

## Working Group: 8- Aging and Neurodegenerative diseases Disease Progression Modeling

Chairs: Yasser Iturria-Medina (MNI), Roberto Rodriguez (CNEURO)

Speakers: Yasser Iturria-Medina, Roberto Rodriguez, Maria A. Bobes, Laura Garcia Pupo, Carlos Tobon (Atioquia University, Colombia)

First, the group discussed the importance of using disease progression models (DP) to track neurodegenerative progression and identify individually-tailored treatments. As discussed, the DP progression models can be empirical or mechanistic. In the first case, the models allow making disease predictions without offering a biological explanation of the underlying disease processes. On the contrary, mechanistic models focus on clarifying pathological factors and their interactions underlying disease development, although in some cases they can also perform predictions.

Different DP applications in the context of Alzheimer's disease were presented by Yasser Iturria Medina, from the Montreal Neurological Institute. In addition, the wide utility of EEG recordings to characterize hereditary Ataxias was discussed by Roberto Rodriguez, from the Cuban Neuroscience Center, who presented the significant advances obtained at the Centre for Research and Rehabilitation of Hereditary Ataxias (CIRAH) in Holguin, Cuba. Similarly, Maria Antonieta Bobes illustrated the importance of analyzing EEG recordings for further understanding disease progression in early-onset Alzheimer's disease. Laura Garcia Pupo presented new molecular tools for characterizing Alzheimer's at the most basic microscopic level.

In general, the group highlighted the crucial need for defining and using robust DP models, informed by the presented molecular, electrophysiological and/or imaging data, as well as discussed their multiple advantages over the traditional biomarkers search/application. Specific collaborations across the group members were discussed, particularly in the context of multimodal data integration and the corresponding development/application of unified DP models.