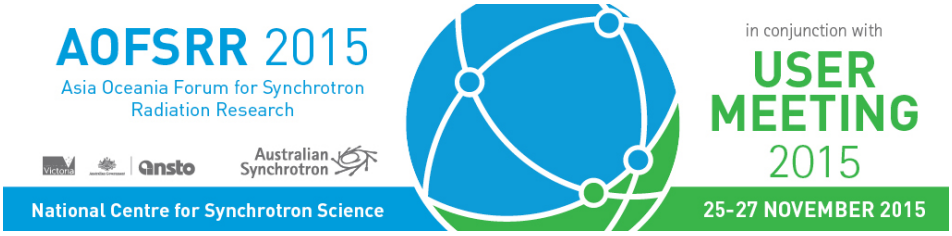

Contribution ID : **231** Type : **Poster**

Small angle scattering examination of structures self-assembled during milk digestion

Friday, 27 November 2015 13:30 (45)

Milk is a critical source of nutrition in the diet of many people, especially for infants for whom milk is the complete diet the first months of life. Milk contains both water soluble and water insoluble components all of which are made bioavailable during digestion to provide everything needed for growth and development. Recent work at the Australian Synchrotron SAXS beamline reported the discovery of self-assembled structures during the in-situ digestion of bovine and human milks. The progression through a range of different highly organized self-assembled structures has been studied using small angle scattering to follow the formation and progression of the structures in real time during digestion. Cryo-TEM was also used to study the phases formed. The lipophilic environment inside milk fat globules was found to gradually transition to more hydrophilic surfaces in highly ordered structure with high internal surface area. Digestion conditions were found to change the rate of transition. These transitions in self-assembled structures are likely to be key to making water insoluble species bioavailable in the gastrointestinal tract. Further small angle scattering studies will allow a greater understanding of how individual components in milks impact the digestion and whether additional species, e.g. adding sparingly soluble vitamins, changes the digestion stages. Understanding the different stages and structures of digestion offers scope to develop improved nutritional supplements or controlled release drug delivery systems.

Keywords

SAXS, Milk

Primary author(s) : Dr HAWLEY, Adrian (Australian Synchrotron); Prof. BOYD, Ben (Monash Institute of Pharmaceutical Sciences)

Co-author(s) : Dr SALENTINIG, Stefan (Monash Institute of Pharmaceutical Sciences); Ms PHAN, Stephanie (Monash Institute of Pharmaceutical Sciences)

Presenter(s) : Dr HAWLEY, Adrian (Australian Synchrotron)

Session Classification : Poster Session 2

Track Classification : Soft Matter