Lay Summary

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Electron microscopic study of CAA

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The basement membranes of capillaries and arteries (BM) are the route for the perivascular elimination of amyloid-β, the failure of which is believed to contribute to Alzheimer's disease (AD) pathogenesis. Collagen IV is a ubiquitous BM component with structural and functional roles. Laminin connects collagen IV to the dystrophin glycoprotein complex (DGC. Dystroglycanopathies are a clinically heterogenous group of muscular dystrophies caused by an abnormality with the α-dystroglycan component of the DGC. Dystroglycanopathies are used in this study as a model of disrupted BMs to explore their potential for use in future AD research where the analysis of amyloid-β along compromised BMs is valuable.

This study investigates how the general morphology and contours of vessels is altered in dystroglycanopathies in human brain tissue by immunohistochemical staining for collagen IV involves a comparison of both staining and blood vessel diameter between dystroglycanopathies and normal tissue. Our results so far demonstrate that Dystroglycanopathies exhibit observably weaker staining for collagen IV and a statistically significant greater blood vessel diameter possibly due to a thickened BM. BMs in dystroglycanopathies appear to be more rugged and tortuous indicating structural irregularities which may result in a functional deficit. Using these observations, we will employ experimental studies on mice with disrupted dystroglycan complex to stud the capacity for removal of amyloid from the brain