Abstract

MicroRNAs are small non-coding RNAs of 20 to 24 nucleotides in size that are able to post-transcriptionally regulate gene expression by binding to mRNA. This paper focuses on how these microRNAs are generated and how they are able to regulate at the level of proteins involved in programmed cell death - apoptosis. By what mechanisms apoptosis occurs, what proteins are involved and what changes the cell undergoes are further discussed in this thesis. The precise influence of this post-transcriptional regulation is presented by using selected microRNAs that influence apoptosis during the development of the central nervous system, as well as during and as a consequence of the neurodegenerative diseases and damage that can affect it. Finally, it will also introduce the use of microRNAs as potential biomarkers, due to changes in their levels associated with various diseases, and as direct therapeutic targets.

Keywords

Apoptosis, microRNA, cell death, central nervous system, neurodegenerative diseases, gene expression regulation