



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.

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| <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> | 3 (Full-time / 3-4 y. PhD study) |
| <u>Project title:</u> | smartLipids® - the 3 rd of solid lipid nanoparticles after SLN & NLC: basic developments in cosmetics & pharma |

Project description:

In 1999 the solid lipid nanoparticles (SLN) were developed as dermal delivery system by our research group and are nowadays being investigated by many research groups world-wide, including many groups in China. The second generation is the Nano Lipid Carriers (NLC) developed also by our research group in 1999, and meanwhile in hundreds of cosmetic products worldwide on the market (e.g. company Amore Pacific, line IOPE, also sold in China). Within the research project, the 3rd generation of lipid nanoparticles should be developed, the smartLipids®.

Limitations of SLN and NLC are sometimes the loading capacity, and expulsion of drug from the particle matrix during storage. Meanwhile we developed a concept to distinctly increase drug loading, and keep the drug firmly enclosed during storage, that means having a very long shelf life of products. This is achieved by special nanostructuring of the lipid particle matrix. Within the project you will perform academic research to clarify underlying mechanisms, how to design the matrix for optimal drug incorporation, but you will also produce final dermal cosmetic and pharmaceutical dermal formulations. These formulations will be tested regarding their performance in vitro, but also in vivo. Besides academic research it will also be a focus to develop formulations for the cosmetic and pharmaceutical market. Ideas to use molecules or extracts from traditional Chinese medicine are highly welcome.

It is a new technology, the principles were not yet published. Therefore you cannot write up a research program. The research program will be provided by Prof. Rainer Müller. But you can make suggestions for innovative molecules/extracts and skin disorders to treat.

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).

Please note:

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.