

Immunoassay innovation: highly sensitive and scalable solution for precise quantification of Neurofilament-Light

Sigrun Badrnya, Martin Kiendl, Markus Miholits
Thermo Fisher Scientific, Campus Vienna Biocenter 2, Vienna, Austria 1030

Introduction

Neurological disorders comprise highly complex, multifaceted diseases that affect the central nervous system (CNS) and/or the peripheral nervous system. They are among the main causes of disability and mortality worldwide and can impair the brain, the spinal cord, peripheral nerves, or neuromuscular function¹. Additionally, as the global population ages, health issues related to aging, like dementia, have become significant public health concerns. Neurodegenerative diseases (NDs) like Alzheimer's disease (AD) result in the most prevalent type of age-related dementia, characterized by neuronal death, cognitive decline, and loss of motor function. Neuronal loss in NDs is supposed to be attributed to the formation and deposition of pathogenic protein aggregates forming "incidental" plaques, tangles, and Lewy bodies, which can arise either spontaneously or due to inherited mutations. Advances in neuroscience have opened new avenues of research. Biomarker discovery is essential for developing strategies that may lead to earlier detection, monitoring of ND progression, and to novel strategies for treatments. Neurofilament-Light (NF-L) particularly emerged as a biomarker demonstrating strong predictive capabilities for the onset and progression of various neurological disorders, making it a valuable tool aiding in the identification of brain injury and neurodegeneration.

Aim

Enable a comprehensive immunoassay solution for the investigation of NF-L ranging from single analyte to high-throughput multiplex analysis together with other biomarkers for neurobiology to gain a deeper understanding of mechanisms underlying blood-brain-barrier integrity, neurodegeneration, neuroinflammation and associated neuropathological conditions.

Biomarkers for neurobiology

Figure 1. Major neuronal and non-neuronal cell types of the CNS and candidate biomarkers for neuroinflammation, brain injury and neurodegeneration.

