



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

Open PhD position for CSC scholarship candidates 2015

The PhD position is only offered to Chinese PhD candidates for application in the framework of the FU-CSC Program.

<u>Department/Institute:</u>	Institute of Pharmacy
<u>Subject area:</u>	Pharmaceutics, Pharmaceutical Nanotechnology & NutriCosmetics
<u>Name of Supervisor:</u>	Prof. Rainer H. Müller
<u>Number of open positions:</u>	2 (Full-time / 3-4 y. PhD study)
<u>Project title:</u>	smartCrystals® - nanocrystal as novel dermal delivery system: formulation development

Project description:

The “nanotechnology age” in dermal delivery started with the liposomes. Liposomes revolutionized the dermal delivery when they were introduced to the market by the cosmetic company Dior in 1986, later on pharmaceutical products followed. The next, second generation in dermal delivery, developed in the 1990ies and around 2000, are the solid lipid nanoparticles (SLN®) and nanostructured lipid carriers (NLC®), and the dermal nanocrystals (smartCrystals®). These 3 delivery systems were invented by our work group and are meanwhile investigated world-wide in many labs. Cosmetic products entered the market, e.g. by Juvena Switzerland, AmorePacific in Korea (e.g. line IOPE) and la prairie (e.g. exclusive product platinum rare, 50 ml for 1000 €).

The nanocrystals are meanwhile an established delivery system, but still providing challenges in production, development of formulations, and the physical stability of the nanocrystals in these formulations. Within the PhD project nanocrystals should be produced from natural plant compounds or plant extracts. By formulating them as nanocrystal their biological activity will be increased many fold. Suggestions are also welcome to use plant extracts from traditional Chinese medicine (TCM). These nanocrystals will then be incorporated into dermal formulations (gels, creams etc.) and their stability and performance will be tested. Testing will be performed in e.g. artificial skin (cooperation with Dep. of Pharmacology), skin models such as the pig ear skin, but also in humans. Here we have a co-operation with the Dermatology Department of the famous Charité hospital in Berlin. Besides increasing the scientific basic understanding, it is also targeted to develop formulations for the benefit of the patient, i.e. marketed products.

Language requirements:

Writing of thesis and oral defense in English, no German required. The working language in our international research group is English, you will meet colleagues from your country China, but also Brazil, Syria etc. Please have a look at our web site, click Research Team. Good English is essential, because all our work is published in English.

Academic requirements:

Subject areas: preferentially pharmacy, but also chemistry, crystallography, physics, process engineering, physicians/medicinal studies.
Master degree is required.

Link to professor and further information:

For more information about the research group, please visit our web site: www.muller-berlin.com.

If you want to access our publication list, please go to the web site, go to the area Research/Science and click publications.

Please send your application directly to the Beijing office of the Free University (FU) Berlin, not to the professor.

It is expected that the thesis including defence is completed within 4 years (standard time), for this a grant of 4 years is the pre-requisite. In general, we try to publish an article for each piece of the work when it is completed. At the end of your PhD time, all these articles are compiled for the thesis (so called "cumulative" thesis).

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