Description for the general public

Neutrophils (PMNs, *polymorphonuclear cells*) are dominating population among human blood leukocytes, which fast turnover and activity must be precisely regulated. Their physiology has to be strictly controlled on each step, starting from maturation in the bone marrow, through migration and life in the blood, to the recruitment to the site of inflammation. At each of these environments neutrophils bactericidal activity, programmed cell death (apoptosis) and the clearance of apoptotic cells by the tissue phagocytes is tightly regulated. Impairment of neutrophil apoptosis and their further elimination contributes to the development of pathological conditions, including inflammatory and auto-immunological diseases, such as: rheumatoid arthritis, acute respiratory disease, periodontitis, sepsis or inflammatory bowel disease. Hence, identification and detailed examination of components responsible for the regulation of the neutrophil programmed cell death, especially in inflammatory and healing environment is extremely important and clinically relevant. We postulate that MCPIP-1 protein is among intracellular proteins that regulate the apoptosis of neutrophils. Systemic analysis, which we plan to conduct, should reveal a novel insight into the MCPIP-1 role in the regulation of neutrophil apoptosis. In our project we will also attempt identification of the molecular mechanism underpinning the function of MCPIP-1 in the execution of both spontaneous and induced apoptosis of neutrophils. The results of our study will extend the existing knowledge about the regulation of the neutrophil involvement in the live and disease conditions. We hope, that in the future the propagation of obtained results will lead to novel clinical approaches to treat and/or prevent inflammatory diseases.