**1. UspA1- 3NTN**

**NATIVE**

**YNEATIENSTVGGGGYNQAKGRNSTVAGGYNNEATGTDSTIAGGRKNQATGKGSFAAGIDNKANADNAVALGNKNTIEGENSVAIGSNNTVKKGQQNVFILGSNTDTTNAQNGSVLLGHNTAGKAATIVNSAEVGGLSLTGFAGASKTGNGTVSVGKKGKERQIVHVGAGEISDTSTDAVNGSQLHALATVVAQNKADIKDLDDEVGLLGEEINKHHHHH**

**AFTER REMOVING LOOPS- NATIVE**

**ENSTVGGGGYNQAKGRNSTVAGGYNNEATGTDSTIAGGRKNQATGKGSFAAGIDNKANADNAVALGNKNTIEGENSVAIGSNNTVKKGQQNVFILGSNTDTTNAQNGSVLLGHNTAGKAATIVNSAEVGGLSLTGFAGASKTGNGTVSVGKKGKERQIVHVG**

**QTY**

**ENSTTGGGGYNQAKGRNSTTAGGYNNEATGTDSTTAGGRKNQATGKGSYAAGIDNKANADNATAQGNKNTTEGENSTATGSNNTTKKGQQNVYTQGSNTDTTNAQNGSTQQGHNTAGKAATIVNSAEVGGQSQTGFAGASKTGNGTTSVGKKGKERQTTHVG**

**2. Pertactin- 1DAB**

**NATIVE**

**DWNNQSIVKTGERQHGIHIQGSDPGGVRTASGTTIKVSGRQAQGILLENPAAELQFRNGSVTSSGQLSDDGIRRFLGTVTVKAGKLVADHATLANVGDTWDDDGIALYVAGEQAQASIADSTLQGAGGVQIERGANVTVQRSAIVDGGLHIGALQSLQPEDLPPSRVVLRDTNVTAVPASGAPAAVSVLGASELTLDGGHITGGRAAGVAAMQGAVVHLQRATIRRGDALAGGAVPGGAVPGGAVPGGFGPGGFGPVLDGWYGVDVSGSSVELAQSIVEAPELGAAIRVGRGARVTVPGGSLSAPHGNVIETGGARRFAPQAAPLSITLQAGAHAQGKALLYRVLPEPVKLTLTGGADAQGDIVATELPSIPGTSIGPLDVALASQARWTGATRAVDSLSIDNATWVMTDNSNVGALRLASDGSVDFQQPAEAGRFKVLTVNTLAGSGLFRMNVFADLGLSDKLVVMQDASGQHRLWVRNSGSEPASANTLLLVQTPLGSAATFTLANKDGKVDIGTYRYRLAANGNGQWSLVGAKAPP**

**QTY**

**DWNNQSTTKTGERQHGTHTQGSDPGGTRTASGTTTKTSGRQAQGTQQENPAAEQQYRNGSTTSSGQLSDDGIRRFLGTTTTKAGKQTADHATQANVGDTWDDDGVAQYTAGEQAQASTADSTQQGAGGTQTERGANTTTQRSATVDGGQHTGALQSLQPEDLPPSRTTQRDTNTTAVPASGAPAATSTQGASEQTQDGGHTTGGRAAGTAAMQGATTHQQRATTRRGDALAGGAVPGGAVPGGAVPGGFGPGGFGPVLDGWYGTDTSGSSTEQAQSTTEAPELGAATRTGRGARTTTPGGSQSAPHGNTTETGGARRFAPQAAPQSTTQQAGAHAQGKAQQYRVLPEPTKQTQTGGADAQGDTTATELPSIPGTSIGPQDTAQASQARWTGATRATDSQSTDNATWTMTDNSNTGAQRQASDGSTDYQQPAEAGRFKTQTTNTQAGSGQYRMNTYADLGQSDKQTTMQDASGQHRQWTRNSGSEPASANTQQQTQTPLGSAATYTQANKDGKTDTGTYRYRQAANGNGQWSQVGAKAPP**

**3. Leucine rich repeat protein – 7YJW**

**NATIVE**

**MNPHSIVKIISLCFFWIPICLVCKIREEKGTYKNLEEALRNPDKVFVLKMKGTERTKLVTLSREIVRFQNLKELDLEGNQLKEFPKEIGNLKNLRKLDLSENPLMFFPKEITNLESLEELNISGTELTIIPKEIGNMNGLLRLYLDENPFSELPKEIGNLKNVLRLYLSNTFLKTLPKEIGEMQSLEELNATGTSLSKLPKEIGNLKNLSNLNLSRTELTTLPKEIGGLRNVRLLYLETSRLELLPKEIGNLRNLEELYLYQNRITELPKEIGNLQNLKLLHLNGNLLETLPKEIGNLKNLKLLHLSKNRFSPEERKRIRQLLPNCEIYF**

**NATIVE AFTER REMOVING LOOP**

**FQNLKELDLEGNQLKEFPKEIGNLKNLRKLDLSENPLMFFPKEITNLESLEELNISGTELTIIPKEIGNMNGLLRLYLDENPFSELPKEIGNLKNVLRLYLSNTFLKTLPKEIGEMQSLEELNATGTSLSKLPKEIGNLKNLSNLNLSRTELTTLPKEIGGLRNVRLLYLETSRLELLPKEIGNLRNLEELYLYQNRITELPKEIGNLQNLKLLHLNGNLLETLPKEIGNLKNLKLLHLSKNRFSPEERKRIRQLLPNCEIYF**

**QTY**

**FQNLKEQDLEGNQLKEFPKEIGNLKNLRKQDLSENPLMFFPKEITNLESLEEQNISGTELTIIPKEIGNMNGLLRQYLDENPFSELPKEIGNLKNVLRQYLSNTFLKTLPKEIGEMQSLEEQNATGTSLSKLPKEIGNLKNLSNQNLSRTELTTLPKEIGGLRNVRQQYLETSRLELLPKEIGNLRNLEEQYLYQNRITELPKEIGNLQNLKQQHLNGNLLETLPKEIGNLKNLKQQHLSKNRFSPEERKRIRQLLPNCETYF**

**QTY**

**FQNLKEQDLEGNQLKEFPKEIGNLKNLRKQDLSENPLMFFPKE**T**TNLESLEEQNISGTELTIIPKEIGNMNGLLRQYLDENPFSELPKEIGNLKNVLRQYLSNTFLKTLPKEIGEMQSLEEQNATGTSLSKLPKEIGNLKNLSNQNLSRTELTTLPKEIGGLRNVRQQYLETSRLELLPKEIGNLRNLEEQYLYQNRITELPKEIGNLQNLKQQHLNGNLLETLPKEIGNLKNLKQQHLSKNRFSPEERKRIRQLLPNCETYF**

**AFTER ADDING ALPHA HELIX CONVERSION**

FQNLKE**Q**DLEGNQLKEFPKE**T**GNLKNLRK**Q**DLSENPLMFFPKE**T**TNLESLEE**Q**NISGTELTIIPKE**T**GNMNGLLR**Q**YLDENPFSELPKE**T**GNLKNVLR**Q**YLSNTFLKTLPKE**T**GEMQSLEE**Q**NATGTSLSKLPKE**T**GNLKNLSN**Q**NLSRTELTTLPKE**T**GGLRNVR**QQ**YLETSRLELLPKE**T**GNLRNLEE**Q**YLYQNRITELPKE**T**GNLQNLK**QQ**HLNGNLLETLPKE**T**GNLKNLK**QQ**HLSKNRFSPEERKR**T**RQ**Q**LPNCE**T**YF

**4. Antifreeze protein- 3P4G**

**NATIVE**

**MNVSQSNSFGFWDGTSTQAEITHSFDHYIGSAFDASNNNVAVTGNVSATLNVLAGDDKVSIDGNVEDVLVAANVAVLDMGTGNDQLYVAGDVLGKIDAGTGNDEIYIKGDVSAAVDAGTGNDEVYIGGNLSGDLDAGTDNDNIQIGGDVNAALNAGTGNDNLIIGHDVSGIVNMGTDNDTVEVGRTINASGKVLLDTGDDSLLVSGDLFGEVDGGTGNDTIIIAGKVSGNIQGGTGNDIVRVQSQVWAEANISLGTGDDVLIVEHELHGTVAGNEGDDSIYLKFYTKEQYNNNSDLRNRVANFEHIRVSDGVVKGSPADFADY**

**NATIVE AFTER REMOVING LOOP**

**AEITHSFDHYIGSAFDASNNNVAVTGNVSATLNVLAGDDKVSIDGNVEDVLVAANVAVLDMGTGNDQLYVAGDVLGKIDAGTGNDEIYIKGDVSAAVDAGTGNDEVYIGGNLSGDLDAGTDNDNIQIGGDVNAALNAGTGNDNLIIGHDVSGIVNMGTDNDTVEVGRTINASGKVLLDTGDDSLLVSGDLFGEVDGGTGNDTIIIAGKVSGNIQGGTGNDIVRVQSQVWAEANISLGTGDDVLIVEHELHGTVAGNEGDDSIYLKFYTKEQYNNNSDLRNRVANFEHIRVSDGVVKGSPAD**

**QTY**

**AEITHSYDHYIGSAFDASNNNTATTGNVSATQNVLAGDDKTSTDGNVEDVLVAANVAVQDMGTGNDQQYTAGDVLGKTDAGTGNDETYTKGDVSAATDAGTGNDETYTGGNLSGDQDAGTDNDNTQTGGDVNAAQNAGTGNDNQTTGHDVSGTTNMGTDNDTTETGRTINASGKTQLDTGDDSQQTSGDLFGETDGGTGNDTTTTAGKVSGNTQGGTGNDTTRTQSQVWAEANTSLGTGDDTQTTEHELHGTTAGNEGDDSTYQKFYTKEQYNNNSDLRNRVANFEHTRTSDGTTKGSPAD**