سمینار هفتگی ماده چگال نرم

Proteinous Nanofibrils and Amyloidosis

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Abstract

There is strong evidence regarding a direct relationship between proteins/peptides fibrillation and development/progression of the diseases known as amyloidoses. To date, more than 30 different kinds of proteins/peptides have been known that cause disorders in human bodies including liver, heart, eyes, lung, and brain, among them, the brain diseases such as Alzheimer's and Parkinson's diseases, Multiple system atrophy (MSA), dementia with Lewy bodies, Huntington's and prion diseases (Creutzfeldt–Jakob disease) are more identified. So far, despite the fact that many compounds have been introduced, At a glance, it seems that by inhibition the fibrillation process we can combat the amyloidosis progression. However, until now despite the fact that many powerful compounds have been introduced and even passed early stages of clinical trials, to my best of knowledge, none received the concluding approved. The fibrillation is a complex phenomenon with multiple stages including changing the natural form of protein (so many forms) to prone forms for self–assembling, going to small oligomeric forms, big oligomeric forms, protofilaments, and the final step is formation of mature fibrils with high ordered beta sheets structure. On the other hand, we have shortcuts pathways that monomeric forms rapidly convert to fibrils (secondary, nucleation independent manners) which have critical role in cell-to-cell transferring of the fibrillation process (prion-like infection). Our group for more than 14 years have been working on α-synuclein (αSN) protein including the recombinant protein production, cell and *in vitro* and in less case animal modeling of PD, work on different natural small molecules to inhibit αSN fibrillation/neurotoxicity, using carriers (…specially nanoliposome) , developing Blood Brain Barrie (BBB), and so on. It is very interesting to know more about mechanism of action of the candidate compounds on αSN fibrillation/seeding/toxicity because they have different behavior despite the mostly similar structures.

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