Study on the Effective Group Model of Traditional Chinese Medicine Compound from the Perspective of Pharmaceutical Dynamics

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Abstract

The study on the basis of Chinese herbal compound is one of the key problems in the modernization of traditional Chinese medicine and traditional Chinese medicine, and is also the bottleneck of the development of traditional Chinese medicine. Compatibility of effective components of Chinese herbal medicine is a new model of compound research in recent ten years. Many clinical commonly used by prescription, after thousands of years of tradition, the effect of doubt, but with modern effect based mechanism is still not clear enough, become a bottleneck in research and development of new drugs of traditional Chinese medicine. The study on the efficacy of compound and the mechanism of modern action has been achieved through group allocation. Study on the compound system in this article provides a method for the modern study of Chinese herbal compound on, there will be conducive to the scientific connotation of system, deeply reveals Chinese herbal compound, guiding drug development, better inheritance and development of traditional Chinese medicine theory.

Keywords: Pharmaceutical dynamics, important, compound prescription, composition, modeling

Introduction

Compound traditional Chinese medicine with TCM diagnosis and treatment characteristics, becomes the main form of clinical prevention and treatment of diseases and inheritance for thousands of years. The stable and reliable curative effect in traditional Chinese medicine theory, according to situation, choose appropriate drugs or complement each other to achieve both opposite and complementary synergistic comprehensive effect. Under the guidance of TCM theory, the classical clinical side effects or commonly used medicines as the main research object, by means of scientific research and technology of modern biology, the Chinese medicine compound prescription composition and mechanism of such extensive and in-depth study is the main trend of the past thirty years of modern Chinese medicine compound. According to the characteristics of the traditional Chinese medicine compound effect of multiple components, multi-level, multi-channel, multi targets, compound Chinese medicine group comprehensive modern analytical chemistry and pharmacology research methods research has gradually become a mainstream in the modern study of Chinese herbal compound. In this paper, by summarizing the relevant literature on the compatibility of components in the past ten years, the existing problems are discussed and predicted.

The foundation of the existing compound technique of this paper, combined with traditional Chinese medicine theory and modern biological technology, according to the system theory and the theory of the combination of macroscopic and microcosmic research combined with in vivo and in vitro study on reduction of the principle of combining with network systems biology and biological technology as the main support, try to put forward the modern traditional Chinese
medicine prescription study on chemical research system including basic research, modern pharmacological research and system biology and biological network. The research system, research ideas will provide an integration of modern science and technology and the theory of traditional Chinese medicine for traditional Chinese medicine compound, which is helpful to the scientific connotation of system, deeply reveals Chinese herbal compound, guiding drug development, better inheritance and development of traditional Chinese medicine theory.

The overall concept, syndrome differentiation treatment and compound prescription are the characteristics and advantages of Chinese medicine treatment and prevention of diseases. After thousands of years of clinical practice, traditional Chinese medicine compound prescription has been proved to be reasonable, scientific and practical. With the development of traditional Chinese medicine and pharmacology of traditional Chinese medicine, it has been recognized that the material basis of traditional Chinese medicine for the treatment of diseases is the chemical composition contained in the compound. With the development of modern medical theory and the application of new technology, people have been trying to screen the pharmacodynamic substances of traditional Chinese medicine compound, and explore the mechanism of action of traditional Chinese medicine compound.

![Figure 1. Chinese herbal compound.](image)

**The Proposed Methodology**

**Present situation of research on Chinese herbal compound.** Research of compound Chinese medicine mostly used western medicine for a long time, the method of active ingredients and simple chemical composition screening combination, although able to explain part of the traditional Chinese medicine compound efficacy material basis and mechanism to a certain extent, however, due to the characteristics of traditional Chinese medicine compound has multiple components, multi-target overall effect, this kind of research it is difficult to explain the real meaning of scientific method of traditional Chinese medicine compound, there is an urgent need to develop a system of research methods for Chinese herbal compound characteristics. Since the beginning of this century, with the gradual implementation of the
strategy of modernization of traditional Chinese medicine, traditional Chinese medicine research has entered a rapid development track, a variety of traditional Chinese medicine compound research ideas and theories have been put forward, greatly promoted the development of traditional Chinese medicine.

With the development of systems biology and bioinformatics, various technologies, such as genomics, proteomics, which have been widely used in traditional Chinese medicine. Systems biology through various interactions between components in the system (including gene, mRNA, proteins, metabolites etc.) to study the mechanism of complex biological process, and the theory of traditional Chinese medicine has a lot in common, such as focusing on research in the overall conditions, pay attention to the body in the etiological factors and therapeutic intervention under the overall reaction.

In general, with the development and application of new technology, at present, based on the viewpoint of system theory on the whole study of compound traditional Chinese medicine has become a consensus, systems biology and bioinformatics of modern biological technology has gradually become a supporting technology to study traditional Chinese medicine. However, research on systems biology and bioinformatics are often limited to the existing drugs before and after the intervention of the biological system for fuzzy characterization, biological drugs play a specific role dynamic process is the lack of specific characterization, especially not mechanism from the flat control network of water molecules on the in-depth study of Chinese herbal compound.

The dynamic process of biological systems biology existing methods are difficult to describe the key components of Chinese medicine group of specific metabolic pathways and molecular regulation of the network, but cannot solve multiple components of traditional Chinese medicine compound at the molecular level on the synergy mechanism.

Pharmaceutical dynamics. The traditional Chinese medicine compound can be regarded as a natural combination which is derived from the composition of different medicinal materials, and has the characteristics of multiple components, multiple pathways and multiple targets. Taking into account the complexity of the composition and pharmacological mechanism of traditional Chinese medicine, the study of Chinese herbal compound should develop a set of unique and effective research methods.

Reductionism is a kind of bottom-up research mode, which is to decompose the research object into a part to understand that the whole is part of the sum of each part of the study is clear, the whole is clear. The system theory is the study of a top-down model, that the whole system is not simple and play the part cannot effect the whole left the whole and isolated, the whole part is different from the separation from the whole part. From the point of view of logical thinking, the method of reduction is the analysis and deduction, focusing on the understanding of the local and micro.

It is one of the key problems to be solved in the process of modernization of traditional Chinese medicine. In the past, the pharmacological research of traditional Chinese medicine has been used for reference to the evaluation standards and norms of Western medicine. At present, the evaluation index of pharmacology of Chinese materia has been extended to a single or a few indicators, such as the whole animal, organ, cell and molecular biology. But overall, the current research on more traditional Chinese medicine compound is used to characterize the overall characteristics from the macro compound Chinese medicine integrated function, has not been able to reach into the molecular network level of gene, protein and small molecule metabolites on the interpretation of compound Chinese medicine pharmacological mechanism.

Combination of in vitro and in vivo assays. For a long time, the study on the pharmaceutical dynamic basis and pharmacological activity of traditional Chinese medicine has
been carried out in vitro. The in vitro analysis preparation is convenient, and easy to achieve high throughput screening of active components, so it has been the main means of Chinese medicine research, and the study of Chinese herbal compound in vivo analysis based on it has not received sufficient attention. However, only if any drugs enter the body to reach the target through the blood and play a therapeutic effect, so it is necessary to carry out the in vivo analysis of traditional Chinese medicine.

In the study of modern Chinese medicine compound, the in vivo and in vitro analysis should be combined. In vitro study is convenient, rapid, high throughput screening, and in vivo analysis is closer to the real biological process of drug action, can more accurately reflect the efficacy of traditional Chinese medicine group and pharmacological activity. Only the combination of the two, in order to give full play to the advantages of in vivo analysis and in vitro analysis, more accurate and effective interpretation of the scientific connotation of traditional Chinese medicine compound.

**Construction of modern Chinese herbal compound research system.** According to the inherent characteristics of traditional Chinese medicine compound, follow the system theory and reductionism by combining micro and macro studies combined with in vivo and in vitro analysis, analysis of the principle of combining core technology in systems biology and biological networks, we explore the establishment of modern Chinese medicine research system including chemical research, basic research, modern pharmacological research systems biology and biological research, network.

It is necessary to clarify the chemical basis of compound prescription of Chinese herbal medicine, which is an important foundation and prerequisite for the study of Chinese herbal compound. The chemical compound traditional Chinese medicine research mainly in two ways: one is by using lead compounds from ideas, traditional Chinese medicine compound or the medicinal substances in the discovery and isolation of single active ingredient, the general method is the comprehensive use of modern chromatographic separation technology, combined with active tracking separation, many effective components of compound or each herb in. And the structures were identified by spectroscopic technique. The other is the optimization of compound prescription and the selection of active ingredient group under the guidance of traditional Chinese medicine theory.

**Modern pharmacological research.** Under the guidance of TCM theory, Chinese medicine research and the mechanism of macroscopic research and microcosmic research should follow the principle of combining the two aspects from the macroscopic and microscopic and pharmacological research, the research object from the whole to the compound key components, and then to the effective combination of components, and implement the top-down and bottom-up two research strategy.
Figure 2. LC/MS/MS fingerprint of traditional Chinese medicine

**Genomics.** Genomics technology is characterized by high flux, multi factor, rapid and sensitive. It can be used to study the characteristics of multi component, multi way and multi target of traditional Chinese medicine. Genomics mainly used in gene expression analysis, new gene discovery, gene mutation, gene polymorphism analysis and detection of the whole genome transcriptional expression, can be used to analyze the mechanism of traditional Chinese medicine, drug screening, quality identification etc.

**Conclusion**

The research system proposed in this paper, including the basis of chemical substances, modern pharmacological research, systems biology and network biology research, will provide a methodology for the study of Chinese herbal compound. The system will help system, reveal the efficacy of the traditional Chinese medicine material foundation and the role of the law, which is expected to solve the long-standing problem of traditional Chinese medicine for further development and application of the "black box" provides an opportunity based on the analysis of Chinese medicine extraction and screening of effective group and active ingredients, combined with effective group, Chinese herbal medicine for more efficient, safety and quality control that is one of the main ways of important development direction of Chinese medicine innovation and realize the modernization of Chinese medicine.
Reference


