



# **Foods as Soft Materials\***

## **New Approaches in Food Science**

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The approach to understand food, its components and the processes producing it underwent a paradigm shift by applying material science methodology to foods. Food products are multi-component and multi-phase systems which show intricate behaviors and properties. Approaching food components as soft matter systems has opened new avenues for controlling food quality and product attributes.

Food raw materials are from biological origins. As such they are already highly organized and structured starting materials. By this token, food making becomes the “art” of restructuring these raw materials and ingredients into new microstructures to obtain the desired sensorial and nutritional benefits. Biopolymers, as in the case of proteins and carbohydrates, behave similar to classical polymers and show a multitude of physical behaviors like phase separation, glass formation or gelling. This lecture will illustrate how food structures can be formed on the basis of the phase separation behavior of milk proteins with polysaccharides.

An other important class of food constituents are emulsifiers which help to disperse oils and fats in food product. Their classical usage as additives has clouded the understanding of their real nature as surface active molecules and the phase behavior which goes with it. The richness of phases can be employed to produce and release flavors or deliver nutritional functional molecules in a novel way.

In our outlook we will discuss how this novel approaches will help us to improve on the sensorial and nutritional functionality of our foods.

\* R. Mezzenga, et al., “*Understanding foods as soft materials*”, Nature Materials (2005) 4, 729-740.

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