

Supporting Information

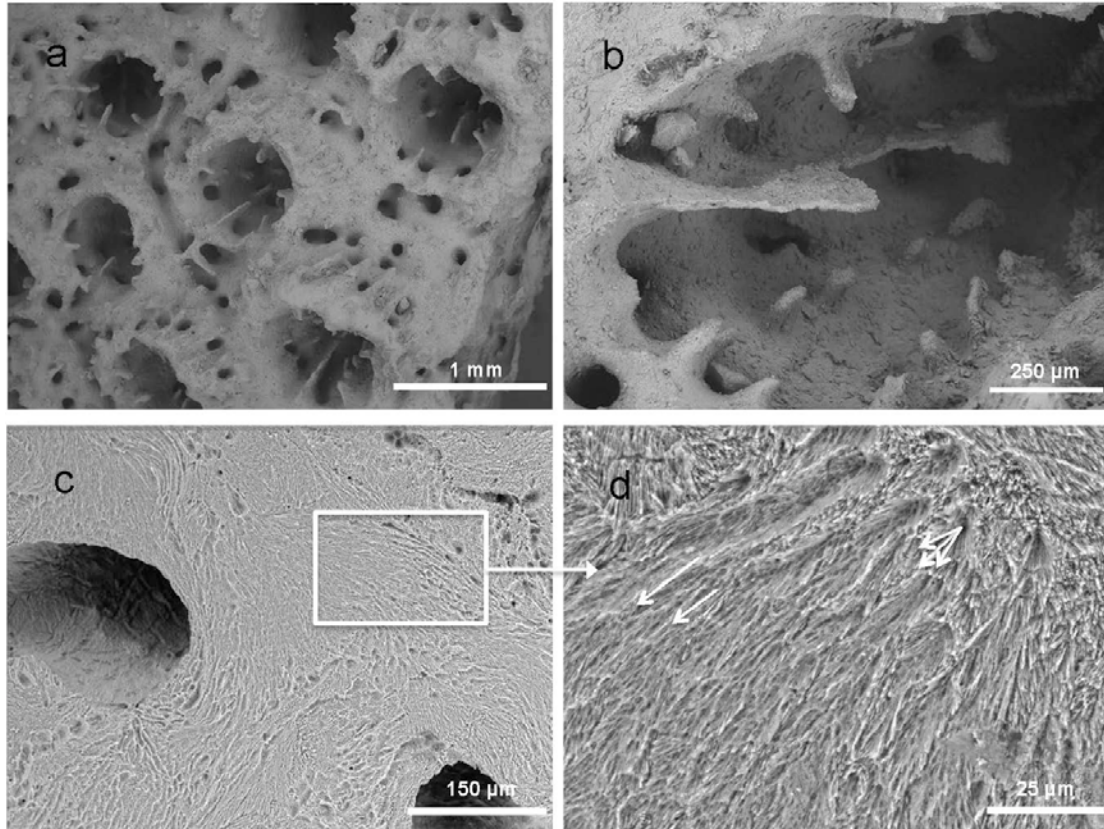


Figure S1 - **SEM images from skeleton macro and microstructure.** (A) Radial corallites arrangement with separate walls and internal septa, (B) Closer view into corallites showing different vestigial and complete septa. Polished and EDTA-etched sections from a longitudinal cut: (C) Fibrous microstructure, (D) Close-up showing evidence of crystalline fibers. The skeleton of *Acropora millepora* is composed exclusively of aragonite. Macroscopic views (Figure 1A) of the skeleton surface reveal cup-like rounded corallites separated by distinct walls and the highly porous coenosteum. The radial corallites are evenly distributed and of approximately equal size (Figure 1A), with complete and incomplete septa (Figure 1B). In longitudinal sections (Figure 1C), a rather uniform microstructure is evident, but with unevenly distributed porosity. At higher magnification (Figure 1D), individual needle-like fibers, constituting the basic units of the coral microstructure (Nothdurft and Webb 2006), are observed. These exhibit a discrete size with trabecular orientation (white arrows on Figure 1D) (Wendt 1990).

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SAARP1/1-386 1 MAFVS CFHRLLLFLCLALFMAAECRPELNNKQVDSDETI SDDDV SARVQPNGGKIMIVR-DNDYDASDD--- 68
SAARP2/1-391 1 ----HCLPLE----SIALFLV--CLADEERKDDNTKTIRGKNVSAKIFGRSGKIMIVRVDDDEDTKDVTVD 62

SAARP1/1-386 69 --NNDNDNDDNNDNND-----NNDNDNDVDNDNDNDDDFDSDNDMLSFELDSI 117
SAARP2/1-391 63 RVS DKKDNVDDRRDNDREESIDKKTVDKKNPIDDKDDKDDKDDVDNDNDK-DDDFRDDDELDFELDEL 133

SAARP1/1-386 118 EEKDS DGNDV GSTEGHSV ESEFDRP FSLSSVDRNSNALGVAAINVNLSLKLEDSDADVDIMLYLFR EDGTIS 189
SAARP2/1-391 134 KEVDADGDEV D--DKHSVD SFDDVEFQLSHVRTASRFKGLAVISVNLSTHLQNNKANVGI MVYLFLEPGSVT 203

SAARP1/1-386 190 FGNETF DVQAGTVKFNIKISNWFCDGSAQDCSEAKAGEYLDVNIKFKSKDTPIEVTDEERK SQNKPAVCKD 261
SAARP2/1-391 204 FGNETFNVKAGTVKFNIEVNNWFCEGSSPACSSRKEGKFLDLTMKIKSKDSPTVEDEDDRKK----AVCND 271

SAARP1/1-386 262 KDTPTDSDPDDSSDNAN GDDDDDDDCPHIYNMGGDSEMLLNRGVM-NGDTYTAMPFGFPKVEIEDGEKI 332
SAARP2/1-391 272 KDDNDDDDVDVDD-----DDDDDDDDDCPIIYSMGGDSEMLLNRGVM LDDDEYTAMPVGFPKLEIEDETRKF 337

SAARP1/1-386 333 KFRVPKFDDNVNIDPSVTPG-RVPKNASPSPALCLKIHILFIALLA VTLFINSW 386
SAARP2/1-391 338 VFRIPKFKSRALVDP SVTPGERTPKLAISAGTW-LQNFLLVTVLVQIAVMEVFH- 390
    
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Figure S2 - Pairwise sequence alignment of the secreted acidic Asp-rich proteins: SAARPs 1 and 2 (UniprotKB Ac. Nos.: B3EWY6, B3EWY8, respectively). Identical residues are dyed in blue. Sequence alignments were performed and visualized with Jalview (Waterhouse *et al.* 2009).

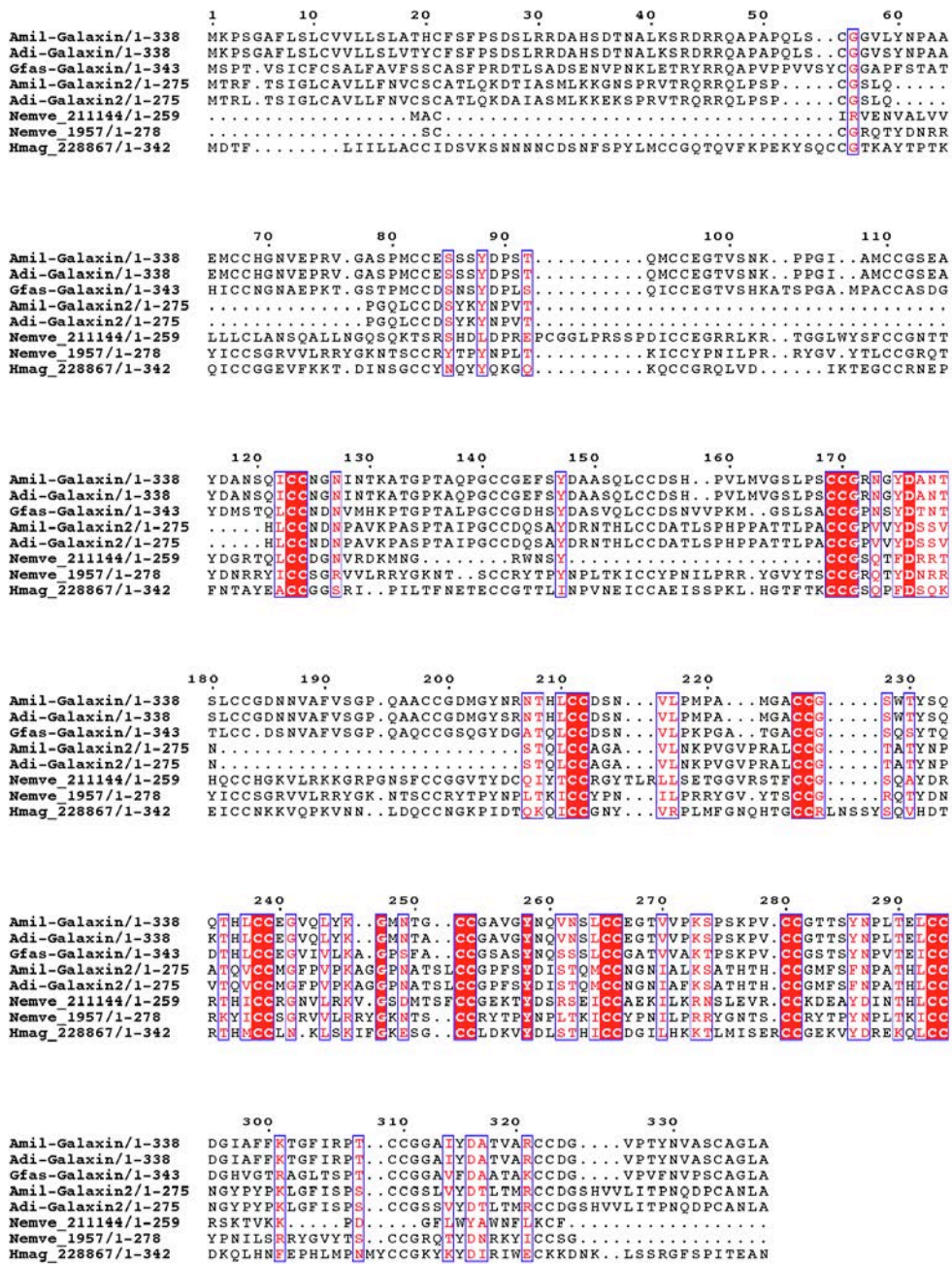


Figure S6 - Multiple sequence alignment showing the sequence similarities between galaxins from *Acropora millepora* (Amil), *Acropora digitifera* (Adi), *Galaxea fascicularis* (Gfas) and the detected homologues from *Nematostella vectensis* (Nemve) and *Hydra magnipapillata* (Hmag). Amil-Galaxin (Uniprot Ac. No.: D9IQ16), and Gfas-Galaxin (Uniprot Ac. No.: Q8I6S1) correspond to the same form of galaxin and are grouped together with Adi-Galaxin1 (predicted from Adi transcriptome: EST_assem_14006). Subsequently the Amil-Galaxin 2 (Uniprot Ac. No.: B8UU51) and Adi-Galaxin 2 (predicted from Adi transcriptome: EST_assem_8935) are shorter lacking the segments in the positions 60-77, 93-120 and 181-206 of the alignment. Finally the distantly related sequences from *Nematostella* (Nemve_211144 (GI:156374951); Nemve_1957 (GI:156377965)) and *Hydra* (GI:221103149) show the conservation of nine double-Cys residues and the presence of other identical residues dyed in red (A). Regions with high frequency of semi-conserved substitutions are also indicated (A). Sequence alignments were performed with MUSCLE (Edgar 2004) and visualized with Esript 2.2 (Gouet et al. 2000).

SOMP_similar_to_cephalotoxin/1-473 1 RWLGWQK[CW]I[SCLFSS]ISSGLD[PG]--EQA[VTT]LD[TAQFA]IA[NEEY]AQAKA[E]--EALKV[S]TQARSAD
 SE-cephalotoxin/1-1052 1 VIL[LFAL]L[WAANAA]P[E]IHTTR[NVPE]E[IKRPN]S[TE]IETPA[V]K[Q]E[TPS]I[FLLT]L[V]EA[EADV]S[ST]L[ETMDK]

SOMP_similar_to_cephalotoxin/1-473 70 LLRRQT-E[LA]K[FGS]K[VG]K[AL]K[VQAA]S[A]IA[S]FV[TF]F[MP]S[E]L[DV]I[TS]I[NER]F[NE]VNA[KLD]R[I]D[KLDE]M[E]K[S]
 SE-cephalotoxin/1-1052 74 RNKNSAK[LS]K[IGNMKS]L[S]L[S]V[FGFL]L[S]L[S]V[VT]T[S]D[LQV]I[SDM]----F[TCV]N[KL]D[IK]D[KL]D[LM]S

SOMP_similar_to_cephalotoxin/1-473 142 [KA]TAFNV[FL]SAW[KW]EYK[VG]AKK[KL]S[DI]R[KA]M[G]T[K]T[QR]I[D]V[KL]A[E]EYV[KY]E[ET]N[LDC]N[VLS]Y[RM]A[AL]
 SE-cephalotoxin/1-1052 143 V[ELQ]---G--L[TN]Y[PWC]YS[V]K[NG]I[E]K[L]I[E]T[Y]K[M]V[E]E[T]D[M]N[KR]L[WA]E[N]F[L]F[E]N[Q]I[E]S[N]I[N]L[L]K[L]T[T]T

SOMP_similar_to_cephalotoxin/1-473 215 P[ES]T[QRN]I[F]R[F]A[Q]F[C]D[I]T[K]L[S]E[M]L[V]Q[N]M[TS]G[Q]Q[K]L[Y]Y[F]K[G]D[QR]N[S]S[F]K[D]Q[M]Y[F]K[R]G[F]
 SE-cephalotoxin/1-1052 212 T[DA]V[HQ]N[L]F[E]L[D]E[A]C[C]D[I]R[TR]L[Y]M[H]V[R]I[F]Y[Q]T[QL]V[L]A[Y]N[S]K---Q[M]D[P]E[M]K[KY]L[N]A[L]F[I]R--R[N]M[Y]

SOMP_similar_to_cephalotoxin/1-473 288 [DR]V[WHC]R[NS]L[D]Y[K]R[D]A[K]I[L]K[N]M[R]G[S]S[R]E[S]I[V]R[A]F[N]E[L]K[V]K[Y]P[W]Y[T]W[V]A[V]K[S]D[R]P[R]I[R]G[L]E[L]R[G]S[T]Y
 SE-cephalotoxin/1-1052 282 [GS]R[V]W[HC]E[T]T[IA]Q[S]K[K]D[I]D[V]K[T]N[A]K[F]G[I]T[V]L[R]K[I]N[S]E[L]S[R]K[Y]P[W]Y[S]W[S]I[V]V[K]K[M]L[A]N[QR]N[S]T[L]-G[N]Q[I]

SOMP_similar_to_cephalotoxin/1-473 361 [R]L[E]D[R]D[A]K[K]V[K]G[V]Y[V]E[D]T[R]S[S]A[S]D[S]T[Q]A[Q]T[L]V[F]K[K]C[D]C[N]S[D]Y[I]Y[A]D[N]I[L]S[K]R[C]G[E]S[T]L[E]R[L]V[D]
 SE-cephalotoxin/1-1052 354 Y[E]E---[V]G[H]G[S]N[E]V[V]W[Q]F[K]E[H]S[Q]E[D]I[Q]K[A]T[A]V[L]T[I]C[K]C[Q]S[H]V[F]T[P]S[N]M[L]N[K]D[T]C[P]N[N]Q[V]P[V]K[A]

SOMP_similar_to_cephalotoxin/1-473 434 F[K]Q[C]P[V]C[H]R[W]P[Y]S[I]T[C]Y[C]A[R]V[K]D[S]Q[N]M[G]L[Y]C[I]S[S]Q[H]H
 SE-cephalotoxin/1-1052 425 E-----[I]D[R]E[F]R-----D[E]I[Q]R[K]K[S]D---V[F]W[V]A[G]F[K]

Figure S7 - Pairwise sequence alignment between the cephalotoxin-like SOMP (Uniprot Ac. No.: B7W114) and the SE-cephalotoxin from *Sepia esculenta* (Uniprot Ac. No.: B2DCCR8). Identical residues are dyed in blue. Conserved and semi-conserved substitutions are dyed in shades of grey. Sequence alignments were performed and visualized with Jalview (Waterhouse et al. 2009).

M_musculus/1-1159 --MFLKQPGGC[LL]Q-FLG-----LLGLVGA[VRT]Y[I]G[V]E[E]Y---WNYVPQ[G]K[V]I[TG]K[S]F[ED]K[L]A[T]L[F]L---E[R]G[P]N[R]I[G]G 72
 H_sapiens/1-1159 --MPRKQAGC[I]L[L]T[FL]G---L--L[SG]L[VG]T[VRT]Y[I]G[V]E[E]Y---WNYVPQ[G]K[V]I[TG]K[S]F[ED]K[L]A[T]L[F]L---E[R]G[P]N[R]I[G]G 73
 Ap_pallida/1-1121 MSFLVYLT[MF]V[LA]S[CA]Q[H]C[E]G[H]L[N]H[A]S[K]G[I]T[R]N[Y]I[A]A[V]E[R]D---WDA[RS]G[F]N[AN]G[I]K[D]N[D]S[D]A[S]V[F]T---V[R]E[D]T[T]G[V]K 81
 Ac_millepora/1-1114 --MMDRSNA[F]V[L]TAC[F]I[S]Q---LICHVA[I]T[R]T[Y]I[A]A[V]E[K]E---WDA[RS]G[F]N[AN]G[I]K[V]K[L]E[D]S[D]A[T]V[A]---T[K]G[A]H[R]I[G]R 75
 H_magnipapillata/1-714 --MLF[K]G[T]V[L]I[L]L[H]E[F]-----VIA[E]I[P]L[D]Y[K]N[E]C[S]P[K]K[E]C[E]F[W]L[E]I[K]E[K]L[T]M[I]Y[K]N[L]L[Y]S[S]G[S]L[E]L[Y]N[E]S[P]G[P]N[A]T[K]I[P] 78

M_musculus/1-1159 YKKA[Y]R[H]F[D]G[S]Y[S]T[E]I[P]K[P]W[L]G[F]L[G]P[I]L[R]A[E]V[G]D[V]I[V]H[L]M[F]-A[S]R[P]F[S]L[H]P[H]G[V]F[Y]D[K]S[E]G[A]L[Y]P[D]G[T]S[G]R[N]K[E]D[M]V[P]P[G]K 159
 H_sapiens/1-1159 YKKA[Y]R[R]F[D]G[S]Y[S]T[E]I[P]K[P]W[L]G[F]L[G]P[I]L[R]A[E]V[G]D[V]I[V]H[L]M[F]-A[S]R[P]Y[S]L[H]P[H]G[V]F[Y]N[K]D[S]E[G]A[L]Y[P]D[G]T[S]G[R]N[K]D[M]V[P]P[G]K 160
 Ap_pallida/1-1121 YK[V]I[Y]R[E]Y[D]G[T]F[T]S[E]K[H]P[K]H[L]C[L]P[V]L[Y]G[E]D[V]I[V]R[V]I[F]K[N]-A[T]R[R]Y[S]V[H]P[H]G[T]F[Y]K[K]N[A]E[G]A[L]Y[E]D[E]T[S]Q[D]K[H]D[H]V[P]P[G]K 168
 Ac_millepora/1-1114 YD[K]V[L]Y[R]E[E]D[S]F[T]E[K]P[H]P[K]Y[L]G[F]L[G]P[I]L[K]G[E]I[G]D[T]I[V]H[F]K[N]-G[S]R[V]Y[S]M[H]P[H]G[V]F[Y]S[K]D[S]E[G]A[L]Y[E]D[N]T[K]G[K]K[D]K[V]P[P]G 162
 H_magnipapillata/1-714 L[D]D[V]I[S]A[D]G[E]N[R]M[V]I[V]N[G]T[L]P-----G[P]I[V]V[Y]E[H]Q[N]L[I]H[V]K[N]M[L]S[D]V[T]L[H]W[R]G[L]---H[Q]K[G]T[F]M[D]G[V]G---W[I]S[Q]C[P]I[S]A[G]Q 155

M_musculus/1-1159 NYT[Y]V[W]P[V]R[E]E[Y]A[P]A[D]A[N]C[L]T[W]Y[H]S[H]I[D]A[P]K[D]I[C]S[L]I[G]P[L]L[V]K[E]G[V]L[N]R[Y]S[G]M[R]T[D]V[D]R[E]F[V]I[M]F[L]V[D]E[N]Q[S]W[Y]L[D]D[N]I[K]Q[F] 247
 H_sapiens/1-1159 NYT[Y]V[W]P[V]R[E]E[Y]A[P]A[D]A[N]C[L]T[W]Y[H]S[H]I[D]A[P]K[D]I[C]S[L]I[G]P[L]L[V]K[E]G[V]L[N]R[Y]S[G]M[R]T[D]V[D]R[E]F[V]I[M]F[L]V[D]E[N]Q[S]W[Y]L[D]D[N]I[K]Q[F] 248
 Ap_pallida/1-1121 NYT[Y]T[W]E[V]K[P]N[H]G[T]K[A]D[S]N[C]L[T]W[Y]H[S]H[L]E[P]G[K]D[I]N[T]L[E]I[G]P[L]I[T]C[K]K[D]T[F]D[S]-N[G]K[R]K[D]V[D]Q[D]F[L]L[F]S[V]F[D]E[N]A[S]W[L]D[E]N[I]D[R]F 255
 Ac_millepora/1-1114 TMT[Y]S[W]H[L]T[Q]S[H]A[P]D[Q]E[D]K[I]T[W]I[H]S[H]V[V]S[K]D[I]N[T]L[E]I[M]L[I]C[R]K[A]L[N]---Q[Q]Q[S]G[V]D[K]E[F]V[A]L[F]T[V]D[E]N[E]S[W]L[S]K[N]I[F]R 247
 H_magnipapillata/1-714 TTY[Y]K[F]-----K[A]E[P]K[G]T[F]W-Y[H]S[H]V[G]S[Q]R---T[N]A[Y]A[F]I[I]K[E]R[E]K[V]N---T[E]K[I]T[D]V-----I[M]T[V]G[D]---W[H]H----- 212

M_musculus/1-1159 CTN[P]N[S]V--D[K]S[D]A[V]F[Q]R[S]N[K]M[H]A[L]N[G]F[L]G[N]M[P]E[F]E[M]C[V]G[E]S[V]S[W]H[L]F[G]M[G]N[E]I[D]H[S]I[Y]E[Y]G[N]T[F]I[R]G[H]R[A]D[V]N[L]F[P]A[T]L[L]T[E] 333
 H_sapiens/1-1159 CTN[P]D[S]V--D[K]K[D]A[V]F[Q]R[S]N[K]M[H]A[L]N[G]Y[L]F[G]N[F]P[D]L[M]C[V]G[E]S[V]S[W]H[L]F[G]M[G]N[E]I[D]H[S]I[Y]E[Y]G[N]T[F]I[R]G[H]R[A]D[V]N[L]F[P]A[T]L[L]T[E] 334
 Ap_pallida/1-1121 C[S]N[P]T[K]A[K]N[S]K[E]K[E]D[F]E[A]N[K]M[H]T[IN]G[M]F[A]N[L]P[D]L[K]C[V]H[K]T[I]S[W]H[L]F[G]I[G]N[E]V[D]I[H]T[A]Y[F]H[G]Q[T]V[D]I[N]S[H]R[K]D[I]A[S]L[L]P[A]T[F]V[T]A[T] 343
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 H_magnipapillata/1-714 ---K[T]S[E]E[V]Y-----L[K]M[V]Y[G]I[G]M[K]P[F]N[V]S[Q]T[V]D---G[L]S[E]G[V]P[W]V----- 233

M_musculus/1-1159 M[I]V[E]N[P]G[K]W[M]I[T]C[Q]V[S]D[H]L[Q]A[G]M[L]G[Q]Y[S]V[G]N[C]R[G]N[A]-P[H]F[K]V[Q]-E[Q]R[R]Y[F]I[A]E[K]V[L]W[D]Y[G]P[Q]G[Y]D[K]F[T]G[F]P[L]N[T]S[G]S[D]A[V]Y[F]T[Q]A 419
 H_sapiens/1-1159 M[I]A[E]N[P]G[K]W[M]I[T]C[Q]V[S]D[H]L[Q]A[G]M[L]G[Q]Y[V]D[N]C[S]D[I]-F[Y]P[K]R[S]-E[Q]R[R]Y[F]I[A]E[K]I[L]W[D]Y[A]P[Q]G[Y]N[K]F[S]G[L]P[L]N[A]S[G]S[D]L[Y]F[T]Q[G] 420
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 Ac_millepora/1-1114 M[K]A[L]N[P]G[K]W[M]L[N]E[L]V[N]D[H]Y[N]A[G]M[Y]L[F]N[V]T[K]G[P]K[V]G[V]A[S]V[S]G[E]K[R]T[Y]F[I]A[A]E[V]E[W]N[Y]G[P]T[V]N[G]M[D]G[Q]S[I]A[P]G[S]D[A]V[F]A[F]A[N] 421
 H_magnipapillata/1-714 A[L]I[E]C[K]G[K]Y[R]I[D]-----P[N]T[G]K[N]G[A]P[L]T[W]Y[T]K[R]H[K]Y[R]F----- 286

M_musculus/1-1159 DNR[IG]G[K]Y[K]A[R]Y[E]Y[D]A[T]F[S]R[R]K[M]P[S]D[S]E[A]H[L]G[L]G[V]P[I]K[A]E[V]G[D]I[L]L[W]T[F]A[N]K[D]K[V]Y[S]I[L]P[H]G[V]F[Y]D[K]S[A]A[P]N[V]D[G]F---L[K] 504
 H_sapiens/1-1159 DNR[IG]G[K]Y[K]V[R]Y[E]F[D]A[T]F[T]R[K]R[L]S[A]E[A]H[L]G[L]G[V]P[I]K[A]E[V]G[D]I[L]L[W]T[F]A[N]K[D]K[V]Y[S]I[L]P[H]G[V]I[Y]D[K]S[A]A[P]N[V]D[G]F---V[K] 505
 Ap_pallida/1-1121 AHR[IG]G[R]Y[K]A[L]Y[E]Y[D]S[S]F[T]Y[K]---N[S]I[H]L[G]F[L]G[V]P[I]R[A]E[V]G[D]T[V]R[V]F[K]L[A]S[R]S[Y]I[A]H[G]V[F]F[K]N[S]E[G]L[Y]N[D]T[F]---A[K] 512
 Ac_millepora/1-1114 AQR[IG]G[T]Y[K]A[I]Y[E]Y[D]A[R]F[S]T[K]V---K[P]E[L]H[G]L[G]V[P]I[R]A[E]V[N]D[I]I[E]V[V]E[K]N[A]R[F]N[F]S[I]P[H]G[V]F[F]K[S]N[E]G[A]L[Y]E[D]G[T]S[R]A[Q] 506
 H_magnipapillata/1-714 ---R[S]I[N]V[G]T[I]Y[M]R[I]S[V]D[G]H[E]I[S]V---A[S]D[G]Y[I]K[P]Y-----S[A]E[S]V[I]H[P]G-----E[R] 331

M_musculus/1-1159 P[G]A[H]V[K]P[G]E[F]T[Y]R[W]T[V]P[S]V[S]P[D]E[P]P[L]L[T]Y[L]F[S]A[V]Q[P]I[K]D[S]A[G]L[V]G[P]L[L]V[K]K[G]T[L]N[A]D[G]T[Q]K[G]I[D]K[E]F[Y]L[L]F[T]V[D]E[N]F[S]S 592
 H_sapiens/1-1159 P[G]A[H]V[K]P[G]E[F]T[Y]K[W]T[V]P[S]V[S]T[A]D[P]P[L]L[T]Y[L]F[S]A[V]D[P]I[K]D[S]S[L]G[V]P[L]L[V]K[K]G[V]L[N]A[D]G[T]Q[K]I[D]K[E]F[Y]L[L]F[T]V[D]E[N]S[R]Y 593
 Ap_pallida/1-1121 Q[D]I[V]K[R]N[T]Y[V]Y[T]W[T]V[D]E[G]P[A]K[E]D[T]Q[C]V[W]A[Y]S[L]D[P]V[K]D[Y]S[G]L[G]P[L]L[T]C[R]K[G]T[L]N[A]E[G]Q[N]I[D]K[E]F[Y]L[L]M[V]M[V]D[E]S[M]S[W] 600
 Ac_millepora/1-1114 A[D]N[V]Q[R]G[T]F[T]Y[R]W[V]P[E]E[G]T[S]D[A]A[C]I[T]W[Y]Y[S]S[V]D[P]V[K]D[Y]S[G]L[G]P[L]L[T]C[K]K[G]T[L]N[D]N[T]R[K]D[T]K[E]F[Y]L[L]F[T]V[D]E[S]S[W] 594
 H_magnipapillata/1-714 F[D]F[L]N[A]N[K]T[I]D[N]Y[I]R[T]S[M]E[D]G[V]Q[N]S[V]Q[A]I[L]H[Y]E[G]A[S]N[E]P[L]T[S]K[V]Q---L[K]G[S]---S[C]V[N]C[P]K--- 397

M_musculus/1-1159 L[D]E[N]I[K]F[T]W[G]P[S]V[D]K[E]D[K]E[F]V[K]S[N]R[M]H[A]N[G]V[Y]M[G]N[P]L[E]M[C]K[R]D[R]V[S]W[H]I[G]L[G]T[D]D[M]H[G]V[F]Q[N]T[I]H[L]R[G]T[H]R[D]S[L]A[L]F[H] 680
 H_sapiens/1-1159 F[D]E[N]I[K]F[I]W[H]P[F]S[I]D[K]E[K]E[F]V[K]S[N]R[M]H[A]N[G]V[Y]M[G]N[P]L[E]M[C]K[R]D[R]V[S]W[H]I[G]L[G]T[D]D[M]H[G]V[F]Q[N]T[I]H[L]R[G]T[H]R[D]S[L]A[L]F[H] 681
 Ap_pallida/1-1121 H[E]E[N]K[R]M[F]D[T]P[S]G[I]T--E[N]E[D]Y[L]E[S]N[K]M[H]G[I]N[G]R[L]Y[A]N[L]D[L]E[M]C[T]F[D]K[V]S[W]H[L]F[G]N[E]V[D]M[H]T[I]A[V]F[G]N[H]R[K]D[S]L[L]P[G] 687
 Ac_millepora/1-1114 H[E]K[N]E[K]M[A]N[I]L[I]N[D]--D[E]D[E]Y[K]E[S]N[K]M[H]G[I]N[G]F[Y]A[N]L[P]G[E]M[L]G[D]T[I]S[W]H[V]I[G]L[G]N[E]V[D]M[H]TAY[Y]F[G]S[K]V[T]H[Q]S[V]K[D]T[V]S[L]P[G] 685
 H_magnipapillata/1-714 P[E]H[L]N[K]D---V[L]M[S]D[L]Q[N]A[D]D[E]P[S]T[F]A[D]S[K]E[Y]-----F[L]N[F]A----- 641

M_musculus/1-1159 M[A]T[T]A[Y]M[Q]P[D]H[S]G[I]F[K]V[F]C[S]T[L]P[H]F[T]R[G]M[G]Q[I]Y[E]I[S]S[C]G[N]R[D]P[S]E[P]P[Y]G[M]L[R]T[F]F[I]A[A]E[V]E[W]D[Y]A[P]N[K]N[W]E[F]E[K]Q[H]L[D]A[G]E[R]H[G]D[I] 768
 H_sapiens/1-1159 M[A]T[T]A[Y]M[Q]P[D]H[A]G[I]F[R]V[F]C[A]T[M]P[H]L[S]R[G]M[G]Q[I]Y[E]V[S]C[D]N[R]D[P]S[E]Q[R]Y[G]M[I]R[T]F[Y]I[A]A[E]V]E[W]D[Y]A[P]N[K]N[W]E[F]E[K]Q[H]V[D]A[R]G[E]R[H]G[D]I 769
 Ap_pallida/1-1121 T[F]T[A]T[M]T[P]D[N]K[E]W[A]L[I]C[K]T[D]H[F]S[A]G[M]Q[A]K[F]V[N]E[C]---N[P]S[T]E[I]S[G]K[T]R[R]Y[I]A[A]E[V]E[W]D[Y]A[P]T[G]K[D]I[L]G[N]K[T]L[E]E---S[E]H[A]K 772
 Ac_millepora/1-1114 V[F]G[T]L[M]T[P]D[N]A[G]D[W]A[L]V[E]R[T]N[D]H[Y]S[A]G[M]Q[A]K[F]V[N]T[C]---N[R]N[P]L[K]T[S]G[K]T[R]D[Y]I[A]A[E]E]M[E]W[D]Y[A]P[T]G[L]D[A]L[D]G[K]K[L]Q[D]---S[E]A[E]K 766
 H_magnipapillata/1-714 A[N]T---G[R]K[F]E[F]P[G]V---N[S]L[T]Q[G]E[I]D[S]Y[D]C[N]K[H]D[C]G[L]D--- 479

M_musculus/1-1159 F[M]N[H]T[E]N[W]I[G]S[Q]Y[R]K[V]V[Y]E[Y]N[T]D[E]F[V]E[I]K[A]R[P]Q[E]E[H]L[L]G[P]M[I]H[A]E[V]G[D]S[I]L[I]I[F]K[N]K[A]S[R]P[Y]S[A]A[G]V---E[D]S[N] 845
 H_sapiens/1-1159 F[M]N[R]T[E]N[W]I[G]S[Q]Y[K]V[V]Y[E]Y]D[E]F[V]E[I]K[A]R[P]R[E]E[H]L[L]G[P]M[I]H[A]E[V]G[D]S[I]L[I]I[F]K[N]K[A]S[R]P[Y]S[A]A[G]V---E[E]M[D] 846
 Ap_pallida/1-1121 F[T]I[N]S[N]N[R]I[G]R[V]Y[K]A[Y]R[E]F[D]D[F]T[K]E[K]R[D]R[K]Y[L]G[V]P[I]V]Y[A]E[V]G[D]I[E]I[V]F[K]N[K]A[S]R[D]Y[S]V[H]P[H]G[V]F[N]N[K]E[G]S[D]Y[M]D[G]S 860
 Ac_millepora/1-1114 F[T]V[T]S[D]K[R]I[G]R[V]Y[K]A[Y]R[E]F[D]D[F]T[K]E[K]R[D]R[K]Y[L]G[V]P[I]V]Y[A]E[V]G[D]I[K]V[V]E[K]N[A]R[N]Y[S]V[H]P[H]G[V]L[Y]S[K]A[H]E[G]S[D]Y[M]D[G]S 854
 H_magnipapillata/1-714 ---K[V]C[Y]C[H]Y-----E[L]K[I]P[R]D[K]T[I]Q---M[I]F[T]N[I]E-----S[G]A[G]W[G]H[P]I[H]L[H]G--- 517

M_musculus/1-1159 N[G]K[L]L[N]V[P]T[K]P[G]E[I]K[T]Y[R]W[V]P[K]R[S]G[P]G[S]D[P]N[C]I[P]W[V]Y[F]S[T]A[N]F[V]K[D]T[Y]S[L]G[M]P[L]I[T]C[R]E[G]V[L]N[E]-K[G]R[R]S[D]V[D]Y[E]F[A]L[L]F[V]N 932
 H_sapiens/1-1159 S[G]K[Q]F[V]P[M]T[K]P[G]E[V]K[T]Y[R]W[V]I[P]K[R]S[G]P[G]S[D]P[N]C]I[P]W[V]Y[F]S[T]V[N]F[V]K[D]T[Y]S[L]G[M]P[L]I[T]C[R]K[G]V[L]N[E]-K[G]R[R]S[D]V[D]Y[E]F[A]L[L]F[V]N 933
 Ap_pallida/1-1121 N[G]A[A]K[N]D[N]R[I]K[P]S[T]K[Y]T[Y]T[W]S[V]P[E]R[A]G[P]D[S]Q[D]A[C]T[L]W[A]Y[S]D[V]S[V]K[D]A[N]T[G]L[V]G[P]L[V]C[K]R[G]T[L]T[A]-E[G]K[P]D[V]N[E]D[F]A[L]L[F]T[V]M[D] 947
 Ac_millepora/1-1114 S[G]A[D]K[L]D[N]A[I]Q[P]G[K]T[Y]T[I]W[S]V[E]R[A]G[P]K[G]D[G]P[A]C[T]R[A]L[W]A[Y]S[D]V[N]P[I]K[D]T[S]L[G]I[G]P[L]I[K]G[K]L[K]E[G]T[E]R[S]D[V]R[E]F[V]L[M]F[V]T[V]M[D] 942
 H_magnipapillata/1-714 ---H[S]F-----V[L]K[M]D[Y]A[P]Q[N]I[T]-T[A]K[L]I[N]A[T]E[N]-----K[D]I[D]C[G]R[G]----- 551

M_musculus/1-1159 E[N]E[S]W[Y]L[D]D[N]I[K]K[Y]L[N]--K[D]P[R]D[F]K[H]T[D]D[F]E[S]N[K]M[H]A[I]N[G]K[I]F[G]N[L]P[E]I[M]T[E]D[S]M[T]N[W]Y[L]L[G]I[G]S[E]V[D]I[H]T[I]H[Y]H[A]E[S]F[L]K[I]D[K]S 1018
 H_sapiens/1-1159 E[N]E[S]W[Y]L[D]D[N]I[K]K[Y]L[N]--K[D]P[R]D[F]K[H]T[D]D[F]E[S]N[K]M[H]A[I]N[G]K[I]F[G]N[L]P[E]I[M]N[E]D[T]M[T]N[W]Y[L]L[G]I[G]S[E]V[D]I[H]T[I]H[Y]H[A]E[S]F[L]K[I]D[K]S 1019
 Ap_pallida/1-1121 E[N]E[S]W[Y]L[D]D[N]I[K]K[Y]C[T]A[R]V[D]K---D[E]F[Q]E[S]N[K]M[H]I[N]G[V]F[G]N[I]P[E]L[E]M[V]D[N]V[S]W[Y]L[L]G[L]T[A]R[V]E[D]M[H]T[V]H[F]H[G]S[V]F[V]Q[S]S[S]Y 1031
 Ac_millepora/1-1114 E[N]E[S]W[Y]L[D]E[N]I[K]K[Y]C[K]N[P]C[K]E[T]L[A]D[D]D[F]E[S]N[K]M[H]I[N]G[V]F[G]N[I]P[E]L[E]M[V]D[E]K[V]D[W]L[L]G[I]G]N[E]V[D]M[H]T[V]H[F]H[G]Q[S]F[L]K[K]Q[V]S[Y] 1030
 H_magnipapillata/1-714 ---Q[X]F[C]N[E]P[K]W[K]-----N[K]Q[W]N-----G[N]I[P]G[L]N[L]I[N]P--- 579

M_musculus/1-1159 Y---R[E]D[V]Y[D]L[F]P[G]T[F]Q[T]I[E]L[F]A[D]H[P]G[T]W[L]H[C]H[V]S[D]H[I]A[G]M[E]T[T]Y[T]V[L]R[N]I[D]N[R]I[P]Y[S]T[K]P[S]G[A]G[S]H[A]V[T]V[S]P[S]Q[E]P[G]K[E]----- 1098
 H_sapiens/1-1159 Y---R[E]D[V]Y[D]L[F]P[G]T[F]Q[T]I[E]L[F]A[D]H[P]G[T]W[L]H[C]H[V]S[D]H[I]A[G]M[E]T[T]Y[T]V[L]R[N]I[D]N[R]I[P]Y[S]T[S]P-G[V]A[S]H[P]A[T]V[S]N[E]R[P]K[E]----- 1098
 Ap_pallida/1-1121 H[P]E[G]M[R]G[D]V[Y]D[L]F[P]G[V]F[A]T[V]K[M]V[P]S[I]G[M]H[C]H[V]N[D]H[A]G[C]M[E]A[R]F[V]R-----E[K]P[T]V[S]I[T]H[F]K[P]K[G]----- 1097
 Ac_millepora/1-1114 H---R[E]D[V]Y[D]L[F]P[G]V[F]A[T]V[E]M[V]P[S]T[E]D[W]L[H]C]H[V]N[D]H[A]G[C]M[E]T[L]S[V]L-----D[K]S[L]K[T]T[P]K[I]T[A]----- 1090
 H_magnipapillata/1-714 ---R[K]B[L]I[I]P[T]G[G]Y[V]L[R]F[K]S[N]P[K]W[F]L[H]C[H]I[E]V[H]A[L]D[G]M[A]M[I]-----S[E]A[V]N[E]A[P]K[P]K[G]F[P]V[C] 639

M_musculus/1-1159 -----E[L]Y[F]F[G]K[N]L[R]P[G]A[K]A[L]V[L]F----I[L]G[L]L[L]---V[A]T[V]V[L]A[L]R[L]S[S]R[R]Q[M]A[Y]R[V]Q[S]C[A]L[P]T[D]A[L] 1159
 H_sapiens/1-1159 -----Q[L]Y[F]F[G]K[N]L[G]P[T]G[A]K[A]L[V]L[F]----I[L]G[L]L[L]---I[T]T[V]I[L]S[L]R[L]C[S]A[M]K[Q]T[D]Y[Q]Q[V]S[C]A[L]P[T]D[A]L 1159
 Ap_pallida/1-1121 -----Q[A]Y[K]P-----S[A]Q[S]I[F]V[L]M---I[M]A[T]L[L]I[V]L--- 1121
 Ac_millepora/1-1114 -----A[S]S[F]-----V[T]S[S]I[F]Y[L]---S[F]P[V]L[A]---L[V]K[A]----- 1114
 H_magnipapillata/1-714 N[F]Y[N]D[L]S[R]D[Y]F[T]R[E]D[S]V[N]T[D]C[T]N[A]K[Y]L[A]T[A]I[A]L[S]V[L]F[V]N[V]V[T]S[I]V[I]W[K]Y[R]Q[K]K[L]H[N]G[K]D[V]G[T]V[L]N[E]I 714

Figure S8 - Multiple sequence alignment showing the sequence similarities between hephaestin-like proteins from *Acropora millepora* (Uniprot Ac. No.: B3E[W]Z9), *Aiptasia pallida* (NCBI GI: 387005847), *Homo sapiens* (Uniprot Ac. No.: Q6M[Z]M0), *Mus musculus* (Uniprot Ac. No.: Q3V1H3) and the cupredoxin-domain containing protein from *Hydra magnipapillata* (NCBI GI: 221113181). Conservation of residues is dyed by shades of blue: the darker the color, the

more conserved the residue among the five species. Sequence alignments were performed with MUSCLE (Edgar 2004) and visualized with Jalview (Waterhouse et al. 2009).

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