

Additional file 3: Tables S2 and S3

Table S2: Select genomic alignments of periostin exon 21V22 and exon 17 produced by VISTA

In the representation below, highly conserved regions were background highlighted by VISTA [63], blue for coding sequence, pink otherwise. Coding sequence for the respective exon was otherwise manually rendered in blue font. Intronic splice sites are highlighted in green, relevant stop codons in red, and the codon corresponding to the central chicken exon21V22 proline in yellow, if conserved, or magenta, if mutated. Translations of exon sequences (bold) are given below the alignment blocks, in red font where frameshifted relative to a functional exon (for exon21V22).

Table S2A: Exon 21V22

Top: chicken [>Gg_galGal3_dna:30581-30931 (+)] Bottom: zebra finch [>Tg_taeGut1_dna _RevComp_ :29612-29959 (+)]	Top: chicken [>Gg_galGal3_dna:30581-30931 (+)] Bottom: opossum [>Md_monDom4_dna _RevComp_ :11489-11808 (-)]
000030581 AAGACCACAGCATGATTACTGTGACCTGCATACATCTACACTCCCCAAA-TGACATTCTT >>>>>>>> 000029612 -----ATAGCATG-----GTCGCTGCA-ACACCTA--CTCCCCAAAATGACATTGTT	000030581 AAG--ACCACAGCA-----TGATTACTG---TGACCTGCATACATCTACACT >>>>>>>> 000011808 GAATTACCAAAGCACATACACCTTTTTTGAGTAATGTTCTATCTCACTATCACACTCGCC
000030640 TCCACTGAAGATTCT-----ATGCTATCCAGATTTAACTCATTGTGTTTT >>>>>>>> 000029657 TCCTCTGAGGGCTCCTTGCATATGGAAAAATGCTATGCCAGCTTTAACTCATTGTGTTTT	000030623 CCCCCAATGACATTCTTCCACT-----GAAGATTTCTATGCTATCCAGATTTAAC- >>>>>>>> 000011748 TCTAAATGCTCCCAATTCCATCATCCAAGGAAATGTTCTCTCCAAAATTATATTGAATT
000030687 AATGCTTATCATAGCTGGAAGTGAAGTACACCAAGGTTACTAAAGTAATTGAGGGAGAACC >>>>>>>> 000029717 GATGCTTACCATAGCCGGAAGTGAAGTACACCAAGGTTACTAAAGTAATTGAGGGAGAGCC	000030675 -----TCATTTGTTTTTAAATGCTTATCATAGCTGGAAGTGAAGTACACCAAGGT >>>>>>>> 000011688 GTACAACTGTGATTACTTGTCTTCTAATGCTTATCTTAGCTGGAAGTGAAGTACACCAAGGT
000030747 ACAGATTATCGAGAGAGAAATCAAGAAAGTCCATTGGAAGGTTAGTTTGTCTATAAATC >>>>>>>> 000029777 ACAGATTATCGAGAGAGAAATCAAGAAAGTTCATCTGGAAGGTAGTTTTTCAA-AAATT	000030723 TACTAAAGTAATTGAGGGAGAACCACAGATTATCGAGAGAGAAATCAAGAAAGTCCATT >>>>>>>> 000011628 CACTAAAGTAATTGAGAGTGAAACACAGATTATCGAAACGGAAATCAAGAAAGTCTCCA
000030807 CAATATCACTAAGGCCTCCTCTGTCTGAAGTAATCATTCTAGGTGCCAATTTATAGTATT >>>>>>>> 000029836 AAGTATCACTAAGACTTGCTTTGTCCAAAGTGATCATTCCAGGTGAGGTTTTATCATATC	000030783 GGAAGGTTAGTTTGTCTATAAATCCAATATCACTAAGGCCTCCTCTGTCTGAAGTAATCA >>>>>>>> 000011568 GGCAGGTAGTTTGTCTATTCTCTAACAGCCCTAAGGTTCC-----
000030867 TATTCACAAAAGTTACTTAGGTCTGAAGTCAATATTTAGCAAGAGTTTTATGTTTGATT >>>>>>>> 000029896 TATTCATTAATAATTA-TTAGGTCTGGAGCCAGCACTTTAGCAAGAGTTTTATAATTGTTT	000030843 TTCTAGGTGCCAATTTATAGTATTTATTACAAAAGTTACTTAGGTCTGAAGTCAATATT >>>>>>>> 000011526 -----TATCTTCACTTGATGTCA-----
hoersch@luria:~/bin/Tools/translateDNA.pl -ks -frames rna -minlength 5 >Tg_ex21V22 (len=87) CCGGAAGTGAAGTACACCAAGGTTACTAAAGTAATTGAGGGAGAGCCACAGATTATCGAGAGAGAAATCAAGAAAGT TCATCTGGAAG	hoersch@luria:~/bin/Tools/translateDNA.pl -ks -frames rna -minlength 5 >Md_ex21V22 (len=87) CTGGAAGTGAAGTACACCAAGGTTACTAAAGTAATTGAGAGTGAACACAGATTATCGAAACGGAAATCAAGAAAGT CCTCCAGGCAG
>Tg_ex21V22 F3_1 [3-86] GTEYTKVTKVIEGEQIIEREIKKVHLE GTEYTKVTKVIEGEQIIEREIKKVHLE (Gg)	>Md_ex21V22 F3_1 [3-86] GTEYTKVTKVIESEQIIETEIKKVLQA GTEYTKVTKVIEGEQIIEREIKKVHLE (Gg)

Exon 21V22 continued

```
Top: chicken [>Gg galGal3_dna:30581-30931 (+)]
Bottom: M. lucifugus [>little.bat GeneScaffold_2401|_RevComp_|:245049-245249 (+)]
```

```
000030581  AAGACCACAGCATGATTACTGTGACCTGCATACATCTACACTCCCAAAATGACATTCTTT
>>>>>>>>      |      | | | | | | | | | | | | | | | | | | | | | |
000245049  CGGGTACTAATATTATGATTTT-----TCACTAAAATACATT----
```

```
000030641  CCACTGAAGATTCT-----ATGCTATCCCAGATTAACTCATTGTTTTTAA
>>>>>>>>      ||||| ||           ||| ||| ||| ||| ||| ||| ||| |||
000245086  -----AGATTCCTTAATAAAAAAAAAATGTTCTCACAAATGCATAAA---GTTTTTCA
```

```
000030689 TGCTTATCATAGCTGGAAGTACACCAAGGTTACTAAAGTAATTGAGGGAGAACCAC
>>>>>>> | ||||| ||||| ||||| ||||| ||||| ||||| ||||| ||||| |||||
000245136 TTCTTATCTTAGGCCAACTGCATTACCAAAAGTACTAAAGTAATTAAGGAAGAAATATC
```

```
000030749  AGATTATCGAGAGAGAAATCAAGAAAGTCCATTGGAAGGTTAGTTTGTCTATAAAATCCA
>>>>>>>> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
000245196  AAACATGGAAGAAAGGAACCAAAAGGTCA---TGAAGGTT-----
```

```
000030809  ATATCACTAAGGCCTCCTCTGTCTGAAGTAATCATTCTAGGTGCCAATTTATAGTATTTA
>>>>>>>
000000000  -----
```

```
000030869 TTCACAAAAGTTACTTAGGTCTGAAGTCAATATTTTAGCAAGAGTTTATGTTGATTTG
>>>>>>> || |||| | |||
000245235 TTGACAAATCTGACT-----
```

```
hoersch@luria:~/bin/Tools/translatedDNA.pl -ks -frames rna
>little.bat_ex21V22 (len=84)
GCCAACTGCATTTACCAAAAGTACTAAAGTAATTAAGGAAGAATATCAAATATGGAGAAAGGAACCAAAAAGGT
CATGGAAG
```

```
>little.bat_ex21V22|F3_1|[3-83]
QTAFTKSTKVIKEEYQTMEKGTKKV-ME
|  |  |  |  |  |  |  |  |  |
GTEYTKVTKVIEGEPQIIEREIKKVHLE (Gg)
```

```
Top: chicken [>Gg galGal3_dna:30581-30931 (+)]
Botton: dog [>Cf canFam2_dna:38906-39134 (+)]
```

```
000030581 AAGACCACAGCATGATTACTGTGACCTGCATACATCTACACTCCCAAATGACATTCTTT
>>>>>>>          ||| | ||
000038906 -----ACATTTA-----
```

[illegible]

000030701 CTGGAAGTCTGAGTACACCAAGGTTACTAAAGTAATTGAGGGAGAACCACAGATTATCGAGA
>>>>>>> | ||| ||||| ||||| ||||| ||||| ||||| ||||| ||||| ||||| |||||
000038919 GTAAAGCTATATTTACTGAACCTACTAAAGTA-TTAAGGGAGAATATCAACCTATAGAGA

```
000030761 GAGAAATCAAGAA--AGTCCATTGGAAGGTTAGTTTGCTATAAATC---CAATATCAC
>>>>>>> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
000038978 AAGGAACAAAAAGAAGTCATTTTAGATGGTT-----TTGACAATCTGCCAATATAGC
```

```
000030816 TAAGGCCCTCCTCTGTCTGAAGTAATCATTCTAGGTGCCAATTTATAGTATTTATTCACAA
>>>>>>>>      ||| ||| | |||      || || || ||| | |
000039032 ATGTAAAGCCTGTGTAGGGAATA-----GGGATCAGCTTGTAGGTCTGGCTTT---
```

```
000030876 AAGTTACTTAGGTCTGAAGTCAA--TATTTTAGCAAG---AGTTTTATGTTTGATTGGA
>>>>>>> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
000039080 ---TGATTGGGCTCTAATTCAAACACTTAAGTAAGTTAATTCTTCTACTTGGTTTC--
```

```
hoersch@luria:~/bin/Tools/translateDNA.pl -ks -frames rna
>Cf_ex21V22 (len=88)
GTAAAGCTATATTCTAGCAACCTACTAAAGTATTAAGGGAGAATATCAACCTATAGAGAAAGGAACAAAAAGAAG
TCATTTTAGATG
>Cf_ex21V22|F3_1|[3-56]
KAIFTEPTKVLRENINL
```

Top: chicken [>Gg galGal3_dna:30581-30931 (+)]
Bottom: human [>Hs hg18_dna:43690-44217 (+)]

```
000030893  AGTCAATATTTTAGCAAGAGTTTTATGTTTGATTGGAA
>>>>>>>  | ||| || |||| || | |||
000044194  -GCCAACAT-----AAGAGGTTAAGATTG-----
```

```
000030856 TTTATAGTATTT-----ATTACAAAAGTTACTTAGGTCTGAAGTC
>>>>>>> || || || | || | || || | | || || |
000027613 TTCCTAACACTTTCATGTTGAGATATCTGAGAGCCAGGAAAGTAAACTCGGGCT----C
```

```
>Mm_exon21V22|F3_1|[3-98]
ALASFSGLHRYIYQMHHINSHPCTHIHTHNK
>Mm_exon21V22|F2_1|[2-91]
GSGILFWSPQVLHTNDAYKLTPMHTHTYT
>Mm_exon21V22|F1_1|[1-48]
GLWHPFLVSTGTTYK
```

Table S2B: Exon 17

```

Top: human [>Hs hg18_dna:36101-36400 (+)]
Bottom: mouse [>Mm mm9_dna:20236-20526 (+)]

000036101 ATCCTGTGCCTTAGTATCCTACAGAGACAAAAAGAAAAGGAAAAAAAAAACCTTT
>>>>>>> | | | ||| | | ||||| ||||| | |||
000020236 AGCTGATAAATTAACGCCGTGATAGAGACAAAAGGACAA-----CTTT

000036161 GTTCAGGTT---TTTATGTAAATATTTTTCATGTTCCACTTTCTATACTTTTCAGCAACTA
>>>>>>> | | | ||| | | ||||| | ||||| ||||| ||||| ||||| |||||
000020280 ATCCGAGTTGTTTCTAGTTAAACTTCGTTTCATGCTCCACTTTCTATGTTTTTCAGCAACTA

000036218 AAATTATAACCAAAGTTGTGGAACCAAAAATTAAAGTGATTGAAGGCAGTCTTCAGCCTA
>>>>>>> ||||||| ||||||| ||||||| ||||||| ||||||| ||||||| |||||||
000020340 AAATTATAACCAAAGTCGTGGAACCAAAAATTAAAGTCATTCAAGGCAGTCTTCAGCCTA

000036278 TTATCAAACTGAAGGTAAAAATCAATGTTATACATGGTTCCTT---TTATAGTAAAAAC
>>>>>>> ||||||| ||||||| ||| | | ||||||| ||| | | |||||
000020400 TTATCAAAACGGAAGGTAAAG-CCAACACTCTCCATGGTTCCTTACATTCTGAAAAAAC

000036335 ATCTGTAAAAAT--ACTGATCTCTATGAATGTATCTACATTCTTTTAAAACTAACATGT
>>>>>>> || | ||| ||| ||||| ||||| | ||||||| ||||| |||||
000020459 ATATCATGTAATCAACTCATCTCTCTGAATATACCTACATTCTTTTGAAACTAACATGC

hoersch@luria:~/bin/Tools/translateDNA.pl -ks -frames rna -minlength 5
>Mm_ex17 (len=81)
CAACTAAAATTATAACCAAAGTCGTGGAACCAAAAATTAAAGTCATTCAAGGCAGTCTTCAGCCTATTATCAAAAC
GGAAG

>Mm_ex17|F3_1|[3-80] (len=81)
TKIITKVVEPKIKVIEGSLQPIIKTE
||||| ||||| ||||| |||||
TKIITKVVEPKIKVIEGSLQPIIKTE (Hs)

Top: human [>Hs hg18_dna:36101-36400 (+)]
Bottom: chicken [>Gg galGal3_dna:23299-23440 (+)]

000036101 ATCCTGTGCCTTAGTATCCTACAGAGACAAAAAGAAAAGGAAAAAAAAAACCTTT
>>>>>>> || | ||| ||| | | ||| | | ||| |
000023299 GACCAGATGATTACCATC-----AGGAATTATAATTTC

000036161 GTTCAGGTTTTTATGTAAATATTTTTCATGTTCCACTTTCTATACTTTTCAGCAACTAAA
>>>>>>> || || | ||| | ||| ||||| ||||| ||||| |||||
000023333 ATTAAGAATG-----GAATGTGCTTTATACTCCATTTTCTATACTTTTCAG-----

000036221 TTATAACCAAAGTTGTGGAACCAAAAATTAAAGTGATTGAAGGCAGTCTTCAGCCTATTA
>>>>>>> ||||||| ||||||| ||| | ||||||| |
000023378 -----AAATTAACATAAATTGAAAGCAACGTACAGCCTATCA

000036281 TCAAACTGAAGGTAAAAATCAATGTTATACATGGTTCCTTTTATAGTAAAAACATCTGT
>>>>>>> ||| || ||||| ||||| ||| ||||
000023414 TCAGAAAGGAAGGTAAA-----TGGGGCCTTC-----

000036341 AAAAATACTGATCTCTATGAATGTATCTACATTCTTTTAAAACTAACATGTTAAATGTT
>>>>>>>
000000000 -----

hoersch@luria:~/bin/Tools/translateDNA.pl -ks -frames rna -minlength 5
>Gg_ex17 (len=48)
AAATTAACATAAATTGAAAGCAACGTACAGCCTATCATCAGAAAGGAAG

>Gg_ex17|F3_1|[3-47]
.....INIIESNVQPIIRKE
| || |||||
TKIITKVVEPKIKVIEGSLQPIIKTE (Hs)

```

Table S3: *X. tropicalis* transcript sequences covering the periostin C-terminal region.

For all Genbank transcript sequences found in the UCSC genome browser (xenTro2/Aug2005), the table lists accession numbers, library information, and exon structure with respect to the cluster of exons 19A – 19H and to exons 21 and 21V22. With one exception (BC154911), ESTs from embryonic and metamorphic frogs show presence of at least a subset of exons 19A – H (yellow), while ESTs from adult frogs do not (blue). No such obvious correlation is apparent for exons 21 and 21V22, with exon 21V22 occurring in both developing and adult frogs. Exon 21 is observed in developing frogs only, but is not always present.

mRNA/EST accession	Library Info	Exon status re. the exon 19A-H cluster ¹	Exon status re. exons 21, 21V22 ¹
BC154911	NICHD_XGC_tropTail_m / tail, tga strain, metamorphic	19-20	20-22
DT424643	NIH_XGC_tropSkil / Skin / Adult	19-20	n/a
CR412272	XGC-tailbud / tailbud (stage 28-30)	19-A-B-C^	n/a
CF345375	NICHD_XGC_Swb1N / whole body / 10 month old male	19-20	20-22
DR891672	NIH_XGC_tropTad5 / whole embryo / Tadpole (st. 36-41)	19-A-B-C-D^	n/a
BX739418	XGC-tadpole / tadpole (stage 35-40) /	19-A-B-D-E-F-20	n/a
CX380890	NIH_XGC_tropTad5 / whole embryo / Tadpole (st. 36-41)	19-A-B-C-D-E-F^	n/a
CX409969	NIH_XGC_tropTad5 / whole embryo / Tadpole (st. 36-41)	19-A-20	20-21-22
DT430191	NIH_XGC_tropSkil / Skin / Adult	19-20	20-21V22-22
DT425263	NIH_XGC_tropSkil / Skin / Adult	19-20	20-22
BX706184	XGC-tadpole / tadpole (stage 35-40)	^A-B-D-E-F-G-H-20	20-21-22
CX374357	NIH_XGC_tropTad5 / whole embryo / Tadpole (st. 36-41)	^A-B-C-D-E-F-G-H-20	na
CX320728	NIH_XGC_tropTad5 / whole embryo / Tadpole (st. 36-41)	^B-D-E-F-G-H-20	20-21-22
EL700850	NICHD_XGC_tropLimb_m / Limb / Metamorphic	^D-E-F-G-H-20	20-21-21V22-22
BX739786	XGC-tadpole / tadpole (stage 35-40)	^E-F-G-H-20	20-21-22
BX716782	XGC-tadpole / tadpole (stage 35-40)	^F-G-H-20	20-21-22
BX718380	XGC-tadpole / tadpole (stage 35-40)	^G-H-20	20-21-22
EL712494	NICHD_XGC_tropLimb_m / Limb / Metamorphic	^G-H-20	20-21-22
EL846058	NICHD_XGC_trop_25 / whole / Stage 25	^G-H-20	20-21-22
BX719218	XGC-tadpole / tadpole (stage 35-40)	^G-H-20	20-21-22
EL701127	NICHD_XGC_tropLimb_m / Limb / Metamorphic	^G-20	20-21-22
BX740939	XGC-tadpole / tadpole (stage 35-40)	^G-H-20	20-21-22
CR434701	XGC-tailbud / tailbud (stage 28-30)	^G-H-20	20-21-22
EL710444	NICHD_XGC_tropLimb_m / Limb / Metamorphic	^G-H-20	20-21V22-22
BX709491	XGC-tadpole / tadpole (stage 35-40)	^H-20	20-21-22
EL712816	NICHD_XGC_tropLimb_m / Limb / Metamorphic	^H-20	20-21V22-22
BX721294	XGC-tadpole / tadpole (stage 35-40)	^H-20	20-21-22
CX336698	NIH_XGC_tropTad5 / whole embryo / Tadpole (st. 36-41)	^H-20	20-21-22
CX317169	NIH_XGC_tropTad5 / whole embryo / Tadpole (st. 36-41)	^H-20	20-21-22
CX344015	NIH_XGC_tropTad5 / whole embryo / Tadpole (st. 36-41)	n/a	^21V22-22
CF589667	NICHD_XGC_Swb1N / whole body / 10 month old male	n/a	^21V22-22
CX318515	NIH_XGC_tropTad5 / whole embryo / Tadpole (st. 36-41)	n/a	20-21-22
CX346636	NIH_XGC_tropTad5 / whole embryo / Tadpole (st. 36-41)	n/a	20-21-22
CF378276	NICHD_XGC_Swb1N / whole body / 10 month old male	n/a	20-22
CF377029	NICHD_XGC_Swb1N / whole body / 10 month old male	n/a	20-21V22-22
DT431619	NIH_XGC_tropSkil / Skin / Adult	n/a	20-21V22-22
CX328322	NIH_XGC_tropTad5 / whole embryo / Tadpole (st. 36-41)	n/a	20-21-21V22-22
CX395892	NIH_XGC_tropTad5 / whole embryo / Tadpole (st. 36-41)	n/a	20-21-22
DT431618	NIH_XGC_tropSkil / Skin / Adult	n/a	^21V22-22

¹ A '^' symbol identifies exons partially covered.