# Different Lenses, Same Target: NMR Spectroscopy and Other Biophysical Tools for the Comprehensive Characterization of Prenylflavonoids Anti-Amyloidogenicity

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**Abstract**:

The major challenge in addressing Alzheimer's disease (AD) lies in the substantial delay between the initiation of the underlying molecular processes and the onset of the first symptoms. As such, the development of primary prevention strategies, as opposed to symptomatic treatment, is of critical importance [1]. In this context, diet has emerged as a promising preventive tool in addressing AD pathogenesis through a multi-targeted approach [2].

Natural products represent a rich source of bioactive molecules, among which the diverse class of flavonoids is well-described for its activity toward several targets in the central nervous system [3]. In particular, prenylated flavonoids (PFs) found in different plant families have been shown to inhibit Aβ1-42 peptide aggregation, one of the main hallmarks of AD [4]. Nonetheless, the detailed molecular mechanisms involved in the neuroprotective and anti-amyloidogenic properties of these compounds have not been widely described yet; thus, it is fundamental to shed light on the molecular features underlying their ability to bind to and inhibit Aβ1–42 aggregation.

Here, we emphasize how the combination of NMR spectroscopy with a suite of other biophysical tools, such as Fourier-Transform Infrared Spectroscopy (FT-IR) and Atomic Force Microscopy (AFM), has allowed the structural characterization of the interaction between Aβ1-42 oligomers and three PFs from hops, i.e. xanthohumol, isoxanthohumol, and 8-prenylnaringenin [5]. Among these, xanthohumol can redirect the aggregation of Aβ1–42 towards the formation of amorphous species, thus holding promise as a nutraceutical in the context of AD prevention.

**References:**

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