Title of the PhD project
The role of tight junctions in dermal absorption: understanding of transport mechanism.

Disciplines: pharmaceutical sciences -
Laboratory LAGEP (Laboratoire d’Automatique et de Génie des Procédés) CNRS UMR 5007), Prof. Stéphanie BRIANÇON, GePharm team
Doctoral school: Interdisciplinary Doctoral program in health-sciences (EDISS) - ED 205

Description
Scientific background and rationale:
Tight junction proteins have been shown to be involved in the skin barrier function. Recent studies have led to significant advances for understanding of TJ function, composition and regulation in healthy skin and dermatologic diseases (atopic dermatitis, psoriasis...). The understanding of the role of TJ in skin barrier could be used to study their involvement in transport of endogenous or exogenous substances. However, there are very few studies related to TJ barrier and its impact on drug delivery or its inclusion in penetration models.

Aim:
The PhD student will study the role of tight junctions in the delivery of hydrophilic drug in the presence of blockers or not and suggest new mechanisms of percutaneous absorption.

Description of the project methodology:
- Bibliographic review and choice of hydrophilic drug models
- Experiments of drug diffusion through the skin under different conditions (with or without stratum corneum which is the main barrier to the penetration of drugs)
- Study of the effect of TJ modulators on skin absorption of model drug
- Characterization of skin permeation parameters by different methods (Tape-stripping, Raman confocal microscopy, electron microscopy, immunofluorescence microscopy...)
- Collection of skin penetration data for establishment in the future of new dynamic models of percutaneous absorption including TJ as skin barrier (collaboration with DYCOP group at LAGEP)

Expected results:
The understanding of the role of TJ in hydrophilic drug cutaneous absorption is expected.

Perspectives:
This knowledge might offer new therapeutic opportunities and improve drug delivery/skin absorption.

Skills required:
- A master degree in Pharmaceutical sciences, Toxicology or Molecular biology.
- Knowledge on skin permeation studies is a plus
- Experience in advanced analytical and bioanalytical techniques
- Fluent English and French

Bibliography:

Key-words: Tight junction, skin absorption, drug delivery, stratum corneum, skin barrier

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Application should include: CV, application letter, Names and addresses of two references.
The application file should be sent before May 14, 2017 to: (marie.bolzinger@univ-lyon1.fr). The open competitive recruitment process is in two steps: 1. Internal laboratory procedure. 2. Interdisciplinary jury of EDISS.