

**SUPPLEMENTARY FILE 2** – Amino acid sequences of *N. vectensis* cadherin cytoplasmic domains, *N. vectensis*  $\alpha$ - and  $\beta$ -catenins, and *N. vectensis*  $\alpha$ -catenin variants used in this study.

**>NvCad1-FL**

MISTLGRVNSNSRAGATAFQLQARDLDSGNSGLIGFQLENIPTLFMINPLTRQIEVGGPRLQTSR  
YGLDIIPFDYDGKPSVNGTKATVDIETVQSPVFNESYFTTVSERAPTMTKIGDVTAVSVSGARL  
SYTIIIEGNTGDKFLAKDNGDIVLNSLLDFERDQSVFNLKVEAKEQIPKGLSSEVDVTITVINANDF  
HPYFDDPVYRLKVPESRGGVGDVIMTVTARDCDCPSDCTCPVGQLKYSVEAGTSFDIDQTGAIV  
VARTLDYETSKVQVLKVMASDQGEKVFTAVTFVVVTTLEDTNDNAPVFKRNDYLFRTADASTG  
SMIGAVIARDQDQDDIEKVRYSVVSGTEFNVNTETGVLTVAKDLSTGAKSEYSMEIRATDSTKS  
NDARVRVNVEYKNMYRPEFTKCGKATIENLLKGQLIATVTATDRDQGRNGEVEYKIVPVGGQ  
DFFTINNKTGEVITSSLDRETATYTVIITAEDGGHGKDPALMSYCFLEVEVQDVNDNYPSPF  
ITRAYLGSIQNTKPIGTSVLTVSATDPDAGDNAKITYAFKSPNDKFEIDSTSGDIRTKVALTGTKD  
VNEKMTVVASNTEAIQGGDANNRDRETEVTIYITDLAPPVCDKNLFTARILESLSVNSDVLKVSA  
QAPGGKSIVYSPKANADIDEKFSVETNGQIKTASQLDYEQLSPGDKTFKLQVRAQEENTNLYS  
TCSVAITLEDVNDKPTFDLGNVDARVRENAPIGTTVITIKATDRDTGDAGVVTYFLKAGSDEHF  
AIDVNSGTLTTKKSFDREGQSLFSVIVIARDKGNP GALSEEVAVKVLVVDENDSPPQFDQAEF  
QTSVSESATIGTSILEVVATDQDIGDNAKLEYFISGGDGRFWFAVQTISKSGRITYGEVQVDARL  
DFETKSSYITDVTATDGRFSATTRVLITITDANDIVPMFMTLTTPTLLSPIYTGRVSEMTGSGVEV  
LKVYAVD TDSPNIQYTLGSSSYFTIARQEGGKFGVGIISTGSQPLDREATPIFSFNVLAKDGVH  
TGSAYIEINVTDINDNQPRFPNSLYVGYVEENKAAGTSVMYVQAHHDDDDPYLGGNAEIRYTLTD  
NAGGKFKIDANTALVTTEEILDRETSPNSFTITVLATDQGANKLSTTKVATIYVTDANDHAPVFTK  
RIFRGTVSEDVRPGYVVTVSATD TDTGPNAELEFVTHGNEPAAFYVDPSKGTVHVSGILNYT  
LRKSYNLTVTVSDRGMPVLSDNSPAYVLITITDANDNAPIFIPNQYNKVAEDLAVGSPVVVTA  
VDYDSGDNAKFVFDITGGNPDDLFEVVPNPDNSSLGIVRTRLPLDRETTPIHHLEITAKDTGGLT  
GKAHVWL TLLDVNDNGPWFQPPFFVGKIKENVVKQFVTKVSANDPDTKNNGAPFTYAIYNGT  
VSGNFAFDIATITNVTTDMSSSGTFDRETMTTWTIGIAGTDSGRPAKSNFTYVYVDVQDDNDNE  
PYDGRMTIIVNSYNGKFRGGPIAKTYRDADYDGDVNTYTLQSQTGGNFFTVDTTTGEISAAKD  
IPVGEYSLVISVTEVNTGNPPRANEVNFPKTVTSRATVIVRDITSKAVSNSVALQISDMRKVEYFV  
GDYHDVVVGELSRMFGVSSSGIEVFSVQPSPIKVMALDVQFAVKTGSDEYTKPYDVIRVVDN  
RERLTNLGLKVTSIGIDMCALERERVGKCINVVETSSAYKIASGDYGKVPAPASSITLVSMDEVL  
RDKYVTIIEPGKNCSNENPCLNGGTCHDTPAGWRVCQCPRGYRGPHCEQTRTRFRGTSYIW  
LPKLTAYDIRELSFEFTTEFKDGLMLYQGPKPGDNNGAKDFLAVFLDEGHLVVRVSLGYEPITI  
NMTRRPNLNDKEWHTVQIIRDVIDRKMIRVIIDRCQSAQIVEENGRVFEKRDTCEITGRVKGRSV  
YLNFGFPLQIGGVETDLTFIGITTTGFRGCIRNIIDTEKMYDLRNPIKVVNAPEGCTLAGTCPNNC  
NDKGYCEPSLMAGKSMCVCDLGYTGRACNDRSEANYYLENSFSQFLTGIRARRELIQPPVPL  
MNEYTHINLQVKLDPGKDCVLFSSNSLGTENRDLVVDHMLRYIFRLGDRMKVLSIPQYNIS  
DGKYHSMVMNREGNYAEMQIDYRAK MAGTTGGVQKLLNMGGGSIFTGGLPNITEVRVVEAIVQ  
SGGDVILRTEDGKVLTSIGVGGGMSFGAGSSVTLITIGSGVLTQRNILDSQSLFVRGIYKNGTV  
LYGSSSSSTFGMNVDDQGIPFKSSDTSSNGNGGVQISQGNPMTYGAGIQWTLNPGRTQVGA  
GNSGGAVEVIGDMEGCTATNRFQGVSLDSPDVEVRRQNVKGCPCAEFGFCENGGTCVDGT  
PPYCLCSPGWTGSTCVLIVTAPNPGQRPGSRVSPFVIACVAVVLLAVMVMGAVLLKKRTPPP  
VIPVMVEDGHVHDNIRPYHDEGAGEEDNFGYDITQLMKYTYVEGGGYGGGGGGYGGGGGGY  
GDGTGGAAFGSAYAADGGGKGLGSGVEEVMVAEEKPLLQGAMEGYGQQHGITTITRRRMM  
NADSVDVGNFINSRVGEADREYILSYDALHIYRYEGDDSDIDDLSELGSDDEGGDDAEQSFDFL  
QDWGRKFENLNKIYNLDD

**>NvCad1-CytoTail**

KKRTPPPVIPVMVEDGHVHDNIRPYHDEGAGEEDNFGYDITQLMKYTYVEGGGYGGGGGGY  
GGGGGYGDGTGGAAFGSAYAADGGGKGLGSGVEEVMVAEEKPLLQGAMEGYGQQHGITTI

TRRRMMNADSVDVGNFINSRVGEADREYILSYDALHIYRYEGDDSDIDDLSELGSDDEGGDDA  
EQSFDFLQDWGRKFENLNKIYNLDD

**>NvCad2-FL**

MSAGRLAAVLTTPLLFLLKTFQLAKAQDTLIEVNFDEGRPARSSVYLFSSSGDVFSLYQAD  
PTVPLLFQISEVGHVTSTQEIEYEIGKTNKYDLTVLQRPRGETLGGIAITLRITLDVNNFHPVFQL  
SQGEHYEGFVKEGTAENTIVEGLEQCHATDRDTSGIRGYSIISGNEKGYFKVETVQIGSGVTSR  
KFLVLKTTGKPIVRDDNNPYIMLTVQVTDGGNPSHSGTANIRVNVEDANDQTPVFESSQYRETI  
AENTPIQTSVLRVRATDKDDGTNGGIYYMKNPVNSYFTIDAITGVIRVAKTLDYNARDKHTLYIS  
ARDRGDPPTSATVEISLRENIQGWPLPDSADPKENTKPYFPQSRYTFSIREDFPPKGALLV  
MRAADNDPIGNKRLRYSLSGNGVSKFAIDPESGVVTLTDSVDYENTPNNHVYDLTVTATDQG  
PGSLSATQLLIEIQVDENKNSPRFDPQQAILEISENLKQNSLVTTVSATDSDSVGNPSSPDGK  
VVYSIVGGTGLGVFRVDSNTGEVKVAVPSLDREGTSQYTLVVKASDNATFPRSSRLFLMINLLD  
EDDNFPYFSQPIYIAQVPENQPSGTFVTVVVGRDADEGFNPSYTVITPGVPYKIEPSTGVIRTSK  
SLDQSELSTRELQVIVRVSTAGSKTADGQVNITVISKVNRPVFKNTPYSVKVPEEMGPLPLNF  
CIAAVDSLSPVQYTLAPGADGLFEVDKDSGRLHTKNSFNENVDRYNLRIEARTSSVQEVASA  
SLTVEVTEEKDLPKFSSDSYQLTVDESAAPGTTLAPGLLIIDSDTSSDQFDCSMEAITSLHTLYNF  
EVTQQSGRCFLRVQAGGKLAHLASKYTFNVRATDRNFRNMFATAQVEVNVIDVNDHKPEFL  
QESYWLSVPSSTPAGSSLVTVQAEDMDIGNAQVRYELLRQENSERFILNDNNQLSTASTLTP  
NVRYQLLIRASDSATRNPSSAQVPVYVSVYSPSEPIVFDKSSYNQNLPEDSSANTLVFTAKAT  
RSGSSSGITYELVGGYKQIGEAMFSIKPDTGQVYLIKLDKFETKSYFPIAVRAKYSGGAIELASEV  
VAKVTIVDNDNGPRFAFHESKTVVIDSFSKDTQLVQARALDADSGSLGEVTYGIDGGRSTS  
NLPFNINVKTMIFATREILYTGSSYIIIVVATDGATDGSQKIQKYTVNVQVLDTPRPPSFPQKT  
YSAPVTETAGVGDVTTVRAVYSKPNFLKYTFVSGNEDNTFCVNGFGIISVAKSLDREKVAGY  
TLGMRVTLGQHVDVTTVYVNLTDINDDAPHFTSAIYRRSIKEGLAEDTEILPPVIAVDHDFGSNG  
KILYSILSGVHPDWDKYFNIDSATGKITTKMTLDYETHKSHTLFIARAEDNGSPKRLSGIAQVDIDVI  
DRNDNSPVFAAAFYRAKISLGAVKGTSLVQVHATDLDSGQNGQITYSIIQGNEEEEFTINEQGGVI  
LVDKSLTTVAADKFLKVEARDKNASPRSGSVTVEINVYLPDGPMPFVVPVTVYVKEGVPAN  
HRVAGVKAATSEALTYTLLSGNEAGMFRINPSTGSLDATRELDYEERRRYELKIEARDTRDRSA  
MVELIIIVNINDNKPTFVDIVDGGQIDRKAIGTCSPTDIAEGEVITRLGAFDRDGDIEITFIVPDDVKD  
LFKIDSRGVVTAKKPIEDLPKIYPFNKALDNGEPPQETDVKVRLVHVHYRPDQKHVRVNVRED  
TPTGSVIATVRRYFPNGIVSLLLPEKANFSVRANGDVILLTPLDYESSQQFHRMTVREELGNQTN  
DVDVEVVLDVNDNRPIWMERERLARVNTNSRAGAQVYQLEARDEDDGSSGLVGYQLKSPS  
NDAKRKRRSPQHPFTINPKTRQMEVAGSLKDQRYDLVFAFDYGIPRLTSDTITLNVDSGAAG  
QLPPRFKSVSYHFMVSEDAKYLSLVGIIARSIGARLDYKIVSGNVGDKFIAMGDGRILLNSLLD  
FERDQTQYNLKVKATEQIPDGLDSTVDVKIDVINANDHFPYFDQQLYSVQIPESTAVGVLVQEV  
TAKDCDCLSSCTCSPGFLTYSIEPSKEQGGKFYIDPATGKISVSVALDYEDQRYHLLKVYATDK  
GKKSFQGLCFVNVTLTNVNDNRPTFLKSAYEFRVAEGAATGESLAIVVAVDADGDAVYTSKAG  
GALQFSVDQSTGVITLNSALDPNKNQYTLQVMAKDSGGLTSTVSVTFNVADANNVPQFTNCG  
TVSIRENDPRDTKITQLTATDADRGQNGQITYSIEDASSQTLFSIEPRTGVVRSLSLDRENKDS  
YNAIIKAEDGSSKQDESERLLWYCYLTINVEDVNDNRPYFLAAKYFGSVFSSAPNGSNILTVQAT  
DADSGSNAKIKYALLDSAGGLFRLDSSGILRTNTNPARLQLETGKKLLEVSADKVESIAGTQPG  
KPTKYTTQIEILVSNPEPPKFSQQVYASINENMETGSTVTRITATSSTGAEISYENVDTNPRAKI  
LFRVQPDGYIITGDRPDYERGTTYNMQFAAKDKKTLTYSTVKVVINIIDVNDVSPAFLAINTRNA  
RVLENKPAPTKVISMKAIDDDGSEPHRRVTYEMKDNPNFQIDASTGMITTKTLLDREVT PKYDV  
EVTAKDGVNKESAILYITVVDQNDQPPVFAPKSYAISVPEDSPIGTSVLDIYATDADVGENAKITY  
FISKGDPEGKFSIVTSPVKGELVVNGKLDKETKSSYTLVETATDGKFSDTAVVTVTIQDVNDLPP  
VFSSPLYESRIQENTGPGAGVVMVTASDIDSPTISFSLDDRDKDYFQITPIRASGPGNVVVGDIR  
TGSKQLDREESPVKVFTVIANDGKHTAQAEIRVNLTVDVNDNAPRFPASPYIGYVEENKPSGTSV  
MYIQAVDDDDPLAGGNKLSYELTDSAGDKFSIDPLSGLIKTKVTFDREQTPNFKFVRVKATDA  
GNPRLSASVDGIIHVSDANDHKPKFTEKFYRGSVAENAPPGYSVLRVTATDEDVGPNAEFEFV

VVQGNDPHAFYIDPFNGTVLVSGILDYEKKKEYTITLTVADRGMPPLQGDETAYVVIEILDANDN  
APEFIPKIYNASVLEDVGARQPVLTVAVDRDSGPNGNFTFAIDPRSDPDDAFTIEPDPNNASIGI  
IRTRVPLDQEKTPSFHLKVATDAGGLQGEGEVRINVIDVNDNGPWFVPPFFVGGIKEGVSARQ  
FVNKLKAYDPDAFVKDQVITFSIYNGTVGENFKLDPVSVTNESVDLHSYGVDREAAPVWKIGIE  
AVDNGVGPQPKNFTYVYVDVLDVNDNAPKDGSLLIIVNAYDGNFTGGVIGKPYQDDDFDGDDE  
NTYELNSQSPGSYFRVNEGNGDITAAPMIPMGEYNLIRVTEKKDSPSTVTSSVRVLVRRIDKE  
AVDNGVAVEFTDMRKVGYFVGDYKGFEDVLASTLGVPTGDIKIFSVQKAHDNGLAVVVFFTV  
AAKDSYMPHWDVVSKLVDKPLESLGLKVSRLGMDECSKGNVGGQSVGVAKNILVRSSNFSV  
ASGDYGVKVPAPASSLTIVSIDILPKCLYEAVFPPEKRCKPHNPCLHGGKCYETVPDCPGFVCKC  
PTGYHGPLCEMTRTFYGNYSIWLPKLMYSLSDLEFEMTKTADGLLVYQGPREGANGLK  
DFIAVVLGRGVELFVSLGLDPVTVMKDKGPRLLDDGEWHTVQVLRNMKDIEIIDRCSTALLEHK  
PDGTVVENRKSCHVYGRMLGRSVFLDGFGLQIGGVSNNMDFPDIPYTGFKGCVRNKIDNH  
NLYDLKNPLKVNAPEGCQLASACPECKNDGYCEPLMARDSICVCPNGYSKGKCDGRGKASY  
YASSFTEYLVAARRRRREVPPPEIFNRFYTTLALQVKLDEDATNVVFLASNRMGTEFQRV  
DVKDSKIRYVLRGARMVLVSFPQLNVTDGVYHSVIVRRHGDYAIMQLDYSYVIGSLHSQRTL  
LDMSGGEIFSGGLPNITIVRIIEAIVENDGSAVISTNVRNDGDGYAADVGGVHVRNLQLSGPLNL  
VSRKRRASGTVSVLGDFFGGCIAGTSVNGANMESDPSIKVHRQNVLDGCPCLSNFCANGGTCV  
DAMPPYICAPGWTGPLCTIVVTAPPVGERGTPFMHPAVIAIILVVMLAIFIMGAVILKRRPEPVV  
VYADSTDTGHVHDNVRLYHDDGGGEEDNLGYDITKLMKYTYIETTIAPPSVAPSKASEDKISTS  
SDQPLLQGRPPDAVFGLTGKEPGPKMPKYMEGDDVGDFFITTRVKITDREVFLAVDELHIYRYE  
GDGDDVDDLSEIEPDEEDEEYEQEFDFLKQWGPKFDKLAKLYEDVDE

#### >NvCad2-CytoTail

KRRPEPVVYADSTDTGHVHDNVRLYHDDGGGEEDNLGYDITKLMKYTYIETTIAPPSVAPSKA  
SEDKISTSSDQPLLQGRPPDAVFGLTGKEPGPKMPKYMEGDDVGDFFITTRVKITDREVFLAVDE  
LHIYRYEGDDTDVDDLSEIEPDEEDEEYEQEFDFLKQWGPKFDKLAKLYEDVDE

#### >NvDachsous-FL

MLELKVVVDVNDYSPVFGNWSYTHVLESTPPDSNIIEVVATDVDSGENGRISYAFDSKVDTSKF  
GLRNGGKIFIKSKLDREDIEEYNLKVIA TDHGTPRRSSSADVKVIVDDVNDNPHFQQASYAFFV  
KENEPVATYLGAVSASDSDEGSNGHVTYRFDTQVAQFIVDKQTGKITT SQVLDREAKASYVFSI  
VATDGGSSPRVDKTQVTVIVRDVND CSPKFSKNKYSVTVNEDLPVGSSLLT LIATDDDQGGPN  
SDITYMIVAGPKAFSLNQVTGVLTLV SPLDRKVTHRHLHVASDKGENQSLETITYIEINVLVDN  
DNYPVFINETTFKTVPEKLPIGSVVA AVLAVSDSQGDNGKVRYKIVNGNTDGT FKINETTG VIST  
LRALDFEVTNRYVLRVSATDMGQKQKQTSYQLVTIYVEDANDNRPTFDKNPIITWIYENVPINTN  
VTTIKAHDDDSGLNSRIWYTIDSQSPRAHFKINSETGLIQTTHPIDREEISEYSLKVRATDQAFTE  
QDRLYSTATLKIIIQDLNDNAPKFVSRNLTYVMEDEPFNFQVTSITALDPDTGQGGNVEYRIVSP  
DTGKFSLDLKTGVLKLGSLDYEDVPQYTLHISATDLGSPPLTSYQLFNVVVDVNDNPPEFTRD  
LFIGTVSENEPTGTSVVKVTAYDRDSGSNAELTYSIPSGVEMDKFSIDKHSLIVTNSILDREKK  
DTYFLTVHATGVSYPFRVSSTSVRINVMRNDNPPKFISPVVTLKVPENSPARLIYTLTVQDLDY  
GNNTKVLYSIMSGNTDGAFTIGTSTGELSTTKLDRETKAFYQLSVQAKDITPPYYTAFANITIFIE  
DQNDNPPVFQQSLYSSTISELTPPGTSILNLTASDKDSGSNGNIVYTLSDNTYGVYSIDSRTGIV  
YSAARFETSIKQEYNFFCIAKDQGGQDPKMAIVPVRIKIEDKNNHAPQFTKTPYEVHIFPNTSASAL  
VTMVTATDADTDKSTNGKVTYRLDDSKNSTSLFVVESNTG SVRTSAGFSNPPQGRHALYIIAED  
HGSPPLRGYGIVQIVIGNIQDDPPRFLNQTPARVSIPENSKVGSYITTVRARASSDAQVTYSIISG  
NKGRAFYVDPFTGVISVASADALDYESTKNFRLHLVATPQGWVSLNGYMILDINVIDRNDNSPA  
FHPSNMLAQIAEDTGAFKPRFVVKVTATDVDSGTNGKVITYSIWTGNEAGVFTIDSTTGEITAKL  
LDRETTASFDLVIRGTD SGIPPKSTNCQVKVVVTDLNDNPPPLFDPLSEVNIREDTRTGAVVTSVV  
ATD TDKESRLTYTLKSASTPGMFSVGRFNGAVSLLKRLDYEKTNKYSLNIAVSDGLHSAEKTITI  
NVLDTNDNTPKFLNSSYQVTL SKTIPAGRAILRVSATDQDSGSNAQIKYSFPITNSDQIDYKIDAD  
TGVISARRTIDVRIRDSFIQIPVQAMDQGVPPQRALVYVRIITREPKFELPSYFGKVPENAMMGT

SVLTVRVTDNAAGLPLGRISYNIENSNYFRIGQRSGVISVNKPLDYETKRRFLLVVS AIDDTAPSK  
PVRVPVYINVSDVNDEKPVFGQSGYMAQWSEGIPVGTIVNVNSAADKDSGANGRVWF AIQSG  
DDKGSFAIDRKTGVIRTQRALDHETIKTHHVSVRATDEGSPPMHTDVSVTIRVLDLNDNPPVFR  
VPGPNDVQVLENLPLNSRLYEINATDRDSGANARLSFTVIGGTGQGLFLIDKFSGWLTTNITFDY  
ENTAVYQYSLTIKATDAGNPPLSSNITIIVNVADEDEYDPSFNRM DYKFDVPGNAKIGDFVGQVT  
ATDRDSGDQGRVFFVFYNPTSNALKMNATTGIISVNRTLNDGSSLETRARRSLDELLIGFEIGSS  
RSRMRRSAESQELRYTIRAYS GKIGSERFADVPASVLVDFTCPGCMVPTTGAREGDPITGTAL  
ALIVGLAVLAGVILLAFVVVLLFIYSHRKKRRRTRQNPPLRFDGSGFDEITVHPRTTGNANYVSAESI  
SLRAFFPAEYSPLSRNTDSNSTPSGTDASDAPGSSGSASSGRGSSEGFDEQPVAIVNADIGSF  
HSDNNAKTIVADSGIQDQDDDDQISQLTSDGSGILHVDTLNGSESKSDKTDKILARLEFQSVESM  
HVFGEEGGGEADGGHDVGNLLYAKLAEADADDESIVDGPRSYIDEGHDHPSYGGSLSSIIGSQ  
EELTGSYNWDYLLDWGPQFQPLAEVFLEIGRMKDEGGDKKEVTRNGSIPSSSRLRPNLSGIAT  
VDMLSSMSSLPRSPVSPSTQYSSPAFSPNFTPAITPLITRSPSVSPLDTGNVSPAYASRGVTP  
NGSRPTSTHIVKLNEDDAYS ELSHSPSISDNESNAEIDV

### >NvDachsous-CytoTail

KKRRRTRQNPPLRFDGSGFDEITVHPRTTGNANYVSAESISLRAFFPAEYSPLSRNTDSNSTPSGTD  
ASDAPGSSGSASSGRGSSEGFDEQPVAIVNADIGSFHSDNNAKTIVADSGIQDQDDDDQISQL  
TSDGSGILHVDTLNGSESKSDKTDKILARLEFQSVESMHVVFGEEGGGEADGGHDVGNLLYAK  
LAEADADDESIVDGPRSYIDEGHDHPSYGGSLSSIIGSQEELTGSYNWDYLLDWGPQFQPLAE  
VFLEIGRMKDEGGDKKEVTRNGSIPSSSRLRPNLSGIATVDMLSSMSSLPRSPVSPSTQYSSP  
AFSPNFTPAITPLITRSPSVSPLDTGNVSPAYASRGVTPNGSRPTSTHIVKLNEDDAYS ELSH  
PSISDNESNAEIDV

### >NvBetaCatenin

METHGMGMQGRDMNKDAQTAMWHQTYHDSGIMSGATTTAHSVKGDEDDDDYMKTTTHMSF  
EWEQSFNDHEMQAMNEQFVSTRSQIRIQAMFPETLEEGAQIPSTQFDSTSSTAVQRLAEP SL  
MLKQAVVNLINYQDDADLATRAIPELAKLLNDDDQVVVGQAAMMVHQLSRKDASRHAIMNSPQ  
MVAALVRALNNMSDVETTRCAAGTLHNL SHHRQGLLSIFKSGGIPALVKLLGSQVEAVVFYAITT  
LHNLLLHQEGAKMAVRLAGGLQKMVALLGRGNVKFLAIVTDCLHVLAYGNQESKLIILASGGPA  
ELVRIMKTYTYEKLLFTTSRVLKVLSVDTDNKMAIVEAGGMQALAMHLGHQSNRLVQNCLWTL  
RNLSDAATKEDGLDNLLQMLVQLLSSNDIQVVTCAAGILSNLTCNNPRNKQLVCRFGGIEALVR  
TCLQAGDREEITEPAVCALRHLTSRHADAEAAQNAVRIHYGLPVLVKLLHPPARWPLIKAVIGLM  
RNLALCPANHAPIREHGGLPRLVQLLMRANQDMQRRPGHNVIDGVRMDDIVEGTVGALHILA  
REAHNRAVIRSLHCISL FVQLLYSPNENIQRVAAGVLCELAQDKEGAEAEIENATQPLTDLLHS  
RNEGIAAYAAAVLFRMSEDKSQDYKKRLSVELTSSLFREDAPWQEMEGDLMDTYQMPGAYTY  
PQESMDYMQGPVDYGHYDFHGDPNMSHQPPGGHYQNPGGPLYDIDL

### >NvAlpha-Catenin-FL

MSRTAYQASGDVKVEHHKVKWDPKLTLEIRTHSVEKALEPLVHQVTTLVNPQPKKRSSKVGKSKN  
AHKLAQDIEDATVRLIKTGESISKDFPEIREEMIAACKDCRGAGDTMHISSEKFEADDPCTSTKRM  
TMVRAARALLSSVTRLLCVADMADVCRLLASLKLVERRLKDLEGASNTADLLNSFKNLGNDLM  
NLAQLSGRRQADLKDPLRRDEMAAARAILKDASKMLLSSSKAYVRHPEVASAKANRDFIISQMN  
EAVNSISGTAQATGPSEPHPLETSGALAKALDDFDSQVVM DPASYSERTRPSLEEQLEKIISG  
AARLADADCTRDNTRDRIIAECNAVRQALQDLLSEYMSHAGGKKA VPGGPLDEAIEKMCSKT  
SGLRGQLRKAVVDNVADS FLETSLPLMMIEAAQAGNEREVEECAKFLNHAAKLEE VATLACS  
MSNNPEKVKMVRIARHIRALAPQVVNAARTLAARPHSKVARENMDVFKDAWEKQVRVLTEA  
VDDVTNIDDFLAAAE AHILEDVNKCVQALQERDVESLDRTAGQIRGRTQRVDDVVTSEMENYQ  
KGPYTDNVHHAVRVMREEVIPHFAKAVEQSVGELNKGPN SKPDEPKFVDASKLVYEGIRDIRR  
AVMAGKRGARSPDMEDAAQALFAEAQAKAREQAAYDALKASGKVQIELRGEGGDDEGGMGT  
ASIRVNGVEYCPCKTGHNIVVLDPTGEVA AVKSFNTNAGEGADMARFLEELPDDHMLVATQD

LTGKEQGNNHAHLAAKALEALGAPKGSASPVYKSSFALAGCTGPTKRYWSTAEIRPRYQGPSIIA  
TIIPTPAAQAGQIKVAIKAEGADDPNSTGR TSMKVNGIERSPMQRGHNVVILDSAGNFIMATHFD  
TADSTKGDGAKMAKFLDNLPKERMVLMATQGTTGTAVNDKSSLYNLGAQGNVHPGFHASW  
AFAGYTGPEENVKAKTVTKARYEGPAVINEMITTPAAETELSLMQESEIEAASDYEPVSDYEGA  
PGHYSEYEDNEDDPTKSLSKRSARSLFRALPEAEKIKIEELTQGLMSERKALERELTKWDESGN  
EIIVLAKKMCMMMMMEMSDFTRGTGPLKTTMDVIEAAKRIARAGAKMKNLAQPIADRCPDSSSK  
NDLLAYLQRIALYSHQLTITSRVKADVQMISGELVVSGLDSATSLITSARNLMNAVILTVKASYVA  
STKHKSGSVKSPVVSWRMRAPEKKPLVHLEAQDERLADLQRADQVRQESPIQALSEFDTAER  
RRKPDFY

**>NvAlpha-Catenin-N-M-ABD**

MSRTAYQASGDVKVEHHKVKWDPKTL EIRTHSVEKALEPLVHQVTTLVNQPKKRSSKVGKSKN  
AHKLAQDIEDATVRLIKTGESISKDFPEIREEMIAACKDCRGAGDTMHISSEKFADDPCTSTKRM  
TMVRAARALLSSVTRLLCVADMADVCRLLASLKLVERRLKDLEGASNTADLLNSFKNLGNDLM  
NLAQLSGRRQADLKDPLRRDEMAAARAILKDASKMLLSSSKAYVRHPEVASAKANRDFIISQMN  
EAVNSISGTAQATGPSEPHPLETSGALAKALDDFDSQVVM DPASYSEKRTRPSLEEQLEKIISG  
AARLADADCTRDNTRDRIIAECNAVRQALQDLLSEYMSHAGGKKKAVPGGPLDEAIEKMCSKT  
SGLRGQLRKAVVDNVADSFL ETSPLLLMMIEAAQAGNEREVEECAKFLNHAAKLEEVATLACS  
MSNNPEKVKMVRIARHIRALAPQVVNAARTLAARPHSKVARENMDVFKDAWEKQVRVLTEA  
VDDVTNIDDFLAAA EAHILEDVNKCVQALQERDVESLDRTAGQIRGRTQRVDDVVTSEMENYQ  
KGPYTDNVHHA VRVMREEVIPHFAKAVEQSVGELNKGPN SKPDEPKFVDASKLVYEGIRDIRR  
AVMNEDDPTKSLSKRSARSLFRALPEAEKIKIEELTQGLMSERKALERELTKWDESGNEIIVLAK  
KMCMMMMMEMSDFTRGTGPLKTTMDVIEAAKRIARAGAKMKNLAQPIADRCPDSSSKNDLLAYL  
QRIALYSHQLTITSRVKADVQMISGELVVSGLDSATSLITSARNLMNAVILTVKASYVASTKHKSG  
SVKSPVVSWRMRAPEKKPLVHLEAQDERLADLQRADQVRQESPIQALSEFDTAERRR KPDFY

**>NvAlpha-Catenin-Insert**

AGKRGARSPDMEDAAQALFAEAQAKAREQAAYDALKASGKVQIELRGEGGDDEGGMG T ASIR  
VNGVEYCPCKTGHNIVVLDPTGEVA AVKSFNTNAGEGADMARFLEELPDDHMLVATQDLTG  
KEQGNNHAHLAAKALEALGAPKGSASPVYKSSFALAGCTGPTKRYWSTAEIRPRYQGPSIIATIIP  
TPAAQAGQIKVAIKAEGADDPNSTGR TSMKVNGIERSPMQRGHNVVILDSAGNFIMATHFD TAD  
STKGDGAKMAKFLDNLPKERMVLMATQGTTGTAVNDKSSLYNLGAQGNVHPGFHASWAF A  
GYTGPEENVKAKTVTKARYEGPAVINEMITTPAAETELSLMQESEIEAASDYEPVSDYEGAPG  
HYSEYED