

The development of spectroscopic analysis of lipid droplets in vitro: biochemistry, and their localisation in relation to the biological function

Lipids play an important role in the body, they are present in cells as the membrane component and in its interior, where, for example they store energy or transmit signals. These clusters are called intracellular lipid droplets, and despite the widespread presence in the cells of almost all organisms, knowledge of their functions, composition and the mechanism is still negligible.

Excess of lipids, both in the circulation and at the level of tissues contribute to the disorder known as endothelial dysfunction, which can cause a number of metabolic diseases such as obesity, atherosclerosis and diabetes and its cardiovascular complications.

As the role and composition of lipid droplets in the endothelium is not fully known hence the objective of the project is the complete, comprehensive study of these cellular organelles, in normal conditions and stimulating stress and disease. As the droplet size ranges from 20-40 nm to 100 microns, *in situ* analysis of cells requires the use of complex methods. This condition meets the vibrational spectroscopy in the form of several techniques. Not all are available in Poland, hence the need for cooperation with foreign partners who have experience in the study of lipids in different cellular models.