Supplemental Table I. Primer sequences used in cellular localization and Real-Time PCR experiments.

Primer Name	Direction	Primer Sequence	Amplicon Size (bp)
AtTIL-F1	Forward	5'-CAATCTAGAACTATTTGCCGAAGAGAGA-3'	560
*At**TIL*-R1	Reverse	5'-GCAGATCTATGACAGAGAGAAGAAAGAGATG-3'	
AtTIL-F2	Forward	5'-TACCATGGTGACAGAGAAGAAAGAGATG-3'	560
AtTIL-R2	Reverse	5'-TACCCATGGATTTGCCGAAGAGAGA-3'	
AtTIL-F2	Forward	5'-TACCATGGTGACAGAGAAGAAAGAGATG-3'	460
AtTIL-R3	Reverse	5'-TACCATGGCACTCTGAGGAGTCTTGTG-3'	
AtTIL-F3	Forward	5'-ATAGATCTGACACACCACCTGAGTCC-3'	100
AtTIL-R4	Reverse	5'-CAATCTAGAACTATTTGCCGAAGAGAGA-3'	
TaTIL-1 FAM	Forward	5'-CACGTCAAGGAGGAAGGCTACGACG[FAM]G-3'	131
TaTIL-1	Reverse	5'-CATTTACCAAAGAGCGACTTGAACC-3'	
TaTIL-2	Forward	5'-TACATGGGCCGGTGGTACG-3'	43
TaTIL-2 FAM	Reverse	5'-GATCGGACGGGAAGCACGCGA[FAM]C-3'	
TaCHL	Forward	5'-GCAAAGGACACCAGCTTTATTCAGATATAC-3'	175
TaCHL FAM	Reverse	5'-GACCAGACATCATCTCCGCAAGCTGG[FAM]C-3'	
TaVDE	Forward	5'-GCTCAAGGAATGCAGGATCGAG-3'	63
TaVDE FAM	Reverse	5'-CAACCTGCTGCACATGATGGG[FAM]TG 3'	
TaZEP FAM	Forward	5'-CAGCATGTTGGAATGCCTTTGATGC[FAM]G-3'	59
TaZEP	Reverse	5'-AGCTTTGAGCTGTTGCCACCT-3'	
18S RNA JOE	Forward	5'-GAACATCGGTCTGTGATGCCCTTAGATG[JOE]TC-3'	83
18S RNA	Reverse	5'-GGCCAAGGCTATATACTCGTTGAATAC-3'	

Supplemental Table II. Lipocalins and lipocalin-like proteins used for the alignment (suppl. fig. 7).

Protein	Species	Abbreviation	Accession numbers*	Clade
Outer membrane lipoprotein	*Vibrio cholerae*	Vcho.Lpro	X64097	I
Outer membrane lipoprotein	*Escherichia coli*	Ecol.OML	AE000487	I
Outer membrane lipoprotein	*Citrobacter freundii*	Cfre.OML	U21727	I
Outer membrane lipoprotein	*Gloeobacter violaceus*	*Gv* Blc	BAC88907	I
Putative lipocalin	*Dictyostelium discoideum*	Ddis.Lip	C24642	I
Lipocalin	*Debaryomyces hansenii*	*Dh* Lip	CAG88663	I
Temperature induced lipocalin 2	*Triticum aestivum*	*Ta* TIL-2		I
Temperature induced lipocalin 1	*Triticum aestivum*	*Ta* TIL-1	AAL75812	I
Temperature induced lipocalin	*Arabidopsis thaliana*	*At* TIL	BAB10998	I
Lipocalin	*Porphira yezoensis*	*Py* Lip		II
Outer membrane lipoprotein	*Magnaporthe grisea*	*Mg* Blc	EAA51774	II
Schistocerca americana	*Schistocerca americana*	Same.Laz	U15656	II
Lipocalin	*Drosophila melanogaster*	Dmel.Lip	AC004439	II
Lipocalin	*Arabidopsis thaliana*	*At* CHL	AAK59669	II
Lipocalin	*Triticum aestivum*	*Ta* CHL		II
Crustacyanin 1	*Homarus gammarus*	Hgam.CRC2	P80007	II
Crustacyanin 2	*Homarus gammarus*	Hgam.CRC1	P80029	II
Insecticyanin A	*Manduca sexta*	Msex.IcyA	X64714	II
Galleria mellonella	*Galleria mellonella*	Gmel.Gall	X64715	II
Bilin-binding protein	*Pieris brassicae*	Pbra.Bbp	X76568	II
Apolipoprotein D	*Mus musculus*	Mmus.ApoD	X82648	II
Apolipoprotein D	*Homo sapiens*	Hsap.ApoD	J02611	II
Purpurin	*Gallus gallus*	Ggal.Purp	M17538	III
Retinol-binding protein	*Xenopus laevis*	Xlae.RBP	J02718	III
Retinol-binding protein	*Oncorhynchus mykiss*	Omyc.RBP1	P24774	III
Retinol-binding protein	*Gallus gallus*	Ggal.RBP	X77960	III
Retinol-binding protein	*Homo sapiens*	Hsap.RBP	X00129	III
Beta-lactoglobulin	*Trichosurus vulpecula*	Tvul.BL	U34289	IV
Pregnancy protein 14	*Homo sapiens*	Hsap.PP14	M61886	IV
Beta-lactoglobulin B	*Bos taurus*	Btau.BLB	X14712	IV
Beta-lactoglobulin B	*Sus scrofa*	Sscr.BLB	X54976	IV
Epididymal secretory protein	*Mus musculus*	Mmus.Lcn11	AAQ81972	M
Endometrial P19 protein	*Equus caballus*	Ecab.p19p	X98459	M
Epididymal secretory protein	*Homo sapiens*	Hsap.Lcn9	AAQ81975	M
Epididymal secretory protein	*Lacerta vivipara*	Lviv.ESP	X63151	M
Quiescence-specific protein 21	*Gallus gallus*	Ggal.QS-21	M55644	V/M
Choroid plexus lipocalin 1	*Xenopus laevis*	Xlae.cpl1	X84414	V
Choroid plexus lipocalin	*Bufo marinus*	Bmar.lip	Q01584	V
Prostaglandin D synthase	*Homo sapiens*	Hsap.PGDS	M61900	V
Prostaglandin D synthase	*Mus musculus*	Mmus.PGDS	X89222	V
Epididymal secretory protein	*Mus musculus*	Mmus.Lcn12	AAQ63836	V
Epididymal secretory protein	*Homo sapiens*	Hsap.Lcn12	BC041168	V
Neutrophil gelatinase lipocalin	*Homo sapiens*	Hsap.NGAL	X83006	V
Neutrophil gelatinase lipocalin	*Mus musculus*	Mmus.NGAL	P11672	V
Alpha-1 microglobulin	*Xenopus laevis*	Xlae.A1mg	D87752	VI
Alpha-1 microglobulin	*Mus musculus*	Mmus.A1mg	D28812	VI
Alpha-1 microglobulin	*Homo sapiens*	Hsap.A1mg	X04494	VI

Alpha-1 microglobulin	*Salmo salar*	Ssal.A1mg	L26598	VI
Alpha-1 microglobulin	*Pleuronectes platessa*	Ppla.A1mg	X63762	VI
Complement C8γ subunit	*Homo sapiens*	Hsap.C8GC	X06465	VII
Complement C8γ subunit	*Oryctolagus cuniculus*	Ocun.C8GC	L26979	VII
Major urinary protein	*Mus musculus*	Mmus.mMUP	X03525	VIII
Major urinary protein 5	*Mus musculus*	Mmus.MUP5	M16360	VIII
Major urinary protein 4	*Mus musculus*	Mmus.MUP4	M16358	VIII
Major urinary protein	*Mus musculus*	Mmus.MUP	M28649	VIII
Submaxillary alpha-2u-globulin	*Rattus norvegicus*	Rnor.a2g3	J00738	IX
Alpha-2u-globulin (L type)	*Rattus norvegicus*	Rnor.a2g1	M26836	IX
Odorant-binding protein	*Bos taurus*	Btau.OBP	P07435	X
Allergen BDA20	*Bos taurus*	Btau.alle	L42867	X
Odorant-binding protein 1	*Rattus norvegicus*	Rnor.OBP1	J03093	X
Pheromone carrier Aphrodisin	*Cricetus cricetus*	Ccri.Aphr	X65238	X
Prosthate protein Probasin	*Mus musculus*	Mmus.Pbas	AF005204	X
Prosthate protein Probasin	*Rattus norvegicus*	Rnor.Pbas	M27156	X
Lactation protein Trichosurin	*Trichosurus vulpecula*	Tvul.Lip	U40376	XI
Allergen f2	*Canis familiaris*	Cfam.f2p	AF027178	XI
Zeaxanthin epoxidase	*Oryza sativa*	*Os* ZEP	BAB39765	XII
Zeaxanthin epoxidase	*Arabidopsis thaliana*	*At* ZEP	BAB08942	XII
Alpha-1 acid glycoprotein	*Mus musculus*	Mmus.a1GP	M27009	XII
Alpha-1 acid glycoprotein	*Rattus norvegicus*	Rnor.a1GP	J00696	XII
Alpha-1 acid glycoprotein	*Oryctolagus cuniculus*	Ocun.a1GP	X58727	XII
Alpha-1 acid glycoprotein	*Homo sapiens*	Hsap.a1GP	M13692	XII
Violaxanthin de-epoxidase	*Triticum aestivum*	*Ta* VDE	AAK38177	XII
Violaxanthin de-epoxidase	*Arabidopsis thaliana*	*At* VDE	AAL34241	XII
Late lactation protein	*Trichosurus vulpecula*	Tvul.LLP	U34287	XIII
Vomeronasal secretory protein 1	*Mus musculus*	Mmus.VNSP1	D38580	XIII
Epididymal secretory protein	*Mus musculus*	Mmus.Lcn13	AAR11375	XIII
Vomeronasal secretory protein 2	*Mus musculus*	Mmus.VNSP2	D38581	XIII
von Ebner's gland protein	*Sus scrofa*	Sscr.VEG	S77587	XIII
Allergen f1	*Canis familiaris*	Cfam.f1p	AF027177	XIII
von Ebner's gland protein	*Homo sapiens*	Hsap.VEG	S77587	XIII
von Ebner's gland protein 2	*Rattus norvegicus*	Rnor.VEG2	X74806	XIII
Epididymal secretory protein	*Homo sapiens*	Hsap.Lcn5	AAQ81974	XIV/M
Epididymal retinoic acid binding protein	*Mus musculus*	Mmus.ERBP	AAD09351	XIV
Epididymal secretory protein	*Mus musculus*	Mmus.Lcn8	AF082221	XIV

* Accession numbers are not yet available for proteins reconstructed in this study.

Supplemental Table III. FASTA files of lipocalins and lipocalin-like sequences used in the alignment presented in suppl. fig. 7.

>Mmus.a1GP
QNPEHVNITIGDPITNETLSWLSDKWFFIGAAVLNPDYRQEIQKTQMVFFNLTPNLINDTMELREYHTIDD
HCVYNSTHLGIQRENGTLSKYVGGVKIFADLIVLKMHGAFMLAFDLKDEKKRGLSLNAKRPDITPELREVF
QKAVTHVGMDESEIIFVDWKKDRCSQQEKQQLELEKETKKDPEEGQA

>Rnor.a1GP
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QCVYNFTHLGVQRENGTLSKCAGAVKIFAHLIVLKKHGTFMLAFNLTDENRGLSFYAKKPDLSPELRKIFQ
QAVKDVGMDESEIVFVDWTKDKCSEQQKQQLELEKETKKETKKDP

>Hsap.a1GP
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CIYNTTYLNVQRENGTISRYVGGQEHFAHLLILRDTKTYMLAFDVNDEKNWGLSVYADKPETTKEQLGEFY
EALDCLRIPKSDVVYTDWKKDKCEPLEKQHEKERKQEEGES

>Ocun.a1GP
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CFYNSSIVRVQRENGTLSKHDGIRNSVADLLLLRDPGSFLLVFFAGKEQDKGMSFYTDKPKASPEQLEEFY
EALTCLGMNKTEVVYTDWTKDLCEPLEKQHEEERKKEKAES

>Hsap.RBP
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GLPPEAQKIVRQRQEELCLARQYRLIVHNGYCDGRSERNLL

>Ggal.RBP
ERDCRVSSFKVKENFDKNRYSGTWYAMAKKDPEGLFLQDNVVAQFTVDENGQMSATAKGRVRLFNNWDVCA
DMIGSFTDTEDPAKFKMKYWGVASFLQKGNDDHWVVDTDYDTYALHYSCRELNEDGTCADSYSFVFSRDPK
GLPPEAQKIVRQRQIDLCLDRKYRVIVHNGFCS

>Xlae.RBP
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NMVGTFIETNDPAKYRMKYHGALAILERGLDDHWVVDTDYTTYAITYACRRRNLDGTCRDSYSFVFSRDIN
GLPSESQRIVRRRQEQLCLDRKYRVVVHNGYCETN

>Omyc.RBP1
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MFGTFEDTPDPAKFKMRYWGAASYLQTGNDDHWVIDTDYDNYAIHYSCREVDLDGTCLDGYSFIFSRHPTG
LRPEDQKIVTDKKKEICFLGKYRRVGHTGFCESS

>Ggal.Purp
QTCAVDSFSVKDNFDPKRYAGKWYALAKKDPEGLFLQDNISAEYTVEEDGTMTASSKGRVKLFGFWVICAD
MAAQYTVPDPTTPAKMYMTYQGLASYLSSGGDNYWVIDTDYDNYAITYACRSLKEDGSCDDGYSLIFSRNP
RGLPPAIQRIVRQKQEEICMSGQFQPVLQSGAC

>*Ta*til-1
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EGTAYKADPASEEAKLKVKFYVPPFLPIIPVVGDYWVLYVDDDYQYALVGEPRRKSLWILCRKTHIEEEVY
NQLLEKAKEEGYDVAKLHKTPQSDPPPESDAAPTDSKGTWWFKSLFGK

>*At*til
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EKAVEEGYDISKLHKTPQSDTPPESNTAPEDSKGVWWFKSLFGK

>*Ta*til-2
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DPAGDEAKLKVRFYVPPFLPVFPVTGDYWVLHVDDAYQFALVGQPSRNYLWILCRQPQMDSEGVYEELVER
AKEEGYDVSKLRKTPHPEPTPESQDAPKDGGLWWIKSLFGK

>*At*ZEP
CITGDRINGLVDGISGTWYVKFDTFTPAASRGLPVTRVISRMTLQQILARAVGEDVIRNESNVVDFEDSGD
KVTVVLENGQRYEGDLLVGADGIWSKVRNNLFGRSEATYSGYTCYTGIADFIPADIESVGYRVFLGHKQYF
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>*Os*ZEP
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VSSDVGAGKMQWYAFHKEPAGGTDPENGKNKRLLEIFNGWCDNVVDLINATDEEAILRRDIYDRPPTFNWG
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>*Ta*VDE
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>*At*VDE
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ELEKAAKSIGRDFSTFIRTDNTCGPEPALVERIEKTVEEGERIIVKEVEEIEEEVEKEVEKVGRTEMTLFQ
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>*Ta*CHL
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FTSVTQTLKKLAEVYFK

>*At*CHL
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>Hsap.ApoD
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DIVRPQQSETCSPGGN

>Cfam.f1p
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EPGKYTAYEGQRVVFIQPSPVRDHYILYCEGELHGRQIRMAKLLGRDPEQSQEALEDFREFSRAKGLNQEI
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>Rnor.VEG2
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GGLNPDNIFTFIPKQSETCPLGSN

>Hsap.VEG
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ESILIPRQSETCSPGSD

>Mmus.VNSP1
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GQYLAFEGKTHLQVQLSSVKGHYMLYCDGEIEGMRFLMTQLIGRDPQENLEALEEFKVFTQIKGLVAENLV
ILEQMEKCEPESFYELPSRPSE

>Mmus.VNSP2
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LQEKIGVPEQRDRCIPIHDSAHQDHKC

>Mmus.MUP4
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HGIIKENIIDLTKTNRCLKARE

>Mmus.MUP5
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DKTEKAGEYSVTYDGFNTFTILKTDYDNYIMFHLINKKDEENFQLMELFGREPDLSSDIKEKFAKLCEEHG
IVRENIIDLSNANRCLQARE

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HGILRENIIDLSNANRCLQARE

>Mmus.mMUP
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>Hsap.Lcn9
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>Cfam.f2p
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LHKDQIVVLSDDDRCQGSRD

>Tvul.Lip
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EEDFMNRGFRRENILDISEVDHC

>Ccri.Aphr
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ILATDTCPE

>Rnor.OBP1
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>Mmus.Pbas
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IMDTDNCPSKIRISITD

>Rnor.Pbas
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>Btau.alle
AQETPAEIDPSKIPGEWRIIYAAADNKDKIVEGGPLRNYYRRIECINDCESLSITFYLKDQGTCLLLTEVA
KRQEGYVYVLEFYGTNTLEVIHVSENMLVTYVENYDGERITKMTEGLAKGTSFTPEELEKYQQLNSERGVP
NENIENLIKTDNCPP

>Btau.BLB
LIVTQTMKGLDIQKVAGTWYSLAMAASDISLLDAQSAPLRVYVEELKPTPEGDLEILLQKWENGECAQKKI
IAEKTKIPAVFKIDALNENKVLVLDTDYKKYLLFCMENSAEPEQSLACQCLVRTPEVDDEALEKFDKALKA
LPMHIRLSFNPTQLEEQCHI

>Sscr.BLB
VEVTPIMTELDTQKVAGTWHTVAMAVSDVSLLDAKSSPLKAYVEGLKPTPEGDLEILLQKRENDKCAQEVL
LAKKTDIPAVFKINALDENQLFLLDTDYDSHLLLCMENSASPEHSLVCQSLARTLEVDDQIREKFEDALKT
LSVPMRILPAQLEEQCRV

>Hsap.PP14

VPAMDIPQTKQDLELPKLAGTWHSMAMATNNISLMATLKAPLRVHITSLLPTPEDNLEIVLHRWENNSCVE
KKVLGEKTGNPKKFKINYTVANEATLLDTDYDNFLFLCLQDTTTPIQSMMCQYLARVLVEDDEIMQGFIRA
FRPLPRHLWYLLDLKQMEEPCRF

>Mmus.A1mg
DPASTLPDIQVQENFSESRIYGKWYNLAVGSTCPWLSRIKDKMSVQTLVLQEGATETEISMTSTRWRRGVC
EEITGAYQKTDIDGKFLYHKSKWNITLESYVVHTNYDEYAIFLTKKSSHHHGLTITAKLYGREPQLRDSLL
QEFKDVALNVGISENSIIFMPDRGECVPGDREVEPTSIAR

>Hsap.A1mg
PVPTPPDNIQVQENFNISRIYGKWYNLAIGSTCPWLKKIMDRMTVSTLVLGEGATEAEISMTSTRWRKGVC
EETSGAYEKTDTDGKFLYHKSKWNITMESYVVHTNYDEYAIFLTKKFSRHHGPTITAKLYGRAPQLRETLL
QDFRVVAQGVGIPEDSIFTMADRGECVPGEQEPEPILIPRV

>Xlae.A1mg
SPIQPEDNIQIQENFDLQRIYGKWYDIAIGSTCKWLKHHKEKFNMGTLELSDGETDGEVRIVNTRMRHGTC
SQIVGSYQKTETPGKFDYFNARWGTTIQNYIVFTNYNEYVIMQMRKKKGSETTTTVKLYGRSPDLRPTLVD
EFRQFALAQGIPEDSIVMLPNNGECSPGEIE

>Ssal.A1mg
VPVLPEPLFPIQDNFDLTKFMGKWHDIAIGSTCPWMQRHKGDAAIGTLELQASGTEDKVSMTRSMKKHGKC
EQISGDYELTATPGRLTYHIAKWGADVDAYVVDTNYDEYAIVMLSKQKTGGEKTKSAKLYSRTMELPPTIL
EDFRRLVREQGMADDTIIIKQNKGECVPGTEPVAAEPQPEITAP

>Ppla.A1mg
LPVLPEPLYPTQENFDLTRFVGTWHDVALTSSCPHMQRNRADAAIGKLVLEKDTGNKLKVTRTRLRHGTCV
EMSGEYELTSTPGRIFYHIDRWDADVDAYVVHTNYDEYAIIIMSKQKTSGENSTSLKLYSRTMSVRDTVLD
DFKTLVRHQGMSDDTIIIKQNKGDCIPGEQVEEAPSQPEPK

>Hsap.C8GC
QKPQRPRRPASPISTIQPKANFDAQQFAGTWLLVAVGSACRFLQEQGHRAEATTLHVAPQGTAMAVSTFRK
LDGICWQVRQLYGDTGVLGRFLLQARGARGAVHVVVAETDYQSFAVLYLERAGQLSVKLYARSLPVSDSVL
SGFEQRVQEAHLTEDQIFYFPKYGFCEAADQFHVLDEVRR

>Ocun.C8GC
RWAQKPRGAPSAISAIQPKANFDAQQFAGTWLLAAVGSACHFLQEQGHRAEATALHVAPQGAAMAVSTFRK
LDGICWQVSQRYGATGVPGRFLLPARGPRGAVHVVAAETDYHSFAVLYLERARQLSVKLYVRSLPVSDSVL
GAFEQRVAQANLTQDQVLFFPTYGFCEAADQFHILDEVRR

>Xlae.cpl1
SLWVGAEVQVQPDFQKEKVLGKWYGIGLASNSNWFKDRKSHMKMCTTIITPTADGNLEVTATYPKMDRCET
KSMTYFKTEQLGGFRAKSPRYGSEHDMRVVETNYDEYILMYTVKTKGSETNQIVSLFGRDKDLRPELLDKF
QNFAKSQGLADDNIIILPHTDQCMTEA

>Bmar.lip
DVPIQPDFQEDKILGKWYGIGLASNSNWFQSKKQQLKMCTTVITPTADGNLDVVATFPKLDRCEKKSMTYI
KTEQPGRFLSKSPRYGSDHVIRVVESNYDEYTLMHTIKTKGNEVNTIVSLFGRRKTLSPELLDKFQQFAKE
QGLTDDNILILPQTDSCMSEV

>Mmus.PGDS
QTPAQGHDTVQPNFQQDKFLGRWYSAGLASNSSWFREKKAVLYMCKTVVAPSTEGGLNLTSTFLRKNQCET
KIMVLQPAGAPGHYTYSSPHSGSIHSVSVVEANYDEYALLFSRGTKGPGQDFRMATLYSRTQTLKDELKEK
FTTFSKAQGLTEEDIVFLPQPDKCIQE

>Hsap.PGDS
QAAPEAQVSVQPNFQQDKFLGRWFSAGLASNSSWLREKKAALSMCKSVVAPATDGGLNLTSTFLRKNQCET
RTMLLQPAGSLGSYSYRSPHWGSTYSVSVVETDYDQYALLYSQGSKGPGEDFRMATLYSRTQTPRAELKEK

FTAFCKAQGFTEDTIVFLPQTDKCMTEQ

>Mmus.NGAL
QDSTQNLIPAPSLLTVPLQPDFRSDQFRGRWYVVGLAGNAVQKKTEGSFTMYSTIYELQENNSYNVTSILV
RDQDQGCRYWIRTFVPSSRAGQFTLGNMHRYPQVQSYNVQVATTDYNQFAMVFFRKTSENKQYFKITLYGR
TKELSPELKERFTRFAKSLGLKDDNIIFSVPTDQCIDN

>Hsap.NGAL
QDSTSDLIPAPPLSKVPLQQNFQDNQFQGKWYVVGLAGNAILREDKDPQKMYATIYELKEDKSYNVTSVLF
RKKKCDYWIRTFVPGCQPGEFTLGNIKSYPGLTSYLVRVVSTNYNQHAMVFFKKVSQNREYFKITLYGRTK
ELTSELKENFIRFSKSLGLPENHIVFPVPIDQCIDG

>Hsap.Lcn12
KVLQAQTPTPLPLPPPMQSFQGNQFQGEWFVLGLAGNSFRPEHRALLNAFTATFELSDDGRFEVWNAMTRG
QHCDTWSYVLIPAAQPGQFTVDHGVEPGADREETRVVDSDYTQFALMLSRRHTSRLAVLRISLLGRSWLLP
PGTLDQFICLGRAQGLSDDNIVFPDVTGNMVHLQACWAVGTGPAGMSLVDPRGAGPSVYPGSSAPACAQGS
PGSWVPVLNPGSEPPPAAPGPLSWATSSHPGSPVPGHLLPPQVPCPGPPPPAPPAPGPLSRPTSSHPGSPV
LGYLLPPQVPCPGPSPPSGSPVLGHLLPSPIPAHKELGLIPGGALDLSSLPWVAAPA

>Mmus.Lcn12
QILESQISAMSQGFPQMTSFQSDQFQGEWFVLGLADNTFRREHRALLNFFTTLFELKEKSQFQVTNSMTRG
KHCNTWSYTLIPATKPGQFTRDNRGSGPGADRENIQVIETDYITFALVLSLRQTSSQNITRVSLLGRNWRL
SHKTIDKFICLTRTQNLTKDNFLFPDLSDWLPDPQVC

>*Dh*Lip
KKEEMPVVEKIELDKYLGKWYEIARKPFLFQKKCYSNVSAKYSLNDNANINVDNSCYSKDGKLRQAIGEAF
TQNPPFNSKLKVSFLPKAIRFLPIGRGDYWILKIDDNYQTVLVGGPSRKYMWILSRSQNHDEIVVQDYLDY
AKEIGFDVSDIIMTKQTNE

>Cfre.OML
CSSPTPPKGVTVVNNFDAKRYLGTWYEIARFDHRFERGLDKVTATYSLRDDGGINVINKGYNPDREMWQKT
EGKAYFTGDPSTAALKVSFFGPFYGGYNVIALDREYRHALVCGPDRDYLWILSRTPTISDEMKQQMLAIAT
REGFEVNKLIWVKQPGA

>Ecol.OML
CSSPTPPRGVTVVNNFDAKRYLGTWYEIARFDHRFERGLEKVTATYSLRDDGGLNVINKGYNPDRGMWQQS
EGKAYFTGAPTRAALKVSFFGPFYGGYNVIALDREYRHALVCGPDRDYLWILSRTPTISDEVKQEMLAVAT
REGFDVSKFIWVQQPGS

>Vcho.Lpro
MEILIGATCLGMPESVKPVSDFELNNYLGKWYEVARLDHSFERGLSQVTAEYRVRNDGGISVLNRGYSEEK
GEWKEAEGKAYFVNGSTDGYLKVSFFGPFYGSYVVFELDRENYSYAFVSGPNTEYLWLLSRTPTVERGILD
KFIEMSKERGFDTNRLIYVQLQ

>Ddis.Lip
ILGGVTYAYNSFKRYIPEGVHAVKPFYPEKYVGKWYEIARLYTYFEKDLDKITAEYSINKDGSITVVNSGY
NYKKKKRENAKGIAYFVNGSDEGMLKVSFFGPFYSGYNVIAIDPDYKYALIAGQSFDYMWILSKEPTIPEK
IKNSYLELAKSVGYDITKLIWSKQNENEN

>Dmel.Lip
AVWVAHAQVPFPGKCPDVKLLDTFDAEAYMGVWYEYAAYPFAFEIGKKCIYANYSLIDNSTVSVVNAAINR
FTGQPSNVTGQAKVLGPGQLAVAFYPTQPLTKANYLVLGTDYESYAVVYSCTSVTPLANFKIVWILTRQRE
PSAEAVDAARKILEDNDVSQAFLIDTVQKNCPRLDGNGTGLAGEDGLDVDDFVSTTVPNAIEKA

>Gmel.Gall
VHEGKCPDFKPVDNFNLTAYQGVWYEISKTPNDAEKNGKCGQAEYKLEGEVVKVKNSHVVDGVQKYVEGTA
KFAEDANKSAKLLVTLTYGAVNRESPLNVIATDYQNYAIAYTCKYDEKSKSHNDSIWILSRAKKLEGDAKT

AVDNYLKEHAKEIDASKLVQTDFSEEACKFTSTSAVTEPQTKKQ

>Pbra.Bbp
NVYHDGACPEVKPVDNFDWSNYHGKWWEVAKYPNSVEKYGKCGWAEYTPEGKSVKVSNYHVIHGKEYFIEG
TAYPVGDSKIGKIYHKLTYGGVTKENVFNVLSTDNKNYIIGYYCKYDEDKKGHQDFVWVLSRSKVLTGEAK
TAVENYLIGSPVVDSQKLVYSDFSEAACKVNN

>Msex.IcyA
GDIFYPGYCPEVKPVDDFDLSAFAGAWHEIAKLPLENENEGKCTVAEYKYDGKKASVYNSFVINGVKEYME
GDLEIAPDAKLTKQGKYVMTFKFGPRVVVQVPWVLATDYKNYAINYNCNYHPDKKAHSIHAWVLSRNKVLE
GNTKEVVDNVLKTFSHLIDASKFMSNEFSEAACQYSTTYSLTGPDRH

>Hgam.CRC2
DGIPSFVTAGKCASVANQDNFDLRRYAGRWYQTHIIENAYQPVTRCIHSNYEYSTNDYGFKVTTAGFNPND
EYLKIDFKVYPTKEFPAAHMLIDAPSVFAAPYEVIETDYETYSCVYSCITTDNYKSEFAFVFSRTPQTSGP
AVEKTAAVFNKNGVEFSKFVPVSHTAECVYRA

>Hgam.CRC1
DKIPDFVVPGKCASVDRNKLWAEQTPNRNSYAGVWYQFALTNNPYQLIEKCVRNEYSFDGKQFVIKSTGIA
YDGNLLKRNGKLYPNPFGEPHLSIDYENSFAAPLVILETDYSNYACLYSCIDYNFGYHSDFSFIFSRSANL
ADQYVKKCEAAFKNINVDTTRFVKTVQGSSCPYDTQKTL

>Mmus.Lcn13
AQEAPPDDLVDYSGIWYAKAMVHNGTLPSHKIPSIVFPVRIIALEEGDLETTVVFWNNGHCREFKFVMKKT
EEPGKYTAFHNTKVIHVEKTSVNEHYIFYCEGRHNGTSSFGMGKLMGRDSGENPEAMEEFKNFIKRMNLRL
ENMFVPEIGDKCVESD

>Tvul.BL
IQAIENIHSKEELVVEKLIGPWYRVEEAKAMEFSIPLFDMNIKEVNRTPEGNLELIVLEQTDSCVEKKFLL
KKTEKPAEFEIYIPSESASYTLSVMETDYDNYILGCLENVNYREKMACAHYERRIEENKGMEEFKKIVRTL
TIPYTMIEAQTREMCRV

>Mmus.Lcn11
LQDFHPEQVTGPWHTLKLASTDRSLIEEGGAYRCFMTDIVLLDNGNLNVTYFHRKDGKCVKEFYIAEKTDT
PGQYTFEYQGRNSLTFVHVTEDFAIMDLENQSEGGTTIVIEFHGRSLSTDELG

>*Gv*Blc
DSQPIETVAEVDFNRYDGRWYELARTPNIFQIGCTCVTANYSVLSESSISVFNTCNRFRPRGNLVTIDGVA
VVADPNAPGKLLITFEGSPVAEDYWIIDLVEDPNNSAGDYAFAAIGGPNRDFIFIISRKPALETYQDVLAY
QGIVKRLQAQHFPVDALNSTPQPTSCTYKSQSLPGGL

>Btau.OBP
KNAQEEEAEQNLSELSGPWRTVYIGSTNPEKIQENGPFRTYFRELVFDDEKGTVDFYFSVKRDGKWKNVHV
KATKQDDGTYVADYEGQNVFKIVSLSRTHLVAHNINVDKHGQTTELTGLFVKLNVEDEDLEKFWKLTEDKG
IDKKNVVNFLENEDHPHPE

>*Mg*Lip
DTSSVPNTVPSLWDGECFYPTPDIGFDTKSYLGRWYQVAGTVAPFTASCKCIYAQYALNDNGTIQVNNTCE
AGGRAVNILGTAEPADPGYGAKGALRVQFPGQPGPACSGPNYVVQDYTGDFALVQTYNFSTLFVLSRNQHP
EEAVLDAWIKRAGALGSDLSDVIKNDQTNCSFT

>Same.Laz
AQETMGCADRSAINDFNATLYMGKWYEYAKMGSMPYEEGGVCVTAEYSMSSNNITVVNSMKDNTTHEVNTT
TGWAEFASELHTDGKLSVHFPNSPSVGNYWILSTDYDNYSIVWSCVKRPDSAASTEISWILLRSRNSSNMT
LERVEDELKNLQLDLNKYTKTEQSAKYCA

>Tvul.LLP

DDVAFSAFTPSEGTYYVQVIAVDKEFPEEEIPRDMSPLTIMYLDDGKMEARFTMKKDDNCEEINIMLEKTA
DPRKITMNRRLRYTCAAVRTSKQKHWILVCPREFQGETIRMAKLVGPNTDKNPKALEDFYRFIYRERFDKR
RIITPKQTEACAPEHA

>Ecab.p19p
RRPHALHMGPGDPNFDEKLVKGKWFSVALASNEPKFIAKDTDMKFFIHKIQVTPESLQFHFHRKVRGMCVP
TMMTAHKTKKKFQYTVNHSGHKTIFLEKVDPKHFVIFCAHSMKHGKETVVVTLFSRTPTVSPDVMWMFKKY
CKTHGIHTSNIVDLTQTDRCLHARH

>Ggal.QS-21
AATVPDSSEVAGKWYIVALASNTDSFLREKGKMKMVMARISFLGEDELEVSYAAPSPKGCRKWETTFKKTS
DDGELYYSEEAEKTVEVLDTDYKSYAVIFATRVKDGRTLHMMRLYSRSREVSPTAMAIFRKLARERNYTDE
MVAVLPSQEECSVDEV

>Hsap.Lcn5
QAVWLGRLDPEQLLGPWYVLAVASREKGFAMEKDMKNVVGVVVTLTPENNLRTLSSQHGLGGCDQSVMDLI
KRNSGWVFENPSIGVLELWVLATNFRDYAIIFTQLEFGDEPFNTVELYSLTETASQEAMGLFTKWSRSLGF
LSQ

>Mmus.Lcn8
ESTRVELVPEKIAGFWKEVAVASDQKLVLKAQRRVEGLFLTFSGGNVTVKAVYNSSGSCVTESSLGSERDT
VGEFAFPGNREIHVLDTDYERYTILKLTLLWQGRNFHVLKYFTRSLENEDEPGFWLFREMTADQGLYMLAR
HGRCAELLKEGLV

>Mmus.ERBP
TEAAVVKDFDVNKFLGFWYEIALASKMGAYGLAHKEEKMGAMVVELKENLLALTTTYYNEGHCVLEKVAAT
QVDGSAKYKVTRISGEKEVVVVATDYMTYTVIDITSLVAGAVHRAMKLYSRSLDNNGEALNNFQKIALKHG
FSETDIHILKHDLTCVNALQSGQI

>Lviv.ESP
DIPVVPNFDAQKTVGKWHPIGMASKLPEVPEYEQKISPMDHMVELTDGDMKLTANYMDGVCKEATAMLKHT
DKPGVFKFTGGEIRMMDIDYEKYLIMYMKKSTFEAMYLSARGSDVGDDIKEKFKKLVLEQNFPEAHIKYFN
AEQCTPTAA

>*Py*Lip
RKCPNPATVPALDVAAYTGRWYQIGVTAEFAERQEDNKPCVTADYRLTGPTVEVINCKQDVPANRSSGAIV
GCAQAVAFPGKKEDPGKLGVQFPGAPFPAPYWVINLAGSKEDGYRVAVVYSCTSTGSFFSQGLFLLSRTPK
LRYGVFEAVYWYVRVLARGIRFQKGNEFKLTPQGKSCTYRGDEGAKVVFQ

Supplemental Table IV. FASTA files of plant lipocalins and lipocalin-like sequences.

Temperature-Induced Lipocalins

>*Ta*TIL-1
MAAKKSGSEMGVVLGLDVARYMGRWYEIASFPNFFQPRDGRDTRATYELMEDGATVHVLNETWSKGKRDFIEGTAYKA
DPASEEAKLKVKFYVPPFLPIIPVVGDYWVLYVDDDYQYALVGEPRRKSLWILCRKTHIEEEVYNQLLEKAKEEGYDV
AKLHKTPQSDPPPESDAAPTDSKGTWWFKSLFGK

>*Ta*TIL-2
MAAMKVVRNLDLERYMGRWYEIACFPSRFQPKDGANTRATYTLGPDGAVKVLNETWTDGRRGHIEGTAFRADPAGDEA
KLKVRFYVPPFLPVFPVTGDYWVLHVDDAYQFALVGQPSRNYLWILCRQPQMDEGVYEELVERAKEEGYDVSKLRKTP
HPEPTPESQDAPKDGGLWWIKSLFGK

>*Hv*TIL-1
MAVKKIGSEMGVVLGLDVARYMGRWYEIASFPNFFQPRDGRDTRATYELMEDGATVHVLNETWSKGKRDYIEGTAYKA
DPASDEAKLKVKFYVPPFLPIIPVVGDYWVLYVDDDYQYALVGEPRRKSLWILCRKTHIEEEVYNQLLEKAKEEGYDV
AKLHKTPQSDPPPEGDAAPTDSKGAWWFKSLFGK

>*Hv*TIL-2
MAAMKVVRNLDLERYMGRWYEIACFPSRFQPKDGANTRATYTLGPDGAVKVLNETWTDGRRGHIEGTAFRADDAGDEA
KLKVRFYVPPFLPVFPVTGDYWVLHVDDAYQYALVGQPSRNYLWILCRQPRMDEGVYNELVERAKEEGYDVSKLRRTP
HPEPTPESQDAPKDGGLWWIRSLFGK

>*Os*TIL-1
MAAAAVEKKSGSEMTVVRGLDVARYMGRWYEIASLPNFFQPRDGRDTRATYALRPDGATVDVLNETWTSSGKRDYIKG
TAYKADPASDEAKLKVKFYLPPFLPVIPVVGYWVLYVDDDYQYALVGEPRRKDLWILCRQTSMDDEVYGRLLEKAKEE
GYDVEKLRKTPQDDPPPESDAAPTDTKGTWWFKSLFGK

>*Os*TIL-2
MKVVRNLDLERYMGRWYEIACFPSRFQPRDGTNTRATYTLAGDGAVKVLNETWTDGRRGHIEGTAYRADPVSDEAKLK
VKFYVPPFLPIFPVVGDYWVLHVDDAYSYALVGQPSLNYLWILCRQPHMDEEVYGQLVERAKEEGYDVSKLKKTAHPD
PPPETEQSAGDRGVWWIKSLFGR

>*At*TIL
MTEKKEMEVVKGLNVERYMGRWYEIASFPSRFQPKNGVDTRATYTLNPDGTIHVLNETWSNGKRGFIEGSAYKADPKS
DEAKLKVKFYVPPFLPIIPVTGDYWVLYIDPDYQHALIGQPSRSYLWILSRTAQMEEETYKQLVEKAVEEGYDISKLH
KTPQSDTPPESNTAPEDSKGVWWFKSLFGK

>*Le*TIL
MATKVMEVVKNLDLKRYMGRWYEIASFPSRFQPKDGVDTRATYTLNSDGTVHVLNETWCNGKRGFIEGTAYKADPNSD
EAKLKVRFYVPPFLPIIPVTGDYWVLYIDEDYQYALIGQPSRRYLWILSRQTRLDDEIYNQLVEKAKEEGYDVSKLHK
TPQSDSPPDSEDSPKDTKGIWWIKSILGK

>*Le*TIL′
MTTKEMEVVKNLDVEKYMGRWYEIASFPSRNQPKDGVNTRATYTLNQDGTVHVLNETWSGGKRGSIEGTAYKADPKSD
EAKLKVKFYIPPFLPIIPIVGDYWVLYIDDDYQYALIGQPSKKYLWILCRQPHLDEEIYNQLVEKAKEVGYDVSKLHK
TPQADPPPDGEDAPKDTKGFWWIKSILGK

>*So*TIL
MAAAEGKKSGGQMTVVRGLDVARYMGRWYEIASFPSFFQPRDGRDTRATYRLLEDGATVHVLNETWSKGKRDYIEGTA
YKADASSDEAKLKVKFYLPPFLPIIPVVGDYWVLYVDDDYQYALVGEPRRKNLWILCRKTSIDEEVYNQLVERAKEEG
YDVSKLHRTPQDDPPPESDAAPTDTKGVWWFKSLFGK

>*Zm*TIL-1
MAAEEGEKAKSGGGGQQMTVVRGLDVARYMGRWYEIASFPSFFQPRDGRDTRATYRLLEDGATVHVLNETWSKGKRDY
IEGTAYKADPGSDEAKLKVKFYLPPFLPIVPVVGDYWVLYVDDDYQYALVGEPRRKNLWILCRKTSIDEDVYNQLVER
AKEEGYDVSKLHRTPQDDPPPESDAAPTDTKGVWWFKSLFGK

>*Zm*TIL-2
MAMQVVRNLDLERYAGRWYEIACFPSRFQPKTGTNTRATYTLNPDGTVKVVNETWADGRRGHIEGTAWRADPASDEAK
LKVRFYVPPFLPLIPVTGDYWVLHIDADYQYALVGQPSRNYLWILCRQPHMDESVYKELVERAKEEGYDVSKLRKTAH
PDPPPESEQSPRDGGMWWVKSIFGK

>*Sb*TIL-1
MAAEAGKTTAATKSGGGGQIMTVVRGLDVARYMGRWYEIASFPSFFQPRDGRDTRATYRLLEDGATVHVLNETWSKGK
RDYIEGTAYKADPNSDEAKLKVKFYLPPFLPVIPVVGDYWVLYVDDDYQYALVGEPRRKNLWILCRKTSIDEEVYNQL
VERAKEEGYDVSKLHRTPQDDPPPESDAAPTDTKGVWWFKSLFGK

>*Sb*TIL-2
MAAAAMRVVRDLDLERYAGRWYEIACFPSTFQPKTGTNTRATYTLNPDDRTVKVLNETWTDGGGRRGHIEGTAWRADP
ASDEAKLKVRLYVPPFLPVFPVTGDYWVLHVDADYQYALVGQPSRKYLWILCRQPQMDESVYNELVERAKEEGYDVSK
LRKTAHPDPPPESEQSPGDRGVWWIKSIFGK

>*Gm*TIL
MANKEMEVVKGLDLQRYMGRWYEIASFPSRNQPKDGENTRATYTLRNDGTVQVLNETWSNGKRGYIQGTAYKVDPKSD
EAKFKVKFYIPPFLPIIPINGDYWVLFTDDEYQYALIGQPSRNYLWILSRKPHLDDEIYNELVQRAKNVGYDVSKLRK
TPQSDPPPEEEGPDDTKGIWWLKSIFGK

>*Gm*TIL'
MANNEMQVERGLDLERYMGRWYEIASFPSRNQPKDGVNTRATYTLRNDGTVQVLNETWSNGKRGHIEGTAFKSNRTSD
EAKFKVKFYVPPFLPIIPVTGDYWVLFIDGDYQYALIGQPSRNCLWILSRKPHLDDEIYNKLVQRAKDVGYDVSKLHK
TPQSDPPPEEEGPQDTKGIWWLKSILGK

>*Pp*TIL
MGGEKDLNVVQNVDLKRYQGRWYEIASIPSRFQPSTGTNSRATYALKEDQTIHVLNETWVSGKRSYIEGKAWKADAAS
PDAKLKVRFLVPPFFPIFPVTGDYWVMKLDENYQWALIGQPSRRYLWVLSRTPELSDEIYNQLLEHATNEGYDVSKLH
KTQQIPEIGEEGTSNSENTDRAGVWWLKSLFGK

>*Pt*TIL
MGKEDLQVVKGLDLQRYMGVWYEIASMPSFFQPKNGINTRATYSLNKDSTVHVLNETFVDGKKSSIEGSAYKVDPKSE
DAKFKVKFMVPPFFPIIPVYGNYWVLLLDEDYQWALIGEPSLKYLWVLCRQRQLDEAIYNRLLEHARQEGYDVGRLHK
TTQNDDPETEAPKDKGFWWIKALLGK

>*Tr*TIL
MGGEKDLNVVQNVDLTRYQGRWYEIASNPTRFQPSRGSNSRATYTLQEDQTVEVLNETWVNNKRSYITGKAWKADPAS
PDAKLKVRFMVPPFLPVIPVTGDYWVMKLDADYQWALVGVPDRTSLWVLSRTQEMSEETYKELVEHAANEGYDVSKLH
KTEQNPEVGEGEEESTDRAGAWWVKSLFGK

>*Vv*TIL
MAKKEMEVVRGIDLQRYMGRWYEIASFPSFFQPKNGINTRATYTLEADGTTVRVLNETWSDGKRSYIEGTAYKADPKS
DQAKLKVKFYVPPFLPIIPVVGDYWVLFLDEEYQYALIGQPSRKYLWILCRQTHMDEEIYEMLVEKAKEVGYDVSKLR
KTTQTDPPPEGEGPQDTKGIWWIKSIFGK

>*Mt*TIL
MANKEMDVARGVDLKRYMGRWYEIACFPSRFQPSDGKNTRATYTLRDDGTVNVLNETWSGGKRSYIEGTAYKADPNSD
EAKLKVKFYVPPMLPIIPVTGDYWVLHLDHDYHYALIGQPSRNYLWILCRQPHLDEEIYNELVQKAKEEGYDVSKLRK
TPQSDTPPEQEGPEDTKGIWWFKSLFGK

>*Mt*TIL’
MGNTVGKDKEVVKGVDLERYMGRWYEIASFPSFFQPKNGENTRATYTLNSDGTVHVLNETWNNGKRTSIEGSAYKADP
KSDEAKLKVKFYVPPFLPIIPAVGDYWILYLDEDYQYALIGGPTNKFLWILSRQPHLDETIYNQLVEKAKEEGYDVSK
LHKTPQSDPPPE

>*St*TIL
MTTKEMEVVKNLDVEKYMGRWYEIASFPSRNQPKDGVNTRATYTLNQDGTVHVLNETWSGGKRGSIEGTAYKVDPKSD
EAKLKVKFYIPPFLPIIPIVGDYWVLYIDDDYQYALIGQPSKKYLWILCRQPHLDEEIYNQLVEKAKEVGYDVSKLHK
TPQADPPPDGEDAPKDDTKGIWWIKSILGK

>*St*TIL’
MATKVMEVVKNLDLKRYMGRWYEIASFPSRFQPKDGVDTRATYTLNSDGTVHVLNETWCNGKRGFIEGTAYKADPNSD
EAKLKVRFYVPPFLPIIPVTGDYWVLYIDEDYQYALIGQPSRRYLWILSRRTCLDDEIYNQLVEKAKEEGYDVSKLHK
TPQSDSPPESEDSPEDTKGIWWIKSILGK

>*Bn*TIL
MTTEKKEMEVVKGLDLERYMGRWYEIASFPSRFQPKNGADTRATYTLNPDGTVKVLNETWDGGKRGFIQGSAFKTDPK
SDEAKFKVRFYVPPFLPIIPVTGDYWVLYIDPEYQHAVIGQPSRSYLWILSRTAHVEEETYKQLVEKAVEQGYDVSKL
RKTAQSDTPPESDAAPDDTKGIWWIKSIFGK

>*Prp*TIL
MAKKTMDVVKGLDLQRYMGRWYEIASFPSRFQPKNGENTRATYTLRDDGTVNVLNETWSDGKRSSIEGTAYKADPSSE
EAKLKVKFYVPPFLPIIPVVGDYWVLFIDEDYQYALIGQPSRNYLWILSRQPRLDDEIYNQLVQRAKDEEYDVSKLHK
TPQSETPPEGEEGPKDTKGIWWFKSLLGK

>*Pa*TIL
MAKKTMDVVKGLDLQRYMGRWYEIASFPSRFQPKNGENTRATYTLRDDGTVNVLNETWSDGKRSSIEGTAYKADPSSE
EAKLKVKFYVPPFLPIIPVVGDYWVLFIDEDYQYALIGQPSRNYLWILSRQPRLDDEIYNQLVQRAKDEEYDVSKLHK
TPQSETPPEGEEGPKDTKGIWWFKSLLGK

>*Mc*TIL
MAQKAKEMVVVKGLELGRYMGRWYEIASFPSRFQPRDGENTRATYTLRDDGIVDVLNETWSLGKRSYIQGTAYKADPN
SDEAKLKVKFYVPPFLPIIPVTGDYWVLFIDDDYQYALIGQPSRNYLWILCRTPHMDESVYNELVQKAVEEGYDVNKL
HKTPQADPPPEGNQAPEDTKGVWWFKSLIGK

>*Mc*TIL’
MAHKSKEMVVVRGLDLERFMGRWYEIASFPSFFQPRDGENTRATYTLNDDGTVHVLNETWSHGKRDAIEGTAYKADPK
SDEAKLKVKFYVPPFLPIIPVTGNYWVLFIDDDYQYALIGEPLRKYLWILCRKTNMDESIYEELVQKAVEEGYDVKKL
HKTPQADPPPESSDQTPKDKGGWWIKSLFGK

>*Ga*TIL
MSQKTMEVVKNLDIKRYMGRWYEIASFPSRFQPRNGVNTRATYTLNEDGTVHVLNETFTDGKRGFIEGTAYKADPQSD
EAKLKVKFYVPPFLPIIPIVGDYWVLHLDDDYQYALIGQPSRNYLWVLCRQTHMDDEIYNQLVQKAKDEGYDVSKLHK
TPQSDPPPEGDDTPKDAKGIWWIKSLLGM

>*Ga*TIL’
MEVVKNLDIQRYMGKWYEIASFPSFFQPKKGENTSAFYTLKEDGTVHVLNETFVNGKKDSIEGTAYKADPKSDEAKLK
VKFYVPPFLPIIPVTGDYWVLYIDEDYQYVLVGGPTKKYLWILCRQKHMDEEIYNMLEQKAKDLGYDVSKLHKTPQSD
STPEGEHVPQEKGFWWIKSLFGK

>*Cs*TIL
MASKKEMEVVRGLDIKRYMGRWYEIASFPSRNQPKNGADTRATYTLNEDGTVHVRNETWSDGKRGSIEGTAYKADPKS
DEAKLKVKFYVPPFFPIIPVVGNYWVLYIDDNYQYALIGEPTRKYLWILCREPHMDEAIYNQLVEKATSEGYDVSKLH
RTPQSDNPPEAEESPQDTKGIWWIKSIFGK

>*Pb*TIL
MATKKEMEVVKGVDLKRYMGRWYEIASFPSRFQPKNGVNTRATYTLNEDGTVHVLNETWNDGKRGYIEGSAYKADPNS
DEAKLKVKFYVPPFLPIIPVVGDYWVLSLDEDYQYALIGQASRKYLWILCRKTHMEDDIYNQLVEKAKEEGYDVEKLH
KTPQTDPPPEEEGPKDTKGIWWFQSILGK

>*Pb*TIL'
MATKKEMEVVKGVDLKRYMGRWYEIASFPSRFQPKNGVNTRATYTLNEDGTVHVLNETWNDGKRGSIEGSAYKADPNS
DEAKLKVKFYVPPFLPIIPVVGDYWILYLDDDYQYALIGQPSRSYLWILCRKTHMEDEIYNQLVEKAKEEGYDVGKLH
KTPQTDPPPEEEGPKDTKGIWWIKSILGK

>*Pot*TIL
MATKKVMEVVKGVDLKRYMGRWYEIASFPSRFQPKNGVNTRATYTLNEDGTIHVLNETWNDGKRGSIEGSAYKADPNS
DEAKLKVKFYVPPFLPIIPVVGDYWILYLDDDYQYALIGQPSRSYLWILCRKTHMEDEIYNQLVEKAKEEGYDVGKLH
KTPQTDPPPEEEGPKDTKGIWWIKSILGK

>*PotxPotr*TIL
MATKKEMEVVKGVDLKRYMGRWYEIASFPSRFQPKNGVNTRATYTLNEDGTVHVLNETWNDGKRGSIEGSAYKADPNS
DEAKLKVKFYVPPFLPIIPVVGDYWILYLDDDYQYALIGQPSRSSLWILCRKTHMEDEIYNQLVEKAKEEGYDVGKLH
KTPQTDPPPEEEGPKDTKGIWWIKSILGK

>*Ls*TIL
MSKKAMEVVKGIDLQRYMGRWYEIASFPSRFQPKDGINTRATYTLKDDGTVNVLNETWSGGKRGFIEGTAYKADPKSD
EAKLKVKFYVPPFLPIIPVTGDYWVLYLDDDYQYALIGQPSRSYLWILCRQTHLDDEIYNQLVQKATEEGYDVSKLKK
TTQTEPPPESEDAPADTKGIWWFKSLFGK

CHloroplastic Lipocalins

>*At*CHL
MILLSSSISLSRPVSSQSFSPPAATSTRRSHSSVTVKCCCSSRRLLKNPELKCSLENLFEIQALRKCFVSGFAAILLL
SQAGQGIALDLSSGYQNICQLGSAAAVGENKLTLPSDGDSESMMMMMMRGMTAKNFDPVRYSGRWFEVASLKRGFAGQ
GQEDCHCTQGVYTFDMKESAIRVDTFCVHGSPDGYITGIRGKVQCVGAEDLEKSETDLEKQEMIKEKCFLRFPTIPFI
PKLPYVIATDYDNYALVSGAKDKGFVQVYSRTPNPGPEFIAKYKNYLAQFGYDPEKIKDTPQDCEVTDAELAAMMSMP
GMEQTLTNQFPDLGLRKSVQFDPFTSVFETLKKLVPLYFK

>*Sb*CHL
MVLVVLGCSPASPRPACTPNSRRRCSATRQKIIRCSLNEETLLSKHGVVSRQLISCLAASLVFVSPPSQAIPAETFAH
PGLCQIATVAAIDNASVPLKFDNPSDDGSAGMMMRGMTAKNFDPVRYSGRWFEVASLKRGFAGQGQEDCHCTQGVYSF
DEKSRSIQVDTFCVHGGPDGYITGIRGRVQCLSEEDMSSAETDLERQEMIREKCFLRFPTLPFIPKEPYDVLATDYDN
YAVVSGAKDTSFIQIYSRTPNPGPEFIEKYKSYVANFGYDPSKIKDTPQDCEYMSSDQIALMMSMPGMNEALTNQFPD
LKLKAPVALNPFTSVFDTLKKLLELYFK

>*Os*CHL
MVLALLLGSSSSSLAAPHPACSSRRKCRPAGRNNFRCSLHDKVPLNAHGVLSTKLLSCLAASLVFISPPCQAIPAETF
VQPKLCQVAVVAAIDKAAVPLKFDSPSDDGGTGLMMKGMTAKNFDPIRYSGRWFEVASLKRGFAGQGQEDCHCTQGVY
SFDEKSRSIQVDTFCVHGGPDGYITGIRGRVQCLSEEDMASAETDLERQEMIKGKCFLRFPTLPFIPKEPYDVLATDY
DNYAVVSGAKDTSFIQIYSRTPNPGPEFIEKYKSYAANFGYDPSKIKDTPQDCEVMSTDQLGLMMSMPGMTEALTNQF
PDLKLSAPVAFNPFTSVFDTLKKLVELYFK

>*Hv*CHL
MALLPLVGFPSFPFPACPSRRTCGPASRMNFRCCVQERVPAVRNDGISKHLLSCLAASLVFISTPSQAVPADTFARPS
LCQVAVVAAIDKAAVPLKFDGPSDDGMMMMTKGMTAKNFDPVRYSGRWFEVASLKRGFAGQGQEDCHCTQGVYTFDEK
AGAIKVETFCVHGSPDGYITGIRGKVQCLSQEDMASAETDLEKEEMISSKCFLRFPTLPFIPKLPYDVLATDYDNYAV
VSGAKDTSFIQIYSRTPNPGPEFIEKYKSYAAGFGYDPSKIKDTPQDCEVSSDQLAQMMSMPGMDEALTNQFPDLKLK
SSVAFDPFTSVTQTLKKLEVYFK

>*In*CHL
MASHNLFVAQSSPVLLPSHHPSKPRGVSGKMIVRCTLEQTAPSKARAKHLVSGLAASIVFLTQVNSVVAADLSYQNNI
CQLASAADNLPSLPLDGGDDNGGMLMMMRGMTAKNFDPTRYAGRWFEVASLKRGFAGQGQEDCHCTQGIYTFDVNAAA
IQVDTFCVHGGPDGYITGIRGKVQCLSEDETLKTATDLEKQEMIKGKCYLRFPTLPFIPKEPYDVIATDYDNFAIVSG
AKDKSFVQIYSRTPDPGPEFIEKYKAYLADFGYDPSKIKDTPQDCEVMSNSQLSAMMSMAGMQQALNNQFPELELKAP
VAFNPFTSVFDTLKKLVELYFK

>*St*CHL
MFCYNLVAQQSPPILVQSQYPSKPRGLPVKVVSACCTECPIFRKVEVKHVISGLATSILCLSPSNMAFAADLPHYNSV
FQLANVADSMPTLPLEKENDGGKLMMMRGMTAKDFDPIRYSGRWFEVASLKRGFAGQGQEDCHCTQGIYTVDMNAPAI
QVDTFCVHGGPDGYITGIRGRVQCLNEEDKEKDETDLERQEMIREKCYLRFPTLPFIPKEPYDVIATDYDNFALVSGA
KDKSFVQIYSRTPNPGPEFIEKYKNYLASFGYDPSKIKDTPQDCEVKTTSQLSAMMSMSGMQQALNNQFPDLELRRPV
QFNPFTSVFETLKKLAELYFK

>*Ta*CHL
MALLPLLGSPSFPFPASRPARPSRRKCGPAARMNFRCSAEERAPVRNSGISKHVLSCLAASLLFISPPSQAVPADTFA
RPSLCQVAVVAAIDKGAVPLKFDAPSDDAMMMMTKGMTAKNFDPVRYSGRWFEVASRKGGFAGQGQEDCHCTQGVYTF
DEKAGAIKVETFCVHGSPDGYITGIRGKVQCLSQEDMAGAETDLEREEMISSKCFLRFPTLPFIPKLPYDVLATDYDN
YAVVSGAKDTSFIQIYSRTPNPGPEFIEKYKSYAAGFGYDLSKIKDTPQDCEVSSDQLAEMMSMPGMDQALTNQFPDL
KLKSSVAFDPFTSVTQTLKKLAEVYFK

>*Gm*CHL
MVELLLRASPPPPHSSYLRQCRTVSGRTLVKCSLEVPSKVLTKHVLSGLAASLIFISPANQTIAADLSRAPNNICQLA
SASENAVTSPFENEKGSNLMMMRGMTAKDFDPVRYSGRWFEVASLKRGFAGQGQEDCHCTQGVYTFDREAPSIQVDTF
CVHGGPNGFITGIRGRVQCLSEEDLGKTETQLEKQEMIKEKCYLRFPTLPFIPKEPYDVIATDYDNFSLVSGAKDQSF
IQIYSRTPNPGPEFIEKYKSYLANYGYDPSKIKDTPQDCEVMSNSQLAAMMSMSGMQQALTNQFPDLGLNAPIELNPF
TSVFDTLKKLLEPYFK

>*So*CHL
GLCQIATVAAIDSASVTLKFDNPSDDGSAGMMMRGMTAKNFDPVRYSGRWFEVASLKRGFAGQGQEDCHCTQGVYSFD
EKSRSIQVDTFCVHGGPDGYITGIRGRVQCLSEEDMASAETDLERQEMIREKCFLRFPTLPFIPKEPYDVLATDYDNY
AVVSGAKDTSFIQIYSRTPNPGPEFIEKYKSYVANFGYDPSKIKDTPQDCEYMSSDQIALMMSMPGMNEALTNQFPDL
KLKAPVALNPFTSVFDTLKKLLELYFK

Violaxanthin De-Epoxidases

>*At*VDE
MAVATHCFTSPCHDRIRFFSSDDGIGRLGITRKRINGTFLLKILPPIQSADLRTTGGRSSRPLSAFRSGFSKGIFDIV
PLPSKNELKELTAPLLLKLVGVLACAFLIVPSADAVDALKTCACLLKGCRIELAKCIANPACAANVACLQTCNNRPDE
TECQIKCGDLFENSVVDEFNECAVSRKKCVPRKSDLGEFPAPDPSVLVQNFNISDFNGKWYITSGLNPTFDAFDCQLH
EFHTEGDNKLVGNISWRIKTLDSGFFTRSAVQKFVQDPNQPGVLYNHDNEYLHYQDDWYILSSKIENKPEDYIFVYYR
GRNDAWDGYGGAVVYTRSSVLPNSIIPELEKAAKSIGRDFSTFIRTDNTCGPEPALVERIEKTVEEGERIIVKEVEEI
EEEVEKEVEKVGRTEMTLFQRLAEGFNELKQDEENFVRELSKEEMEFLDEIKMEASEVEKLFGKALPIRKVR

>*Nt*VDE
MALAPHSNFLANHETIKYYVGSKLPGHKRFSWGWEDYFGSIVVAKICSSRRIPRYFRKSPRICCGLDSRGLQLFSHGK
HNLSPAHSINQNVPKGNSGCKFPKDVALMVWEKWGQFAKTAIVAIFILSVASKADAVDALKTCTCLLKECRLELAKCI
SNPACAANVACLQTCNNRPDETECQIKCGDLFENSVVDEFNECAVSRKKCVPRKSDVGDFPVPDPSVLVQKFDMKDFS
GKWFITRGLNPTFDAFDCQLHEFHTEENKLVGNLSWRIRTPDGGFFTRSAVQKFVQDPKYPGILYNHDNEYLLYQDDW
YILSSKVENSPEDYIFVYYKGRNDAWDGYGGSVLYTRSAVLPESIIPELQTAAQKVGRDFNTFIKTDNTCGPEPPLVE
RLEKKVEEGERTIIKEVEEIEEEVEKVRDKEVTLFSKLFEGFKELQRDEENFLRELSKEEMDVLDGLKMEATEVEKLF
GRALPIRKLR

>*Os*VDE_jap
MAARPEVVSALSPPAGGGAMGGVRYHRCCPPRAYLWRKGDHLPLHHAKISARCSEIKAHTVLQGSDALSSIREWSRSH
LVTMTGLVACAVLVVPSADAVDALKTCTCLLKECRIELAKCIANPSCAANVACLNTCNNRPDETECQIKCGDLFENTV

VDEFNECAVSRKKCVPQKSDVGEFPVPDPSALVKNFNMADFNGKWYISSGLNPTFDTFDCQLHEFRVEGDKLIANLTW
RIRTPDSGFFTRTAIQRFVQDPAQPAILYNHDNEFLHYQDDWYIISSKVENKEDDYIFVYYRGRNDAWDGYGGAVLYT
RSKVVPESIVPELERAAKSVGRDFSTFIRTDNTCGPEPPLVERIEKTVEQGEKTIIREVQEIEGEIEGEVKELEEEEV
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>*Os*VDE_ind
MAARPEVVSALSPPAGGGAMGGVRYHRCCPPRAHLWRKGDHLPLHHAKIPARCSEIKVHTVLQASDALSSTREWSRSH
LVTMTGLVACAVLVVPSADAVDALKTCTCLLKECRIELAKCIANPSCAANVACLNTCNNRPDETECQIKCGDLFENTV
VDEFNECAVSRKKCVPQKSDVGEFPVPDPSALVKNFNMADFNGKWYISSGLNPTFDTFDCQLHEFRVEGDKLIANLTW
RIRTPDSGFFTRTAIQRFVQDPAQPAILYNHDNEFLHYQDDWYIISSKVENKEDDYIFVYYRGRNDAWDGYGGAVLYT
RSKVVPESIVPELERAAKSVGRDFSTFIRTDNTCGPEPPLVERIEKTVEQGEKTIIREVQEIEGEIEGEVKELEEEEV
TLFKRLTDGLMEVKQDLMNFFQGLSKEEMELLDQMNMEATEVEKVFSRALPIRKLR

>*Cs*VDE
MALSAHLIYLSNDGSIGLCARRQLTCERLRRRVADPCCVVNVKMQPNRRIPKYFGLLRSYRMPCGLESKYSNLLSCGS
MKISSVCENSTSIPEEKGIFEFQMEVIMSVLKSQLIRVAAVMACIFLVIPAADAVDALKTCSRLLKECGVELAKCIAN
PSCAANVACLQACNNRPDETECQIKCGDLFENSVVDEFNECAVSRKKCVPQKSDVGEFPVPHPNVLVRNFNMKDFSGK
WFITSGLNPTFDAFDCQLHEFHMESNKLLGNSTWRIRTPDGGFFTRSAVQRFVQDPTQPAILYNHDNEYLHYQDDWYI
LSSKIENKPDDYVFVYYRGRNDAWDGYGGAVVYTRSAVLPNSIIPELEKAAQSVGRDFSKFIRTDNSCGPEPPLVERL
EKTVEEGERTIIREVEEIEGEVEKTEMNLFGRLLEGFKELQQDEENFLRELSKEEMDILSELKMEASEVEKLFGQALP
LRKLR

>*So*VDE
MALVARSICVSYDEIAGICNNVSHRNFKKWVQWKNPFLFQDDARRNIRFNDRKLSCTKFIGASEKLQHSKSPKSGLIS
CGWEVNSSKVVSNAVIPKKWNLLKLKVVEVTAIVACTFFVMSSAQAVDALKTCTCLLKECRIELAKCIANPSCAANVA
CLQTCNNRPDETECQIKCGDLFANKVVDEFNECAVSRKKCVPQKSDVGEFPVPDPSVLVKSFNMADFNGKWFISSGLN
PTFDAFDCQLHEFHLEDGKLVGNLSWRIKTPDGGFFTRTAVQKFAQDPSQPGMLYNHDNAYLHYQDDWYILSSKIENQ
PDDYVFVYYRGRNDAWDGYGGAFLYTRSATVPENIVPELNRAAQSVGKDFNKFIRTDNTCGPEPPLVERLEKTVEEGE
RTIIKEVEQLEGEIEGDLEKVGKTEMTLFQRLLEGFQELQKDEEYFLKELNKEERELLEDLKMEAGEVEKLFGRALPI
RKLR

>*Ta*VDE
MLPRQCFKHVFPAEGSSSSILHGPGSRGAGSRGRTTLNFHRCCVRASLWRTDHLHISTARSSEIKVHTLLQVPDVFNT
IKSWSKLQLVTVTGLAACVVLLVPSAGATDALKTCTCLLKECRIELAKCIANPSCAANVACLNTCNNRPDETECQIKC
GDLFENSVVDEFNECAVSRKKCVPKKSDVGEFPVPDPSALVKNFNMADFRGKWYISSGLNPTFDTFDCQLHEFRLEGD
RLVANLAWRIPTPDTGFFTRGAVQRFVQDSSQPAILYNHDNEYLHYQDDWYILSSKIENKDDDYIFVYYRGRNDAWDG
YGGAVVYTRSKELPETIVPELERATKSVGRDFSTFIRTDNTCGAEPPLADRIERTVEKGEKLIVDEVKEIEGEIEGEV
KELEREEETLVKRLADGIMEVKQDVMNFFQGLSKEEMEILDQLNLEATEVEELFSRSLPIRKLR

>*Ls*VDE
MALSLHTVFLCKEEALNLYARSPCNERFHRSGQPPTNIIMMKIRSNNGYFNSFRLFTSYKTSSFSDSSHCKDKSQICS
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ACLQTCNNRPDETECQIKCGDLFENSVVDQFNECAVSRKKCVPRKSDVGEFPVPDRNAVVQNFNMKDFSGKWYITSGL
NPTFDAFDCQLHEFHMENDKLVGNLTWRIKTLDGGFFTRSAVQTFVQDPDLPGALYNHDNEFLHYQDDWYILSSQIEN
KPDDYIFVYYRGRNDAWDGYGGSVIYTRSPTLPESIIPNLQKAAKSVGRDFNNFITTDNSCGPEPPLVERLEKTAEEG
EKLLIKEAVEIEEEVEKEVEKVRDTEMTLFQRLLEGFKELQQDEENFVRELSKEEKEILNELQMEATEVEKLFGRALP
IRKLR

>*Hs*VDE
MLSRQCFKHVFPAEGSSSSILHGPGSRGAASRSRTALNFHRCCVRASLWRADHLNIRTAGSSEVKVYTSLQVPDVFNS
IKSWSKLQLVTVTGLAACVVLLVPSAGATDALKTCTCLLKECRIELAKCIANPSCAANVACLNTCNNRPDETECQIKC
GDLFENSVVDEFNECAVSRKKCVPKKSDVGEFPVPDPSSALVKNFNMADFTGKWYISSGLNPTFDTFDCQLHEFRVEG
DRLVANLAWRIPTPDTGFFTRGAVQRFVQDPSQPAILYNHDNEYLHYQDDWYILSSKIENKEDDYIFVYYRGRNDAWD
GYGGAVVYTRSKELPETIVPELERAAKSVGRDFSTFIRTDNTCGAEPPLADRIERTVEKGEKLIVDEVKEIEGEIEGE
VKELEREEETLVKRLADGIMEVKQDVMNFFQGLSKEEMEILDQLNLEATEVEELFSRSLPIRKLR

Zeaxanthin Epoxidases

>*At*ZEP_col
MGSTPFCYSINPSPSKLDFTRTHVFSPVSKQFYLDLSSFSGKPGGVSGFRSRRALLGVKAATALVEKEEKREAVTEKK
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RINGLVDGISGTWYVKFDTFTPAASRGLPVTRVISRMTLQQILARAVGEDVIRNESNVVDFEDSGDKVTVVLENGQRY
EGDLLVGADGIWSKVRNNLFGRSEATYSGYTCYTGIADFIPADIESVGYRVFLGHKQYFVSSDVGGGKMQWYAFHEEP
AGGADAPNGMKKRLFEIFDGWCDNVLDLLHATEEEAILRRDIYDRSPGFTWGKGRVTLLGDSIHAMQPNMGQGGCMAI
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TLCLTKDEDQPCIVGSEPDQDFPGMRIVIPSSQVSKMHARVIYKDGAFFLMDLRSEHGTYVTDNEGRRYRATPNFPAR
FRSSDIIEFGSDKKAAFRVKVIRKTPKSTRKNESNNDKLLQTA

>*At*ZEP_ler
MGSTPFCYSINPSPSKLDFTRTHVFSPVAKQFYLDLSSFSGRSGGGLSVFRSRKTLLGVKAATALVEKEEKREAVTEK
KKSRVLVAGGGIGGLVFALAAKKKGFDVLVFEKDLSAIRGEGKYRGPIQIQSNALAALEAIDIEVAEQVMEAGCITGD
RINGLVDGISGTWYVKFDTFTPAASRGLPVTRVISRMTLQQILARAVGEDVIRNESNVVDFEDSGDKVTVVLENGQRY
EGDLLVGADGIWSKVRNNLFGRSEATYSGYTCYTGIADFIPADIESVGYRVFLGHKQYFVSSDVGGGKMQWYAFHEEP
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TLCLTKDEDQPCIVGSEPDQDFPGMRIVIPSSQVSKMHARVIYKDGAFFLMDLRSEHGTYVTDNEGRRYRATPNFPAR
FRSSDIIEFGSDKKAAFRVKVIRKTPKSTRKNESNNDKLLQTA

>*At*ZEP_?
MGSTPFCYSINPSPSKLDFTRTHVFSPVSKQFYLDLSSFSGKPGGVSGFRSRRALLGVKAATALVEKEEKREAVTDKK
KKSRVLVAGGGIGGLVFALAAKKKGFDVLVFEKDLSAMRGEGKYRGPIQIQSNALAALEAIDIEVAEQVMEAGCITGD
RINGLVDGISGTWYVKFDTFTPAGVTGLPVTRVISRMTLQQILARAVGEDVIRNESNVVDFEDSGDKVTVVLENGQRY
EGDLLVGADGIWSKVRNNLFGRSEATYSGYTCYTGIADFIPADIESVGYRVFLGHKQYFVSSDVGGGKMQWYAFHEEP
AGGADAPNGMKKRLFEIFDGWCDNVLDLLHATEEEAILRRDIYDRSPGFTWGKGRVTLLGDSIHAMQPNMGQGGCMAI
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HPGRVGGRFFVDIAMPSMLDWVLGGNSEKLQGRPPSCRLTDKADDRLREWFEDDDALERTIKGEWYLIPHGDDCCVSE
TLCLTKDEDQPCIVGSEPDQDFPGMRIVIPSSQVSKMHARVIYKDGAFFLMDLRSEHGTYVTDNEGRRYRATPNFPAR
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>*Cu*ZEP
MVSSMFYNSVNLSTAVFSRTHFPVPVYKHSCIEFSRYDHCINYKFRTGTSGQSKNPTQMKAAVAESPTNNSDSENKKL
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GLVDGISGSWYIKFDTFTPAAEKGLPVTRVISRMTLQQILAKAVGDEIILNESNVIDFKDHGDKVSVVLENGQCYAGD
LLIGADGIWSKVRKNLFGPQEAIYSGYTCYTGIADFVPADIESVGYRVFLGHKQYFVSSDVGAGKMQWYAFHKEPAGG
VDDPEGKKERLLKIFEGWCDNVVDLILATDEEAILRRDIYDRTPIFTWGRGRVTLLGDSVHAMQPNLGQGGCMAIEDG
YQLAVELEKACKKSNESKTPIDIVSALKSYERARRLRVAVIHGLARSAAVMASTYKAYLGVGLGPLSFLTKFRIPHPG
RVGGRFFIDLAMPLMLSWVLGGNSSKLEGRSPCCKLSDKASDNLRTWFRDDDALERAMNGEWFLVPSGSENVVSQPIY
LSGSHENEPYLIGSESHEDFPRTSIVIPSAQVSKMHARISYKDGAFYLIDLQSEHGTYVTDNEGRRYRVSSNFPARFR
PSDTIEFGSDKKAIFRVKVIGTPPNNNSERKEAGEILQAV

>*Cr*ZEP
MLASTYTPCGVRQVAGRTVAVPSSLVAPVAVARSLGLAPYVPVCEPSAALPACQQPSGRRHVQTAATLRADNPSSVAQ
LVHQNGKGMKVIIAGAGIGGLVLAVALLKQGFQVQVFERDLTAIRGEGKYRGPIQVQSNALAALEAIDPEVAAEVLRE
GCITGDRINGLCDGLTGEWYVKFDTFHPAVSKGLPVTRVISRLTLQQILAKAVERYGGPGTIQNGCNVTEFTERRNDT
TGNNEVTVQLEDGRTFAADVLVGADGIWSKIRKQLIGETKANYSGYTCYTGISDFTPADIDIVGYRVFLGNGQYFVSS
DVGNGKMQWYGFHKEPSGGTDPEGSRKARLLQIFGHWNDNVVDLIKATPEEDVLRRDIFDRPPIFTWSKGRVALLGDS
AHAMQPNLGQGGCMAIEDAYELAIDLSRAVSDKAGNAAAVDVEGVLRSYQDSRILRVSAIHGMAGMAAFMASTYKCYL
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AQVWRGLAGLPPSSSSASTAAASASAASSAASGTASTLGSSEGYWLRDLGSGRGTWVNGKRLPDGATVQLWPGDAVEF
GRHPSHEVFKVKMQHVTLRSDELSGQAYTTLMVGKIRNNDYVMPESRPDGGSQQPGRLVTA

>*Csp*ZEP
MHARSSLGPRARAGARAPAVCHVAALAACRPAASTPPQPLCATISNSAGSARAAIMPQQGRGLGSGLVRCPTTPVATR
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SHVVGFEESNNGVSVTLENGDVHRGDILVGADGIWSKIRKAILGETEANYSQYTCYTGISDFTPADIDIVGYRVFLGN
SQYFVSSDVGGGKMQWYGFHKEPAGGTDPEGQRKARLLDIFGHWNDNVVDLIKATPEEDIMRRDIFDRPPVFKWSEGR
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LMENDEAIIQSSHADWMLMTSREAGSGSSDSNARVDATADATSTSECKGIYIGDEPSIIGRKSESADLSINDGQVAPQ
HARVWRTETSSVSGRDVVAYEYHVQDLGSDAGTWLNGRPMPRGGTCQLHAGDVLEFGQSPSKEVYRVKMQHVSLRNDK
LNGHAFTTLVVGAHEGHGDKHMIMA

>*Le*ZEP
MYSTVFYTSVHPSTSVLSRKQLPLLISKDFSAELYHSLPCRSLENGHINKVKGVKVKATIAEAPVTPTEKTDSGANGD
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CITGQRINGLVDGISGNWYCKFDTFTPAVERGLPVTRVISRMTLQQILARAVGEEIIMNESNVVDFEDDGEKVTVVLE
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FYNEPAGGADAPNGKKERLLKIFGGWCDNVIDLLVATDEDAILRRDIYDRPPTFSWGRGRVTLLGDSVHAMQPNLGQG
GCMAIEDSYQLALELEKACSRSAEFGSPVDIISSLRSYESARKLRVGVIHGLARMAAIMASTYKAYLGVGLGPLSFLT
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NFPTRFHPSDVIEFGSDKAAFRVKAMKFPLKTSERKEEREAVEAA

>*Nt*ZEP
MYSTVFYTSVHPSTSAFSRKQLPLLISKDFPTELYHSLPCSRSLENGQIKKVKGVVKATIAEAPATIPPTDLKKVPQK
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INGLVDGVSGNWYCKFDTFTPAVERGLPVTRVISRMTLQQNLARAVGEDIIMNESNVVNFEDDGEKVTVTLEDGQQYT
GDLLVGADGIRSKVRTNLFGPSDVTYSGYTCYTGIADFVPADIETVGYRVFLGHKQYFVSSDVGGGKMQWYAFHNEPA
GGVDDPNGKKARLLKIFEGWCDNVIDLLVATDEDAILRRDIYDRPPTFSWGKGRVTLLGDSVHAMQPNLGQGGCMAIE
DSYQLALELDKALSRSAESGTPVDIISSLRSYESSRKLRVGVIHGLARMAAIMASTYKAYLGVGLGPLSFLTKFRIPH
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LVLSRDENMPCNIGSVSHANIPGKSVVIPLPQVSEMHARISYKGGAFFVTDLRSEHGTWITDNEGRRYRASPNFPTRF
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>*Np*ZEP
MYSTVFYTSVHPSTSAFSRKQLPLLISKDFPTELYHSLPCSRSLENGQIKKVKGVVKATIAEAPATIPPTDLKKVPQK
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GGVDDPNGKKARLLKIFEGWCDNVIDLLVATDEDAILRRDIYDRPPTFSWGKGRVTLLGDSVHAMQPNLGQGGCMAIE
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LVLSRDENMPCNIGSVSHANIPGKSVVIPLPQVSEMHARISYKGGAFFVTDLRSEHGTWITDNEGRRYRASPNFPTRF
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>*Os*ZEP
MALLSATAPAKTRFSLFSHEEAQHPHPHALSACCGGGASGKRQRARARVAAAMRPADAAASVAQAASPGGGGEGTRRP
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LLVGADGIWSKVRKVLFGQSEATYSEYTCYTGIADFVPPDIDTVGYRVFLGHKQYFVSSDVGAGKMQWYAFHKEPAGG
TDPENGKNKRLLEIFNGWCDNVVDLINATDEEAILRRDIYDRPPTFNWGKGRVTLLGDSVHAMQPNLGQGGCMAIEDG
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RVGGRFFIKYGMPLMLSWVLGGNSTKLEGRPLSCRLSDKANDQLRRWFEDDDALEQAMGGEWYLLPTSSGDSQPIRLI
RDEKKSLSIGSRSDPSNSTASLALPLPQISENHATITCKNKAFYVTDNGSEHGTWITDNEGRRYRRTSELPCPFPSLG
CH

>*Pa*ZEP
MASTLFYNSMNLSAAVFSRTHFPIPINKDFPLEFSPCIHTDYHLRSRTRSGQKKCLTEVRATVASPTEVPSAPASTQP
KKLRILVAGGGIGGLVFALAAKKKGFDVVVFEKDLSAVRGEGQYRGPIQIQSNALAALEAIDMDVAEEVMRVGCVTGD
RINGLVDGVSGTWYVKFDTFTPAVERGLPVTRVISRIALQQILARAVGEEIIINDSNVVNFEDLGDKVNVILENGQRY
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PGGVDSPNGKKERLLKIFEGWCDNVIDLLLATEEDAILRRDIYDRTPILTWGKGHVTLLGDSVHAMQPNMGQGGCMAI
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HPGRVGGRVFIDKAMPLMLSWVLGGNSSKLEGRSPSCRLSDKASDQLRNWFEDDDALERAIDGEWYLIPCGQDNDASQ
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FRPSDAIEIGSQKVAFRVKVMKSSPGSVEKEGILQAA

>*Ca*ZEP
MYASSARDGIPGKWCNARRKQLPLLISKDFPAELYHSLPCKSLENGHIKKVKGVKATLAEAPATPTEKSNSEVPQKKL
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LLVGADGIRSKVRTNLFGPSELTYSGYTCYTGIADFVPADIDTAGYRVFLGHKQYFVSSDVGGGKMQWYAFHNEPAGG
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RVGGRFFIDLGMPLMLSWVLGGNGEKLEGRIQHCRLSEKANDQLRNWFEDDDALERATDAEWLLLPAGNSNAALETLV
LSRDENMPCTIGSVSHANIPGKSVVIPLSQVSDMHARISYNGGAFLGTAFRSDHGTWFIDNEGRRYRVSPNFPMRFHS
SDVIVFGSDKAAFRIKAMKFAPKTAAKEDRQAVGAA