

Cellular and molecular mechanisms driving the induction of mobilizing cytokines

Blood cells are produced in the bone marrow from the hematopoietic stem cells. Under normal conditions, only a strictly defined number of newly formed mature cells are released from the bone marrow into the bloodstream. However, in special circumstances, such as inflammation or a bleeding, the amount of new blood cells released from the bone marrow increases rapidly. We call this process mobilization. **Mobilization is crucial for the body's adaptation to stressful conditions.** Importantly, the factors that trigger mobilization have been identified and successfully applied to the clinical practice. Currently, these factors are commonly used in hematology in the treatment of neutropenia, which is a common complication after chemotherapy, or for the collection of hematopoietic stem cells for transplantation.

Although mobilizing factors are well known and used as drugs, **little is known about the mechanisms that regulate the first stages of mobilization.** The above project aims to identify which cells in the body produce mobilizing cytokines and which proteins are responsible for their production.

To this end, we will create special mouse models that will allow us to study the cells that produce mobilizing factors during stimulation. We will also check whether selected proteins are involved in the production of mobilizing agents, using known pharmacological compounds that modulate their activity.

The completion of this project will contribute to the better understanding of the mobilization process. The obtained results may also contribute to the development of new methods of inducing mobilization in patients, especially those in whom administration of standard mobilizing factors does not result in the expected outcome. The results of the project may point to **the new therapeutic options**, allowing for the induction of the production of mobilizing factors in the patient's body.