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院士講座系列

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Department of Biomedical Engineering
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Speaker: **Prof. Gu Ning**
Division of Information Technical Sciences
Chinese Academy of Sciences
中國科學院技術科學部

Title: 基於鐵基微納材料的血管診療先進技術

Iron-Based Nanomaterial Innovations for Cardiovascular Theranostics

Date: Wednesday, 17 April 2024
Time: 14:30 – 16:15
Venue: Room B6, Ho Tim Building
Registration: http://www.cuhk.edu.hk/cneo/cas_2024/

Biography

Dr. Gu is a Professor in Medical School of Nanjing University, Nanjing, China. He obtained his Ph.D. in Biomedical Engineering at Southeast University in 1996, followed by the postdoctoral research at University of Yamanashi, Japan. Dr.Gu has been well recognized for his professional accomplishments with national and international awards and honors, including Academician of Chinese Academy of Sciences, American Institute for Medical and Biological Engineering (AIMBE) Fellow, Yangtze River Scholars Distinguished Professor, The National Science Fund for Distinguished Young Scholars, State Science and Technology Progress Award, and State Natural Science Award, etc. Dr.Gu has dedicated himself to the research in nanomedicine for more than 30 years, with special interests in the fields of biomedical nanomaterials, including fabrication, characterization and biomedical application of iron-based magnetic nanomaterials and synthetic phospholipids. Dr.Gu has published over 600 scientific papers in peer-reviewed journals, including Nature Materials, Advanced Materials, Biomaterials, ACS Nano, etc, and obtained over 100 patents for invention.

Abstract

Despite advances in medical theranostics for cardiovascular diseases (CVDs), it remains a leading global cause of mortality and morbidity. This underscores the urgent need for innovative approaches aimed at early and precise detection and treatment of CVDs to reduce the disease burden. Iron-based nanomaterials, leveraging their distinctive magnetism and enzyme-like activity, have demonstrated considerable promise in this regard [1]. For instance, iron oxide nanoparticles, serving as important contrast agents for contrast-enhanced magnetic resonance imaging (MRI), exhibit robust diagnostic performance and excellent safety in identifying significant coronary stenosis, offering a promising alternative to digital subtraction angiography (DSA) for the diagnosis of coronary artery disease [2]. Another typical iron-based nanomaterial, prussian blue nanoparticles, with their excellent enzyme-like activity, can be designed to simultaneously target and eliminate various proinflammatory factors within the plaque microenvironment. This approach demonstrates significantly greater efficacy in resolving the proinflammatory plaque microenvironment and attenuate atherosclerosis in comparison to conventional approaches [3]. We also developed a self-homing and traceable cardiac patch leveraging iron oxide nanoparticles for spatiotemporal therapeutic delivery [4]. Continuous advancement in the field of iron-based nanomaterials hold great promise for effectively addressing current challenges in CVD diagnostics and treatment, providing more personalized and efficient options for the medical theranostics.

Language: Putonghua **ALL ARE WELCOME**