

Additional File 12.

Arrangement of the leucine zipper in gnathostome Dact1, 2 and 3, and in cyclostome and *Branchiostoma* dact proteins.

L234567L234567L234567L234567L234567L234567L23	L for L-zipper	gene
LEENI LLL LRKQ INCL RRRDAG LLNQ LQ ELDKQ ISD LR LDVEKTS	6	Hs DACT1
LEAALAA LQEQ LS SR LRQQD IGL K THLDQ L DLQ ISK LQL DVGTAS	6	Hs DACT2
L234567L234567L2...345...67L234567L234567L234567L234567L	L for L-zipper	gene
(gap) LEE Q LEALP...GLV...WD L G QQ L GD LS LE SG LE QESGRSSG	5	Hs DACT3
PEE Q LDALP...GLM...WE L EQ QL L LL RL NPEKTPGEAAETD SWPSS	3	Ac Dact3
LQGG ED LD...R QL ...WE L ER Q L GE LL RL RAENDNEN	3	Cpb Dact3
L234567L234567L234567L2...67L234567L234567L234567L234567L	L for L-zipper	gene
GARHFTEEST L K RQ L NG LKSHY L GL I ...SQ L EQ Q V GE L Q LEREPAYGDIVET L DSQPSSG	3+2	Lc Dact3
PVSRAGD LL LR RQ IN SL KGTPWALM...AS L EQ Q V EL RVDAETAYAEPPSDVGD SRPSSG	3+2	Lo dact3
EQE QL LR RQ IN RL Q GAP S LLM ... L L Q Q L SE MRVDS GL ACEQ NTEED L ES PSGSSSG	3	Dr dact3a
QES LT LR RQ LRAL Q GS PWGLM ...Q L EQ Q V GE L RL DDAEGCGGAPGEPGDT WPSSG	3+2	Tn dact3a
QQN LT LR RQ LSAL H SS PWGF M...Q L ER Q V GE L RI DTDDGCCDGA Q GTGDS RPSSG	2+2	Ol dact3a
QEN LT LR RQ LSAL Q SS PWGLM ...Q L EQ Q V GE L RI DAADDCCDGA Q ETGNS RPSSG	3+2	On dact3a
EQQSPRGTPESCWS LM ...K LL QH Q V GE L K VDTENSSAAAVENCTEDGERAGAG	2	Dr dact3b
RSAL V SL A HL Q CASWYFD...PAMK Q Q V A E LS L K T EDHST	-	Tn dact3b
RQIS R F Q LS H VDSR...SS L EE H V A EL K IK T EVK S VNSD E ED R PL T S	2	Ol dact3b
DAPNGKESY G LS S L Q FT P W L S...AS L EE Q V A EL K V D CEV K SSD S T N L D AS Q V I S G	2+2	On dact3b
L234567L234567L23L234567L234567L234567L234567L34567L	L for L-zipper	gene
LGG R D W LY ALL V GP HLAR Q HDPACG T AGSV QL LE Q R F CE L GR GE GGPPAAAG	2	Lj dactA
L ER DFVES L RAM KE Q IG CL P QR D L G LL S RL R HL N EQ F SE L K M DM D R A A	2+4	Lj dactB
Q CG L G K P CA L ER PL SE L RV DT D GT	?+2	Lj dactC
A LL AVGRD LE L I KE Q	3+?	Lj dactC/D
L234567L234567L234567L234567L234567L234567L234567L234567L	L for L-zipper	gene
P GC IN S S I DK L RNA V D HL K R TDS D L V GA L H T L N T Q I L Q L K L AEAA E T D GEN D L M SAS C RS M SS S	5	Bf1 dact
exon1-encoded	exon2-encoded	

Amino acids are displayed using the 1-letter code. A template with L correctly placed for a L-zipper is shown above each set of sequences. Abbreviations: see Additional File 1.

Green highlighter, end of exon 1 - encoded sequences

orange **L**, L encoded by 1st exon

red **L**, L encoded by 2nd exon

L contributing to a continuous or 1st part of a bipartite L zipper are highlighted in **blue**, L contributing to the 2nd part of a L zipper are highlighted in **pink**.

In gnathostome Dact1 and Dact2 proteins, the exon1-2 splice generates a continuous 6x leucine (L-) zipper (top).

In coelacanth (Lc) and actinopterygian dact3 proteins, 3 amino acids having been lost, leading to a bipartite motif. In most teleost dact3b sequences, conversion of L into other amino acids further reduced the L-zipper. In tetrapod Dact3 proteins, additional four amino acids have been shed, restoring a reduced but continuous L-zipper.

In cyclostomes, dact A carries a small, exon 2 encoded L-zipper, and dact B a bipartite L-zipper. For dact C and D, exon 1 cannot currently be allocated, hence the state of the L-zipper is unclear.

In Branchiostoma dact, a continuous 5L zipper is found.