CIC biomaGUNE: CIF: G-20788840· Parque Tecnológico de San Sebastián · Pº Miramón 182· 20014 San Sebastián (Gipuzkoa)· Tel.: + 34 943 00 53 00· Fax: + 34 943 00 53 01· info@cicbiomagune.es ·www.cicbiomagune.es

CIC biomaGUNE
CENTER FOR COOPERATIVE RESEARCH IN BIOMATERIALS

seminar

Tuesday, 11th June, 12.00 pm, Seminar Room

Host: Dr. Jordi Llop

Positron emission tomography of tau pathology

Michael Schöll1,2,3

1 Wallenberg Centre for Molecular and Translational Medicine and the Department of Psychiatry and Neurochemistry, University of Gothenburg
2 Clinical Memory Research Unit, Lund University, Sweden
3 Dementia Research Centre, UCL Queen Square Institute of Neurology, London UK

The aggregation and accumulation of pathologic forms of the microtubule-associated tau protein into fibrils, eventually forming characteristic tangle pathology, hallmarks the majority of all neurodegenerative disorders. These so-called tauopathies, of which Alzheimer's disease (AD) is the most common form, are difficult to identify and diagnose, especially at early disease stages. However, a recently proposed research framework for the biological definition of AD called for the definition of tau pathology status, highlighting the need for highly specific tools to assess disease-related tau pathology [1]. While it has been possible to measure tau pathology in the cerebrospinal fluid (CSF) for decades [2], the relatively recent development of positron emission tomography (PET) ligands to visualize, map, and quantify tau pathology in the living brain has already provided substantial additional information about the temporal and spatial characteristics of tau aggregation during disease development, holding promise to serve as a highly valuable diagnostic tool to stage disease-related pathology [3]. This talk will describe the current state of tau biomarkers derived from neuroimaging with PET as well as their relationship with *post mortem* findings[4], fluid-derived biomarkers for tau pathology [5], and cognition [6]. Specifically, I will focus on the potential research and clinical applications of tau PET, as well as on potential stumbling blocks on the road ahead.

Keywords

Positron emission tomography, tau, tauopathies, Alzheimer's disease

References

1. Jack Jr., C.R., et al., *NIA-AA Research Framework: Toward a biological definition of Alzheimer's disease.* Alzheimer's & Dementia, 2018. **14**: p. 535-562.
2. Blennow, K., et al., *Tau protein in cerebrospinal fluid: a biochemical marker for axonal degeneration in Alzheimer disease?* Mol Chem Neuropathol, 1995. **26**(3): p. 231-45.
3. Schöll, M., et al., *Biomarkers for tau pathology.* Mol Cell Neurosci, 2018.
4. Smith, R., et al., *Correlation of In Vivo [18F]Flortaucipir With Postmortem Alzheimer Disease Tau Pathology.* JAMA Neurol, 2018.
5. Mattsson, N., et al., *(18)F-AV-1451 and CSF T-tau and P-tau as biomarkers in Alzheimer's disease.* EMBO Mol Med, 2017. **9**(9): p. 1212-1223.
6. Mattsson, N., et al., *Predicting diagnosis and cognition with (18)F-AV-1451 tau PET and structural MRI in Alzheimer's disease.* Alzheimers Dement, 2019. **15**(4): p. 570-580.