Alumni of the BRAIN and MIND Sciences Seminar Series

ΔΙΙΔΡΥΜΑΤΙΚΟ ΠΡΟΓΡΑΜΜΑ ΜΕΤΑΠΤΥΧΙΑΚΩΝ ΣΠΟΥΔΩΝ
ΕΓΚΕΦΑΛΟΣ και ΝΟΥΣ
που οδηγει σε Μεταπτυχιακό Δίπλωμα Ειδίκευσης
INTERDISCIPLINARY GRADUATE PROGRAMME in the
BRAIN and MIND sciences
leading to Master's degree

Tracking the interplay between protein deposition and neuroinflammatory response in dementia disorders, as measured with multimodal imaging and biofluid markers

Konstantinos Ioannou, MD, MSc

PhD candidate,

Nordberg Translational Molecular Imaging Lab

Karolinska Institutet, SWEDEN

Thursday, November 20, 2025

14:00-15:00

Alumni of the BRAIN and MIND Sciences Seminar Series ZOOM LINK
Meeting ID: 898 1282 5746
Passcode: 703942

Info: Vassilis Raos, 4512, raos@uoc.gr

The speaker:

Konstantinos Ioannou

I completed my MD at the University of Ioannina in 2016 and obtained a MSc in Brain and Mind Sciences from the University of Crete in 2021. Later that year, I joined the Nordberg Translational Molecular Imaging Lab at Karolinska Institutet as a research assistant. In March 2023, I started my PhD in the same lab, with the project titled *"Tracking the interplay between protein deposition and neuroinflammatory response in dementia disorders, as measured with multimodal imaging and biofluid markers."* My research interests include elucidating the pathophysiological mechanisms underlying neurodegenerative disorders, validating PET imaging and fluid biomarkers through autopsy studies, and applying these biomarkers to assess emerging disease-modifying treatments for Alzheimer's disease.

Summary of the presentation:

Alzheimer's disease (AD) is characterized by the accumulation of amyloid-β (Aβ) peptides forming extracellular plaques and hyperphosphorylated tau proteins forming intracellular neurofibrillary tangles. These pathological aggregates disrupt neuronal communication, impair synaptic function, and trigger neuroinflammatory responses. The progressive interplay between Aβ deposition and tau pathology ultimately leads to neuronal loss and cognitive decline. Recent advances now allow the in vivo detection of Aβ and tau pathology, as well as the visualization of inflammatory responses, using positron emission tomography imaging, which serves as the gold standard for evaluating these hallmark processes of AD. Complementary to imaging, cerebrospinal fluid and plasma biomarkers have emerged as minimally invasive tools for quantifying Aβ and tau levels. However, the clinical implementation of these biomarkers remains challenging. Validation against neuropathological findings and longitudinal clinical studies is essential to ensure their accuracy and reliability. Current visualization and quantification methods lack standardization, with variable cut-offs and limited understanding of technical and biological factors that may influence the measurement of Aβ and tau proteins. Furthermore, autopsy studies have shown that mixed pathologies (i.e., the co-presence of misfolded Aβ, tau, α-synuclein, or TDP-43 proteins) are a common finding in older individuals. This suggests that, in many cases, cognitive impairment may stem from the cumulative effect of the overall pathological burden rather than being the exclusive outcome of AD pathology. These challenges, alongside the recent approval of the first disease-modifying treatments for AD, underscore the need for the development of accurate biomarkers and a further understanding of the underlying disease mechanisms.