

Electron tomography reveals the fibril structure and lipid interactions in amyloid deposits.

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Abstract

Electron tomography is an increasingly powerful method to study the detailed architecture of macromolecular complexes or cellular structures. Applied to amyloid deposits formed in a cell culture model of systemic amyloid A amyloidosis, we could determine the structural morphology of the fibrils directly in the deposit. The deposited fibrils are arranged in different networks, and depending on the relative fibril orientation, we can distinguish between fibril meshworks, fibril bundles, and amyloid stars. These networks are frequently infiltrated by vesicular lipid inclusions that may originate from the death of the amyloid-forming cells. Our data support the role of nonfibril components for constructing fibril deposits and provide structural views of different types of lipid-fibril interactions.

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