

Supplementary Figure 1: QMEAN Z-score and MetaMQAPII-predicted RMSD for experimental and theoretical models. A. X-axis: predicted RMSD; Y-axis: QMEAN Z-score. R^2=0.1418..

		10	20	. 30	40		60	. /0	80	90
4758556lhPrp 3/535-613	ED-IS-QGV	HISVYRV	- RNLS -	NPAKKFKIE	ANAGQLYLT	GVVV	LHK-DVNVV	VVEGGPKAQKK	FKRLMLHR	KWDEQTSNTKG
1482268311Xen/28/533-60	9 6 0 . 1 5 . 0 6 1	HVSVY	. RNIS.	NESKKEKLE	ANANOLYLT	6 VVV	LHK. DVNVV	VVEGGEKSOKK	EKREMISRI	KWDEOTTNSKG
4529799910apm/555 622	ED IS HOW	HIAVYBI	BNIL	NBAKKEKVE	ANANOLYLT	TVV	LHK DVNIV	VERGERKAGKK	EVELMETRI	KIDEBNEKBDE
45367633[Dame/555-633	ED.LS.HOV	HIAVIRI	- KNLH-	NFARRENVE	ANANGLILI		LHK-DVNIV	VOROOFRAGER	REWLIN	REDEFNSERDE
24667063[Drome1/455-534	ED-IS-CGV	HVSVYRI	- RDLQD	NQSKKEKVE	INAKQLQMI	SVV	LFR-DCCVV	VVEGGPKQQKK	TRREMEIRI	KWEEDNAKGND
17554268 Caeele/471-549	ED.TS.TAV	NVSVYRV	· KSLA ·	HPSKKFKVE	TNAKQLQMS	GAIM	MHK · AQNVI	VVE <mark>G</mark> GPKQQKF	YKNLMINRI	KWSDEITGQKK
221115483 Hydmag/516-59	94ED - LS - TGV	'HTS <mark>LY</mark> KL	- L N I S -	NPAKKFKVD	TNAQQLYLT	GCVI	ITK-GMALV	I TE <mark>G</mark> GPKSQKK	FKKLMLSRI	KWEEDSAQGMR
115903728 Strpur/426-504	ED . TS . TGV	TVNVYRV	- L N L N -	NPAKRFKVE	ANAKQLQMT	GIAV	VHK - DMNCV	V V E <mark>G</mark> G P K Q Q K K	FQRLMLHRI	KWGEDKRSKHD
198412413 Cioint/422-500	ED . TS . DVV	HVTMYRI	- R N L R -	DPSKKFKVE	MNSKQLYLT	GCTI	LHP - DINIV	VVE <mark>G</mark> GPKSQRK	FRRLMMSRI	KWEEDKKGNEE
167520844 Monbre/284-36	2DS · TA · DGV	AASLFLV	• SSMK •	SEKNKFKVE	TNAKQYNMT	GAAI	MTP - TNNIV	IVE <mark>G</mark> GPRNMRK	YKRLMTHRI	NWNDKVANSAA
66821609 Dicdis/417-495	ID - AK - QEL	YCSLYKV	· VDLS ·	HPLYRSIIG	RNSKENLAT	GCII	FHP - SCNLI	AFEGGLKIQKK	FKKLLLNRI	DWDNPPPIKQS
19115472 Schpo/392-470	ED - SA - AGL	RCLVFRI	· KYLA ·	HRPHRLKID	LNAKQWGAT	GVCI	LNA-NENLV	IFEAGQKAIKK		DWTDTSRNSII
145240345 Aspni/381-459	AD - AE - KG I	QMTVYRI	. DSLA.	NGRNRFKIS	KNAEQNALT	GVCV		IVEGGSHSINN		DWTENAGPNAV
58265580lCrvneo/407-485	AR . FR . NG I	RGAVEKI	. KYL T .	NGRHKEKVR	ETAKADLLS	GICI	FHP - SFALV	MVEGVEKSIKH	EKREMLSRI	DWTEGARPMAD
63206811Saccer/331-411	VE.KP.TVY	HCKVEOF	KNLO.	NPKIREKIK	MNSKELSLK	al ci	IRDDGPGIL	LVVGNEKSCKE	YENLVMKRI	KWNEDFELHTN
451903731Emmao/290-256	AP. DP. GOD	LCRVVSI	PPLA	DEKARYKLV	TNAPOLULP	CCL	HVPDGPALV	VALGPREACTE	VDRI I TRRI	AWHASAR
15217915LApth/645.724	DDPTT.VET	IVEVYKI	KKI S.	UPVTPEVVE	MNAPENDIT	CSV	MTD. EMSVV	VVERVSVALVR	VAKLMMKRI	NWEEAEBKEGN
1454794500 man/0404724	COPNT LET	IVOVYBI	BDLS	HPOTREKVE	VNAOENBLT		LAD CLEWN	VVEGAVVELVE		DWAAAVDDDDD
115478156[Ofysat/326-405	AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	VOOVTRI	. RDLS.	REQ IREKVD	NAGENELI	CAAV	TAD- GISVV	VVEOGRASTRA	TNKLMLNKI	DWAAAVDDDDDD
159477299[Chih/308-388	AAAAAGVDL	VUSVYRV	- GRLI-	DPUHRFKVD	ANARENHMI	GIVIII	VSD-DFSLV	VVEGVDKATER	TEREMMERI	DURDANGDAAM
118400295 / letthe/6/4-/62	RD-SA-TEC	RVALFRI	- ENLQ -	DRVHKEKVD	INAQQMQLH	GALI	TIN-MPATV	LVEGGPKATKF	YKKLMLRRI	KWNKNSYLPKD
124512930 Plafal/545-623	SN · SD · EEN		• TNLS •	NKKHIFKID	INAQQLHLT	GVCF	MTV·LYNFI	IVEGKHVSIER	YKRLIFRRI	KWNEDVYDDEE
156084512 Babbov/395-47	4VG - KN - EE I	EAALFTL	- R S L T -	NPKLLFKVD	VNAQQFHLT	GCCI	VARHAQSIV	VIE <mark>G</mark> SKLSVKR	Y I KLLMRRI	KWEEAETTTDE
67624083 Cryhom/327-403	LDQNN-PIV	HAAIFKI	• GSLK•	NKRYIFKID	RNAHDCHLT	GCCV	ISSIDPCII	LVEGSKKSIKF	YKNLLLNRI	KWDQPI
123431166 Trivag/406-486	ED - AD - KNT	IDL <mark>CY</mark> SV	- KSLN-	HPLHLSTIL	KMGQKLFLS	GIF	KYP · ERYFV	VAECGEKGFRK	FKSLMENRI	NWNLEHESIPK
183231013 Enthis/38-107	1 I - ES - QG I	FMVGFKF	- T S I	DEKMINK <mark>c</mark> r	HKSKELFMK	GVIL	YTD - YKGLI	IVEGTQKSIIK	FERMITKEN	QK
157878877 Leimaj/442-521	RH - AT - EAP	LLRAYRV	- F P I F -	SAAHLGKLR	NFANDNLLR	GFVL	YVGDCDAVI	VLAGGEVAARH	LDRWIMHKN	DWEHPDTRAVR
71744418 Trybru/374-453	RH - SE - ERP	VFRAYHI	· YPIY-	SSAHLGKLR	NFANDGLLR	GFVL	WICRCHAIL	VLTGGEVAVRH	LERWILEKN	KWESSETKAVR
motif	5									W dddddd
inetpred hPrp3										-
,		'					,			
		<b>4</b> 5 ,	55	65	, 75		85	103	113	, 123
4758556 hPrp 3/614-683	DDDEESDEE	њ кктикс	55 VLVWE <mark>G</mark>	65 	75 	PTEN	85 Imareh <mark>f</mark> kki	103 IGAEH <mark>YW</mark> DLAL	113 • • • • SES	123 VLESTD
4758556 hPrp3/614-683 148226831 Xenlae/610-679	DDDEESDEE KDNDESDEE	15 - ККТЙКС - РКАЙКС	55 VLVWE TLVWE	65 - TAKDRS - TTKERS	75 	PTEN	85 Imarehfkki Imarehfkki	103 HGAEH <mark>YW</mark> DLAL LGAEH <mark>YW</mark> DLAL	113 SES SQS	123 VLESTD VLETAD
4758556 hPrp3/614-683 148226831 Xenlae/610-679 45387899 Danre/634-700	DDDEESDEE KDNDESDEE HPDADES	ЧБ ККТŃКС РКАNRС RRNNRС	55 VLVWEG TLVWEG SLVWEG	65 • TAKDRS • TTKERS • TSKERN	75 6 EM - KF KQC 6 GDM - KF KQC 7 G EV - KF KQC	PTEN	85 IMAREHFKK IMAREHFKK IMAREHFKK	103 IGAEH <mark>YW</mark> DLAL GAEH <mark>YW</mark> DLAL IGTEH <mark>YW</mark> DLAL	113 SES SQS SQS	123 VLESTD VLETAD VLETTDD
4758556 hPrp3/614-683 148226831 XenIae/610-675 45387899 Danre/634-700 24667063 Dromel/535-598	DDDEESDEE KDNDESDEE HPDADES GQDV	РБ ККТŃКС РКАNRС RRNNRС PNSC	55 VLVWEG TLVWEG SLVWEG	65 - TAKDRS - TTKERS - TSKERN - TSQRRH	75 6 EM - KFKQC 6 DM - KFKQC 7 GEV - KFKQC 6 EI - KFKIF	PTEN PTEN PTEN PMEK	85 IMAREHFKK IMAREHFKK IMAREHFKK MAREFFQK	103 IGAEH <mark>YW</mark> DLAL GAEH <mark>YW</mark> DLAL IGTEH <mark>YW</mark> DLAL IQVEH <mark>YW</mark> DLAY	113 SES SQS SQS SGA	123 VLESTD VLETAD VLETTDD VLEASTDQQ
4758556 hPrp 3/614-683 148226831 XenIae/610-679 45387899 Danre/634-700 24667063 Drome/535-598 17554268 Caeele/550-621	DDDEESDEE KDNDESDEE HPDADES GQDV DAEKDAP	45 	55 VLVWEG TLVWEG SLVWEG VLVWEG	65 - TAKDRS - TTKERS - TSKERN - TSQRRH - QVKRRN	75 G EM - KF KQC G DM - KF KQC G EV - KF KQC G E I - KF KI F R DF - T VH T A	PTEN PTEN PTEN PMEK	85 IMAREHFKK IMAREHFKK IMAREHFKK (MAREFFQK)	103 HGAEH <mark>YW</mark> DLAL LGAEH YWDLAL HGTEH YWDLAL HQVEH YWDLAY HGVAQ YWDLCY	113 SES SQS SQA SGA STT	123 VLESTD VLETAD VLETTDD VLEASTDQQ VLEASTDQQ.LPTA
4758556 hPtp.3/614-683 148226831 Xenlae/610-679 45387899 Danre/634-700 24667063 Drome//535-598 17554268 Caeele/550-621 221115483 Hydmag/556-63	DDDEESDEE KDNDESDEE HPDADES GQDV DAEKDAP BQDKIDKKNN	45 	55 CLVWEG SLVWEG CLVWEG CLVWEG CLVWEG CKLIWEG	65 - TAKDRS - TTKERS - TSKERN - TSQRRH - QVKRRN - QVKRRN	75 G G M - KF KQ C G G M - KF KQ C YG E V - KF KQ C G E I - KF KI F F RD F - TVH TA F TD W - RF HVF	PTEN PTEN PTEN PMEK TLEK	85 IMAREHFKK IMAREHFKK IMAREFFKK (QAREFFEK PEAHDFLRRS	103 HGAEHYWDLAL GGEHYWDLAL HGTEHYWDLAL HQVEHYWDLAY HGVAQYWDLCY SNVEHFWNLAA	113 	123 VLESTD VLETAD VLETTDD VLEASTDQQ VLLEGQDILPTA VLEEADS
4758556 hPrp3/614-683 148226831 Xenlae/610-673 45387899 Danre/634-700 24667063 Dromel/535-598 17554268 Caeele/550-621 221115483 Hydmag/595-66i 115903728 Strpur/505-572	DDDEESDEE KDNDESDEE HPDADES- GQDV DAEKDAP GQDKIDKKNN DDDSSGDEA-	45 K K T N K C P K A N R C R R N N R C P N S C G E R N L C K K K N E C V K S N H C	55 CVLVWEG SLVWEG CVLVWEG EMIWEG CKLIWEG	65 	75 G G M - K F K Q C G G D M - K F K Q C G G U - K F K Q C G G U - K F K I F R D F - T V H T A T D W - R F H V F S D L - H F K L C	PTEN PTEN PMEK TLEK KTDP	85 IMAREHFKK IMAREHFKK MAREHFKK GAREFFCK 2 EAHDFLRR MAREQFKK	103 HGAEHYWDLAL GAEHYWDLAL HGTEHYWDLAL HQVEHYWDLAY HGVAQYWDLAY SNVEHFWNLAA HVVEHYWGLVH	113 	123 VLESTD VLETTDD VLETTDD VLEASTDQQ VLEGQDILPTA VLEEADS
4758556 h Prp 3/614-683 148226831 Xenlae/610-678 45387899 Danre/634-700 24667063 Dromel/535-598 17554268 Caeele/550-621 221115483 Hydmag/595-661 115903728 Strpur/505-572 115903728 Strpur/505-572	DDDEESDEE KDNDESDEE HPDADES- DAEKDAP- DAEKDAP- BQDKIDKKNN DDDSGDEA-	45 - KKTNKC - PKANRC - RRNNRC - GERNLC - GERNLC - KKKNEC - VKSNHC - ANIKWC	55 VLVWEG SLVWEG CLVWEG CMIWEG CLMWSG CLMWSG CLMWSG CLWEG	65 - TAKDRS - TTKERS - TSKERN - TSQRRH - QVKRRN - QVKRRN - MIKQRN - MIKQRN	75 G G M - K F K Q C G G M - K F K Q C G G U - K F K I F G G I - K F K I F F R D F - T V H T A F T D W - R F H V F S D L - H F K Q C	PTEN PTEN PTEN PMEK TLEK KTDP PTEA TTDS	85 IMAREHFKK IMAREHFKK (MAREFFQK QAREFFEK MAREQFKK GAREFFKK	103 HGAEHYWDLAL LGAEHYWDLAL HGTEHYWDLAL HQVEHYWDLAL HGVAQYWDLCY SNVEHFWNLAA HNVEHYWDLCH HGVEHYWDLSH	113 	123 VLESTD VLETAD VLETTDD VLEASTDQQ VLLEGQDILPTA VLESADS VLDSTDT
4758556 hPrp 3/614-683 148226831 Xenlae/610-679 45387899 Danre/634-700 24667063 Dromel/535-598 17554268 Caeele/550-621 221115483 Hydmag/595-66 115903728 Strpur/50-572 198412413 Cioint/501-558	DDDEESDEE KDNDESDEE HPDADES GQDV DAEKDAP BQDKIDKKNN DDDSGDEA. A	R5 - · KKTNKC - · RRNNRC - · · PNSC - · GERNLC - · KKKNEC - · KKSNHC - · AN I KWC - · RGPNTC	55 VLVWEG SLVWEG SLVWEG CLIWEG CLIWEG SLUWEG CLIWEG TLIWEG	65 - TAKDRS - TTKERS - TSKERN - TSQRRN - QVKRRN - QVKRRN - MIKQRN - MIKQRN - TKIKRF	75 6 G E M - K F K Q C 7 G D M - K F K Q C 7 G E I - K F K I F 7 G E I - K F K I F 7 R D F - T V H T A 7 T D W - R F H V F 8 D L - H F K L C 6 G E M - T F K K F	PTEN PTEN PTEN TLEK KTDP FTEA FTEA RSEA	85 IMAREHFKKI IMAREHFKKI (MAREFFKKI QAREFFEKI PEAHDFLRR QAREFFKKI QAREFFKKI QAREFKKI QAREFKKI	103 HGAEHYWDLAL LGAEHYWDLAL HGTEHYWDLAL HGVEHYWDLAY HGVAGYWDLAY SNVEHFWNLAA HNVEHYWGLVH HGVEHYWDLAL SRSAHYWDLAL	113 	123 VLESTD VLETAD VLEASTDQQ VLEGADILPTA VLEEADS VLDSTDT LQSEKQ
4758556 hPtp.3/614-683 148226831 Xenlae/610-679 45387899 Danre/634-700 24667063 Dromel/535-598 17554268 Caeele/550-621 221115483 Hydmag/595-661 115903728 Strpur/505-572 198412413 Cioint/501-558 167520844 Monbre/363-431 66821609 Diodio/496-571	DDDEESDEE KDNDESDEE HPDADES GQDV DAEKDAP BQDKIDKKNN DDDSGDEA. A DDEGEGEE DPEQQTKHQ	R5 - KKTNKC - PKANRC - RRNNRC - GERNLC - KKKNEC - KKKNEC - KKSNHC - ANIKWC - RGPNSC	55 2 V L VWE G 2 T L VWE G 2 S L VWE G 2 C L VWE G 2 C L VWE G 2 C L VWE G 2 C L WE G 2 C L WE G 2 T L I WE G 2 T L I WE G 2 T L I WE G 2 T L VWE G	65 - TAKDRS - TTKERS - TSQRRH - QVKRNN - QVKRNN - TNIKKT - MIKQRN - TNIKKT - TLERN - TLERN	75 G EM - KF KQC G G DM - KF KQC G G EI - KF KI C G G EI - KF KI C F RDF - TVHTA F TDW - RF HVF S DL - HF KL C G G EM - TF KQC K GF - F I KF F	PTEN PTEN PTEN TLEK KTDP FTEA RSEA PLES	85 IMAREHFKKI IMAREHFKKI (MAREHFKKI COAREFFCKI SCAREFFKKI SCAREFFKKI SCAREFKLONI	103 HGAEHYWDLAL GGAEHYWDLAL HGTEHYWDLAL HGVAQYWDLAY HGVAQYWDLAY SNVEHFWNLAA HNVEHYWGLVH HGVEHYWDLSH RRSAHYWDLAL HNVPHYWDLAL	113 	123 VLESTD VLETAD VLEASTDQQ VLLEGQDILPTA VLEEADS VLDSTDT LQQSEKQ
4758556 h Prp 3/614-683 148226831 Xenlae/610-679 45387899 Danre/634-700 24667063 Dromel/535-598 17554268 Caeele/550-621 221115403 Hydmag/595-661 115903728 Strpur/505-572 198412413 Cioint/501-558 167520844 Monbre/363-431 66821609 Dicdis/496-571 9111674735brbo/471-542	DDDEESDEE HPDADES- GQDV DAEKDAP BQDKIDKKNN DDDSGDEA- A DDEDGEGEE DPEQQTKHQ AQGNKLVDT	45 - KKTNKC - RRNNC - GERNLC - KKKNEC - KKSNHC - ANIKWC - RGPNTC - GPNTC - JYTENTC	55 2 V L V W E G 2 T L V W E G 2 S L V W E G 2 C L V W E G 2 C L W E G 2 C L W E G 2 T L I W E G 2 T L I W E G 3 H L V W E G	65 - TAKDRS - TTKERS - TSKERN - TSKERN - QVKRRN - QVKRRN - MIKQRN - MIKQRN - EIKKN - FILERF - FILERF	75 6 GEM - KF KQC 7 GEV - KF KQC 7 GEV - KF KI F 7 RDF - TVHTA 7 TDW - RF HVF 5 SDL - HF KLC 6 GEM - TF KLC 6 GEM - TF KLC 6 GEM - TF KLC 7 KDF - F I KF F 8 KJF - F NYE I S	PTEN PTEN PTEN FTLEK FTLES RSEA PLES	85 IMAREHFKK IMAREHFKK MAREFFCK 2 EAHDFLRR MAREQFKK GQAREFFKK LAREWLDN 2 GAREYLQE	103 HGAEHYWDLAL GGEHYWDLAL HGTEHYWDLAL HGVEHYWDLAL HGVEHYWDLAY SNVEHFWNLAA HNVEHYWDLAH RRSAHYWDLAL HNVPHYWDLAL HNVPHYWDLAL	113 	123 VLESTD VLETTDD VLEATDQQ VLEASTDQQ.ILPTA VLE&QDILPTA VLESTDT LQSEKQ PEI
4758556 hPrp3/614-683 148226831 Xenlae/610-679 45387899[Danre/634-700 24667033 Dromel/535-598 17554268[Caeele/550-621 221115483 Hydmag/595-661 15903728 Stpur/50-579 198412413 Cioint/501-558 167520844 Monbre/363-431 66821609[Diodia/496-571 19115472]Sohpo/471-542	DDDEESDEE KDNDESDEE HPDADES GQDV DAEKDAP BQDKIDKKNN DDDSGDEA A DDEEDGEGEE DPEQQTKHQ AQGNKLVDT AEGNKLVDT	H5 - KKTNKC - PKANRC - RRNNRC - GERNLC - KKKNEC - KKKNEC - ANIKWC - RGPNTC - GTPNSC - JESNTC	55 2 V V V WEG 2 S L V WEG 2 S L V WEG 2 S L V WEG 2 S L V WEG 3 S L V WEG 3 C L V WEG 4 C L V V WEG 4 C L V V WEG 4 C L V V V V V V V V V V V V V V V V V V	65 TAKDRS TTKERS TSKERN TSQRH QVKRRN TNIKKT MIKQRN TLERRF PILEAH PILEAH QVKRA	75 6 GEM - KF KQ C 6 GDM - KF KQ C 7 GEV - KF KQ C 7 GEV - KF KQ C 7 GEV - KF KVF 7 TDW - RF HVF 5 GEM - TF KQ C 6 GEM - TF KQ C 6 GEM - TF KQ C 7 KGF - NYE IS 7 KW - SF RS C	PTEN PTEN PTEN FTLEK FTLES RSEA PLES FSEN	85 IMAREHFKKI IMAREHFKKI IMAREHFKKI IMAREFFKKI IMAREGFKKI IMAREGFKKI IMAREGFKKI IMAREGFKKI IMAREJFKKI IMAREJFKKI IMARSYLEE IMAKSYLEE	103 HGAEH YWDLAL LGAEH YWDLAL HGTEH YWDLAL HGTEH YWDLAY HGVEH YWDLAY SNVEH FWNLAA HNVEH YWDLSH RRSAH YWDLAL HNVPH YWDLAL SGAEH FWNLAK SGAEH FWNLAK	113 	123 VLESTD VLETAD VLETAD VLEASTDQQ VLEGQDILPTA VLEGQDILPTA VLEGQDI.PTA VLEGQD LQE PEI PEI QNES
4758556 hPrp 3/614-683 148226831 Xenlae/610-679 45387899 Danre/634-700 24667063 Dromel/535-598 17554268 Caeele/550-621 221115483 Hydmag/595-661 115903728 Stpur/505-572 198412413 Cioint/501-558 166821609 Dicdis/496-571 19115472 Schpo/471-542 145240345 Agpn/471-542 14526580 Comeo/486-569	DDDEESDEE KDNDESDEE HPDADES GQDV BQDKIDKKNN DDDSGDEA. A DDESGEGEE DPEQQTKHQ AQGNKLVDT REGNREAQPG	145 - KKTNKC - PKANRC - RRNNCC - GERNLC - KKKNEC - KKKNEC - KKNNC - RGPNTC - GTPNSC - GTPNSC - JLADNKC	55 CVLVWEG CVLVWEG CVLVWEG CVLVWEG CVLVWEG CLIWEG CLIWEG CLIWEG CLIWEG CLIWEG CLIWEG CLIWEG CLIWEG	65 - TAKDRS - TTKERS - TSKERN - TSVRRN - TSVRRN - TNIKKT - MIKQRN - TLERKF - TLERKF - FILEAH - EIGRRA - EIGRRA - EIGRRA	75 6 GEM - KF KQ C 7 GEM - KF KQ C 7 GEU - KF KQ C 7 GEI - KF KQ C 7 GEI - KF KVF 7 TDW - RF HVF 7 SDL - HF KL C 7 GEM - TF KC 7 KDF - NYEIS 7 KWF - RARHY 7 KMF - RARHY	PTEN PTEN PTEK FTER FTER FTER FTER FTER FER FER FER FER FER FER FER FER	85 IMAREHFKKI IMAREHFKKI IMAREFFKKI CAREFFEKI CAREFFKKI CAREFFKKI CAREFFKKI CAREVLONI CARKYLQE IDAKSYLEE CAKKVLAR	103 HGAEHYWDLAL GAEHYWDLAL HGTEHYWDLAL HGTEHYWDLAY HGVAQYWDLAY SNVEHFWNLAA HNVEHYWGLVH HGVAQYWDLAY RRSAHYWDLAL SGAEHFWNLAK SGAEHFWNLAK SREARWDLAK	113 	123 VLESTD VLETAD VLETAD VLEASTDQQ VLEEADS VLEEADS LQSTDT PEI ENV QNES
4758556 h Prp 3/614-683 148226831 XenJae/610-679 45387899 Danre/634-700 24657033 Drome//535-598 17554268 Caeele/550-621 221115483 Hydmag/595-661 115903728 Strpur/505-572 198412413 Cioint/501-558 167520844 Monbre/363-431 66821609 Diodia/496-571 19115472 Schpo/471-542 145240345 Aspni/460-541 582265580 Cryneo/488-569	DDDEESDEE HPDADES- GQDV DAEKDAP DAEKDAP DDEGEGEA DDDSGDEA- A DDEDGEGEE DPEQQTKHQ AQGNKLVDT REGNREAQA GDGGEDAPG GDGEMD	45 - KKTNKC - PKANRC - RNNRC - GERNLC - GERNLC - KKNEC - ANIKWC - ANIKWC - RGPNTC - SSNTC - LSSNTC - LSSNTC - LSSNTC	55 C V L VWE 6 C S L VWE 6 C S L VWE 6 E M I WE 6 C L MWE 6 C L WE	65 - TAKDRS - TSKERN - TSKENN - TSKENN - TSKENN - TSKENN - TSKENN - TSKENN - TSKENN -	75 G EM - KF KQC G G W - KF KQC G G E I - KF KI C G G E I - KF KI C G E I - KF KI K F TDW - RF HVF S D L - HF KL C G EM - TF KQC K GF - FI KF F R YW - SF RSC F KWL G A RV C K GW - RA KV C	PTEN PTEN PTEK FTLEK FTLEK FTLEK FTLES FLES FLES FLES FLES FLES	85 IMAREHFKKI IMAREHFKKI (MAREHFKKI CQAREFFQKI SQAREFFKKI SQARKYLQE IDAKSYLEE (SQAKVLAR SKAKEWLT-I	103 HGAEHYWDLAL GGAEHYWDLAL HGTEHYWDLAL HGVAQYWDLAY HGVAQYWDLAY HGVAQYWDLAY HGVAQYWDLAY HGVEHYWDLAY HGVEHYWDLAY HGVEHYWDLAL HNVEHYWDLAL HNVPHYWDMVK GGAEHFWMLAK AKLENFWVLAK PRFEAMWDLAK DSEHFYSPYO	113 	123 VLESTD VLETAD VLETAD VLEASTDQQ VLLEGQDILPTA VLEEADS VLDSTDT LQSEKQ ENV QNES WAGEDL
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Supplementary Figure 2: Alignment of sequences of BLUF-like domains from eukaryotic **Prp3 homologues.** Vertical blue lines indicate hidden columns in the alignment. In the "motifs" annotation row, uppercase W marks a conserved tryptophane residue; lowercase d, residues of a disordered loop; lowercase w, the position corresponding to a tryptophane residue conserved in BLUF domain proteins. The "jnetpred hPrp3" annotation row displays predicted secondary structure elements of the human Prp3.



## Supplementary Figure 3: Results of clustering of sequences of DEAH family helicases. For

eukaryotic proteins, only clusters containing the most important four human helicases are indicated. Also indicated are the positions of the sequences of the three *Giardia lamblia* DEAH helicases (red dots with GI numbers).



Supplementary Figure 4. N-terminal region of hPrp8 (PRO8NT). A. Model of the conserved core of the PFAM PRO8NT domain. De novo model. RMSD 2.4 Å, QMEAN Z-score -1.93. B. Alignment of the Prp8 N-terminal domain. In the "de novo" annotation row, boundaries of the de novo model are shown. In the "bromodomain prediction", boundaries of the bromodomain prediction are shown (about twenty amino acids are cut from the C terminus). In the "jnetpred hPrp8", secondary structure prediction is shown.

В														
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91208426 hPrp8 Homsap/84-153	DKRV	YLGA	L <mark>K Y</mark> M P	HAVLK	(LLE <mark>N</mark> I	M <mark>PM</mark> PWE	Q   <mark>R</mark> D \	/PVLY	HITGA	ISFVNE	IPWVI	EPVYIS	S <mark>QW</mark> GSN	WIMMRF
6321959 Saccer/157-226	DKKA	FLGA	L <mark>K Y</mark> L P	HAILK	(LLE <mark>N</mark> I	M <mark>P</mark> H <mark>PWE</mark>	Q A <mark>K</mark> E \	/K <mark>VL</mark> Y	HTSGA		TPRVI	EPVYT	A <mark>Q W</mark> S A T	WIAMRE
58258365 Cryneo/96-165	DKRV	HLGA	L <mark>K Y</mark> V P	HAVME		I <mark>PMPWE</mark>	Q V <mark>R</mark> E I	/PVLY	HISGA		VPRVI	EPVYH	a <mark>q w</mark> a sm	WLAMRE
66821559 Dicdis/71-140	DKRV	YLGAI	L <mark>KY</mark> MP	HAILK		I <mark>PMPWE</mark>	αν <mark>κ</mark> γι	/K <mark>VL</mark> Y	HLSGA		IPFVI	EPIYIA	A <mark>QW</mark> ATM	WVTMRF
42567520 Aratha/79-148	DKRV	Y L G A I	L <mark>K F</mark> V P	HAVFK	(L L E <mark>N</mark> I	M <mark>PM</mark> PWE	Q V <mark>R</mark> D I	/K <mark>VL</mark> Y	HITGA		VRWVV	EPIYMA	a <mark>qw</mark> g sm	WIMMRF
159462482 Chlrei/94-163	DKRV	YLGAI	L <mark>K F</mark> V P	HAVFK	(LLE <mark>N</mark> I	M <mark>PM</mark> PWE	Q V <mark>R</mark> H V	/K <mark>VI</mark> Y	HITGA		IPWVI	EPVYL	A <mark>Q W</mark> G S M	WIMMRF
124505249 Plafal/430-499	DKRV	YLGAI	L <mark>K Y</mark> I P	HAVFK		I <mark>PMPWE</mark>	сі <mark>к</mark> и.	r k <mark>v i</mark> y	HITGA		TFVVI	DPLYI	A <mark>QW</mark> G TM	WIMMRF
67607121 Cryhom/72-141	EKRI	Y L G A I	L <mark>K Y</mark> I P	HSIFK		I <mark>PMPWE</mark>	RV <mark>K</mark> Y۱	/DCLY	HTTGA		IPWVI	EPIYIA	AQ <mark>W</mark> STM	WTMMRF
123976938 Trivag/64-133	QKRL	YIGA	L <mark>KY</mark> AP	HAVLK	(FLE <mark>N</mark> I	M <mark>PMPWE</mark>	EL R KI	/RVLY	HTAGA	LTFVNE	VPRVV	PPQYL	A Q W A E T	WIAMRE
67475030 Enthis/28-97	DKRV	YLGAI	L <mark>K F</mark> L P	HAVYK		I PMPWE	E I KW	/DVMY	HITGA		IPKVI	EPIYF	A <mark>QW</mark> G TM	WIAMRN
71745512 Trybru/85-154	ERKL	CVAL	LRYMP	LALYK	(LLENI	M <mark>PMPWE</mark>	E A R Y I	/NVVY	HMRGV		TPTAP	EPLYL	A Q W G S I	WTKMRS
19074153 Enccun/203-269	• • • s	FMGAI	MRYMP	HALHN	ILLRSI	M <mark>PMPWE</mark>	S I R Y I	/DVVY	HVSGL	ITFVAE	KRRED	ADEYK	R <mark>R W</mark> S R V	SASFSS
162606442 Guithe/46-117	EKRI	SLNT	FRYYP		LLES	I <mark>PMPW</mark> D	ENKR	INFLS	HKSES	FYIPFE	NYRFV	KKIVF	A <mark>r w</mark> s n l	WFQDR\
159109144 Gialam/35-103	- KLA	AMGS	LKFLV	YAIRK		M <mark>P</mark> Q <mark>PWE</mark>	AV <mark>R</mark> Y)	/TVAH	QKAGA	LTYILS	KSTSS	EHDLI	RQWTRV	CDSIP
de novo model	d d	dddd	d d d d	dddd	dddd	d d d d d	dddd	bbbbb	ddddd	d d d d d	dddd	d d d d d	1 d d d d	d d
bromodomain prediction										bbbbb	b b b b b	bbbbbb	b b b b b	b
jnetpred hPrp8						-			<b></b>			-		
			14		24		35		45		55		65	
91208426lbPm8lHomean/154-22	EKRD	- B B H F		PPFD	EEPP		LL DV	- 		DPEED				RKVVNG
6321959  Saccer/227-295	EKRD	RTHE	KRMRF	PPFD	DEPP	LSVEOH	IENI			DSODD	EVVKDW	VDSR	PLEED	SKKVNG
58258365ICovee/166-233	EKRD	RRHF	KRMRF	PPFD	FEPP	MDVGDN	VIDV		LOLEI	DEEDD		EVDEK	PLVDT	POVNG
668215591Dicdis/141-208	EKRD	RTHE	RRMKE	PIFD	FEPP	LDVSDN	LIDN	EVEDP	LOMEL	DENDD	SEVIDW	UVDSK	PLVNT	KEVNG
4256752014ratha/149-216	EKRD	RRHF	KRMRF	PPFD	FEPP	LDVADN	LIDV		LOLEI	DEEED	SAVVSW	EVDHK	PLVKT	KMING
1594624821Chlmi/164-232	EKRD	RRHF	KRMRF	PPFD	FEPP	LDYASN	LIDV	FPIFA	LEMEL	DEEED	AAVYEW	U YDHO	PLKYT	KEVNG
1245052491Plafal/500-568	EKRD	RKHE	KRMRF	PPFD	FEPP	LDVADN	LLDU	EPLEC	LOWKI	DKDED	KSVIDW	FYDSK		RNHIPG
676071211Crybom/142-209	EKRD	RKHE	KRIRF	PPFD	FEPP	IDYCEN	LIGV	FPIDS	LOIVE	DSEED	ISVYDW	FYLDS	KOOFK	YEHKK
123976938ITrivac/134-200	EKRD	RHOL	RRIRE	PPFD	FEOP	LDEVIN	LEGV	EPPEA	LLMEL	DEDED	AAVYEW	FYDYL	GL PS -	OYING
674750301Entbis/98-165	EKAN	RKNE	RRMII	PSED	FEPP	LDYGDN	LLDV	DPIPS	IRIFI	DGIED	KSVMEW	FYDSK	PLVHS	HNVNG
71745512 Trybru/155-226	HKVE	LOOF	RRVIS	KG - NF	NEPP	IDESDY	IMDR	FPPPA	LYDDI	DEEDA	AAVIDW	FYDPF	PRIVHE	PNOIRG
19074153 Enccun/270-314	FTOK	RGLV	RILRY	PVFD	DDPV	VDYG . S	LIGI	PVPTA	VECEG	SEE.				
162606442 Guithe/118-173	LELK	IHRI	NRIFI	DDFK	NOK-	KDN	KILK	KSNEF	YDKTL	NNDKL	FKNLEF	F F		KIINL
159109144 Gialam/104-143	DAAP	PSY.		PIFDO	TAPY	MCYRDN	LAFA	RPI					PLEKT	NALIR.
de neve medel	<b>B</b> rand						LALA							
bromodomain prediction	<b>b b b b</b>	<b>b</b> b b b	<b></b>			<b>b b b b b b</b>	<b>b b b b</b>		<b>b</b> b b b b	hhhh		<b>b</b> b b b b		
instand hPm8		0000	00000		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		0000		00000	00000		00000		
Jitetpred in tpo														
			10		20									
91208426 hPrp8 Homsap/223-24	<b>ESTYQ</b>	RW	QFTLF	MMSTL	YRLA	NQLLTD	(							
6321959 Saccer/296-321	TSYK	• • KW	SFDLF	PEMSNI	YRLS	TPLRDE								
58258365 Cryneo/234-259	SSYK	• • Y F	QLALF	QMANI	YRIG	RQLLSD								
66821559 Dicdis/209-234	SSYR	KW	RLNLF	PIMSTL	FRLA	SPLLSD								
42567520 Aratha/217-242	PSYQ	• • тw	NLSLF	IMSTL	HRLA	AQLLSD								
159462482 Chlrei/233-258	PSYK	RW	KLPLF	VMAAL	YRLS	GQLLTD								
124505249 Plafal/569-594	TSYK	• • KY	KLSLE	QMGVL	YRLG	NQLFSD								
67607121 Cryhom/210-237	GNYK	KHKW	HLTFE	QLGTI	YRLS	MQILPI								
123976938 Trivag/201-226	LSYR	KW	KLPLI	VMSTL	YRLA	RPLVDQ								
67475030 Enthis/166-191	TSYK	RW	KLNIE	QLSTI	HRLS	ERLLGD								
71745512 Trybru/227-253	SRRP	- NGY	YFTIC	VIETL	FRNA	IPILPN								
19074153 Enccun/314-318	C R					D V	,							
162606442 Guithe/174-193	NKFK	• • T I	LLDKG	LVIK	LKIE									
159109144 Gialam/143-153				· · · · F	HRLK	N - L C A D	-							
de novo model														
bromodomain prediction	b	b	bbbbb	bbbbb	) b b b b									
jnetpred hPrp8														