[0009] Alpha-lactalbumin is a 14 kDa acidic Ca^{2+} binding monomer stabilized by four disulfide bridges, it is a regulatory component in the galactosyltransferase system that synthesizes lactose. Sequence analysis showed high amino acid sequence homology to human alpha-lactalbumin (hALA) and lysozyme from hen's egg; a major allergen of hen's egg. The allergenicity of alpha-lactalbumin may be explained by its stability.

[00010] In suspension the proteins of the casein fraction form ordered aggregates (micelles) with a constant proportion of the individual molecules: alphaSI- and alphaS2-casein 37% each, beta- and kappa-casein 13% each. The four casein molecules have little primary structure homology, have different functional properties, but are all phosphorylated proteins with rheomorph, highly hydrated tertiary structures that can be easily degraded by some proteases. This sensitivity to proteolytic digestion is a rather unusual characteristic for an important allergen. Cow's milk caseins share amino acid sequence homologies of up to 90% with caseins of other mammals, like goat and sheep. This sequence homology might be the reason for the frequently observed cross-reactivity between cow's milk and milk from other animals.

[00011] The present invention addresses the need to provide methods which allow to identify allergenic proteins and peptides present in a biological source. The present invention thereby also addresses the need to provide methods which allow to identify non-allergenic proteins and peptides present in a biological source, specifically in milk from a mammal and in particular in cow milk and nutritional formulations containing such milk. Moreover, the invention provides means and methods for diagnosing and treating an allergy in an individual.

SUMMARY ~~OF THE INVENTION~~

[00012] An aspect of the present ~~invention~~disclosure relates to a method for identifying allergenic cow's milk alphaS1-, alphaS2-, beta- or kappa- casein proteins and/or peptides, which comprises the steps of providing at least one expression library comprising DNA or cDNA derived from the mammary gland tissue of ~~a lactating mammal, preferably~~ a lactating cow, expressing at least one alphaS1-, alphaS2-, beta- or kappa- casein protein or peptide encoded by said expression library, determining the binding capacity of said at least one alphaS1-, alphaS2-, beta- or kappa- casein protein or peptide to IgE of at least one serum of an individual who is sensitive to ~~mammalian milk, preferably~~ cow's milk, contacting the ~~said~~ at least one alphaS1-, alphaS2-, beta- or kappa- casein protein or peptide exhibiting an IgE binding capacity as determined earlier with basophil cells, ~~eosinophil cells~~ or mast cells, and identifying the ~~said~~ at least one alphaS1-, alphaS2-, beta- or kappa- casein protein or peptide as being allergenic when said basophil cells, ~~eosinophil cells~~ or mast cells release at least one mediator upon contact with ~~said~~ at least one alphaS1-, alphaS2-, beta- or kappa- casein protein or peptide. The invention in another aspect provides a method for identifying at least one allergenic milk protein or peptide, which comprises the steps of providing at least one expression library