PADOVA
neuroscience
CENTER

9 APRIL 2026 3:00 pm
SALA SEMINARI VIMM
(Via Giuseppe Orus 2, Padova)

PNC SEMINARS

A talk by Marta Campagnolo
(University of Padova)

BIOLOGICAL DEFINITION OF NEURODEGENERATIVE DISORDERS: THE SEARCH FOR BIOMARKERS IN PARKINSON'S DISEASE, ATYPICAL PARKINSONISMS AND DEMENTIAS

The increasing awareness on the complexity of the pathogenetic mechanisms in neurodegenerative disorders including Parkinson's disease (PD), atypical parkinsonisms (multiple system atrophy MSA, progressive supranuclear palsy PSP) and dementias (including Alzheimer's disease and frontotemporal dementia FTD) in the early/premotor stages is crucial for effective symptomatic treatment, and especially in light of the recent availability of disease-modifying specific therapies (namely monoclonal antibodies against aggregated α-syn and tau). Moreover, the description of different clinical and functional phenotypes according to imaging and neuropsychological biomarkers, especially in the context of atypical parkinsonisms, provides a more tailored and personalized approach.

The integration of morphological and functional data with an accurate biological characterization has become routinely employed in the clinical practice, to support the differential diagnosis and to detect the disease in the early stages.

Blood-based biomarkers including NfL, GFAP and phosphorylated-tau pTau181 can be

easily incorporated into clinical practice, both individually and in combination, and have proven useful to distinguish different clinical entitites across a range of complex neurodegenerative disorders, including rare conditions such as atypical parkinsonisms and FTD.

Moreover, phosphorylated-tau pTau217, that has demonstrated significant potential as a biomarker for early amyloid pathology in patients with initial AD, has proven useful in identifying AD co-pathology in the context of other neurodegenerative disorders, particularly in movement disorders where the cognitive burden might be significant.

The detection of phosphorylated α-synuclein and the evaluation of its burden via histology and seed amplification assays in the skin and the gastrointestinal system, together with the concomitant immunological changes occurring in the tissue provide a definite biological characterization in α-synucleinopathies, supporting the clinical diagnosis and differentiating patients according to the specific condition and to the severity.

The evaluation of non-invasive techniques such as Optical Coherence Tomography, showed specific abnormal patterns in the retinal structures in patients diagnosed with PD and MSA, showing potential as an additional biomarker to confirm the clinical diagnosis.

Biography

Marta Campagnolo obtained her Master's Degree in Medicine in 2008 and her Residency in Neurology in 2017, both from the University of Padova. She was a Research Fellow at the Center for Autonomic and Peripheral Nerve Disorders at the Harvard Medical School in Boston, USA, and in 2021 she was awarded her PhD in Translational Specialistic Medicine 'G.B. Morgagni', Neuroscience curriculum, at the University of Padova. She currently serves as an Assistant Professor of Neurology (RTDa) at the Department of Neuroscience.

Her research activity focuses on identifying possible biological markers for the early diagnosis of Parkinson's disease, specifically blood and CSF biomarkers, and their possible correlations with clinical and neuropsychological profiles. Moreover, Marta has been studying the pathological deposition of different proteins (e.g. alpha-synuclein, tau) in specific tissues (e.g. skin and gastrointestinal system), and the concomitant immunological changes occurring in the tissue. These projects, together with the evaluation of non-invasive techniques such as Optical Coherence Tomography, aim to identify specific patterns supporting the differential diagnosis of different conditions, including Parkinson's disease and atypical parkinsonisms such as Multiple System Atrophy, as well as and other neurodegenerative disorders (e.g. Alzheimer's disease).