Supplementary information (Figures and Tables)

Supplementary Fig. S1:



Supplementary Figure S1. a Attributed origin of the reads, from all libraries, according to the matched organism (left pie chart). The library origin of the chicken (*Gallus gallus*)-derived contigs is shown in the right pie chart. **b** Heat map for 12,484 selected transcripts showing diversity of transcripts expressions among studied libraries. UP - unfed protonymph, FP - fed protonymph, FD - fed deutonymph, FA - fed adult, MG - midgut.

Supplementary Fig. S2:



Supplementary Figure S2. Left: A pie chart of the partition of individual protease families identified in the *D. gallinae* transcriptome; Asp, Cys, Ser, MP - Aspartyl, Cysteine, Serine proteases, and Metalloproteases. **Right:** BlastP results of known cysteine and aspartic proteases against selected Chelicerates with a specific focus on Acari species. Accession IDs of homologues identified, as well as query sequences used, presented in Figure 3a are shown here. *Lp, Limulus polyphemus; Pt, Parasteatoda tepidariorum* (a representative of Araneae); *Tu, Tetranychus urticae; Ss, Sarcoptes scabiei; Is, Ixodes scapularis; Rm, Rhipicephalus microplus; Mo, Metaseiulus occidentalis; Vd, Varroa destructor; Nc, Neoseiulus cucumeris; Dg, Dermanyssus gallinae.*

Supplementary Fig. S3:



Supplementary Figure S3. a The reconstructed chromatogram for Coproporphyrinogen III $[M+H]^+$ 661.3165-661.3297 for *Dermanyssus gallinae* samples, confirmed only by the exact mass. **b** The reconstructed chromatogram for Haem $b [M+2]^+$ 616.1698-616.1822, first for standard (Haemin) and second for *Dermanyssus gallinae* sample and mass spectrum of Heamin for explanation of diagnostic mass $[M+2]^+$.

Supplementary Fig. S4:



Supplementary Figure S4. Intracellular and secretory ferritins from *D. gallinae* – cDNA and deduced amino-acid sequences. Putative Iron-Responsive-Element in *D. gallinae* 5' UTR of Ferritin 1 transcript: Green, the "head" part of the stem-loop structure; violet, complementary bases forming the stem; Signal peptide of secretory ferritin 2 is highlighted in yellow.



Supplementary Fig. S5:

Supplementary Figure S5. Overview of transcripts encoding proteins implicated in nutrient status signaling pathways. IIS, insulin/IGF signaling; InR, insulin receptor; Ilp, insulin-like petide. **a** Mapping of nutrient sensing and storage, and TOR-mediated signaling pathway in *D. gallinae* developmental stages, using *Caenorhabditis elegans* homologues, FPKMs and accession numbers are shown. **b** Survival plot of mites exposed to Torin2 inhibitor, through an *ex vivo* membrane feeding system. Each value is derived from 10 engorged mites in the feeding chamber; Mean and SEM from three independent chambers are shown from two independent experiments. Statistical t-test indicate *** p = 0.0001 and **** p < 0.0001.

Supplementary Fig. S6:

Signal peptide

MBD2887064								70
MBD2876840	MSVNICNALS	SAMYILLGTI	LLGSATVLAS	ALSPNHHKOO	OMOEFAGVSS	PSLYCOPLPL	POA IRGKPKS	
MBD2886266	MSVNTCNALS	SAMYTLIGTT	LIGSATVLAS	AL SPNHHKOO	OMOEFACUSS	PSLYCOPLPL	POATRGKPKS	
MBD2879406	MSVNTONALS	SAMYTLIGTT	LIGSATVLAS	ALSPNHHKOO	OMOEFACUSS	PSLYCOPLPL	POATRGKPKS	
ND 507090	MATWINCKLT	TASLTICIDA	CONDTROOT	FEDDNDNCTT	TLESLADITS	D		
ND 491470			MUTDSSPST	Lannenorr	IJ.J.I.I.M	D		
MP_4514/0.			- MI 12 002 02	L.				
1000000000	MECTAPON	ANDATOT	IDOTIONDU	DODTOTICTN	N TOODALID	INTUTOCTOR	TODITISCOUT	140
MBD2887064	MISDKEGK	ANFRALERRI	LOSIIGVGRY	DSRIRPMGIN	N-IDGPALVR	VNIYIRSIGK	IDDVIMEYIV	140
MBD2876840	PYMTSDKEGK	ANFRALEKRI	LDSIIGVGRY	DSRIRPMGIN	N-TDGPALVR	VNIYIRSIGK	IDDVIMEYIV	
MBD2886266	PIMISDREGR	ANFRALEKRI	LDSIIGVGRY	DSRIRPMGIN	N-TDGPALVR	VNIYIRSIGK	IDDVIMEYIV	
MBD2879406	PYMTSDKEGK	ANFRALEKRI	LDSIIGVGRY	DSRIRPMGIN	N-TDGPALVR	VNIYIRSIGK	IDDVIMEYIV	
NP_507090.	IHIPIEOP	QTSDSKI	LAHLFTSG-Y	DERVRPPTDN	GGPVVVS	VNMLLRTISK	1 DV VNMEY SA	
NP_491470.		MQSEQEI	TNATTRNJ	LMRV RPP PAN	SSIEGAVNVR	VNIMIRMLSK	IDVVNMEYSI	
MBD 288 70 64		FRIOVEDIC-	COTRVITI	TROPRETAORD	LEFSNEVECH	THOT TUDNUT.	T. D.T. YON COUT.	21.0
MBD2876840	OLT TO OONDD	FPLOYDDLC-	COLDALTI	TROKKTWORD	LEFSNEKECH	LHOT TUDNUT.	LOT VDNCDVI	210
MBD2886266	OLT FROOMPD	EDIOVDDLG-	COLDVI.TL	TDOKKTWODD	L.FFSNFKFCH	LHOT TUDNUL	T.DT VDNCDVI	
MD2000200	OT TEL OCHIDE	ENIQIDDUG	COLDVIT	TROUVEROPP	L PROMERCE OIL	THOTTOPNUL	I DIVINGDUI	
MBD2879406	QLIFRQQWRD	KERGIDDDG-	GQIRILIL	TUCIOTWODD	TEEDERICH	THOTTOPNAT	LETIPNGDVL	
NP_507090.	QUITERESWID	KRLSIGVKGD	GOPDFVIL	IVGHQIWMPD	IFF PREKUAI	RHILDRPNVL	INTERPORT	
NP_491470.	OPIEKEOMID	PREATENDER	INPPAELIVP	HVKKSLWIPD	1 FF PIEKAAH	RHEIDMENME	TRIIDORID	
	2022200000	Cys 1	oop	22.02.02.02.02.02.02.02.02.02.02.02.02.0		201023005 - 9372		
MBD2887064	FSIRISLVLS	CPMNLKFYPL	DKOICSILMA	SYGYTTEDLV	FLWKEGDPVQ	VIKNTHTb	RFTLER-FNT	280
MBD2876840	FSIRISLVLS	C PMN LKFYP L	DECICSILMA	SYGYTTEDLV	FLWKEGDPVQ	VIKNTHTb	RFTLER-FNT	
MBD 288 62 66	FSIRISLVLS	C PMN LKFYP L	DKDICSILMA	SYGYTTEDLV	FLWKEGDPVQ	VTKNLHLP	RFTLER-FNT	
MBD2879406	FSIRISLVLS	C PMN LKFYP L	DECICSILMA	SYGYTTEDLV	FLWKEGDPVQ	VIKNLHLP	RFTLER-FNT	
NP_507090.	YSVRISLVLS	CPMYLQYYPM	DVQQCSIDLA	SYAYTTKDIE	YLWKEHSPLQ	LKVGLSSSLP	SFQLTN-TST	
NP_491470.	YSSRISLTSS	CFMRLQLYPL	DYOSCNFDLV	SYAHTMNDIM	YEWDPSTPVQ	LKPGVGSDLP	NFILKNYTTN	
			out	TM1	i	n	TM2	
MBD2887064	DYCTSRINTG	EYSCLKVDLV	FKREFSYYLI	OIYIPCCMLV	VVSWVSEWLD	PISIPARVSL	GVTTLLTMAT	350
MBD2876840	DYCTSRINIG	EYSCLKVDLV	FKREFSYYLI	OIYI PCCMLV	VVSWVSEWLD	PISIPARVSL	GVTTLLTMAT	
MBD2886266	DYCTSRINTG	EYSCLKVDLV	FKREFSYYLI	OIYIPCCMLV	VVSWVSEWLD	PTSIPARVSL	GVTTLLTMAT	
MBD2879406	DYCTSRINIG	EYSCLKVDLV	FKREFSYYLI	OIYIPCCMLV	VVSWVSEWLD	PISIPARVSL	GVTTLLTMAT	
NP 507090.	TYCTSVINIG	IYSCLRTTIO	LKREFSFY	OLY SCALV	IVSWVSEWED	RTAIPARVTL	GVTTLLTMTA	
NP 491470.	ADCTSHTNTG	SYGCLEMOLL	FKRQFSYYLV	QLYAPTTMIV	IVSWVSFWID	LHSTACRVAL	GVTTLLTMTT	
				m (2				
		1 L		TMS				
MBD2887064	QISCINASLP	PVSYTKAIDV	WTGVC LTEVE	GALLEFALVN	YASRSDORRO	NIHKQSVPQA	SQQRQKWLLP	420
MBD2876840	QISCINASLP	PVSYTKAIDV	WTGVC LTEVE	GALLEFALVN	YASRSDORRO	NIHKQA	SQQRQKWLLP	
MBD 288 62 66	OISGINASLP	PVSYTKAIDV	WTGVC LTEVE	GALLEFALVN	YASRSDORRO	NIHKOSVPQA	SOOROKWLLP	
MBD2879406	QISCINASLP	PVSYTKAIDV	WTGVC LTEVE	GALLEFALVN	YASRSDORRO	NIHKQ		
NP 507090.	GAGINSQLP	PVSYIKAIDV	WIGACHTFIF	CALLEFALVN	HIANKQGVER	KARTE		
NP_491470.	MOSAINAKLP	PVSYVKVVDV	WLGACQTEVE	GALLEYAFVS	YODSVRONDR	SREKA		
MBD2887064	ASIAAAGLEN	NOSAIDHCDE	AFAMPFOGSA	AERGGMARNA	LPNDADILVP	RORTHTAPPO	EIRQCEVHMK	490
MBD2876840	ASIAAAGLEN	NOSAIDHCDE	AFAMPFOGSA	AERGGMARNA	LPNDADILVP	RORTHTAPPO	EIROCEVHMK	
MBD2886266	ASTAAAGLEN	NOSA TOHCOE	AFAMPFOGSA	AERGOMARNA	LPNDADILVP	RORTHTA PPO	ETROCEVSST	
MBD2879406							VCIT	
NP 507090.					-REKAEIPLL	ONLHNDVPTK	VENCEEKVRT	
NP 491470.					-ARKAORR	REKLEMVDAE	VYOPPCTCHT	
MDD 200 70 CA	CDESTERNIC	DOM COPPOS	in_	TODIPOLIUP	M4	out		
MDD 2007 CO 40	CDCCTCCNLC	ROWLOKEPIK	CTOTOT	TODIPONI	ALENLY IWIT	VI PDPDAD	222	
MBD 28/6840	GPS ST SSNLC	RSWLSRFFIR	SKRIDV	ISKIEPUME	ALENLY YWIT	ILEKEDAD		
MBD2886266	SPROHTALFC	CLITINYFIG	NSDLIV	NSVLKVNIIF	KMSWQL	ALIGT		
MBD2879406	CSYINSLLVV	LVELYIILQS	YSTINL	N				
NP_507090.	VPLNRRQMNS	FLNLLETKTE	WNDISKRVDL	ISRALFPVLF	EVENILYWS-	REGQ	OWATE.	
NP_491470.	FEA-RETFRD	KVRRYFTKPD	YLPAKIDF	YAREVVPLAF	LAFNVIYWVS	CLIMSANAST	PESLV	

Supplementary Figure S6. Amino acid alignment of identified sequences of *D. gallinae* glutamate-gated chloride channels (in bold). Alpha and beta subunits of *C. elegans* homologues (NP_507090 and NP_491470, respectively) served as templates for identifications of secondary structures. Residues involved in interactions with ivermectin are highlighted in green.





Supplementary Figure S7. Visualisation of read coverage of glutamate-gated chloride channels encoding transcripts, assessed through RNA-Seq by Expectation-Maximization (RSEM) software package. Red indicates aligned read assignment over multiple transcripts, while black indicates uniquely assigned reads.

Supplementary Fig. S8:

Туре	Thiol	Protein-ID ^a	RNAseq-ID	Unfed Protonymph FPKM	Fed Protonymph FPKM	Deutonymph FPKM	Adult FPKM	Midgut (adult) FPKM
DgA2M(sv1)	Yes	MBD2876438.1	Dg-350935_FR6_221-1770	193,66	78,56	60,35	59,62	76,14
DgA2M(sv2)	Yes	MBD2883834.1	IrSigP-350924_FR6_98-1629	23,34	120,29	149,36	47,93	20,13
DgA2M(sv3)	Yes	MBD2876440.1	IrSigP-350933_FR6_221-1778	15,71	11,66	12,86	0,33	0,86
DgA2M(sv4)	Yes	MBD2879613.1	IrSigP-1160473_FR1_175-1366	8,87	20,43	20,51	6,63	7,4
DgA2M(sv5)	Yes	MBD2878485.1	Dg-350932_FR3_95-1489	0,1	11,37	8,72	9,18	9,41
DgC3	Yes	MBD2883842.1	IrSigP-433789_FR5_615-2320	39,31	21,25	23,05	27,66	28,98
DgTEP	Yes	MBD2879163.1	IrSigP-580656_FR2_299-1580	33,55	77,78	83,56	26,9	8,46
DgMCR-1	No	MBD2885045.1	Dg-370713_FR6_393-2047	12,62	12,64	15,08	1,62	0,17
DgMCR-2	Yes	MBD2885046.1	IrSigP-392592_FR1_123-1721	16,12	36,15	28,07	0,98	0,06
DgMCR-3	No	MBD2882826.1	Dg-594457_FR6_1037-2807	7,2	4,1	5,21	0,26	0,02



Alternative splicing within the 'bait regions' of *D. gallinae* α_2 -macroglobulins:



Supplementary Figure S8. Identified transcripts encoding *D. gallinae* members of thiol-ester containing protein (TEP) family and phylogenetic tree with selected well-annotated TEPs from other invertebrates. The tree was reconstructed using the maximum likelihood method based on the alignment of full amino acid sequences (~1500 residues). Ag – malaria mosquito *Anopheles* gambiae; Dg (in red) – red poultry mite *Dermanyssus gallinae;* Dm – the fruit fly *Drosophila melanogaster;* Ir – the hard tick *Ixodes ricinus;* Lp – the horseshoe crab *Limulus polyphemus.* Numbers at the branches represent bootstrap support values calculated from 1,000 replicates. GenBank Accession Nos. to the TEP sequences of other invertebrates shown in the phylogenetic tree: AgTEP1 (AVK92986.1); AgTEP13 (XP_317044.4); DmTEP1 (CAB87807.1); DmTEP2 (CAB87808.1); DmTEP3 (CAB87809.1); DmTEP4 (CAB87810.1); DmMCR (AAF52601.1); IrA2M-1 (Q0J54010.1); IrA2M-2 (Q0J54011.1); IrA2M-3 (Q0J54012.1); IrC3-1 (Q0J54014.1); IrC3-2 (Q0J54015.1); IrC3-3 (Q0J54016.1); IrMCR-1 (Q0J54017.1); IrMCR-2 (Q0J54018.1); IrTEP (Q0J54013.1); LpA2M (BAA19844.1); LpC3-1 (XP_013775397.1); LpMCR-1 (XP_022254489.1); LpMCR-2 (XP_013776899.1); Lp-ovostatin (XP_022249030.1); LpTEP1 (XP_013786421.1).Expression values (FPKM) are shown in the Table below, "blue Accession Nos. are used in the phylogenetic tree.



Supplementary Figure S9. Identified transcripts encoding components of RNAi pathway in the *D. gallinae* transcriptomes. Protein sequences of *Drosophila* or *Tribolium* (Tube) RNAi pathway were used to search in our *D. gallinae* translated protein database by using program Bioedit (Local BLAST, E value 0.1, Matrix BLOSUM62). Conservation of the domains was checked by CD-search (NCBI). Only hits with similar domain structures and an E-value $< 10e^{-3}$ were considered as putative homologues. Accession numbers are available as Supplementary Table S9.

Sample	Raw Reads	Effective Rate (%)	GC content (%)	Error Rate (%)	Q20 (%)	Q30 (%)
unfed protonymphs	57338502	97.58	49.19	0.03	97.89	94.09
fed protonymphs	58861591	97.54	49.69	0.03	97.79	93.90
deutonymphs	58727555	97.99	49.87	0.03	97.85	94.00
adults	54699347	97.73	50.75	0.02	98.14	94.77
midguts from adults	61346035	98.09	49.51	0.03	97.90	94.33

Supplementary Table S1: Information on read counts and quality scores achieved by Illumina sequencing.

Supplementary Table S2: Summary of reads origin.

	Sum of reads	% total reads	Contigs	% total contigs
REFSEQ- INVERTEBRATE	126,948,051	41.52	19,590	23.02
ACARI	153,704,406	50.27	11,739	13.79
GALLUS	3,301,469	1.08	11,258	13.23
TICK-PATHOGENS	6,432,162	2.10	4,251	4.99
UK	15,389,923	5.03	38,279	44.97
Total	305,776,011	100	85,117	100

Supplementary Table S3: Accession IDs to differentially expressed transcripts in blood-fed protonymphs over transcriptomes of unfed protonymphs, shown in Figure 2c. Oligoes used in RT-qPCR in Figure 2c' are shown in the last column.

DET No	Annotation	Transcript ID (hyper- linked Excel file)	Protein ID (NCBI)	RT-qPCR primers
2	Carboxypeptidase	IrSigP-456705_FR5_11- 515	MBD2876455	F: GAGAATCGCCAGCAGAACCT R: CGTATGGTACTGGGTCAGGC
3	717131_FR2_65- 201	Dg-717131_FR2_65-201	MBD2886605	F: AAACCTTTGGCAGCGTACTC R: CGCTCCCTCGGTAGAAATCT
4	465142_FR6_1943- 2222	IrSigP- 465142_FR6_1943-2222	MBD2879726	F: GACGAGAAGGGTTTGTCCTC R: TGTCGAGGTAGATGTGCTGG
5	Stubble	IrSigP- 702379_FR6_1752-2725	MBD2890242	F: TGATCGGCATCATCTCGTGG R: CCTCGTGATGCGGGTGTAAA
6	Cathepsin L5	Dg-417098_FR1_205- 573	MBD2876666	F: GTGTTCGATCCGTGGTTCTG R: AGTTCTTCACGAGCCAGGAG
7	Cuticle protein 7	IrSigP-633645_FR4_104- 234	MBD2890009	F: CGATTACCGGCCGAGTCTAC R: GGCGCTATGTACGAGGTGAC
8	464593_FR5_41- 172	IrSigP-464593_FR5_41- 172	MBD2874827	F: TGTTTGCTCACATGGTACGC R: GATCTTTCCGGCAGCTTAGC
9	Chitinase-like	Dg-426972_FR5_591- 1070	MBD2887237	F: ACAGAAAAGACCTGGTGGCC R: CACCAGGTTTTCTCCGTCGA
10	Neyo-like	Dg-429223_FR6_180- 923	MBD2886979	F: TGGCGTTGACAATTCCGAGA R: GTACAGAGGCCCCATGATGG
11	Astacin-like metalloprotease	Dg-768351_FR2_357- 560	MBD2887970	F: ACGGTGGTTCACGAGTTTGG R: GCTTGATGAATTGGTCGCGG
12	703171_FR2_257- 506	IrSigP-703171_FR2_257- 506	MBD2883573	F: GAAGCCGCTGTGAAGCTAGA R: GCACTGCGCATAGATCTGGA
13	Mucin	Dg-385271_FR5_1-555	MBD2881848	F: AGTACCAGGCTCCTCAACCT R: TATAGGCAGGTTGACGGGGA
14	Peritrophin 1	IrSigP-436463_FR6_542- 720	MBD2890592	F: GTGCTTTCAGTCGCCGTATG R: CAAGTTGCTTCACCTGACGC
15	Peritrophin 2	IrSigP-436466_FR2_223- 511	MBD2889708	F: GGCACCTACTTTGTTTCGCA R: CACGTGATAGAATGGGCAGC
	Legumain isoenzyme 4	IrSigP- 379957_FR2_1085-1545	MBD2885568	F: CCATAGCGGTGTGTGTCCTC R: GTTTGGCCACCATCTTCAGC

Supplementary Table S4: Accession IDs to differentially expressed transcripts in midguts over whole bodies of adult mites, shown in Figure 2d. Oligoes used in RT-qPCR in Figure 2d' are shown in the last column.

DET No	Annotation	Transcript ID (hyper- linked Excel file)	Protein ID (NCBI)	RT-qPCR primers
1	Trypsin-like serine protease	IrSigP-562590_FR6_227- 579	MBD2888300	F: CGGACGGACTTCTTTGACGA R: GAACGCTACTTCCGCTCGTA
2	Caspase-1-like isoform X2	Dg-598524_FR2_222- 566	MBD2885764	F: AGGTATTCTGGCCACTGACC R: TAGCCGGCCACAGTTGAATA
3	Amino acid transporter	Dg-370073_FR3_533- 1060	MBD2877231	F: ACACCAATGCCAGCACTCAT R: TTAGTTGGCCAATGTCCGCA
4	Apolipophorins-like	Dg-404344_FR1_98- 2680	MBD2886271	F: TCTCGACATCGTTGATCGGC R: CGAGTCGCTCCGTGATGATT
5	P2X purinoceptor 4	Dg-950939_FR2_274- 714	MBD2886414	F: GAAGTGGAGTACAGACGGGC R: CCAGCCTCGGATTTCGCATA
6	S- adenosylmethionine synthetase	Dg-620064_FR5_192- 681	MBD2883952	F: GTAGTGGTGAGAGCGGTCAT R: ATTGGGCCTCCTTCGATGAA
7	Ferritin 2	IrSigP-384458_FR2_148- 399	MBD2883635	F: TCCTCGAGCATCACGTCAAC R: GGATCACGACAGTCCTCGTC
8	Sulfotransferase family cytosolic 2B	Dg-807076_FR4_126- 470	MBD2875543	F: AACGGATCAACGAGTGGAGG R: GTCGTACTTCACCGAGCAGT
9	Ferrochelatase	Dg-649831_FR2_303- 703	MBD2876119	F: GAGCTGGCCAAAGAGCTGAA R: AGACCCCGAATGAAGTGCTC
10	Acid sphingomyelinase	IrSigP-602409_FR5_87- 754	MBD2884868	F: ATCGGGGTTAACTTCGTCGC R: CGTCGATACTGTAGACGCGG
11	Cathepsin D1	IrSigP-519820_FR3_359- 840	MBD2876745	F: TTCAGTACGGCTCAGGATCC R: ACTCCTTTGTGATCTCGCCA
12	Solute carrier family 35 member F6-like	IrSigP- 662643_FR6_1690-2093	MBD2876932	F: ATATCGGGTTCGTGCCCTTC R: CTTCGCGTGTCCTCCTCTTC
13	GABA receptor	Dg-565248_FR2_220- 775	MBD2887064	F: CCCAACGATGCCGACATTCT R: TGAACCTCACATTGCCGGAT
14	Cathepsin L3	IrSigP-413246_FR4_193- 533	MBD2885740	F: GTCAAGGATCAGCAGCAGTG R: TCGACAAGGTTCTGTTCGGA
15	Hemolymph lipoprotein	Dg-350407_FR6_167- 1642	MBD2878204	F: GTTGCAGATGCTTGCTCGTG R: TTTCGCCAGTTGTCAGCTCA

Supplementary Table S5: Accession IDs to transcripts encoding cysteine and aspartic proteases shown in Figure 3b.

Protease	isoenzyme type	Transcript ID (hyper-linked Excel file)	Protein ID (NCBI)
	1. Chymotrypsin	Dg-651195 , IrSigP-651191, Dg-651193, Dg- 404258, IrSigP-651189	MBD2881020
	2. Anionic trypsin	Dg-404994	MBD2877379
	3. Chymotrypsin-like elastase	IrSigP-607270	MBD2881713
ses	4. Chymotrypsin-like elastase	IrSigP-76325, IrSigP-355347	MBD2878320
roteas	5. Stubble-like serine protease,trypsin	IrSigP-387896	MBD2880678
ne Pi	 Stubble-like serine protease, trypsin 	Dg-615055	MBD2879484
Seri	7. Chymotrypsin	IrSigP-417374, Dg-417373	MBD2877373
	8. Chymotrypsin	IrSigP-622345	MBD2875824
	9. Chymotrypsin	IrSigP-997083	MBD2875973
	10. Chymotrypsin	Dg-602081 , Dg-602079	MBD2879331
	11. Prolyl oligopeptidase	Dg-1021459 , IrSigP-1081927	MBD2887264
	12. Serine protease K12H4.7	IrSigP-351248, IrSigP-351247	MBD2884270
	1. Cathepsin L1	Dg-632847 , IrSigP-632845	MBD2879342
	2. Cathepsin L2	IrSigP-354374, IrSigP-354370	MBD2878524
Ises	3. Cathepsin L3	IrSigP-413246, IrSigP-10997, IrSigP-413245,	MBD2885740
otea	4. Cathepsin L4	IrSigP-349742, IrSigP-349741	MBD2885566
e Pr	5. Cathepsin L5	Dg-417098 , Dg-417097,	MBD2876666
tein	6. Cathepsin L6	IrSigP-1037340	MBD2884871
Cys	7. Legumain 1	IrSigP-439085, Dg-439086	MBD2885742
	8. Legumain 2	Dg-445098	MBD2886063
	9. Legumain 3	IrSigP-535196	MBD2885743
	10. Legumain 4	IrSigP-379957	MBD2885568
eases	1. Cathepsin D1	Dg-519818 ,IrSigP-476369, IrSigP-519820, IrSigP-519817	MBD2876748
yl Prot	2. Cathepsin D2	Dg-370446 , IrSigP-808266	MBD2879957
Aspart	3. Cathepsin D3	IrSigP-16089 , Dg-1042377, Dg-1042375	MBD2876189

Supplementary Table S6: Overview of transcripts encoding proteins involved in haem and iron biology.

Reference genome Aedes aegypti Strain: Liverpool AGWG Assembly: AaegL5 BioProject Query: 597301 tBlastN

	-		%	
Query protein + ID's	transcript ID	protein ID	coverage	E value
ALAS: XP_001658653.1	Dg-608857_FR3_129-736	MBD2882839.1	91	0.0
PBGS : XP_001661237.1	Dg-568812_FR5_621-1005	MBD2885691.1	98	2e-133
HMBS: XP_001654431.1	Dg-541660_FR4_65-424	MBD2879167.1	54	5e-82
UROS: XP_001660743.2	Dg-987039_FR1_193-481	MBD2880820.1	94	1e-33
UROD: XP_001657958.2	Dg-478956_FR4_182-541	MBD2884748.1	83	6e-126
CPOX : XP_001663577.1	Dg-945296_FR1_180-609	MBD2883466.1	87	2e-151
PPOX : XP_021693143.1	IrSigP-605064_FR5_94-622	MBD2885503.1	99	1e-93
FECH: XP_001650846.1	Dg-649831_FR2_303-703 / Dg- 381015_FR5_530-916	MBD2876119.1	94	2e-149
HO: XP_001658955.1 (aedes)	NI (not identified)			0.0001
GETP01214966.1 (varroa)	NI			0.0001
Fer1 (Ir-108507)	Dg-367272_FR4_390-576	MBD2884432.1	99	1,00E-80
	IrSigP-384454_FR3_720- 940/IrSigP-384458_FR2_148- 399/IrSigP-384452_FR6_307- 551/IrSigP-384456_FR6_68-			
Fer2 (Ir-108441) IRP (c-Aconitase, Ir-	245/Dg-384450_FR2_2079-2251	MBD2876852.1	82	6,00E-62
109153)	Dg-351924_FR3_573-1476	MBD2876478.1	100	0
Tf1 (VD_001647710)	NI		27	1 OOE 14
$T_{11} (\Lambda^{P}_{001047719})$	INI	MDD2077/22 1	رد دە	1,00E-14
112 (VL_021033/03)	NII	WIDU20//452.1	93 15	0,00E+00
TFA (VD 001661901)	NI NI		40 E1	2,00E-18
114 (XP_001661801)	INI		51	5,UUE-15

Supplementary Table S7: Accession IDs to transcripts encoding adult-specific transcripts shown in Figure 5b. Oligoes used in RT-qPCR in Figure 5b' are shown in the last column.

DET No	Annotation	Transcript ID (hyper- linked Excel file)	Protein ID (NCBI)	RT-qPCR primers
1	Vitellogenin 1	IrSigP-350331_FR2_207- 2055	MBD2876257	F: GTCTCAAGCAACGCGAACTG R: AACGGAGATGCGTACTTCCC
2	Vitellogenin 2	Dg-9795_FR3_189-2089	MBD2876256	F: CCCGTCAACGAGGAACTTCA R: GAGTCCACATGCTGTTGGGA
3	Vitellogenin receptor	Dg-353835_FR3_42- 1900	MBD2877430	F: GTGGTGGAGGTGGTAGCTTC R: CCTCCTTTGGTGTTCTCGCA
4	Vitellogenin-like	IrSigP-349783_FR3_1- 1870	MBD2876000	F: TGCCTATCAAACGGGTCACT R: CCGTTGAACATGACCACGAG
5	Arginine kinase	Dg-844682_FR1_111- 471	MBD2886196	F: ACACGCGTGATGGACATCTT R: CCGGTCAATGGGTGGTAGAC
6	Tubulin alpha-8 chain	Dg-579987_FR2_129- 594	MBD2876362	F: CCCTACAATTCGGTGCTGAC R: CGGCAGATGTTGTAGATGGC
7	Paramyosin-like isoform X2	Dg-573818_FR1_53-613	MBD2885035	F: ACTCAAGCTGAACGAGACCG R: TTTTCACCCGTTCCTGCAGT
8	Elongation of very long chain fatty acids	IrSigP- 1087573_FR5_204-473	MBD2890092	F: GACTTTCCCTCGACTCAGGC R: GCAGAATTTGCGCTGAGGTC
9	Epoxide hydrolase 1	Dg-415549_FR2_82-620	MBD2877337	F: CTTATGGTTCATGGCTGGCC R: ACGTCAAAAGCAAGACCGTC
10	Histone-lysine N- methyltransferase	Dg-404921_FR2_1-529	MBD2889185	F: AAGGCTGTGATCGTTCTGGA R: TCTTTGGCCGAGTACCCTTT
11	Serine protease 27- like	Dg-423801_FR3_697- 1274	MBD2884827	F: CCTGAAGCTCCATCCGAACT R: ACTTTACGCGCCGATCTAGT

Taxonomy		Vg1	Vg1-like	Vg2
PARASITIFORM MITES				
Arthropoda: Chelicerata: Ara	chnida: Acari: Parasitiform	es: Mesostigmata: Monogy	naspida: Gamasina: Dermar	ivssoidea
	Varroa jacobsoni	XP_022710380	XP_022700578	XP_022701897
Varroidae	Varroa destructor	AFN88463	XP_022657753	AFN88464
	Stratiolaelaps scimitus	JABWDB010000015 (00009700-RA)	JABWDB010000015 (00009665-RA)	JABWDB010000015 (00009740-RA)
Laelapidae	Tropilaelaps mercedesae	OQR72561	OQR79705 + OQR72029	OQR67440
Macronyssidae	Ornithonyssus sylviarum	GIXZ01020088	GIXZ01000835	GIXZ01000591
Dermanyssidae	Dermanyssus gallinae	MBD2876257 (IrSigP-	MBD2876000.1 (IrSigP-	MBD2876256 (Dg-
		350331_FR2_207-2055)	349783_FR3_1-1870)	9795_FR3_189-2089)
Arthropoda; Chelicerata; Ara	chnida; Acari; Parasitiform	es; Mesostigmata; Monogy	naspida; Gamasina; Phytos	eioidea
· · · · · · · · · · · · · · · · · · ·	Amblyseius swirskii	GHIT01048819 +	absent	GHIT01045440
		GHIT01041025		
	Amblyseius eharai	QKO00543	absent	QBZ96191
	Neoseiulus cucumeris	AGQ56698	absent	
Phytoseidae	Neoseiulus barkeri	ASB3/115	absort	AGQ56699
	Galendromus occidentalis	XP 003746410	absent	ASB34116
				VD 019404462
	Euseius nicholsi	QKO00545	absent	AF_018494403 OCX36526
TICKS				QUANUEL
Arthropoda; Chelicerata; Ara	chnida; Acari; Parasitiform	ies; Ixodida; Ixodoidea		
	Rhipicephalus microplus	XP_037287934	absent	
				XP_037287793
	Rhipicephalus sanguineus	XP_037527682	absent	
	Dhiniaanhalua	05100400		XP_037528003
	Rnipicephaius haemaphysaloides	QEL09190	absent	
	Hvalomma asiaticum	KAH6940719	absent	GIJA01010490
	Dermacentor silvarum	XP 037555503	absent	КАН6940634
		-		XP 037555480
Ixodidae			absent	
	Dermacentor variabilis	AAW78557		ABW82681
	Amblyomma hebraeum	AGQ57039	absent	
				AGQ57040
	Haemaphysalis longicornis	GHI T01005427	absent	GHLT01004136 + GHLT01003656
	Ixodes scapularis	MOY43367	absent	MOY34203
	Ixodes ricinus	GIDG01029412	absent	GIDG01034908.1
	Ixodes holocyclus	GIBQ01001668	absent	GIBQ01041644
			absent	
Argasidae	Ornithodoros moubata	JAW06414		BAH02666
ACARIFORM MITES				
Arthropoda; Chelicerata; Ara	chnida; Acari; Acariformes	; Trombidiformes; Prostign	nata	
Eleutherengona;	Tetranychus urticae	XP_015793828; XP_015793	699	
Tetranychidae	[`] Tetranychus truncatus	AYV88983		
	Tetranychus evansi	AYV89292		

Supplementary Table S8: The list of taxa used for the phylogenetic analysis of arthropod vitellogenins.

	Panonychus citri	AHN48900
Anystina; Parasitengona; Trombidioidea; Trombidiidae	Dinothrombium tinctorium	RWS06019; RWS07112
Anystina; Parasitengona; Trombiculoidea; Trombiculidae	Leptotrombidium deliense	RWS27858
Arthropoda; Chelicerata; Ara	chnida; Acari; Acariformes	; Sarcoptiformes; Astigmata
Psoroptidia; Analgoidea; Pyroglyphidae;	Dermatophagoides pteronyssinus	XP_027195573
Dermatophagoidinae	Dermatophagoides farinae	KAH7640524
Psoroptidia; Sarcoptoidea; Sarcoptidae; Sarcoptinae	Sarcoptes scabiei	KAF7496282
SPIDERS		
Arthropoda; Chelicerata; Ara	chnida; Araneae	
	Trichonephila clavata	GFQ69744, GFQ69748
	Parasteatoda tepidariorum	XP_015930209; XP_015921257
	Pardosa pseudoannulata	AXN69712; AXN69713
SCORPIONS		
Arthropoda; Chelicerata; Ara	chnida; Scorpiones	
	Contruroidos soulsturatus	VD 02225260
HORSESHOE CRAB	Centraroldes scalpturatus	AF_023223300
Arthropoda; Chelicerata; Mer	ostomata; Xiphosura	
	Limulus polyphemus	XP_022258932; XP_022244466
CRUSTACEANS		
Arthropoda; Mandibulata; Pa	ncrustacea; Crustacea; Mu	lticrustacea; Malacostraca; Eumalacostraca; Eucarida; Decapoda
	Penaeus vannamei	AAP76571
	Metapenaeus ensis	AAM48287, AAN40701, AAT01139
	Macrobrachium rosenbergii	BAB69831
	Pandalus hypsinotus	BAD11098
	Cherax quadricarinatus	AAG17936
INSECTS		
Arthropoda; Mandibulata; Pa	ncrustacea; Hexapoda; Ins	ecta
	Solenopsis invicta	AAP47155; AAY22960; AAY22961
	Cimex lectularius	CLEC001325-RA; CLEC001323-RA
	Aedes albopictus	XP_019542945; XP_019542959
	вопрух топ	INF_001037308
	Pediculus humanus corporis	xM_002431351; XM_002431353
	Tribolium castaneum	XP_970210; XP_971398
	Papilio xuthus	KPJ04900

Supplementary Table S9: Accession IDs to transcripts encoding Toll, IMD, and RNAi pathway components.

Toll pathway		According to Palmer and Jiggins,		Bioedit, local blast			
Tagret	Drosophila / Tribolium	MBE, 2015 D. gallinae	e-value	U.1 Identities	Protein ID	Final number of genes	Unique sequences
PGRP-SA	NP_572727.1	Dg-540147_FR1_164-359	6,00E-40	76/163 (46%)	MBD2887001.1	3	2
		Dg-540146_FR1_117-298	6,00E-40	76/163 (46%)	MBD2886483.1		
		IrSigP-364299_FR6_987- 1226	8,00E-27	57/193 (29%)	MBD2876088.1		
GNBP1	NP_524142.2	missing				0	0
GNBP3	NP_523986.2	missing				0	0
spz	NP_524526.1	Dg-700091_FR4_344-668	9,00E-11	34/108 (31%)	MBD2885047.1	11	9
		Dg-453081_FR2_746-	2,00E-05	33/116 (28%)	MBD2881466.1		
		Dg-1044839_FR6_83-641	2,00E-05	33/116 (28%)	MBD2881465.1		
		Dg-518881_FR1_385- 2031	2,00E-05	37/152 (24%)	MBD2886331.1		
		Dg-382595_FR1_94-374	3,00E-05	30/111 (27%)	MBD2875246.1		
		Dg-382596_FR1_549-829	3,00E-05	30/111 (27%)	MBD2875239.1		
		IrSigP-382594_FR1_134- 419	3,00E-05	30/111 (27%)	MBD2875245.1		
		IrSigP-512652_FR1_183- 755	8,00E-05	35/146 (23%)	MBD2886337.1		
		IrSigP- 1079353 FR4 183-755	8,00E-05	35/146 (23%)	MBD2886336.1		
		IrSigP-778055_FR6_423-	8,00E-05	31/105 (29%)	MBD2890046.1		
		Dg-782185_FR4_112-753	8,00E-05	31/105 (29%)	MBD2882432.1		
Toll-1	NP_524518.1	Dg-576571_FR1_304- 1394	9,00E-92	267/914 (29%)	MBD2880219.1	12	8
		Dg-567274_FR5_43-1875	2,00E-91	278/968 (28%)	MBD2879243.1		
		Dg-578655_FR2_164- 1257	4,00E-91	266/909 (29%)	MBD2880160.1		
		IrSigP-382316_FR3_61- 1433	1,00E-77	257/985 (26%)	MBD2882696.1		
		Dg-446710_FR5_49-1280	3,00E-73	247/971 (25%)	MBD2885043.1		
		IrSigP-446711_FR2_241- 1533	4,00E-73	246/971 (25%)	MBD2883423.1		
		Dg-709305_FR5_596- 2090	3,00E-71	222/852 (26%)	MBD2877998.1		
		Dg-32901_FR5_352-1601	7,00E-71	257/1002 (25%)	MBD2885673.1		
		Dg-446923_FR2_336- 1582	2,00E-68	241/981 (24%)	MBD2875902.1		
		Dg-1068943_FR6_265- 1548	1,00E-65	248/992 (25%)	MBD2885481.1		
		IrSigP- 1142933_FR4_826-2108	7,00E-58	232/912 (25%)	MBD2885044.1		

		Dg-964834_FR3_197-	2,00E-57	243/1033 (23%)	MBD2883165.1		
Myd88	NP_610479.1	Dg-366848_FR6_409-694	7,00E-10	64/274 (23%)	MBD2883109.1	1	1
tube	XP_008198084 (<i>T. castaneum</i>)	Dg-1030207_FR3_288- 932	1,00E-30	87/277 (31%)	MBD2875407.1	1	1
pele	NP_476971.1	Dg-520307_FR2_978- 1673	1,00E-57	137/329 (41%)	MBD2887978.1	2	1
		Dg-520315_FR1_520- 1491	3,00E-36	83/194 (42%)	MBD2889692.1		
dorsal	NP_724052.1	Dg-476498_FR5_529- 1233	5,00E-72	175/459 (38%)	MBD2879760.1	3	1
		Dg-476504_FR3_183-907	5,00E-72	175/459 (38%)	MBD2875479.1		
		Dg-476503_FR2_303- 1034	5,00E-72	175/459 (38%)	MBD2878093.1		
Dif	NP_523589.2	missing				0	0
cactus	NP_723960.1	Dg-359173_FR2_263-734	1,00E-20	92/338 (27%)	MBD2878651.1	1	1
Imd							
pathway							
PGRP-LB	NP_650079.1	Dg-540147_FR1_164-359	2,00E-36	76/162 (46%)		0	0
		Dg-540146_FR1_117-298	2,00E-36	76/162 (46%)			
		IrSigP-364299_FR6_987- 1226	4,00E-24	58/170 (34%)			
		Dg-540150_FR4_273-459	1,00E-21	54/124 (43%)			
PGRP-SC	NP_610410.1	Dg-540147_FR1_164-359	7,00E-34	65/160 (40%)		0	0
		Dg-540146_FR1_117-298	7,00E-34	65/160 (40%)			
		IrSigP-364299_FR6_987- 1226	2,00E-25	48/160 (30%)			
		Dg-540150_FR4_273-459	3,00E-23	49/128 (38%)			
PGRP-LC	NP_729468.2	Dg-540147_FR1_164-359	1,00E-33	68/162 (41%)		0	0
		Dg-540146_FR1_117-298	1,00E-33	68/162 (41%)			
		IrSigP-364299_FR6_987- 1226	3,00E-26	54/156 (34%)			
		Dg-540150_FR4_273-459	3,00E-22	51/125 (40%)			
PGRP-LE	NP_573078.1	Dg-540147_FR1_164-359	2,00E-33	71/161 (44%)		0	0
		Dg-540146_FR1_117-298	2,00E-33	71/161 (44%)			
		Dg-540150_FR4_273-459	2,00E-21	52/125 (41%)			
		IrSigP-364299_FR6_987- 1226	3,00E-20	41/117 (35%)			
imd	NP_573394.1	missing				0	0
tak1	NP_524080.1	Dg-625516_FR6_1422- 2006	5,00E-67	150/374 (40%)	MBD2883593.1	2	1
		Dg-540567_FR1_999- 1370	6,00E-35	88/231 (38%)	MBD2880322.1		

IKKgamma	NP_523856.2	missing				0	0
IKKbeta	NP_524751.3	Dg-442267_FR6_1351- 2127	1,00E-35	119/375 (31%)	MBD2885575.1	3	2
		Dg-444853_FR2_344- 1010	1,00E-35	119/375 (31%)	MBD2887170.1		
		Dg-823437_FR6_191-936	8,00E-27	91/283 (32%)	MBD2885364.1		
Fadd	NP_651006.1	missing				0	0
Dredd	NP_477251.3	Dg-598513_FR3_41-413	9,00E-17	86/308 (27%)	MBD2878667.1	7	4
		Dg-598516_FR3_41-422	9,00E-17	86/308 (27%)	MBD2885764.1		
		Dg-598535_FR2_222-590	4,00E-16	71/223 (31%)	MBD2885765.1		
		Dg-598533_FR3_41-446	4,00E-16	71/223 (31%)	MBD2885765.1		
		Dg-971248_FR1_366-698	8,00E-10	71/261 (27%)	MBD2875414.1		
		Dg-559693_FR4_576-	2,00E-05	33/137 (24%)	MBD2880927.1		
		Dg-559695_FR1_592- 1466	2,00E-05	33/137 (24%)	MBD2880926.1		
Relish	NP_477094.1	missing				0	0
Caspar	NP_611080.1	missing				0	0
RNAi							
pathway							
A							
Dicer-1	NP_524453	IrSigP-590221_FR1_364- 2293	e-157	293/533 (54%)	MBD2887739.1	2	1
		Dg-590223_FR1_2376- 2596	3,00E-64	128/197 (64%)	MBD2890853.1		
Dicer-2	NP_523778	Dg-575620_FR6_62-1581	6,00E-55	256/1059 (24%)	MBD2876567.1	1	1
Drosha	NP_477436	IrSigP-360170_FR2_1- 1800	0	607/1247 (48%)	"MBD2878995.1	1	1
Pasha	NP_651879					0	0
R2D2	NP_609152					0	0
XPO5						0	0
Argonaute-1	NP_725341	Dg-708394_FR3_85-1031	0	715/904 (79%)	MBD2877359.1	6	5
		Dg-708392_FR1_92-1020	0	707/906 (78%)	MBD2877356.1		
		Dg-632068_FR1_374-	e-143	343/942 (36%)	MBD2878837.1		
		Dg-632065_FR4_131-	e-142	342/945 (36%)	MBD2878839.1		_
		Dg-571008_FR5_218-	e-140	314/854 (36%)	MBD2877547.1		
		Dg-400391_FR1_369-	e-108	308/974 (31%)	MBD2875929.1		
Argonaute-2	NP_648775					0	0
Loquacious	NP_723813	Dg-1131049_FR2_355-	9,00E-55	146/395 (36%)	MBD2882785.1	2	2
		Dg-364025_FR4_2135- 2633	3,00E-05	36/136 (26%)	MBD2881328.1	+	1