

A survey of well conserved families of C2H2 zinc-finger genes in *Daphnia* reveals vertebrate-type KLF homologs not present in *Drosophila*.

Arun Seetharam, Yang Bai, and Gary Stuart (Indiana State University)

Background

A recent comparative genomic analysis has tentatively identified roughly 40 orthologous groups of C2H2 Zinc-finger proteins that are well conserved in bilaterians (i.e. worms, flies, and humans). Here we extend that analysis to include a second arthropod genome from the crustacean, *Daphnia pulex*.

Results

Most of the 40 orthologous groups of C2H2 zinc-finger proteins are represented by just one or two proteins within each of the previously surveyed species. Likewise, *Daphnia* were found to possess a similar number of orthologs for most (all?) of these small orthology groups. In contrast, the number of Sp/KLF homologs tends to be greater and to vary between species. Like the corresponding mammalian Sp/KLF proteins, most of the *Drosophila* and *Daphnia* homologs can be placed into one of three sub-groups: Class I-III. *Daphnia* were found to have three Class I proteins that roughly correspond to their *Drosophila* counterparts, dSP1, btd, CG5669, and three Class II proteins that roughly correspond to Luna, CG12029, CG9895. However, *Daphnia* have four additional KLF-Class II proteins that are most similar to the vertebrate KLF1/2/4 proteins, a subset not found in *Drosophila*. Two of these four proteins are encoded by genes linked in tandem. *Daphnia* also have three KLF-Class III members, one more than *Drosophila*. One of these is a likely Bteb2 homolog, while the other two correspond to Cabot and KLF11, a vertebrate homolog of Cabot. In addition, a *Daphnia* homolog of *Drosophila* hkb can be identified, but none for CG3065 (tentative).

Conclusion

Consistent with their likely roles as fundamental determinants of bilaterian form and function, most of the 40 groups of C2H2 zinc-finger proteins are conserved in kind and number in *Daphnia*. However, the KLF family includes several additional genes present in vertebrates but missing in *Drosophila*. This work provides another example of the general observation that the *Daphnia* genome differs from the typical arthropod genome exemplified by *Drosophila*.