Mesoderm and muscle formation in the quagga mussel, *Dreissena rostriformis*

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Myogenesis involves modification, reduction and de novo formation of muscular tissue and is particularly dynamic in molluscs. Only few studies on myogenesis in bivalves using state-of-the-art methods such as fluorescence labelling and confocal microscopy are currently available, with the most detailed ones stemming from the scallop *Nodípecten nodosus* and the shipworm *Lyrodus pedicellatus*. The quagga mussel *Dreissena rostriformis* is a small, mytiliform freshwater mussel with an indirect life cycle that includes a trochophore and a veliger larva. *Dreissena rostriformis* is an invasive species in Europe and in the USA. Herein, we describe the dynamics of myogenesis and larval myoanatomy in the quagga mussel. The first visible F-actin positive cells are found in the gastrula and in the trochophore larva. In the early veliger larva there are two anterior adductors, a ventral larval retractor, a velum ring musculature and a dorsal and ventral velum retractor. Subsequent muscle development includes a median velum retractor and an accessory velum, foot and mantle retractors. A comparative analysis suggests that the ground pattern of bivalve larvae includes a velum ring, velum retractors, a ventral larval retractor and anterior adductors. Unfortunately, we have so far not been able to produce postmetamorphic quagga mussels in the lab, thus hampering reconstruction of the fate of larval muscles and emergence of the adult muscular bodyplan.

Very little is known about gene expression during mesoderm formation (the germ layer from which the musculature forms) in molluscs. Therefore, we investigate expression patterns of some well-known mesodermal marker genes (e.g., *Hes*, *myosin heavy chain*, *even skipped*, *brachyury*) during *Dreissena rostriformis* development. Preliminary results suggest that a *Hes* gene is expressed during early mesoderm formation at gastrulation. We found *myosin heavy chain* expression from the late gastrula until the veliger stage, where it is colocalized with developing muscle cells.