

Conceptual System Construction of Materia Medica Literature Corpus

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ABSTRACT. *The present study, under the guide of Chinese traditional medicine theory, aims to reorganize the original knowledge with the conceptual system corresponding to Chinese traditional medicine knowledge framework, thus providing a conceptual system based on knowledge for the realization of transferring ancient materia medica literature stored in the form of natural language into structural information comprehended by computer.*

Keywords: Materia Medica, Conceptual System, Corpus

This study is composed of two parts: classification of ancient materia medica literature based on its own development characteristics; establishment of multi-layer conceptual structure based on the practical corpus of Chinese traditional medicine.

1. An Overview of Corpus. As defined by *Webster's Collegiate Dictionary*, corpus is a collection of bodies of text or knowledge. *Longman Dictionary of Language Teaching and Applied Linguistics* states that corpus is a collection of data for special purposes. *Oxford Advanced Learners' Dictionary* describes corpus as a collection of data for researches. [1]

Currently, corpus has not just been a storehouse for the storage and process of language materials, but an ordered large-scale collection of real language data. It employs the ever-developing computer to collect, store and process language data, offering sufficient language materials for natural information processing and linguistic researches, which can mirror dynamic features of natural language. With different levels of treatment such as automatic word differentiation, part of speech labeling and phrase marking, corpus itself takes shape into a platform of natural language knowledge resource, which is multi-level, diversified and granularly refined.

Traditional Chinese medicine sticks to inheritance a lot, so it is greater with Chinese herb. Ancient doctors emphasized much on the inheritance of previous medical experiences, and explored medical rules in practice. This empirical approach based on experience is intensified by computer technology, whose rapid evolution not only enhances personal capacity to search medical materials, but also makes computer a powerful tool to handle

information. [2] Compared with the current dictionary of traditional Chinese medical terms, selecting terms from materia medica literature corpus demonstrates three merits:

The first one is one-sidedness can be avoided. Thorough search of the corpus makes the complete medical materials available, which to the utmost avoids one-sided conclusion from one-sided data; generalization and scientification of the result can be increased, which avoids apriorism.

The second one, strain of discipline framework is broken. On the one hand, in the large framework of traditional Chinese medicine, the corpus reserves interface with modern scientific framework; on the other hand, with differentiation and labeling of materia medica literature, terms abstracted from it carry messages connecting traditional Chinese medicine with other disciplines.

The third one, corpus can be updated timely based on requirement. New academic knowledge can easily be added and new terms can be searched out without much effort.

2. Classification of Ancient Materia Medica Literature. Ancient materia medica literature should first be classified based on its own characteristics in order to build the corpus for it.

There is no consensus on criteria to classify materia medica literature, and people have their own angles and approaches to do this job. Materia medica literature in *National Union Catalog for Traditional Chinese Medicine Books*[3] is divided into eight categories: classic of materia medica, comprehensive materia medica, easy readings in rhyme, materia medica for dietotherapy, studies on medicine made from a single herb and special categorized medicine, drug processing, materia medica manual and mixed books. Other classified books of traditional Chinese medicine, materia medica materials in other book, and non-medical literature articles are not involved in this book. *Outline of Materia Medica Literature*[4] written by Gao Xiaoshan divides materia medica literature into these categories based on the content of books: comprehensive materia medica (i.e., mainstream materia medica), non-comprehensive materia medica (including ethnic materia medica, local materia medica, herb materia medica, monographic materia medica, private materia medica), processing materia medica, materia medica for famines, materia medica for dietotherapy, monographic materia medica, materia medica reference books and so on.

Historically, ancient literature recording materia medica can be classified into three categories: professional literature on materia medica, traditional Chinese medicine literature and non-medical literature.

(1). The first category: professional literature on materia medica

After a series of researches, scholars through the ages believed that the origin of herbalism represented by *Shennong's Classic of Materia Medica* could be traced back to eastern Han dynasty, after which herbalism grew prosperously and *Shennong's Classic of Materia Medica* was viewed as the first professional document of herbalism.

Based on its own discipline features and academic content, professional herbalism documents are classified into five categories in this paper: materia medica monograph, monograph on property of medicines, monograph on medicine processing, monograph on dietotherapy and famines, monograph on planting and gathering.

Materia medica monograph is mainly about rich accounts of medicines, including name of medicines, shape and trait, place of origin, gathering, processing, nature and flavor, function, indication. For instance, *Shennong's Classic of Materia Medica*, *Variorum of Materia Medica*, *Newly Revised Materia Medica (Tang Dynasty Materia Medica)*, *Compendium of Materia Medica* and so on.

Monograph on property of medicines mainly records medicines' nature and flavor, channel tropism, function, attending disease and corresponding formulas. Example works to develop theories of medicine property include: *On Medicine Property*, *application of medicine based on symptom*, *understanding medicine property*, *summary of medicine property*, *questions and answers on materia and medica*. Example works on medicines classified according to their corresponding viscera, meridians and collaterals contain: *Longevity Doctors*, *meridian distribution of materia medica*, *unit of materia medica division*, *branches of materia medica*, *materia medica of meridian distribution*, *meridian and therapy distribution of materia medica*, *meridian distribution of medicinal property* and so on.

Monograph on processing focuses on the processing of medicinal herbs, covering processing theories, techniques, specifications and standards. Examples include *Master Lei's Discourse on Drug Processing*, *Methods of Drug Processing*.

Monograph on dietotherapy and famine chiefly puts down the utilization of edible plants, to illustrate it: *Heart Mirror of Dietotherapy*, *Materia Medica for Dietotherapy*, *Principles of Correct Diet*, *Materia Medica for Famines*.

Monograph on planting and gathering is small in number and related record can be found in the above-mentioned works, so it is not recruited in the materia medica literature corpus.

(2). The second category: literature on traditional Chinese medicine

In the literature on traditional Chinese medicine, works concerning materia medica incorporate books on prescription and classic medical theories. In the record of many medical literature theories, treatment is combined with medicine and prescription is interdependent with medicine. Take the first volume *Chief Catalog of Medicine in A Supplement to Recipes worth a Thousand Gold* as an example: it puts down information about materia medica, such as season and time of gathering herbs, name of the place for herb origin, name of the herb, prescription of the herb, etc. Furthermore, the chapter on pharmacy in *Classic of Holy Benevolence* discusses medical theory firstly, which by no means is an isolated case.

(3). The third category: non-medical literature

In ancient times, works about materia medica scattered in Confucian classics, historical records, philosophical writings and miscellaneous works, some of which are certain volumes and collections, e.g., *Sui Dynasty Book · Notes of Classics*, *New Tang Dynasty Book · Notes of Art and Literature*, *Old Tang Dynasty Book · Notes of Classics*, *Note of Historical Figures · Sketch of Art and Literature*, bearing records of how to gather herbs; some of which are special items and pieces. Apart from some works called "Natural Science", "Entertainment", "Technology", some poems and songs, Chinese philology, agriculture, eclectics and geography all mention writings about materia medica.

Non-medical literature concerning materia medica is divided into four parts: key encyclopedic work (reference books with material taken from various sources and arranged according to subjects), for example: *Taiping Imperial Encyclopedia*, *Taiping Eclectics*, *The Great Encyclopedia of Emperor Yongle*, *Collection of Books Ancient and Modern*, *Complete Library of the Four Treasures of Knowledge*, *Collected Taoist Scriptures*; writings about local chronicles and economic history; writings about agriculture and craftsmanship, for instance: *Complete Library of Agriculture*, *Important Arts for the People's Welfare*, *Exploitation of the Works of Nature*, *Classics of Tea*, *Flora of Southern Part of China*, *Gardening*, *Florilegium* and so on; other essential ancient works, for instance: *the Book of Poetry*, *the Mountain and Sea Bible*, *the Pleasure*, *Encyclopedia by Lv*, *Collection of Essays by Huainan King*, *Commentary on the Waterways Classic*, *Notes on Confucius Classic of Spring and Autumn*, *Dream Rivulet Diary*.

The above-mentioned writings on materia medica are boundless and over whelming to individuals, while limited and operational to computers good at handling huge information. Among them, the first category of professional literature on materia medica is primary and fundamental to the construction of present materia medica literature corpus.

3. Establishment of Multi-level Conceptual Structure.

(1). The first and the second class of conceptual levels

Herbalism is closely related with traditional Chinese medicine and other disciplines such as geography and ancient philosophy. To classify conceptual terms of traditional Chinese medicine actually is to classify knowledge of traditional Chinese medicine, based on which, in the process of materia medica literature corpus construction, the conceptual terms of materia medica literature are divided into two categories according to the related materia medica content they concern. One category is traditional Chinese medicine knowledge, containing nine types: life, disease, diagnosing, therapy, traditional Chinese medicine, prescription, acupuncture, health promotion, five movements and six climates. The other category is knowledge related with traditional Chinese medicine, encompassing six types: Yin-yang and five elements, geography, figures, writings, institutions, disciplines. For those conceptual terms exclusive to the above two categories, we summarize them into a special type temporarily: the others. Therefore, the first class of conceptual framework of materia medica literature corpus is composed of sixteen types of knowledge.

Knowledge about life is mainly about understandings of life production, growth, organs, functions and mental activities, [3-6] covering viscera state, meridians and collaterals, acpoint, qi, blood, body fluid, spirit, figure shape and position, body constitution, etc.

Knowledge about disease is mainly about its occurrence, development, transmission and result, clinical manifestation, [5] including pathogeny, pathogenesis, disease position and syndrome, etc.

Knowledge about diagnosing refers to the gathering, reasoning and judgment of symptoms demonstrated by ill people, [5] including diagnostic method, syndrome differentiation, diagnosis, etc.

Knowledge about therapy concerns therapeutic principle, therapeutic method and treatment, including detailed therapeutic principle, therapeutic method and treatment.

Knowledge about traditional Chinese medicine concerns medicinal name, variety, place of origin, nature and flavor, meridian distribution, function, attending disease and application. With independent theory, practical method and specific masterpieces, this type has a system of its own.

Knowledge about prescription mainly derives from disease-treating practice with medicine under the guide of traditional Chinese medicine theory and therapeutic method, [5] containing prescription name, composition, usage, attending disease, adding and subtracting, application, etc.

Knowledge about acupuncture concerns acupuncture and moxibustion therapy, [5] covering needling and moxibustion method, acupuncture and moxibustion prescription.

Knowledge about health promotion is mainly about health preserving, health care, disease prevention, longevity prolongation, [5] covering healthy diet, health promotion with medicine, health promotion in accordance with the four seasons, daily life health promotion, health promotion with conduction exercise.

Five movements and six climates are usually shortened as “movements and climates”. “Movements” indicate the mutual shifting of the five stages of wood, fire, earth, metal and water; “climates” refer to the transferring of six climates, namely wind, fire, heat, dampness, dryness and coldness. Ancient doctors determine “movements” based on the ten heavenly stems: the first, the second, the third, the fourth, the fifth, the sixth, the seventh, the eighth, the ninth, and the last of the ten heavenly stems; and determine “climates” based on the twelve earthly branches: rat, ox, tiger, hare, dragon, snake, horse, sheep, monkey, cock, dog, pig. (Note: Ancient Chinese people use these twelve symbolic animals to indicate the twelve time period in a day, one animal representing two hours) Five movements and six climates are firstly discussed in the seven pieces of writings in *Inner Canon of Huangdi: on Ancient Calendar, on Five Movements, on Six Climates, on Interaction and Interchange of Qi, on Five Elements, on Relationship of Six Climates, on Superior, Genuine and Essential Principles of Five Movements and Six Climates*. The theory of movements and climates, under the guide of holism concept of traditional Chinese medicine, is based on the theory of Yin-yang and five elements. It deduces the effect of climate change on people’s health and disease with the aid of symbols of heavenly stems and earthly branches.

The theory of five movements and six climates involves knowledge of astronomy, geography, calendar and medicine, which predicates and analyzes people’s health and disease by considering the factors of six climates as pathogeny, seasonal characters of disease, and influence of climate and weather change in different regions on disease. This theory is seldom applied in medicine property theory directly, but is related with theory of herb production and natural endowment, which holds that property of medicine is affected by its natural environment such as climatic condition and geography. The theory of five movements and six climates is occasionally found to be used to explain medicine property in ancient times. For example, detailed discussion can be found in *Questions and Answers to Materia Medica*: “Shennong tastes medicines, matching the five movements and six climates in nature with five zang organs and six fu organs in human body, to differentiate medicine nature and flavor so as to treat disease.”

Content about theory of five movements and six climates differs from the other eight categories of traditional medicine knowledge; therefore, it is listed as a separate category.

The first and second classes of conceptual category are shown in figure1-9 below:

- Knowledge of traditional Chinese medicine
 - Life
 - Disease
 - Diagnosing
 - Therapy
 - Traditional Chinese medicine
 - Prescription
 - Acupuncture
 - Health promotion
 - Five movements and six climates

- Knowledge related with traditional Chinese medicine
 - Yin-yang and five elements
 - Works
 - Figures
 - Geography
 - Institution
 - Discipline

- Other knowledge

FIGURE 1. Conceptual level framework of the first class in materia medica literature corpus

- Life
 - Viscera state
 - Meridians and collaterals
 - Acupoint
 - Qi, blood, body fluid
 - Body constitution

FIGURE 2. Conceptual level of the second class ---life

- Disease
 - Pathogeny
 - Pathogenesis
 - Disease position
 - Symptom

FIGURE 3. Conceptual level of the second class ---disease

- Diagnosing
 - Diagnosing method

- Syndrome differentiation
- Disease diagnosing

FIGURE 4. Conceptual level of the second class ---diagnosing

- Therapy
 - Therapeutic principle
 - Therapeutic method
 - Therapeutics

FIGURE 5. Conceptual level of the second class ---therapy

- Prescription
 - Prescription theory
 - Prescription

FIGURE 6. Conceptual level of the second class ---prescription

As a comparatively independent philosophical theory in ancient China, the theory of yin - yang and five elements is pervasive in ancient science and culture, especially in traditional Chinese pharmacy and the theory of medicinal properties. In the book of *Plain Questions · Vital Theory of Mutual Action of Yin and Yang*, the theory of strong and slight, yin and yang properties of flavor is applied directly into the theory of medicinal properties. For instance, in his book *Collections of Plain Questions about Pathogenesis on Proper Therapy for Qi Disorder · on Medicine* Liu Wansu drew a schematic diagram of pharmacologic discrimination, which segmented medicinal properties and flavors in detail using the theory of yin-yang and five elements and constructed a fruitful system of the theory of properties of medicine in Jin-yuan dynasty. Another ancient doctor named Zhu Zhenheng, in his book *Augmented Materia Medica Supplement*, also put the five-element property of medicine in top priority.

Though the theory of yin-yang and five elements is widely adopted in different aspects of traditional Chinese medicine, it is not peculiar to this discipline and therefore is classified as a separate category.

- The theory of yin-yang and five elements
 - The theory of five elements
 - The theory of yin-yang

FIGURE 7. Conceptual level of the second class---yin-yang and five elements

Geography is closely related with traditional Chinese medicine. Different regions have different influences on traditional Chinese medicine in its academic development and formation of characteristic schools, making regional features distinctive to it. In the field of herbalism region is especially significant, so geography is listed as a separate category.

The category of figure, classified according to historic dynasty preliminarily, consists of doctors in the developing process of traditional Chinese medicine, and patients and related

staff recorded in materia medica literature.

The category of works contains all of the specialized works related with traditional Chinese medicine. See the two tables below.

- Figures
 - Doctors
 - Patients
 - Others

FIGURE 8. Conceptual level of the second class---figure

- Works
 - Works related with *Inner Canon of Yellow Emperor* and *Classic of Questioning*
 - Works related with basic theories
 - Works related with *Treatise on Cold Pathogenic Diseases* and *Synopsis of Golden Chamber*
 - Works related with diagnostic methods
 - Monograph of herbs
 - Prescriptions
 - Clinic synthesis
 - Monograph of warm diseases
 - Works on internal medicine
 - Works on gynecology
 - Works on pediatrics
 - Works on surgery
 - Works on traumatology
 - Works on ophthalmology
 - Works on ear, nose, throat, mouth and tooth
 - Monograph of acupuncture
 - Monograph of massage
 - Monograph of health promotion
 - Medical cases and notes
 - Monograph of medical history
 - Comprehensive monographs
 - Other monographs
 - Works lost to the ages

FIGURE 9. Conceptual level of the second class---works

The above-mentioned structure cannot meet the demand to classify all the materia medica literature; it still needs to be added, deleted, merged and split based on specific situation of literature content in the practice of corpus segmentation.

(2). Multi-level structure of Chinese medicine

Chinese medicine is subdivided into five classes: Chinese medicine, material ingredients

of Chinese medicine, natural history of Chinese medicine, basic theory of Chinese medicine, nature and potency of Chinese medicine. Since the present corpus emphasizes clinic application, the later three classes are discarded for their insignificance as far as corpus index is concerned. In practical conceptual system of Chinese medicine, the subcategories of these three classes are adopted instead to stand in parallel with the other two classes, namely Chinese medicine and material ingredients of Chinese medicine, in order to improve indexing efficiency and reduce invalid information. To conclude, Chinese medicine is classified into the following 23 subclasses as shown in table 10: Chinese medicine, shape, color, texture, name, growing environment, picking time, medicinal part, drug regimen, decocting method, processing, dosage, contraindication, compatibility of medicines, type of formulation, four natures of medicine, five flavors of medicine, five smells of medicine, meridian distribution, lifting, lowering, sinking and floating, toxicity, medicinal effect, material ingredients of medicine.

For example, the medicinal nature “cold” is labeled as the first format instead of the second one below:

cold/n_zhongyao.sx.han (Chinese medicine/four natures/cold)

cold/n_zhongyao.xxfl.sx.han (Chinese medicine/classification of nature and effect/four natures/cold)

- Chinese medicine
 - Single Chinese medicine
 - ◆ Chinese medicine
 - Subclasses of natural history
 - ◆ Shape
 - ◆ Color
 - ◆ Texture
 - ◆ Name
 - ◆ Growing environment
 - Others
 - Subclasses of basic theories
 - ◆ Picking time
 - ◆ Medicinal part
 - ◆ Drug regimen
 - ◆ Decocting method
 - ◆ Processing
 - ◆ Dosage
 - ◆ Contraindication
 - ◆ Compatibility of medicines
 - ◆ Type of formulation
 - Subclasses of nature and potency
 - ◆ Four natures
 - ◆ Five flavors

- ◆ Meridian distribution
- ◆ Lifting, lowering, sinking and floating
- ◆ Toxicity
- ◆ Five smells of medicine
- ◆ Medicinal effect
- Chemical composition of Chinese medicine

FIGURE 10. Conceptual level structure of Chinese medicine

(3). Subclasses of natural history

The word “natural history” has existed since ancient times and its ancient meaning is totally different from the one nowadays. In the present paper its ancient meaning is adopted, which refers to being learned and experienced, namely, well-informed and rich in knowledge, “having the capacity to identify birds, beasts, grass and trees”. This understanding reflects the special humanism ideas and knowledge structure system of Chinese people [6].

Natural history is defined as comprehensive and pragmatic knowledge about the physical world in real life [7]. Traditional Chinese natural history absorbs advantages from wide-ranged disciplines (e.g., thingology, topology, herbalism, agriculture, graphic science and so on) and features with knowledgeable, comprehensive and evidence supporting. It advocates the worldview that man is an integral part of nature and encourages understanding nature in practice, which shares same philosophical thought with herbalism. The above-mentioned features indicate undoubtedly that there is natural connection between traditional natural history and Chinese medicine.

Influenced by the concept of holism and animism, the thought “medicine of anything” prevailed in ancient herbalism field, which implies that everything can be used as medicine and has no definite concept [8]. In the first volume of Sun Simiao’s book *A Supplement to Recipes worth a Thousand Gold*, he wrote: “all the things in the nature are effective drugs; everything can be used as medicine”. This belief has great impact on herbalism and many aspects of it such as medicine shape, nature, growing environment, place of origin and nominating are concerned with natural science; let’s call it “natural science of Chinese medicine” for the moment. Someone even holds that “herbalism actually can be regarded as natural history with Chinese characteristics.” [9] For example, the book *Compendium of Materia Medica* by ancient doctor Li Shizhen is universally acknowledged as a masterpiece of herbalism and natural history.

Systematic explanation of traditional herbalism for principles behind medicine to treat disease originated from the book *Classic of Holy Benevolence · Pharmacology* in Beisong dynasty: “some herbs are used as medicine based on its nature; some are used as guide based on its function, and some are used as controller based on its counterpart being restrained. Though belonging to different classes, all the herbs can be approached based on expediency and applied based on principles.” Here pharmacology consists of two aspects: the essential aspect is to explain pharmacology with internal qualities of medicine such as four natures and five flavors; the other aspect is to interpret pharmacology with such

external properties of medicine as morphology, texture, color and etc, concerning basic principles and habitual nature of medicine. Before this explanation appeared, discussion on principles behind medicine to treat disease were only scattered in Chinese medicinal works before Song dynasty. After it, systematic statement of Chinese medicinal theory including drug properties became a common practice. This total population and sum of external phenomenon and property of things is called “Fa Xiang (refers to modeling natural phenomenon)”, which means to understand things based on phenomenon in the nature. Fa Xiang pharmacology then is to explain medicine effect with herbs’ external representation, which is named “comprehensive properties of medicine” by Gao Xiaoshan [10] and includes medicine type Fa Xiang, medicine administration Fa Xiang, eight methods to identify medicine and so on. For instance, “cicada is good at breathing in wind, so it can be used to treat wind-pathogen; gadfly is good at sucking blood, so it can be used to treat diseases about blood”.

Both Fa Xiang pharmacology and animism explain drug property and effect with connecting thought from the perspective of holism. Although these theories are not considered main stream in herbal property theory, they leave marks in its formation process; so they always gain a foothold in ancient herbal works. Therefore, in the present paper, natural history of Chinese medicine is listed as a subclass of Chinese medicine, itself containing six subclasses still: herbal shape, color, texture, name, growing environment and others.

- Natural history of Chinese medicine
 - Shape
 - Color
 - Place of origin
 - Name
 - Growing environment
 - Others

FIGURE 11. Subclasses of natural history of Chinese medicine

(4). Subclasses of herbal nature and potency

Here, herbal nature and potency refer to the core content of herbal property and medicinal effect.

The core content of herbal property includes five aspects: four natures, five flavors, meridian distribution, lifting, lowering, sinking and floating, and toxicity; while medicinal effect actually is the generalization of herbal therapeutic effect. The two are closely related with each other and put into categories under the same level as a result. Detailed discussion can be found in the chapter of reconstruction of knowledge description system in the third part.

Seven subclasses are listed under this category: four natures, five flavors, five smells, lifting, lowering, sinking and floating, meridian distribution, toxicity, and medicinal effect.

- Herbal nature and potency

- Meridian distribution
- Lifting, lowering, sinking and floating
- Four natures
 - ◆ Cold
 - ◆ Heat
 - ◆ Even
- Five flavors
 - ◆ Sour
 - Sour sweet
 - Sour bitter
 - Sour hot
 - Sour salty
 - Sour light
 - ◆ Bitter
 - ◆ Sweet
 - ◆ Hot
 - ◆ Salty
 - ◆ Light
- Toxicity
- Medicinal effect

FIGURE 12. Subclasses of herbal nature and potency

(5). Subclasses of basic theories of Chinese medicine

In this paper, subclasses of basic theories of Chinese medicine cover key elements of Chinese medicinal theory except: natural history content (shape, color, place of origin, name, and growing environment), core content of herbal property (four natures, five flavors, meridian distribution, lifting, lowering, sinking and floating, toxicity) and medicinal effect content.

Nine subclasses are listed in this category: picking time, medicinal part, drug regimen, decocting method, processing, type of formulation, dosage, contraindication, compatibility of medicines.

- Basic theories of Chinese medicine
 - ◆ Picking time
 - ◆ Medicinal part
 - ◆ Drug regimen
 - ◆ Decocting method
 - ◆ Processing
 - ◆ Dosage
 - ◆ Contraindication
 - ◆ Compatibility
 - ◆ Type of formulation

FIGURE 13. Subclasses of basic theories of Chinese medicine

4. Summary. This paper classifies conceptual terms of ancient materia medica literature into 16 categories: life, disease, diagnosing, therapy, traditional Chinese medicine, prescription, acupuncture, health promotion, five movements and six climates, yin-yang and five elements, geography, figures, writings, institutions, disciplines and others. Each category is subdivided into subclasses, and this classification is four-leveled to the most, almost covering Chinese medicine knowledge recorded in materia medica works. Besides, in the process of corpus construction work, newly-discovered conceptual terms unable to be sorted out will be induced, classified and complemented to the first class of conceptual level, with the aim to perfect Chinese medicine conceptual system.

The construction of this system adheres to traditional Chinese medicine's own characteristics and law of development, setting its initial framework on the basis of knowledge content. Then grounded on practical corpus and newly-discovered conceptual terms, this initial framework will be improved further.

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