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## Proteinaceous microgels in bulk and interface: Applications in food

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### Abstract

Proteinaceous microgels are hydrogel microparticles with well-defined deformability that arises from the swollen nature of the integral biopolymeric network. These colloidal gel particles are extremely important to address fundamental biophysical research questions on oral tribology or digestion when they are present either in bulk phase or at the oil-water interface, respectively. Using a combination of multiscale experimental techniques and theoretical considerations, this invited talk will present an overview on the bio-functional performances of soft proteinaceous microgels. Specifically, one case study will focus on the oral lubrication properties<sup>1-3</sup> of the microgels, where these microgels present in the bulk phase act as viscosity modifiers and demonstrate high lubrication performance in elastomeric contact surfaces (with different wetting properties) emulating oral surfaces. Microgels showing aqueous 'soft ball-bearing' abilities depending upon their volume fraction will be highlighted<sup>2-3</sup>. Also, a case study will be presented on how these proteinaceous microgels can be fused when present at the oil-water interface to alter lipid digestion kinetics<sup>4</sup> of Pickering emulsion droplets. These recent advances on bio-functional properties of microgels hold promise for designing foods in the future with tailored properties.

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