Universität Basel

Research Project

The role of maternal RNA in intergenerational information transfer in wild fish

Third-party funded project

Project title The role of maternal RNA in intergenerational information transfer in wild fish
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Many organisms are able to pass information about the environment to the following generation. For example, a
mother's nutritional status impacts metabolic parameters of her offspring, as unraveled by famine cohort studies
(reviewed in (El Hajj et al. 2014)). Also, parental knowledge about environment temperatures can induce preadaptation
to a warmer climate in offspring in fish (Shama, Lisa N. S. et al. 2014).
These informations are not genetically encoded – DNA itself is not sensitive to instructive cues from the environment. RNA expression however is highly sensitive to environmental cues. Maternal RNA, which is loaded in
massive amounts into developing oocytes, therefore is a candidate for a molecular vector of environmental
information.
In the presented project, we will investigate whether the non-model vertebrate fish Neogobius melanostomus
modulates the RNA contents of oocytes in response to environmental cues. Neogobius melanostomus is an
invasive species that adapts remarkably well to novel environments. This trait has been observed in many highly
successful invasive organisms, but is poorly understood. The proposed project will for the first time show whether
wild living organisms are able to modulate the maternal RNA content of their eggs.

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