

Oxidative stress in the aging brain

M.C. Polidori^{I,II}

^IAgeing Clinical Research, Department II of Internal Medicine and Center for Molecular Medicine Cologne, Faculty of Medicine, University Hospital Cologne, University of Cologne, Cologne, Germany, ^{II}Cologne Excellence Cluster on Cellular Stress-Responses in Aging-Associated Diseases (CECAD), Faculty of Medicine, University Hospital Cologne, University of Cologne, Cologne, Germany

Aging is a multifactorial process occurring in a pathophysiological continuum which leads to organ and system functional loss. While aging is not a disease, its pathophysiological continuum predisposes to illness and multimorbidity clusters which share common biomolecular mechanisms - the pillars of aging. Accordingly, brain aging and neurodegeneration share many hallmarks with other age-related diseases. The central nervous system is one of the main weakest links susceptible to the aging process and its deterioration, leading among others to cognitive impairment, is associated to factors like proteostasis collapse, stem cell exhaustion, repair mechanisms, altered brain nutrient sensing, endothelial changes, inflammation, oxidative distress, energy unbalance. These mechanisms are highly interwoven and much research aims at their disentangling and disclosure of clinically relevant impact, particularly to identify pharmacological and non pharmacological therapeutic strategies.