

Additional file 12

LaMa	-----
NePa	-----
CroHe	-----
DeFu	EPSSSKHPVH-TNATMALPD--AYEVPREQKQLKADIKKKIYWSYSPFRCNLCGDIM
AgTri	-----AGEGTPEALPPVPGENGGSQPDNIKVTVTPDKNPP---CPCCGTRV
GaGa	----PESAPVQRTEADTTLPS--ASAPAGEGEPSTRVFLVRLPDSNPP---CPICGDHV
SPun	RPIHPEESAICVTANESTPQIEYNIIERETDVIPSSSAIVQLPQTNPA---CPFCADRI
PlaMe	EPI-----INGTQK-----TIIQLPNDNPA---CPFCGDHV
PBlA	-----KRERKLDKDEPTIWLDPNKPE---CPYCKEVV

LaMa	-----DNITC
NePa	-----ERVPC
CroHe	-----PKHSC
DeFu	STIKELKRHISCKHKTfNLVVFCSKCDKEDA-FHNIACHFAKCNKKIIED---ATFMC
AgTri	NSVVSLLLEHLKSGSHGKKRVRFCAKCGKENVNYHVSICHFPCKCKGAEIEK--VPAGEWIC
GaGa	GKPSALAVHLVESHAWADVQYQCTHCEKVSSNKHSILCHIPRCQGRVTD---SDRNWAC
SPun	TTPALLKKHVKGYGKGLLQFQCSKCGRLNENQHSIITHLPCKCKGNSIDP---ALGEFHC
PlaMe	GKPSALNVHLKRNHGGREVEFQCSMCNKADPKAHSILCHIPCKGKVTEE---PTGDWAC
PBlA	GKPTALQKHLTGvHGNQAVTFGCMKCQRKDPVRHAILVHIPCKCKGPNIPDARQAQNKHRC

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LaMa	RDCGRAFPSRLSLGMHRHHQHPEEVNEERLELIKKK-----RKQWSKEEDEQLMSTA
NePa	-FCGLTFATKRGLSMMQHHRHPTELNAARLTALPSR-----RGVWTSGEDEALIRLA
CroHe	-PCGSEFGTKRGLAMHRFHCHPAEVNAERLTTLPK-----KLWVTQEEMDGLLRHA
DeFu	RHCDERFTTKSGVSQHARHRHPKAVNDIRLKIAMPA-----KRSKLWLTEETLLMLDLE
AgTri	EVCGRDFTTKIGLGQHKRLAHPLIRNQERIVASQPKETSNRGAHKRCWTKEEEELLIKLE
GaGa	VQCPASFNNKVGLSQHKRHVHPVTRNAERVAGSLSRAGLRPRTRRGCSVVEEETLTRLD
SPun	EICNNFLTksGLSQHKRIRHPLVRNEERIMASQPKENSRLGKHKSCWSNDEVEQLKTLF
PlaMe	ETCNKQFNTKSGLSQHKRIAHPAIRNQERIAAASQPKPNSQRGKHNSCWTVEEEQLLAAFN
PBlA	EDCGNQYDTQSGLSQHTRHKHPETRNKQRIEEKEKEKGGRGTHKSCWTQEETEQLALLW

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LaMa	DMEWKVGMKKDHLAAIRIKFSHRTLDSIKKRLQHLGWAPPAGQQPQNTPLPARSRPPR
NePa	NDIWPSVTLKKHLYNALMPHFPGRSAEALKRRLQLLQWLP-----
CroHe	NGAWKEGMLKTQIFTSLMPHFPGRSAEAIKKRLQSLKWVP-----ARDNPER
DeFu	ATYKN---SKKINMDIQKHFNKTSIQIGEKRRRELREKT-----AKMEKEA
AgTri	AQFEG---NKNINKLIAEHITTKTAKQISDKRRLLPKKL-----PEVTDKE
GaGa	ALFRG---ARNINQLIAAEMGTKLPKQISDKRRRLGLCP-----EQATSGG
SPun	DEFGK---YKDVNKRIANLLPSKTAKQIADKRRLLNLYI-----KSTKTPN
PlaMe	NMFWG---KKNINILISDHIHMTAKQISEKRRLLGLNK-----NATVTTT
PBlA	EKYEG---HANINKLIQQLHTKTAKQIGEKRRNILEKR-----NNKPEIG

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LaMa	RIARASSPPLT---SALAGPLPPSPIGSPPPQAKRRRGALWTNREDSELEEhARRLWKPNM
NePa	-----PL----TPSHETLNASAL---SP-----
CroHe	----NSQPL----HATSGNVAPATLPTPDP-----
DeFu	----NL-----HIDSDDIEIESINKSEDE-----
AgTri	----PGVCLRTTRAAGSVGTEPGTSQQSQA-----
GaGa	----DA-----ESTSVVEEESVTEPET-----
SPun	----PI-----EPET--QEV TIPENRES-----
PlaMe	----NP-----LPVS---STCHLKIRT-----
PBlA	----EE-----IPKT---KTQSINRQT-----

LaMa	LKKS LAEALSCIIKGRSAEAIKRLQKLGISSATMTSREDIDSEAMRDKDIHQTTPCVQP
NePa	-----KALD-----
CroHe	-----SRVD-----
DeFu	-----EHTN-----
AgTri	-----GILD-----
GaGa	-----QSPL-----
SPun	-----SAPV-----
PlaMe	-----DSPN-----
PBlA	-----

LaMa	EEDGGYETPTSKEEWRTLLTKALETl-NEARIESDKL-----KL
NePa	ED-----LI--RWKGRMLDAISPNL-SEPRLGTEEL-----LS
CroHe	DQGANIEDPAA---SWRRALLAAAADHF-KEPKLGAGTL-----KQ
DeFu	VPQSDVQI-----RNTRISTHKKSPQI-KDHKDLVERITEIKDCMKNPEYYDCGIGLME
AgTri	NGPGKCHL-----PGRPAAGEKTMEKL-RRHPDKDNGR-----QK
GaGa	KPPGKI-----RKVLAQRARRWL-KKGQDLSDKV-----RE
SPun	--KGLC-----EALQSKARKNLEKESAMKFE-----KD
PlaMe	TTTGLK-----DTYMCKINENIVNQGIKFD-----SE
PBlA	EKEGLA-----NKFQQTAITLI-QEHRIKNESI-----AR

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LaMa	MAKGMLEG---TMTREEAAEQLECIT-----
NePa	LVCNLRDG---SLSSEELNARLEAHA-----
CroHe	ITQDLLNG---KISSGECRVLMGEHA-----
DeFu	VITQYIT----ENISTIKPSASVRPTDDPAAPNDATE-IEV-----
AgTri	TSGQRREGLLQAHYQKTIKEGLSAGAINNFPAGFKQLMDGREMRTMINQTAQDCFGCLES
GaGa	VLGAWVEG---QPGIRARVESVSLDVLTSFLGAPSG-----
SPun	FLT NWLDN---MQNVRHLEEETTVDALCNFLPEPKN-----
PlaMe	VISAWMAG---DSNIRSLVESTSLDILSTFLMETPK-----
PBlA	ALHTWLQE---NNNTRQTVEKATEEILNNFPRTAG-----

LaMa -----QEFAPLKWKPREKRTGHR--KEPRSNKQIRRARYAHIQRLYKLRKDDAAHSIL
NePa -----ARHFPHLWRPSTKRTQSI--NKP-SARQIRRANYAAIQRLYQTQRKDAASSVL
CroHe -----QHWFPHTWKPSSARPEPK--ARQWKTREIRRANYAAVQKLYLRRRDAQAQV
DeFu -----PTNVPQNAEPTTASSSHKRNSGHKKRYAKRKGSYKEYQTMFLKDKKKIARIVC
AgTri ISQIRTAMRGKNSGKKATMEQPARKF-QKWMKDRAIKGNFLRFQRLFHLDRGKLAKIIL
GaGa -----PRGAPDKKRP--EKGGST--TSWMSRRAVKRGVFLKYQRLFQTKRKLADIIL
SPun -----ITKPKKDRRP-VKDRKQA--KSWMKKRAKKRGVLYQHYQSLFLKNKTRLASIIL
PlaMe -----PRKKGNNKIT-NKKS GKK--KKWMEKRAVKKG FYKRYQHLFETDRCKLASIIL
PBla -----IHNIPKRKKTKKPRGPYR--GKWRQKRIQKLT YKQLQEL YDKDRAAAAAYIL
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LaMa DGKWREAYREKEREVEGVEEHWAQVFETQAK-DGWPQSM--LPPDLSNIKWGLLEPVTAM
NePa NGSWRSAYKNRTSITDDLSYWSNIFLQPSHEDPT-----PADPPSTPHWSILD PITAT
CroHe SGSWRNAYRGRAPQPKMDQYWA EVFETASATDVT-----PPGSPSEIYWSVVGKITPS
DeFu DGAEDMSCQ---IEATEIFDY YKNILENENTKNPKFELSNIVPSEEDFDHLN--RPITEF
AgTri DDIECLSCD---ISPSEIYSVFKARWETPGNFAGLGDFK--ITGKADNNAFK--DLITAK
GaGa DGADRAQCV---LPLEEVL RAYRGKWEVESSFEGLGRFG--VRRDADNFAFK--ALITPE
SPun DGTEKFECE---IDPKIVYEAYKNKWESATEFKGLSNFH--SFDVTDNSKFY--TRISGK
PlaMe DGTERLQCQ---IPLTEILETYKSKWETLTPFEGLGQFK--SHAVADNTAFE--ILLSAK
PBla DGEKKTNCD---LPIQEVYQTYKDKWETKTEFKGLQNFH--PWGGTNNDILS--NLITGE
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LaMa EVEVALRSM-NNTSAGMDKLSAQEVL TWDL---PSLAGLLNVILATERLPSTLATARVTL
NePa EVTSALSSM-KSSATGLDRLSASQLL SWDA---NSIGAYFNILLVSGLVPTHTMARITY
CroHe EVANALKGM-RNSAPGLDRITAEELLTWDH---PSLAAYYNLMLAAGGPPEHLACSRVTF
DeFu EITWHLENSNMNKTATGPDNVGLKELFGLHARDHTILTDLFNIWLQTSKVPECIKRNRSIL
AgTri EIERNVQEMSKSGAPGPDGITLGDIVKMDP-GYSRTAELFNLWLTSGEIPDMVRGCRSVL
GaGa EVVKHMMAMASKSAPGPKLTLRDLRRADP-EGDALAELFSLWLITGTVPDGLKECRSVL
SPun EVQKNIKEMSRKTAPGPDGITVEDLENVDP-DGEIL AALFNLWMAVGIIPTDIKECRSLL
PlaMe EIMKNKIKEMMNKNSAPGPKVSLRDLLADP-ECNALEKLFNTWLITGIIPNSIKECRSLL
PBla EVKEHLQAMCNKTAAGPDNISVKDLKQVLH-VEQKLAELFNLWLITGQIPNTVVKRSRIL
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LaMa IPKVEEPS---GPNDYRPIAISSVIARALHKVLSKRMREQEFESPLQYAF LQRDGCLEAS
NePa VPKTDSPTS---GPSEYRPISVTSVLLRAMHKILARRMLATLDFSDLQLAFLQRDGLDAS
CroHe IPKVENPQ---TPGDYRPISVASTVLR AFHKILAWRLRDNQLSPFQHGLQRDGCLEAT
DeFu IPKNVPLDSLGNIGNWRPITIGTALMKLFTKLLTKRLSTFVSIHERQKGFINARGCLENL
AgTri IPKSTKPERLKDINNWRPITIGSILLR LFSRIVTARLSKACPLNPRQRGFIRAAGCSEN
GaGa IPKTVDRKLGQLGNWRPITIGSIVLRLFSRVLTARLAAACPINPRQRGFIAAPGAENL
SPun IPKTSDEPKLKDIGNWRPLTIGSIIIRLFSRILTIRLAKACPLNARQRGFIDSPGCSENL
PlaMe IPKTADPEALKELGNWRPLTIGSIVLRLFSRIITNRLAKACPINARQRGFIATPGCSENL
PBla IPKTSDETEKKVGNWRPLTISSVVLRLFSKIMTSRITKACPLNNRQRGFIAASGCSEN
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LaMa ALLHAVLRTAHERTKPLAAAFLDVSKAFDTVSHNAILGAAEKAGTPPPILRYLNQLYKNA
NePa TILHTILRKVHTELKPLSMMFLDVSKAFDSISHHTLIRVATTSGLPAPLLSYLRHLYQTS
CroHe ALLHTILRKVHNSRKSCAMFLDVAKAFDTVSHQTLFRVAVELGLPPPLVNYLKCLYSRS
DeFu NILKNSZKGARKNKDSLAVIFIDISKAFDSVGHKHTLNSLKRHLVPLGYRQLTKDLYTNS
AgTri KLLQTIIRTAKESEHKPLGVVFDIAKAFDTVSHQHILHALQQRGVDPHIIGLVNNMYKDI

GaGa KVELELLRKRKRDRQPLGVVFDLARA FDSVSHDHISWVLKAKGVDEHIVNLIEDSYQKV
SPun KSLQSIIEYSKKEKQQFGVVFDIAKAFDSVSHDHIWVLKERK VDEHIIKIIQDSYTKV
PlaMe KILHTIVKQAKTSKKS LGVVFDIAKAFDSVSHDHIMWVLQERGLDQHI VNIIEDSYKKI
PBla WLLHNIIRAKDKKKELGVVLVDIAKAFDTVSHDHIRWVL RERGMDKHIIQLIMSAYDNA
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LaMa KLQL-----GSTTTQCSRGVRQGDPI SPILFILVMGEVLEEALPD-VGVRW----GERQ
NePa KIRL-----GTHDSSCGRGVRQGDPLSPILFILAIEDILHRVLPE-AGFDL----AATR
CroHe TVRL-----ADKATKCGRGVRQGDPLSPLL FIMVDDIVRKTLP E-VGFDL----DGQR
DeFu TTTFKGKNNINTDEIHMKSGVKQGD SLSPLLFNIAMDPLICDLQYKCGCSFNNIQGT RQ
AgTri STYVTTKRDTHTDKIQIRVG VKQGDPLSPLL FNLAMDPLLCKLEESGKG FHR----GESS
GaGa TTRVQVFNG-VTPPISIKTGVKQGDPMSP LLLFNIAMDPLIAKLET DGQGVKV----GSAS
SPun STRLKVSKT-LTDSISLKVGVKQGDPMSP LLLFNLAMDPLINAL EEEQGEGVQV----EDMK
PlaMe HTRMEVGTE-RTPPIEIKVGVKQGDPMSP LLLFNLAI DPLITALEKANTGFSY----GKNK
PBla TTSIKLKEG-NTPDIHIRSGVKQGDPLSPLL FNLAMDPLITELETEGHGVED----ENWT
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LaMa IDSIA YADDLILLAESP RELQRKLDGVC RGLQKAGMALNNKSVMTILK DGRRKT LALA
NePa IGSIA YADDLILLAERPERLQE KLNILL SAFHDAGLIINSSKSHGLTIAKDGKKLLVLL
CroHe VDSLAYADDLVLLAEKSPRLQDKLHL LSEALRKAGMSLNARKSRGLTITKVSRRKQM VIT
DeFu TTALAFADDIAVLSNSWKGMQANLQIIEKFSKATGLKLVNKKTHGFLISHF-GDKIVV NK
AgTri ITAMAFADDLVLLSDSWENMQTNIKI LETFCDLTGLKTQGEKCHGFYIKPT-KDSYTI NN
GaGa LTTLAFADDLVLLSDSWEGMLKNISI LEDFCNL TGLRVQPKKCQGF LNP T-CDSFTVNN
SPun LKTMAFADDLVLLSNSFEGMSKNIKILEQFCQTTGLQVQPKKCQGF LITPT-KDSYIINN
PlaMe ITSLAFADDLVMLSDTWEGMNKNIQILETF CNLSGLKVQAKKCYGFFLSPT-HDSYTI NK
PBla ITTLAFADDIAVMSDSCKEMQNQLQIEAF CNLTGLKVQTTKSYGFALQPT-KDSYIVNN
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LaMa PHQYTTDNGQVPCMLGSDSQR YLGIQFT-WKGRVTPK-QTSELGRMLLEITSAPLKP YQR
NePa PHEYRTGSSTIKPIGPTNVITYLGLRFN-WKGQLLPR-HTATLSTMLAEVSQAPLKP YQR
CroHe PTTYECEGEPIKPMGTDDSVRYLGLHFN-WKGRIVPK-HTGKLDSL LKELTKAPLKP YQR
DeFu CKPWLFERSKIEFIHPGESERYLGLNFDPHIGCNTPNALNLKLQSWAKKLDLPLKPTQK
AgTri CAAWTINGTPLNMNINPGESEKYLGLQFDPWTGLAKTN-LTTKLEFWLERIDQAPLKLQK
GaGa CEAWKIAGREITMLPGGESTRYLGLNVGPWVGIDKPD-LGTQLSSWLERIGTAPLKP MQK
SPun CKKWSIEGTEVNMIQPGQREKYLGA KIDPWTIFA EIN-FEEKIEDWLCKLEVAPLKPSQK
PlaMe CDAWKIDKDSLNMIQGESEKYLGLKVDPWIGFSKPV-LAEKLTIW LKRLTEAPLKPSQK
PBla IKPWTIKDQPIQM VQPAHTTRYLGIQVGPWKMEKPN-MIADTKKWLQNITKAPLKP TQK
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LaMa IELVRDFLVPRLLHELVLGCAHRNTIARMDRMIRRETRTWLRLPKDTS LGFLHSPVKS GG
NePa LEVL RNYLIPKLTHELVLGRAHRNTLKKIDV LIRAAIRQWLRFPKDTPTAYFHARIQDGG
CroHe LQLLKFHAVPKFTH ELVLGHAHRNTVKKLDCLTRA AVRKWLRLPQDTP LGYLHANVKDGG
DeFu IKIFCQYIVPKLSYSLEMTGTGANTLVALDQTIKATVKHYHLHPHYINDGLLYSRKKNGG
AgTri LDILKTYTIPRLTYLADHSEIKAGALEALDQKIRTAVKDWLHLP PCTCDAILY SSTKDGG
GaGa LSLLVQYAI PRLNYQADYAGIGRVALEALDSMNRRKVK EWFHLPACTSDGLLHSRHRDGG
SPun LEILNIHTIPRIIYLADHTNCNITKLKNL DNMIRKRLKDWLHLPASTCHGLFYSKNRDGG
PlaMe LTMLNIYTI PRIIYLADHTDTKKTL LSSLDDNIRTVVKGWLHLPDPTCN GFYITKTRDGG
PBla LEILRTYTI PRLIYHNEQTGTGKTKL KELDNLIRAGIKSWLHLAHDTCNL IYTKTKDGG
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LaMa LGIPCLGTTVPLLQKRFEKLLSSDCPIKQTLTELPFMTTLRRVNL-----
 NePa LGIPALTTQMPFLQHHRFTKLLSSASPSIQSICQEPAFVQAYARVLT-----
 CroHe LGIPCSTSIPLQKKRFEKIATNPATIFQIMQRQDSFRTQGRRLDK-----
 DeFu LSIPKLCTSIGINKVNLLYLRESTDVCITNSFLYAGIV-----IN
 AgTri LGVTKLAGLIPSVQARRLHRIAQSSDETMKEFLEKDQMEQLYRKLWVQAGGEREETPSIW
 GaGa LGLPRLAKAIPAEQVRRILRVATSSDEVTRKVSACGISDEVERLWLARGGDMSSVPRFE
 SPun LGIPRLERLIPSVQARSLHRISQSSDYKIMNIAFSCGLESEFEKKWVQAGGAKETRPNLK
 PlaMe LGVTRLASLIPSIQARRLHRIATSEDETIRNIAMANNIEEFQNLWVTAGGKKEEIPRIT
 PBla LGITRLETTLPHQRCNTLLKIINSPDLTTRTIARALGIEEQFSKWWKKAGGSEDNPKIY
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LaMa -----PCRVRNEIV-----CSSKEAQVEWEKIWRTSAD
 NePa -----P---TLPIF-----ESKSAIKQHWAQDLQSID
 CroHe -----PCRLNSTVV-----TSKTEVREEWGNMLSNSVD
 DeFu DVIDEIIKTHH-----LHILHA-ECLNMSLELTASY-----VVQ
 AgTri E----ALPTSEQSNRG---DTTSEWEAPILKPKFKPKC---DWRKKEFEKWTKL---VSQ
 GaGa D----PEAPRSPGVQGPCEAAQEIPSVVRKLAIPRPS---NWRAEEHSKWAQL---SCQ
 SPun DILPPPPEPKY-----YEKLNEWKPKLKIKFPLPL---NYRKEEFREWAKL---KCQ
 PlaMe D----PVSIDYRLPRILELLNEWKPAKMKYPIPC---NWREAEMAHWKNL---PCQ
 PBla P-----QPNQTTQKPTEKEEIPVTTKIQPHKKKEAEEGWAKL---PCQ
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LaMa GRSGVNEVDVPASYTWVGKPRRVFPRILHRLGIQLRGGLTNTKARASRGRETAPSDIACRG
 NePa GRDLAQTDIDVASHWWIQHPENVFPRHLRLGLQLRGGLLSTKTRNRNGPTRQ-ANVSCVG
 CroHe GRELRHPEVDKASHEWLLRPDRVFPRLHMRGIQLRGGLLPTKARSGRGNRQVTSKTCRG
 DeFu GDGVQYYQNNACSNYWLMPKPMKENQYIAALKLRANIPDTRTLTRGR-NR-QFSNCRY
 AgTri GRGISSFKNDSISNDWLQYYRRIPHRKLITALQLRANVYPTREFLSRGREEN-STKACRH
 GaGa GEGVELFRNDPVSNGWINGRGLAERLRIVALKLRSNVYPTREFLGRGM-AG-TNVGCRH
 SPun GSGIQHFQDDIISNNWLRINKGITEKQFILALKLRANVFPTRREFLGRGT-QN-ANRACRH
 PlaMe GSGIEHFDNDTISNDWLQFHRGFSERQFLMGLKIRANVYPTREYQGRGR-TN-KNVNCRN
 PBla GGAVENFINDSISNDWIRYKKDMTEKEFITAIKLRNTNYPTREFLARGK-EN-YERKCRK
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LaMa ACHARETLNHILQICEVTHDARCARHNRIAKLLEKMLRRRVDRTWIEPIIP-TQKSFIKP
 NePa ACRMPESINHLQVCEKTHDARCARHNRMKKVNQLLRAKGLKSWMEPIIP-TSTTFMKP
 CroHe ACQNVETLNLHILQCDVTHDARCARHNRLHRLERLLHKKGLRTTLEPVIP-AGSSFIKP
 DeFu CMDVGETISHISGSCPCTKDRIIRRHNKILELLIERAKRCGWIAYREPHLRNPNGELRKP

AgTri CNVENETCAHIIGQCPVTKDARIKRHNHICDMLSEEARKKDWVVFKEPYIRDTTKELYKP
 GaGa CTHPRETLGHILGICPSVQEARILRHNKLCILAAEGKKCEWTVYEPHLRNAAGELRKP
 SPun CKAKFETCSHILGQCPTLQEARIKRHNKLCITLLKEEAKELEWVFDEPHLNRAGELRKP
 PlaMe CTASYESLSHILGQCPAVQGARIRRRHNKLCMLKREAKELEKWWVVEPHLHTEKELRKP
 PBla CPAKYESLSHILGQCPGLQNAIRIWRHNAIGKLLANQAKKKKWTVHQEPHLRNKDNQLRKP
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LaMa DLLVDTGKRIIILDVTVAEPR---MEQSHQLKSSKYGSPDNTAAIVAWTG--TKVPIKH
 NePa DILVESAGKLIIVMDVSIVAGHR---LPETWNLKTSKYGSNQATQDLQRWHN--SLISIKH
 CroHe DLIIETDTQTYVLDVSVVAGYR---MTESWDIKVEKYGRPDVEAIRKWAAPATKRVEH
 DeFu DLILTKNNTAHVVDVSIRYETSAGSLESAFEQKVSYY--ELMSAIQQHTK---CSQVAF
 AgTri DLIFVKDGHAFVVDVTYRETTTTSLEEA-AAEKVNKY--HLETEVRNLTN---AKDVVF
 GaGa DLIFVRDGTALVVDVTVRYEKDSASLSAAAADKAAKYL--GLNAQIQELTG---AEHVTY
 SPun DVILVKDKKALVVDVTVRFEYKEDGLRKAKEKASYYS--DLTEPIIELTK---AKKVNY
 PlaMe DLIFVKEEMALVVDVTVRFEYKEKFEDAAAEKVRHYK--DLTSQIKELTG---AKEIEY
 PBla DYIFTKERTAMVVDITVRWEGKMGGLEEAQEKIKYYE--ELRDTIQKEWG---VKDISF
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LaMa VPPVLLSSRGLLYGSPGRGLRTMGLTSRDLCD----LCLLAVAGSLKCYDAYTRGT-----
 NePa VPVVIISARGLLFNKSGQGLRDLGLTRRDISD----ICLLSIIGSLKSYDLYKRGTLDDFR
 CroHe LPVIVSNRGLCYQPSGDGLRALGLTSRDISD----LCLLAIISGSLRCYDLYMRGTRAV--
 DeFu HGFIVGCRGTWPTCNNNLLDKLGIQYPNPFK--KNICFTTMDTLKMFQIFMDN-----
 AgTri MGFPLGARGKWYTGNFELLNTLGLSKSRQVRVAKTLSTVALLSSVDIVHMFASRRRVQ-
 GaGa FGFPIGARGKWHADNGEVLSELGLSRKERVARLLSWRALLGSVDMVNIFASKHRQETL
 SPun FGLPIGARGKWPPENNLLRELGMEEGRVKRLARLFSRLTLLYSTNMLHMFENIGKGQKA
 PlaMe FGFPLGARGKWPEINEKVLTAIGMPDYQKQRTAKRFKSKRTLLYSIDVINTFENIGKNNK-
 PBla HGFVCGARGKWPDQNFILTKLGIESHRLDGLAKLFSRRTVQYSCRMLHTFERDKKNQTG
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LaMa -----
 NePa RTKPR---SGIG
 CroHe -----
 DeFu -----
 AgTri -----DSG-
 GaGa LDDAPACVEHVA
 SPun Y-----FVNSNL
 PlaMe -----NNVP
 PBla HVDC-----

Figure S12: Multiple sequence alignment of R2 proteins selected for activity testing: LaMa (*L. marequensis*, Largescale yellowfish), NePa (*N. papilliferus*, killifish), DeFu (*D. fucus*, Northern dusky salamander), CroHe (*C. o. helleri*, Southern Pacific Rattlesnake), PBla (*P. blainvillii*, Blainville's Horned Lizard), SPun (*S. punctatus*, Tuatara), GaGa (*G. gangeticus*, Gharial crocodile), AgTri (*A. tricolor*, Tricoloured blackbird) and PlaMe (*P. megacephalum*, Big-headed turtle). Myb2 domain highlighted in orange. N-terminal ZnFs annotated with red asterisk.