

This is an alignment of gene sequences related to vitellogenin from across the animal kingdom. Sequences were aligned using the PileUp and Pretty programs within the GCG Sequence Analysis Software Program (Madison, WI).

Parameters: Plurality: 6.00 Threshold: 1.00 AveWeight 1.00
 AvMatch 0.54 AvMismatch -0.40

	1				50
Bollweevil	.....	.....	.....	.....	.....
Mosquito	mlakllllal	agltaayqye	nsfkgynpgy	kydagykygy	gydagykygyg
Silkworm	.....	.....	.....	.....	.....
Sturgeon	.....	.....	.....	.....	.....
Frog	.....	.....	.....	.....	.....
Chicken	.....	.....	.....	.....	.....
Killifish	.....	.....	.....	.....	.....
Lamprey	.....	.....	.....	.....	.....
Nematode	.....	.....	.....	.....	.....
Drosophila Yp1	.....	.....	.....	.....	.....
Drosophila Yp3	.....	.....	.....	.....	.....
Medfly Yp1	.....	.....	.....	.....	.....
Medfly Yp2	.....	.....	.....	.....	.....
Calliphora	.....	.....	.....	.....	.....
Drosophila Yp2	.....	.....	.....	.....	.....
Human Apob	.....	.....	.....	.....	.....
Lipase	.....	.....	.....	.....	.....
Consensus	-----	-----	-----	-----	-----
	51				100
Bollweevil	....mwstv	alcllvglisy	vssss.....	.....	..paWkdnte
Mosquito	ydagykyynnq	gysyknqfey	gyqnayqAaf	ykhrpnvtef	efssWmpnye
Silkworm	.....	.mklfvlaai	iaavssdrFs	sqsqstggqt	yvspWqvgkq
Sturgeon	.....	.....	.....Lt	iaLvgsqqtk	yepsFsgskt
Frog	.....	.....	.mkgivlALl	laLagserth	iepvFseski
Chicken	.....	.....	.mrgiilALv	ltLvgsqkfd	idpgFnsrrs
Killifish	.....	.....	.mkavvlALt	laFvagq..n	fapeFaagkt
Lamprey	.....	.....	mwklllvALa	faLadaq...	....Fqpgkv
Nematode	.....	.....	.mksiiiAsl	vaLaiiaaspa	ldrtFspkse
Drosophila Yp1	.....	.....	.....	.....	.....
Drosophila Yp3	.....	.....	.....	.....	.....
Medfly Yp1	.....	.....	.....	.....	.....
Medfly Yp2	.....	.....	.....	.....	.....
Calliphora	.....	.....	.....	.....	.....
Drosophila Yp2	.....	.....	.....	.....	.....
Human Apob	.....mdpp	rpallallal	palllllllag	araeeemlen	vslvcpkdat
Lipase	.....	.....	.....	.....	.....

Consensus

-----AL- --L-----F-----

	101				150
Bollweevil	YvYsvngrtL	tGLEEtadqY	sGvfleaKlh	lsirpdgklq	grIsePkFaq
Mosquito	YvYnvtsktM	taLaEldddQW	tGvftraylv	Irpksrdyvv	ayVvkqPeYav
Silkworm	YrYevtsrtL	ahLqE..gps	sGsafkaqft	Irvkspgrlq	aKlenPqhgn
Sturgeon	YqYkYEGviL	tGLpEkglAR	aGlkvhcKve	Isevaqktyl	LKIlnPeige
Frog	svYnYEaviL	nGFpEsglSR	aGikincKve	Isayaqrsyf	LKIqsPeike
Chicken	YlYnYEGsmL	nGLqDrslgk	aGvrlssKle	Isglpenayl	LKVrsPqvee
Killifish	YvYkYEaliL	gGLpEeglaR	aGlkistKll	lsaadqntym	LKlvePeLse
Lamprey	YrYsYDafsi	sGLpEpgvnR	aGlsgemKie	Ihghthnqat	LKITqvnLky
Nematode	YvYkFDgllL	sGLptrssda	sGqtliscrtr	lqavddryih	LqltdiqYsa
Drosophila Yp1	.....	.....	.....	.....	.....
Drosophila Yp3	.....	.....	.....	.....	.....
Medfly Yp1	.....	.....	.....	.....	.....
Medfly Yp2	.....	.....	.....	.....	.....
Calliphora	.....	.....	.....	.....	.....
Drosophila Yp2	.....	.....	.....	.....	.....
Human Apob	rfkhLrkyty	nyeaEsssGv	pGtadsrsat	rinckvelev	pqlcsfiLkt
Lipase	.....	.....	.....	.....	.....
Consensus	Y-Y-YE---L	-GL-E---R	-G---K--	I-----	LKI--P-L--

	151				200
Bollweevil	ilsqldpdgWk	seipdsqisY	kql..qlsqk	PfqLvlengl	IkrlivekDt
Mosquito	FnerlphgYa	tkfyhdmfKF	qpm..pmssk	PfgiryhkGa	IkglYvektI
Silkworm	FneqlpdpRe	lpv...dlKY	qpt..pnidk	vfeieidgGr	IvsldfptsV
Sturgeon	Y....ngiWP	kapfypasKL	tqalasqLtq	PikFqyrnGq	VgdIFaseDV
Frog	Y....ngvWP	kdpftrssKL	tqalaeqLtk	ParFeysnGr	VgdIFvadDV
Chicken	Y....ngvWP	rdpftrssKi	tqvisscFtr	lfkFeyssGr	IgnIYapeDc
Killifish	Y....sgiWP	kdpavpatKL	taahlssqf	PssLntpmvf	VgkVFapeEV
Lamprey	F....lgpWP	sdsfypltag	ydhfiqqLev	PvrFdysaGr	IgdIYappqV
Nematode	shipqseqWP	kiesleqreL	sdefkelLel	PfraqirnGl	IseIqfssEd
Drosophila Yp1	.....	.....	.....	.....	.....
Drosophila Yp3	.....	.....	.....	.....	.....
Medfly Yp1	.....	.....	.....	.....	.....
Medfly Yp2	.....	.....	.....	.....	.....
Calliphora	.....	.....	.....	.....	.....
Drosophila Yp2	.....	.....	.....	.....	.....
Human Apob	sqcilkevYg	fnpegkallk	ktknseeFaa	amsryelkla	Ipegkqvfly
Lipase	.....	.....	.....	.....	.....
Consensus	Y-----WP	-----KL	-----L--	P--F---G-	I--I----DV

Bollweevil	lnwea	NI	iks	IvsqFqmdlq	genalqnpts	sfptneymda	vFktm	EetVt
Mosquito	pnnev	NI	lka	wisqLqvdtr	ganlmhsskp	ihpsknewng	hYkvm	EplVt
Silkworm	pvqqe	NI	likG	lisaLqldts	ahrvihsqn	ny.dreqqqg	lFrkm	EtdVt
Sturgeon	sDtv	NI	iqRG	ILNmL.....	.....	.qLtikttn	vYglq	EngIa
Frog	sDtva	NI	yRG	ILNlL.....	.....	.qvtikksqd	vYdlq	EssVg
Chicken	pDlcv	NI	vRG	ILNmF.....	.....	.qMtikksqn	vYelq	EagIg
Killifish	stlvl	NI	yRG	ILNlL.....	.....	.qLnikkthk	vYdlq	Evgtg
Lamprey	tDtav	NI	vRG	ILNlF.....	.....	.qLslkknqq	tFelq	EtgVe
Nematode	aEwsk	NA	kRs	ILNlFslrks	apvdmnqdg	kdMesdkdsv	fFnhv	Ektme
Drosophila Yp1	.....	.....	.....	.....	.....	.....	.....	.....
Drosophila Yp3	.....	.....	.....	.....	.....	.....	.....	.....
Medfly Yp1	.....	.....	.....	.....	.....	.....	.....	.....
Medfly Yp2	.....	.....	.....	.....	.....	.....	.....	.....
Calliphora	.....	.....	.....	.....	.....	.....	.....	.....
Drosophila Yp2	.....	.....	.....	.....	.....	.....	.....	.....
Human Apob	pEkdeptyil	nikrgiisal	lvppeteeak	qvLfldtvyg	nCsthftvkt	.....	.....	.....
Lipase	.....	.....	.....	.....	.....	.....	.....	.....
Consensus	-D---	NI-RG	ILN-L----	-----	-----	--L-----	-Y---	E--V-

Bollweevil	251	Gkte	TiYdIh	rlpeylvqsq	pwiapqyklk	gedg.lIeVi	KsknYtNard	300
Mosquito	GeCe	ThYdVn	lipaymiqah	kqwpqgqlr	geddqfIqVT	KtqnFdrCdq	.....	.....
Silkworm	GdCe	TlYtVs	pvasewrrel	pkfa.....	.neqdpVeVT	KstnYghChh	.....	.....
Sturgeon	GiCeas	YvIq	.....	.....	DrkankIiVT	KskdLnNCne	.....	.....
Frog	GiCh	TrYvIq	.....	.....	DkrgdqIrIi	KstdFnNCqd	.....	.....
Chicken	GiChar	YvIq	.....	.....	DrknsrIyVT	rtvdLnNCqe	.....	.....
Killifish	GvCk	TlYsIs	.....	.....	DarienIllT	KtrdLsNCqe	.....	.....
Lamprey	GiCq	TtYvVq	.....	.....	gyrtremaVv	KtkdLnNCdh	.....	.....
Nematode	GdCr	srlhIv	.....	.....	E..gektiyT	KsvnFdkCit	.....	.....
Drosophila Yp1	.....	.....	.....	.....	.....	.....	.....	.....
Drosophila Yp3	.....	.....	.....	.....	.....	.....	.....	.....
Medfly Yp1	.....	.....	.....	.....	.....	.....	.....	.....
Medfly Yp2	.....	.....	.....	.....	.....	.....	.....	.....
Calliphora	.....	.....	.....	.....	.....	.....	.....	.....
Drosophila Yp2	.....	.....	.....	.....	.....	.....	.....	.....
Human Apob	rkgnvateIs	.....	.....	.....	t	Erdlgqcdrf	Kpirtgispl	.....
Lipase	.....	.....	.....	.....	.....	.....	.....	.....
Consensus	G-C-T-Y-I-	-----	-----	-----	-----	D-----I-VT	K---L-NC--	.....

Bollweevil	301	rpsyhyGFge	ieeseptank	m..gqffirq	snsraultgk	psryiiqsty	.....	.....
Mosquito	rmgyhfGFtg	ysdFrpntnq	m..gnvasks	lvsYmYltgn	wynftiqsss	.....	.....	.....
Silkworm	rvayhfGvpv	gaeWtgahk	tqeqligra	tysriltgKe	gpiykaetts	.....	.....	.....
Sturgeon	kikmdiGMa.	...YshtCsn	crkirkntrg	taaYtYilKp	tdtgltitqa	.....	.....	.....
Frog	kvsktiGLE.	...LaefChs	ckqlnrviqg	aatYtYklKg	rdqgtvimev	.....	.....	.....
Chicken	kvqksiGMa.	...YiypCpv	dvmkerltkg	ttaFsYklKq	sdsgtlitdv	.....	.....	.....

Killifish	rlnkdiGLa.	...YtekCdk	cqeetknlrg	tttLsYvlKp	vadavmilka
Lamprey	kvyktmGta.	...YaerCpt	cqkmmknlrs	tavYnYaifd	epsgyiiksa
Nematode	rpetayGLr.	...FgseCke	cekegqfvkp	qtvYtYtfKn	e.....kl
Drosophila Yp1	.....	.....	.....	.....	.....
Drosophila Yp3	.....	.....	.....	.....	.....
Medfly Yp1	.....	.....	.....	.....	.....
Medfly Yp2	.....	.....	.....	.....	.....
Calliphora	.....	.....	.....	.....	.....
Drosophila Yp2	.....	.....	.....	.....	.....
Human Apob	alikgmtrp.	...Lstliss	sqscqytlda	krkhvaeaic	keqhlflpfs
Lipase	.....	.....	.....	.....	.....
Consensus	-----GL--	---Y---C--	-----	---Y-Y--K-	-----

	351				400
Bollweevil	tvnkImvnpI	LknkemgsIt	smvnvtLleI	nnqqqqpeel	snpLdi.GnL
Mosquito	minkVaiaps	LvnkepalVy	aqvnmtLndV	hpydkvpmgp	aedLkvfvdL
Silkworm	tvh...vhph	LygkqkaeVy	shvhmeLisV	dqdsgeawpr	agaMrpaqsi
Sturgeon	tsqeVhqltp	FnemtgaaIt	.earqkLvLe	dakvihvtvp	eqeLknrGsi
Frog	tarqVlqvtp	Faerhgaatm	.esrqvLaWV	gsksgqltpp	qiqLknrGnL
Chicken	ssrqVyqisp	FneptgvaVm	.earqqLtLV	evrsergsap	dvpMqnyGsL
Killifish	yvneliqfsp	Fseangaaqm	.rtkqsLeFl	eiekepipsv	kaeyrhrGsL
Lamprey	hseeIqqlsv	FdikegnVi	.esrqkLiLe	gigsapaasq	aasLqnrGgL
Nematode	qeseVhsvyt	LnvngqevVk	setrakvtFV	eeskinreik	kvs.gpkeei
Drosophila Yp1	.....	.....	.....	.....	.....
Drosophila Yp3	.....	.....	.....	.....	.....
Medfly Yp1	.....	.....	.....	.....	.....
Medfly Yp2	.....	.....	.....	.....	.....
Calliphora	.....	.....	.....	.....	.....
Drosophila Yp2	.....	.....	.....	.....	.....
Human Apob	yknkygmvaq	vtqtlkledt	pkinsrFfge	gtkkmglafe	stkstspkq
Lipase	.....	.....	.....	.....	.....
Consensus	----V-----	F-----V-	-----L-LV	-----	---L---G-L

	401				450
Bollweevil	vYtYgqpknn	qvhsklnenl	me.....	.....	.....dssse
Mosquito	vYsYnmpsdk	knyvrpnet	xxxxxxxxxxx	xxxxxexxxx	xxesvenpki
Silkworm	lYsLstkqmt	khy.....	.....	.....exxx	xxxxxeshef
Sturgeon	qYqF.....	.....	.....	.....	.....
Frog	hYqF.....	.....	.....	.....	.....
Chicken	rYrF.....	.....	.....	.....	.....
Killifish	kYeF.....	.....	.....	.....	.....
Lamprey	mYkF.....	.....	.....	.....	.....
Nematode	vYsm.....	.....	.....	.....	.....
Drosophila Yp1	.....	.....	.....	.....	.....
Drosophila Yp3	.....	.....	.....	.....	.....
Medfly Yp1	.....	.....	.....	.....	.....

Medfly Yp2	.....	.....	.....	.....	.....
Calliphora	.....	.....	.....	.....	.....
Drosophila Yp2	.....	.....	.....	.....	.....
Human Apob	aeav.....	.....	.....	.....	.....
Lipase	.....	.....	.....	.....	.....
Consensus	-Y-F-----	-----	-----	-----	-----

	451				500
Bollweevil	esseq.....	...emthrrf	rrsanslt..	.....kq	wr.....
Mosquito	spveqykpll	dkvekrgnry	rrdlnaikek	kyyeaykmdq	yrlhrlndtx
Silkworm	nfpeqhehph	qsnqrsrrsy	mrsklvtvhk	vl.....	.....
Sturgeon	.....	.....	.....	.....	.....
Frog	.....	.....	.....	.....	.....
Chicken	.....	.....	.....	.....	.....
Killifish	.....	.....	.....	.....	.....
Lamprey	.....	.....	.....	.....	.....
Nematode	.....	.....	.....	.....	.....
Drosophila Yp1	.....	.....	.....	.....	.....
Drosophila Yp3	.....	.....	.....	.....	.....
Medfly Yp1	.....	.....	.....	.....	.....
Medfly Yp2	.....	.....	.....	.....	.....
Calliphora	.....	.....	.....	.....	.....
Drosophila Yp2	.....	.....	.....	.....	.....
Human Apob	.....	.....	.....	.....	.....
Lipase	.....	.....	.....	.....	.....
Consensus	-----	-----	-----	-----	-----

	501				550
Bollweevil	.....	...esseew	nqqq.....	.....	.....
Mosquito	xdxxxxdxxx	xxxxeskehr	ngttxyxxxx	xxxxxxxxxe	xxxxyxxxxxx
Silkworm	.....	.....kkr	nsexxxxxxx	xxadxxxxt..	.....
Sturgeon	.....	.....	.....	.....	.....
Frog	.....	.....	.....	.....	.....
Chicken	.....	.....	.....	.....	.....
Killifish	.....	.....	.....	.....	.....
Lamprey	.....	.....	.....	.....	.....
Nematode	.....	.....	.....	.....	.....
Drosophila Yp1	.....	.....	.....	.....	.....
Drosophila Yp3	.....	.....	.....	.....	.....
Medfly Yp1	.....	.....	.....	.....	.....
Medfly Yp2	.....	.....	.....	.....	.....
Calliphora	.....	.....	.....	.....	.....
Drosophila Yp2	.....	.....	.....	.....	.....
Human Apob	.....	.....	.....	.....	.....
Lipase	.....	.....	.....	.....	.....
Consensus	-----	-----	-----	-----	-----

	551				600
Bollweevil	.....	....qqprpq	ltraphspll	Psmvgyhgks	ikenKdfdir
Mosquito	xsesysisse	eyyyqptpan	fsyapeapfl	Pffftgykgyn	ifyarnvdai
Silkworm	.....	..yinddipd	idepayaaly	mspphadkk	.....qna
Sturgeon	.....	.....	...aseilqt	Pi.....q	lf..Ktrspe
Frog	.....	.....	...aselhqm	Pi.....h	lm..Ktkspe
Chicken	.....	.....	...pavlpqm	Pl.....q	li..Ktknpe
Killifish	.....	.....	...sdellqt	Pl.....q	li..Kisdap
Lamprey	.....	.....	...pssaitk	ms.....s	lfvtKgknle
Nematode	.....	.....	...eneklie	qfyqqgdae	vnpfKaieme
Drosophila Yp1	.....	.....	.....	.....	.....
Drosophila Yp3	.....	.....	.....	.....	.....
Medfly Yp1	.....	.....	.....	.....	.....
Medfly Yp2	.....	.....	.....	.....	.....
Calliphora	.....	.....	.....	.....	.....
Drosophila Yp2	.....	.....	.....	.....	.....
Human Apob	.....	.....	...lktlqel	kkltiseqni	qranlfnklv
Lipase	.....	.....	.....	.....	.....
Consensus	-----	-----	-----	P-----	----K-----

	601				650
Bollweevil	qnVenlvtei	sdeikqsekt	iskhtLdkyt	ilntlvrldm	eddiqfvaeq
Mosquito	rsVgklveei	asdlenpsnl	pkantMskfn	iltrairamg	yediyeLaQk
Silkworm	mnaqkiLqdi	aqqlqnpnm	pk sdfLskfn	ilvrliasm	teqL.....
Sturgeon	tkIkevLqhl	vqnnqqvqs	dapskF....	.....	...L.qLtQL
Frog	aqavevLqhl	vqdtqqhire	dapakF....	.....	...L.qLvQL
Chicken	qrIvetLqhi	vlnnqqdfhd	dvsyrF....	.....	...L.evvQL
Killifish	aqVaevLkhl	atyniedvhe	naplkF....	.....	...L.eLvQL
Lamprey	seIhtvLkhl	vennqlsvhe	dapakF....	.....	...L.rLtaF
Nematode	qkVeqlqeif	rqi qe heqnt	petvhL....	.....	...iaravrM
Drosophila Yp1	.....	.....	.....	.....	.....
Drosophila Yp3	.....	.....	.....	.....	.....
Medfly Yp1	.....	.....	.....	.....	.....
Medfly Yp2	.....	.....	.....	.....	.....
Calliphora	.....	.....	.....	.....	.....
Drosophila Yp2	.....	.....	.....	.....	.....
Human Apob	telrglsdea	vtsllpqlie	vsspit....	.....	...LqaLvQc
Lipase	.....	.....	.....	.....	.....
Consensus	--V---L---	-----	-----F----	-----	---L---L-QL

	651				700
Bollweevil	.....	.mYsqmkngq	qrytWsiFrD	svaeAgTgpa	LlnIkkWIet
Mosquito	YfvsqkErqv	aqFsdkkfsk	rvdaWvtLrD	AvaeAgTpsa	FkLIfdFIke
Silkworm	...sqtsrsi	etaktsnnii	ksdmWMIfrD	gvtqAgTlpa	FkqIqsWIen
Sturgeon	LRacthEnie	giWrqyektq	LyrRWiL..D	ALpAAaTpta	Frytq RImk

Frog		LRasnfEnlq	alWkqfaqrt	qyrRcLL..D	ALpmAgTvdC	LkFIkqlIhn
Chicken		cRianaDnle	siWrqvsdkP	ryrRWLL..s	AvsAsgTtet	LkFlknRIrn
Killifish		LRiaryEdle	myWnqykkms	phrhWFL..D	tipAtgTfag	LrFIkekfma
Lamprey		LRnvdagvlq	siWhklhqqk	dyrRWiL..D	AvpAmaTsea	LlFlkrtlas
Nematode		FRmctiEelk	kvhttiytka	ekkvqLviet	siavAgTknt	iqhlihfhfek
Drosophila	Yp1	.....	.....MNP	M..RvLsLla	cLavAalA..	.....kpngr
Drosophila	Yp3	.....	.....Mms	L..RicLLat	cLlvAahA..	.....skdas
Medfly	Yp1	.....	.....MNP	L..kiFcFla	lviAvasA..	.....nkhgk
Medfly	Yp2	.....	.....MNP	L..tiFcLva	vLlsAaTA..	.....hRgs.
Calliphora		.....	.....MNP	L..Rivcvaa	lLlAagsA..	.....n....
Drosophila	Yp2	.....	.....MNP	L..RtLcvma	cLlAvamg..	.....npqsg
Human Apob		gqpqcsthil	qwLkrvhaNP	LlidvvtYlv	ALipepsAqq	LreIfnmard
Lipase		.....	.....	.mliFwtitl	fLlgAakgke	.....
Consensus		LR----E---	--W----MNP	L--RWLLL-D	AL-AA-TA--	L-FI--RI--

		701				750
Bollweevil		kkiqktEAAq	vIgtlaqStR	FptEEyMrkF	feLatetqVr	qgetLnqtci
Mosquito		kkrlrgyEAAt	vIaslaqSiR	YptEhLLheF	flLvtsdvVL	hqeyLnatAl
Silkworm		kkigeeEAAq	vVvalprtLR	YptkqiMtqF	fnFarspaVk	DqMfLnssAl
Sturgeon		rdltdaEAiq	tlvt.amhlv	qtnhqivqMa	AeLvfdranL	kcpvLrkhAv
Frog		eelttqEAAv	lItf.amrsa	rpgqrnFqis	AdLvqdsqVq	kystvhkaAi
Chicken		ddlnyiqtLL	tVsl.tlhll	qadEhtLpia	AdLmtssrIq	knpvLqqvAc
Killifish		eeitiaEAAq	afit.avhmv	tadpEvikLF	esLvdsdkVv	EnplLrevvf
Lamprey		eqltsaEAtq	iVys.tlSnq	qatrEsLsya	reLlhtsfIr	nrpiLrktAv
Nematode		ksitplrAAe	llks.vqetl	YpsEhiadLL	iqLaqsplse	kyepLrqsAw
Drosophila	Yp1	.mdnsvnqAL	.....kPSqW	LsgsqLeaip	AldDftierL	EnMnLErgA.
Drosophila	Yp3	.....ndrL	.....kPtkW	LtatELenvp	slnDitwerL	EnqpLEggA.
Medfly	Yp1	nkdnagpnsL	.....kPtdW	LsvEELqsMt	AidDitlqqL	EnMsvEdae.
Medfly	Yp2	...nairnNL	.....qPSgx	LsprELedMp	AinEitfekL	qeMpaEeaA.
Calliphora		.gnlsglnkL	.....rPSqW	LsssqLdkLp	rsMEislqkL	EsMsvEkgA.
Drosophila	Yp2	nrsgrrsnsL	dnve.qPSnW	vnprEveeLp	nlkEvtlkkL	qeMsMEegA.
Human Apob		qrstratlyAL	shav.nnyhk	tnptgtqeLL	dianylmeqi	qddctgdedy
Lipase		.....	.....	vcyEDLgcFs	dtepwggtai	rpLkilpwsp
Consensus		-----EAAL	-----PS-W	L--EELL-LF	A-L-----VL	E-M-LE--A-

		751				800
Bollweevil		LsYtnLVhkv	yinrneshnq	fpvhafgsfy	tkkgrefvkt	tvIPhLkqeL
Mosquito		FaYsnFVnqa	hvsnrstayny	ypvfsfgrl.	adadykiieh	kiVPwFahqL
Silkworm		MaatkLInlg	qvmnytahsy	ypthMygrl.	thkhdafvle	eilPtLaadL
Sturgeon		LaYGsMVnr.	.....	...ycaeT..	.....Lncre	ealkpLhdfa
Frog		LaYGtMVrr.	.....	...ycdQ1..	.....sscpe	halepLhela
Chicken		LgYssvVnr.	.....	...ycSQT..	.....sacpk	ealqpihdla
Killifish		LgYGtMVnk.	.....	...ycnkT..	.....vdcpv	elIkpiqqrL
Lamprey		LgYGsLVFr.	.....	...ycanT..	.....vscpd	ellqpLhdlL
Nematode		LaaGsvVrg.	.....	...faSkTqd	lplirpasrq	tkeyvrvfM
Drosophila	Yp1	.ellqqVY..	.....	...hLSQihh	nvePnYv..P	SgIqvYvpkp

Drosophila Yp3	.kvi	ekI	...hvg	dL	Sn
Medfly Yp1	.rki	reA	...hL	aL	Sn
Medfly Yp2	.dlv	katV	...hL	nie	nq
Calliphora	.elm	ndA	...hL	dL	Sn
Drosophila Yp2	.tlld	deA	...hL	vF	Sq
Human Apob	tylil	aeA	...nM	qL	....i
Lipase	eki	deA	...ytn	nF	St
Consensus	L-YG--VY--	L-YG--VY--	-----LSQT--	-L-P-Y---P	S-IP-L---L

	801				850
Bollweevil	ekA	kih	Ni	Fqp	gek
Mosquito	reA	kiq	NL	Fep	gti
Silkworm	katV	kaq	NL	Fap	gk
Sturgeon	ndA	Et	Na	iqk	gas
Frog	aeA	Dia	Na	iqk	sad
Chicken	deA	kM	NM	ilk	sa
Killifish	sdA	niI	Na	Ltk	aav
Lamprey	sqss	Ei	Na	iqr	sl
Nematode	qhfr	Ek	Na	Lv	..
Drosophila Yp1	nG	EM	NF	iV	tv
Drosophila Yp3	nG	ny	gF	vL	aq
Medfly Yp1	nG	Ey	NF	FIT	avl
Medfly Yp2	tG	qL	NF	FIT	aml
Calliphora	nG	kL	NF	LIT	tvr
Drosophila Yp2	rG	tL	kF	FI	qv
Human Apob	stk	aa	pk	Lq	gd
Lipase	.....	.....	NF	i	es
Consensus	-GAI-----	ELVLAL	NFGEDEVTKI	FITFLP--SE	-----I-

	851				900
Bollweevil	lmm	adc	VF	elp	hq
Mosquito	laim	viy	VL	dv	hl
Silkworm	thi	akl	VL	ep	qs
Sturgeon	vDA	akke	ltm	lhs	mv
Frog	tDA	aked	ILL	vrt	la
Chicken	iDA	awkd	yLi	lpp	avi
Killifish	vEA	akkes	laL	lhp	iv
Lamprey	aEA	akrd	Iv	iks	iv
Nematode	tEA	kdv	VLL	nkp	wr
Drosophila Yp1	.....	vq	qq	nq	qr
Drosophila Yp3	.....	iq	qq	qq	.s
Medfly Yp1	.....	vq	qq	y....	qgn
Medfly Yp2	.....	vq	rv	.....	dsn
Calliphora	.....	id	kr	.....	gek
Drosophila Yp2	.....	vq	qp	.....	eeq
Human Apob	.....	mrs	kiv	neq	hian

LipasemckKL fev.....
 Consensus --AV-ALRKL --AYPQ-VQ- VLLQIY-N-- ---EVR--A- --LFET-PSE

901 950
 Bollweevil EMLqrmAqyt ntDsqqeevna AvksvIEssc kLeS.skhAe LrkaAqsA..
 Mosquito DMLqrmAeft hhDprlyvra AvksaIEtaa LaddYdedsk LalnAkaA..
 Silkworm EMmqamAemt hnDpsvevra vlksaIlsaa eLq.hprnfy LsrtAqaA..
 Sturgeon aLVatIAeal lkE..tslqv AsFtYshMka itrStapenh alssACnvAV
 Frog atVtaiAnva arEsKtnlql AsFtFsqMka LskSsvphle plaaACsvAl
 Chicken aLittiAnva mkEsKtnmqv AsFVYshMkS LskSrlpFmy nissACniAl
 Killifish gLVttvAnsv ktE..enlqv AsFtYshMkS LsrSpatihp dvaaACSAAM
 Lamprey aLVsmvAvrl rrE..pnlqv AsFVYsqMrS LsrSsnpefr dvaaACsvAI
 Nematode pvlahivsqm enEs..nqhv AaFtYhvLrq FykStnpcyq qlavrCski.
 Drosophila Yp1 Edyseevk.. ..naKtq..s gdiIvIDLGS kLntYerYAM LdIektGAKI
 Drosophila Yp3 Ea.adqwk.. ..saKaa..s gdLIiIDLGS tLtnFkrYAM LdVlntGAmI
 Medfly Yp1 Edyseswk.. ..nqKst..k gnLViInLGS tLtnmkrFAL LdVeqtGnmI
 Medfly Yp2 Essnrpng.. ..qqpkp..n gnLVvIDLGA virnFedLvL LdInrvGAAI
 Calliphora Edsnewqn.. ..qqass..g nlvViIDLGN eLnSFkrFsL LdVdetGAmI
 Drosophila Yp2 Eqqtqrrkqn geqddtk..t gdLIvIqLGN aiedFeqYAT LnIerlGeiI
 Human Apob ldIqdlkklv kealKesqlp tvMdFrkFsr nyqlYksvsL psldpasAkI
 Lipase ee vncICVDwkk gsqatyqAa nnVrvvGAqV
 Consensus ELV---A--- --E-K----- A-FVYIDLGS LL-SF---AL L-V-ACGAAI

951 1000
 Bollweevil .rpLltkkqY gmeqSyinlr DyvaEqmgle lhVqrtshsS aessFPkimk
 Mosquito .inFlnpEdv siqYSfnhir DyalEnLels yrIHygeIaS ndhrYpSglf
 Silkworm .ryLVtnEeF gyqhSfkfid DsYdEdndiG tfV.IshIGS edsLlPKdfk
 Sturgeon klLsrklDrL syrYSkamhm DtFkypLmaG aanIhiInn aasiLPsaVv
 Frog kiLnpslDnL gyrYSkvmrv DtFkynLmaG aaakVfimnS antmFPvfIl
 Chicken klLspklDsm syrYSkvira DtYfDnYrvG atgeIfvVnS prtmFPsaIi
 Killifish kiLgtklDrL slrYSkavhv DLYNssLavG aaatafyInd aatfmPksfv
 Lamprey kmLgsklDrL gcrYSkavhv DtFNartmaG vsadyfrInS psgpLPraVA
 Nematode .lLFtryqpq eqmlStysql pLFNseWlsG vqfdfatIfe knafLPkeVq
 Drosophila Yp1 gkwiV..... qMvNEldmPf DtIHlI..Gq nvgAhvAGaA
 Drosophila Yp3 gqtLI..... DLtNk.gvPq EiIHlI..Gq gisAhvAGaA
 Medfly Yp1 gktLV..... qLtNEvdvPq EiIHIV..aq cigAqvAGaA
 Medfly Yp2 gnsLV..... qLtaqadvPq EvInIV..aq giaAhvAGaA
 Calliphora rsaiV..... EMtekcdvad EtIHVV..aq giaAhvAGaA
 Drosophila Yp2 gnrLV..... ELtNtvnvPq EiIHlI..GS gpaAhvAGVA
 Human Apob egnLIfdpnn ylpkesmlkt tLtafgFasa DLieIgleGk gfeptlealf
 Lipase aqMLdi..... .LLtEysyPp skVhI..Gh slgAhvAGeA
 Consensus --LLV--D-L ---YS----- DLFNE-L-PG E-IHII-IGS ---ALPAGVA

1001 1050
 Bollweevil fqLhqnhGm kqhilstgGM issireLlnV Lyrq.....
 Mosquito yhLrqnfgGf kkyt.sfyyL vssmEaFfdI FkKqyntkyf adyyksadys

Silkworm		ivtnskggaw	erntieas..	fssaErFl	ldy	Lrd.....	.....
Sturgeon		mKFqaiYilsa	tadpl.eiGL	..htEGYqeV	Imqn.....	.....	h
Frog		aKFreYtSslv	enddi.eiGi	..rgEGieef	LrKq.....	.....	n
Chicken		sKlMansaGs	vadLv.evGi	..rvEGYadV	imKr.....	.....	n
Killifish		aKtkgFiaGs	taevl.eiGa	..niEGLqel	ilKn.....	.....	p
Lamprey		aKirgqgmGy	asdiv.efGL	..raEGLqel	Lyrg.....	.....	s
Nematode		asLetvfgGn	wncyfaqvGF	..sqqnFeqV	ilKt.....	.....	l
Drosophila	Yp1	aqe..FTrlT	GhkLRRVTGL	..DP...SkI	vaKs.....	.....	k
Drosophila	Yp3	gnk..YTaqt	GhkLRRITGL	..DP...akV	LsKr.....	.....	p
Medfly	Yp1	grq..YkrlT	GhqLRRITaL	..DP...SkI	FaKn.....	.....	r
Medfly	Yp2	arq..YTrqT	GntLRRITaM	..DP...SkI	Yark.....	.....	p
Calliphora		gne..FTrkT	GrqLRRITaL	..DP...SkI	LaKn.....	.....	p
Drosophila	Yp2	grq..FTrqT	GhkLRRITaL	..DP...tkI	YgKp.....	.....	e
Human Apob		gKqgfFpdsV	nkaLyWVnGq	..vPDGvSkV	Lv.d.....	.....	h
Lipase		gsk.....	tpgLSRITGL	..DPveaS..	Fest.....	.....	p
Consensus		-KL---T-GT	G--LRRITGL	--DPEGLS--	L-K-----	-----	

		1051					1100
Bollweevil		tevfqqeksq	rsqeq...gk	dne.....	.....	...wssania	
Mosquito		tnYynFdkys	kyykqyyysk	dseYyqkfyg	qkKdyndke	pfkftapria	
Silkworm		svFaphpkfD	rahk.....	.....	.....	...ysaekia	
Sturgeon		ehidqmps..	.....	...agkIqq	imKmLsgWks	vp...sektL	
Frog		iqFanFpm..	.....	...rkkIsq	iVKsLlgFkG	Lp...sqvPL	
Chicken		ipFaeYpt..	.....	...ykqIke	lgKaLqgWke	Lp...teTPL	
Killifish		alsestdR..	.....	...Itkmkr	vIKaLseWrs	Lp...tskPL	
Lamprey		qeQdaYgtal	drqtllrsgq	arshVssIhd	tlrkLsdWks	vp...eerPL	
Nematode		ekLslYgkqs	dE...lrsrr	vqsgIqmlqe	iVkkMniRpr	vqqtDsqnah	
Drosophila	Yp1	ntLtGLaRGD	AE.....	...FVDaiHT	SV.....YG	M.....GTPi	
Drosophila	Yp3	qiLgGLsRGD	AD.....	...FVDaiHT	St.....Fa	M.....GTPi	
Medfly	Yp1	naLtGLaRGD	AD.....	...FVDaiHT	St.....CG	M.....GTrq	
Medfly	Yp2	ntLvGLaRGn	AD.....	...FVDaiHT	Sa.....YG	L.....GTtt	
Calliphora		hsLtGLsRGD	AE.....	...FVDaiHT	nV.....YG	M.....GTiq	
Drosophila	Yp2	erLtGLaRGD	AD.....	...FVDaiHT	Sa.....YG	M.....GTsq	
Human Apob		fgYtkddkHE	qD.....	...mVngIml	SV.....ek	L.....ikdL	
Lipase		eev.rLdpsD	AD.....	...FVDvIHT	daapLipFlG	F.....GTnq	
Consensus		--L-GL-RGD	AD-----	---FVDaiHT	SVK-L--WYG	-----GTPL	

		1101					1150
Bollweevil		RlmnyErder	Eqleaiiyaq	.VeDvqklws	fdnqtlehlp	evIrqqeeiy	
Mosquito		kllnIDaeea	Eqlegqllfk	.lfngyffta	fdnqtienlp	hkmrhlfenL	
Silkworm		kllnIkndee	EPleasfyvD	.fmnqrlfs	fsesdlqqls	qyIseymkkv	
Sturgeon		aSayIkLFgq	EisFsrlDKk	tIqEalq...	.avrepverq	tvIkrvvnqL	
Frog		iSGyIkLFgq	EiaFtelnKE	vIqntiq...	.alnqpAerh	tmIrnvlnkL	
Chicken		vSaylkiLgq	EvaFininKE	llqqvmk...	.tvvepAdrn	aaIkrianqi	
Killifish		aSvyVkvFFgq	EigFanidKp	mIdkavk...	.fgkelpiqe	ygrealkalL	
Lamprey		aSGyVkvhgq	EvvFaeldKk	mmqrisqlwh	sarshhAaaq	eqIravvskL	

Nematode		avfylyrYkem	DyivlpidmE	tIdtlve...	...kyvrnge	fdIkslltfl
Drosophila	Yp1	RSGdVDFYPN	gPaagvPGas	nVVE.....	.....Aa..	.....
Drosophila	Yp3	RcGdVDFYPN	gPstgvPGsE	nVIE.....	.....Av..	.....
Medfly	Yp1	RvGdVDFYvN	gPastaPGtn	nVVE.....	.....As..	.....
Medfly	Yp2	RaGdVDFYPN	gPsvnmPGTD	dIIE.....	.....As..	.....
Calliphora		RvGdIDFYPN	gPsaavPGAq	sIVE.....	.....As..	.....
Drosophila	Yp2	RlanVDFFPN	gPstgvPGaD	nVVE.....	.....At..	.....
Human Apob		kSkeV...Pe	araYlrlilGE	elgf.....	.....As..	.....
Lipase		qmGhlDFFPN	ggesmpgcKk	nals.....	.....qivd	ldgiwagtrd
Consensus		RSG-VDF-PN	EP-F--PGKE	-IVE-----	-----A---	--I-----L

		1151				1200
Bollweevil		rqGkdfsYvk	lkqlnEmals	fPTemGLPF1	Ytydvpvlmk	vegkiralan
Mosquito		edGyafdvtk	fYqqqDVvla	wPlatGFPFi	YtlkAptvfk	Fevdasakth
Silkworm		esGaekhYtk	vYnqDqVsim	fPvasGMPFi	Fkykepaviv	Fqsklkgk..
Sturgeon		erGaaaqlsk	plLvaEVRri	lPTciGLPMe	mslyvsavtt	adiNvqahit
Frog		lnGvvgqYAr	RWmtwEyRhi	iPTtvGLPae	Lslyqsaivh	aavNsdvkvk
Chicken		lnsiagqWtq	pvWmgELryv	vPsclGLPLe	Ygsyttalar	aavsvegkmt
Killifish		lsGinhfYAk	pvLAaEmRri	lPTvaGiPMe	Lslysaavaa	asveikpnts
Lamprey		eqGmdvLltk	gYvvsEVRym	qPvciGiPMd	Lnllvsgvtt	nraNlhasfs
Nematode		tndskfelhr	alFfyEaerr	iPTtiGMPLt	is...gkmp	tilsingkvs
Drosophila	Yp1	.....MRat	RYFAEsVRPG	ne..RsFP..	.AvpAnSlqq	YkqNdGF...
Drosophila	Yp3	.....aRat	RYFAEsVRPG	se..RnFP..	.AvpAnSlkq	YkeqdGF...
Medfly	Yp1	.....MRat	RYFAEsVRPG	ne..RnFP..	.AvaAnSlng	YenNeGn...
Medfly	Yp2	.....LRat	RYLAeTVLPG	nd..RnFP..	.AvaAeSlqq	YknNnGn...
Calliphora		.....MRat	RYFAEsVRPG	ne..RnFP..	.AvaAnSlke	YknNdGF...
Drosophila	Yp2	.....MRat	RYFAEsVRPG	ne..RnFP..	.svaAsSyqe	YkqNkGY...
Human Apob		.....Lhdl	qllgkl1llmG	arTlqGiP..	.qmigevirk	gskNdfF...
Lipase		fvacnhLRsy	kYYlEsIlnp	d....GFa..	.AypctSyks	FesdkcFpcp
Consensus		--G----RA-	RYFAEEVRPG	-PT-RGFP--	-A--A-S---	Y--N-GF---

		1201				1250
Bollweevil		Paisr.....	.....nnkLt	KpeqisteIk	arvtctgktq	shlsfvtpFd
Mosquito		Pqvykmpagh	petenddfFy	mpqsingsVD	vnLlyhrmvd	akvgfvtpFd
Silkworm		.....f	sfpskdnkyy	eanmik...D	vqFtyainid	gNvgfmdtLs
Sturgeon		Pspt.....	.....ndFn	vaqLLnsnIv	LhtDvtpsia	mhtiavmGin
Frog		Ptps.....	.....gdFs	aaqLLesqIq	LngEvkpsvl	VhtvatmGin
Chicken		Pplt.....	.....gdFr	lsqLlestmq	irsDlkpsLy	VhtvatmGvn
Killifish		Prls.....	.....adFd	vktLLetdVE	LkaEirpmva	mdtyavmGLn
Lamprey		qslp.....	.....adMk	ladLLatnIE	LrvaattsMs	qhavaimGLt
Nematode		.....	.....	.ieLeklgar	LvLDivptva	tthvtempLl
Drosophila	Yp1	.....	.....G	KRAYMGidta	hDLEGDYILq	VNpKSpFGr.
Drosophila	Yp3	.....	.....G	KRAYMGlqID	YDLrGDYILE	VNaKSpFGq.
Medfly	Yp1	.....	.....G	KRAYMGiatD	FDLEGDYILk	VNpKSpFGk.
Medfly	Yp2	.....	.....G	rRAYMGiaad	YDLEGDYILq	VNaKSpFGk.
Calliphora		.....	.....G	KRAYMGinVD	YDLEGDYILE	VNsKgpFGk.

Drosophila Yp2	.....	.....	G	KRgYMGiatD	FDLqGDYILq	VNsKSpFGr.
Human Apob	.....	.....	l	hyiFMenafE	LptgagLqLq	Isssgviap.
Lipase	dqgc.....	.....	pqMG	hyAdkfagrt	sEqqkFfLn	tgeaSfFarw
Consensus	P-----	-----	FG	KRA-MG--ID	LDLEGDYIL-	VN-KS-FGL-

	1251					1300
Bollweevil	hqiymAGydK	nmyvsipvNA	rLemdvksKE	akiefEveqq	qqDsrlVhit	
Mosquito	hqryiAGYQK	klhgylpfnv	eLgldfvkdE	yeFefkflep	kdDhllfhms	
Silkworm	ngyssvGvvn	klqFnipf..	kFgieiksgl	ikFrvEplhp	dqDqtlVhys	
Sturgeon	thviqtGvel	hvkarttvpM	kFtakidlKE	knFkiEsepc	qqEtevlsls	
Frog	splfqAGief	hgkvHahlpA	kFtafldmKD	rnFkiEtppf	qqEnhlVeir	
Chicken	teyfqhavei	Qgevtqtrmpm	kFdakidvKl	knLkiEtnpc	reEteiVvgr	
Killifish	tdifqAalva	rakLHsVvpa	kiaarlNiKE	gdFklEalpv	dvpenitsmn	
Lamprey	tdlakAGmQt	hyktsaglgv	ngkiemnarE	snFkaslkpf	qqktvVlvt	
Nematode	ypvieqGvks	lqsarlhtpl	rFestvelKk	ntLeithkfv	vpEnkkttvs	
Drosophila Yp1	....nApaQK	QssYHgVhqA	wntnqdsdY	q.....	.....
Drosophila Yp3	....rspahK	QaaYHgmhA	qn.....	.....	.....
Medfly Yp1	....sApaQK	QrrYHglhqs	wksgknqnqE	.....	.....
Medfly Yp2	....sApaQK	QnsYHgIhqg	. agrpn...	.....	.....
Calliphora	....rApvQK	QnsYHgVqqf	lekegg....	.....	.....
Drosophila Yp2	....stpaQK	QtgYHqVhqp	wrqsssnqgs	rrq.....	.....
Human Apob	....gAkagv	klevanmqae	lvakpsvsvE	fvtnmgiip	dfarsgVqmn	
Lipase	rygvsitlsg	rtatgqIkvA	lFgnkgnthq	ysifrgilkp	gsthsyefda	
Consensus	-----AG-QK	Q--YH-V--A	-F-----KE	--F--E----	--E--V----	

	1301					1350
Bollweevil	stpYtsrsdV	maispvalrp	nTyVikshrn	nhryfdfnfg	kketgltfrg	
Mosquito	swpYtgykdI	tdmrpiaenp	nakIvhddnq	stktmehtfg	qdmgtgvalrf	
Silkworm	vwpYsasqkk	dslvaisqdp	aTkIv.errs	kvfsvdskyg	qsthaviy..	
Sturgeon	aqafaisrnV	ed...ldaak	knpllpeeav	rnlnegqfns	gtedsner..	
Frog	aqtFaftrnI	ad...ldsar	kTlVvprne	qnllkkhfet	tgrtsae...	
Chicken	hkaFavsrnI	ge...lgvek	rTsIlpedap	ldvteepfqt	serasrehfa	
Killifish	vttFavarnI	ee...plver	iTpllptkvl	vpipirrhts	kldptrnsml	
Lamprey	mesivfvrpd	sgsrilpvlp	pkmtldkgli	sqqqqqphhq	qqphqhgqdq	
Nematode	vhtrpva...	.....	.....	.....fir	vpknqdseyv	
Drosophila Yp1	.....	.....	.....	.....	.....
Drosophila Yp3	.....	.....	.....	.....	.....
Medfly Yp1	.....	.....	.....	.....	.....
Medfly Yp2	.....	.....	.....	.....	.....
Calliphora	.....	.....	.....	.....	.....
Drosophila Yp2	.....	.....	.....	.....	.....
Human Apob	tnfFhesgle	ahvalkagkl	kfiIpspkrp	vkllsggnty	yiwslppkpe	
Lipase	kldvgtiekV	kflwnnnvin	pTlpkvgatk	itvqkgeekt	vynfcsedtV	
Consensus	---F-----I	-----	-T-I-----	-----	-----	

1351

1400

Bollweevil	wghhpeqsig	fndLvsmwqs	rgvagvweql	wdkcsteYse	atisfipsqs
Mosquito	hakydfdlin	fqqFwqliqk	ndfvsavnyp	fayqpyeYhq	fnl.fydsqr
Silkworm	.aggytyssd	wrnFgakfts	rdyftnlasl	ltqedialth	fnlkhkckqs
Sturgeon	.eragkfarp	saeMmsgelm	nsgehqnrkg	ahatrsaCak	aknfgfevcF
Frog	...gasmmmed	sseMgpkkys	aepghhgyap	ninsydaCtk	fskagvhlci
Chicken	mqqpdsmprk	qshssredlr	rstgkrahk.	....rdiClk	mhhigcqlcF
Killifish	.....d	sseLlpmeee	dvepipeykf	rrfakkyCak	higvglkacF
Lamprey	araayqrpwa	sheFspaeqk	qihdimtarp	vmrrkqhCsk	saalsskvcF
Nematode	eaeektishs	qyqMsteeid	rqye.....	.....	.....tfgL
Drosophila Yp1	.....	.....	.....	.....	.....
Drosophila Yp3	.....	.....	.....	.....	.....
Medfly Yp1	.....	.....	.....	.....	.....
Medfly Yp2	.....	.....	.....	.....	.....
Calliphora	.....	.....	.....	.....	.....
Drosophila Yp2	.....	.....	.....	.....	.....
Human Apob	viplienrq	swsvckqvfp	glnyctsgay	snasstdsas	yypltgdtrL
Lipase	redtlltltp	c.....	.....	.....	.....
Consensus	-----	-----	-----	-----C--	-----F

1401				1450	
Bollweevil	ttrkatfrin	vdqkYqkqp.	EtqspedLlt	lnqlssk...	.....lqk
Mosquito	thaks.fkff	ayqkFgapsf	Eetgpkhpan	rhsysgnyye	snyaqpfvys
Silkworm	qskaltitay	ydeyYnqq..	nsgiltatd	rndlspn...	.....
Sturgeon	egksenvafl	rdspLykiig	qhhckiaLkp	shsseatiek	iqL.Elqtgn
Frog	qckthnaasr	rntiFyqavg	EhdfkltMkp	ah.tegaiek	lql.Eitagp
Chicken	srrsrdasfi	qntyLhklig	EheakivLmp	vh.tdadidk	iqL.Eiqags
Killifish	kfasqngasi	qdivLyklag	shnfsfsvtp	ie..gevver	lem.Evkvga
Lamprey	sarlrnaafi	rnalLykitg	Dyvskvyvqp	t.sskaqiqk	vel.Elqagp
Nematode	rinaqgnvls	qwtlpmvlmt	EqdfeytLen	knrpveftar	vtignlektD
Drosophila Yp1	.....	.....	.....	.....	.....
Drosophila Yp3	.....	.....	.....	.....	.....
Medfly Yp1	.....	.....	.....	.....	.....
Medfly Yp2	.....	.....	.....	.....	.....
Calliphora	.....	.....	.....	.....	.....
Drosophila Yp2	.....	.....	.....	.....	.....
Human Apob	elelrptgei	eqysvsatyE	lqredraLvd	tlkfvtqaeg	akqtEatmtf
Lipase	.....	.....	.....	.....	.....
Consensus	-----	-----L-----	E-----L--	-----	-----E-----

	1451			1500	
Bollweevil	depkqrqqeI	kkhvgsgins	allscsdisl	ef.egdkKye	hVvgfavaks
Mosquito	pgsqrryeqf	frnaasgirn	sfvryydfgf	efyapqyKse	ftFttafads
Silkworm	.settraem	vkllvsagink	arvrvdlsa	sfegsqdq.n	yVltgtwgds
Sturgeon	kaaskiirvV	amqslae...	.....adem	k.gnilkKLn	klLtvdgetq
Frog	kaaskimglV	evegteg...	.....epmd	e.tavtkrLk	mILgidesrk
Chicken	raaariiteV	npeseee...	.....dess	pyediqaKLk	rILgidsmfk

Killifish	kaaeklvkrI	nlsedee...	.....teeg	..gpvlvKLn	kILxxxxxxx
Lamprey	qaaekvirmV	elvakaskks	kknstiteeg	vgetiisqLk	kILssdkdkd
Nematode	lseikfdkif	ekefdlen..	.....nese	nrrqyfhKMi	reiqsegqgfk
Drosophila Yp1	.....	.....	.....	.....	.....
Drosophila Yp3	.....	.....	.....	.....	.....
Medfly Yp1	.....	.....	.....	.....	.....
Medfly Yp2	.....	.....	.....	.....	.....
Calliphora	.....	.....	.....	.....	.....
Drosophila Yp2	.....	.....	.....	.....	.....
Human Apob	kynrqsmtls	sevqipdfdv	dlgtilrvnd	estegktsyr	ltLdiqnkki
Lipase	.....	.....	.....	.....	.....
Consensus	-----V	-----	-----	-----KL-	-IL-----

	1501				1550
Bollweevil	nadpksrvmf	yy.....	.....knk	nenkqgalei	rseipntngl
Mosquito	pvdktsrqly	yfyaspmfps	qsyfk dipfs	gkqfqcata	tsefprvpyl
Silkworm	pvdskvqgml	f.....	...agtkSAT	qgnqqinavf	attkpeihs1
Sturgeon	dstlrgfkr.	.....	..rxxxxxxx	xxxxxxxxxxx	xxxxxqq...
Frog	dtnetalyr.	.....	..skqkkknk	ihnrrldaev	vearkqqxxx
Chicken	vanktrhpk.	.....	..nrpskkgn	tvlaefgtep	dakts.....
Killifish	xxxxxxxxxx.	.....	..xxxxxxxx	xxxxxxxxxxx	xrr.....
Lamprey	akkppgxxx.	.....	..xxxxxxxx	xxxxxxxxdks	gkktprq...
Nematode	nlitlklea.	.....	..pqqmywnt	el.....	.....
Drosophila Yp1	.....	.....	.....	.....	.....
Drosophila Yp3	.....	.....	.....	.....	.....
Medfly Yp1	.....	.....	.....	.....	.....
Medfly Yp2	.....	.....	.....	.....	.....
Calliphora	.....	.....	.....	.....	.....
Drosophila Yp2	.....	.....	.....	.....	.....
Human Apob	tevalmghl.	.....	..scdtkeer	kikgvisipr	lqaearseil
Lipase	.....	.....	.....	.....	.....
Consensus	-----	-----	-----	-----	-----

	1551				1600
Bollweevil	nlddsldtep	stkynmrlqy	gnsendafei	saqaqlsrsq	erkqylinqd
Mosquito	kfsdfdkyyg	dasqyfdfly	gescqggahi	avkgkqkqtg	kcreylrfsd
Silkworm	sfskplqsd1	rapfgmhfky	gqsg....ei	rvsgsfdrtk	kyttelen.h
Sturgeon	.....	.....	.....	...srmekr	meqdklten1
Frog	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxyskrskr	rehnphhqre
Chicken	.....	.....s	ssssasstat	ssassassp	nrkkpmdeee
Killifish	.....	.....	.....	.....	.....
Lamprey	.....	.....	.....gstv	nlaakraskk	qrgkdxxxxx
Nematode	.....	.....	.....	.....	.....
Drosophila Yp1	.....	.....	.....	.....	.....
Drosophila Yp3	.....	.....	.....	.....	.....
Medfly Yp1	.....	.....	.....	.....	.....

Medfly Yp2	.....	.....	.....	.....	.....
Calliphora	.....	.....	.....	.....	.....
Drosophila Yp2	.....	.....	.....	.....	.....
Human Apob	ptgrlpncfs	nglicyslwl	hsfqevawhy	deekiefewn	rgtnvdtkkm
Lipase	.....	.....	.....	.....	.....
Consensus	-----	-----	-----	-----	-----

	1601				1650
Bollweevil	plyhvckeqm	qqknfqlpac	qnmtakanfl	dhikyqvvyq	klnwklvetl
Mosquito	.vakackeqm	angyyqfeec	qqaidqayyy	dfydiaieyk	dvgsvaknlt
Silkworm	plakqcsqqt	tlnnfyqdsc	hkaivmahap	dhvefsvsfq	dmspqyrnfs
Sturgeon	erdrdhmrk	qs.....	.....	.....	.....
Frog	xxxxxxqeqn	kk.....	.....	.....	.....
Chicken	ndqvkqarnk	daxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx
Killifish	.....	.....	.....	.....	.....
Lamprey	xxxxxxdss	ksphkhgg..	.....	.....	.....
Nematode	.....	.....	.....	.....	.....
Drosophila Yp1	.....	.....	.....	.....	.....
Drosophila Yp3	.....	.....	.....	.....	.....
Medfly Yp1	.....	.....	.....	.....	.....
Medfly Yp2	.....	.....	.....	.....	.....
Calliphora	.....	.....	.....	.....	.....
Drosophila Yp2	.....	.....	.....	.....	.....
Human Apob	tsnfpvdlsd	ypkslhmyan	rlldhrvpqt	dmtfrhvgsk	livamsswlq
Lipase	.....	.....	.....	.....	.....
Consensus	-----	-----	-----	-----	-----

	1651				1700
Bollweevil	egmfkglrvl	yypmteiksi	ssvgqnvveg	evqfqppe..	.....
Mosquito	nkfyynyfya	fypfyfesnff	yhgksnyika	efefapygdy	ynasffgpsy
Silkworm	yhtyrlyeyl	gywyteanpl	kltqngkmdf	kidsyfdrt	ytvdiaspsg
Sturgeon	.....	.....k	nkkqewknkq	kkhhkqlpxx	xxxxxxxxxxx
Frog	.....	.....r	nlqenrkhgq	kgmxxxxxxx	xxxxxxxxxxx
Chicken	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx	xxxxxxxxxxx
Killifish	.....	.....	..kidlaart	nxxxxxxxxxx	xxxxxxxxxxx
Lamprey	.....	.....	akrqhaghga	phlqpqshxx	xxxxxxxxxxx
Nematode	.....	.....	.....	.....	.....
Drosophila Yp1	.....	.....	.....	.....	.....
Drosophila Yp3	.....	.....	.....	.....	.....
Medfly Yp1	.....	.....	.....	.....	.....
Medfly Yp2	.....	.....	.....	.....	.....
Calliphora	.....	.....	.....	.....	.....
Drosophila Yp2	.....	.....	.....	.....	.....
Human Apob	kasgslpytq	tlqdhlnslk	efnlqnmglp	dfhipenlfl	ksdgrvkytl
Lipase	.....	.....	.....	.....	.....
Consensus	-----	-----	-----	-----	-----

	1701				1750
Bollweevil	.frqvnvtvr	ntdee..tvf	fnisltnell	rtllvphpvf	hakcr.....
Mosquito	afqvqnyvpf	ndystyfyf	fkytffpryq	pyymhrpsh	kprnrpyyel
Silkworm	earmrdmpia	tmapgalsfy	.....	.....	.....qpl
Sturgeon	xxxxxxxxxx	xxxxxrshn	hrnn.....	trtlskskry	qnnnn.....
Frog	xxxxxxxxxx	xeenrphknr	qhdn.....	kqakmqsnqh	qqkknkfsex
Chicken	xxxxxxxxxx	xxxxxhshs	hshghlngxx	xxxxxrsvs	hshshehshg
Killifish	xxxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx	rrvnstrxxx	xxxrtssass
Lamprey	xxasksfstv	kppmtrkprp	arxxxxxxxx	xxxxxxxxxx	xxxxxxxxxx
Nematode	.....	.....	.....	.....	.....
Drosophila Yp1	.....	.....	.....	.....	.....
Drosophila Yp3	.....	.....	.....	.....	.....
Medfly Yp1	.....	.....	.....	.....	.....
Medfly Yp2	.....	.....	.....	.....	.....
Calliphora	.....	.....	.....	.....	.....
Drosophila Yp2	.....	.....	.....	.....	.....
Human Apob	nknslkieip	lpfggkssrd	lkmltvtvtp	alhfksvgfh	lpsrefqvpt
Lipase	.....	.....	.....	.....	.....
Consensus	-----	-----	-----	-----	-----

	1751				1800
Bollweevil	.....faglm	qgqqnyrptc	vIdqттаqtf	snktysvnl	keptvvmqyv
Mosquito	snyeqfaifd	rkpqy..psc	sfsndnFytf	dnkkyfydmg	ecwhavmytv
Silkworm	kayelvanyf	tghq.yqpyc	sIdgtrihtf	snrsyeypls	rswhvvmqde
Sturgeon	..xxxxxxxx	xxxeeiqkn	eIfayrFrsh	rdklgfgnkr	grmxxxxxxxx
Frog	xxxxxxxxxx	emwnkkkhh	nfydlnFrst	artkgttehr	srlxxxxxxxx
Chicken	leddxxxxxxxx	xvlskiwgrh	eIyqyrFrse	hrqefpkrkl	pgdratsrys
Killifish	lasffsdxxx	xxxxxdrsk	eVme.kFqrl	hkkmv.....	.....a
Lamprey	xxxxesksle	wlavkdvnqs	afynfkYvpq	rkpqtstrht	paxxxxxxxxx
Nematode	.....	.....r	tVcdkwirnc	kvemdarrsp	mehenkewtl
Drosophila Yp1	.....	.....	.....	.....	.....
Drosophila Yp3	.....	.....	.....	.....	.....
Medfly Yp1	.....	.....	.....	.....	.....
Medfly Yp2	.....	.....	.....	.....	.....
Calliphora	.....	.....	.....	.....	.....
Drosophila Yp2	.....	.....	.....	.....	.....
Human Apob	ftipklyqlq	vpllgvldls	tnvysnLynw	sgllqwwqhq	hrpfqlrary
Lipase	.....	.....	.....	.....	.....
Consensus	-----	-----	-I----F--	-----	-----

	1801				1850
Bollweevil	pkdarvngqq	sksveqllr.	.....esie	nyvvlvrqva	anqkeviinl
Mosquito	kpdydfyaqq	shfynsdfey	kYkngfeeye	qfaalArRgs	dnqlyFkflf
Silkworm	stq.....	.....	.....rgnwh	elailsrRqq	rdqqeyisy
Sturgeon	xxxxxqstln	skqd....ak	fLgDssppif	afvarAvRsd	glqqgYqvaa

Frog	xxxxesay..	.rhk....ak	fLgDkeppvl	vvtfkAvRnd	ntkqgYqmvv
Chicken	strsshdtSr	aasw....pk	fLgDiktpvl	aafllhgisnn	kktggLqlvv
Killifish	sgssassvea	iyke....kk	yLgE.eeavv	avilrAvkad	krmvgYqlgf
Lamprey	xxxxxxxxxx	xdsdmtvsae	sFekhskpkv	vivlrAvRad	gkqqgLqttl
Nematode	rt....ella	arpqmpsslR	qLrEqphrev	qlafnAkWgs	skkseitvna
Drosophila Yp1	.....	.....	.....	.....	.....
Drosophila Yp3	.....	.....	.....	.....	.....
Medfly Yp1	.....	.....	.....	.....	.....
Medfly Yp2	.....	.....	.....	.....	.....
Calliphora	.....	.....	.....	.....	.....
Drosophila Yp2	.....	.....	.....	.....	.....
Human Apob	hmkadsvvdl	lsynvqgsge	ttyDhkntft	lscdgsLRhk	fldsniKfsh
Lipase	.....	.....	.....	.....	.....
Consensus	-----	-----	-L-D-----	-----A-R--	-----Y----

	1851				1900
Bollweevil	nhprtqgktv	kIemkpsedr	qksaRnpaak	vtidgqemhf	ddkqia....
Mosquito	gdn.....	yIevfpnng.	.....gvpf	vkyngRpydi	sksniahfey
Silkworm	ksEsgqd..l	eIeiqpasg.	.....dsayq	vkvtnttkki	tdddlTmywd
Sturgeon	ytDnrV.srp	rVqllateii	eksrWqicad	ailasnykam	almr.....
Frog	yqEyhs.skq	qIqayvmd.i	sktrWaacfd	avvvnPheaq	aslk.....
Chicken	yaDtds.vrp	rVqvfvtnlt	dsskWklcad	asvrnapqav	ayvk.....
Killifish	yLD..k.pna	rVqiiivanis	sdsnWricad	avvlSkhkvt	tkis.....
Lamprey	yygltsnglp	kakivavels	dlsvWklcak	frlsahmkak	aaig.....
Nematode	qlEqsteqkk	fIrniereyk	gipeYellik	aarlnqvnvV	seyk.....
Drosophila Yp1	.....	.....	.....	.....	.....
Drosophila Yp3	.....	.....	.....	.....	.....
Medfly Yp1	.....	.....	.....	.....	.....
Medfly Yp2	.....	.....	.....	.....	.....
Calliphora	.....	.....	.....	.....	.....
Drosophila Yp2	.....	.....	.....	.....	.....
Human Apob	veklginpvs	kgllifdass	swgpqmsasv	hldskkkqhl	fvke.....
Lipase	.....	.....	.....	.....	.....
Consensus	-----	-I-----	-----W-----	-----	-----

	1901				1950
Bollweevil	.dkcdgYvqv	Yalpngevkl	ev...edafy	liydggRvkV	tatgnklrds
Mosquito	kegyPsFpff	Yafaypnkdl	evsffggklk	fatdgyRarf	fs.dysfynn
Silkworm	dvkeqpFlqy	ht..hkdgvl	vinieddrir	aiydggRfvV	ftqd..yrns
Sturgeon	.....Wgee	Cqdykvavsa	vtgrlashps	lqikakWsrI	praakqtqn.
Frog	.....Wgqn	Cqdykinmka	etgnfgnqpa	lrvtanWpkI	pskwkstgk.
Chicken	.....Wgwd	Crdykvstel	vtgrfaghpa	aqvkleWpkV	psnvrsvve.
Killifish	.....Wgeq	Crkystnvtg	etgivssspa	arlrVsWerl	pstlkrygk.
Lamprey	.....Wgkn	Cqqyramlea	stgnlqshpa	arvdikWgrl	psSlqrakna
Nematode	.....Ltpq	se.....	.....	....ytFsrI	fdlikayn..
Drosophila Yp1	.....	.....	.....	.....	.....

Drosophila Yp3	.....	.....	.....	.....	.....
Medfly Yp1	.....	.....	.....	.....	.....
Medfly Yp2	.....	.....	.....	.....	.....
Calliphora	.....	.....	.....	.....	.....
Drosophila Yp2	.....	.....	.....	.....	.....
Human Apob	.....vkid	gqfrvssfya	kgtyglscqr	dpntgrlnge	snlrfnssyl
Lipase	.....	.....	.....	.....	.....
Consensus	-----W---	C-----	-----	-----W---	-----

	1951				2000
Bollweevil	vyglCgrfsq	dkhedftvps	ncvtRdtrkf	vesyqvekqg	.....
Mosquito	fvglCgtngg	eyfdefvtad	qcymRkpeff	aAsyaitgqn	ctgpakafny
Silkworm	trgiCgrmsg	eqrddyltpe	g.lvdkpely	aAayslneen	sDpktq....
Sturgeon	ilaeYvpgaa	fmlgFsqkeq	rNpskqfkii	lAv..tspnt	iDtlikaPki
Frog	vvgeYvpgam	ymmgFqgeyk	rNsqRqvklv	fAl..ssprt	cDvviriPrl
Chicken	wfyeFvpgaa	fmlgFsermd	kNpsRqarmv	vAl..tsprt	cDvvvklPdi
Killifish	mvnkYvp.vk	ilsdLihtkr	eNstRnisvi	ava..tsekt	iDiitktPms
Lamprey	llenkapvia	skleMeimpk	kNqkhqsvsi	lAa..mtpr	mniivklPkv
Nematode	.....	.fwtvsekrv	qNenRrvvlq	lsveplsrqs	hEhdhqtPeq
Drosophila Yp1	.....	.....	.....	.....	.....
Drosophila Yp3	.....	.....	.....	.....	.....
Medfly Yp1	.....	.....	.....	.....	.....
Medfly Yp2	.....	.....	.....	.....	.....
Calliphora	.....	.....	.....	.....	.....
Drosophila Yp2	.....	.....	.....	.....	.....
Human Apob	qgtnqitery	edgtLsltst	sdlqsgiikn	tAslkyenye	ltlksdtngk
Lipase	.....	.....	.....	.....	.....
Consensus	-----	----F-----	-N--R-----	-A-----	-D-----P--

	2001				2050
Bollweevil	qwrnspseqc	ikkvlplytn	visnqn....	.....	.....
Mosquito	ayqqkakqec	vkrev.yygd	iiynqeyyhp	ryryynhnve	xxxxxxxxxxx
Silkworm	elkalatqqa	yypeyk.yts	ilrsdptwqe	esqscged..	.....
Sturgeon	tlfkqavqiP	vqipme...p	sdaerrspgl	a.simneipf	lieeatkskC
Frog	tvyyralrlP	vpipvg...h	hakenvlqtp	twrifaeapk	limdsiggeC
Chicken	ilyqkavrlP	lslpvg...p	ripaselqpp	iwnvfaeaps	avlenlkarC
Killifish	svynvtmhlP	mcipid...e	ikglspfd..	.evidkihf	mvskaaaaeC
Lamprey	tyfqggillP	ftfpsprfwd	rpegsqsds1	paqiasafsg	ivqdpvasaC
Nematode	evelknariP	rvv.....	.....lpti	arsamfqqtw	...ektgatC
Drosophila Yp1	.....	.....	.....	.....	.....
Drosophila Yp3	.....	.....	.....	.....	.....
Medfly Yp1	.....	.....	.....	.....	.....
Medfly Yp2	.....	.....	.....	.....	.....
Calliphora	.....	.....	.....	.....	.....
Drosophila Yp2	.....	.....	.....	.....	.....
Human Apob	yknfatsnkm	dmtfskqnal	lrseyqadye	slrffsllsg	slnshgleln

Lipase
 Consensus -----P-----C

2051 2100

Bollweevilgsqmr tKlasgtvmk
 Mosquito xdxxxxxxxxxx efssLgrsgx xxxxxxxxeeq kefhphkqeh smkecpvqhq
 SilkwormqwqsE tvyksrsydk hKgacevrqq
 Sturgeon vaqenkfiTF dgvkFsyqMp ggCYhilaqD CrskvrFmVM lKqasmsknl
 Frog kvaqdqitTF ngvdLasaLp enCYnvlaqD CspemkFmVL mrnskespnh
 Chicken svsynkikTF nevkFnysMp anCYhilvqD CsselkFLVM mKsageatnl
 Killifish sfvedtlyTF nnrsYknkMp ssCYqvaaqD CtdelkFmVL lr..kdsseq
 Lamprey elneqsltTF ngafFnydMp esCYhvlaqE CsstrppFiVL iKl..dserr
 Nematode kvdqsevstTF hnviYrapLt t.CYslvakD CseqprFaVL aKkinknsee
 Drosophila Yp1
 Drosophila Yp3
 Medfly Yp1
 Medfly Yp2
 Calliphora
 Drosophila Yp2
 Human Apob adilgtdkin sgahkatlri gqdgistsat tnlkcsLlVL end.....
 Lipase
 Consensus -----TF----F---M-- --CY-----D C-----F-VL -K-----

2101 2150

Bollweevil hryieengEi cftirplpvc nt..sVkqv tknvpvhciq gtkt.ayyyk
 Mosquito hqffeqgdri cfslrplpvc hskcaateki skyfdvhcfe kdstqakkyk
 Silkworm vqfyenhgDi cIttsrvpsc qshcragdyk Iqhvqvvtcks kldhdfrmyk
 Sturgeon ravnakiykn dIdilpttkg svrllInnne Iplsqlipftd ss.gnihIkr
 Frog kdinvklgEy dIdmy.y sad afkmmInnle Vseehlpyks fnyptveIkk
 Chicken kainikigsh eIdmhp.vng qvkl1lVdgae sptanislis ag.aslwIhn
 Killifish hhinvkisEi dIdmfp.kdd nvtvkVneme Ipppa.clta tqqlplkIkt
 Lamprey islelqlDk kVkvsvrnd. ...irVdgek Vplrrls..q knqygflVld
 Nematode llvkvvrrEe eI.vvkkssdd kflvkVdgkk Vnptel.... .eqynieIlg
 Drosophila Yp1
 Drosophila Yp3
 Medfly Yp1
 Medfly Yp2
 Calliphora
 Drosophila Yp2
 Human Apob
 Lipase
 Consensus -----E- -I----- -V----- -I--

2151 2200

Bollweevil slidqggnpd fsrksetrta rmeVaaqcn.
 Mosquito seigrgytpd fksfaphkty kfnypkscvy kay.....

Silkworm		eqikkgnpe	vsgipsvkqf	kvpVtcqp..	.....	.....
Sturgeon		adegvsvsaq	qygleslyFd	gktVqvkvts	em.rgktCGl	CGhnDgErrk
Frog		kgngvslsas	eygidsldYd	gltfkfrpti	wm.kgktCGi	CGhnDdEsek
Chicken		enqgfalaap	ghgidklyFd	gktItiqvpl	wm.agktCGi	CGkyDaEceq
Killifish		krrglavyap	shglqevyFd	rktwrikvad	wm.kgktCGl	CGkaDgEirq
Lamprey		agvhllykyk	dl...rvsFn	sssVqvwvps	sl.kgqtCGl	CGrnDdElvt
Nematode		dn....livi	rlpqgevrFd	gytVktmmps	vasqnqlCGl	CGnnDgErdn
Drosophila	Yp1	.....	.....	.....	.....	.....
Drosophila	Yp3	.....	.....	.....	.....	.....
Medfly	Yp1	.....	.....	.....	.....	.....
Medfly	Yp2	.....	.....	.....	.....	.....
Calliphora		.....	.....	.....	.....	.....
Drosophila	Yp2	.....	.....	.....	.....	.....
Human	Apob	.....	.....	.....	.....	.....
Lipase		.....	.....	.....	.....	.....
Consensus		-----	-----F-	---V-----	-----CG-	CG--D-E---

2201 2250

Bollweevil		.....	.....	.....	.....	.....
Mosquito		.....	.....	.....	.....	.....
Silkworm		.....	.....	.....	.....	.....
Sturgeon		Efrmpdgrqa	rgp.....	.....sv...	.....	.....
Frog		Elqmpdgsva	kdqmrfihs	ilpaesc...	.....	.....
Chicken		Eyrmpngyla	knafsfgsh	ileeapc...	.....	.....
Killifish		Eyhtpngrva	knsisfahs	ilpaesc...	.....	.....
Lamprey		Emrmpnleva	kdftsfa	hw iapdetc...	.....	.....
Nematode		Efmtadnyet	edveefhrs	y llkneecefe	fdrisekkny	rnkwnreekk
Drosophila	Yp1	.....	.....	.....	.....	.....
Drosophila	Yp3	.....	.....	.....	.....	.....
Medfly	Yp1	.....	.....	.....	.....	.....
Medfly	Yp2	.....	.....	.....	.....	.....
Calliphora		.....	.....	.....	.....	.....
Drosophila	Yp2	.....	.....	.....	.....	.....
Human	Apob	.....	.....	.....	.....	.....
Lipase		.....	.....	.....	.....	.....
Consensus		E-----	-----	-----	-----	-----

2251 2300

Bollweevil		.....	.....	.....	.....	.....
Mosquito		.....	.....	.....	.....	.....
Silkworm		.....	.....	.....	.....	.....
Sturgeon		.....spt..	pgl.....	.....clekt	ateaasFcv	m.....
Frog		.....seg..	cnlkhtlvkl	e...kaiatd	gakakcYsv	q pvlrcakgcs
Chicken		.....rga..	cklhsvfkl	e...ktvqla	gvdskcYste	pvlrcakgcs
Killifish		.....rdase	crlklesvql	e...kqltih	gedstcFsve	pvprclpgcl
Lamprey		.....gga..	calsrqtvhk	e...stsvis	gsrencYste	pimrcpatcs

Nematode		sdyesssdye	snydekete	elvkklike	fsnrvcFsie	pvsecrrgle
Drosophila Yp1		.....	.....	.....	.....	.....
Drosophila Yp3		.....	.....	.....	.....	.....
Medfly Yp1		.....	.....	.....	.....	.....
Medfly Yp2		.....	.....	.....	.....	.....
Calliphora		.....	.....	.....	.....	.....
Drosophila Yp2		.....	.....	.....	.....	.....
Human Apob		.....	.....	.....	.....	.....
Lipase		.....	.....	.....	.....	.....
Consensus		-----	-----	-----	-----	-----

		2301				2350
Bollweevil		.....	.....	.....	.....	.....
Mosquito		.....	.....	.....	.....	.....
Silkworm		.....	.....	.....	.....	.....
Sturgeon		.....	.....	.....	.....	.....
Frog		pvktvevstg	fhclp...sd	vsldlp....	eggirle.ks	edfsekveah
Chicken		atkttpvtvg	fhclp...ad	sanslt....	dkqmkydqks	edmqdtvdah
Killifish		pvkttpvtvg	fscla...sd	pqtsvy....	d.....rs	vdlrqttqah
Lamprey		asrsvpvsva	mhclp...ae	seaislamse	grpfs1sgks	edlvtemeah
Nematode		sektsnkkir	ftcmprhrqe	rsrflqgsse	qtvaelvdfp	vsfvesvkip
Drosophila Yp1		.....	.....	.....	.....	.....
Drosophila Yp3		.....	.....	.....	.....	.....
Medfly Yp1		.....	.....	.....	.....	.....
Medfly Yp2		.....	.....	.....	.....	.....
Calliphora		.....	.....	.....	.....	.....
Drosophila Yp2		.....	.....	.....	.....	.....
Human Apob		.....	.....	.....	.....	.....
Lipase		.....	.....	.....	.....	.....
Consensus		-----	-----	-----	-----	-----

		2351	2362
Bollweevil		.....	..
Mosquito		.....	..
Silkworm		.....	..
Sturgeon		.....	..
Frog		tacscetspc	aa
Chicken		ttcsceneec	st
Killifish		lacscentkcs	..
Lamprey		vscva.....	..
Nematode		tacvay....	..
Drosophila Yp1		.....	..
Drosophila Yp3		.....	..
Medfly Yp1		.....	..
Medfly Yp2		.....	..
Calliphora		.....	..

Drosophila Yp2	..... ..
Human Apob	..... ..
Lipase	..... ..
Consensus	----- --