

Supplementary Information

Acute-phase proteins during inflammatory reaction by bacterial infection: Fish-model

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Attachment 1
(SDS-PAGE polyacrylamide gel)

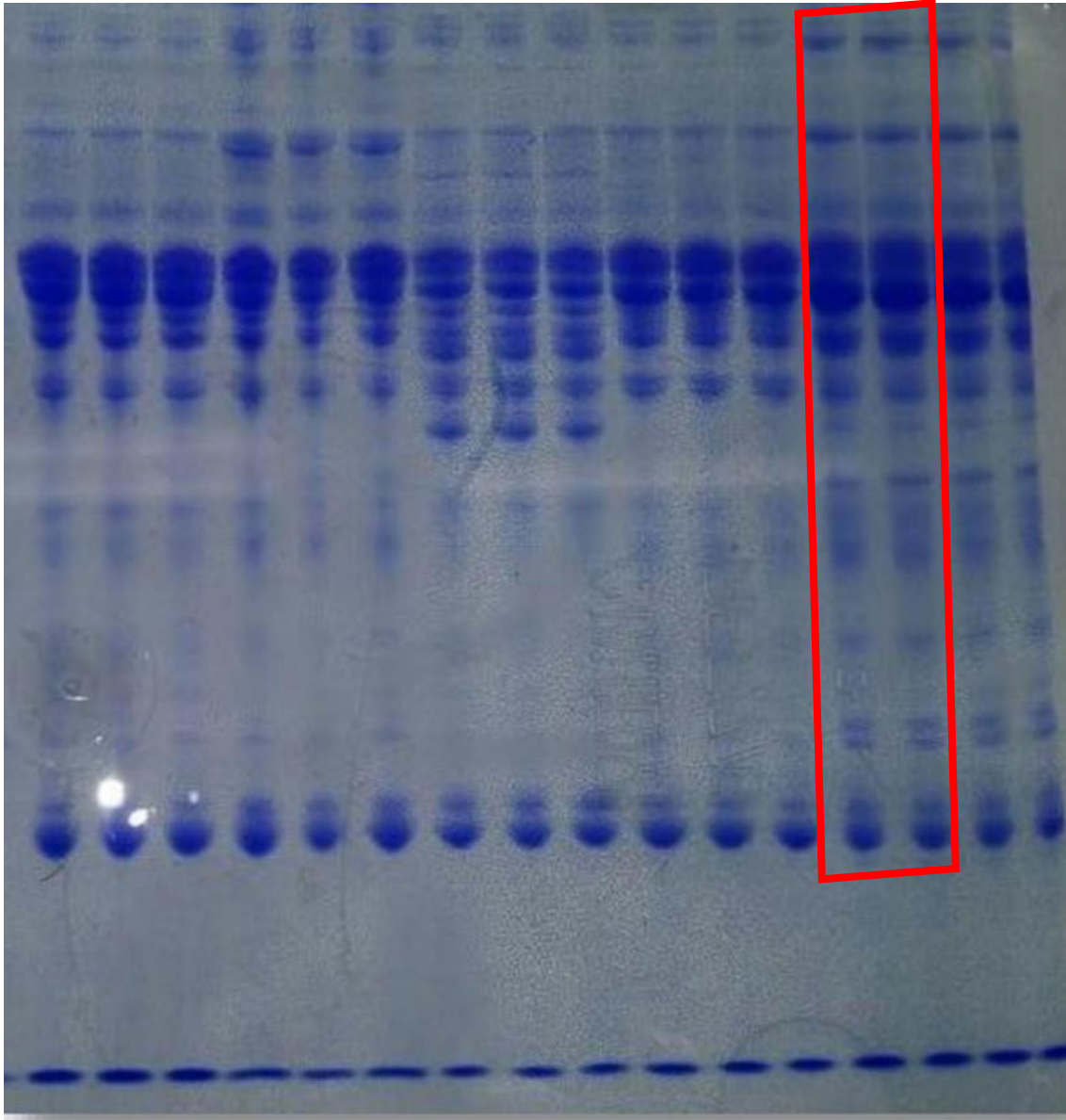


Figure I. SDS-PAGE polyacrylamide gel during acute inflammatory response in tilapias 6 and 24 HPI. Highlighted in red the area presented in the Figure 1.

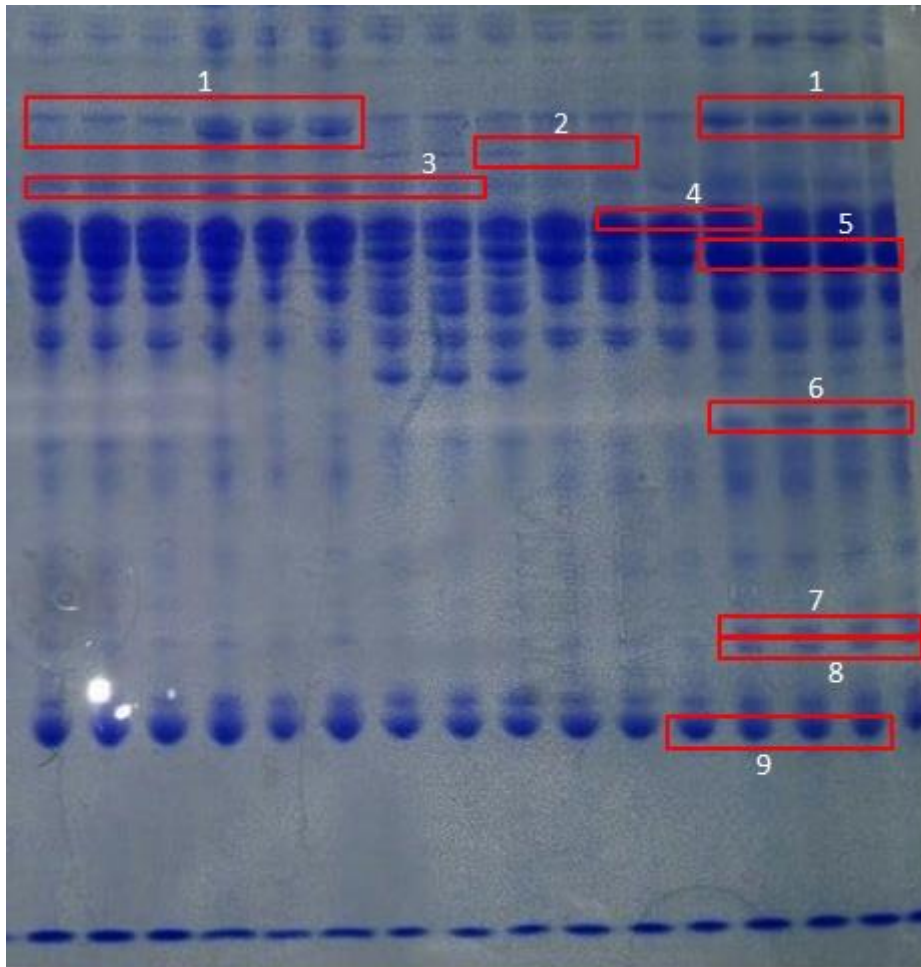


Figure II. SDS-PAGE polyacrylamide gel demonstrating the cut areas (highlighted in red) submitted to in gel trypsin digestion coupled to mass spectrometric analysis resulting in the identification of proteins present in the bands (Figure 1). (1) ceruloplasmin; (2) complement C3; (3) α_2 macroglobulin; (4) albumin; (5) transferrin; (6) haptoglobin; (7) apolipoprotein Eb and complement C3 isoform X1; (8) complement factor 3 and apolipoprotein Eb; (9) apolipoprotein A1.

Attachment 2 (Protein comparative analysis)

XP_019212735.1 sp|P01023|A2MG_HUMAN	1	. . MDRLWILSCTLCVLLSWIHVDQVAEPOYHVAIPAVIEAGAEAKFCATLRQSPGLTLMV
	1	MGKNGKILHPSLVLLLVLLPPTDA SVSGKPOYMLVLPSSLHTETTERKGCVLRLSYLNETVTV
XP_019212735.1 sp|P01023|A2MG_HUMAN	59	TVTMSREKNTLFTHTSN E . AFQT CVQFKAP . . LVQKEVQHFOVEVRGDTFYSKQVTKV
	61	SASLESVVRGNRSLFTDLEAENDVLHCVAFAVAPKSSSN EVMFLLIVQVKGPTQEFKRRITV
XP_019212735.1 sp|P01023|A2MG_HUMAN	116	MIQTYDPFTFIQTDKPIYLPQKVNFRVVTMDNKM RPANQLYDVI EIQDPNSNRI GQWLN
	121	MVKNEDSLV FVQTDKSIYKPGQTVKFRVVSMDENFHPLENLIPLVYIQDPKGNRI AQWQS
XP_019212735.1 sp|P01023|A2MG_HUMAN	176	ETSSSRILQLSVSLDTEAREGPYQIIVSMGER . KISHNFKVEK YVLPKFDVTVNTSEEVS
	181	FQLEGG LKQFSEPLSSEPFQGSYKVVVQKKS GGRTEHPFTEVEFVLPKFEVQVTVPKIIT
XP_019212735.1 sp|P01023|A2MG_HUMAN	235	IQQEDTEAKVC AKYTYGQVPVGRVTNVCRPIKYF F HGVSVSHS EDDLALLQISAPCHTE T
	241	ILEEEMNVSVSGLYTYGKVPVGHVTVSICR KYSDASDCHGED SQAFCEKFS
XP_019212735.1 sp|P01023|A2MG_HUMAN	295	KQADKTGCATFSFNMSIFTKVDQKVLHDVLDIRAKVEEECTGISHPQEKRRIRISYVVLGKV
	292	GQLNSHGC FYQVVKTKVFLK . RKEYEMK LHTBAQIQEECTVVELTGRQSSEITRTITKL
XP_019212735.1 sp|P01023|A2MG_HUMAN	355	SFINMPKVWERGSNVEGKVRAYHNNTPVCDAPVYLFTGQMRQTHSLQNLTTDSNGVASF
	351	SFVKVDSHFROGIPFFGQVRLVDGKGVPIPNKVIFIRG . . NEANYYSNATTEHGLVQF
XP_019212735.1 sp|P01023|A2MG_HUMAN	415	SFSTDNFDQDIQLHASLTPVDYPRYAAFYDRGFHILSMSQPSSPDIKTISSELEVQIND
	408	SINTNVMGTSLTVRVNYKDRSPCYQWVSEHEEAHHTAYLVFSPSKS FVLEPMS . .
XP_019212735.1 sp|P01023|A2MG_HUMAN	475	KAVACDAEEDISVNYTIVGESP SVDVIYLVLSRGAVTM OGQKQVEVQDRSVTEGQV
	466	HELPCGHTQTVOAHYIILNGGTL LGLLKKLSFY YLIMAKGGLVR TGTHGLLVK . QEDMKGHF
XP_019212735.1 sp|P01023|A2MG_HUMAN	532	SFKVVRVSP EMAP EFQVVA YAVLPS E DVI AHSA D FSTDKCF SNKVSVE FSPSAVPG EETN
	525	SISIPVKS DIAPVARLLIYAVLPTGDVIGD SAKYDVENCLANKV DLS FSPSOSLPASHAH
XP_019212735.1 sp|P01023|A2MG_HUMAN	592	MQVMALPHSLCVCVSAIDKSVL I KE PGK L DADKIFD LFLPKKSGIPEYVD DATECLNVR
	585	LRVTAAPQSVCA LRAVDQSVLLMKPDAE LSASVYNNLPLPKDLTGFGPLNDQDNEDCIN
XP_019212735.1 sp|P01023|A2MG_HUMAN	652	PK RYVLEPYRQEQNDAY AIFQK VGLKMATNLLIRLPSCLQFKGKFYHERSHRVY
	645	RHN VYINGITYTPEVSSINEKDMY SFL E D MGLKAF TNSKIRRP KMCPQLQYVE
XP_019212735.1 sp|P01023|A2MG_HUMAN	706	YAMAPRF RDNSIRLSSPVAASAGNDLAP E P A I ETVRSFP PETWIDLVEVGDGKRGVSL
	697	MHGPEGLRVGFYESDVMGRGHARLVHVEEPHT ETVRKFP PETWIDLVVNSAGVAE VGV
XP_019212735.1 sp|P01023|A2MG_HUMAN	766	TVPDTITWETEAFCLSSQG . FGLAPRKE MKVFOFF FELTMPYSIRGEHFLKATVFN
	757	TVPDTITWKAGAFCLSE DAGLGLSSSTAS LRAFOPFFVELTMPYSIRGEAFLKATVFN
XP_019212735.1 sp|P01023|A2MG_HUMAN	825	YLTSCIMVTVTPGPS SDYTLITPLSGDLYTSCHCANERKTLRWTMIPALGAVNVTVSAEA
	817	YLPK CIRVSVQLEASPAFLAVPVKEQAPHCHCANGROT VSWAVTPEKSLGNVNF TVSAEA
XP_019212735.1 sp|P01023|A2MG_HUMAN	885	VASHVSCDNEVSVVDPDRGRIDVVTKSLIVKAEGETEMTKTYNWL LCPK GSP L TEEAEIHL P
	877	LESQELCGTEVP SVPEHGRKDTVIKPLLV EPEGLEKETENS L LCPSGGEVSEELSLKLP
XP_019212735.1 sp|P01023|A2MG_HUMAN	945	ENVTEGSARTSVSVLGDILGRALKNLDG LLQMPYGCGEQNMAL L APNIYI LHYLKGTOQL
	937	PNVTEGSARASVSVLGDILGSAMONTQN LLQMPYGCGEQNMV L F APNIYVLDVYLNETOQL
XP_019212735.1 sp|P01023|A2MG_HUMAN	1005	TTAIMEKATNFLTSGYQRLNYK S ADGAYTTFCTGPG NTWLTAFVVRSESKAQSFV
	997	TPEIKSKAIGYLNLTGYQRLNYKH YDGSYSTFGERYGRNQGN TWLTAFVVKTEFAQARAYI
XP_019212735.1 sp|P01023|A2MG_HUMAN	1061	YIDPRKIEESKSWLQHRQENGCPEKSGKLFNNRMKGGVSEDEVLSAYVTAALLEMNTSQ
	1057	FIDEAHI TQALIWLSQRQKDNCCRS SGLNNAIKGGVEDEVLSAYITIALLEIPLTV
XP_019212735.1 sp|P01023|A2MG_HUMAN	1121	HDVPMNKS LACIKESLSDLSN YTTALLAYVFTLAGDVE TRAHLLQHLDTVAVR
	1117	THPVVRNALFCIESAWKTAQEGDHGSHVYTKALLAYAFALAGNDRKKEVLKSLNEEAVK
XP_019212735.1 sp|P01023|A2MG_HUMAN	1175	EGGFLYWSQTAETS ASLSEISSYVLLAKLSAS . . PTAEDLGYASGIIR
	1177	KDNSVHWERPQKPKAPVGHFYEPQAPSAEVE MTSYVLLAVLTAQAP TSEDLTSA TNIVK
XP_019212735.1 sp|P01023|A2MG_HUMAN	1223	WITGQONYYGGFSSQTDTVVALQALALYSTLVFSP EGWSVTVQAPSSQLT . . FDNQSN
	1237	WITKQONAOGGFSSQTDTVVALHALSKYGAATFTRTGKAAQVTTIQSSGTFSSK FQVDNNN
XP_019212735.1 sp|P01023|A2MG_HUMAN	1281	KLLYQEEALQDVSGKYSIEVKG TACASVOISATYNIPTADVTTLSVKVQLEVNITSES .
	1297	RLLLQOVSLPELPGEYSMKVTEGECVYLOTSLKYNI LPEKEEFPFALGVO TLPQTCD EPK
XP_019212735.1 sp|P01023|A2MG_HUMAN	1340	ARPKFTVQIQSLYSGKEKT TNMVIDIKMISGFSPDPE SIKSLKHLGLLVS RVEQKEDHVL
	1357	AHTSFQISLSVSYTGRSASNNMAIWDVKM VSGFIP LKPTVKMLERSNHVS RVEVSSNHVL
XP_019212735.1 sp|P01023|A2MG_HUMAN	1400	VYLEEIPKDTPI NHSLDI IQELPVDN LKPAVVKIYDYYQPGDQAE TOYMFVS
	1417	IYLD R VSNQ T . LSLFFTVIQDVPV RDLKPAIVK VYDYYETDEFAIABYNAPCSKDLGNA

Figure III. Structural comparison of the alpha-2-macroglobulin between *Oreochromis niloticus* and *Homo sapiens*. The FASTA files related to tilapia and human proteins were acquired on the UNIPROT search platform (<http://www.uniprot.org>).

XP_021322235.1 sp|P01023|A2MG_HUMAN	1	MALIVSCCLKGFFLIFLFLCVNGNKRPIFMVTFPAVIESGSDAKLCASLTKPNKTLFPM
	1	MGKNKLLHPSLVLLLVLPDASVSGKPKQVMVLPSPSLHTEETEGCVLLSYLNETVTV
XP_021322235.1 sp|P01023|A2MG_HUMAN	61	NIYLVHSNQSLTLLQEKAEQEFHRCFNFOAP.LAAEASVQKIKVEIQGSESNMTEERKV
	61	SASLESVRGNRSLFTDLAEADVLCVAFVPEKSSSNSEVMFLTVQVKGPTQEFKRRITV
XP_021322235.1 sp|P01023|A2MG_HUMAN	119	MFKSYHPLETFQMDKPFYIAQGTVNFVRVTFMDKSFRTDQQYSAVVLEDSQDNRIQWNTN
	121	MVKNEEDSLVFWQTDKSLYKPGQTVKFRVVSMDENFHPNELIPLVYIQDPKGNRIAQWQS
XP_021322235.1 sp|P01023|A2MG_HUMAN	179	VSTRWILORSYDLNPEAREGTIVKAFIFIG.ERMISHDFDVKKIVLPKFGVFIISPNPVS
	181	FQLEGGKQFSEPLSEPFQGSYKVVVQKKSGRTEHPFTVVEEFLVLPKFEVQVTVPKIIT
XP_021322235.1 sp|P01023|A2MG_HUMAN	238	IDDEFMVIIEVCGKYTYGKPVLGKSVKVCRTLDT.....HSPLCVKESTEISKTGCA
	241	ILDEEMNVSVCGLYTYGKPVGHVTVSICRKYSDASDCHGEDSQAFCKKFSGQLNSHGCF
XP_021322235.1 sp|P01023|A2MG_HUMAN	291	NHTIALSVFYPTHHQLLNDLHIETATEEETETITMTQSNITISTEYIGKVTFTDLPKTY
	301	YQVQKTKVFLK.RKREYEMKLEHAEQIQEEGTVEELTGRQSSSEIIRTITKLSFVKVDSHE
XP_021322235.1 sp|P01023|A2MG_HUMAN	351	EYGSVIEGKVKLARFRCTAVPGKHTYILENYSWPPKVLNLTDSNGLANFSINTLRFVVK
	360	ROGIPFFGQVRLVDGKGVIPNKKVIFIRGNAN...YYSNATTEDEHGLVQFSINTTNVMG
XP_021322235.1 sp|P01023|A2MG_HUMAN	411	SDINLMASAYPGYRSYFQKSPYFNTEKTVQFFPKPAASYPTPTFSELIENIEQPLKCGT
	417	ISLTVRVNYKDRSPCYG...YQWVSEHEEAHTAYLVFSPSKSFVHLEPMSHELPCGH
XP_021322235.1 sp|P01023|A2MG_HUMAN	471	EITATVKYFVKEVTK.TFNADIVYVLSRGVIHGHGKVEVKSNAVASGTMSEFKLSV
	473	TQTVQAHYILNGGTLGLGKLLSFYVLMKAGCTVTRTGTHGLLVKQEE..DMKGFHSISITPV
XP_021322235.1 sp|P01023|A2MG_HUMAN	530	GADVAPLVQITLAYCVLPSENIAIHSNFHVEKCLKNKVSLOFSPAKAVPGEKNTLQLSAQ
	531	KSDTAPVARLLIYAVLPTGDVIIGDSAKYDVENCLANKVDLSFSPSQSLPASHAHLRVTAA
XP_021322235.1 sp|P01023|A2MG_HUMAN	590	PGSHGLS AVDQSVLMEESGKR.LDADKIFNLLPVKYGSGYSSLPDE..KCFYMMAVPI
	591	POSWCALR AVDQSVLMEKPDALSAASSVYNLLPEKDLTGFPGLNDQDNEDCINRHNVI
XP_021322235.1 sp|P01023|A2MG_HUMAN	648	ENIFKS.....SKRIGLKMATNLAVRSCTSTCEMYKKFMSFAILPVDLFRDI
	651	NGITYTPVSSNEKDMYSFLEDMGLKRAFNSKIRKPKMCPQLQYEMHGPEGLRVGFYSE
XP_021322235.1 sp|P01023|A2MG_HUMAN	695	GLAEDSVPHWTLFEEEN...VRSVFPKTLWOLIEISDSGSAEVPVTPDITISWETEAF
	711	DVMGRGHARLVHVHEEPTETVRKYFETWINDLVVNSAGVAEVEVTPDITIEWKAGAF
XP_021322235.1 sp|P01023|A2MG_HUMAN	751	CLSTG.LGLAPPQALVFQPFLELSPYSIRGEMFBLKATVFNYSKCIIMVKVSPAP
	771	CLSEADAGLGISSTASLRAFOPFFVELTMPYSVIRGEAFTLKATVFNLYLPKCIIRVSVQLEA
XP_021322235.1 sp|P01023|A2MG_HUMAN	810	SDYTLKASSDQYSSCHCANGRKTFKWLTFVSVIGVNVTVRAEAESAQTVCNDEIVSV
	831	SPAELAVPVEKEQAPHCHCANGROTFSWAVTEKSLGNVNTVSAEELSLKCTEIVSV
XP_021322235.1 sp|P01023|A2MG_HUMAN	870	PERGRIDTVTRSLLVQAECTKKAKTNSWLLCPKGDSELEEDLTLPLKDMIEGSVTSVSV
	891	PEHGRKDTVIRKPLLEVEPEGLKKEKTFNSLLCPSGGEVSEELSLKLPNVEESAARASVSV
XP_021322235.1 sp|P01023|A2MG_HUMAN	930	IGDIVGRSLKLLHRTLWRIYRSNGNIAIILSPSIYILOYLENTRKQLTSAIREKASSFLKS
	951	LGDILGSAMQNTQNLQMPYGCGEQNMVLFAPNIYVLDYLNETOQLTPEIKSKAIGVINT
XP_021322235.1 sp|P01023|A2MG_HUMAN	990	GYQROLKYRHRNGAYSTFGN...GKNALWLTAFVLKSEFVKAQKYIYIDPQITKSAKKWL
	1011	GYQROLNYKHYGSGSYSTFGERYGRNQNTWLTAFVLKTEAQARAYEIDEAHTQALIWL
XP_021322235.1 sp|P01023|A2MG_HUMAN	1046	IGTODPEGCFIQHGRLFNRLKGGVSDHVTMTAYITASLLELETSTVDPIIKGLSCLRS
	1071	SQRQKDN GCFRSSGSLNNAIKGGVSDHVTLSAYITIALLEIPLTVHHPVVRNALFCLES
XP_021322235.1 sp|P01023|A2MG_HUMAN	1106	VIKDVKN.....TYTALLAYTFSLARDTNTREQQLFNKTEDLAIISDGPLVHWSQSAS..
	1131	AWKTAQEGDHGSHVYTKALLAYAFALAGNQDKRKEVLSKSLNEEAVKKKDNSVHWERPQKPK
XP_021322235.1 sp|P01023|A2MG_HUMAN	1158	.....ADDSDSLDVEISSYVLLAVLTA.D.SLTTADLGFANRIVSWLVKQNA YGGFSS
	1191	APVGHFYEPQAPSAEVEMTSYVLLAYLTAQPAPTSSEDTSATNIVKWIITKQNAQGGFSS
XP_021322235.1 sp|P01023|A2MG_HUMAN	1210	TQDTVVALQALSLYATKVFSDDGSSVTVQV.SAG..D.SHYFNVDNKNLVYQEKQLANVPG
	1251	TQDTVVALHALSKYGAATFTRTGKAAQVTIQSSGTFSSKEQVDNKNRLLQVQVSLPELPG
XP_021322235.1 sp|P01023|A2MG_HUMAN	1268	KYKTEVKGSA CVSVQMAQFYNILTPKEVKTLSDVKIEGCKKKT..FGNKLLEFETVNYD
	1311	EYSMKVTEGCVYLOQTSLYNILPEKEFFPALGVQTLPTQCDPEKAHTSFQISLSVSYT
XP_021322235.1 sp|P01023|A2MG_HUMAN	1326	GPHEETNMLIVDVKLLSGFTADDTFMFGSSSGFYVPLVEQVDYKDDHVIIVYKKEVPKHFP
	1371	GSRSASNMAIVDVKVMVSGFIPLKPTVMKMLE...RSNHVSRTEVSSNHHVLIYLDKVSNTQ.
XP_021322235.1 sp|P01023|A2MG_HUMAN	1386	VNYQIQMKQVTHVMNLKPAVIVKYDYYQTSQSETEYFHC.....
	1427	LSLFFTVLQDVPVRDLKPAIVKYDYYETDEFAIAEYNAPCSKDLGNA

Figure IV. Structural comparison of the alpha-2-macroglobulin between *Danio rerio* and *Homo sapiens*. The FASTA files related to zebrafish and human proteins were acquired on the UNIPROT search platform (<http://www.uniprot.org>).

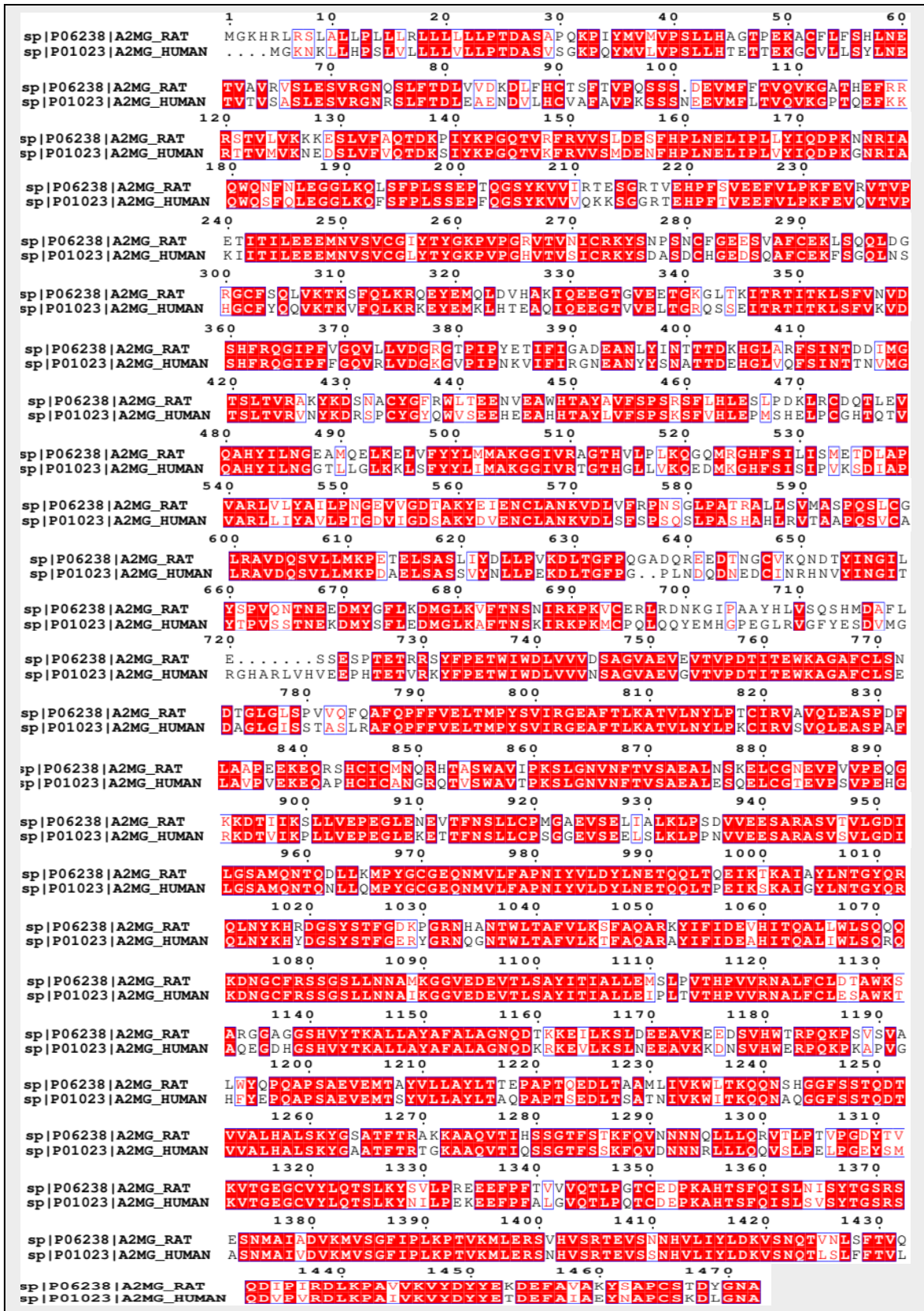


Figure V. Structural comparison of the alpha-2-macroglobulin between *Rattus norvegicus* and *Homo sapiens*. The FASTA files related to rodent and human proteins were acquired on the UNIPROT search platform (<http://www.uniprot.org>).

tr|I7J7R5|I7J7R5_ORENI	1	MK F V A L A L T L L L A V G S Q A S L Q A D A P . . . S Q L A Q I R S A V D V Y L T Q A K E G A I K A L D Q L D D T
sp|P02647|APOA1_HUMAN	1	M K A A V L T L A V L F L T G S Q A R H F W Q Q D E P P Q S P W D R V K D L A T V Y V D V L K D S G R D Y V S Q F E G S
tr|I7J7R5|I7J7R5_ORENI	58	P Y . Q E F K V I L A Q R L E D L H T Q V K A L Q G S V A P V T D S V F T T V S E A T A E L R S N I A T D I E A L R T E
sp|P02647|APOA1_HUMAN	61	A L G K Q L N L K L L D N W D S V T S T F S K L R E Q L G P V T Q E F W D N L E K E T E G L R Q E M S K D L E E V K A K
tr|I7J7R5|I7J7R5_ORENI	117	L E P K R A H L R E V I D R H I E D Y R S R L Q E V I S E Y Y A K H T A E M D E L K T K I E P I M T E I R E K I R T N V
sp|P02647|APOA1_HUMAN	121	V Q P Y L D D F Q K K W Q E E M E L Y R Q K V E P L R A E L Q E G A R Q K L H E L Q E K L S P L G E E M R D R A R A H V
tr|I7J7R5|I7J7R5_ORENI	177	E E T K A A L T P I V E S I R A R V A T H V E Q A K A M L A P Y V E E Y K E Q L R Q A Y D H A H N V R A E D L T A L R A
sp|P02647|APOA1_HUMAN	181	D A L R T H L A P Y S D E L R Q R L A A R L E A L K E N G G A R L A E Y H A K A T E H L S T L S E K A K P A L E D L R Q
tr|I7J7R5|I7J7R5_ORENI	237	K I N P L A E D I K T K L Q Q I F A I L S E T F T K S
sp|P02647|APOA1_HUMAN	241	G L L P V L E S F K V S F L S A L E E Y T K K L N T Q

Figure VII. Structural comparison of the apolipoprotein A1 between *Oreochromis niloticus* and *Homo sapiens*. The FASTA files related to tilapia and human proteins were acquired on the UNIPROT search platform (<http://www.uniprot.org>).

sp|O42363|APOA1_DANRE	1	M K F V A L A L T L L L A L G S Q A N L F Q A D A P . . . T Q L E H Y K A A A L V Y L I N Q V K D Q A E K A L D N L D G T
sp|P02647|APOA1_HUMAN	1	M K A A V L T L A V L F L T G S Q A R H F W Q Q D E P P Q S P W D R V K D L A T V Y V D V L K D S G R D Y V S Q F E G S
sp|O42363|APOA1_DANRE	58	D Y . E Q Y K L Q L S E S L T K L Q E Y A Q T T S Q A L T P Y A E T I S T Q L M E N T K Q L R E R V M T D V E D L R S K
sp|P02647|APOA1_HUMAN	61	A L G K Q L N L K L L D N W D S V T S T F S K L R E Q L G P V T Q E F W D N L E K E T E G L R Q E M S K D L E E V K A K
sp|O42363|APOA1_DANRE	117	L E P H R A E L Y T A L Q K H I D E Y R E K L E P V F Q E Y S A L N R Q N A E Q L R A K L S P L M D D I R K A F E S N I
sp|P02647|APOA1_HUMAN	121	V Q P Y L D D F Q K K W Q E E M E L Y R Q K V E P L R A E L Q E G A R Q K L H E L Q E K L S P L G E E M R D R A R A H V
sp|O42363|APOA1_DANRE	177	E E T K S K V V P M V E A V R T K L T E R L E D L R T M A A P Y A E E Y K E Q L V K A V E E A R E K I A P H T Q D L Q T
sp|P02647|APOA1_HUMAN	181	D A L R T H L A P Y S D E L R Q R L A A R L E A L K E N G G A R L A E Y H A K A T E H L S T L S E K A K P A L E D L R Q
sp|O42363|APOA1_DANRE	237	R M E P Y M E N V R T T F A Q M Y E T I A K A I Q A .
sp|P02647|APOA1_HUMAN	241	G L L P V L E S F K V S F L S A L E E Y T K K L N T Q

Figure VIII. Structural comparison of the apolipoprotein A1 between *Danio rerio* and *Homo sapiens*. The FASTA files related to zebrafish and human proteins were acquired on the UNIPROT search platform (<http://www.uniprot.org>).

sp|P04639|APOA1_RAT	1	MKAAVLAVLVFLTGCAWEFWQDEPQSQWDRVKDFATVYVDVVKDSGRDYVSQFESS
sp|P02647|APOA1_HUMAN	1	MKAAVLTDAVLFLLTGSQARHFWQDEPPQSPWDRVKDLATVYVDVVKDSGRDYVSQFEGS
sp|P04639|APOA1_RAT	60	TLGKQLNINLLDNWDTLSTVGRLEQLGPVTQEFWANLEKETDWRNEMNKDLENVKQK
sp|P02647|APOA1_HUMAN	61	ALGKQLNLIKLLDNWDSVSTVFSKLEQLGPVTQEFWDNLEKETEGLRQEMSKDLEEVKAK
sp|P04639|APOA1_RAT	120	MQPHLDEFQEKWNEEVEAYRQKLEPLGTTELHK...NAKEMQRHLKVVAAEEFRDRMRVNA
sp|P02647|APOA1_HUMAN	121	VQPYLDDFQKQWQEEEMELYRQKVEPLRAELQEGARQKLHELEKELSPLGEEMRDRARAHV
sp|P04639|APOA1_RAT	176	DALRAKFGLYSDQMRNLAQRLETKN.HPTLIEYHTKASDHLKTLGKAKPALDDLGO
sp|P02647|APOA1_HUMAN	181	DALRTHLAPYSDELRRQLARLEALKENGGARLAEYHAKATEHLSTLSEKAKPALEDLRO
sp|P04639|APOA1_RAT	234	GLMPVLEAKKAKIMSMIDEAKKKNLA.
sp|P02647|APOA1_HUMAN	241	GLLPVLESFKVSVLSALEEYTKKLNTO

Figure IX. Structural comparison of the apolipoprotein A1 between *Rattus norvegicus* and *Homo sapiens*. The FASTA files related to rodent and human proteins were acquired on the UNIPROT search platform (<http://www.uniprot.org>).

sp|Q00623|APOA1_MOUSE	1	MKAVVLAVALVFLTGSQAVHFWQDEPQSQWDRVKDFANVYVDVVKDSGRDYVSQFESS
sp|P02647|APOA1_HUMAN		MKAAVLTDAVLFLLTGSQARHFWQDEPPQSPWDRVKDLATVYVDVVKDSGRDYVSQFEGS
sp|Q00623|APOA1_MOUSE	60	SLGQQLNINLLENWDTLSTVSRQLERLGLPLTRDFWDNLEKETDWRQEMNKDLEEVKQK
sp|P02647|APOA1_HUMAN		ALGKQLNLIKLLDNWDSVSTVFSKLEQLGPVTQEFWDNLEKETEGLRQEMSKDLEEVKAK
sp|Q00623|APOA1_MOUSE	120	VQPYLDEFQKKWKEDVELYRQKVAPLGAELQESARQKLELQGLRSPVAEEFRDRMRTHV
sp|P02647|APOA1_HUMAN		VQPYLDDFQKKWQEEEMELYRQKVEPLRAELQEGARQKLHELEKELSPLGEEMRDRARAHV
sp|Q00623|APOA1_MOUSE	180	DSLRTQLAPHSSEQMRSLAQRLEALKSN.PTLNEYHTRAKTHLKTLEKAKPALEDLRH
sp|P02647|APOA1_HUMAN		DALRTHLAPYSDELRRQLARLEALKENGGARLAEYHAKATEHLSTLSEKAKPALEDLRO
sp|Q00623|APOA1_MOUSE	240	SLMPMLETLKTKVQSVIDKASETLTAQ
sp|P02647|APOA1_HUMAN		GLLPVLESFKVSVLSALEEYTKKLNTO

Figure X. Structural comparison of the apolipoprotein A1 between *Mus musculus* and *Homo sapiens*. The FASTA files related to rodent and human proteins were acquired on the UNIPROT search platform (<http://www.uniprot.org>).

tr|I3JNN4|I3JNN4_ORENI sp|P00450|CERU_HUMAN	1	MLRLD	LR	AV	LL	LF	CV	VS	GM	RE	YF	LK	IE	EV	SW	NA	PT	GR	NI	IQ	NR	SI	IQ	DD	EA	SI	FL		
	1	..MKI	LI	LI	GI	LF	LC	ST	PA	WA	KE	HY	IG	IE	ET	TD	YA	SD	HG	..EK	LI	SV	DT	EH	SN	IT	LT		
tr|I3JNN4|I3JNN4_ORENI sp|P00450|CERU_HUMAN	61	KSGE	QR	IG	ST	YK	KAV	YK	OY	SD	AT	YR	TE	VT	KA	EW	LG	YLG	PL	MA	EG	DT	LI	VH	LKN	AS	RP		
	57	QNGE	DR	IG	RI	YK	KAV	YI	OY	TD	TE	FT	RT	TE	EP	WV	LG	YLG	PI	KA	ET	GD	KV	YV	VH	LKN	LA	SR	
tr|I3JNN4|I3JNN4_ORENI sp|P00450|CERU_HUMAN	121	YSAH	PH	GL	NY	TK	GN	EG	AL	YD	GT	GP	EL	KR	DD	SV	AP	GT	VT	YEW	TL	AE	SH	GP	TS	HD	SN	CM	
	117	YIFH	SH	GI	TY	YK	EH	EG	AL	YD	NT	TD	FQ	RA	DD	KV	YF	GE	QY	TY	ML	LA	TE	QS	PG	EG	DN	CV	
tr|I3JNN4|I3JNN4_ORENI sp|P00450|CERU_HUMAN	181	RFYH	SH	VSP	PK	DI	NS	GL	IG	PL	IV	CK	RT	GL	LD	LHG	SS	GD	YQ	VA	LL	FM	VS	DEN	FS	WY	LD	EN	
	177	RIYH	SH	ID	AP	PK	DI	AS	GL	IG	PL	IV	CK	KS	LD	KE	KE	KHI	DRE	FV	VM	SV	V	DEN	FS	WY	LD	EN	
tr|I3JNN4|I3JNN4_ORENI sp|P00450|CERU_HUMAN	241	RTYI	TNP	ARN	LK	ED	ED	FI	ES	NKM	HG	IN	GL	YGN	LR	CL	SM	CQ	GN	KI	QW	HL	FA	LG	NE	VD	MH	SH	
	237	KTYC	SE	PE	KV	DK	ND	ED	FE	SN	RM	YS	VN	GY	TE	GS	LP	GL	SM	C	AE	D	RV	KW	YF	LG	MN	EV	DV
tr|I3JNN4|I3JNN4_ORENI sp|P00450|CERU_HUMAN	301	VHFG	QILT	MN	HT	DT	IS	LF	PA	S	TT	A	M	V	A	D	N	P	G	H	W	L	L	C	S	V	N	D	
	297	AFHG	QALT	NK	NY	RI	DT	IN	LF	PA	L	F	D	A	Y	M	V	A	Q	N	P	G	E	W	M	L	S	C	
tr|I3JNN4|I3JNN4_ORENI sp|P00450|CERU_HUMAN	361	CFPN	VHK	PR	PH	G	E	L	R	O	Y	F	I	A	A	E	E	V	W	D	Y	A	P	T	V	P	T	
	357	CNK	SS	KD	N	I	R	G	K	H	V	R	Y	I	A	A	E	E	I	W	N	Y	A	P	S	G	I	
tr|I3JNN4|I3JNN4_ORENI sp|P00450|CERU_HUMAN	410	GSR	YK	V	R	Y	E	Y	T	D	N	T	E	M	T	K	I	L	R	S	P	E	E	Q	H	L	G	I	
	417	GGS	YK	L	V	R	E	Y	T	D	A	S	T	N	R	K	B	R	G	S	P	E	E	Q	H	L	G	I	
tr|I3JNN4|I3JNN4_ORENI sp|P00450|CERU_HUMAN	470	PHGV	QYS	VE	QD	GT	LY	H	N	E	L	E	S	Y	T	D	K	L	R	E	L	K	R	L	P	R	V	T	
	477	PIGV	R	F	N	K	N	B	G	T	Y	S	P	N	Y	N	P	.....	Q	S	R	S	V	P	P	S	A	
tr|I3JNN4|I3JNN4_ORENI sp|P00450|CERU_HUMAN	530	GAGP	VE	GE	AD	CL	TY	LY	SA	VD	PK	DS	SG	LV	GP	LL	IC	RP	KL	KG	V	Q	N	Y	N	K	E		
	524	E	V	GP	T	N	A	D	P	V	CL	A	K	M	Y	S	A	V	D	P	K	D	I	F	T	GL	I		
tr|I3JNN4|I3JNN4_ORENI sp|P00450|CERU_HUMAN	589	VFDEN	L	SW	L	D	N	I	R	T	F	T	A	P	N	T	V	N	K	E	D	E	G	F	I	E	S		
	584	VFDEN	E	S	L	L	E	D	N	I	R	M	F	T	T	A	P	D	V	D	K	E	D	E	D	F	Q		
tr|I3JNN4|I3JNN4_ORENI sp|P00450|CERU_HUMAN	649	WHL	S	G	L	G	S	E	T	D	I	I	S	L	Y	F	O	G	N	R	F	I	Y	E	Q	N	R		
	644	WYLF	S	A	G	N	E	A	D	V	H	G	I	Y	F	S	G	N	T	Y	L	W	R	G	E	R	R		
tr|I3JNN4|I3JNN4_ORENI sp|P00450|CERU_HUMAN	709	HYRN	G	M	R	A	N	Y	T	V	E	K	C	S	I	L	H	R	Q	S	E	M	M	L	H	S	K		
	704	HYTG	G	M	K	Q	K	Y	T	V	N	Q	C	R	R	Q	S	E	D	S	T	F	Y	L	G	E			
tr|I3JNN4|I3JNN4_ORENI sp|P00450|CERU_HUMAN	769	P	I	F	L	D	K	Q	G	G	F	I	G	S	R	Y	K	K	V	V	Y	R	O	F	T	S	D		
	764	SN	A	F	L	D	K	G	E	F	Y	I	G	S	K	Y	K	K	V	V	Y	R	O	F	T	S	D		
tr|I3JNN4|I3JNN4_ORENI sp|P00450|CERU_HUMAN	828	FKNM	A	T	R	P	Y	S	I	H	A	G	V	K	T	E	N	S	P	S	V	H	Q	T	P	G	E		
	824	FKNM	A	T	R	P	Y	S	I	H	A	G	V	Q	T	E	S	T	V	T	P	T	L	P	G	E	T		
tr|I3JNN4|I3JNN4_ORENI sp|P00450|CERU_HUMAN	888	DVA	K	D	L	S	G	L	I	G	L	P	V	V	C	R	R	S	W	G	R	T	L	G	L	K	E		
	884	DQV	K	D	L	S	G	L	I	G	L	P	V	V	C	R	R	P	Y	L	K	V	F	N	P	R	R		
tr|I3JNN4|I3JNN4_ORENI sp|P00450|CERU_HUMAN	948	RP	N	L	K	D	E	D	F	I	E	S	N	K	M	H	A	I	N	G	Y	V	Y	G	N	L	N		
	943	E	K	V	N	K	D	E	E	F	I	E	S	N	K	M	H	A	I	N	G	R	M	F	G	N	L		
tr|I3JNN4|I3JNN4_ORENI sp|P00450|CERU_HUMAN	1008	VE	Y	K	L	G	G	A	H	R	A	D	V	Y	E	L	F	F	A	T	F	O	T	V	K	M	R		
	1003	F	Q	Y	K	H	R	G	V	Y	S	S	D	V	E	D	I	F	F	G	T	Y	O	T	L	E			
tr|I3JNN4|I3JNN4_ORENI sp|P00450|CERU_HUMAN	1068	K	S	G	I	F	G	.....	V	P	T	D	G	A	E	T	F	V	T	R	.....	F	E	Q	N	R	
	1062	T	K	S	G	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Figure XI. Structural comparison of the ceruloplasmin between *Oreochromis niloticus* and *Homo sapiens*. The FASTA files related to tilapia and human proteins were acquired on the UNIPROT search platform (<http://www.uniprot.org>).

tr|Q6P3G1|Q6P3G1_DANRE sp|P00450|CERU_HUMAN	1	MKG	1	MKGLQFALGLGLVLCAGIASSITREYFFAIKEIQWDYAPSGKNLIQNKIVQQDEAARVFE
				.MKLILILGLIFLFCSTPAWAKEKHYYIGIIEITWDYAS..DHGEKKLISVDTEHSNLYEC
tr|Q6P3G1|Q6P3G1_DANRE sp|P00450|CERU_HUMAN	61	RGE	58	RGERIGRVYKKAIVYHQYTDATYRQEIIDKPKWLGVLGPLISAEEDDTVIVHLKNMARRAY NGPDRIGRLYKKAALYLYQYDTETRTTEIKPVLWGLGPIIKAEATGDKVYVHLKNLASRPY
tr|Q6P3G1|Q6P3G1_DANRE sp|P00450|CERU_HUMAN	121	SLHA	118	SLHAGCLSYNKTNEGALYPDSSEKVEKHDDSVAPGTFETTYIWTLPASHAPGKDDTNCITFR TFHSHGITYYKHEGALYPDNITDFQRADDKVPYGEQYTYMLLAITEEQSPGEGDGNCVTR
tr|Q6P3G1|Q6P3G1_DANRE sp|P00450|CERU_HUMAN	181	IYHSH	178	IYHSHVNA PKDIASGLIGPLIVCKKGSLDVHGDKTDGDLTYTLMFTVSDENLSWYLEDENIK IYHSHIDAPKDIASGLIGPLIVCKKDSLDKKEKEDI DREYVVMFSSVDENFWSYLEDENIK
tr|Q6P3G1|Q6P3G1_DANRE sp|P00450|CERU_HUMAN	241	TYCSA	238	TYCSAPAKVNDKDEAFQESNKMHSINGYVYGNLPDLSCIGNKIHWHLFGMGNEVDIHSAA TYCSBPEKVDKDNEDAFQESNRMYSVNGYTFGSLPGLSCAEDRVKKYVFGMGNEVDVHAA
tr|Q6P3G1|Q6P3G1_DANRE sp|P00450|CERU_HUMAN	301	FFHGO	298	FFHGOILTDKROHVDTVSLFPATFVNVEEMVADNPGQWLLSCQVNDHLIAGMQAFFEIKKQ FFHGOALTNKNYRIDTINLFPATLFDAYMVAONPGEWMLSCQNLNLHLKAGLOAFFQVQBC
tr|Q6P3G1|Q6P3G1_DANRE sp|P00450|CERU_HUMAN	361	FPNVH	358	FPNVHKPRPFG.EVROYYIAAEEIIVDYGPTIINQYTMKKLVDDIVS.DTFFDNRNDRIG NKSSSKDNIRCKHVRYYIAAEEIIVNVAESGIDITKENLTAPGSDSAVFFEQGTTRIG
tr|Q6P3G1|Q6P3G1_DANRE sp|P00450|CERU_HUMAN	419	GKYKK	418	GKYKKVQYVEYTDFTFKRKEKTPPEQHLGILGPVIRAEEDDTIKVTFRNKASRPFSTIOF GSYKKLVYREYTDASFTNRKERGPEEHLGILGPVIWAEEVGDITIKVTFHNKAYPLSIOE
tr|Q6P3G1|Q6P3G1_DANRE sp|P00450|CERU_HUMAN	479	HGVQ	478	HGVQYNIDMDGTLVHNVLEESYTDKLLRELKKQPRVIEEPLAAMVFPDTPYKVEWVVPKD IGVRENKNNEGTYYS.....PNYNPQSRSVPEPSASHVAPTEETIYEWVVPKE
tr|Q6P3G1|Q6P3G1_DANRE sp|P00450|CERU_HUMAN	539	GPT	525	GPTTEKDPDCLTYLYYSAVDPIRDINSGLVGPILLICKPKTLKS.GKQKNVDKEFHLLATV VPTNADPVCIAKMYSAVDPIRDI FTGLGPMKICKKGSLEHANGROKDV DKEFYLFPTV
tr|Q6P3G1|Q6P3G1_DANRE sp|P00450|CERU_HUMAN	598	FDENL	585	FDENLSWYLDNINRYAKQPKSVNKEDADFOESNKMHSINGMYGNLKGILNMCCKGDKVSW FDENBSLLELDNIRMTTAPDQVDKEDDFQESNKMHSMNGEYMGNQPLTMCKGDSVWV
tr|Q6P3G1|Q6P3G1_DANRE sp|P00450|CERU_HUMAN	658	HLSG	645	HLSGLGSETDTHGLYFEGNRFLYKETE RRD TINVFP HI SHTVIMEPDSMGQFEVNC KTTDH YLFSAAGNEADVHGIIYFSGNTYLRWGERRRDTANLFPQTSLTLHMWPDTEGTFNVECLTTDH
tr|Q6P3G1|Q6P3G1_DANRE sp|P00450|CERU_HUMAN	718	YHGM	705	YHGMRYAN YTV EKCRFWNRQSE TMLHQKKYYIAAVEMDWDYSPTRTWE D KMHNGLKE SPG YTGMKQKYTVNQCRQSESDSTFYLGERTYYIAAVEVEWDYSPQREWEKELHHLQEQNVS
tr|Q6P3G1|Q6P3G1_DANRE sp|P00450|CERU_HUMAN	778	NEFL	765	NEFLKKEGKFI GSKYKVVLYKE YTD EFTKLKERTADMEHLGIMGPMIHGKVGKVKIIF NAFLDKGEFYIGSKYKVVYRQYTDSTFRVPPERKAE EHLGILGPQLHADVGDKVKIIF
tr|Q6P3G1|Q6P3G1_DANRE sp|P00450|CERU_HUMAN	838	KNMA	825	KNMARPYSIHAGVKTDSPQVALTRPGETQTYTWYLPKNSPTEEQEECSVGAAYSTVD KNMARPYSIHAGVQTESSIVTFTLPGETLTYVWKLIPERSAGTEDSACIPWAYSTVD
tr|Q6P3G1|Q6P3G1_DANRE sp|P00450|CERU_HUMAN	898	VIKD	885	VIKDMYSGLVGPIVICKKSLARTLGLKKEVEEFALLFMVFDENESWYLEENIKTHVKNP QVKDLYSGLIGPLIVCRPYLKVFNPR.RKLEFALLLVFDENESWYLEDENIKTYSDDHPE
tr|Q6P3G1|Q6P3G1_DANRE sp|P00450|CERU_HUMAN	958	KALT	944	KALTE DQQFIESNKMHGINGLVFGNLKGLNMMKVGDKVYWYLMGLGNEVDIHTAHFHGHSF KVNKDD EEFIESNKMHAINGRMFGNLQGLTMHVGDVWNWYLMGMGNEVDLHTVHFHGHFS
tr|Q6P3G1|Q6P3G1_DANRE sp|P00450|CERU_HUMAN	1018	DYK	1004	DYKVS GTHRA DVFDLVPGTFQTVTMRPLYS GTWLLHCHVTDHI QAGMETTYTVLEK DGRK QYKHRGVYS DVFDLFPGTYQTL E MFRPTPGI WLLHCHVTDHI HAGMETTYTVLQNE DTK
tr|Q6P3G1|Q6P3G1_DANRE sp|P00450|CERU_HUMAN	1078	RG	1064	RGFLGIFGSG SG.....

Figure XII. Structural comparison of the ceruloplasmin between *Danio rerio* and *Homo sapiens*. The FASTA files related to zebrafish and human proteins were acquired on the UNIPROT search platform (<http://www.uniprot.org>).

sp|P13635|CERU_RAT	1	MKFLLSALFLHSSLANTREKHYIIGITEAVWDYASGSBEKEELISVDTEQSNFYLRNGP
sp|P00450|CERU_HUMAN	1	MKILLLGLIFLFCSTPAWAKKHYIIGIETETWDYASDHGKELISVDTEHSNLYLQNGP
sp|P13635|CERU_RAT	61	DRIGRKYKKALYSEYTDGTFKTIIDKPAWLGFLGPVIKAEVGDKVSVHVKNFASRPYTFH
sp|P00450|CERU_HUMAN	61	DRIGRLYKKALYLQYDERTTIEKPVWLGFLGPIIKAEVGDKVSVHVKNFASRPYTFH
sp|P13635|CERU_RAT	121	AHGVTYTKANEGAIYPDNTDFQRADDKLFPGOYLYVLRANEP.SPGEGDSNCVTRIIYH
sp|P00450|CERU_HUMAN	121	SHGITYYKEHEGAIYPDNTDFQRADDKVYPCGOYTYMLLATEEQSPGEGDGNVCVTRIIYH
sp|P13635|CERU_RAT	180	SHVDAPKDIASGLIGPLIICKKGSLSHKEKENIDQEFVLMFSVVDENLSWYLEDNIKTFEC
sp|P00450|CERU_HUMAN	181	SHVDAPKDIASGLIGPLIICKKDSLDSHKEKHIDREFVLMFSVVDENLSWYLEDNIKTYEC
sp|P13635|CERU_RAT	240	SEPEKVDKDNEDFQESNRMYSINGYTFGSLPGLSMCAEDRVKWLFLFGMGNEVDVHSELFFH
sp|P00450|CERU_HUMAN	241	SEPEKVDKDNEDFQESNRMYSVNGYTFGSLPGLSMCAEDRVKWLFLFGMGNEVDVHAFFH
sp|P13635|CERU_RAT	300	GOALTSKNYHTDIINLFPATLIDVSMVAQNPGVWMLSCQNLNHLKAGLQAFFQVRDCNKP
sp|P00450|CERU_HUMAN	301	GOALTNKNYRIDTINLFPATLFDAYSVAQNPGVWMLSCQNLNHLKAGLQAFFQVQECNKS
sp|P13635|CERU_RAT	360	SPDDDIQDRHVRHYIAAEEIWDYAPSGTIDFTGENFTSLGSDSRVFFEQGATRIGGSY
sp|P00450|CERU_HUMAN	361	SKNDNIRGKHVRHYIAAEEIWNYAPSGIDFTKENLTAPEGSDSRVFFEQGATRIGGSY
sp|P13635|CERU_RAT	420	KKLVYREYTDASFTNRKERGPEEEHLGILGPVIWAEVGDITRVTFHNKQFPLSTQPMGV
sp|P00450|CERU_HUMAN	421	KKLVYREYTDASFTNRKERGPEEEHLGILGPVIWAEVGDITRVTFHNKQAYPLSTEPIGV
sp|P13635|CERU_RAT	480	RFTRKNEGTYGPDGRSSKQ.....ASHVAPKETFTYEWTVPKEMGPTYADPVCLSKMY
sp|P00450|CERU_HUMAN	481	RFTRKNEGTYGPNYNPSSRSVPPASHVAPETFTYEWTVPKEVGTNADPVCLAKMY
sp|P13635|CERU_RAT	535	SGVDLTKDIFTGLIGPMKICKKGSLLADGROKQVDVDFEYLFATVFDENESLLLDDNIRMF
sp|P00450|CERU_HUMAN	541	SAVDPTKDIFTGLIGPMKICKKGSLLHANGROKQVDVDFEYLFATVFDENESLLLDDNIRMF
sp|P13635|CERU_RAT	595	TTAPENVDKEDDFQESNKMHSNMGFMYGNLPLGNMCLGESSIVWYLFVSAGNEADVHGIYF
sp|P00450|CERU_HUMAN	601	TTAPDQVDKEDDFQESNKMHSNMGFMYGNQPLGTMCKGESSIVWYLFVSAGNEADVHGIYF
sp|P13635|CERU_RAT	655	SGNTYLSKGERRDANLFFHKSLTLLMTPDTEGSDFNVECLTTDHYTGGMKQKYTVNQCKG
sp|P00450|CERU_HUMAN	661	SGNTYLRGERRDANLFFQTSLTLLHWPDTEGTFNVECLTTDHYTGGMKQKYTVNQCR
sp|P13635|CERU_RAT	715	QPEDVTLVCGERTYYIAAVEVEWDYSPRRWEKELHHLQEQNVSNAPFLDKGEFFIGSKYK
sp|P00450|CERU_HUMAN	721	QSEDSTFYCGERTYYIAAVEVEWDYSPRRWEKELHHLQEQNVSNAPFLDKGEFFIGSKYK
sp|P13635|CERU_RAT	775	KVYREFTDSTFRVVRRAEEHLGLLGPQIHADVGAKVKVVFKNMATRPYSIAHAGVK
sp|P00450|CERU_HUMAN	781	KVYRQYTDSTFRVVRRAEEHLGLLGPQIHADVGAKVKVVFKNMATRPYSIAHAGVQ
sp|P13635|CERU_RAT	835	TKSSTVAPTLPGEVRTYHWKIPERSGAGTEDSPCIPWAYYSTVDKVKDLYSGLIGPLIVC
sp|P00450|CERU_HUMAN	841	TKSSTVTPTLPGETLTYHWKIPERSGAGTEDSPCIPWAYYSTVDKVKDLYSGLIGPLIVC
sp|P13635|CERU_RAT	895	RKSYVKVFNPKKKMEFSLFLVFDENESWYLDNINITYSDHPEKDNKDEEFIESNKMHA
sp|P00450|CERU_HUMAN	901	RRTYLKVFNPKRKKLEFSLFLVFDENESWYLDNINITYSDHPEKVNKDEEFIESNKMHA
sp|P13635|CERU_RAT	955	INCRMFGNLQGLTMRVGVDEVNWWYVMMGMNEIDLHTVHFHGHSPQYKHRGTHSSDVFDLFF
sp|P00450|CERU_HUMAN	961	INCRMFGNLQGLTMRVGVDEVNWWYVMMGMNEIDLHTVHFHGHSPQYKHRGTHSSDVFDLFF
sp|P13635|CERU_RAT	1015	GTYTLEMPFQTPGILLHCHVTDHIHAGMVTYTVLQNEETKSG
sp|P00450|CERU_HUMAN	1021	GTYTLEMPFQTPGILLHCHVTDHIHAGMVTYTVLQNEETKSG

Figure XIII. Structural comparison of the ceruloplasmin between *Rattus norvegicus* and *Homo sapiens*. The FASTA files related to rodent and human proteins were acquired on the UNIPROT search platform (<http://www.uniprot.org>).

sp|Q61147|CERU_MOUSE	1	MKFLIISTFIFLYSSLALARDKHVFIGITEAVWDYASGTE	EKKLISVDTEQSNFYLQNGP
sp|P00450|CERU_HUMAN	1	MKILLIGIFLFLCSIPAWAKEKHVYIGIETTDWYASDHG	EKKLISVDTEHSNIYLQNGP
sp|Q61147|CERU_MOUSE	61	DRIGRKYKKALYFEYTDCTFSKTIKPAWLGFLGPVIKAEVE	DKVYVHLKLNLSRIYTFH
sp|P00450|CERU_HUMAN	61	DRIGRLYKKALYLQYTDCTFRRTTIKPVWLGFLGPIIKAE	TGDKVYVHLKLNLSRPIYTFH
sp|Q61147|CERU_MOUSE	121	AHGVTYTKYEAGAVYPDNTTDFORADDKVLPGQYVYVLLHANE	PSPGEGDSNCVTRIYH
sp|P00450|CERU_HUMAN	121	SHGLTYYKEHEGAHYPDNTTDFORADDKVPGEQYTYMLLATEEQ	SPGEGDGNVTRIYH
sp|Q61147|CERU_MOUSE	180	SHVDAPKDIASGLIGPLIICCKGSLYKEKEKNIDQEFVLMFSVVDEN	LSWYLEDNIKTEC
sp|P00450|CERU_HUMAN	181	SHLDAPKDIASGLIGPLIICCKDSLDEKEKEKIDREFVLMFSVVDEN	FWSWYLEDNIKTYC
sp|Q61147|CERU_MOUSE	240	SEPEKVDKDNEDFQESNRMYSINGYTFGSLPGLSMCAADR	RVKWFYFGMGNEVDVHSAFFH
sp|P00450|CERU_HUMAN	241	SEPEKVDKDNEDFQESNRMYSVNGYTFGSLPGLSMCAE	DRVWYFGLMGNEVDVHAAFFH
sp|Q61147|CERU_MOUSE	300	GOALTSRNYQTDIINLFPATLIIDAYMVAQNPGVWMLSCQNLNHLKAGLQAFFQV	RDCNKP
sp|P00450|CERU_HUMAN	301	GOALTNNKYRIDTINLFPATLIDAYMVAQNPGVWMLSCQNLNHLKAGLQAFFQV	QECNKS
sp|Q61147|CERU_MOUSE	360	SPEQNIQDRHVRHYIAAEEVIWNYAPSGTDIFTGENLTALESDS	RVFFEQGATRIGGSY
sp|P00450|CERU_HUMAN	361	SKDNIRGKHVRHYIAAEEIWIWNYAPSGIDIFTKENLTALESDS	RVFFEQGATRIGGSY
sp|Q61147|CERU_MOUSE	420	KKMAYREYTDGSFTNRKRGPEDEEHLGILGPVIWAEVGDITK	RVTFHNKQHPLESIQPMGV
sp|P00450|CERU_HUMAN	421	KKLVYREYTDASFTNRKRGPEDEEHLGILGPVIWAEVGDITR	RVTFHNKQAYPLESIEPIGV
sp|Q61147|CERU_MOUSE	480	SFTAENEGTYYG...PGRSSQQAASHVAPKETFTYEWTVPKEM	GPTYADPVLCKMY
sp|P00450|CERU_HUMAN	481	RFNKNNEGTYYSENYNPQRSVPPSASHVAPKETFTYEWTVPKEM	GPTYADPVLCKMY
sp|Q61147|CERU_MOUSE	536	SGVDPTKIDFTGLIGPMKICKKGSLLADGRQKDVDFEYLFPTVFDENESLL	LDNIRMF
sp|P00450|CERU_HUMAN	541	SAVDPTKIDFTGLIGPMKICKKGSLLANGRQKDVDFEYLFPTVFDENESLL	LDNIRMF
sp|Q61147|CERU_MOUSE	596	TTAPDQVDKEDDFQESNKMHSNMGFMYGNQPLNMC	LGEISIVWYLFSAAGNEADVHG
sp|P00450|CERU_HUMAN	601	TTAPDQVDKEDDFQESNKMHSNMGFMYGNQPLTMC	RGSISVWYLFSAAGNEADVHG
sp|Q61147|CERU_MOUSE	656	SGNTYLSKGERRDANLFRHKSLTLDMNPDTKGTFDVECLTTDHYTGGMKQKYTVNQ	QR
sp|P00450|CERU_HUMAN	661	SGNTYLRKGERRDANLFRQTSLTLHMWPDTEGTFNVECLTTDHYTGGMKQKYTVNQ	RR
sp|Q61147|CERU_MOUSE	716	QFEDFTVYLGERTYYVAAVEVEWDYSPSRANEKELHHLQEONVSNV	FLDKREFFIGSKYK
sp|P00450|CERU_HUMAN	721	QSEDSTFYLGERTYYVAAVEVEWDYSPORANEKELHHLQEONVSNV	FLDKREFFIGSKYK
sp|Q61147|CERU_MOUSE	776	KVVYRQFTDSSFRVQVRRRAEDELHLGILGPPIHANVGDVKVVF	FKNMATRPYSIHAGVK
sp|P00450|CERU_HUMAN	781	KVVYRQYTDSTFRVVPVRRRAEDELHLGILGPPIHADVGDVKVVI	IFKNMATRPYSIHAGVQ
sp|Q61147|CERU_MOUSE	836	TESSTVPTLPGEVRYTYTWQIPERSGAGR	EDSACIPWAYYSTVDQVKDLYSGLIGPLIVC
sp|P00450|CERU_HUMAN	841	TESSTVPTLPGETLTYTWQIPERSGAGT	EDSACIPWAYYSTVDQVKDLYSGLIGPLIVC
sp|Q61147|CERU_MOUSE	896	RKSYVYKVFSPKPKMEFLLFLVFDENESWYLDNIIKTYSDH	HPKVNKNDNEEFESNKMHA
sp|P00450|CERU_HUMAN	901	RRPYLKVFNPRRKLEFALLFLVFDENESWYLDNIIKTYSDH	HPKVNKNDNEEFESNKMHA
sp|Q61147|CERU_MOUSE	956	INGRMFGNLQGLTMHVKDEVNWMGMGNEIDLHTVHFHGHFSFQYK	HGRGVYSSDVFDLFP
sp|P00450|CERU_HUMAN	961	INGRMFGNLQGLTMHVGDEVNWMGMGNEIDLHTVHFHGHFSFQYK	HGRGVYSSDVFDLFP
sp|Q61147|CERU_MOUSE	1016	GTYTLEMFQTPGTWLLHCHVTDHVGAGMATTYTVLPVEQETKSG	
sp|P00450|CERU_HUMAN	1021	GTYTLEMFRTPGTWLLHCHVTDHVGAGMETTYTVLQNEETKSG	

Figure XIV. Structural comparison of the ceruloplasmin between *Mus musculus* and *Homo sapiens*. The FASTA files related to rodent and human proteins were acquired on the UNIPROT search platform (<http://www.uniprot.org>).

tr|I3KHS6|I3KHS6_ORENI sp|P01024|CO3_HUMAN	1	.RTRLWLLASLAFLSLTFITDGSMPKVMASAPNLLGVGTAAQNIQVECDCTDES DLMVEIT	1	MGPTSGPSLLLHLTLHLALGSPMYSITIPNILLRLESEEEMVLEAHDAQG..DUPVTVT
tr|I3KHS6|I3KHS6_ORENI sp|P01024|CO3_HUMAN	60	VMSYPTKSKRLISTSVNLTSANKFQAFGQIKIPT.EGFSRDPQRKQVYVLAQAFPDDVKLE	59	VHDEPCKKLVLSSEKTVLTPATINHMGNVITFTIPANREFKSEKGRNKVEVTVQVVE
tr|I3KHS6|I3KHS6_ORENI sp|P01024|CO3_HUMAN	119	KIVLVSFHSGYFIQTDKTIYTPNSKVHYRFFALTPNMEPVERDNSTISDTVAIQFVNP	119	KVVLVSLQSGYEFIQTDKTIYTPNSTVLYRFFALTPNMEPVERDNSTISDTVAIQFVNP
tr|I3KHS6|I3KHS6_ORENI sp|P01024|CO3_HUMAN	179	EGVIFPPLDTSVKS.S.GIHSGHFQINEIVSTGLWKMMSFQSKPQLSVSAEFEVKKDYVLP	171	EGIPVKQDLSLSQNLGLVLP LSLWIDIPELVNMGQWKIRAYIENSFQQVPSSTEFVKKDYVLP
tr|I3KHS6|I3KHS6_ORENI sp|P01024|CO3_HUMAN	237	NFEVKLTNENPFYVDSD.E.LTINI KATYLFGEVDSGSAFVFGVHLHQDKTINFAQLSLOK	231	SFEVTVPETEKRYIYNEKGLVETITARFLMGKKVBTAFVIFGIQDGBQRIISLPESLKR
tr|I3KHS6|I3KHS6_ORENI sp|P01024|CO3_HUMAN	296	VSIENCGVTITKKEHIIKQTFEN..ISSLVGSIFAAVNVLTDSGSEMAEAELETCIQIVT	291	IPIEDGSGEVVLSRKLKGLDGVQNPRAEDLVGKSLYVSAATVILHSGSDMVAERSGTIVT
tr|I3KHS6|I3KHS6_ORENI sp|P01024|CO3_HUMAN	354	SPYTIHFKKTSRFYFKPGMSFDVVEVLNPDGSPAQCQAVMIDPQD.VOGFTAAANGMARLT	351	SPYQIHFTKTPRYFKPGMSFDLMVFEVLPDGPSPARVAVVQGEDVQGLTQDGMVAKLS
tr|I3KHS6|I3KHS6_ORENI sp|P01024|CO3_HUMAN	413	INTVNNPQPMKITAKTQVVKISPEROASATMTALPYASQ..SNSYIHIQVDTAEVKNQGN	411	INTHPSQKPLSITVTRTKQELSEAEQATRMOALPYSTVGNSSNYLHLVLRTELRPGET
tr|I3KHS6|I3KHS6_ORENI sp|P01024|CO3_HUMAN	471	MKINIHLSRQ...QNVQNDITYLLSRGQLVKYG.RYRTSGOIMISLITVTKDLPSFR	471	LNVNFLLRMDRAHEAKIRYYTYLIMNKGRLKAGRQVREPQDGLVVL LLSITTDLPSFR
tr|I3KHS6|I3KHS6_ORENI sp|P01024|CO3_HUMAN	527	IIAYYHPN...DNEVSDSVWVDVDETCMGLLQLOS.EGGSRFYEPKIFR LKIGDPE	531	LVAYYTLIGASGQRVAVDSVWVDVKDSCVGLVVKSGQSEDRQPVGGQMT LKIGDHG
tr|I3KHS6|I3KHS6_ORENI sp|P01024|CO3_HUMAN	582	ATVGLVAVDKGVYILNSKHLRTOQKIWDTVENYDTGCTPGGKDSMVFV DAGLTFESNI	591	ARVVLVAVDKGVYILNSKHLRTOQKIWDTVENYDTGCTPGGKDSMVFV DAGLTFESNI
tr|I3KHS6|I3KHS6_ORENI sp|P01024|CO3_HUMAN	642	ASGTPYRQELKCLTPNRRRSVDMNVTTLLSQQYKDKLEHDCCLDGIRETPTSSNCKRR	651	GQQTAAQRAELQCPAARRRRSVQLTEKRMKDKVGYKELRKCCE DGMRENPMRFSCQRR
tr|I3KHS6|I3KHS6_ORENI sp|P01024|CO3_HUMAN	702	SEFITD.TACFEAFLHCCKEMEKRAERKEDGLKLARSEDDDSFSMDSNEIVSRNFPES	711	TRFISLGEACKKVFLDCCNYITELRQHARASHLGLARSNLDEDI IAEENIVSRSBFPES
tr|I3KHS6|I3KHS6_ORENI sp|P01024|CO3_HUMAN	761	WLWSDIKLPACPEENAKCETESVTRNIPLODSITTWETITGISTSKTHGICVGDPLETVVR	771	WLWNVEDLKEPE...KNGISTKLMNIFLKDSITTWETITLAVSMDDKKGICVADPEVTVM
tr|I3KHS6|I3KHS6_ORENI sp|P01024|CO3_HUMAN	821	KDFVVDLKLPSAVRGEQEIKAIVTNNHGN.LYTVRVDL TEAEHFCSAASKRGRYQEM	827	QDFFDLRLPYSVVRNEQEIKAIVTNNHGN.LYTVRVDL TEAEHFCSAASKRGRYQEM
tr|I3KHS6|I3KHS6_ORENI sp|P01024|CO3_HUMAN	880	KVGAKSIRSVSFTIIPTKCQHRITPKAAVKESEISDITVKMLRVVPEGILVKS SHTLTL	887	TIPKSSLSVPIVPLTKGLQEVVKAAYVHHFISDGVKSLRVVPEGIRMNKIVAVRT
tr|I3KHS6|I3KHS6_ORENI sp|P01024|CO3_HUMAN	940	DPKQRDGRQVEILN..SKTPVIDBVPNSPTSTQISLQKQQRNV LKNTISGESMGLIYQ	947	LDPBRDGRQVEIQKEDIPADLSDOVPDTESETRILLOGTTPVAQMTEDAVDAERLKH LIT
tr|I3KHS6|I3KHS6_ORENI sp|P01024|CO3_HUMAN	998	PSGCGENMIHMTLPVIAITYLDRADLWEIVNIDQRHQALQHIITGYHNLQLEYSKKDG SF	1007	PSGCGEQNMIHMTPTVIAIHYLDETEQWEKFGLEKRGQALELKKGYTQQLAFRQPS SAF
tr|I3KHS6|I3KHS6_ORENI sp|P01024|CO3_HUMAN	1058	ARTQDVPSSTWLTAYVVKVFLANLLIAVQSEVICNAVRFLLIINTQPNGMFMEVGSVSH	1067	AAFVKKRAPSTWLTAYVVKVFLANLLIAIDSQVLCGAVKWLILEKQKPDGVFQEDAPVH
tr|I3KHS6|I3KHS6_ORENI sp|P01024|CO3_HUMAN	1118	KEIIGVDLDTDS.DASFVAFCSVMSOESRTICAPTVDHNLQASIDKAVGRLPERRLSLVNP	1127	QEMIGGLRNNNEKDMAITAFV LISHQEAKDICEEQVNSLPGSITKAGDLEANYMHLQRS
tr|I3KHS6|I3KHS6_ORENI sp|P01024|CO3_HUMAN	1177	YAVAITSYAMANENKLNREIFFKFS.S.PDSSYWPABAGR VFTVEATYALLALVRAKAF	1187	YTVAITAGYALAQMGRLKGPLLNKFLTAKDKNRWEDGKQLYNVEATS YALLALVQLKDF
tr|I3KHS6|I3KHS6_ORENI sp|P01024|CO3_HUMAN	1235	DEARPTVRRWFNKQIRENGGYGSAQATMTVYQAIAYWVISE.KEP EYDLNVDILLPGRSKP	1247	DFVPPVRRWLNQORYYGGYGSQATFMVROALAQYQKDAPDHQELNLDVSLQLPGRSSK
tr|I3KHS6|I3KHS6_ORENI sp|P01024|CO3_HUMAN	1294	DKYNFNWDNHFAITRTSKINVINQDVKVSAATGPEATLTIITSLYIYELPKKKNCKOKNDS	1307	ITHRIHWESASLRSSEET.KENEGFTVTAEGKQGLTSLVYMYHAKAKDLT.CNKFNDK
tr|I3KHS6|I3KHS6_ORENI sp|P01024|CO3_HUMAN	1354	VQLLEESLG...DDEINIYLNKIKVFKNKNERNATTPVLDIGLLTGFVSTKDLDLQAK	1365	VTIKESAPETERKRPQDARKNTMI LECTRYR.GDQATMSILDSMMTGFPAPD TDLRQLAN
tr|I3KHS6|I3KHS6_ORENI sp|P01024|CO3_HUMAN	1409	GHARTLSKYRLNSES.ERRLTIYLNKVPYT.ELEIAFRVHQKLVGILQPAAVVYVYFES	1424	GVDRYISKYELDKAFSDRNTLIYLDKVSHEDDCLAFKVVHQYFVVELIQGAVKVVYVY
tr|I3KHS6|I3KHS6_ORENI sp|P01024|CO3_HUMAN	1467	DQLQNTKCVRFYHPERKAGELLRLCRNDECICAENCSMOK.KGKINNDERKDKICESTV	1484	NLEES..CTRFYHPEKEDGKLNKLCRDELCRCAEENCIFQKSDDKVTLBERLDKACEP..
tr|I3KHS6|I3KHS6_ORENI sp|P01024|CO3_HUMAN	1526	RSKIDYAYKVSVEQFADGLSTDIYITVQVLEVKEGSYDVGAGQRORTFLGYPHCRMALDL	1540	..GVDYVYKTRLVKVLQSNDFDEYITMAIEQTIKSGSEVQVGGQORTFLSPICKRBALKL
tr|I3KHS6|I3KHS6_ORENI sp|P01024|CO3_HUMAN	1586	GVGKTEFLMGTSDIFKDEKQSQSYQVYLGERTWIEYWFVTVTECTEEHNSTCSAIDEMVN	1597	EEKKHVLMWGLSSDFWGEKPN..LSYIIGKDTWVEHWEDEECQDEENKQKQDLDGAFTE
tr|I3KHS6|I3KHS6_ORENI sp|P01024|CO3_HUMAN	1646	EYMIKRCRN	1655	SMVVFQCPN

Figure XV. Structural comparison of the complement C3 between *Oreochromis niloticus* and *Homo sapiens*. The FASTA files related to tilapia and human proteins were acquired on the UNIPROT search platform (<http://www.uniprot.org>).

tr|F1QYN0|F1QYN0_DANRE sp|P01024|CO3_HUMAN	1	.MHGCLVC	VAAVILSLPLLSFCQPIYIISAPNKLKIGSAERVFVEAODYAGASLNV	VRISV
	1	MGPTSGPS	LLLLLLTHLPLDALGSEMYSIITPNILRLSESETEVLEAHDAAQGDVP.	VTVTV
tr|F1QYN0|F1QYN0_DANRE sp|P01024|CO3_HUMAN	60	RRFKDDQREVAS	TSVTLTAGKNFQELVEIEVPSN.SFTFDKSAQOYAVLQAOFPNKLLOK	
	60	HDFPGKLLVLS	SEKTVLTPATNHMGNVFTTIPANREFKSEKGRNKFEVTVQATFSTQVVEK	
tr|F1QYN0|F1QYN0_DANRE sp|P01024|CO3_HUMAN	119	QILVTFQSGHIV	LQTDKTIYTPDSTVHYRVFSLSPGMTRPFQSGVRVEILTPDGI	LESK
	120	VLVSLQSGYLV	IQTDKTIYTPGSTVLYRIFTVN.HKLLPVGRTVMVNIENPBGIPVKQD	
tr|F1QYN0|F1QYN0_DANRE sp|P01024|CO3_HUMAN	179	SVFPDG..GVVSGT	FTGIDPASPGLWKLVAHKNSPQKNFTSEFEVKEVYVLPSEFVSLSP	
	179	SLSSQNQLGVL	PLSWDIPLELVNMGQWKIRAYYENSPQVFTSEFEVKEVYVLPSEFVIVBP	
tr|F1QYN0|F1QYN0_DANRE sp|P01024|CO3_HUMAN	237	HKAFFYVND.D.S	LLVDIHAHYLFGETVNGHGFVVFVGVTEDEKGRKISIPGSLORVQIWDGS	
	239	TEKFYIYNEKGL	LEVITARFLMGKKGVTAFVVFVGIQDGEQ.RISIPESLRRIPIDGS	
tr|F1QYN0|F1QYN0_DANRE sp|P01024|CO3_HUMAN	296	GTAQLTKRQHLQ.	TFPEITRQLVQKSLYISVSLTESGSEMVAHKKGIHIVTSPYTIYF	
	298	GEVVLRSKVLLD	GVQNRRAEDLVGKSLYVSATVILHSGSDMVQAERSGIPIVTSPYQIH	
tr|F1QYN0|F1QYN0_DANRE sp|P01024|CO3_HUMAN	354	KRTPQEFKPGMP	PDVSVVVTNPDTEPAKNVKEVEV.PGGVSGQTKANKIAKVTINTPGGS	
	358	TKTPKQEFKPGMP	PDLMVVTNPDGSPAYRVPVAVQGEDTVQSLTQGDGVAKLSINTHPGQ	
tr|F1QYN0|F1QYN0_DANRE sp|P01024|CO3_HUMAN	413	STLEITARTSDPQ	LTSRQOAEKRMATAHAYVPKGGSNYLHTGIDAAELRIGDSMKVNLNL	
	418	KPLSITVTRTKKQ	LEAEQATRLMQLALYVSTVGNSSNYLHTGIDAAELRIGDSMKVNLNL	
tr|F1QYN0|F1QYN0_DANRE sp|P01024|CO3_HUMAN	473	GQS..PGVVRDQD	FYMIILSRQIVQANRFKRR.GQILVLSLSPVTKDMVPSFSEVYVYHV	
	478	RMDRAHEAKIRY	YTYLIMNKGRLKAGRQVREPQDGLVLPSPITDFIPSPFSEVYVYHV	
tr|F1QYN0|F1QYN0_DANRE sp|P01024|CO3_HUMAN	530	GSS...EVVSDSV	VVDVKDTCMGSLLKVEVHDP.VEVYEPGEFELELRTGDPGARVGLVA	
	538	IGASQQR	EVVADSVVDVKDSCMGSLLVVKSGQSEDRQPVPCCQMTLRTGDPGARVGLVA	
tr|F1QYN0|F1QYN0_DANRE sp|P01024|CO3_HUMAN	585	VDKGVVVLNKKH	RITQSKIWDVVESHDTCAGSGKNSMQVFS DAGLLEFSSSAGGT	TSVR
	598	VDKGVVVLNKKH	KLTQSKIWDVVEKADIGCTPGSGKDYAGVFS DAGLLEFSSSAGGT	TAQR
tr|F1QYN0|F1QYN0_DANRE sp|P01024|CO3_HUMAN	645	TNSECPSSSR	RRKRETLVNLHKTLLDKYSGLARECCV DGLRALDVLDFSCYR	SFILD
	658	AELQCPQPAARR	RRRSVQLTEKRLMDKVGKYPKELRKCCEDGMR.ENPMPFSCYRRT	PFISL
tr|F1QYN0|F1QYN0_DANRE sp|P01024|CO3_HUMAN	705	GKECRDAFLDCC	NRLTSHR.EEPAAEEETFLGRTGEDDEFVNSDDIVSRTLFPESWLWEEV	
	717	GEACKKVFLDCC	NYITELRQHARASHLGLARSNLDEDIIEENIVSRSEFPESWLWNVE	
tr|F1QYN0|F1QYN0_DANRE sp|P01024|CO3_HUMAN	764	MLPKCLGNRQC	TTTLPKDLWLKDSITWEITAEISLNTHGICVADVHEMIVAKNFFID	
	777	DLKEPPKN...	GISTKLMNIELKDSITWEILAVSMSDKRGICVADPFEVTVMQDFFID	
tr|F1QYN0|F1QYN0_DANRE sp|P01024|CO3_HUMAN	824	LKIPYSAVRNEQ	IEIKALIHNLYS.KAVKVRVELKE TKDICS PASNKRGRYAVTVT	VASKS
	833	LRLPYSVVRNEQ	VEIRAVLYRYRQNEKVRVELLHNPAPFSGLATERRKHQVIT	IPKKS
tr|F1QYN0|F1QYN0_DANRE sp|P01024|CO3_HUMAN	883	SYVPEVIVPIAL	GRHATEVKAASGRGN.DGVRKDLVVESEGLT.RKISENLQFNPFK	
	893	SLSVPEVIVPIK	TGLQVEVKAAYHFFHS.DGVRKSLKVPPEGIRMNQTVAVRILD	PERL
tr|F1QYN0|F1QYN0_DANRE sp|P01024|CO3_HUMAN	941	GETIVTKQSH..	ILKQAPNTPSSTYVQAIQDITITIEKATSGAAMGSLIIQPGCGGE	
	953	GREGVQKEDIPP	ADLSQVPTSETRILLQGTVAQMTEDAVDAERLKHLIQTPSGCGGE	
tr|F1QYN0|F1QYN0_DANRE sp|P01024|CO3_HUMAN	998	QNMMGHTMPVIA	THYLDKTNQWHTVRAGLRQATATEYIRKGYNOELAYRKS DGS	FAAWINR
	1013	QNMMGHTMPVIA	VHYLDETEQWEKFGLEKRGALERTKKGYSQQLAFRQPSAFAAEVKR	
tr|F1QYN0|F1QYN0_DANRE sp|P01024|CO3_HUMAN	1058	PSSTWLTAYVAK	VAFAMSDIILIDQNVICSA LRWLIMNROLNPGVFR ENAPVIHGE	MTGN
	1073	APSTWLTAYVAK	VFAVNLIAIDSOVLCGAVKWLILEKQKPDGVFQEDAPVIHGE	MTGN
tr|F1QYN0|F1QYN0_DANRE sp|P01024|CO3_HUMAN	1118	VQGSNS.EASMTAF	VITLQEGRSRCNGQVSSLDSIYKAIAYLKSQLOGLINPYAVAMA	
	1133	LRNNNEKDMALT	AFVITLSLOEAKDICEBOVNSLPGSITKAGDFLEANNLQRSYTVATA	
tr|F1QYN0|F1QYN0_DANRE sp|P01024|CO3_HUMAN	1177	SYALANANSLNKQ	VLMKAS..ADKSHNPVPGSSFTLEASSYALLALVKLHDYQNTAP	IF
	1193	GYALAQMGRLKGP	LLNKFLITAKDKNRNEDPGKQLYNVEAFSYALLALLQLKDEDFV	PBV
tr|F1QYN0|F1QYN0_DANRE sp|P01024|CO3_HUMAN	1235	VNWLNNORQYNG	GGYGTQATIMVFOVAEYRIHAKNIKQLDLELSIRVEG.VRPTVFTFS	
	1253	VRWLNORQYNG	GGYGTQATIMVFOALAQYQKADAPDHOELNLDVSLQLPSRSSKITHRIH	
tr|F1QYN0|F1QYN0_DANRE sp|P01024|CO3_HUMAN	1294	KNNDHLSQTAK	IPSNKGITISAKGFGEASVTVTVEYAKPKESSTCKNFLELETFE..K	
	1313	WESASLLRS	EETKENEGFTVTAEGKGGQLSVVTMYHAKAKD.QLTCNKFDLKVITK	PAP
tr|F1QYN0|F1QYN0_DANRE sp|P01024|CO3_HUMAN	1352	DNEVRYQGATE	SYKLTINTRYLSADR DATMSILDVSLTGFVDPDENDLKALSTGRDR	LITIS
	1372	ETEKRPODAKNT	IMILEICTRYR.GDQDATMSILDISMGTGAPDLDLQLANGVDRYI	
tr|F1QYN0|F1QYN0_DANRE sp|P01024|CO3_HUMAN	1412	KFEMNKQLSBRG	SLIYLDKISHTRKDRVAFRLHRIMNGGFTOPAGVTVYVEYYSIENRCV	
	1431	KYELDKAFSDRN	TLIYLDKVSHEDDCLAFKVHQYFNVELTOPGAVVYAYYNLEESC	T
tr|F1QYN0|F1QYN0_DANRE sp|P01024|CO3_HUMAN	1472	KFYHPTRKEGGL	OKICRNDVCCAE DNCSIQK.KEKIQEAHRNKKACE SKINVYKAVL	L
	1491	RFYHPEKEDGKL	NKLCRDELCCAE ENCFIQKSDDKVTLERLDRKACEPGVDVYKTR	L
tr|F1QYN0|F1QYN0_DANRE sp|P01024|CO3_HUMAN	1531	GQDEDASTVSY	YMRIOQLKIGPEDDVEGKRRTFTVQISCKEALDLKRGESYLI	MCQSEB
	1551	KVQLSNDFD	YIMALEQTIKSGSEVQVQQRTEISPIKCREALKLEKKHYLWGLSS	D
tr|F1QYN0|F1QYN0_DANRE sp|P01024|CO3_HUMAN	1591	VQLEGGKVGQY	ALGERTWLEFWPSELQSKTSAELKLCDYIMSFSKNSSSAGCKN	
	1611	FWGEEKPNLSY	IIGKDTWVEHWPEDDECQDEENQKQCDLGAFTESMVFVGC	PN

Figure XVI. Structural comparison of the complement C3 between *Danio rerio* and *Homo sapiens*. The FASTA files related to zebrafish and human proteins were acquired on the UNIPROT search platform (<http://www.uniprot.org>).

sp|P01026|CO3_RAT	1	MGPTSGSQLLVLLLLASSL LALGSPMYSITPNVLRLESEETFL LEAHDAQGDVPVTVT
sp|P01024|CO3_HUMAN	1	MGPTSGP..SLLLLLTHLPLALGSPMYSITPNILRLESEETMVL LEAHDAQGDVPVTVT
sp|P01026|CO3_RAT	61	VQDFLKKQVLTSEKTVLTGATGHLNRVFIKIPASKEFNADKGHKYVTVVANFGATVVE
sp|P01024|CO3_HUMAN	59	VHDFPGKKLVLSSEKTVLTPATNHMGNVFTFIPANREEKSEKGRNKEVTVQAFGTQVVE
sp|P01026|CO3_RAT	119	KAVLVSFQSGYLFIQTDKTIYTPGSTVEYRIFTVDNLLPVGKTVVIVIEIPDGVPIKRD
sp|P01024|CO3_HUMAN	119	KVVLVSTQSGYLFIQTDKTIYTPGSTVLYRIFTVNHKLLPVGRTVMVNIENPEGIPVQRD
sp|P01026|CO3_RAT	179	ILSSHNQYGCILPLSWNIPELVNMGQWKIRAFYEHAPEKQTFSAEFEVKEYVLPSEFVIVPEP
sp|P01024|CO3_HUMAN	179	SLSSONQLGVLPISWDIPELVNMGQWKIRAYEENSPEQVFSFEFEVKEYVLPSEFVIVPEP
sp|P01026|CO3_RAT	239	TEKFYIYHGP KGLEVSI TARFLYGNVDGTAFVIFGVQDEDKKISLALSLTRVLI EDGSG
sp|P01024|CO3_HUMAN	239	TEKFYIYNE KGLEVSI TARFLYGNKVEGTAFVIFGVQDEGEQRISLPESLKRILP IEDGSG
sp|P01026|CO3_RAT	299	EAVLSRKVLM DGV RPSSEALV GKSLSYVS VVILHSGSDMVEAERSGIPIVTSPYQIHFT
sp|P01024|CO3_HUMAN	299	EVVLSRKVLD DGV QNPRAE DLV GKSLSYVS ATVILHSGSDMVQAERSGIPIVTSPYQIHFT
sp|P01026|CO3_RAT	359	KTPKFKPAMPFDLMVFVTPNDGSPARVVPVTOGSDAQALTO D DGVAKLSVNT PNNRQ
sp|P01024|CO3_HUMAN	359	KTPKFKPAMPFDLMVFVTPNDGSPAYRVPVAVOGE DTVQSLTO D DGVAKLSVNT HPSRQ
sp|P01026|CO3_RAT	418	PLTITVSTKKEGTPDARQATRTMQAQPYSTMHNSNNYLHLSVSRVELKPGDNLNVNHLR
sp|P01024|CO3_HUMAN	419	PLSITVSTKKEGTPDARQATRTMQALPYSTVGNNSNNYLHLSVLRTEL R PGETLNVNHLR
sp|P01026|CO3_RAT	478	TDAGQEA KIRYYTYLV MNKGRLLKAGRQVREPGQDLVVLSPITP EFIPSRFLVAYYTLI
sp|P01024|CO3_HUMAN	479	MDRAHEA KIRYYTYLV MNKGRLLKAGRQVREPGQDLVVLPLSITP D EFIPSRFLVAYYTLI
sp|P01026|CO3_RAT	538	GANGQREVVADSVVVDVKDSCVGT LVVKGDPDRDNROPAPGHOTLRIEGNOGARVGLVAV
sp|P01024|CO3_HUMAN	539	GASGQREVVADSVVVDVKDSCVGS LVVKS GQSEDRQRPVPGQOMTLRIEGDHGARVVLAV
sp|P01026|CO3_RAT	598	DKGVFVLNKKNKLTQSKIWDVVEKADIGCTPGSGKNYAGVFM DAGLTFKTNQGLQTDQRE
sp|P01024|CO3_HUMAN	599	DKGVFVLNKKNKLTQSKIWDVVEKADIGCTPGSGKD YAGVFS DAGLTFSSSGQQTAAQRA
sp|P01026|CO3_RAT	658	DPECAKPAARRRRSVOLMERMDKAGQYTDKGLRKCCEGDMRIPMPYSCORRARLITQG
sp|P01024|CO3_HUMAN	659	ELQCPQPAARRRRSVOLTEKRMKDKVGY PKE LRKCCEGDMRENPMRESCORRRTRFISLG
sp|P01026|CO3_RAT	718	ESCLKAFMDCCNYITKLRERQHRRDHV LGLARSVDDEDIIP EEDIISRSHPFESWLWTIEE
sp|P01024|CO3_HUMAN	718	EACKRVFLDCCNYITELRERQHARASH LGLARSNDDEDIIE ENIISRSHPFESWLWNVED
sp|P01026|CO3_RAT	778	LKEPEKNGISTKVMNIFLKDSITWEILAVSISDKKGCIVADPVEETVMQDFFIDLRLPY
sp|P01024|CO3_HUMAN	778	LKEPEKNGISTKLMNIFLKDSITWEILAVSM SDDKGCIVADPVEETVMQDFFIDLRLPY
sp|P01026|CO3_RAT	838	SVVRNEQVEIRAVL E NYRQEKLVVRVELLHNPFCSMATAKKRY YQTI EIPPKSSVAVE
sp|P01024|CO3_HUMAN	838	SVVRNEQVEIRAVL E NYRQEKLVVRVELLHNPFCSMATTKRRHQQTIVTIPPKSSLSVE
sp|P01026|CO3_RAT	898	YVIVPLKIGLQEEVEKAAVFNHFTSDGVKKILKVVPEGRMKNKTAVVRTLDPERL NQGGV
sp|P01024|CO3_HUMAN	898	YVIVPLKTGLQEEVEKAAVYHFTSDGVKRSLKVVPEGRMKNKTAVVRTLDPERL GREGV
sp|P01026|CO3_RAT	958	QREDVNAADLSDQVPD T DSETRILLQGTPVAQMAEDA V DGERLKHILVTPSGCGEQNMIG
sp|P01024|CO3_HUMAN	958	QKEDIIPADLSDQVPD T ESETRILLQGTPVAQMTEDA V DGERLKHILVTPSGCGEQNMIG
sp|P01026|CO3_RAT	1018	MTPTVIAVHYLDQTEQWEKFGLEKREQALELKKGYTQQLAFKQPI S AYAANRNP PSTW
sp|P01024|CO3_HUMAN	1018	MTPTVIAVHYLDETEQWEKFGLEKREQALELKKGYTQQLAFRQPS S AFAAVKRAPSTW
sp|P01026|CO3_RAT	1078	LTA MWSRSLAANLIAIDSQVLCGAVKWLILEKQKPDGVFQEDG PVIHQEMIGGFRNTK
sp|P01024|CO3_HUMAN	1078	LTA YVVKVFSLAVNLIAIDSQVLCGAVKWLILEKQKPDGVFQEDA PVIHQEMIGGLRNNK
sp|P01026|CO3_RAT	1138	EADVSLTAFVLI A LQEAR DICEQVNSLPGSINKAGEYLEASYNLQR P YTVAIAGYALA
sp|P01024|CO3_HUMAN	1138	EKDMALTAFLVLI S LQEAR DICEQVNSLPGSITKAGDFLEANYNLQRS YTVAIAGYALA
sp|P01026|CO3_RAT	1198	LMNKL EEPYLT KFLN TAKDRNRWE EPGQOLYNVEATS YALLALL LKDFDS VPPVVRWLN
sp|P01024|CO3_HUMAN	1198	QMGR LKGEELN KFLN TAKDRNRWE DPGKOLYNVEATS YALLALL LKDFD F VPPVVRWLN
sp|P01026|CO3_RAT	1258	DE RYGGGYGSTQATFMVFQALAQYRADVPDHKDLNMDVSLH LPSRSSPTVFRILWESGS
sp|P01024|CO3_HUMAN	1258	EQRYGGGYGSTQATFMVFQALAQYQK DAPDHQELNMDVSLQLPSRSSKITHRH WESAS
sp|P01026|CO3_RAT	1318	LLRSEETKQNEGFSLTAKGKGQTL SVVTVYHAKVKGKTTCCKFDL RVTIKPAPETA KKP
sp|P01024|CO3_HUMAN	1318	LLRSEETKQNEGFIVTAEKKGQTL SVVTVYHAKAKDQLTCNKFDL RVTIKPAPETA KRP
sp|P01026|CO3_RAT	1378	QDAKSSMIL DICTRYLGDV DATMSILDISM TGFIPDNTDLEL LSGVD RYISKYEMDKA
sp|P01024|CO3_HUMAN	1378	QDAKNTMIL EICTRYLGDV DATMSILDISM TGFAPDNTDLKQL ANGVDRYISKYELDKA
sp|P01026|CO3_RAT	1438	FSNKNLTIYLEKISHSEEDCLSFKVHGF FNVGLIQPGAVKVYSYNLEESCTRFYHPEK
sp|P01024|CO3_HUMAN	1438	FSDRNTLTIYLDKISHSEEDCLSFKVHGF FNVGLIQPGAVKVYAYNLEESCTRFYHPEK
sp|P01026|CO3_RAT	1498	DDGMLS KLCHEMCRCAEENC F HQSDDQVSLNERLDKACEPGVDVYKTR LITIELSD D
sp|P01024|CO3_HUMAN	1498	EDGKLNKLCRDELCRCAEENC F QKSDDKVTLNERLDKACEPGVDVYKTR L V K V Q L S N D
sp|P01026|CO3_RAT	1558	FDEYIMTIEQVIKSGSDEVQAGQERRR FISHVKCRNALKKQKQKQYLMWGLSSDLWGEKPN
sp|P01024|CO3_HUMAN	1558	FDEYIMAEIEQVIKSGSDEVQVGQOR T FISPIKCRNALKHEEKHYLMWGLSSDFWGEKPN
sp|P01026|CO3_RAT	1618	TSYIIIGKDTWVEHWPEAEERQDQKNQKQCEDLGAFTE TMVVF GCPN
sp|P01024|CO3_HUMAN	1618	LSYIIIGKDTWVEHWPEAEDECQDEENQKQCQDLGAFTESMVVF GCPN

Figure XVII. Structural comparison of the complement C3 between *Rattus norvegicus* and *Homo sapiens*. The FASTA files related to rodent and human proteins were acquired on the UNIPROT search platform (<http://www.uniprot.org>).

sp|P01027|CO3_MOUSE	1	10	20	30	40	50	60
sp|P01024|CO3_HUMAN	1	10	20	30	40	50	60
sp|P01027|CO3_MOUSE	70	80	90	100	110		
sp|P01024|CO3_HUMAN	70	80	90	100	110		
sp|P01027|CO3_MOUSE	120	130	140	150	160	170	
sp|P01024|CO3_HUMAN	120	130	140	150	160	170	
sp|P01027|CO3_MOUSE	180	190	200	210	220	230	
sp|P01024|CO3_HUMAN	180	190	200	210	220	230	
sp|P01027|CO3_MOUSE	240	250	260	270	280	290	
sp|P01024|CO3_HUMAN	240	250	260	270	280	290	
sp|P01027|CO3_MOUSE	300	310	320	330	340	350	
sp|P01024|CO3_HUMAN	300	310	320	330	340	350	
sp|P01027|CO3_MOUSE	360	370	380	390	400	410	
sp|P01024|CO3_HUMAN	360	370	380	390	400	410	
sp|P01027|CO3_MOUSE	420	430	440	450	460	470	
sp|P01024|CO3_HUMAN	420	430	440	450	460	470	
sp|P01027|CO3_MOUSE	480	490	500	510	520	530	
sp|P01024|CO3_HUMAN	480	490	500	510	520	530	
sp|P01027|CO3_MOUSE	540	550	560	570	580	590	
sp|P01024|CO3_HUMAN	540	550	560	570	580	590	
sp|P01027|CO3_MOUSE	600	610	620	630	640	650	
sp|P01024|CO3_HUMAN	600	610	620	630	640	650	
sp|P01027|CO3_MOUSE	660	670	680	690	700	710	
sp|P01024|CO3_HUMAN	660	670	680	690	700	710	
sp|P01027|CO3_MOUSE	720	730	740	750	760	770	
sp|P01024|CO3_HUMAN	720	730	740	750	760	770	
sp|P01027|CO3_MOUSE	780	790	800	810	820	830	
sp|P01024|CO3_HUMAN	780	790	800	810	820	830	
sp|P01027|CO3_MOUSE	840	850	860	870	880	890	
sp|P01024|CO3_HUMAN	840	850	860	870	880	890	
sp|P01027|CO3_MOUSE	900	910	920	930	940	950	
sp|P01024|CO3_HUMAN	900	910	920	930	940	950	
sp|P01027|CO3_MOUSE	960	970	980	990	1000	1010	
sp|P01024|CO3_HUMAN	960	970	980	990	1000	1010	
sp|P01027|CO3_MOUSE	1020	1030	1040	1050	1060	1070	
sp|P01024|CO3_HUMAN	1020	1030	1040	1050	1060	1070	
sp|P01027|CO3_MOUSE	1080	1090	1100	1110	1120	1130	
sp|P01024|CO3_HUMAN	1080	1090	1100	1110	1120	1130	
sp|P01027|CO3_MOUSE	1140	1150	1160	1170	1180	1190	
sp|P01024|CO3_HUMAN	1140	1150	1160	1170	1180	1190	
sp|P01027|CO3_MOUSE	1200	1210	1220	1230	1240	1250	
sp|P01024|CO3_HUMAN	1200	1210	1220	1230	1240	1250	
sp|P01027|CO3_MOUSE	1260	1270	1280	1290	1300	1310	
sp|P01024|CO3_HUMAN	1260	1270	1280	1290	1300	1310	
sp|P01027|CO3_MOUSE	1320	1330	1340	1350	1360	1370	
sp|P01024|CO3_HUMAN	1320	1330	1340	1350	1360	1370	
sp|P01027|CO3_MOUSE	1380	1390	1400	1410	1420	1430	
sp|P01024|CO3_HUMAN	1380	1390	1400	1410	1420	1430	
sp|P01027|CO3_MOUSE	1440	1450	1460	1470	1480	1490	
sp|P01024|CO3_HUMAN	1440	1450	1460	1470	1480	1490	
sp|P01027|CO3_MOUSE	1500	1510	1520	1530	1540	1550	
sp|P01024|CO3_HUMAN	1500	1510	1520	1530	1540	1550	
sp|P01027|CO3_MOUSE	1560	1570	1580	1590	1600	1610	
sp|P01024|CO3_HUMAN	1560	1570	1580	1590	1600	1610	
sp|P01027|CO3_MOUSE	1620	1630	1640	1650	1660		
sp|P01024|CO3_HUMAN	1620	1630	1640	1650	1660		

Figure XVIII. Structural comparison of the complement C3 between *Mus musculus* and *Homo sapiens*. The FASTA files related to rodent and human proteins were acquired on the UNIPROT search platform (<http://www.uniprot.org>).

tr|I3J4H8|I3J4H8_ORENI sp|P00738|HPT_HUMAN	1	MSALGAVIALLLWGQLFAVDSGNDVTDIADDGCPKPPEIAHGYVEHSVRYQCKNYYKLRT
tr|I3J4H8|I3J4H8_ORENI sp|P00738|HPT_HUMAN	61	EGDGVYTLNDKKQWINKAVGDKLPECEADDGCPKPPEIAHGYVEHSVRYQCKNYYKLRT
tr|I3J4H8|I3J4H8_ORENI sp|P00738|HPT_HUMAN	121	.....MKGSVLASRTASLRSRMVGGLAPH..V PWQAMVY GDGVYTLNNEKQWINKAVGDKLPECEAVCGKPKNPANPVQRILGGHLDAGKGSFPWQAKMV
tr|I3J4H8|I3J4H8_ORENI sp|P00738|HPT_HUMAN	35 181	IAE S I L D C G Y A G G A L T S D R W V L T A G R N L F V K K S R E A I Q G K E P V I P K V Y I G I T K K D D A N S S S H H N L T T G A T L L N E Q W L L T A K N L F L N H S E N A T A K D I A P T L T L Y V G K K Q
tr|I3J4H8|I3J4H8_ORENI sp|P00738|HPT_HUMAN	95 230	SE V A V E K V L L H P G F Q N Q S D W N N D L A L T Q L K O P V V I N D K V T P I P L P E R G Q D L A K A V H G S G I . L V E I E K V V L L H P N Y S Q V D I G L I K L K Q K V S V N E R V M P I C L P S K D . . . Y A E V G R V G Y
tr|I3J4H8|I3J4H8_ORENI sp|P00738|HPT_HUMAN	155 281	I T G W G W G P L L T P S P F L K H I V V P L A N H S E C R A E Y E S F A L T P T V D D D M I C V S G W G R N A N F K F T D H L K Y V M L P V A D Q D Q C I R H Y E G S T V P E K K T P K S P V G V O P I L N E H T F C
tr|I3J4H8|I3J4H8_ORENI sp|P00738|HPT_HUMAN	203 341	T A A T K Y Q E N V C F G D A G G A L A V T D P E T G D I Y A A G I L S Y D K S C T R Y K H A V Y M K L S S Y L P W I H A G M S K Y Q E D T C Y G D A G S A F A V H D L E E D T W Y A T G I L S F D K S C A V A E Y G V Y V K V T S I Q D W V Q
tr|I3J4H8|I3J4H8_ORENI sp|P00738|HPT_HUMAN	263 401	S I M R G D T D T S T A V R F K A M S S M Y R R Q E K T I A E N

Figure XIX. Structural comparison of the haptoglobin between *Oreochromis niloticus* and *Homo sapiens*. The FASTA files related to tilapia and human proteins were acquired from the UNIPROT search platform (<http://www.uniprot.org>).

tr|F8W5P2|F8W5P2_DANRE sp|P00738|HPT_HUMAN	1	MSALGAVIALLLWGQLFAVDSGNDVTDIADDGCPKPPEIAHGYVEHSVRYQCKNYYKLRT
tr|F8W5P2|F8W5P2_DANRE sp|P00738|HPT_HUMAN	1 61	.....MRWLSVAVLLGLTLPD D A S F A L E R V EGDGVYTLNDKKQWINKAVGDKLPECEADDGCPKPPEIAHGYVEHSVRYQCKNYYKLRT
tr|F8W5P2|F8W5P2_DANRE sp|P00738|HPT_HUMAN	28 121	GEH V S A L R S R M V G G S I T A S . . V P W Q A M V Y GDGVYTLNNEKQWINKAVGDKLPECEAVCGKPKNPANPVQRILGGHLDAGKGSFPWQAKMV
tr|F8W5P2|F8W5P2_DANRE sp|P00738|HPT_HUMAN	56 181	L S E N I L D C G F A G G A L T A E R W V L T A G R N L F V G K S K I Q T R G Q E P L I P K V Y I G I S K R A D A T A S S H H N L T T G A T L L N E Q W L L T A K N L F L N H S E N A T A K D I A P T L T L Y V G K K Q
tr|F8W5P2|F8W5P2_DANRE sp|P00738|HPT_HUMAN	116 230	T E V A V E K V L L H P G F Q N T S D W D N D L A L I K L K E P V K F S K S I L P I P L P E T G D N L E E R D C E R G I . L V E I E K V V L L H P N Y S Q V D I G L I K L K Q K V S V N E R V M P I C L P S K . . . D Y A E V G R V G Y
tr|F8W5P2|F8W5P2_DANRE sp|P00738|HPT_HUMAN	176 281	V A G W G W G R L L T P A P V L K F L S L P V K S . . C K G N Y Q A R V L E S T P N T D D K Q F C V S G W G R N A N F K F T D H L K Y V M L P V A D Q D Q C I R H Y E G S T V P E K K T P K S P V G V G I L N E H T F C
tr|F8W5P2|F8W5P2_DANRE sp|P00738|HPT_HUMAN	223 341	T C S G R Y L E N V C F G D A G G A I A F L N T K T N A V Y A A G I L S F D K A C S V E E H A V Y T K I S A H L P W I H A G M S K Y Q E D T C Y G D A G S A F A V H D L E E D T W Y A T G I L S F D K S C A V A E Y G V Y V K V T S I Q D W V Q
tr|F8W5P2|F8W5P2_DANRE sp|P00738|HPT_HUMAN	283 401	S V M R G D S Q D I A S Q R S S A I R H M F S Q Q L K T I A E N

Figure XX. Structural comparison of the haptoglobin between *Danio rerio* and *Homo sapiens*. The FASTA files related to zebrafish and human proteins were acquired on the UNIPROT search platform (<http://www.uniprot.org>).

sp|P06866|HPT_RAT	1	MRALGAVVTLLWQQLFAVELGNDATDIEDDSCPKPPEIAN.....
sp|P00738|HPT_HUMAN	1	MSALGAVIAALLWQQLFAVDSGNDVTDIADDGCPKPPEIAHGYVEHSVRYQCKNYKLRTE
sp|P06866|HPT_RAT	42	.....GYVEHLVRYRCRQFYKLRTE
sp|P00738|HPT_HUMAN	61	EGDGVYTLNDKKQWINKAVGDKLPECEADDGCPKPPEIAHGYVEHSVRYQCKNYKLRTE
sp|P06866|HPT_RAT	62	GDGYTLNSEKQVNPAAAGDKLPKCEAVCGKPKHPVDQVQRIIGGSMDAKGSFPWQAKMI
sp|P00738|HPT_HUMAN	121	GDGVYTLNNEKQWINKAVGDKLPECEAVCGKPKNPANPVQRIIGGHLDAKGSFPWQAKMV
sp|P06866|HPT_RAT	122	SRHGLTTGATLISDQWLLTTAKNLFNLHSEENATAKDIAPTLTLYVGKNQLVEIEKVVVLP
sp|P00738|HPT_HUMAN	181	SHHNLTTGATLINEQWLLTTAKNLFNLHSEENATAKDIAPTLTLYVGKQLVEIEKVVVLP
sp|P06866|HPT_RAT	182	ERSVVDIGLIKLRQVLLVTERVMPICLPSKDYIAPGRMGYVSGWGRNVNFRFETDLKLYVM
sp|P00738|HPT_HUMAN	241	NYSQVDIGLIKLRQVSVNERVMPICLPSKDYAEVGRVGYVSGWGRNANFRFETDHLKYVM
sp|P06866|HPT_RAT	242	LPVADQDKCELVHYNSTVPEKKNLTPKSPVGVQPIILNEHTFCAGLTKYQEDTCYGDAGSAFA
sp|P00738|HPT_HUMAN	301	LPVADQDQCIIRHYEGSTVPEKKNLTPKSPVGVQPIILNEHTFCAGMSKYQEDTCYGDAGSAFA
sp|P06866|HPT_RAT	302	VHDLDEEDTWYATGILSFDKSCAVAEYGVYVVRATDLDKDWVQETMAKN
sp|P00738|HPT_HUMAN	361	VHDLDEEDTWYATGILSFDKSCAVAEYGVYVVKVTSIQDWVQKTIAEN

Figure XXI. Structural comparison of the haptoglobin between *Rattus norvegicus* and *Homo sapiens*. The FASTA files related to rodent and human proteins were acquired on the UNIPROT search platform (<http://www.uniprot.org>).

sp|Q61646|HPT_MOUSE	1	10	20	30	40	50	60
sp|P00738|HPT_HUMAN							
sp|Q61646|HPT_MOUSE		70					
sp|P00738|HPT_HUMAN							
sp|Q61646|HPT_MOUSE		80	90	100	110	120	
sp|P00738|HPT_HUMAN							
sp|Q61646|HPT_MOUSE		130	140	150	160	170	180
sp|P00738|HPT_HUMAN							
sp|Q61646|HPT_MOUSE		190	200	210	220	230	240
sp|P00738|HPT_HUMAN							
sp|Q61646|HPT_MOUSE		250	260	270	280	290	300
sp|P00738|HPT_HUMAN							
sp|Q61646|HPT_MOUSE		310	320	330	340		
sp|P00738|HPT_HUMAN							

Figure XXII. Structural comparison of the haptoglobin between *Mus musculus* and *Homo sapiens*. The FASTA files related to rodent and human proteins were acquired on the UNIPROT search platform (<http://www.uniprot.org>).

tr|I3J919|I3J919_ORENI	1	..MQGFYPIILLFSIFVCSVSAKKMRWCTVSDPEQRKCAELAKAIAAVVSPAILAFAFL
sp|P02787|TRFE_HUMAN	1	MRLAVGALLVCAVLGLCLAVDPDKTWRWCAVSEHEATKCSFRDHMKSVIP...SDGSPV
tr|I3J919|I3J919_ORENI	58	SCIRAYSTTDCINRIRKANRADIVTLDAGEIYSAVKQFD.LVAIAKEIYSDDLSTGGCTLS
sp|P02787|TRFE_HUMAN	57	ACVKKASYLDICIRATIANEADAVTLDAGLVYDAYLAPNNLKPVVAEFYGSKEDPQTFYYA
tr|I3J919|I3J919_ORENI	117	VAVVRNNS.LDIRSLOGRRSCHSGVWRWTAGWSLPIGFLLSRNYLSWAKEHPLSQDVSITFF
sp|P02787|TRFE_HUMAN	117	VAVVRKDSGFGMQLRCKKKSCHGLGRSAGWNIPGILLYCDLPE...PRKPLEKAVANFF
tr|I3J919|I3J919_ORENI	176	SASCIPGAGAMALP.LCTLCOGLKSYIRQKNYHCETSHSEPFYNNOGALRCLRRCTGDVA
sp|P02787|TRFE_HUMAN	174	SGSCAPCADGTDFFQLCQLCP.....GCGCSTLNOYFYGSGAFKCLKDGAGDVA
tr|I3J919|I3J919_ORENI	235	FVDHLALET.IEESERDEFRLLCSDCTQAPLSQHRSCNLRGPGGGMVTRVNFRKVVVK
sp|P02787|TRFE_HUMAN	223	FVKHSTIFENLANKADRQYBLLCLDNTRKPVDEYKDCHTAQVPSHTVVARSMGGKEDLI
tr|I3J919|I3J919_ORENI	293	FLATVQTLFGRQGRERQR.FQLFSSSSFGENDLLFRDVEKLVVLLQDDIDVVSQVGLDYVA
sp|P02787|TRFE_HUMAN	283	WELLNQAQEHFGKDKSKE.FQLFSSPHG..KDLLFKDSAHGFLKVPFRMDAKMYLGYBYVT
tr|I3J919|I3J919_ORENI	353	LLKGLGH...EGSLEDsvIRWCITSYAEQKCEQWALSIKSDPLVQVRAISMRDCIEK
sp|P02787|TRFE_HUMAN	341	AIRNLRREGTCEAPTEDECKPVKWCASHHERLKCDEWSVNSVVG.KLIECVSAETEDCIAK
tr|I3J919|I3J919_ORENI	409	IKRDEVDVAVSLDATHSFIAGKCGLVVVT EY YGKNCVPAEGSTHLETDVFPSSVVG IAVVK
sp|P02787|TRFE_HUMAN	400	IMNGEADAMSLDGGFVYIAGKCGLVVLAENYNK.....SDNCEDTPEAGYFA IAVVK
tr|I3J919|I3J919_ORENI	469	HSSRNIFIGNLGGRRSCHSNTYSPAGWLPYRHSLSLANSSSSPCDPDKVYNEVFWKSCLE
sp|P02787|TRFE_HUMAN	453	KSASDLTWDNLKCKKKSCHAVGRTAGWNIPMGLLYNKLNHCR.....DEFFFESECA
tr|I3J919|I3J919_ORENI	529	PGSK..GNLCKVCTGTGETATKRCTENHNERYYGNMGALRCLVGRDRSGKSYGDVAFLEQ
sp|P02787|TRFE_HUMAN	505	PGSKKDSLSLCKKCMG...SGLNLCEPNNKEEYYGYTGAFRCLVEK.....GDVAFVKH
tr|I3J919|I3J919_ORENI	587	HSLHTNILGLNITGWAEGWSSSDFELLCADGRRAPLSDWETCNLGVIPNPTVMTRPVLT A
sp|P02787|TRFE_HUMAN	555	QTVPONTGKNPDPWAKNLSNEKDYELLCLDGT RKPV EY ANCHLARAPNHAVTRKDKEA
tr|I3J919|I3J919_ORENI	647	RVYDFLMKSOEALAVNSNTEFRLEFESHQYGESDLLFKDATQCFATSHMD.YRSILGEEF
sp|P02787|TRFE_HUMAN	615	CVHKILRQQQHLLFGSNVTDCSGNFCLFRSETKDLLFRDPTVCLALHLDNRNTYEKYLGE EY
tr|I3J919|I3J919_ORENI	706	YTHADTVFNCTHSDILEFCNQDVC
sp|P02787|TRFE_HUMAN	675	VKAVGNLRKCSISLLEACTIFRRP

Figure XXIII. Structural comparison of the serotransferrin between *Oreochromis niloticus* and *Homo sapiens*. The FASTA files related to tilapia and human proteins were acquired on the UNIPROT search platform (<http://www.uniprot.org>).

tr|B8JL43|B8JL43_DANRE	1	MKVL	LI	SL	LG	CL	LV	AV	PS	ASA	QK	VK	WC	VT	QNE	FQ	SK	R	.....	H	T	A	T	K	A	A	D	T	E	C	H	L																												
sp|P02787|TRFE_HUMAN	1	MRLA	V	G	A	L	L	V	CA	V	L	G	L	C	L	A	V	P	D	K	T	V	R	W	C	A	V	S	E	H	E	A	T	K	C	Q	S	F	R	D	H	M	K	S	V	L	P	S	D	G	P	S	V	A	C	V	K				
tr|B8JL43|B8JL43_DANRE	53	QP	T	V	I	D	C	M	R	S	I	A	A	G	G	T	D	I	V	T	D	G	A	N	V	F	T	G	G	L	N	N	Y	L	R	P	I	I	A	E	K	K	E	C	C	Y	A	V	A	V										
sp|P02787|TRFE_HUMAN	61	K	A	S	Y	L	D	C	H	R	A	I	A	A	N	E	A	D	A	V	T	E	D	A	G	L	V	Y	D	A	Y	L	A	P	N	N	L	K	P	V	V	A	E	F	Y	G	S	K	E	D	P	Q	T	F	Y	Y	A	V	A	V	
tr|B8JL43|B8JL43_DANRE	107	R	A	G	S	G	F	N	I	N	E	L	K	G	K	S	S	C	H	S	C	Y	Q	R	S	G	W	N	T	P	I	G	K	L	I	A	T	N	K	I	T	W	E	G	P	N	E	M	P	V	E	R	A	V	S	E	F	F	S		
sp|P02787|TRFE_HUMAN	121	R	K	D	S	G	F	Q	M	N	Q	L	R	G	K	S	C	H	S	C	H	T	G	L	R	S	A	G	W	N	T	P	I	G	L	L	Y	C	D	L	P	E	P	R	K	P	L	E	K	A	V	A	N	F	F	S				
tr|B8JL43|B8JL43_DANRE	167	S	C	V	P	G	V	S	K	P	K	Y	P	N	L	C	K	A	Q	C	G	D	C	S	H	N	E	K	Y	F	G	D	D	G	A	F	Q	C	L	K	N	D	N	G	Q	V	A	F	V	C	H	H	A	T	P	E	...				
sp|P02787|TRFE_HUMAN	176	S	C	A	P	C	A	D	G	T	D	F	P	Q	L	C	Q	L	C	P	G	C	G	S	T	L	N	Q	Y	F	G	Y	S	G	A	F	K	C	L	K	D	G	A	D	V	A	F	V	K	H	S	T	I	F	E	N	L	A			
tr|B8JL43|B8JL43_DANRE	224	..	S	E	R	Q	N	Y	E	L	L	C	M	D	C	S	R	K	S	V	E	D	Y	K	T	C	N	F	A	R	E	P	A	R	T	V	I	A	R	T	D	D	L	Q	Y	V	Y	D	V	L	K	Q	I	P						
sp|P02787|TRFE_HUMAN	235	N	K	A	D	R	D	Q	Y	E	L	L	C	M	D	N	T	R	K	P	V	E	D	Y	K	D	C	H	L	A	Q	V	P	S	H	T	V	V	A	R	S	M	G	G	K	E	D	L	I	W	E	L	L	N	Q	A	E	H	F	G	
tr|B8JL43|B8JL43_DANRE	277	A	S	D	L	F	S	S	Q	A	F	G	..	G	K	D	L	I	F	S	D	S	A	T	E	L	M	L	L	P	K	R	T	D	S	L	Y	L	K	E	E	Y	E	A	M	Q	A	F	K	D	G	..	N	P	S	A	P				
sp|P02787|TRFE_HUMAN	295	K	D	K	S	K	E	F	Q	L	F	S	S	P	H	G	K	D	L	L	F	D	S	A	H	G	F	L	K	V	P	P	R	M	D	A	K	M	Y	L	G	Y	E	V	T	A	R	N	L	R	E	G	T	C	P	E	A	P			
tr|B8JL43|B8JL43_DANRE	333	T	S	Q	T	K	..	L	A	M	C	T	I	G	H	A	E	K	N	K	C	D	S	L	D	H	..	V	K	K	S	C	T	L	E	A	S	V	D	D	C	T	E	K	I	K	R	K	E	A	D	F	L	A	V	D	G	G			
sp|P02787|TRFE_HUMAN	355	T	D	E	C	K	P	V	K	W	C	A	L	S	H	E	R	L	K	C	D	E	W	S	V	N	S	V	G	K	I	E	C	V	S	A	E	T	T	E	D	C	T	A	K	I	M	N	G	E	A	D	A	M	S	L	D	G	G	F	
tr|B8JL43|B8JL43_DANRE	389	V	Y	I	A	G	K	C	G	L	V	P	V	M	A	E	Q	S	N	S	Q	S	C	S	S	G	S	G	T	A	S	Y	A	V	A	V	R	K	..	G	S	G	L	T	W	N	N	L	E	G	K	K	S	C	H	T	G	L			
sp|P02787|TRFE_HUMAN	415	V	Y	I	A	G	K	C	G	L	V	P	V	L	A	E	N	Y	N	..	K	S	D	N	C	E	D	T	P	E	A	G	Y	F	A	L	A	V	V	K	K	S	A	S	D	L	T	W	D	N	L	K	G	K	K	S	C	H	T	A	V
tr|B8JL43|B8JL43_DANRE	448	G	R	S	A	G	W	K	I	P	E	S	A	I	C	G	E	K	D	K	C	T	L	D	K	F	F	S	E	G	C	A	P	G	A	D	P	T	S	N	M	C	K	L	C	K	G	S	C	K	P	V	G	D	E	S	K	C	K	P	S
sp|P02787|TRFE_HUMAN	474	G	R	T	A	G	W	N	I	P	M	G	L	L	Y	N	K	I	N	H	C	R	F	D	E	F	F	S	E	G	C	A	P	G	S	K	K	D	S	S	L	C	K	L	C	M	G	S	C	L	N	L	C	E	P	N				
tr|B8JL43|B8JL43_DANRE	508	A	E	E	Q	Y	Y	G	Y	D	G	A	F	R	C	L	A	E	K	A	G	D	V	A	F	I	K	H	T	V	G	D	Y	T	D	G	K	G	K	D	..	W	A	K	D	L	K	S	E	D	F	E	L	I	C	P	N	T	P	D	
sp|P02787|TRFE_HUMAN	529	N	K	E	G	Y	Y	G	Y	T	G	A	F	R	C	L	V	E	K	G	..	D	V	A	F	V	K	H	Q	T	V	P	Q	N	T	G	G	K	N	P	D	W	A	K	N	L	N	E	K	D	Y	E	L	E	C	L	D	G	..		
tr|B8JL43|B8JL43_DANRE	567	T	M	K	Y	T	D	F	E	K	C	N	L	A	Q	V	P	V	H	A	V	T	R	E	D	A	R	S	A	V	V	S	F	L	S	D	I	Q	S	K	N	N	D	L	F	T	S	K	D	G										
sp|P02787|TRFE_HUMAN	586	T	R	K	P	V	E	E	Y	A	N	C	H	L	A	R	A	P	N	H	A	V	T	R	K	D	K	E	A	C	V	H	K	I	L	R	Q	Q	H	L	F	G	S	N	V	T	D	C	S	G	N	F	C	L	F	R	S	E	T		
tr|B8JL43|B8JL43_DANRE	618	K	N	L	L	F	T	D	G	T	K	C	L	Q	E	I	K	G	..	S	V	D	D	F	L	T	K	K	Y	I	D	M	I	E	R	T	Y	K	T	S	Q	N	V	P	D	L	V	K	A	C	T	F	G	N	C	I	S	S			
sp|P02787|TRFE_HUMAN	646	K	D	L	L	F	R	D	D	T	V	C	L	A	K	L	H	D	R	N	T	Y	E	K	Y	L	G	E	E	Y	V	K	A	V	G	N	L	R	K	C	S	T	S	..	L	L	B	A	C	T	F	R	R	P	..						

Figure XXIV. Structural comparison of the serotransferrin between *Danio rerio* and *Homo sapiens*. The FASTA files related to zebrafish and human proteins were acquired on the UNIPROT search platform (<http://www.uniprot.org>).

sp|P12346|TRFE_RAT	1	MRFAVGAALLCAALGLCLAVPDKTVKWC	AVSEHENTKCI	SFRDHMKTVL	PADGPR	LACVK
sp|P02787|TRFE_HUMAN	1	MRFAVGAALLCAVVLGLCLAVPDKTVR	WC	AVSEHEATKCI	SFRDHMKSV	IPSDGFSVACVK
sp|P12346|TRFE_RAT	61	KTSYQDCIKATSGGEADAITLDG	GWVYDAGLTPNNLKPVAAEFYGS	LEH	PQTHY	LAVAVV
sp|P02787|TRFE_HUMAN	61	KASYLDCIRAIAN EADAVTLDAGL	VYDAYLAPNNLKPVVAAEFYGS	KE	DPQTHY	YAVAVV
sp|P12346|TRFE_RAT	121	KKGTDFQINQLQGKKSCHTGLGRSAG	WIPIIGLLFCN	LPEPRKPLEKAVAS	FFSGSC	VPC
sp|P02787|TRFE_HUMAN	121	KKDSGFQINQLRGRKKSCHTGLGRSAG	WNIPIGLLYC	LPEPRKPLEKAVAN	FFSGSC	APC
sp|P12346|TRFE_RAT	181	ADPVAFPQLCQLCPGCGCSPTQP	FFGYVGAFKCLR	DGGD	VAVFKHT	TIFEVLPQKADR
sp|P02787|TRFE_HUMAN	181	ADGTDVFPQLCQLCPGCGCS	TLNQYFGYS	GAFKCLR	KDGA	GDVAVFKHSTIFENLANKADR
sp|P12346|TRFE_RAT	241	OYELLCLDNRKPPVDQYEDCY	LARTPSHVVARN	GD	GKEDLIWEI	LKV
sp|P02787|TRFE_HUMAN	241	OYELLCLDNRKPPVDYKDC	HLAQVPSHTVVAR	SMG	GKEDLIWEI	LNV
sp|P12346|TRFE_RAT	301	FQLFGSPLGKDLLFKDSA	FGLLRVPPRMDYRL	YLGHS	YVTAIRN	QREGV
sp|P02787|TRFE_HUMAN	301	FQLFS	SPHGKDLLFKDSAHG	FLRVPPRMD	KMYLGYE	YVTAIRN
sp|P12346|TRFE_RAT	360	VKWCALSHQERAKCDEWSVSN	NGQIECESAESTEDCI	DKI	VNGEADAMSLDGG	HAYIAGQ
sp|P02787|TRFE_HUMAN	361	VKWCALSHHERLKCDEWSVSN	VGKIECVSAETTEDCI	AKI	MNGEADAMSLDGG	FVYIAGK
sp|P12346|TRFE_RAT	420	CGLVPVMAENYDIS	SCTNPQS	DVFPKGY	AVAVVKA	SDS
sp|P02787|TRFE_HUMAN	421	CGLVPVMAENY	NKSS	DNCE	DTEAGYFA	AVVKA
sp|P12346|TRFE_RAT	480	GWNIPMGLLFSRINHCKFDEFFS	QGCAPGV	KKNSTL	CDL	CIGP
sp|P02787|TRFE_HUMAN	478	GWNIPMGLLYNKHINHRFDEFFS	EGCAPGS	KKDSS	SLC	R
sp|P12346|TRFE_RAT	538	GAFQCLVEKGDVAFVKHQT	VLENTNGKN	TAAWAKD	LKQED	DFQLLCPDGT
sp|P02787|TRFE_HUMAN	538	GAFRCLVEKGDVAFVKHQT	VPONTG	GKNPDP	WAKN	LNEKDYELLC
sp|P12346|TRFE_RAT	598	LAQAPNHVVSRKEKARVST	VLTAKD	LF	WKGDK	DC
sp|P02787|TRFE_HUMAN	598	LARAPNHAVVSRKDK	EA	CV	HKIL	RQ
sp|P12346|TRFE_RAT	658	TKLP	EGT	TYE	YLG	EY
sp|P02787|TRFE_HUMAN	658	AKL	H	R	N	T

Figure XXV. Structural comparison of the serotransferrin between *Rattus norvegicus* and *Homo sapiens*. The FASTA files related to rodent and human proteins were acquired on the UNIPROT search platform (<http://www.uniprot.org>).

sp|Q921I1|TRFE_MOUSE	1	MRLTVGALLACAA ¹ LG ² LCLAVPDKTV ³ KWCAVSEHEN ⁴ TKC ⁵ ISFRDHMK ⁶ TVLPP ⁷ DGPR ⁸ LACVK ⁹
sp|P02787|TRFE_HUMAN	1	MRLAVGALLVCAV ¹ LG ² LCLAVPDKTV ³ RWCAVSEHEA ⁴ TKC ⁵ QISFRDHMK ⁶ SVIP ⁷ SDGPR ⁸ VACVK ⁹
sp|Q921I1|TRFE_MOUSE	61	KTSY ¹ PCIK ² AK ³ IS ⁴ ASEADAM ⁵ TLD ⁶ GG ⁷ WVYDA ⁸ GL ⁹ T ¹⁰ PNNLKP ¹¹ VAAEFYGS ¹² VEH ¹³ PQTY ¹⁴ YYAVAV ¹⁵ V
sp|P02787|TRFE_HUMAN	61	KASY ¹ LDCI ² RAIA ³ ANEADA ⁴ VTLDA ⁵ GL ⁶ VYDA ⁷ VLA ⁸ PNNLKP ⁹ VAAEFYGS ¹⁰ KED ¹¹ PQTY ¹² YYAVAV ¹³ V
sp|Q921I1|TRFE_MOUSE	121	KKGT ¹ DF ² QLN ³ NQLE ⁴ GKKSCHT ⁵ GLGRSAGW ⁶ V ⁷ IP ⁸ I ⁹ GLLE ¹⁰ FC ¹¹ KL ¹² SEPR ¹³ SPLEKAV ¹⁴ SEFFSGSC ¹⁵ VPC ¹⁶
sp|P02787|TRFE_HUMAN	121	KKDS ¹ SG ² FQMN ³ NQLR ⁴ GKKSCHT ⁵ GLGRSAGW ⁶ N ⁷ IP ⁸ I ⁹ GLLE ¹⁰ YCD ¹¹ LP ¹² EPR ¹³ KPLEKAV ¹⁴ ANFFSGSC ¹⁵ APC ¹⁶
sp|Q921I1|TRFE_MOUSE	181	ADP ¹ VAF ² FK ³ LCQLCPGCGCS ⁴ ST ⁵ Q ⁶ PF ⁷ FGY ⁸ VGA ⁹ FKCLKDG ¹⁰ G ¹¹ GDVAFVKH ¹² TTIFE ¹³ V ¹⁴ LPEKADR ¹⁵ D
sp|P02787|TRFE_HUMAN	181	ADG ¹ TDF ² Q ³ LCQLCPGCGCS ⁴ ST ⁵ LN ⁶ Q ⁷ YFGY ⁸ S ⁹ GAFKCLKDG ¹⁰ A ¹¹ GDVAFVKH ¹² STIFE ¹³ N ¹⁴ LANKADR ¹⁵ D
sp|Q921I1|TRFE_MOUSE	241	QYELLCLDNTRKPV ¹ DQ ² YEDC ³ YLAR ⁴ IP ⁵ SHA ⁶ VVAR ⁷ KNN ⁸ GKEDLIWE ⁹ IT ¹⁰ KV ¹¹ AOEHFGK ¹² GKSK ¹³ D
sp|P02787|TRFE_HUMAN	241	QYELLCLDNTRKPV ¹ D ² YKDC ³ H ⁴ LAQ ⁵ VPSH ⁶ T ⁷ VVAR ⁸ SMG ⁹ GKEDLIWE ¹⁰ LL ¹¹ NQ ¹² AOEHFGK ¹³ DKSKE ¹⁴
sp|Q921I1|TRFE_MOUSE	301	FOLFSS ¹ PL ² GKDLLFKDSA ³ F ⁴ GL ⁵ LRVPPRMD ⁶ Y ⁷ R ⁸ LYLGH ⁹ N ¹⁰ YVTAIRN ¹¹ QQEG ¹² V ¹³ CPE ¹⁴ G ¹⁵ .S ¹⁶ ID ¹⁷ NS ¹⁸ P
sp|P02787|TRFE_HUMAN	301	FOLFSS ¹ PH ² GKDLLFKDSA ³ H ⁴ GF ⁵ LRVPPRMD ⁶ A ⁷ KMYLGY ⁸ EB ⁹ YVTAIRN ¹⁰ LR ¹¹ EGT ¹² CPE ¹³ APT ¹⁴ DECK ¹⁵ P
sp|Q921I1|TRFE_MOUSE	360	VKWCALSH ¹ LER ² TKCDEWS ³ I ⁴ ISE ⁵ GKIEC ⁶ EAETTEDCI ⁷ E ⁸ KI ⁹ VNGEADAM ¹⁰ TL ¹¹ DGG ¹² HAYIAG ¹³ Q
sp|P02787|TRFE_HUMAN	361	VKWCALSH ¹ HER ² LK ³ CDEWS ⁴ VNS ⁵ V ⁶ GKIEC ⁷ V ⁸ EAETTEDCI ⁹ A ¹⁰ KIM ¹¹ NGEADAMS ¹² SL ¹³ DGG ¹⁴ FVYIAG ¹⁵ K
sp|Q921I1|TRFE_MOUSE	420	CGLVPVMAE ¹ Y ² ESSNCAIP ³ S ⁴ QQGIFPK ⁵ GY ⁶ YAVAVVKA ⁷ SD ⁸ TS ⁹ ITW ¹⁰ N ¹¹ NLKGKKSCHT ¹² GV ¹³ DR ¹⁴ T
sp|P02787|TRFE_HUMAN	421	CGLVPVLAEN ¹ Y ² NKS... ³ DN ⁴ CEDTPEA ⁵ GY ⁶ F ⁷ AVAVVKA ⁸ SD ⁹ DL ¹⁰ TW ¹¹ N ¹² NLKGKKSCHT ¹³ AV ¹⁴ GR ¹⁵ T
sp|Q921I1|TRFE_MOUSE	480	AGWNIPMG ¹ MLYN ² RINHC ³ KFDEFFS ⁴ Q ⁵ GCAPGYE ⁶ K ⁷ N ⁸ STLCL ⁹ LCIGP ¹⁰ .L ¹¹ K ¹² CAPNNKE ¹³ EYNGY ¹⁴
sp|P02787|TRFE_HUMAN	477	AGWNIPMG ¹ MLYN ² KINHC ³ R ⁴ FDEFFS ⁵ E ⁶ GCAPGSK ⁷ K ⁸ D ⁹ SSLCL ¹⁰ LCMG ¹¹ SGINL ¹² CEPNNKE ¹³ GYGY ¹⁴
sp|Q921I1|TRFE_MOUSE	538	TGAFRCLVEKGDVAFVKHOTV ¹ LD ² NTE ³ GKNP ⁴ AE ⁵ WAKNL ⁶ KQE ⁷ DFELLC ⁸ PDGTRKPV ⁹ KDFASC ¹⁰
sp|P02787|TRFE_HUMAN	537	TGAFRCLVEKGDVAFVKHOTV ¹ P ² QNT ³ GKNP ⁴ DP ⁵ WAKNL ⁶ NEK ⁷ DYELLC ⁸ LDGTRKPV ⁹ EYANC ¹⁰
sp|Q921I1|TRFE_MOUSE	598	HLAQ ¹ APNH ² VVSRKE ³ KAARV ⁴ KAVL ⁵ TSQETLFGG ⁶ .S ⁷ DC ⁸ TGNFCLF ⁹ K ¹⁰ ST ¹¹ TKDLLFRDD ¹² TK ¹³ C
sp|P02787|TRFE_HUMAN	597	HLAR ¹ APNH ² AVVTRK ³ KEACV ⁴ HRIL ⁵ RQQH ⁶ LFGSNV ⁷ ID ⁸ CSGNFCLF ⁹ RS ¹⁰ E ¹¹ TKDLLFRDD ¹² TV ¹³ C
sp|Q921I1|TRFE_MOUSE	656	FV ¹ KL ² PE ³ GT ⁴ TP ⁵ EKYLGA ⁶ EYMQ ⁷ SVGNMRK ⁸ CSTS ⁹ R ¹⁰ LLEACT ¹¹ FHK ¹² H
sp|P02787|TRFE_HUMAN	657	LAK ¹ L ² HD ³ RNT ⁴ YEKYLGE ⁵ EYVKA ⁶ VGNLRK ⁷ CSTS ⁸ S ⁹ LLEACT ¹⁰ FRR ¹¹ P

Figure XXVI. Structural comparison of the serotransferrin between *Mus musculus* and *Homo sapiens*. The FASTA files related to rodent and human proteins were acquired on the UNIPROT search platform (<http://www.uniprot.org>).

Attachment 3

(Blood analysis- Manual counting)

Results and discussion for blood analysis (manual counting)

Fish inoculated with *A. hydrophila* showed a significant decrease ($p < 0.05$) in erythrocyte, leukocyte and granulocyte counts 6 HPI when compared to animals inoculated with saline (Figure XXVII and XXVIII). No difference was observed in the number of circulating lymphocytes, thrombocytes and monocytes 6 and 24 HPI (Figure XXVIII). The study of hematocrit, MCV, hemoglobin and MCHC did not demonstrate significant variations during the experimental period (Figure XXVII). Similar to our results, Inoue et al.¹ showed correlation between manual counting and flow cytometry of fish blood cells. According to these authors, this technique presented advantages, because it is a simple and rapid method for analysis of fish blood cells.

Automatic counting methods have been routinely used for the diagnosis of diseases in mammals. However, the techniques applied to mammalian blood depend on lysing the erythrocytes, and then the remaining leukocytes can be counted automatically by the machine. In fish, these techniques are not precise, since their erythrocytes are nucleated, and the glutinous nature of released chromatin from red blood cells interferes with automated counting². On the other hand, the limitations of the use of flow cytometry would be the high costs of the analysis, such fact difficult its use in routine clinical analysis, besides the need for technical training to carry out the sampling.

Material and Methods for blood analysis

Blood samples were drawn from the caudal vessel. Red (RBC) and white blood cell (WBC) counts were made using a haemocytometer and Natt and Herrick solution. The haemoglobin concentration (Hb) was determined with Drabkin's reagent read at 540 nm and haematocrit (Ht) by a microhaematocrit centrifugation technique. Mean cell volume (MCV) and cell haemoglobin concentration (MCHC) were calculated from the Ht, [Hb] and RBC. Blood smears for differential leukocyte counts were stained with a combination of May-Grünwald Giemsa and Wright's Method³.

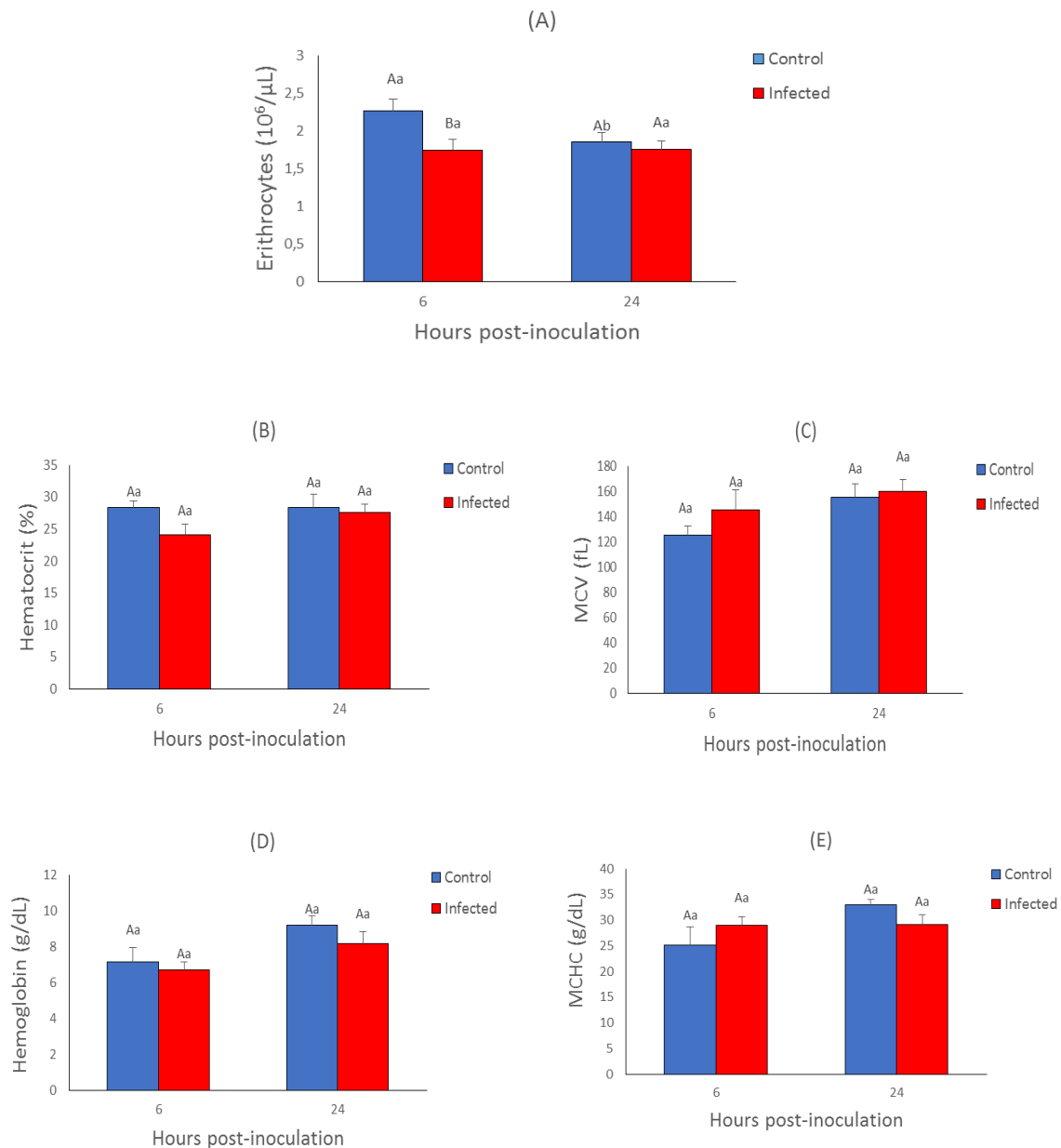


Figure XXVII. Mean values (\pm SE) and ANOVA for hematological parameters: (A) Number of erythrocytes; (B) Hematocrit; (C) MCV - Mean corpuscular volume; (D) Hemoglobin; (E) MCHC – Mean corpuscular hemoglobin concentration. Mean values (n=10) and ANOVA observed for total cells and differential counting of cells present in the blood during acute inflammatory response in tilapias 6 and 24 HPI. Means followed by the same letter do not differ by the Tukey test ($P < 0,05$). The variance analysis is represented by capital letters to compare the different treatments within each experimental period, lowercase letters to compare the evolution of each treatment in the different experimental periods. Different letters indicate significant difference ($p < 0,05$).

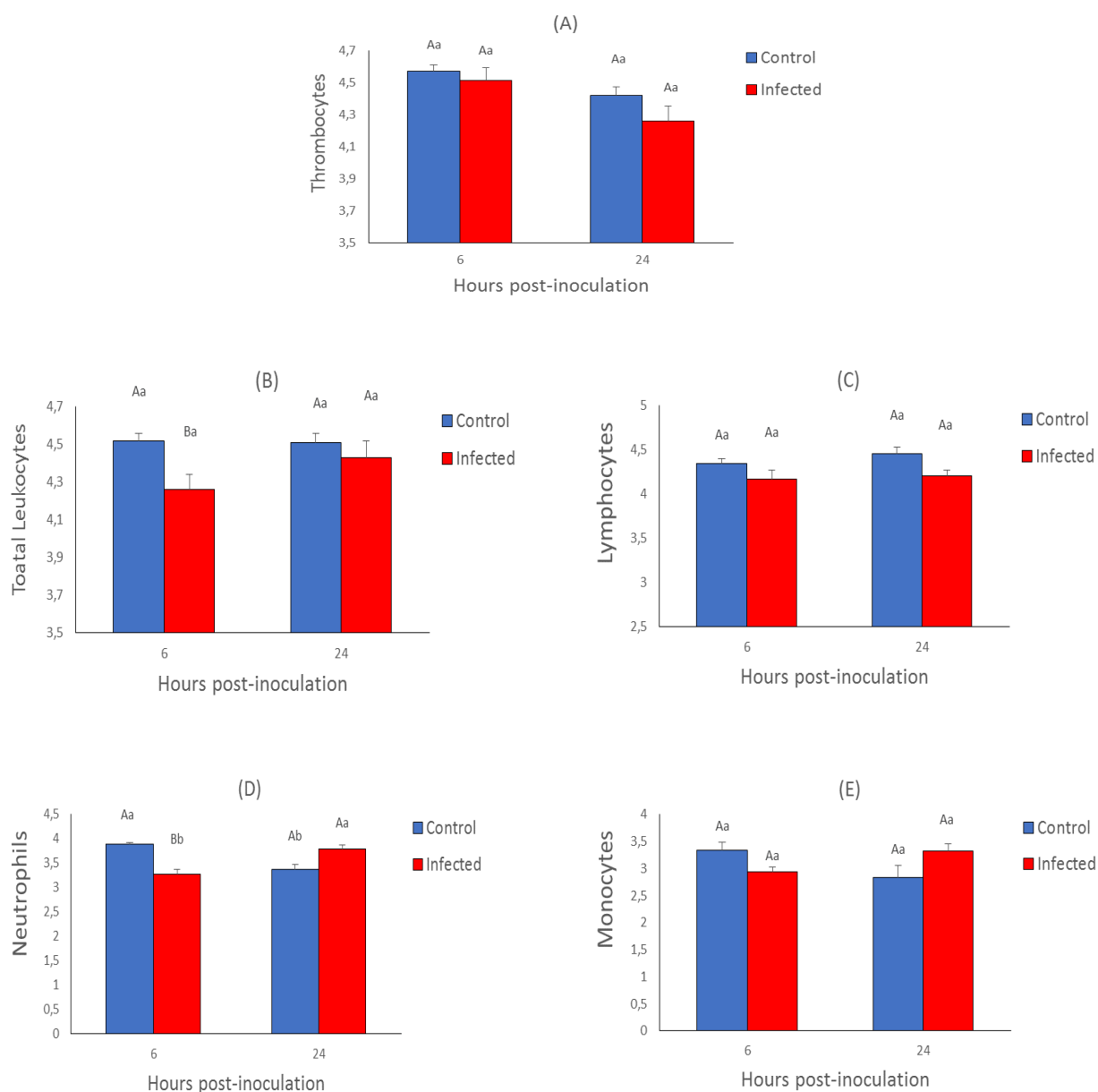


Figure XXVIII. Mean values (\pm SE, data transformed in Log $x+1$) and ANOVA for thrombocyte and leukocyte counts: (A) Number of thrombocytes; (B) Number of leukocytes; (C) Number of lymphocytes; (D) Number of neutrophils; (E) Number of monocytes. Mean values ($n=10$) and ANOVA observed for total cells and differential counting of cells present in the blood during acute inflammatory response in tilapias 6 and 24 HPI. Means followed by the same letter do not differ by the Tukey test ($P<0,05$). The variance analysis is represented by capital letters to compare the different treatments within each experimental period, lowercase letters to compare the evolution of each treatment in the different experimental periods. Different letters indicate significant difference ($p < 0.05$).

References

1. Inoue, T. et al. A new method for fish leucocyte counting and partial differentiation by flow cytometry. *Fish Shellfish Immunol* **13**, 379-390, 2002.
2. Burgess, S. C. & Davison, T. F. Counting absolute numbers of specific leukocytes subpopulations in avian whole blood using a single-step flow cytometric technique: comparison of two inbred lines of chickens. *J. Immunol Methods* **227**, 169–176, (1999).
3. Belo, M. A. A. et al. Haematological response of curimbas *Prochilodus lineatus*, naturally infected with *Neoechinorhynchus curemai*. *J Fish Biol* **82** 1403-1410, (2013).