



Simoa® Phosphorylated-Tau 231 (p-Tau 231)

What is p-Tau 231?

Tau protein phosphorylated at threonine 231 (p-Tau231) is an important protein implicated in neurobiological processes, particularly within the context of neurodegenerative disorders. Characterized by a molecular weight of 48 kDa to 67 kD, p-Tau 231 plays a pivotal role in the pathogenesis and progression of various neurodegenerative conditions.

Within neuronal physiology, p-Tau 231 exhibits intricate associations with cellular structures, including microtubules, thereby influencing cytoskeletal dynamics and neuronal morphology. Through its phosphorylation at threonine 231, this protein undergoes conformational changes, impacting its ability to interact with other cellular components and consequently altering neuronal function.

Under physiological conditions, p-Tau 231 maintains a balanced presence within neuronal compartments. However, in the context of neurodegeneration, dysregulation of phosphorylation events at threonine 231 occurs, leading to aberrant accumulation and aggregation of p-Tau 231 species. Such pathological aggregation contributes significantly to the development of neurofibrillary tangles, a hallmark pathological feature observed in Alzheimer's disease (AD) and other tauopathies.

Moreover, emerging evidence suggests that altered levels of p-Tau 231 may serve as a biomarker for disease progression and severity in various neurodegenerative disorders. Increased concentrations of p-Tau 231 have been detected in cerebrospinal fluid and blood samples of individuals afflicted with AD, Parkinson's disease (PD), and other tauopathies, indicating its potential utility as a diagnostic and prognostic marker.

In conclusion, the intricate involvement of p-Tau 231 in neurobiological processes underscores its significance as a molecular target for understanding and potentially intervening in neurodegenerative diseases. Its molecular characteristics, cellular interactions, and implications in disease pathology position p-Tau 231 as a promising avenue for further research and therapeutic exploration.

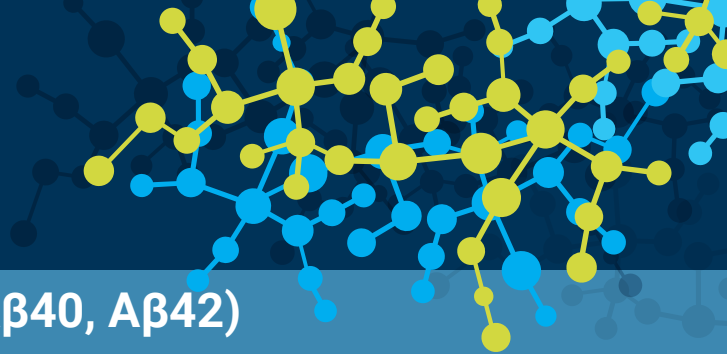
How to Measure p-Tau 231?

The Simoa® p-Tau 231 assay is an ultra-sensitive digital immunoassay for the quantitative determination of p-Tau 231 in human EDTA plasma and CSF.

What is the Simoa® Difference?

Simoa® is a powerful digital immunoassay technology that is up to 1000 times more sensitive than standard sandwich-based immunoassay techniques. Traditional ELISA measurements are limited to pg/ml levels of detection. Quanterix Simoa® can achieve sensitivity as low as femtogram (fg/ml) levels, delivering the gold standard for early, ultra-sensitive detection and quantification of proteins far below the typical lower limit of quantification (LLOQ).

Simoa® is based upon the isolation of individual immunocomplexes on paramagnetic beads using standard ELISA reagents. The main difference between Simoa® and conventional immunoassays lies in the ability to trap single molecules in femtoliter-sized wells, allowing for a “digital” readout of each individual bead to determine if it is bound to the target analyte or not.



Simoa® Neurology 2-Plex A (A β 40, A β 42)

What is the Simoa® Difference? continued

Neurological disorders continue to be among the most challenging to diagnose early and treat. Unlike 'visible' illnesses, neuronal injury and neurodegeneration can be overlooked or mistaken for other conditions. The subtlety of symptoms and the subjective nature of today's assessments also make it difficult to identify these diseases early. Currently, no definitive tests exist for the early detection of neurodegenerative diseases such as AD. Clinicians can only conclusively diagnose them once symptoms start to present. As a result, many patients may wait years for a diagnosis or a clear treatment pathway.

p-Tau 231 has risen as a vital biomarker for AD pathology and neuronal injury. Its specificity to AD distinguishes it, making it a promising tool for clinical use. With innovations like Simoa® technology, p-Tau 231 levels can be accurately and reliably quantified in biofluids, aiding in early detection and differential diagnosis of AD. Thousands of studies validate Simoa® immunoassays for detecting neurodegenerative biomarkers, emphasizing p-Tau 231's importance in neurology. Its emergence signifies a significant advancement in AD diagnosis and treatment monitoring, offering potential insights into disease mechanisms and therapeutic targets.