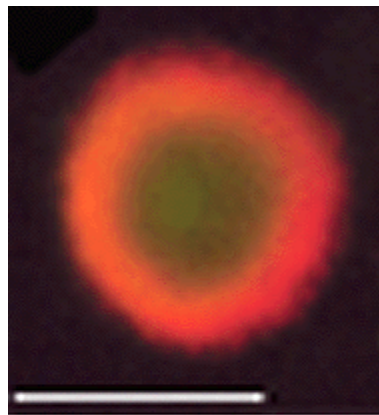




Parkinson disease



An overlapping immunofluorescent stain showing alpha-synuclein localization in Lewy bodies of Parkinson's disease brain. The Lewy body is stained green (with antibody against ubiquitin), while alpha-synuclein is stained red. Where both ubiquitin and alpha-synuclein are found, the stain appears yellow/orange. With thanks to M. Polymeropoulos for supplying the picture.

Parkinson disease, first described by James Parkinson in 1817, is a growing national problem, with more than half a million Americans affected at any one time. Most people are over 50 years old when the disease appears, although it can occur in younger patients. It is a neurodegenerative disease that manifests as a tremor, muscular stiffness and difficulty with balance and walking. A classic pathological feature of the disease is the presence of an inclusion body, called the Lewy body, in many regions of the brain.

Until relatively recently, Parkinson disease was not thought to be heritable, and research was primarily focused on environmental risk factors such as viral infection or neurotoxins. However, a positive family history was gradually perceived to be a risk factor, a view that was confirmed last year when a candidate gene for some cases of Parkinson disease was mapped to chromosome 4. Mutations in this gene have now been linked to several Parkinson disease families. The product of this gene, a protein called alpha-synuclein, is a familiar culprit: a fragment of it is a known constituent of Alzheimer disease plaques.

Since alpha-synuclein fragments are implicated in both Parkinson and Alzheimer diseases, there may be shared pathogenic mechanisms between the two, therefore research into one disease may aid understanding of the other. Further avenues for research are also being suggested by cross-species comparisons assisted by database searching. Among others, rats, cows and zebra finches all possess alpha-synuclein; in the rat they play a role in the sense of smell, while in the zebra finch it is thought to be involved in the process of song learning. Further

work to elucidate the function of alpha-synuclein in humans, and therefore clues as to the pathology of Parkinson disease, should be assisted by studying these other species.

Related diseases

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