Recent biotechnological research has contributed significantly to the continuous expansion and understanding of the mechanisms of eukaryotic cell functioning in yeast. Nevertheless, the influence of selenium on the resistance of yeast cells and the processes of anhydrobiosis requires extending the existing knowledge. The current project was born out of the need to understand how metabolic and detoxification mechanisms work in yeast cells. However, the mechanisms that control yeast function under stressful conditions are still not fully understood. This project has been carried out in consultation with scientists from the University of Latvia. Therefore, the main goal of the proposed project is to explain the influence of selenium on the processes of anhydrobiosis in yeast cells on two different strains of yeast, *Saccharomyces* and *Rhodotorula*. Information obtained on intracellular protective reactions that promote the survival of living organisms under extreme conditions can also be extrapolated to higher organisms and have medical applications. Accordingly, one of the most important directions in research on the effect of selenium and the anhydrobiosis processes in yeast is to characterize the mechanisms underlying their transition to this state, as well as the reasons that different species and strains of yeast show varying resistance to dehydration processes. The combination of all this information with the knowledge of selenium metabolism and its detoxification processes within the cell cytosol will extend existing knowledge and enable future study of the molecular and genetic impacts of stress conditions on the function of yeast cell metabolism. It should be noted that the study on the accumulation of elements by yeast cells and studying the processes of anhydrobiosis is of great importance in the production of food enriched with essential elements. This encourages to further analysis of the identification of new selenium compounds present in the biomass of various yeast species. Appropriate conditions for the cultivation of yeast and appropriate analytical methods for the estimation of selenium will allow learning about the differences in metabolic processes of selenium biotransformation to its organic forms. This will facilitate the synthesis of new products and design of a dietary supplement enriched with suitable forms of selenium in the future. Consequently, this project is crucial for a comprehensive understanding of the functioning of eukaryotic cells (yeasts) and the future use of the high-potential results obtained in a variety of biotech industries.