

PML is a tumor-suppressor protein involved in the pathogenesis of promyelocytic leukemia. In proliferating mammalian cells, PML is a principal component of characteristic nuclear bodies, which also contain multiple other proteins. Typically there are several PML bodies per nucleus; they form round, sub-micrometer foci scattered throughout the interchromatin space. The molecular function of PML protein is unclear, yet the majority of data points to its involvement in regulation of gene-expression and/or intranuclear protein storage and degradation. In brain, PML has been implicated in the pathogenesis of neurodegenerative disorders, glioma,, control of circadian rhythm and embryonic neurogenesis. However, the function of PML and PML bodies in the normal adult brain is still poorly understood. Therefore we have investigated the expression and localization of PML at the cellular and subcellular levels, in the adult mouse brain, focusing on the cerebellum. By immunofluorescence, PML bodies were found in a subset of neurons in the cerebellar cortex. Particularly strong and rather diffuse PML immunoreactivity was found in the nuclei of Purkinje cells. Next by co-immunoprecipitation and mass spectrometry analysis, we have found known partners of PML and many new proteins that are involved in: transcription regulation, RNA processing or are connecting with other nuclear structures. We decided to focus on FMR1 protein, which is involved in RNA processing and very important for neuronal function. Our study indicates that PML protein and the PML bodies can play a role in the cerebellar function.