

Science Bridges China Research Profile

Name: **Jiwen Zhang**
Position: **Professor**
Institute/division: **Centre for Drug Delivery Systems, Shanghai Institute of Materia Medica, Chinese Academy of Sciences**
Email: **jwzhang@simm.ac.cn**
Tel: **+86-21-20231980**



SUMMARY OF MY RELEVANT RESEARCH AREAS:

Prof. Dr. Jiwen Zhang has carried out the interdisciplinary research by establishing cooperation with research team at home and abroad. Aiming at the evaluation of DDS, he has established the pharmacokinetics theory for the sustained and controlled-release systems, putting forward the quantitative method for optimizing the formulation of the sustained and controlled-release systems, and has designed new formulation such as biomimetic DDS. Pointing at the complexity of the structure of pharmaceutical dosage forms, his team utilized primarily the synchrotron radiation light facility to establish quantitative methods for characterizing the irregular and dynamic structure of DDS. Novel cage-like tablet and the osmotic pump with new structures have been designed. His team has studied the release mechanisms associated with kinetic rate constants of supramolecular DDS by HPLC, SPR and SPRi as well as prediction by molecular simulation. He and his team are working on Structure Pharmaceutics for scales from molecule to dosage forms.

Primary Research interests:

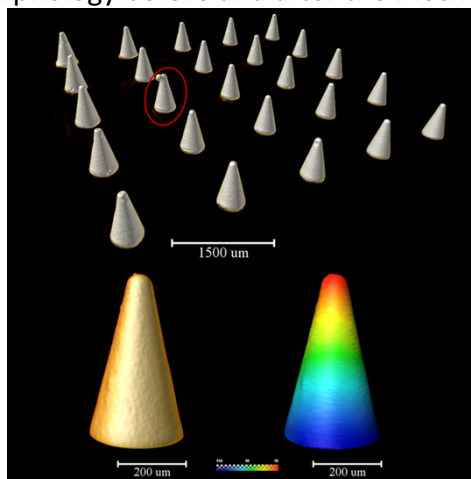
My research interests are mainly focused on the pharmacokinetics of the drug delivery systems (DDS), including new theories and methods for the pharmacokinetics of the sustained/controlled release dosage forms, pharmacometrics for the multiple release kinetics of the traditional Chinese medicines (TCMs), and computational pharmaceutics.

Topics in which you would like to develop collaborative research:

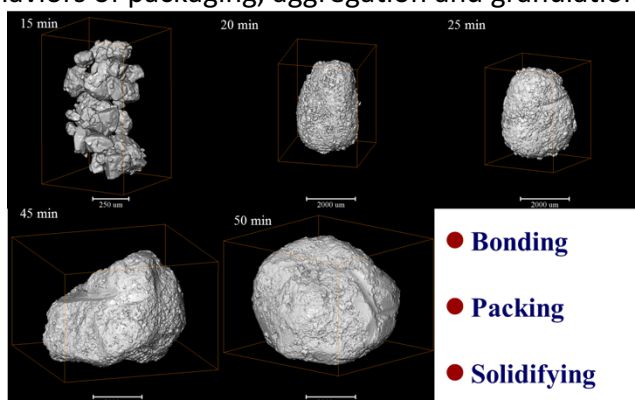
Smart drug delivery systems with advanced materials; Architecture of DDS and materials.

Collaborative Research with University of Bradford:

1. 3D Structural Investigation of Micro Needle Array, Xianzhen Yin, Karthik Nair, Ben Whiteside, Jiwen Zhang. SR- μ CT makes it possible to characterize the morphology of micro-needle arrays and each single needles. With the high resolved structure of micro-needles, the diameter at each point has been obtained. For each micro-needle, about 10 million values have been calculated, then the diameter distribution was mapped with the morphology model. The established quantitative characterization methodology will be powerful for the evaluation of morphology before and after the mechanical and in vivo experiments.



2. Mechanism for formation and internal structure of Lactose-PEG 6000 granules obtained by Hot Melt Granulation, Xianzhen Yin, Niten Jadav, Aniket Sabnis, Anant Paradkar, Jiwen Zhang. SR- μ CT as a non-destructive and sensitive detection technology, makes it possible to detect the composition of single granule or particle and determine the distribution of PEG and Lactose. The 3D structures of granules at different high speed shared time show the initial packaging of lactose crystal particles at the early stage and the aggregation pattern in big size granules. With the high resolved structure of granules, the mechanism and growth behaviors of packaging, aggregation and granulation can be studied.



3. Two extramural Ph.D. students to be graduated this year.

- Mr. Xianzhen Yin, supervised by Prof. Peter York, Dr. Qun Shao, Prof. Jiwen Zhang, Structure Pharmaceutics Based on Synchrotron Radiation X-Ray Micro-Computed Tomography, From Characterization to Evaluation and Innovation of Pharmaceutical Structures, 2016.
- Mr. Zhen Guo, supervised by Prof. Laurence Patterson, Dr. Qun Shao, Prof. Jiwen Zhang, Insights of Taste Masking from Molecular Interactions and Microstructure of Microspheres, 2016.