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Liquid crystal self-assembly during in vitro lipolysis of milk and infant formula

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Milk provides an important source of energy for children, and is one of the staple foods for adults with Western diet. The World Health Organization and the Australian government have recommended exclusive human milk feeding for infants below 6 months, although commercial infant formulas (IF) can be used as human milk substitute in circumstances where human milk is not adequate.[1,2] IF is generally manufactured from blends of vegetable oils (such as coconut, palm, palm kernel, safflower, soybean, sunflower, and recently FDA-approved canola) and/or bovine milk fat to match the required fatty acid compositions.[3] As such, there exists variation in the composition of triglycerides between IF and bovine milk, in addition to the different brands of IF. Our group has recently demonstrated, using the Australian Synchrotron time-resolved small angle X-ray scattering (SAXS), formation of different lipid nanostructures during lipase-catalysed milk digestion where transition from lipid emulsion to L2, Fd3m, H2, Q2, and lamellar vesicles occurred.[4,5] In this study, changes in the lipid self-assembly during the intestinal digestion process of various infant formulas were investigated. The effects of milk fat globule (MFG) sizes on the extent of digestion, and the particle size distribution of the MFG in both milk and IF were analysed. We also characterised the partitioning of the liquid crystalline structures in the milk lipolytic products using SAXS and cryo-TEM.

Keywords or phrases (comma separated)

Milk, digestion, structure

Are you a student?

No

Do you wish to take part in the Student Poster Slam?

No

Are you an ECR? (<5 yrs since PhD/Masters)

No

What is your gender?

Female

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