

Title: MiR-190 in Neutrophil Migration Regulation

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Abstract:

Neutrophils are one of the most abundant white blood cells in humans, involved in various essential innate immune responses to infections and inflammation. When functioning normally, neutrophils can defend against infections through migrating to the inflammation site, express and release cytokines to recruit other cells of the immune system while also directly attack foreign microorganisms through degranulation, phagocytosis and generation of neutrophil extracellular traps. However, when neutrophil activity is not normally regulated, this can lead to diseases such as inflammatory arthritis or Bechet's disease. Therefore, the regulation of neutrophil migration is important to maintain a balanced and efficient immune system. Although the specific molecules involved in the regulation of neutrophil activity or the exact mechanisms behind such regulations are not yet well-known, one component speculated to play a role in this regulation are microRNAs (miRNAs). MiRNAs are short, conserved, noncoding RNAs that function as regulators of the transcriptome. They bind to the 3' untranslated regions of their target gene and recruits the RNA-induced silencing complex, which results in down regulating the target gene expression.

A previous study screening a wide array of known miRNAs in zebrafish through tail wounding and ear infection assays of miRNA overexpressing transgenic fishlines showed a significant decrease of neutrophil activity in miRNA-190 (miR-190) overexpressing transgenic fish. Further investigation on miR-190 and its target genes will provide a better understanding behind how neutrophil migration is regulated, allowing for the development of drugs or potential therapeutics to help cure diseases caused by disruptions in normal neutrophil motility regulation.