

DESCRIPTION FOR THE GENERAL PUBLIC (IN ENGLISH)

Interventional cardiology is one of the rapidly developing branch of medicine. Unfortunately, despite many innovative solutions, the thromboembolic complications remain the most serious problem and one of the main causes of perioperative mortality. Any attempt to eliminate the risk factors in cardiac surgery and anticoagulant therapy may be valuable for patients and may contribute to the development of invasive medicine.

The primary aim of the project is to investigate the effect of protamine on perioperative thromboembolic complications. Protamine is widely used in medicine as the only antidote for heparin, especially for reversing anticoagulation during open-heart surgery. However, it is not neutral to the human organism. The immunogenic potential of protamine is supported by numerous evidences from clinical studies. Recent reports showed that the complexes of protamine and heparin caused a rapid drop in platelet count in an immuno-dependent manner and increased the risk of thromboembolic complications. The new immuno-hematological disorder was described as protamine-induced thrombocytopenia (PIT).

The current state of knowledge does not fully confirm the existence of PIT phenomenon. There are studies confirming the presence of the PIT and the results which challenge this thesis. In this project we will try to answer the question: can we define PIT as a new medical disorder?

The new facts about PIT encouraged us to explore this clinical relevant scenario in more details with the use of animal *in vivo* models. Observation of changes in platelet count will allow to evaluate the possible thrombocytopenia. The assessment of platelet aggregation will indicate possible thrombotic complications. The measurement of antibodies level will evaluate the immune response in PIT. The thromboembolic complications will examine in the experimental arterial thrombosis models and by monitoring of the cardio-respiratory parameters.

The current project may contribute to the development of new strategies for the diagnosis, prevention, and therapy of PIT. The proper management in the perioperative prophylaxis of thromboembolic complications significantly reduces the risk of death. In addition, prophylaxis is always better for the patient and is much cheaper than treating the complications.