Amyloid Fibrils

Amyloid fibrils are peptide or protein aggregates that form under certain conditions in vitro or in vivo. For example, the amyloid fibril plaques found in brain tissue of Alzheimer patients are formed from the peptide Aβ and are associated with neurodegeneration. Amyloid formation is also observed with other diseases, such as type II diabetes and Creutzfeldt-Jakob disease.

Amyloid structures represent an alternative to the native folding pattern of many peptides and proteins. A characteristic motif of this folding pattern is the cross-β structure in which the peptides or proteins associate by β-sheet formation within protofilaments making up a fibril.

In collaboration with Marcus Fändrich (Ulm University, Germany), we study the molecular architecture of amyloid fibrils associated with human disease. Our goal is to identify fundamental principles of amyloid formation, and potential targets for disease treatment. The Figure shows an 8 Å structure of an Aβ(1-40) fibril [1]. At this resolution, the path of the peptide can be identified.

Other publications on the topic: [2][3][1][4][5][6][7][8][9][10][11][12]

References