Inflammation, Amyloid and Atrophy in The Aging Brain: The Borders between Healthy Brain Aging and Neurodegeneration

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Country

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Inflammation, Amyloid and Atrophy in The Aging Brain: The Borders between Healthy Brain Aging and Neurodegeneration

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The project/programme is most relevant to:

Alzheimer's disease & other dementias

Keywords

aging brain | genes | cognition | AD | amyloid | neuro-inflammation | PET

Research Abstract
How the link between aging and AD should be understood is a major question in contemporary neuroscience. Evidence is mounting that Alzheimer-vulnerable neural systems are highly susceptible to a number of different factors in aging, with some being diseas e related while others are not. Our aim is to identify fundamental mechanisms causing these systems to decline also in non-demented elderly, allowing us to address the overarching question of why do some people maintain cognitive abilities in higher age w hile others decline? First, using 1100 cross-sectional and 207 longitudinal examinations, we will compute detailed age-vulnerability maps for a range of brain characteristics representing different neurobiological traits. In Part 2, we will launch the mos t intensive study of normal aging to date in an attempt to understand mechanisms and moderators of the vulnerabilities identified in Part 1. In an independent sample of 200 healthy participants (25-90 yrs), we will obtain extremely comprehensive longitudi nal measures of brain structure and function, cognition, genes and life-style factors. The most novel aspect is that we simultaneously map distribution of amyloid deposition and neuro-inflammation (PET), which has not previously been done. This is strikin g, as there is evidence for a relationship between amyloid and neuro-inflammation from animal studies, and effects of amyloid on brain health in non-demented is a major area of research. Also, life-style related risk factors for cognitive decline, such as overweight, blood pressure and cholesterol, are hypothesized to impact the brain partly through neuro-inflammation. Thus, systematic testing of how amyloid and neuro-inflammation are related to each other and to cerebral and cognitive change in non-demen ted, and the possibly mediating roles played by life-style and genetic risk factors, has the potential to really push the boarders of our understanding of brain aging, thereby opening new venues for intervention.

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