Aortic aneurysm is defined as a permanent, localized dilatation of the aorta, which encompasses all the three layers of the vessel wall and exceeds the normal diameter by 50%. The underlying problem of this disease is constant weakening of the aortic wall, which left untreated can result in progressive dilatation and eventual rupture leading to a life-threating condition. Mostly due to the unclear pathogenesis, there is no effective medical therapy of the disease. Surgical procedure is the only efficient treatment for patients with aneurysms; however, it is still associated with high risk of major complications, including stroke, cardiovascular events and death.

The goal of the current project is to establish the role of selected cytokines in abdominal aortic aneurysm. Cytokines, which function will be assessed during this study, were chosen based of our previous research, bioinformatics analysis and literature search. According to that, the whole project is divided into following main parts:

1) assessment of the level of circulating cytokines in terms of pathogenesis of abdominal aortic aneurysm
2) *in vitro* studies that aim to establish the molecular mechanisms of influence of selected cytokines on vascular wall cells
3) measurement of metabolites released by impaired endothelial cells in patient's serum

This approach will allow us to construct a complex model of cytokine-mediated dysregulation of vascular wall cells in terms of pathogenesis of abdominal aortic aneurysm. In addition we will be able to indicate pathways which could be a target for novel therapies for diseases associated with endothelial dysfunction.