REVIEW
Integrative Medicine Discovery 2025;9:e25006. https://doi.org/10.53388/IMD202509006

Review on the research progress into the traditional Chinese medicinal Jing Fang granules: chemical composition, pharmacological effects and clinical applications

Rui Zhao[1#], Tai-Li Zhao[1#], Hong-Hua Li[2], Pei-Pei Zhao[1], Meng-Meng Wang[1], Yi-Wei Meng[1], Jing-Li Ren[1], Xin Yin[1*], Jing-Chun Yao[2*]

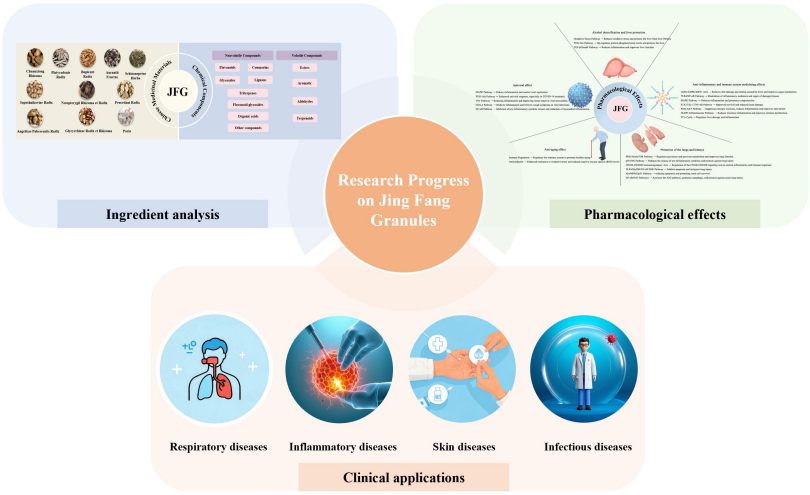
[1]Biology Institute, Qilu University of Technology (Shandong Academy of Sciences), Jinan 250103, China. [2]State Key Laboratory of Generic Manufacture Technology of Chinese Traditional Medicine, Lunan Pharmaceutical Group Co., Ltd., Linyi 276005, China.

[#]These authors contributed equally to this work and are co-first authors for this paper.
[*]**Correspondence to:** Xin Yin. Biology Institute, Qilu University of Technology (Shandong Academy of Sciences), No. 28789, Jingshi Road, Jinan 250103, China. E-mail: yinxin@sdas.org. Jing-Chun Yao. State Key Laboratory of Generic Manufacture Technology of Chinese Traditional Medicine, Lunan Pharmaceutical Group Co., Ltd., No. 209, Hongqi Road, Linyi 276005, China. E-mail: yaojingchun@yeah.net.

Abstract

Jing Fang granules (JFG) are a modern Chinese medicinal formulation derived from Jing Fang Defeating Toxin San (JFDS). JFG primarily contains bioactive compounds such as flavonoids/flavonoid glycosides, coumarins and other components, which have various activities: anti-inflammatory, immune system regulation, antiviral, anti-aging, detoxification, and protection of the liver, lungs, and kidneys. JFG has broad potential therapeutic applications. The mechanisms of JFG's actions are primarily associated with signaling pathways such as TLR4/NF-κB, PI3K/AKT, and MAPK. This article reviews the research progress on JFG, including chemical composition, pharmacologic effects, mechanism of action, safety, clinical application, etc., serving as a foundation for future research and clinical applications.

Keywords: chemical composition; clinical application; Jing Fang granules; pharmacological effect; traditional Chinese herbal formula



Author contributions

Conceptualization, Yin X and Zhao R; Formal analysis, Li HH and Zhao PP; Investigation, Zhao R, Zhao TL and Ren JL; Data proofreading, Meng YW and Ren JL; Writing – original draft preparation, Zhao R and Zhao TL; Writing – review and editing, Zhao PP and Yin X; Supervision, Yao JC; Funding acquisition, Wang MM, Yin X and Yao JC.

Competing interests

The authors declare no conflicts of interest.

Acknowledgments

This work was supported by the Key R&D Program of Shandong Province, China (No. 2024TZXD067, 2022SFGC0105), Natural Science Foundation of Shandong Province (No. ZR2023QB021), Young Taishan Scholarship to Xuekui Xia (No. tsqn202103100), Jinan Talent Project for Universities (No. 2021GXRC062, 202228088), Key innovation Project and Science, Education and Industry Integration Innovation Pilot Project of Qilu University of Technology (Shandong Academy of Sciences) (No. 2022JBZ01-06, 2024ZDZX03, 2023RCKY214).

Peer review information

Integrative Medicine Discovery thanks Ya-Dong Fan and other anonymous reviewers for their contribution to the peer review of this paper.

Abbreviations

JFG, Jing Fang granules; JFDS, Jing Fang Defeating Toxin San; HPLC, high-performance liquid chromatography; SARS, severe acute respiratory syndrome; IL, interleukin; TLR4, Toll-like receptor 4; NF-κB, nuclear factor-kappa B; NLRP3, NOD-like receptor family pyrin domain containing 3; MAPK, mitogen-activated protein kinase; PI3K, phosphoinositide 3-kinase; AKT, protein kinase B; STAT3, signal transducer and activator of transcription 3; TNF, tumor necrosis factor; ILK, integrin-linked kinase; ALI, acute lung injury; H1N1, influenza A; TCM, traditional Chinese medicine.

Citation

Zhao R, Zhao TL, Li HH, et al. Review on the research progress into the traditional Chinese medicinal Jing Fang granules: chemical composition, pharmacological effects and clinical applications. *Integr Med Discov*. 2025;9:e25006. doi: 10.53388/IMD202509006.

Executive editor: Xin-Yue Zhang.
Received: 25 December 2024; **Revised:** 29 January 2025; **Accepted:** 24 February 2025; **Available online:** 28 February 2025.

Integrative Medicine Discovery 2025;9:e25006. https://doi.org/10.53388/IMD202509006

Introduction

During the period of COVID-19, the marked preventive and treatment efficacy of traditional Chinese medicine (TCM) has again come to the fore. Jing Fang Defeating Toxin San (JFDS), also known as ginseng Defeating Toxin San, was first recorded in the Song Dynasty in the medical book "*Taiping Huimin and the Pharmacy Bureau*" (Taigu Bureau in the Song Dynasty, 1078–1252 C.E.) [1]. JFDS is a pungent and flat agent, but it is extraordinary. It is said to "treat typhoid fever", and it has been a good prescription to deal with the plague since the Song Dynasty [1]. Its therapeutic scope is particularly wide, and it has been used to treat influenza epidemics, and in internal medicine, gynecology, pediatrics, neurology, and diseases affecting the five senses.

The prescription of Jing Fang granules (JFG) is from JFDS. JFDS is known as "the general cure for plague" and "the divine cure for colds in all seasons" in Shi-Che Zhang's "*The Wonderful Recipes for Regenerating Life*" of the Ming Dynasty (1550 C.E.) [1]. JFG is a proprietary medicine granule extracted and condensed from a 1,000-year-old prescription by using an advanced Chinese medicine preparation technology [2]. JFG are a traditional Chinese herbal formula mainly composed of *Schizonepetae Herba* 3–9 g, *Saposhnikoviae Radix* 3–10 g, *Notopterygii Rhizoma et Radix* 3–9 g, *Angelicae Pubescentis Radix* 3–9 g, *Bupleuri Radix* 3–9 g, *Peucedani Radix* 3–6 g, *Chuanxiong Rhizoma* 3–9 g, *Aurantii Fructus* 3–9 g, *Poria* 6–12 g, *Platycodonis Radix* 3–9 g, *Glycyrrhizae Radix et Rhizoma* 3–6 g (Figure 1) [3]. JFG are often used in the treatment ofinflammations, infectious diseases and respiratory tract infections, and have a remarkable clinical effect [1, 3].

This paper describes and summarizes the current research status of JFG from the aspects of chemical composition, pharmacologic activity, mechanism of action, safety, and clinical applications, and aims to provide a reference point for further research and evaluation.

Ingredient analysis and effectiveness

The clinical application of JFG in China has been well established for some time, yet there are a paucity of studies investigating the components of this remedy. To ensure the therapeutic efficacy and safety of JFG, researchers employed high-performance liquid chromatography (HPLC), fingerprinting, and quantitative chemical composition analyses to qualitatively and quantitatively analyze the raw materials and finished products. These approaches effectively controlled the content and active ingredients in JFG [4].

Chemical composition analysis

The chemical composition of JFG and the cleavage pattern were systematically analyzed [5]. Gas chromatography-mass spectrometry and ultra performance liquid chromatography-quaternary high-resolution orbitrap mass spectrometry techniques were used to characterize the volatile and nonvolatile chemical components in JFG. The technical descriptions of HPLC and gas chromatography-mass spectrometry provide complete information but require a more concise summary to improve clarity. A total of 109 compounds were identified from JFG, including 85 nonvolatile compounds and 24 volatile compounds. The above 85 nonvolatile compounds were mainly divided into eight categories: coumarins (n = 25), flavonoids (n = 15), flavonoid glycosides (n = 15), organic acids (n = 9), lignans (n = 6), glycosides (n = 5), triterpenes (n = 4), and other compounds (n = 6) (Figure 1). The predominated flavonoids, flavonoid glycosides, and coumarins were shown in Table 1. The 24 volatile compounds in JFG were divided into four categories: terpenoids (n = 19), aldehydes (n = 2), esters (n = 2), and aromatic ethers (n = 1). The main components were shown in Table 2, including D-limonene, 3-carene, γ-pinene, β-pinene, L-mentholone, o-cymene, menthone, β-phellandrene, and β-ocimene.

Flavonoid pharmacology

Flavonoids, which are secondary plant metabolites, are widely distributed in the plant kingdom and are the main active ingredients in Chinese herbal medicines [6]. There are numerous flavonoids with medicinal value, including wogonin [7], isorhamnetin [8], hesperidin [9], which can be used for anti-inflammatory, antiviral, antioxidant, and prevention of cardiovascular and cerebrovascular diseases. Wogonin, derived from the flavonoids in *Saposhnikoviae Radix* [10], has potent in vivo activity against hepatitis B virus and is a potential therapeutic agent [11]. Wogonin has antiviral activity against several viruses by modulating the interferon cell-signaling pathway and the adenosine monophosphate-activated protein kinase pathway, thereby inhibiting influenza A (H1N1) replication and attenuating the formation of vacuoles containing influenza B [12]. Besides antibacterial, antiviral, and anti-inflammatory effects, the antioxidant, antitumor, and cardiovascular effects of wogonin are increasingly being studied [10].

Isorhamnetin is a flavonoid derived from *Bupleuri Radix* and *Glycyrrhizae Radix et Rhizoma*, and is a potent antioxidant that scavenges for cell and tissue damage caused by oxygen free radicals [13]. Isorhamnetin has broad-spectrum antimicrobial activity, and is commonly used to treat bacterial and fungal infections, including those caused by *Staphylococcus aureus*, *Salmonella* spp., *Bacillus* spp. and other bacteria [14]. Isorhamnetin also has significant activity against influenza virus, can directly or indirectly inhibit viral hemagglutinin and neuraminidase gene expression, and can inhibit virus-induced autophagy, the production of reactive oxygen species, and extracellular regulatory protein kinase phosphorylation [15]. Hesperidin is mainly derived from the flavonoid component of *Aurantii Fructus*, and has shown an in vitro inhibitory effect against coronavirus, and is also effective in the treatment of severe acute respiratory syndrome (SARS) [16].

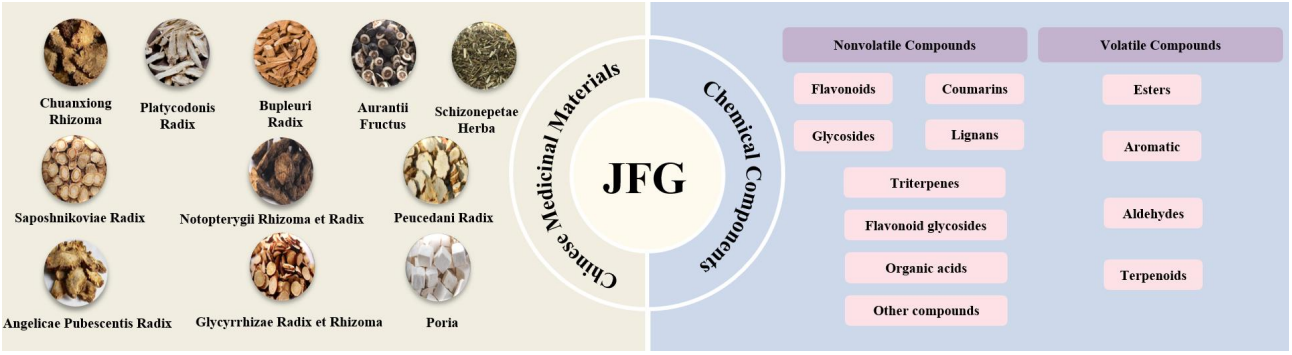
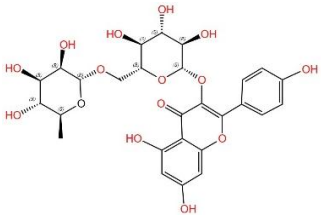
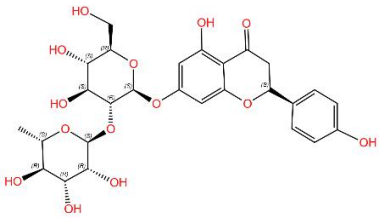
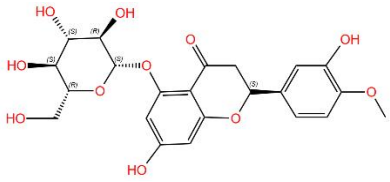
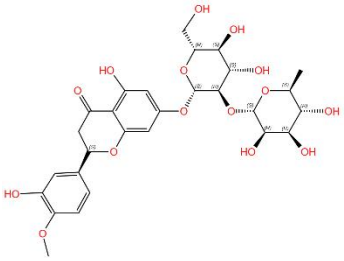
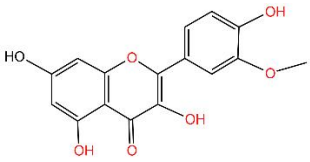
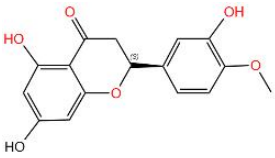
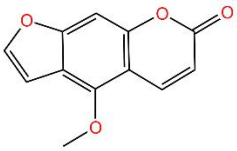
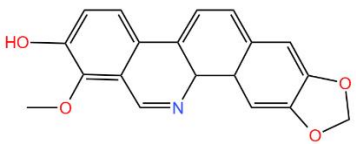


Figure 1 Eleven traditional Chinese medicinal herbs used in the preparation of JFG and the main chemical constituents in JFG. JFG, Jing Fang granules.

Integrative Medicine Discovery 2025;9:e25006. https://doi.org/10.53388/IMD202509006

Table 1 Main chemical constituents and their herbal attribution in JFG

Compounds	Chemical structure	Classify	Medicinal herbs attribute
Kaempferol 3-rutinoside		Flavone glycosides	*Glycyrrhizae Radix et Rhizoma*
Naringin		Flavone glycosides	*Aurantii Fructus/Glycyrrhizae Radix et Rhizoma*
Hesperetin 5-O-glucoside		Flavone glycosides	*Schizonepetae Herba*
Neohesperidin		Flavone glycosides	*Aurantii Fructus*
Isorhamnetin		Flavonoid	*Poria*
Hesperetin		Flavonoid	*Aurantii Fructus*
Bergamotlactone		Coumarin	*Peucedani Radix*
Zanthoxylin		Coumarin	*Schizonepetae Herba*, *Saposhnikoviae Radix*, *Peucedani Radix*

Integrative Medicine Discovery 2025;9:e25006. https://doi.org/10.53388/IMD202509006

Table 1 Main chemical constituents and their herbal attribution in JFG (*continued*)

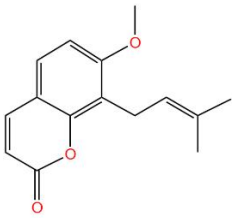
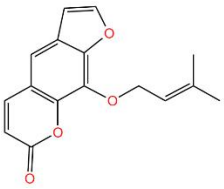
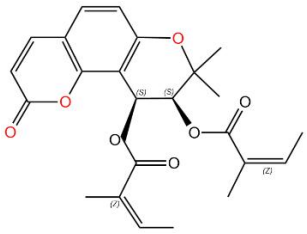
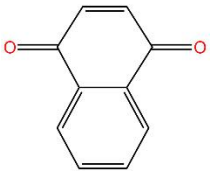
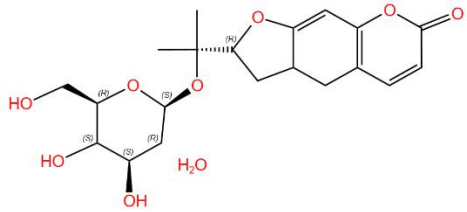
Compounds	Chemical structure	Classify	Medicinal herbs attribute
Osthol		Coumarin	*Saposhnikoviae Radix, Peucedani Radix*
Imperatorin		Coumarin	*Saposhnikoviae Radix, Peucedani Radix*
Praeruptorin B		Coumarin	*Peucedani Radix*
Naphthoquinone		Naphthoquinones	*Saposhnikoviae Radix*
Nodakenin		Glycoside	*Angelicae Pubescentis Radix, Peucedani Radix*

Table 2 Chemical constituents in the volatile oil of JFG

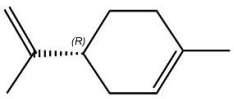
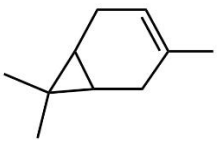
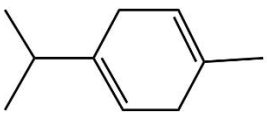
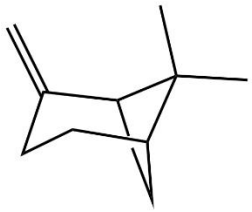
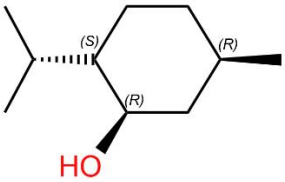
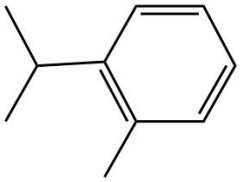
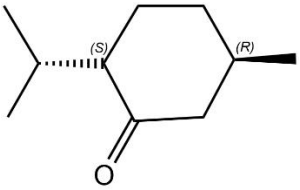
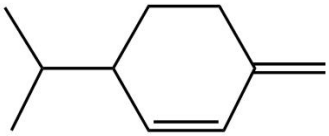
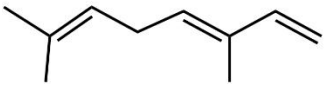
Compounds	Molecular formula	Categorization
D-limonene		Terpenoids
3-Carene		Terpenoids
γ-Pinene		Terpenoids

Table 2 Chemical constituents in the volatile oil of JFG (*continued*)

Compounds	Molecular formula	Categorization
β-Pinene		Terpenoids
L-mentholone		Terpenoids
o-Cymene		Terpenoids
Menthone		Terpenoids
β-Phellandrene		Terpenoids
β-Ocimene		Terpenoids

Coumarin analogs pharmacology

Coumarins are natural compounds with a parent nucleus of phenanthrene α-pyranone, which is mainly found in the flowers, leaves, stems, and fruits of plants [17]. Coumarins have anti-HIV, antitumor, anti-inflammatory, antioxidant, antibacterial, and other biologic activity, and have been used as important quality control compounds in TCM [18]. Xanthotoxin is derived from coumarins in *Schizonepetae Herba* and exhibits good free-radical scavenging and antioxidant activity [19]. Osthol is derived from coumarins in *Saposhnikoviae Radix* and is an anti-inflammatory and pain reliever, and also has antibacterial, anti-itching, antioxidant, and neuroprotective activity [20]. Bergapten comes from coumarins in *Peucedani Radix*, which has antitumor activity, regulates blood sugar, improves insomnia, prevents osteoporosis, anti-aging, anti-inflammatory, and anti-allergic effects [21].

Menthone is the main constituent of JFG in *Schizonepetae Herba*, showed inhibitory effects in animal models of acute inflammation [22, 23]. β-sitosterol is present in many TCM and has diverse pharmacological activity, including antiviral, antibacterial, anti-inflammatory, anticancer, antioxidant, and immunomodulatory effects [24]. β-sitosterol demonstrated anti-HIV activity both in vivo and in vitro. Its action mechanism is mainly related to the regulation of $CD4^+$ T-lymphocyte counts and to a significant reduction of interleukin (IL)-6 levels [25]. β-sitosterol also attenuates chemically induced hepatotoxicity in vitro [26], and has the potential to combat hepatitis B virus infection by reducing cellular oxidative stress [27].

Pharmacologic activity of some single components

Based on the chemical constituents of JFG, combined with the pharmacologic activity of some single components, scholars have also carried out the study of its quality control, especially the establishment of some methodologies, aimed at improving the quality of the product. Zheng et al. established an HPLC-MS/MS technique for the simultaneous determination of the contents of 10 active ingredients in JFG, such as bupleurum saponins A and D, ferulic acid, naringin, and glycyrrhizin [28]. This method is rapid, simple, sensitive, and specific, which can be used for the quality control of JFG [28]. Jiang et al. established a solid-phase extraction–ultraperformance liquid chromatography method for the simultaneous determination of asiaticoside and 5-O-methylviscumabolol glycoside in JFG from *Saposhnikoviae Radix* over 10 min [29]. Liu et al. simultaneously determined six constituents of JFG, namely prim-Oglucosyicimifugin, ferulic acid, naringin, menthone, osthole, and isoimperatorin, by using HPLC [30].

Shang et al. identified 56 compounds in JFG by using LC/MS, including 8 coumarins, 5 chromones, 18 flavonoids, 18 saponins, and 7 phenolic acids, and established an LC-PRM-MS method capable of determining 16 major components, and found that JFG contain glycosides with high polarity [31].

Overall, JFG contains a large amount of active compounds, which give it various pharmacological activities, providing a basis for further research into other potential clinical applications such as cardiovascular and cerebrovascular protection and regulation of blood glucose and lipid levels.

Pharmacological effects

Research on the pharmacodynamic substance basis of JFG has been a hot topic in recent years [32]. Although the specific action mechanism of JFG has not been fully elucidated, the pharmacological effects of JFG appear to center mainly on anti-inflammatory [4], antiviral [33], immunomodulatory [34], anti-aging and other effects through multiple pathways and targets (Figure 2) [35–37].

Anti-inflammatory and immunomodulatory effects

JFG can exert anti-inflammatory and immunomodulatory effects through various pathways, such as inhibiting the production of inflammatory mediators, and reducing the infiltration of inflammatory cells [38]. JFG ameliorate disturbed glucose metabolism and inflammation, and inhibit the glycolysis and pentose phosphate pathways in skin tissues by regulating the liver kinase B1/adenosine monophosphate-activated protein kinase/silent information regulator 1 axis, thereby alleviating skin tissue damage and itching in mice with urticaria [39]. JFG can reduce the Firmicutes/Bacteroidetes ratio, improve disorders of intestinal bacteria in mice with acute lung injury, regulate diversity of the intestinal flora, increase the abundance of probiotics in the intestinal tract, reduce the abundance of harmful bacteria, and exert anti-inflammatory and lung-protecting effects by altering metabolites associated with the intestinal flora [40]. JFG reduces intestinal inflammation, repairs damaged intestinal barriers, and improves intestinal flora and fecal-metabolite dysregulation through inhibition of the Toll-like receptor 4 (TLR4)/nuclear factor-kappa B (NF-κB) and NOD-, LRR- and pyrin domain-containing protein 3 (NLRP3) inflammasome pathways, which in turn ameliorates low temperature and high humidity-induced immune disorders and inflammatory responses [41]. JFG can also improve skin barrier function and reduce dermatitis by attenuating T-cell activity through the NF-κB/mitogen-activated protein kinase (MAPK) pathway, and suppress type I allergic reactions by inhibiting the phosphoinositide 3-kinase (PI3K)/protein kinase B (AKT)-signaling pathway [42, 43].

In a murine model of *Pseudomonas aeruginosa* acute pneumonia, JFG 5.85, 11.7, and 23.4 g/kg were administered by gavage and significantly reduced the expression or phosphorylation levels of key regulators of the signal transducer and activator of STAT3/IL-17/NF-κB signaling pathway in murine lung tissues (STAT3, ERK1/2 (MAPK1/3), Akt, NF-κB RelA (p65), and retinoic acid receptor-related orphan receptor γ), inhibited the STAT3/IL-17/NF-κB pathway, reduced the levels of pro-inflammatory cytokines, and reduced acute lung inflammation and improved survival [44]. JFG regulated the production of inflammatory factors, such as IL-1β, IL-4, IL-6, tumor necrosis factor-α (TNF-α), IFN-γ, and IL-10 by decreasing activation of the TLR4/NF-κB and MAPK pathways, and inhibited hepatic injury, apoptosis, and inflammatory pathways through regulation of the tricarboxylic acid cycle cycle, in concanavalin A-induced autoimmune hepatitis in mice [45].

In a murine tail thrombosis model, established with carrageenan gum injury to the vascular endothelium and a cold environment, JFG 2.1 g/kg administered by gavage reduced the plasma levels of inflammatory factors, such as IL-1β, IL-6, and TNF-α. In addition, the expression of p38 and ERK1/2 proteins, and their phosphorylation levels, in the murine spleen were downregulated, which ameliorated vascular endothelial damage and facilitated thrombus dissolution [46].

JFG attenuate mastitis by regulating NF-κB, NLRP3, PI3K/Akt, and MAPK signaling pathways, and inhibit inflammation, improve blood – milk barrier integrity, and inhibit apoptosis [47]. JFG also inhibit the maturation of bone marrow-derived dendritic cells through p38-MAPK signaling and inhibit the proliferation and inflammation of Kupffer cells by targeting the peroxisome proliferator-activated receptor-γ/NF-κB/STAT3 pathway, further antipsoriasis [48]. Inhibition of iron prolapse and exerts anti-inflammatory effects through activation of STAT3/p53/Solute carrier family 7, membrane 11 signaling pathway [49].

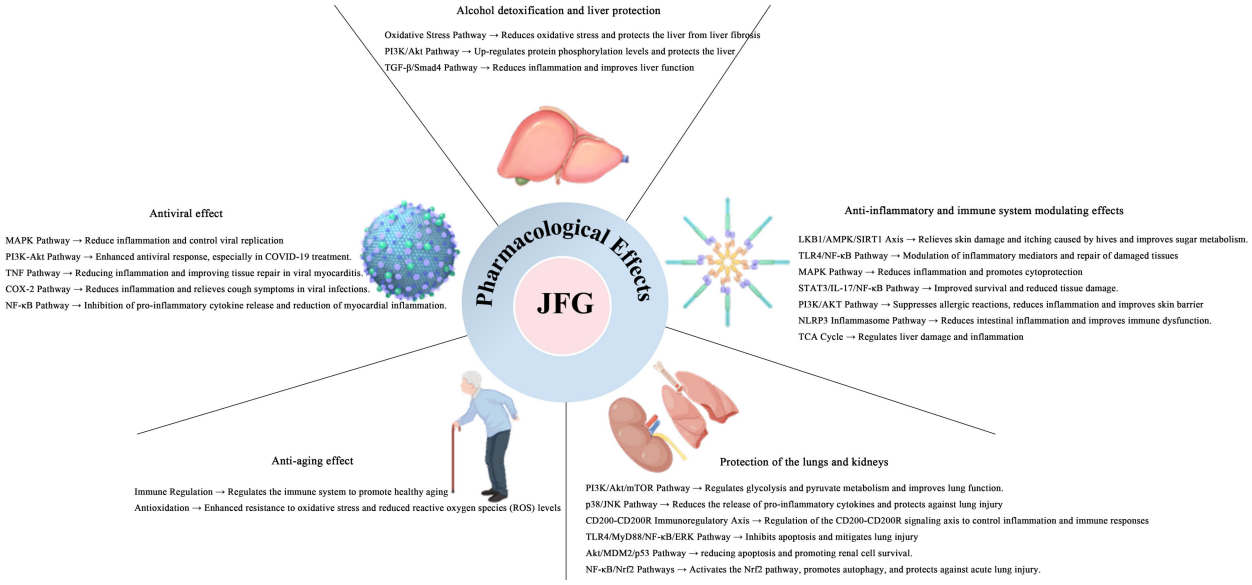


Figure 2 Pharmacologic effects of JFG and the corresponding molecular mechanisms involved. JFG, Jing Fang granules; TLR4, Toll-like receptor 4; NF-κB, nuclear factor-kappa B; NLRP3, NOD-like receptor family pyrin domain containing 3; MAPK, mitogen-activated protein kinase; PI3K, phosphoinositide 3-kinase; AKT, protein kinase B; STAT3, signal transducer and activator of transcription 3; TNF, tumor necrosis factor; TCA, tricarboxylic acid cycle; IL, interleukin; LKB1, liver kinase B1; AMPK, AMP-activated protein kinase; SIRT1, sirtuin 1; COX-2, cyclooxygenase-2; Smad4, small mothers against decapentaplegic 4; JNK, c-Jun N-terminal kinase; CD200-CD200R, Cluster of differentiation 200/Cluster of differentiation 200 receptor; MDM2, murine double minute 2.

JFG have good anti-inflammatory activity, which is the pharmacologic basis for their use in allergic diseases (urticaria), intestinal and lung inflammation, and thrombotic diseases. The mechanism of action of JFG is related to an influence on signaling pathways, such as STAT3/IL-17/NF-κB, p38 MAPK, and TLR4/NF-κB/NLRP3. In addition, a modulatory effect of JFG on the above signaling pathways may become the theoretic basis for conducting research on certain other drugs in these disease models.

Antiviral activity

Researchers have used experimental and bioinformatic techniques to confirm that JFG are effective against novel coronaviruses [50], viral myocarditis [33], influenza virus [51], and Newcastle disease virus [52]. Clinically, JFG have been widely used in the prevention and treatment of acute bronchitis, dengue fever, acute/viral upper respiratory tract infections, and H1N1 [3]. Therefore, JFG can significantly improve the symptoms of headache, sore throat, fever, and sputum production in patients [39].

JFG have a therapeutic effect in COVID-19 through the MAPK-signaling pathway, and the PI3K-Akt and other signaling pathways, which provides a reference point for the treatment of COVID-19 with Chinese medicine [53, 54]. In viral myocarditis, using network pharmacology and molecular docking, it was found that JFG may exert therapeutic effects by acting on three key targets, JUN, MAPK1/3 and STAT1/3, through components such as quercetin, lignans, and kaempferol, which act by inhibiting the release of pro-inflammatory cytokines (e.g., TNF-α) and controlling the NF-κB, MAPK, and TNF-signaling pathways [33, 36].

Also, using bioinformatics, JFG were found to have a therapeutic effect against viral myocarditis induced by Coxsackievirus b3. In a murine model of viral myocarditis, the administration of JFG at 0.23, 0.46, and 0.69 g/20 g by consecutive gastric gavage for 7 days significantly reduced pathologic damage to the cardiac tissues, reduced myocardial inflammation, fibrosis, and apoptosis, and reduced the expression of inflammatory genes [34].

The inhibitory effect of JFG extract on SARS-CoV-2 was determined by an enzymatic method, and it was found that JFG's main components, neohesperidin, asiaticoside, and naringenin, had inhibitory effects on 3-chymotrypsin-like protease and papain-like protease proteases, and had inhibitory activity and an antitussive effect via cyclo-oxygenase-2 [31]. Through the "drug component-potential target" network, it was found that JFG may regulate signaling pathways for H1N1, TNF, MAPK, and IL-17, via quercetin, lignocerotoxin, and kaempferol, and play a role in treating influenza and modulating the immune response [51].

JFG not only reduce the inflammatory response in the body, but also have some antiviral activity and inhibit the replication of viruses such as respiratory syncytial virus [34]. Overall, further studies on action mechanisms are needed to clearly define the full spectrum of antiviral activity for JFG.

Anti-aging effects

JFG not only treat human epidemics and infectious diseases, but also have potential anti-aging properties. Yin et al. used *Caenorhabditis elegans* N2 as a model organism, and the median lifespan was increased by 31.2% after administration of JFG 10 mg/mL. JFG also increased the nematode oviposition rate by 11.3%, and subsequently delayed reproductive senescence. In addition, JFG enhanced the resistance to oxidative stress induced by paraquat 5 and 10 mM, leading to decreased reactive oxygen species levels, in *C. elegans* [35].

JFG is gradually gaining attention for its potential in the field of anti-aging, particularly in the prevention and treatment of aging-related diseases. While pharmacologic studies on the anti-aging effects of JFG are still limited, existing research suggests that JFG may promote health, delay aging, and enhance cellular defense mechanisms through mechanisms such as antioxidation, immune regulation, and improving circulation. Given these findings, JFG holds significant translational value in modern medicine. With further clinical validation, it could be applied in the prevention and treatment of geriatric diseases, thus contributing to the enhancement of human health and prolongation of healthy lifespan. Therefore, as a unique TCM, JFG may have therapeutic potential as an anti-aging agent.

Alcohol detoxification and liver protection

Excessive alcohol consumption can affect liver function, and JFG have hepatoprotective activity [55]. Through network pharmacology and molecular docking methods, combined with experimental validation, a murine model of acute alcohol intoxication was constructed and found that JFG significantly reduced serum ethanol levels, and upregulated the expression rate of p-PI3K/PI3K and p-Akt/Akt proteins in liver tissue [56]. JFG have a therapeutic effect on CCL4-induced hepatic fibrosis in mice by reducing serum levels of alanine aminotransferase, aspartate aminotransferase, triglyceride, and 1L-1β, thereby decreasing the expression of pro-inflammatory factors and ameliorating hepatic fibrosis. The action mechanism appears to be related to regulation of the transforming growth factor-β/Smad4-signaling pathway [57]. In addition, JFG increased hepatic levels of superoxide dismutase and glutathione, and reduced oxidative stress-induced damage during liver fibrosis, which demonstrated that JFG may have therapeutic potential in the prevention and treatment of liver fibrosis [57].

Protection of the lungs and kidneys

In experimental studies, JFG had a protective effect on the lungs and kidneys. JFG inhibited lung inflammation, and improved lung energy metabolism, lung microcirculation, and resistance to viral infections [58].

In rats with adriamycin-induced nephropathy, JFG gavage for 28 days reduced urine output, blood creatinine level, and integrin-linked kinase (ILK) content [59]. Kang et al. found that different injury stimuli can cause ILK overexpression in podocytes, and can inhibit expression of the podocyte lacunar septal protein nephrin [60]. Therefore, the mechanism of action for JFG in the treatment of nephropathy may be to downregulate ILK expression, and upregulate the expression of nephrin and CD2AP [59]. In a murine model of acute kidney injury caused by aristolochic acid I, JFG 4, 8, and 16 g/kg for 7 days significantly promoted the expression of p-Akt and mouse double minute 2 proteins to inhibit p53, thus altering the Bax/Bcl-2 ratio. This suggests that JFG can improve the expression of apoptosis-related proteins, by activating the Akt/mouse double minute 2/p53 pathway, and thus have a protective effect on aristolochic acid I-induced acute kidney injury in mice [61]. JFG can reduce inflammation, oxidative stress, and renal fibrosis; regulate glucose and lipid metabolic disorders in diabetic nephropathy; delay the progression of diabetic nephropathy; regulate blood glucose; and improve renal function [62, 63].

Acute lung injury (ALI) and acute respiratory distress syndrome are inflammatory diseases of the lungs with high morbidity and mortality [64]. JFG inhibit the p38/c-Jun N-terminal kinase pathway and reduce the release of pro-inflammatory cytokines through the CD200-CD200R immunoregulatory signaling axis, which subsequently protects the lungs from acute injury [2]. Sun et al. established a model of ALI, and with the help of bioinformatics and experimental validation, they found that JFG regulated glycolysis and pyruvate metabolism through upregulation of the PI3K/Akt/mammalian target of rapamycin signaling pathway, and had a protective effect against ALI [65]. In addition, JFG ameliorated lung pathologic injury (induced by *Klebsiella pneumoniae*) in mice by inhibiting the TLR4/Myeloid differentiation primary response protein 88/NF-κB/ERK signaling pathway and suppressing apoptosis [66]. JFG promotes autophagy and ameliorates LPS-induced anti-ALI in mice by inhibiting the NF-κB signaling pathway and promoting the Nrf 2 signaling pathway [67].

Safety

The safety of JFG was evaluated by researchers through acute and long-term toxicity tests and other methods. Repeated gavage

administration of JFG to rats revealed no significant toxicity at a dosage of 3 g/kg/day. However, at a dosage of 10 g/kg/day, the rats had reduced appetite, a slow increase in bodyweight, and an increase in the prevalence of chronic nephritis, which was reversible after the recovery period [68]. In addition, no abnormal changes in food intake, bodyweight, and pregnancy were observed during administration of JFG 10 g/kg/day to pregnant rats, and the first and second filial generation offspring (i.e., breast-fed, neonatal rats) had no toxicities affecting developmental or reproductive function, and no abnormal physical signs were observed [69].

Clinical applications

JFG are used clinically for the treatment of various systemic diseases. Recent research has shown that JFG can improve cellular immune status and immune function in the body. The clinical applications of JFG were shown in Table 3 [70–73, 75, 78, 79, 81, 83, 84, 86–89, 91]. For respiratory diseases, the efficacy of JFG in treating coryza is remarkable [70], which can alleviate the clinical symptoms of cold patients to a certain extent, and it has achieved better efficacy in adding and subtracting in treating spring wind-cold exopathogens in the elderly population and pediatric wind-cold colds [71–73]. For skin diseases, JFG can be used in the treatment of urticaria, a common allergic skin disease, which is called “addiction rash” in Chinese medicine [74, 75]. In 127 patients given one dose of JFG per day, and who had a follow-up visit after 2 weeks, the overall efficacy was 81.0%, with no statistically significant difference compared to loratadine [76].

Table 3 Summary of the clinical applications of JFG

Indications	Drug dose	Treatments	Clinical samples	Improved efficacy	Side effects	Reference
Common cold	1 dose daily, divided into two doses.	7 d	60 patients	Shortening of fever reduction time, relief of runny nose and headache.	No	[70]
Cold in elderly people	Thorny defense and septicemia powder formula.	7 d	50 patients	Body temperature returned to normal, and all cold symptoms disappeared.	No	[71]
Childhood wind-cold flu	1 dose daily, divided into 3 doses.	5 d	40 patients	The total effective rate of the observation group was 95.00%, and the total effective rate of the control group was 75.00% for ribavirin granules. The disappearance time of clinical symptoms was significantly shorter than that of the control group.	No	[72]
Childhood influenza	JFG 5 g/dose, 3 times daily; oseltamivir 1.5 mg/kg per dose, 2 times daily.	5 d	112 patients	The total effective rate of the treatment group was 96.43%, which was significantly higher than that of the control group, which was 85.45%; the time for the disappearance of symptoms such as fever, cough, and sore throat was significantly shortened.	No	[73]
Chronic nettle rash	JFG 4 g/dose once in the morning and once in the evening; loratadine 5 mg, once daily.	14 d	65 patients	Reduced itching and shorter time for rash to subside.	Most patients experienced no side effects, but a few individuals had stomach discomfort.	[75]
Mycoplasma pneumonia in adults	JFG 1 sachet/dose, 3 times a day; intravenous infusion of azithromycin for injection, 0.5 g/dose, 1 time a day.	14 d	112 patients	Improvement in clinical symptoms and overall effectiveness.	No	[78]
Mumps in children	Purple gold ingot cactus applied externally in combination with JFG taken orally.	3 d	108 patients	Localized swelling, fever, pain and other symptoms have been significantly improved, relieving the child's symptoms of swelling and pain.	No	[84]
Pediatric acute bronchitis	JFG 1 dose once daily.	7 d	142 patients	Decreased cough, decreased sputum, and improved lung wet rales.	No	[79]
Otitis media	JFG oral, 1 dose daily, 2 divided doses in the morning and evening.	28 d	136 patients	Significantly improved tympanic conductance mapping and lowered serum inflammatory factor levels in patients.	No	[81]

Table 3 Summary of the clinical applications of JFG (*continued*)

Indications	Drug dose	Treatments	Clinical samples	Improved efficacy	Side effects	Reference
Oral and maxillofacial inflammation	JFG orally, 1 dose daily.	3–7 d	106 patients	The general condition is good, local erythema has subsided, hardness has decreased, and tenderness is no longer obvious.	No	[83]
COVID-19 infection	JFG specific dose not available.	7–10 d	Mildly ill patients with unspecified sample size	Improvement of nucleic acid conversion rate and reduction of nucleic acid conversion time and hospitalization time.	No	[86]
Avian influenza	JFG specific dose not available.	15 d	500 patients	Completely protects test chickens from H9N2 subtype avian influenza virus.	No	[87]
H1N1	JFG specific dose not available.	2–3 d	43 patients	All patients were discharged from the hospital after their major clinical symptoms disappeared and the test paper was negative for H1N1 virus nucleic acid.	No	[88]
Acute upper respiratory tract infection	JFG specific dose not available.	5–7 d	100 patients	Significant improvement in symptoms such as fever, headache and sore throat.	No	[89]
Cough-variant asthma	The treatment group was given the addition and subtraction of Jing, Fang, Chai, and Park Tang, and the control group was given fluticasone.	10 d	120 patients	Effective rate 91.4% in the treatment group, 86.2% in the control group, better in the treatment group than in the control group.	No	[91]

H1N1, influenza A; JFG, Jing Fang granules.

For inflammatory diseases, inflammation of the lungs caused by *Mycoplasma pneumoniae* is mainly characterized by fever, cough, headache, and other symptoms, and is contagious [77]. Ji et al. used JFG and azithromycin to treat adult mycoplasma pneumonia, and acute bronchitis in children, and found that the combination was clinically effective [78, 79]. In addition, JFG can be used to treat cough in patients with colds and have an anti-inflammatory effect in this setting [80]. JFG can also be used to treat mumps [84], respiratory diseases such as acute bronchitis [80], otitis media [81], toothache [82], and oral and maxillofacial inflammation [83]. JFG effectively prevent and control viral respiratory infections due to antiviral, immunity-enhancing, expectorant, metabolism-accelerating, and intestinal microenvironment-improving properties [84]. At the end of 2019, there was an outbreak of COVID-19 in Wuhan. Huang suggested that the Jingfu Defeating Toxin Dispensary and Shishen Tang can be used for mass prophylaxis against COVID-19, but this requires further clinical verification [85]. Nonetheless, the active ingredients in JFG can inhibit SARS-CoV-2 proteins, and can protect the cardiovascular system, regulate immune function and anti-inflammatory effects, and prevent and control coronavirus infection [86].

For infectious diseases, JFG completely protected chickens against H9N2 avian influenza virus, which provides important information on the dosage of JFG for the clinical control of low-virulence avian influenza [87]. JFG have demonstrated efficacy in some infectious diseases, such as H1N1 [88], acute upper respiratory tract infection [89, 90], dengue fever, and cough-variant asthma [91].

JFG show broad clinical efficacy in treating a range of diseases, including respiratory, skin, inflammatory, and infectious conditions. Their ability to enhance immune function, alleviate inflammation, and prevent viral infections highlights their therapeutic potential. JFG have been proven effective in conditions such as coryza, urticaria, mycoplasma pneumonia, and even COVID-19, demonstrating their versatility and importance in clinical practice.

Conclusion

JFG have wide-ranging clinical applications and are used in the treatment of respiratory diseases (e.g., colds), urticaria, inflammation (e.g., pneumonia and bronchitis), and influenza and other diseases. The constituents of JFG responsible for medicinal effects include volatile oils, flavonoids, flavonoid glycosides, coumarins, lignans, and other constituents. Recent pharmacologic studies have shown that JFG have effects such as anti-inflammatory, immune system regulation, antiviral, anti-aging, detoxification, hepatoprotection, lung protection, and kidney protection. The mechanism of action for JFG involves the regulation of TLR4/NF-κB, PI3K/Akt, MAPK, and other signaling pathways.

JFG exerts potent anti-inflammatory and immunomodulatory effects by regulating key pathways such as TLR4/NF-κB, MAPK, and PI3K/AKT. These signaling pathways play crucial roles in regulating immune responses, reducing inflammation, and alleviating pathological damage in conditions like acute lung injury, dermatitis, and autoimmune diseases. JFG exhibits antiviral properties, showing significant efficacy against viruses such as SARS-CoV-2 and influenza, likely through the MAPK and PI3K/AKT pathways. JFG has potential anti-aging effects, possibly through its antioxidant properties and modulation of cellular stress responses, which help slow down the aging process and enhance lifespan. JFG also offers hepatoprotective and renoprotective effects, particularly in alcohol-induced liver injury and kidney disease, by regulating oxidative stress, inflammation, and fibrosis. Overall, the multifaceted pharmacological effects of JFG, mediated by these complex molecular mechanisms, highlight its potential in treating a wide range of diseases, including infectious, inflammatory, and degenerative conditions.

Although some progress has been made in the preparation process for JFG, and in knowledge regarding the pharmacodynamic activity and clinical applications of JFG, the specific mechanisms of action for JFG have not yet been fully elucidated, due to the multi-component and multi-targeting nature of TCM. JFG may play a role in regulating

the immune system, inhibiting inflammatory responses, alleviating oxidative stress, and in other pathways. The mechanisms of JFG action are related to multiple signaling pathways, and these signaling pathways may be involved in many diseases. Therefore, further in-depth studies are needed to investigate the effects of JFG in other diseases, and the specific mechanisms of JFG, to achieve the scientific goal of broadening the clinical applications for JFG.

JFG has demonstrated significant efficacy in the field of TCM, but its lack of large-scale, multicenter clinical trials has left its efficacy and safety unproven. The complexity of studying multi-ingredient formulations increases the difficulty of investigating the pharmacological mechanisms, as it is difficult to clarify the mechanisms by which the multiple components in TCM interact and affect the efficacy. In addition, the research framework and experimental design for modern scientific methods applied to TCM formulations are still incomplete, which limits their clinical popularization and application. Future studies should strengthen multicenter large-scale clinical trials, combine with modern molecular biology techniques, thoroughly explore the pharmacological mechanism of JFG, and focus on the synergistic effect and mechanism of action among the components of TCM compounding, so as to provide a scientific basis for its clinical application.

In conclusion, JFG have several promising clinical applications, but existing problems and challenges remain to be overcome to better serve the health needs of patients. Indeed, JFG are expected to play an increasing role in the field of TCM, and to make increasing contributions to general public health.

References

1. Wang Z, Yu L, Gong XP, et al. Experimental study on the mechanism of anti-anaphylaxis effect of ethyl acetate extraction of Jing-Fang powder. *Chin Pharm J.* 2014;49(11):963–966. (Chinese) Available at: https://kns.cnki.net/kcms2/article/abstract?v=691tpyMQYm1B1n3yKDcALNc88SjGHxGfjd5JP3TpaYxNtK9zlLiE5TGiCXsmtsB6-svVYCt_0q6BCKi1sDOogmg2H8MNZcKb4EFqk41zweUB5gJo2pQ0frx3fO4jCk96nmTn0gAvTUem7PgqT6gh2ouHp5Q8mrbOd3WyJiGkt0I8B8fUy904SQ==&uniplatform=NZKPT
2. Lv K, Li M, Sun C, et al. Jingfang Granule alleviates bleomycin-induced acute lung injury via CD200-CD200R immunoregulatory pathway. *J Ethnopharmacol.* 2023;311:116423. Available at: http://doi.org/10.1016/j.jep.2023.116423
3. Ni WT, Ma DL, Shao JJ, et al. Molecular mechanism of Jingfang mixture against H1N1 influenza based on network pharmacology and experimental verification. *Chin J Exp Tradit Med Form*. 2022;28(12):200–209. (Chinese) Available at: http://doi.org/10.13422/j.cnki.syfjx.20220815
4. Rao ZL, Cao HJ, Shi BY, Luo J, Liu XB, Zeng N. Effects of Jingfang n-butanol extraction isolated fraction A on LPS-induced inflammation in RAW264.7 cells. *Chin J Tradit Chin Med.* 2019;44(5):1026–1033. (Chinese) Available at: http://doi.org/10.19540/j.cnki.cjcmm.20181214.004
5. Liang HB, Jiang YJ, Yuan XM, et al. Chemical constituents of Jingfang Granules based on GC-MS and UPLC-Q exactive MS. *Chin Tradit Herb Drugs.* 2022;53(6):1697–1708. (Chinese) Available at: https://kns.cnki.net/kcms2/article/abstract?v=691tpyMQYm1zqUouBjcVMCxCMtR_QnifmB8KwhexRaAGhMI1WPHjUPwDjbkpqjUHzSL030sZSAGcrMxGSre3-sq_c-2oqJYvF-Phc7-LiE_thXwrqe2ScnohQ5Ho46CKjxdLu5t4ga8XahyQwXJsrJYTECyWdNFE0Pjre8qScHVP04JvLobHnw==&uniplatform=NZKPT
6. Sun Q, Liu Q, Zhou X, et al. Flavonoids regulate tumor-associated macrophages – From structure-activity relationship to clinical potential (Review). *Pharmacol Res.* 2022;184:106419. Available at: http://doi.org/10.1016/j.phrs.2022.106419
7. Liu XQ, Jiang L, Li YY, et al. Wogonin protects glomerular podocytes by targeting Bcl-2-mediated autophagy and apoptosis in diabetic kidney disease. *Acta Pharmacol Sin.* 2022;43(1):96–110. Available at: http://doi.org/10.1038/s41401-021-00721-5
8. Liu H, Han J, Lv Y, et al. Isorhamnetin and anti-PD-L1 antibody dual-functional mesoporous silica nanoparticles improve tumor immune microenvironment and inhibit YY1-mediated tumor progression. *J Nanobiotechnology.* 2023;21(1):208. Available at: http://doi.org/10.1186/s12951-023-01967-3
9. Han D, Gong H, Wei Y, et al. Hesperidin inhibits lung fibroblast senescence via IL-6/STAT3 signaling pathway to suppress pulmonary fibrosis. *Phytomedicine.* 2023;112:154680. Available at: http://doi.org/10.1016/j.phymed.2023.154680
10. Banik K, Khatoon E, Harsha C, et al. Wogonin and its analogs for the prevention and treatment of cancer: A systematic review. *Phytother Res.* 2022;36(5):1854–1883. Available at: http://doi.org/10.1002/ptr.7386
11. Guo Q, Zhao L, You Q, et al. Anti-hepatitis B virus activity of wogonin in vitro and in vivo. *Antivir Res.* 2007;74(1):16–24. Available at: http://doi.org/10.1016/j.antiviral.2007.01.002
12. Seong RK, Kim JA, Shin OS. Wogonin, a flavonoid isolated from Scutellaria baicalensis, has anti-viral activities against influenza infection via modulation of AMPK pathways. *Acta Virol.* 2018;62(1):78–85. Available at: http://doi.org/10.4149/av_2018_109
13. Gong G, Guan YY, Zhang ZL, et al. Isorhamnetin: A review of pharmacological effects. *Biomed Pharmacother.* 2020;128:110301. Available at: http://doi.org/10.1016/j.biopha.2020.110301
14. Jiang LX, Li HG, Wang LY, et al. Isorhamnetin Attenuates Staphylococcus aureus-Induced Lung Cell Injury by Inhibiting Alpha-Hemolysin Expression. *J Microbiol Biotechnol.* 2016;26(3):596–602. Available at: http://doi.org/10.4014/jmb.1507.07091
15. Abdal Dayem A, Choi HY, Kim YB, Cho SG. Antiviral effect of methylated flavonol isorhamnetin against influenza. *PLoS One.* 2015;10(3):e0121610. Available at: http://doi.org/10.1371/journal.pone.0121610
16. De Clercq E. Potential antivirals and antiviral strategies against SARS coronavirus infections. *Expert Rev Anti Infect Ther.* 2006;4(2):291–302. Available at: http://doi.org/10.1586/14787210.4.2.291
17. Bhattarai N, Kumbhar AA, Pokharel YR, Yadav PN. Anticancer Potential of Coumarin and its Derivatives. *Mini Rev Med Chem.* 2021;21(19):2996–3029. Available at: http://doi.org/10.2174/1389557521666210405160323
18. Xia DG, Liu H, Cheng X, Maraswami M, Chen YT, Lv XH. Recent Developments of Coumarin-based Hybrids in Drug Discovery. *Curr Top Med Chem.* 2022;22(4):269–283. Available at: http://doi.org/10.2174/1568026622666220105105450
19. Wu A, Lu J, Zhong G, Lu L, Qu Y, Zhang C. Xanthotoxin (8-methoxypsoralen): A review of its chemistry, pharmacology, pharmacokinetics, and toxicity. *Phytother Res.* 2022;36(10):3805–3832. Available at: http://doi.org/10.1002/ptr.7577
20. Sun MN, Sun MJ, Zhang J. Osthole: an overview of its sources, biological activities, and modification development. *Med Chem Res.* 2021;30(10):1767–1794. Available at: http://doi.org/10.1007/s00044-021-02775-w
21. Liang Y, Xie L, Liu K, et al. Bergapten: A review of its pharmacology, pharmacokinetics, and toxicity. *Phytother Res.* 2021;35(11):6131–6147. Available at: http://doi.org/10.1002/ptr.7221
22. Chen X, Wu Q, Gong Z, et al. A Natural Plant Ingredient, Menthone, Regulates T Cell Subtypes and Lowers Pro-inflammatory Cytokines of Rheumatoid Arthritis. *J Nat Prod.* 2022;85(4):1109–1117. Available at:

http://doi.org/10.1021/acs.jnatprod.1c01231
23. Su YH, Lin JY. Menthone Inhalation Alleviates Local and Systemic Allergic Inflammation in Ovalbumin-Sensitized and Challenged Asthmatic Mice. *Int J Mol Sci.* 2022;23(7):4011. Available at: http://doi.org/10.3390/ijms23074011
24. Khan Z, Nath N, Rauf A, et al. Multifunctional roles and pharmacological potential of β-sitosterol: Emerging evidence toward clinical applications. *Chem Biol Interact.* 2022;365:110117. Available at: http://doi.org/10.1016/j.cbi.2022.110117
25. Tanaka T, Ikeda T, Kaku M, et al. A New Lignan Glycoside and Phenylethanoid Glycosides from Strobilanthes cusia BREMEK. *Chem Pharm Bull (Tokyo).* 2004;52(10):1242–1245. Available at: http://doi.org/10.1248/cpb.52.1242
26. Arbab AH, Parvez MK, Al-Dosari MS, et al. Therapeutic efficacy of ethanolic extract ofAerva javanicaaerial parts in the amelioration of CCl4-induced hepatotoxicity and oxidative damage in rats. *Food Nutr Res.* 2016;60:30864. Available at: http://doi.org/10.3402/fnr.v60.30864
27. Parvez MK, Alam P, Arbab AH, Al-Dosari MS, Alhowiriny TA, Alqasoumi SI. Analysis of antioxidative and antiviral biomarkers β-amyrin, β-sitosterol, lupeol, ursolic acid in Guiera senegalensis leaves extract by validated HPTLC methods. *Saudi Pharm J.* 2018;26(5):685–693. Available at: http://doi.org/10.1016/j.jsps.2018.02.022
28. Zheng ZQ, Gong CQ, Zhang X, Sun Q, Guan YJ. Simultaneous determination of ten constituents in Jingfang Granules by HPLC-MS/MS. *Chin Tradit Pat Med.* 2023;45(12):3901–3905. (Chinese) Available at: https://kns.cnki.net/kcms2/article/abstract?v=691tpyMQYm0Ib1Oyy0U9AaigHxynmoZUjW0gZoA8GSWAX-KzR3XcP9-HUJKUXpi_zfxODUF0bJl9-jiP-2VRQHyIXora00Bbw78tL-W90XQ9yVs8XUUHEmQ9cE03mrxrGTwkhbOpiM9i0j25se89Ddi0LpukJkp0Yqi3lJfE583t06xYAfj1ZQ==&uniplatform=NZKPT
29. Jiang L, Yu H, Cao YX, Gong CY. Simultaneous determination of Prim-O-Glucnylcimifugin and 4'-O-β-glucosyl-5-O-Methylvismmiside in compound Jingfang Granules by SPE-UPLC. *China Med Herald.* 2020;17(1):33–37. (Chinese) Available at: http://doi.org/10.20047/j.issn1673-7210.2020.01.009
30. Liu W, Li F, Sun CL, Zhang WW. Simultaneous determination of six components in Jingfang Granule by HPLC. *Chin J Exp Tradit Med Form.* 2016;22(17):55–58. (Chinese) Available at: http://doi.org/10.13422/j.cnki.syfjx.2016170055
31. Shang ZP, Yi Y, Yu R, et al. Bioactive compounds of Jingfang Granules against SARS-CoV-2 virus proteases $3CL^{Pro}$and PL^{pro}. *J Peking Univ (Med Sci).* 2022;54(5):907–919. (Chinese) Available at: http://doi.org/10.19723/j.issn.1671-167X.2022.05.018
32. Yenigun S, Basar Y, Ipek Y, et al. A potential DNA protector, enzyme inhibitor and in silico studies of daucosterol isolated from six Nepeta species. *Process Biochem.* 2024;143:234–247. Available at: http://doi.org/10.1016/j.procbio.2024.04.039
33. Yao T, Sun B, Li Y, et al. Integrating network pharmacology and experimental validation to decipher the mechanism of action of Jingfang Granule in the treatment of viral myocarditis. *Naunyn Schmiedebergs Arch Pharmacol.* 2023;396(9):2151–2163. Available at: http://doi.org/10.1007/s00210-023-02464-y
34. Sun B, Lin L, Yao T, et al. Jingfang Granule mitigates Coxsackievirus B3-induced myocardial damage by modulating mucolipin 1 expression. *J Ethnopharmacol.* 2024;320:117396. Available at: http://doi.org/10.1016/j.jep.2023.117396
35. Yin X, Meng Y, Sun C, et al. Investigation of anti-aging and anti-infection properties of Jingfang Granules using the Caenorhabditis elegans model. *Biogerontology.* 2024;25(3):433–445. Available at: http://doi.org/10.1007/s10522-023-10058-7
36. Wang BS, Huang GJ, Tai HM, Huang MH. Antioxidant and anti-inflammatory activities of aqueous extracts of Schizonepeta tenuifolia Briq. *Food Chem Toxicol.* 2012;50(3–4):526–531. Available at: http://doi.org/10.1016/j.fct.2011.12.010
37. Yu X, Niu Y, Zheng J, et al. Radix Saposhnikovia extract suppresses mouse allergic contact dermatitis by regulating dendritic-cell-activated Th1 cells. *Phytomedicine.* 2015;22(13):1150–1158. Available at: http://doi.org/10.1016/j.phymed.2015.09.002
38. Rao Z, Cao H, Shi B, Liu X, Luo J, Zeng N. Inhibitory effect of Jing-Fang powder n-butanol extract and its isolated Fraction D on LPS-induced inflammation in RAW264.7 cells. *J Pharmacol Exp Ther.* 2019;370(1):62–71. Available at: http://doi.org/10.1124/jpet.118.255893
39. Sun C, Liang H, Zhao Y, et al. Jingfang Granules improve glucose metabolism disturbance and inflammation in mice with urticaria by up-regulating LKB1/AMPK/SIRT1 axis. *J Ethnopharmacol.* 2023;302(Pt A):115913. Available at: http://doi.org/10.1016/j.jep.2022.115913
40. Xiao H, Sun XX, Sun CH, Wang EL, Wang XZ, Yao JC. Therapeutic effect and mechanism of Jingfang Granules on acute lung injury based on intestinal flora and fecal metabolomics. *Chin J Tradit Chin Med.* 2024;49(7):1915–1923. (Chinese) Available at: http://doi.org/10.19540/j.cnki.cjcmm.20231213.401
41. Li SR, Wu JY, Cao NN, et al. Jingfang granules ameliorate inflammation and immune disorders in mice exposed to low temperature and high humidity by restoring the dysregulation of gut microbiota and fecal metabolites. *Biomed Pharmacother.* 2023;165:115050. Available at: http://doi.org/10.1016/j.biopha.2023.115050
42. Zhao G, Tong Y, Xu J, et al. Jing-Fang powder ethyl acetate extracts attenuate atopic dermatitis by modulating T-cell activity. *Mol Immunol.* 2023;160:133–149. Available at: http://doi.org/10.1016/j.molimm.2023.07.002
43. Yuan A, Zeng J, Zhou H, et al. Anti-type I allergic effects of Jing-Fang powder extracts via PI3K/Akt pathway in vitro and in vivo. *Mol Immunol.* 2021;135:408–420. Available at: http://doi.org/10.1016/j.molimm.2021.01.015
44. Gu M, Su W, Dai J, et al. Jingfang granule alleviates Pseudomonas aeruginosa-induced acute lung inflammation through suppression of STAT3/IL-17/NF-κB pathway based on network pharmacology analysis and experimental validation. *J Ethnopharmacol.* 2024;318(Pt A):116899. Available at: http://doi.org/10.1016/j.jep.2023.116899
45. Zhang YK, Liu MF, Zhang X, et al. Jingfang Granule protects against Concanavalin-A-induced immune hepatitis in mice through regulating tricarboxylic acid cycle. *Res Square.* 2022. Available at: http://doi.org/10.21203/rs.3.rs-1787231/v1
46. Zhou JD, Li HH, Li XZ, et al. Effect of Jingfang Granules on carrageenan-induced tail thrombosis in mice based on ERK/p38 MAPK signaling pathway. *Chin J Tradit Chin Med.* 2022;47(8):2195–2199. (Chinese) Available at: http://doi.org/10.19540/j.cnki.cjcmm.20211029.403
47. Li SR, Li XZ, Yang TT, et al. Jingfang Granules alleviate LPS-induced mastitis by inhibiting inflammation, protecting the blood-milk barrier structure and regulating cell apoptosis. *Pharmacol Res Mod Chin Med.* 2022;2:100072. Available at: http://doi.org/10.1016/j.prmcm.2022.100072
48. Xu Q, Sheng L, Zhu X, et al. Jingfang granules exert anti-psoriasis effect by targeting MAPK-mediated dendritic cell maturation and PPARγ-mediated keratinocytes cell cycle progression in vitro and in vivo. *Phytomedicine.* 2023;117:154925. Available at:

http://doi.org/10.1016/j.phymed.2023.154925
49. Li XY, Qi H, Zhang XW, Liang H, Zeng N. Jing-Fang n-butanol extract and its isolated JFNE-C inhibit ferroptosis and inflammation in LPS induced RAW264.7 macrophages via STAT3/p53/SLC7A11 signaling pathway. *J Ethnopharmacol.* 2023;316:116689. Available at: http://doi.org/10.1016/j.jep.2023.116689
50. Chen WL, Zhang YP, Mu YF, et al. Mechanism of Jingfang Granule in treatment of coronavirus infection by biological information technology. *Chin Tradit Herb Drugs.* 2020;51(15):3937–3951. (Chinese) Available at: https://kns.cnki.net/kcms2/article/abstract?v=i_LPdPvRpB4nfcag05etw-I4gim7eGI9PuwOB6bvf6fbPpW_alMjvdf_gjIp8Yjy1h7d8HrUJCZtnlLVc-86KvixBRxAPrQ7FsSImOone2dtvrSS0UvJnFxJUlIsVuAkoYEyo_MvFmsvDIa6RWVTaUa1MZwhMfE2bU_RevSHE4dJ_ad1MVa352mZ4I_Y4PeT&uniplatform=NZKPT
51. Huang JQ, Tan YY, Chen ML, et al. Mechanism of Jingfang Granules in the treatment of influenza based on network pharmacology and molecular docking technology. *Eval Anal Drug-Use Hosp China.* 2021;21(11):1291–1297. (Chinese) Available at: https://kns.cnki.net/kcms2/article/abstract?v=i_LPdPvRpB4T8BkI5A2YOd0p0llkkEXPyg1IrfBKLVOtzAmpKnx9cmsPYyZG35gZZwK4oebj1ZHhIegrn3qyo6of55kNNZgrmyUEMls6gsFv4fxc7wTkkXyMmehgFtBT0X0QWKjD80sGAXtDTeK1i240N7MFtU0MnkpLQsLzWlr2yE6y3dX1AQ==&uniplatform=NZKPT
52. Guo SJ, Wang YP, Shen ZQ, Dong L, Zhang Y. Effection of Jing Fang Bai Du Ke Li on activity of newcastle disease virus. *Livest Poult Ind.* 2010;2:36–37. (Chinese) Available at: http://doi.org/10.19567/j.cnki.1008-0414.2010.02.018
53. Li J, Zhang K, Bao J, Yang J, Wu C. Potential mechanism of action of Jing Fang Bai Du San in the treatment of COVID-19 using docking and network pharmacology. *Int J Med Sci.* 2022;19(2):213–224. Available at: http://doi.org/10.7150/ijms.67116
54. Huang H. Thoughts on Coronavirus Disease 2019 Based on JingFang Medicine (Classical Chinese Formula) Solutions for COVID-19. *Chin Med Cult.* 2020;3(3):115–120. Available at: http://doi.org/10.4103/CMAC.CMAC_26_20
55. Thomes PG, Rasineni K, Saraswathi V, et al. Natural Recovery by the Liver and Other Organs After Chronic Alcohol Use. *Alcohol Res.* 2021;41(1):05. Available at: https://pubmed.ncbi.nlm.nih.gov/33868869/
56. Gao M, Yang RC, Liu Q, Lei W, Rao ZL, Zeng N. Mechanism of Jingfang Granules in relieving alcohol and protecting liver based on bioinformatics technology. *Chin J Tradit Chin Med.* 2021;46(21):5683–5692. (Chinese) Available at: http://doi.org/10.19540/j.cnki.cjcmm.20210721.401
57. Li YR, Zhao YF, Cheng GL, et al. Therapeutic effect of Jingfang Granules on CCl_4-induced liver fibrosis in mice and its mechanism. *Chin J Tradit Chin Med.* 2022;47(22):6127–6136. (Chinese) Available at: http://doi.org/10.19540/j.cnki.cjcmm.20220530.402
58. Zhao MM, Yao L, Yao JC, Sun CH, Zhang GM, Zeng KW. Anti-infectious pneumonia target discovery and molecular mechanism study of Jingfang Granules. *Chin J Tradit Chin Med.* 2023;48(3):789–796. (Chinese) Available at: http://doi.org/10.19540/j.cnki.cjcmm.20220929.402
59. Zhang T, Chen HJ, Zhu LL, Zhang KP. Effects of Jingfang Baidu powder on nephrin, CD2AP and ILK pathway in podocytes of adriamycin-induced nephropathy rats. *Shanghai J Tradit Chin Med.* 2018;52(5):71–74. (Chinese) Available at: http://doi.org/10.16305/j.1007-1334.2018.05.021
60. Kang YS, Li Y, Dai C, Kiss LP, Wu C, Liu Y. Inhibition of integrin-linked kinase blocks podocyte epithelial–mesenchymal transition and ameliorates proteinuria. *Kidney Int.* 2010;78(4):363–373. Available at: http://doi.org/10.1038/ki.2010.137
61. Cao TY, Qu HH, Dong LY, et al. Preventive and protective effects of Jingfang Granules on aristolocholic acid linduced acute kidney injury in mice. *Chin Tradit Herb Drugs.* 2022;53(18):5742–5749. (Chinese) Available at: https://kns.cnki.net/kcms2/article/abstract?v=WOTiXAdNI6PvS8Fxtrob-ct_7Ogblkdd4Y8lPHdUcl8gzGPE2pxsZ0YjXbgoRQ-_Q_x4XKz4YMNynYJkmXt0yvpYFoPiW4A1FaM163cx2BMt9l0AOaWB7l6paOab40YK_6MWkHIYGNAmnBipmpw6l-1kiGgRJorO7W_AAu5bHR5D5LaymjSZ2Q==&uniplatform=NZKPT
62. Li XB, Liu W, Wang X, et al. Basic Research Progress of Promoting Blood Circulation and Removing Blood Stasis Jingfang on Diabetic Nephropathy. *IOP Conf Ser: Mater Sci Eng.* 2019;677(2):022127. Available at: http://doi.org/10.1088/1757-899X/677/2/022127
63. Zhao Y, Wang X, Gu L, et al. Efficacy of danggui buxue decoction on diabetic nephropathy-induced renal fibrosis in rats and possible mechanism. *J Tradit Chin Med.* 2023;43(3):507–513. Available at: http://doi.org/10.19852/j.cnki.jtcm.20230214.004
64. Long ME, Mallampalli RK, Horowitz JC. Pathogenesis of pneumonia and acute lung injury. *Clin Sci (Lond).* 2022;136(10):747–769. Available at: http://doi.org/10.1042/CS20210879
65. Sun XX, Xiang HX, Liu Z, et al. Jingfang Granules alleviates bleomycin-induced acute lung injury through regulating PI3K/Akt/mTOR signaling pathway. *J Ethnopharmacol.* 2024;318(Pt A):116946. Available at: http://doi.org/10.1016/j.jep.2023.116946
66. Sun CB, Xu YT, Xu GP, Ji X, Jiang P, He YF. Active fractions from Jingfang Baidu Powder alleviate Klebsiella-induced Pneumonia by inhibiting TLR4/Myd88-ERK signaling pathway. *J Ethnopharmacol.* 2024;330:118067. Available at: http://doi.org/10.1016/j.jep.2024.118067
67. Rao ZL, Zeng JS, Li XY, et al. JFNE-A isolated from Jing-Fang n-butanol extract attenuates lipopolysaccharide-induced acute lung injury by inhibiting oxidative stress and the NF-κB signaling pathway via promotion of autophagy. *Phytomedicine.* 2022;96:153891. Available at: http://doi.org/10.1016/j.phymed.2021.153891
68. Xu BH, Wang EL, Zheng CC, et al. Toxicity of Jingfang granule extractum by 90 days repeated ingastric administration in rats. *Chin J Pharmacovigilance.* 2022;19(5):510–514+521. (Chinese) Available at: http://doi.org/10.19803/j.1672-8629.2022.05.08
69. Zheng CC, Wang EL, Xu BH, et al. Toxicity of the reproductive and early embraonic development of Jingfang granule extract in rats. *Chin J Pharmacovigilance.* 2022;19(5):505–509. (Chinese) Available at: http://doi.org/10.19803/j.1672-8629.2022.05.07
70. Cui NJ. Observation on the clinical curative effect of modified Jingfang Baidu Powder in treating anemofrigid cold. *Guang Ming Chin Med.* 2017;32(1):60–62. (Chinese) Available at: https://kns.cnki.net/kcms2/article/abstract?v=WOTiXAdNI6PG7iHVelHEsQ1IYAoawyWQxTeHB6v1nhAR0KnCqEfygFlHtnXdhTlgXdaL6qQGgdrcRILIAVFs6BXq98dRDN8DTJs8MdfP-v1gLnhlU67Ip60iyE_gmCSN_y3cHSzlDJDpl09x2PnKpnzRdE-68FzL5-E-chx-63CFAZjr6PJIwA==&uniplatform=NZKPT
71. Zhu YY. Effective observation on treating cold in elderly people with the Jingfang Baidu decoction. *TCM Clin Res.* 2016;8(11):101–102. (Chinese) Available at: https://kns.cnki.net/kcms2/article/abstract?v=WOTiXAdNI6MzdzQzzJ_V-TnTO1triJIlGwBuNE1DEVLaUxnyj2WfXFV0JYGg76j5ySjgfF3R7blbNeEqXskJO-i6bhyy1GobRP9pw1e4U2FsKvJcMQqACIl-sBEnUP5FCcGQjY5m8hG4JY9J-rdDMus7OWVJp4X8lExto0IYQTxkW5plAIsvYw==&uniplatform=NZKPT
72. Gan XX, Zeng QF, Zhang LL, Liu Q. The efficacy of Jing Fang Septic powder in the treatment of 20 cases of children's wind chill and cold was observed. *J Clin Med.* 2015;2(32):6703–6704. (Chinese) Available at: http://doi.org/10.16281/j.cnki.jocml.2015.32.107

73. Gu MY, Jiang Q, Chan JY. Clinical study on Jingfang Granules combined with oseltamivir in treatment of children with influenza. *Mod Med Clin.* 2024;39(11):2848–2852. (Chinese) Available at: https://kns.cnki.net/kcms2/article/abstract?v=i_LPdPvRpB69hkTxEP6NOXX9OI9HgNvlFr95v5eKEdb7xS3363Aoq3CEfLSq3WRt7F1pOH-pKqA7c2kAZQKLn9y37141zu6lHjek3k7Tc2siWbcPRFYTIcP03_kAe_hO9JNTYv5kw8jcukM_LYd1vKyl6cCx3vKFYMcANwtMFQPQuxeGac_UsqBnrnu1MRoG&uniplatform=NZKPT
74. Fan Y, Yu H, Zhao YJ, et al. Experience of Gao Jianzhong in treating pruritus with Jingfang Xingfu decoction. *J Chin Med Libr Inf.* 2024;48(3):184–186. (Chinese) Available at: https://kns.cnki.net/kcms2/article/abstract?v=WOTiXAdNI6MNmSBPX9G-hBYWvGYQtRi4qrpJ4PJ1kg5rBBVbMcB-O6ySYHFDtcgm4GN0biwQ9qQf_1KtjRzmbzW9uVpwU5nEV6nW_FTLyDztb_we4EgiHpPp1H-6ucysg4JpUaAJ6n8-RFQk1yE10BS3O9kwn0QWKO1GvEF42FdK6mz6WX3Vog==&uniplatform=NZKPT
75. Saini SS, Kaplan AP. Chronic Spontaneous Urticaria: The Devil's Itch. *J Allergy Clin Immunol Pract.* 2018;6(4):1097–1106. Available at: http://doi.org/10.1016/j.jaip.2018.04.013
76. Sui DL. The application of Jingfang Baidu powder in skin diseases. *Guang Ming Chin Med.* 2024;39(9):1870–1873. (Chinese) Available at: https://kns.cnki.net/kcms2/article/abstract?v=WOTiXAdNI6MouZ6ZNKoglUsBx6ZzuyGpTK9g45lx85mlyaJrkBvsDgUOw5KTdCyHDsUOJxkL-H0gREIC9Dmq4K45qSMk2MvVQQJODQ8GFv48R7By-80Kz-zWXi0EyEvq-_yM3F5YKhYmN3sNXWj4MMcc1yGktTKrcd1JQbJOWNJ-NaRGK_900Q==&uniplatform=NZKPT
77. Chen YC, Hsu WY, Chang TH. Macrolide-Resistant Mycoplasma pneumoniae Infections in Pediatric Community-Acquired Pneumonia. *Emerg Infect Dis.* 2020;26(7):1382–1391. Available at: http://doi.org/10.3201/eid2607.200017
78. Ji X, Zhang ZJ, Wei L. Clinical study of Jingfang Granules combined with azithromycin in treatment of adult mycoplasma pneumonia. *Drug Eval Res.* 2021;44(8):1703–1706+1711. (Chinese) Available at: https://kns.cnki.net/kcms2/article/abstract?v=WOTiXAdNI6ONNmu5b9sPazHGh3R7rBPLo6ZhqWHrW5aGFszkPEdkhn6uHUl6jdUy6eAKDeaU_zW8rtizWGNYnegTC5u6apedGuMAIPEPuUbAHx9bX17d6N132fshg9tlN3zLOTYEE_F6WK3tFjSL95ZXIKilbN1FekpHnFz8JvaRi9BWhHFCMw==&uniplatform=NZKPT
79. Hu XP, Zhang LP. The clinical efficacy of Jingfang Sescuitsu combined with azithromycin in the treatment of acute bronchitis in children and its dynamic observation on lung function in children. *Matern Child Health Care China.* 2016;31(19):3975–3978. (Chinese) Available at: https://kns.cnki.net/kcms2/article/abstract?v=WOTiXAdNI6MgbnXN4oxk0DXKiMv14SdqqHHaNwW9QkE-jpvwZJe0WesiTtYq-P0H5CNYDpNEtmRW9rnXmaKsJvate6FxGPd1OdnoPjYMMfo5yMoU3MUoQPghZMvhbQHJp_vO_58sF60byummDJkYlQK53qw4kIWUXTc-xijeG9hiK8zFgEH7aA==&uniplatform=NZKPT
80. Huang HF, Fan L, Fu RM, Lin YH, Chen R, Lin CX. Modified Jingfang Baidusan combined with ginger therapy of bladder meridian in treatment of coughing (syndrome of wind-cold invading lung) caused by acute tracheitis and bronchitis. *Chin J Exp Tradit Med Formula.* 2018;24(21):193–198. (Chinese) Available at: http://doi.org/10.13422/j.cnki.syfjx.20182144
81. Chen HL, Huang RJ. Effect of Jingfang Baidusan combined with western medicine in treatment of wind cold attacking the ear of secretory otitis media and the influence on tympanogram and serum inflammatory factors. *Mod J Integr Tradit Chin West Med.* 2017;26(6):584–586+618. (Chinese) Available at: https://kns.cnki.net/kcms2/article/abstract?v=WOTiXAdNI6PqpHaPlAEapObO9zFQsf2S32EYhwFsQard_-3ZxGDc-GSs-_2Ky99NyDEmos7niqyVmOifEk5AE9vAxJP_Co181vYsjsEEUm1HlEfg6xiNc0BW7HhXWzZMleWxhfzGETtxev_uL6JCNCrVSSiXFPVS4IJ3kfzc8XpkvUcpSnhVfg==&uniplatform=NZKPT
82. Zheng EH. Modified Jing Fang Bai Du San for the treatment of toothache. *World Latest Med Inf.* 2015;15(64):136. (Chinese) Available at: https://kns.cnki.net/kcms2/article/abstract?v=WOTiXAdNI6PIl-aSdVnFHJYxH8Ez9GU1eEOjt4vOvilEvOAcrGIs5E80U-_64-Sng4raV5WpcplN-5Lh_Z3SfuG7WXZzm2gIfeott8BrwLyrybFbG3VziG2-yFMj-1rmw1-0aeGCY_lTfu8UawG89T6xXGjnG6YEjbuDQ5WTrFZLeLmXdBlNGg==&uniplatform=NZKPT
83. Yang X, Dong ZM, Lin XQ. Clinical report on the treatment of 106 cases of oral and maxillofacial inflammation with Jingfang Baidu powder. *Chin Med Mod Distance Edu China.* 2008;(1):64. (Chinese) Available at: https://kns.cnki.net/kcms2/article/abstract?v=WOTiXAdNI6PT8Mbv-Za8z6Br28kotkYPWWjHSuuUbLX_9oBSfw2aDMq--Fk2SdR0faAE0ggD1-VAMe1-Cek1zlNDjCrY-an2Bea1MZiNHXac9Z-yjP_fB-LUsk-sIPxzcfsTLknhLLOR2rdka29s_0tTPVPy2_DArxxkyYaYLioYoJGnSVmffg==&uniplatform=NZKPT
84. Qi WQ, Liu YT, Qi FY. The efficacy and safety of external application of Zijinding cactus combined with modified Jingfang Baidu Powder for oral administration in the treatment of childhood mumps. *Matern Child Health Care China.* 2020;35(21):4013–4016. (Chinese) Available at: http://doi.org/10.19829/j.zgfybj.issn.1001-4411.2020.21.035
85. Huang H. Pondering over the outbreak of COVID-19 from the perspective of medicine of Jingfang. *J Nanjing Univ Tradit Chin Med.* 2020;36(2):152–156. (Chinese) Available at: http://doi.org/10.14148/j.issn.1672-0482.2020.0152
86. Feng Q, Guan YX, Huang ZY, et al. Study on active ingredients of Jingfang Baidu San for preventing COVID-19 based on network pharmacology and molecular docking. *J Pharm Pract.* 2020;38(6):485–491+538. (Chinese) Available at: https://kns.cnki.net/kcms2/article/abstract?v=WOTiXAdNI6PXR4r_5dhFk-H158rsjNsW79_QuhJe73gaTvYDepLTMpvQm4z8CbpTvlTizucS0k2jfj57WQ1bX0DzFSIP6Vx220_NGQx8UDxY6TyiFiWa42zCHnA29GKwpyrU41iPUZ3wGocpLGdkKnbxvvPJuO9A6UVS3GUfJjl4qFRaV2KS8w==&uniplatform=NZKPT
87. Wang YP, Xu QQ, Dong L, et al. Jingfang Baidu Granules for the treatment of low pathogenic avian influenza in egg chickens. *China Poult.* 2012;34(16):49–50. (Chinese) Available at: http://doi.org/10.16372/j.issn.1004-6364.2012.16.018
88. Dou ZQ. Modified Jingfang Baidu powder for the treatment of 8 cases of H1N1 influenza A. *Inf Tradit Chin Med.* 2011;28(1):67–68. (Chinese) Available at: https://kns.cnki.net/kcms2/article/abstract?v=WOTiXAdNI6ML03X6bQeh6r0gAn-osGtcgUssOa8s_0VwaSSo4zK19yDt90XOJ1tAQs6OPWmXUlkkVHPwZ62jxtg5pFXItFQstXqEnL7K_N4NO4znrYXAL4IoZdFI4Mxg-NLG-qN1sCZlQ5Jkae3ZHdp8gLdBHC_A1KVMJkQYA_VJ68EDkLfbOA==&uniplatform=NZKPT
89. Du P. Observation on the therapeutic effect of Jingfang Baidu Powder in treating acute viral upper respiratory tract infections. *Chin Naturopathy.* 2017;25(11):57–58. (Chinese) Available at: https://kns.cnki.net/kcms2/article/abstract?v=WOTiXAdNI6PLjTnYnB9EZ-FWiZ-SAaJ5rxY-Jea7piRqs4ODZM2DEuz1-dxQV0zUKdK2He6BkHZI0IxpHCVRWcx9cRljQrBPls7a24oUrS9uhn8e-MST7h74YwnxlF9NTiI3d3YP1tDb39EUasM0D54PEnZOZBVex1iInQgd6DamHwuXFw440g==&uniplatform=NZKPT
90. Rong P, Ma R, Liu QH, et al. A commentary of literature research of traditional Chinese medicine for acute upper respiratory tract infection in children. *Chin J Tradit Chin Med.* 2017;42(8):1455–1466. (Chinese) Available at: http://doi.org/10.19540/j.cnki.cjcmm.2017.0042
91. Chen ZG, Sun WJ, Dou JQ, et al. Modified Jing Fang Chai Pu Tang for the treatment of cough variant asthma. *Henan Tradit Chin Med.* 2019;39(3):410–413. (Chinese) Available at: http://doi.org/10.16367/j.issn.1003-5028.2019.03.0102