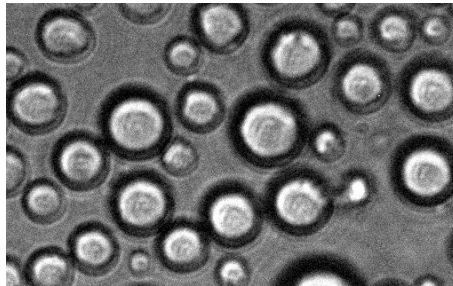


Use of Rayleigh Raman scattering to investigate milk fat globules:

Problem:

Human milk is a complex mixture of different macronutrients, where fat forms the main source of energy for the infant. Fat in human milk is contained in milk fat globules with a size range from 0,3 to 15 μm . The composition of milk fat globules is highly variable and known to be dependent on maternal diet and many other factors. However, the relation between milk fat globule size and composition is not yet completely understood and can potentially reveal important clues about the secretion mechanism of milk fat globules inside the breast. We hypothesize that Rayleigh Raman scattering can be used to simultaneously analyse the size and composition of individual milk fat globules.



Goal:

The goal of this project is to investigate the relation between lipid composition, membrane composition and size, as well as the variation in composition between different milk fat globules in breastmilk by simultaneously measuring the Rayleigh and Raman scattering properties of optically trapped milk fat globules.

What will you learn:

This project is a combination of performing experiments and performing the data analysis. You will learn how to trap particles in the laser focus and how to perform Rayleigh Raman scattering measurements with an existing Rayleigh Raman setup. Furthermore, you will work with measured Raman spectra, which includes spectral processing and interpretation of these spectra.

Supervisors:

Hanna de Wolf, j.r.dewolf@utwente.nl

Nienke Bosschaart, n.bosschaart@utwente.nl

Cees Otto, c.otto@utwente.nl