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ONLINE SEMINAR

Piotr Szwedziak

AMYLOID-B OLIGOMER INTERACTIONS WITH LIPID MEMBRANES BY CRYO-ELECTRON TOMOGRAPHY

May 5th, 2021, 2 P.M. CET
Online seminar via ZOOM

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Amyloid-β oligomer interactions with lipid membranes by cryo-electron tomography

SPEAKER

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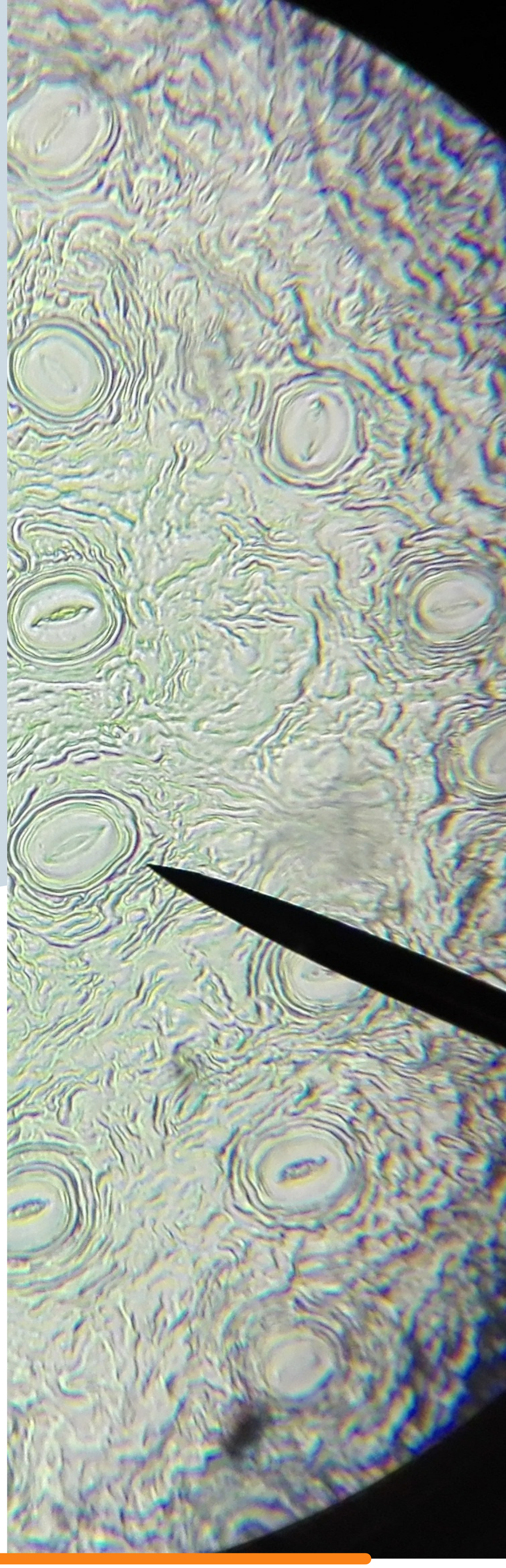

ABSTRACT:

Amyloid-β (Aβ) assemblies have been shown to bind to lipid bilayers. This can disrupt membrane integrity and cause a loss of cellular homeostasis, that triggers a cascade of events leading to Alzheimer's disease. However, molecular mechanisms of Aβ cytotoxicity and how the different assembly forms interact with the membrane remain enigmatic. Here we use cryo-electron tomography (cryoET) to obtain three-dimensional nano-scale images of various Aβ assembly types and their interaction with liposomes. Aβ oligomers and curvilinear protofibrils bind extensively to the lipid vesicles, inserting and carpeting the upper-leaflet of the bilayer. Aβ oligomers concentrate at the interface of vesicles and form a network of Aβ-linked liposomes, while crucially, monomeric and fibrillar Aβ have relatively little impact on the membrane. The different effects of Aβ assembly forms observed align with the highlighted cytotoxicity reported for Aβ oligomers. The wide-scale incorporation of Aβ oligomers and curvilinear protofibrils into the lipid bilayer suggests a mechanism by which membrane integrity is lost.

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