



	11	103	111																																																		
DQ464249	LDAKKYVEFVVVLDHGM	YTKYKDDLDKIKTRI	YIEIVNTMNEIYIPL	LNIRVALVRL	LEIWSNGDLIN	VSSAANVTLDS	FRNWRVTDLLRR	KKSHDNAQLL	TTD																																												
Jararhagin	-DPYKIEFFVVDQGT	VTKNGDLDKIKARM	YELANIVNEIFRY	LYMHVALVGL	EIWSNGDKIT	VKPDVDYTL	NSFAEWRKTD	LLTRKKHD	NAQLLTAID	PIIIa																																											
Bothropasin	-NPFYVELFIVVDQ	GMVTKNNGDLDK	IKARMYELANIV	NEILRYLYMHA	ALVGLIWSNG	DKITVKPDV	DYTLNSFAE	WRKTDLLTR	KKHDNAQLL																																												
Acurhagin	-DPFKYVETVVVVD	KAMVTKYNGDLD	KIKTMYEAANN	MNEMRYMFRV	VVMVGLI	IWTEEDKI	TVKPDVDY	TNLSFAE	WRKTYLLA																																												
Catrocollastatin	-NPRFVELFLVVD	KAMVTKNNGDLD	KIKTRMYEIV	NTVNEIYRYM	IHVALVGL	EIWSNEDKI	TVKPEAGY	TNLSFAE	WRKTDLLTR	KKHDNAQLL	TAID																																										
DQ464255	LNAKKYVKLFVADY	VMYLKYGRNLT	AVRTRMYD	TNVNVI	TPYHRMNI	HVALVGL	EIWSNRDKI	IVQSSP	DVTLDL	FAKWRATD	LLRRKSHD	NAQLLT	GIN																																								
VAP1	LNAKKYVKLFVADY	IMYLKYGRNLT	AVRTRMYD	IVNVI	TPYHRMNI	HVALVGL	EIWSNTDKI	IVQSSA	DVTLDL	FAKWRATD	LLRRKSHD	NAQLLT	GIN																																								
HV1	LNAKKYVKFLVADH	IMYLKYGRNLT	LRTRMFD	TNVNVI	QILQRINH	VALIGIEI	WSKEDKI	IVQSPD	VTLKLF	ATWRESV	LLRRKH	NDNAHLL	TGIN																																								
Halysase	LNAKKYVKLVMDY	IMYLKYGRNLT	AVRTRMYD	IVNVI	TPYHRMNI	HVALVGL	EIWSNEDKI	TVKPEA	SNVTLD	LFATWRE	TDL	LLRRKH	SHDNAQLL	TGIN																																							
VLAIP-A	LNSPKYIKLVIVADY	IMFLKYGRSLIT	IRTRIE	IVNINL	VNIYRVLN	IYIALLGL	EIWNNGDK	INVLPE	TKVTL	DLFGK	WRERD	LLNR	RRKH	DNAQLL	TDIN																																						
VLAIP-B	LKSKEYVELVIVADY	IMFWKYDRSL	STIRTRIE	IVNTLN	VIRFLNI	YIALVA	VEIWSKG	DLINVT	SSAYD	TLDSFG	EWRE	RDL	LN	RRKH	RNAQLL	TGIN																																					
Stejnihagin-A	--PRRYVLAIVADR	RRMYMKHQK	NLK---	PWVFQ	MVNSVHQI	YRSMNV	LIALVY	LNIVK	KNDKIT	VQSASD	VTLD	DLFAE	WRET	VLL	RRK	KHDCAH	LLTAID																																				
Stejnihagin-B	--PRRYVLAIVADR	HRMYTKHK	NLK---	PWVFQ	MVNSVHQI	YRSMNV	LIALVY	LNIVK	KNDKIT	VQSASD	VTLD	DLFGN	WRET	VLL	RRK	RHDCA	QLLTAID																																				
HR1B	--PRRYIKLAIVVD	HGIVTKHGH	NLKKIRKWI	YQLVNT	INNIYR	SLNILV	ALVYLE	IWSQ	NKITV	QSASN	VTLD	DLFGD	WRES	VLL	KKQ	RSHDCA	QLLTTID																																				
DQ464251	--TKRYVELVIVAD	HGMFMKHN	--ETLRT	WVFM	VNTINEI	YIPLNIR	FALVGL	EIWSNGDKI	TVQSSA	HNTLH	LFGN	WRK	RVL	KKK	KHD	NAQLL	TSID																																				
DQ464250	LNNFRYIELVIVADY	RMFTKYNRKL	TEVKTWVYE	IVNTLNE	IYRYLIR	VALVGL	EIWSNGD	LSNVTLS	ADDTL	DSFG	EWKR	DLL	RRK	SHG	NAQLL	TAID																																					
Kaouthiagin	LNAKKEYEFYIV	DNRMYRYNYD	NLTPAIR	RVYEMINA	VNTKFR	PLKI	HIALVGL	EIWSNEDK	FEVKA	SVTLK	SFREW	QTVL	LL	RRK	RND	NAQLL	TGIN																																				
HF3	-NHKYYIELVILADY	RMVTKNNGDL	GKIRTKI	YEVNIN	LNEIFRY	LYRIR	ALVGL	EIWSNAD	LSNVTLS	ADDTL	ASFG	TWR	GT	VLL	KKR	SHD	NAQLL	TAID																																			
Berythracivase	LDAKKYVEFVVVLDHGM	YKYYKDDLDKIKRRI	YIEIVNTMNE	FIPLNIV	ALVGL	EIWSKGDK	INVTSE	SWFTL	ILFTN	WRGAD	LLRRK	SHD	NAQLL	TNTD																																							
Ecarin	FE-KKFIELVVVDH	SMVTKYNN	DSAIR	TWIEML	NTVNEI	YIPLNIR	VALVGL	EWNGD	LINVT	STAD	TLHS	FG	EW	RAS	DL	LN	RRKH	DHAQLL	TNVT																																		
Atrolysin	--TKRYVELVIVADR	HRMFTKYNGNL	KKIRKWI	YQIVNT	INEIYI	PLNIR	VALVRL	EIWSNGD	LIDVT	SAANVT	LKSF	GN	WR	VTL	LL	RRK	SHDNA	QLLTAID																																			
HR1A	LNNFRFIELVIVADY	RMFTKFN	SNLNE	VKTWVYE	IVNTLNE	IYRYLYR	VALVLE	VWSNGD	LSVTL	LSAYD	TLDS	FG	EW	KRD	LL	RRK	SHD	NAQLL	TAID																																		
	112			181		195		211																																													
DQ464249	FDGDTVGLAYM	RSMCQPRGS	VGVIE	QHSTIN	LLMAV	TMAHEM	GHNLGMS	HGDNQ	CHCGAP	SCIMADR	LSHQ	PSTQ	FSD	CESEK	YCR	TYL	INSR	PQCIL	INEP																																		
Jararhagin	FNGPTIGYAYIG	SMCHPKRS	VGIVQD	YSPIN	LVVAVI	MAHEM	GHNLGI	HHD	TGSC	SCGD	YPCIM	GPTI	SN	EP	SK	FFSN	CYIQ	WDF	IM	NHN	PECI	INEP																															
Bothropasin	FNGPTIGYAYIG	SMCHPKRS	VAVI	VEDYSP	INLVVAVI	MAHEM	GHNLGI	HHD	TDFC	SCGD	YPCIM	GPTI	SN	EP	SK	FFSN	CYIQ	WDF	IM	KEN	PQCIL	INEP																															
Acurhagin	FRGSIIGYAYIG	SMCHPKRS	VGI	IQDYSP	INLVVAVI	MAHEM	GHNLGI	HHD	DGYCY	CGGYPCIM	GPSI	SP	EP	SK	FFSN	CYIQ	WDF	IM	NHN	PECI	DNEP																																
Catrocollastatin	LDR-VIGLAYV	GSMCHPKR	STGII	QDYSE	INLVVAVI	MAHEM	GHNLGIN	HDS	SGYCS	CGDYACIM	RPEI	S	PEP	ST	FFSN	CYIF	WDF	IM	NHN	PECI	INEP																																
DQ464255	FNGPTAGLAYLGGI	CNTMYSAGI	VQDHSK	IHHLVA	IAMAHEM	GHNLGMD	HDKD	CTC	GRTRP	CVMAG	LSL	CEAS	FL	SD	C	SQ	KEH	REF	L	KNMP	QCIL	LKPP																															
VAP1	FNGPTAGLAYLGGI	CKPMYSAGI	VQDHNK	IHHLVA	IAMAHEM	GHNLGMD	HDKD	CTC	CRAKA	CVMAG	LSL	CDAS	Y	SD	C	SR	QEH	RAF	L	KNMP	QCIL	LKPP																															
HV1	FNGPTAGLAYLGGI	CNPMSAGI	VQDHNK	IHHLVA	IAMAHEM	GHNLGMD	HDKD	CTC	CGAKS	CVMAG	LSL	CDAS	Y	SD	C	SR	KEH	QAF	L	KNMP	QCIL	LKPP																															
Halysase	FNGPTAGLYVGS	MCDPQYSAGI	VQDHNK	VNLFV	AVIAMAHEM	GHNLGMD	HDEIH	CTC	CGAKS	CIMSG	TLSC	CEAS	IR	SN	C	SRE	EH	QY	L	KNMP	QCIL	LNKP																															
VLAIP-A	FNGPSAGRGFV	GRMCQPKYS	VGIVQD	HSAI	YLLVAS	AMAHEM	GHNLGMD	HDRID	CTC	CGAKS	CIMSG	ILRC	ETS	Y	SD	C	SRE	EH	RK	YL	KNMP	QCIL	LNKP																														
VLAIP-B	FNGPTIGRAHIA	SMCNKLS	VGIVQNY	TEIN	LVNAI	MAHEL	GHNLGI	SHD	GNQNC	--HTC	IMSA	V	SN	PP	SERF	SN	C	SE	DY	HQ	SF	LTAYN	PQCIL	LNAP																													
Stejnihagin-A	FDGPTIGRAHV	SSVCDPKR	STGIVQNY	TEIN	LVNAI	MAHEL	GHNLGMD	H	DNQNC	--HAC	IMSA	V	SN	PP	SERF	SG	C	SM	G	Y	Q	T	FTAYN	PQCIL	LNAL																												
Stejnihagin-B	FDGPTIGKAYT	ASMCNPKRS	VQDHSK	IHHLVA	IAMAHEM	GHNLGMD	HDEIH	CTC	CGAKS	CIMSG	TLSC	CEAS	IR	SN	C	SRE	EH	QY	L	KNMP	QCIL	LNKP																															
HR1B	FDGRTVGLAHV	SSMCNQK	LSTGVI	QDHS	AINLV	MAV	TMAHEL	GHNLGMD	HDIKY	CTCGA	PA	CVM	G	N	L	S	E	Q	P	S	Y	G	F	SN	C	S	Q	N	Q	Y	T	F	I	N	Y	N	P	QCIL	INEP														
DQ464251	FNGTTIGLAHV	ASMCEL	KRSTG	VQDHS	PINLV	VAVI	MAHEM	GHNLGI	RH	DKCY	CTCGY	SCIM	SA	V	LSH	Q	A	S	Y	F	SN	C	S	Y	N	Q	Y	W	N	Y	I	N	F	Y	K	P	QCIL	INEP															
DQ464250	LNGTAVGAIY	PGSLCT-Q	RSV	FVVQD	YNRRMS	LVASTM	THEL	GHNLGI	H	DEAS	CICIP	GP	CIM	L	K	R	T	A	-	Q	F	S	S	C	S	I	R	D	Y	Q	E	Y	L	L	R	D	R	P	QCIL	LNKP													
HF3	FDGTTIGIANI	ASMCNQN	KSVG	VMDYSP	INLVVAVI	MAHEM	GHNLGIN	H	D	TGSC	SCGD	YPCIM	AP	E	S	D	P	S	E	L	F	SN	C	S	K	Q	A	Y	Q	R	Y	L	N	Y	K	P	QCIL	INEP															
Berythracivase	FDGSTIGRAHIG	SMCHPY	LSVGI	IQDYSP	VNLLV	ASTMAHEM	GHNLGM	H	D	N	D	CTCGA	P	CV	M	A	A	I	S	K	D	P	S	K	L	F	SN	C	S	Q	E	Y	Q	R	K	Y	L	I	KNR	PQCIL	LNKP												
Ecarin	LDHSTLGI	TFVYGM	CKSD	RSVELI	L	D	YSNI	TFN	MAYII	AHEM	GHSL	G	M	L	H	D	T	K	F	CTCGA	K	P	CIM	F	G	K	E	S	I	P	P	P	K	E	F	S	S	C	S	Y	D	Q	N	K	Y	L	L	K	N	P	K	CIL	LDPP
Atrolysin	LDEETLGLAP	LGTMC	PKLS	GIVQD	HSPIN	LLVAVI	MAHEL	GHNLGM	V	DENR	CHC	STPA	CV	M	CA	V	L	R	Q	R	P	S	Y	E	F	SD	C	S	L	N	H	Y	T	F	I	N	Y	N	P	QCIL	INEP												
HR1A	FNGTTIGLAHV	ASMCDPK	STGIVQD	YSRNL	VAVI	MAHEM	GHNLGI	RH	D	REN	CTCHANS	CIMSA	V	S	D	Q	P	S	K	Y	F	SN	C	S	H	V	Q	Y	W	I	N	D	E	P	QCIL	INEP																	