Abstract

Cellular prion protein (PrP^{C}) is well known for its pathological isoform PrP^{Sc}, widely believed to be the infectious agent of the prion diseases, which include Bovine spongiform encephalopathy (BSE), scrapie and Creutzfeldt-Jakob disease. The physiological role of PrP^{C} is poorly understood, but its involvement in the regulation of apoptosis, adhesion molecules, antioxidant, or signal molecules, has been described. Despite of these findings, it hasn't been proven, that the protein is necessary for normal development of mice. However, the protein was shown to be essential for regeneration of hematopoietic stem cells after exposure to lethal stress conditions. Expression of PrP^{C} may have an effect on the proliferation and differentiation of cells by helping them keep the proliferative activity, or slow spontaneous differentiation. The quantity of the protein correlates positively or negatively with expression of transcription factors such as Oct4/Nestin, which are essential for development in embryogenesis. Its expression also regulates transition of cells from G_1 phase to S phase of the cell cycle. This bachelor thesis is focused on published results describing the influence of PrP^{C} on cellular proliferation and differentiation.