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Zhen-Qi Sijunzi decoction can alleviate cisplatin-induced toxicity and prolong the survival time of cachectic mice by recovering muscle atrophy

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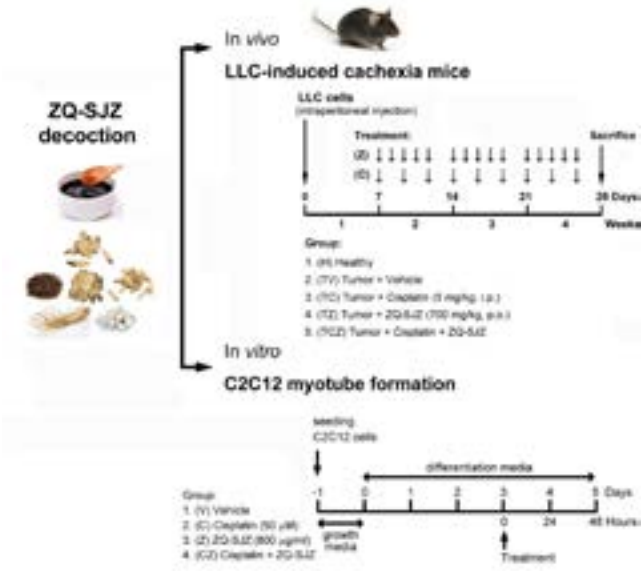
Cachexia is a devastating clinical condition frequently associated with many types of cancers and is also a common consequence of chemotherapy administration. Based on the Traditional Chinese Medicine (TCM) theory, the formula empirically used as invigorators for treating weakness, fatigue and poor appetite are often used for improving cachectic conditions. However, comprehensive evidence to characterize the anti-cachexia mechanism of TCM remains largely needed. In this study, we employed Lewis lung carcinoma (LLC)-induced cancer cachectic mice model to demonstrate the anti-cachectic effect of a novel combination of decoction referred to as Zhen-Qi Sijunzi (ZQ-SJZ). Administration of ZQ-SJZ can recover tumor- and/or cisplatin-induced body weight loss, intestinal mucosal damage, as well as forelimb grip strength and myofiber size. Mechanistically, ZQ-SJZ increased the levels of myogenic proteins, such as MyHC and myogenin, and decreased the atrophy-related protein, atrogin-1 in cisplatin-treated C2C12 myotubes in vitro. Moreover, cisplatin-induced mitochondria dysfunction can be hampered by the co-administration of ZQ-SJZ, by which it recovered cisplatin-mediated decrease of PGC-1□ and PKM1. Given that PGC-1□ plays a role in both mitochondria biogenesis and myogenesis, ZQ-SJZ likely plays a role in the modulation of mitochondrial function and subsequent myogenesis. Notably, ZQ-SJZ administration significantly prolonged the survival of LLC-induced cachectic mice under cisplatin treatment, indicating its profound activity in anti-cachexia and chemo-toxicity alleviation. Taken together, these results demonstrated the anti-cachectic mechanism of ZQ-SJZ and its potential use as a palliative strategy to improve the efficacy of chemotherapy.



Biography

Upon completion of her doctorate in Biochemistry and Molecular Biology at the National Taiwan University in 2003, she stayed in the National Taiwan University for Postdoctoral training where she worked on the ROCK-mediated signaling pathway in phorbol ester-induced apoptosis. Dr. Lai joined the faculty of Department of Life Science, Fu-Jen Catholic University in Taiwan in 2004. She is currently an Associate Professor. At Fu-Jen University, Dr. Lai worked on the role of PBK/TOPK protein kinase in lung carcinogenesis and cancer therapeutics. Recently, she worked on the Chinese medicine in alleviating tumor- and/or cisplatin-induced cachexia.

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