Aiduqing inhibits breast cancer metastasis via TAM/CXCL1/Treg pathway suppression

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Video Byte

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Abstract

Metastasis is the leading cause of breast cancer-related death, but traditional Chinese medicines such as Aiduqing (ADQ) can help prevent it. ADQ is known to target caveolin-1, CXCL1-mediated autophagy, and matrix metalloproteinase-related epithelial-mesenchymal transition, but it remains unclear whether it also modulates tumor-associated macrophage (TAM)/CXCL1 activity to remodel the tumor microenvironment. To find out, researchers recently examined the effects of ADQ in mice and cultured cells. In mice, ADQ significantly reduced xenograft tumor growth and lung metastasis without causing toxicity. ADQ also remodeled the immunosuppressive tumor microenvironment. Mechanistic studies revealed that ADQ reduced CXCL1 expression and secretion from TAMs to suppress CD4⁺ T cell chemotaxis and Treg differentiation, thus increasing CD8⁺ T cell cytotoxicity. Conversely, TAM-derived CXCL1 promoted CD4⁺ T cell differentiation into Tregs via NF- κ B/FOXP3 signaling, and additional mouse experiments confirmed that ADQ inhibited breast cancer immune escape and lung metastasis via TAM/CXCL1/Treg pathway suppression. Although further research is necessary given the complexity of the tumor microenvironment, the results provide preclinical evidence of ADQ's antimetastatic effects and suggest that the TAM/CXCL1/NF- κ B/FOXP3 pathway is a promising target for Treg modulation and breast cancer treatment.