|  |  |  |
| --- | --- | --- |
| ***Ixodes scapularis* genes**  **coding for haemoproteins** | **No. of genes** | **Function** |
| ***Cytochrome P450*** | **205** | **Detoxification / Lipid metabolism** |
| ***Cytochrome b5*** | **2** |
| ***Haem o synthase*** | **1** | **Haem synthesis** |
| ***Haem a synthase*** | **1** |
| ***Holocytochrome c synthase*** | **1** |
| ***Cytochrome b561*** | **2** | **Iron metabolism** |
| ***Ferric-chelate reductase*** | **1** |  |
| ***Succinate dehydrogenase cytochrome b*** | **1** | **Mitochondrial respiration** |
| ***Cytochrome b*** | **1** |  |
| ***Cytochrome c1*** | **1** |
| ***Cytochrome c*** | **2** |
| ***Cytochrome c oxidase I*** | **1** |
| ***Dual oxidase*** | **1** | **Redox homeostasis** |
| ***Catalase*** | **1** |
| ***Soluble guanylyl cyclase*** | **2** | **Nitric oxide metabolism** |
| ***Nitric oxid synthase*** | **1** |  |
| ***Tryptophan 2,3-dioxygenase*** | **1** | **Tryptophan metabolism** |

**Supplementary Table 2: Oligonucleotides used in this work**

|  |  |  |  |
| --- | --- | --- | --- |
| Amplicon name | Forward primer 5´- 3´ | Reverse primer 5´- 3´ | Amplicon length (bp) |
| CP3\_qPCR | AGGCGAATCAAAGCGTAAGA | TGGGTACCATAACGCAGATG | 62 |
| Vg1\_qPCR | GTACGACAACGTGAGCTAC | TGCAGTCTCCAGTAAGCAGGTCC | 68 |
| Vg2\_qPCR | CCTCACTTCCCTCCAGACTTC | CCAGGAGCAAGTCGAGGAC | 62 |
| EF1\_qPCR | ACGAGGCTCTGACGGAAG | CACGACGCAACTCCTTCAC | 81 |
| Actin\_qPCR | CGACATCAAGGAGAAGCTCTG | GTCGGGAAGCTCGTAGGAC | 103 |
| CP3\_pet100 | caccTTCGAAGTGGGCAAGGAC | tcactattaGCGGAAGGCGCTGGTCACG | 1819 |
| Vg1\_pet100 | caccGTCTACAAGGTCAATGGTACC | ttattaCTTGAGGGCAGTGTACACGTA | 2080 |
| Vg2\_pet100 | caccTTCGAGCCGAACCAGGAAT | ttattaCAGCGTAGAGTAGGTGAACG | 2161 |
| *Ir*Fer1\_pet100 | caccATGGCCGCCACTCAGC | ctattaTCAGTCGGACAGGGTCTCC | 529 |
| CP3\_RNAi | atgggcccCCTCGACCTAGAAAGGCAC | attctagaGTGCAGCTGGAACGACGGTG | 521 |
| Vg1\_RNAi | atgggcccGTACAAGCACACGTACTACAA | attctagaCTTGAAAAGACTGGTCTCG | 317 |
| Vg2\_RNAi | atgggcccGACCCACCTGAAGAACGAC | attctagaTACAGACTCAGGTGCTCGAG | 319 |
| *Ir*Fer1\_RNAi | atggtaccAAACGGTTCGCTTTCCTC | attctaGAGCCCCACTCGTCCTGGG | 380 |
| IRP\_RNAi | atgggccCAGCAAGAACTGGCAGAG | attctagaCAGGTGCAGGGTGCGTGG | 391 |

**Supplementary file 1: Design, sequences, and sequence similarities of recombinant Vitellogenin\_N domains of *Ir*CP3, *Ir*Vg1, and *Ir*Vg2 used for raising specific antibodies**

|  |
| --- |
| ***Ir*CP3 (GenBank KP663716)** |
| **Domain structure**  **vWD**  (1356‒1514)  **DUF1943**  (658‒945)  **Vitellogenin\_N**  (18‒619)    1  **-C**  **N-**  1537 |
| **His-tagged recombinant fragment - r*Ir*CP3 (18-619)**  MRGSHHHHHHGMASMTGGQQMGRDLYDDDDKDHPFTFEVGKDYVYHYNGKMQVYNPEQPLQSSGFAFRSKVVAQPRPDHTHFKIIDFEVDSFNGDHVHVGEHEFNYHSTEALKQFIERPFAGKFSEGKLEEAELSKSEPKWARNLKKGVLSIFQLDLVKGRHDHPHAKQFHVREEGLHGNCDTLYVVAEEEGHLKVTKIKNLEKCDKEHYAVYGRIKGHECVDCEAQETHPFVATSQVKYRLDGTPEHYVINHACATSENVFRPFGQGKTFVAQLNRTLDLEEVHDANTDTQLPEDLEKVHHIAQTFPESDEVESLEELKHVNRYVTTFDLSTDKDKFISGLNHLAALEYEDSDIKDVHSKESGGLNFLILFGSLASMPFEDIAHVYEQAVANAPEASKSQVRKVFLDLLSAVGNNPHAAFGLQLVKEDKLTDEEAEHFLAKLALNLKENSPALLTELAEVCEHVKPKRPVWVNCQLALSTLAGQEGCVRAKTDKEQDEGFCKPSIVSHFFNYEIKPEDKKDQPEYKRTVYMKAAGNLATRGAVHYLERYVSDTNQPEYRRSAALWAMVRAAPHHHELVRDVALPLYKNKSETAYLRIGAFVNVLMTKPDLYLLKYIGHNIIDDPSDQLASYVTSAFR |
| ***Is*Vg1 (ISCW013727)** |
| **Domain structure**  **Vitellogenin\_N**  (33‒243,262‒723)  **DUF1943**  (755‒992)  **vWD**  (1491‒1659)  1  **-C**  **N-**  1936 |
| **His-tagged recombinant fragment - r*Ir*Vg1 (34‒723)**  MRGSHHHHHHGMASMTGGQQMGRDLYDDDDKDHPFTVYKVNGTVTLKTLELDVTEGPALTYEGDLAVQKLTETDYVAKFLNFTLVKFDKVLGDVHHFEPHYESSLYGQEVDYFQHLQYPVRFTLKQGKVVEYGVAQEVRAGALNVYKAVLTLLQSQPETFQELPTVVSYYEDGVSGYCRVNYELQSLDAHVYTGANVVNVTKTKYLDDCKKTRPVYTVDSVEVQGYPPLCNKHLPNNFLPGYQEDTAEYEASPTVGCPVGYKPFNTLVTAHEVSYYNLSDNVLESAYTESLDVLNVFTGKVVVKTLLKVLLAHVDGPQLEEFTPVQTYQTLELTLPETSHYFDLPVYSLLVETPEEGPLKFPEALTTVVDELVSLEVEDNTAEPKQTPGLLLQLVKTVGVLTFEQLKQTVPEFLQRPVLELAPHEQVHRSLWVDLVGKAGSKSSLDLVLYLLEQNLLTRNEARRVLQDVAAFKAYPEKETLEKYLEFALGQSQVLPPLVFSTLLHTLGELVNEACPSEVEYSSYEEGYLVEVEEHAPLHRLSLPVGAQCTVQDLQQYVLRISEALKQTDDFKKVVAYLHGLGKFAKPEVLPVLLAYVNGTAENLYRLVSEGEDYLESVYFVRKAALLALDHVVKYYPKEVSPLVRTLVLNTTEPTDLRTLAFDIWLKSVPAKWDLQQVVLAAKTDLSLEFGTYEGTALK |
| ***Is*Vg2 (ISCW021228)** |
| **Domain structure**  **Vitellogenin\_N**  (28‒248,255‒745)  **VWD**  (1321‒1488)    1  **-C**  **N-**  1644 |
| **His-tagged recombinant fragment - r*Ir*Vg2(28‒744)**  MRGSHHHHHHGMASMTGGQQMGRDLYDDDDKDHPFTFEPNQEYLYKYRTAVSLSLPLKATHATGEETYGLLSVVVKEASGTGRSLVLQLLNVTSTLYDKEVEDQTEPVPGVYHQPLPVFESYQTGPVVLKLVDHSVESLEVPVGVPEEVVNLYRGLASVLTLSNPSYKKVPFTKEVPLALNDDVVVYKVYEDDLVGTCETVYNVLSSPHDEYVLNFTKTKNYHKCVGKTTVFQHVDYEHSGCPHACLKHQPKPLSETLEPELSDYVDPYGGGCPTETHLKNDLAESFLTVHYNVSLHQEVGVLEEVKAIDKKVLTSGKQQLVSTSVLHLELLLKTTPFTAVGPLEDVKTYTNLSYVYPKQHYSWHGQLYELEHLSLYGPVDTVEARTAVRGLLDQLAGLLVLDDLEVKDDYADLVSQLLTAVNVLKEYDLELLLQTVVPLENVKVVSEKEYIERKLLLDVLSLAGTDAAAKTVLRLLLEQKLTLVEAVHVLTSLQTSLVKPSTEVLDLLLDLATGGVLEKDRLLYSTAYLTLAKVVSKHCHLYDTTSHVPYGKLLRMNELDAIKKKTVPHLPTYRSMKTLKPRMSGRQYQETETEEPQYTGVPVTCTSQDYLKYVQALVQKLNEAKEFHQVTVLVHALTQLQHPEALKALVPVVLGKHHLCQTTLPEEEQSESCQYLRLVTLYALRHSLKHHAAEIQPLAQTVYFNTDEDYELRNAALVLLMGSHPPEPVLARVVLTLQKELNLQVASFTTLRCN |
| **Amino-acids identity matrix of recombinant fragments**   |  |  |  |  | | --- | --- | --- | --- | | **r*Ir*CP3** | **r*Ir*Vg1** | **r*Ir*Vg2** |  | |  | **14.5%** | **15.8%** | **r*Ir*CP3** | |  |  | **22.3%** | **r*Ir*Vg1** | |  |  |  | **r*Ir*Vg2** | |