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Antiangiogenic activity of Elaiophylin via downregulation of VEGFR2 and HIF-1α

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Cancer is an angiogenesis-dependent disease and angiogenesis inhibition is one of the important strategy to arrest tumor growth and metastasis. The current study demonstrated that a microbial metabolite, elaiophylin, exhibits potent antiangiogenic activity from *in vitro* and *in vivo* angiogenesis assays. Elaiophylin dramatically suppressed *in vitro* angiogenic characteristics such as proliferation, migration, adhesion, invasion and tube formation of Human Umbilical Vein Endothelial Cells (HUVECs) stimulated by Vascular Endothelial Growth Factor (VEGF) at non-toxic concentrations. In addition, elaiophylin immensely inhibited *in vivo* angiogenesis of the Chorioallantoic Membrane (CAM) from growing chick embryos without cytotoxicity. The activation of VEGF receptor 2 (VEGFR2) in HUVECs by VEGF was inhibited by elaiophylin, resulting in the suppression of VEGF-induced activation of downstream signaling molecules, Akt, extracellular signal-regulated kinase 1/2 (ERK1/2), c-Jun N-terminal Kinase (JNK), p38, Nuclear Factor-κB (NFκB), Matrix Metalloproteinase (MMP)-2 and -9. We also found that elaiophylin blocked tumor cell-induced angiogenesis both *in vitro* and *in vivo*. Elaiophylin downregulated the expression of VEGF by inhibiting Hypoxia Inducible Factor-1κ (HIF-1κ) accumulation in tumor cells. Therefore, elaiophylin could be utilized as a new class of natural antiangiogenic agent for cancer therapy.

Biography

Haet Nim Lim has obtained her Bachelor's degree in Pharmaceutical Engineering from Sun Moon University, South Korea in 2015. Currently, she is pursuing her Masters in Life Science and Biochemical Engineering in Sun Moon University, South Korea.

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