

**Supplementary File S8**

**Coefficient of Type I and Type II functional divergence among EMP orthologs.**

<b>A</b> Reptiles + Mammals	Type I				Type II		
Reptiles vs. Mammals	$\Theta_1$	$\Theta_1$ SE	$\Theta_1$ LRT	P value	$\Theta_2$	$\Theta_2$ SE	P value
AMBN*	0.63	± 0.08	61.75	< <b>0.01</b> *	-0.17	0.24	0.24
AMEL	0.23	± 0.18	1.67	0.14	-0.04	0.18	0.41
ENAM*	0.56	± 0.05	110.08	< <b>0.01</b> *	-0.88	0.28	< <b>0.01</b> *

<b>B</b> Reptiles ONLY	Type I				Type II		
Croc vs. Squamates	$\Theta_1$	$\Theta_1$ SE	$\Theta_1$ LRT	P value	$\Theta_2$	$\Theta_2$ SE	P value
AMBN	0.001	± 0.02	0.000	1.0	0.035	0.1s	0.36
AMEL	0.93	± 0.96	1.62	0.20	0.065	0.12	0.29
ENAM	0.51	± 0.29	3.04	0.08	-0.05	0.1	0.31

<b>C</b> Reptiles ONLY	Type I				Type II		
Snakes vs. Lizards + Crocodylians	$\Theta_1$	$\Theta_1$ SE	$\Theta_1$ LRT	P value	$\Theta_2$	$\Theta_2$ SE	P value
AMBN*	0.55	± 0.14	14.53	< <b>0.01</b> *	-0.002	0.106	0.49
AMEL	0.001	± 0.02	0	1.0	-0.076	0.141	0.29
ENAM*	0.50	± 0.10	24.09	< <b>0.01</b> *	-0.117	0.109	0.14

<b>D</b> Reptiles ONLY	Type I				Type II		
Snakes vs. Crocodylians	$\Theta_1$	$\Theta_1$ SE	$\Theta_1$ LRT	P value	$\Theta_2$	$\Theta_2$ SE	P value
AMBN*	0.49	± 0.86	1.28	0.26	0.366	0.049	< <b>0.01</b> *
AMEL*	0.45	± 0.44	0.39	0.53	0.221	0.062	< <b>0.01</b> *
ENAM*	0.999	± 0.38	6.75	< <b>0.01</b> *	0.304	0.044	< <b>0.01</b> *

\* Indicates significant divergence of either Type I or Type II;  $\Theta_1$  values represent ThetaML

# AMBN-Mammals + Reptiles – Type I divergence sites highlighted

CLUSTAL format alignment by MAFFT (v7.370)

60

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Allig_sinensis -----
Allig_mississip -----
Crocodilus_poro -----
Gharial -----
Caiman -----
Tursiops M-----
Sus M-----
Bos_taurus M-----
Ursus M-----
Equus M-----
Homo M-----
Cavia M-----
Rattus M-----
Mus M-----
Monodelphis M-----AREQNV-----EKRREDSVQSL-----GVLP
Ornithorhynchus MIPLIVAQVGAQGAILLSSEELIFTGLFIQPLAPGRMAPIGQDNPEDQDQVLP TGQSGMSP
Aspidoscelis MK-----
Boa_constrictor -----
Python_mulurus -----
Cobra -----
Thamnophis -----
Crotalus_horrid -----
Crotalus_mitche -----
Protobothrops -----
Vipera -----
Pantherophis -----
Ophisaurus -----
Shinisaurus -----
Pogona -----
Anolis -----
Eublepharis -----
Gekko_japon -----
MournGecko -----

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120

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Allig_sinensis -----MNVWML-MLCL
Allig_mississip -----MNVWML-TLCL
Crocodilus_poro -----MNVWML-TLCL
Gharial -----MNVWML-TLCL
Caiman -----MNVWML-TLCL
Tursiops -----PALKIPLFKMKDMIL-ILCL
Sus -----PALKIPLFKMKDMVL-ILCL
Bos_taurus -----PALKIPLFKMKDMIL-ILCL
Ursus -----SALKIPLSKMKDLIL-ILCL
Equus -----PALKIPLFKMKDLVL-ILCL
Homo -----SASKIPLFKMKDLIL-ILCL
Cavia -----SPSKIPLFKMKDLML-FLSL
Rattus -----SASKIPLFKMKGLL-FLSL
Mus -----SASKIPLFKMKGLIL-FLSL
Monodelphis -----PLTRS-----LDWYLQALG-----TRLKPVVKKSLFKMKDLLL-MLCL
Ornithorhynchus ATQDPPEDQPP TASGLLDESEVTL PANLQGVSLTTEESTTEEP RGP TLK MENLVL-ILSL
Aspidoscelis -----DLKQWIL-FSWL
Boa_constrictor -----MKQWIF-VLCL
Python_mulurus -----MKQWIF-VLCL
Cobra -----MKQWTF-VLCL
Thamnophis -----MKQWTF-VLCL
Crotalus_horrid -----MKQWIF-ALCL
Crotalus_mitche -----MKQWIF-ALCL
Protobothrops -----MKQWIF-ALCL
Vipera -----MKQWIY-VLCL
Pantherophis -----MKQWTF-VLCL
Ophisaurus -----MKQWIL-VSCL
Shinisaurus -----MKQWILVVSCL
Pogona -----MKQWIL-VSSL
Anolis -----MKQWML-VSSL
Eublepharis -----MQRWIL-VSCL
Gekko_japon -----MQRWIL-VSCL
MournGecko -----MQRWIL-VSCL

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175 177

Allig\_sinensis LGTGFALP---MYPQHTGT-----RGMASMSLE-MRQYGR-QNMNMLPQYGR-YDYGEFF  
 Allig\_mississip LGTGFALP---MYPQHTGT-----RGMASMSLE-MRQYGR-QNMNMLPQYGR-YDYGEFF  
 Crocodilus\_poro LGTGFALP---MYPQHTGT-----RGMASMSFE-MRQYGR-QNMNMLPQYGR-YDYGEFF  
 Gharial LGTGFALP---MYPQHTGT-----RGMASMSLEKMRQYGR-QNMNMLPQYGR-YDYGEFF  
 Caiman LGTGFALP---MYPQHTGT-----RGMASMSLE-MRQYGR-QNMNMLPQYGR-YDYGEFF  
 Tursiops LKMSSAVP---VFPRQPGT-----PGMASLSLETMRQLGSLQGLNMLSQYSR-FCGCKSF  
 Sus LKMSSAVP---AFPRQPGT-----PGVASLSLETMRQLGSLQGLNMLSQYSR-FCGCKSF  
 Bos\_taurus LKMSSAVP---AFPRQPGI-----PGMASLSLETMRQLGSLQGLNMLSQYSR-FCGCKSF  
 Ursus LGMSSAVP---VFPRQPGT-----PGMASLSLETMRQLGSLQGLNMLSQYSR-FCGCKSF  
 Equus LEMGSAVP---AFPRQPGI-----PGMASLSLETMRQLGSLQGLNMLSQYSR-FCGCKSF  
 Homo LEMSFVAVP---FFPQQSGT-----PGMASLSLETMRQLGSLQGLNMLSQYSR-YGFCCKSF  
 Cavia LKISFVAVP---AFPRQPGAPNMAPPGMASLSLETMRQLGSLQGLNMLSQYSR-FCGCKSL  
 Rattus VKMSLAVP---AFPRQPGAQGMAPPGMASLSLETMRQLGSLQGLNMLSQYSR-LGFCKAL  
 Mus VKMSLAVP---AFPRQPGAQGMAPPGMASLSLETMRQLGSLQGLNMLSQYSR-LGFCKAL  
 Monodelphis LGTCSALP---ILPRHAGI-----PGMGISLEGMRLGGPSIPNIFPQYATYSYADPF  
 Ornithorhynchus FGTSFAIP---VFLQPGGP-----PGMGSLLETMRHLGN---LNLLPQFSR-FCGCKQF  
 Aspidoscelis LGTCSALP---XXXXXXXX-----XXXXXXXXXXXXXXXXXXXXXXXXXXL---YTYADPF  
 Boa\_constrictor LGTCSALP---ILPRHAGI-----PGMGISLEGMRLGGPSIPNIFPQYATYSYADPF  
 Python\_mulurus LGTCSALP---ILPRHAGI-----PGMGISLEMMRKLGGGIPQEDVTYAPYSYADPF  
 Cobra LGTCSALP---ILPRHAGI-----PGMGISLEGMRLGGPSIPKVLVQYGTYSYADPF  
 Thamnophis LGTCSALP---VLPRHAGI-----PGMGISLEGMRLGGPNVVKVLPQYGTYSYADPF  
 Crotalus\_horrid LGTCSALP---ILPHHAGI-----PGMGISLEGMRLGGPSISKVLPQYGTYSYADPY  
 Crotalus\_mitche LGTCSALP---ILPHHAGI-----PGMGISLEGMRLGGPSISKVLPQYGTYSYADPY  
 Protobothrops LRTCSALP---ILPHHAGI-----PGMGISLEGMRLGGPSISKVLPQYGTYSYADPY  
 Vipera LGTCTALP---ILPHHAGI-----PGMGISLEGMRLGGPSISKVLPQYGTYSYADPY  
 Pantherophis LGTCSALP---ILPRHAGI-----PGMGISLE-----YGTYSYADPF  
 Ophisaurus LGTCSALP---ILPQHAGI-----PGLGISLERLRQFGRPNMNPV---QYAQPYTYADPF  
 Shinisaurus LGTCSALP---IRPQHAGI-----PGIGSISLEGMRLGGPNVLPQYAPYTYADPF  
 Pogona LGTCSALP---ILPQHAGI-----PGLGISLETMRQMGGRNPNALSQYAMPYSYADLF  
 Anolis LGTCSALP---LFPQHAGI-----PGMGISLERTRQLGGLNIPPAVFPQ-ALPYSYADPF  
 Eublepharis LGTCSAMP---MLPQHAGI-----PGMGISLXXXXXXXXXXXXXXXXXXYARHYSYADPF  
 Gekko\_japon LEICSAMP---ILLQHSKI-----PGIGSISLEXXXXXXXXXXXXXXXXXXYARHYTYADPF  
 MournGecko LEICSAMP---ILLQHSKI-----PGIGSISLEXXXXXXXXXXXXXXXXXXYARHYTYADPF  
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183 191

Allig\_sinensis NSVWLHGLLP HSS-FPWLQRRPQERETQYQYAMPVHPPPLPSQQTPLQPPQPRLQAQN  
 Allig\_mississip NSVWLHGLLP HSS-FPWLQRRPQERETQYQYAMPVHPPPLPSQQTPLQPPQPRLQAQN  
 Crocodilus\_poro NSVWLHGLLP HSS-FPWLQRRPQEHETQYQYAMPVHPPPLPSQQTPLQPPQPRLQAQN  
 Gharial NSVWLHGLLP HSS-FPWLQRRPQEHETQYQYAMPVHPPPLPSQQTPLQPPQPRLQAQN  
 Caiman NSVWLHGLLP HSS-FPWLQRRPQEHETQYQYAMPVHPPPLPSLQTPPLQPPQPRLQAQN  
 Tursiops NSLWMHGLLP HSS-FPWW--RPREHETQYQYSLPVHPPPLPSQPS-LQPQPG---QK  
 Sus NSLWMHGLLP HSS-FQWM--RPREHETQYQYSLPVHPPPLPSQPS-LQPQPG---QK  
 Bos\_taurus NSLWMHGLLP HSS-FPWW--RPREHETQ-----QPS-LQPQPG---QK  
 Ursus NSLWLHGLLP HSS-FPWW--RPREHETQYQYSLPVHPPPLPSQPS-LQPQPG---QK  
 Equus NSLWMHGLLP HSS-FPWW--RPREHETQYQYSLPVHPPPLPSQPS-LQPQPG---QK  
 Homo NSLWMHGLLP HSS-LPWW--RPREHETQYQYSLPVHPPPLPSQPS-LKPQPG---LK  
 Cavia NSLWLQGLLP HSS-FPWL--RPREHETQYQYSLPVHPPPLPSQPS-QPPQPG---MK  
 Rattus NSLWLHGLLP HNS-FPWI--GPREHETQYQYSLPVHPPPLPSQPS-LQPHQPG---LK  
 Mus NSLWLHGLLP HNS-FPWI--GPREHETQYQYSLPVHPPPLPSQPS-LQPHQPG---LK  
 Monodelphis TSLWMHGLLP HSS-FPWW--QPREHETQYQYALPVHPPPLPSQQT-LQPQKSG---QK  
 Ornithorhynchus NSLWMHGFLLP HSN-YPWL--SPRDQETQYQYALPVHPPPLPSQRT-LQPQPK---QN  
 Aspidoscelis APFWIRNFLRP HSS--YWIK-IPQ----QYQYSLPVHPPPLPSQQTPTIPQFAGRODNP  
 Boa\_constrictor HSMWMMHFLP HSS-FYLIRQRPQ-PETQYQYSLPVHPPPLPS-QTPTLLQPPGPIEQP  
 Python\_mulurus HSMWMMHFLP HSS-FYLIRQRPQ-HETQYQYSLPVHPPPLPS-QTPTLLQPPGPIEQP  
 Cobra HSMWMMHFLP HSS-FYLIRQRPQ-HETQYQYSLPVHPPPLPS-QTPTLLQPPGPIEQP  
 Thamnophis HSMWMMHFLP HSS-FYLIRQRPQ-HETQYQYSLPVHPPPLPS-QTPTLLQPPGPIEQP  
 Crotalus\_horrid HSMWMMHFLP HSA-FYLIRQRPQ-DETQYQYSLPVHPPPLPS-QTPTLLQPPGPIEQP  
 Crotalus\_mitche HSMWMMHFLP HSA-FYLIRQRPQ-HETQYQYSLPVHPPPLPS-QTPTLLQPPGPIEQP  
 Protobothrops HSMWMMHFLP HSS-FYLIRQRPQ-HETQYQYSLPVHPPPLPS-QTPTLLQPPGPIEQP  
 Vipera HSMWMMHFLP HSS-FYLIRQRPQ-HETQYQYSLPVHPPPLPS-QTPTLLQPPGPIEQP  
 Pantherophis HSMWMMHFLP HSS-FYLIRQRPQ-HETQYQYSLPVHPPPLPS-QTPTLLQPPGPIEQP  
 Ophisaurus HSMWMMHFLP HSS-FYWKRRPQEHETQYQYSLPVHPPPLPSQQTPTLLQPPGVIEQH  
 Shinisaurus HSMWMMHFLP HSS-FYVWMSRRPQEHGTQYQYSLPVHPPPLPSQQTPTLLQPPGPIEQP  
 Pogona FPEWMMHFLP HSS-FYWLQRRPQDHETQYQYSLPVHPPPLPSQQTPTLLQRRPPIEQP  
 Anolis HSMWGRSFLP HTF-LWMTQGGPQRQDTQYQYAMPVHPPPLPSLQTPPIQFAEPRLEQP  
 Eublepharis H-VWIHFLP HSSPPYWGKRRIDHDHTQYQYSLPVHPPPLPSQQTPI--LHHGVQEQF  
 Gekko\_japon H-MWMMHFLP HSSPSFWGKRRLEHEDTQYQYSLPVHPPPLPSQQTPL--QPPGPIEQP  
 MournGecko H-MWMMHFLP HSSPSFWGKRRLEHEDTQYQYSLPVHPPPLPSQQTPL--QPPGPIEQP  
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242 244 257 274 278  
 Allig\_sinensis PSLR-STLP--S-KQGQ-IQQNEVLPPVQVGQPLQQGELPGI--QQLVPAEKQ--LQLP  
 Allig\_mississip PSLH-STLP--S-KQGQ-IQQNEVLPIQVGQPLQQGELPGI--QQLVPAEKQ--LQLP  
 Crocodilus\_poro PSLH-SMLP--S-KQGQ-IQQNDVLPPIQVGQPLQQGELPGI--QQLIPADKQ--LQLP  
 Gharial PSLH-SMLP--S-KQGQ-IQQNEVLPIHVGQPLQQGELPGI--QQLIPADKQ--LQLP  
 Caiman PSLR-STLP--T-KQGQ-IQLNEALLPVQVGQPLQQGELPGI--QQLIPADKQ--LQLP  
 Tursiops PFLQPTVVT--S-VQNT-VQKGIQPPPIYPGHPPLQQSEGPMI--QQVAPSEKPSKTELP  
 Sus PFLQPTVVT--S-IQNF-VQKGVQPPIYQGHPLQQVEGPMV--QQVAPSEKPPAEELP  
 Bos\_taurus PFLQPTVVT--S-MQNA-VQKGVQPPIYQGHPLQQVEGPMV--EQVAPSEKPPTELP  
 Ursus PFLQSAIVT--D-IRDT-APKGGPQRVYQGGPPLQQGEGPML--EQVAPSDKPPKAELP  
 Equus AFLQPTIVT--SGIQDT-IQKGGHQPPIYQGHPLQQSEGPMV--QQVAPSDKPPKAELR  
 Homo PFLQSAAT--T-NQAT-ALKEALQPIHLGHLPLQEGELPLV--QQVAPSDKPPKPELP  
 Cavia HFQOPTAAT--A-IQDT-PQKAGPQPMHPRQLPLKDAELPEA--HEQVAPTEMLNPELP  
 Rattus PFLQPTAAT--G-VQVT-PQKPGPHPMHPGQLPLQEGELIAPDEPQVAPSENPPTEVP  
 Mus PFLQPTAAT--G-VQVT-PQKPGPQPMHHPGQLPLQEGELIAPDEPQVAPSENPPTEVP  
 Monodelphis SFLQSSPAP-----DA-AQHGVPLPLNQEQSHMQPEKDGAG--QQPGLPLGNAGRPELP  
 Ornithorhynchus AFLPPTVAP--S-AQGFPAQNGDPQPPILHLQPLQQGEEKPSV--QEQVAPKRPKPELP  
 Aspidoscelis HYLQTNRIP--A-RQIQ-LQQYNF-----PFLQLEGNQPGI-----PSDRQ-NEQLP  
 Boa\_constrictor NHHYTHFIP--T-RQLQ-TQHYDVQPVFQPKQFSPSEGNPPDI--QQQLSPSDRQ--TQQLP  
 Python\_mulurus HHHYTHFIP--T-RQMQ-IQHYDVQPAFQPKQFSPSEGNQPDV--QQQSPSDRQ--TQQLP  
 Cobra HHHYAHFLP--T-RQVQ-IQHYDVQPPFHPKQFSPSEGNQLGV--QQQLS-LDRH-AQQLP  
 Thamnophis HHHYAHFLP--T-RQVQ-MQHYDVQPPFHPKQFSPSEGNQPDV--QQQLS-LDRQ-AQQLP  
 Crotales\_horrid NHHYTHFIP--T-RQVQ-IQHYDVQPAFQPKQFSPSEGNQPDV--QQQLS-LDRQ--TQQLP  
 Crotales\_mitche PHHYTHFIP--T-RQVQ-IQHYDVQPAFQPKQFSPSEGNQPDV--QQQLS-LDRQ--TQQLP  
 Protobothrops PHHYTHFIP--T-RQVQ-IQHYDVQPAFQPKQFSPSEGNQPDV--QQQLS-LDRQ--TQQLP  
 Vipera PHHYTHFIP--T-RQVQ-IPHYDVQPAFQPKQFSPSEGNQPDV--QQQLS-LDRQ--TQQLP  
 Pantherophis HHHYAHFLP--T-RQVQ-LQHYDVQPPFHPNPFSPSEGNQPD-----LS-LDR-----  
 Ophisaurus RHPFINLSP--T-RQVQ-LQQYDMQPPFQONPYALPEGNQPV--QQQLPPDRQ--TQQM-  
 Shinisaurus HHSFTHLIP--T-RQVQ-LHRQYDMQPPFQONPYALPEGNQPV--QQQLPPDRQ--TQQM-  
 Pogona HMQFTDLTP--T-MQAO-LQQYEMQPPFQQ--TFLPEGNQPVVQKRRPPLDRQ--TQXX  
 Anolis FFIQITNLIP--T-RQVQ-IPRYAIQPSIQQ-TFQQVEAHPVDPQQPLPAERQ--THQ--  
 Eublepharis PHLVNTNQPST-RQGG-LQQYDIQPPFQKLFQAEQHHPVV--QQLLPLDRQ--TQLP  
 Gekko\_japon PHLLANQIPYTP-RQIQ-PQQYDMQPPFQKPFLLQPEGRHPVV--QQLQLPDRQ--MQQLS  
 MournGecko PHLLANQIPYTP-RQIQ-PQQYDMQPPFQKPFLLQPEGRHPVV--QQLQLPDRQ--MQQLS

Allig\_sinensis AL-EYSGHLGQM-----MYPLVHQLVHQGPMQPPQQSAL  
 Allig\_mississip AL-EYSGHLGQM-----MYPVHQLVHQGPMQPPQQPAL  
 Crocodilus\_poro AL-EYSGHLGQV-----MYPVHQLVHQGPMQPPQQPAL  
 Gharial AL-EYSGHLGQM-----MYPVHQLVHQGPMQPPQQPAL  
 Caiman AL-EYSGHLGQV-----MYPVHQLVHQGPMQPPQQPAL  
 Tursiops GM-NFADPQDPS-----MFPVIA-RLISLGPVQNKPPPL  
 Sus GL-DFADPQDPS-----MFPVIA-RLISQGPVQDKPSPL  
 Bos\_taurus GM-DFADLQDPP-----MFPVIA-HLISRGPMQNKPSQL  
 Ursus GM-DFADPEGPS-----VFQVIA-RLISQGPMPQNKPSPL  
 Equus EM-DFPGPQDDPQ-----MFPVIA-RLIARGPMPQNKQAPL  
 Homo GV-DFADPQGSPLPGMDFPDPQGPSPLGLDFADPQGSTIFQVIA-RLISHGMPQNKQSPL  
 Cavia VL-DFADPQIPS-----VFQVIA-RFVSRVPVQNKPAML  
 Rattus IM-DFADPQFPT-----VFQVIA-HLSIRGPMAHNKVPTF  
 Mus IM-DFADPQFPT-----VFQVIA-RSISRGPMAHNKASAF  
 Monodelphis EM-DFAGQLGQS-----MFPVGM-RLISQGPQKAEKAPL  
 Ornithorhynchus AL-DFTVQLRQS-----IFPIAQKLISQGPQKAEQSPL  
 Aspidoscelis AIQEYLGTLGQ-----RGPPQDLVQQPQQQPV  
 Boa\_constrictor AVQEYSGTLGQA-----IYPGL-FGTQONSARQPQQRSI  
 Python\_mulurus AIQEYSFK-NIM-----IYPGL-FGTQONTAQQPQQRSI  
 Cobra AIQDYSGT-LSQ-----IYPGL-LGTQONTAQQPQQRSI  
 Thamnophis AIQDYSGT-LGQ-----IYPGL-FGTQONTAQQPQQRSI  
 Crotales\_horrid VIQDYSGT-LGQ-----IYPGL-FGTQONTAQQPQQRSI  
 Crotales\_mitche VIQDYSGT-LGQ-----IYPGL-FGTQONTAQQPQQRSI  
 Protobothrops AIQDYSGT-LGQ-----IYPGL-FGTQONTAQQPQQRSI  
 Vipera AIQDYLGT-LGQ-----IYPGL-FGTQONTAQQPQQRPI  
 Pantherophis -----XX-----XXXXX-XXXXQNTAQQPQLQSI  
 Ophisaurus ---ELNKT-QRS-----HHHND-LXXXXXXXXXXXXXXXXM  
 Shinisaurus ---EPNKT-QHN-----HHSNN-LXXXXXXXXXXXXXXXXM  
 Pogona XX-XXXXXXXXXX-----IYGL-LHGNQDQQAQPPQQSI  
 Anolis -----IYPAL-HGTQDPSQQLQQQSI  
 Eublepharis FQ-EYSATLGQA-----IYPSL-LGTPQEPVQPPQQRSI  
 Gekko\_japon FQ-EYLRTLQGT-----IYPGL-LTTPQDPPVQPPQQQSI  
 MournGecko FQ-EYLRTLQGT-----IYPGL-LTTPQDPPVQPPQQQSI

364 370 396 401402  
Allig\_sinensis HPALFYMSYAAANQGG-APARL-GIVSSEEMLGGRGVPAYGAMIP-----GFRGMPQD  
Allig\_mississip HPALFYMSYAAANQGG-APARL-GIVSSEEMLGGRGVPAYGAMIP-----GFRGMPQD  
Crocodylus\_poro HPALFYMSYCANQGG-APARL-GIVSSEEMLGGRGAPAYGAMIP-----GFRGMPQD  
Gharial HPALFYMSYAAANQGG-APARL-GIVSSEEMLGGRGAPAYGAMIP-----GFRGMPQD  
Caiman HPALFYMSYAAANQGG-APARL-GIVSSEEMLGGRGVPAYGAMIP-----GFRGMPQD  
Tursiops YPGIFYMSYCANQLN-APARL-GIMSSEEMAGGGGCPMAYGAMFPFGGMRPGLGGMPPN  
Sus YPGMFYMSYCANQLN-SPARL-GILSSEEMAGGRGCPLAYGAMFPFGGMRPNLGGMPPN  
Bos\_taurus YPGIFYVTYCANQL-----GGRGDPLAYGAIFPGFGMRPRLGGMPHN  
Ursus YPGIFYMSYCANQLN-APGRL-GIMSSEEMAGGRGCPMAYGAMFPFGGMRPNLGGMPHN  
Equus YPGLFYLYTYCANQLN-TPGRL-GIMSSEEMAGGRGCPMAYGAMFPFGGMRSSLRGMPPN  
Homo YPGMLYVPPFCANQLN-APARL-GIMSSEEVAGGRECPMAYGAMFPFGGMRPGFEGMPHN  
Cavia YPGMVYMSYGTNQL-----GGRVAPVTYGGLLPLGTGVRHTIRRVQD  
Rattus YPGMFYMSYCANQLN-APARI-GFMSSEEMPGERGCPMAYGTLFPGYGGFRQTLRGLNQN  
Mus YPGMFYMSYCANQLN-APARI-GFMSSEEMPGERGCPMAYGTLFPFRFGGFRQTLRRLNQN  
Monodelphis DPGMFYMPYCANRLN-APARF-GLLSSEEMGGGRGTPMGYAMFP---GMKSGFGGMPPN  
Ornithorhynchus YPELVYVPPFCANQQNAAPARL-GKVSSEEMPGGGGPLAYGSIFFPGFGSMRPGFGAMQIN  
Aspidoscelis HPNLQYMSYVANQGG-APARL-GIVSSEEMQGGGFCAPAYQAMSPDVFAMNAGFGNMKPR  
Boa\_constrictor YPNLQYMSYIANQG--APTRL-GVVSSEEMQGGGFCAPAYRAAGPHLFPMDARFGNIPLN  
Python\_mulurus YPSLQYMSYVANQG--APTGL-GIVSSEEMQGGGFCAPAYRAAGPHLFPMDARFGNMPLN  
Cobra YPNLQYMSYVANKG--APTRL-GIVSSEEMQGGGFCAPAYRAAGPHVFPMDARFGNMPLN  
Thamnophis YPNLQYMSYVANKG--VPTL-GIVSSEEMQGGGFCAPAYQATGPHGFPIDARFGNMPLN  
Crotales\_horrid YPNLQYMSYVANKE--APARL-GIVSSEEMQGGGFCAPAYRAAGPHVFPMDARFGNMPLN  
Crotales\_mitche YPNLQYMSYVANKG--TPARL-GIVSSEEMQGGGFCAPAYRAAGPHVFPMDARFGNMPLN  
Protobothrops YPNLQYMSYVANKG--APARL-GIVSSEEMQGGGFCAPAYRAAGPHVFPMDARFGNMPLN  
Vipera YPNLQYMSYVANKG--APTRL-GIVSSEEMQGGGFCAPAYRAAGPHVFPMDARFGNMPLN  
Pantherophis YPNLQYMSYIANKG--VPTL-GIVSSEEMQGGGFCAPAYRAAGSHGFPMDARFGNMPLN  
Ophisaurus YPSLYLPPYVANQGG-APARL-GIVSSEEMQGGGFCAPAYRAGGNLFPMNTRFVNMPQN  
Shinisaurus YPSLYMPYIANQGG-APARL-GIVSSEEMQGGGFCAPAYRAASPDLFAMDARFGNMPLN  
Pogona YPNLYMPYVANQGA-APGRL-GIVSSEEMQGGGFCPPAYQAPGPDLFATDARLRHMALN  
Anolis YPSLYMPYVANQGA-APARQ-GIVSSEEMQGGGFCAPAYRAPGPDLFAMDTRFGNSPLN  
Eublepharis YPSLYMPYVANQGA-APGRLGIVSSEEMQGGGFCAPAYRAMSPDFFGMSAGFGNPPPN  
Gekko\_japon YPSMYLZYAAANQGA-APATL-GIVSSEEMQGGGFCAPAYRAMSPDFFSMGAGFGSPQD  
MournGecko YPSMYLZYAAANQGA-APATL-GIVSSEEMQGGGFCAPAYRAMSPDFFSMGAGFGSPQD  
\* : \* : : \* : \* :

438 462  
Allig\_sinensis P-ALQGDFTTEDDNP-ATAHNPAIQGGANQGPSRGSQFPVAVNPAGHGSA-ILLPEGIPAG  
Allig\_mississip P-ALQGDFTTEDDNP-ATAHNPAIQGGANQGPSRGSQFLAVNPAGHGSA-ILLPEGIPAG  
Crocodylus\_poro P-ALQGDFTTEDDNP-ATAHNPAFQGGANQGPSRGSRFPALNPAGHGSA-ILFPEGTPAG  
Gharial P-ALQGDFTTEDDNP-ATAHNPAFQGGANQGPSRGSRFPALNPAGHGSA-IFLPEGTPAG  
Caiman P-ALQGDFTTEDDNP-ATAHNPAIQGGANQGFSRGSRFPVAVNPAGHGSA-ILLPDGTPAG  
Tursiops P-AMGGDFTLEFDSPAAGTKGPEKGEQGAQDQD----PVPEANPADLENP-ALLSELAPGA  
Sus S-AKGGDFTLEFDSPAAGTKGPEKGEQGAQGS----PVAEANTADPEP-ALFSEVASGV  
Bos\_taurus P-DMGGDFTLEFDSPAAGTKGPEKGEQGAQDS----PVPEANLADPEP-ALLSELAPGA  
Ursus P-AMGGDFTLEFDSPAAGTKGPEKGEQGAQGS----PMPDGPANLENP-DLLPGVAPGA  
Equus P-AMGGDFTLEFDSPAAGTKGPEKGEQGAQGS----PAKEADANPENQ-ALLSEIASGP  
Homo P-AMGGDFTLEFDSPAAGTKGPENEEQAQGS----PMPEANPDLENP-AFLTELEPAP  
Cavia P-TMAGDFTLEFDTP-AATKGPEKGEQGAQGS----PLHETGEDPEN-ALLSQIAPGA  
Rattus S-PKGGDFTVEVDSPVSVTKGPEKGE-GPEGS----PLQEANPDKGENP-ALLSQMAPGA  
Mus S-PKGGDFTVEVDSPVSVTKGPEKGE-GPEGS----PLQEANPDKREN-ALLSQMAPGA  
Monodelphis P-AMGGDFTLEHDQPTGKNKSPGVAEQAQDS----PGPKGNPKNLEKP-AFLPEEIPVA  
Ornithorhynchus P-ALGKDFTELEDDSP-TVAGKPPQGGEVLGS----PRDGAIPAGHPNP-GLLPERISRL  
Aspidoscelis I-GQPGDYTVEDDQL-GITEQPDVQGGVNMGP-----NPPQTGNN-MNPID---GQ  
Boa\_constrictor R-GQPGDYTVEDDQL-GITEQPEVQGGANLGS-----NPSRGN- VIPVD---GN  
Python\_mulurus R-GQPGDYTVEDDQL-GITEQPEVQGGANLGS-----NPSRGN- VIPVD---GN  
Cobra N-GQPGDYTVEDDQL-GITEQPEVQKGVKLGPE-----NPPNRGN- VIPVD---IN  
Thamnophis R-GQPGDYTVEDDQL-GITEQPEVQKGANPGP-----NPLDRGN- VIPVD---IN  
Crotales\_horrid R-GQPGDYTVEDDQL-GITEQPEVQKGSNLGP-----NPSDRGN- LIPVD---SN  
Crotales\_mitche R-GQPGDYTVEDDQL-GITEQPEVQKGSNLGP-----NPSDRGN- LIPVD---SN  
Protobothrops R-GQPGDYTVEDDQL-GITEQPEVQKGSNRGP-----NPSDRGN- LIPVD---SN  
Vipera R-GQPGDYTVEDDQL-GITEQPEVQKGSNLGP-----NPSDRGN- VIPVD---SN  
Pantherophis R-GQPGDYTVEDDQL-GITEQPKVPKANLGP-----NPPDRGN- VIPVD---IN  
Ophisaurus I-GQPGDYTVEDDQL-GITEQPELQGGANLGA-----NPSAKRNN-GIPLD---GN  
Shinisaurus R-GQPGDYTVEDDQL-GITEQPEVQGGANLGA-----NPSGKNN- VIPLD---GS  
Pogona ---QPGDYTVEDDQL-GITEQPDVQKGGANVGA-----NPAGKGN- ISPLE---GN  
Anolis ---QPGDYTVEDDQL-GITEQPDVQKGGANVGA-----NPSGKNN- AVLLD---GT  
Eublepharis RLGQPGDYTVEDDQL-GITEQPDVQGGANPAA-----NPSGNGNS-VVSLN---NN  
Gekko\_japon RLGQPGDYTVEDDQL-GITEQPEVQGGAKQAA-----NPSGNNVVSVNG---NN  
MournGecko RLGQPGDYTVEDDQL-GITEQPEVQGGAKQAA-----NPSGNNVVSVNG---NN

Allig\_sinensis QEG-FLPNI--NDMPGQGVNVPVQ-RGTLG-VIPTA TAPELTQGI PDSFMTFGA-EGIVP **513516** **534** **538**  
 Allig\_mississip QEG-FLPNI--NDMPGQGVNVPVQ-RGTLG-VIPTA TAPELTQGI PDSFMTFGA-EGIVP  
 Crocodilus\_poro QEG-FLPNI--NDMPGQEVNVPVQ-RGTLG-VIPTA AAPELTQGI PDSFMPFGA-EGIVP  
 Gharial QEG-FLPNI--NMMPGQEVNVPVQ-RGTLG-VIPTA AAPELTQGI PDSFMPFGA-EGIVP  
 Caiman HEG-FLPNI--NDMPGQGVNVPVQ-RGTPE-VIPTA TAPELTQGI PDSFMTFGA-EGIVP  
 Tursiops LGG-LLANP-KGNIPNLARGPAGQSRGFLR-VI PAAADPLMTPGLADVYETYSA-DETTT  
 Sus LGG-LLANP-KGKIPNLARGPAGRSRGGPPG-VI PAAADPLMTPGLADAYETYGA-DETTT  
 Bos\_taurus LEG-LLANP-EGNIPNLARGPAGRSRGLRGV PAAADPLMTPGLAEVYETYGA-DETTT  
 Ursus LGG-LLAHP-KDEPGLARGPAGQSGGPPR-VI PAAADPLMTPGLADLYETYGA-DVITP  
 Equus LGG-LLALP-KGSVPNLARGPAGQSRGPPR-VI PAAADPLMTPGLAEAYETYGA-DVITP  
 Homo HAG-LLALP-KDDIPGLPRSPSGKMKGLPS-VI PAAADPLMTPGLADVYRTYDA-DMTTS  
 Cavia HTG-LFGFP-NDNVPSMARGPSGHRNRPLE-VI PV TADPLITPELAEVYETYGG-DVITP  
 Rattus HAG-LLAFP-NDHIPNMARGPAGQR--LLG-VI PAAADPLITPELAEVYETYGA-DVITP  
 Mus HAG-LLAFP-NDHIPSMARGPAGQR--LLG-VI PAAADPLITPELAEVYETYGA-DVITP  
 Monodelphis QGG-ILSFP-KGRISLGGGPGQVKGFLR-GI SPTPESGITPGPSDITETFGT-DITTP  
 Ornithorhynchus RSGAALTFF-SDFI PHRGQGPAGQSKLPPG-VI PPAADPLMTPGSPDLEFFEG-DGITP  
 Aspidoscelis QGG-TLLNA-NSNL----QNSLAQSKGLLG-AA QVTANPLATQGLPDTFLPFGA-DT---  
 Boa\_constrictor PGV-ALPNA-NNNL----LNPAGQSKGQPG-AA QATALPPAT---HDSFIPLEAADTAMP  
 Python\_mulurus LGV-ALPNV-NNNL----LNPAAQSKGQPS-AA QATALPPAT---HDSFIPLEAADTAMP  
 Cobra PRD-ALPNA-NSNL----LNPAGQSKGQPN-AA QATALPPAI---PDSFIPLEASSTEMP  
 Thamnophis PRV-ALPNANNNV----LNPAGQSKGQPN-AA QATALPPVT---PDSFIPLEATSTEMP  
 Crotales\_horrid PRV-ALPNA-HNNL----LNPAGQSKGQPN-AA QATVLPPIAI---PDSFTPLEATSTEMP  
 Crotales\_mitche PRV-ALPNA-HNNL----LNPAGQSKGQPN-AA QATVLPPIAI---PDSFTPLEATSTEMP  
 Protobothrops PRV-ALPNA-HNNL----LNPAGQSKGQPN-AA QATVLPPIAI---PDSFTPLEATSTEMP  
 Vipera PRV-ALPNA-HNNL----LNPAGQSKGQPN-AA QATVLPPIAI---PDSFTPLEATSTEMP  
 Pantherophis PRV-ALPNA-NNNL----LNPAGQSKGQPN-AA QATALPPAT---PDSFTPLEATSTEMP  
 Ophisaurus QGG-AVPNA-NSNL----LNPAGQSKGQTG-AA QATI I PLATQGFPSFLPLDAADPTAMP  
 Shinisaurus QGG-AVPNG-NSNL----FNPAGQSK-----AQATVNPLVTQGLPDSFIPPLDAADTAMP  
 Pogona PAIGASPNA-NSYL----LHPAGQSKGFLG-EE QATGGPLAPEGLP----VVDAGTAMP  
 Anolis QGG-ALPNA-NSHL----FSPAGQSGLSG-LAQATAAPHATQG---PFLPLDAADPSMP  
 Eublepharis LGG-ALSNA-NSNL----MNPAGQSQGPAG-GI QATVNPLVTQGLPDSFVPPFEA-DTAMP  
 Gekko\_japon PGG-ALS---NSNL----MNPAGQSKGPGG-ME QATVNPLATQGLPDSFIPFEA-DTAMP  
 MournGecko PGG-ALS---NSNL----MNPAGQSKGPGG-ME QATVNPLATQGLPDSFIPFEA-DTAMP

Allig\_sinensis LGIQKEVTVEPTMFPEAQHTLMAGNGAEQPQVMQDVVWHFQEP  
 Allig\_mississip LGIQKEVTVDPTMFPEAQHTLMAGNGAEQPQVMQDVVWHFQEP  
 Crocodilus\_poro LGIQKEVTVDPTMFPEAQHTLMAGNGAEQPQVMQDAWHFQEP  
 Gharial LGIQKEVTVDPTMFPEAQHTLMAGNGAEQPQVMQDAWHFQEP  
 Caiman LGIQKEVTADPTMFPEAQHTLMAGNGAEQPQVMQDVVWHFQEP  
 Tursiops LGLQEETTVDSTVTPDSQHTSMGPKAQQPQIKHDAWHFQEP  
 Sus LGLQEEMTMDSTATPYSEHTSMGPKAQQPQIKRDAWRQEP  
 Bos\_taurus LGLQEETTVDSTATPDQTHTLMRPNKAQQPQIKHDAWHFQEP  
 Ursus L---EETPTDITAVPDTQQTLMPEKAAQQPQIMHDVWHFQEP  
 Equus LDFEEETTDTTPTVTPESPQTSMPGNEAEQPQMVHDAWRQEP  
 Homo VDFQEEATMDTMAPNSLQTSMPGKAEPEMMHDAWHFQEP  
 Cavia LG---EATMETMTPTDTPQTPMPGNKVRQPQMVHEPWHFQEP  
 Rattus LG-DGEATMDITMSPDTQQPMPGNKVHQPQV-HNAWRQEP  
 Mus LG-DGEATMDITMSPDTQQPLLPGNKVHQPQV-HNAWRQEP  
 Monodelphis LGMLEEGPLDITIEPDTHTTSVQGNESQQPQIMQDVVWHFQEP  
 Ornithorhynchus LGLQREALLDITMTPTDQSTYMPGNEAQQMVTQDQWQFQEP  
 Aspidoscelis L-----DPTMLPDAMATT---NVAGYPQVQGDMMWHFQEP  
 Boa\_constrictor L-----DPTMFPDSFFSTASAGNEVGPQVQVQNSWHFQEP  
 Python\_mulurus L-----DPTMFPDSFYST-GGNEAGPQLSQNSWHFQEP  
 Cobra L-----DPTMFPDSFYSTASAGNEAGQPQVIQSSWHLQEP  
 Thamnophis L-----DPTMFPDSFYSTASAGNEAGQPQVQSSWHLQEP  
 Crotales\_horrid L-----DPTMFPDFFYSTASAGNEPGQPQVQSSWHLQEP  
 Crotales\_mitche L-----DPTMFPDFFYSTASAGNEPGQPQVQSSWYHQEP  
 Protobothrops L-----DPTMFPDFFYSTASAGNEPGQPQVQSSWHLQEP  
 Vipera L-----DPTMFPDFFYSTASAGNEPGQPQVQSSWHLQEP  
 Pantherophis L-----DPTIFPDPFYSTASAGNEAGQPQVQSSWYHQEP  
 Ophisaurus L-----DPTMFPDAIYTTNAVNEAGQPQVQGDVWHFQEP  
 Shinisaurus L-----DPTMFPDAIYTTNVGNEAGQPQVQGDVWHFQEP  
 Pogona L-----DPTTFPDPTMFPDVTGNGAGLSPIGQDMWHFQEP  
 Anolis L-----DATMFPD-LYTSNVGNEAGLAQVQDAWHFQEP  
 Eublepharis L-----DPTMSPDAIYTPQTGYEAGQP---QDGWHFQEP  
 Gekko\_japon L-----DPTMYPDAIYTAQAGNEVGRPQIGQDGWHFQEP  
 MournGecko L-----DPTMYPDAIYTAQAGNEVGRPQIGQDGWHFQEP

# ENAM-Mammals + Reptiles – Type I divergence sites highlighted

CLUSTAL format alignment by MAFFT (v7.370)

60

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Ornithorhynchus MGRGTEANGGTETQRFQVQTPQGTSGMGEIRGQILKLKEATINHCQILKKKTLWIRSRKD
Monodelphis M-----LLHQGNH-
Mus_musculus M-----LLLQCRN-
Rattus M-----LLLQCRN-
Cavia M-----RLLHCRK-
Homo M-----LVLRCRL-
Equus M-----LLLPCRH-
Ursus M-----LLQYRH-
Bos -----MLLQCRH-
Sus -----MLLSCRH-
Tursiops M-----LLHCRH-
Allig_mississip -----
Allig_sinensis -----
Gharial -----
Crocodilus_nilo -----
Crocodilus_poro -----
Aspidoscelis -----
Shinisaurus -----
Ophisaurus -----
Anolis -----
Eublepharis -----
MournGekko -----
Gekko_japon -----
Python -----
Boa_constrictor -----
Vipera -----
Protobothrops -----
Crot_horrid -----
Crot_mitch -----
Thamnophis -----
Cobra -----
Pantherophis -----
Pogona -----

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120

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Ornithorhynchus CKWSFHHFQKWVQVLLGLGNRPSGLMVNLGKARVASSATGTGSPTAPLPWHRIYAFDFGS
Monodelphis -----RTFSPE-----
Mus_musculus -----PTSPPK-----
Rattus -----TASPPK-----
Cavia -----GASFPPK-----
Homo -----GTSFPPK-----
Equus -----GTSFPPK-----
Ursus -----GASLPK-----
Bos -----EASSPK-----
Sus -----GASSPK-----
Tursiops -----EASSPK-----
Allig_mississip -----
Allig_sinensis -----
Gharial -----
Crocodilus_nilo -----
Crocodilus_poro -----
Aspidoscelis -----
Shinisaurus -----
Ophisaurus -----
Anolis -----
Eublepharis -----
MournGekko -----
Gekko_japon -----
Python -----
Boa_constrictor -----
Vipera -----
Protobothrops -----
Crot_horrid -----
Crot_mitch -----
Thamnophis -----
Cobra -----
Pantherophis -----

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Ornithorhynchus YILLELTRYWQAVHQEFKFSGEDKHLN TVQIREANEYKD VYICAEGVGIARGKMKSFLLF
Monodelphis --LVDV-----VPRGKMKTLMLF
Mus_musculus --PCGL-----V PNVKMS-LLVF
Rattus --PCDM-----V KMS-LLVF
Cavia --LYNL-----V P NGKMKMLLVF
Homo --LDNL-----V PKGKMKILLVF
Equus --LDDL-----V P SGKMKILLVF
Ursus --LDNL-----V P SGKMKILLVF
Bos --LDYL-----V P SGKMKILLVF
Sus --LDNL-----V P SGKMKILLVF
Tursiops --LDNL-----V P SGKMKSVLVF
Allig_mississip -----MFLQF
Allig_sinensis -----MFLQF
Gharial -----MFLQF
Crocodylus_nilo -----MFLQF
Crocodylus_poro -----MFLQF
Aspidoscelis -----MKLILLY
Shinisaurus -----XXXXXXXX
Ophisaurus -----MKLILLF
Anolis -----MKQLLLY
Eublepharis -----MKIIVLC
MournGekko -----MKIILMY
Gekko_japon -----MKIILMY
Python -----MKLILLY
Boa_constrictor -----MKLILLY
Vipera -----MKLILLY
Protobothrops -----MKLILLY
Crot_horrid -----MKLILLY
Crot_mitch -----MKLILLY
Thamnophis -----MKLILLY
Cobra -----MKLILLY
Pantherophis -----MKLILLY
Pogona -----MKLFLVLY
    
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Ornithorhynchus LGLFGASTAMP--MHMPRMPGFSGSKSEEMMPY-QQYNFMNSPHMAQL-GPL--YGYGL--
Monodelphis LSLFSCSIAMP--MQMPRMGGFSGSKSEEMMRY-QQYSFMNPHMAHL-GPL--YGYNI--
Mus_musculus LGLLGVSAAAMPQMPMPRMPGFSGSKSEEMMRY-NQFNFMNAPPMMPM-GP---YGNMMPM
Rattus LGLLGVSAAAMP--MPMPRMPGFSGSKSEEMMRY-NQFNFMNAPPMHM-GP---WQNGLPM
Cavia LGLLGNSAAMP--MYMPRMPGFSGSKSEEMMRY-GQFNFMNPPMAPM-GPMGPYNGY--
Homo LGLLGNSVAMP--MHMPRMPGFSGSKSEEMMRY-NQFNFMNPHMAHL-GPF--FGNGL--
Equus LGLLGNSVAMP--LQMPRI PGFSGSKSEEMMRY-GQFNFMNSPHMAQL-GPM--YGNM--
Ursus LGLLGNSVAMP--MQMPRMPGFSGSKSEEMMRY-GQFNFMNSPHMAQL-GPL--YGNM--
Bos LSLLGYSIAMPLQMHMPRI PGFSGSKSEEMMRY-GHFNFMNPHLAHL-SPF--YNGI--
Sus LGLLCYSAAMP--MQMPRMPGFSGSKSEEMMRY-GHFNFMNPHMAHL-GTL--YGNM--
Tursiops LGLLCYSIAMP--MQMPRMPGFSGSKSEEMMRY-GHFNFMNSPQMVHL-GPL--YGNM--
Allig_mississip LCLFGMSIAMP--MRLPRKAGFGSGSKSEEMMQY-QQYAYMNSPAM---NPF--YGYGS--
Allig_sinensis LCLFGMSIAMP--MRLPRKAGFGSGSKSEEMMQY-QQYAYMNSPAM---NPF--YGYGS--
Gharial LCLFGMSIAMP--MRLPRKAGFGSGSKSEEMMQY-QQYAYMNSPAM---NPF--YGYGS--
Crocodylus_nilo LCLFGMSIAMP--MRLPRKAGFGSGSKSEEMMQY-QQYAYMNSPAM---NPF--YGYGS--
Crocodylus_poro LCLFGMSIAMP--MRLPRKAGFGSGSKSEEMMQY-QQYAYMNSPAM---NPF--YGYGS--
Aspidoscelis ACLMGSSCAAL--LRKPRQAGFGSGSKSEEMMQFGGPFYGLNSPHLAHLAASL--YGFRS--
Shinisaurus XXXXXXXXXXXX--LRKPRKAGFGSGSKSEEMMQF-GPYGYINSPQLA---ASL--YGYRA--
Ophisaurus LCLVGTSCAVP--LRKPRKAGFGSGSKSEEMMQF-GPYSYMNSPQLAQLAASL--YGYRA--
Anolis LCLIGTSWAVR--LRKPRKAGFGSGSKSEEMMQY-GPYGYINSPQLTQLAASL--YGYRS--
Eublepharis LCLV SITCAIP--LRKPRKAGFGSGSKSEEMMQF-GPYSYMNSPQLAPL---L--YGYRP--
MournGekko LCLVGTSCAIL--LRKPRRAGFGSGSKSEEMMQF-GPYAYMNSPQLSPF---L--YGYRP--
Gekko_japon LCLVGTSCAIL--LRKPRRAGFGSGSKSEEMMQF-GPYAYMNSPQLSPF---L--YGYRP--
Python LCLVGISYAGP--LRKPRRAGYSGSKSEEMTQF-GPYGYIQSPQVT---GPF--YGYHS--
Boa_constrictor LCLVGISYAGP--LRKPRKAGYSGSESEEMMQF-SPYGYIHSQVA---GSF--YGYHS--
Vipera LCLVGISYAGP--LRKPRRAGYSGSKSEEMMQF-GPYGYINSPQVA---GSF--YG----
Protobothrops LCLVGISYAGP--LRKPRRAGYSGSKSEEMMQF-GPYGYINSPQVA---GSF--YGYP--
Crot_horrid LCLVGISYAGP--LRKPRRAGYSGSKSEEMMQF-GPYGYINSPQVA---GSF--YGYP--
Crot_mitch LCLVGISYAGP--LRKPRRAGYSGSKSEEMMQF-GPYGYINSPQVA---GSF--YGYP--
Thamnophis LCLVGMSYAGP--LRKPRRAGYSGSKSEEMMQF-GPYGNINSPQIA---GSF--YGYHS--
Cobra LCLVGISYASP--LRKPRRAGYSGSKSEEMMQF-GPYGYINSPQIA---GSF--YGYHS--
Pantherophis LCLVGMSYAGP--LRKPRKAGYSGSKSEEMMQF-GPYGYINSPQIA---GSF--YGYHS--
Pogona LCLVGTSCAIP--LRKRRKAGFGSGSKSEEMMPF-GAYGFLNSPQLSQAASL--YGYRP--
    
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Ornithorhynchus --QL-PQFFQPPQM-PPWPQPPPNWPA-QNPGPPQGGKPKQ-AKPGQSQ----NTKQPNP  
 Monodelphis --RL-PQQFPQIQM-PVWPQPPNWLPRIPC-HRTYQDH-RKAGEGQ----EIPRPSQ  
 Mus\_musculus PPHM-PPQYPPYQM-PMWPPVPNGW---QQ---PPMPNFP-SKTDQIQ----ETAKPNQ  
 Rattus PPHM-PPQYPPYQM-PMWPPVPNGW---QQ---PPMPNFP-SKTEQIQ----ETAKPNQ  
 Cavia --QI-PPYPQYPMPPMWPPLPSGW---QN---PPVPOHQ-TKTDQIQ----ETQKPNQ  
 Homo ----PQQFPQYQM-PMWQPPPNWHP-RK---SSAPKRH-NKTDQIQ----ETQKPNQ  
 Equus --QLPQLFPPQYQM-PMWQPPAIMGRP-KKSS-PSIQKPKQ-SKTDQAP----ETMPNPN  
 Ursus ----PPVFPQYQM-PMWQPPPNMGLH-QKSSPPSAPKRQKSKTDQIP----ETQPNNE  
 Bos --QL-PQLFPPQYQM-PMWQPPPNKKSP-QK---PSSPAAP-KQTDQAP----ETSPNPN  
 Sus --QL-PQFFPQYQM-PMWQPPPNKKHP-QK---PSASKQK-SKTDQAP----ESQKPNQ  
 Tursiops --QL-PQLFLPYQM-PMWQPPPNKKRP-QKPSSPSAPKHQ-SKTDQAP----ETQKPNQ  
 Allig\_mississip --SY-PQIFQQQ---PVWPQQQLYLWQQ-QKPVQPPAIQIQ-QKPRQIQ----RSPQPSR  
 Allig\_sinensis --SY-PQVFQQQ---PVWPQQQLYLWQQ-QKPVQPPAIQIQ-QKPRQIQ----RSPQPSR  
 Gharial --SY-PQVFQQQ---PVWPQQQLYLWQQ-QKPVQPPAIQIQ-QKPRQIQ----RSPQPSK  
 Crocodilus\_nilo --SY-PQVFQQQ---PVWPQQQLYLWQQ-QKPVQPPAIQIQ-QKPRQIQ----RSPQPSR  
 Crocodilus\_poro --SY-PQVFQQQ---PVWP-QQLYLWQQ-QKPVQPPAIQIQ-QKPRQIQ----RSPQPSR  
 Aspidoscelis --RQ-PPLFPQ-----LPQRQFLMWQQ-QTPGHQAARLPE-RKLHKAP----GVKHPNM  
 Shinisaurus --SY-PQMFSQ---PISPLQRFFLWQP-QTPVHQAARLPE-QKPHQTP----VAKQPNP  
 Ophisaurus --GY-PQMFPQQ---PGSPLQGFYLWQP-QTPVHQAARLPE-LKPHQTP----VAEQPNS  
 Anolis --GF-PQMVPQQ---PTFPLQRFFYLWQP-QMPVHQASARPPQ-QKAHQTP----VPKPNP  
 Eublepharis --SY-PQLFPQ-----PRQRFYIWPQ-QTPAHQAARLPE-RKPHQTP----AARQPIQ  
 MournGekko --SY-PQLFPQ-----PLQRFFYLWQP-QTPVHQAARLPE-RKPHQTL----GARQPIH  
 Gekko\_japon --SY-PQLFPQ-----PLQRFFYLWQP-QTPVHQAARLPE-RKPHQTL----GARQPIH  
 Python --SY-PQIFPKW---PILPLQRFFIWPQPAPSHQAARLPE-KKPQQTP----GTKQSNQ  
 Boa\_constrictor --SY-PQMFSQW---PILPLQRFFPWPQPASPTHQAARLPE-QKPPQTP----GIKQPNQ  
 Vipera ---Y-PQMFSQW---PILPLQRFFLWQPSATPAHQASARLPE-QKPPQIP----GTKQPNQ  
 Protobothrops --GY-PQMFSQW---PTLPLQRFFLWPPSATPAHQASARLPE-QKPPQIP----RTKQPNQ  
 Croc\_horrid --GY-PQMFSQW---PILPLQRFFLWQSTTPAHQAARLPE-QKPPQIP----GTKQPNQ  
 Croc\_mitch --GY-PQMFSQW---PILPLQRFFLWQSTTPAHQAARLPE-QKPPQIP----GTKQPNQ  
 Thamnopis --NY-PQMLPQW---PVLPLQRFFLWQPSASPVHQAARLPE-QKLQIP----GTKQPNQ  
 Cobra --N-PQMFSQW---PILPLQRFFLWQPSASPTHQAARLPE-QKPPQIP----RTKQPNQ  
 Pantherophis --NY-PQMFPQW---PVLPLQRFFLWQPSASPVHQAARLPE-QKPPQIP----ETKKPNQ  
 Pogona --SY-LQLFPQQ---SMPPLSRPSLWQQ-QMPAHEAARFES-QNPHRLPQQPSAARRPNS

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Ornithorhynchus -----SQ-----P-KKPPQ--QQ-PPKQAAKQAPAGPS-----  
 Monodelphis -----PL-----P-TKPPT--T---PKPPTKQSPGEP-----  
 Mus\_musculus -----TN-----P-QEP----Q-PQKQPLKEPPNEAA-----  
 Rattus -----TD-----P-QEP----Q-PQKQPLKEPPNEAA-----  
 Cavia -----TQ-----P-QKP-----PEKQPSNQPPENPP-----  
 Homo -----TQ-----S-KKP-----PQKRPLKQPSHNQP-----  
 Equus -----TQ-----P-KKS-----PPKQPAQ-----T-----  
 Ursus -----PQ-----P-KKP-----PPKQPLKQPPPTPA-----  
 Bos -----PQ-----P-TDS-----PPNQHLLKQPSTTTA-----  
 Sus -----PQ-----P-KTP-----TPKQPLNEPSPTPT-----  
 Tursiops -----PQ-----L-KQP-----LPEHPLKQPSPTPT-----  
 Allig\_mississip -----PQPQPQPRPQPRPQPSQ--QP--AKPKPKQPKQKPP--PTQPAHPSHSQPPAQ  
 Allig\_sinensis -----PQPQPQPRPQPRPQPSQ--QP--AKPKPKQPKQKPP--PTQPAHPSHPQPPAQ  
 Gharial -----PQPQPQPRPQPRPQPSQ--QP--AKPKPKQPKQKPP--PTQPAHPSRPQPPAQ  
 Crocodilus\_nilo -----PQPQPQPRPQPRPQPSQ--QP--AKPKPKQPKQKPP--PTQPAHPSRPQPPAQ  
 Crocodilus\_poro -----PQPQPQPRPQPRPQPSQ--QP--AKPKPKQPKQKPP--PTQPAHPSRPQPPAQ  
 Aspidoscelis -----RSQPKPQLP--P--QPRR--QQ--PQPKMPQLPKLPQ--NTNPSQ--T--QQVVPVQ  
 Shinisaurus -----RPQPRPQLL--P--QQPRY--QQ--PQPKMQPPKQPKQ--NIRPTQ--TRQQVPIQ  
 Ophisaurus -----RPQARPQLP--P--QQPRY--QQ--PQAKIQQPSKPPQ--NTRPTQ--THQQVVPVQ  
 Anolis -----RPRLKPRLV--P--QQPRY--QQ--PQPKIHLPKQKPPVATHFPQ--PQPQTPVQ  
 Eublepharis -----RPKLQPMQPPQ--HKPIQ--QQ--PHPKIQPPKPP--STSSPQ--IHHQGPVY  
 MournGekko RPQLPQLRPLRPLRQMPQPP--HKPIQ--QQ--PRPRIQLPPKPP--NTSPPQ--TPHQVPPVH  
 Gekko\_japon RPQLPQLRPLRPLRQMPQPP--HKPIQ--QQ--PRPRIQLPPKPP--NTSPPQ--TPHQVPPVH  
 Python -----RPQ---LP--P-RQPRP--QQPPPPQ---PKQFQ--KTNPSH--THQVPMQ  
 Boa\_constrictor -----RPQ---LP--P-QQPRY--QQ--PQ-----PKQFQ--KTNPSQ--IYPQVPIQ  
 Vipera -----RPQ---LP--P-QQPRY--QQ--PQPL----PKQFQ--KTKPSQ--TYPQVFFX  
 Protobothrops -----RPQ---LP--P-QQPRY--QQ--PQPL----PKQFQ--KTNPSQ--TYPQVFFQ  
 Croc\_horrid -----RPQ---LP--P-QQPRY--QQ--PQPL----PKQFQ--KTNPSQ--TYPQVFFQ  
 Croc\_mitch -----RPQ---LP--P-QQPRY--QQ--PQPL----PKQFQ--KTNPSQ--TYPQVFFQ  
 Thamnopis -----RPQ---LP--P-QQPRY--QQ--PQPL----PKQFQ--KTNPSQ--TYPQVFFQ

344

Cobra -----RPQ---LP--PQQPRY--QQ--PQPL----PKLPQ-KTNPSQ-TYPQVFPQ  
 Pantherophis -----RPQ---LP--P-QQPRY--QQ--PQPL----PKQPQ-KTNPSQ-TYPQVFPQ  
 Pogona -----RPQPKLQLP--P-QQPTHQVQQ--PQIKVQQPPKLPBSAADPSQ-PQPQLP--

420

Ornithorhynchus KPT-EE-----TRQPQMYPPFGNGFFP-----FQLQPWQIPP-----  
 Monodelphis RPK-EE-----DQPPQYPPFGNGMFP-----FHQPWHIPQF--YNQGGFSPSPNNP  
 Mus\_musculus RAK-DD-----AQPQFPPFPNGLYP-----YQPPWPPIQ-----  
 Rattus RAK-DE-----AQPQFPPFPNGLYP-----YQPPWPPIQ-----  
 Cavia KDK-AD-----AQPQFPPFPNGLYP-----FQPPWPPIQ-----  
 Homo QPE-EE-----AQPQAFPPFGNGLFP-----YQPPWPPIQ-----  
 Equus QAE-EE-----AQPQAFPPFGNGLFP-----YHQPWPQVPH-----  
 Ursus QPE-EE-----TQPQAFPPFGNGLFPFNSGLYQPPWPQVPH-----  
 Bos PQQEEE-----TQTPQAFPPFGNGLFP-----YQPPWHIPH-----  
 Sus QPE-EE-----TQTPQAFPPFGNGLFP-----YQQLPWHVPH-----  
 Tursiops QPQ-EE-----TQTPQAFPPFGNGLFP-----YQQLPWHVPH-----  
 Allig\_mississip PRNEEK-----QLSPQVYFPYSNAHFP-----YQPPWHIPQI--YNQGGFLPQ-LNP  
 Allig\_sinensis PRNEEK-----QLSPQKCIYPSNAHFP-----YQPPWHIPQI--YNQGGFLPQ-LNP  
 Gharial PRNEEK-----QLSPQVYFPYSNAHFP-----YQPPWHIPQI--YNQGGFLPQ-LNP  
 Crocodilus\_nilo PRNEEK-----QLSPQVYFPYSNAHFP-----YQPPWHIPQI--YNQGGFLPQ-LNP  
 Crocodilus\_poro PRNEEK-----QLSPQVYFPYSNAHFP-----YQPPWHIPQI--YNQGGFLPQ-LNP  
 Aspidoscelis QPKARKEQQQQQQQVLP-----YLQPPWHFPQI--FRQGFQF--FGP  
 Shinisaurus QPKWGN-----QQPQALFP-----HLQPPWHFPPI--FGHGGFQPPFRP  
 Ophisaurus QPKRGN-----QPPQAFPP-----HPQPPWHFPQI--FGHGGFQPPSFGP  
 Anolis PPKGEK-----PQPQAFPP-----HPQPPWHFPQI--FGHGGFQPPFLNP  
 Eublepharis QSKRVQ-----PQPQILFP-----RQYPPWHFPQI--FNQGGFHPQPSFGP  
 MournGekko QSKGVK-----QQPQILFP-----NQHLWHFPQI--LSQGGFHPQPSFP  
 Gekko\_japon QSKGVK-----QQPQILFP-----NQHLWHFPQI--LSQGGFHPQPSFP  
 Python HPTEGK-----QHPQAFAP-----YPQPPWHFPQI--FGAGGFQPPQFGP  
 Boa\_constrictor HPKEGK-----QQPQAFPP-----YPQPPWHFPQI--FGPGCFQPPQFGP  
 Vipera XXXXXX-----XXXXXGFP-----YSQPPWHFPQI--YVSRGFHPRHL-S  
 Protobothrops HPKEGK-----QQPQGFPP-----YPQPPWHFPQI--FGPRGFQPKHFGS  
 Croc\_horrid HPKEGK-----HQPPQGFPP-----YLQPPWHFPQI--FGSRGFQPKHFGS  
 Croc\_mitch HPKEGK-----QQPQGFPP-----YPQPPWHFPQI--FGSRGFQPKHFGS  
 Thamnophis YPTEGK-----QQPQGFPP-----YSQPPWHFPQI--FGSRGFQPKRSQG  
 Cobra HPKEGK-----QQLQQPQGFPP-----YSQPPWHFPQI--FGPRGFQPKHYGS  
 Pantherophis HPKEGK-----QQPQGFPP-----YSQPPWHFPQI--FGPRGFQPPQYGS  
 Pogona -----DLQSKAFLP-----HQPPWHFPQI--FGHGGFQPPQMFGP

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480

Ornithorhynchus ---QM-PP--GYRPPGSNEEGGNPYFGYFGHQGFGGRPPYYSEEMKEE-----EKES  
 Monodelphis FHGRM-PP--GYRPPVSNEEGGNPYFGYFGYHGFGRPPYYSEEMFEQDFEKKP-EEDP  
 Mus\_musculus ---RG-PP-TAFGRPKFSNEE-GNPYYAFFGYHGFGR-PYYSEEMFE-DYEKKP-EKDP  
 Rattus ---TG-PP-TGFRPKFSNEE-GNPYYAFFGYHGFGR-PYYSEEMFE-DYEKKP-EKDP  
 Cavia ---RMPPP--GYRPPISNEEGGNPYFGYFGYHGFGR-PYYSEEMFE-DYEKKP-EEDP  
 Homo ---RLPPP--GYRPPISNEEGGNPYFGYFGYHGFGRPPYYSEEMFEQDFEKKP-EEDP  
 Equus ---RL-PP--GYRPLGSNEEGGNPYFGYFGYHGFGRPPYYSEEMFE-DFEKKP-EEDP  
 Ursus ---RV-PP--GYRPPGSNEEGGNPYFGYFGYHGFGRPPYYSEEMFEQDFEKKP-EEDP  
 Bos ---KI-PP--GFRPPSNEEGGNPFFGFFGYHGFGRPPYYSEEMFE-DFEKKP-EEDP  
 Sus ---RI-PP--GYRPPSNEEGGNPYFGYFGYHGFGRPPYYSEEMFEQDFEKKP-EKDP  
 Tursiops -----PP--GYRPPVSNEEGGNPYFGYFGYHGFGRPPYYSEEMFEQDFEKKP-EKDP  
 Allig\_mississip QHRQM-PP--GFGQPPISNEEGGNPYGY-FFQGLGQRPPYYSEEMFEHEYDKPKPEKEA  
 Allig\_sinensis QHRQM-PP--GFGQPPISNEEGGNPYGY-FFQGLGQRPPYYSEEMFEHEYDKPKPEKEA  
 Gharial QHRQM-PP--GFGQPPISNEEGGNPYGY-FFQGLGQRPPYYSEEMFEHEYDKPKPEKEA  
 Crocodilus\_nilo QHRQM-PP--GFGQPPISNEEGGNPYGY-FFQGLGQRPPYYSEEMFEHEYDKPKPEKEA  
 Crocodilus\_poro QHRQM-PP--GFGQPPISNEEGGNPYGY-FFQGLGQRPPYYSEEMFEHEYDKPKPEKEA  
 Aspidoscelis YQGHM-P---LGRPPVSNEE-GTPYFGY-GFHGLGGRPPYYSEEMFEQDFEKKP-EKDP  
 Shinisaurus YQGHV-P---FGRPPVSTEE-GTPHYGY-GFQGMGRPPYYSEEMFEQDFEAK-EKEA  
 Ophisaurus YQGRM-P---FGRPPAS-EE-GTPYFGY-GYQG---RPPYYSEEMFEQDFEKKP-EKEP  
 Anolis YQGHM-P---FGRPPAS-EE-GNPYFGP-GYQGMGRPPYYSEEMFEQE-----DKEA  
 Eublepharis FQGSMP-PP--GFGHPPISNEE-GTPYGY-GYHGLGNRRPYNSEE-FENDYEKKP-EKEA  
 MournGekko FHGRM-PA--GFRPPISNEE-GTPYGY-GYPGLGVR-PYNSEE-FEQDYEKKP-EKEA  
 Gekko\_japon FHGRM-PA--GFRPPISNEE-GTPYGY-GYPGLGVR-PYNSEE-FEQDYEKKP-EKEA  
 Python YQRHM-P---FGRPPISNEE-GTPYFGY-GYHGLGNRLPYSEEMFEQDFEKKP-EKDS  
 Boa\_constrictor YQGHM-P---FGRPPVSNEE-GTPYFGY-GYHGLGNRPPYYSEEMFEQDFEKKP-EKDP  
 Vipera AMGHM-P---FGQPPVSNEE-GTPYFGY-GYHGLGNRPPYYSEEMFEQDFEKKP-EKEP  
 Protobothrops YQGHM-P---FGQPPVSNEE-GTPYFGY-GYHGLGNRPPYYSEEMFEQDFEKKP-EKEP  
 Croc\_horrid YQGHM-P---FGQPPVSNEE-GTPYFGY-GYHGLGNRPPYYSEEMFEQDFEKKP-EKEP  
 Croc\_mitch YQGHI-P---FGQPPVSNEE-GTPYFGY-GYHGLGNRPPYYSEEMFEQDFEKKP-EKEP

478

Thamnophis YCHHM-P----FGQPPVSNEE-GTPYFGY-GYHGLGNRSPYYSEEMFEQDFEKKP-EKEP  
Cobra YQGHI-P----FGQPPVSNEE-GTPYFGY-GYHGLGNRPPYYSEEMFEQDFEKKP-EKEP  
Pantherophis YQGHM-P----FGQPPVSNEE-GTPYFGY-GYHGLGNRPPYYSEEMFEQDFEKKP-EKEP  
Pogona YQGR-T-PLGRPLGRPHVSNEE-GAPYFGY-GYHGMGHRPP-YSEEMFEQDFEPPV-EKEP  
\* \*: \* \* : \* \* . . \* \* \* \* \* \* \* : : .

492  
Ornithorhynchus PKED-----SPPEPTANSTVAETNSTQPSGSPQAGSQGGNATDPGQS-AGNGSPAQTTPG  
Monodelphis PKVE-----STPAAPTNSTVPETNSTQATVPVSSGQGGNETST---TGNEAEVQNPG  
Mus\_musculus PKPEDPPDDPPEASTNSTVPDANATQSI---P---EGGNDTSP---IGNTGPSPNAG  
Rattus PKPEDPPDDPPEASTNSTVPDANATQSI---PGGQGGNDSSP---VGNTPGPNAG  
Cavia PKPE-----DPSEPSANSTVPETNSTQLT-----NQKNDTGP---TLNSIPGLNTG  
Homo PKAE-----SPTEPTANSTVTETNSTQ---PNPKGSQGGNDTSP---TGNSTPGLNTG  
Equus PKAE-----SPATEPSSNSTVPENNSTQPNAPNPRGSQGGNDTSP---TGNSGYGPNTV  
Ursus PKKE-----SPAAPVSNSTGPETNSTQSNAPIPGGSQGGNDTSP---TG-----PNM-  
Bos PKTE-----TPATDPSVNSTVPETNSTQPGAPSFRAGQGGNDTSP---AGNNGQDPNTV  
Sus PKTE-----TPATEPSVNTTVPETNSTQPNAPNPR---GNDTSP---TGTSQGPNPR  
Tursiops PKTE-----SPATDPSVNSTVPETNSTQSNAPNPRGSQGGNDTSP---TGNSVQGSNTV  
Allig\_mississip PKEE-----SPAAPVSNATVPVVSTTTPSPSPSQQGQGGNATHPGVSAGENGTPSQNPE  
Allig\_sinensis PKEE-----SPAAPVSNATVPVVSTTTPSPSPSQQGQGGNATHPGVSAGGNGTPSQNPE  
Gharial PKEE-----SPAAPVSNATVPVVSTTTPSPSPSQQGQGGNATHPGVSAAGSGTPSQNSE  
Crocodilus\_nilo PKEE-----SPAAPVSNATVPVVSTTTPSPSPSQQGDRGGNATHPGVSAGGSGTPSQNPE  
Crocodilus\_poro PKEE-----SPAAPVSNATVPVVSTTTPSPSPSQQGDRGGNATHPGVSAGGSGTPSQNPE  
Aspidoscelis -----PAPDPATNSTVSDTNSTLSNPP---SQGENATLSGLSTS--GANSVPLE  
Shinisaurus PK-----ATDPATNSTVSDTNSTISNPA---NQGGNATISGLSTSTNSGANSPLDQ  
Ophisaurus PK-----TDPPTNSTVSDTNSTISNPA---SQGGNATISGLSTTMNGANSPLGQ  
Anolis PK-E-----SPATDPTNSTVSDTNSTISNPA---SQGGNATISGLSTSTNSGANSPLGQ  
Eublepharis PKTE-----SPATDPTNSTVSDTNSTISNPA---SQGGNATISGLSTSTNSGANSPLGQ  
MournGekko PNTE-----SPAADPATNAT--DTNSTLSNPS---SQAGNATNSGLSVDTSGANSPLNE  
Gekko\_japon PNTE-----SPAADPATNAT--DTNSTLSNPS---SQAGNATNSGLSVDTSGANSPLNE  
Python PK-E-----NPADPTNSTVSDTNSTI--PA---SHGGNATLSGLSPTNNEANFPLGVP  
Boa\_constrictor PK-E-----NPADPTNSTVSDTNSTI--PA---SHGGNATLSGLSPTNNEANFPLGVP  
Vipera PK-E-----NPASDPTNSTVSDTNSTI--PA---SHGGNATLSGLSPTNNEANF----  
Protobothrops PK-E-----NPASDPTNSTASDTNSTI--PA---SHGGNATLSGLSPTNNEANF----  
Crot\_horrid PK-E-----NPASDPTNSTASDTNSTI--PA---SHGGNATLSGLSPTNNEANF----  
Crot\_mitch PK-E-----NPASDPTNSTASDTNSTI--PA---SHGGNATLSGLSPTNNEANF----  
Thamnophis AK-E-----NPASDPTNSTVSDTNSTI--PA---SHGGNATFSGLSPTNNEANFPLGS  
Cobra PK-E-----KPASDPTNSTVSDTNSTI--PA---SHRENATLSGLSPTNNEANFPLGS  
Pantherophis PK-E-----NPASDPTNSTVSDTNSTI--AA---SNGGNATLSGLSPTNNEANFPLGS  
Pogona AK-E-----TPATNPVNSTVADTNTTVSNPA---SQGGNATISEPIATGNGANPLGLQ  
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556  
555 574 597  
Ornithorhynchus HGTVPDNGE-PPGPLLNASDHGGARGPKPTGPGPPGPPFRGRPANPN-AAPGFPAGQRR  
Monodelphis -----I-NLAPAVNVSGQDGPDS--QVPPGYQPTILENSPNPN--LRGFPISSQW  
Mus\_musculus NNPTVQNGV-FPPPKVNVSGQGVPKS--QIPWRPSQPNIYENYPYPN-----YPSEQW  
Rattus NNPTVNLGV-FPLPKVNVSGQGVPKN--QIPWRPSQPNIYENYPYPN-----YPSEQW  
Cavia NNPTVQNGI-FPLPTVNFSGQVIPGS--QIPWKPNQPNYGSYKPN--IRNPSGSQS-  
Homo NNPPAQNGI-GPLPAVNASGQGGPDS--QIPWRPSQPNIYENYPYPN--IRNFPSPGRQW  
Equus SNRTVQNGV-ILPPTVNVSGQVIPRR--QIPWRPSQPNIYENYPNPN--IRNFPARQW  
Ursus ---AQNGV-NSSPTVNVSGQAVPRT--QIMWGSQPNIYENYPNPN--NRNFPVGRQW  
Bos SNPTVQNN----PVMVNSGQGVPRS--QTPWRPSQNIYENYPYPN--IRNFPAGRQW  
Sus SNPTGQNG----PAVNVSGQGVPRS--QSPWGRQTIYIYENYPNPN--IRGFPARQW  
Tursiops SNPTAQNS----PVMVNSGQGVPRS--QTPQGSQNIYENYPNPN--IRSFPAQRQW  
Allig\_mississip NKPAGVNET-TPSPTVNISSPQEPGSEGVQPQNGPEQPNARRNAPTLD-IIQRFPANRQW  
Allig\_sinensis NKPAGVNET-TPSPTVNISSPQEPGSEGVQPQNGPEQPNARRNAPTLD-IIQRFPANRQW  
Gharial NKPAVENGT-TPSPTVNISSPQEPGSEGVQPQNGPEQPNAGRNTPTLD-IIQRFPANRQW  
Crocodilus\_nilo NKPAVENGT-TPSPTVNISSPQEPGSEGVQPQNGPEQPNAGRNTPTLD-IIQRFPANRQW  
Crocodilus\_poro NKPAVENGT-TPSPTVNISSPQEPGSEGVQPQNGPEQPNAGRSTPTLD-IIQRFPANRQW  
Aspidoscelis GKSIGG---PTLSPTDVSGVNA-----IAQNGNQSLSRPNSPSMN-AIQNFPDPDAQW  
Shinisaurus SKLVSGNVPTPSPTVNISSGNG-----AAQNGIDQSSHRPQPNVN-GVQSFPSGRQW  
Ophisaurus SKLLSNGVPTPSPSVLMSSGANG-----AAQNGIDQSSHRPSSSTVN-GIQSFPSGRQW  
Anolis NNMFSGNVSTSSPTVNISSGNG-----VAQNVLQIRHRSKLPNGD-VIQSFPSGRQH  
Eublepharis SRWHIGNVPTLLPTLHVSNNGT-----AAQNGMDQSVHRASSPNIIYHIVQNLPSDQW  
MournGekko SRLLVNGVPTISPTLHVSKGVDV-----AAQNVMDQSIHRASSPNSNHIIQNLPSDQW  
Gekko\_japon SRLLVNGVPTISPTLHVSKGVDV-----AAQNVMDQSIHRASSPNSNHIIQNLPSDQW  
Python NKFVSRNGIPTPSPTVNISSGQNE-----VAQNGIDQLSYRKPNTNAN-VFHNIFSDQW

Boa\_constrictor NKFANGNGIPTSPADHISAQNE----AGQNGIDQSNYKPKSTNAN-VFHNLFSGSQQ-  
 Vipera ---VHNGIPTSPSTGHMSGQNE----AAQNGIDQSNYRPKSTNTN-VFHNFFSGSQQ-  
 Protobothrops ---VHGNGIPTSPSTGHMSGQNE----AAQNGIDQSNYRPKSTNTN-VFHNFFPGSQQ-  
 Croc\_horrid ---VHGNGIPTLSPSTGHMSGQNE----AAQNGIDQSNYRPKSTDTN-VFHNFFSGSQQ-  
 Croc\_mitch ---VHGNGIPTSPSTGHMSGQNE----AAQNGIDQSNYRPKSTDTN-VFHNLFSGSQQ-  
 Thamnophis KKIVSGNGIPTSPSTGHMSGQND----AVQNGFDQSNYRPKSTNTN-VFRNFFSGSQQ-  
 Cobra KKIVSGNGIPTSPSTGHMSGQNE----AAQNGFDQSNYRPKSTNTN-VFHNFFSGSQQ-  
 Pantherophis KTIVSGNGIPTSPSTGHVSGQNE----ASQNGFDQSNYRPKSTNTN-VFHNFFSGSQQ-  
 Pogona SKLVDGNGFSTPSPTAHVSGGNG----AAQDALEQSGHQKSPN---MIQSFPPASQQ-

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660

Ornithorhynchus PFVHPFGRPFDRPVGRPVGRDRHPTYGNTPKARGPLRWNAVTSSEKRV-ARPGYPMYRR  
 Monodelphis -----SQTSPFVGPRLMGPFYRNYPNQRSY-QWPSLAYVSKQI-VRPGNTAYQK  
 Mus\_musculus -----QTTGT-QGPRQNGPGYRNQPVERGP-QWNSFAWEGKQA-TRPGNPTYGK  
 Rattus -----QTTDT-QGPKQNGPGYQNQPQIQRGP-QWNSFAWEGKQATTHPGNPTYHK  
 Cavia -----NPTHTATGQRPFGPSYRNQPGQWDA-QGNSFAWEGKQA-AGPKNPTYHK  
 Homo -----YFTGTVMGHRQNRPFYRNQOVQVQRP-RWNFFAWERKQV-ARPGNPVYHK  
 Equus -----RPTGTATGNRQNGPFYRN-QVQRDP-QWNSFAWEGKRT-VHPGNPIYRK  
 Ursus -----RPTGTIMGHRQNGPFYRNQOVQVQRP-RWNSFALERKQA-VRPGNPIYRK  
 Bos -----HPTGTSMGNRRNGPFYRNQOVQVQRP-RWNSFVLEGGQA-IRLGYPIYRR  
 Sus -----RPPGPAMGHRNGPFYRNQOVQVQRP-RWNSFTLEGGQA-VRPGYPTYRR  
 Tursiops -----RPTGTATGHRNGPFYRNQOVQVQRP-RWNSFVLEGGQA-VRPGYPIYRR  
 Allig\_mississip -----MFGHGSFGHREYSOGYRSSLDQGA-RHRASASMVNPS-TPSENSLYRK  
 Allig\_sinensis -----MFGHGSFGRREYSOGYRSSLDQGA-RHRAYASMVNPS-TPSENSLYRK  
 Gharial -----MFGHGSFGRREYSOGYRSSLDQGA-RNRASAFMVNPS-TPSENSLYRK  
 Crocodilus\_nilo -----MFGHGSFGRREYSOGYRSSPDQGA-RHRASAFMVNPS-TPSENSLYRK  
 Crocodilus\_poro -----MFGHGSFGHREYSOGYRSSPDQGA-RHRASAFMVNPS-TPSENSLYRK  
 Aspidoscelis -----SAGHG-----SNIYNLHPDMREP-RHNAMISRGNFP-IRTENPNYVS  
 Shinisaurus -----STGHG-----SHVYKPHPDMDGT-RHNTLISGGNPS-IQTENPTYPL  
 Ophisaurus -----PTGHG-----SHDYKPHPDMDGM-RHNTLVSRGNPS-VQSENPTYPF  
 Anolis -----STMQV-----SNIHKPHEHMENT-KQN-LISRGNPS-IQSEDPTYPM  
 Eublepharis -----STGNG-----LPVYKHPGMENS-RPNTYISNGNPS-GHPETPTYPS  
 MournGekko -----STGNG-----LHVYKPYPGMDES-RHNTYISRGNPS-GHPENPTYPS  
 Gekko\_japon -----STGNG-----LHVYKPYPGMDES-RHNTYISRGNPS-GHPENPTYPS  
 Python -----SRGHS-----SYIYKANPDMGNT-RHNTLVSRGNPS-IQAENPTEPW  
 Boa\_constrictor -----SRGRS-----SYIYKPNPDMGNT-RHNTLVSRGNPS-IQAENPTEPW  
 Vipera -----SRGRD-----SYIYKANPDMGNT-RYNTLVSRGNPS-IQAENPADPW  
 Protobothrops -----SRGRD-----SYIYKPNPDMGNT-RHNTLVSRGNPS-IQAENPADPW  
 Croc\_horrid -----SRGRE-----SYIYKPNPDMGNI-RHNTLVSRGNPS-IQAENPADPW  
 Croc\_mitch -----SRGRD-----SYIYKPNPDMGNT-RHNTLVSRGNPS-IQAENPADPW  
 Thamnophis -----SRGHG-----SDIYKPNPDMGNS-RHDTLISRGNPS-MQAENPEEPW  
 Cobra -----PRGRG-----TYIYKPNPDISNS-RHNTLVSRGNPS-MQAENPKEPW  
 Pantherophis -----SRGRG-----SYIYKPNPDMGNS-RHNTLVSRGNPS-MQAENPEDPW  
 Pogona -----STGHV-----PHIYNPHSEMGA-RHNTLTFRGNPS-IQAENPSRSF

688

Ornithorhynchus PFPVAAPGRGFPNAGNPLNLRKNPQAF-----  
 Monodelphis VYPYISKSN-SPNHVSNPANRRKQGF-----  
 Mus\_musculus PPSPTSGV---NYAGNPVHFRNLPGFNKPFVGANPASNKPFGVGNPASNKPFGVGNPA  
 Rattus PPSPTSRVN-YPNYAGNPVNFGRKLPGEKKPFMGANPASNKPFGVGNPASNKPFGVGNPA  
 Cavia AYTPTSRKN-YPSYAGNPANFRKLGQF-----  
 Homo AYPPTSRGN-YPNYAGNPANLRRKQGF-----  
 Equus SYTPTTRGN-SPNAGNPANLRRKQGF-----  
 Ursus AYASTARGN-SPNHAGNLGNFRKQGF-----  
 Bos AYASTVRGN-YPNYAGNPVNFRRKPEGF-----  
 Sus VYGSTARSN-PPNYAGNSANLRRKPEGF-----  
 Tursiops AYASTARGN-SPNYAGNPANFRKPEGF-----  
 Allig\_mississip GPPDNSPIQ-----TNRGDLQSF-----  
 Allig\_sinensis GPPDNSPIQ-----TNRGDLQSF-----  
 Gharial GPPDNSLIQ-----ANRRGNLQSF-----  
 Crocodilus\_nilo GPPDKSLIQ-----ANRRGNLQSF-----  
 Crocodilus\_poro GPPDKSLIQ-----ANRRGNLQSF-----  
 Aspidoscelis AYGETI-----NHRGEPQNA-----  
 Shinisaurus GYGEDS-----NHRGNLHNT-----  
 Ophisaurus GYAENS-----IHRGNLQNT-----  
 Anolis GNGWNS-----NHRGNIQNT-----  
 Eublepharis GYGDNS-----NQRGNLQNT-----

720

MournGekko	GYGESS-----NQRGNLQDT-----
Gekko_japon	GYGESS-----NQRGNLQDT-----
Python	VYGGNS-----IHRDNLQRT-----
Boa_constrictor	VYGDNS-----IHRDNLQRT-----
Vipera	VYRDNS-----VHRTDLQRT-----
Protobothrops	VYRDNS-----VHRTNLQRT-----
Crot_horrid	VYRDNS-----VHRTNLQRT-----
Crot_mitch	VYRDNS-----VHRTNLQRT-----
Thamnophis	VYRDNL-----VHRANLQRT-----
Cobra	VYRDNS-----VHRANLQRT-----
Pantherophis	IYRDNS-----VHRANLQRT-----
Pogona	GYRDNL-----DPRGNLQST-----

780

Ornithorhynchus	-----
Monodelphis	-----
Mus_musculus	SNKPFVGANPASNKPFVGANPASNKPYVGANPASNKPFIGANPAANKPSIGTNPAANKPS
Rattus	SNKPFVGANPASNKPFVGANPASNKPFVGANPASNKPFVGANPASNKPFMGTNPAANKPS
Cavia	-----
Homo	-----
Equus	-----
Ursus	-----
Bos	-----
Sus	-----
Tursiops	-----
Allig_mississip	-----
Allig_sinensis	-----
Gharial	-----
Crocodylus_nilo	-----
Crocodylus_poro	-----
Aspidoscelis	-----
Shinisaurus	-----
Ophisaurus	-----
Anolis	-----
Eublepharis	-----
MournGekko	-----
Gekko_japon	-----
Python	-----
Boa_constrictor	-----
Vipera	-----
Protobothrops	-----
Crot_horrid	-----
Crot_mitch	-----
Thamnophis	-----
Cobra	-----
Pantherophis	-----
Pogona	-----

840

Ornithorhynchus	-----
Monodelphis	-----
Mus_musculus	IGTNPAANKPFVRNNG-----ANKPFVGTNPSSNQPFVRSNQ
Rattus	IGTNAASNKPFVGTNAGTNKPFMGINVASNKPFMGTNPASNKPFVGTNPASNKPFVRSNH
Cavia	-----
Homo	-----
Equus	-----
Ursus	-----
Bos	-----
Sus	-----
Tursiops	-----
Allig_mississip	-----
Allig_sinensis	-----
Gharial	-----
Crocodylus_nilo	-----
Crocodylus_poro	-----
Aspidoscelis	-----
Shinisaurus	-----
Ophisaurus	-----
Anolis	-----
Eublepharis	-----
MournGekko	-----

Gekko\_japon -----  
 Python -----  
 Boa\_constrictor -----  
 Vipera -----  
 Protobothrops -----  
 Croc\_horrid -----  
 Croc\_mitch -----  
 Thamnophis -----  
 Cobra -----  
 Pantherophis -----  
 Pogona -----

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868 870 874

Ornithorhynchus -----AKHPGEANSQPVVSRGGLMAPREPVASQENPPSPREKPSFPTRGP  
 Monodelphis -----TKQPEEINGGLA-GFKLGTAKKEEQIQNPKENSVTQREKITFPTRDP  
 Mus\_musculus ASNKPFMRSNQASNKPFVGTNVASV-GFKQVTVSHNMKTQNPKEKSLGQKERTVTPTKDA  
 Rattus ASNKPFVGGANAASNKPFVGTNVPSV-GFKQVTVSHNMKTQNPKEKSLGQKERTVTPTKDT  
 Cavia -----NKHPVGTNVTPM-SFKQGTIGRNEKIQNPKEKSLGQKERTVTPTKGM  
 Homo -----NKHPVGTTVAPL-GFKQVTVSHNMKTQNPKEKSLGQKERTVTPTKNP  
 Equus -----NKHPVGTNV-PL-GFKHDTVLDNEKVQNPKEKPPDQKE-IVIPTRDP  
 Ursus -----NKHPVGTNVAPL-SFKQGTIVVHNEKIQNPKEKPPVGPKERIVIPTRDP  
 Bos -----SKQPEGT-IAPL-GFKHGTGHNENIQNPKEKPPVGPKERIVIPTRDP  
 Sus -----NKNPMVTNVAPP-GFKHGTVDQENIQNPKEKPPVGPKERIVIPTRDP  
 Tursiops -----NKHPVGTNVAPL-GFKHGTGHNENIQNPKEKPPVGPKERIVIPTRDP  
 Allig\_mississip -----PS-----NYPAL-NFRHGSPGSE--FQQHGKRAAGQRQRPPFPDTHP  
 Allig\_sinensis -----PS-----NYPAL-NFRHGSPGSE--FQQHGKRAAGQRQRPPFPDTHP  
 Gharial -----PS-----NYPAL-NFRHGSPGSE--LQQPGKRPAGQRQRPPFPDTHP  
 Crocodilus\_nilo -----PS-----NYPAL-NFRHGSPGSE--FQQPGKRPAGQRQRPPFPDTHP  
 Crocodilus\_poro -----PS-----NYPAL-NFRHGSPGSE--FQQPGKRPAGQRQRPPFPDTRP  
 Aspidoscelis -----NS-----NYPAL-NFRHGSPGSE--LQQPGKRPAGQRQRPPFPDTHP  
 Shinisaurus -----NI-----NHPST-GTEPIPYGQEQPHYSGRNPLGQREPERFPSSDP  
 Ophisaurus -----NI-----NHPST-VSGPNPYGQEQHPHYSGRNPLGQREPERFPSSNP  
 Anolis -----NV-----NNPST-NFRHPIPYGQEQPHYPERNEFSQIDSVFPSSDP  
 Eublepharis -----NNN-----NNIP-I-NFRPNPYGQEQHPHYPERNPSNQRQILPFPSSDP  
 MournGekko -----NSN-----NNPST-NFRHPIPYGQEQHPHYPERNPSNQRQILPFPSSDP  
 Gekko\_japon -----NSN-----NNPST-NFRHPIPYGQEQHPHYPERNPSNQRQILPFPSSDP  
 Python -----NS-----NHPTV-NFRPNPYGQEQELRYPGNNPSRWR----PSSGR  
 Boa\_constrictor -----NS-----NHATA-NFRPNPYGQEQELRYPGNNPSRWR----NPSSGP  
 Vipera -----NS-----NHPTA-KNRPNTFGQEQKSHYPGNNPSRWR----DPSSGP  
 Protobothrops -----NS-----NHPTA-KNRPNTFGQEQKSHYPGNNPSRWR----DPSSGP  
 Croc\_horrid -----NS-----NHPTA-KNRPNTFGQEQKSHYPGNNPSRWR----DPSSGP  
 Croc\_mitch -----NS-----NHPTA-KNRPNTFGQEQKSHYPGNNPSRWR----DPSSGP  
 Thamnophis -----NS-----NHPTA-KNRPNTFGQEQKSHYPGNNPSRWR----HPSSDP  
 Cobra -----NS-----NHPTA-KNRPNTFGQEQKSHYPGNNPSRWR----HPSSDP  
 Pantherophis -----NRE---LNYPFA-KNRPNTFGQEQKSHYPGNNPSRWR----HPSSDP  
 Pogona -----NS-----NQAMA-NFRPIISYGQEQSHLPGRSPSGQREIMPITSDP

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Ornithorhynchus AVPWRKPNYGPVKPVY--PPLSEGRP-ADPGSPFPDPRENPIYPRGDATDRRFLSSGG  
 Monodelphis TSTWRNSQGYETNKSNYK--LTPPQGSF-SVPSVNSVDQPEN--YPRVDS--RRFPAS--  
 Mus\_musculus SNPWRSAKQYGINPNYK--LPRSEGSF-VGPNFNSFDQEQNSYFSGAS--KRVSPNI  
 Rattus GNPWRSSKQYGINPNYK--LPHPEGSF-VGPNFNSFDQEQNSYFSGAS--KRVSPNI  
 Cavia SGWRNSQYGPVKNPNYK--WHPEDNM-LGPNFNSVQYENSYYPRGEV--IKVPSNA  
 Homo TSPWRNSQYEVNKNYK--LPHSEGYM-PVPNFNSVDQHENSYYPRGDS--RKVPNSDG  
 Equus PGPWRNSQYEVNKNYK--LPHSEGNM-LVPNFNSVDQHENSYYPRGDI--IRAPNYDG  
 Ursus SGPWRNSQYEVNKNYK--LPHSEGNM-LVPNFNSVDQHENSYYPRGDS--RRAPNSDG  
 Bos NGPWRNSQYEVNKNYK--LPHPEGNI-LVPNFNSVDQHENSYYPRGDS--RGTPNNSG  
 Sus SGPWRNSQYEVNKNYK--LPHPEGNI-LVPNFNSVDQHENSYYPRGDS--RGTPNNSG  
 Tursiops SGPWRNSQYEVNKNYK--LPHPEGNI-LVPNFNSVDQHENSYYPRGDS--RGTPNNSG  
 Allig\_mississip LSQRQNAAPSYSNNRAGYKQGIILPDSKP-PAPTFNTVGTNEHTQHSQDDA--SRIPASGL  
 Allig\_sinensis LSQRQNAAPSYSNNRAGYKQGIILPDSKP-PAPTFNTVGTNEHTQHSQDDA--SRIPASGL  
 Gharial LSQRQNAAPSYSNNRAGYKQGIILPDSKP-PAPTFNTVGTNEHTQHSQDDA--SRIPASGL  
 Crocodilus\_nilo LNQRQNAAPSYSNNRAGYKQGIILPDSKP-LAPTFNTVGTNEHTQHSQDDA--NKIPASGL  
 Crocodilus\_poro LNQRQNAAPSYSNNRAGYKQGIILPDSKP-LAPTFNTVGTNEHTQHSQDDA--NKIPASGL  
 Aspidoscelis KNQWIKDPVYRDNLHNP----PPEGHS-LDP---PLRETENVFNAREN----DPSKPSRM  
 Shinisaurus PGQWNKDPVYRDNLHNP----PPEGHS-LDPQFNTLERAENVYNAREGF--DRFQPSGM



Ophisaurus LGQWNKDPVYRDNSLNS---PPEGHS-LDPQFNTLGRPENAYNAREEF--DRFQPSGM  
 Anolis VGQWNKDPVYRDNDPKNS---PPEGHP-LDPQFKTM-RIDNIYNARQDA--ERFQPSGM  
 Eublepharis QSQWNKDPVYRDNNLNSF---PPEGHS-MDPQFNTLGAENSYNTRKET--DLFQPSGV  
 MournGekko QSQWNNDPVYRDNSLNSF---PPEGTSGVDAQFNTLGAENSYNIRKDT--DQFQPSGM  
 Gekko\_japon QSQWNNDPVYRDNSLNSF---PPEGTSGVDAQFNTLGAENSYNIRKDT--DQFQPSGM  
 Python GPQWSKNPAHGDNKQPSS---PSESHS-L-----YQVEEKT--GMYPQSRM  
 Boa\_constrictor GPQWNSNLAYRDNKQPSS---PSESHS-L-----YKVEENT--DMYHPSRM  
 Vipera GPQWNKNPTYGGNKQPSS---PLESHS-L-----KKVEENS--DMYHPSRK  
 Protobothrops GPQWNKIPTYGGNKQPSS---PLESHS-L-----KKVEENS--DMYHPSRK  
 Croc\_horrid GPQWNKIPTYGGNKQPSS---PLESHS-L-----KKVEENS--DLYHPSRK  
 Croc\_mitch GPQWNKIPTYGGNKQPSS---PLQSHS-L-----KKVEENS--DMYHPSRK  
 Thamnophis GPQWNKNPAYGRHKQPSS---PPESHV-L-----NKVEENS--DWHYPSRK  
 Cobra GPQWNKNPAYGGNKQPSS---PSESHS-V-----NKLEENT--DRYHPSRK  
 Pantherophis GSQWNRNPAYGDNKQPSS---PPEGHS-L-----NKVEENT--DRYHPSRK  
 Pogona PSRWNKDPVYRDNYLHNS---PPEGHS-VDPQINTLR-----RPSGM

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1020

Ornithorhynchus SAPGRHFPEGIVLKP-----EDDQPPSKQKPFHP-VTERTP---REPSPTK--QRT  
 Monodelphis -IQASNFPGKIVSEPRKGPSDEINPPEIKHGTHQT---DEGYPYPKESFFLRNS-TWN  
 Mus\_musculus QIQSQNLPGKIGALEPRRTPFQSETKKPELKHSTHQP-AYPKIPSPTRKHFPAERN-TWN  
 Rattus QIQSQNLPGKIGALEPRRTPFQSETKKPELKHSTHQP-VYPKKNPSPTRGHFPAGRN-TWN  
 Cavia KTQSQNFPKRVALEPKRIPYEQTMQPELKHSTHQP-IYPEVIPSAREHFPAERN-TWS  
 Homo QTQSQNLPGKIVLGSRRMPYEQTMQPELKHSTHQP-VYQVEEIPSPAREHFPAERN-TWD  
 Equus QTQSQNLPGKIGALEPRRTPYEQTMQPELKHSTHQP-VYQVEEIPSPAREHFPAERN-TWN  
 Ursus QTQSQNLPGKIGALEPRRTPYEQTMQPELKHSTHQP-VYQVEEIPSPAREHFPAERN-TWN  
 Bos QTQSQNLPGKIGALEPRRTPYEQTMQPELKHSTHQP-VYQVEEIPSPAREHFPAERN-TWN  
 Sus QTQSQNLPGKIGALEPRRTPYEQTMQPELKHSTHQP-VYQVEEIPSPAREHFPAERN-TWN  
 Tursiops QTQSQNLPGKIGALEPRRTPYEQTMQPELKHSTHQP-VYQVEEIPSPAREHFPAERN-TWN  
 Allig\_mississip QLTQATPKGVFLDARRHPSTPEASQRDWEKQAVNP-----SYPEREHFPLSGSKMWR  
 Allig\_sinensis QLTQATPKGVFLDARRHPSTPEASQRDWEKQAVNP-----SYPEREHFPLSGSKMWR  
 Gharial QLTQATPKGVFLDARRHPSTPEASQRDWEKQAVNP-----SYPEREHFPLSGSKMWR  
 Crocodilus\_nilo QLTQATPKGVFLDARRHPSTPEASQRDWEKQAVNP-----SYPEREHFPLSGSKMWR  
 Crocodilus\_poro QLTQATPKGVFLDARRHPSTPEASQRDWEKQAVNP-----SYPEREHFPLSGSKMWR  
 Aspidoscelis HQSNTRSHWDTFSATSMTPFETATNQHTWKEQFFIPI-----PDHERELYSPPQKQIWR  
 Shinisaurus HQSNTRSHWDTFSATSMTPFETATNQHTWKEQFFIPI-----PDHERELYSPPQKQIWR  
 Ophisaurus HRSNTLSHQGVFSATRRTPFETEAHQYDWEKQSFNH-----PDREREQFPSSQNHMWN  
 Anolis HQSNALSHQGVFLDARRHPSTPEASQRDWEKQAVNP-----IDQKRGQFLSAQTPPTWN  
 Eublepharis HQLSSSLPQGVFLPTKRTLSEAEATHQYHWEKQGFNS-----PVHEREQFLSPRNHVWN  
 MournGekko HQLSSSLPQGVFLPTKRTLSEAEATHQYHWEKQGFNS-----PVHEREQFLSPRNHVWN  
 Gekko\_japon HQLSSSLPQGVFLPTKRTLSEAEATHQYHWEKQGFNS-----PVHEREQFLSPRNHVWN  
 Python QQSNGLSHQEIVLDTRGTPPETETHKNDWKEPSFIH-----PDHQREQFPSSQNHMWN  
 Boa\_constrictor QQSNGLSHQEIVLDTRGTPPETETHKNDWKEPSFIH-----PDHQREQFPSSQNHMWN  
 Vipera QQSNGQFHQETFLDTRGIPPEKKAHKNWKEQSFH-----PDHQREQFPSSQNHMWN  
 Protobothrops QQSNGQFHQETFLDTRGIPPEKKAHKNWKEQSFH-----PDHQREQFPSSQNHMWN  
 Croc\_horrid QQSNGQFHQETFLDTRGIPPEKKAHKNWKEQSFH-----PDHQREQFPSSQNHMWN  
 Croc\_mitch QQSNSQFHQETFLDTRGIPPEKKAHKNWKEQSFH-----PDHQREQFPSSQNHMWN  
 Thamnophis QQSNGQSHPEIFSDTRGTPPEKKAHKNWDEQSFH-----MDHQKGFPPSLQNHMWN  
 Cobra QQSNGQSHHIDFLDTRGTPPEKKAHKNWDEQSFH-----PDHQREQFPSSQNHMWN  
 Pantherophis QQTNSQSHQDLFSDTRGTPPEKKA-----FIH-----PDHQREQFPSSQNHMWN  
 Pogona QQPNIQSEQEIFPSTKRTPFETETHWYDQKQPLNP-----PDRERERFSAQNHMWN

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1080

Ornithorhynchus SPEPPP1026LEEGPGRQDKSLTYPP1044ISPRSG-IPYPDH---HP---YDPK-----GTW  
 Monodelphis LQKGSIFFEDEPTKQEGSLLYPALGAREN-VPYPEY---VP---YDPQRSLLYARGNMW  
 Mus\_musculus RQKILPPLKEDYGRQDENLRHPSYGSRGN-IFYHEY---TN---PYHNEKSQYIKSNPW  
 Rattus HQKTLPLKEDYGRQDENLRHPSYGSRGN-IFYHEY---NN---PYPNEKSPYLGRNTW  
 Cavia HHEIIPPFKEDPGKQDKHLPHVSGSQRG-VFYHXY---NS---FYTRENSPYTGSNTW  
 Homo HQEISPFKEDPGRQEEHLPHVSGSRG-VFYPEY---NP---YDPRENSPYLRGNTW  
 Equus HQEISPFKEDPGRQEEHLPHVSGSRG-VYYPDY---YP---YDPRENSPYFRGNAW  
 Ursus HQEISPFKEDPGRQEEHLPHVSGSRG-VYYPDSYYPNS---YDPRENSPYPRSNW  
 Bos QQEISPFKEDPGRQEEHLPHVSGSRG-IYYTDY---NP---YDRENSPYLRNSW  
 Sus QQEISPFKEDPGRQEEHLPHVSGSRVH-VYYPDY---NP---YDRENSPYLRNSW  
 Tursiops QQEISPFKEDPGRQEEHLPHVSGSGR-VYYPDY---NP---YDRENSPYPRSNW  
 Allig\_mississip HQQNSPFPEAGLHESSTYPPGALFGQRGS-VSYPEY---NS---FNQKGIPIHFSQGSW  
 Allig\_sinensis HQQNSPFPEAGLHESSTYPPGALFGQRGS-VSYPEY---NS---FNQKGIPIHFSQGSW  
 Gharial HQQNSPFPEAGLHESSTYPPGALFGQRGS-VSYPEY---NS---FNQKGIPIHFSQGSW  
 Crocodilus\_nilo HQQNSPFPEAGLHESSTYPPGALFGQRGS-VSYPEY---NS---FNQKGIPIHFSQGSW  
 Crocodilus\_poro HQQNSPFPEAGLHESSTYPPGALFGQRGS-VSYPEY---NS---FNQKGIPIHFSQGSW  
 Aspidoscelis NQEDSVRFRESRYSNIFSTGSHQKGH-ATYSEK---NS---YQGRSQSFYF--SPW  
 Shinisaurus NQEDPQGFQEVPPRYNSIYSSGSLNRRGH-ATYTEK---NS---YQHTHSSFPP--RAW  
 Ophisaurus NQEDS1026GFREVPPRYNTMYSSGSLNRRGH-1044AAYAEN---NS---YQHTHSSFPP--STW



Anolis NREASLQFQEAPPRQSSMYSSGSGFNQREM-PTYSGK---KS----YNQYTHPFPP--RAW  
 Eublepharis KQEELQVQDDPPRYNSRHSSGYFGQSRNRI SYPEK---SS----YDQPPRSFYF--ETW  
 MournGekko KQEDLQVQDDPPRYNSRHSSGYFGQSRER-LSYPEK---SS----YAQPPRSFYF--DTW  
 Gekko\_japon KQEDLQVQDDPPRYNSRHSSGYFGQSRER-LSYPEK---SS----YAQPPRSFYF--DTW  
 Python -QKDLQIVQEVPPGYNSVTSSGSHQQRGH-DTYADK---NF----YSQQTPSFYF--RAW  
 Boa\_constrictor -QKDLQVVKQVKEAPPYNSVYSLGSHHQQGH-TTYADK---NS----YSQQTPSFYF--RAW  
 Vipera -QKDLQVVKQVKEAPPYNSVYSPGSHQQRGH-ATYSDK---TF----YSQQA PSFYF--RAW  
 Protobothrops -QKDLQVVKQVKEAPPYNSVYSPGSHQQRGH-ATYSDK---NF----YSQQA PSFYF--RAW  
 Croc\_horrid -QKDLQVVKQVKEAPPYNSVYSPGSHQQRGH-ATYSDK---NF----YSQQA PSFYF--RAW  
 Croc\_mitch -QKDLQVVKQVKEAPPYNSVYSPGSHQQRGH-ATYSDK---NF----YSQQA PSFYF--RAW  
 Thamnophis -QKDLQIVKETPPGYNSAYS SPGSHQQRGH-ATYSDK---NS----YREEAPSFHP--RFW  
 Cobra -QKDLQIVKETPPGYNSAYS SPGSHQQRGH-ATYSDK---NS----YRQQA PSFYF--RFW  
 Pantherophis -QKDLQVVKQVKEAPPYNSAYS SPGSHQQRGH-ATYSDK---NS----YRQQA PSFHP--RFW  
 Pogona SRENSLQFQDAPPYNSMYSLDSTHQQRGH-EIYSER---NSFRNPYQQNGHPSTS---RTW

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1140

Ornithorhynchus DEGNPTSSGPAEQGRQSPSPSPRMGQRGEVYNEEDPVDPTGDEPN-LGPGPWE-ET  
 Monodelphis DEGDEFPGTFRPAGQGNPLHSTNSPSGQRHRSTDNEEDPIDPTGDEFY-RGPDAGG-KE  
 Mus\_musculus DK---SSPSTM---MRPENQYTM TSL-DQKETEYNEEDPIDPNEDES F-PGQSRWGDEE  
 Rattus DKRISTPGTM---MQPENQYTM TSSL-DQKETEYNEEDPIDPNEDES F-PGQSRWGDEE  
 Cavia EKRADSPKT-----QAKTPQYPLKNT-DQKETIQYNEKDPSPDTRHGPF-PGLSRWGEV  
 Homo DERDDSPNTM---GQKESPLYPLNTP-DQKEIVPYNEEDPVDPTGDEVF-PGQNRWEE-EE  
 Equus DERNYSPNTM---GRLKNPLYPLNTP-DVKETVLYNEEDPDTGGEAF-PGQSRWGVVE  
 Ursus DERDDSPNNI---GQPKNSLYPLNTP-ELKETVYNEEDPLDPTGDESF-PGQSRWGMEE  
 Bos DERNDPNTM---GQENPHYPLNTP-DPKETIPYNEEGPADPTGDETF-PGQTRWSVDE  
 Sus YERDDSPNTM---GQENPHYPLNTP-DPKETIPYNEEDPIDPTGDEHF-PGQSRWDMEE  
 Tursiops AERDDSPNAM---RQENPHYPLNTP-DPKETIPYNEEDPIEPTGDESF-PGQSRWSVAE  
 Allig\_mississip ENSPVS-----PAGQRGNPLYPLDS--SQREGGPHYENDPFDQLGPDYSY-PGQRTWDQEQ  
 Allig\_sinensis ENSPVS-----PAGQRGNPLYPLDS--SQREGGPHYENDPFDQLGPDYSY-PGQRTWDQEQ  
 Gharial ENSPVS-----PAGQRGSHLYPLDA--SQREGNPHYENDPFDQLGPDYSY-PRQRIWDQEQ  
 Crocodilus\_nilo ENSPVS-----PEGQRGNSLYPLDA--SQREGNPHYENDPFDQLRPDYSY-PRQRTWDQEQ  
 Crocodilus\_poro ENSPVS-----PEGQRGNSLYPLDA--SQREGNPHYENDPFDQLRPDYSY-PRQRTWDQEQ  
 Aspidoscelis EDRESSP-TVGADQREHRSYSEPLTSDQMQRNIYHRD---IPLQHELY-HKQHPWDEK  
 Shinisaurus EDGENSP-TMGPPVQRESPSYSFALPSNQMQRNTYQRS---AQQEHPEY-ARQNLRTHEN  
 Ophisaurus EDRESSP-TLGSQVQRESPSYSFALPSNQMQRNTYQRN---MQQEHPEY-SRQNLWTHEN  
 Anolis EDREHSP-TISPSDQRESSPYFVSPSDQIQRNTYRR---IQPEYEPY-PRQDPWTRQ  
 Eublepharis EGRENSE-TLGPAGQKERPFYSE----QMQRNSYRRSDPVVQQESMY-PRPSPWAQEK  
 MournGekko EGRESSP-TLGPAGQREHPLYSSAVPSNQVQXXXXXXXX---XXXXXXXXY-PRQTPWAHEK  
 Gekko\_japon EGRESSP-TLGPAGQREHPLYSSAVPSNQVQXXXXXXXX---XXXXXXXXY-PRQTPWAHEK  
 Python EDKENLP-TIQPLGQRERPYNSFLLPSNQMHRSEYHGS---IQQEHFHSRQNIWPHEK  
 Boa\_constrictor EDKENLP-TIEPLGQ--RGSYSFLLPSDQMHRSEYHGS---IQQENELY-SRQNIWPHEK  
 Vipera DDKENLP-TIEPLGQ--RGSYSFLLPSDQMHRSEYHGS---IQQENELY-SRQNIWPHEK  
 Protobothrops DDKENLP-TIEPLGQ--RGSYSFLLPSDQMHRSEYHGS---IQQENELY-SRQNIWPHEK  
 Croc\_horrid DDKQNLPT-TIEPLGQ--RGSYSFLLPSDQMHRSEYHGS---IQQENELY-SRQNIWPHEK  
 Croc\_mitch DDKQNLPT-TIEPLGQ--RGSYSFLLPSDQMHRSEYHGS---IQQENELY-SRQNIWPHEK  
 Thamnophis DDKENLP-TVEPLGQRERPYSFLLPSDQMHRSEYHES---IQQENELY-SRQNIWPQEK  
 Cobra VDKENFP-TIEHLGQRERPYSFLLPSDQMHRSEYHGS---IQQENELY-SRQNIWPHEK  
 Pantherophis EDEENLP-TIEPPGQRERPYSFLLPSYQMHRSEYHGS---IQQENELY-SRQNIWPHEK  
 Pogona EERKDSPT-VTGSTGQRERLSYSEFLLPSNQMQKNHYHRS---VQQEHEAH-PNQNPWVDEK

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1200

Ornithorhynchus ANGKED--PSRYHKSPQYPQSRATEPQDYPPYPEG-GLEK--HRDFPYGDFYPRGPEDNL  
 Monodelphis SNFKGS--QVRYRERYPYAPSHPSKPKEYPQHSTD-NLERQ-R-NPSYGEYYPW----HF  
 Mus\_musculus MNFKGN-PTVRHYEGEY---ASTLAKEYLPSLS-NPPKP-SEDFPYSEFYPNWNPQETF  
 Rattus LSFKGN-PTLRQYEGEY---TSTLAKEYLPSLS-NPPKP-SEDFPYSEFYPNWNPQETF  
 Cavia LSFNER-PMGRHNDGKQY---ASNQPKYLYPLD-NPSKP-REESPYTDFYPWSLDETF  
 Homo LSFKGC-PTVRHYEGEY---TSNQPKYLYPLD-NPSKP-REDFYSEFYPNWNPDENF  
 Equus SSLKQC-PTVRHYEGEY---TSNQPKYLYPLD-NPSKP-REDFPYGEFYPNWNPDENF  
 Ursus TSFKEC-PTVRHYEGEY---TSNQPKYLYPLD-NPSKP-REDFPYGEFYPNWNPDENF  
 Bos SNFKTA-PTAR-YEGKQY---TSNQPKYLYPLD-NLPPK-REYFPYGEFYPNWNPDENF  
 Sus LSFKED-PTVRHYEGEY---TSNQPKYLYPLD-NPSKP-REDFLYGEFYPNWNPDENF  
 Tursiops SSFKGD-PTVRHYESEY---TSNQPKYLYPLDINPSKP-RKDFPYGEFYPNWNPDENF  
 Allig\_mississip PLPEAEGSPAGQYGNPQYLPSPNAEQEVYFQYSK-----Q-GRYFPYNEISPWAPEDNY  
 Allig\_sinensis PLPEAEGSPAGQYGNPQYLPSPNAEQEVYFQYSK-----Q-GRYFPYNEISPWAPEDNY  
 Gharial PLPEAEGSPAGQYGNPQYPPNPAEQEVYFQYSK-----Q-GRYFPYDEISPWAPEDNY  
 Crocodilus\_nilo PLPEAEGSPAGQYGNPQYPPSPNAEQEVYFQYSK-----Q-GRYFPYDEISPWAPEDNY  
 Crocodilus\_poro PLPEAEGSPAGQYGNPQYPPSPNAEQEVYFQYSK-----Q-GRYFPYDEISPWAPEDNY

Aspidoscelis QLLDLD----RQYRNDPY---SPTQHMYPKYSIE-NPFSQ-RSNLPYEEIGTWNAAEENP  
 Shinisaurus HLLDLD----KQYRNPSY---NPSQHAYPKYSTE-NPSND-RGNLPYKEINQWTPPEERS  
 Ophisaurus RFLDLD----RHYRNPPY---NPSQRHAYPNYSTE-NPAND-RGNLPYEGINQWTPPEER  
 Anolis HLHDPD----NQYSNSPY---NPTHHTQYQKYTTE-NPPSE-INSNLPYRKINQWTPPEEHS  
 Eublepharis HLHDL D----REYRNIPY---SPTQQHAYPKYSPE-NPSDQQRSNVPYKEIHPWIPEEHS  
 MournGekko HLLDQD----REYRNPPY---NPTHQHAYPKYSPE-NPSNQRRGNAPYTEINPWIPPEEHS  
 Gekko\_japon HLLDQD----REYRNPPY---NPTHQHAYPKYSPE-NPSNQRRGNAPYTEINPWIPPEEHS  
 Python HLADLD----RQYQNPY-----NPKYSTE-HTANE-RGNLPYEEINRRIP-EHS  
 Boa\_constrictor HLADLD----RQYQNPY---NPNEHHVNPKYSTE-HPTNE-RDNLPEEINRQIP-EHS  
 Vipera HLADPD----IQYQNPY---NPSEHHINPKYSIE-HPANG-RGNLPYEEINRQIP-EHS  
 Protobothrops HLADPD----IQYQNPY---NPSEHHINPKYSIE-HPANG-RGNLPYEEINRQIP-EHS  
 Croc\_horrid HLADPD----IRYQNPY---NPSEHHINPKYSIE-HPANG-RGNLPYEEINRQIP-EHS  
 Croc\_mitch HLADPD----IRYQNPY---NPSEHHINPKYSIE-HPANG-RGNLPYEEINRQIP-EHS  
 Thamnophis HMTDPD----IQYQNPY---NPSEHHINPKYTTD-QPANE-RGNLPYEEINRRI-----  
 Cobra HLADPD----IQYQNPY---NPSEHHINPKYYTE-QPANE-RGNLPYEEINRWIP-EHS  
 Pantherophis HLADPD----IQYQNPY---NPS---INPKYYTE-QPAND-RGNLPYEEINRRIP-EHS  
 Pogona HLLDLD----REYKNSPY---NPPQYPMHPRFSTE-TPPNE-RDNLPEYERMNQWTPPEKHI

1260

Ornithorhynchus QP1203NGADQL--PVEGRGYT-HDAVGO1215GGLQFPSRDS12271228SWDWGLRSAAQ12381239E-----RRAP  
 Monodelphis PLYNFAPLTPPRENSGYYPNALEQESTPSPSWGSDWKQNYVPAK-----GRIP  
 Mus\_musculus PIYNPGPTIAPPVDP1215RSYV-NNAIGQESTLFP1228SWTSDWDRNQAERQK-----ESEP  
 Rattus PIYNPGPTIAPPVDP1215RSYV-NNAVGOESTLFP1228SWTSDWDRNQAERQK-----ESEP  
 Cavia PSYSPGPTVSPGK1215NRGHQV-NNAMRQEGSALFP1228SPNSWDQGIQVQGOQ-----ESEP  
 Homo PSYNTASTMPPIES1215RGYV-NNAAGPEESTLFP1228SRNSWDHRIQAQGOR-----ERRP  
 Equus LS1215YNTAPT1215VLPVENKGYT-SDVIGQENTPFP1228SWNSWDHRIQAQGOQK-----EIRP  
 Ursus PSYNTAPT1215VPPVES1215RGYV-NNAVGOESTLFP1228SWNSWDHRIQAQGOQK-----ERRP  
 Bos PSYNTAPT1215VPPVES1215RGYV-NNAVGOESTLFP1228SWNSWDHRIQAQGOQK-----ERRP  
 Sus PSYNTAPT1215VPPVES1215RGYV-NNAVGOESTLFP1228SWNSWDHRIQAQGOQK-----ERRP  
 Tursiops PSYNTAPT1215VPPVES1215RGYV-NNAVGOESTLFP1228SWNSWDHRIQAQGOQK-----ERRP  
 Allig\_mississipp PLYKVGPPR--Q1215TENIPYHL-KREFGPRGSI-----P1228DQETNPLPQNFNPPHPGRSQ  
 Allig\_sinensis PLYKVGPPR--Q1215TENIPYHL-KREFGPRGSI-----P1228DQETNPLPQNFNPPHPGTSQ  
 Gharial PLYKVEPPR--Q1215TENIPYHL-KRESGPRGSI-----P1228DQETNPLPQNFNPPHPGRSQ  
 Crocodilus\_nilo PLYKVEPPR--Q1215TENIPYHL-KREFGPRGSI-----P1228DQETNPLPQNFNPPHPGRSQ  
 Crocodilus\_poro PLYKVEPPR--Q1215TENIPYHL-KREFGPRGSI-----P1228DQETNPLPQNFNPPHPGRSQ  
 Aspidoscelis PAFNAEHLR--Q1215TEDIPI---PVFREKEMNA-QNQLW1228DLSPLQRITQVP-----VRTQ  
 Shinisaurus PVHGAEHLR--H1215TENIPYRM-NNVFGH1228RERNL-QNQRSS1228SALQSTTLQ-----GGPQ  
 Ophisaurus PVHSIEPLR--R1215TENIPYRM-NNVFGH1228RERNL-QSQRSS1228SPLQSATFQ-----GGPQ  
 Anolis PVHTAGHLR--Q1215MENVPYRT-NSKFEQ1228ERKF-QNVGSG1228SPQQRNT-FQ-----EEAQ  
 Eublepharis PLYTAEYLW--Q1215TEGIPDRK-SNAF1228GHEERTY-QNEGANS1228SPSQGPTLVQ-----RVPQ  
 MournGekko PLYTAAEHLR--Q1215TENIPYRR-NNEFGH1228RERNF-PNEGANS1228SPPQSTTLQ-----GCSR  
 Gekko\_japon PLYTAAEHLR--Q1215TENIPYRR-NNEFGH1228RERNF-PNEGANS1228SPPQSTTLQ-----GCSR  
 Python PVG1215GSEH----YENIPYHI-SNTFGH1228TERNL-PYQGLY1228SPPQSSNLQ-----GRSH  
 Boa\_constrictor PVG1215GPEH----YENVPYHI-SNTFGH1228TERNL-PHQG1228PYSPQSSKLFQ-----GRSH  
 Vipera PVH1215GSEH----YEHIPYHI-SNIHG1228TERNL-PYPG1228PYPAKTSHLFQ-----GRSP  
 Protobothrops PVH1215GSEH----YEHIPYHI-SNTHG1228TERNL-PYPG1228PYPPQTSNLFQ-----GRSP  
 Croc\_horrid PVH1215GSEH----YEHIPYHI-SNTHG1228TERNL-PYPG1228PYPPQTSNLFQ-----GRSP  
 Croc\_mitch PVH1215GSEH----YEHIPYHI-SNTHG1228TERNL-PYPG1228PYPPQTSNLFQ-----GRSP  
 Thamnophis PVH1215GPEH----YENVPYHI-SNTHG1228Q1228GRNP-PYP-PYPP1228QTSNLFQ-----GRSP  
 Cobra PVH1215GSEH----YENVPYHI-SNTHG1228PEK1228NL-PYPG1228PYPPQTSNLFQ-----GRSP  
 Pantherophis PVH1215GSEH----YENVPYHI-SNTHG1228TERNL-RYPG1228PYPPQTSNLFQ-----GRSP  
 Pogona FLT1215VTEHLK--PVENIPYHT-NGMFG1228QK1228QNM-GNQG1228SNSPPQ1228SISLSQ-----RGAQ

1320

Ornithorhynchus YDE-RDSW1269DHAINSPKSTAGA---TETLSPSHSVPAGIRGKP--HEESVD--WSYRGGQV  
 Monodelphis YYN-RYFWDQATNLHKSAA1269SALEQREHQPHSSSF1269PAGLRGSL-TYQETEN--LNYDSVHN  
 Mus\_musculus YFN-RNVWDQ1269SINLHKSNI--P---NHPYSTTSPARFPKDP-TWFE1269GEN--LNY-DLQI  
 Rattus YFN-RNVWDQ1269SMLHKSNIQNP---NHPYSTTSPAGFPKDP-TWLE1269GEN--LNY-DLQI  
 Cavia QFH-RNYWDQATNLHE--VGPPNQRRNYPYPSQPHVGLQKTP-TWQEGKN--LNY-DMQM  
 Homo YFN-RNIWDQATHLQKAPARPPDQKGNQPYYSNTPAGLQKNP-IWHE1269GEN--LNY-GMQI  
 Equus YFN-INFWDQPTNLHKAPANPPHQKENQPYSSNSPAGLQKNP-TWFE1269GEN--LNY-GMQI  
 Ursus YFN-RNFWDQPTTLHKAPPSPPHQKENQPYSSNSPAGLQKIP-TWFE1269GEN--LNY-GMQI  
 Bos YFT-RTFWGQPTNLKAPASPPYHKENQPYFSNSPTGLQKDP-TWHE1269GEN--LNY-GMQI  
 Sus YLN-RNFWDQSTNLYKTPTSSPHQKENQPYSSNSPAGLQKNP-TWHE1269GEN--LNY-GMQI  
 Tursiops YFN-RNFWDQPTNLHKAPASSPYQKENKPYSSNSPAGLQKNP-IWHE1269GEN--LNY-GMQT  
 Allig\_mississipp FLT-RSPR1269DPE-----MGSPVQ1269TERTPH-----  
 Allig\_sinensis FLT-RSPR1269DPE-----MGSPAQ1269TERNPH-----  
 Gharial FLT-RSPR1269DPE-----MGSPAQ1269TERTPY-----

Crocodylus\_nilo FLT-RSPRDPE-----VGSPAQTERTPY-----  
Crocodylus\_poro FLT-RSPQDPE-----VGSPAQTERTPY-----  
Aspidoscelis YFE-RDTWAPKR-----VGSVQEEPSPYFNAYQKHFRNNP-TVSEGRKEVIPG-SVPF  
Shinisaurus YAEKRNTWVPM-----GGSSAQKDTSPYNTYSTDFRRNP-TYTEDTGGAIHV-SAPI  
Ophisaurus YIE-RDTWVPPR-----VASSTQKDTPPYNYGYSTDFRRNP-TYSEDGTGDAIHA-RAPI  
Anolis YAE-RNTWVPPR-----VDPASAQKETAPYNYIYSTDFRGNP-THVEDRERI IHM-NAPI  
Eublepharis YSE-RDTWGPFR-----MGPSVQKEASPYFNYSYPPDFRRNP-THMEDTR-----SAPM  
MournGekko YPE-RDTWSPHR-----MGPSIQKEASPYFNYSYSPDSRRNP-THMEDAG-----GAHI  
Gekko\_japon YPE-RDTWSPHR-----MGPSIQKEASPYFNYSYSPDSRRNP-THMEDAG-----GAHI  
Python YDE-RDTWAPQK-----VDQVAPKETSPYFNYSYNTNFRNNP-TRTEDAWRAIHM-RAPI  
Boa\_constrictor HDE-RNTWPEI-----VDPAAALKETSSYFNYSYNTNFRNNP-TQIEDTWK-IHM-SAPI  
Vipera YDE-RDTWGPKL-----ADPSAPKETSSYFNYSYNTNFRNNP-THTEDTWRTHI-NPPI  
Protobothrops YDE-RDTWAPKV-----ADPSAPKETSSYFNYSYNTNFRNNP-THTEDTWRTHI-SAPI  
Crot\_horrid YDE-RDTWAPKV-----ADPSAPKETSSYFNYSYNTNFRNNP-THTEDTWRTHI-SAPI  
Crot\_mitch YDE-RDTWAPKV-----ADPSAPKETSSYFNYSYNTNFRNNP-THTEDTWRTHI-SAPI  
Thamnophis YDE-RDRWAPKV-----ADTSAPKETSSYFNYSYNTNFRNNP-TYTEDTWRAIHI-SAPF  
Cobra YDE-RDTWATKV-----ADPSTLKETSSYFNYSYNTNFRNNP-TYTEDTWRAVHI-SAPI  
Pantherophis YDE-RDTWAPKV-----ADSSAPKETSSYFNYSYNTNFRNNP-TYTEDTWKAIHI-SAPF  
Pogona YAE-RSTWVPI-----LGSPSQKETSPYFNAYSTDLRRKSDDDDIDDTGKITHG-SAPL

1380

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Ornithorhynchus SDLGVPEAEGPALMEPVARSADPADPREASSYFVAVARSSCCAGGSPGPRDVPPLAPPDYPP  
Monodelphis NRINTPEKGQFPVTDSDVIQNNLIYQGEVYSYSPASQRSPPCAGESPGRPLISLDY--  
Mus\_musculus TSLSPPEREQLAFPDFLPQSYPTGQNEAHLFH-QSQRGSCCIGGSTGHKDNVLAALQDY--  
Rattus TSLSQPEREQLAFPDFLPQSYPTGQNEAHLFH-QSQRGSCCIGGSTGHKDNVLAALQDY--  
Cavia TRLYSPERSHLAFPDVMPQSYPLGQTESHLFH-PNPSSCCVGAAGPHKNPLALQDY--  
Homo TRMNSPEREHSFPNFIPPSYPSGQKEAHLFH-LSQRGSCCAGSSTGPKDNPLALQDY--  
Equus TRLNSPEGEHVAFDPSIPLSYPAQKEAHLFH-LSQRSPCCVGGSIGPEDNPLALQDY--  
Ursus TRLNSPDGEHLAFPDLPYPSYPAQKEAHLFH-LSQRGSCCAGGSGHKNVLAALQDY--  
Bos TRLNSPEGGHLAFPDLPYPSYPAQKEAHLFH-LSQRGSCCAGGSMWPKNNPLALQDY--  
Sus TRLNSPERDHLAFPDLPYPSYPAQKEAHLFH-LSQRGSCCAGGSMWPKNNPLALQDY--  
Tursiops TRLNSPEREHLVFPDLPYPSYPAQKEAHLFH-LSQRGSCCAGGSGHKNVLAALQDY--  
Allig\_mississip -----SKGYPPNFRGITAEP--SSRLCCAGNSPVKEDPLASLDY--  
Allig\_sinensis -----SKGYPPNFRGITAEP--SSHLCCAGNSPVKEDPLASLDY--  
Gharial -----SKGYPPNFRGITAEP--SSRLCCAGNSPVKEDPLASLDY--  
Crocodylus\_nilo -----SKGYPPNFRGITAEP--SSRLCCAGSSPAPKEDPLASLDY--  
Crocodylus\_poro -----SKGYPPNFRGITAEP--SSRLCCAGSSPAPKEDPLASLDY--  
Aspidoscelis ---NDAEGRSYVNPLGYPDDYPPEHRTITSS--TNTRLCCSGNSPGRENILAPLRS--  
Shinisaurus SNVNVAGRRRYPDTLGYPDDYPPEHRTITSS--TANHLCCAGDSPVRENILAPLRS--  
Ophisaurus SSVNIVGRRRYPDTVDPDDYPPEHRTITSS--SENHLCCAGDSPGRENMPAPLRS--  
Anolis STENAPRRRHYLDRMGYSDDYPKERRMTSS--TANQLCCADDSMPRENRLAPLRS--  
Eublepharis SNANVAERSNYRDTLGYPDNYPREHRTITSS--TADHLCCAGNAPVPQENVLAPLRS--  
MournGekko SSVNTAERRNYPDRLYPDDYPPEHRTITSS--TANRLCCAGDSSVPRGNSLAPLRS--  
Gekko\_japon SSVNTAERRNYPDRLYPDDYPPEHRTITSS--TANRLCCAGDSSVPRGNSLAPLRS--  
Python SSNNAPVRRNYPNTGGYPDDYPPEHRTITSS--TVNYFCCADESRGANENIQAPLKI--  
Boa\_constrictor SSNNAPGRRNYPNTGGYPDDYPPEHRTITSS--TVNYFHCTGETPGANENILAPLRT--  
Vipera SSNNSPGRRNYPNTGG---YPREHRTITSS--TINYFCCAGESLGNENILAPLRI--  
Protobothrops SSNNAPGRRNYPNTGG---YPREHRTITSS--TINYFCCAGESLGNENILAPLRI--  
Crot\_horrid SSNNAPGRRNYPNTGG---YPREHRTITSS--TINYFCCAGESLGNENILAPLRI--  
Crot\_mitch SSNNAPGRRNYPNTGG---YPREHRTITSS--TINYFCCAGESLGNENILAPLRI--  
Thamnophis SSNNVPGRRNYPNTGV---YPREHRTITSS--TINYFCCAGESLGNENILAPLRI--  
Cobra SSNNGPGRNYPNTGV---YPREHRTITSS--TINYFCCAGESPGGNQNILAPLRT--  
Pantherophis SSNNAPERRNYPNTGV---YPREHRTITSS--IINYFCCAGESPGAKENILAPLRI--  
Pogona SSVNVAGERHYPDTRRYSEDYRGEYRTITSS--TADHLCCAEDSPVTKEGLPAPLRS--

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1440

Ornithorhynchus LALPGYLPLDPLDYPPDRPDPYLPAPRDYPPDPNTNYSPLDTPDYPPHYPLAPQDYSS  
Monodelphis -----SP  
Mus\_musculus -----TS  
Rattus -----TS  
Cavia -----TP  
Homo -----TP  
Equus -----TP  
Ursus -----TP  
Bos -----TL  
Sus -----TQ  
Tursiops -----TP  
Allig\_mississip -----SL  
Allig\_sinensis -----SL

Gharial -----SL  
 Crocodilus\_nilo -----SL  
 Crocodilus\_poro -----SL  
 Aspidoscelis -----AP  
 Shinisaurus -----AP  
 Ophisaurus -----AP  
 Anolis -----AP  
 Eublepharis -----VP  
 MournGekko -----AS  
 Gekko\_japon -----AS  
 Python -----AP  
 Boa\_constrictor -----AP  
 Vipera -----AP  
 Protobothrops -----AP  
 Croc\_horrid -----AP  
 Croc\_mitch -----AP  
 Thamnophis -----AP  
 Cobra -----AP  
 Pantherophis -----AP  
 Pogona -----AP

1500

Ornithorhynchus PLGLSLWELQVGGPRSPG--GSRSRHQQAAASPVGVPAIRRNGTEEA---PPTRREEPAP  
 Monodelphis PFGLVSGDDGERNPPTTE--GIHMKHARHIIYSTDIQPNQRNSSEKN---LSEKGANPDP  
 Mus\_musculus SYGLPPRKNQETSPVHTE--SSYIKYARPNVSPASILPSQRNISENK---LTAESPNSP  
 Rattus SYGLPPRKTQETISPVHTE--SSYTKYAKPNVSPASILPNQRNISENK---LTAESPNSP  
 Cavia SYGLAPGENHNTNPTYTE--SSHHTHTRPNVSPSILPGQRNSSEKK---LPGESTKPS  
 Homo SYGLAPGENQDTSPLYTD--GSHTKQTRDIISPTSILPGQRNSSEKR-----ESQNF  
 Equus SFGLLPGENQDTSLLYME--DSHTNHARDTISPTIIPPVEGNSSEKR---LPGESQNPSP  
 Ursus SFGPVPGETQDTSPLYTE--DSHTKHARHTISPTSINLPDQRNSSEKR---LPGESQNPSP  
 Bos FFLAPGENQDTSPLYTE--DSHTKHARYTISPTSILPGQRNSSEKR---LPGESQNPSP  
 Sus SFGLAPGENPDTSIGYAE--DSHIKYARQTVSPTSIVPGQRNSSEKI---LPGESQNPSP  
 Tursiops SFGLALGENQDTSVPVYIE--DSQTHVRHTISPTSILAGQRNSSEKR---LPGESQNPSP  
 Allig\_mississip QLRPSTWE-HKP----PE--GSHSKHARHVAYPAAIQSGQKNCSLRL---EKSPGENAEN  
 Allig\_sinensis QLRPSTWE-HKP----PE--GSHSKHARHVAYPAAIQSGQKNCSLRL---EKSPGENAEN  
 Gharial QLRPSTWE-HKP----PE--GSHSKHARHVTPVAIHSGQKNCSLRL---EKSPGENAEN  
 Crocodilus\_nilo QLRPSTWE-HKP----PE--GSHSKHARHVTPVAAIQSGQKNCSLRL---EKSPGENAEN  
 Crocodilus\_poro QLRPSTWE-HKP----PE--GSHSKHARHVTPVAAIQSGQKNCSLRL---EKSPGENAEN  
 Aspidoscelis HFQLALWE-QKGSSTYPE--VSHAKYARHAPHPAGLQTSNRDNFLRTGEKNGNQGEKIDT  
 Shinisaurus QFRLASWE-HKGSSTYPE--GSHAKHARHAPYLPSPITNH---SLKTGKMLPNQREHLGA  
 Ophisaurus HFRLASWE-HKGSSTYPE--GSHAKHARHAPYPAGNQANH---SLKTGKMOPNQRREPLSA  
 Anolis QFRHALWA-AKESSTYPD--GSHANYVRHAHSPAGIQANN---PLKNGG---REQEELGA  
 Eublepharis QFRQALWP-QKGSSTYPEADGSHPKQAGHTLYPSGMQS----SLKTEKSTPKQREDLGV  
 MournGekko QFRLASWE-QKGSSTYPEADGSHPKQAGHTLYPSGMQS----SLKTDKSPPNQRENLGV  
 Gekko\_japon QFRLASWE-QKGSSTYPEADGSHPKQAGHTLYPSGMQS----SLKTDKSPPNQRENLGV  
 Python QFRLASW-QKRSPTYPE--GSHASYARHPPYLAGIQSNHWNNLSLKFQKSLPNHRENPGG  
 Boa\_constrictor RFRLASWE-QKGSPTYPE--GSHTLYARHPPYLAGVFNHWNNLSLKSGESLPNHRENPGG  
 Vipera QFRAVSWE-QKSSPTYPE--GSHALYARRPAYLAGIQSNLWNNLSLKT----NHNRENPGD  
 Protobothrops QFRAVSWE-QKSSPTYPE--GSHALYARRPAYLAGIQSNLWNNLSLKS----NHNRENPGD  
 Croc\_horrid QFRAVSWE-QKSSPTYPE--GSHALYARRPAYLAGIQSNLWNNLSLKS----NHNRENPGD  
 Croc\_mitch QFRAVSWE-QKSSPTYPE--GSHALYARRPAYLAGIQSNLWNNLSLKS----NHNRENPGD  
 Thamnophis QFKLVSWG-QKNSPTYPE--GSHALYARRPAYLAGIQSNHWNNLSLKS----NHNRENPGD  
 Cobra QFKLVSWE-QKSSPTYPE--GSHALYARRPAYLAGIQSNHWNNLSLKS----NHNRENPGD  
 Pantherophis QFKLVSWE-QKNSPIYPE--GSHALHARRPAYLAGIQSNHWNNLSLKS----NHNRENPGD  
 Pogona QFRLAPWE-EKISAGYSE--GSHGKHARHAPSPAGIQSNY---PFMVGK---KQKENLDT

1550

Ornithorhynchus SRDGLAP-GRSPPCSLRPRASPRAGLAFPEACL-PPAKPAPCFKSRLRGDVSVPQILLD  
 Monodelphis FRADTAMLKKSPPCSKRSPAGQTESVPFSEADS-LQA-NMPCRKSNLRGEGNNVLAKILG  
 Mus\_musculus FGDGVPTVRKNTPYSGKNQL-ETGIVAFSEASS-SQPKNTPLKSDLGDDRDLVKOFFE  
 Rattus FGDVPTVRKNTPNQSGKNQL-ETGIVAFSEASS-SQPKNTACLKSDLGDDRDLVKOFFE  
 Cavia LRDNVSSL-KNAPCSAKTQQGTGGVRSFPKASAPQS-NTLCLSNLDGGDGNVLEQIFE  
 Homo FRDDVSTLRRNTPCSIKNQLGQKEIMPFPEASS-LQSKNTPCLKNDLGGDGNVLEQIFE  
 Equus FGDVSTLRRNTPCSIKNQLGQKEIMPFPEASS-LQPKNTPCLKSDLGDDGNVLEQIFE  
 Ursus FRDDVSTLRRNTPCSMKNQLSQRGIMPFPEASS-LQSKNMPCLTSDLGGDGNVLEQIFE  
 Bos FRDDVSTLRRNTPCSINNQLSQRGIMPLPEASS-LQSKNIPCLKSDL-EDGNHVLEQITLE  
 Sus FRDDVSTLRRNTPCSVKSQLSQRGIMPLPEASS-LQSKNTPCLTSDLGGDGNVLEQIFE  
 Tursiops FRDDMSTLKRNTPRSI-NQLGQRGIMPFPEASS-LQSKNTPCLKSDLGEG-NILEQIFE  
 Allig\_mississip FEDGTRDQERDMPCSKNALGQNK-QGSPKKEP-DPTRNPLYFESNTRGDGNSVFAQIFG

Allig\_sinensis FEDGTRDQERDMPCSKNALGQNKK--CGSPKKGP-DPTRNPLYFESNTRGDGNSVFAIFG  
 Gharial FEDGTRDQERDMPCSKNVLGQNKK--CGSPQKGP-DPTRNPLYFESNTRGDGNSVFAIFG  
 Crocodilus\_nilo FEDGTQDQERDMPCSKNVLGQNKK--CGSPQKGP-DPTRNPLYFESNTRGDGNSVFAIFG  
 Crocodilus\_poro FEDGTQDQERDMPCSKNVLGQNKK--CGSPQKGP-DPTRNPLYFESNTRGDGNSVFAIFG  
 Aspidoscelis LGEKIAGVEKNLPCSKTQLNQKHEHQINEAGL-PLSDDAPCSGSNIRGDRHNVLGILG  
 Shinisaurus FGEVADLEKSPPCSNPQLRQKNDHEDADYETGL-PPRPNAPCYGSSTRGDGHNVLGIVG  
 Ophisaurus FREEAAVLEKSPPCSNPQLRQENDHEDADYESGL-PPQRKVPICYGSSIRGDGHNVLGIVG  
 Anolis FRVENAGSEKSLPCSNHLSQDSKQANLQRGL-FKFRNMPCHGSNIRGDRHNPLALVVG  
 Eublepharis FEKDAATLEKAPPSCRSQLSQONERFVNYETGLAAPTARKPPCYGRSVRGDGHISIFENI--  
 MournGekko FGEDVAGLEKAPPSCSKSLGQENGHEVHHGNGL-APTRNTPCYGRSIRGDGHISILENII-  
 Gekko\_japon FGEDVAGLEKAPPSCSKSLGQENGHEVHHGNGL-APTRNTPCYGRSIRGDGHISILENII-  
 Python FGEVADLEKSPPCSNQLGQIRGHDTNYETGL-FPSKILCSRNSIRGDGHTVLAHIMG  
 Boa\_constrictor FGEVADLEKSPPCSKTQLGQVSDHDTTYETGL-FPSKNILCSRNSIRGDGHTVLAHIMG  
 Vipera FEVEVADLGKSPPCSNLLAQTSDDHTIYETGL-FPSKIPCSKTSIRGDGHTVLAHIVE  
 Protobothrops FEKVDALGKSPPCSNLLAQTSDDHTIYETGL-FPSKILCSKNSIRGDGHTVLAHIVE  
 Croc\_horrid FEEVADLGKSPPCSNLLAQTSDDHTIYETGL-FPSKILCSKNSIRGDGHTVLAHIVE  
 Croc\_mitch FEEVADLGKSPPCSNLLAQTSDDHTIYETGL-FPSKILCSKNSIRGDGHTVLAHIVE  
 Thamnophis FGEKVADLEMSPPCSNLLGQTSDDHTIYETGL-FSSKGLCSKNSIRGDGHTVLAHIVE  
 Cobra FGEVADLEMSPPCSNLLGQTSDDHTMYETGL-FPSKILCSKNSIRGDGHVLAHIVE  
 Pantherophis FGEVADLEMGPCCSNLLGLTS--DTIYETGL-FPSKIRCSKNSIRGDGHTVLAHIVE  
 Pogona FTEEAAGAQNLPCCSKSLSQDHTHTNCETGL-PPSENTHDYGNLSRGRHSIPALIMG

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1620

Ornithorhynchus PDPVAGNDGPAEAGDLAVV---VPERDPGPVGIR---GDPEPGPE--AGAPGFQWVPCFG  
 Monodelphis VNQFNARTSNLIEEEL--E---APEENLGPENIQSEGGGSEGRVKQ--KGVPNIQKVPCLH  
 Mus\_musculus GSQLSERTAGLTPEQLVIG---IPDKGSGPDSIQSEVQKKEGEMQ--QRPPITMKLPCFG  
 Rattus GTQLGERTAGLTPEQLVIG---SPDKGSGPDGTHSEVQSGEGEMQ--QRPPITRKLPCFG  
 Cavia GNHLSERTVNLTPPEQLFIG---TLNEGLKPPGIQKEMQGEEDRPP--QRPPSILQVPCFG  
 Homo DNQLNERTVDLTPEQLVIG---TPDEGSNPEGIQSQVQENESERQQ--QRPSILHLPCFG  
 Equus GNQLNERTVDLTPEQLVID---IPDEGPKPEGIQSEVQGNENGERQQ--QRPPSILQLPCFG  
 Ursus DNQFDERTADLTPEQLVIG---SPDEGPQPEGIQSEVQGNENGERQQ--QRPSILQLPCFG  
 Bos GNQLNERTVDLTPEQLVMD---TPDEGPKPEGIPSEVQGNENGERQQ--QRPSILQLPCFG  
 Sus GNQLNERTVDLTPEQLVFG---TPDKEPPEGIPNEMQGNENESERQQ--QRSSILQLPCFD  
 Tursiops GNQLNERTVDLTPEQLVIG---TPDEGPKPEGIPSEVQGNENGER--Q--QRPSILQLPCFG  
 Allig\_mississip LNQYNGRDAGPDEENHMTGPHDIPPEEPLPEGIRSATLGSKADMKE--VAHEFKRIPCFG  
 Allig\_sinensis VNQYNGRDAGPDEENHMTGPHAIPEEPLPEGIRSATLGSKADMKE--VAHEFKRIPCFG  
 Gharial VNQYNGRDAGPDEENHMTGPHDIPPEEGLTPEGIRSATLGSKADMKE--VAHEFKRIPCFG  
 Crocodilus\_nilo INQYNGRDAGPDEENHMTGPHDIPPEEGLTPEGIRSATLGSKADMKE--VAHEFKRIPCFG  
 Crocodilus\_poro INQYNGRDAGPDEENHMTGPHDIPPEEGLTPEGIRSATLGSKADMKE--VAHEFKRIPCFG  
 Aspidoscelis SNQSKREIERAASMKL-----VSEDVSAPQGISVSLDVKDDRRNEHTTHGFKRIPCFG  
 Shinisaurus ANQSKREFEF--AALKL-----IPETFSQPQGIRSEALVSEVDRKEQHATLGFKRIPCFG  
 Ophisaurus TNHAKRELER--AALKL-----IPETFPPEQVRSSEALVSEVGGKEQQAELGFKRTPCFR  
 Anolis TQQS---FGR--GILNF-----LPEQFPQPHGIQSEALVSEDDGKE--YAALGAKRIPCFG  
 Eublepharis --DPPKREQERAAAVNL-----IPEKGPPAQGIKSAALDTKGRSRKQPAVGFGRIPCLG  
 MournGekko --QPKRDHERAAAVKF-----VPQKGPFAHGIKSAVAFDSEDSRKEQAVLGFKRIPCLL  
 Gekko\_japon --QPKRDHERAAAVKF-----VPQKGPFAHGIKSAVAFDSEDSRKEQAVLGFKRIPCLL  
 Python VNQPKREFEF--AALRF-----PQPQIRNEAIVGEIDRKEYHATHGFKRTPCFG  
 Boa\_constrictor VNQPKREFEF--AALRF-----PQPQIRNEAIVGEIDRKEYHATHGFKRTPCFG  
 Vipera VNQPKREFEF--AALTF-----PQPQIRNEA--VGEIDRKEHRAIQGFGWTPCFG  
 Protobothrops VNQPKREFEF--AALTF-----PQPQIRNEA--IGEIDRKEHRATQGFQWTPCFG  
 Croc\_horrid VNQPKREFEF--AALTF-----PQPQIRNEA--IGEIDRKEHRATQGFQWTPCFG  
 Croc\_mitch VNQPKREFEF--AALTF-----PQPQIRNEA--IGEIDRKEHRATQGFQWTPCFG  
 Thamnophis VNQPKREFEF--AVRF-----PQPQIRNEA--VGEIDRKEHRATQGFQWTPCFG  
 Cobra VNQPKREFEF--AALKF-----PQPQIRNEA--VSDIDRKHATQGFQWTPCFG  
 Pantherophis VNQPKREFEF--AALRF-----PQPQIRNEA--VSETDRKEHRATQGFQWTPCFG  
 Pogona ESESRRFRQ--AAVKL-----VPEKSEPEQRIRSQALASEDRKEQHAALAIKRIPCFG

\* \* \* \*\* :

1680

Ornithorhynchus SETQNHYLAWTGAPPNGNEKPDSEPVS--TAPAETLDA-VSGLPTGVPSEGPSL--PRSE  
 Monodelphis SKLKDHLSSSTGAPLGRKRRPGLSTGEP--AMVSAQPSSTLTGLTAREQLGGTNDPLVAS  
 Mus\_musculus SN--SKFHSSTTGPPINRRRPTLLNGAL--STPTESPNT-LVGLATREQLKSINVDKLNAD  
 Rattus SKLAKLHSSSTGPPPTNNGGPSLPGAL--STPTESPNT-LVGLATREQLKSINVDKLNAD  
 Cavia SQTQLHSSSTGTPTSSRRRPGSPGGDL--TKPTENPNT-FVGFATGEPFRSINADQLSVA  
 Homo SKLAKHSSSTGTPTSSDGRQSPFDGDS--ITPTENPNT-LVELATEQFQKSINVDPLDAD  
 Equus SNLAKYHSSGAGTPTSSIGRQGLFDGDP--IMPTEIPNS-LAGLATGAEFQSI SVDPLNAD  
 Ursus SEIAKYHSSSTGTPTSSIGRQGFDEDP--IMPTEIPNS-LSRLATGAEFQSI SVDPLNAD  
 Bos SKLTKYTSSTGTPTSSLGRQGSFDGDP--IMPTEIPNS-LAELATGAQFQINVDPLNAD  
 Sus SKLANYHTSSIGTPTSSLGRQGSFDGDP--IMPTEIPNS-LAGLATGAQFQINVDPLNED  
 Tursiops SKLTKYHTSSGTPTSSIGRQGSFDGDP--ITPTEIPNS-LAELATRAQFQINVDPLNAD



Allig\_mississip SWLRQ-HLSSTGVPPGVRKQESIYGDQLLVIPTKPNL---QLETEAKIPSAEP-----  
 Allig\_sinensis SWLRQ-HLSSTGVPPGVRKQESIYGDQLLVIPTKPNL---LLETEAKIPSAKP-----  
 Gharial SWLRQ-HLSSTGVPPGVRKQESVYGDQLPVIPTKPNL---QLETEAKIPSAEP-----  
 Crocodilus\_nilo TWLRQ-HLSSTGVPPGVRKQESIYGDQLLVIPTKPNL---QLETEAKIPSAEP-----  
 Crocodilus\_poro TWLRQ-HLSSTGVPPGVRKQESIYGDQLLVIPTKPNL---QLETEAKIPSAEP-----  
 Aspidoscelis NWLKQ-YLPSTGAPSGDQNNLFNAES--PTPTGKLN I---MPPEPQPISSSTPFHNTQE  
 Shinisaurus SWLKQ-YLSSTGAPSGDQQHDLF-----  
 Ophisaurus SWLKQ-YLSSTGAPSGDQQHDLFYGED--PVPTGKPD I---LHPEPQPISSSTPNPSHNVEE  
 Anolis SWLKQ-YLSNTEVPSGDQQRDPFYGEN--PVPTERPNS---IPPKPEPISSSFLSNGVEE  
 Eublepharis NQLQQ-YLSSTGAPSSGKQDLYFYAEN--PMLIGKSF I---ILPEPHPLTSTNPSYDTEE  
 MournGekko NRLKQ-FLSSTGAPSGDTQDLYFYAEN--PALIGQSYV---ILPEPHPLSSTDPSTYDTEE  
 Gekko\_japon NRLKQ-FLSSTGAPSGDTQDLYFYAEN--PALIGQSYV---ILPEPHPLSSTDPSTYDTEE  
 Python SWLKQ-HISSTGTPLGQDQPSGVFYAEH--SMHAGKPI I---MLPEPQPISSSTVPSHSIGE  
 Boa\_constrictor NWLKQ-HISSTGTPLGQDQSDVIFYAEN--SMHAGKPI I---MLPEPQPISSSTVPSHDI-E  
 Vipera SWLKQ-HIFSTGDPLVDQSSDIFYAEN--SMQAGKPI I---MLPEPQPMSTTVLSQDVGE  
 Protobothrops SWLKQ-HIFSTGDPLVDQSSDIFYAEN--SMQAGKPI I---MLPEPQPMSTTVLAQDVGE  
 Croc\_horrid SWLKQ-HIFSTGDPLVDQSDIFYAEN--SMQAGKPI I---MLPEPQPMSTTVLAQDVRE  
 Croc\_mitch SWLKQ-HIFSTGDPLVDQSSDIFYAEN--SMQAGKPI I---MLPEPQPMSTTVLAQDVGE  
 Thamnophis SWLKQ-HISSTGDPLVDQPSDIFYLEN--SMHAGKPI I---MLPEPQPMSTTVPSQDGE  
 Cobra SWLKQ-HISSTRDPLVDQPSDIFYLEN--SMHAGKPI I---MLPEPQPMSTTVPSQDGE  
 Pantherophis NWLKE-HISSTGDPLVDQPSDIFYLEN--SMHAGKPI I---MLPEPQPVSSSTVPSQDGE  
 Pogona SWLKQ-YLSSTGAPSGDQQHNLHFHGET--PVPTSRPND---MPPESKPISSSTPNSHDDRE  
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Ornithorhynchus -LSPPFKTLQWEVADGPEQQGADCSSLQ-  
 Monodelphis --EPPLSFP--SLSIPKNAEFQDCLLLHS-  
 Mus\_musculus -EHTTLESF--Q-GTSPQDQ--GCLLLQA-  
 Rattus -GHTTLESF--Q-DTSQQDQAHGCLLLQA-  
 Cavia -GHTPFESF--QRGTDQDQIQDCLLIQV-  
 Homo -EHSPEFEL--QRGTNPQDQVQDCLLLQA-  
 Equus -EHTSFDYL--QIGTDPEDQVQDCLLLQA-  
 Ursus -EHTPFDSL--QLGTNPQDHVQDCLLLQA-  
 Bos -DHTPFDSL--QVGTNPQDQVQDCLLLQA-  
 Sus -EHTPFDSL--QIGTNPQDQVQDCLLLQA-  
 Tursiops -EHTLFDL--QVGTNPQDQVQDCLLLQA-  
 Allig\_mississip --PNGVSSLTGGMANDSEERRPDCLLLQN-  
 Allig\_sinensis --PNGVSSLTGGMANDSEERRPDCLLLQN-  
 Gharial --PNGVSSLTGGMANDSEERRPDCLLLQN-  
 Crocodilus\_nilo --PNGVSSLTGGMANDLEERRPDCLLLQN-  
 Crocodilus\_poro --PNGVSSLTGGMANDSEERRPDCLLLQN-  
 Aspidoscelis -NPVKSSSPGRELVDQANESVDCFLQNK  
 Shinisaurus -----  
 Ophisaurus -NLLDFSSPGEELAEQPNIEWIPDCLLLQNK  
 Anolis -KPLKINAPEEAWAKLATQSTPDCLLLQKK  
 Eublepharis -KPLTPSALGEDLADQPKERTPDCLLLQK-  
 MournGekko -KPLTPSSLGEDLADQPNERTSDCLLLQK-  
 Gekko\_japon -KPLTPSSLGEDLADQPNERTSDCLLLQK-  
 Python -DHIKFSTP-EELVGQPNERTDCLLLRNK  
 Boa\_constrictor -DQLKFSPP-EELVGQPNERTDCLLLQNK  
 Vipera -DQLKLTSP-EEQVGQPNERTDCLLLHE-  
 Protobothrops -DQLKLTSP-EEQVGQPNERTDCLLLHE-  
 Croc\_horrid -DQLKLTSP-EEQVGQPNERTDCLLLHE-  
 Croc\_mitch -DQLKLTSP-EEQVGQPNERTDCLLLHE-  
 Thamnophis -DQLKLTSP-GEQVGQPNEGTIDCLVLQNE  
 Cobra -DQLKLTSP-EEQMGQPNERTDCLLLFQNE  
 Pantherophis -DQLKLTSP-EEQVGQPNERTDCLLLHE-  
 Pogona GKHLKFGSPGEEWVERPNETTPDCLLLQKK