2-Hydroxycinnamaldehyde inhibits the epithelial-mesenchymal transition in breast cancer cells

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Abstract:

Since epithelial-mesenchymal transition (EMT) plays a critical role in cancer progression and in maintaining cancer stem cell properties, EMT is emerging as a therapeutic target for inhibiting the metastatic progression of cancer cells. 20-Hydroxycinnamaldehyde (HCA) and its derivative, 20-benzoyloxy-cinnamaldehyde, have recently been suggested as promising therapeutic candidates for cancer treatment. The purpose of this study is to investigate the anti-metastatic effect of HCA on breast cancer and the molecular mechanisms by which HCA regulates the transcriptional program during EMT. HCA induces epithelial reversion at nanomolar concentrations by suppressing Snail via the nuclear translocalization of GSK-3β, which results in the transcriptional upregulation of E-cadherin. HCA also activates the transcription factor KLF17, which suppresses Id-1, indicating that HCA inhibits EMT by multiple transcriptional programs. Further, HCA treatment significantly inhibits lung metastasis in a mouse orthotopic breast cancer model. This study demonstrates the anti-metastatic effect of the non-toxic natural compound HCA through attenuation of EMT in a breast cancer model.

Keywords:

20-Hydroxycinnamaldehyde · Breast cancer cells · Epithelial-mesenchymal transition (EMT) · Cell invasion · Snail · KLF17

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