Alzheimer's disease (AD) is the most common neurodegenerative disease leading to dementia and represents a significant socio-economic problem. Currently, only symptomatic treatment of AD is possible and the development of new causal therapy faces a number of difficulties, which are inter alia related to identifying early stages and the possibilities of differential diagnosis of specific neurodegenerative diseases. Therefore, in recent years, methods that are easily available and able to reliably identify individuals at risk of developing AD already at preclinical and prodromal stages are of particular interest.

The work presents a basic overview of the current knowledge about neurodegenerative diseases and especially AD and extends the knowledge in this area. The main goals of the thesis are to map out the potential contribution of spatial navigation testing as a new experimental method, which is suitable for early diagnosis and differential diagnosis of advanced stages of neurodegenerative diseases, and to evaluate the benefits of metabolic biomarker testing in clinical practice.

In the early stages of neurodegenerative diseases, the work focuses primarily on the evaluation of impairment of a specific type of spatial navigation – path integration in patients with AD and also on subjective spatial navigation complaints in preclinical and prodromal stages of AN. In the more advanced stages of neurodegenerative diseases, specific differences in the spatial navigation strategies of the most common neurodegenerative diseases leading to dementia are investigated. Attention is also paid to the possible use of spatial navigation as a reliable method for evaluating the effect of newly developed drugs. One of the other topics of this work is the comparison of the diagnostic concordance of the most commonly used metabolic biomarkers in AD.