ECOLE DOCTORALE
ED 468
«Mécanique, Energétique, Génie Civil, Procédés »

Tema de projeto de tese de doutorado a ser desenvolvido no Laboratorio RAPSODEE, em Albi, na França

Titulo	**Bi-gelled beads as emerging oral lipid-based drug delivery systems**
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Proposal abstract

The study of oral drug delivery has a long history in the literature from the particle engineering perspective. This project addresses novel drug delivery systems, bi-gelled beads, to deal with the vast majority of the new chemical entities (NCE) that have poor solubility or permeability or to improve the delivery of existing drugs.

Bi-gelled beads are bipartite dosage forms engineered to optimize encapsulation of hydrophobic drugs in their dissolved form (organogel core), as well as to manipulate enzymatic digestion of lipid-based carriers (hydrogel shell), hence facilitating improved solubilization and absorption of poorly soluble drugs.

Such specific bi-gelled beads will be fabricated by a prilling process, to form a layer of hydrogel at the organogel droplet interface. The beads will be of different thicknesses, porosity or chemistry based on their formulation and hydrogelation conditions, followed by a drying process to remove the aqueous solvent of the hydrogel membrane.

These gels are capable of incorporating drug as a guest molecule. Microstructural changes in the state of the gels will control drug diffusion. The bi-gelled beads will exhibit tunable structures and release properties under different stimulations.

As a summary, the main challenges in those systems are to:

- understand the network structure and the thermodynamic nature of the components of the two different networks (organogels and hydrogels) and their role in the diffusional behavior of entrapped drug molecules,

- predict the bi-gelled bead structures from the prilling process,

- deal with variations of the organic phase and biopolymers to produce respectively the organogel core and the hydrogel shell of the beads.

The key point of this project is to engineer a new and versatile platform for oral delivery of hydrophobic drugs with poor availability, through a research program starting from theory, developing experimentally the new structures and new numerical tools to predict drug release behavior.

Informações complementares :

Direção de tese : **Maria Inês Ré**

Co-direção : Martial Sauceau (co-orientador)

Projeto a submeter ao programa CIENCIAS SEM FRONTEIRAS para financiamento da bolsa de doutorado.

Perfil do(a) candidato(a) **: formação em engenharia (quimica, de alimentos, materiais) ou farmacia com solidos conhecimentos em processos quimicos ; interesse pela area farmaceutica.**

Infra estrutura que sera disponibilizada : laboratorio Rapsodee + plataforma tecnologica GALA (onde a parte experimental do HME e do SD serà realizada)

A tese sera inscrita no programa MEGEP : www.ed-**megep**.fr

site de Rapsodee : www.rapsodee.mines-albi.fr

site : www.plateforme-gala.com

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