



PhD Program between the Freie Universität Berlin (FUB) and the China Scholarship Council (CSC)

Open PhD position at FUB for CSC scholarship candidates 2017

Please note: the PhD position is only offered to Chinese PhD candidates for application in the framework of the FUB-CSC PhD Program.

<u>Department/Institute:</u>	Department of Biology, Chemistry, Pharmacy/ Institute of Pharmacy
<u>Subject area:</u>	Pharmaceutical Technology
<u>Name of Supervisor:</u>	Prof. Dr. Roland BODMEIER (Mr.)
<u>Number of open PhD positions:</u>	1
<u>Type of the PhD Study:</u>	Full-time
<u>Project title:</u>	Formulation of drug nanocrystals for the treatment of inflammatory skin diseases

PhD Project description:

Many drugs (new candidates but also established ones) possess poor bioavailability (not only oral, but also dermal) due to their poor water solubility. Formulating those as nanocrystals can increase their bioavailability. The cure of inflammatory skin diseases such as Psoriasis is challenging up to now. Poorly soluble drug candidates are e.g. Dexamethasone, Tacrolimus, Tofacitinib and Apremilast. Nanocrystals are produced by high pressure homogenization and bead milling (ultra small scale and lab scale by the use of machines such as a Dyno-Mill). Additionally the suitability regarding formulation optimization of implementing processes like freeze drying in the preparation process is investigated. Long term (up to years) stable (physically and chemically) nanosuspensions with a high drug content (up to 20% m/m) are desirable. Suitable stabilizers and their concentrations have to be defined. The optimization of the formulations is monitored by throughout characterization by using e.g. the following techniques: PCS (DLS), (static) LD, ultrasound extinction (which can follow the particle size online during preparation), light and electron microscopy, HPLC, DSC, XRD and SS-NMR. The increased solubility of nanocrystals is investigated by in situ UV measurements (Sirius Analytics). This increased solubility is caused by both, the particle size reduction to the nanometer range and the change of the degree of the crystallinity during preparation, whereas it is investigated which fact is dominating. Finally, optimized nanosuspensions will be formulated into dermal carriers such as gels and the increased skin penetration (e.g. compared to existing commercial products) will be investigated in vitro and in vivo.

Language requirements:

English PhD study / thesis: IELTS 6.5 or TOEFL 95 ibt.

Academic requirements:

M.Sc. Pharmaceutical Sciences, M.Sc. Pharmacy, M.Pharm.

Information of the professor or research group leader:

http://www.bcp.fu-berlin.de/en/pharmazie/pharmazeutische_technologie/bodmeier/index.html
(for publications see PUBMED etc.)

Please note:

In a first step the complete application should be submitted to the Beijing Office for evaluation by January 4th, 2017. Please don't contact the professor before. He/She will get in contact with you after having received the complete application in January.