**UMR INRA 454 MEDIS (Microbiologie, Environnement Digestif et Santé), Université Clermont Auvergne (P. Peyret)**

**Supervisor : Eric Beyssac (Pr, PhD)**

[**Eric.beyssac@uca.fr**](mailto:Eric.beyssac@uca.fr)

**Multiparticulate drug dosage form to improve oral bioavailability of peptide/protein drugs**

The main objective of this project is to develop innovative multiparticulate drug dosage forms able to improve the bioavailability of peptide/protein drugs. The peptide/protein drugs administered alone by oral route are not bioavailable. The causes of this low oral bioavailability are mainly i) drug degradation by gastric pH and gastrointestinal enzymes and ii) low permeability because of the nature of the drugs and their height molecular weight. These problems could be overcome, using an association of new synthetic or natural polymers, able to functionalize a multiparticulate drug dosage form for oral administration.

The aim of the project is to develop a functionalized polymeric multiparticulate drug dosage form combining protection, modulation and control release properties in the gastro intestinal tract of a therapeutical peptide/protein drug.

After encapsulation of the drug and functionalisation of the particles, the dosage form will be characterized from a physicochemical point of view and release properties will be evaluated in vitro, ex vivo then in vivo.

This project is at the interface between technology and health and need interdisciplinary competencies in material science, formulation, biopharmaceutics and pharmacokinetic.

Hsein, et al. (2015). Whey protein mucoadhesive properties for oral drug delivery: mucin-whey protein interaction and mucoadhesive bond strength. Coll. and Surf. B., 136, 2015, 799-808.

Déat-Lainé, et al. (2013). Efficacy of mucoadhesive hydrogel microparticles of whey protein and alginate for oral insulin delivery. Pharm. Res., 30(3), 721-734.