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VABILO NA PREDAVANJE
V OKVIRU DOKTORSKEGA ŠTUDIJA
KEMIJSKE ZNANOSTI / INVITATION TO THE
LECTURE WITHIN DOCTORAL PROGRAMME IN
CHEMICAL SCIENCES

Prof. Stefan Salentinig

Department of Chemistry, University of Fribourg, Switzerland

z naslovom / title:

Nature-inspired Colloidal Nanomaterials for Health Applications

v sredo, 20. 4. 2022 ob 15. uri / on Wednesday, 20. 4. 2022 at 15.00

v predavalnici 1 v 1. nadstropju Fakultete za kemijo in kemijsko tehnologijo, Večna pot 113 **/ in lecture room 1,** 1st floor at the Faculty of Chemistry and Chemical Technology, Večna pot 113

Vljudno vabljeni! / Kindly invited!

Abstract:

Fluid-like colloidal structures including liquid crystals are key components in nature's own functional materials and important for a wide range of applications. Recently, the self-assembly of food emulsions including milk, into diverse liquid crystalline structures was discovered during digestion. This was possible by the use of in situ time-resolved X-ray scattering and diffraction techniques at synchrotron sources, combined with an advanced in vitro digestion model containing cell cultures that simulates the conditions in the human digestive tract.[1, 2] The discovered prototypical natural nanomaterials have implications for the design of novel adaptive materials including functional foods and antimicrobial materials. They were blueprinted, for instance, to nano-architect delivery matrices for poorly water soluble bioactives and novel antimicrobial materials.[3-5] This material design was guided by highly contemporary experimental methods including time-resolved (grazing incidence) small angle X-ray scattering and diffraction, imaging ellipsometry, confocal Raman microscopy as well as cryogenic electron microscopy and NMR techniques. Additional biological assays were used to bridge the boundaries from the molecular and structural to the cellular level. This provides essential knowledge for the comprehensive design of advanced materials for food and health application.

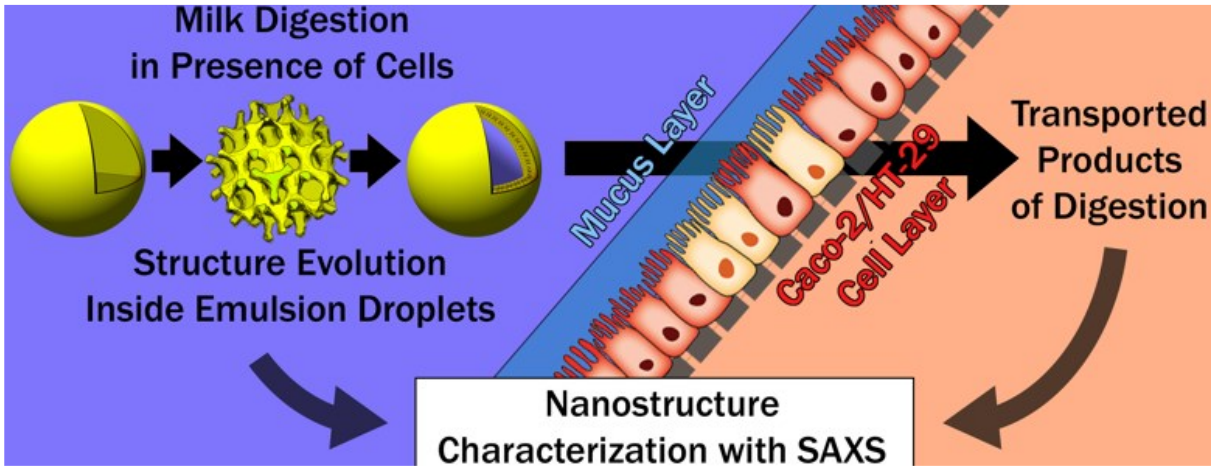

Figure 1: In-situ synchrotron SAXS study of nanostructure formation during the digestion of milk in the presence of a cell culture model simulating the small intestine.[2]

References:

[1] S. Salentinig. Supramolecular structures in lipid digestion and implications for functional food delivery (2019) Current Opinion in Colloid & Interface Science, 39, 190-201.

[2] C. Hempt et al. Nanostructure generation during milk digestion in presence of a cell culture model simulating the small intestine. Journal of Colloid and Interface Science, 2020, 574, 430-440.

[3] M. Gontsarik et al. Dispersed liquid crystals as pH-adjustable antimicrobial peptide nanocarriers. Journal of Colloid and Interface Science, 2021, 583, 672-682.

[4] M. Zabara et al. Bioinspired antimicrobial coatings from peptide-functionalized liquid crystalline nanostructures. ACS Applied Biomaterials, 2021, in press.

[5] S. Watts et al. Virus pH-dependent interactions with cationically modified cellulose and their application in water filtration. Small, 2021, in press