

Precision Nanomedication Research group

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<https://www.pharmscilab.fi/nanoprecisionmed>

Group Members:

Visiting Professors:

Junnian Zhou; You Zhou

Postdoc:

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PhD students:

Chang Liu; Wali Inam; Dhayakumar Rajan Prakash; Guanlan Huang; Xia Chu

Co-supervised PhD students:

Zehua Liu (UH); Feng Zhang (UH); Marco Mennillo (ÅAU); Diosangeles Soto Veliz (ÅAU); Sepideh Parvanian (ÅAU)

Description of the scientific aims

Nanotechnology has provided revolutionary impacts for the traditional medication. However, there are also distinct challenges for nano-medication for their clinical translation. Our research focuses on the development of functional nanomaterials for solving real clinical problems. We have multidisciplinary team from chemistry, material science, engineering, medicine and biology. We always initial the project with clinical doctors and their clinical questions, and the clinical doctors and/or medical students are involved in the projects from start to the end. We synthesize all kinds of nanomaterials, and we are especially interested in mesoporous silica nanoparticles, the synthetic and nature polymers, DNA nanoparticles and etc. We also apply microfluidic technology for nanoparticles and microparticles fabrication and 3D print technology for fabricating biomedical scaffold and medical devices.

Selected publications 2010-

Shengcai Qi, Pengfei Zhang, Ming Ma*, Minghua Yao, Jinjin Wu, Ermei Mäkilä, Jarno Salonen, Heikki Ruskoaho, Yuanzhi Xu, Hélder A. Santos*, **Hongbo Zhang***, “Cellular Internalization-Induced Aggregation of Porous Silicon Nanoparticles for Ultrasound Imaging and Protein-Mediated Protection of Stem Cells”, *Small* 2018.

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Yuezhou Zhang*, Jing Tu, Dongqing Wang, Haitao Zhu, Sajal Kumar Maity, Xiangmeng Qu, Bram Bogaert, Hao Pei, **Hongbo Zhang***. Programmable and Multifunctional DNA-Based Materials for Biomedical Applications. *Advanced Materials* 2018

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Hongbo Zhang*, Dongfei Liu, Mohammad-Ali Shahbazi, Ermei Mäkilä, Bárbara Herranz-Blanco, Jarno Salonen, Jouni Hirvonen, Hélder A. Santos*, “Fabrication of a Multifunctional Nano-in-Micro Drug Delivery Platform by Microfluidic Templated Encapsulation of Porous Silicon in Polymer Matrix”, *Adv. Mater.* 2014, 26(26), 4497–4503.