

Abstract

The cell nucleus is a complex structure composed of different parts, the nucleolus and PML nuclear bodies are important compartments of the nucleus. In the nucleolus, transcription of ribosomal DNA and biogenesis of ribosomes take place. The nucleolus may regulate the expression of proteins and thus the subsequent cell growth through regulating the amount of ribosomes. The nucleolus is also a sensor of stress. PML nuclear bodies play an important role in many cellular process – response to stress, virus infection or DNA damage. PML nuclear bodies consist of many proteins, the major protein is PML protein (Promyelotic leukemia protein). PML protein is coded by PML gene, it is spliced postranscriptionally and it has several isoforms. PML protein is an important cellular regulator and also a tumor suppressor. The nucleolus and PML protein cooperate together and have a functional relationship, which is not entirely clear. It was shown that PML protein changes its localization after exposure to stress and it goes near the nucleolus or into the nucleolus and this happens mainly in primary cells (the reason can be that the level of PML protein downregulates in tumour cells). The relationship between the nucleolus and PML nuclear bodies is important for cell response to stress.

Keywords: nucleolus, ribosomal biosynthesis, nucleolus as a sensor of stress, PML nuclear bodies, PML protein, genotoxic stress