



Laboratoire
d'automatique,
de génie des procédés,
et de génie pharmaceutique.

UCB Lyon 1 - UMR CNRS 5007

Title: "Design and development of gene delivery systems for oral route"

Supervisors: Dr. Giovanna Lollo

Keywords: Nanocarriers, nucleic acid, physico-chemical characterization, oral administration, *in vivo* studies

Starting date: January 2022 (12-18 months)

Laboratory: The LAGEPP (<https://lagepp.univ-lyon1.fr/en/home/>) is a research laboratory of the University Lyon 1 and the French national Institute for scientific research (CNRS UMR 5007). It develops pluridisciplinary research in chemical engineering, pharmaceutical engineering and biochemical processes. The Gepharm "pharmaceutical engineering" group has a strong expertise in drug delivery. The research encompasses several scientific domains as development of new drug delivery systems, physical chemistry properties, biological *in vitro* evaluation, *in vivo* biodistribution and efficacy studies in mice models.

The postdoc will be part of the ANR project HyDNano working closely with different partners from industry and academic research groups. The aim of the project is to optimize and characterize novel nanomedicines for the oral delivery of genetic material for autoimmune diseases.

Principal activities:

The post doc will be involved in the:

- i) optimization of nanoparticulate systems based on either FDA approved materials or new chemical entities to ensure the correct biodistribution of the systems *in vivo*;
- ii) evaluation of the association, integrity and activity of the encapsulated/associated genetic material;
- iii) development of *in vitro* and *in vivo* tests to validate the efficacy of the selected systems. An extensive characterization of immune responses is envisaged to provide a better understanding of immune landscape involved in the healthy and inflamed tissues.
- iv) *in vivo* imaging to study nanoparticles biodistribution, *ex vivo* flow cytometry, microscopy and image data analysis will be also performed.

Required skills:

Scientific:

Previous experience in:

- Design and development of nanomedicines for gene delivery (experience with microfluidic is a plus)
- Evaluation of nucleic acid association to the nanomedicines (electrophoresis, ITC, NTA)
- *in vitro* cell culture studies (viability MTT-MTS, FACS analysis, confocal microscopy, Western Blot)
- *in vivo* animal experience

Soft skill:

- Motivated for the position
- Enthusiastic, ambitious and strong commitment to research
- Excellent communication, presentation and writing skills
- Able to work independently and collaborate in team
- Good sense for initiative and quality, accuracy and detail, team player.

Language: English is required. French is a plus.

The application must include:

- CV
- Motivation Letter
- PhD degree diploma
- Two reference letters
- Academic works - published or unpublished - that you would like to be considered in the assessment (up to 3 works)

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