



Universität
Basel

Research Project

DevUTRs - Uncovering the roles of 5'UTRs in translational control during early zebrafish development (Marie Curie Fellowship Madalena Pinto)

Third-party funded project

Project title DevUTRs - Uncovering the roles of 5'UTRs in translational control during early zebrafish development (Marie Curie Fellowship Madalena Pinto)

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Organisation / Research unit

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Project Website <http://schierlab.biozentrum.unibas.ch>

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Status Completed

During early developmental stages, metazoan embryos are transcriptionally silent, and embryogenesis is controlled by maternally deposited factors. Developmental progression requires the synthesis of new mRNAs and proteins in a coordinated fashion. Many posttranscriptional mechanisms regulate the fate of maternal mRNAs, but it is less understood how translational control shapes early embryogenesis. Protein synthesis is primarily regulated at the translation initiation step by elements in the 5' untranslated region (5' UTR) of the mRNA. However, we currently lack a systematic understanding of the regulatory information contained within 5' UTRs and how they functionally impact mRNA translation throughout development. Using zebrafish as a model of vertebrate development, we are developing an *in vivo* massively parallel reporter assay (MPRA) to identify 5' UTR motifs involved in translation regulation. By integrating the translational behaviour of 5' UTR reporters throughout embryogenesis with sequence-based regression models, we anticipate to uncover novel *cis*-regulatory elements in 5' UTRs with developmental roles. The MPRA will lay the foundation for future studies dissecting the molecular mechanisms underlying the function of newly identified 5' UTR motifs.

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