MiR-125a-3p and Fyn regulate maternal mRNA degradation during maternal to zygotic transition

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Abstract Body

Massive degradation of maternal-mRNAs and their replacement by zygotic transcripts is defined as maternal-to-zygotic transition (MZT). Currently, the factors involved in maternal-mRNAs stability and degradation during early stages of embryogenesis are unknown, Recently, Fyn, a member of the Src family kinases (SFKs), was found to inhibit the activity of AGO2 in oligodendrocytes. A previous study, conducted in our laboratory, indicated that Fyn is post-transcriptionally regulated by microRNA-125a-3p in mouse oocytes. We hypothesize that miR-125a-3p and Fyn retain a reciprocal pattern of expression during early embryogenesis. Our preliminary results indicate that miR-125a-3p is one of the first miRNAs to be transcribed by the late zygote stage. We found that the expression of maternal Fyn mRNA decreases concomitantly with the increase in miR-125a-3p during MZT. qPCR analysis reveals two 'waves' of maternal mRNA degradation; the first occurring during oocyte maturation and the second one takes place during the transition from zygote to a 2-cells stage embryo. The exposure of GV oocytes to an SFK inhibitor leads to premature destruction of most of the examined maternal-mRNAs. Hence, our data strongly suggest that SFKs, Fyn in particular, participate in regulation of maternal-mRNAs stability and destruction.