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**4AAQB inhibits vascular endothelial growth factor-induced angiogenesis in in vitro and in vivo model**

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Angiogenesis, the formation of new capillaries from preexisting blood vessels, plays an important role in physiologic and pathologic processes, such as the embryonic development, wound healing, tumor growth, metastasis, and various inflammatory disorders. Vascular endothelial growth factor (VEGF) plays an important role in angiogenesis induction of these angiogenic processes. Thus, inhibition of these critical angiogenic steps is a practicable therapeutic strategy for these diseases. *Antrodia cinnamomea* in the Polyporaceae, Basidiomycoline family, is a native mushroom parasitic on the endemic perennial tree, *Cinnamomum kanehirai* Hay in Taiwan. 4AAQB is an ubiquinone-derivate isolated from *Antrodia cinnamomea* which have been shown to antioxidation, anti-inflammation and antitumor activities. In this study, 4AAQB showed an inhibitory activity on migration and tube formation of human umbilical vascular endothelial cells in a concentration-dependent manner (0.3-10 µg/ml). Using aortic ring sprouting, and mouse matrigel implant models, 4AAQB significantly inhibited VEGF-induced neovascularization (0.3-10 µg/ml). In addition, VEGF-induced ERK 1/2 and PI3K p85α tyrosine phosphorylation were blocked by 4AAQB. These results indicate that 4AAQB is a potential candidate for the treatment of angiogenesis related-diseases.

**AP-170**

**Procoagulant and prothrombotic effects of herbal medicine, dipsacus asper on human platelets**

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Despite the growing popularity of herbal medicines and food supplements, their adverse effects on cardiovascular homeostasis remain largely unknown, especially regarding their pro-thrombotic risks. Here, through screening of the extracts from 21 herbal teas widely consumed, we discovered that Dipsacus asper (DA), previously known to have analgesic and anti-inflammatory efficacy may induce procoagulant activity in platelets, a critical promoter of thrombosis. Dipsacus saponin C (DSC) was identified as the key active ingredient for DA-induced procoagulant activities through activity-guided purification.

DSC- and DA-induced procoagulant activities were achieved by the exposure of PS and MP generation that were caused from the alteration in activities of scramblase and flippase. These events were initiated by increased intracellular calcium and ATP depletion. Notably, DSC induced a series of apoptotic events including the disruption of $\Delta \Psi_m$, mitochondrial translocation of Bax, cytochrome c release, and caspase-3 activation. Key roles of apoptosis and caspase activation were demonstrated by the reversal of DSC-induced PS exposure and procoagulant activities with the pretreatment of caspase inhibitors. These results were also confirmed in vivo where the rats exposed to DSC exhibited $\Delta \Psi_m$ dissipation and PS exposure in platelets. Most importantly, DSC or DA treatment led to increased thrombus formation in rat venous thrombosis model, demonstrating that herbal medicines or natural products like DA or DSC might have prothrombotic risks through procoagulant activation.