



Department: School of Materials Science and Engineering

Professional field: Interfacial Electrochemistry and Biomaterials

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Profile

Prof. Dr. Huiliang Cao is a Humboldtian, a member of the Chinese Society for Biomaterials, and a member of the Experts Panel in the Surface Engineering Branch of Chinese Mechanical Engineering Society. Cao earned his Ph.D. from the South China University of Technology in 2008. After working at Nanchang Hangkong University (China), Shanghai Institute of Ceramics (Chinese Academy of Sciences), and Friedrich Schiller University Jena (Germany), he joined East China University of Science and Technology. Cao's research includes all phenomena associated with interfacial electrochemistry of biomaterials and their biomedical applications. Cao and his colleagues were awarded The First Prize for Natural Science in Shanghai (China) in 2020 for their outstanding work on biomaterials science and engineering.

Research Field

Implantable antibacterial surfaces; Metallic biomaterials; Protein adsorption; Dental biomaterials; Wound dressings.

Research results and selected published papers

Research results and important peer-reviewed publications:

(1) On Developing of Implantable Antibacterial Surfaces

[1] H Cao, X Liu, F Meng, PK Chu. Biological actions of silver nanoparticles embedded in titanium controlled by micro-galvanic effects. *Biomaterials* 2011, 32:693-705.

[2] H Cao, Y Qiao, X Liu, T Lu, T Cui, F Meng, PK Chu. Electron storage mediated dark antibacterial action of bound silver nanoparticles: Smaller is not always better, *Acta Biomaterialia* 2013, 9:5100-10.

[3] H Cao, Y Qiao, F Meng, X Liu. Spacing-Dependent Antimicrobial Efficacy of Immobilized Silver Nanoparticles. *The Journal of Physical Chemistry Letters* 2014, 5: 743-8.

[4] K Tang, L Wang, H Geng, J Qiu, H Cao*, X Liu. Molybdenum disulfide (MoS₂) nanosheets vertically coated on titanium for disinfection in the dark. *Arabian Journal of Chemistry* 2020, 13:1612-23.

[5] H Cao, Hui Qin, Yongsheng Li, Klaus D. Jandt. The Action-Networks of Nanosilver: Bridging the Gap between Material and Biology. *Advanced Healthcare Materials* 2021:2100619.

(2) On Tissue-integration of Biomaterials

[1] H Cao, X Liu. Activating titanium oxide coatings for orthopedic implants. *Surface and Coatings Technology* 2013, 233: 57-64.

[2] H Cao, W Zhang, F Meng, J Guo, D Wang, S Qian, X Jiang, X Liu, PK Chu. Osteogenesis Catalyzed by Titanium-Supported Silver Nanoparticles. *ACS Appl Mater Interfaces* 2017, 9 (6):5149-5157.

[3] H Cao, Tang K, Liu X. Bifunctional galvanics mediated selective toxicity on titanium. *Materials Horizons* 2018, 5:264-7.

[4] Q Luo, H Cao*, L Wang, X Ma, X Liu. ZnO@ZnS nanorod-array coated titanium: Good to fibroblasts but bad to bacteria. *Journal of Colloid and Interface Science* 2020, 579:50-60.

[5] S Yin, W Zhang, Y Tang, G Yang, X Wu, S Lin, X Liu, H Cao*, X Jiang*. Preservation of alveolar ridge height through mechanical memory: A novel dental implant design. *Bioactive Materials* 2021, 6:75-83,