

Fig. 1. (**A**) SDS page gel image and size exclusion chromatography of the purified α -syn monomer, confirming the pure α -syn monomer with ~14kDa of molecular weight. (**B**) ThT aggregation kinetics of α -syn fibrils formation without membranes (black) and in the presence of neuronal mimetic (green) and Parkinson's disease-related (red) membranes. (**C**) Negatively stained electron microscopy images of α -syn fibrils grown in the presence of neuronal mimetic and Parkinson's disease-related membranes.

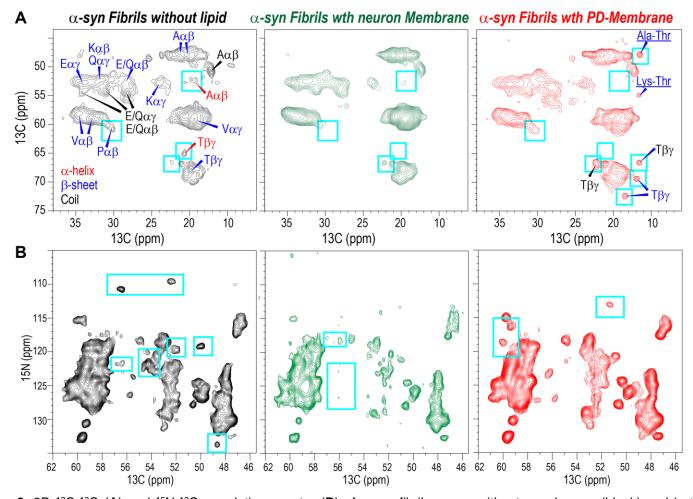


Fig. 2. 2D 13 C- 13 C (**A**) and 15 N- 13 C correlation spectra (**B**) of α-syn fibrils grown without membranes (black) and in the presence of neuronal mimetic (green) and Parkinson's disease-related (red) membranes. Distinct spectral patterns are highlighted in cyan boxes, confirming conformational variations among these α-syn fibrils.

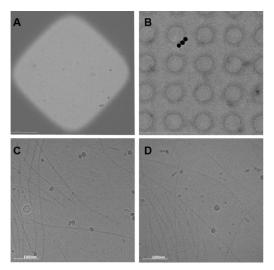


Fig. 3. Examples of cryo-EM images of α -syn amyloid fibrils grown in the presence of PD-associated membranes, obtained on a Glacios microscope. (**A**) Representative images of squares and (**B**) holes of the grid, and (**C**, **D**) frozen fibrils. The images confirm the optimal ice thickness and the distribution of α -syn amyloid fibrils for data collection.