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示例: oil spill* mediterranean ✕

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... for exploring active components and effective mechanism

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Systems pharmacology reveals the mechanism of activity of Ge-Gen-Qin-Lian decoction against LPS-induced acute lung injury in Balb/c mice

mechanism of TCM formulae

作者: Ding, ZH (Ding, Zhe)^{1,2,1}; Zhong, RX (Zhong, Renxing)^{1,2,1}; Yang, YN (Yang, Yanni)^{1,2,1}; Xia, TY (Xia, Tianyi)^{1,2,1}; Wang, WJ (Wang, Wujing)^{1,2,1}; Wang, Y (Wang, Yi)^{1,1}; Xing, N (Xing, Na)^{1,1}; Luo, Y (Luo, Yun)^{1,1}; Li, SY (Li, Shuyuan)^{1,2,1}; Shang, LF (Shang, Lifeng)^{1,1}... 更多内容

PHARMACOLOGICAL RESEARCH

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文编号: 104759
DOI: 10.1016/j.phrs.2020.104759
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摘要

Acute lung injury (ALI), a severe and life-threatening inflammation of the lung, with high morbidity and mortality, underscoring the urgent need for novel treatments. Ge-Gen-Qin-Lian decoction (GQD), a classic Chinese herbal formula, has been widely used to treat intestine-related diseases in the clinic for centuries. In recent years, a growing number of studies have found that GQD has a favorable anti-inflammatory effect. With the further study on the viscera microbiota, the link between the lungs and the gut-the gut-lung axis has been established. Based on the theory of the gut-lung axis, we used systems pharmacology to explore the effects and mechanisms of GQD treatment in ALI. Hypothesis that GQD inhibits ALI response, one of the main objectives of this study is to model of lipopolysaccharide (LPS)-induced ALI in Balb/c mice to evaluate the therapeutic potential of GQD. Our results showed that GQD exerted protective effects against LPS-induced ALI in Balb/c mice. To further understand the molecular mechanism of GQD in the treatment of ALI, we used the network pharmacology to predict the disease targets of the active components of GQD. Lung tissue and serum samples of the mice were separately analyzed by transcriptomics and metabolomics. KEGG pathway analysis of network pharmacology predicted targets indicated that PI3K/Akt signaling pathway was significantly enriched, suggesting that it may be the main regulatory pathway for GQD treatment in ALI.

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Systems pharmacology reveals the mechanism of activity of Ge-Gen-Qin-Lian decoction against LPS-induced acute lung injury: A novel strategy for exploring active components and effective mechanism of TCM formulae

作者: Ding, ZH (Ding, Zhe)^{1,2}; Zhong, RX (Zhong, Rensheng)^{1,2}; Yang, YN (Yang, Yanna)^{1,2}; Xia, TY (Xia, Tianyi)^{1,2}; Wang, WJ (Wang, Wujing)^{1,2}; Wang, Y (Wang, Yi)¹; Kong, N (Kong, Na)¹; Luo, Y (Luo, Yan)¹; Li, SY (Li, Shuyuan)¹; Shang, LF (Shang, Lifeng)¹... 更多内容

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Acute lung injury (ALI), a severe and life-threatening inflammation of the lung, with high morbidity and mortality, underscoring the urgent need for novel treatments. Ge-Gen-Qin-Lian decoction (GQD), a classic Chinese herbal formula, has been widely used to treat intestine-related diseases in the clinic for centuries. In recent years, a growing number of studies have found that GQD has a favorable anti-inflammatory effect. With the further study on the viscera microbiota, the link between the lungs and the gut the gut lung axis has been established. Based on the theory of the gut lung axis, we used systems pharmacology to explore the effects and mechanisms of GQD treatment in ALI. Hypothesizing that GQD inhibits ALI progression, we used the experimental model of lipopolysaccharide (LPS) induced ALI in Balb/c mice to evaluate the therapeutic potential of GQD. Our results showed that GQD exerted protective effects against LPS-induced ALI by reducing pulmonary edema and microvascular permeability. Meanwhile, GQD can downregulate the expression of LPS induced TNF- α , IL-1 β , and IL-6 in lung tissue, bronchoalveolar lavage fluid (BLAF), and serum. To further understand the molecular mechanism of GQD in the treatment of ALI, we used the network pharmacology to predict the disease targets of the active components of GQD. Lung tissue and serum samples of the mice were separately analyzed by transcriptomics and metabolomics. KEGG pathway analysis of network pharmacology and transcriptomics indicated that PI3K/Akt signaling pathway was significantly enriched, suggesting that it may be the main regulatory pathway for GQD in the treatment of ALI. By immunohistochemical analysis and apoptosis detection, it was verified that GQD can inhibit ALI apoptosis through PI3K/Akt signaling pathway. Then, we used the PI3K inhibitor LY294002 to block the PI3K/Akt signaling pathway, and reversely verified that the PI3K/Akt signaling pathway is the main pathway of GQD anti-ALI. In addition, differential metabolites in mice serum samples indicate that GQD can inhibit the inflammatory process of ALI by reversing the imbalance of energy metabolism. Our study showed that, GQD did have a better therapeutic effect on ALI, and initially elucidated its molecular mechanism. Thus, GQD could be used to develop novel therapeutics for ALI. Moreover, our study also provides a novel strategy to explore active components and effective mechanism of TCM formulae combined with TCM theory to treat ALI.

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impact factor

5.631

2019 5年

JCR 类别	类别中的排序	JCR 分区
Pharmacology & Pharmacy	10	Q1

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