



## **SYMPOSIUM: APPLYING NOVEL NEUROSCIENTIFIC TOOLS FOR PROMOTING HUMAN NEUROPLASTICITY THROUGH COGNITIVE AND PHYSICAL TRAINING**

### **Presenters**

Soledad Ballesteros  
Christos Frantzidis  
Panteleimon Chriskos

### **Short description**

During the last decades human neuroscience have demonstrated that both physiological and pathological aging affect brain structure and function degrading the performance of various cognitive domains (executive functioning, attention, episodic memory, speed of sensory information processing). Various interventions within the context of cognitive and/or physical training have been proposed in order to delay or event prevent the clinical onset of neurodegenerative mechanisms. Although there is concrete evidence of the beneficial effect of training in cognition, mood and quality of life there are still open questions regarding the neuroplastic effects on cortical connectivity and brain functional organization.

## Objectives and Outline

The present symposium welcomes studies which evaluate the efficacy of various intervention approaches in either the functional or the structural connectome and its network properties. It targets on neurologists, neuroscientists and psychologists aiming to answer the following challenges regarding aging and human neuroscience:

1. Is there a linear decrease of brain network performance across the life span?
2. What are the age-related changes in the brain (hubs) and how these changes may be related to pathological neurodegeneration?
3. How can we detect/quantify compensatory mechanisms through brain network properties?
4. How do we establish evaluation models for quantifying the impact of interventions in terms of brain network properties?
5. What is the optimal identification of network states and how do they evolve during aging?

## Keywords

applying novel neuroscientific tools, pathological aging, neurodegenerative mechanisms, cognition, neuroplastic effects