

# MODELLING OF THE IRON PARTICIPATION IN THE DEVELOPMENT OF ATHEROSCLEROSIS — A SYSTEMIC APPROACH

## Summary

The hypothesis that higher serum iron concentration plays an important role in the development of diseases of the cardiovascular system has been proposed in 1981 by J.L. Sullivan. Nowadays, more and more research results confirm importance of iron in the development of atherosclerosis. The essential role plays Fenton reaction catalyzed by ions of this chemical element, which produces highly toxic hydroxyl radical involved in lipids peroxidation. As a result of this process, modified lipid molecules are produced

and phagocytosed in unlimited way by mononuclear cells to become foam cells and then apoptotic bodies that form atherosclerotic plaque. In this paper, a systemic approach to the study of these issue is presented. For this purpose, a model based on Petri nets of the iron participation in the development of atherosclerosis has been built. The analysis of this model allowed us to draw the conclusion that without the Fenton reaction, which is catalyzed by iron, atherosclerotic plaque cannot actually arise.