

From single cells to complex organs – evolutionary developmental insights from hitherto neglected mollusks

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Mollusks are a highly diverse clade of spiralian protostomes that we all share a fascination for. The majority of current phylogenies suggest a sister group relationship of Conchifera and Aculifera rendering it difficult to polarize character states and to infer how the last common molluscan ancestor looked alike. In contrast to morphological traits, the developmental pathways that give rise to the latter have been studied to a lesser degree, in particular in non-gastropod mollusks.

In order to gain deeper insights into the molecular underpinnings of molluscan development I study neglected taxa that are phylogenetically informative such as polyplacophorans, solenogastres, and scaphopods. In addition, crucial molluscan outgroups such as entoprocts or representatives of the lophotrochozoan sister clade, the Gnathifera, are studied in my lab in order to infer putative apomorphies and synapomorphies of spiralian clades.

Recent advances in RNA-sequencing allow for the identification of cell types based on their gene expression profiles. In my talk, I will focus on the use of state-of-the-art single-cell RNA-sequencing on polyplacophoran developmental stages and explain how these data contribute to our understanding on molluscan body plan development and evolution.