

## **Supplementary Information for**

**DNA binding protein identification by combining pseudo amino acid composition  
and profile-based protein representation**

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**Supplementary S1. Performance of iDNAPro-PseAAC with different  $\lambda$  and  $\omega$  on the benchmark dataset.**

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Distance Accuracy Weight	1	2	3	4	5	6	7	8	9	10
0.1	75.35	75.91	76.28	75.81	75.44	75.72	75.44	75.53	75.35	75.91
0.2	75.81	75.91	76.00	76.09	75.91	75.72	75.44	75.72	75.26	75.72
0.3	75.81	75.35	76.37	76.00	75.63	75.44	75.72	75.53	75.16	75.63
0.4	75.91	75.44	77.12	75.35	76.00	76.19	75.63	75.53	74.98	75.16
0.5	75.72	75.26	76.47	75.72	76.19	75.35	75.44	75.07	74.70	74.51
0.6	75.63	75.53	76.47	75.91	75.72	75.07	75.07	75.26	74.60	74.51
0.7	75.35	75.81	77.21	75.72	76.00	74.79	75.26	75.07	74.51	74.23
0.8	75.16	75.26	76.93	76.09	75.91	74.70	75.63	75.16	74.33	74.51
0.9	75.53	74.88	76.09	75.63	74.88	74.79	75.53	74.88	74.33	74.33
1.0	75.44	75.35	76.09	75.72	74.88	74.88	75.44	75.16	74.51	74.05

## Supplementary S2. The extended negative dataset contains 2059 non DNA-binding protein sequences.

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### (1)2059 non DNA-binding proteins

>1RQWA

ATFEIVNRCSYTVWAAASKGDAALDAGGRQLNSGESWTINVEPGTKGGKIWARTDCYFDDSGSGI  
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>1H2GB

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VGAKILYEAVQGDKSPIPQAVDLFAGKPQQEVVLAAL EDTWETLSKRYGNNVSNWKT PAMALTFR  
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>1A12A

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RVFLWGSFRDNNNGVIGLLEPMKKSMPVQVQLDVPVVKVASGNDHLVMLTADGDLYTLGCGEQQG  
LGRVPELFANRGGRRQGLERLLV PKCVM LKSRGSRGHVRFQDAFCGAYFTFAI SHEGHVYGFGLSN  
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>3INGA

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>2RAUA

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SIEEMEAKGIYVIPSRGGPNPIWSYALANPDMSPDPKYKISDFLMDSLYVTGSANPYDYPYS  
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>1P0WA

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>1XKWA

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>1KZ1A

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MHHHHHH

>1YU0A

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>2QND

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>3EOFA

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>2MBRA

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 PTTVTQPQVFN AVCHMRTTKLPDPKVNGNAGSFFKNPVVSAETAKALLSQFP TAPNYPQADGSVK  
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FIGASGEVSAVETIS

>3V0RA

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KSS

>1SDIA

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>3BCYA

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>3JQ1A

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PLRLTASQSPSTFPLAKSSQADIWAQAKEDLKTAASLLPI TNKIGKPTQGAAYAALGKIYVYEEN  
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TRPKEYAAA EVGGWYEANPTQQIMDI FWKEKDKDGNFDYRARC SVAWDYEGCTYYQRPFREVFQAQ  
DKWKTYWILKYQNWKTQKDEPAPPKSFINERAI RYADVLLMLAEAYMNKGALDTSIGYINQIRRR  
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>4JHDC

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>3M1XA

MAHHHHHHMGTLEAGQQGPGSMSKLTVVASPLAPEAVGAYSQAI ICNGMVYCSGQIGLDRKTGDF  
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>3I7AA

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SLLQIYNKKHPSGLNYDTLTLAGLVHNI GALPVLTEAEAHPEMFTTIEHLRSLVRKMQGP IGRA  
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>3ZUXA

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ALSVAVTSVSTLTSPLLP AIFLMLAGEMLEIQ AAGMLMSIVKMVLLPIVLGLIVHKVLGSKTEK  
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SENL YFQ

>1GND- \_

MDEEYDVIVLGTGLTECILSGIMSVNGKVLHMDRNPYYGGESSITPLEELYKRFQLEGGPPET  
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LMGMFEKRRFRKFLVFNANFDENDPKTFEGVDPQNTSMRDVYRKFDLGDQVIDFTGHALALYRTD  
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ENGVVGVKSEGEVARCKQLICDPSYVPDRVRKAGQVIRIICILSHPIKNTNDANSCQIIIPQNQ  
VNRKSDIYVCMISYAHNVAAQGYIAIASTTVETTDPEKEVEPALELLEPIDQKFVAISDLYEPI  
DDGSESQVFCSCSYDATTHFETTCNDIKDIYKRMAGSAFDFENMKRQNDVFGQADQ

>1PHP- \_

MNKKTIIRDVDVRGKRVFCRVDFNVPMEQGAITDDTRIRAALPTIRYLIHGAKVILASHLGRPKG  
KVVEELRLDAVAKRLGELLERPVAKTNEAVGDEVKAAVDRLNEGDVLLLENVRFYPGEEKNDPEL  
AKAFAELADLYVNDAFGAAHRAHASTEGIAHYLPAVAGFLMEKELEVLGKALSNPDRPFTAIIGG  
AKVKDKIGVIDNLLKVDNLIIGGLAYTFVKALGHDVKGSLLEEDKIELAKSFMEKAKEKGVRF  
YMPVDVVVADR FANDANTKVVPIDAI PADWSALDIGPKTRELYRDVIRESKLVVWNGPMGVFEMD  
AFAHGTKAIAEALAEALDITYSVIGGGDSAAAVEKFGGLADKMDHISTGGGASLEFMEGKQLPGVVA  
LEDK

>1LKI- \_

SPLPITPVNATCAIRHPCHGNLMNQIKNQLAQLNGSANALFISYYTAQGEPPFNVEKLCAPNMT  
DFPSFHNGTEKTKLVELYRMVAYLSASLTNITRDQKVLNPTAVSLQVKLNATIDVMRGLLSNVL  
CRLCNKYRVGHVDVPPVDPHSDKEAFQRKKLGCQLLGTQYKQVISVVVQAF

>1MRP- \_

DITVYNGQHKEAATAVAKAFEQETGIKVTNLNGKSEQLAGQLKEEGDKTPADVIFYTEQTATFADL  
SEAGLLAPISEQTIQQTAKGVPLAPKKDWIALSGRSRVVYDHTKLSEKDMEKSVLDYATPKWK  
GKIGYVSTSGAFLEQVVALSKMKGDKVALNWLKGLKENGKLYAKNSVALQAVENGEVPAALINNY  
YWYNLAKEKGVENLKSRLYFVRHQDPGALVSYSGAAVLKASKNQAEAQKFVDFLASKKQGEALVA  
ARAEYPLRADVVSPFNLEPYEKLEAPVVSATTAQDKEHAIKLIEEAGLK

>1MAI- \_

MHGLQDDPDLQALLKGSQLLKVKSSSWRRERFYKLQEDCKTIWQESRKVMRSPESQLFSIEDIQE  
VRMGHRTEGLEKFARDIPEDRCFSIVFKDQRNTLDLIAPSPADAQHWVQGLRKI IHHSGSMDQRQ  
K

>1A8E- \_

DKTVRWCAVSEHEATKCSFRDHMKSVIPSDGSPVACVKKASYLDCIRAIANAENDAVTLDAGLV  
YDAYLAPNNLKPVVAEFYGSKEDPQTFYYAVAVVKKDSGFQMNQLRGKKSCHTGLGRSAGWNIPI  
GLLYCDLPEPRKPLEKAVANFFSGSCAPCADGTDFFPQLCQLCPGCGCSTLNQYFGYSGAFKCLKD  
GAGDVAFVKHSTIFENLANKADRDQYELLCLDNTRKPVDEYKDCHLAQVPSHTVVARSMGGKEDL  
IWELLNQAQEHFGKDKSKEFQLFSSPHGKDLLFKDSAHGFLKVPVRMDAKMYLGYEYVTAIRNLR  
EGTC

>1CZJ- \_

ETFEIPESVTMSPKQFEGYTPKKGDVTFNHASHMDIACQQCHHTVPDITYTIESCMTEGCHDNIKE  
RTEISSVYRTFHHTTKDSEKSCVGCHELRKQGPSDAPLACNSCHVQ

>1A53- \_

PRYLKGWLKDVVQLSLRRPSFRASRQRPIISLNERILEFNKRNITAIIEYKRKSPSGLDVERDP  
IEYSKFMERYAVGLSILTEEKYFNYSYETLRKIASSVSIPIILMKDFIVKESQIDDAYNLGADTVL  
LIVKILTERELESLEYARSYGMEPLIEINDENDLDIALRIGARFIGINSRDLETLEINKENQRK



LISMIPSNVVKVAESGISERNEIEELRKLGVNAFLIGSSLMRNPEKIKEFIL

>1BR9- \_

CSCSEVHPQQAFCNADVIRAKAVSEKEVDSGNDIYGNPIKRIQYEIKQIKMFKGPEKDIEFIYT  
APSSAVCGVSLDVGKKEYLIAGKAEGDGKMHITLCDFIVPWTLSSTQKKS LNHR YQMGECKI  
TRCPMIPCYISSPDECLWMDWVTEK NINGHQAKFFACIKRSDGSCAWYRGAAPPKQEFLDIEDP

>1FIT- \_

MSFRFGQHLIKPSVFLKTELSFALVNRKPVVPGHVLCPLRPVERFHDLRPDEVADLFQTTQRV  
GTVVEKHFHGTSLTFSXQDGPEAGQTVKHVHVHVLPRKAGDFHRNDSIYEELQKHKEDFPASWR  
SEEXAAEAAAALRVYFQ

>1BDB- \_

MKLKGEAVLITGGASGLGRALVDRFVAEGAKVAVLDKSAERLAELETDHGDNVLGIVGDVRSLED  
QKQAASRCVARFGKIDTLIPNAGIWDYSTALVDLPEESLDAAFDEVFHINVKGYIHAVKACL PAL  
VASRGNVIFTISNAGFYPNGGGPLYTAAKHAI VGLVRELAFELAPYVRVNGVGS GGINS DLRGPS  
SLGMGSKAISTVPLADMLKSVLP IGRMPEVEEYTGAYVFFATR GDAAPATGALLNYDGGLGVRGF  
FSGAGNDLLEQLNIHP

>1RCB- \_

HKCDITLQEI IKTLNSLTEQKTLCTELTVTDIFAASKNTTEKETFCRAATVLRQFYSHHEKDTRC  
LGATAQQFHRHKQLIRFLKRLDRNLWGLAGLNSCPVKEANQSTLENFLERLKTIMREKYSKCSS

>1COT- \_

QDGDAAKGEKEFNKCKACHMIQAPDGTDI IKGGKTGPNLYGVVGRKIAS EEGFKYGE GILEVAEK  
NPDLTWTEADLIEYVTDPKPWLVKMTDDKGA KTKMTFKMGKNQADVVAFLAQNSPDAGGDGEAA

>1CSH- \_

STNLKDVLASLIPKEQARIKTFRQQHGNTAVGQITVDMSYGGMRGMKGLIYETSVLDPDEGIRFR  
GFSIPECQKLLPKAGGGEPLPEGLFWLLVTGQIPTPEQVSWVSKEWAKRAALPSHVVTMLDNFP  
TNLHPMSQLSAAITALNSESNFARAYAEGINRTKYWEFVYEDAMDLIAKLPCVAAKIYRNLYRAG  
SSIGAIDSKLDWSHNFTNMLGYTDPQFTELMRLYLTIHSDHEGGNVAHTSHLVGSALS DPYLSF  
AAAMNGLAGPLHGLANQEVLLWLSQLQKDLGADASDEKLRDYIWNTLNSGRVVPYGHAVLRKTD  
PRYTCQREFALKHLPSPDMFKLVAQLYKIVPNVLEQ GKAKNPWPVND AHSGVLLQYYGMTEMNY  
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>1A8P- \_

MSNLNVERVLSVHHWNTLFSFKTTRNPSLRFENGQFVMIGLEVDGRPLMRAYS IASPNYEEHLE  
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VYERFEKVLIHGVRQVNELAYQQFITEHL PQSEYFGEAVKEKLIYYPTVTRESFHNQGR L TDLM  
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>1BG2- \_

MADLAECNIKVMCRFRPLNESEVNRGDKYIAKFQGEDTVVIASKPYAFDRVFQSSTSQE QVYND C  
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KVSYFEIYLDKIRDLLDVSKTNLSVHEDKNRVPYVKGCTERFVCS PDEVMDTIDEGKSNRHVAVT  
NMNEHSSRSHSIFLINVKQENTQTEQKLSGKLYLVDLAGSEKVSKTGAEGAVLDEAKNINKSLSA  
LGNVISALAE GSTYVPYRDSKMTRILQDSLGGNCR TTIVICCSPSSYNESETKSTLLFGQRAKTI

>1FMK- \_

MVTTFVALYDYESRTETDLSFKKGERLQIVNNT EGDWLLAHSLS TGQTGYIPSNYVAPSDS IQAE  
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FYITSRTQFN SLQQLVAYYSKHADGLCHRLTTVCPTSKPQTQGLAKDAWEIPRESLRLEVKLGQG

CFGEVWMTWNGTTRVAIKTLKPGTMSPEAFLOEAQVMKKLRHEKLVQLYAVVSEEPYIYIVTEYM  
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 LARLIEDNEYTARQGAKFPIKWTAPEAALYGRFTIKSDVWSFGILLTELTTKGRVYPGMVNREV  
 LDQVERGYRMPCCPECPESLHDLMCQCWRKEPEERPTFEYLQAFLEDYFTSTEPQXQPGENL

>1NDH- \_

STPAITLENPDIKYPLRLIDKEVNVNHDTRRRFRFALPSPEHILGLPVGQHIYLSARIDGNLVIRPY  
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 RPKDKSSPVIKTVKSVGMIAGGTGITPMLQVIRAIMKDPDDHTVCHLLFANQTEKDILLRPELEE  
 LRNEHSARFKLWYTVDRAPEAWDYSQGFVNEEMIRDHLPPPEEPLVLMCGPPPMIQYACLPNLE  
 RVGHPKERCFAF

>1CSN- \_

MSGQNNVGVHYKVGRRIGEGSFGVIFEGTNLLNNQOVAIKFEPRRSDAPQLRDEYRKYKLLAGC  
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 DIKPDNFLIGRPNKSNANMIYVDFGMVKFYRDPVTKQHIPYREKKNLSGTARYMSINTHLGREQ  
 SRRDDLEALGHVFMFLRGLPWQGLKAATNKQKYERIGEKKQSTPLRELCAGFPEEFYKYMHYA  
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>1OYC- \_

MSFVKDFKQALGDTNLFKPIKIGNNELLHRAVIPP LTRMRALHPGNI PNRDWAVEYYTQRAQRP  
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 DGLRYDSASDNVFMDAEQEAKAKANNPQHSLTKDEIKQYIKEYVQAAKNSIAAGADGVEIHSAN  
 GYLLNQFLDPHSNTRTDEYGGSIENRARFTLEVVDALVEAIGHEKVGLRLSPYGVFNSMSGGAET  
 GIVAQYAYVAGELEKRAKAGKRLAFVHLVEPRVTNPFLTEGEGEYEGGSNDFVYSIWKGPVIRAG  
 NFALHPEVVREEVKDKRTLIGYGRFFISNPDLVDRLEKGLPLNKYDRDTFYQMSAHGYIDYPTYE  
 EALKLGWDKK

>1LFO- \_

XMNFSGKYQVQSQENFEPFMKAMGLPEDLIQKGKDIKGVSEIVHEGKKVCLTITYGSKVIHNEFT  
 LGEEEXELETMTGEKVKAVVKMEGDNKMVTTFKGIKSVTEFNGDTITNTMTLGDIVYKRVSKRI

>1CIY- \_

IETGYTPIDISLSLTQFLLSEFVPGAGFVLGLVDIIWGI FGPSQWDAFLVQIEQLINQRIEFAR  
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 QNIRQPHLMDILNSITIIYTDVHRGFNYWSGHQITASPVGFSGPEFAFPLFGNAGNAAPPVLVSLT  
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 NFSATMSSGSNLQSGSFRTVGF TTPFNFSNGSSVFTLSAHVFNSGNEVYIDRIEFVPAEVTFEAE  
 YDLER

>1GKY- \_

XSRPVIISGPGTGKSTLLKKLFAEY PDSFGFSVSSTTRTPRAGEVNGKDYNFVSVDEFKSMIKN  
 NEFIEWAQFSGNYGSTVASVKQVSKSGKTCILDIDMQGVKSVKAIPELNARFLFIAPPSVEDLK  
 KRLEGRGTETEE SINKRLSAAQAE LAYAETGAHDKVIVNDDLDKAYKELKDFIFA EK

>1AXN- \_

SASIWVGHRTVRDYPDFSPSVDAEAIQKAIRGIGTDEKMLISILTERSNAQRQLIVKEYQAAYG

KELKDDLKGDLSGHFEHLMVALVTPPAVFDKQLKKSMMKGAGTNEDALIEILTTRTSRQMKDISQ  
 AYYTVYKKSGLGDDISSETSGDFRKALLTLADGRRDESLKVDEHLAKQDAQILYKAGENRWGTDED  
 KFTEILCLRSFPQLKLTDFEYRNISQKDIVDSIKGELSGHFEDLLLAIVNCVRNTPAFLAERLHR  
 ALKGIGTDEFTLNRIMVSRSEIDLDIRTEFKKHGYSLYSAIKSDTSGDYEITLLKICGGDD

>1FDS- \_

ARTVVLITGCSSGIGLHLAVRLASDPSQSFVKVYATLRDLKTQGRLEWAARALACPPGSLETQLQD  
 VRDSKSVAAARERVTEGRVDVLCNAGLGLLPLEALGEDAVASVLDVNVVGTVRMLQAFLPDMK  
 RRGSGRVLVTGSVGGMLPFDNDVYCASKFALEGLCESLAVLLLPGVHLSLIECGPVHTAFMEK  
 VLGSPEEVLDRDTHFTFRFYQYLAHSKQVFREAAQNPEEVAEVFLTALRAPKPTLRYFTTERFL  
 PLLRMRLDDPSGSNYVTAMHREVFVDVPAKAEAGAEAGGGRGPGAEDAEAGRSVAVGDPPELGDPPAA  
 PQ

>1DRW- \_

MHDANIRVAIAGAGGRMGRQLIQAALALEGVQLGAALEREGSSLLGSDAGELAGAGKTGVTVQSS  
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 VGVNVMKLLLEKAAKVMGDYTDIEIEAHHRHKVDAPSGTALAMGEAIAHALDKDLKDCAVYSRE  
 GHTGERVPGTIGFATVRAGDIVGEHTAMFADIGERLEITHKASSRMTFANGAVRSALWLSGKESG  
 LFDMRDVLDLNNL

>1IDO- \_

GCPQEIFADSDIAFLIDGSGSII PHDFRRMKEFVSTVMEQLKKSCTLFLSLMQYSEEFRIHFTFKE  
 FQNNPNRSLVKPITQLLGRTHATGIRKVVRELFNITNGARKNAFKILVVIDGEEKFGDPLGYE  
 DVIPEADREGVIRYVIGVGDVFRSEKSRQELNTIASKPPRDHVFQVNNFEALKTIQNQLREK

>1FRB- \_

ATFVELSTKAKMPIVGLGTWKSPPNQVKEAVKAAIDAGYRHIDCAYAYCNENEVGEAIQEKIKEK  
 AVQREDLFI VSKLWPTCFEKKLLKEAFQKTLTDLKLDYLDLYLIHWPQGLQPGKELFPKDDQGRI  
 LTKSTTFLEAWEGMEELVDQGLVKALGVSFNHFQIERLLNKPGLKHKPVTNQVECHPYLTQEKL  
 IQYCHSKGISVTAYSPLGSPDRPSAKPEDPSLLEDPKIKEIAAKHEKTSAQVLIRFHIQRNVVVI  
 PKSVTPSRIQENIQVDFDQLSDEEMATILSFNRNWRACLLEPETVNMEEYPYDAEY

>1LAM- \_

TKGLVLGIYSKEKEEDEPQFTSAGENFNKLVSGKLEILNISGPPLKAGKTRTFYGLHEDFPSVV  
 VVGLGKKTAGIDEQENWHEGKENIRAAVAAGCRQIQDLEIPSVVEVDPCGDAQAAAEGAVLGLYEY  
 DDLKQKRKVVVS AKLHGSEDQEAWQRGVLFASGQNLARRLMETPANEMTPTKFAEIVEENLKSAS  
 IKTDVFI RPKSWIEEQEMGSFLSVAKGSEPPVFLEIHYKGS PNASEPPLVFGKGITFDSGGIS  
 IKAAAANMDLMRADMGAATICS AIVSAAKLDLPINIVGLAPLCENMPSGKANKPGDVVRARNGKT  
 IQVDNTDAEGRILADALCYAHTFNPKVI INAATLTGAMDIALGSGATGVFTNSSWLWNKLF EAS  
 IETGDRVWRMPLFEHYTRQVIDCQLADVNNIGKYRSAGACTAAAFLEFVTHPKWAHLDIAGVMT  
 NKDEVYPYLRKGMAGRPTRTLIEFLFRFSQ

>1CPT- \_

MDARATIPEHIARTVILPQGYADDEVIYPAFKWLRDEQPLAMAHIEGYDPMWIATKHADVMQIGK  
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 ENIRRIAQASVQRLLDFDGECDFMTDALYYPLHVMTALGVPEDEPLMLKLTQDFFGVEAARR  
 FHETIATFYDYFNGFTVDRRSCPKDDVMSLLANSKLDGNYIDDKYINAYYVAIATAGHDTTSSSS  
 GGAIIGLSRNPEQLALAKSDPALIPRLVDEAVRWTAPVKSFMRTALADTEVRGQNIKRGDRIMLS  
 YPSANRDEEVFSNPDEFDITRFPNRHLGFGWGAHMCLGQHLAKLEMKIFFEELLPKLKSVELSGP  
 PRLVATNFVGGPKNVPIRFTKA

>1HCZ- \_

YPIFAQQNYENPREATGRIVCANCHLASKPVDIEVPQAVLPDTVFEAVVKIPYDMQLKQVLANGK  
 KGALNVGAVLILPEGFELAPPDRISPENKEKIGNLSFQNYRPNKKNILVIGPVPQKYSEITFPI  
 LAPDPATNKDVHFLKYPYVGGNRGRGQIYPDGSKSNNTVYNATAGGIISKILRKEKGGYEITIV  
 DASNERQVIDIIPRGGLELLVSEGESIKLDQPLTSNPNVGGFGQDAEIVLQDPLRVQ

>1AYL- \_

MRVNNGLTPQELEAYGISDVHDIYNPSYDILLYQEELDPSLTGYERGVLTNLGAVAVDTGIFTGR  
 SPKDKYIVRDDTTRDTFWWADKKGKNDKNPLSPETWQHLLKGLVTRQLSGKRLFFVDAFCGANPD  
 TRLSVRFITEVAWQAHFVKNMFI RPSDEELAGFKPDFIVMNGAKCTNPQWKEQGLNSENFVAFNL  
 TERMQLIGGTWYGGEMKKGMSMMNYLLPLKGIASMHCSANVGEKGDVAVFFGLSGTGKTTLSTD  
 PKRRLIGDDEHGWDGDFVNFEGGCYAKTIKLSKEAEPEIYNAIIRDALLENTVREDGTIDFDD  
 GSKTENTRVSYPYIYHIDNIVKPVSKAGHATKVIFLTADAFGVLPVSRILTADQTYHFLSGFTAK  
 LAGTERGITTEPTPTFSACFGAAFLSLHPTQYAEVLVKRMAAGAAYLVNTGWNGTGKRISIKDT  
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 FDKYTDTPAGAALVAAGPKLS

>1A60-A

MSKARVYADVNVLRPKEYWDYEALTVQWGEQDDYEVVRKVGGRKYSEVFEGINVNNEKCIKIL  
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 YIYELLKALDYCHSQGIMHRDVKPHNVMIDHELKRLRIDWGLAEFYHPGKEYNVRVASRYFKGP  
 ELLVDLQDYDYSLDMWSLGCMFAGMIFRKEPFYFGHDNHDQLVKIAKVLGTDGLNVYLNKYRIEL  
 DPQLEALVGRHSRKPWLKFMNADNQHLVSPEAIDFLDKLLRYDHQERLTALEAMTHPYFQQVRAA  
 ENSRTRA

>1GOX- \_

XMEITNVNEYEAIKQKLPKMVYDYASGAEDQWTLAENRNAFSRILFRPRIIDVTNIDMTTII  
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 VYKDRNVVAQLVRRERAGFKAIALTVDTPRLGRREADIKNRFVLPFLLTKNFEGIDLKMDKA  
 NDSGGLSSYVAGQIDRSLSWKDVAWLQTTITSLPILVKGVITAEDARLAVQHGAAGIVSNHGARG  
 LDYVPATIMALEEVVKAQGRIPVFLDGGVRRGTDVFKALALGAAGVFIGRPVVFSLAAEGEAGV  
 KKVLMRDEFELTMALSGCRSLKEISRSHIAADWDPSSRAVARL

>10AA- \_

ADGLGCAVCVLTGASRGFGRALAPQLARLLSPGSVMLVSARSESMLRQLKEELGAQQPDLKVVLA  
 AADLGTEAGVQRLLSAVRELPRPEGLQRLLLINNAATLGDVSKGFLNVNDLAEVNNYWALNLTSM  
 LCLTSGTLNAFQDSPGLSKTVVNISSLCALQPYKGWGLYCAGKAARDMLYQVLAEEPSVRVLSY  
 APGPLDNDMQQLARETSKDPELRSKLQKLKSDGALVDCGTSAQKLLGLLQKDTFQSGAHVDFYD

>1A17- \_

RDEPPADGALKRAEELKTQANDYFKAKDYENAIKFYSQAIELNPSNAIYYGNRSLAYLRTECYGY  
 ALGDATRAIELDKKYIKGYRRAASNALGKFRAALRDYETVVVKVPHDKDAKMKYQECNKIVKQ  
 KAIFERAIAGDEHKRSVVDSLDIESMTIEDEYSGPKL

>1PBE- \_

MKTQVAIIAGPSGLLLGQLLHKAGIDNVILERQTPDYVLGRIRAGVLEQGMVDLLREAGVDRRM  
 ARDGLVHEGVEIAFAGQRRRIDLKRSLGGKTVTVYQTEVTRDLMEAREACGATTVYQAAEVR LH  
 DLQGERPYVTFERDGERLRLCDYIAGCDGFHGISRQSI PAERLKVFERVYPPFGWLGLLADTPPV  
 SHELIYANHPRGFALCSQRSATRSRYVQVPLTEKVEDWSDERFWTELKARLPAEVAEKLVTPS  
 LEKSIAPLRSFVVEPMQHGRFLAGDAAHIVPPTGAKGLNLAASDVSTLYRLLLKAYREGRGELL

ERYSAICLRRIWKAERFSWWMTSVLHRFPDTPDAFSQRIQQTELEYLGLSEAGLATIAENYVGLPY  
EEIE

>1SKF- \_

VTKPTIAAVGGYAMNNGTGTTLYTKAADTRRSTGSTTKIMTAKVVLAQSNLNLDKAVTIQKAYSD  
YVVANNASQAHLIVGDKVTVRQLLYGLMLPSGCDAAAYALADKYGSGSTRAARVKSFIGKMNTAAT  
NLGLHNTHFDSFDGIGNGANYSTPRDLTKIASSAMKNSTFRFVVKTKAYTAKTVTKTGSIRTMDT  
WKNTNGLLSSYSGAIGVKTGSGPEAKYCLVFAATRGGKTVIGTVLASTSIPARESDATKIMNYGF  
AL

>1AF7- \_

SVLLQMTQRLALSDAHFRRICQLIYQRAGIVLADHKRDMVYNRLVRRRLRALGLDDFGRYLSMLEA  
NQNSAEWQAFINALTTNLTAFFREAHHPILAEHARRRHGEYRVWSAAASTGEEPYSIAITLADA  
LGMAPGRWKVFASDIDTEVLEKARSGIYRSELKTLSPQQLQRYFMRGTGPHEGLVRVRQELANY  
VEFSSVNLLKQYNVPGPFDAIFCRNVMIFYDKTTQEDILRRFVPLLKPDGLLFAGHSENFNSLV  
REFSLRGQTVYALS

>1AJ2- \_

MKLFAQGTSLDLSHPHVMGILNVTSPDSFSDGGTHNSLIDAVKHANLMINAGATIIDVGGESTRPG  
AAEVSVEEELQRVIPVVEAIAQRFEVWISVDTSKPEVIRESAKVGAIHINDIRSLSEPGAEEAAA  
ETGLPVCMLHMQGNPKTMQEAPKYDDVFAEVNRYFIEQIARCEQAGIAKEKLLLDPGFGFGKNLS  
HNYSLLARLAEFHFNPLLVGMSRKSMMIGQLLNVPSERLSGSLACAVIAAMQGAHIIRVHDVK  
ETVEAMRVVEATLSAKENKRYE

>153L- \_

RTDCYGNVNRIDTTGASCKTAKPEGLSYCGVSASKKIAERDLQAMDRYKTIKKVGEKLCVEPAV  
IAGIISRESHAGKVLKNGWDRNGFGLMQVDKRSHKPOGTWNGEVHITQGTILINFIKTIQKK  
FPSWTKDQQLKGGISAYNAGAGNVRSYARMDIGTTHDDYANDVVARAQYYKHGY

>1A1X- \_

GSAGEDVGAPPDHLVWHQEGIYRDEYQRTWVAVVEETSFLRARVQQIQVPLGDAARPSHLLTSQ  
LPLMWQLYPEERYMDNNSRLWQIQHHLMVRGVQELLLKLLPDD

>1A44- \_

PVDLSKWSGPLSLQEVDERPQHPLQVKYGGAEVDELGKVLTPQTQVKNRPTSITWDGLDPGKLYTL  
VLTDPDAPSRKDPKYREWHHFLVNMKGNNISSGTVLSDYVGSPPKGTGLHRYVWLVEQEGPL  
KCDEPILSNRSGDHRGKFKVASFRKKYELGAPVAGTCYQAEWDDYVPKLYEQLSG

>1A48- \_

XSITKTELDGILPLVARGKVRDIYEVDAGTLLFVATDRISAYDVIMENSIPEKGILLTKLSEFWF  
KFLSNDVRNHLVDIAPGKTI FDYLPKALSEPKYKTQLEDRLVHKHKLIPLEVIVRGYITGSAW  
KEYVKGTGVHGLKQPQGLKESQEFPEPIFTPSTKAEQGEHDENISPAQAAELVGEDLSRRVAELA  
VKLYSKCKDYAKEKGI I IADTKFEFGIDEKTNEI I LVDEVLTDPSSRFWNGASYKVGESQDSYDK  
QFLRDWLTANKLNGVNGVKMPQDIVDRTRAKYIEAYETLTGSKWSH

>1A6Q- \_

MGAFLDKPKMEKHNAQQGNGRLRYGLSSMQGWRVEMEDAHTAVIGLPSGLESWSFFAVYDGHAGS  
QVAKYCCHELLDHITNNQDFKGSAGAPSVENVKNGIRTGFLEIDEHMRVMSEKKGADRSGSTAV  
GVLISPQHTYFINGDSRGLLCRNRKVHFFTQDHKPSNPLEKERIQNAGGSVMIQRVNGSLAVSR  
ALGDFDYKCVHGKGPTEQLVSPPEVVDIERSEEDDQFI I LACDGIWDVMGNEELCDFVRSRLEV  
TDDLEKVCNEVVDTCLYKGSRDNMSVILICFPNAPKVSPEAVKKEAELDKYLECRVEE I IKKQGE  
GVPDLVHVMRTLASENIPSLPPGGELASKRNVIEAVYNRLNPNYKNDTDTSTSTDDMW

>1A8L- \_

MGLISDADKKVIKEEFFSKMVNPVKLIVFVRKDHQCQYCDQLKQLVQELSELTDKLSYEIVDFDTP  
EGKELAKRYRIDRAPATTITQDGKDFGVRYFGLPAGHEFAAFLEDIVDVSREETNLMDETKQAIR  
NIDQDVRILVFVTPTCPYCP LAVRMAHKFAIENTKAGK GKILGDMVEAIEYPEWADQYNVMAVPK  
IVIQVNGEDRVEFEGAYPEKMFLEKLLSALS

>1A8Y- \_

EEGLDFPEYDGVDRVINVNAKNYKNVFKKYEVLALLYHEPPEDDKASQRQFEMEELILELAAQVL  
EDKGVGFGLVDSEKDAAVAKKLG LTEEDSIYVFKEDEVEIYDGEFSADTLVEFLLDVLEDPVELI  
EGERELQAFENIEDEIKLIGYFKNKDSEHYKAFKEAAEEFHPYI PFFATFDSKVAKKLT LKLN EI  
DFYEAFMEEPVTIPDKPNSEEEIVNFVEEHRRSTLRK LKPESMYETWEDDMDGIHIVAF AEADP  
DGYEFLEILKSVAQDNTDNPDL SI IWIDPDDFLLVPYWEKTFDIDLSAPQIGVVNVT DADSVWM  
EMDDEEDLPSAELEDWLEDVLEGEINTEDDDDDEDDDDDDDD

>1ABE- \_

ENLKLGLFLVKQPEEPWFQTEWK FADKAGKDLGF EVIKIAVPDGEKTLNAIDSLAASGAKGFVICT  
PDPKLGSAIVAKARGYDMKVIAVDDQFVNAK GKPM DTVPLVMMAATKIGERQ GQELYKEMQKRGW  
DVKESAVMAITANELDTARRRTTGSM DALKAAGFPEKQIYQVPTKSNDIPGAFDAANSMLVQHPE  
VKHWLIVGMNDSTVLGGVRATEGQG FKAADIIGIGINGVDAVSELSKAQATGFYGSLLPSPDVHG  
YKSSEM LYNWVAKDVEPPKFTEVTDVVLITRDNFKEELEKKGLGGK

>1AC5- \_

LPSS EYK VAYELL PGLSEVPDPSNIPQMHAGHIPLRSEDADEQDSSDLEYFFWKFTNND SNGNV  
DRPLI IWLNGGPGCSSMDGALVESGPF RVNSDGKLYLNEGSWISKGDLLFIDQPTGTGFSVEQNK  
DEGKIDKNKFDEDEDLVTKHFMDFL ENYFKIFPEDLTRKIILSGESYAGQYI PFFANAILNHNKF  
SKIDGDTYDLKALLIGNGWIDPNTQ SLSYLPFAMEKKLIDESNPNFKHLTNAHENCQNLINSAST  
DEAAHFSYQECENILNLLLSY TRESSQKGTADCLNMYNFN LKDSYPSCGMNWP KDISFVSKFFST  
PGVIDSLHLSDSKIDHWKECTNSVGT KLSNPISKPSIHL L PGLLESGIEIVLFNGDKDLICNNKG  
VLDTIDNLKWGGIKGFSDDAVSFDWIHKSKSTDDSEEFSGYVKYDRNLTFVSVYNASHMVPFDKS  
LVSRGIVDIYSNDVMIIDNNGKNVMITT

>1AHO- \_

VKDG YIVDDVNCTYFCGRNAYCNEECTK LKGESGYCQWASPYGNACYCYKLPDHVRTKGPGRCH

>1AIR- \_

ATDTGGYAATAGGNVTGAVSKTATSMQDIVNII DAARLDANGKKVKGGAYPLVITYTGNEDSLIN  
AAAANICGQWSKDPRGVEIKEFTKGITII GANSSANFGIWIKKSSDVVVQNMRI GYLPGGAKDG  
DMIRVDDSPNVWVDHNELF AANHECDGTPDN DTTFESAVDIKGASNTVTVSYNYIHGVKKVGLDG  
SSSSDTGRNITYHHNYNDVNARLPLQRGGLVHAYNNLYTNI TGSGLNVRQNGQAL IENNWFEKA  
INPVT SRYDGKNFGTWVLKGNNITKPADFSTYSITWTADTKPYVNADSWTSTGTFFPTVAYNYS PV  
SAQC VKDKLPGYAGVGKNLATLTSTACK

>1AJJ- \_

PCSAFEFHCLSGECIHSSWRCDGGPDCKDKSDEENCA

>1AL3- \_

MKLQQLRYIVEVVNHNLNVSSTAEGLYTSQPGISKQVRMLEDELGIQIFARSGKHLTQVTPAGQE  
IRIAREVLSKVDAIKSVAGEHTWPDKGS L YVATTH TQARYALPGVIKGFIERYP RVSLMHMQGS  
PTQIAEAVSKGNADF A IATEALHLYDDL VMLPCYHWNRSIVVTPEHPLATKGSV SIEELAQYPLV  
TYTFGFTGRSELDTAFNRAGLTPRIVFTATDADVIKTYVRLGLGVGVIASMAVDPVSDPDLVKLD  
ANGIFSHSTTKIGFRRSTFLRSYMYDFIQRFAPHLTRDVVDTAVALRSNEDIEAMFKDIKLEPK

>1ALU- \_

MAPVPPGEDSKDVAAPHRQPLTSSERIDKQIRYILDGISALRKETCNKSNMCESSKEALAENNLN  
LPKMAEKDGCFSQSGFNEETCLVKIITGLLEFEVYLEYLQNRFESEEQARAVQMSTKVLIQFLQK  
KAKNLDAITTPDPTTNASLLTKLQAQNQWLQDMTTHLILRSFKEFLQSSLRALRQM

>1AMF- \_

DEGKITVFAAASLTNAMQDIATQFKKEKGVDDVSSFFASSSTLARQIEAGAPADLFI SADQKWMY  
AVDKKAIDTATRQTLGNSLVVAPKASVQKDFITIDSKTNWTSLLNGGRLAVGDPEHVPAGIYAK  
EALQKLGAWDTLSPKLAPAEDVRGALALVERNEAPLGIVYGS DAVASKGVKVVATFPEDSHKKVE  
YPVAVVEGHNNATVKAFYDYLKGPQAAEIFKRYGFTIK

>1AMK- \_

MSAKPQPIAAANWKCNGTTASIEKLVQVFNEHTISHDVQCVVAPT FVHIPLVQAKLRNPKYVISA  
ENAIAKSGAFTGEVSMPIKDIGVHWVILGHSERRTYGETDEIVAQKVSEACKQGMVIACIGE  
TLQQREANQTAKVVLSTSAIAAKLTKDAWNQVVLAYEPVWAIGTGKVATPEQAQEVHLLLRKWV  
SENI GTDVAAKLRILYGGSVNAANAATLYAKPDINGFLVGGASLKPEFRDIIDATR

>1AMM- \_

GKITFYEDRGFQGHCECSDCPNLQPYFSRCNSIRVDSGCWMLYERP NYQGHQYFLRRGDYPDY  
QQWGMFNDSIRSCRLIPQHTGTFRMRIYERDDFRGQMSEITDDCPSLQDRFHLTEVHSLNVLEGS  
WVLYEMPSYRGRQYLLRPGEYRRYLDWGAMNAKVGSLRRVMDFY

>1AMP- \_

MPPITQQATVTAWLPQVDASQITGTISSLESFTNRFYTTTSGAQASDWIASEWQALSASLPNASV  
KQVSHSGYNQKSVVMTITGSEAPDEWIVIGGHL DSTIGSHTNEQSVAPGADDDASGIAAVTEVIR  
VLSENNFQPKRSIAFMAYAAEEVGLRGSQDLANQYKSEGKNVVSALQLDMTNYKGSAQDVVFITD  
YTDSNFTQYLTQLMDEYLP SLTYGFDT CGYACSDHASWHNAGYPAAMPFESKFNDYNPRIHTTQD  
TLANS DPTGSHAKKFTQLGLAYAIEMGSATG

>1AMX- \_

MRGSHHHHHHSITSGNKSTNVTVHKSEAGTSSVFYYKTGDMLPEDTTHVRWFLNINNEKSYVSK  
DITIKDQIQGGQQLDLSTLNINVTGTHSNYYSGQSAITDFEKAFPGSKITVDNTKNTIDVTIPQG  
YGSYNSFSINYKTKITNEQQKEFVNNSQAWYQEHGKEEVNGKSFNHTVHN

>1AOA- \_

EGICALGGTSELSSEGTQHSYSEEEKYAFVNWINKALENDPCRHVIPMNPNTDDLKAVGDGIV  
LCKMINLSVPDTIDERAINKKKLT PFI IQENLNALNSASAIGCHVVNIGAEDLRAGKPHLVLGL  
LWQIIKIGLFADIELSRNEALAALLRDGETLEELMKLSPEELLRWANFHLENSGWQKINNFSAD  
IKDSKAYFHLLNQIAPKGQKEGEPRIDINMSGFNETDDLKRAESMLQQADKLGCRRQFVTPADVVS  
GNPKLNLA FVANLFN

>1AOL- \_

QVYNI TWEVTNGDRET VWAISGNHPLWTWWPVLTPDL CMLALS GPPHWGLEYQAPYSSPPGPPCC  
SGSSGSSAGCSRDCDEPLTSLTPRCNTAWNRLKLDQVTHKSSEG FYVCPGSHRPREAKSCGGPDS  
FYCASWGCETTGRVYWKPSSSWDYITVDNNLTTSQAVQVCKDNKWCNPLAIQFTNAGKQVTSWTT  
GHYWGLRLYVSGRDPGLTFGIRLRYQNLGPRVP

>1AQP- \_

KETAAAKFERQHMSSTSAASSSNYCNQMMKSRNLTKDRCKPVNTFVHESLADVQAVCSQKNVAC  
KNGQTNQYQSYSTMSITDCRETGSSKYPNCAYKTTQANKHII VACEGNPYVPVHFDASV

>1ARB- \_

GVSGSCNIDVVCPEGDGRDIIRAVGAYS KSGTLACTGSLVNNTANDRKMYFLTAHHCGMGTAST

AASIVVYWNYQNSTCRAPNTPASGANGDGMSQTSQSGSTVKATYATSDFTLLELNNAANPAFNLF  
 WAGWDRRDQNYPGAIAIAHHPNVAEKRISNSTSPTSFWAWGGGAGTTHLNVQWQPSGGVTEPGSSG  
 SPIYSPEKRVLGQLHGGPSSCSATGTNRSDQYGRVFTSWTGGGAAASRLSDWLDPASTGAQFIDG  
 LDSGGGTP

>1ARU- \_

QGPGGGGSVTCTPGGQSTSNQCCVWFVLDLQTNFYQGSKCESPVRKILRIVFHDAIGFSPAL  
 TAAGQFGGGGADGSI IAHSNIELAFPANGGLTDTIEALRAVGINHGVSFGDLIQFATAVGMSNCP  
 GSPRLEFLTGRSNSSQSPPSLIPGPGNTVTAILDRMGDAGFSPDEVVDLLAAHSLASQEGLNSA  
 IFRSPLDSTPQVFDQFYIETLLKGTTPQGPSTLGFAEELSFPFGEFRMRS DALLARDSRTACRWQ  
 SMTSSNEVMGQRYRAAMAKMSVLGFDRNALTDCSDVIPS AVSNNAAPVIPGGLTVDDIEVSCPSE  
 PFPEIATASGPLPSLAPAP

>1ASH- \_

ANKTRELCMKSLAHAKVDTSNEARQDGDIDLYKMHFENYPPLRKYFKSREEYTAEDVQNDPFFAKQ  
 GQKILLACHVLCATYDDRET FNAYTRELLDRHARDHVHMPPEVWTD FWKLFEEYLGKKTTLDEPT  
 KQAWHEIGREFAKEINKHGR

>1AT0- \_

CFTPESTALLESGVRKPLGELSIGDRVLSXTANGQAVYSEVILFXDRNLEQXQNFVQLHTDGGAV  
 LTVTPAHLVSVWQPE SQKLTFFVADRIEKNQVLVRDVETGELRPQRVVKVGSVRSKGVVAPLTR  
 EGTIVVNSVAASCYA

>1AUK- \_

RPPNIVLIFADDLGYGDLGCGHPSSTTPNLDQLAAGGLRFTDFYVPVSLXTPSRAALLTGRLPV  
 RMGMYPGVLPSSRGGLPLEEVTVAEVLAARGYLTMAGKWHLGVGPEGAFLLPPHQGFHRFLGIP  
 YSHDQGPCQNLTCFPATPCDGGCDQGLVPI PLLANLSVEAQPPWLPGLEARYMAFAHDLMADAQ  
 RQDRPFFLYYASHHHTYPQFSGQSFAERSGRGPF GDSLMELDAAVGTLMTAIGDLGLLEETLVIF  
 TADNGPETMRMRSGGCSGILLRCGKGTTYEGGVREPALAFWPGHIAPGVTHELASSLDLLPTLAAL  
 AGAPLPNVTLDGFDLSPLLLGTGKSPRQSLFFYPSYPDEVRGVFAVRTGKYKAHFFTQGSAHSDT  
 TADPACHASSSLTAHEPPLLYDLSKDPGENYNLLGGVAGATPEVLQALKQLQLLKAQLDAAVTFG  
 PSQVARGEDPALQICCHPGCTPRPACCHCPDPHA

>1AV4- \_

MTPSTIQTASPFRLASAGEI SEVQGILRTAGLLGPEKRIAYLGVLDPARGAGSEAEDRRFRVFIH  
 DVSGARPQEVTVSVTNGTVI SAVEDTAATGELPVLEEEFEVVEQLLATDERWLKALAARNLDVS  
 KVRVAPLSAGVF EYAEERGRRI LRGLAFVQDFPEDSAWAHPVDGLVAYVDVVSKEVTRVIDTGVF  
 PVPAEHGNYTDPELTGPLRRTTQKPISITQPEGPSFTVTGGNHIEWEKWSLDVGFVREGVVLHNI  
 AFRDGDRLRPI INRASIAEMVVPYGDPSPIRSWQNYFDTGEYLVGQYANSLELGCDCLGDITYLS  
 PVISDAFGNPREIRNGICMHEEDWGILAKHSDLWSGINYTRRNRRMVISFFTTIGNXDYGFYWYL  
 YLDGTIEFEAKATGVVFTSAFPEGSDNISQLAPGLGAPFHQHIF SARLDMAIDGFTNRVEEDV  
 VRQTMGPGNERGNAFSRKRTVLTRESEAVREADARTGRTWII SNPESKNRLNEPVGYKLHANNQP  
 TLLADPGSSIARRAAFATKDLWVTRYADDERYPTGDFVNQHSGGAGLPSYIAQDRDIDGQDIVVW  
 HTFGLTHFPRVEDWPIMPVDTVGFKLRPEGFFDRSPVLDVPANPSQSGSHCHG

>1AZ9-A

SEISRQEFQRRRQALVEQMOPGSAALIFAAPVTR SADSEYPYRQNSDFWYFTGFNEPEAVLVLII  
 KSDDTHNHSVLFNRVRDLTAEIWFGRRLGQDAAPEKLGVDRALAFSEINQQLYQLLNGLDVVYHA  
 QGEYAYADVIVNSALEKLRKGSRQNLTA PATMIDWRPVVHEMRLFKSPEEIAVLR RAGEITAMAH  
 TRAMEKCRPGMFEYHLEGEIHHEFNHRHGARYPSYNTIVGSGENGCILHYTENEXEMRDGLVLID



AGCEYKGYAGDITRTPVNGKFTQAQREIYDIVLESLETSRLRYRPGTSILEVTGEVVRIMVSGL  
VKLGILKGDVDELIAQNAHRPFFMHGLSHWLGLDVHVDVGVYQDRSRILEPGMVLTVEPGLYIAP  
DAEVEPEQYRGIGIRIEDDIVITETGNENLTASVVKKPEEIEALMVAARKQ

>1B5L-\_\_

CYLSRKLMLDARENKLLDRMNRLSPHSCLODRKDFGLPQEMVEGDQLQKDQAFPVLYEMLQOSF  
NLFYTEHSSAAWDTTLLLEQLCTGLQQQLDHLDTCRGQVMGEEDSELGNMDPIVTVKKYFQGIYDY  
LQEKGYSDCAWEIVRVEMMRALTVSTTLQKRLTKMGGDLNSP

>1B6A-\_\_

MAGVEEVAASGSHLNGDLDPDDREEGAASTAEAAKKRRRKKKSKGPSAAGEQEPDKESGASVD  
EVARQLERSALEDKERDEDEDGDGDGDGATGKKKKKKKKRGPVQTDPPSVPICDLYPNGVFP  
KGQECEYPPTQDGRTAAWRTTSEEKALDQASEEIWNDFREAAEAHRQVRKYVMSWIKPGMTMIE  
ICEKLEDCSRKLIKENGLNAGLAFPTGC SLNCAAHYTPNAGD'TTVLQYDDICKIDFGTHISGRI  
IDCAFTVTFNPKYDTLLKAVKDATNTGIKAGIDVRLCDVGEAIQEVMESEYEVEIDGKTYQVKPI  
RNLNGHSIGQYRIHAGKTVPIVKGGEATRMEEGEVYAIETFGSTGKGVVHDDMECSHYMKNFDVG  
HVPIRLPRTKHLLNVINENFGTLAFCCRRLDRLGESKYLKMLKNCDLGIVDPYPPLCDIKGSYT  
AQFEHTILLRPTCKEVVSRGDDY

>1BA3-\_\_

MEDAKNIKGPAPFYPLEDGTAGEQLHKAMKRYALVPGTIAFTDAHIEVNIITYAEYFEMSVRLAE  
AMKRYGLNTNHRIVVCSENSLQFFMPVLGALFIGVAVAPANDIYNERELLNSMNISQPTVVFVSK  
KGLQKILNVQKLP I IQK I IIMDSKTDYQGFQSMYTFVTSHLPPGFNEYDFVPESEFDRDKTIALI  
MNSSGSTGLPKGVALPHRTACVRFSHARDPIFGNQIIPDTAILSVPFHHGFGMFTTLGYLICGF  
RVVLMYRFEELFLRSLQDYKIQSALLVPTLFSFFAKSTLIDKYDLSNLHEIASGGAPLSKEVGE  
AVAKRFHLPGIRQGYGLTETTSAILITPEGDDKPGAVGVVPPFEAKVVDLDTGKTLGVNQRGEL  
CVRGPMIMSGYVNNPEATNALIDKDGWLHSGDIAYWDEDEHFFIVDRLKSLIKYKYQVAPAELE  
SILLQHPNIFDAGVAGLPDDDAGELPAVVVLEHGKTMTEKEIVDYVASQVTTAKKLRGGVVFVD  
EVPKGLTGKLDARKIREILIKAKKGGKSKL

>1BB9-\_\_

MGSSHHHHHSSGLVPRGSHMATVNGAVEGSTTTGRLDLPPGFMFKVQAQHDYTATDTDELQLKA  
GDVVLVIPFQNPPEEQDEGWLMGVKESDWNQHKELEKCRGVFPENFTEVQ

>1BDO-\_\_

EISGHIVRSPMVGTfYRTfPSPDAKAFIEVGQKVNVDGTL CIVEAMKMMNQIEADKSGTVKAILVE  
SGQPVEFDEPLVIE

>1BEA-\_\_

SAGTSCVPGWAI PHNPLPSCRWYVTSRTCGIGPRLPWPELKRRCRELADIPAYCRCTALSILMD  
GAIPPGPDAQLEGRLEDLPGCPREVQRGFAATLVTEAECNLATISGVAECPWILGGGTMP SK

>1BFD-\_\_

MASVHGTTYELLRRQIDTVFGNPGSNELPFLKDFPEDFRYI LALQEACVVGIADGYAQASRKPA  
FINLHSAAGTGNAMGALSNAWNSHSPLIVTAGQQTRAMIGVEALLTNVDAANLPRPLVKWSYEP A  
SAAEVPHAMSRAIHMASMAPQGPVYLSVPYDDWDKDADPQSHHLFDRHVSSSVRLNDQDL DILVK  
ALNSASNPAIVLGPDVDAANANADCVM LAERLKAPVWVAPSAPRCPFPTRHPCFRGLMPAGIAAI  
SOLLEGHDVVLVIGAPVFRYHQYDPGQYLKPGTRLISVTCDPLEAARAPMGDAIVADIGAMASAL  
ANLVEESSRQLPTAAPEPAKVDQDAGRLHPETVFDTLNDMAPENAIYLN ESTSTTAQMWQR LNMR  
NPGSYFCAAGGLGFALPAAIGVQLAEPERQVIAVIGDGSANYSISALWTA AQYNIPTIFVIMNN  
GTYGALRWFAGVLEAENVPGLDVP GIDFRALAKGYGVQALKADNLEQLKGS LQEALS AKGPVLIE

VSTVSPVK

>1BG6-\_\_

MIESKTYAVLGLNGGGHAFAAAYLALKGQSVLAWDIDAQRRIKEIQDRGAIIEGPGLAGTAHPDLL  
 TSDIGLAVKDADVILIVVPAIHHSIAANIASYISEGQLIILNPGATGGALEFRKILRENGAPEV  
 TIGETSSMLFTRCSERPGQVTVNAIKGAMDFACLPAAKAGWALEQIGSVLPQYVAVENVLHTSLT  
 NVNAVMPHPLPTLLNAARCESGTPFQYYLEGITPSVGS LAEKVDAERIAIAKAFDLNVPSVCEWYK  
 ESYGQSPATIYEAVQGNPAYRGIAGPINLNTRYFFEDVSTGLVPLSELGRAVNVPTPLIDAVLDDL  
 ISSLIDTDFRKEGRTLEKLGLSGLTAAGIRSAVE

>1BGC-\_\_

TPLGPARSLPQSFLKCLEQVRKIQADGAELQERLCAAHKLCHPEELMLLRHSLGIPQAPLSSCS  
 SQSLQLRGCLNQLHGGLFLYQGLLQALAGISPELAPTLDLTLQLDVTDVFATNIWLQMEDLGAAPAV  
 QPTQGAMPTFTSAFQRRAGGVLVASQLHRFLELAYRGLRYLAEP

>1BHE-\_\_

SDSRTVSEPKTPSSCTTLKADSSTATSTIQKALNNCDQKAVRLSAGSTSVFLSGPLSLPSGVSL  
 LIDKGVTLRAVNNAKSFENAPSSCGVVDKNGKGCDAFITAVSTTNSGIYGPGTIDGQGGVKLQDK  
 KVSWWELAADAKVKKLQNTPRLIQINKSKNFTLYNVSLINSPNFHVVFSDGDGFTAWKTTIKTP  
 STARNTDGDIDPMSSKNITIAYSNIATGDDNVAIKAYKGRAETRNI SILHNDFGTGHGMSIGSETM  
 GVVNVTVDDLKMNGTNGLRIKSDKSAAGVVNGVRYSNVVMKNVAKPIVIDTVYEKKEGSNVPDW  
 SDITFKDVTSETKGVVVLNGENAKKPIEVTMKNVKLTS DSTWQIKNVNVKK

>1BHP-\_\_

KSCCKSTLGRNRCYNLCRARGAQKLCANVCRCKLTSGLSCP KDFPK

>1BK0-\_\_

MGSVSKANVPKIDVSPLFGDDQAAKMRVAQQIDAASRDTGFFYAVNHGINVQRLSQKTKEFHMSI  
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 DETKHPGFQDFAEQYYWDVDFGLSSALLKGYALALGKEENFFARHFKPDDTLASVVLIRYPYLDPY  
 PEAAIKTAADGTKLSFEWHEDVSLITVLYQSNVQNLQVETAAGYQDIEADDTGYLINCGSYMAHL  
 TNYYKAPIHRVKWVNAERQSLPFFVNLGYDSVIDPFDPREPNGKSDREPLSYGDY LQNGLVSLI  
 NKNQQT

>1BOB-\_\_

MSANDFKPEWTWTSSANEALRVSIVGENAVQFSPLFTYPIYGDSEKIYGYKDLIIHLAFDSVTFKP  
 YVNVKYSAKLGDDNIVDVEKKLLSFLPKDDVIVRDEAKWVDCFAERKTHNLSDFEKFVSEYSLN  
 GEEFVVYKSSLVDDFARRMHRVQIFSLLFIEAANYIDETDPSWQIYWLLNKKTKELIGFVTTYK  
 YWHYLGAKSFDEDIDKKFRAKISQFLIFPPYQNKGHGSCLYEAI IQSWLEDKSITEITVEDPNEA  
 FDDLDRNDIQRRLRKLGYDAVFQKHS DLSDEFLESSRKS LKLEERQFNRLVEMLLLLLNS

>1BPI-\_\_

RPDFCLEPPYTGPCKARIIRYFYNAKAGLCQTFVYGGCRAKRNNFKSAEDCMRTCGGA

>1BQK-\_\_

ADFEVHMLNKGKDGAMVFEPASLKVAPGDTVTFIPTDKGHNVETIKGMIPDGAEAFKSKINENYK  
 VTFTAPGVYGVKCTPHYGMGMVGVVQVDAPANLEAVKGAKNP KKAQERLDAALALGN

>1BS9-\_\_

SCPAIHVFGARETTASPGYGSSSTVVNGVLSAYPGSTAEAINYPACGGQSSCGGASYSSSVAQGI  
 AAVASAVNSFNSQCPSTKIVLVGYSQGGEIMDVALCGGGDPNQYTNNTAVQLSSSAVNMVKA AIF  
 MGDPMFRAGLSYEVGTCAAGGFQRPAGFSCPSAAKIKSYCDASDPYCCNGSNAATHQGYGSEYG  
 SQALAFVKSKLG

>1BTN- \_

MEGFLNRKHEWEAHNKKASSRSWHNVYCVINNQEMGFYKDAKSAASGIPYHSEVPVSLKEAICEV  
ALDYKKKKHVFKLRLSDGNEYLFQAKDDEEMNTWIOAISSA

>1BV1- \_

GVFNYETETTSVIPAARLFKAFILDGDNLFKVPQAISSVENIEGNGGPGTIKKISFPEGLPFK  
YVKDRVDEV DHTNFKNYSVIEGGPIGDTLEKISNEIKIVATPDGGSILKISNKYHTKGDHEVKA  
EQVKASKEMGETLLRAVESYLLAHS DAYN

>1BX7- \_

TQGN TCGGETCSAAQVCLKGKVCNEVHCRIRCKYGLKKDENGCEYPCSCAKASQ

>1C52- \_

QADGAKIYAQCAGCHQONGQIPGAFPPLAGHVAEILAKEGGREYLILVLLYGLQGQIEVKGMKY  
NGVMSSFAQLKDEEIAAVLNHIATAWGD AKKVKGFKPFTAEEVKKLRAKKLTPQQVLAERKKLGL  
K

>1CA1- \_

WDGKIDGTGTHAMIVTQGVSI LENDLSKNEPESVRKNLEILKENMHQLGSTYPDYDKNAYDLY  
QDHFWDPD TDNNFSKDNSWYLAYSIPDTGESQIRKFSALARYEWQRGNKYQATFYLG EAMHYFGD  
IDTPYHPANVTAVDSAGHVKFETFAEERKEQYKINTV GCKTNEDFYADILKNKDFNAWSKEYARG  
FAKTGKSIYYSHASMSHSDWDYAAKVT LANSQKGTAGYIYRFLHDVSEGN DPSVGNVKELVA  
YI STS GEK DAGTDDYMYFGIKTKDGKTQEWEMDNPGNDFMTGSKDTYTFKLK DENL KIDDIQNMW  
IRKRKYTAFP DAYKPENIKVIANGKVVDKDINEWISGNSTYNIK

>1CEC- \_

MVSFKAGINLGGWISQYQVFSKEHFDTFITEKDIETIAEAGFDHVRLPFDYPIIESDDNVGEYKE  
DGLSYIDRCLEWCKKYNLGLVLDMMHAPGYRFQDFKTSTLFEDPNQQRKFVDIWRFLAKRYINER  
EHIAFELLNEVVEPDSTRWNKLMLECIKAIREIDSTMWLYIGGNNYNSPDELKNLADIDDDYIVY  
NFHFYNPFFFFTHQKAHWSESAMAYNRTVKYPGQYEGIEEFVKNNPKYSFMMELNNLKNKELLRK  
DLKPAIEFREKKCKLYCGEFGVIAIADLESRIKWHEDYISLLEEYDIGGAVWNYKKMDFE IYNE  
DRKPVSQELVNILARRKT

>1CEM- \_

AGVPFNTKYPYGPTS IADNQSEVTAMLKAEWEDWKS KRITSN GAGGYKRVQDASTNYD TVSEGM  
GYGLLLAVCFNEQALFDDLYRYVKSHFNGNGLMHW H I DANNVTSHDGGDGAATDADEDIALALI  
FADKQWSSGAINYQGEARTLINNLYNHCVEHGSYVLKPGDRWGGSSVTNPSYFAPAWYKVYAQY  
TGDTRWNQVADKCYQIVEEVKKYNNGTGLVPDWCTASGTPASGQSYDYKYDATRYGWR TAVDYSW  
FGDQRAKANCMLTKFFARDGAKGIVDGYTIQGSKISNNHNASF IGPVAAASMTGYDLNFAKELY  
RETVAVKDSEYYGYGNSLRLLTLLYITGNFPNPLSDL

>1CFB- \_

IVQDVNPAPKLTGITCQADKAEIHWEQQGDNRSPILHYTIQFNTSFTPASWDAAAYEKPNTDSSF  
VVQMSPWANYTFRVIAFNKIGASPPSAHSDSCTTQPDVPFKNPDNVVGGQTEPNNLV ISWTPMPE  
IEHNAPNFHYVSWKRDI PAAAWENNNIFDWRQNNIV IADQPTFVKYL IKVVA INDRGESNVAAE  
EVLGYSGEDR

>1CHD- \_

LKAGPLLSSEKLI AIGASTGGTEAIRHVLQPLPLSSPAV IITQHMPGFTRSFAERLNKLCQISV  
KEAEDGERVLP GHAYIAPGDKHME LARSGANYQIKI HDGPPVNRHRPSVDVLFH SVAKHAGRNAV  
GVIL TGMGNDGAAGMLAMYQAGAWTIAQNEASCVVFGMPREAINMGGVSEVVDLSQVSSQQMLAKI  
SAGQAIRI

>1CLC- \_

TMITNSRGSVDLQPSLTGVFPSSGLIETKVSAAKITENYQFDSRIRLNSIGFIPNHSSKATIAANC  
 STFVYVKEDGTIVYTGTATSMFDNDTKETVYIADFSSVNEEGTYYLAVPGVGKSVNFKIAMNVYE  
 DAFKTAAMLGMYLLRCGTSVSATYNGIHYSHGPCHTNDAYLDYINGQHTKKDSTKGWHDAGDYNKY  
 VVNAGITVGSMLAWEHFKDQLEPVALEIPEKNNSIPDFLDELKYEIDWILTMQYPDGSGRVAHK  
 VSTRNFGGFIMPENEHDERFFVPWSSAATADFVAMTAMAARIFRPYDPQYAEKCINAARKVSYEFL  
 KNNPANVFANQSGFSTGEYATVSDADDRLWAAAEMWETLGDEEYLRDFENRAAQFSKKIEADFDW  
 DNVANLGMFTYLLSERPGKNPALVQSIKDSLLSTADSIVRTSQNHGYGRTLGTYYWGCNGTVVR  
 QTMILQVANKISPNNDYVNAALDAISHVFGRNYYNRSYVTGLGINPPMNPHDRRSAGDGIWEPWP  
 GYLVGGGWPGPKDWVDIQDSYQTNIEIAINWNAALIYALAGFVNYNSPQNEVLYGDVNDGKVNST  
 DLTLKRYVLKAVSTLPSKAEKNADVNRDGRVNSSDVTILSRYLIRVIEKLP I

>1CNV- \_

DISSTEIAVYWGQREDGLLRDTCKTNNYKIVFISFLDKFGCEIRKPELELEGVCGPSVGNPCSF  
 ESQIKECQRMGVKVFLLALGGPKGTYSACSADYAKDLAEYLHTYFLSERREGPLGKVALDGIHF  
 QKPVDELNWDNLLEELYQIKDVYQSTFLLSAAPGCLSPDEYLDNAIQTRHFDYIFVRFYND  
 RSCQYSTGNIQRIRNAWLSWTKSVYPRDKNLFLELPASQATAPGGGYIPPSALIGQVLPYLPDLQ  
 TRYAGIALWNRQADKETGYSTNIIRYLNATAMPFTSNLLKYPS

>1CPO- \_

XEPGSGIGYPYDNNTLPYVAPGPTDSRAPCPALNALANHGYIPHDGRAISRETLQNAFLNHMGIA  
 NSVIELALTNAFVCEYVTGSDCGDSLNLTLAEPHAFEDHDSFSRKDYKQGVANSNDFIDNRN  
 FDAETFQTSLDVVAGKTHFDYADMNEIRLQRESLSNELDFPGWFTEKPIQNVESGFIFALVSD  
 FNLDPNDENPLVRIDWWKYWFTNESFPYHLGWHPSPAREIEFVTSASSAVLAASVTSTPSSLPSG  
 AIGPGAEAVPLSFASMTMPFLLATNAPYYAQDPTLGPND

>1CPQ- \_

ADTKEVLEAREAYFKSLGGSMKAMTGVAKAFDAEAAKVEAAKLEKILATDVAPLFPAGTSSTDL  
 P GQTEAKAAIWANMDDFGAKGKAMHEAGGAVIAAANAGDGAAFGAALQKLGGTCKACHDDYREED

>1CTJ- \_

EADLALGKAVFDGNCAACHAGGGNNVDPDHTLQKAAIEQFLDGGFNIEAIVYQIENGGAMP  
 PAWDGRLDEDEIAGVAAYVYDQAAGNKW

>1CTT- \_

MHPRFQTAFAQLADNLQSALEPILADKYFPALLTGEQVSSLSKATGLDEDALAFALLPLAACAR  
 TPLSNFNVGAIARGVSGTWYFGANMEFIGATMQQTVHAEQSAISHAWLSGEKALAAITVNYTPCG  
 HCRQFMNELNSGLDLRIHLPGREAHALRDYLPDAFGPKDLEIKTLLMDEQDHGYALTGDALSQA  
 AIAANRSHMPYSKSPSGVALECKDGRIFSGSYAENAAFNPPLPPLQGALILLNLKGYDYPDIQRA  
 VLAEKADAPLIQWDATSATLKALGCHSIDRVLLA

>1CV8- \_

YNEQYVNKLENFKIRETQGNNGWCAGYTMSALLNATYNTNKYHAEAVMRFLHPNLQGGQFQFTGL  
 TPREMIYFGQTQGRSPQLLRMTTYNEVDNLTKNNKGIAILGSRVESRNGMHAGHAMAVVGN  
 AKL NNGQEVII IWNPWDNGFMTQDAKNNVIVPVSNGDHYQWYSSIIYGY

>1CVL- \_

ADTYAATRYPVILVHGLAGTDKFNVDYWYGIQSDLQSHGAKVYVANLSGFQSDDGPNRGEQL  
 LAYVKQVLAATGATKVNLIHGSQGGTSTRYVAAVAPQLVASVTTIGTPHRGSEFADFVQDVLKTD  
 PTGLSSTVIAAFVNVFGTLVSSSHNTDQDALAALRTLTTAQTATYNRNFPSAGLGAPGSCQTGAA  
 TETVGGSQHLLYSWGGTAIQPTSTVLGVTGATDTSTGTLDVANVTDPSLALLATGAVMINRASG

QNDGLVSRCSLFGQVISTSYHWNHLDEINQLLGVRGANAEDPVAVIRTHVNRLKLQGV  
 >1CYO-\_  
 SKAVKYYTLEEIQKHNNKSTWLLIHYKVYDLTKFLEEHPGGEEVLREQAGGDATENFEDVGHST  
 DARELSKTFIIGELHPDDRSKITKPSES  
 >1DDT-\_  
 GADDVVDSSKSFVMENFSSYHGTPGYVDSIQKGIQKPKSGTQGNVDDDWKGFYSTDNKYDAAGY  
 SVDNENPLSGKAGGVVKVTPGLTKVLALKVDNAETIKKELGLSLTEPLMEQVGTTEEFIKRFGDG  
 ASRVVLSLPPFAEGSSSVEYINNWEQAKALSVELEINFETRGRGQDAMYEYMAQACAGNRVRRSV  
 GSSLSCINLDWDVIRDKTKTKIESLKEHGPIKNKMSESPNKTVSEEKAKQYLEEFHQTALEHP  
 SELKTVTGTNPVAFAGANYAAWAVNVAQVIDSETADNLEKTTAALSILPGIGSVMGIADGAVHNT  
 EEIQAQSIALSSLMVAQAIPLVDELVDIGFAAYNFVESIINLFQVVHNSYNRPAYSPGHKTQPF  
 HDGYAVSWNTVEDSIIIRTGFQGESGHDIKITAENTPLPIAGVLLPTIPGKLDVNKSKTHISVNGR  
 KIRMRCRAIDGDVTFCRPKSPVYVGNVHANLHVAFHRSSSEKIHSNEISSDSIGVLGYQKTVDH  
 TKVNSKLSLFFFEIKS  
 >1DFX-\_  
 PKHLEVYKCTHCGNIVEVLHGGGAELVCCGPEMKHMVEGSTDGAMEKHVPVIEKVDGGYLIKVGS  
 VPHPMEEKHWIEWIELLADGRSYTKFLKPGDAPEAFFAIDASKVTAREYCNLHGHWKAEN  
 >1DHN-\_  
 MQDTIFLKGMRFGYGHGALSAENEIGQIFKVDVTLKVDLSEAGRTDNVIDTVHYGEVFEEVKSIM  
 EGKAVNLEHLAERIANRINSQYNRMETKVRITKENPPIPGHYDGVGIEIVRENK  
 >1DHR-\_  
 MAASGEARRVLVYGGRGALGSRVQAFRARNWWWASIDVVENEASASVIVKMTDSFTEQADQVT  
 AEVVKLLGDQKVDAILCVAGGWAGNAKSKSLFKNCDLMWKQSIWTSTISSHLATKHLKEGGLLT  
 LAGAKAALDGTGPMIGYMAKGAHVHQLCQSLAGKNSGMPSGAAAIAVLPVTLDTPMNRKSMPEAD  
 FSSWTPLEFLVETFDWITGNKRPNSGSLIQVVTTDGTTELTPAYF  
 >1DIN-\_  
 MLTEGISIQSYDGHFTFGALVGS PAKAPAPVIVIAQEIFGVNAFMRETVSWLVDQGYAAVCPDLYA  
 RQAPGTALDPQDERQREQAYKLWQAFDMEAGVGDLEAAIRYARHQPYNSGKVGVLVGYXLGGALAF  
 LVAAKGYVDRAVGYGVGLEKQLNKVPEVKHPALFHMGGQDHFVPAPSRQLITEGFGANPLLQVH  
 WYEEAGHSFARTSSSGYVASAAALANERTLDFLAPLQSKKP  
 >1DOI-\_  
 PTVEYLNVEVDDNGWDMYDDDFGEASDMDLDEDEDYGSLEVNEGEYILEAAEAQGYDWPFSRA  
 GACANCAAIVLEGDIDMDMQQILSDEEVEDKNVRLTCIGSPDADEVKIVYNAKHLDYLQNRVI  
 >1DUN-\_  
 MLAYQGTQIKEKRDEDAGFDLCVPYDIMIPVSDTKIIPDVKIQVPPNSFGWVTGKSSMAKQGLL  
 INGGIIDEGYTGEIQVICTNIGKSNIKLIEGQKFAQLIILQHHSNSRQPWDENKISQRGDKGFGS  
 TGVF  
 >1DXY-\_  
 MKIIAYGARVDEIQYFKQWAKDTGNTLEYHTEFLDENTVEWAKGFDGINSLOTTTPYAAGVFEKMH  
 AYGKFLTIRNVGTDNIDMTAMKQYGIKSNVPAVSPAAIAEFALDTLYLLRNMGKVQAQLQAG  
 DYKAGTFIKELGQQTVMGTGHIGQVAIKLFGKFGAKVIAIDPYPMKGDHPDFDYVSLEDLF  
 KQSDVIDLHVPGIEQNTHIINEAAFNLMPGAIIVINTARPNIIDTQAMLSNLKSGKLAGVGIDTY  
 EYETEDLLNLAKHGSFKDPLWDELGMPNVVLSPHIAYYTETAVHNMVYFSLQHLVDFLTKGETS  
 TEVTGPAK

>1EAF- \_

IPPIPPVDFAKYGEIEEVPMTRLMQIGATNLHRSWLNVPHVTFQESADITELEAFRVAQKAVAKK  
AGVKLTVLPLLLKACAYLLKELPDFNSSLAPSGQALIRKKYVHIGFAVDTPDGLLVVIRNVDQK  
SLLQLAAEAAELA EKARSKKLGADAMQGACFTISSLGHIGGTAFTPIVNAPEVAI LGVSKASMQP  
VWDGKAFQPRMLPLSLSYDHRVINGAAAARFTKRLGDL LADIRAILL

>1ECY- \_

AESVQPLEKIAPYPQAEKGMKRQVIQLTPQEDESTLKVELLIGQTLEVDCNLHRLGGKLENKTL  
GWGYDYVFDKVVSPVSTMMACPDGKKEKKFVTAYLGDAGMLRYNSKLPVVYTPDNVDVKYRVW  
KAEEKIDNAVVR

>1EDG- \_

MYDASLIPNLQIPQKNIPNNDGMNFVKGLRLGWNLGNTFDFANGTNTITNELDYETSWSGIKTTKQ  
MIDAIKQKGFNTVRI PVSWHPHVSGSDYKISDVWMNRVQEVVNYCIDNKMYVILNTHHDVVKVG  
YFPSSQYMASSKKYITSVWAQIAARFANYDEHLIFEGMNEPRLVGHANEWWPELTNSDVVDSINC  
INQLNQDFVNTVRATGGKNASRYLMCPGYVASPDGATNDYFRMPNDISGNNNKIIVSVHAYCPWN  
FAGLAMADGGTNAWNINDSKDQSEVTWFMNDIYNKYTSRGI PVIIGECGAVDKNNLKTREYMSY  
YVAQAKARGILCILWDNNNFSGTGELFGFFDRRSCQFKFPEIIDGMVKYAFGLIN

>1ESC- \_

APADPVPTVFFGDSYTANFGIAPVTNQDSERGWCFQAKENYPAVATRSLADKGITLDVQADVSCG  
GALIHFWWEKQELPFGAGELPPQQDALKQDTQLTVGSLGGNTLGFNRILKQCSDELKPSLLPGD  
PVDGDEPAAKCGEFFGTGDGKQWLDDQFERVGAEELELLDRIGYFAPDAKRVLVGYPRLPEDTT  
KCLTAAPGQTQLPFADIPQDALPVLQIQKRLNDAMKAAAADGGADFVDLYAGTGANTACDGADR  
GIGLLEDSQLELLGTKI PWYAHPNDKGRDIQAKQVADKIEEILNR

>1FUA- \_

MERNKLARQIIDTCLMTRLGLNQGTAGNVSVRYQDGM LITPTGIPYEKLTESHIVFIDNGKHE  
EGKLPSSSEWRFHMAAYQSRPDANAVVHNHAVHCTAVSILNRSIPAIHYMIAAAGGNSIPCAYAT  
FGTRELSEHVALALKNRKATLLQHHGLIACEVNLEKALWLAHEVEVLAQLYLTTLAITDPVPVLS  
DEEIAVVLEKFKTYGLRIEE

>1FUS- \_

XSATTCGSTNYSASQVRAANAACQYYQNDDTAGSSTYPHTYNNYEGFDFPVDGPYQEFPIKSGG  
VYTGGSPGADRVVINTNCEYAGAITHTGASGNNFVGCSTN

>1G3P- \_

AETVESCLAKSHTENSFTNVXKDDKTLDRYANYEGCLWNATGVVCTGDETCYGTWVPIGLAIP  
ENEGGGSEGGGSEGGGSEGGGKTPPEYGDTPIPGYTYINPLDGTYPGTEQN PANPNPSLEESQP  
LNTFMFQNNRFRNRQGALTVYTGTVTQGTDPVKTYTYQYTPVSSKAMYDAYWNGKFRDCAFHSGFN  
EDIFVCEYQGQSSDLPQPPVNA

>1GCA- \_

ADTRIGVTIYKYDDNFMSVVRKAIEKDGSAPDVQLLMNDSQNDQSKQNDQIDVLLAKGVKALAI  
NLVDFAAAGTVIEKARGQNPVVFNFKEPSRKALDSYDKAYVGTDSKESGVIQGDLIAKHQWAN  
QGWDLNKDGKIQYVLLKGEHPDAEARTTYVVKELNDKGIQTEQLALDTAMWDTAQAKDKMDAW  
LSGNANKIEVVIANN DAMAMGAVEALKAHNKSSIPVFGVDALPEALALVKS GAMAGTVLNDANN  
QAKATFDLAKNLAEGKGAADGTSWKIENKIVRVPYVGVKDNLSEFTQK

>1GEN- \_

ELYGASPDIDLGTGPTPTLGPVTPEICKQDIVFDGIAQIRGEIFFFKDRFIWRTVTPRDKPMGPL  
LVATFWPELPEKIDAVYEAPQEEKAVFFAGNEYWIYSASTLERGYPKPLTSLGLPPDVQRVDAAF

NWSKNKTYIFAGDKFWRYNEVKKKMDPGFPKLIADAWNAIPDNLDAVVDLQGGGHSYFFKGAYY  
LKLENQSLKSVKFGSIKSDLWLC

>1GOF- \_

ASAPIGSAISRNNWAVTCDSAQSGNECNKAIDGNKDTFWHTFYGANGDPKPPHTYTTIDMKTQNV  
NGLSMLPRQDGNQNGWIGRHEVYLSSDGTNWGSPVASGSWFADSTTKYSNFETRPARYVRLVAIT  
EANGQPWTSIAEINVFQASSYTAPQPGLGRWGPTIDLPIVPAAAAIEPTSGRVLMWSSYRNDAFG  
GSPGGITLTSSWDPSTGIVSDRVTVTVKHDMFCPGISMDGNGQIVVTGGNDAKKTSLYDSSSDSW  
IPGPDQVARGYQSSATMSDGRVFTIGGSWSGGVFEEKNGEVYSPSSKTWTSLPNAKVNPLMTADK  
QGLYRSDNHAWLFGWKKGSVFQAGPSTAMNWYYTSGSGDVKSAGKRQSNRGVAPDAMCGNAVMYD  
AVKGIKILTFGGSPDYQDSDATNAHIITLGEPGTSPNTVVFASNGLYFARTFHTSVVLPDGSTFIT  
GGQRRGIPFEDSTPVFTPEIYVPEQDTFYKQNPNSIVRVYHSISLLLDPGRVFNNGGGGLCGDCTT  
NHFDAQIFTPNYLYNSGNLATRPKITRTSTQSVKVGGRITISTDSSISKASLIRYGTATHTVNT  
DQRRIPLTLTNNGGNSYSFQVPSDSGVALPGYWMLFVMMNSAGVPSVASTIRVTQ

>1GPR- \_

MIAEPLQNEIGEEVFPVSPITGEIHPITDVPDQVFSGKMMGDGFAILPSEGIVVSPVRGKIILNVFP  
TKHAIQLQSDGGREILIHFGIDTVSLKGEFTSFVSEGDVEPGQKLEVDLDAVKPNVPSLMTF  
IVFTNLAEGEETVSIKASGSVNREQEDIVKIEK

>1GSA- \_

MIKLGIVMDPIANINIKKDSFAMLLAQRRGYELHYMEMGDLYLINGEARAHTRTLNVKQNYEE  
WFSFVGEQDLPLADLDVILMRKDPDFDEFIYATYILERAEEKGTILVNKPQSLRDCNEKLFATW  
FSDLTPETLVTRNKAQLKAFWEKHSIILKPLDGMGGASIFRVKEGDPNLGVIAETLTHEGTRYC  
MAQNYLPAIKDGDKRVLVVDGEPVPYCLARIPOGGETRGNLAAGGRGEPRLTESDWKIARQIGP  
TLKEKGLIFVGLDIIGDRLTEINVTSPTECIREIEAEFPVSI TGMLMDAIEARLQQQ

>1GYM- \_

ASSVNELENWSKWMQPIPDSIPLARISIPGTHDSGTFKLQNPVKQVWGMTQEYDFRYQMDHGARI  
FDIRGRLTDDNTIVLHHGPLYLYVTLHEFINEAKQFLKDNPSETIIMSLKKEYEDMKGAE DSFSS  
TFEKKYFVDPIFLKTEGNIKLG DARGKIVLLKRYSGSNEPGGYNNFYWPDNETFTTTVNQANVT  
VQDKYKVSYDEKVKSIKDTMDETMNSEDNLHLYINF TSLSSGGTAWN SPYYASYINPEIANYI  
KQKNPARVGVVIQDYINEKWSPLLYQEVIRANKSLIKE

>1HFC- \_

VLTEGNPRWEQTHLTYRIENYTPDLPRADVDAIEKAFQLWSNVTPFTFTKVSEGQADIMISFVR  
GDHRDNSPFDGPGGNLAHAFQPGPGIGGDAHFD EDERWTNNFREYNLHRVAAHELGHSLGLSHST  
DIGALMYPSTYFSGDVQLAQDDIDGIQAIYGRSQNPVQP

>1HKA- \_

TVAYIAIGSNLASPLEQVNAALKALGDIPESHILTVSSFYRTPPLGPQDQPDYLNAAVALETSLA  
PEELLNHTQRIELQQGRVKAERWGPRTLDDIMLFGNEVINTERLTVPHYDMKNRGFMLWPLFE  
IAPELVFPDGEMLRQILHTRAFDKLNKW

>1HOE- \_

DTTVSEPA PSCVTLYQSWRYSQADNGCAETVTVKVVYEDDTEGLCYAVAPGQITTVGDGYIGSHG  
HARYLARCL

>1HTP- \_

SNVLDGLKYAPSHEWVKHEGSVATIGITDHAQDHLGEVVFVELPEPGVSVTKGKGF GAVESVKAT  
SDVNSPISGEVIEVNTGLTGKPGLINSSPYEDGWMIKIKPTS PDELESLLGAKEYTKFCEEDAA  
H

>1HXN- \_

HRNSTQHGHSTRCDPDLVLSAMVSDNHGATYVFSGSHYWRLDTNRDGHWSWPIAHQWPQGPSTV  
 DAAFSWEDKLYLIQDTKVYVFLTKGGYTLVNGYPKRLEKEKLGSPVVISLEAVDAAAFVCPGSSRLH  
 IMAGRRLWLLDLKSGAQATWTELPWPHEKVDGALCMEKPLGPNSCSTSGPNLYLIHGPNLYCYRH  
 VDKLNAAKNLPQPQRVSRLLGCTH

>1HYP- \_

ALITRPSCPDLISICLNILGGSGLTVDDCCALIGGLGDIEAIVCLCIQLRALGILNLRNLQLILN  
 SCGRSYPSNATCPRT

>1IAE- \_

AAILGDEYLWSSGVIPYTFAGVSGADQSAILSQEQELEEKTCIRFVPRTTESDYVEIFTSGSGCW  
 SYVGRISGAQQVSLQANGCVYHGTIIHELMHAI GFYHEHTRMDRDNYVTINYQNVDPSMTSNFDI  
 DTYSRYVGEDYQYYSIMHYGKYSFSIQWGVLETIVPLQNGIDLTPYDKAHMLQTDANQINNLYT  
 NECSL

>1INP- \_

MSDILQELLRVSEKAANIARACRQOETLFQLLIEEKEKEKKNKFAVDFKTLADVLVQEVIKENM  
 ENKFPGLGKKIFGEESNELTNDLGEKIIMRLGPTEETVALLSKVLNGNKLASEALAKVVHQDVF  
 FSDPALDSVEINIPQDILGIWVDPIDSTYQYIKGSADITPNQGI FPSGLQCVTVLIGVYDIQTGV  
 PLMGVINQPFVSQDLHTRRWKGQCYWGLSYLGTNIHSLPPVSTRSNSEAQSQGTQNPSSSEGSCR  
 FSVVISTSEKETIKGALSHVCGERIFRAAGAGYKSLCVILGLADIYIFSEDTTFKWDSCAAHAIL  
 RAMGGMVLDKECLERNPDTGLDLPQLVYHVGNEGAAGVDQWANKGGLIAYRSEKQLETFLSRL  
 QHLAPVATHT

>1JDW- \_

MLRVRCLRGGSRGAEAVHYIGSRLGRTLGTGWVQRTFQSTQAATASSRNSCAADDKATEPLPKDCP  
 VSSYNEWDPLEEVIVGRAENACVPPFTIEVKANTYKEYWPFYQKQGGHYFPKDHLKKAVAEIEEM  
 CNILKTEGVTVRRPDPIDWSLKYKTPDFESTGLYSAMPRDILIVVGNIEIEAPMAWRSRFFEYRA  
 YRSIIKDYFHRGAKWTTAPKPTMADELYNQDYPIHSVEDRHKLAAQGFVTTTEFEPCFDAADFIR  
 AGRDIFAQRSQVTNYLGIEMRRHLAPDYRVHII SFKDPNPMHIDATFNIIGPGIVLSNPDRPCH  
 QIDLFFKAGWTIITPPTPIIPDDHPLWSSKWL SMNVLMLEKRVMDANEVPIQKMFELGITT  
 IKVNIRNANSLGGGFHCWTCVRRRGTLSYLD

>1JER- \_

MQSTVHIVGDNTGWSVPSSPNFYSQWAAGKTRVGDLSLQFNFPANAHNVHEMETKQSF DACNFVN  
 SDNDVERTSPVIERLDELGMHYFVCTVGTHTCSNGQKLSINVVAANATVSMPPSSSPSSVMPPP  
 VMPPPSPS

>1KLO- \_

CPCPGSSCAIVPKTKEVVCTHCPTGTAGKRCELCDGDFYFGDPLGSNGPVRLCRPCQCNNDIDPN  
 AVGN CNRLTGECLKCIYNTAGFYCDRCKEGFFGNPLAPNPADKCKACACNPYGTVQQSSCNPVT  
 GQCQCLPHVSGRDCGTCDPGYYNLQSGQCER

>1KOE- \_

QPVLHLVALNTPLSGGMRGIRGADFQCFQARAVGLSGTFRAFLSSRLQDLYSIVRRADRGSVPI  
 VNLKDEVLSPSWDSLFGSQQLQPGARIFSFDRDVL RHPAWPQKSVWHGSDPSGRRLMESYCE  
 TWRTEETGATGQASSLLSGRLLEQKAASCHNSYIVLCIENSF

>1KPF- \_

XADEIAKAQVARPGGDTIFGKIIRKEIPAKIIFEDDRCLAFHDISPQAPTHFLVIPKKHISQISV  
 AEDDDDESLLGHLMIVGKKCAADLGLNKGYRMVVNEGSDGGQSVYHVHLHVLGGRQMHWPPG



>1KTE- \_

AQAFVNSKIQPGKVVVFIKPTCPFCRKTQELLSQLPFKEGLLEFVDITATSDTNEIQDYLQQLTG  
ARTVPRVFIGKECIGGCTDLESMHKRGELLTRLQOVGAVK

>1KUH- \_

TVTPTYDPSNAPSFQOEIANAAQIWNSSVRNVQLRAGGNADFSYYEGNDSRGSYAQTDGHGRGYI  
FLDYQQNQYDSTRVTAHETGHVGLGLPDHYQGPCSELMSSGGGPGPSCCTNPYPNAQERSRVNALWA  
NG

>1LBU- \_

DGCYTWSGTLSEGSSEAVRQLQIRVAGYPGTGAQLAIDGQFGPATKAAVQRFQSAAYGLAADGIA  
GPATFNKIYQLQDDCTPVNFTYAELNRCNSDWSGGKVSAAATARANALVTMWKLQAMRHAMGDKP  
ITVNGGFRSVTCNSNVGGASNSRMYGHAADLGAGSQGFCALQAARNHGFTEILGPGYPGHNDH  
THVAGGDGRFWSAPSCGI

>1LCL- \_

MSLLPVPHYTEAASLSTGSTVTIKGRPLVCFLEPYLQVDFHTEMKEESDIVFHFQVCFGRRVVMN  
SREYGAWKQQVESKNMPFQDQGEFELSISVLPDKYQVMVNGQSSYTFDHRIKPEAVKMQVWRDI  
SLTKFNVSYLKR

>1LED- \_

XNTVNFTYPDFWSYSLKNGTEITFLGDATRI PGALQLTKTDANGNPVRSSAGQASYSEPVFLWDS  
TGKAASFYTSFTFLLKNYGAPTADGLAFFLAPVDSSVKDYGGFLGLFRHETAADPSKNQVVAVEF  
DTWINKDWNPPYPHIGIDVNSIVSVATTRWENDDAYGSSIATAHITYDARSKILTLLSYEHGR  
DYILSHVVDLAKVLPQKVRIGFSAGVGYDEVTYILSWHFFSTLDGTNK

>1LIT- \_

QEAQTELPQARISCEPGETNAYRSYCYFFNEDRETWVDADLYCQNMNSGNLVSVLTAEGAFVASL  
IKESGTDDEFNVWIGLHDPKKNRRWHWSGSLVSYKSWGIGAPSSVNPGYCVSLTSSSTGFQKWKDV  
PCEDKFSFVCKFKN

>1LST- \_

ALPQTVRIGTDTTYAPFSSKDAKGEFIGFDIDLGNEMCKRMQVKCTWVASDFDALIPSLKAKKID  
AIISSLSITDKRQOEIAFSDKLYAADSRLIAAKGSPIQPTLESKKGKHVGLVQGSTQEAYANDNW  
RTKGVDVVAYANQDLIYSDLTAGRLDAALQDEVAASEGFLKQPAGKEYAFAGPSVKDKKYFGDGT  
GVGLRKDDTELKAAFDKALTELQDGTYDKMAKKYFDFNVYGDK

>1LTM- \_

EPQHNVMMGGDFANNPNAQQFIDKMNKHGFDQRQQLQEILSQAKRLDSVLRMLDNQAPTTSVKP  
PSGPNGAWLRYRKKFITPDNVQNGVVFVNQYEDALNRAWQVYGPPEIIVGIIGVETRWGRVMGK  
TRILDALATLSFNYPRAEYFSGELETFLMARDEQDDPLNLKGSFAGAMGYGQFMPSSYKQYAV  
DFSGDGHINLWDPVDAIGSVANYFKAHGWVKGDQVAVMANGQAPGLPNGFKTKYSISQLAAAGLT  
PQQPLGNHQQASLLRLDVGTGYQYWYGLPNFYTTITRYNHSTHYAMAVWQLGQAVALARVQ

>1MAT- \_

MAISIKTPEDIEKMRVAGRLAAEVLEMIEPYVKPGVSTGELDRICNDYIVNEQHAVSACLGYHGY  
PKSVCISINEVVCHGIPDDAKLLKGDIVNIDVTVIKDGFGHDTSKMFIVGKPTIMGERLCRITQ  
ESLYLALRMVKPGINLREIGAAIQKFVEAEGFSVVREYCGHGIGRGFHEEPQVLHYDSRETNVVL  
KPGMTFTIEPMVNAGKKEIRTMKDGWTVKTKDRSLSAQYEHTIVVTDNGCEILTLRKDDTI PAII  
SHDE

>1MAZ- \_

MSMAMSQSNRELVDFLSYKLSQKGYSWSQFSDVEENRTEAPEGTESEMETPSAINGNPSWHLAD

SPAVNGATGHSSSLDAREVI PMAAVKQALREAGDEFELRYRRAFSDLTSQLHITPGTAYQSFEQV  
 VNELFRDGVNWGRIVAFFSFGGALCVESVDKEMQVLVSRIAAWMATYLNHLEPWIQENGGWDTF  
 VELYGNNAAESRKGQERLEHHHHHH

>1MBA- \_

XSLSAAEADLAGKSWAPVVFANKNANGLDFLVALFEKFPDSANFFADFKGKSVADIKASPKLRDVS  
 SRIFTRLNEFVNNAANAGKMSAMLSQFAKEHVGFGVGSQAQFENVRSMPFGFVASVAAPPAGADAA  
 WTKLFGLIIDALKAAGA

>1MLA- \_

MTQFAFVFPQGQSQTVMGLADMAASYPIVEETFAEASAALGYDLWALTQQGPAEELNKTWQTQPA  
 LLTASVALYRVWQQQGKAPAMMAGHSLGEYSALVCAGVIDFADAVRLVEMRGKFMQEAVPEGTG  
 AMAAIIGLDDASIAKACEEAAEGQVVSFVNFNSPGQVVIAGHKEAVERAGAACKAAGAKRALPLP  
 VSVPSHCALMKPAADKLAVELAKITFNAPTVPVNNVDVKCETNGDAIRDALVRQLYNPVQWTKS  
 VEYMAAQGVEHLYEVGPGKVLTLGLTKRIVDTLTASALNEPSAMAALEL

>1MOQ- \_

DAGDKGIYRHYMQKEIYEQPNAIKNTLTGRI SHGQVDLSELGPNADELLSKVEHIQILACGTSYN  
 SGMVSRYWFEFLAGIPCDVEIASEFRYRKSAVRRNSLMI TLSQSGETADTLAGLRLSKELGYLGS  
 LAICNVPGSSLVRESLALMTNAGTEIGVASTKAFTTQQLTVLLMLVAKLSRLKGLDASIEHDIVH  
 GLQALPSRIEQMLSQDKRIEALAEDFS DKHHALFLGRGDQYPIALEGALKLKEISYIHA EAYAAG  
 ELKHGPLALIDADMPVIVVAPNNELLEKLKSNIIEVRARGGQLYVFADQDAGFVSSDNMHI IEMP  
 HVEEVIAPIFYTVPLQLLAYHVALIKGTDVDQPRNLAKSVTVE

>1MPP- \_

AEGDGSVDTPGLYDFDLEEYAI PVSIGTPGQDFYLLFDTGSSDTWVPHKGCNSEGCVGKRFFDP  
 SSSSTFKETDYNLNITYGTGGANGIYFRDSITVGGATVKQQT LAYVDNVSGPTAEQSPDSEFLD  
 GIFGAAYPDNTAMEAEYGDYNTVHVNLKQGLISSPVFSVYMNTNDGGGQVVFVGGVNNLLGGD  
 IQYTDVLKSRGGYFFWDAPVTGVKIDGSDAVSFDGAQAFTIDTGTNFFIAPSSFAEKVKAALPD  
 ATESQQGYTVPCSKYQDSKTTFSLVLQKSGSSSDTIDVSVPI SKMLLPVDKSGETCMFIVLPDGG  
 NQFIVGNLFLRFFVNVYDFGKNRIGFAPLASGYEND

>1MSK- \_

KKPRTPPVTLEAARDNDFAFDWQAYTPPVHRLGVQEVEAS IETLRNYIDWTPFFMTWSLAGKYP  
 RILEDEVVGVEAQRFLFKDANDMLDKLSAEKTLNPRGVVGLFPANRVGDDIEIYRDETRTHVINVS  
 HHLRQQTEKTGFANYCLADVFVAPKLSGKADYIGAFAVTGGLEEDALADAFEAQHDDYNKIMVKAL  
 ADRLAEFAEYLHERVRKVYWGYPNENLSNEELIRENYQGIRPAGYPACPEHTEKATI WELLE  
 VEKHTGMKLTESFAMWPGASVSGWYF SHPDSKYAVAQIQRDQVEDYARRKGM SVTEVERWLAPN  
 LGYDAD

>1MUP- \_

CVHAEASSTGRNFNVEKINGEWH TII LASDKREKIEDNGNFRLFLEQIHVLENSLVLFHTVRD  
 EECSELSMVADKTEKAGEYSVTYDGFNTFTI PKTDYDNFLMAHLIN EKDGETFQLMGLYGREPDL  
 SSDIKERFAQLCEEHGILRENI IDLSNANRCLQARE

>1NAR- \_

PKPIFREYIGVKPNSTTLHDFPTEI INTETLEFHYILGFAIESYYESGKGTGTFEESWDVELFGP  
 EKVKNLKRRHPEVKVVISIGGRGVNTPFDPAENNVWSNAKESLKLIIQKYSDDSGNLIDGIDIH  
 YEHIRSDEPFATLMGQLITELKKDDDLNINVVS IAPSENNSSH YQKLYNAKKDYINWVDYQFSNQ  
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>1NEU-\_  
 IVVYTDREVIYGAVGSQVTLHCSEWVSSDDISFTWRYQPEGGRDAISIFHYAKGQPYIDEVGT  
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>1NFP-\_  
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>1NIF-\_  
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 VVVYHCAPEGMVPWHVTSGMNGAIMVLPDGLKDEKGOPLTYDKIYYVGEQDFYVPKDEAGNYKK  
 YETPGEAYEDAVKAMRTLTPTHIVFNGAVGALTGDHALTAAVGERVLVVHSQANRDTRPHLIGGH  
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>1NKR-\_  
 MHEGVHRKPSLLAHPGPLVKSEETVILQCWSDVMFEHFLHREGMFNDTLRLIGEHHDGVSKANF  
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 LLVSVT

>1NLS-\_  
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 NQFSKDQKDLILQGDATTGTDGNLELTRVSSNGSPQSSVGRALFYAPVHIWESSAVVASFEATF  
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>1NNC-\_  
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 PVTEINTWARNILRTQESECCHNGVCPVVF TDGSATGPAETRIYYFKEGKILKWEPLAGTAKHI  
 EECSCYGERAEITCTCRDNWQGSNRPVIRIDPVAMTHTSQYICSPVLTDNPRPNDPTVGKCNDPY  
 PGNNNNGVKGFSYLDGVNTWLGRTISIASRSGYEMLKVPNALTDKSKPTQGQTIVLNTDWSGYS  
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>1NPK-\_  
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 GLVSFITSGPVVAMVFEGKGVVASARLMIGVTNPLASAPGSIRGDFGVDVGRNI IHGSDSVESAN  
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>1OBR-\_  
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 NRQPNSSGSSYVGTDLNRNYGYKWGCCGSSGSPSETYRGRSAFSA PETAAMRDFINSRVVGGKQ  
 QIKTLITFHTYSELILYPYGYTYTDVPSDMTQDDFNVFKTMANTMAQTNGYTPQQASDLYITDGD  
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 K

>1OPS-\_

SQSVVATQLIPMNTALTPAMMEGKVTNPIGIPFAEMSQLVGKQVNTPVAKGQTLMPNMVKTYAA  
 >1OPY-\_  
 MNLPTAQEVQGLMARYIELVDVGDIEAIVQMYADDATVEDPFGQPPIHGREQIAAFYRQGLGGGK  
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 Q  
 >1OSA-\_  
 AEQLTEEQIAEFKEAFALFDKDGDTITTKELGTVMRSLGQNPTAEELQDMINEVDADGNGTIDF  
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 >1PDO-\_  
 TIAIVIGTHGWAAEQLLKTAEMLLGEQENVGWIDFVPGENAETLIEKYNAQLAKLDTTKGVLFV  
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 KPFAG  
 >1PEA-\_  
 MGSHQERPLIGLLFSETGVTADIERSQRYGALLAVEQLNREGGVGGRPIETLSQDPGGDPDRYRL  
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 LAAYLIRHYGERVVFI GSDYIYPRESNHVMRHLRQHGGTVLEEIYIPLYPSDDDLQRAVERIYQ  
 ARADVVFSTVVGTTAELYRAIARRYGDGRPPIASLTTSEAEVAKMESDVAEGQVVVAPYFSSI  
 DTPASRAFVQACHGFFPENATITAWAEAAWQTL LLGRAAQAGNWRVEDVQRHLYDIDIDAPQG  
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 >1PGS-\_  
 APADNTVNIKTFDKVKNAFGDGLSQAEGTFTFPADVTTVKT IKMFIKNECPNKTCDEWDRYANV  
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 FDIVYGTDPDYKSAVVPVIQYNKSSIDGVPYGAHTLGLKKNIQLPNTTEKAYLRTTISGWGHAK  
 PYDAGSRGCAEWCFRTHHTIAINNANTFQHQLGALGCSANPINNQSPGNWTPDRAGWCPGMAVPTR  
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 >1PHD-\_  
 TTETIQSNANLAPLPPHVPEHLVDFDFMYNPSNLSAGVQEAWAVLQESNVPDLVWTRCNGGHWIA  
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 IQELACSLIESLRPQGQCNTEDYAEFPPIRIFMLLAGLPEEDI PHLKYLTDQMTRPDGSM TFAE  
 AKEALYDYLIPIIEQRQKPGTDAISIVANGQVNGRPITSDEAKRMCGLLLVGGLDTVVNFLSFS  
 MEFLAKSPEHRQELIERPERIPAACEELLRRFSLVADGRILTS DYEFGHVQLKKGDQILLPQMLS  
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 >1PHM-\_  
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 DISAFRDNHKDCSGVSVHLTRVPQPLIAGMYLMMSVDTVIPPGEKVVNADISQYKMPMHVFAY  
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 >1PHR-\_  
 AEQVTKSVL FVCLGNICRSPIAEAVFRKLVTDQNI SDNWVIDSGAVSDWNVGRSPDPRAVSCLRN  
 HGINTAHKARQVTKEDFVTFDYILCMDES NLRDLNRKSNQVKNCRAKIELLSYDPQKQLI IEDP  
 YGNDADFETVYQQCVRCCRAFLEKVR

>1PHT- \_

MSAEGYQYRALYDYKKEREEDIDLHLGDILT VNKGS LVALGFSDGQEARPEEIGWLN GYNETTGE  
RGDFPGTYVEYIGRKKISPP

>1PMI- \_

SSEKLFRIQCGYQNYDWGKIGSSSAVAQFVHNSDPSITIDETKPYAELWMGTHPSVPSKAIDLNN  
QTLRDLVTAKPQEYLGESIITKFGSSKELPFLFKVLSIEKVLSIQAHDPKKLGAQLHAADPKNYP  
DDNHKPEMAIAVTD FEGFCGFKPLDQLAKTLATVP E LNEIIGQELVDEFISGIKLP AEVGSQDDV  
NNRKLQKVF G KLMNTDDDVIKQQTAKLLERTDREPQVFKDIDSRLPELIQRLNKQFPNDIGLFC  
GCLLLNHVGLNKGEAMFLQAKDPHAYISGDIIECMAASDNVVRAGFTP KF KDVKNLVEMLTYSYE  
SVEKQKMPLQEFPRSKGDAVKS VLYDPPIAEFSVLQTI FDKSKGGKQVIEGLNGPSIVIATNGKG  
TIQITGDDSTKQKIDTGYVFFVAPGSSIELTADSANQDQDFTTYRAFVEA

>1PNE- \_

XAGWNAYIDNLMADGTCQDAAIVGYKDSPSVWAAVPGKTFVNITPAEVGILV GKDRSSFFVNGLT  
LGGQKCSVIRDSLLQDGEFTMDLRKSTGGAPT FNITVTMTAKTLVLLMGKEGVHGGMINKKCYE  
MASHLRRSQY

>1POA- \_

NLYQFKNMIQCTVPSRSW WDFADYGCYCGRGGSGTPVDDLD RCCQVHDNCYNEAEKISGCWPYFK  
TYSYEC SQGTLTCKGGNACAAAVCD CDRLAAICFAGAPYNDNDYNINLKARC

>1POC- \_

I IYPGTLWCGHGNKSSGPNELGRFKHTDACCRT HDMCPDVMSAGESKHGLTNTASHTRLSCDCDD  
KFYDCLKNSADTISSYFVGKMYFNLIDTKCYKLEHPVTGCGERTEGRCLHYTVDKSKPKVYQWFD  
LRKY

>1PRN- \_

EISLNGYGRFGLQYVEDRGVGL EDTIISSRLRINIVGTETDQGVTFGAKLRMQWDDGDAFAGTA  
GNAAQFWTSYNGVTVSVGNVDTA FDSVALTYDSEMGYEASSFGDAQSSFFAYNSKYDASGALDNY  
NGIAVTY SISGNLYLSYVDPDQTV DSSLVTEEFGIAADWSNDMISLAAAYTTDAGGIVDNDIAF  
VGAAAYKFN DAGTVGLN WYDNGLSTAGDQVTLYGNYAFGATTVRAYVSDIDRAGADTAYGIGADYQ  
FAEGVKVSGSVQSGFANETVADVGVRFDF

>1PTF- \_

MEKKEFHIVAETGIHARPATLLVQTASKFNSDINLEYK G KSVNLKSIMGVMSLGVGQGS DVTITV  
DGADEAEGMAAIVETLQKEGLAE

>1PUC- \_

SKSGVPRLLTASERERLEPFIDQIHYS PRYADDEYEYRHVMLPKAMLKAIPTDYFNPETGTLRIL  
QEEEWRLGITQSLGWEMYEVHVPEPHILLFKREKDYQMK

>1RB9- \_

XMKKYVCTVCGYEYDPAEGDPDNGVKPGTSFDDL PADWVCPVCGAPKSEFEAA

>1REC- \_

GNSKSGALSKEILEELQLNTKFTEEELSSWYQSFLKECPSGRITRQEFQTIYSKFFPEADPKAYA  
QHVF R SFDANS DGTLD FKEYVIALHMTSAGKT NQKLEWAFSLYDVDGNGTISKNEVLEIVTAIFK  
MISPEDTKHLPEDENTPEKRAEKI WGF FGKDDDKLTEKEFIEGTLANKEILRLIQFEPQVKVEK  
LKEKKL

>1RFS- \_

FVPPGGGAGTGGTIAKDALGNDVIAAEWLKTHAPGDRTLTQGLKGDPTYLVVESDKTLATFGINA  
VCTHLGCVVPFNAENKFCPC HGSQYNNQGRVVRGPAPLSLALAHCDVDDGKVVFVPWTE TDFR

TGEAPWWSA

>1RH4- \_

XAALAQQXKKEIAYLLAKXKAEILAALKKXKQEIAX

>1RIE- \_

VLAMSKIEIKLSDIPEGKNMAFKWRGKPLFVRHRTKKEIDQEAAVEVSQLRDPQHDLERVKKPEW  
VILIGVCTHLGCVPIANAGDFGGYYCPCCHGSHYDASGRIRKGPAPLNLEVPSYEFTSDDMVIVG

>1RKD- \_

MQNAGSLVVLGSINADHILNLQSFPTPGETVTGNHYQVAFGGKGANQAVAAGRSGANIAFIACCTG  
DDSIGESVRQQLATDNIDITPVSVIKGESTGVALIFVNGEGENVIGIHAGANAALSPALVEAORE  
RIANASALLMQLESPLSVMAAAKIAHQNKTI VALNPAPARELPDELLALVDIITPNETEAEKLT  
GIRVENDEDAKAAQVLHEKGIRTVLITLGSRGVWASVNGEGQRPVPGFRVQAVDTIAAGDTFNGA  
LITALLEEKPLPEAIRFAHAAAAIAVTRKGAQPSVPWREEIDAFLDRQR

>1RMG- \_

QLSGSVGPLTSASTKGATKTCNILSYGAVADNSTDVGPAITSAWAACKSGGLVYIPSGNYALNTW  
VTLTGGSATAIQLDGI IYRTGTASGNMIAVTDTTDFELFSSTSKGAVQGGFYVYHAEGTYGARIL  
RLTDVTHFSVHDIILVDAPAFHFTMDTCSDEYVNMAIRGGNEGGLDGDVWGSNIWVHDVEVTN  
KDECVTVKSPANNILVESIYCNWSSGCGAMGSLGADTDVTDIVYRNVYTWSNQMYSIKSNGGSGT  
VSNVLLNFIGHGNAYSLDIDGYWSSMTAVAGDGVQLNNITVKNWKGTEANGATRPPIRVVCSDT  
APCTDLTLEDIAIWTEGSSSELYLCRSAYGSGYCLKDSSSHSTSYTTTSTVTAAPSGYSATTMAAD  
LATAFGLTASIP IPT IPTSFYPGLTPYSALAG

>1RSY- \_

GGGILDSMVEKLGKQLQYSLDYDFQNNQLLVGIIQAAELPALDMGGTSDPYVKVFLLPDKKKKFET  
KVHRKTLNPFVNEQFTFKVPYSELGGKTLVMAVYDFDRFSKHDIIGEFKVPMTVDFGHVTEEWR  
DLQSA

>1RZL- \_

ITCGQVNSAVGPCLTYARGGAGPSAACCSSVRSKAAAATTADRRTACNCLKNAARGIKGLNAGN  
AASIPSKCGVSVPYTISASIDCSRVS

>1SBP- \_

KDIQLLNVSYDPTRELYEQYNKAFSAHWKQETGDNVVIDQSHGGSGKQATSVINGIEADTVTLAL  
AYDVNAIAERGRIDKNWIKRLPDDSAPTYTSTIVFLVRKGNPKQIHDWNDLIKPGVSVITPNPKSS  
GGARWNYLAAWGYALHHNNNDQAKAEDFVKALFKNVEVLDSGARGSTNTFVERGIGDVLIAWENE  
ALLATNELGKDKFEIVTPSESI LAEPTVSVVDKVVKKDTKAVAEAYLKLYLSPGQEI AAKNFY  
RPRDADVAKKYDDAFPKLKLFTIDEVFGGWAKAQKDHFA DGGTFDQISKR

>1SEK- \_

MAGETDLQKILRESNDQFTAQMFSEVVKANPGQNVVLSAFSVLPPLGQLALASVGESHDLLRAL  
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VEAAGAINKWVEDQTNRIKNLVDPDALDETTTRSVLVNAIYFKGSWKDFNKERTMDRDFHVSKD  
KTIKVPTMIGKKDVRVYADVPELDAKMIEMSYEGDQASMI IILPNQVDGITALEQKLDKPKALSRA  
EERLYNTEVEIYLPKFKIETTTDLKEVLSNMNIKKLFTPGAARLENLLKTKESLYVDAAIQKAFI  
EVNEEGAEAAAANAFKITTSFHFVPKVEINKPFFFSLKYNRNSMFSGVVCVQP

>1SFP- \_

MDWLPRNTNCGGILKEESGVIATYYGPKTNCVWTIQMPPEYHVRVSIQYLQLNCNKESLEIIDGL  
PGSPVLGKICEGSLMDYRSSGSIMTVKYIREPEHPASFYEVLYFQDPQA

>1SMD- \_

XYSSNTQQGRTSIVHLFEWRWVDIALECERYLAPKGFGGVQVSPPNENVAIHNPFRPWWERYQPV  
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>1SRA- \_

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>1SVY- \_

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 AAEVARAIDAERKGLPKVEVFXETDSDI PAEFWKLLGGKGAIAAKHETA

>1TCA- \_

LPSSGSDPAFSQPKSVLDAGLTCQGASPSVSKPILLVPGTGTTPQSFDNSWIPLSTQLGYTPCW  
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 FAPDYKGTVLAGPLDALAVSAPSVWQQTTSALTTALRNAGGLTQIVPTTNLYSATDEIVQPQVS  
 NSPLDSSYLFNGKNVQAQAVCGPLFVIDHAGSLTSQFSYVVGSRALRSTTGQARSADYGITDCNP  
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>1TDE- \_

GTTKHSKLLILGSGPAGYTAAVYAARANLQPVLTITGMEKGGQLTTTTEVENWPGDPNDLTGPLLM  
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 GVSACATCDGFFYRNQKVAVIGGGNTAVEEALYLSNIASEVHLIHRRDGFRAEKIILIKRLMDKVE  
 NGNII LHTNRTLEEVTGDQMGVTGVRLRDTQNSDNIESLDVAGLFVAIGHSPNTAIFEGQLELEN  
 GYIKVQSGIHGNATQTSIPGVFAAGDVMDDHIYRQAITSAGTGCMAALDAERYLDGL

>1TFE- \_

AREGIIGHYIHHNQRVGVLEVELNCETDFVARNELFQNLAKDLAMHIAMNPRYVSAEEI PAEELE  
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 VVRRFCRFELGAMMC

>1TMY- \_

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>1TON- \_

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>1TUL- \_

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>1UOK- \_

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>1USH- \_

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>1UTG- \_

GICPRFAHVIENLLLGTSSYETSLKEFEPDDTMKDAGMQMCKVLDLSPQTTRENIMKLTKEIKV  
 SPLCM

>1VLS- \_

MNQQGFVISNELRQQQSELTSTWDLMLQTRINLSRSAARMMMDASNQQSSAKTDLLQNAKTTLAQ  
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 LGNYARVSENLYRQT



**Supplementary S3. The benchmark dataset  $\mathcal{S}$  contains 1075 protein sequences, which are classified into subset  $\mathcal{S}^+$  with 525 DNA-binding proteins (positive samples) and subset  $\mathcal{S}^-$  with 550 non DNA-binding proteins (negative samples).**

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(1).525 DNA-binding proteins

>1AKHA

KKEKSPK GKSSISPQARAFLEEVFRRKQSLNSKEKEEVAKKCGITPLQVRVWFINKRMRSK

>1AOII

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>1B6WA

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>1C1KA

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>1C6VD

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>1D8BA

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>1DMLG

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AFPGFFRGLKESARPLKALLLDQRLAAGVGNIYADEALFRARLSPFRPARSLTEEEARRLYRALR  
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>1E1JA

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>1F1EA

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>1F2RI

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>1F6VA

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>1HCRA

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>1HKQA

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>1HLVA

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>1HQ3H

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>1IUFA

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>1IXCB

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>1JE5B

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>1JEQB

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I AAYKSILQERVKKTWTVVDAKTLKKEDIQKETVYCLNDDDETEVLKEDI IQGFRYGS DIVPFSK  
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>1KIXA

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>1MP9B

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>3RFYA

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KTPFYGSTLEELGLYKAQVVI PFNAFGTMAMAREEFENDSGSSQVFWLLKESELTPSNSNILDGR  
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>2YFKA

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>2LBTA

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NHHHHHH

>3AXDA

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>2YEVB

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VEGFDFGALPKF

>2YEVA

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WLVIVTIFYVW

>3RBUA

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>2YDQA

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>3R6TA

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>3R3JA

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>3R18A

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>3QVSA

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>3QSYA

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>3QMXA

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>3QLIA

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 IHTEVLNPGVLVDLIRRGVVTNQRKTLDRGRSVFTFAMGQQEMYEYLNDHPAIFSRPV D YVNDPHI  
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>2L97A

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>3QKGA

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>3QJJA

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>2Y6YA

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>2L8LA

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>3QDDA

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MIGQFGVGFYSAYLVAEKVTVITKHNDDEQYAWESSAGGSFTVVRTDTGEPMGRGTKVILHLKEDQ  
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>3QBDA

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SIVHLPTTLLGMVDAAVGGKTGIN TDAGKNLVGAFHQPLAVLVDL ATLQTLPRDEMICGMAEVVK  
AGFIADPVILDIEADPQAALDPAGDVLPELIRRAITVKA EVVADEKESELREILNYGHTLGHA  
IERRERYRWRHGA AVSVGLVFAAE LARLAGRLDDATAQRHRTILSSLGLPVSYDPDALPQLLEIM  
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>3QB4A

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>2L8BA

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EKLSLKETLTL LDGAARHNVQVLITDSGQRTGTGSALMAMKDAGVNTYRWQGGEQRPAT

**Supplementary S4. The seven physicochemical properties used in pseudo amino acid composition. See the text of the paper for more information.**

ID <sup>a</sup>	NOZY7 10101	HOPT81 0101	TSAJ99 0101	CHOC76 0101	PRAM82 0101	GEIM80 0101	FINA77 0101
A	0.5	-0.5	89.3	115	0.305	1.29	1.08
R	0	3	190.3	225	0.227	1	1.05
N	0	0.2	122.4	160	0.322	0.81	0.85
D	0	3	114.4	150	0.335	1.1	0.85
C	0	-1	102.5	135	0.339	0.79	0.95
Q	0	0.2	146.9	180	0.306	1.07	0.95
E	0	3	138.8	190	0.282	1.49	1.15
G	0	0	63.8	75	0.352	0.63	0.55
H	0.5	-0.5	157.5	195	0.215	1.33	1
I	1.8	-1.8	163	175	0.278	1.05	1.05
L	1.8	-1.8	163.1	170	0.262	1.31	1.25
K	0	3	165.1	200	0.391	1.33	1.15
M	1.3	-1.3	165.8	185	0.28	1.54	1.15
F	2.5	-2.5	190.8	210	0.195	1.13	1.1
P	0	0	121.6	145	0.346	0.63	0.71
S	0	0.3	94.2	115	0.326	0.78	0.75
T	0.4	-0.4	119.6	140	0.251	0.77	0.75
W	3.4	-3.4	226.4	255	0.291	1.18	1.1
Y	2.3	-2.3	194.6	230	0.293	0.71	1.1
V	1.5	-1.5	138.2	155	0.291	0.81	0.95

<sup>a</sup>ID represents the ID of the physicochemical property in the AAindex database.