Prediction and validation of emulsifying properties of peptides in oil-in-water emulsions.

Charlotte Jacobsen

National Food Institute. Technical University of Denmark. Denmark,

chja@food.dtu.dk

Food industry largely has relied on synthetic emulsifiers, phospholipids or proteins (egg, soy and dairy proteins) for production of food emulsions. However, due to the green transition there is an increasing interest in producing protein-based emulsifiers from side-streams or other new sustainable sources such as seaweed/microalgae, microbes and insects. Often emulsifying properties of proteins can be improved by enzymatic hydrolysis, which produces peptides with enhanced interfacial properties compared to the parent proteins. Traditionally, a trial-and-error top-down approach has been used to produce such emulsifying peptides. This approach involves evaluation of different proteases added either individually or in combination to obtain a range of protein hydrolysates with different degrees of hydrolysis. Subsequently, the hydrolysate is used directly or fractionated before the emulsifying activity is assessed. Such an approach is time-consuming and resource demanding. This presentation will discuss recent advances in a fundamentally different bottom-up strategy which is facilitated by quantitative proteomics and bioinformatic functionality prediction, to produce emulsifying peptides by targeted enzymatic hydrolysis. Results from studies using this approach on a range of different proteins (seaweed, potato, microbial, brewers spent grain) will be presented.