

The aim of the project is to increase knowledge on the quality, stability and authenticity of food products by investigating the molecular dynamics of their components and linking the mechanisms of the dynamical processes with macroscopic physicochemical characteristics of the products.

To identify the molecular dynamics parameters Nuclear Magnetic Resonance relaxometry will be used. Selected food products of different categories (dairy products, eggs, fats, honey) and also products of their digestion maintained in vitro will be examined. The influence of temperature and light on the process of accelerated aging, and the presence of selected additives (preservatives, dyes, emulsifiers) on the quality of food products and their digestion mechanism will be investigated. NMR relaxometry will be also used to evaluate the authenticity of herbal raw materials used for food purposes (tea) and for pharmaceuticals (drugs of plant origin).

The research is related to fundamental questions of science regarding the mechanisms of molecular dynamics in complex systems.

The investigations will help to identify markers of raw materials and products intended for human consumption in the future help to improve food quality through the use of adequate methods of control, leading to improving food safety and hence health and quality of life of consumers.