



学术报告通知

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题 目: Bioresponsive RNA Nanomedicines

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地 点: 国家纳米科学中心, 南楼二层会议室

主 持 人: 王浩 研究员

报告摘要:

Biologically responsive nanotechnologies have attracted tremendous attentions for controlled delivery of therapeutic molecules and development of precision nanomedicines. We have recently developed various bioresponsive nanoparticle (NP) platforms to address the challenges involved in systemic RNA delivery to solid tumors, such as enzymatic degradation, rapid elimination from circulation, and insufficient tumor penetration, cellular uptake and endosomal escape. For example, with a robust self-assembly technology, we have rationally designed a new generation of lipid-polymer hybrid NPs that are small and responsive to serum albumin, can efficiently encapsulate siRNA for robust gene silencing, and exhibit controllable blood circulation and tumor accumulation. The hybrid NPs have also been applied to systemic delivery of mRNA to restore the function of tumor suppressors (e.g., PTEN and p53) in various primary and metastatic tumor models. The mRNA NP-mediated tumor suppressor restoration could further synergize with other therapies for highly effective cancer treatment. We expect that bioresponsive nanotechnologies could become clinically useful tools for the development of novel RNA therapeutics for cancer and other diseases.

个人简介:

Dr. Shi is an Associate Professor at Harvard Medical School, and a faculty member in the Center for Nanomedicine and Department of Anesthesiology at Brigham and Women's Hospital. His lab is interested in basic and applied science in the field of nanomedicine. His research involves a highly interdisciplinary combination of nanotechnology, biomaterials, drug delivery, immunotherapy, and antioxidative therapy for biomedical applications in cancer, atherosclerosis, and other diseases. He has developed various nanoparticle platforms for effective delivery of therapeutics ranging from small molecules to RNAs and proteins. Notably, the immunonanotherapeutics developed by him and colleagues using self-assembled polymeric nanoparticles has resulted in the clinical trials of synthetic nanoparticle vaccines for different diseases. His current research focuses include: i) RNAi nanotechnology for gene silencing; ii) mRNA delivery for restoration of tumor suppressors; and iii) development of stimuli-responsive nanomaterials and bioinspired antioxidative polymers. He has also received the K99/R00 Career Development Award from National Institutes of Health, the Young Investigator Award and the Movember Challenge Award from Prostate Cancer Foundation, the Lung Cancer Discovery Award from American Lung Association, and other awards.