



## Oroxylin A, a classical natural product, shows a novel inhibitory effect on angiogenesis induced by lipopolysaccharide

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### Abstract:

**Background:** There is an obvious relationship among angiogenesis and inflammation. From previous study, we learn that oroxylin A possesses anti-angiogenic activity *in vitro* and *in ovo*. It also has an inhibitory effect on inflammation. But whether oroxylin A suppresses the inflammation-induced angiogenesis is still unknown. Our present study focuses on the role of oroxylin A in targeting LPS-induced angiogenesis, inflammatory and related pathways.

**Methods:** The effects of oroxylin A on angiogenesis were investigated by transwell assay, tube formation assay, rat aortic ring assay and chorioallantoic membrane (CAM) model. Western blotting analysis was used to detect the expression of certain proteins.

**Results:** We found that oroxylin A inhibited LPS-induced migration and tube formation of human umbilical vein endothelial cells (HUVECs), as well as microvessel sprouting from rat aortic ring *in vitro* and the angiogenesis of chicken chorioallantoic membrane (CAM) model *in ovo*. The results also indicated that oroxylin A could inhibit the expression of LPS receptor toll-like receptor 4 (TLR4) and the activities of its downstream mitogen-activated protein kinases (MAPKs), including reducing expressions of the phosphorylation of JNK, p38, and ERK. Moreover, oroxylin A prevented NF- $\kappa$ B dimers from translocating to the nucleus.

**Conclusions:** Taken together, oroxylin A can suppress the angiogenesis induced by LPS and it may affect the LPS/TLR4 signaling pathway.

### Key words:

*Scutellaria baicalensis* Georgi (Lamiaceae), oroxylin A, lipopolysaccharide, angiogenesis, toll like receptor 4 (TLR4)

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