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Herba Siegesbeckiae inhibits production of inflammatory mediators in lipopolysaccharide-stimulated RAW264.7 and THP-1 cells

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*H*erba Siegesbeckiae (HS, Xi Xian Cao in Chinese), a Chinese Medicinal Herb, is commonly used by Chinese Medicine doctors to treat joint inflammatory disorders such as arthritis and rheumatoid arthritis. Toll-like receptor 4 (TLR-4) is widely recognized as an essential element in the triggering of innate immunity and in initiating a cascade of pro-inflammatory events. However, the role of TLR-4 in anti-inflammatory effect of HS is not fully understood. This study aims to provide justification for clinical application of HS in treating inflammatory disorders by delineating the effects of HS in the Toll-like receptor 4 (TLR4) signaling cascades. In this study, HS was extracted using 50% ethanol. We observed that HS reduced the secretion of various pro-inflammatory cytokines, chemokines and the respective mRNA expression regulated by the three transcription factors AP-1, NF-κB and IRF3. In addition, HS could also inhibit the secretion and mRNA expression of inflammatory mediators stimulated by MPLAs, a specific TLR-4 activator. Phosphorylation and nuclear protein levels of AP-1, NF-κB and IRF3 were decreased by HS treatment. Moreover, HS inhibited the activation/phosphorylation of MAPKs, IκB-α, IKKα/β, TAK1, TBK1, IRAK-1 and IRAK-4 signaling pathways. We also found that HS blocked the activation of TLR-4 signaling pathways by inhibiting LPS-TLR4 binding. Taken together, HS inhibits the production of inflammatory mediators through suppression of IRAK1/TAK1 and TBK1/IRF3 signaling pathways, and the binding of LPS to TLR-4 on macrophages.

Biography

Hui Guo is currently pursuing a PhD in Molecular Pharmacology and targets of herbal medicines at School of Chinese Medicine, Hong Kong Baptist University.

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