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NDS with encapsulation and delivery efficiency to overcome tumor chemotherapeutic resistance

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Chemotherapeutics are still the primary options applicable to cancer treatments; however, the chemo-resistance developed by tumor limits their further clinical application. One way to solve this obstacle is to improve the bioavailability of anti-cancer drugs mostly with poor intracellular accumulation. Various nanoparticle-based delivery systems (NDS) such as dendrimer, vesicles, liposomes, micelles and inorganic materials are fabricated to greatly enhance their stability and blood circulation period. Meanwhile, these NDS are also widely employed in cancer therapy owing to their improved pharmacokinetics and pharmacodynamics arising from the enhanced permeation and retention (EPR). Because traditional DDSs are poor to enter the cells and release drugs up to effective therapeutic dosage, NDS such as nanomicelle with small size, high drug loading, controlled and sustained drug release and their potential to overcome drug resistance, a shell/core nanostructure self-assembled by amphiphilic macromolecules, constitutes a promising nanocarrier for efficient chemotherapeutics. Drug-encapsulated nanomicelles were also developed under clinical evaluation. NDS has emerged as an effective strategy for pharmaceutical formulation to deliver payloads into the targeted regions and gained particular attention in biomedical field.

Biography

Xing-Jie Liang has completed his PhD from National Key Laboratory of Biomacromolecules, Chinese Academy of Sciences and Post doctorate for 5 years at LCB, CCR, NCI and NIH. He was a Research Fellow at Surgical Neurology Branch, NINDS and an Assistant Professor at Howard University. He is currently a Deputy Director of Key Laboratory for Biomedical Effects of Nanomaterials and Nanosafety, CAS and a Principal Investigator at National Center for Nanoscience and Technology of China. He is the current Associate Editors of *Biomaterials* and *Biophysics Report*; Advisory Editorial Board Member of *ACS Nano*; Editorial Member of *Advances in Nano Research*, *Current Nanoscience, Biomaterials Research, Theranostics* and Guest Editor of *Biotechnology Advances*.

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