Abstract

Translation is one of the fundamental biological processes. It is assumed that the localization of mRNA and its translation in a certain time and at specific locations plays a role in many cellular processes. The mammalian oocyte becomes transcriptionally inactive when it reaches its full size and utilizes only RNA that has been synthesized and stored in the early stages of development. Thus the regulation of protein synthesis at the translational level is critical for the correct completion of meiotic maturation of oocytes and early development of embryos.

To monitor cellular physiology, it is necessary to be able to visualize and monitor specific molecules and processes at single cell level. This is enabled by the development of light microscopy and fluorescence probes that specifically bind to certain organelles, cellular structures, proteins or other molecules. In this thesis I describe selected methods of visualization of RNA, global translation as well as translation of specific transcripts, and proteins. The methods that this thesis describes are RNA FISH, visualization of translation using methionin analogs, FUNCAT, SUnSET, FlAsH, ReAsH, TRICK, SINAPS, FUNCAT-PLA, PURO-PLA.

Key words: Translation, RNA, Protein, Visualization, Oocyte