

PROTEOMICS

Supporting Information

for Proteomics

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The chicken egg white proteome

Supplementary Material

Table S1**Comparison of protein concentration (% of dry weight) and emPAI**

Egg white protein concentrations were compiled from [1, 8, 9, 12 (Tenp), 44].

Protein	% of dry weight	emPAI in-solution	emPAI in-gel
Ovalbumin	54	2,738,419	99,999,999
Ovotransferrin	12-13	489	37,275
Ovomucoid	11	214	1,291
Lysozyme	3.4-3.5	1,290	3,593,813
Ovomucin	1.5-3.5	α : 2.5 β : 0.1	α : 72 β : 2.7
Ovoinhibitor	1.5	14	224
Ovoglycoprotein	1	9	27
Ovoflavoprotein (RBP)	0.8-1	1.8	4.3
Ovostatin (ovomacroglobulin)	0.5	1.9	75
Tenp	0.1-0.5	7.4	58
Avidin	0.05-0.06	0.9	138
Cystatin	0.01-0.05	1.2	99

Figure S1

The predicted sequence of IPI00597482.1 (similar to ovomucin β -subunit).

The peptide sequences identified by MS are in red. That part of the sequence which is identical to UniProt/TrEMBL entry Q6L608 is underlined. Predicted von Willebrand domains are shaded yellow, a predicted CT domain is shaded green.

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1 MAADLRCPNS LHKGPHSRDN TKTRTAEH RSRTDCEELC AREQVAIFIA
51 LLEEEQLKQQ LAFEGNYWSH FFLQKQKETL QRIRRSQQR SMEEYFVST
101 VLSKDSCSTW GGGHFSTFDK YQYDFTGTCN YIFATVCDES SPDFNIQFRR
151 GLDKKIARII IELGPSVIIV EKDSISVRSV GVIKLPYASN GIQIAPYGRS
201 VRLVAKLMEM ELVVMWNNED YLMVLTEKKY MGKTCGMCN YDGYELNDFV
251 SEGKLLDTYK FAALQKMDDP SEICLSEEIS IPAIPHKKYA VICSQLNLV
301 SPTCSVPKDG FVTRCQLDMQ DCSEPGQKNC TCSTLSEYSR QCAMSHQVVF
351 NWRTENFCSV GKCSANQIYE ECGSPCIKTC SNPEYSCSSH CTYGCFCPEG
401 TVLDDISKNR TCVHLEQCPC TLNGETYAPG DTMKAACRTC KCTMGQWNCK
451 ELPCPGRCSL EGGSFVTTFD SRSYRFHGVC TYILMKSSSL PHNGTLMAIY
501 EKSGYSHSET SLSAIYLST KDKIVISQNE LLTDDDELKR LPYKSGDITI
551 FKQSSMFIQM HTEFGLLELVV QTSPVFQAYV KVSAQFQGRT LGLCGNYNGD
601 TTDDFMTSMD ITEGTASLFV DSWRAGNCLP AMERETDPCA LSQLNKISAE
651 THCSILTKKG TVFETHAVV NPTPFYKRCV YQACNYEETF PYICSALGSY
701 ARTCSSMGLI LENWRNSMDN CTITCTGNQT FSYNTQACER TCLSLSNPTL
751 ECHPTDIPIE GCNCPKGMYL NHKNECVRKS HCPCYLEDK YILPDQSTMT
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801 GGITCYCVNG RLSCTGKLQN PAESCKAPKK YISCSDSLEN KYGATCAPTC
851 QMLATGIECI PTKCESGCVC ADGLYENLDG RCVPPPEECPC EYGGLSYGKG
901 EQIQTECEIC TCRKGGKWKCV QKSRCSSTCN LYEGEGHITTF DGQRFVFDGN
951 CEYILAMDGC NVNRPLSSFK IVTENVICGK SGVTCSRIS IYLGNLTIIL
1001 RDETYISISGK NLQVKYNVKK NALHLMFDII IPGKYNMTLI WNKHMNFFIK
1051 ISRETQETIC GLCGNYNGNM KDDFETRSKY VASNELEFVN SWKENPLCGD
1101 VYFVVDPCSK NPYRKAWAEK TCSIINSQVF SACHNKVNRM PYYEACVRDS
1151 CGCDIGGDCE CMCDAIAVYA MACLDKGICI DWRTPPEFCPV YCEEYN SHRK
1201 TGS GGAYSYG SSVNCTWHYR PCNCPNQYYK YVNIEGCYNC SHDEYFDYEK
1251 EKCMPCGDES ISTTPETSSP STVTAMQPTS VTLPTATQPT SPSTSSASTV
1301 LTETTNPVVT SKITVSRTSS SSPLVTIKST TEFCKKVEYE ENLTYKGCSA
1351 NVTLRCEGL CPSSTKLNVE NMVFS AACSC CRPLQLHKEK FQLPCEDFDN
1401 PGKRLTKEIT VFGGCVGNFD SCIQ

Figure S2

Sequence comparison of the chicken ovalbumin family proteins, similar to ovalbumin-related Y protein IPI00585021.1 (ovalbumin-related protein X; **OVA_X**), ovalbumin-related protein Y (P01014; **OVA_Y**) and ovalbumin (P01012; **OVA**). Sequences identified by MS/MS are in red. The published sequence of ovalbumin-related protein X (P01013) is underlined. Sequence identities to Ovalbumin X are shaded yellow.

OVA_X	1	MELKKSLIRP	IHTSNPEQNI	GASGSLHSSA	ENCDEELRVR	GKMCCSYQCS
OVA_X	51	SIICSGSIKA	SWREHYQKDT	NYSGTVYITK	DSENLFRFNW	QAGLLRASLM
OVA_X	101	<u>FFYNTDFRMG</u>	SISAANAFC	FDVFNELKVQ	HTNENILYSP	LSIIVALAMV
OVA_Y	1	MD	SISVTNAKFC	FDVFNEMKVH	HVNENILYCP	LSILTALAMV
OVA	1	G	SIGAASMEFC	FDVFKELKVH	HANENIFYCP	IAIMSALAMV
OVA_X	151	YMGARGNTEY	QMEKALHFDS	IAGLGGSTQT	KCGKSVNIHL	LFKELSDIT
OVA_Y	43	YLGARGNTEES	QMKKVLHFDS	ITGAGSTTDS	QCGSSEYVHN	LFKELLSEIT
OVA	42	YLGAKDSTRT	QINKVVRFDK	LPGFGDSIEA	QCGTSVNVHS	SLRDILNQIT
OVA_X	201	ASKANYSLRI	ANRLYAEKSR	PILPIYKCV	KKLYRAGLET	VNFKTASDQA
OVA_Y	93	RPNATYSLEI	ADKLYVDKTF	SVLPEYLSCA	RKFYTGVEE	VNFKTAEEA
OVA	92	KPNDVYSFSL	ASRLYAEERY	PILPEYLQCV	KELYRGGLEP	INFQTAADQA
OVA_X	251	RQLINSWVEK	QTEGQIKDLL	VSSSTDLDIT	LVLVNAIFYK	GMWKTAFNAE
OVA_Y	143	RQLINSWVEK	ETNGQIKDLL	VSSSIDFGTT	MVFINTIYFK	GIWKIAFNTE
OVA	142	RELINSWVES	QTNGIIRNVL	QPSSVDSQTA	MVLVNAIVFK	GLWEKAFKDE
OVA_X	301	DTREMPFHVT	KEESKPVQMM	CMNNSFNVAT	LPAEKMKILE	LPFASGDLISM
OVA_Y	193	DTREMPFSMT	KEESKPVQMM	CMNNSFNVAT	LPAEKMKILE	LPYASGDLISM
OVA	192	DTQAMPFRVT	EQESKPVQMM	YQIGLFRVAS	MASEKMKILE	LPFASGTMSM
OVA_X	351	<u>LVLLPDEVSG</u>	LERIEKTINF	EKLTIEWINPN	TMEKR RV KVY	LPQMKIEEKY
OVA_Y	243	<u>LVLLPDEVSG</u>	LERIEKTINF	DKLREWTSN	AMAK K SMKVY	LPRMKIEEKY
OVA	242	<u>LVLLPDEVSG</u>	LEQLESIINF	EKLTIEWISSN	VMEER K IKVY	LPRMKMEEKY

OVA_X	401	NLTSVLMALG	MTDLFIPSAN	LTGISSAESL	KISQAVHGAF	MELSEDGIEM
OVA_Y	293	NLTSILMALG	MTDLFSRSAN	LTGISSVDNL	MISDAVHGVF	MEVNNEEGTEA
OVA	292	NLTSVLMAMG	ITDVFSSSAN	LSGISSAESL	KISQAVHAAH	AEINEAGREV
OVA_X	451	AGSTGVIEDI	KHSPELEQFR	ADHPFLELIK	HNPTNTIVYF	GRYWSP
OVA_Y	343	TGSTGAIIGNI	KHSLELEEFR	ADHPFLFFIR	YNPTNAILFF	GRYWSP
OVA	342	VGSAEAGVDA	ASVS--EEFR	ADHPFLFCIK	HIATNAVLFF	GRCVSP

Figure S3

Alignment of IPI00595847.1 (similar to α -2-macroglobulin-1) to human α -2-macroglobulin /A2MG_HUMAN, P01023) and chicken ovostatin (OVOS_CHICK, P20740; IPI00589747.1). Sequence stretches containing peptides identified by MS/MS are in red. Residues identical to IPI00595847.1 are shaded yellow.

IPI00595847.1	84	KEEVQSLLKGGAFECKLNDVFCSYAMCMVTHYLVVIPAHLRYP <i>SIQVACLHITCYEAK</i> IQ
A2MG_HUMAN	1	MGKNKLLHPSLVLLLLVLLPTDASVSGKPQYMLVPSLLHTETTEKGCVLLSYLNETVT
OVOS_CHICK	12	FFCLTVRKMWLKFIILAILLLHAAAGKEPEPQYVLMVPAVLQSDSPSQVCLQFFNLNQTIS
IPI00595847.1	144	VKLVLERFAGHDLLVQKNIQKEKTFMCTKFWVAPPADGTEEIIATVRLIITGQGVNIEEKK
A2MG_HUMAN	60	VSASLESVRGNRSLFTDLEAENDVLHCVAFAV-PKSSSNEEVMFLTVQVKGPTQEFKKRT
OVOS_CHICK	72	VRVVLEYDITINTTIFEKNITTSNGLQCLNFMIPPVTSVS-LAFISFTAKGTTFDLKERR
IPI00595847.1	204	NVLIHKANS <i>GTFIQMDKPIYKPGQTVK</i> FRIVTLDEDFIAFNDSIS-VFLQDPKNNRIEQW
A2MG_HUMAN	119	TVMVKNEDSLVVFQTDKSIYKPGQTVKFRVVSMDENFHPLNELIPLVYIQDPKGNRIAQW
OVOS_CHICK	130	SVMIWNMESFVVFQTDKPIYKPGQSVMFRVVALDFNFKPVQEMYPLIAVQDPQNNRIFQW
IPI00595847.1	263	LNVPQEGTADLSFQLSDEPLLGTYYINVTNR---KIYDSFTVVEEYVLPKFEVIFEAPVK
A2MG_HUMAN	179	QSFQLEGLKQFSFPLSSEPFQGSYKVVVQKKSGGRTEHPFTVEEFVLPKFEVQVTVPKI
OVOS_CHICK	190	QNVTSEINIVQIEFPLTEEPILGNYSIIIVTKKSGERTSHSFLVEEYVLPKFDVTVTAPGS
IPI00595847.1	320	IYALDKTFPLRVCGRYTYGKAVQGMVYVSLCQKISQFLPSASKPDLQEFYNQVNCLAGA
A2MG_HUMAN	239	ITILEEEMNVSVCGLYTYGKVPVPHVTVSICRKYS-----ASD---CHGEDSQAFC-----
OVOS_CHICK	250	LTVMDSSELTVKICAVYTYGQPVVQVQVLSVCRDFDSYGRCKKSP-VCQSETKDL-----
IPI00595847.1	380	ENYSVTVLTDNMGCFFTNV-TLSFSQDLRYRDSIVAEASLLEDGTEIQVNAASHKLLISK
A2MG_HUMAN	289	EKFSGQL--NSHGCFYQQVKTQVQLKRKEYEMKLHTEAQIQEEGTVVVELTGRQSSEITR
OVOS_CHICK	304	-----TD--GCLSHILLSKVFELNRIGYKRNLDVKAIVTEKEQVCNLTATQSSITQ
IPI00595847.1	439	IGGMALFDDVNSYYHAGEMYRGKIKVIDYKGMKLYKKVLLVVSFGEQQFQOKYLTGDT-
A2MG_HUMAN	346	TITKLSFVKVDSHFROGIPFFGQVRLVDGKGVPIPN-KVIFI-RGNEANYYSNATTTDEH-
OVOS_CHICK	354	VMSSLQFENVDDHYRRGIPYFGQIKLVD-KDNSPISNKVIQLFVN---NKNTHNFTTDIN
IPI00595847.1	498	GTASFSLNTTAWNSTSVSLEASVLHQMDREPGT--VDLNYMRASHFIRPFYSTSRSFLS
A2MG_HUMAN	403	GLVQFSINTT--NVMGTSLSLTVRVNYKDRSPCYGYQWVSEEHEEAHHTAYLVFSPSKSFVH

OVOS_CHICK	410	GIAPFSDITSKIFDPELSLKALYKTSDQCHSEGWIEPSYPDASLSVQRLYSWT-S-SFVR
IPI00595847.1	556	IVHVPEMMPCKGKQAIQVDFRIYQEDLEHGPKRVIFSYLVTGKSGIVHAGQKTVVWGLPR
A2MG_HUMAN	461	LEPMSHELPCGHTQTVQAHY-ILNNGTLLGLKLSFYLLIMAKGGIVRTGTHGLLVKQED
OVOS_CHICK	468	IEPLWKDMSCGQKRMITVYYILNTEGYEH-INIVNFYVGMAGKIVLVTGEIKVNI-QAD
IPI00595847.1	616	MLKGFSSIPVTFSSVYAPTSTLIVYVIFPNGKTIADSAVFSVSMCFRNKAELSFSPVKIL
A2MG_HUMAN	520	M-KGHFSISIPVKSDIAPVARLLIYAVLPTGDVIGDSAKYDVENCLANKVDLSFSPSQSL
OVOS_CHICK	526	Q-NGTFMIPLVVNEKMAPALRLLVYMLHPAKELVADSVRFSEKCFKNKVQLQFSEKQML
IPI00595847.1	676	PGSEVNLHLQAAPGSTCAVWAVDQTVFLLKPEKELSHSMIYGLFSPSTYSGYPHQVSE
A2MG_HUMAN	579	PASHAHLRVTAAPQSVCALRAVDQSVLLMKPDAELSASSVYNLLP--EKDLTGFPGLND
OVOS_CHICK	585	TTSNVSLVIEAAANSFCAVRAVDKSMLLKSETELSAETIYNLHP--IQDLQGYIFNGLN
IPI00595847.1	736	--DD--NSC-----GF-----QNSDQPDVFTAFREMGLKIMSNTNIRKPRLCLTTQ
A2MG_HUMAN	637	-QDD--EDCINRHNVIYINGITYTPVSSSTNEKDMYSFLEDMGLKAFTNSKIRKPKMCPQLQ
OVOS_CHICK	643	LEDDPQDPCVSSDDIFHKGLYYRPLTSGLGPVYQFLRDMGMKFFFTNSKIRQPTVC--TR
IPI00595847.1	778	STTMMQERGMFTSRPMLMFAQPHKESNICLCLWCEPAIHKVGSWDVSWDKGEADL-HRSP
A2MG_HUMAN	694	QYEMHGPEGLRVG-----FYESDV-----MG-----RGHARLVHVEE
OVOS_CHICK	701	ETV-----RPPSYF-----LNAGFTASTHHV-----KLSAEVAR-EE
IPI00595847.1	837	PQDLGLCPVRKAEDSVSVQDSPWTRKQISVFQTGRGSRMVVWEAIFHRASEERDKLLKIF
A2MG_HUMAN	726	PHTE---TVRKYFPET-----WIWDLV
OVOS_CHICK	732	-----RGKRHIL-ETI--REFFPETWIWDII
IPI00595847.1	897	LLWTSSELPKGKQTVTVTPNTITGWKAGMFC TGHN-GFGLAPTSSLLVFKPFSVELTLPS
A2MG_HUMAN	745	VVN-SA---GVAEVGVTVPDTITTEWKAGAFCLSEDAGLGISSTASLRAFQPPFFVELTMPY
OVOS_CHICK	755	LIN-ST---GKASVSYTIPDTITTEWKA SAFCVEELAGFGMSVPATLTAFQPPFVDLTLPY
IPI00595847.1	956	SVIQGETFILKATVLSYLLQCMKIQVMTMEFFPQFLKSCGCVYSSCLCAGEVKTFLWSV
A2MG_HUMAN	801	SVIRGEAFTLKATVNLNPKCIRVSVQLEASPFLAVPVEKEQAPHCI CANGRQTVSWAV
OVOS_CHICK	811	SIIHGEDFLVRANVFNLYLNHCIKINVLLESLDYQAKLISPED-DGCVCAKIRKSYVWNI
IPI00595847.1	1016	TAERLGFTNITLSTEAIATKELCGKEIPFVFNQGGKDTITKLLLVLRPEGVLI EKAHSSIL
A2MG_HUMAN	861	TPKSLGNVNFVSAEALESQELCGTEVPSVPEHGRKDTVIKPLLVEPEGLEKETT FNSLL
OVOS_CHICK	870	FPKGTGDVLF SITAE T-NDDEACEEEALRNIRIDYRDTQIRALLVEPEGIRREETQNF LI
IPI00595847.1	1076	CPKKGSPAEESVSLTLPNNTVEGSRATVSVTGDLMGTALQNL DHLVQMPHGCGEQNMVL
A2MG_HUMAN	921	CPSGGEVSEE-LSLKLPPNVVEESARASVSVLGDILGSAMQNTQNL LQMPYGCGEQNMVL

OVOS_CHICK	929	CMKDDVISQD-VAIDLPTNVVEGSPRPSFSVVGDIMGTAIQNVHQLLQMPFGNGEQNMVL
IPI00595847.1	1136	FAPIVYMLQYLEKTRQLTPEIKERATGFLRNGYQIQIQYQHPDGSFSEFGTK--DEYGNT
A2MG_HUMAN	980	FAPNIYVLDYLNQQLTPEVKSKAIGYLNQYQYQHPDGSFSEFGTK--DEYGNT
OVOS_CHICK	988	FAPNIYVLDYLDKTRQLSEDVKSSTIGYLVSGYQKQLSYKHPDGSYSTFGIR--DKEGNT
IPI00595847.1	1194	WLTAFVVKCFAQAKPYIFLDDRSIQAAFNWLEFHQLPNGCFRDVQQLFHTAMKS-----
A2MG_HUMAN	1039	WLTAFVVKCFAQAKPYIFLDDRSIQAAFNWLEFHQLPNGCFRDVQQLFHTAMKS-----
OVOS_CHICK	1046	WLTAFVVKCFAQAKPYIFLDDRSIQAAFNWLEFHQLPNGCFRDVQQLFHTAMKS-----
IPI00595847.1	1248	-----TVVRKALGCIIPSLPKA-----TSTYTQALLAYTFALAKD
A2MG_HUMAN	1100	TLISAYITIALLEIPLTVTHPVVRNALFCLESARKTAQEGDHGSHVYTKALLAYAFALAGN
OVOS_CHICK	1106	SLISAYITIALLEAGHSMSHTVIRNAFYCLETASEKNITDI-----YTQALVAYAFCLAGK
IPI00595847.1	1283	PQRTQELLIDIDEKAIKIRAGGQIHWSS--QTPSKAHSTSLWSQPLSVDVELTAYVLLALLSK
A2MG_HUMAN	1159	QDKRKEVVKSLNEEAVKKNDSVHWERPQKPKAPVGHFYEPQAPSAEVEMTSYVLLAYLTA
OVOS_CHICK	1161	AEICESFLRELQKSAKEVDGSKYWEQNRSAPEKSH-LLDHVQSTDVEITSYVLLALLYK
IPI00595847.1	1341	PNV-TEADFTIASGIVAWLTRQONAYGGFASTQDQTVVALQALAKYAALTHNTKG-VAEVR
A2MG_HUMAN	1219	QPAPTSEDLTSATNIVKWKITKQNAQGGFSSTQDQTVVALHALSKYGAATFTRTGKAAQVT
OVOS_CHICK	1220	PNR-SQEDLTKASAIVQWIIROQNSYGGFASMQDQTVVALQALAAAYGAATYNSVTQNVIKI
IPI00595847.1	1399	VRSQRGSGRKFQVSYHNRLLVQEMALREIPGKFSVQAHGSCCVFTRTVLRYNIPFPQVSK
A2MG_HUMAN	1279	IQSSGTFSSKFQVDNNRLLQLQVSLPELPGEYSMKVVTGEGCVYLQTSLKYNI-LPEKEE
OVOS_CHICK	1279	NSKN-TFEKVFVNNENRLLQLQVSLPELPGEYSMKVVTGEGCVYLQTSLKYNI-LPEKEE
IPI00595847.1	1459	-SFALQVKTTPDNCTEDDAY-SVTLYVNVRYTGKRAISNMVIVEVSLLSGFV-LAARSGM
A2MG_HUMAN	1338	FPPFALGVQTLPTQTCDEPKAHTSFQISLSVSYSYTSRSASNMALVDVKMVSQGFIPKPTVKM
OVOS_CHICK	1338	-GFSLSVQTSNASCPRDQPGKFDIVLIS-SYTGKRSSSNMVIDVKMLSGFVPVKSSLDQ
IPI00595847.1	1516	SPHHWYVRRTEKTQAGVAIYLDKLSHVSETYVLHLEREIE-VTNLKPQVRVYDYHPE
A2MG_HUMAN	1398	LERSNH-VSRTEVSSNHVLIYLDKVSNQTLNLSLFFTVL-QDVPVRDLKPAIVKVDYDYETD
OVOS_CHICK	1396	LIDDHT-VMQVEYKKNHLLYLGNILOKRRRKEVTFVSVEQDFVVTHTPKPAPVQIYDYETE
IPI00595847.1	1575	EQALADYNVSCI
A2MG_HUMAN	1457	EFAIAEYNAPCSKDLGNA
OVOS_CHICK	1455	EYAVAEYMSLCRGVVEEMG

Figure S4

Overlap of IPI00595253.2, “74kDa protein” and IPI00584163.1, “similar to PIT 54” (*sequence in italics*). Peptides identified by MS are in red. Identical residues in the overlap are underlined. Predicted complete Scavenger Receptor Cysteine-Rich (SRCR) domains are shaded yellow.

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1 SCFLLVVENN KIVQLRLVNG TNHCSGRVEV LYGQQWGTVC DDNWDLIDAE
51 VVCRQLGCGT ALSAAFSAYF GRGSDPIWLD DVMCKGTEAA LSECTAKPWG
101 KHDCGHGEDA GVVCSGFAKP APLRLVDGST HCSGRIEVFY GQHWGTVCDD
151 GWDLADAEVV CRQLGCGKAL SAPHGAHFGQ GSDPIWLDDV SCTGTEAGLS
201 TCKASAWGSH NCGHGEDAGV VCAGLAELLP VRLVNGSNFC SGRVEVFHEQ
251 QWGTVCDDSW DLTDAQVCCR QLGCGEATSA TGSARFGQGT GTIWLDDVNC
301 AGSETALTEC PAKPWGDHNC NHGEDAGVVC SGAAEPAPIR LVNGPSHCAG
351 RVEVFHDRQW GTVCCDNWDK AEANVVCRL GCGAALSAPG SARFGQSDP
401 IWMDDVNCVG TEAALSQCQF RGWGSNCKH GEDAGVVCSD IPRAVPLRLI
451 NGPSRCSGRV EVFYGHQWGT VCCDNWDISD AEVVCQQLGC GRALSTATSA
501 SFGEGSGPIW LDDVNCTGAE TSLSKCETSL WGAHNCNHGE DAGVVCLGVP
1 MSARGLCKN LSICSNENGN IYKDKMIRVP
551 EPAPVRLVNG SNFCSGRVEV FHEQQWGTVC DDSWDLTDAQ VVCRQLGCGE
30 EPAPVRLVNG SNFCSGRVEV FHEQQWGTVC DDSWDLTDAQ VVCRQLGCGE
601 AISTPGSARF GQGTGKIWLD DVNCAGSETA LTECQVRPWG EHNCNHGEDA
80 AISTPGSARF GQGTGTIWLD DVNCAGSETA LIECQVRPWG EHNCNHGEDA
651 GVVCSGTAEA APLRLVNGPS RCAGRVEVLH SQWGTVCDD SWDLSDAAVV
130 GVVCSGIAEP APLRLVNGPN LCTGRVEVFH DHQWGTVCDD NWDKAEANVV
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180 CRQLGCGAAL SAPGSAHFGQ GSDPIWMDDV SCVGTEAALS QCRFRGWGSHN

230 CKHGEDAGVV CSGTAEAAPL RLVNGPSHCA GRVEVLHSQQ WGTVCDDSWDL

280 SDAAVVCQQL GCGTAMSAPG SAYFGQGYGR IWLDDVKCSS RESALAECAA

330 RPWGVHNCNH GEDAGVICSG GI

