Abstract:

Alpha-lactalbumin (α-La), a globular protein found in all mammalian milk, has been used as an ingredient in infant formulas. The protein can be isolated from milk using chromatography/gel filtration, membrane separation, enzyme hydrolysis, and precipitation/aggregation technologies. α-La is appreciated as a source of peptides with antitumor and apoptosis, antiulcerative, immune modulating, antimicrobial, antiviral, antihypertensive, opioid, mineral binding, and antioxidative bioactivities, which may be utilized in the production of functional foods. Nanotubes formed by the protein could find applications in foods and pharmaceuticals, and understanding its amyloid fibrils is important in drawing strategies for controlling amyloidal diseases. Bioactive peptides in α-La are released during the fermentation or ripening of dairy products by starter and nonstarter microorganisms and during digestion by gastric enzymes. Bioactive peptides are also produced by deliberate hydrolysis of α-La using animal, microbial, or plant proteases. The occurrence, structure, and production technologies of α-La and its bioactive peptides are reviewed.