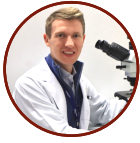


Guest Editors



**Fabio Moda, PhD**

PhD, Fondazione IRCCS Istituto  
Neurologico Carlo Besta, Division of  
Neurology 5 and Neuropathology,  
Milan, Italy

✉ Fabio.Moda@istituto-besta.it



**Giorgio Giaccone, MD**

Fondazione IRCCS Istituto  
Neurologico Carlo Besta, Division of  
Neurology 5 and Neuropathology,  
Milan, Italy

✉ Giorgio.Giaccone@istituto-besta.it

# From protein misfolding to dementia: basic research, innovative diagnosis and early biomarkers

🕒 **Deadline: 30 March 2023**

Dear Colleagues,

Misfolding, aggregation, and accumulation of specific proteins in the brain represent the key molecular pathways of many neurodegenerative disorders (NDs), including Alzheimer's disease, Parkinson's disease and transmissible spongiform encephalopathies (prion diseases).

Although the molecular mechanisms and the whole range of molecules involved in each NDs still need to be clarified, compelling evidences suggest that the misfolded proteins are the basic change of the disease and can adopt a wide spectrum of aberrant conformations which are believed to determine and influence the clinical and neuropathological features.

The definite diagnosis of the different NDs requires postmortem neuropathological analysis and relies on detection and localization of the misfolded protein in the brain. The in vivo diagnosis is based on the clinical presentation, neuropsychology and neuroimaging and has been recently improved by the availability of peripheral biomarkers, most of which related to secondary changes.

However, in the last few years, thanks to the better understanding of these diseases and striking technological advancement (e.g. the development of innovative and ultrasensitive tools), significant progresses have been made toward biomarkers tightly linked to the core pathology of these diseases.

In particular, the development of (1) new cellular and animal models that better recapitulate the most important features of NDs; (2) cell-free amplification techniques (e.g. seeding aggregation assays) that mimic the process of protein misfolding

and aggregation in vitro in a very rapid manner; (3) new disease biomarkers, and (4) new technologies and disciplines (e.g. metagenomics, structural and molecular biology, biophysics, biochemistry and artificial intelligence) exploitable for disease research, diagnosis and treatment, are revolutionizing the world of NDs.

The aim of this special issue is to present the most recent discoveries associated with different facets of NDs, including neuropathology, pathophysiology, basic research, and classical or innovative diagnostic approaches that might be on the frontiers of research in the field.

Dr. Fabio Moda and Dr. Giorgio Giaccone  
Guest Editors

## Published Papers

 Open Access

Original Research

### **Platelet TAU is Associated with Changes in Depression and Alzheimer's Disease**

Bettina Sarg, Dhvani S. Korde, Josef Marksteiner, Christian Humpel  
*Front. Biosci. (Landmark Ed)* 2022, 27(5), 153; <https://doi.org/10.31083/j.fbl2705153>

 Open Access

Original Research

### **Seed amplification assays for diagnosing synucleinopathies: the issue of influencing factors**

Giovanni Bellomo, Silvia Paciotti, Leonardo Gatticchi, Domenico Rizzo, ... Lucilla Parnetti  
*Front. Biosci. (Landmark Ed)* 2021, 26(11), 1075–1088; <https://doi.org/10.52586/5010>

 Open Access

Review

### **Raman Spectroscopy Techniques for the Investigation and Diagnosis of Alzheimer's Disease**

Panagis Polykretis, Martina Banchelli, Cristiano D'Andrea, Marella de Angelis, Paolo Matteini  
*Front. Biosci. (Schol Ed)* 2022, 14(3), 22; <https://doi.org/10.31083/j.fbs1403022>