2	2	3
SRPN3	47.1	47.2	IH	5	4	4	8	6	11	26	11	18	2	3	3
AGAP004996-PA	46.8	3.5	CH	5	3	0	5	9	6	21	9	3	3	4	31
Fibrinogen		3.7		/	4	2	0	28	2	1/	6	5	6	/	30
GNRPR4	46.7	2.1	ш	0	14	15	25	20	0	0	10	0	0	0	0
AGAP006911-PA		142	CH	3	3	4	8	7	19	25	24	2	0	1	3
SRPN2	46.5	128.1	IH	3	4	4	10	4	22	34	11	3	2	1	2
AGAP011780-PA	45.0	87.7	CH	5	4	4	6	7	6	19	10	9	15	7	7
CLIPA4 homolog	43.9	93.6	IH	6	5	4	8	8	9	16	12	8	12	7	7
AGAP011789-PA	45.7	315	CH	6	6	5	9	9	7	18	22	10	3	2	4
CLIPA6 homolog	1017	377.6	IH	7	7	6	11	8	9	18	18	7	4	3	3
AGAP004855-PA	44.8	17.7	CH	11	9	8	16	16	10	18	6	5	0	0	1
		88	СН	5	5	11	20	6	0	10	20	3	3	5	7
CLIPB8	44.8	72.3	Ш	5	6	4	10	6	12	14	17	8	7	6	6
AGAP007693-PA		23.2	CH	5	5	4	11	12	10	13	31	3	2	4	1
SRPN7	44.3	26	IH	7	9	6	15	9	7	31	11	2	1	1	0
AGAP004455-PA	44.1	326.2	CH	7	7	5	13	13	9	14	17	3	3	7	2
GNBPB1	44.1	307.3	IH	9	9	6	15	13	9	18	6	4	4	5	3
AGAP002798-PA	43.7	13.2	CH	10	10	7	11	12	9	10	21	4	1	1	4
GNBPB2		18.4	IH	12	10	8	13	10	10	8	17	3	2	0	6
AGAP00302/-PA	13.6	4.4	СН	0	12	3	14	19	4	8	16	3	0	14	/
protein	43.0	7.1	IH	4	10	10	9	18	3	7	9	1	1	18	11
AGAP002270-PA	43.6	1.5	CH	0	0	0	0	0	0	0	14	21	31	34	0
CLIPB7 homolog	-5.0	2.5	IH	0	0	0	0	0	0	0	16	25	25	30	4
AGAP012614-PA	43.4	6.7	CH	0	0	3	6	3	9	10	53	12	1	1	3
Serine protease 14		15.2	IH	1	1	1	/	4	/	5	50	15	5	3	1
AGAPUU2/99-PA GNRPR3	43.1	0.1	ш	0	0	0	0	0	100	0	0	0	0	0	0
010105				0	0	0	0	U	100	U	U	0	0	0	0
AGAP004318-PA	10.5	6	CH	5	5	4	16	9	8	11	27	7	0	4	3

AGAP005246-PD		5	CH	8	7	6	10	7	10	15	8	5	0	19	4
SRPN10B	42.6	6.2	IH	7	6	5	9	8	10	8	6	6	3	27	3
AGAP008835-PA		29	CH	2	3	3	6	8	15	23	33	2	2	2	1
CLIDC1	42.6	68.5	ш	2	3	3	5	6	20	30	27	1	1	1	1
		1.5		0	0	0	0	0	20	24	27	12	0	10	10
CLIDD26 homolog	42.5	1.3		0	0	0	0	0	9	24	20	12	0	20	10
		1.5		0	0	0	0	0	0	24	52	0	0	30	0
AGAP008/9/-PA		0	СН	0	0	0	0	0	0	0	0	0	0	0	0
Immunoglobulin	42.2														
(CD79A) binding		0	IH	0	0	0	0	0	0	100	0	0	0	0	0
protein I															
AGAP005246-PE	42.2	0	CH	0	0	0	0	0	0	0	0	0	0	0	0
SRPN10D	72.2	0.1	IH	0	0	0	0	0	100	0	0	0	0	0	0
AGAP009110-PA	40	27	CH	4	3	3	4	6	3	12	4	5	7	17	34
GNBP	42	19.9	IH	4	3	6	5	7	5	5	8	6	9	23	20
AGAP004317-PA		4.2	CH	4	3	1	7	9	9	11	19	7	7	5	19
CLIPC2	41.5	33	IH	4	2	0	13	11	14	0	16	8	5	5	22
AGAP004148-PA		93	CH	6	8	2	10	7	11	6	15	4	1	4	25
CLIPR5	41.3	11.2	ш	8	12	10	13	7	7	6	9	4	0	4	21
ACAD011791 DA		10		11	0	7	12	12	,	12	12	12	0	-	0
CLIDA12 homolog	40.9	10 5	п	11	9	/	13	13	9	13	12	12	0	0	0
CLIPAT2 Holliolog		10.5	IH	12	10	8	14	14	9	12	12	1	2	0	0
AGAP010/31-PA	40.9	18.6	СН	3	3	I	2	4	6	4	10	5	8	5	50
CLIPA8 homolog		15.5	IH	2	3	1	3	4	6	5	8	6	8	4	51
AGAP003251-PA	40.0	8.6	CH	6	5	6	9	14	13	21	25	0	0	0	0
CLIPB1	40.9	7.2	IH	10	9	8	15	12	9	19	17	0	2	0	0
AGAP000572-PA	40.0	2.2	CH	0	0	0	0	0	3	30	37	13	0	16	0
CLIPC10	40.9	2.7	IH	0	0	0	0	0	3	27	39	11	5	15	0
AGAP009844-PA		4.8	CH	3	5	4	13	8	12	10	29	3	0	1	12
CLIPR15	40.6	5.4	ш	8	8	4	16	11	0	0	16	1	0	1	16
A C A DO0 4710 D A		1.9		0	0	17	10	26	22	3	10	1	0	1	10
AGAP004/19-PA	40.6	1.8		0	4	1/	10	30	23	4	0	0	0	0	0
CLIPC9		2.1	IH	5	10	21	15	27	16	/	0	0	0	0	0
AGAP003249-PA	40.1	15.4	СН	6	4	5	7	7	8	7	32	8	5	6	6
CLIPB3	10.1	13.9	IH	4	4	4	7	8	11	8	28	6	7	6	6
AGAP009214-PA	30.8	11.2	CH	7	7	9	6	12	15	16	6	9	6	4	4
CLIPB11	39.0	10.5	IH	9	8	10	8	9	17	17	7	9	7	0	1
AGAP003686-PA	20.0	0.4	CH	0	0	0	0	0	0	0	34	7	0	0	59
CLIP	39.8	0.6	IH	0	0	0	0	0	0	0	5	0	0	0	95
AGAP006327-PA		4.6	CH	3	8	4	17	18	14	24	12	0	0	0	0
LRIM (Short)	39.6	4.3	ш	6	15	5	24	5	14	22	3	2	3	0	0
		0.0		0	0	0	0	0	7	15	29	10	0	14	16
CLIDC4	39.6	0.0	п	0	0	0	0	0	/	15	20	10	9	14	10
		10		0	0	0	0	10	1	15	20	15	14	19	10
AGAP003250-PA	39.4	12.1	СН	4	5	2	6	10	12	8	29	10	2	3	9
CLIPB4		11.8	IH	6	8	4	10	11	11	7	27	6	2	2	5
AGAP000573-PB	39.4	396.3	CH	7	6	7	10	9	15	10	13	4	7	5	8
CLIPC4	57.4	330.7	IH	7	7	7	11	8	13	11	10	4	8	5	10
AGAP001613-PA		0.3	CH	0	0	0	0	0	0	0	16	84	0	0	0
Thioredoxin-															
related	38.9	0.0		0	0	0	0	0	0	0	20	60	10	0	0
transmembrane		0.8	IH	0	0	0	0	0	0	0	28	60	12	0	0
protein 1															
AGAP003246-PA		1.5	CH	0	0	0	7	9	4	8	55	4	0	1	11
CLIPB2	38.4	0.4	ш	0	0	0	16	Ó	35	5	45	0	0	0	0
ACAD006742 DA		0.4	CH	0	25	0	20	45	0	0	-+5	0	0	0	0
Fibringgon	37.4	0.5	<u>ш</u>	0	0	0	52	49	0	0	0	0	0	0	0
		10.4		0	0	0	32	40	11	10	15	0	0	0	0
AGAP004638-PA	27.2	19.4	СН	9	/	6	13	6	11	18	15	3	2	3	5
Serine protease	37.3	17	IH	6	7	4	16	6	25	11	8	2	5	3	7
homolog													-		
AGAP012328-PA	36 5	0.9	CH	0	0	0	0	0	0	0	10	0	0	0	90
Serine protease 14	50.5	0.8	IH	0	0	0	0	0	0	0	7	0	0	0	93
AGAP011608-PA	26.4	0.2	CH	0	0	0	0	0	0	23	23	54	0	0	0
Chymotrypsin BI	30.4	0.1	IH	0	0	0	0	0	0	100	0	0	0	0	0
AGAP004674-PA		176.4	CH	0	0	0	0	1	0	0	2	5	7	49	34
Phenoloxidase	36.3			~		-		-					_		
inhibitor protein	2 5.0	180.1	IH	0	0	0	0	0	0	0	4	5	7	54	28
AGAP009184-PA		41.1	CH	10	8	9	15	13	7	10	20	2	1	3	2
FRNS	35.9	24 /	IH	11	8	10	18	17	9	6	15	1	2	1	1
		4T.T	111	11	0	10	10	1/	/	0	15		4	1	1
1010	357	07	СН	0	0	0	0	0	6	10	56	20	0	0	0

AGAP004566-PA		0.8	ш	0	0	0	0	0	11	10	55	16	0	0	0
Serine protease		0.8	111	0	0	0	0	0	11	19	35	10	0	0	0
AGAP012946-PA	35.5	18.1	CH	5	5	4	9	11	7	8	29	5	9	4	4
Plasminogen	55.5	21.8	IH	5	7	5	9	9	10	8	22	5	11	2	4
AGAP004918-PA	35	7.8	CH	6	5	1	9	8	5	8	38	9	5	5	2
Fibrinogen	55	5.3	IH	5	6	4	14	10	7	9	28	6	5	4	2
AGAP013221-PA	35	1.7	CH	2	7	6	16	19	18	7	23	2	0	0	0
Plasminogen		2.1	IH	14	16	6	27	14	5	7	12	0	0	0	0
AGAP011225-PA	34.5	175	СН	5	4	4	7	9	10	11	25	9	5	9	2
FBN8		175.4	IH	4	4	4	8	9	12	13	23	6	5	7	3
AGAP003626-PA		4	СН	10	1	4	11	9	14	15	32	4	0	0	0
Vitamin k- dependent protein c	34.5	2.2	IH	0	5	4	15	8	19	19	28	0	0	0	3
AGAP004917-PA		4.4	CH	0	0	0	2	7	7	9	21	10	19	12	12
Fibrinogen-related	34.2	4.3	IH	0	0	0	5	0	5	7	18	11	18	18	18
AGAP011325-PA		5.4	CH	0	3	0	9	5	8	12	53	4	0	3	3
Serine protease	34.2			-			10	-	0		10			-	-
homolog		14	IH	5	4	1	10	7	9	11	40	3	1	2	7
AGAP013487-PA		4.1	CH	2	5	0	10	13	13	15	32	9	0	1	1
Serine protease 14	34.2	18	ш	5	6	4	11	14	12	14	25	7	1	0	0
homlog		4.0		5	0	-	11	14	12	14	23	'	1	0	0
AGAP009216-PA		0	CH	0	0	0	0	0	0	0	0	0	0	0	0
Serine protease	33.9	0	IH	0	0	0	0	0	0	100	0	0	0	0	0
homolog		20.4	CH	2	2	2	4	4	4	Ē	~	20	26	-	(
AGAP005663-PA	22.0	38.4	СН	3	2	2	4	4	4	5	5	32	26	6	6
Cnymotrypsin-like	33.8	29.4	IH	4	3	3	6	4	3	4	7	32	20	7	8
		1.2	СН	0	0	0	0	0	0	10	54	13	0	14	0
Protein BCP1	33.6	2.1	ш	0	0	0	3	4	16	25	25	28	0	0	0
		2.1	СН	6	8	0	13	4	0	14	36	20	0	4	0
GNRP	33.5	2.0	ш	7	12	4	19	11	11	14	21	0	0	0	0
GIADI		2.2	111	,	14	-	1/	11	11	17	21	0	0	0	0
AGAP013117-PA		10.3	CH	0	0	0	2	3	1	1	63	9	7	11	0
AGAP013117-PA Serine protease	33.5	10.3	СН	0	0	0	2	3	1	1	63	9	7	11	0
AGAP013117-PA Serine protease homolog	33.5	10.3 3.9	CH IH	0	0	0 0	2 3	3 3	1 2	1	63 64	9 6	7 7	11 11	0
AGAP013117-PA Serine protease homolog AGAP008804-PB	33.5	10.3 3.9 0.2	CH IH CH	0 0 0	0 0 0	0 0 0	2 3 0	3 3 0	1 2 0	1 4 0	63 64 100	9 6 0	7 7 0	11 11 0	0 0 0 0
AGAP013117-PA Serine protease homolog AGAP008804-PB Peroxin-19	33.5 33.2	10.3 3.9 0.2 0.1	CH IH CH IH	0 0 0 0	0 0 0 0	0 0 0 0	2 3 0 0	3 3 0 0	1 2 0 0	1 4 0 0	63 64 100 100	9 6 0 0	7 7 0 0	11 11 0 0	0 0 0 0
AGAP013117-PA Serine protease homolog AGAP008804-PB Peroxin-19 AGAP003248-PA	33.5 33.2	10.3 3.9 0.2 0.1 0.1	CH IH CH IH CH	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	2 3 0 0 0	3 3 0 0 0	1 2 0 0 0	1 4 0 0 0	63 64 100 100 100	9 6 0 0	7 7 0 0 0	11 11 0 0 0	0 0 0 0 0
AGAP013117-PA Serine protease homolog AGAP008804-PB Peroxin-19 AGAP003248-PA Serine protease 14	33.5 33.2 33.2	$     \begin{array}{r}       10.3 \\       3.9 \\       0.2 \\       0.1 \\       0.1 \\       0.1     \end{array} $	CH IH CH IH CH	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	2 3 0 0 0	3 3 0 0 0	1 2 0 0 0	1 4 0 0 0	63 64 100 100 100	9 6 0 0 0	7 7 0 0 0	11 11 0 0 0	0 0 0 0 0
AGAP013117-PA Serine protease homolog AGAP008804-PB Peroxin-19 AGAP003248-PA Serine protease 14 like	33.5 33.2 33.2	$ \begin{array}{r} 10.3 \\ 3.9 \\ \hline 0.2 \\ 0.1 \\ 0.1 \\ \hline 0.1 \end{array} $	CH IH CH IH CH IH	0 0 0 0 0 0	0 0 0 0 0	0 0 0 0 0 0	2 3 0 0 0 0	3 3 0 0 0 0	1 2 0 0 0 0	1 4 0 0 0 0	63 64 100 100 100 100	9 6 0 0 0 0	7 7 0 0 0 0	11 11 0 0 0 0	0 0 0 0 0 0
AGAP013117-PA Serine protease homolog AGAP008804-PB Peroxin-19 AGAP003248-PA Serine protease 14 like AGAP006673-PA	33.5 33.2 33.2 33.1	10.3           3.9           0.2           0.1           0.1           0.1	CH IH CH IH CH IH CH	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	2 3 0 0 0 0 0 0	3 3 0 0 0 0 0 0	1 2 0 0 0 0 0 0	1 4 0 0 0 0 0 0	63 64 100 100 100 100 0	9 6 0 0 0 0 100	7 7 0 0 0 0 0	11 11 0 0 0 0 0 0	0 0 0 0 0 0 0
AGAP013117-PA Serine protease homolog AGAP008804-PB Peroxin-19 AGAP003248-PA Serine protease 14 like AGAP006673-PA Serine protease	<ul><li>33.5</li><li>33.2</li><li>33.2</li><li>33.1</li></ul>	$     \begin{array}{r}       10.3 \\       3.9 \\       0.2 \\       0.1 \\       0.1 \\       0.1 \\       0.1 \\       0 \\       0   \end{array} $	CH IH CH IH CH IH CH IH	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	2 3 0 0 0 0 0 0 0 0	3 3 0 0 0 0 0 0 0 0	1 2 0 0 0 0 0 0 0 0	1 4 0 0 0 0 0 0 0 0	63 64 100 100 100 100 0 0	9 6 0 0 0 0 0 100 0	7 7 0 0 0 0 0 0 0	11 11 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0
AGAP013117-PA Serine protease homolog AGAP008804-PB Peroxin-19 AGAP003248-PA Serine protease 14 like AGAP006673-PA Serine protease AGAP005642-PA	33.5         33.2         33.2         33.1	$ \begin{array}{r} 10.3 \\ 3.9 \\ 0.2 \\ 0.1 \\ 0.1 \\ 0.1 \\ 0 \\ 0 \\ 2.6 \\ \end{array} $	CH IH CH IH CH IH CH IH CH	0 0 0 0 0 0 0 0 0 12	0 0 0 0 0 0 0 0 0 2	0 0 0 0 0 0 0 0 0 0	2 3 0 0 0 0 0 0 0 6	3 3 0 0 0 0 0 0 0 7	1 2 0 0 0 0 0 0 0 4	1 4 0 0 0 0 0 0 0 0 0 10	63 64 100 100 100 100 0 0 13	9 6 0 0 0 0 0 100 0 12	7 7 0 0 0 0 0 0 0 12	11 11 0 0 0 0 0 0 20	0 0 0 0 0 0 0 0 0 2
AGAP013117-PA Serine protease homolog AGAP008804-PB Peroxin-19 AGAP003248-PA Serine protease 14 like AGAP006673-PA Serine protease AGAP005642-PA Chymotrypsin-like	<ul> <li>33.5</li> <li>33.2</li> <li>33.2</li> <li>33.1</li> <li>33</li> </ul>	$ \begin{array}{r} 10.3 \\ 3.9 \\ 0.2 \\ 0.1 \\ 0.1 \\ 0.1 \\ 0 \\ 0 \\ 2.6 \\ 2.1 \\ \end{array} $	CH IH CH IH CH IH CH IH CH IH	0 0 0 0 0 0 0 0 12 9	0 0 0 0 0 0 0 0 2 6	0 0 0 0 0 0 0 0 0 0 0 0	2 3 0 0 0 0 0 0 6 8	3 3 0 0 0 0 0 0 7 4	1 2 0 0 0 0 0 0 4 12	1 4 0 0 0 0 0 0 0 0 10 23	63 64 100 100 100 100 0 0 13 13	9 6 0 0 0 0 0 100 0 12 10	7 7 0 0 0 0 0 0 12 12	11 11 0 0 0 0 0 0 0 0 0 0 0 20 3	0 0 0 0 0 0 0 0 2 0
AGAP013117-PA Serine protease homolog AGAP008804-PB Peroxin-19 AGAP003248-PA Serine protease 14 like AGAP006673-PA Serine protease AGAP005642-PA Chymotrypsin-like protease	33.5 33.2 33.2 33.1 33	$ \begin{array}{r} 10.3 \\ 3.9 \\ 0.2 \\ 0.1 \\ 0.1 \\ 0.1 \\ 0 \\ 2.6 \\ 2.1 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0$	CH IH CH IH CH IH CH IH CH IH	0 0 0 0 0 0 0 0 12 9	0 0 0 0 0 0 0 0 2 6	0 0 0 0 0 0 0 0 0 0 0 0	2 3 0 0 0 0 0 0 0 6 8	3 3 0 0 0 0 0 0 7 4	1 2 0 0 0 0 0 0 4 12	1 4 0 0 0 0 0 0 0 0 0 0 0 10 23	63 64 100 100 100 100 0 0 13 13 13	9 6 0 0 0 0 0 100 0 12 10	7 7 0 0 0 0 0 0 12 12	11 11 0 0 0 0 0 0 0 20 3	0 0 0 0 0 0 0 0 2 0 0
AGAP013117-PA Serine protease homolog AGAP008804-PB Peroxin-19 AGAP003248-PA Serine protease 14 like AGAP006673-PA Serine protease AGAP005642-PA Chymotrypsin-like protease AGAP007252-PA	33.5 33.2 33.2 33.1 33	$ \begin{array}{r} 10.3 \\ 3.9 \\ 0.2 \\ 0.1 \\ 0.1 \\ 0.1 \\ 0 \\ 2.6 \\ 2.1 \\ 2.8 \\ \end{array} $	CH IH CH IH CH IH CH IH CH IH CH	0 0 0 0 0 0 0 0 0 12 9 0	0 0 0 0 0 0 0 0 2 6 0	0 0 0 0 0 0 0 0 0 0 0 0 0	2 3 0 0 0 0 0 0 6 8 0	3 0 0 0 0 0 0 0 7 4 0	1 2 0 0 0 0 0 0 4 12 10	1 4 0 0 0 0 0 0 0 0 10 23 13	63           64           100           100           100           0           0           13           18	9 6 0 0 0 100 0 12 10 53	7 7 0 0 0 0 0 0 12 12 12 0	11 11 0 0 0 0 0 0 0 20 3 2	0 0 0 0 0 0 0 0 2 0 5
AGAP013117-PA Serine protease homolog AGAP008804-PB Peroxin-19 AGAP003248-PA Serine protease 14 like AGAP006673-PA Serine protease AGAP005642-PA Chymotrypsin-like protease AGAP007252-PA Chymotrypsin-like	33.5 33.2 33.2 33.1 33 33 32.9	$ \begin{array}{r} 10.3 \\ 3.9 \\ 0.2 \\ 0.1 \\ 0.1 \\ 0.1 \\ 0 \\ 2.6 \\ 2.1 \\ 2.8 \\ 2.6 \\ \end{array} $	СН IH CH IH CH IH CH IH CH IH IH	0 0 0 0 0 0 0 0 12 9 0 0	0 0 0 0 0 0 0 2 6 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 3 0 0 0 0 0 0 6 8 0 0 0	3 0 0 0 0 0 0 7 4 0 0	1 2 0 0 0 0 0 0 0 4 12 10 8	1 4 0 0 0 0 0 0 0 0 0 0 10 23 13 19	63 64 100 100 100 0 13 13 13 18 15	9 6 0 0 0 100 0 12 10 53 56	7 7 0 0 0 0 0 0 0 12 12 12 0 0	11 11 0 0 0 0 0 0 0 0 20 3 2 0	0 0 0 0 0 0 0 2 0 5 3
AGAP013117-PA Serine protease homolog AGAP008804-PB Peroxin-19 AGAP003248-PA Serine protease 14 like AGAP006673-PA Serine protease AGAP005642-PA Chymotrypsin-like protease AGAP007252-PA Chymotrypsin-like protease	33.5 33.2 33.2 33.1 33 32.9	$ \begin{array}{r} 10.3 \\ 3.9 \\ 0.2 \\ 0.1 \\ 0.1 \\ 0.1 \\ 0 \\ 2.6 \\ 2.1 \\ 2.8 \\ 2.6 \\ 62.2 \\ \end{array} $	СН IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH CH CH CH CH CH CH CH CH C	0 0 0 0 0 0 0 0 0 12 9 0 0	0 0 0 0 0 0 0 0 2 6 0 0 0 2	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 3 0 0 0 0 0 6 8 0 0 7	3 3 0 0 0 0 0 0 7 4 0 0 5	1 2 0 0 0 0 0 0 4 12 10 8 6	1 4 0 0 0 0 0 0 0 0 0 10 23 13 19 0	63 64 100 100 100 0 0 13 13 13 18 15	9 6 0 0 0 100 0 12 10 53 56 26	7 7 0 0 0 0 0 0 12 12 12 0 0	11 11 0 0 0 0 0 0 0 0 20 3 2 0 4	0 0 0 0 0 0 0 0 2 0 5 3 8
AGAP013117-PA Serine protease homolog AGAP008804-PB Peroxin-19 AGAP003248-PA Serine protease 14 like AGAP006673-PA Serine protease AGAP005642-PA Chymotrypsin-like protease AGAP007252-PA Chymotrypsin-like protease AGAP006674-PA Chymotrypsin-like	33.5 33.2 33.2 33.1 33 32.9	$ \begin{array}{r} 10.3 \\ 3.9 \\ 0.2 \\ 0.1 \\ 0.1 \\ 0.1 \\ 0 \\ 2.6 \\ 2.1 \\ 2.8 \\ 2.6 \\ 62.3 \\ \end{array} $	СН IH CH IH CH IH CH IH CH IH CH IH CH IH	0 0 0 0 0 0 0 0 0 12 9 0 0 0 4	0 0 0 0 0 0 0 0 2 6 0 0 0 3	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 3	2 3 0 0 0 0 0 0 6 8 0 0 7	3 0 0 0 0 0 0 0 7 4 0 0 5	1 2 0 0 0 0 0 0 4 12 10 8 6	1 4 0 0 0 0 0 0 0 0 0 0 10 23 13 19 9	63           64           100           100           100           0           0           13           18           15           10	9 6 0 0 0 100 0 12 10 53 56 36	7 7 0 0 0 0 0 12 12 0 0 5	11 11 0 0 0 0 0 0 0 0 20 3 2 0 4	0 0 0 0 0 0 0 2 0 5 3 8
AGAP013117-PA Serine protease homolog AGAP008804-PB Peroxin-19 AGAP003248-PA Serine protease 14 like AGAP006673-PA Serine protease AGAP005642-PA Chymotrypsin-like protease AGAP007252-PA Chymotrypsin-like protease AGAP006674-PA Chymotrypsin-like	<ul> <li>33.5</li> <li>33.2</li> <li>33.2</li> <li>33.1</li> <li>33</li> <li>32.9</li> <li>32.4</li> </ul>	$ \begin{array}{r} 10.3 \\ 3.9 \\ 0.2 \\ 0.1 \\ 0.1 \\ 0.1 \\ 0 \\ 2.6 \\ 2.1 \\ 2.8 \\ 2.6 \\ 62.3 \\ 72.4 \\ \end{array} $	СН IH CH IH CH IH CH IH CH IH CH IH IH IH	0 0 0 0 0 0 0 0 0 12 9 0 0 0 4 5	0 0 0 0 0 0 0 0 2 6 0 0 0 3 3	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 3 3	2 3 0 0 0 0 0 0 6 8 0 0 7 7 7	3 0 0 0 0 0 0 0 0 7 4 0 0 5 5	1 2 0 0 0 0 0 0 4 12 10 8 6 7	1 4 0 0 0 0 0 0 0 0 0 0 10 23 13 19 9 11	63           64           100           100           100           0           0           13           13           18           15           10           11	9 6 0 0 0 100 0 12 10 53 56 36 33	7 7 0 0 0 0 0 12 12 12 0 0 5 5	11           11           0           0           0           0           0           0           0           0           0           0           0           0           0           0           0           20           3           2           0           4           3	0 0 0 0 0 0 0 2 0 0 5 3 8 8 6
AGAP013117-PA Serine protease homolog AGAP008804-PB Peroxin-19 AGAP003248-PA Serine protease 14 like AGAP006673-PA Serine protease AGAP005642-PA Chymotrypsin-like protease AGAP007252-PA Chymotrypsin-like protease AGAP006674-PA Chymotrypsin-like protease AGAP006674-PA	33.5         33.2         33.2         33.1         33         32.9         32.4	$ \begin{array}{r} 10.3 \\ 3.9 \\ 0.2 \\ 0.1 \\ 0.1 \\ 0.1 \\ 0 \\ 2.6 \\ 2.1 \\ 2.8 \\ 2.6 \\ 62.3 \\ 72.4 \\ 6.7 \\ \end{array} $	СН IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH CH IH CH CH CH CH CH CH CH CH CH C	0 0 0 0 0 0 0 0 0 12 9 0 0 0 4 5 7	0 0 0 0 0 0 0 0 2 6 0 0 3 3 8	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 3 3 3	2 3 0 0 0 0 0 0 6 8 0 0 7 7 13	3 0 0 0 0 0 0 0 7 4 0 0 5 5 12	1 2 0 0 0 0 0 0 4 12 10 8 6 7 5	1 4 0 0 0 0 0 0 0 0 0 10 23 13 19 9 11 11	63           64           100           100           100           0           0           13           13           18           15           10           11           22	9 6 0 0 0 100 0 12 10 53 56 36 33 15	7 7 0 0 0 0 0 0 0 12 12 12 0 0 0 5 5 5	11           11           0           0           0           0           0           0           0           0           0           0           0           20           3           2           0           4           3           0	0 0 0 0 0 0 0 2 0 0 5 3 8 6
AGAP013117-PA Serine protease homolog AGAP008804-PB Peroxin-19 AGAP003248-PA Serine protease 14 like AGAP006673-PA Serine protease AGAP005642-PA Chymotrypsin-like protease AGAP007252-PA Chymotrypsin-like protease AGAP006674-PA Chymotrypsin-like protease AGAP006674-PA Chymotrypsin-like protease AGAP011197-PA Fibrinogen	<ul> <li>33.5</li> <li>33.2</li> <li>33.2</li> <li>33.1</li> <li>33</li> <li>32.9</li> <li>32.4</li> <li>32.3</li> </ul>	$ \begin{array}{r} 10.3 \\ 3.9 \\ 0.2 \\ 0.1 \\ 0.1 \\ 0.1 \\ 0 \\ 2.6 \\ 2.1 \\ 2.8 \\ 2.6 \\ 62.3 \\ 72.4 \\ 6.7 \\ 8.7 \\ \end{array} $	СН IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH IH CH IH IH CH IH IH CH IH IH CH IH IH CH IH IH CH IH IH CH IH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH CH CH IH CH CH CH CH IH CH CH CH IH CH CH IH CH CH IH CH CH IH IH CH CH IH IH CH CH IH IH CH CH IH IH CH CH IH IH CH CH IH IH CH CH IH IH CH CH IH IH CH CH IH CH CH IH CH CH CH CH IH CH CH CH CH IH CH CH CH CH CH CH CH CH CH C	0 0 0 0 0 0 0 0 12 9 0 0 0 4 5 7 8	0 0 0 0 0 0 0 2 6 0 0 3 3 8 8	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 3 0 0 0 0 0 0 6 8 0 0 7 7 13 12	3 3 0 0 0 0 0 0 0 7 4 0 0 5 5 12 12	1 2 0 0 0 0 0 0 4 12 10 8 6 7 5 7	1 4 0 0 0 0 0 0 0 0 10 23 13 19 9 11 11 11	63         64           100         100           100         0           0         0           13         13           18         15           10         11           22         15	9 6 0 0 100 0 12 10 53 56 36 33 15 16	7 7 0 0 0 0 0 0 0 0 0 12 12 12 0 0 0 5 5 5	11           11           0           0           0           0           0           0           0           0           0           0           0           0           0           4           3           0           0	0 0 0 0 0 0 0 2 0 5 3 8 8 6 1
AGAP013117-PA Serine protease homolog AGAP008804-PB Peroxin-19 AGAP003248-PA Serine protease 14 like AGAP006673-PA Serine protease AGAP005642-PA Chymotrypsin-like protease AGAP007252-PA Chymotrypsin-like protease AGAP006674-PA Chymotrypsin-like protease AGAP006674-PA Chymotrypsin-like protease AGAP0011197-PA Fibrinogen	33.5         33.2         33.2         33.1         33         32.9         32.4         32.3	$ \begin{array}{r} 10.3 \\ 3.9 \\ 0.2 \\ 0.1 \\ 0.1 \\ 0.1 \\ 0 \\ 2.6 \\ 2.1 \\ 2.8 \\ 2.6 \\ 62.3 \\ 72.4 \\ 6.7 \\ 8.7 \\ 5.5 \\ \end{array} $	СН IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH CH IH CH CH CH CH CH CH CH CH CH C	0 0 0 0 0 0 0 0 0 12 9 0 0 0 4 5 7 8 3	0 0 0 0 0 0 0 0 2 6 0 0 0 3 3 8 8 8 8 2	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 3 0 0 0 0 0 0 6 8 0 0 7 7 13 12 3	$   \begin{array}{r}     3 \\     3 \\     0 \\     0 \\     0 \\     0 \\     0 \\     0 \\     7 \\     4 \\     0 \\     0 \\     5 \\     5 \\     12 \\     12 \\     4 \\   \end{array} $	1 2 0 0 0 0 0 0 4 12 10 8 6 7 5 7 0	1 4 0 0 0 0 0 0 0 0 10 23 13 19 9 11 11 11 1	$\begin{array}{c} 63 \\ 64 \\ 100 \\ 100 \\ 100 \\ 100 \\ 0 \\ 0 \\ 13 \\ 13$	9 6 0 0 0 100 0 12 10 53 56 36 33 15 16 8	7 7 0 0 0 0 0 0 0 0 0 12 12 12 0 0 0 5 5 5 1 3 57	11 11 0 0 0 0 0 0 0 20 3 2 0 4 3 0 0 17	0 0 0 0 0 0 0 2 0 5 3 8 6 1 1 3
AGAP013117-PA Serine protease homolog AGAP008804-PB Peroxin-19 AGAP003248-PA Serine protease 14 like AGAP006673-PA Serine protease AGAP005642-PA Chymotrypsin-like protease AGAP007252-PA Chymotrypsin-like protease AGAP006674-PA Chymotrypsin-like protease AGAP006674-PA Chymotrypsin-like protease AGAP011197-PA Fibrinogen AGAP005707-PA Serine collagenase	33.5         33.2         33.2         33.1         33         32.9         32.4         32.3	$ \begin{array}{r} 10.3 \\ 3.9 \\ 0.2 \\ 0.1 \\ 0.1 \\ 0.1 \\ 0 \\ 2.6 \\ 2.1 \\ 2.8 \\ 2.6 \\ 62.3 \\ 72.4 \\ 6.7 \\ 8.7 \\ 5.5 \\ 5.5 \\ 0.2 \\ 0.2 \\ 0.1$	СН IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH CH IH CH CH IH CH CH CH IH CH CH CH IH CH CH CH CH CH CH CH CH CH C	0 0 0 0 0 0 0 0 0 0 12 9 0 0 0 4 5 7 8 8 3	0 0 0 0 0 0 0 0 0 2 6 0 0 0 3 3 8 8 8 2	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 3 0 0 0 0 0 0 6 8 0 0 7 7 13 12 3 i	3 3 0 0 0 0 0 0 0 0 7 4 0 0 5 5 12 12 4 0	1 2 0 0 0 0 0 0 0 4 12 10 8 6 7 5 7 0 0	1 4 0 0 0 0 0 0 0 0 0 0 10 23 13 19 9 11 11 11 1 0	63         64           100         100           100         0           0         0           13         13           18         15           100         11           22         15           3         -	9 6 0 0 0 100 0 12 10 53 56 36 33 15 16 8	7 7 0 0 0 0 0 0 0 0 0 12 12 0 0 0 5 5 5 1 3 57	11         11         0         0         0         0         0         0         20         3         0         4         3         0         17	0 0 0 0 0 0 0 0 2 0 0 5 3 8 8 6 1 1 3
AGAP013117-PA Serine protease homolog AGAP008804-PB Peroxin-19 AGAP003248-PA Serine protease 14 like AGAP006673-PA Serine protease AGAP005642-PA Chymotrypsin-like protease AGAP007252-PA Chymotrypsin-like protease AGAP006674-PA Chymotrypsin-like protease AGAP006674-PA Chymotrypsin-like protease AGAP0011197-PA Fibrinogen AGAP005707-PA Serine collagenase 1 homolog	33.5         33.2         33.2         33.1         33         32.9         32.4         32.3         32.3	$ \begin{array}{r} 10.3 \\ 3.9 \\ 0.2 \\ 0.1 \\ 0.1 \\ 0.1 \\ 0 \\ 2.6 \\ 2.1 \\ 2.8 \\ 2.6 \\ 62.3 \\ 72.4 \\ 6.7 \\ 8.7 \\ 5.5 \\ 3.2 \\ \end{array} $	СН IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH IH CH IH IH IH IH IH IH IH IH IH I	0 0 0 0 0 0 0 0 0 0 0 0 4 5 7 8 3 7	0 0 0 0 0 0 0 0 0 2 6 0 0 0 3 3 8 8 8 2 4	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 3 0 0 0 0 0 0 0 6 8 0 0 7 7 13 12 3 4	3 3 0 0 0 0 0 0 0 7 4 0 0 5 5 12 12 4 0	1 2 0 0 0 0 0 0 4 12 10 8 6 7 5 7 0 0 0	1 4 0 0 0 0 0 0 0 0 10 23 13 19 9 11 11 11 1 0	$\begin{array}{c} 63 \\ 64 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 100 \\ 13 \\ 13$	9 6 0 0 0 100 0 12 10 53 56 36 33 15 16 8 13	7 7 0 0 0 0 0 0 0 0 12 12 0 0 0 5 5 5 1 3 3 57 59	11         11         0         0         0         0         0         0         20         3         0         4         3         0         17         7	0 0 0 0 0 0 0 2 0 0 5 3 8 6 1 1 3 0
AGAP013117-PA Serine protease homolog AGAP008804-PB Peroxin-19 AGAP003248-PA Serine protease 14 like AGAP006673-PA Serine protease AGAP005642-PA Chymotrypsin-like protease AGAP007252-PA Chymotrypsin-like protease AGAP006674-PA Chymotrypsin-like protease AGAP006674-PA Chymotrypsin-like protease AGAP005707-PA Serine collagenase 1 homolog AGAP005671-PA	33.5         33.2         33.2         33.1         33         32.9         32.4         32.3         32.3	$ \begin{array}{r} 10.3 \\ 3.9 \\ 0.2 \\ 0.1 \\ 0.1 \\ 0.1 \\ 0 \\ 2.6 \\ 2.1 \\ 2.8 \\ 2.6 \\ 62.3 \\ 72.4 \\ 6.7 \\ 8.7 \\ 5.5 \\ 3.2 \\ 186.4 \\ \end{array} $	СН IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH CH IH CH CH IH CH CH IH CH CH IH CH CH IH CH CH IH CH CH CH CH CH CH CH CH CH C	0 0 0 0 0 0 0 0 0 0 0 0 0 0 4 5 7 8 3 3 7 6	0 0 0 0 0 0 0 0 0 2 6 0 0 0 3 3 8 8 8 2 4 4	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 3 0 0 0 0 0 0 6 8 0 0 7 7 13 12 3 4 7	3 3 0 0 0 0 0 0 0 0 7 4 0 0 5 5 12 12 4 0 8	1 2 0 0 0 0 0 0 4 12 10 8 6 7 5 7 0 0 8	1 4 0 0 0 0 0 0 0 0 0 0 0 0 0	63         64           100         100           100         100           0         0           13         13           13         13           15         10           11         22           15         3           5         8	9 6 0 0 0 100 0 12 10 53 56 36 33 15 16 8 13 30	7 7 0 0 0 0 0 0 0 0 12 12 0 0 0 5 5 5 1 3 3 57 59 7	11           11           0           0           0           0           0           0           20           3           2           0           4           3           0           17           7           5	0 0 0 0 0 0 0 0 2 0 0 5 3 8 6 1 1 3 0 5 5
AGAP013117-PA Serine protease homolog AGAP008804-PB Peroxin-19 AGAP003248-PA Serine protease 14 like AGAP006673-PA Serine protease AGAP005642-PA Chymotrypsin-like protease AGAP007252-PA Chymotrypsin-like protease AGAP006674-PA Chymotrypsin-like protease AGAP006674-PA Chymotrypsin-like protease AGAP005707-PA Fibrinogen AGAP005707-PA Serine collagenase 1 homolog	33.5         33.2         33.2         33.1         33         33         32.9         32.4         32.3         32.3         32.2	$ \begin{array}{r} 10.3 \\ 3.9 \\ 0.2 \\ 0.1 \\ 0.1 \\ 0.1 \\ 0 \\ 2.6 \\ 2.1 \\ 2.8 \\ 2.6 \\ 62.3 \\ 72.4 \\ 6.7 \\ 8.7 \\ 5.5 \\ 3.2 \\ 186.4 \\ 251.7 \\ \end{array} $	CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH IH IH CH IH	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 3 0 0 0 0 0 0 0 6 8 0 0 7 7 13 12 3 4 7 0	3 3 0 0 0 0 0 0 0 0 7 4 0 0 5 5 12 12 4 0 8 6	1 2 0 0 0 0 0 0 4 12 10 8 6 7 5 7 0 0 8 8	1 4 0 0 0 0 0 0 0 0 0 0 0 0 0	63         64         100         100         100         100         0         0         13         13         13         13         13         13         13         15         10         11         22         15         3         5         8         2         8         2	9 6 0 0 0 100 0 12 10 53 56 36 33 15 16 8 13 30 27	7 7 0 0 0 0 0 0 0 0 12 12 0 0 0 5 5 5 1 3 3 57 59 7	11         11         0         0         0         0         0         0         20         3         2         0         4         3         0         177         7         5	0 0 0 0 0 0 0 0 0 0 2 0 0 5 3 8 6 1 1 1 3 0 5 5
AGAP013117-PA Serine protease homolog AGAP008804-PB Peroxin-19 AGAP003248-PA Serine protease 14 like AGAP006673-PA Serine protease AGAP005642-PA Chymotrypsin-like protease AGAP007252-PA Chymotrypsin-like protease AGAP006674-PA Chymotrypsin-like protease AGAP006674-PA Chymotrypsin-like protease AGAP0011197-PA Fibrinogen AGAP005707-PA Serine collagenase 1 homolog AGAP005671-PA Chymotrypsin-like protease	33.5         33.2         33.2         33.1         33         32.9         32.4         32.3         32.3         32.2	$ \begin{array}{r} 10.3 \\ 3.9 \\ 0.2 \\ 0.1 \\ 0.1 \\ 0.1 \\ 0 \\ 2.6 \\ 2.1 \\ 2.8 \\ 2.6 \\ 62.3 \\ 72.4 \\ 6.7 \\ 8.7 \\ 5.5 \\ 3.2 \\ 186.4 \\ 251.7 \\ \end{array} $	CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH IH IH IH IH IH	0 0 0 0 0 0 0 0 0 0 0 0 0 4 5 7 8 3 7 6 5	0 0 0 0 0 0 0 0 0 2 6 0 0 0 3 3 8 8 8 2 4 4 4	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 3 0 0 0 0 0 0 6 8 0 0 7 7 13 12 3 4 7 9	3 3 0 0 0 0 0 0 0 7 4 0 0 5 5 12 12 4 0 8 9	1 2 0 0 0 0 0 4 12 10 8 6 7 5 7 0 0 8 9	1 4 0 0 0 0 0 0 0 0 0 0 0 0 10 23 13 19 9 11 11 11 1 0 8 10	63         64           100         100           100         100           0         0           13         13           13         13           15         10           11         22           15         3           5         8           8         8	9 6 0 0 0 100 0 12 10 53 56 36 33 15 16 8 13 30 27	7 7 0 0 0 0 0 0 0 0 12 12 0 0 0 5 5 5 1 3 3 57 59 7 55	11         11         0         0         0         0         0         20         3         2         0         4         3         0         17         7         5         4	0 0 0 0 0 0 0 0 2 0 0 5 3 8 6 1 1 3 0 5 4
AGAP013117-PA Serine protease homolog AGAP008804-PB Peroxin-19 AGAP003248-PA Serine protease 14 like AGAP006673-PA Serine protease AGAP005642-PA Chymotrypsin-like protease AGAP007252-PA Chymotrypsin-like protease AGAP006674-PA Chymotrypsin-like protease AGAP006674-PA Chymotrypsin-like protease AGAP005707-PA Serine collagenase 1 homolog AGAP005671-PA Chymotrypsin-like protease	33.5         33.2         33.2         33.1         33         32.9         32.4         32.3         32.3         32.2	$\begin{array}{c} 10.3 \\ \hline 3.9 \\ \hline 0.2 \\ \hline 0.1 \\ \hline 0.1 \\ \hline 0.1 \\ \hline 0 \\ \hline 2.6 \\ \hline 2.1 \\ \hline 2.8 \\ \hline 2.6 \\ \hline 2.1 \\ \hline 2.8 \\ \hline 2.6 \\ \hline 62.3 \\ \hline 72.4 \\ \hline 6.7 \\ \hline 8.7 \\ \hline 5.5 \\ \hline 3.2 \\ \hline 186.4 \\ \hline 251.7 \\ \hline 66.9 \\ \hline \end{array}$	СН IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH IH CH CH IH IH CH CH IH IH CH CH IH IH CH CH IH IH CH CH IH IH CH CH IH IH CH CH IH IH CH CH IH IH CH CH IH IH CH CH IH IH CH CH IH CH CH IH CH CH IH CH CH IH CH CH CH IH CH CH CH CH CH CH CH CH CH C	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 4 5 7 8 3 7 6 5 5	0 0 0 0 0 0 0 0 0 0 2 6 0 0 0 3 3 3 8 8 8 8 2 4 4 4 4 4 3	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 3 0 0 0 0 0 0 6 8 0 0 7 7 13 12 3 4 7 9 7	3 3 0 0 0 0 0 0 0 0 7 4 0 0 5 5 12 12 4 0 8 9 6	1 2 0 0 0 0 0 4 12 10 8 6 7 5 7 0 0 8 9 7	1 4 0 0 0 0 0 0 0 0 0 0 0 0 0	63         64         100         100         100         0         0         13         13         13         13         13         13         15         10         11         22         15         3         5         8         8         8         8         8	9 6 0 0 0 100 0 12 10 53 56 36 33 15 16 8 13 30 27 32	7 7 0 0 0 0 0 0 0 12 12 0 0 0 5 5 5 1 3 3 57 59 7 7 5 11	$ \begin{array}{c} 11\\ 0\\ 0\\ 0\\ 0\\ 0\\ 0\\ 0\\ 20\\ 3\\ 2\\ 0\\ 4\\ 3\\ 0\\ 17\\ 7\\ 5\\ 4\\ 5\\ \end{array} $	0 0 0 0 0 0 0 2 0 0 5 3 8 6 1 1 1 3 0 5 4 4
AGAP013117-PA Serine protease homolog AGAP008804-PB Peroxin-19 AGAP003248-PA Serine protease 14 like AGAP006673-PA Serine protease AGAP005642-PA Chymotrypsin-like protease AGAP007252-PA Chymotrypsin-like protease AGAP006674-PA Chymotrypsin-like protease AGAP005670-PA Serine collagenase 1 homolog AGAP005671-PA Chymotrypsin-like protease AGAP005670-PA Chymotrypsin-like protease	33.5         33.2         33.1         33         33         32.9         32.4         32.3         32.2         32.2         32.2	$\begin{array}{c} 10.3 \\ 3.9 \\ 0.2 \\ 0.1 \\ 0.1 \\ 0 \\ 0 \\ 2.6 \\ 2.1 \\ 2.8 \\ 2.6 \\ 62.3 \\ 72.4 \\ 6.7 \\ 8.7 \\ 5.5 \\ 3.2 \\ 186.4 \\ 251.7 \\ 66.9 \\ 72.6 \\ \end{array}$	СН IH CH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH IH CH IH IH CH IH IH CH IH CH IH CH IH CH IH CH IH CH CH IH CH IH CH CH IH CH CH IH CH CH IH CH CH IH CH CH IH CH CH IH CH CH IH CH CH IH CH CH IH CH CH IH CH CH IH CH CH IH CH CH IH CH CH IH CH CH IH CH CH IH CH CH IH CH CH CH IH CH CH IH CH CH IH CH CH CH IH CH CH CH IH CH CH CH CH IH CH CH CH IH CH CH CH CH IH CH CH CH CH CH CH CH CH CH C	0 0 0 0 0 0 0 0 12 9 0 0 0 4 5 7 8 3 7 6 5 5 6	0 0 0 0 0 0 0 2 6 0 0 2 6 0 0 3 3 3 8 8 8 8 2 4 4 4 4 3 5	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 3 0 0 0 0 0 0 6 8 0 0 7 7 13 12 3 4 7 9 7 8	3         3         0         0         0         0         0         0         0         7         4         0         5         12         12         4         0         8         9         6         7	1 2 0 0 0 0 0 4 12 10 8 6 7 5 7 0 0 8 9 7 9	1 4 0 0 0 0 0 0 0 0 0 0 0 0 0	63           64           100           100           100           0           0           13           13           13           13           13           13           15           3           5           8           8           8           8           8	9           6           0           0           0           0           100           0           12           10           53           56           33           15           16           8           13           300           27           32           28	7         7         0         0         0         0         0         0         0         0         0         0         12         12         0         0         5         1         3         57         59         7         5         111         9	$ \begin{array}{c} 11\\ 0\\ 0\\ 0\\ 0\\ 0\\ 0\\ 0\\ 20\\ 3\\ 2\\ 0\\ 4\\ 3\\ 0\\ 0\\ 17\\ 7\\ 5\\ 4\\ 5\\ 4\\ 5\\ 4\\ 5\\ 4\\ 5\\ 4\\ 5\\ 4\\ 5\\ 6\\ 6\\ 6\\ 6\\ 6\\ 6\\ 6\\ 6\\ 6\\ 6\\ 6\\ 6\\ 6\\$	0 0 0 0 0 0 0 0 0 2 0 0 2 0 0 5 3 8 6 1 1 1 3 0 5 4 4 4 3
AGAP013117-PA Serine protease homolog AGAP008804-PB Peroxin-19 AGAP003248-PA Serine protease 14 like AGAP006673-PA Serine protease AGAP005642-PA Chymotrypsin-like protease AGAP007252-PA Chymotrypsin-like protease AGAP006674-PA Chymotrypsin-like protease AGAP005707-PA Serine collagenase 1 homolog AGAP005671-PA Chymotrypsin-like protease AGAP005670-PA Chymotrypsin-like protease AGAP005670-PA	33.5         33.2         33.1         33         33         32.9         32.4         32.3         32.2         32.2         32.2	$\begin{array}{c} 10.3 \\ 3.9 \\ 0.2 \\ 0.1 \\ 0.1 \\ 0 \\ 0 \\ 2.6 \\ 2.1 \\ 2.8 \\ 2.6 \\ 62.3 \\ 72.4 \\ 6.7 \\ 8.7 \\ 5.5 \\ 3.2 \\ 186.4 \\ 251.7 \\ 66.9 \\ 72.6 \\ 0.5 \\ \end{array}$	СН IH CH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH CH IH CH CH IH CH CH IH CH CH IH CH CH IH CH CH IH CH CH IH CH CH IH CH CH IH CH CH IH CH CH IH CH CH IH CH CH CH IH CH CH IH CH CH CH CH IH CH CH CH CH CH CH IH CH CH CH CH CH IH CH CH CH CH CH CH CH CH CH C	0 0 0 0 0 0 0 12 9 0 0 0 4 5 7 8 3 7 6 5 5 6 0	0 0 0 0 0 0 2 6 0 0 2 6 0 0 3 3 3 8 8 8 8 2 4 4 4 4 3 5 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 3 0 0 0 0 0 0 6 8 0 0 7 7 13 12 3 4 7 9 7 8 0	3         3         0         0         0         0         0         0         0         7         4         0         5         12         12         4         0         8         9         6         7         0	1 2 0 0 0 0 0 4 12 10 8 6 7 5 7 0 0 8 9 7 9 0	1 4 0 0 0 0 0 0 10 23 13 19 9 11 11 11 11 11 11 0 8 10 8 9 0	63         64         100         100         100         0         0         13         13         13         13         13         13         13         5         8         8         8         8         33	9 6 0 0 100 0 12 10 53 56 33 56 33 33 15 16 8 13 30 27 32 28 66	7         7         0         0         0         0         0         0         0         0         0         0         12         12         0         0         5         1         3         57         59         7         5         111         9         0	$ \begin{array}{c} 11\\ 0\\ 0\\ 0\\ 0\\ 0\\ 0\\ 0\\ 20\\ 3\\ 2\\ 0\\ 4\\ 3\\ 0\\ 0\\ 17\\ 7\\ 5\\ 4\\ 5\\ 4\\ 0\\ 0 \end{array} $	0 0 0 0 0 0 0 2 0 0 5 3 8 6 1 1 1 3 0 5 4 4 4 3 0
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AGAP005687-PA															
Chymotrypsin-like		0.7	IH	0	0	0	5	0	0	27	40	17	11	0	0
ACAPO06675 PA		22.6	СЦ	4	6	2	0	4	5	6	25	0	5	11	1
Chymotrypsin-like	32.1	23.0	Сп	4	0	3	9	4	3	0	33	0	3	11	4
protease	52.1	16	IH	4	9	7	12	9	3	7	25	4	8	12	1
AGAP011503-PA	22	1.9	CH	0	0	0	15	13	6	14	31	21	0	0	0
LRR	32	1.4	IH	0	7	0	16	0	0	23	50	5	0	0	0
AGAP005686-PA		5.8	CH	6	5	4	11	11	7	11	13	28	1	2	2
Chymotrypsin-like	31.9	8.3	IH	7	6	6	14	10	9	8	13	22	2	2	0
protease		0.0	CU		0	0	0	0	0	10	50	17	-	-	0
AGAP005462-PA Thioredoxin like	31.6	0.9	СН	0	0	0	0	0	0	19	30	17	0	0	δ
protein 1	51.0	0.8	IH	0	0	0	0	0	16	30	47	7	0	0	0
AGAP012505-PA		0	СН	0	0	0	0	0	0	0	0	0	0	0	0
Trypsin-like	31.5	0	ш	0	0	0	0	0	0	0	100	0	0	0	0
protein		0	ш	0	0	0	0	0	0	0	100	0	0	0	0
AGAP005703-PA		0	CH	0	0	0	0	0	0	0	100	0	0	0	0
Serine collagenase	31.4	0	IH	0	0	0	0	0	0	0	0	0	0	0	0
		18	СН	0	12	0	16	13	11	13	13	12	0	0	0
Fibrinogen-related	31.3	4.0	CII		12	0	10	15	11	15	15	12	0	0	0
protein 1		3.3	IH	9	14	11	30	8	8	15	4	0	0	0	0
AGAP001708-PA		5.9	CH	0	3	0	5	4	5	9	23	18	8	12	14
Serine protease	30.9	5.8	ш	0	0	0	5	2	6	11	24	15	7	17	13
homolog gd-like		5.0		0	0		5	2	0	11	24	15	'	17	15
AGAP006790-PA	30.8	2	CH	8	6	4	21	0	0	13	15	28	0	5	0
Fibrinogen		2.6		15	8	6	22	0	0	8	6	28	0	/	0
Pres 3	30.8	0.1	ш	0	0	0	0	0	100	0	0	18	0	0	0
AGAP006485-PA		39.2	CH	5	5	4	9	9	7	11	38	7	1	3	3
Trypsin-alpha	30.5	47.1	IH	6	6	4	14	9	, 7	14	26	7	2	3	2
AGAP011239-PA	20.4	150.1	CH	8	7	6	10	13	7	11	20	7	6	4	2
FBN7	30.4	188.8	IH	9	8	7	10	15	10	11	17	5	5	4	2
AGAP003615-PA		0.1	CH	0	0	0	0	0	0	0	16	84	0	0	0
Toll-interacting	30.4	0.3	IH	0	0	0	0	0	0	0	41	59	0	0	0
protein		21.0	CU		ź		10	0	·	10	11	26		0	0
AGAP011/88-PA	30.4	31.9		6	5	4	12	8	6	10	0	26	4	2	8
		34.9	CH	1/	/	5	14	20	8 11	8	8 17	19	0	2	0
Trypsin-alpha like	30.4	4.0	Ш	14	10	10	12	20	13	7	17 4	4	0	0	0
AGAP001246-PA		2	CH	0	0	0	11	0	8	9	13	55	2	2	0
Eupolytin	30.3	4.7	IH	0	3	2	6	4	6	8	18	35	6	8	4
AGAP002543-PA	20.9	0.1	CH	0	0	0	0	0	0	0	100	0	0	0	0
Serine protease	29.8	0	IH	0	0	0	0	0	0	0	0	0	0	0	0
AGAP003987-PA		3.6	CH	0	0	0	0	0	0	4	8	53	7	13	15
Complement	29.6	2.0		0	0	0	0	0	2		20	26		1.4	10
component I Q		2.8	IH	0	0	0	0	0	3	14	20	36	3	14	10
AGAP006677-PA		0.4	СН	0	0	0	0	0	0	0	7	7	75	11	0
Trypsin (late)	29.6	0.4		0	0	0	0	0	0	0	,	,	15		0
homolog		0	IH	0	0	0	0	0	0	0	0	0	0	0	0
AGAP005708-PA		1.6	CH	3	2	0	6	7	10	6	9	28	4	17	9
Serine collagenase	29.6	2.2	Ш	7	9	2	8	8	7	5	13	22	4	7	8
1 homolog		2.2		,		-	0	0	,		10			,	0
AGAP001198-PA	29.4	0.2	CH	0	0	0	0	0	0	0	100	0	0	0	0
		0	IH	0	0	0	0	0	0	11	10	16	20	0	0
Trypsin II_P70 like	29.2	2.1	ш	1	4	2	30	4	3	15	2	10	30	2	2
AGAP001248-PA		0.7	СН	4	0	0	14	14	0	0	12	4	0	6	6
Eupolvtin	28.9	1.2	IH	11	0	0	15	6	0	6	16	28	6	0	12
AGAP006539-PA	20.0	2.6	СН	5	3	4	10	6	9	11	19	25	3	6	0
Eupolytin	28.8	4.1	IH	9	11	7	14	7	7	7	21	12	2	4	0
AGAP001245-PA	287	16.5	CH	0	2	0	8	0	3	7	12	55	0	0	14
Eupolytin	20.7	18.7	IH	2	0	0	10	0	0	3	10	56	0	0	19
	28.7	0	CH	0	0	0	0	0	0	0	100	0	0	0	0

AGAP005709-PA															
Serine collagenase		0	IH	0	0	0	0	0	0	0	0	0	0	0	0
I homolog		20.7	CII	(	5	5	10	11	7	10	0	24	1	(	2
AGAP0000/0-PA	28.6	32.7	СН	0	5	3	12	11	1	12	9	24	1	0	Z
1 homolog	28.0	37.6	IH	8	8	7	17	11	7	12	6	14	3	6	2
AGAP010240-PA		24.7	CH	7	10	8	11	17	9	7	13	16	0	1	1
Trypsin (late)	28.2	32.6	IH	8	12	9	17	12	5	15	11	9	1	0	1
AGAP010730-PA		11	CH	12	6	5	8	6	7	11	7	27	4	5	2
PPO activating	28.2	0.6		11	0	~	11	10	2	4	10	07	6	2	2
factor homolog		8.6	IH	11	8	2	11	10	2	4	12	27	6	2	2
AGAP013164-PA		52.6	CH	6	6	6	11	12	11	15	24	4	1	2	1
Trypsin-like	28.2	51.8	Ш	8	10	8	15	11	10	15	15	5	3	2	0
protein					10				10	10	10		5	-	
AGAP011919-PA	28.1	24.3	CH	4	2	2	3	4	3	3	4	40	4	10	21
Eupolytin-like		16.3	IH	6	3	2	6	4	2	6	4	3/	6	/	1/
AGAP004/40-PA	27.8	2.1	СН	0	0	0	9	0	10	15	1/	39	0	1	9
1 homolog	27.8	0.9	IH	0	0	0	39	0	6	28	0	26	0	0	0
AGAP009121-PA		3.4	CH	0	5	0	17	3	2	13	7	32	0	6	15
Chymotrypsin-like	27.7				0			0		10	,		0	0	
protease		3.1	IH	4	8	3	31	0	3	17	2	22	3	0	1
AGAP001249-PA	27.1	109.4	CH	4	4	3	10	3	8	8	9	25	15	7	4
Eupolytin	27.1	100.9	IH	5	5	4	15	2	7	14	6	18	14	7	3
AGAP010193-PA	27	12	CH	0	0	0	3	1	1	5	10	72	1	4	4
CTLGA3	21	17.4	IH	0	2	0	4	0	1	4	11	71	1	2	4
AGAP010822-PA	263	41.7	CH	5	4	4	6	5	5	8	8	34	6	4	10
Fasciclin	20.5	33.5	IH	6	5	3	9	5	7	9	8	26	8	3	10
AGAP010477-PB	26.3	20.3	CH	5	5	4	7	10	11	12	21	6	3	7	9
Phosducin-like 3	2010	27	IH	6	5	4	8	7	11	15	14	6	4	12	8
AGAP011920-PA	26.3	0.4	CH	0	0	0	0	0	0	5	0	19	0	69	7
Eupolytin		0.6	IH	0	0	0	0	0	9	21	0	20	0	49	0
AGAP011917-PA	26.2	0.8	СН	0	0	0	0	0	0	1	13	6/	0	0	13
		~ ~ ~					~ ~ ~							~ ~	~ ~ ~
Serine protease		0.7	IH	0	0	0	0	0	0	0	20	80	0	0	0
AGAP004631-PA		0.7	IH CH	0	0	0	0	0	0	0	20 100	80 0	0	0 0	0
AGAP004631-PA Coagulation factor deficiency 2	26.1	0.7	IH CH IH	0	0	0	0	0	0	0	20 100	80 0	0	0 0 0	0
AGAP004631-PA Coagulation factor deficiency 2 homolog	26.1	0.7 0.1 0.1	IH CH IH	0	0 0 0	0	0 0 0	0 0 0	0	0	20 100 100	80 0 0	0 0 0	0 0 0	0 0 0
AGAP004631-PA Coagulation factor deficiency 2 homolog AGAP000396-PA	26.1	0.7 0.1 0.1 2.1	IH CH IH CH	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0	0 0 0 2	0 0 0 0 0	0 0 0 0 0	20 100 100	80 0 0 39	0 0 0 8	0 0 0 9	0 0 0 20
AGAP004631-PA Coagulation factor deficiency 2 homolog AGAP000396-PA Thioredoxin	26.1	$     \begin{array}{r}       0.7 \\       0.1 \\       0.1 \\       \underline{2.1} \\       2.2       \end{array} $	IH CH IH CH	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 10	0 0 0 2 0	0 0 0 0 0	0 0 0 0 12	20 100 100 13	80 0 0 39	0 0 8	0 0 0 9	0 0 0 20
Serine protease AGAP004631-PA Coagulation factor deficiency 2 homolog AGAP000396-PA Thioredoxin peroxidase	26.1	0.7 0.1 0.1 2.1 2.3	IH CH IH CH IH	0 0 0 0 0	0 0 0 4	0 0 0 0 0	0 0 0 10 11	0 0 0 2 0	0 0 0 0 0	0 0 0 12	20 100 100 13 17	80 0 0 39 28	0 0 0 8 8	0 0 0 9 3	0 0 20 18
Serine protease AGAP004631-PA Coagulation factor deficiency 2 homolog AGAP000396-PA Thioredoxin peroxidase AGAP011319-PA	26.1 26	0.7 0.1 0.1 2.1 2.3 207.9	IH CH IH CH IH CH	0 0 0 0 0 0	0 0 0 4 0	0 0 0 0 0 0	0 0 10 11 0	0 0 2 0 0	0 0 0 0 0 0	0 0 0 12 0	20 100 100 13 17 1	80 0 39 28 4	0 0 8 8 19	0 0 9 3 63	0 0 20 18 14
AGAP004631-PA Coagulation factor deficiency 2 homolog AGAP000396-PA Thioredoxin peroxidase AGAP011319-PA Pacifastin-related	26.1 26 25.3	0.7 0.1 0.1 2.1 2.3 207.9 166 5	IH CH IH CH IH CH H	0 0 0 0 0 0 0	0 0 0 4 0 0	0 0 0 0 0 0 0	0 0 10 11 0 0	0 0 2 0 0 0	0 0 0 0 0 0 0	0 0 0 12 0	20 100 100 13 17 1 1	80 0 39 28 4 4	0 0 8 8 19	0 0 9 3 63 58	0 0 20 18 14 21
Serine protease AGAP004631-PA Coagulation factor deficiency 2 homolog AGAP000396-PA Thioredoxin peroxidase AGAP011319-PA Pacifastin-related peptide	26.1 26 25.3	0.7 0.1 0.1 2.1 2.3 207.9 166.5	IH CH IH CH IH CH IH	0 0 0 0 0 0 0 0	0 0 0 4 0 0	0 0 0 0 0 0 0 0	0 0 10 11 0 0	0 0 2 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 12 0 0	20 100 100 13 17 1 1 1	80 0 39 28 4 4	0 0 8 8 19 15	0 0 9 3 63 58	0 0 20 18 14 21
Serine protease AGAP004631-PA Coagulation factor deficiency 2 homolog AGAP000396-PA Thioredoxin peroxidase AGAP011319-PA Pacifastin-related peptide AGAP011824-PA	26.1 26 25.3	0.7 0.1 0.1 2.1 2.3 207.9 166.5 59.6	IH CH IH CH IH CH IH CH	0 0 0 0 0 0 0 4	0 0 0 4 0 0 3	0 0 0 0 0 0 0 3	0 0 10 11 0 0 5	0 0 2 0 0 0 5	0 0 0 0 0 0 0 5	0 0 0 12 0 0 7	20 100 100 13 17 1 1 9	80 0 39 28 4 4 40	0 0 8 8 19 15 5	0 0 9 3 63 58 5	0 0 20 18 14 21 10
Serine protease AGAP004631-PA Coagulation factor deficiency 2 homolog AGAP000396-PA Thioredoxin peroxidase AGAP011319-PA Pacifastin-related peptide AGAP011824-PA Thioredoxin prorvidaso	26.1 26 25.3 25	0.7 0.1 0.1 2.3 207.9 166.5 59.6 87.1	IH CH IH CH IH CH IH CH IH	0 0 0 0 0 0 0 4 3	0 0 0 4 0 0 3 3 3	0 0 0 0 0 0 0 0 3 3 3	0 0 10 11 0 0 5 5 5	0 0 2 0 0 0 0 5 4	0 0 0 0 0 0 0 0 5 7	0 0 0 12 0 0 7 12	20 100 100 13 17 1 1 9 13	80 0 39 28 4 4 4 40 32	0 0 8 8 19 15 5 4	0 0 9 3 63 58 5 5 5	0 0 20 18 14 21 10 9
Serine protease AGAP004631-PA Coagulation factor deficiency 2 homolog AGAP000396-PA Thioredoxin peroxidase AGAP011319-PA Pacifastin-related peptide AGAP011824-PA Thioredoxin peroxidase AGAP006430-PB	26.1 26 25.3 25	0.7 0.1 0.1 2.1 2.3 207.9 166.5 59.6 87.1 1.6	IН СН IН СН IН СН СН СН СН	0 0 0 0 0 0 0 0 4 3	0 0 0 4 0 0 3 3 0	0 0 0 0 0 0 0 0 3 3 0	0 0 10 11 0 0 5 5 5	0 0 2 0 0 0 0 5 4	0 0 0 0 0 0 0 0 5 7 0	0 0 0 12 0 0 7 12 0	20 100 100 13 17 1 1 1 9 13 0	80 0 39 28 4 4 40 32 58	0 0 8 8 19 15 5 4	0 0 9 3 63 58 5 5 5 5 22	0 0 20 18 14 21 10 9
Serine protease AGAP004631-PA Coagulation factor deficiency 2 homolog AGAP000396-PA Thioredoxin peroxidase AGAP011319-PA Pacifastin-related peptide AGAP011824-PA Thioredoxin peroxidase AGAP006430-PB CTLGA2	26.1 26 25.3 25 24.9	$\begin{array}{c} 0.7 \\ 0.1 \\ \hline 0.1 \\ \hline 2.1 \\ 2.3 \\ 207.9 \\ \hline 166.5 \\ 59.6 \\ 87.1 \\ \hline 1.6 \\ 2.2 \\ \end{array}$	IH CH IH CH IH CH IH CH IH CH IH	0 0 0 0 0 0 0 0 4 3 0 0	0 0 0 4 0 0 3 3 0 0	0 0 0 0 0 0 0 0 3 3 0 0	0 0 10 11 0 0 5 5 5 0 0	0 0 2 0 0 0 0 5 4 0 0	0 0 0 0 0 0 0 0 5 7 0 0	0 0 0 12 0 0 7 12 0 0	20 100 13 17 1 1 9 13 0 0	80 0 39 28 4 4 40 32 58 65	0 0 8 8 19 15 5 4 5 10	0 0 9 3 63 58 5 5 5 22 12	0 0 20 18 14 21 10 9 16 13
Serine protease AGAP004631-PA Coagulation factor deficiency 2 homolog AGAP000396-PA Thioredoxin peroxidase AGAP011319-PA Pacifastin-related peptide AGAP011824-PA Thioredoxin peroxidase AGAP006430-PB CTLGA2 AGAP011223-PA	26.1 26 25.3 25 24.9	$\begin{array}{c} 0.7 \\ 0.1 \\ \hline 0.1 \\ \hline 2.1 \\ 2.3 \\ 207.9 \\ 166.5 \\ \hline 59.6 \\ 87.1 \\ \hline 1.6 \\ 2.2 \\ 2.1 \\ \end{array}$	IН СН СН ИН СН СН ИН СН ИН СН	0 0 0 0 0 0 0 0 4 3 0 0 0 3	0 0 0 4 0 0 3 3 0 0 0 6	0 0 0 0 0 0 0 0 3 3 0 0 0 0	0 0 10 11 0 5 5 5 0 0 0		0 0 0 0 0 0 0 0 5 7 0 0 0 13	0 0 0 12 0 0 7 12 0 0 0 17	20 100 13 17 1 1 1 9 13 0 0 0 22	80 0 39 28 4 4 4 40 32 58 65 5	0 0 8 8 19 15 5 4 5 10 0	0 0 9 3 63 58 5 5 5 22 12 0	0 0 20 18 14 21 10 9 16 13 0
Serine protease AGAP004631-PA Coagulation factor deficiency 2 homolog AGAP000396-PA Thioredoxin peroxidase AGAP011319-PA Pacifastin-related peptide AGAP011824-PA Thioredoxin peroxidase AGAP006430-PB CTLGA2 AGAP011223-PA FBN8	26.1 26 25.3 25 24.9 24.8	$\begin{array}{c} 0.7 \\ 0.1 \\ \hline 0.1 \\ \hline 2.1 \\ 2.3 \\ 207.9 \\ 166.5 \\ \hline 59.6 \\ 87.1 \\ \hline 1.6 \\ 2.2 \\ 2.1 \\ 1.1 \end{array}$	IН СН СН ИН СН СН ИН СН ИН СН ИН	0 0 0 0 0 0 0 0 4 3 0 0 0 3 0	0 0 0 4 0 0 3 3 0 0 0 6 0	0 0 0 0 0 0 0 0 3 3 0 0 0 0 0 0	0 0 10 11 0 0 5 5 5 0 0 0 18 23	0 0 2 0 0 0 0 5 4 0 0 16 22	0 0 0 0 0 0 0 0 5 7 0 0 0 13 10	0 0 0 12 0 0 7 12 0 0 17 20	20 100 13 17 1 1 1 9 13 0 0 0 22 21	80 0 39 28 4 4 4 40 32 58 65 5 3	0 0 8 8 19 15 5 4 5 10 0 0	0 0 9 3 63 58 5 5 5 22 12 0 0	0 0 20 18 14 21 10 9 16 13 0 0
Serine protease AGAP004631-PA Coagulation factor deficiency 2 homolog AGAP000396-PA Thioredoxin peroxidase AGAP011319-PA Pacifastin-related peptide AGAP011824-PA Thioredoxin peroxidase AGAP006430-PB CTLGA2 AGAP011223-PA FBN8 AGAP010775-PA	26.1 26 25.3 25 24.9 24.8	$\begin{array}{c} 0.7 \\ 0.1 \\ \hline 0.1 \\ \hline 2.1 \\ 2.3 \\ \hline 207.9 \\ 166.5 \\ \hline 59.6 \\ 87.1 \\ \hline 1.6 \\ 2.2 \\ 2.1 \\ \hline 1.1 \\ 0 \end{array}$	IН СН СН IH СН ПН СН IH СН СН ПН СН СН ПН СН СН СН	0 0 0 0 0 0 0 0 4 3 0 0 0 3 0 0	0 0 0 4 0 0 3 3 0 0 0 6 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 10 11 0 0 5 5 5 0 0 0 18 23 0	0 0 2 0 0 0 0 5 4 0 0 16 22 0	0 0 0 0 0 0 0 0 5 7 0 0 0 13 10 0	0 0 0 12 0 0 7 12 0 0 7 12 0 0 17 20 0	20 100 100 13 17 1 1 1 9 13 0 0 22 21 100	80 0 39 28 4 4 40 32 58 65 5 3 0	0 0 8 8 8 19 15 5 4 5 10 0 0 0 0	0 0 9 3 63 58 5 5 5 22 12 0 0 0 0	0 0 20 18 14 21 10 9 16 13 0 0 0
Serine protease AGAP004631-PA Coagulation factor deficiency 2 homolog AGAP000396-PA Thioredoxin peroxidase AGAP011319-PA Pacifastin-related peptide AGAP011824-PA Thioredoxin peroxidase AGAP006430-PB CTLGA2 AGAP011223-PA FBN8 AGAP010775-PA FBN8	26.1         26         25.3         25         24.9         24.8         23.3	$\begin{array}{c} 0.7 \\ 0.1 \\ \hline 0.1 \\ \hline 2.1 \\ 2.3 \\ \hline 207.9 \\ 166.5 \\ \hline 59.6 \\ 87.1 \\ \hline 1.6 \\ 2.2 \\ 2.1 \\ \hline 1.1 \\ 0 \\ 0 \end{array}$	IH CH IH CH CH IH CH IH CH IH CH IH CH IH CH IH IH CH IH IH IH CH IH IH IH IH IH IH IH IH IH I	0 0 0 0 0 0 0 0 4 3 0 0 0 0 0 0 0 0	0 0 0 4 0 0 3 3 0 0 0 6 0 0 0 0	0 0 0 0 0 0 0 0 3 3 0 0 0 0 0 0 0 0 0	0 0 10 11 0 0 5 5 5 0 0 0 18 23 0 0	$ \begin{array}{c} 0 \\ 0 \\ 0 \\ 2 \\ 0 \\ 0 \\ 0 \\ 5 \\ 4 \\ 0 \\ 0 \\ 16 \\ 22 \\ 0 \\ 0 \\ 0 \\ 0 \end{array} $	0 0 0 0 0 0 0 0 5 7 0 0 0 13 10 0 0	0 0 0 12 0 0 0 7 12 0 0 0 17 20 0 0	20 100 100 13 17 1 1 1 9 13 0 0 22 21 100 0 0	80 0 39 28 4 4 40 32 58 65 5 3 0 0	0 0 8 8 8 19 15 5 4 5 10 0 0 0 0 0	0 0 9 3 63 58 5 5 5 22 12 0 0 0 0 0	0 0 20 18 14 21 10 9 16 13 0 0 0 0
Serine protease AGAP004631-PA Coagulation factor deficiency 2 homolog AGAP000396-PA Thioredoxin peroxidase AGAP011319-PA Pacifastin-related peptide AGAP011824-PA Thioredoxin peroxidase AGAP006430-PB CTLGA2 AGAP001223-PA FBN8 AGAP010775-PA FBN8 AGAP001212-PB	26.1         26         25.3         25         24.9         24.8         23.3         22.3	$\begin{array}{c} 0.7 \\ 0.1 \\ \hline 0.1 \\ \hline 2.1 \\ 2.3 \\ \hline 207.9 \\ 166.5 \\ \hline 59.6 \\ 87.1 \\ \hline 1.6 \\ 2.2 \\ 2.1 \\ 1.1 \\ 0 \\ 0 \\ 2.9 \end{array}$	IН СН СН СН СН ПН СН ПН СН ПН СН ПН СН ПН СН ПН СН ПН СН СН СН СН СН СН СН СН СН С	0 0 0 0 0 0 0 0 4 3 0 0 0 0 0 0 0 0	0 0 0 4 0 0 3 3 0 0 0 6 0 0 0 0 0	0 0 0 0 0 0 0 0 3 3 0 0 0 0 0 0 0 0 0 0	0 0 10 11 0 0 5 5 5 0 0 0 18 23 0 0 0 0	$ \begin{array}{c} 0 \\ 0 \\ 0 \\ 2 \\ 0 \\ 0 \\ 0 \\ 0 \\ 16 \\ 22 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{array} $	0 0 0 0 0 0 0 0 5 7 0 0 0 13 10 0 0 0 0	0 0 0 12 0 0 0 7 12 0 0 0 17 20 0 0 1	20 100 100 13 17 1 1 1 1 9 13 0 0 22 21 100 0 1	80 0 39 28 4 4 40 32 58 65 5 3 0 0 37	0 0 8 8 8 19 15 5 4 5 10 0 0 0 0 0 55	0 0 9 3 63 58 5 5 5 22 12 0 0 0 0 0 7	0 0 20 18 14 21 10 9 16 13 0 0 0 0 0 0
Serine protease AGAP004631-PA Coagulation factor deficiency 2 homolog AGAP000396-PA Thioredoxin peroxidase AGAP011319-PA Pacifastin-related peptide AGAP011824-PA Thioredoxin peroxidase AGAP006430-PB CTLGA2 AGAP001223-PA FBN8 AGAP010775-PA FBN8 AGAP001212-PB PGRPLB	26.1         26         25.3         25         24.9         24.8         23.3         23.3	$\begin{array}{c} 0.7 \\ 0.1 \\ \hline 0.1 \\ \hline 2.1 \\ 2.3 \\ \hline 207.9 \\ 166.5 \\ \hline 59.6 \\ 87.1 \\ \hline 1.6 \\ 2.2 \\ 2.1 \\ \hline 1.1 \\ 0 \\ 0 \\ \hline 2.9 \\ 9.3 \\ \end{array}$	IH CH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH IH CH IH IH IH CH IH IH IH IH IH IH IH IH IH I	0 0 0 0 0 0 0 0 4 3 0 0 0 0 0 0 0 0 0 0	0 0 0 4 0 0 3 3 0 0 0 6 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 10 11 0 0 5 5 5 0 0 0 18 23 0 0 0 0 0 0	$ \begin{array}{c} 0 \\ 0 \\ 0 \\ 2 \\ 0 \\ 0 \\ 0 \\ 0 \\ 16 \\ 22 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0$	0 0 0 0 0 0 0 0 5 7 0 0 0 0 13 10 0 0 0 0 0	0 0 0 12 0 0 0 7 12 0 0 0 17 20 0 0 1 0 0	20 100 100 13 17 1 1 1 1 9 13 0 0 22 21 100 0 0 1 22	80 0 39 28 4 4 40 32 58 65 5 3 0 0 37 26	0 0 8 8 19 15 5 4 5 10 0 0 0 0 0 55 69	0 0 9 3 63 58 5 5 5 22 12 0 0 0 0 0 7 1	$\begin{array}{c} 0 \\ 0 \\ 0 \\ 20 \\ 18 \\ 14 \\ 21 \\ 10 \\ 9 \\ 16 \\ 13 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 2 \\ \end{array}$
Serine protease AGAP004631-PA Coagulation factor deficiency 2 homolog AGAP000396-PA Thioredoxin peroxidase AGAP011319-PA Pacifastin-related peptide AGAP011824-PA Thioredoxin peroxidase AGAP006430-PB CTLGA2 AGAP001223-PA FBN8 AGAP010775-PA FBN8 AGAP001212-PB PGRPLB AGAP009556-PA	26.1         26         25.3         25         24.9         24.8         23.3         23.4	$\begin{array}{c} 0.7 \\ 0.1 \\ \hline 0.1 \\ \hline 2.1 \\ 2.3 \\ \hline 207.9 \\ 166.5 \\ \hline 59.6 \\ 87.1 \\ \hline 1.6 \\ 2.2 \\ 2.1 \\ \hline 1.1 \\ 0 \\ \hline 0 \\ 2.9 \\ \hline 9.3 \\ 18.3 \\ \end{array}$	IH CH CH CH CH CH IH CH IH CH H CH H CH H CH H CH H CH C	0 0 0 0 0 0 0 0 4 3 0 0 0 0 0 0 0 0 0 0	0 0 0 4 0 0 3 3 0 0 0 0 0 0 0 0 0 0 5	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 10 11 0 0 5 5 5 0 0 0 18 23 0 0 0 0 0 9	0 0 2 0 0 0 0 5 4 0 0 0 0 0 0 0 0 9	0 0 0 0 0 0 0 0 5 7 0 0 0 0 13 10 0 0 0 0 0 0 0 0	0 0 0 12 0 0 7 12 0 0 7 12 0 0 0 17 20 0 0 1 1 0 0 12	20 100 100 13 17 1 1 1 1 9 13 0 0 22 21 100 0 1 2 21 100 0 1 2 34	80           0           0           39           28           4           40           32           58           65           5           3           0           0           377           26           14	0 0 8 8 19 15 5 4 5 10 0 0 0 0 0 55 69 1	0 0 9 3 63 58 5 5 5 22 12 0 0 0 0 0 7 1 1	$\begin{array}{c} 0 \\ 0 \\ 0 \\ 20 \\ 18 \\ 14 \\ 21 \\ 10 \\ 9 \\ 16 \\ 13 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 2 \\ 2 \end{array}$
Serine protease AGAP004631-PA Coagulation factor deficiency 2 homolog AGAP000396-PA Thioredoxin peroxidase AGAP011319-PA Pacifastin-related peptide AGAP011824-PA Thioredoxin peroxidase AGAP006430-PB CTLGA2 AGAP0011223-PA FBN8 AGAP010775-PA FBN8 AGAP001212-PB PGRPLB AGAP009556-PA FBN8	26.1         26         25.3         25         24.9         24.8         23.3         22.4	$\begin{array}{c} 0.7 \\ 0.1 \\ \hline 0.1 \\ \hline 2.1 \\ 2.3 \\ \hline 207.9 \\ 166.5 \\ \hline 59.6 \\ 87.1 \\ \hline 1.6 \\ 2.2 \\ 2.1 \\ \hline 1.1 \\ 0 \\ 0 \\ \hline 2.9 \\ 9.3 \\ \hline 18.3 \\ 16.4 \end{array}$	IН СН СН СН СН ПН СН ПН СН ПН СН ПН СН ПН СН ПН СН ПН СН ПН СН ПН СН ПН СН ПН СН ПН ПН СН ПН ПН СН ПН ПН СН ПН ПН СН ПН ПН СН ПН ПН СН ПН ПН СН ПН ПН СН ПН ПН СН ПН ПН СН ПН ПН СН ПН ПН СН ПН ПН СН ПН ПН СН ПН ПН СН СН ПН ПН СН СН ПН ПН СН СН ПН ПН СН СН ПН ПН СН СН ПН ПН СН СН ПН СН ПН СН ПН ПН СН ПН ПН СН ПН ПН СН ПН ПН СН ПН ПН СН ПН ПН СН ПН ПН СН ПН ПН СН ПН ПН ПН ПН ПН ПН ПН ПН ПН П	0 0 0 0 0 0 0 0 4 3 0 0 0 0 0 0 0 0 0 5 6	0 0 0 4 0 0 3 3 0 0 0 0 0 0 0 0 0 0 5 7	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 10 11 0 0 5 5 5 0 0 0 18 23 0 0 0 0 9 9	0 0 2 0 0 0 0 0 5 4 0 0 0 0 0 0 0 0 9 12	0 0 0 0 0 0 0 0 5 7 0 0 0 0 0 0 0 0 0 0	0 0 0 12 0 0 0 7 12 0 0 0 17 20 0 0 1 10 0 12 11	20 100 100 13 17 1 1 1 1 9 13 0 0 22 21 100 0 1 2 21 100 0 1 2 2 34 25	80           0           0           39           28           4           40           32           58           65           5           3           0           0           377           26           14           6	0 0 8 8 19 15 5 4 5 10 0 0 0 0 0 55 69 1 2	0 0 9 3 63 58 5 5 5 22 12 0 0 0 0 0 7 1 1 1 0	$\begin{array}{c} 0 \\ 0 \\ 0 \\ \hline \\ 20 \\ 18 \\ 14 \\ 21 \\ 10 \\ 9 \\ 16 \\ 13 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ $
Serine protease AGAP004631-PA Coagulation factor deficiency 2 homolog AGAP000396-PA Thioredoxin peroxidase AGAP011319-PA Pacifastin-related peptide AGAP011824-PA Thioredoxin peroxidase AGAP006430-PB CTLGA2 AGAP006430-PB CTLGA2 AGAP001223-PA FBN8 AGAP010775-PA FBN8 AGAP001212-PB PGRPLB AGAP009556-PA FBN8 AGAP000536-PA	26.1         26         25.3         25         24.9         24.8         23.3         22.4         22.4         22.4	$\begin{array}{c} 0.7 \\ 0.1 \\ \hline 0.1 \\ \hline 2.1 \\ 2.3 \\ \hline 207.9 \\ \hline 166.5 \\ \hline 59.6 \\ 87.1 \\ \hline 1.6 \\ 2.2 \\ 2.1 \\ \hline 1.1 \\ 0 \\ \hline 0 \\ 2.9 \\ \hline 9.3 \\ \hline 18.3 \\ \hline 16.4 \\ 7.5 \\ \end{array}$	IH CH CH CH CH CH IH CH IH CH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH CH IH CH CH IH CH CH CH CH CH CH CH CH CH C	0 0 0 0 0 0 0 0 4 3 0 0 0 0 0 0 0 0 0 0	0 0 0 4 0 0 3 3 0 0 0 0 0 0 0 0 0 0 0 5 7 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 10 11 0 0 5 5 5 0 0 0 0 18 23 0 0 0 0 0 9 9 14 0	$\begin{array}{c} 0 \\ 0 \\ 0 \\ 2 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\$	0 0 0 0 0 0 0 0 0 5 7 0 0 0 0 0 0 0 0 0	$\begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \\ 12 \\ 0 \\ 0 \\ 0 \\ 12 \\ 12$	$\begin{array}{c} 20\\ \hline 100\\ \hline 100\\ \hline 100\\ \hline 13\\ \hline 17\\ \hline 1\\ \hline 1\\ \hline 1\\ \hline 9\\ \hline 13\\ \hline 0\\ \hline 0\\ \hline 22\\ \hline 21\\ \hline 100\\ \hline 0\\ \hline 100\\ \hline 0\\ \hline 1\\ 2\\ \hline 34\\ \hline 25\\ \hline 2\\ \hline \end{array}$	80           0           0           39           28           4           40           32           58           65           5           3           0           0           377           26           14           6           5	0 0 8 8 8 19 15 5 4 5 10 0 0 0 0 0 55 69 1 2 75	0 0 9 3 63 58 5 5 5 22 12 0 0 0 0 0 7 1 1 1 0 15	$\begin{array}{c} 0 \\ 0 \\ 0 \\ \hline 0 \\ 20 \\ 18 \\ 14 \\ 21 \\ 10 \\ 9 \\ 16 \\ 13 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ $
Serine protease AGAP004631-PA Coagulation factor deficiency 2 homolog AGAP000396-PA Thioredoxin peroxidase AGAP011319-PA Pacifastin-related peptide AGAP011824-PA Thioredoxin peroxidase AGAP006430-PB CTLGA2 AGAP006430-PB CTLGA2 AGAP0011223-PA FBN8 AGAP010775-PA FBN8 AGAP001212-PB PGRPLB AGAP009556-PA FBN8 AGAP000536-PA FBN8	26.1         26         25.3         25         24.9         24.8         23.3         22.4         22.4	$\begin{array}{c} 0.7 \\ 0.1 \\ \hline 0.1 \\ \hline 2.1 \\ 2.3 \\ \hline 207.9 \\ \hline 166.5 \\ \hline 59.6 \\ 87.1 \\ \hline 1.6 \\ 2.2 \\ 2.1 \\ \hline 1.1 \\ 0 \\ \hline 0 \\ 2.9 \\ \hline 9.3 \\ \hline 18.3 \\ \hline 16.4 \\ 7.5 \\ \hline 4.4 \\ \hline \end{array}$	IH CH CH CH CH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH IH CH IH IH CH IH IH CH IH IH CH IH CH IH IH CH IH CH IH IH CH IH CH IH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH CH IH CH IH CH CH IH IH CH IH IH CH IH IH CH IH IH CH IH IH CH IH IH CH IH IH CH IH IH CH IH IH IH CH IH IH IH IH CH IH IH IH IH IH IH IH IH IH I	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 4 0 0 3 3 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 10 11 0 0 5 5 5 0 0 0 5 5 0 0 0 0 0	$\begin{array}{c} 0 \\ 0 \\ 0 \\ 2 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 12 0 0 0 7 12 0 0 0 17 20 0 0 17 20 0 0 11 20 0 0 12 11 11 1 7	20 100 100 13 17 1 1 1 9 13 0 0 0 22 21 100 0 1 2 21 100 0 1 2 2 34 25 2 3 3	80         0         0         39         28         4         40         32         58         65         5         3         0         0         377         266         14         6         5         11	0 0 8 8 8 19 15 5 4 5 10 0 0 0 0 0 55 69 1 2 75 53	0 0 9 3 63 58 5 5 22 12 0 0 0 0 0 7 1 1 0 15 20	$\begin{array}{c} 0 \\ 0 \\ 0 \\ \hline 0 \\ 20 \\ 18 \\ 14 \\ 21 \\ 10 \\ 9 \\ 16 \\ 13 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ $
Serine protease AGAP004631-PA Coagulation factor deficiency 2 homolog AGAP000396-PA Thioredoxin peroxidase AGAP011319-PA Pacifastin-related peptide AGAP011824-PA Thioredoxin peroxidase AGAP006430-PB CTLGA2 AGAP006430-PB CTLGA2 AGAP0011223-PA FBN8 AGAP010775-PA FBN8 AGAP001212-PB PGRPLB AGAP009556-PA FBN8 AGAP000536-PA PGRPS1 AGAP000305-PA	26.1         26         25.3         25         24.9         24.8         23.3         22.4         22.4         22.4         22.4         22.4	$\begin{array}{c} 0.7 \\ 0.1 \\ \hline 0.1 \\ \hline 2.1 \\ 2.3 \\ \hline 207.9 \\ \hline 166.5 \\ \hline 59.6 \\ 87.1 \\ \hline 1.6 \\ 2.2 \\ 2.1 \\ \hline 1.1 \\ 0 \\ \hline 0 \\ 2.9 \\ \hline 9.3 \\ \hline 18.3 \\ \hline 16.4 \\ \hline 7.5 \\ \hline 4.4 \\ \hline 1.5 \\ \hline 4.4 \\ \hline 1.5 \\ \hline 5.7 \\ \hline 1.5 \\ \hline 1$	IН СН СН СН СН ПН СН ПН СН ПН СН ПН СН ПН СН ПН СН ПН СН ПН СН ПН СН ПН СН ПН СН ПН ПН СН ПН ПН СН СН ПН ПН СН СН ПН ПН СН СН ПН ПН СН СН ПН ПН СН СН ПН СН СН ПН СН СН СН СН СН СН СН СН СН С	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 4 0 0 3 3 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 10 11 0 0 5 5 5 0 0 0 5 5 0 0 0 0 0	$\begin{array}{c} 0 \\ 0 \\ 0 \\ 2 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 12 0 0 0 7 12 0 0 0 17 20 0 0 17 20 0 0 11 20 0 0 12 11 17 20 0 0 12	20 100 100 13 17 1 1 1 9 13 0 0 22 21 100 0 1 2 21 100 0 1 2 34 25 2 3 29 25 25 25 25 25 25 25 25 25 25	80           0           0           39           28           4           40           32           58           65           5           3           0           0377           266           14           6           5           11           27	0 0 8 8 8 19 15 5 4 5 10 0 0 0 0 55 69 1 2 75 53 16	0 0 9 3 63 58 5 5 22 12 0 0 0 0 0 7 1 1 0 15 20 26 5	$\begin{array}{c} 0 \\ 0 \\ 0 \\ \hline 0 \\ 20 \\ 18 \\ 14 \\ 21 \\ 10 \\ 9 \\ 16 \\ 13 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ $
Serine protease AGAP004631-PA Coagulation factor deficiency 2 homolog AGAP000396-PA Thioredoxin peroxidase AGAP011319-PA Pacifastin-related peptide AGAP011824-PA Thioredoxin peroxidase AGAP006430-PB CTLGA2 AGAP006430-PB CTLGA2 AGAP001223-PA FBN8 AGAP001212-PB PGRPLB AGAP009556-PA FBN8 AGAP000536-PA FBN8 AGAP000305-PA SPARC	26.1         26         25.3         25         24.9         24.8         23.3         22.4         22.4         22.2	$\begin{array}{c} 0.7 \\ 0.1 \\ \hline 0.1 \\ \hline 2.1 \\ 2.3 \\ \hline 207.9 \\ \hline 166.5 \\ \hline 59.6 \\ 87.1 \\ \hline 1.6 \\ 2.2 \\ 2.1 \\ \hline 1.1 \\ 0 \\ \hline 0 \\ 2.9 \\ \hline 9.3 \\ \hline 18.3 \\ \hline 16.4 \\ \hline 7.5 \\ \hline 4.4 \\ \hline 1.5 \\ 2.7 \\ \hline (1.5) \\ \hline 1.5 \\ \hline 1$	IH CH CH CH CH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH IH CH CH IH CH CH IH CH CH IH CH CH IH CH CH IH CH CH IH CH CH CH CH CH CH CH CH CH C	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 4 0 0 3 3 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	$\begin{array}{c} 0 \\ 0 \\ 0 \\ 10 \\ 11 \\ 0 \\ 0 \\ 5 \\ 5 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0$	$\begin{array}{c} 0 \\ 0 \\ 0 \\ \end{array}$	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 12 0 0 0 7 12 0 0 0 12 0 0 0 12 11 1 1 7 1 0 0 0	$\begin{array}{c} 20\\ \hline 100\\ \hline 100\\ \hline 100\\ \hline 13\\ \hline 17\\ \hline 1\\ \hline 1\\ \hline 1\\ \hline 9\\ \hline 13\\ \hline 0\\ \hline 0\\ \hline 22\\ \hline 21\\ \hline 100\\ \hline 0\\ \hline 0\\ \hline 100\\ \hline 0\\ \hline 1\\ 2\\ \hline 34\\ \hline 25\\ \hline 2\\ 3\\ \hline 3\\ 29\\ \hline 25\\ \hline 2\\ 3\\ \hline 3\\ 29\\ \hline 25\\ \hline 1\\ \hline 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ $	80           0           0           39           28           4           40           32           58           65           5           3           0           377           266           14           6           5           11           27           27           27	0 0 8 8 8 19 15 5 4 5 10 0 0 0 0 0 55 69 1 2 75 53 16 16	0 0 9 3 63 58 5 5 5 22 12 0 0 0 0 0 7 1 1 0 0 0 7 1 1 1 0 0 26 33	$\begin{array}{c} 0 \\ 0 \\ 0 \\ \hline 0 \\ 20 \\ 18 \\ 14 \\ 21 \\ 10 \\ 9 \\ 16 \\ 13 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ $
Serine protease AGAP004631-PA Coagulation factor deficiency 2 homolog AGAP000396-PA Thioredoxin peroxidase AGAP011319-PA Pacifastin-related peptide AGAP011824-PA Thioredoxin peroxidase AGAP006430-PB CTLGA2 AGAP0011223-PA FBN8 AGAP001212-PB PGRPLB AGAP001212-PB PGRPLB AGAP009556-PA FBN8 AGAP000536-PA FBN8 AGAP000305-PA SPARC AGAP011054-PA	26.1         26         25.3         25         24.9         24.8         23.3         22.4         22.4         22.2	$\begin{array}{c} 0.7 \\ 0.1 \\ \hline 0.1 \\ \hline 2.1 \\ 2.3 \\ \hline 207.9 \\ 166.5 \\ \hline 59.6 \\ 87.1 \\ \hline 1.6 \\ 2.2 \\ 2.1 \\ \hline 1.1 \\ 0 \\ \hline 0 \\ 2.9 \\ 9.3 \\ \hline 18.3 \\ 16.4 \\ \hline 7.5 \\ 4.4 \\ \hline 1.5 \\ 2.7 \\ \hline 61.6 \\ \end{array}$	IH CH CH CH CH CH IH CH IH CH H CH H CH H CH H CH H CH H CH H CH C	0 0 0 0 0 0 0 0 4 3 0 0 0 0 0 0 0 0 0 0	0 0 0 4 0 0 3 3 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 10 11 0 0 5 5 5 0 0 0 5 5 0 0 0 0 0	0 0 2 0 0 0 0 0 5 4 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 5 7 0 0 0 0 0 0 0 0 0 0	0 0 0 12 0 0 0 7 12 0 0 0 12 11 1 0 0 0 12 11 1 1 7 1 0 8	$\begin{array}{c} 20\\ \hline 100\\ \hline 100\\ \hline 100\\ \hline 13\\ \hline 17\\ \hline 1\\ \hline 1\\ \hline 1\\ \hline 9\\ \hline 13\\ \hline 0\\ \hline 0\\ \hline 22\\ \hline 21\\ \hline 100\\ \hline 0\\ \hline 0\\ \hline 1\\ \hline 2\\ \hline 34\\ \hline 25\\ \hline 2\\ \hline 3\\ \hline 3\\ \hline 29\\ \hline 25\\ \hline 11\\ \hline \end{array}$	80           0           0           39           28           4           40           32           58           65           5           3           0           0           377           266           14           6           5           11           27           24	0 0 8 8 19 15 5 4 5 10 0 0 0 0 0 0 0 55 69 1 2 75 53 16 16 13	$\begin{array}{c} 0 \\ 0 \\ 0 \\ \end{array}$	$\begin{array}{c} 0 \\ 0 \\ 0 \\ \hline \\ 20 \\ 18 \\ 14 \\ 21 \\ 10 \\ 9 \\ 16 \\ 13 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ $
Serine protease AGAP004631-PA Coagulation factor deficiency 2 homolog AGAP000396-PA Thioredoxin peroxidase AGAP011319-PA Pacifastin-related peptide AGAP011824-PA Thioredoxin peroxidase AGAP006430-PB CTLGA2 AGAP006430-PB CTLGA2 AGAP0011223-PA FBN8 AGAP001212-PB PGRPLB AGAP001212-PB PGRPLB AGAP000536-PA FBN8 AGAP000536-PA FBN8 AGAP000536-PA PGRPS1 AGAP001055-PA SPARC AGAP011054-PA Thioredoxin peroxidase	26.1         26         25.3         25         24.9         24.8         23.3         22.4         22.4         22.4         22.4         22.4         22.2         22	$\begin{array}{c} 0.7\\ 0.1\\ \hline 0.1\\ \hline 2.1\\ 2.3\\ \hline 207.9\\ \hline 166.5\\ \hline 59.6\\ 87.1\\ \hline 1.6\\ 2.2\\ 2.1\\ \hline 1.1\\ 0\\ 0\\ 2.9\\ 9.3\\ \hline 18.3\\ \hline 16.4\\ 7.5\\ \hline 4.4\\ \hline 1.5\\ 2.7\\ \hline 61.6\\ 83.8\\ \end{array}$	IH CH CH CH CH CH CH CH CH H CH C	0 0 0 0 0 0 0 0 4 3 0 0 0 0 0 0 0 0 0 0	0 0 0 4 0 0 3 3 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 10 11 0 0 5 5 0 0 0 5 5 0 0 0 0 18 23 0 0 0 0 0 0 9 9 14 0 0 0 0 0 6 8	0 0 0 2 0 0 0 0 5 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 5 7 0 0 0 0 0 0 0 0 0 0	0 0 0 12 0 0 7 12 0 0 7 12 0 0 0 17 20 0 0 17 20 0 0 17 20 0 0 17 10 0 8 12	$\begin{array}{c} 20\\ \hline 100\\ \hline 100\\ \hline 100\\ \hline 13\\ \hline 17\\ \hline 1\\ \hline 1\\ \hline 1\\ \hline 9\\ \hline 13\\ \hline 0\\ \hline 0\\ \hline 22\\ \hline 21\\ \hline 100\\ \hline 0\\ \hline 0\\ \hline 22\\ \hline 21\\ \hline 100\\ \hline 0\\ \hline 1\\ \hline 2\\ \hline 22\\ \hline 21\\ \hline 100\\ \hline 0\\ \hline 1\\ \hline 10\\ \hline 10\\ \hline 0$	80           0           0           39           28           4           40           32           58           65           3           0           37           26           14           6           5           11           27           24           19	0 0 8 8 19 15 5 4 5 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 2 5 5 6 9 1 2 5 16 16 13 11	0 0 9 3 63 58 5 5 5 5 22 12 0 0 0 0 0 0 0 0 0 0 7 1 1 0 0 0 0 0 26 33 6 5 5	0 0 20 18 14 21 10 9 16 13 0 0 0 0 0 0 0 2 2 0 0 0 0 2 2 0 0 1 3 0 0 0 9 9 9
Serine protease AGAP004631-PA Coagulation factor deficiency 2 homolog AGAP000396-PA Thioredoxin peroxidase AGAP011319-PA Pacifastin-related peptide AGAP011824-PA Thioredoxin peroxidase AGAP006430-PB CTLGA2 AGAP0011223-PA FBN8 AGAP001212-PB PGRPLB AGAP001212-PB PGRPLB AGAP000536-PA FBN8 AGAP000536-PA FBN8 AGAP000536-PA PGRPS1 AGAP000305-PA SPARC AGAP011054-PA Thioredoxin peroxidase AGAP004811-PA	26.1         26         25.3         25         24.9         24.8         23.3         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.2         21.8	$\begin{array}{c} 0.7 \\ 0.1 \\ \hline 0.1 \\ \hline 2.1 \\ 2.3 \\ \hline 207.9 \\ \hline 166.5 \\ \hline 59.6 \\ 87.1 \\ \hline 1.6 \\ 2.2 \\ 2.1 \\ \hline 1.1 \\ 0 \\ 0 \\ 2.9 \\ 9.3 \\ \hline 18.3 \\ \hline 16.4 \\ 7.5 \\ 4.4 \\ \hline 1.5 \\ 2.7 \\ \hline 61.6 \\ 83.8 \\ \hline 4 \\ \end{array}$	IH CH CH CH CH CH CH CH CH H CH H CH C	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 4 0 0 3 3 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 10 11 0 0 5 5 0 0 0 5 5 0 0 0 18 23 0 0 0 0 0 0 9 9 14 0 0 0 0 0 6 8 8 0	0 0 0 2 0 0 0 0 5 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 5 7 0 0 0 0 0 0 0 0 0 0	0 0 0 12 0 0 7 12 0 0 7 12 0 0 0 17 20 0 0 17 20 0 0 17 20 0 0 112 11 1 0 0 8 12 12 0 0 0 12 0 0 12 0 0 7 12 0 0 0 7 12 0 0 0 7 12 0 0 0 7 12 0 0 0 7 12 0 0 0 7 12 0 0 0 7 12 0 0 0 7 12 0 0 0 7 12 0 0 0 7 12 0 0 0 7 12 0 0 0 0 7 12 0 0 0 0 12 0 0 0 0 0 12 0 0 0 0 0 0	$\begin{array}{c} 20\\ \hline 100\\ \hline 100\\ \hline 100\\ \hline 13\\ \hline 17\\ \hline 1\\ \hline 1\\ \hline 1\\ \hline 9\\ \hline 13\\ \hline 0\\ \hline 0\\ \hline 22\\ \hline 21\\ \hline 100\\ \hline 0\\ \hline 22\\ \hline 21\\ \hline 100\\ \hline 0\\ \hline 1\\ \hline 2\\ \hline 22\\ \hline 21\\ \hline 100\\ \hline 0\\ \hline 1\\ \hline 2\\ \hline 22\\ \hline 21\\ \hline 100\\ \hline 0\\ \hline 1\\ \hline 2\\ \hline 2\\ \hline 1\\ \hline 10\\ \hline 5\\ \hline \end{array}$	80           0           0           39           28           4           40           32           58           65           5           3           0           377           266           14           6           5           11           277           24           19           222	0 0 8 8 8 19 15 5 4 5 4 5 4 5 4 5 4 5 10 0 0 0 0 0 0 5 5 69 1 2 7 5 5 3 16 16 13 34	0 0 9 3 63 58 5 5 5 5 22 12 0 0 0 0 0 0 0 0 0 0 7 1 1 0 0 0 0 0 0 26 33 6 5 5 30	0 0 20 18 14 21 10 9 16 13 0 0 0 0 0 0 0 2 2 0 0 0 2 2 0 0 1 3 0 0 0 9 9 9 9 6
Serine protease AGAP004631-PA Coagulation factor deficiency 2 homolog AGAP000396-PA Thioredoxin peroxidase AGAP011319-PA Pacifastin-related peptide AGAP011824-PA Thioredoxin peroxidase AGAP006430-PB CTLGA2 AGAP006430-PB CTLGA2 AGAP0011223-PA FBN8 AGAP001212-PB PGRPLB AGAP001212-PB PGRPLB AGAP009556-PA FBN8 AGAP000305-PA SPARC AGAP011054-PA Thioredoxin peroxidase AGAP004811-PA CTL1	26.1         26         25.3         25         24.9         24.8         23.3         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.4         22.2         21.8	$\begin{array}{c} 0.7\\ 0.1\\ \hline 0.1\\ \hline 2.1\\ 2.3\\ \hline 207.9\\ \hline 166.5\\ \hline 59.6\\ 87.1\\ \hline 1.6\\ 2.2\\ 2.1\\ \hline 1.1\\ 0\\ 0\\ 2.9\\ 9.3\\ \hline 18.3\\ \hline 16.4\\ \hline 7.5\\ 4.4\\ \hline 1.5\\ 2.7\\ \hline 61.6\\ 83.8\\ \hline 4\\ 1.5\\ \hline \end{array}$	IH CH CH CH CH CH CH CH CH CH H CH C	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 4 0 0 3 3 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 10 11 0 0 5 5 0 0 0 5 5 0 0 0 18 23 0 0 0 0 0 0 9 9 14 0 0 0 0 0 6 8 8 0 0 0	0 0 0 2 0 0 0 0 5 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 5 7 0 0 0 0 0 0 0 0 0 0	0 0 0 12 0 0 7 12 0 0 7 12 0 0 0 17 20 0 0 17 20 0 0 17 20 0 0 112 11 1 1 0 0 8 12 12 0 0 0 0 12 0 0 0 7 12 0 0 0 7 12 0 0 0 0 7 12 0 0 0 7 12 0 0 0 0 7 12 0 0 0 7 12 0 0 0 7 12 0 0 0 7 12 0 0 0 0 7 12 0 0 0 7 12 0 0 0 0 12 0 0 0 0 12 0 0 0 0 0 0 0	$\begin{array}{c} 20\\ \hline 100\\ \hline 100\\ \hline 100\\ \hline 13\\ \hline 17\\ \hline 1\\ \hline 1\\ \hline 1\\ \hline 9\\ \hline 13\\ \hline 0\\ \hline 0\\ \hline 22\\ \hline 21\\ \hline 100\\ \hline 0\\ \hline 0\\ \hline 22\\ \hline 21\\ \hline 100\\ \hline 0\\ \hline 1\\ \hline 2\\ \hline 34\\ \hline 25\\ \hline 2\\ \hline 3\\ \hline 34\\ \hline 25\\ \hline 2\\ \hline 3\\ \hline 34\\ \hline 25\\ \hline 2\\ \hline 11\\ \hline 10\\ \hline 5\\ \hline 6\\ \hline \end{array}$	80           0           0           39           28           4           40           32           58           65           3           0           377           26           14           6           5           11           27           24           19           22           20	0 0 8 8 8 19 15 5 4 5 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 9 3 63 58 5 5 5 22 12 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 7 1 1 0 0 0 0	$\begin{array}{c} 0 \\ 0 \\ 0 \\ \hline 0 \\ 20 \\ 18 \\ 14 \\ 21 \\ 10 \\ 9 \\ 16 \\ 13 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ $

AGAP003625-PA		153.8	ш	3	3	2	5	4	4	10	8	11	14	29	8
CTL8		155.0		5	5	-		-	T	10	0		14	2)	0
AGAP004810-PA	20.8	23	CH	0	0	0	0	4	0	1	3	6	5	9	71
CIL3		28.7	IH	0	0	0	0	9	1	2	4	6	4	16	59
AGAP001325-PA		60	СН	0	1	0	1	1	1	1	2	3	1	68	15
etypical 2 Cyc	20.6	66.2	ш	0	0	0	1	1	0	2	2	2	0	50	22
neroxiredoxin		00.5	ш	0	0	0	1	1	0	2	2	3	0	39	23
AGAP007412-PA		1.9	CH	0	0	0	0	0	0	0	20	7	46	27	0
CTLMA1	20.1	0.6	IH	0	0	0	0	0	0	0	31	15	25	29	0
AGAP006343-PA		0	CH	0	0	0	0	0	0	0	0	0	0	0	0
PGRPS2	20	0	IH	0	0	0	0	0	0	100	0	0	0	0	0
AGAP006342-PA	20	36	CH	0	0	0	1	0	0	1	2	2	4	81	8
PGRPS3	20	49.8	IH	0	1	0	1	0	0	1	1	2	6	74	13
AGAP005335-PA	10.8	1.8	CH	0	0	0	0	0	0	0	0	6	0	76	19
CTL4	19.0	0.4	IH	0	0	0	0	0	0	0	0	0	0	100	0
AGAP007411-PA	19.4	12.8	CH	3	2	1	6	4	2	3	9	8	22	37	4
CTLMA3	17.4	8.9	IH	5	4	4	8	3	0	8	11	11	23	24	0
AGAP002857-PB	18.1	7.3	CH	1	0	0	3	5	2	2	5	5	7	62	8
MDL2	1011	4	IH	0	0	0	0	3	0	6	7	7	6	50	20
AGAP011119-PA	18	11.5	CH	0	0	0	0	0	0	2	4	2	18	57	17
Lysozyme 3		12.4	IH	0	0	0	0	0	0	0	0	4	9	57	31
AGAP0088/8-PA	17.7	59.2	CH	2	2	1	2	4	0	1	4	5	5	69	5
Defense protein		/0.1	IH	1	1	1	1	6	0	3	4	/	9	63	3
AGAP002911-PA	17.5	0.3		0	0	0	0	0	0	0	0	0	0	0	100
		0.3	CII	0	0	0	0	0	0	0	1	0	0	12	100
L vsozvme 4 (c-	174	1.1	Сп	0	0	0	0	0	0	0	1	0	0	15	80
type)	17.4	0.5	IH	0	0	0	0	0	0	0	0	0	0	0	100
AGAP007345-PA		10.9	CH	0	0	0	0	3	2	0	3	6	5	23	58
Lysozyme 3 (c-	16.6	10.9		0	0	0		5		0	-	0	-	23	
type)		19.9	IH	0	0	0	1	6	0	2	7	8	7	29	39
AGAP007344-PA		0	CH	0	0	0	0	0	0	0	0	0	0	0	0
Lysozyme 8 (c-	16.5	0	ш	0	0	0	0	0	0	100	0	0	0	0	0
type)		0	ш	0	0	0	0	0	0	100	0	0	0	0	0
AGAP007201-PA	15.6	2.3	CH	0	0	0	0	0	0	0	0	0	0	0	100
Thioredoxin	15.0	5.8	IH	0	0	0	0	0	0	7	3	4	4	0	82
AGAP003338-PA	15.5	0.4	CH	0	0	0	0	0	0	0	0	0	0	0	100
Thioredoxin		0.1	IH	0	0	0	0	0	0	0	0	0	0	100	0
AGAP007347-PA	15.0	1.9	СН	0	0	0	0	0	0	0	0	0	0	18	82
Lysozyme I (c-	15.3	1.8	IH	0	0	0	0	0	0	0	0	0	0	34	66
		1.2	СЦ	0	0	0	0	0	0	0	0	0	0	70	28
Programmed cell	14.8	1.5	CII	0	0	0	0	0	0	0	0	0	0	12	20
death protein 5	14.0	1.9	IH	0	0	0	0	0	0	0	0	0	0	69	31
AGAP006813-PA		0.2	CH	0	0	0	0	0	0	0	0	100	0	0	0
TIL domain-	13.4			0	0	0	0	0	0	0	0	100	0	0	0
containing protein		0.4	IH	0	0	0	0	0	0	0	0	100	0	0	0
AGAP009584-PA	12.1	35.6	CH	4	3	2	2	7	0	0	4	6	7	8	57
Thioredoxin	12.1	41	IH	4	3	3	3	11	0	1	10	9	8	12	36
AGAP011460-PA		39.4	CH	0	0	0	0	0	0	0	0	0	1	6	93
Cysteine-rich	11.2	16	ш	0	0	0	0	0	0	0	0	1	0	10	89
protein (salivary)		10		0	0	0	0	-	0	0			U.	10	
AGAP002878-PA		7.2	СН	0	0	0	3	7	0	0	4	6	5	43	33
Cystatin-like	11	11.4	IH	0	0	0	1	5	0	0	6	8	8	46	26
ACAPO11922 DA		12.0	CU	0	0	0	0	0	0	0	0	0	2	07	10
AGAP011852-PA	10.3	13.9	CH	0	0	0	0	0	0	0	0	0	3	87	10
protein 1	10.3	12	IH	0	0	0	0	0	0	0	0	0	2	90	7
AGAP004632-PA		0	СН	0	0	0	0	0	0	0	0	0	0	0	0
Defensin	10	0.1	IH	0	0	0	0	0	0	0	0	0	0	0	100
AGAP006253-PA		47	CH	0	0	0	0	0	0	0	0	0	0	1	99
Cysteine-rich	9.5	(F A		0	0	0	0	0	0	0	0	0	0	2	0.0
venom protein		65.4	ш	0	U	0	0	0	0	U	U	U	0	2	98
AGAP008645-PA	88	0.6	CH	0	0	0	0	0	0	0	0	0	0	0	100
Gambicin	0.0	0.5	IH	0	0	0	0	0	0	0	0	0	0	0	100
	8.8	1.3	CH	0	0	0	0	0	0	0	0	0	0	0	100

AGAP012970-PA Cysteine-rich		4.3	IH	0	0	0	0	0	0	0	0	0	0	0	100
venom protein															
AGAP011482-PA		3.3	CH	0	0	0	0	0	0	0	0	0	0	0	100
Kazal domain- containing protein	8.5	5.1	IH	0	0	0	0	0	0	0	0	0	1	2	97
AGAP007199-PA	7	0.5	CH	0	0	0	0	0	0	0	0	0	0	0	100
Defensin	/	1.5	IH	0	0	0	0	0	0	0	0	0	0	0	100
AGAP008968-PA		44.3	CH	0	0	0	0	0	0	0	0	1	2	1	95
Kazal domain- containing protein	6.5	52	IH	0	0	0	0	0	0	0	0	0	1	1	97

\*RA stands for relative abundance, it's represented as [protein abundance \* 10000/total protein abundance of CH or IH]. Molecular weight under each gel slice indicates the upper limit of each slice. The values of each protein in each slice is the percentage of abundance out of the protein's total abundance in CH or IH, so 12 slices of each protein adds up to 100%. Red boxes indicate the calculated positions of the proteins.

#### Abbreviations:

PPO: Prophenoloxidase **RNAi: RNA interference** CTL: c-type lectin PRR: pathogen recognition receptor PAMP: pathogen associated molecular pattern LPS: lipopolysaccharide LTA: lipoteichoic acid IMD: immune deficiency PGRP: peptidoglycan recognition protein  $\beta$ GRP:  $\beta$ -1, 3-glucan recognition protein GNBP: Gram-negative bacteria binding protein AMP: antimicrobial peptide PAP: PPO activating protease SPH: serine protease homolog CH: control hemolymph HP: hemolymph protease DHI: 5, 6-dihydroxyindole MS: mass spectrometry LFQ: label-free quantification PTU: 1-phenyl-2-thiourea IH: induced hemolymph PTGS: post-transcriptional gene silencing **RISC: RNA inducing silencing complex** qRT-PCR: quantitative reverse transcriptional PCR TBS: tris-buffered saline GAR-AP: alkaline phosphatase linked goat-anti-rabbit secondary antibody LDLp: low density lipophorin TEP: thioester-containing protein FBN: fibrillin OBP: odorant-binding protein LRR: leucine-rich repeat SP: serine protease

## VITA

## Xuesong He

#### Candidate for the Degree of

### Master of Science

# Thesis: LARVAL HEMOLYMPH PROTEINS AND PHYSIOLOGICAL ROLE OF PROPHENOLOXIDASES IN ANOPHELES GAMBIAE

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