

THE ENDOTHELIUM – UNDERESTIMATED ORGAN. 1. STRUCTURE AND PHYSIOLOGICAL FUNCTION

Summary

The endothelium is made of a layer of cells located on the inner surface of blood and lymphatic vessels. It is considered as the integral organ of human body. It is formed of endothelial cells anchoring in extracellular matrix and at the same time tightly connected one with another through various types of cellular junctions. There is a number of adhesion molecules: proteins and glycans, taking part in this cell-to-cell and cell-to-ECM adhesion, and many of them are involved in variety of biomechanical and biochemical processes occurring in the endothelial cells. One of the most characteristic feature of the endothelial cells is the presence of the Weible-Palade bodies as well as numerous caveolae and cellular membrane-anchored enzymes regulating blood clotting. It has been shown that there is a specific type of endothelial cells called high endothelial cells, which are characteristic for the lymphatic

vessels. This high endothelium facilitates physiological transmigration of leukocytes from vessels to surrounding lymphatic tissue. The endothelium is known to have the uppermost role in maintaining the constant flow of blood in vessels through its regulatory influence on blood clotting processes. The endothelial cells produces a wide variety of factors including: anticoagulants, vasodilators - causing relaxation of vessels, vasoconstrictors - leading to constriction of blood vessels, as well as pro- and antiangiogenic factors that regulates formation of new blood vessels. Therefore, it seems to be very important to fully analyze the physiology of endothelium. *In vitro* cultures of endothelial cells, despite their limitations, seems to be a reliable model for biochemical and molecular analysis of this tissue under physiological and pathological conditions.