

Use of Raman spectroscopy to evaluate the structure of amyloid-b polymorphs and their interactions with cell membranes

Overview: This figure illustrates the structural and interaction differences between two amyloid fibril polymorphs (Polymorph 1 and Polymorph 2) and their effects on disrupting cellular membranes and generating reactive oxygen species (ROS) in cells.

Left Panel: Polymorph 1 is depicted in a green-colored structure. The polymorph causes minimal disruptions to the lipid bilayer of cellular membranes (depicted by the hexagonal-shaped molecules) and produces relatively low levels of ROS (depicted by a red starburst icon). The changes in the fluidity and chemical composition of the lipid bilayers can be probed using Raman spectroscopy (shown in the green graph).

Right Panel: Polymorph 2 is depicted in a red-colored structure. The polymorph aberrantly interacts with cellular membranes, causing large disruptions in the fluidity and chemical composition of the lipid bilayer, as well as producing a large amount of ROS (depicted by a larger red starburst icon). The changes in the fluidity and chemical composition of the lipid bilayers can be probed using Raman spectroscopy (shown in the red graph).

Takeaway: The figure highlights the structural differences between the two polymorphs, their distinct Raman scattering properties, and the impact on ROS production in a biological membrane context.