

Age-Related Features of Cellular Mechanisms of Polyploid Hepatocyte Formation in the Liver of White Rats

Tornike Gogolauri

Email: Tornike.Gogolauri101@ens.tsu.edu.ge

Department of Biology, Faculty of Exact and Natural Sciences Ivane Javakhishvili Tbilisi State University

Supervisor: Professor Diana Dzidziguri, Doctor of Biological Sciences

Abstract

Polyploidization in mammalian liver tissue is a physiological process associated with aging and is often considered one of the main hallmarks of cellular aging. Although polyploidization has been studied for decades, the pathways of polyploid cell formation remain a subject of debate and a relevant scientific issue. It is noteworthy that the mechanisms and signaling pathways involved in polyploid cell formation are actively being investigated. Nevertheless, the mechanism of cell fusion and its role in the polyploidization process are not yet fully understood and remain controversial.

The aim of the presented study was to conduct a comparative analysis of the mechanisms underlying the formation of multinuclear hepatocytes in the livers of white rats of various ages. The investigation established that the formation of these cells is not a random event but represents an age-associated dynamic process. Of particular interest is the fact that the quantitative increase in multinuclear hepatocytes correlates with the decline in the proliferative activity of the liver. This observation suggests that the accumulation of multinuclear hepatocytes represents a key mechanism of polyploidization, which becomes activated in parallel with the decrease in mitotic potential.