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Intratumoral immunotherapy using platelet-cloaked nanoparticles enhances antitumor immunity in solid tumors

Intratumoral immunotherapy is an emerging modality for the treatment of solid tumors. Toll- like receptor (TLR) agonists have shown promise for eliciting immune responses, but sys- temic administration often results in the development of adverse side effects. Herein, we investigate whether localized delivery of the TLR agonist, resiquimod (R848), via platelet membrane-coated nanoparticles (PNP-R848) elicits antitumor responses. The membrane coating provides a means of enhancing interactions with the tumor microenvironment, thereby maximizing the activity of R848. Intratumoral administration of PNP-R848 strongly enhances local immune activation and leads to complete tumor regression in a colorectal tumor model, while providing protection against repeated tumor re-challenges. Moreover, treatment of an aggressive breast cancer model with intratumoral PNP-R848 delays tumor growth and inhibits lung metastasis. Our findings highlight the promise of locally delivering immunostimulatory payloads using biomimetic nanocarriers, which possess advantages such as enhanced biocompatibility and natural targeting affinities.

Biography

Hua Gong has completed his PhD from Soochow University and postdoctoral studies from University of California, San Diego, Nanoengineering Department. He has published more than 45 papers in reputed journals.