

(a)

PjGGPPS_SSU	..MVFSVTITSSPHICLFKAR..RPLTRR.....TRCSAAS.....	33
SiGGPPS_SSU	..MVFSVTMTCSFHVCFKAA..FPVIRR.....TRCSAAS.....	33
GgGGPPS_SSU	..MVFSALCSSSPYIHLFKTKTTRPFRRFSSSSSSSSSS.....ETMAASAAASKTRA.....	50
AeGGPPS_SSU	..MAFSIVTSSSPRLNLGTRRP..ILQPP.....TRCSVSSS.....	33
CaGGPPS_SSU	..MVFSITISSSPHLYLRRVPTNLRPPP.....TRCSSSSSSSS.....	37
GgGGPPS	MALINSAPSVVQAHTIS..IYYNGSSSLFP..CHISKNAFV..FLSNPCKTNFGRSTFSICAILTKEET.....K	66
CrGGPPS	MSFVNSITTWVPAQSIYC..LENGRSSSMRSNLCHFKNQLPISFFLSGTIRKPIFSCSRLSTSAIITKEQTQE..EESK	77
CaGGPPS	MSLVNSSATWQTPSIYNNLTSSRHNSANSYLYHFLKNKLPFSIFLNPPIKTAIPFSSFSIAAILTKEQTNAPQAEESK	80
CeGGPPS	MSLVNSSATWQTPSIYNNLTSSRHNSANSYLYHFLKNKLPFSIFLNPPIKTAIPFSSFSIAAILTKEQTNAPQAEESK	80
GjGGPPS	MSLMNSSATWQTPSTYN..LTSSRHNSANSYLYHFLKNKLPFSIFLNPMTKTAIPFSSFSIAAILTKEQTSAPQEEES.K	78
PjGGPPS_SSU	..ISPMELIKTYNTALIKEINQMLDEAIPVQYFHCITPDMRYSLAKGAKRAEVMVACELFGGNRLAAHET	105
SiGGPPS_SSU	..LSFPELIKTYNTSLIKEIQMLDEAIPVQYFQCITPDMRYSLAKGAKRAEVMVACELFGGNRLAAHET	105
GgGGPPS_SSU	..LASQELIKTYNTTLIKEINQMLDEAIPVQYFHCITPDMRYSLAKGAKRAEVMVACELFGADRLLAAHET	122
AeGGPPS_SSU	..VSTKSELREYNTTLIAEINQMLDEAIPVQYFQCITPDMRYSLAKGAKRAEVMVACELFGGDRLLAAHET	105
CaGGPPS_SSU	..VSIQELIKTYNTTLIGEVNQMLEAIPVQYFHCITPDMRYSLAKGAKRAEVMVACELFGGNRLAAHET	109
GgGGPPS	IKKRAHIFS...ENFMDYMLEKADSVNKALEBAVSIRPEVITPDSMRYSLLAGG.KRVREMLIAACEIFGGDESVMVES	141
CrGGPPS	SKKEVAFSSSSSEFKAYMIGKANSVNKALEBAVLVRPELITPDSMRYSLLAGG.KRVREMLIAACEIFGGTESVMVES	156
CaGGPPS	SKEDQIFPTSPSEFKAYVLQKADSVNKALEBAVLIRPELITPDSMRYSLLAGG.KRVREMLIAACEIFGQESVMVES	159
CeGGPPS	SKEDQIFPTSPSEFKAYVLQKADSVNKALEBAVLIRPELITPDSMRYSLLAGG.KRVREMLIAACEIFGQESVMVES	159
GjGGPPS	SQKDQIFSSLSSEFKAYMLQKADSVNKALEBAVLIGPELITPDSMRYSLLAGG.KRVREMLIAACEIFGGQESVMVES	157
CXXXC		
PjGGPPS_SSU	ACAEEMVHAASLIHDDLPCMDIPSRRGQPSNHTMYGVDMAILAGDALFPLGRRHIVSHTPTNLVPETRLLEFVIAETARA	185
SiGGPPS_SSU	ACAEEMVHAASLIHDDLPCMDIPSRRGQPSNHTMYGVDMAILAGDALFPLGRRHIVSHTPTDLVPETRLLEFVIAETARA	185
GgGGPPS_SSU	ACAEEMVHAASLIHDDLPCMDIPSRRGQPSNHTMYGVDMAILAGDALFPLGRRHIVSHTPTDLVPETRLLEFVIAETARA	202
AeGGPPS_SSU	XCAEEMVHAASLIHDDLPCMDIPSRRGQPSNHTMYGVDMAILAGDALFPLGRRHIVSHTPTDLVPETRLLEFVIAETARA	185
CaGGPPS_SSU	ACAEEMVHAASLIHDDLPCMDIPSRRGQPSNHTMYGVDMAILAGDALFPLGRRHIVSHTPTDLVPETRLLEFVITEIACA	189
GgGGPPS	ACAEEMVHTMSLIHDDLPCMDIPSRRGQPSNHTMYGVDMAILAGDALFPLGRRHIVSHTPTDLVPETRLLEFVIELAKC	219
CrGGPPS	ACAEEMVHTMSLIHDDLPCMDIPSRRGQPSNHTMYGVDMAILAGDALFPLGRRHIVSHTPTDLVPETRLLEFVIELAKC	234
CaGGPPS	ACAEEMVHTMSLIHDDLPCMDIPSRRGQPSNHTMYGVDMAILAGDALFPLGRRHIVSHTPTDLVPETRLLEFVIELARS	237
CeGGPPS	ACAEEMVHTMSLIHDDLPCMDIPSRRGQPSNHTMYGVDMAILAGDALFPLGRRHIVSHTPTDLVPETRLLEFVIELARS	237
GjGGPPS	ACAEEMVHTMSLIHDDLPCMDIPSRRGQPSNHTMYGVDMAILAGDALFPLGRRHIVSHTPTDLVPETRLLEFVIELARS	235
FARM		
PjGGPPS_SSU	VGSTGMAAGCFILLE.....GGPGAVLFVQEKKFGEMGQCSAVCEGLLAGASDDEIQRLRNYGRAVGVLVQVDDILLEA	259
SiGGPPS_SSU	VGSTGMAAGCFILLE.....GGPNAVLFVQEKKFGEMGQCSAVCEGLLAGASDDEIQRLRNYGRAVGVLVQVDDILLEA	259
GgGGPPS_SSU	VGSTGMAAGCFILLE.....GGPNAVLFVNEKKYFEMGEC SAVCEGYLAGASDDEIQRLRNYGRAVGVLVQVDDILLEE	276
AeGGPPS_SSU	VGSTGMAAGCFILLE.....GGPNSVLFVQEKKFGEMGEC SAVCEGLLAGASDDEIQRLRNYGRAVGVLVQVDDILLEE	259
CaGGPPS_SSU	VGSTGMAAGCFILLE.....GGPNSVLFVQEKKFGEMGEC SAVCEGLLAGASDDEIQRLRNYGRAVGVLVQVDDILLEE	263
GgGGPPS	VGSEBGLVAGCIVVVCSEGISDVGLCHLEFIHVKTAALLEGSVVMGAILGGANAEQVAKLRKFARCIIGLFQVVDLILIV	299
CrGGPPS	IGCBGLVAGGVVVICSEGIADVGLCHLEFIHVKTAALLEGSVVIGAILGGANAEQVAKLRKFARCIIGLFQVVDLILIV	314
CaGGPPS	IGCBGLVAGGVVVICSEGMSTVGLCHLEFIHVKTAALLEGSVVMGAILGGANAEQVAKLRKFARCIIGLFQVVDLILIV	317
CeGGPPS	IGCBGLVAGGVVVICSEGMSTVGLCHLEFIHVKTAALLEGSVVMGAILGGANAEQVAKLRKFARCIIGLFQVVDLILIV	317
GjGGPPS	IGCBGLVAGGVVVICSEGMSTVGLCHLEFIHVKTAALLEGSVVMGAILGGANAEQVAKLRKFARNIGLFQVVDLILIV	315
SARM		
PjGGPPS_SSU	KSETEKN...DEENINKGKSNVSVYGVEKAMEVAEDIRCAKKELDALFKYGRVIFLHSFVIMPADRGFSFVAT	331
SiGGPPS_SSU	KTETAKK...DEKNKKKGKSNVSVYGVEKAMEVAEDIRCAKKELDGLERYGKVIPLYSFVIMPADRGFSFVAVP	331
GgGGPPS_SSU	KAKRING...SEYKNGKSNVGIYGVKAMKVAEDIRCAKKELDGFKYGINVIFLHSFVIMPADRGFGLEY.	347
AeGGPPS_SSU	KLKSDER...EEDKKGKSNVSVYGVEKAMEVAEDIRAKKQELDGFEKYGEKVIPLYSFVIMPADRGFSVGDO	331
CaGGPPS_SSU	KMSRSEE...NEERKKKGKSNVSVYGVEKAMEVAEDIRAKKQELDGFEKYGESVPLYSFVIMPADRGFNVGDS	335
GgGGPPS	TKSSQELGKTAGKDLVADKVTTEKLIIGIKSREFAEKNRBAQDQIAEFDF..EKAPLIALANYIAYREN.....	368
CrGGPPS	TKSSQELGKTAGKDLVADKVTTEKLIIGIKSREFAEKNRBAQDQIAEFDF..EKAPLIALANYIAYREN.....	383
CaGGPPS	TKSSQELGKTAGKDLVADKVTTEKLIIGIKSREFAEKNRBAQDQIAEFDF..EKAPLIALASYIAYREN.....	386
CeGGPPS	TKSSQELGKTAGKDLVADKVTTEKLIIGIKSREFAEKNRBAQDQIAEFDF..EKAPLIALASYIAYREN.....	386
GjGGPPS	TKSSQELGKTAGKDLVADKVTTEKLIIGIKSREFAEKNRBAQDQIAEFDF..EKAPLIALANYIAYREN.....	384

(b)

GsGPP5	MVLELRAGRIASMSRORWILSVKN..EAPFHLLHSSSR.....YSSFIHISPVVLGCRVIYSTVSNALSNVG.IVQE	73
CrGPP52	.MLEFRGLYRIARTSLNRSRLLYPLQS..QSPPELLCSFC.....FRSEIGSSQXVSGFRVIYSTVSSALANVGQCVCR	70
CrGPP51	.MLEFRGLYRIARTSLNRSRLLYPLQS..QSPPELLCSFC.....FRSEIGSSQXVSGFRVIYSTVSSALANVGQCVCR	70
GsyFPP5	MVLEFRGLYRIARTSLNRSRLLYPLQS..ESQ..QCSYC.....FNSEVDCSQXVSGFRVIYSTVSNALSNARCCVCH	69
CaSPP5	MVLEFRGLYRIARTSLNRSRLLYPLQS..LQSPRNCSTQILLESATHFYSEHDSQXVVLGCRVYSTVSNALANVGHTQCR	78
CeSPP5	MVLEFRGLYRIARTSLNRSRLLYPLQS..LQSPRNCSTQILLESATHFYSEHDSQXVVLGCRVYSTVSNALANVGHTQCR	78
SiSPP5	.MMSVRGITRVSRSACARCRWVYSSIGTYADPELLONSS.....HERSEVQASQXVVLGCRVIYSTVSSALSSVGGQCAHI	73
NaSPP5	.MLEFRGLISQISRRSINRORWILRSQQ.....QQFHHSN.....HFESEHDSQXVVLGCRVIYSTVSNALSGIGQCIHH	67

GsGPP5	QNSVSEEDVDPEFLVADELSYIGIRLRSMVVAEVPKLATAAEYFFRMGLEGRFRFETVLLLMATAIDGFIIRPPSGTITA	153
CrGPP52	QNSVSEEDVDPEFLVADELSYILANRLRSMVVAEVPKLASAAEYFFKIGVEGKRFRFETVLLLMATAIDAFISSTPPTSL	150
CrGPP51	QNSVSEEDVDPEFLVADELSYILANRLRSMVVAEVPKLASAAEYFFKIGVEGKRFRFETVLLLMATAIDAFISSTPPTSL	150
GsyFPP5	QSTSVSEEDVDPEFLVADELSYILANRLRSMVVAEVPKLASAAEYFFKIGVEGKRFRFETVLLLMATAIDGAFVSRFPDTAV	149
CaSPP5	QSSPAZFEKLDPEFLVADELSYILANRLRSMVVAEVPKLASAAEYFFKIGVEGKRFRFETVLLLMATAIDAFILRPLPTTV	158
CeSPP5	QSSPAZFEKLDPEFLVADELSYILANRLRSMVVAEVPKLASAAEYFFKIGVEGKRFRFETVLLLMATAIDAFILRPLPTTV	158
SiSPP5	QSSSAVEEQLDPEFLVADELSYILANRLRSMVVAEVPKLASAAEYFFKMGVEGKRFRFETVLLLMATAIDVCMRHEPATAAI	153
NaSPP5	QSTAVSEEDVDPEFLVADELSYILANRLRSMVVAEVPKLASAAEYFFKMGVEGKRFRFETVLLLMATAIDNAFVLRPQM..V	145

GsGPP5	DLISKLRLRQCCIAEITMIHVASLLHDDVLLDATTTRRGVSLNFMVGNKILVLAGDFLLSRACVALASLNTEVVSLL	233
CrGPP52	DLISKLRLRQCCIAEITMIHVASLLHDDVLLDATTTRRGVSLNFMVGNKILVLAGDFLLSRACVALASLNTEVVSLL	230
CrGPP51	DLISKLRLRQCCIAEITMIHVASLLHDDVLLDATTTRRGVSLNFMVGNKILVLAGDFLLSRACVALASLNTEVVSLL	230
GsyFPP5	DLISKLRLRQCCIAEITMIHVASLLHDDVLLDATTTRRGVSLNFMVGNKILVLAGDFLLSRACVALASLNTEVVSLL	229
CaSPP5	DLISKLRLRQCCIAEITMIHVASLLHDDVLLDATTTRRGVSLNFMVGNKILVLAGDFLLSRACVALASLNTEVVSLL	238
CeSPP5	DLISKLRLRQCCIAEITMIHVASLLHDDVLLDATTTRRGVSLNFMVGNKILVLAGDFLLSRACVALASLNTEVVSLL	238
SiSPP5	DLISKLRLRQCCIAEITMIHVASLLHDDVLLDATTTRRGVSLNFMVGNKILVLAGDFLLSRACVALASLNTEVVSLL	233
NaSPP5	DLISKLRLRQCCIAEITMIHVASLLHDDVLLDATTTRRGVSLNFMVGNKILVLAGDFLLSRACVALASLNTEVVSLL	225

SARM

GsGPP5	ARVVEHLVTGETMCMITTSDCRCMEYYKQTYXTASLISNSCKAIALLAGCTABVAMLAYDYGNLGLAFQLIDDDVLD	313
CrGPP52	ARVVEHLVTGETMCMITTSDCRCMEYYKQTYXTASLISNSCKAIALLAGCTSEVAMLAYDYGNLGLAFQLIDDDVLD	310
CrGPP51	ARVVEHLVTGETMCMITTSDCRCMEYYKQTYXTASLISNSCKAIALLAGCTSEVAMLAYDYGNLGLAFQLIDDDVLD	310
GsyFPP5	ARVVEHLVTGETMCMITTSDCRCMEYYKQTYXTASLISNSCKAIALLAGCTABVAMLAYDYGNLGLAFQLIDDDVLD	309
CaSPP5	ARVVEHLVTGETMCMITTSDCRCMEYYKQTYXTASLISNSCKAIALLAGCTABVAMLAYDYGNLGLAFQLIDDDVLD	318
CeSPP5	ARVVEHLVTGETMCMITTSDCRCMEYYKQTYXTASLISNSCKAIALLAGCTABVAMLAYDYGNLGLAFQLIDDDVLD	318
SiSPP5	ARVVEHLVTGETMCMITTSDCRCMEYYKQTYXTASLISNSCKAIALLAGCTABVAMLAYDYGNLGLAFQLIDDDVLD	313
NaSPP5	ARVVEHLVTGETMCMITTSDCRCMEYYKQTYXTASLISNSCKAIALLAGCTABVSTLAFDYGNLGLAFQLIDDDVLD	305

SARM

GsGPP5	FTGTSASLGKGSLSDIRHGIVTAPILFAEEFEELRSIVIRGHEFNENFNVLLALEYLKSGRGITRTRELAKHANLASAA	393
CrGPP52	FTGTSASLGKGSLSDIRHGIVTAPILFAEEFEELRAVVDEGFEN.FYNVLLALEYLKSGRGITRTRELAKHANLASAA	389
CrGPP51	FTGTSASLGKGSLSDIRHGIVTAPILFAEEFEELRAVVDEGFEN.FYNVLLALEYLKSGRGITRTRELAKHANLASAA	389
GsyFPP5	FTGTSASLGKGSLSDIRHGIVTAPILFAEEFEELRDIVIQGGFN.FLNVLLALEYLKSGRGITRTRELAKHANLASAA	388
CaSPP5	FTGTSASLGKGSLSDIRHGIVTAPILFAEEFEELRSIVIRGHEFN.FTNVLLALEYLKSGRGITRTRELAKHANLASAA	397
CeSPP5	FTGTSASLGKGSLSDIRHGIVTAPILFAEEFEELRSIVIRGHEFN.FTNVLLALEYLKSGRGITRTRELAKHANLASAA	397
SiSPP5	FTGTSASLGKGSLSDIRHGIVTAPILFAEEFEELRTVVNEGHS.SANVLLALEYLKSGRGITRTRELAKHANLASAA	392
NaSPP5	FTGTSATLGKGSLSDIRHGIVTAPILFAEEFEELRTVVNEGHS.FYNVLLALEYLKSGRGITRTRELAKHANLASAA	384

GsGPP5	IDSLEFVANDERVLRSRRRAVELTCRVITRR	423
CrGPP52	IDSLEFVIDERVLRSRRRAVELTCRVITRR	419
CrGPP51	IDSLEFVIDERVLRSRRRAVELTCRVITRR	419
GsyFPP5	IDLLEFVIDERVLRSRRRAVELTCRVITRR	418
CaSPP5	IDSLEFVIDERVLRSRRRAVELTCRVITRR	427
CeSPP5	IDSLEFVIDERVLRSRRRAVELTCRVITRR	427
SiSPP5	IDSLEFVIDERVLRSRRRAVELTCRVITRR	422
NaSPP5	IDSLEFVIDERVLRSRRRAVELTCRVITRR	414