Table S1. Gene name, gene length and accession no. of *W. bancrofti*

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| **Gene name**  | ***Gene length***  | **Accession** **No**. |
| *Wb14* | 462 | AAC17637.1\_1  |
| *mif-2* | 363 | AIM47690.1\_1  |
| *paramyosin* | 2619 | AEY79495.1\_1  |
| *troponin* | 411 | AEY79494.1\_1 |
| *independent isoglyceratre mutase isoform1* | 1548 | ABX38807.1\_1 |
| *glutathione S transferase* | 627 | AAO45827.1\_1 |
| *translationally controlled tumor protein-like-protein* | 546 | AAK71499.1\_1 |
| *cut 1* | 1173 | AAD28743.2\_1 |
| *VAH* | 663 | AAD16985.1\_1 |
| *abundant larval transcript 2 protein* | 387 | AAC35355.1\_1 |
| *20/22kDa protein* | 558 | AAG31481.1\_1 |
| *ubiquitin like protein* | 387 | AAG31480.1\_1 |
| *cuticular ochitinase* | 1515 | AAF66988.1\_1  |
| *heat shock protein 70* | 1938 | AAF66987.1\_1  |
| *TPx1* | 687 | ACL82593.1\_1  |
| *cuticular collagen* | 990 | ACJ66259.1\_1  |
| *putative RNA binding protein* | 249 | ACI26725.1\_1  |
| *high mobility group protein 1* | 306 | ABN80426.1\_1 |
| *VAH* | 654 | AAD28256.1\_1 |
| *TRX* | 438 | AAN34968.1\_1 |
| *GTP binding protein* | 576 | AAD55261.1\_1 |
| *mif-2* | 348 | AAC82615.1\_1 |
| *WbL2* | 462 | ABW38023.1\_1 |
| *WbL1* | 462 | ABO40019.1\_1  |
| *Col-4* | 180 | ABG22161.1\_1  |
| *C30G7.2* | 555 | NP\_001256634.2\_1 |
| *C30G7.2* | 561 | NP\_001256633.2\_1 |
| *psa -3* | 630 | NP\_001257263.1\_1 |
| *jud-4* | 819 | NP\_510534.3\_1  |
| *T10B10.4* | 894 | NP\_001024902.1\_1 |
| *F20D1.3* | 1392 | NP\_510486.2\_1  |
| *F54E4.3* | 819 | NP\_510433.3\_1  |
| *C05E7.2* | 861 | NP\_510150.1\_1  |
| *C34 E7.4* | 747 | NP\_510149.1\_1  |
| *C34F6.11* | 648 | NP\_001024441.1\_1 |
| *lpr5* | 1698 | NP\_509851.1\_1  |
| *F48E3.8* | 1128 | NP\_741841.2\_1  |
| *M03A8.3* | 1125 | NP\_509143.3\_1  |
| *Y72A10A.1* | 600 | NP\_509030.2\_1  |
| *M02F4.3* | 753 | NP\_508520.1\_1  |
| *Y60A3A.21* | 294 | NP\_001256895.1\_1  |
| *Y43F8C.4* | 1605 | NP\_507804.2\_1  |
| *C14B4.2* | 5331 | NP\_507767.2\_1  |
| *C25D7.5* | 1089 | NP\_506705.2\_1  |
| *F20G2.3* | 453 | NP\_001129893.1\_1 |
| *T10G2.3* | 957 | NP\_506343.2\_1  |
| *R186.8* | 216 | NP\_001024085.2\_1 |
| *F23H12.3* | 498 | NP\_001122928.1\_1 |
| *T19C4.1* | 1275 | NP\_505835.1\_1  |
| *ZK856.7* | 366 | NP\_505622.1\_1  |
| *F07C3.2* | 399 | NP\_505390.2\_1  |
| *Y57E12AL.6* | 393 | NP\_504792.1\_1  |
| *hpo-26* | 537 | NP\_504660.1\_1  |
| *C04E6.11* | 2988 | NP\_504540.2\_1  |
| *C14C11.1* | 1041 | NP\_504492.1\_1  |
| *ZC317.6* | 1041 | NP\_504445.2\_1  |
| *abu-8* | 1338 | NP\_504393.1\_1  |
| *C18G1.9* | 1041 | NP\_504282.2\_1  |
| *K03B4.1* | 1167 | NP\_504263.1\_1  |
| *Y45G5AM.9* | 1113 | NP\_001041193.1\_1 |
| *ssu-2* | 1209 | NP\_001255806.1\_1 |
| *Y67H2A.5* | 438 | NP\_502556.1\_1  |
| *H01G02.3* | 420 | NP\_001129860.1\_1  |
| *T12A7.6* | 1209 | NP\_502226.2\_1  |
| *F59B8.1* | 642 | NP\_001023249.1\_1 |
| *T19E7.6* | 375 | NP\_001033432.1\_1 |
| *Y4C6B.4* | 459 | NP\_741397.1\_1  |
| *Y56A3A.31* | 1242 | NP\_499563.1\_1  |
| *F44E2.3* | 735 | NP\_498950.1\_1  |
| *F44B9.2* | 1512 | NP\_498748.1\_1  |
| *tag-250* | 459 | NP\_001021189.2\_1  |
| *F42A10.7* | 564 | NP\_498341.1\_1  |
| *F01F1.3* | 747 | NP\_498270.1\_1  |
| *R12B2.2* | 846 | NP\_498255.2\_1  |
| *Y50D7A.8* | 1710 | NP\_497186.3\_1  |
| *Y53F4B.9* | 3507 | NP\_497095.1\_1  |
| *C09H10.9* | 1104 | NP\_496379.2\_1  |
| *mrpl-53* | 390 | NP\_001022058.1\_1  |
| *C06C3.4* | 681 | NP\_495996.3\_1  |
| *T26C5.5* | 321 | NP\_001022371.1\_1  |
| *eff-1* | 399 | NP\_001021989.1\_1  |
| *F07F6.1* | 1287 | NP\_495032.1\_1  |
| *F59A6.10* | 420 | NP\_001022216.2\_1  |
| *F41C3.8* | 951 | NP\_001040776.1\_1  |
| *F41C3.8* | 1047 | NP\_001040777.1\_1  |
| *eat-18isoform d* | 237 | NP\_001021694.1\_1  |
| *W04A4.5* | 3216 | NP\_493396.1\_1  |
| *B0379.1* | 639 | NP\_001251292.1\_1  |
| *C34B7.1* | 1323 | NP\_492264.1\_1  |
| *C30F12.5* | 1158 | NP\_001250369.1\_1  |
| *gei-3* | 876 | NP\_001076774.1\_1  |
| *C18E9.8* | 1761 | NP\_495914.1\_1  |
| *C06C3.9* | 654 | NP\_495997.2\_1  |
| *psa -3* | 726 | NP\_001076766.1\_1 |
| *F22D3.4* | 1320 | NP\_495421.2\_1  |
| *B0034.1* | 765 | NP\_495192.2\_1  |
| *Y43F8B.1* | 783 | NP\_001041192.1\_1 |
| *C46C2.6* | 237 | NP\_001040926.1\_1 |
| *Y22D7AL.6* | 435 | NP\_497426.2\_1  |
| *Y71G12B.26* | 1230 | NP\_490893.2\_1  |
| *eat-18 isoformc* | 216 | NP\_001021693.1\_1  |
| *M05D6.9* | 816 | NP\_001022254.1\_1  |
| *C50B8.6* | 615 | NP\_001023720.1\_1  |
| *C35A5.10* | 861 | NP\_001023700.1\_1  |
| *F32B5.2* | 1044 | NP\_491026.2\_1  |
| *pqn-2* | 1278 | NP\_505668.2\_1  |
| *T06F4.1* | 555 | NP\_508694.1\_1  |
| *F56E10.1* | 1077 | NP\_503135.1\_1  |
| *abu-7* | 1317 | NP\_504384.1\_1  |
| *F26A1.7* | 450 | NP\_497996.1\_1  |
| *F10E9.4* | 789 | NP\_498825.1\_1  |
| *C09B8.3* | 1164 | NP\_509005.1\_1  |
| *K08D12.4* | 303 | NP\_500124.1\_1  |
| *T05C1.3* | 702 | NP\_494793.1\_1  |
| *cre-far-7* | 417 | XP\_003105846.1\_1  |
| *paramyosin* | 2643 | AAC18613.1\_1  |
| *cecropin B2* | 180 | AAO38518.1\_1  |
| *cecropin B1* | 180 | AAO38517.1\_1  |
| *cecropinA* | 180 | AAO38516.1\_1  |
| *gambicin* | 258 | AAO38515.1\_1  |
| *beta-tubulin* | 1347 | AAU12501.1\_1  |

Table S2. Gene name, gene length and accession no. of *S. haematobium*

|  |  |  |
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| **Gene name** | **Gene length** | **Accession No.** |
|
| tropomycin | 855 | AAA88530.1\_1 |
| serine protease inhibitor | 1221 | AAA19730.3\_1 |
| Sh 23 | 657 | AAC46959.1\_1 |
| precursor anticoagulant SAP-1 | 567 | AAD00565.1\_1 |
| TCTP like protein | 507 | AAN78324.1\_1 |
| triose phosphate isomerase | 762 | BAF62292.1\_1 |
| paramyosin | 2601 | BAF62291.1\_1 |
| calpain | 2277 | BAF62290.1\_1 |
| 22.6 kDa tegmental antigen | 573 | BAF62289.1\_1 |
| fatty acid binding protein | 402 | BAF62288.1\_1 |
| tegumental protein sh 13 | 315 | AAZ29530.1\_1 |
| 22.6 kDa tegument associated protein | 573 | AAW49250.1\_1 |
| HMGB1 | 324 | AAS88235.1\_1 |
| nicotinic acetylcholine receptor non alpha subunit precursor | 2211 | AAR84358.1\_1 |
| nicotinic acetylcholine receptor alpha subunit precursor | 2145 | AAR84357.1\_1 |
| TM3 | 861 | AAK11492.1\_1 |
| cAMP dependent protein kinase catalytic subunit | 1053 | ACZ66263.1\_1 |
| acetylcholine esterase | 2070 | AAO49838.1\_1 |
| AChE | 2070 | AAO62355.1\_1 |
| CE-1a | 792 | AAM43943.1\_1 |
| acetylcholine esterase | 2070 | AAQ14322.1\_1 |
| GST | 639 | AAA29892.1\_1 |
| nicotinic acetylcholine receptor non alpha subunit precursor ShAR2 beta | 1638 | AAX59989.1\_1 |
| beta tubulin | 1335 | AAW66672.1\_1 |

TableS3. The overall nucleotide composition and nucleotide composition at the third codon position of *W. bancrofti*

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| **Gene**  | **A %** | **T %** | **G %** | **C %** | **A3 %** | **T3 %** | **G3 %** | **C3 %** |
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| *Wb14* |

 | 34.41 | 24.67 | 20.99 | 19.91 | 38.96 | 28.57 | 18.83 | 13.63 |
| *mif-2* | 34.43 | 28.37 | 19 | 18.18 | 37.19 | 30.57 | 23.14 | 9.09 |
| *paramyosin* | 29.74 | 30.35 | 18.4 | 21.49 | 26.57 | 27.6 | 19.93 | 25.88 |
| *troponin* | 31.87 | 25.54 | 25.79 | 16.78 | 29.92 | 32.84 | 19.7 | 17.51 |
| *independent isoglyceratre mutase isoform1* | 31.39 | 28.48 | 23.83 | 16.27 | 31.2 | 38.75 | 18.6 | 11.43 |
| *glutathione S transferase* | 33.17 | 28.54 | 20.41 | 17.86 | 30.62 | 38.27 | 17.22 | 13.87 |
| *translationally controlled tumor protein-like-protein* | 32.23 | 25.27 | 28.2 | 14.28 | 34.06 | 26.37 | 25.27 | 14.28 |
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| *cut 1* |

 | 32.22 | 31.28 | 19.86 | 16.62 | 41.43 | 43.22 | 8.43 | 6.9 |
| *VAH* | 31.97 | 26.39 | 23.22 | 18.4 | 29.86 | 36.19 | 19.45 | 14.47 |
| *abundant larval transcript 2 protein* | 32.29 | 23.25 | 27.64 | 16.79 | 29.45 | 28.68 | 21.7 | 20.15 |
| *20/22kDa protein* | 40.14 | 20.07 | 29.92 | 9.85 | 36.01 | 30.1 | 22.58 | 11.29 |
| *ubiquitin like protein* | 32.81 | 25.58 | 20.67 | 20.93 | 26.35 | 36.43 | 21.7 | 15.5 |
| *cuticular ochitinase* | 33.33 | 25.47 | 23.3 | 17.88 | 31.08 | 33.46 | 18.41 | 17.02 |
| *heat shock protein 70* | 29.51 | 26.26 | 24.71 | 19.5 | 23.99 | 37.77 | 21.2 | 17.02 |
| *TPx1* | 28.09 | 30.27 | 21.68 | 19.94 | 27.51 | 39.73 | 16.59 | 16.15 |
| *cuticular collagen* | 30.1 | 22.22 | 26.16 | 21.51 | 45.75 | 38.78 | 8.78 | 6.66 |
| *putative RNA binding protein* | 21.68 | 27.3 | 30.92 | 20.08 | 24.09 | 33.73 | 22.89 | 19.27 |
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| *high mobility group protein 1* |

 | 39.86 | 15.68 | 28.1 | 16.33 | 34.31 | 16.66 | 35.29 | 13.72 |
| *VAH* | 31.8 | 26.75 | 22.78 | 18.65 | 29.81 | 35.77 | 21.1 | 13.3 |
| *TRX* | 33.1 | 27.62 | 21.68 | 17.57 | 34.93 | 34.24 | 15.06 | 15.75 |
| *GTP binding protein* | 31.59 | 27.25 | 22.39 | 18.75 | 33.85 | 30.72 | 21.35 | 14.06 |
| *mif-2* | 30.45 | 28.73 | 22.7 | 18.1 | 28.44 | 37.06 | 20.68 | 13.79 |
| *WbL2* | 36.14 | 24.02 | 19.04 | 20.77 | 42.2 | 27.92 | 15.58 | 14.28 |
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| *WbL1* |

 | 34.19 | 24.67 | 20.99 | 20.12 | 38.96 | 28.57 | 18.83 | 13.63 |
| *Col-4* | 33.33 | 18.88 | 27.77 | 20 | 41.66 | 36.66 | 11.66 | 10 |
| *C30G7.2* | 23.42 | 29.36 | 21.8 | 25.4 | 24.86 | 27.56 | 16.75 | 30.81 |
| *C30G7.2* | 23.35 | 29.41 | 21.74 | 25.49 | 25.13 | 27.8 | 16.57 | 30.48 |
| *psa -3* | 33.17 | 25.55 | 22.22 | 19.04 | 39.04 | 27.14 | 24.76 | 9.04 |
| *jud-4* | 31.74 | 24.78 | 23.19 | 20.26 | 32.23 | 29.3 | 20.87 | 17.58 |
| *T10B10.4* | 28.41 | 25.05 | 21.81 | 24.72 | 21.47 | 26.17 | 22.48 | 29.86 |
| *F20D1.3* | 27.29 | 23.63 | 21.62 | 27.44 | 23.92 | 29.31 | 17.88 | 28.87 |
| *F54E4.3* | 30.28 | 27.47 | 20.26 | 21.97 | 27.83 | 28.93 | 16.48 | 26.73 |
| *C05E7.2* | 29.96 | 26.82 | 22.64 | 20.55 | 26.82 | 29.61 | 18.46 | 25.08 |
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| *C34 E7.4* |
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 | 26.37 | 23.82 | 22.62 | 27.17 | 25.3 | 22.89 | 16.06 | 35.74 |
| *C34F6.11* | 26.08 | 34.56 | 21.75 | 17.59 | 27.77 | 35.18 | 18.05 | 18.98 |
| *lpr5* | 29.32 | 25.79 | 20.31 | 24.55 | 30.91 | 31.44 | 13.95 | 23.67 |
| *F48E3.8* | 33.24 | 26.32 | 20.03 | 20.39 | 30.58 | 32.18 | 17.28 | 19.94 |
| *M03A8.3* | 33.15 | 26.13 | 21.6 | 19.11 | 29.86 | 27.2 | 21.86 | 21.06 |
| *Y72A10A.1* | 29.83 | 24.83 | 24.16 | 21.16 | 28 | 21.5 | 27.5 | 23 |
| *M02F4.3* | 32 | 24.83 | 21.77 | 21.38 | 24.7 | 26.69 | 21.91 | 26.69 |
| *Y60A3A.21* | 26.19 | 28.91 | 23.8 | 21.08 | 27.55 | 32.65 | 17.34 | 22.44 |
| *Y43F8C.4* | 32.77 | 19.56 | 26.23 | 21.43 | 29.15 | 24.48 | 29.15 | 17.19 |
| *C14B4.2* | 29.11 | 25.09 | 24.92 | 20.85 | 23.69 | 25.71 | 27.34 | 23.24 |
| *C25D7.5* | 30.85 | 27.45 | 19.55 | 22.13 | 29.75 | 28.92 | 21.21 | 20.11 |
| *F20G2.3* | 28.69 | 27.37 | 21.63 | 22.29 | 27.15 | 33.11 | 17.21 | 22.51 |
| *T10G2.3* | 35.1 | 24.86 | 21.1 | 18.91 | 36.67 | 35.1 | 16.92 | 11.28 |
| *R186.8* | 34.25 | 23.14 | 25.46 | 17.12 | 41.66 | 20.83 | 18.05 | 19.44 |
| *F23H12.3* | 29.71 | 28.91 | 20.68 | 20.68 | 29.51 | 31.32 | 20.48 | 18.67 |
| *T19C4.1* | 30.98 | 27.37 | 19.13 | 22.5 | 39.29 | 34.11 | 14.58 | 12 |
| *ZK856.7* | 30.6 | 26.77 | 25.13 | 17.48 | 25.4 | 33.6 | 20.49 | 20.49 |
| *F07C3.2* | 29.32 | 30.07 | 23.55 | 17.04 | 26.31 | 33.08 | 19.54 | 21.05 |
| *Y57E12AL.6* | 27.98 | 22.64 | 21.62 | 27.73 | 20.61 | 22.9 | 25.95 | 30.53 |
| *hpo-26* | 27 | 28.11 | 21.97 | 22.9 | 22.34 | 39.1 | 14.52 | 24.02 |
| *C04E6.11* | 31.99 | 27.91 | 21.35 | 18.74 | 34.13 | 32.73 | 18.47 | 14.65 |
| *C14C11.1* | 29.68 | 27.47 | 21.7 | 21.13 | 27.37 | 34.58 | 18.44 | 19.59 |
| *ZC317.6* | 29.58 | 27.28 | 21.9 | 21.22 | 27.37 | 34.29 | 18.73 | 19.59 |
| *abu-8* | 29.97 | 18.23 | 16.51 | 35.27 | 31.16 | 20.85 | 14.79 | 33.18 |
| *C18G1.9* | 29.1 | 26.51 | 22.38 | 21.99 | 26.22 | 31.41 | 20.17 | 22.19 |
| *K03B4.1* | 30.07 | 24.33 | 23.99 | 21.59 | 28.02 | 27.5 | 23.65 | 20.82 |
| *Y45G5AM.9* | 29.2 | 24.97 | 22.28 | 23.53 | 28.3 | 30.18 | 22.91 | 18.59 |
| *ssu-2* | 29.28 | 27.29 | 23.9 | 19.52 | 27.54 | 33.25 | 21.33 | 17.86 |
| *Y67H2A.5* | 26.71 | 21 | 22.37 | 29.9 | 25.34 | 17.12 | 17.8 | 39.72 |
| *H01G02.3* | 27.85 | 28.8 | 21.9 | 21.42 | 30.71 | 32.14 | 17.14 | 20 |
| *T12A7.6* | 32.42 | 27.37 | 21.17 | 19.02 | 31.51 | 31.76 | 19.6 | 17.12 |
| *F59B8.1* | 35.98 | 23.98 | 21.65 | 18.38 | 40.18 | 27.1 | 21.49 | 11.21 |
| *T19E7.6* | 35.2 | 25.06 | 22.4 | 17.33 | 36.8 | 27.2 | 18.4 | 17.6 |
| *Y4C6B.4* | 25.7 | 38.12 | 19.6 | 16.55 | 24.83 | 40.52 | 18.3 | 16.33 |
| *Y56A3A.31* | 25.92 | 26.97 | 24.95 | 22.14 | 26.08 | 30.67 | 29.46 | 13.76 |
| *F44E2.3* | 38.23 | 17.14 | 26.25 | 18.36 | 44.48 | 21.22 | 24.89 | 9.38 |
| *F44B9.2* | 31.34 | 28.24 | 20.76 | 19.64 | 37.89 | 37.89 | 13.49 | 10.71 |
| *tag-250* | 29.41 | 27.23 | 20.26 | 23.09 | 32.67 | 31.37 | 19.6 | 16.33 |
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| *F42A10.7* |

 | 27.3 | 25.17 | 19.85 | 27.65 | 22.87 | 24.46 | 16.48 | 36.17 |
| *F01F1.3* | 29.58 | 28.91 | 20.48 | 21.01 | 29.71 | 34.93 | 17.26 | 18.07 |
| *R12B2.2* | 37.35 | 25.05 | 21.98 | 15.6 | 40.42 | 32.97 | 19.14 | 7.44 |
| *Y50D7A.8* | 31.98 | 19.82 | 23.62 | 24.56 | 28.94 | 25.78 | 27.01 | 18.24 |
| *Y53F4B.9* | 28.48 | 20.15 | 26.37 | 24.97 | 26.68 | 21.3 | 31.9 | 20.1 |
| *C09H10.9* | 31.43 | 26.44 | 20.74 | 21.37 | 26.9 | 34.23 | 20.1 | 18.75 |
| *mrpl-53* | 32.05 | 24.87 | 20.76 | 22.3 | 33.07 | 30 | 20 | 16.92 |
| *C06C3.4* | 26.72 | 32.59 | 20.99 | 19.67 | 29.51 | 40.96 | 13.21 | 16.29 |
| *T26C5.5* | 31.46 | 26.16 | 25.54 | 16.82 | 34.57 | 25.23 | 25.23 | 14.95 |
| *eff-1* | 28.82 | 27.06 | 19.04 | 25.06 | 30.07 | 32.33 | 18.79 | 18.79 |
| *F07F6.1* | 27.27 | 28.74 | 20.82 | 23.15 | 22.14 | 35.89 | 21.67 | 20.27 |
| *F59A6.10* | 29.52 | 28.8 | 22.61 | 19.04 | 35.71 | 37.85 | 14.28 | 12.14 |
| *F41C3.8* | 27.54 | 28.81 | 19.34 | 24.29 | 31.54 | 29.33 | 17.66 | 21.45 |
| *F41C3.8* | 27.88 | 28.27 | 19.29 | 24.54 | 32.09 | 28.36 | 18.33 | 21.2 |
| *eat-18isoform d* | 21.51 | 32.06 | 29.95 | 16.45 | 15.18 | 31.64 | 34.17 | 18.98 |
| *W04A4.5* | 32.08 | 28.04 | 21.67 | 18.19 | 34.32 | 34.23 | 18.56 | 12.87 |
| *B0379.1* | 27.23 | 29.42 | 18.15 | 25.19 | 23.94 | 42.25 | 12.2 | 21.59 |
| *C34B7.1* | 31.06 | 30.15 | 18.89 | 19.87 | 32.19 | 41.72 | 12.01 | 14.05 |
| *C30F12.5* | 31.69 | 27.02 | 19.86 | 21.41 | 37.04 | 35.49 | 14.5 | 12.95 |
| *gei-3* | 31.27 | 23.85 | 19.52 | 25.34 | 29.45 | 25.34 | 22.94 | 22.26 |
| *C18E9.8* | 28.79 | 28.73 | 23.33 | 19.13 | 25.38 | 35.6 | 21.8 | 17.2 |
| *C06C3.9* | 28.44 | 30.12 | 21.4 | 20.03 | 31.19 | 35.32 | 15.13 | 18.34 |
| *psa -3* | 33.05 | 25.34 | 21.07 | 20.52 | 36.77 | 27.68 | 23.96 | 11.57 |
| *F22D3.4* | 34.16 | 29.77 | 19.54 | 16.51 | 32.04 | 36.59 | 15.68 | 15.68 |
| *B0034.1* | 30.19 | 26.01 | 23.92 | 19.86 | 40 | 33.33 | 12.94 | 13.72 |
| *Y43F8B.1* | 29.75 | 17.36 | 25.03 | 27.84 | 26.05 | 19.15 | 30.65 | 24.13 |
| *C46C2.6* | 31.64 | 31.64 | 23.62 | 13.08 | 35.44 | 43.03 | 12.65 | 8.86 |
| *Y22D7AL.6* | 27.35 | 25.97 | 27.58 | 19.08 | 17.24 | 28.27 | 31.72 | 22.75 |
| *Y71G12B.26* | 21.21 | 27.15 | 23.65 | 27.96 | 13.65 | 21.21 | 29.51 | 35.6 |
| *eat-18 isoformc* | 23.14 | 31.94 | 27.77 | 17.12 | 19.44 | 30.55 | 31.94 | 18.05 |
| *M05D6.9* | 31 | 29.16 | 22.05 | 17.76 | 32.35 | 38.6 | 16.54 | 12.5 |
| *C50B8.6* | 32.03 | 24.39 | 21.62 | 21.95 | 36.58 | 22.92 | 20.97 | 19.51 |
| *C35A5.10* | 30.66 | 29.5 | 19.39 | 20.44 | 27.17 | 38.32 | 9.4 | 25.08 |
| *F32B5.2* | 28.54 | 29.31 | 21.55 | 20.59 | 27.01 | 29.88 | 21.55 | 21.55 |
| *pqn-2* | 29.65 | 22.3 | 16.51 | 31.53 | 37.32 | 30.04 | 12.91 | 19.71 |
| *T06F4.1* | 32.97 | 22.88 | 23.06 | 21.08 | 27.56 | 27.02 | 25.4 | 20 |
| *F56E10.1* | 35.19 | 22.37 | 25.34 | 17.08 | 31.47 | 26.46 | 23.39 | 18.66 |
| *abu-7* | 30.29 | 18.6 | 16.17 | 34.92 | 32.8 | 21.86 | 13.89 | 31.43 |
| *F26A1.7* | 31.55 | 31.77 | 20.88 | 15.77 | 35.33 | 33.33 | 18 | 13.33 |
| *F10E9.4* | 41.31 | 21.67 | 22.81 | 14.19 | 42.2 | 26.61 | 15.2 | 15.96 |
| *C09B8.3* | 34.36 | 26.2 | 19.93 | 19.5 | 30.92 | 34.79 | 15.97 | 18.29 |
| *K08D12.4* | 22.77 | 23.43 | 26.07 | 27.72 | 21.78 | 22.77 | 24.75 | 30.69 |
| *T05C1.3* | 31.19 | 26.92 | 22.93 | 18.94 | 29.91 | 29.91 | 23.5 | 16.66 |
| *cre-far-7* | 32.37 | 25.89 | 20.14 | 21.58 | 31.65 | 30.21 | 20.14 | 17.98 |
| *paramyosin* | 37.04 | 24.13 | 22.05 | 16.76 | 42.67 | 35.3 | 16.68 | 5.33 |
| *cecropin B2* | 28.33 | 21.11 | 27.77 | 22.77 | 28.33 | 16.66 | 30 | 25 |
| *cecropin B1* | 27.22 | 22.77 | 28.88 | 21.11 | 25 | 18.33 | 33.33 | 23.33 |
| *cecropinA* | 26.11 | 22.77 | 30 | 21.11 | 25 | 13.33 | 33.33 | 28.33 |
| *gambicin* | 22.48 | 26.35 | 30.23 | 20.93 | 19.76 | 22.09 | 30.23 | 27.9 |
| *beta-tubulin* | 28.87 | 27.09 | 24.64 | 19.37 | 28.95 | 33.85 | 20.04 | 17.14 |

Table S4. The overall nucleotide composition and nucleotide composition at the third codon position of *Schistosoma haematobium*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Gene**  | **A %** | **T %** | **G %** | **C %** | **A3 %** | **T3 %** | **G3 %** | **C3 %** |
| tropomycin | 39.76 | 21.63 | 23.97 | 14.61 | 43.85 | 32.63 | 15.78 | 7.71 |
| serine protease inhibitor | 34.47 | 31.04 | 18.5 | 15.97 | 37.59 | 38.32 | 14.74 | 9.33 |
| Sh 23 | 25.26 | 32.87 | 24.5 | 17.35 | 26.94 | 34.24 | 18.72 | 20.09 |
| precursor anticoagulant SAP-1 | 39.5 | 28.04 | 15.69 | 16.75 | 37.56 | 29.62 | 14.28 | 18.51 |
| TCTP like protein | 28.4 | 28.4 | 24.45 | 18.73 | 24.26 | 34.31 | 21.3 | 20.11 |
| triose phosphate isomerase | 33.46 | 28.74 | 22.96 | 14.82 | 38.58 | 39.76 | 11.81 | 9.84 |
| paramyosin | 40.71 | 26.98 | 18.87 | 13.14 | 50.63 | 39.21 | 7.72 | 2.42 |
| calpain | 33.99 | 31.09 | 19.89 | 15.01 | 37.94 | 45.45 | 9.48 | 7.11 |
| 22.6 kDa tegmental antigen | 41.01 | 29.49 | 18.32 | 11.16 | 42.93 | 36.12 | 14.13 | 6.8 |
| fatty acid binding protein | 33.83 | 25.12 | 21.64 | 19.4 | 30.59 | 29.1 | 20.14 | 20.14 |
| tegumental protein sh 13 | 35.87 | 33.65 | 12.69 | 17.77 | 41.9 | 37.14 | 6.66 | 14.28 |
| 22.6 kDa tegument associated protein | 41.01 | 29.31 | 18.49 | 11.16 | 42.93 | 35.6 | 14.65 | 6.8 |
| HMGB1 | 34.87 | 22.53 | 23.76 | 18.82 | 27.77 | 31.48 | 26.85 | 13.88 |
| nicotinic acetylcholine receptor non alpha subunit precursor | 36.9 | 33.28 | 14.11 | 15.69 | 40.56 | 43.96 | 9.49 | 5.97 |
| nicotinic acetylcholine receptor alpha subunit precursor | 36.36 | 34.07 | 15.15 | 14.4 | 41.53 | 43.63 | 8.81 | 6.01 |
| TM3 | 29.61 | 31.59 | 15.91 | 22.88 | 22.99 | 44.25 | 13.58 | 19.16 |
| cAMP dependent protein kinase catalytic subunit | 32.85 | 30.76 | 21.08 | 15.28 | 34.47 | 39.6 | 15.38 | 10.54 |
| acetylcholine esterase | 33.28 | 32.75 | 17.48 | 16.47 | 36.37 | 46.66 | 10.43 | 6.52 |
| AChE | 33.28 | 32.75 | 17.48 | 16.47 | 36.37 | 46.66 | 10.43 | 6.52 |
| CE-1a | 25.5 | 26.13 | 24.74 | 23.61 | 31.06 | 28.78 | 20.83 | 19.31 |
| acetylcholine esterase | 33.28 | 32.75 | 17.48 | 16.47 | 36.37 | 46.66 | 10.43 | 6.52 |
| GST | 32.55 | 24.72 | 25.19 | 17.52 | 27.23 | 30.98 | 26.76 | 15.02 |
| nicotinic acetylcholine receptor non alpha subunit precursor ShAR2 beta | 34.12 | 34.98 | 17.58 | 13.3 | 37.72 | 42.12 | 13.18 | 6.95 |
| beta tubulin | 28.01 | 26.51 | 24.71 | 20.74 | 25.39 | 33.93 | 20.44 | 20.22 |

Table S5. ENC, overall GC (%), GC1(%), GC2(%),GC3(%) , CAI and Genelength of *W. bancrofti*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Gene name**  | ENC |  GC % | GC1 % | GC2 % | GC3 % | CAI | Gene Length(nt) |
| *Wb14* | 54 | 40.9 | 53.2 | 37 | 32.5 | 0.6052 | 462 |
| *mif-2* | 54 | 37.2 | 41.3 | 38 | 32.2 | 0.4982 | 363 |
| *paramyosin* | 60 | 39.9 | 42 | 31.8 | 45.8 | 0.918 | 2619 |
| *troponin* | 57 | 42.6 | 60.6 | 29.9 | 37.2 | 0.5946 | 411 |
| *independent isoglyceratre mutase isoform1* | 52 | 40.1 | 54.5 | 35.9 | 30 | 0.8909 | 1548 |
| *glutathione S transferase* | 53 | 38.3 | 53.6 | 30.1 | 31.1 | 0.6974 | 627 |
| *translationally controlled tumor protein-like-protein* | 58 | 42.5 | 58.2 | 29.7 | 39.6 | 0.7838 | 546 |
| *cut 1* | 41 | 36.5 | 54 | 40.2 | 15.3 | 0.7613 | 1173 |
| *VAH* | 55 | 41.6 | 46.2 | 44.8 | 33.9 | 0.7447 | 663 |
| *abundant larval transcript 2 protein* | 59 | 44.4 | 52.7 | 38.8 | 41.9 | 0.4788 | 387 |
| *20/22kDa protein* | 55 | 39.8 | 56.5 | 29 | 33.9 | 0.5681 | 558 |
| *ubiquitin like protein* | 57 | 41.6 | 49.6 | 38 | 37.2 | 0.4545 | 387 |
| *cuticular ochitinase* | 56 | 41.2 | 48.1 | 40 | 35.4 | 0.9163 | 1515 |
| *heat shock protein 70* | 57 | 44.2 | 55.4 | 39 | 38.2 | 0.9228 | 1938 |
| *TPx1* | 54 | 41.6 | 51.1 | 41 | 32.8 | 0.7276 | 687 |
| *cuticular collagen* | 41 | 47.7 | 67 | 60.6 | 15.5 | 0.7613 | 990 |
| *putative RNA binding protein* | 59 | 51 | 62.7 | 48.2 | 42.2 | 0.3721 | 249 |
| *high mobility group protein 1* | 60 | 44.4 | 41.2 | 43.1 | 49 | 0.511 | 306 |
| *VAH* | 55 | 41.4 | 44.5 | 45.4 | 34.4 | 0.7658 | 654 |
| *TRX* | 53 | 39.3 | 52.7 | 34.2 | 30.8 | 0.5051 | 438 |
| *GTP binding protein* | 56 | 41.1 | 52.6 | 35.4 | 35.4 | 0.7301 | 576 |
| *mif-2* | 55 | 40.8 | 48.3 | 39.7 | 34.5 | 0.4804 | 348 |
| *WbL2* | 52 | 39.8 | 53.9 | 35.7 | 29.9 | 0.5608 | 462 |
| *WbL1* | 54 | 41.1 | 53.2 | 37.7 | 32.5 | 0.6219 | 462 |
| *Col-4* | 46 | 47.8 | 61.7 | 60 | 21.7 | 0.0898 | 180 |
| *C30G7.2* | 60 | 47.2 | 49.7 | 44.3 | 47.6 | 0.6951 | 555 |
| *C30G7.2* | 60 | 47.2 | 49.7 | 44.9 | 47.1 | 0.6938 | 561 |
| *psa -3* | 55 | 41.3 | 51 | 39 | 33.8 | 0.6917 | 630 |
| *jud-4* | 57 | 43.5 | 48.7 | 43.2 | 38.5 | 0.8821 | 819 |
| *T10B10.4* | 60 | 46.5 | 50.3 | 36.9 | 52.3 | 0.8387 | 894 |
| *F20D1.3* | 60 | 49.1 | 56.9 | 43.5 | 46.8 | 0.8742 | 1392 |
| *F54E4.3* | 59 | 42.2 | 51.3 | 32.2 | 43.2 | 0.8356 | 819 |
| *C05E7.2* | 60 | 43.2 | 49.8 | 36.2 | 43.6 | 0.8152 | 861 |
| *C34 E7.4* | 60 | 49.8 | 51.8 | 45.8 | 51.8 | 0.7109 | 747 |
| *C34F6.11* | 57 | 39.4 | 39.8 | 41.2 | 37 | 0.7715 | 648 |
| *lpr5* | 57 | 44.9 | 54.2 | 42.8 | 37.6 | 0.8794 | 1698 |
| *F48E3.8* | 57 | 40.4 | 41.8 | 42.3 | 37.2 | 0.85 | 1128 |
| *M03A8.3* | 59 | 40.7 | 44.3 | 34.9 | 42.9 | 0.9086 | 1125 |
| *Y72A10A.1* | 60 | 45.3 | 53 | 32.5 | 50.5 | 0.8087 | 600 |
| *M02F4.3* | 60 | 43.2 | 45.4 | 35.5 | 48.6 | 0.8078 | 753 |
| *Y60A3A.21* | 58 | 44.9 | 43.9 | 51 | 39.8 | 0.3667 | 294 |
| *Y43F8C.4* | 60 | 47.7 | 58.7 | 37.9 | 46.4 | 0.9403 | 1605 |
| *C14B4.2* | 60 | 45.8 | 49.1 | 37.6 | 50.6 | 0.9897 | 5331 |
| *C25D7.5* | 59 | 41.7 | 44.6 | 39.1 | 41.3 | 0.9034 | 1089 |
| *F20G2.3* | 58 | 43.9 | 51.7 | 40.4 | 39.7 | 0.6305 | 453 |
| *T10G2.3* | 51 | 40 | 52 | 39.8 | 28.2 | 0.765 | 957 |
| *R186.8* | 57 | 42.6 | 48.6 | 41.7 | 37.5 | 0.5182 | 216 |
| *F23H12.3* | 58 | 41.4 | 52.4 | 32.5 | 39.2 | 0.828 | 498 |
| *T19C4.1* | 50 | 41.6 | 52.9 | 45.4 | 26.6 | 0.8204 | 1275 |
| *ZK856.7* | 59 | 42.6 | 50 | 36.9 | 41 | 0.4656 | 366 |
| *F07C3.2* | 59 | 40.6 | 42.1 | 39.1 | 40.6 | 0.4462 | 399 |
| *Y57E12AL.6* | 60 | 49.4 | 57.3 | 34.4 | 56.5 | 0.4519 | 393 |
| *hpo-26* | 58 | 44.9 | 38.5 | 57.5 | 38.5 | 0.6693 | 537 |
| *C04E6.11* | 54 | 40.1 | 49.7 | 37.4 | 33.1 | 0.9554 | 2988 |
| *C14C11.1* | 57 | 42.8 | 49 | 41.5 | 38 | 0.8635 | 1041 |
| *ZC317.6* | 57 | 43.1 | 49 | 42.1 | 38.3 | 0.8508 | 1041 |
| *abu-8* | 60 | 51.8 | 57 | 50.4 | 48 | 0.7786 | 1338 |
| *C18G1.9* | 59 | 44.4 | 49.3 | 41.5 | 42.4 | 0.8783 | 1041 |
| *K03B4.1* | 60 | 45.6 | 57.8 | 34.4 | 44.5 | 0.9235 | 1167 |
| *Y45G5AM.9* | 59 | 45.8 | 53.6 | 42.3 | 41.5 | 0.8928 | 1113 |
| *ssu-2* | 58 | 43.4 | 46.7 | 44.4 | 39.2 | 0.92 | 1209 |
| *Y67H2A.5* | 59 | 52.3 | 54.8 | 44.5 | 57.5 | 0.2944 | 438 |
| *H01G02.3* | 57 | 43.3 | 48.6 | 44.3 | 37.1 | 0.5797 | 420 |
| *T12A7.6* | 57 | 40.2 | 46.4 | 37.5 | 36.7 | 0.8852 | 1209 |
| *F59B8.1* | 54 | 40 | 50.5 | 36.9 | 32.7 | 0.6996 | 642 |
| *T19E7.6* | 56 | 39.7 | 52.8 | 30.4 | 36 | 0.4223 | 375 |
| *Y4C6B.4* | 56 | 36.2 | 35.9 | 37.9 | 34.6 | 0.669 | 459 |
| *Y56A3A.31* | 59 | 47.1 | 57.2 | 40.8 | 43.2 | 0.8895 | 1242 |
| *F44E2.3* | 55 | 44.6 | 55.9 | 43.7 | 34.3 | 0.7268 | 735 |
| *F44B9.2* | 48 | 40.4 | 57.1 | 39.9 | 24.2 | 0.8501 | 1512 |
| *tag-250* | 56 | 43.4 | 49 | 45.1 | 35.9 | 0.7824 | 459 |
| *F42A10.7* | 60 | 47.5 | 50 | 39.9 | 52.7 | 0.514 | 564 |
| *F01F1.3* | 56 | 41.5 | 54.2 | 34.9 | 35.3 | 0.7447 | 747 |
| *R12B2.2* | 50 | 37.6 | 52.8 | 33.3 | 26.6 | 0.9152 | 846 |
| *Y50D7A.8* | 60 | 48.2 | 59.1 | 40.2 | 45.3 | 0.9539 | 1710 |
| *Y53F4B.9* | 60 | 51.4 | 57.9 | 44.1 | 52 | 0.9718 | 3507 |
| *C09H10.9* | 58 | 42.1 | 48.9 | 38.6 | 38.9 | 0.9092 | 1104 |
| *mrpl-53* | 57 | 43.1 | 50.8 | 41.5 | 36.9 | 0.4672 | 390 |
| *C06C3.4* | 52 | 40.7 | 48 | 44.5 | 29.5 | 0.7302 | 681 |
| *T26C5.5* | 58 | 42.4 | 47.7 | 39.3 | 40.2 | 0.4813 | 321 |
| *eff-1* | 57 | 44.1 | 54.9 | 39.8 | 37.6 | 0.6915 | 399 |
| *F07F6.1* | 59 | 44 | 49 | 41 | 42 | 0.892 | 1287 |
| *F59A6.10* | 49 | 41.7 | 48.6 | 50 | 26.4 | 0.4809 | 420 |
| *F41C3.8* | 58 | 43.6 | 47.9 | 43.8 | 39.1 | 0.8888 | 951 |
| *F41C3.8* | 58 | 43.8 | 46.7 | 45.3 | 39.5 | 0.8954 | 1047 |
| *eat-18isoform d* | 60 | 46.4 | 51.9 | 34.2 | 53.2 | 0.3197 | 237 |
| *W04A4.5* | 53 | 39.9 | 51 | 37.1 | 31.4 | 0.9536 | 3216 |
| *B0379.1* | 55 | 43.3 | 51.2 | 45.1 | 33.8 | 0.6491 | 639 |
| *C34B7.1* | 49 | 38.8 | 44.2 | 46 | 26.1 | 0.858 | 1323 |
| *C30F12.5* | 50 | 41.3 | 53.1 | 43.3 | 27.5 | 0.8454 | 1158 |
| *gei-3* | 60 | 44.9 | 49 | 40.4 | 45.2 | 0.8427 | 876 |
| *C18E9.8* | 58 | 42.5 | 53.2 | 35.3 | 39 | 0.898 | 1761 |
| *C06C3.9* | 54 | 41.4 | 45.4 | 45.4 | 33.5 | 0.7631 | 654 |
| *psa -3* | 56 | 41.6 | 49.2 | 40.1 | 35.5 | 0.7758 | 726 |
| *F22D3.4* | 53 | 36.1 | 41.4 | 35.5 | 31.4 | 0.9027 | 1320 |
| *B0034.1* | 50 | 43.8 | 56.1 | 48.6 | 26.7 | 0.7206 | 765 |
| *Y43F8B.1* | 60 | 52.9 | 65.1 | 38.7 | 54.8 | 0.7563 | 783 |
| *C46C2.6* | 46 | 36.7 | 45.6 | 43 | 21.5 | 0.1472 | 237 |
| *Y22D7AL.6* | 60 | 46.7 | 42.8 | 42.8 | 54.5 | 0.595 | 435 |
| *Y71G12B.26* | 56 | 51.6 | 52 | 37.8 | 65.1 | 0.8999 | 1230 |
| *eat-18 isoformc* | 60 | 44.9 | 50 | 34.7 | 50 | 0.3487 | 216 |
| *M05D6.9* | 52 | 39.8 | 50.4 | 40.1 | 29 | 0.7711 | 816 |
| *C50B8.6* | 58 | 43.6 | 47.3 | 42.9 | 40.5 | 0.7449 | 615 |
| *C35A5.10* | 55 | 39.8 | 38.3 | 46.7 | 34.5 | 0.8159 | 861 |
| *F32B5.2* | 59 | 42.1 | 43.1 | 40.2 | 43.1 | 0.8912 | 1044 |
| *pqn-2* | 54 | 48 | 58.5 | 53.1 | 32.6 | 0.7374 | 1278 |
| *T06F4.1* | 60 | 44.1 | 50.8 | 36.2 | 45.4 | 0.6988 | 555 |
| *F56E10.1* | 59 | 42.4 | 57.1 | 28.1 | 42.1 | 0.8669 | 1077 |
| *abu-7* | 60 | 51.1 | 57.2 | 50.8 | 45.3 | 0.783 | 1317 |
| *F26A1.7* | 53 | 36.7 | 45.3 | 33.3 | 31.3 | 0.6912 | 450 |
| *F10E9.4* | 53 | 37 | 53.6 | 26.2 | 31.2 | 0.8207 | 789 |
| *C09B8.3* | 55 | 39.4 | 45.9 | 38.1 | 34.3 | 0.8728 | 1164 |
| *K08D12.4* | 60 | 53.8 | 58.4 | 47.5 | 55.4 | 0.3385 | 303 |
| *T05C1.3* | 58 | 41.9 | 47.4 | 38 | 40.2 | 0.7091 | 702 |
| *cre-far-7* | 57 | 41.7 | 51.1 | 36 | 38.1 | 0.6515 | 417 |
| *paramyosin* | 46 | 38.8 | 63 | 31.4 | 22 | 0.9188 | 2643 |
| *cecropin B2* | 60 | 50.6 | 60 | 36.7 | 55 | 0.1053 | 180 |
| *cecropin B1* | 59 | 50 | 60 | 33.3 | 56.7 | 0.1762 | 180 |
| *cecropinA* | 57 | 51.1 | 58.3 | 33.3 | 61.7 | 0.0719 | 180 |
| *gambicin* | 59 | 51.2 | 44.2 | 51.2 | 58.1 | 0.3004 | 258 |
| *beta-tubulin* | 57 | 44 | 56.6 | 38.3 | 37.2 | 0.8833 | 1347 |

Table S6 ENC, overall GC (%), GC1(%), GC2(%),GC3(%) , CAI and Genelength of *S. haematobium*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Gene name** | **ENC** | **GC %** | **GC1 %** | **GC2 %** | **GC3 %** | **CAI** | **Gene Length(nt)** |
| tropomycin | 48 | 38.6 | 61.1 | 31.2 | 23.5 | 0.7269 | 855 |
| serine protease inhibitor | 48 | 34.5 | 44.7 | 34.6 | 24.1 | 0.8101 | 1221 |
| Sh 23 | 58 | 41.9 | 49.3 | 37.4 | 38.8 | 0.8312 | 657 |
| precursor anticoagulant SAP-1 | 54 | 32.5 | 41.3 | 23.3 | 32.8 | 0.6237 | 567 |
| TCTP like protein | 59 | 43.2 | 53.3 | 34.9 | 41.4 | 0.6283 | 507 |
| triose phosphate isomerase | 46 | 37.8 | 52.4 | 39.4 | 21.7 | 0.6949 | 762 |
| paramyosin | 37 | 32.3 | 53.6 | 33.1 | 10.1 | 0.8551 | 2601 |
| Calpain | 43 | 34.9 | 51.4 | 36.8 | 16.6 | 0.8791 | 2277 |
| 22.6 kDa tegmental antigen | 46 | 29.5 | 36.6 | 30.9 | 20.9 | 0.5252 | 573 |
| fatty acid binding protein | 58 | 41 | 42.5 | 40.3 | 40.3 | 0.5119 | 402 |
| tegumental protein sh 13 | 46 | 30.5 | 39 | 31.4 | 21 | 0.3345 | 315 |
| 22.6 kDa tegument associated protein | 46 | 29.7 | 36.6 | 30.9 | 21.5 | 0.5266 | 573 |
| HMGB1 | 59 | 42.6 | 50.9 | 36.1 | 40.7 | 0.4131 | 324 |
| nicotinic acetylcholine receptor non alpha subunit precursor | 41 | 29.8 | 38 | 36 | 15.5 | 0.8620 | 2211 |
| nicotinic acetylcholine receptor alpha subunit precursor | 41 | 29.6 | 39.3 | 34.5 | 14.8 | 0.8520 | 2145 |
| TM3 | 54 | 38.8 | 36.6 | 47 | 32.8 | 0.9425 | 861 |
| cAMP dependent protein kinase catalytic subunit | 49 | 36.4 | 49 | 34.2 | 25.9 | 0.7956 | 1053 |
| acetylcholine esterase | 43 | 34 | 44.9 | 40 | 17 | 0.8716 | 2070 |
| AChE | 43 | 34 | 44.9 | 40 | 17 | 0.8716 | 2070 |
| CE-1a | 58 | 48.4 | 56.1 | 48.9 | 40.2 | 0.8335 | 792 |
| acetylcholine esterase | 43 | 34 | 44.9 | 40 | 17 | 0.8716 | 2070 |
| GST | 59 | 42.7 | 53.5 | 32.9 | 41.8 | 0.8014 | 639 |
| nicotinic acetylcholine receptor non alpha subunit precursor ShAR2 beta | 45 | 30.9 | 41.8 | 30.8 | 20.1 | 0.8519 | 1638 |
| beta tubulin | 59 | 45.5 | 56.2 | 39.6 | 40.7 | 0.9168 | 1335 |

TableS7. Correlation coefficients between ENC and compositional constraints in *W. bancrofti*

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|   | GC | GC1 | GC2 | GC3 | A3 | T3 | G3 | C3 | GRAVY  | AROMO | ENC |
| GC |   |   |   |   |   |   |   |   |   |   |   |
| GC1 | -0.481 |   |   |   |   |   |   |   |   |   |   |
| GC2 | -0.379 | -0.069 |   |   |   |   |   |   |   |   |   |
| GC3 | -0.733 | 0.039 | -0.128 |   |   |   |   |   |   |   |   |
| A3 | -0.481 | 0.191 | 0.35 | -0.76 |   |   |   |   |   |   |   |
| T3 | -0.63 | 0.006 | 0.159 | -0.755 | 0.147 |   |   |   |   |   |   |
| G3 | -0.435 | 0.227 | -0.342 | 0.713 | -0.45 | -0.631 |   |   |   |   |   |
| C3 | -0.668 | 0.674 | 0.105 | 0.812 | -0.694 | -0.536 | 0.17 |   |   |   |   |
| GRAVY  | 0.023 | 0 | -0.056 | 0.271 | -0.441 | 0.032 | 0.063 | 0.329 |   |   |   |
| AROMO | -0.269 | 0 | -0.121 | 0.03 | -0.27 | 0.226 | -0.09 | 0.118 | 0.424 |   |   |
| ENC | -0.504 | 0.156 | -0.18 | 0.847 | -0.685 | -0.597 | 0.598 | 0.692 | 0.155 | 0.07 |   |
| CAI | 0.247 | 0.29 | -0.111 | -0.184 | 0.075 | 0.203 | -0.188 | 0.101 | 0.164 | -0.058 | 0.01 |

\*\* p < 0.01. \* p < 0.05.

Table S8. Correlation coefficients between ENC and compositional constraints in *S. haematobium*

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|   | GC | GC1 | GC2 | GC3 | A3 | T3 | G3 | C3 | GRAVY  | AROMO | ENC |
| GC |   |   |   |   |   |   |   |   |   |   |   |
| GC1 | 0.697 |   |   |   |   |   |   |   |   |   |   |
| GC2 | 0.537 | 0.173 |   |   |   |   |   |   |   |   |   |
| GC3 | 0.842 | 0.34 | 0.219 |   |   |   |   |   |   |   |   |
| A3 | 0.771 | -0.206 | -0.489 | -0.837 |   |   |   |   |   |   |   |
| T3 | 0.555 | -0.351 | 0.204 | -0.754 | 0.272 |   |   |   |   |   |   |
| G3 | 0.788 | 0.438 | 0.118 | 0.9 | 0.708 | -0.734 |   |   |   |   |   |
| C3 | 0.739 | 0.187 | 0.271 | 0.913 | -0.806 | -0.638 | 0.643 |   |   |   |   |
| GRAVY  | 0.081 | -0.191 | 0.222 | 0.143 | -0.287 | 0.094 | -0.125 | 0.368 |   |   |   |
| AROMO | -0.236 | -0.45 | -0.042 | -0.049 | -0.254 | 0.39 | -0.032 | -0.056 | 0.138 |   |   |
| ENC | 0.833 | 0.331 | 0.206 | 0.998 | -0.84 | -0.747 | 0.892 | 0.916 | 0.15 | -0.027 |   |
| CAI | 0.091 | 0.211 | 0.416 | -0.216 | -0.119 | 0.523 | -0.208 | -0.185 | 0.217 | 0.104 | -0.226 |

\*\* p < 0.01. \* p < 0.05.