

6 months Masters internship

Full time paid position at Nestle research, near Lausanne
Supervision – Adam Burbidge, Armand Roucher, Axel Syrbe

Grand theme – to better understand the hydrodynamics of emulsion breakup and recoalescence in homogenizers

Several factors control breakup of emulsions in homogenizers – droplet size, concentration, rheology, surface properties, geometry and flow rate.

Very likely the breakup is very fast on the timescale of surfactant diffusion and rearrangement such that we can nominally separate into 2 steps:

- (i) Hydrodynamic breakup in ‘nozzle’ – broadly independent of surface properties
- (ii) Subsequent quiescent coalescence downstream of the nozzle/breaker plate

We have some simulation nozzles built to fit the lab homogenizer that could be used to ‘test’ model systems under controlled, but variable geometry and flowrates

Dyed blue/red emulsions have/can be produced which would be perfect ‘tracer’ systems to deconvolute (i) from (ii) via image analysis of droplet populations at 2 wavelengths (colours).

Project is deliberately quite open ended and can be adapted to specific interests/skillset of the selected student

Please contact Adam Burbidge (adam.burbidge@rdls.nestle.com) if you are interested.