Abstract

Iron-sulfur clusters are important inorganic cofactors of many cellular reactions, including those that occur in the nucleus. Nuclear iron-sulfur proteins play an important role in DNA replication, genome repair, and maintenance of genome stability. The biosynthesis of these iron-sulfur clusters is initiated in the mitochondria by the iron-sulfur cluster assembly pathway (ISC), continues in the cytosol by the cytosolic iron-sulfur cluster assembly pathway (CIA), and ends with the incorporation of the clusters into target apoproteins such as polymerases, primases, helicases, endonucleases, or glycosylases. This bachelor thesis summarizes current knowledge about the pathways of iron-sulfur cluster biosynthesis, the functions of nuclear iron-sulfur proteins, and the role of the clusters in these proteins, including the phenotypes and clinical manifestations caused by the absence of iron-sulfur clusters.

Keywords: iron-sulfur clusters, metalloproteins, nucleus, DNA replication, DNA repair