

Symposium 9: Towards disease modifying drugs for neurodegeneration: connecting learnings from genetics, molecular and pathology studies

Theme: Neurodegenerative disorders and ageing

Monday 10th April, 16:20 – 18:00

Neurodegenerative diseases such as Alzheimer's and Parkinson's disease are an increasing concern for society. There are no known means to halt these conditions at present, and they always prove devastating to afflicted patients, caregivers and families. Over 45 million people worldwide are currently living with dementia, and up to 10 million with Parkinson's disease. Considering that many of these patients often require constant caregiving and ultimately institutionalization, the social impact is paralleled with a staggering economic burden. Healthcare costs for Alzheimer's disease are projected to reach over \$1 trillion by 2050 in the United States alone. Neurodegenerative diseases will likely prove to be one of the largest healthcare issues of the modern world, and treatments that significantly alter their progression are urgently needed.

Hope is by no means lost, however. Post mortem, the brains of patients who have suffered from such diseases exhibit unequivocal molecular pathological hallmarks, such as deposits of abnormally aggregated beta-amyloid, tau and alpha-synuclein proteins. While undoubtedly complex, hypotheses regarding the onset of Alzheimer's and Parkinson's disease are emerging, suggesting an inter-play between suspected pathological protein species with several genetic and environmental risk factors. Such basic research is also driving drug discovery efforts whereby key hypotheses of neurodegenerative disease pathology will be directly tested by putative treatments in the clinic in the near future.

This symposium will look at progress made over recent years in attempting to target different aspects and stages of Alzheimer's and Parkinson's pathology and what lessons have been learned here. Current biological mechanisms under clinical and pre-clinical evaluation will be described, together with an exploration of how developing genetic insights are expanding the range of mechanisms that could be probed for potential new treatments.

Co-Chairs: Dr Rita Guerreiro and Professor Karen Duff

Speaker 1: Dr Rita Guerreiro (University College London)

'Using novel genetic approaches to probe the causes of neurodegenerative disease'

Speaker 2: Professor Karen Duff (Columbia University)

'Tau: propagation, pathology, Alzheimer's disease (and beyond)'

Speaker 3: Professor George Tofaris

Alpha-synuclein trafficking as a rational mechanism for therapies in Parkinson's Disease

Speaker 4: Dr Michael Hutton (Eli Lilly & Co. Ltd.)

'How does the pharmaceutical industry tackle neurodegenerative disease?'