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# A multiparametric analysis of the synergistic impact of anti-Parkinson's drugs on the fibrillation of human serum albumin

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Protein aggregation has been associated with several human neurodegenerative diseases, such as Parkinson's and Alzheimer's diseases. There are several small molecules that can reduce aggregation of proteins. The present study aimed to test the hypothesis that the application of more than one inhibitor either simultaneously or consecutively may result in more efficient inhibition of protein aggregation. To this end, the anti-amyloidogenic behaviour of benserazide hydrochloride (BH) and levodopa (LD) individually and in combination (BH + LD) was investigated using various biophysical, microscopic and computational techniques. BH, LD, and BH+LD treatments showed inhibitory effects on protein aggregation and had the ability to minimize the amyloid-induced cytotoxicity in human neuroblastoma cell line (SH-SY5Y). The two drugs in combination showed synergism (combination index, CI < 1) between them. These drugs also destabilized the preformed fibrils of human serum albumin (HSA). Our studies consistently showed that the BH+LD treatment showed highest efficacy towards inhibition and disaggregation of amyloid fibrils in comparison to treatment with BH and LD individually. Therefore, application of drugs in combination against fibrillogenesis may represent a new route for the development of means for prevention or delaying of the aggregation-related diseases.

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