Abstract

One of the main features of Alzheimer‘s disease (AD) are senile plaques in the brain. They are composed of β-amyloid (Aβ) peptides, which oligomerize and form fibrils during pathological conditions.

Inhibition of this oligomerization process is believed to be a possible therapy to prevent the progression of AD. Circular dichroism (CD) spectrometry is an optical method which enables to follow changes in the secondary structures of proteins. Within this study a CD-method was established by which the oligomerization process of synthetic Aβ 42 was monitored. During the validation of the method several parameters as the influence of several organic solvents as Ethanol, Methanol and DMSO on the spectra and the solvent solution and concentration of Aβ 42 were assessed. Then it was investigated if the addition of proposed disintegrating substances (natural compound, fluorescence dyes and antibiotics) resulted in a delayed onset of the oligomerization process of Aβ 42. Since these substances were dissolved in different solvents, the possible effects of the solvents alone as appropriate blank values were also carried out. The oligomerization experiments were carried out at 37 °C and CD-spectra were recorded at several time points (0, 7, 24, 48 hours).

In general, resulted CD-spectra showed concentration dependent effects on the Aβ 42 oligomerization caused by the inhibitors used. Thus, a CD-method was established which can be used to characterize the influence of compounds on Aβ 42 oligomerization and moreover to screen for potential substances maybe leading to drug candidates against Alzheimer‘s disease (AD).