

## Abstract

Hematopoiesis is the process of proliferation, differentiation and self-renewal of hematopoietic stem cells. Regulation of hematopoiesis is a complex process, which takes place on many different levels and is directed by many signals. *RNF207* is one of the perspective genes chosen based on a screen in chicken model, where obtained data show its role in hematopoiesis. The aim of this work was to confirm the role of *rnf207b* as a new regulator of hematopoiesis in *Danio rerio* and to find out on which level of hematopoiesis is active.

*Danio rerio* is an excellent model to study the function of genes *in vivo*, thanks to the easy manipulation of genetic expression and wide range of phenotypes during the development. To study the effect of *rnf207b* in hematopoiesis of *Danio rerio* we performed the knock-down of this gene by microinjection of morpholino oligonucleotides into one cell stage embryos. In these injected fish, we saw the effect in both thrombocyte and erythroid lineage, suggesting that *rnf207b* could be a regulator at the hierarchical level of progenitors or even more upstream. The results of developmental and tissue specific expression analysis then show that expression of *rnf207b* begins as early as 18 hpf, at the time of primitive hematopoiesis. Although *rnf207b* is expressed in the kidney (an anatomical site of definitive hematopoiesis in fish) in adulthood, its expression is not as high as in some other tissues.

Hematopoietic mechanisms between *Danio rerio* and human are firmly conserved. In addition to *Danio rerio*, the role of *RNF207* in human hematopoiesis will also need to be verified later. Clarifying the conservation of this player in hematopoiesis among vertebrates will allow to use of model organisms for the transfer of knowledge to humans. Defects in function of these regulatory genes can cause problems in hematopoiesis, which are the cause of many diseases in humans and their deeper knowledge can contribute to discovering new targets for their treatment or cure.

**Key words:** hematopoiesis, differentiation, morpholino oligonucleotides, erythrocytes, thrombocytes, Rnf207b, *Danio rerio*