

## **Nanoscale spatial organisation of the Retromer complex in Parkinson's disease**

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The protein complex retromer plays a pivotal role in regulating the transport of numerous proteins and lipids (cargos) in the endocytic and biosynthetic pathways, as well as to specialised organelles. This sorting function relies on the formation of tubovesicular membrane domains. Impairment of retromer function is closely associated with age-related neuronal diseases such as Parkinson's disease (PD). It is not understood how retromer coordinates the cargo identities of those tubovesicular carriers. We used super-resolution microscopy to map the precise localisation of retromer and associated proteins in different types of carriers in healthy and pathological conditions. Our multi-colour STED microscopy data revealed the presence of distinctive retromer domains regulating the core nanoscale architecture of the tubovesicular carriers that likely coordinate their formation and determine which cargo they transport. We provide evidence that the growth and scission of these carriers are assisted by the microtubule molecular motor, dynein.