

Abstract

The aim of this work was to obtain better insight into the principles of cell structures and organs in the chicken embryo development. To reach this goal special methods of micromanipulations and visualization *in vitro*, *ex vivo*, *ex ovo* and *in ovo* were implemented and adjusted. These methods were used to study gene expression in neural crest development and eye development.

In the course of long term research in our laboratory we observed that oncoprotein v-Myb influences the development of the neural crest and has the capacity to change natural cell fate. We performed a series of experiments to investigate v-Myb protein influence on neural crest cells differentiation, especially melanocyte lineage development, and its influence on gene expression in the neural crest. Therefore we focused on Gremlin 2 (PRDC), the gene upregulated by v-Myb in the neural crest.

The established procedure of electroporation *in ovo* was adjusted to transfect cells of the developing eye and used to study gene expression during lens induction. The results obtained from chicken embryo experiments endorsed the study performed on mouse embryos.

Futhermore, the electroporation technique was slightly modified for manipulations of the neural retina in the developing eye *in ovo*. Thereafter, the retinas were processed *ex vivo* and *in vitro* to study snRNPs localization in photoreceptor cells.