

Review

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# Protein Complexations and Amyloid Fibrilization as Novel Approaches to Improve Techno-Functionality of Plant-Based proteins

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**Abstract:** Proteins play a critical role in human diet and nutrition. Plant proteins hold immense potential in the development of sustainable, ethical, and low-cost future foods to achieve food security. Designing novel high-protein foods with plant proteins that mimic the attributes of animal proteins requires plant protein modification to enhance their functionality, quality, and utilization. The review highlights the salient aspects of protein complexation and fibrillization as emerging modulation techniques that can create bioparticles with superior functionality, without forming any chemical conjugates, and thus can be regarded as GRAS (generally recognized as safe) substances. In complexation, the ability of proteins to readily interact with other protein molecules, polysaccharides, surfactants, and polyphenols through van der Waals, hydrophobic, and electrostatic interactions to form binary/ternary complexes is exploited. Fibrils have uniquely ordered structures with superior stability, emulsification, and gelling properties, making them efficient emulsifiers, stabilizers, texturizing agents, and carriers in drug delivery systems.

**Keywords:** proteins; polysaccharides; phenols; complexation; amyloid fibrilization; techno-functional properties

