Figure S1. Alignment of the amino acid sequences for the Arabidopsis VAMP proteins. Identical residues for VAMP721, VAMP722, and VAMP723 highlighted in grey and key residues identified in the central longin domain are boxed in red.

	Langia Demoir					
	Longin Domain					
VAMP711	MAILYALVARGTVVLSEFTATSTNASTIAKQILEKVPGDN-DSNVSYSQDRYVFHVKRTDGLT					
VAMP712	MSILYALVARGTVVLAELSTTSTNASTIAKQILEKIPGNG-DSHVSYSQDRYVFHVKRTDGLT					
VAMP713	MAIIFALVARGTVVLSEFSATSTNASSISKQILEKLPGNDSDSHMSYSQDRYIFHVKRTDGLT					
VAMP714	MAIVYAVVARGTVVLAEFSAVTGNTGAVVRRILEKLSPEISDERLCFSQDRYIFHILRSDGLT					
VAMP721	57 61 M ¹ AQQSLIYSFVARGTVILVEFTDFKGNFTSIAAQCLQKLPSSN-N-KFTYNCDGHTFNYLVEDGFT					
VAMP722	M ¹ AQQSLIYSFVARGTVILVEFTDFKGNFTSIAAQCLQKLPSSN-N-KFTYNCDGHTFNYLVEN <mark>GF</mark> SSESKYCSIS					
VAMP723	M ¹ AQQSLFYSFIARGTVILVEFTDFKGNFTSVAAQYLENLPSSN-N-KFTYNCDGHTFNDLVENGFT					
VAMP724	M ¹ GQESFIYSFVARGTMILAEYTEFTGNFPSIAAQCLQKLPSSS-NSKFTYNCDHHTFNFLVEDGYA					
VAMP725	M ⁶⁶ GQQNLIYSFVARGTVILVEYTEFKGNFTAVAAQCLQKLPSSN-N-KFTYNCDGHTFNYLVENGFT					
VAMP726	M ¹ GQQSLIYSFVARGTVILAEYTEFKGNFTSVAAQCLQKLPSSN-N-KFTYNCDGHTFNYLADNGFT					
VAMP727	M ³ SQKGLIYSFVAKGTVVLAEHTPYSGNFSTIAVQCLQKLPTNS-S-KYTYSCDGHTFNFLVDNGFV					
VAMP728	MVVDRNGYNYLTQQ					
	Longin Domain					
VAMP711	VLCMAEETAGRRIPFAFLEDIHORFVRTYGRAVHTALAYAMNEEFSRVLSQOIDY					
VAMP711 VAMP712	VLCMADEDAGRRIPFAFJEDIHQRFVRIIGRAVHIAQAYAMNDEFSRVLSQQIDI VLCMADEDAGRRIPFSFLEDIHQRFVRIYGRAIHSAQAYAMNDEFSRVLNQQIEY					
VAMP712 VAMP713	VLCMADEDAGKTIFFFIEDINGKEVKTIGRAIHSAQAYSMNDEFSRVLSQQHEF					
VAMP713 VAMP714	FLCMANDTFGRRVPFSYLEEIHMRFMKNYGKVAHNAPAYAMNDEFSRVLHQQMEF					
VAMP721	76 80 YCVVAVDSAGROIPMSFLERVKEDENKRYGGGKAATAQANSLNKEFGSKLKEHMQY0					
VAMP721 VAMP722	YCVVAVDSAGKOIPHAFLERVKEDENKKIGGGKAATAQANSLIKEFGSKLKEHMQYC					
VAMP722 VAMP723	ICVVAVDSAGREIPMAFLERVKEDFIKRIGGGKAATDQANSLNKEFGSALKEHMQYC					
VAMP724	YCVVAKDSLSKOISIAFLERVKADFKKRYGGGKASTAIAKSLNKEFGPVMKEHMNY					
VAMP725	YCVVAKBBBKQIDIALBKVKABLAKKIGGGKATIAOANSLNREFGSKLKEHMOY					
VAMP726	YCVVVIESAGROIPMAFLERVKEDFNKRYGGGKASTAKANSLNKEFGSKLKEHMOY					
VAMP727	FLVVADESTGRSVPFVFLERVKEDFKKRYEASIKNDERHPLADEDEDDDLFGDRFSVAYNLDREFGPILKEHMOY					
VAMP728	 LEQRVLVJ					
	R-SNARE					
	N-ONARE					
VAMP711						
	SNDP-NADRINRIKGEMNQVRGVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR					
VAMP712	SNDP-NADRINRIKGEMNQVRGVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWRI SNDP-NADTISRIKGEMNQVRDVMIENIDNILDRGERLELLVDKTANMQGNTFRFRKQTRRFNNTVWWRI					
VAMP712 VAMP713	SNDP-NADRINRIKGEMNQVRGVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWRI SNDP-NADTISRIKGEMNQVRDVMIENIDNILDRGERLELLVDKTANMQGNTFRFRKQTRRFNNTVWWRI SNDP-NADRMSRIKGEMSQVRNVMIENIDKVLDRGERLELLVDKTENMQGNTFRFRKQARRYRTIMWWRI					
VAMP712 VAMP713 VAMP714	SNDP-NADRINRIKGEMNQVRGVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWRI SNDP-NADTISRIKGEMNQVRDVMIENIDNILDRGERLELLVDKTANMQGNTFRFRKQTRFNNTVWWRI SNDP-NADRMSRIKGEMSQVRNVMIENIDKVLDRGERLELLVDKTENMQGNTFRFRKQARRYRTIMWWRI SSNP-SVDTLNRVRGEVSEIRSVMVENIEKIMERGDRIELLVDKTATMQDSSFHFRKQSKRLRRALWMKI					
VAMP712 VAMP713 VAMP714 VAMP721	SNDP-NADRINRIKGEMNQVRGVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWRI SNDP-NADTISRIKGEMNQVRDVMIENIDNILDRGERLELLVDKTANMQGNTFRFRKQTRFNNTVWWRI SNDP-NADRMSRIKGEMSQVRNVMIENIDKVLDRGERLELLVDKTENMQGNTFRFRKQARRYRTIMWWRI SSNP-SVDTLNRVRGEVSEIRSVMVENIEKIMERGDRIELLVDKTATMQDSSFHFRKQSKRLRRALWMKI MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTTGTQMRRKMULQ					
/AMP712 /AMP713 /AMP714 /AMP721 /AMP722	SNDP-NADRINRIKGEMNQVRGVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWRI SNDP-NADTISRIKGEMNQVRDVMIENIDNILDRGERLELLVDKTANMQGNTFRFRKQRRFRNNTVWWRI SNDP-NADRMSRIKGEMSQVRNVMIENIDKVLDRGERLELLVDKTENMQGNTFRFRKQARRYRTIMWWRI SSNP-SVDTLNRVRGEVSEIRSVMVENIEKIMERGDRIELLVDKTATMQDSFHFRKQSKRLRRALWMKI MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTTGTQMRRKMKLQ MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTTGTQMRRKMKFQ					
/AMP712 /AMP713 /AMP714 /AMP721 /AMP722 /AMP723	SNDP-NADRINRIKGEMNQVRGVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SNDP-NADTISRIKGEMNQVRDVMIENIDNILDRGERLELLVDKTANMQGNTFRFRKQTRFNNTVWWR SNDP-NADRMSRIKGEMSQVRNVMIENIDKVLDRGERLELLVDKTENMQGNTFRFRKQARRYRTIMWWR SSNP-SVDTLNRVRGEVSEIRSVMVENIEKIMERGDRIELLVDKTATMQDSSFHFRKQSKRLRALWMK MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTTGTOMRRKMLQ MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTGGTOMRRKMLQ MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELLVDKSESQPQ-AFYIKRTOMKRKMFQ					
/AMP712 /AMP713 /AMP714 /AMP721 /AMP722 /AMP723 /AMP724	SNDP-NADRINRIKGEMNQVRGVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SNDP-NADTISRIKGEMNQVRDVMIENIDNILDRGERLELLVDKTANMQGNTFRFRKQTRFNNTVWWR SNDP-NADRMSRIKGEMSQVRNVMIENIDKVLDRGERLELLVDKTENMQGNTFRFRKQARRYRTIMWWR SSNP-SVDTLNRVRGEVSEIRSVMVENIEKIMERGDRIELLVDKTATMQGNTFRFRKQARRYRTIMWWR MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTTGTQMRRKMLQ MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTGTQMRRKMFQ MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELVDKSESQAQ-DFRTGGTQMRRKMFQ MDHPDEISNLAKAKAQVSEVKSIMMENIEKVLARGVICEMIGSSESQAQ-AFYIKRTQMKRKKFQ VDHAEEIEKLIKVKAQVSEVKSIMLENIDKAIDRGENLTVLTDKTENLRSQAR-EYKKQGTQVRRKLWYQ					
7AMP712 7AMP713 7AMP714 7AMP721 7AMP722 7AMP723 7AMP724 7AMP725	SNDP-NADRINRIKGEMNQVRGVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SNDP-NADTISRIKGEMSQVRDVMIENIDNILDRGERLELLVDKTANMQGNTFRFRKQTRFNNTVWWR SNDP-NADRMSRIKGEMSQVRNVMIENIDKVLDRGERLELLVDKTENMQGNTFRFRKQARRYRTIMWWR SSNP-SVDTLNRVRGEVSEIRSVMVENIEKIMERGDRIELLVDKTATMQGNTFRFRKQARRYRTIMWR MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELLVDKTENL-RSQAQ-DFRTTGTOMRKMMFQ MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELLVDKTENL-RSQAQ-DFRTQGTOMRKMMFQ MDHPDEISKLAKVKAQVSEVKSIMMENIEKVLARGVICEMIGSSESQPQ-AFYIKRTOMKRKWFQ VDHAEEIEKLIKVKAQVSEVKSIMLENIDKAIDRGENLTVLTDKTENL-RSQAQ-DFRTQGTOWRKMVFQ					
7AMP712 7AMP713 7AMP714 7AMP721 7AMP722 7AMP723 7AMP724 7AMP725 7AMP726	SNDP-NADRINRIKGEMNQVRGVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SNDP-NADTISRIKGEMNQVRDVMIENIDNILDRGERLELLVDKTANMQGNTFRFRKQTRRFNNTVWR SNDP-NADRMSRIKGEMSQVRNVMIENIDKVLDRGERLELLVDKTENMQGNTFRFRKQARRYRTIMWR SSNP-SVDTLNRVRGEVSEIRSVMVENIEKIMERGDRIELLVDKTATMQDSSFHFRKQSKRLRRALWMK MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTGTOMRRKMFQ MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTGGTOMRRKMFQ MDHPDEISNLAKAKAQVSEVKSIMMENIEKVLDRGEKIELLVDKSESQPQ-AFYIKRTOMKRKMFQ VDHAEEIEKLIKVKAQVSEVKSIMLENIDKAIDRGENLTVLTDKTENLRSQAQ-DFRTQGTOMRRKMFQ VDHAEEIEKLIKVKAQVSEVKSIMLENIDKAIDRGENLTVLTDKTENLRSQAQ-DFRTQGTKIRRKMFFE ADHPEEISKLAKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRRKMFFE					
VAMP712 VAMP713 VAMP714 VAMP721 VAMP722 VAMP723 VAMP724 VAMP725 VAMP726 VAMP727	SNDP-NADRINRIKGEMNQVRGVMIENIDVLDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SNDP-NADTISRIKGEMNQVRGVMIENIDVLDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SNDP-NADRMSRIKGEMSQVRNVMIENIDVLDRGERLELLVDKTANMQGNTFRFRKQARRYRTIMWR SSNP-SVDTLNRVRGEVSEIRSVMVENIEKIMERGDRIELLVDKTATMQGNTFRFRKQARRYRTIMWR MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DERTTGTQMRRKMFD MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DERTTGTQMRRKMFD MDHPDEISKLAKVKAQVSEVKSIMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DERTGGTQMRRKMFD VDHAEEIEKLIKVKAQVSEVKSIMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DERTQGTQMRRKMFD NDHPDEISNLAKAKAQVSEVKSIMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTQMRRKMFD VDHAEEIEKLIKVKAQVSEVKSIMLENIDKAIDRGENLTVLTDKTENLRSQAQ-DFRTQGTKIRKMFD NDHPDEISKLAKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRKMKFD ADHPEEISKLSKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKKRKKMFD ADHPEEISKLSKVKAQVTEVKGIMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKKRKKLWFEI ADHPEEISKLSKVKAQVTEVKGIMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKKRKKLWFEI ADHPEEISKLSKVKAQVTEVKGIMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKKRKWFDI ADHPEEISKLSKVKAQVTEVKGIMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKKRKWFD					
VAMP712 VAMP713 VAMP714 VAMP721 VAMP722 VAMP723 VAMP724 VAMP725 VAMP726 VAMP727	SNDP-NADRINRIKGEMNQVRGVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SNDP-NADTISRIKGEMSQVRDVMIENIDNILDRGERLELLVDKTANMQGNTFRFRKQTRFNNTVWWR SNDP-NADRMSRIKGEMSQVRNVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRYRTIMWR SSNP-SVDTLNRVRGEVSEIRSVMVENIEKIMERGDRIELLVDKTATMQGNTFRFRKQARRYRTIMWR MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELLVDKTANLRSQAQ-DFRTTGTOMRRKMFQ MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTGTOMRRKMFQ VDHPDEISKLAKVKAQVSEVKSIMMENIEKVLDRGEKIELLVDKSESQPQ-AFYIKRTOMKRKMFQ VDHAEEIEKLIKVKAQVSEVKSIMLENIDKAIDRGENLTVLTDKTENLRSQAQ-DFRTQGTVRRKMVFQ VDHPDEISKLAKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRKMFFE ADHPEEISKLSKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKRRKMFFE ADHPEEISKLSKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKKRKMFFE ADHPEEISKLSKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKKRKMFFE MSHPEEMSKLSKLKAQITEVKGIMMDNIEKVLDRGEKIELLVDKTENLQFQAD-SFQRQGRQLRRKMWLQ LAHPEEISKLAKVKALVTKMKGVMMENIEKALDRSEKIKILVDLRSKYSNLPFPSYGQEDIITPGTKITRKMFQ					
VAMP712 VAMP713 VAMP714 VAMP721 VAMP722 VAMP723 VAMP724 VAMP725 VAMP726 VAMP727 VAMP728	SNDP-NADRINRIKGEMNQVRGVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SNDP-NADTISRIKGEMSQVRNVMIENIDNILDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SNDP-NADRMSRIKGEMSQVRNVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SSNP-SVDTLNRVRGEVSEIRSVMVENIEKIMERGDRIELLVDKTATMQDSSFHFRKQSKRLRALIMMI MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIEL VDKTENLRSQAQ-DFRTGTOMRRKMFQ MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIEL VDKTENLRSQAQ-DFRTGGTOMRRKMFQ VDHPDEISNLAKAKAQVSEVKSIMMENIEKVLDRGEKIEL VDKSESOPQ-AFYIKRTOMKRKKWFQ VDHAEEIEKLIKVKAQVSEVKSIMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTVRRKMVFQ ADHPDEISNLAKAKAQVSEVKSIMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKRRKMFQ VDHAEEIEKLIKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKRRKMFQ ADHPDEISKLAKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKRRKMFQ ADHPEEISKLSKLKAQITEVKGIMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKRKKKFQ ULHPEEISKLSKLKAQITEVKGIMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKRKKKFQ MSHPEEMSKLSKLKAQITEVKGIMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKKKKKFQ ILHPEEISKLAKVKALVTKMKGVMENIEKALDRSEKIKILVDLRSKYSNLPFPSYGQEDIITPGTKITRKMFQ					
7AMP712 7AMP713 7AMP714 7AMP721 7AMP722 7AMP723 7AMP724 7AMP725 7AMP726 7AMP727 7AMP728	SNDP-NADRINRIKGEMNQVRGVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SNDP-NADTISRIKGEMSQVRNVMIENIDNILDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SNDP-NADRMSRIKGEMSQVRNVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SSNP-SVDTLNRVRGEVSEIRSVMVENIEKIMERGDRIELLVDKTANMQDSSFHFRKQSRRLRALMWR MDHPDEISKLAKVKAQVSEVKGVMMENIEKVIDRGEKIELLVDKTENLRSQAQ-DFRTGTOMRRKMFQ MDHPDEISKLAKVKAQVSEVKGVMMENIEKVIDRGEKIELLVDKTENLRSQAQ-DFRTGGTOMRRKMFQ VDHPDEISKLAKVKAQVSEVKSIMMENIEKVIDRGEKIELLVDKSESOPQ-AFYIKRTOMKRKMFQ VDHAEEIEKLIKVKAQVSEVKSIMMENIEKVIDRGEKIELLVDKTENLRSQAQ-DFRTQGTOMRRKMFQ ADHPDEISKLAKVKAQVSEVKSIMLENIDKAIDRGENLTVLTDKTENLRSQAQ-DFRTQGTKRRKMFQ VDHAEEIEKLIKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKRRKMFQ ADHPDEISKLAKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKRRKMFQ ADHPEEISKLSKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKRRKMFQ LAHPEEISKLSKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKKRKKKFQ CKLTVLLILLLVIYIAVAFLCHGPTLPSCI.					
7AMP712 7AMP713 7AMP714 7AMP721 7AMP722 7AMP723 7AMP724 7AMP725 7AMP726 7AMP726 7AMP728 7AMP728	SNDP-NADRINRIKGEMNQVRGVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SNDP-NADTISRIKGEMNQVRDVMIENIDNILDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SNDP-NADRMSRIKGEMSQVRNVMIENIDKVLDRGERLELLVDKTENMQGNTFRFRKQARRYRTIMWWR SSNP-SVDTLNRVRGEVSEIRSVMVENIEKIMERGDRIELLVDKTENLRSQAQ-DFRTTGFOMRRKMLQ MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTTGFOMRRKMLQ MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTGFOMRRKMFQ MDHPDEISNLAKAKAQVSEVKSIMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTQGTOMRRKMFQ VDHAEEIEKLIKVKAQVSEVKSIMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTQGTOMRRKMFQ ADHPDEISNLAKAKAQVSEVKSIMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTOMRRKMFQ VDHAEEIEKLIKVKAQVSEVKSIMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRKMWFQ ADHPDEISNLAKAKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRKMWFQ ADHPEEISKLSKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKMKRKLWFE MSHPEEMSKLSKLKAQITEVKGIMMDNIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKMKRKLWFQ LAHPEEISKLSKVKALVTKMKGVMMENIEKALDRSEKIKILVDLRSKYSNLPFPSYGQEDIITPGTKITRKMWFQ CLAHPEEISKLAKVKALVTKMKGVMMENIEKALDRSEKIKILVDLRSKYSNLPFPSYGQEDIITPGTKITRKMWFQ					
<pre>YAMP712 YAMP713 YAMP714 YAMP721 YAMP722 YAMP723 YAMP724 YAMP725 YAMP726 YAMP727 YAMP728 YAMP728 YAMP711 JAMP712 JAMP713</pre>	SNDP-NADRINRIKGEMNQVRGVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SNDP-NADTISRIKGEMSQVRDVMIENIDNILDRGERLELLVDKTANMQGNTFRFRKQTRFNNTVWWR SNDP-NADRMSRIKGEMSQVRDVMIENIDKVLDRGERLELLVDKTENMQGNTFRFRKQARRYRTIMWWR SSNP-SVDTLNRVRGEVSEIRSVMVENIEKIMERGDRIELLVDKTENLRSQAQ-DFRTTGTOMRRKMLQ MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTTGTOMRRKMLQ MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTOMRRKMLQ VDHAEEIEKLIKVKAQVSEVKSIMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTOMRRKMKFQ VDHAEEIEKLIKVKAQVSEVKSIMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTOMRRKMKFQ VDHAEEIEKLIKVKAQVSEVKSIMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRRKMFE ADHPDEISNLAKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRRKMFE MHPDEISKLAKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRRKMFE ADHPEEISKLSKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRRKMFE MSHPEEMSKLSKLKAQITEVKGIMMDNIEKVLDRGEKIELLVDKTENLQFQAD-SFQRQGRQLRRKMKLQ LAHPEEISKLAKVKALVTKMKGVMMENIEKALDRSEKIKILVDLRSKYSNLPFPSYGQEDIITPGTKITRKMFQ KITULLILLVIIYIAVAFLCHGPTLPSCI. CKLTVLLILLLVIYIMAVFLCHGPTLPSCI. CKLTULLILLVIYIMAFCCHGPSLPSCFK.					
<pre>YAMP712 YAMP713 YAMP714 YAMP721 YAMP722 JAMP723 YAMP724 YAMP725 JAMP726 JAMP727 YAMP728 VAMP711 VAMP711 VAMP712 YAMP713</pre>	SNDP-NADRINRIKGEMNQVRGVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SNDP-NADTISRIKGEMNQVRDVMIENIDNILDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SNDP-NADRMSRIKGEMSQVRNVMIENIDKVLDRGERLELLVDKTENMQGNTFRFRKQARRYRTIMWWR SSNP-SVDTLNRVRGEVSEIRSVMVENIEKIMERGDRIELLVDKTENLRSQAQ-DFRTTGFOMRRKMLQ MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTTGFOMRRKMLQ MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTGFOMRRKMFQ MDHPDEISNLAKAKAQVSEVKSIMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTQGTOMRRKMFQ VDHAEEIEKLIKVKAQVSEVKSIMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTQGTOMRRKMFQ ADHPDEISNLAKAKAQVSEVKSIMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTOMRRKMFQ VDHAEEIEKLIKVKAQVSEVKSIMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRKMWFQ ADHPDEISNLAKAKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRKMWFQ ADHPEEISKLSKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKMKRKLWFE MSHPEEMSKLSKLKAQITEVKGIMMDNIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKMKRKLWFQ LAHPEEISKLSKVKALVTKMKGVMMENIEKALDRSEKIKILVDLRSKYSNLPFPSYGQEDIITPGTKITRKMWFQ CLAHPEEISKLAKVKALVTKMKGVMMENIEKALDRSEKIKILVDLRSKYSNLPFPSYGQEDIITPGTKITRKMWFQ					
YAMP712 YAMP713 YAMP714 YAMP721 YAMP722 YAMP723 YAMP724 YAMP725 YAMP726 YAMP727 YAMP728 VAMP728 VAMP711 VAMP712 YAMP712 YAMP713 YAMP714 YAMP713	SNDP-NADRINRIKGEMNQVRGVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SNDP-NADTISRIKGEMSQVRDVMIENIDNILDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SNDP-NADRMSRIKGEMSQVRDVMIENIDKVLDRGERLELLVDKTENMQGNTFRFRKQARRYRTIMWWR SSNP-SVDTLNRVRGEVSEIRSVMVENIEKIMERGDRIELLVDKTENLRSQAQ-DFRTTGTOMRRKMLQ MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTTGTOMRRKMLQ MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTTGTOMRRKMLQ VDHPDEISKLAKVKAQVSEVKSIMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTQGTOMRRKMFQ MDHPDEISNLAKVKAQVSEVKSIMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTQGTOMRRKMFQ VDHAEEIEKLIKVKAQVSEVKSIMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTVRRKMVFQ VDHAEEIEKLIKVKAQVSEVKSIMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRRKMFF ADHPEEISKLSKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRRKMFFQ VDHPEEISKLSKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRRKMFFQ ADHPEEISKLSKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLQFQAD-SFQRQGRQLRRKMLQ LAHPEEISKLSKVKAQVTEVKGTMMENIEKVLDRGEKIELLVDKTENLQFQAD-SFQRQGRQLRRKMVLQ VHTPEISKLAKVKALVTKMKGVMMENIEKALDRSEKIKILVDLRSKYSNLPFPSYGQEDIITPGTKITRKMWFQ KLTIALILVLAIVTIMAFLCHGPTLPSCI. CKLTVLLILLLVVIIMAFCCHGPSLPSCFK. LVLLTCLIVFLLYIIIASFCGGTLPSCRS. MKIKLIVLAIIIALILLIVSVEHEFKG.					
VAMP712 VAMP713 VAMP714 VAMP721 VAMP722 VAMP723 VAMP724 VAMP725 VAMP726 VAMP726 VAMP727 VAMP728 VAMP711 VAMP711 VAMP713 VAMP714 VAMP711	SNDP-NADRINRIKGEMNQVRGVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SNDP-NADTISRIKGEMSQVRNVMIENIDNILDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SNDP-NADRMSRIKGEMSQVRNVMIENIDKVLDRGERLELLVDKTENMQGNTFRFRKQARRYRTIMWR SSNP-SVDTLNRVRGEVSEIRSVMVENIEKIMERGDRIELLVDKTENLRSQAQ-DFRTGFOMRRKMIQ MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTGFOMRRKMIQ MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTGFOMRRKMIQ VDHAEEIEKLIKVKAQVSEVKSIMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTQGFOMRRKMIQ VDHAEEIEKLIKVKAQVSEVKSIMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTQGFOMRRKMIFQ NDHPDEISNLAKAKAQVSEVKSIMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGFXIRRKMWFE ADHPEEISKLAKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGFXIRRKMWFE ADHPEEISKLAKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGFXIRRKMWFE ADHPEEISKLSKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGFXIRRKMWFQ VHPDEISKLAKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLQFQAD-SFQRQGRQLRRKMKQ LAHPEEISKLSKVKAQVTEVKGFMMENIEKALDRSEKIKILVDLRSKYSNLPFPSYGQEDIITPGTKITRKMWFQ KLTILLLLVIIYIQVAFACHGPTLPSCI. CKLTVLLILLLVIIYIGVAFACHGPTLPSCV. VKLTIALILLVALVVIAMAFVCHGPSLPSCFK. LVLLTCLIVFLLYIIASFCGGITLPSCRS. MKIKLIVLAIIIALILIIVSVCHGFKG. MKIKLIVLAIIIALILIIVSVCHGFKG.					
VAMP712 VAMP713 VAMP714 VAMP721 VAMP722 VAMP723 VAMP724 VAMP725 VAMP726 VAMP726 VAMP727 VAMP728 VAMP711 VAMP711 VAMP711 VAMP713 VAMP714 VAMP721 VAMP722	SNDP-NADRINRIKGEMNQVRGVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SNDP-NADTISRIKGEMSQVRNVMIENIDNILDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SNDP-NADRMSRIKGEMSQVRNVMIENIDKVLDRGERLELLVDKTENMQGNTFRFRKQARRYRTIMWWR SSNP-SVDTLNRVRGEVSEIRSVMVENIEKIMERGDRIELLVDKTENLRSQAQ-DFRTTGTOMRRKMLQ MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTTGTOMRRKMLQ MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTQGTOMRRKMLQ VDHAEEIEKLIKVKAQVSEVKSIMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTQGTOMRRKMKFQ VDHAEEIEKLIKVKAQVSEVKSIMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTQGTOMRRKMKFQ VDHAEEIEKLIKVKAQVSEVKSIMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRRKMWFQ ADHPDEISNLAKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRRKMWFQ LAHPEEISKLSKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRRKMWFQ KIHPEEISKLSKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRRKMFQ VUHPEEISKLSKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLQFQAD-SFQRQGRQLRRKMVLQ LAHPEEISKLSKVKAQVTEVKGFMMENIEKVLDRGEKIELLVDKTENLQFQAD-SFQRQGRQLRRKMVLQ LAHPEEISKLAKVKALVTKMKGVMMENIEKALDRSEKIKILVDLRSKYSNLPFPSYGQEDIITPGTKITRKMWFQ KLTIALLILVIJIJAAFLCHGPTLPSCI. CKLTVLLILLLLVIJIJAAFCCHGPSLPSCFK. LVLLTCLIVFLLYIIIASFCGGITLPSCRS. MKIKLIVLAIIIALILLIVSVEHGFKG.					
VAMP712 VAMP713 VAMP714 VAMP721 VAMP722 VAMP723 VAMP724 VAMP725 VAMP726 VAMP726 VAMP726 VAMP727 VAMP728 VAMP711 VAMP711 VAMP711 VAMP711 VAMP712 VAMP712 VAMP721 VAMP723 VAMP724	SNDP-NADRINRIKGEMNQVRGVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SNDP-NADTISRIKGEMSQVRNVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SNDP-NADRMSRIKGEMSQVRNVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRYRTIMWWR SSNP-SVDTLNRVRGEVSEIRSVMVENIEKIMERGDRIELLVDKTENLRSQAQ-DFRTTGTOMRRKMULQ MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTTGTOMRRKMULQ MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTQGTOMRRKMUFQ VDHAEEIEKLIKVKAQVSEVKSIMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTQGTOMRRKMUFQ MDHPDEISNLAKVKAQVSEVKSIMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTQGTOMRRKMUFQ VDHAEEIEKLIKVKAQVSEVKSIMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRRKMWFE ADHPEEISKLAKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRRKMWFQ VDHAEEIEKLIKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRRKMWFQ ADHPEEISKLSKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLQFQAD-SFQRQGRQLRRKMVLQ LAHPEEISKLSKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLQFQAD-SFQRQGRQLRRKMVLQ LAHPEEISKLAKVKALVTKMKGVMMENIEKALDRSEKIKILVDLRSKYSNLPFPSYGQEDIITPGTKITRKMWFQ MKIKLIVLAIIIALILIIVSVCHGFRC. MKIKLIVLAIIIALILII SIGGFINGCK. MKIKLIVLAIIIALILII ISIGGFINGCK. MKIKLIVLAIIIALILII ISIGGFINGCK. MKIKLIVLAIIIALILII ISIGGFINGCK. MKIKLIVLAIIIALILII ISIGGFINGCK.					
VAMP712 VAMP713 VAMP714 VAMP721 VAMP722 VAMP723 VAMP724 VAMP725 VAMP726 VAMP726 VAMP726 VAMP727 VAMP728 VAMP711 VAMP711 VAMP711 VAMP711 VAMP712 VAMP712 VAMP721 VAMP723 VAMP724	SNDP-NADRINRIKGEMNQVRGVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SNDP-NADTISRIKGEMSQVRNVMIENIDNILDRGERLELLVDKTANMQGNTFRFRKQTRFNNTVWWR SNDP-NADRMSRIKGEMSQVRNVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRYRTIMWWR SSNP-SVDTLNRVRGEVSEIRSVMVENIEKIMERGDRIELLVDKTATMQDSSFHFRKQSKRLRALWMK MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTGTOMRRKMLQ MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTGTOMRRKMLQ MDHPDEISNLAKAKAQVSEVKSIMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTQGTOMRRKMFQ MDHPDEISNLAKAKAQVSEVKSIMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTQGTOMRRKMFQ VDHAEEIEKLIKVKAQVSEVKSIMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRRKMFFQ ADHPEEISKLAKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRRKMFFQ ADHPEEISKLSKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRRKMFFQ ADHPEEISKLSKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRRKMFFQ ADHPEEISKLSKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRRKMFFQ VUHPEEISKLSKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLCPQAD-SFQRQGQLRRKMNLQ LAHPEEISKLSKVKAQVTEVKGFMMENIEKALDRSEKIKILVDLRSKYSNLPFPSYGQEDIITPGTKITRKMFFQ KLTILLLLVLIVIIYIAVAFLCHGPTLPSCI. CKLTVLLILLLVIIYIAVAFLCHGPTLPSCV. VKLTIALILVLAUVYIAMAFVCHGPSLPSCFK. LVLLTCLIVFLLYIIIASFCGGTLPSCRS. MKIKLIVLAIIIALILIIVSVCHGFKQ. MKIKLIVLAIIIALILIISICGGFNGGK. MKIKLIVLAIIIALILIISICGGFNGGK.					
VAMP712 VAMP713 VAMP714 VAMP721 VAMP722 VAMP723 VAMP724 VAMP725 VAMP726 VAMP726 VAMP727 VAMP727 VAMP728 VAMP711 VAMP711 VAMP711 VAMP711 VAMP714 VAMP723 VAMP724 VAMP724 VAMP725	SNDP-NADRINRIKGEMNQVRGVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SNDP-NADTISRIKGEMSQVRNVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SNDP-NADRMSRIKGEMSQVRNVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRYRTIMWWR SSNP-SVDTLNRVRGEVSEIRSVMVENIEKIMERGDRIELLVDKTENLRSQAQ-DFRTTGTOMRRKMULQ MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTTGTOMRRKMULQ MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTQGTOMRRKMUFQ VDHAEEIEKLIKVKAQVSEVKSIMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTQGTOMRRKMUFQ MDHPDEISNLAKVKAQVSEVKSIMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTQGTOMRRKMUFQ VDHAEEIEKLIKVKAQVSEVKSIMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRRKMWFE ADHPEEISKLAKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRRKMWFQ VDHAEEIEKLIKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRRKMWFQ ADHPEEISKLSKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLQFQAD-SFQRQGRQLRRKMVLQ LAHPEEISKLSKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLQFQAD-SFQRQGRQLRRKMVLQ LAHPEEISKLAKVKALVTKMKGVMMENIEKALDRSEKIKILVDLRSKYSNLPFPSYGQEDIITPGTKITRKMWFQ MKIKLIVLAIIIALILIIVSVCHGFRC. MKIKLIVLAIIIALILII SIGGFINGCK. MKIKLIVLAIIIALILII ISIGGFINGCK. MKIKLIVLAIIIALILII ISIGGFINGCK. MKIKLIVLAIIIALILII ISIGGFINGCK. MKIKLIVLAIIIALILII ISIGGFINGCK.					
VAMP714 VAMP721 VAMP722 VAMP723 VAMP724 VAMP725 VAMP726 VAMP727	SNDP-NADRINRIKGEMNQVRGVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SNDP-NADTISRIKGEMSQVRNVMIENIDNILDRGERLELLVDKTANMQGNTFRFRKQARRFRSNVWWR SNDP-NADRMSRIKGEMSQVRNVMIENIDKVLDRGERLELLVDKTANMQGNTFRFRKQARRYRTIMWWR SSNP-SVDTLNRVRGEVSEIRSVMVENIEKIMERGDRIELLVDKTATMQDSSFHFRKQSKRLRRALWMKU MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTTGTOMRRKMFLQ MDHPDEISKLAKVKAQVSEVKGVMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTQTOMRRKMFLQ MDHPDEISKLAKVKAQVSEVKSIMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTQTOMRRKMFFQ VDHAEEIEKLIKVKAQVSEVKSIMMENIEKVLDRGEKIELVDKTENLRSQAQ-DFRTQTOMRRKMFFQ NDHPDEISNLAKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRRKMFFQ VDHAEEIEKLIKVKAQVSEVKSIMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRRKMFFQ ADHPEEISKLSKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRRKMFFQ NHPEEISKLSKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLRSQAQ-DFRTQGTKIRRKMFFQ VUHAPEEISKLSKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLQFQAD-SFQRQGRQLRRKMLQ LAHPEEISKLSKVKAQVTEVKGVMMENIEKVLDRGEKIELLVDKTENLQFQAD-SFQRQGRQLRRKMLQ LAHPEEISKLAKVKALVTKMKGVMMENIEKALDRSEKIKILVDLRSKYSNLPFPSYGQEDIITPGTKITRKMFQM MKIKLIVLAIIIALILIIVSVCHGFLPSCI. CKLTVLLILLLVIIYIGVAFACHGPLPSCI. VKLTIALILLIIVSVCHGFKG. MKIKLIVLAIIIALILII ISICGGFNCGK. MKIKLIVLAIIIALILII ISICGGFNCGK. MKIKLIVLAIIIALILII ISICGGFNCGK. MKIKLIVLAIIIALILII ISICGGFNCGK. MKIKLIVLAIIIALILII ISICGGFNCGK. MKIKLIVLAIIIALILII ISVCHGFNCTD. MKIKLIVLGIILLLVLINWISVCHGFNCTD.					

Figure S2. VAMP721, but not VAMP723, interacts with the KC1 K^+ channel in vivo.

rBiFC analysis of nYFP-VAMP fusions of VAMP721 and VAMP723 and their interaction with KC1-cYFP. Images were collected from Arabidopsis roots epidermal cells transiently transformed as in Figure 2. Three-dimensional projections were derived from confocal image stacks and the projections were analysed for YFP and RFP fluorescence intensities after background subtraction. Images are (*left* to *right*) YFP (BiFC) fluorescence, RFP fluorescence as a cell marker, and the corresponding mid-plane brightfield image. The images correspond to constructs (*top* to *bottom*) including the coding sequences for KC1-cYFP with the empty cassette (control), VAMP721, and VAMP723. Scale bar, 10 μ m. Immunoblot analysis verifying the expression of the fusion proteins are included on the right. Mean ±SE for rBiFC ratios (YFP/RFP fluorescence) comprise data from three independent experiments, each including images (n>10) taken from randomly selected roots. rBiFC fluorescence ratios were calculated from the mean fluorescence intensities determined from each YFP/RFP image pair after background subtraction. Significance is indicated by letters (P < 0.01).

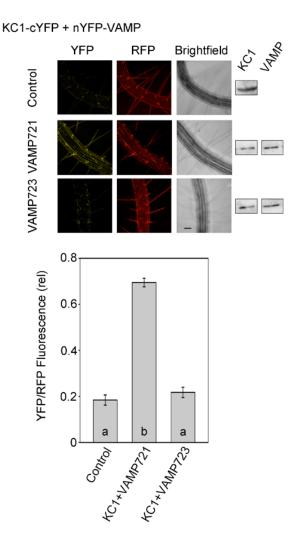


Figure S3. The central section of the VAMP721 Longin Domain is essential for interaction with KAT1.

Yeast mating-based split-ubiquitin assay for interaction of the VAMP longin domain chimeras with KAT1-Cub as the bait. Longin domain chimeras were constructed by exchange of three segments designated L_A, L_B, and L_C. Chimeras were constructed both in VAMP721 and VAMP723. Segment alignments (above) for the two VAMPs at the junction points are shown with arrows indicating the breaks. Yeast diploids created with NubG fusion constructs of each VAMP chimeras together with controls (negative, NubG; positive, wild-type Nub[NubI]) spotted (left to right) on CSM medium without Leu, Trp, Ure, and Met (CSM_{-LTUMAH}) to verify mating, CSM medium without Leu, Trp, Ure, Met, Ade, and His (CSM_{-LTUMAH}) to verify adenine- and His-independent growth (second panel), and on CSM_{-LTUMAH} with the addition of 50 μ M Met to verify interaction at lower KAT1-Cub expression levels (Grefen et al., 2009). Diploid yeast was dropped at 1.0 and 0.1 OD600 in each case. Immunoblot analysis (5 μ g total protein/lane) of the haploid yeast used for mating is included (right) using commercial HA antibody for VAMPs and and VP16 antibody for K⁺ channels.

Longin	Domain(L) –	R-SNARE(S)	- TM helice	s(M) ·				
	L _A	L _B -	Lc					
VAMP721QKL ³⁹ P ⁴⁰ SSMSF ⁸¹ L ⁸² ER VAMP723ENL ³⁹ P ⁴⁰ SSMAF ⁸¹ L ⁸² ER								
KAT1-Cub								
+ VAMP nnn	CSM_LTUM		-LTUMAH	αVP16				
	0 Met 1.0 0.1	0 Met 1.0 0.1	50 μM Met 1.0 0.1	αHA				
L _A L _B L _c SM 721		ت چ	\$	-				
723	•							
721L _{AB} 723L		*	۵.	1				
721L _{BC} 723L		•	*	-				
721L _{AC} 723L	3 • •			-				
721L _A 723L _{BO}	•			-				
721L _B 723L _{AC}		€ \$	\$ \$					
721L _c 723L _{AE}				-				
NubG								
Nubl		• •	•					

Figure S4. Single-site mutants VAMP721^{D61N}, VAMP721^{Y57F} and VAMP721^{Q76E} have no substantive effect on interaction with KAT1 or KC1, and AKT1 shows no interaction with VAMP721 or VAMP723.

Yeast mating-based split-ubiquitin assay for interaction of VAMPs with KAT1-Cub (A), KC1-Cub (B), and AKT1-Cub (C) as baits. Yeast diploids were created with NubG fusion constructs of each of the VAMP proteins together with controls [NubG, negative; NubI (wild-type), positive] spotted (*left* to *right*) on CSM medium without Leu, Trp, Ura, and Met (CSM_{-LTUM}) to verify mating, CSM medium without Leu, Trp, Ura, Met, Ade, and His (CSM_{-LTUMAH}) to verify adenine- and His-independent growth, and on CSM_{-LTUMAH} with the addition of Met to verify interaction at lower K⁺ channels-Cub expression levels (50 μ M for KAT1 and AKT1, 500 μ M for KC1). Diploid yeast was dropped at 1.0 and 0.1 OD₆₀₀ in each case. Immunoblot analysis (5 μ g total protein/lane) of the haploid yeast used for mating (*right*) using commercial HA antibody for the VAMP fusions and VP16 antibody for the K⁺ channel fusions.

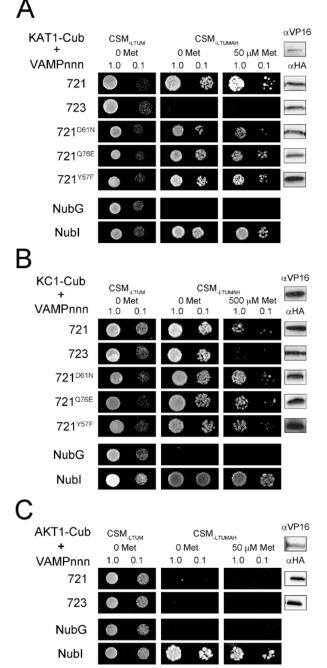


Figure S5. The VAMP721^{Y57D} mutant suppresses interaction with the KC1 K⁺ Channel. Yeast mating-based split-ubiquitin assay for interaction of single-site mutants of VAMP721 with KAT1-Cub as bait. Yeast diploids were created with NubG fusion constructs of each of the VAMP proteins together with controls [NubG, negative; NubI (wild-type), positive] spotted (*left* to *right*) on CSM medium without Leu, Trp, Ura, and Met (CSM-LTUM) to verify mating, CSM medium without Leu, Trp, Ura, Met, Ade, and His (CSM-LTUMAH) to verify adenine- and His-independent growth, and on CSM-LTUMAH with the addition of Met to verify interaction at lower K⁺ channels-Cub expression levels. Diploid yeast was dropped at 1.0 and 0.1 OD₆₀₀ in each case. Immunoblot analysis (5 µg total protein/lane) of the haploid yeast used for mating (*right*) using commercial HA antibody for the VAMP fusions and VP16 antibody for the K⁺ channel fusion.

KC1-Cub	CSM.LTUM	CSM.	αVP16	
+	0 Met	0 Met	500 µM Met	-
VAMPnnn	1.0 0.1	1.0 0.1	1.0 0.1	αHA
721		۰ ۱	8	
723) 🛞	۲		-
721 ^{Y57A}		۵	۰.	
721 ^{Y57D}		۵.		
721 ^{D61A}	۲	۰	🏶 <u></u> ,	-
721 ^{Q76A}	۵	۵		
721 ^{S80A}	۱	چ 🔮	۵ 🚱	-
723 ^{D57Y}		چه 🌒	۰ ک	•
NubG				
Nubl	۲		@	

Figure S6. The single-site mutants VAMP721^{Y57D} and VAMP723^{D57Y} affect the localization of the R-SNAREs.

Images showing (*left* to *right*) optical sections through Arabidopsis root hairs with GFP fluorescence, bright-field and overlay, and with Z-axis transects (panels 1-4) for GFP-tagged constructs of VAMP721, VAMP721^{Y57D}, VAMP723, and VAMP723^{D57Y}. The GFP-VAMP constructs were transiently transformed in Arabidopsis seedlings and images collected 3 d post-transformation. Transects were taken through the root hair nucleus at positions marked in the overlap images (1-4 from *top* to *bottom*) in each example. No GFP signal was observed to the inside of the nucleus for GFP-VAMP721 and GFP-VAMP723^{D57Y}, indicating a peripheral localization. GFP fluorescence was evident to the inside of the nucleus (*white arrows*) on transformations with GFP-VAMP721^{Y57D} and GFP-VAMP723, consistent with the localization of the constructs to one or more endomembrane compartments. Scale bar, 5 μ m.

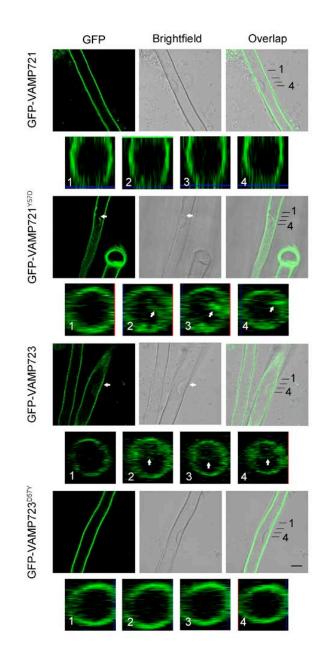


Figure S7. Arabidopsis lines carrying VAMP721 VAMP723 and VAMP721^{Y57D} under the Dex-inducible promoter show no substantive effects on root growth dependent on channel-mediated K^+ uptake at submillimolar K^+ in the absence of dexamethasone.

(A) Arabidopsis seedlings grown for 10 d on vertical 0.7% agar plates with defined minimal salts medium containing 0.01, 0.1 and 1 mM K⁺ with 2 mM NH_4^+ to block high-affinity K⁺ uptake. Shown are seedlings of wild-type (wt) and representative Arabidopsis transgenic lines. Scale bar, 1 cm.

(B) Root length analysis of Arabidopsis seedlings for wt and pooled lines carrying the VAMP721, VAMP723, and VAMP721^{Y57D} constructs, including the seedlings in (A). Data are means \pm SE from three independent experiments with >20 seedlings for each line normalized to the wild-type. Root lengths for lines of each transgene have been pooled and are normalized to the wild-type at the same K⁺ concentration. Lines are not significantly different at P<0.1. Immunoblot analysis for transgene expression are included in Figure 12.

