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何鴻燊博士醫療拓展基金會
Dr. Stanley Ho Medical Development Foundation

澳門大學—何鴻燊博士醫療拓展基金會

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“揚帆追夢、創啟未來” 2022年度獲資助研究項目

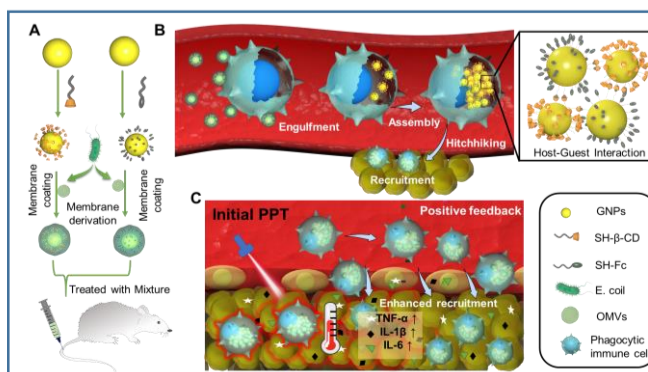
“SET SAIL FOR NEW HORIZONS, CREATE THE FUTURE” FUNDED PROJECT FOR 2022



細菌仿生納米藥物通過體內搭便車免疫細胞以及胞內自組裝實現腫瘤的靶向治療 In Vivo Hitchhiking Immune Cells by Intracellular Self-assembly of Bacteria-mimetic Nanomedicine for Targeted Cancer Therapy

細胞因其“自我”特性和獨特的生理功能而成為一種理想的藥物載體。在此，我們提出了一種新的體內策略來構建基於細胞的納米藥物載體，其中菌膜包被的金納米顆粒（GNPs）通過靜脈注射，在體內被吞噬性免疫細胞選擇性吞噬，隨後通過GNPs之間的主客體相互作用自組裝成細胞內聚集體，從而減少了免疫細胞在傳遞過程中GNPs的胞吐，並通過GNPs聚集體的等離子體偶聯效應激活光熱特性。免疫細胞的炎性趨向驅動載藥細胞定向運送GNPs聚集體到腫瘤組織。隨後的光熱治療（PTT）顯著提高抗腫瘤治療，免疫檢查點阻斷進一步加強抗腫瘤治療。

Cell has emerged as an ideal drug carrier, attributed to its “self” nature and unique physiological functions. Herein, we developed a novel in vivo strategy to construct cell-based nanomedicine carriers, where bacteria-mimetic gold nanoparticles (GNPs) are intravenously injected, selectively phagocytosed by phagocytic immune cells in vivo, and subsequently self-assemble into large intracellular aggregates via strong host-guest interactions between GNPs. The intracellular aggregates minimize exocytosis of GNPs from immune cells during delivery, and activate the photothermal property via plasmonic coupling effects of GNPs. The inflammatory tropism of immune cells drives the targeted hitchhiking delivery of intracellular GNP aggregates to the cancer tissue. Subsequent photothermal treatment (PTT) significantly improves antitumor therapy, which is further strengthened by immune checkpoint blockade. These effects have been fully validated in vitro and in vivo.



基於免疫細胞的納米藥物載體構建，用於靶向藥物遞送和增強腫瘤光熱/免疫治療

In vivo construction of immune cell-based nanomedicine carriers for targeted delivery into the tumor and improved antitumor immunotherapy

王瑞兵教授
Prof. Ruibing WANG

王瑞兵，澳門大學中華醫藥研究院、健康科學學院藥物科學系副教授；主持國家自然科學基金、深圳科創委深港澳科技計畫、澳門科技發展基金等多個科研項目；當選英國皇家化學會會士；擔任澳大全球事務部總監。

Ruibing WANG is an Associate Professor at the Institute of Chinese Medical Sciences and Department of Pharmaceutical Sciences, Faculty of Health Sciences, University of Macau (UM) and a grantee of NSFC Fund, SZSTIC Fund, and FDCT Fund. He is an elected Fellow of the Royal Society of Chemistry (FRSC), UK, and currently serves as the Director of Global Affairs Office at UM.