

**INTERNATIONAL PROGRAM OF SCIENTIFIC RESEARCHES OF CHINESE IMAGE MEDICINE
AND ZHONG YUAN QIGONG FOR 2017-2023 YEARS: THE OBJECTIVES OF THE PROGRAM AND
THE STATE OF ITS IMPLEMENTATION**

Ternopil Ivan Puluj National Technical University, Ternopil, st. Ruska, 56

Today, in the era of intensive globalization of the economy, politics, science, technology, social and cultural life, the processes of globalization and integration have not passed the medical industry. In particular, this also applies to the problems of integration, synthesis, mutual harmonization and complementary to conventional (western) and nonconventional (alternative, complementary) medicine. Thus, according to the strategy of the World Health Organization (WHO) in the field of folk medicine [1], an important strategic problem is the development of a scientifically sound approach to the implementation of alternative and complementary medicine in the field of official medicine, both internationally and nationally. WHO recommends to its member countries:

1. To strengthen the use of the potential of folk and complementary medicine for the provision of health, well-being, health care to the population.
2. To promote the safe and effective use of folk and complementary medicine by establishing norms and rules, conducting scientific research and integrating products, practices and practitioners of folk and complementary medicine into national health systems.

Today, in most countries of the world, in particular, in the USA, China, Japan, Korea, Russia, many countries of Europe, Brazil there is a significant revival in the scientific study of non-conventional (alternative, complementary) methods of human health improvement and treatment, which contributes to the formation of such a perspective the direction of medicine as an integrative (integral, holistic) medicine [2-6]. Integrative (holistic) medicine (the term holistic, from "holistik", means integral or complete) is an "integral" in two complementary meanings: firstly, it is based on the scientific, evidence base inherent in conventional medicine, but unlike the conventional, integrative medicine synthesizes the experience of diagnosing and treating all ancient medicine (Traditional Chinese medicine (TCM), Tibetan medicine, ancient Indian Ayurvedic medicine etc.) and modern Western medicine and tries to create the medicine of the future, which would absorb the best of their achievements (see Figure 1); secondly, integrative medicine is holistic, comprehensively looking at a person and his illness, taking into account their physical, psychological, environmental and social aspects.

Figure 1 presents a conditional scheme of the strategy for the formation of Integrative Medicine from a set of well-known medical areas, through the scientific selection of qualitative knowledge and methods of each of them and the synthesis of these selected components of integrative scientific medicine.

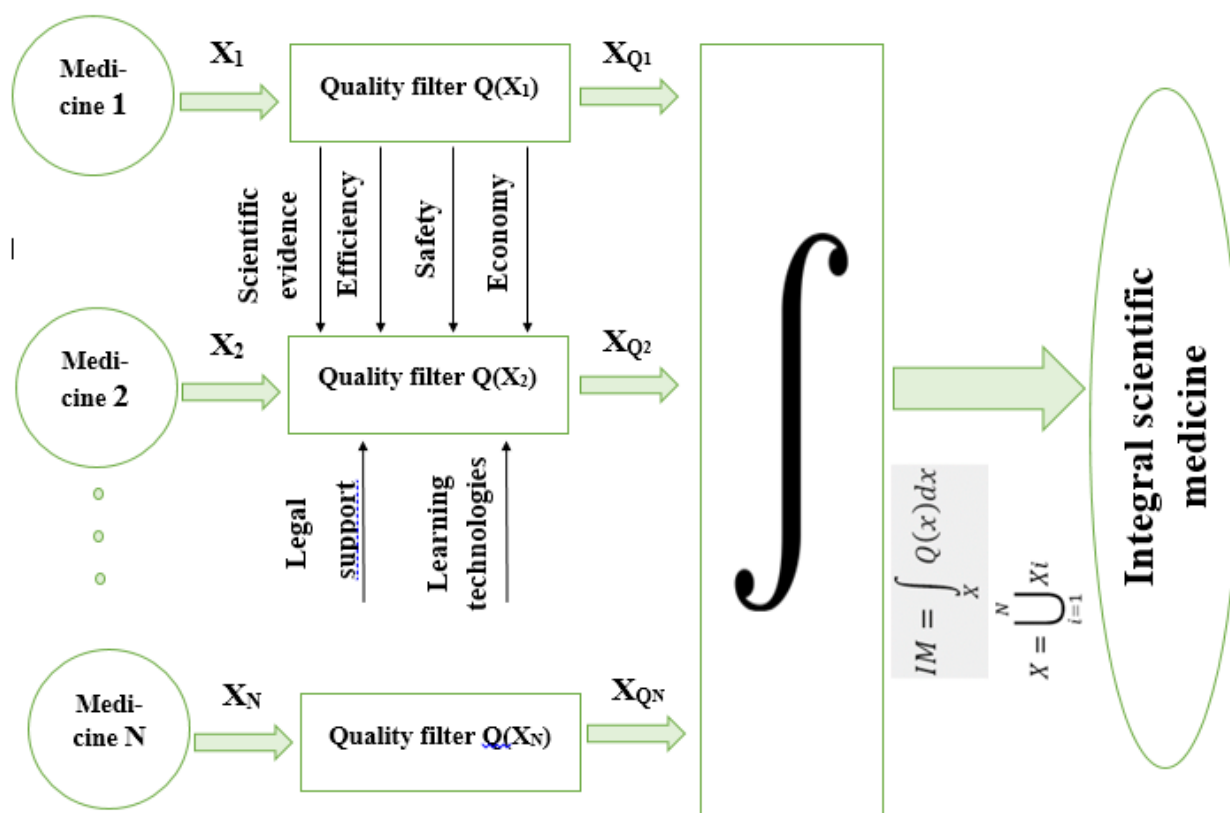


Fig. 1. Conditional scheme of the strategy of formation of Integrative medicine from a set of well-known medical directions

Integrative medicine applies an individual approach to the patient and individual norms, focuses on the prevention and rehabilitation of the organism, by activating its internal potential and its priority is safety (the minimum of side effects), efficiency and cost-effectiveness of medical intervention.

The table provides a comparative analysis of quality characteristics (scientific evidence, effectiveness, safety, cost effectiveness, legalization, infrastructure development and technology training specialists) of conventional, nonconventional and integrative medicine.

Table 1. Comparative of the quality characteristics of conventional, nonconventional and integrative medicine

QUALITY CHARACTERISTICS	CONVENTIONAL MEDICINE (actually)	NONCONVENTIONAL MEDICINE (actually)	INTEGRATED MEDICINE (predicted)
Scientific evidence	High +	Low -	High +
Effectiveness of treatment of acute diseases	High +	Low -	High +
Effectiveness of treatment for chronic diseases	Low -	Average +/-	High +
Effectiveness of disease prevention	Average +/-	High +	High +
Level of side effects	High -	Average +/-	Low +
Economic cost	High -	Average +/-	Optimal +
Level of legalization and legal support	High +	Low -	High +
The development of	High	Low	High

infrastructure and training technologies	+	-	+
--	---	---	---

Table 2.

Comparative of the other characteristics of conventional, nonconventional and integrative medicine

CHARACTERISTICS	CONVENTIONAL MEDICINE (actually)	NONCONVENTIONAL MEDICINE (actually)	INTEGRATED MEDICINE (predicted)
The level of adherence to the principle of the holistic nature of the body, soul, mind, and spirit; the integrity of the Universe and human	Low -	High +	High +
The level of respect for the principle of vitality in relation to the Universe and human	Low -	High +	High +
The level of individuality of the norm and approach to the patient	Low -	High +	High +
Focus on bias of disease, disease prevention	Low -	High +	High +
Focus on the psycho-mental state of the patient	Low -	High +	High +
Focus on mobilizing the patient's internal resources	Low -	High +	High +
The importance of close psychological contact between a doctor and a patient	Low -	High +/-	Optimal +

Integrative (holistic) medicine develops all over the world, dating back to the 90s of the twentieth century. The Academic Consortium for Integrative Medicine and Health, the National Center for Complementary and Integrated Healthcare (NCCIH) were founded in the United States, and in 2001, the Institute for Integrative Medicine was opened in Harvard. In some countries of the world there are higher education institutions that train specialists in the field of Integrative Medicine, and many national and international public organizations (associations) have been established, whose activities are aimed at the development of Integrated Medicine around the world. In 2017, Berlin hosted the first World Congress of Integrative Medicine, and in 2018, the Baltimore will host the International Congress of Integrative Medicine. In China, integrative medicine has become an integral part of the state health system, successfully combining the achievements of Western medicine and traditional Chinese medicine. There is a large number of prestigious international journals dedicated to Integrative Medicine. Unlike TCM, for which a number of large-scale clinical trials, theoretical scientific substantiation and a range of relevant information and analytical tools (ontologies, expert systems, grid systems for TCM [7-13]), for Chinese Image medicine (CIM) and Zhong Yuan qigong (ZYQ) has almost no similar research and relevant information and analytical tools. The absence of the comprehensive theoretical and experimental researches of the CIM, as well as the lack of technical information and analytical decisions in the field of CIM and ZYQ, is a significant barrier to the creation of a complete scientific CIM paradigm in medical science, as many of the theoretical and experimental

aspects and regularities of this area of folk medicine remain unclear. Given this state of affairs, a Program for the researches of Chinese Imaging medicine for 2017-2023 (Program) was developed [14]. The Program is aimed at conducting comprehensive scientific researches of Chinese Imaging medicine in order to create theoretical and experimental scientific basis for CIM, which will promote the disclosure of the deep causes and mechanisms of human diseases and will help to create effective methods for their prevention and treatment.

Creating a scientific direction of CIM and ZYQ, pursue two global goals, namely:

1. Entering CIM into the Integrative scientific medicine, which will facilitate the legalization, consolidation and growth of the prestige of CIM and ZYQ at the national, international and world levels, as well as increase the efficiency of the work of the CIM-specialists through the standardization of the theory and practice of the CIM and the implementation of the newest intellectualized information systems for the organization, coordination of activity, training, advanced training of the CIM-professionals community.
2. The development of scientific theories, models, methods and informational-analytical tools within the framework of various sciences (medicine, biology, physics of complex systems, artificial intelligence, cognitive psychology, semiotics), which are based on the post-classical type of scientific rationality, the paradigm of rational holism and subjective ontologies, taking into account internal (semantic, spiritual, ideal) dimensions of reality.

In order to integrate the CIM into the Integrative scientific medicine, it is necessary to clearly outline the set of existing shortcomings in the scientific researches of the CIM, which determine the corresponding scientific problems that affect their systemic solution. The disadvantages of research CIM, include the following:

1. In the course of research on the methods of CIM, insufficient attention is paid to the planning and organization of the research process itself in accordance with the standards of modern evidence-based medicine, in particular, studies are characterized by very limited (sometimes isolated cases) volume of homogeneous statistical data, and the use of an alternative (control) group of patients in research, there are no standardized requirements, reporting forms for all the CIM-therapists during diagnosis and treatment, which is substantially complicated evaluating of the effectiveness of CIM-methods with a high degree of statistical accuracy and reliability.
2. There is practically no valid scientific justification and explanation of the real mechanisms (physical, chemical, energy, information, psychological, socio-cultural) for obtaining diagnostic information and emerging therapeutic effects in the CIM and in the practice of ZYQ, which forms some skeptical attitude to its methods in a wide academic community.
3. It is not clear which factors have the highest priority in the treatment of a particular patient's illness, its health improvement and rehabilitation by the methods of CIM: physical impact (massage), psychological impact (conversation with the patient), energy impact of the CIM-therapist with the help of radiation of his Chi, information effect of the therapist by changing the image of the disease, the impact of drugs, herbs and supplements, the role of the patient in the cure (the placebo effect).
4. There are not sufficiently substantiated, statistically significant scientific evidence of the explicit therapeutic effects of such specific factors as the effect of using Chi radiation and information influence by changing (erasing) the image of the disease, since such essential factors for CIM are hidden by other known factors of the therapeutic effect, namely: physical effects (massage), psychological effects (conversation with the patient) and the role of the patient in the cure (the placebo effect).

5. The theory of CIM is based on ancient Chinese philosophical and medical concepts, and not on strict scientific concepts of modern science, and therefore it does not satisfy the principles of scientific (logic, verifiability, falsification). For the concepts and conceptual models of the CIM characteristic fuzzy, blurred, multi-valued interpretations. This significantly complicates the construction of a scientific theory with the properties of integrity (completeness), the absence of logical contradictions, scientific interpretation, clarity and unambiguousness of its elements and structure.

6. From the general traditional theory of CIM, it is not possible to construct a detailed nosological taxonomy of the types of human diseases in the CIM and to compare it with the developed exact nosological taxonomy of the western (scientific) medicine.

7. There are no modern information and analytical software tools for collecting and analyzing the results of diagnosis and treatment of CIM methods, intelligent expert systems for the CIM, as well as the e-learning system CIM.

According to this Program, the creation of the scientific direction of the CIM and the ZYQ is appropriate to realize in four interrelated areas: the theoretical direction, the experimental direction, the direction of clinical researches and the information-analytical direction (see Table 3).

Table 3. Directions of scientific researches of CIM

DIRECTION	DESCRIPTION OF THE DIRECTION
<i>THE THEORETICAL DIRECTION</i>	Relates to the development of scientific concepts, models, methods, theories of CIM using the theoretical and methodological approach of modern science
<i>THE EXPERIMENTAL DIRECTION</i>	Relates to the organization and conduct out of comprehensive objective instrumental, laboratory and statistical studies of the physical and physiological (biophysical, biochemical, bioinformational) processes in the human body under the influence of the CIM-therapist and the individual practice of ZYQ.
<i>DIRECTION OF CLINICAL RESEARCHES</i>	Relates to the development and implementation of clinical research programs for CIM and ZYQ methods in accordance with the requirements and standards of modern evidence-based medicine.
<i>INFORMATIONAL-ANALYTICAL DIRECTION</i>	Relates to the development and support of an integrated information and analytical system of scientific research, professional healing activities and training of the CIM, which serves for the organization and coordination of the activities of researchers, CIM-therapists and instructors, the collection, automated statistical and intellectual analysis of the results of treatment by the methods of CIM and the results of ZYQ practice, the creation of a unified database of all theoretical, experimental and clinical research in the field of CIM and ZYQ, the development of the web-oriented system of e-learning of the CIM-specialists, the expert system of support for the adoption of diagnostic and therapeutic decisions in the field of CIM.

In the Program for each directions of researches formulated a number of fundamental tasks that need to be addressed during its implementation. Also, the Program contains information on the stages of its implementation, potential participants, material and technical support, financing and quality criteria for the implementation of the Program.

In early 2017, a team of researchers from the scientific and pedagogical staff of the Ternopil Ivan Puluj National Technical University and I. Horbachevsky Ternopil State Medical University was organized for the implementation of the Research Program of CIM. An active research work began, which in 2017 gave its positive results. We briefly describe the state of the CIM research in accordance with the Program, that is we will focus on the results of researches in the information-analytical and theoretical research directions of the CIM.

According to the CIM research program, the actual scientific and applied problem is the creation of an integrated onto-oriented information and analytical environment for scientific research, professional healing activities and e-learning of the CIM. The purpose of developing this information-analytical environment is:

1. Improving the quality (evidence, effectiveness, safety, controllability, reliability, cost-effectiveness, intensity) of professional activity and the exchange of experience of CIM-therapists.
2. Providing effective organization and coordination of the functioning of the CIM-therapists, the researchers of the CIM, the persons studying the CIM.
3. Providing at high scientific, technological and infrastructural levels of collection, automated statistical and intellectual analysis of the results of diagnosis and treatment of CIM methods.
4. Creation of a unified database and knowledge base for theoretical, experimental and clinical research in the field of CIM.
5. Formation of modern intellectualized information resources and resources in the field of folk, complementary and integrative medicine on both at the national and international levels.

The main users of the information environment are practical CIM-therapists, students at the CIM courses (including online), researchers of CIM.

The general requirements for an integrated onto-oriented information-analytical environment are formulated. The integrated onto-oriented information-analytical environment as its components should include the following systems: the information system of professional healing activity "Image Therapist" (ISPHA Image Therapist), the knowledge base of the CIM (CIM KB), the expert system for diagnostic and therapeutic decision-making support in CIM (ES CIM), information system of CIM e-learning (ISEN KOM), information system for CIM research (ISR CIM) (Figure 2).

General architecture of integrated onto-based information analytical environment of scientific researches, professional healing and e-learning of Chinese image medicine is presented in Figure 2.

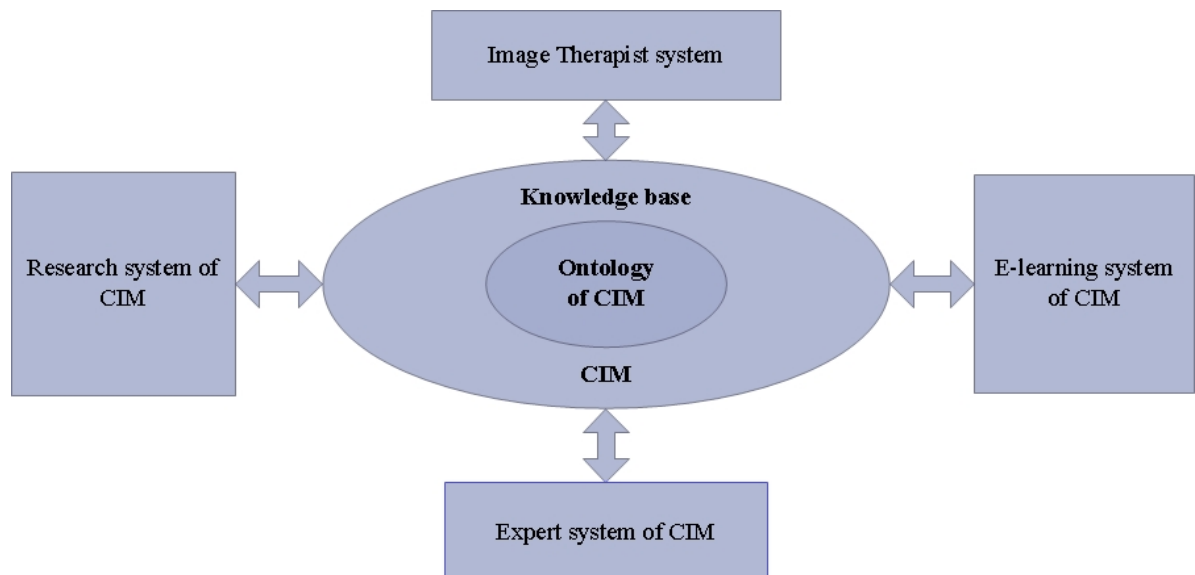


Fig. 2. General architecture of integrated onto-based information analytical environment of scientific researches, professional healing and e-learning of Chinese image medicine

Detailed consideration of the components of information analytical environment of scientific researches, professional healing and e-learning of Chinese image medicine and their general architecture.

Information system of professional healing "Image Therapist". Information system of professional healing "Image Therapist" is designed for centralized organization, upgrading (efficacy, safety, controllability, reliability, efficiency, intensity) of professional activities and experience exchange of the existing CIM therapists. Main requirements for this information system are:

1. The structure of the information system should include: 1) CIM therapist's electronic personal office with GUI (graphical user interface); 2) module of diagnostics results generation by means of CIM; 3) module of therapeutic decisions generation (therapeutic records); 4) medical data-base; 5) module of data exchange between CIM therapists (Fig. 4).

2. Image Therapist information system should have access to information systems CIM KB, ES CIM, CIM EIS, and ISR CIM.

3. Module of diagnostics results generation by means of CIM should provide input of personal and medical information about patients including data obtained by means of conventional medicine, such as case history and medical examinations (tests, functional diagnostics results, doctor's conclusion, etc.), and include diagnostic information obtained by TCM and CIM methods, such as palpation diagnostics, energy diagnostics with hand and (or) body, internal image diagnostics ('eye of mind', 'second heart'), and self-assessment information (physical and psychological state) of a patient before and after treatment (Table 4).

Medical data-base in addition to the traditional personal information about patients and their health data obtained by conventional medicine methods (case history, tests, functional diagnostics results, etc.) contains visual data (image) diagnostic information of a CIM therapist, and therapeutic schemes used by an image therapist when healing a patient. The elements of medical data-base should be used as specific examples of CIM ontology classes as a compound of the CIM onto-based knowledge-base.

Table 4. Types of diagnostic information in the Image-therapist system

Personal information (age, sex, family members, etc.)	Medical information about a patient includes data obtained by means of conventional (Western) medicine, such as case history and medical examinations (tests, functional diagnostics results, doctor's conclusion, etc.)
Self-assessment information (physical and psychological state) about a patient before and after therapy by means of psychologic testing	Diagnostic information obtained by TCM and CIM, such as results of TCM diagnostics methods (examination, auscultation, palpation diagnostics), energy diagnostics with hand and (or) body, internal image diagnostics ('eye of mind', 'second heart')

General architecture of information system of professional healing "Image Therapist" is presented in Figure 3.

Expert system for diagnostic and therapeutic decision-making support in CIM. An important part of the developed information analytical environment is the expert system for diagnostic and therapeutic decision-making support in CIM, which will help to improve the skills of CIM therapists. Expert system will issue diagnostic recommendations and personalized patient care scheme by means of CIM, based on data (personal and clinical) about a patient and CIM knowledge-base content.

General architecture of the expert system for diagnostic and therapeutic decision-making support in CIM is presented in Figure 5.

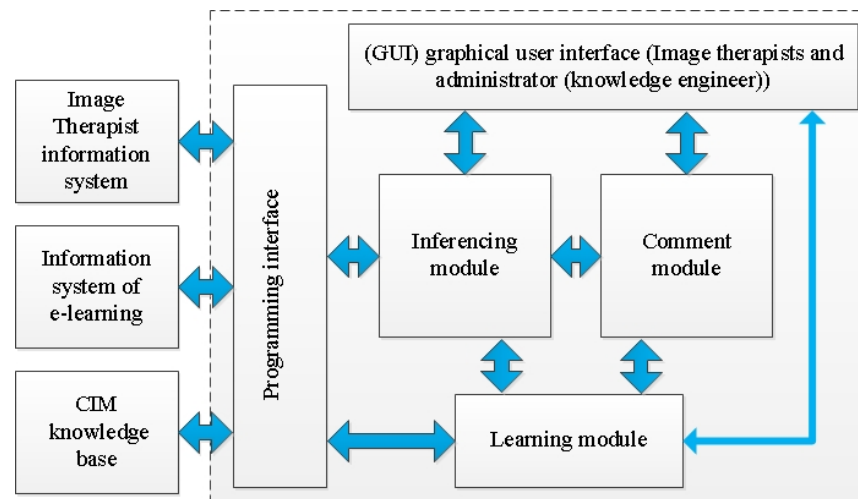


Fig. 5. General architecture of the expert system for diagnostic and therapeutic decision-making support in CIM

Information system of CIM e-learning. An important part of the integrated information analytical environment is CIM information system of e-learning. Development of such e-learning system will considerably simplify, intensify and improve quality and availability of educational process in CIM. For implementation of e-learning information system evidence-based standards of CIM learning should be developed firstly; they include educational and professional program for a CIM therapist, educational qualification of a CIM therapist, curricula and steering documents in disciplines, lecture and practice-oriented learning materials, methods of testing and self-assessment testing of CIM specialists. General architecture of the e-learning information system for CIM therapists is presented in Figure 6.

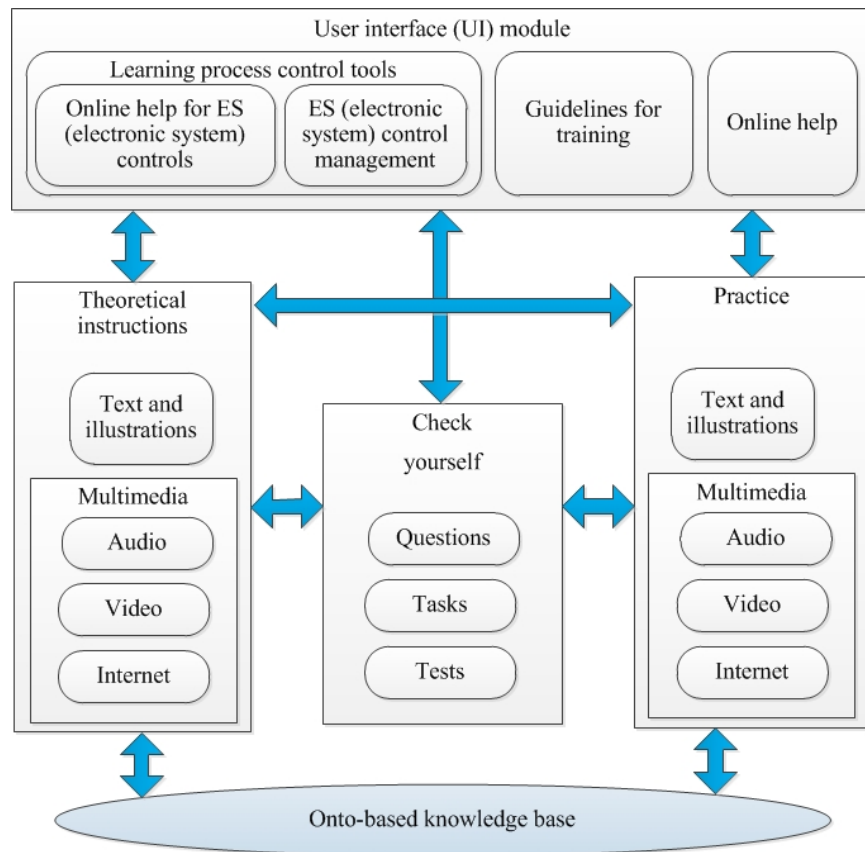


Fig. 6. General architecture of the e-learning information system for CIM therapists

Information system of CIM research. Information system of CIM research (ISR CIM) is designed for analysis, verification, prediction, evaluation of efficiency, optimization of diagnosis and treatment results for CIM therapists. Information system of CIM research benefits to comprehensive analysis and estimation of diagnosis and treatment results for CIM therapists, to evaluation of their efficacy and safety that is essential and important for CIM inclusion into the field of integrative medicine. This system will enable verification (testing) of new concepts, theories, models, methods, which explain the mechanisms of getting CIM diagnostic information and therapeutic effects on the grounds of research results.

General architecture of the information system of research is presented in Figure 7.

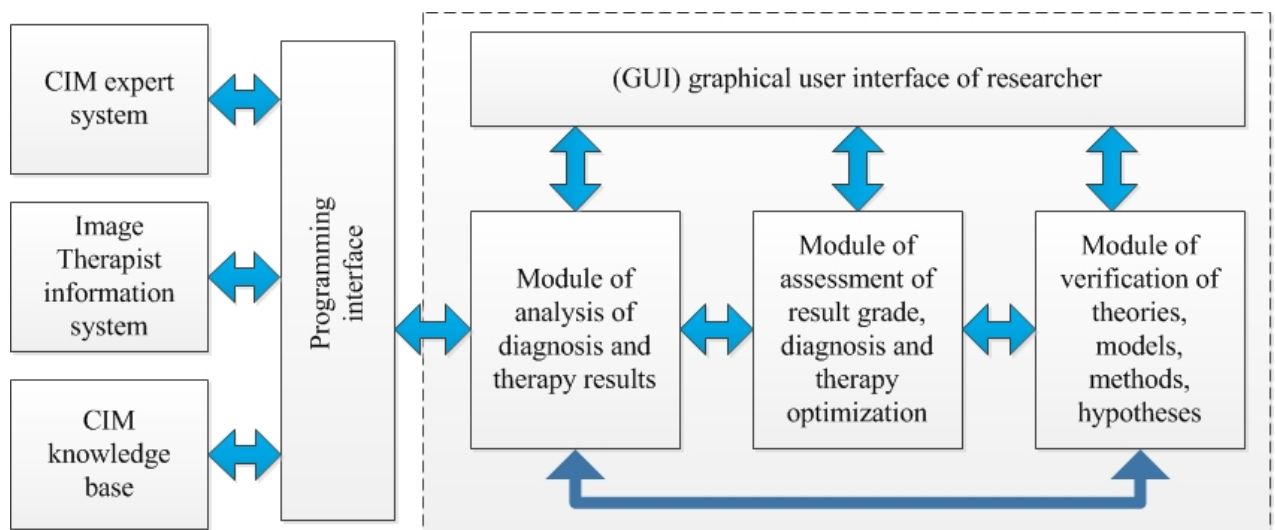


Fig. 7. General architecture of the information system of CIM research.

Within the framework of the theoretical direction of research of the CIM received the following new results. The object and subject of the scientific direction of the research of the CIM are formulated (see table 5).

Table 5. The object and subject of the scientific direction of the study CIM

A generalized research object	The generalized object of the research of the scientific direction of the CIM is the process of diagnostic-therapeutic interaction of the image-therapist and the patient, as well as the consequences (results) of such interaction in all its aspects: physical, energy, information, psychological (emotional), mental, spiritual, cultural
A generalized subject of research	The generalized subject of the research of the scientific direction of the CIM is the models, methods, concepts, theories, technologies of diagnostic-therapeutic interaction of the image-therapist and the patient.
Set of separate subjects of research	Since the generalized object of research can be studied from the standpoint of various modern scientific fields, for example, such as physics, mathematics, psychology, physiology, anatomy, computer science, cybernetics, synergetics, system theory, semiotics, as well as from the positions of various technical sciences, then in natural way a wide range of possible research subjects in the scientific direction of the CIM are formed.

The requirements for the scientific theory of the CIM are formulated (see Table 6).

Table 6. Requirements for the scientific theory of CIM

REQUIREMENTS TO THE SCIENTIFIC THEORY OF CIM	DESCRIPTION OF GROUP OF REQUIREMENTS
A group of logical theory requirements	Contains the requirements for the theory of the CIM from the standpoint of satisfaction of the principles of logical rigor (the law of identity), the not contradiction, completeness and compactness of the presentation of knowledge (concepts, statements, models and methods) in this theory
A group of requirements for the experimental validity of the theory	Contains requirements (clinical, measuring, experimental, introspective) of verifiability and falsifiability of concepts, statements, principles, models, methods of the theory of CIM
A group of requirements of convenience in use	Contains the requirements for the characteristics of the convenience of using the theory of CIM in terms of logical, technical and educational operation of its terminology-conceptual apparatus, models and methods. In particular, this group contains the requirements that the scientific theory of CIM should be presented in three forms: a meaningful verbal form, as a formalized (formal) theory and in the form of computer ontology.
Group of requirements of consistency	Contains the requirements for the consistency of the scientific theory of CIM with the scientific theory of Integrative Medicine and with the traditional theory of CIM and TCM

The deductive-axiomatic strategy of building the theory of CIM is substantiated, which provides fulfillment of a group of logical requirements and a number of convenience in use requirements (see Table 7).

Table 7. The deductive-axiomatic strategy of building the theory of CIM

The deductive-axiomatic strategy of constructing a terminology-conceptual apparatus CIM	1. Isolation of the set of fundamental concepts of the theory of CIM. 2. The definition of derivative concepts of the theory of CIM based on its fundamental concepts.
Deductive-axiomatic strategy for organizing a set of	1. Isolation of the set of true assertions-axioms, the truth

true assertions of the theory of CIM	of which is accepted without proof. 2. Setting the set of rules for the logical deduction (proof) of all assertions (theorems) of the theory from the set of its axioms.
---	---

The theory of CIM is appropriate to present in the form of two interrelated and inter complementary conceptual projections, such as: 1) Ancient Chinese traditional conceptual projection - a projection of practical understanding and use of CIM-specialists; 2) modern scientific conceptual projection - describes and investigates the CIM using a rigorous scientific methodology within the classical, non-classical and post-classical type of scientific rationality (see Table 8).

Table 8. Traditional and modern scientific conceptual projection of the theory of CIM

TRADITIONAL CONCEPTUAL PROJECTION OF CIM THEORY	MODERN SCIENTIFIC CONCEPTUAL PROJECTION OF CIM THEORY
Describes CIM in terms and concepts that are characteristic of ancient Chinese culture, philosophy and medicine. And also reflects the terminological-conceptual apparatus of practical understanding of the theory of the CIM by modern CIM-specialist	Describes and investigates the CIM using a rigorous scientific methodology within the classical, non-classical and post-classical type of scientific rationality.

Consequently, considering the holistic subject-object character of the CIM with the predominance of intuitive-image forms of the existence of its knowledge (its traditional theory), it is right to construct a scientific theory of CIM based on the latest types of scientific rationality (objectivity, truth) and subjective ontologies.

Based on the works of Styopin, Miseyev, in the table 9 in a concise form, the characterization and comparison of classical and non-classical types of scientific rationality with their ontological, epistemological and axiological peculiarities were conducted, which underlie methodological models of the development of the theory of CIM.

Table 9. Types of scientific rationality

	Classical rationality (antagonism of polar origin)	Non-classical rationality (unity of polar origin)
Ontological status	Ontological status is endowed with only actual material (external) being. The inner (ideal, potential, spiritual, conscious) being declared epiphenomenon	Ontological status is endowed with actual material (external) being, as well as the potential (internal, ideal, spiritual, conscious) being. Synergy between actual and potential forms of Being.
Subject-object interaction	Independence of the object of research from the subject who knows it	Takes into account the fundamental role of the subject in the process of knowing the object. Subject-object integrity.
Matter, energy and information	Matter as a substance is primary. Between energy and matter there is no close interconnection. The role of information is minimal. Matter is passive	Interconversion of energy and matter, interconnection, unity of energy and information. Matter has inner activity
Space and time	Space and time as independent separate forms of existence of matter	Synthesis of the concepts of space and time in a single concept of space-time (space-time continuum)
Substance - field, particles-waves	Antagonism of substance and field, particles and waves	The holistic notion of "substance -field," the principle of completeness of Bohr for particles and waves
Local and nonlocal interactions	Nonlocal interactions are not recognized	Synergy between local and nonlocal interactions
Live and inanimate	Lives - only the highest form of the existence of inanimate, the	Vitalization of objects of science, subjective ontologies

	epiphenomenon is declared	
Reduction and holism	The priority of reductionism, analysis	Prioritize holism, the integrity of analysis and synthesis
Axiological aspects	The priority of truth over other valuable categories	Convergence of the category of truth with other value categories (goodness, beauty)

Table 10 provides justification for the application of classical and non-classical methodological models in the construction of the scientific theory of CIM

Table 10. Classical and non-classical methodological models of the research of the CIM

Classical methodological model	Non-classical methodological model
The use of the classical methodological model will make sense for organizing, conducting and analyzing clinical trials of CIM in the framework of evidence-based medicine	Non-classical methodological model has considerable research potential in the scientific substantiation and explanation of the real mechanisms for obtaining diagnostic information in the CIM, the emergence of the received therapeutic effects in the CIM because it is possible to describe the psychological, energy impact of the CIM therapist, the information influence of the therapist by changing the image of the disease, and also psychosomatic processes of self-treatment of the patient

The sections of the theory of CIM is substantiated (see Table 11).

Table 11. The sections of the theory of CIM

SECTIONS OF THEORY	DESCRIPTION OF SECTION CONTENT
General theory of CIM	Describes the basic concepts and ideas of the CIM and serves as a practical-philosophical foundation for the rest of the CIM sections
The theory of health and diseases in CIM	Describes the basic concepts of health and diseases in CIM; diagnostic standards of health and diseases for their evaluation by various methods of diagnosis of CIM; the classification and definition of the types of diseases in the CIM
The theory and technology of diagnostics in the CIM	Describes and formalizes theoretical foundations, methods and means of obtaining diagnostic medical information by the methods of the CIM, as well as methods of its interpretation.
Theory and technology of therapy in CIM	Describes and formalizes theoretical foundations, methods and means of conducting therapeutic procedures in the CIM, as well as their interrelations with the corresponding diagnostic information.
Theory and technology of training, the development of a CIM-specialist	Describes educational theoretically and practically oriented content, as well as technologies for its implementation into the educational process for the preparation and improvement of the qualification of the CIM-specialists

It is proposed to divide the scientific theory of CIM into two large parts (see Table 12):

- 1) General Scientific Theory of Integrative Medicine;
- 2) Special Scientific Theory of Chinese Image Medicine.

Table 12. General and special parts of the theory of CIM

GENERAL SCIENTIFIC THEORY OF CIM	SPECIAL SCIENTIFIC THEORY OF CIM
Taking into account the promising role of CIM in the use of Integrative Medicine, it is right to develop the general scientific theory of CIM as a general theory of Scientific Integrative Medicine, which is currently in the stage of its active development	Displays the specific and unique knowledge that is typical for the CIM, and which is based on the knowledge of the general scientific theory of Integrative Medicine

Taking into account the information contained in tables 11 and 12, the sections of the general and special parts of the CIM theory was developed (see Table 13).

Таблица 13. The sections of the general and special parts of the CIM theory

SECTIONS OF GENERAL THEORY OF INTEGRATED MEDICINE	SECTIONS OF THE SPECIAL THEORY OF CHINESE IMAGE MEDICINE
The General Theory of Reality and human in Integrative Medicine	Special theory of Reality and human in the CIM
General theory of health and diseases in Integrative medicine	Special theory of health and diseases in CIM
General theory and diagnostic technologies in Integrative Medicine	Special theory and diagnostics technology in the CIM
General theory and technology of therapy in Integrative medicine	Special theory and technology of therapy in CIM
General theory and technology of training, development of a specialist in Integrative Medicine	Special theory and technology of training, development of the CIM-specialist

Three forms of presentation of the theory of CIM were represented (see Table 14).

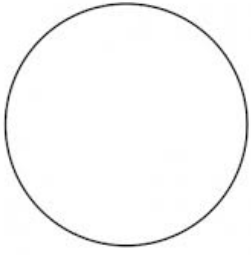
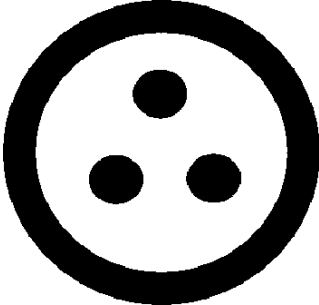
Table 14. Forms of presentation of the theory of CIM

FORMS OF PRESENTATION OF THE THEORY OF CIM	DESCRIPTION OF THE FORMS OF PRESENTATION OF THEORY CIM
A meaningful form of presentation of the theory of CIM	Presentation of the theory of the CIM in the verbal-conceptual form by means of natural language
Formalized (formal) theory of CIM	It is presented in the theory of CIM with the use of artificial languages of mathematics and mathematical logic (descriptive logic), which make it possible to have an accurate, consistent and compact description of it.
Theory of CIM as a computer ontology	The presentation of the theory of CIM in the form of a computer knowledge base in the language of ontology development (for example, OWL), which enables the use of modern systems of artificial intelligence in the professional activities and training of CIM-professionals

The general outlook philosophical concept of the Universe reflects a generalized image of Reality (Life), which underlies the view of life (perception of environment, world perception, sense of global consciousness), and the practical activities of the therapist, in particular, the CIM-therapist. This picture of the world is fundamentally important for understanding the nature of the CIM because it is an ontological, gnosiological, axiological and praxiological foundation of the theory and practice of the CIM, a theory that points to the meaning and direction of the development of the Universum, as well as to the person as an integral part of it. We will analyze the basic concepts of the traditional conceptual model of Reality in the CIM in the context of their correspondence to the main categories of Western philosophy. It is established that between the basic conceptual models of the traditional theory of CIM there is the relation of cholorhii (see table 15).

Table 15. Holarhia of Conceptual Models of Reality in CIM

Type of conceptual model	Model Properties	Examples of the model
Zero-dimensional preverbal model 	The meaning can not be expressed verbal rationally. He is over-rational. It is possible to only mark it, point to it. "Tao, which can be expressed in words - is not true Tao"	Tao (Absolute, God, Parabrahman)
One-dimensional conceptual model	1) covers all possible manifestations, aspects of Reality, reflecting only the fact of the unity of Reality and all its possible manifestations.	Emptiness (Unity, Physical and Semantic Vacuum)

	2) points out only to this one side of the Reality - to its integrity and unity, that all plural in its true nature is something of one. 3) is poor in the informational sense, since it does not contain information about the Universe in its plural aspect	
Binary conceptual model 	1) reflects the unity, integrity, unity of the polar aspects of Reality; 2) points to the dual aspect of Reality as the basis of its multiple aspect; 3) contains information on the fundamental patterns of interaction of the polar origin of Reality, in particular, their dialectic, equality.	Yin Yang, Purusha-Prakriti, all paired categories of dialectics (being-non-being, single-plural, matter-consciousness space-time, form-content, object-subject, manifested-non-manifested, actual-potential, etc.)
Ternary conceptual model 	1) reflect the fact of unity, integrity of all of their three components; 2) contain information about the plurality, dialectic, equality of the three components; 3) detail binary models, by separating the third component of the reality model, which something absorbs from itself two components of the binary model.	Jing-Chi-Shen, Earth-Human-Sky, body-soul-spirit, consciousness-culture-matter, substrate-energy-information

Following the above analysis of the fundamental categories of the CIM, as well as taking into account the modern theories of rational holism, the neo-unity philosophy, modern theories of consciousness, the ontological core of CIM in the form of a synthetic reality model in a CIM with fractal scale is proposed, which lies at the foundation of the concept of the general theory of Integral medicine. Namely, we will develop a new model of Reality (Life) "all level-all sector-all aspects", which combines the approach of Ken Wilber, namely, the «all level-all sector» model, and the basic scientific model of substrate-energy-information, and also makes it possible detail (enrich) for the purposes of constructing a nosological taxonomy CIM, which would be co-ordinated with the nosological taxonomy of Western scientific medicine and would be included in the nosological taxonomy of Integrative Medicine (see Table 16).

Table 16. Synthetic model of Reality in CIM with fractal scale

STRUCTURE OF THE CONCEPTUAL MODEL	PROPERTIES OF THE MODEL
Model of Reality - "all level-all sector-all aspects". Levels of Reality: 1) Physical matter (corresponds to Jing); 2) Physical field (corresponding to the rough level of Chi or a thin level of Jing), which includes well-	1) absorbs knowledge of conceptual models of smaller dimension (scale); 2) synthesizes the Wilber «all level-all sector» model

known fields and fundamental interactions of modern physics; 3) the level of potential Reality of quantum physics; 4) level of thin physical fields (morphogenic potential fields, torsion fields, etc.); the level of thin non-physical fields), the details of which are in the mystical cult traditions (corresponds to the thin level of Chi); 5) level of sensory-emotional (corresponds to the astral level of the Vedic tradition); 6) level mental (corresponds to the conceptual-rational level, level of thinking); 7) the level of intellectual intuition, wisdom; 8) level of non-duality. Reality Sector: 1) the sector of the internal individual; 2) internal collective sector; 3) the sector of the external individual; 4) external collective sector. Aspects of reality: 1) substrate; 2) energy; 3) information (structure)	and the ternary model "substrate-energy-information"; 3) Takes into account the results of research in the field of Integral Medicine and the Integral Approach, the neo-unity philosophy and subject ontologies. 3) makes it possible to detail the concepts of Reality, by fractal scaling. 4) is the basis of the generation of the nosology of the CIM
--	---

The conceptual and formally mathematical models of the computer diagnostic space have been developed. The diagnostic ontology of the CIM is developing, which includes the CIM ontology, the topological diagnostic ontology of the CIM, the ontology of the diagnostic methods of the CIM and the ontology of the diagnostic metrics of the CIM (see table 17).

Table 17. Components of the CIM diagnostic ontology

Components of the diagnostic ontology of CIM	Description of components of diagnostic ontology CIM
Nosological Ontology of CIM	Nosological CIM ontology reflects knowledge about the types (classes) of diseases that are taken in the diagnostic theory of CIM
Topological diagnostic ontology of CIM	Topological diagnostic ontology CIM reflects the data on the topological localization of diseases related to the physical body, the energy system (field system, Chi system) and information systems (psycho-mental-spiritual system, Shen system), in particular, contains information about body parts, organs, tissues of the physical body, information about bioactive points and energy channels of the human energy system, information about information, psycho-emotional, mental and spiritual topological aspects of a person.
Ontology of diagnostic methods of CIM	The ontology of diagnostic methods in the CIM reflects the knowledge about the methods (channels) of obtaining and the specifications of sensory diagnostic information in the CIM.
Ontology of the diagnostic metric of CIM	Describes the quantitative characteristics (indicators) of the diagnostic space of the CIM, which determine the degree of manifestation of a particular disease and can be given on a certain number (for example, 1 to 5) or non-numeric (eg, very weak, weak, medium, strong, very strong) scale.

According to the results of the research, a number of scientific works were published and an application for a patent for Ukraine was submitted [15-23].

More in detail with the Program of scientific researches CIM and ZYQ, as well as with the results of its realization you can get acquainted with such information resources:

1) The official website of the public organization "Association of Chinese Image medicine of Ukraine" (<http://cima.org.ua/uk/naukovi-doslidzhennya/>);

2) The website of scientific research of Chinese Image medicine at I. Horbachevsky Ternopil State Medical University (<https://sites.google.com/tdmu.edu.ua/kom/>, <https://sites.google.com/tdmu.edu.ua/cim/>).

References:

1. WHO strategy for traditional medicine for 2014-2023 [Electronic source] – 2013. – 72 p. – On-line mode: http://www.who.int/medicines/publications/traditional/trm_strategy14_23/ru/, free access (date of access: 20.11.2016).
2. Barnes PM, Bloom B, Nahin R. CDC National Health Statistics Report #12. The Use of Complementary and Alternative Medicine in the United States. Findings from the 2007 National Health Interview Survey (NHIS) conducted by the National Center for Complementary and Alternative Medicine (NCCAM) and the National Center for Health Statistics. December 2008. <http://nccam.nih.gov/news/camstats/2007/cam-survey/fs1.htm> Accessed November 5, 2011, вільний (дата звернення: 23.11.2016)
3. Ananth S. 2010 Complementary and Alternative Medicine Survey of Hospitals: Summary of Results. Health Forum (American Hospital Association) and the Samueli Institute. September 2011. <http://www.siib.org/news/2468-SIIB/version/default/part/AttachmentData/data/CAM%20Survey%20FINAL.pdf> Accessed December 11, 2011.
4. Guarneri E, Horrigan B, Pechura C. The Efficacy and Cost Effectiveness of Integrative Medicine: A Review of the Medical and Corporate Literature. *Explore: The Journal of Science and Healing*. 2010; 5:308–312.
5. Maizes V, Rakel D, Niemiec C. Integrative medicine and patient-centered care. *Explore: The Journal of Science and Healing*. 2009;5(5):277–89.
6. Horrigan B. What is Integrative Medicine? Published by The Bravewell Collaborative; 2010. <http://www.bravewell.org/integrative-medicine/what-is-IM> Accessed November 6, 2011, вільний (дата звернення: 23.11.2016)
7. Wang Y, Zhonghua Y, Jiang Y, Liu Y, Chen L, Liu Y. A Framework and Its Empirical Study of Automatic Diagnosis of Traditional Chinese Medicine Utilizing Raw Free-text Clinical Records. *Journal of Biomedical Informatics*. 2012;45(2):210–223. doi: 10.1016/j.jbi.2011.10.010.
8. Wang H. A computerized diagnostic model based on naive bayesian classifier in traditional chinese medicine. *Proceedings of the 1st International Conference on BioMedical Engineering and Informatics (BMEI '08)*; May 2008; IEEE; pp. 474–477.
9. Wang X, Qu H, Liu P, Cheng Y. A self-learning expert system for diagnosis in traditional Chinese medicine. *Expert Systems with Applications*. 2004;26(4):557–566.
10. Huang M-J, Chen M-Y. Integrated design of the intelligent web-based Chinese Medical Diagnostic System (CMDS)—systematic development for digestive health. *Expert Systems with Applications*. 2007;32(2):658–673.
11. Mao Y, Yin A. Ontology modeling and development for Traditional Chinese Medicine. *Proceedings of the 2nd International Conference on Biomedical Engineering and Informatics (BMEI '09)*; October 2009; IEEE; pp. 1–5.
12. Lukman S, He Y, Hui SC. Computational methods for traditional Chinese medicine: a survey. *Computer Methods and Programs in Biomedicine*. 2007;88:283–294.]
13. Chen H, Wang Y, Wang H, et al. Towards a semantic web of relational databases: a practical semantic toolkit and an in-use case from traditional Chinese medicine. *Proceeding of the 5th international conference on The Semantic Web (ISWC '06)*; 2006; pp. 750–763.
14. International program of scientific research in Chinese image medicine and Zhong Yuan Qigong for 2017-2023 [Electronic source]. On-line mode: <https://kundawell.com/ru/mezhdunarodnaya-programma->

nauchnykh-issledovaniy-kitajskoj-imidzh-meditsiny-i-chzhun-yuan-tsigun-na-2017-2023-god, free access (date of access: 22.11.2016).

15. Lupenko S. A., Orobchuk O. R. Ontological simulation of Chinese Image medicine. // *Materials of the V International Scientific and Technical Conference of Young Scientists and Students "Actual Problems of Modern Technologies"*. – Ternopil: Ternopil Ivan Pul'uj National Technical University, 2016. – C. 67-68.

16. Lupenko S. A., Orobchuk O. R., Vakulenko D. V., Sverstyuk A. S., Horkunenko A. B. Integrated Onto-based Information Analytical Environment of Scientific Research, Professional Healing and E-learning of Chinese Image Medicine // *Scientific Journal «Information systems and networks»*. – Lviv: Lviv Polytechnic National University, 2017. – C. 10-19.

17. S. Lupenko, A. Pavlyshyn, O. Orobchuk. Conceptual Fundamentals for Ontological Simulation of Chinese Image Medicine as a Promising Component of Integrative Medicine // *Science and Education a New Dimension. Natural and Technical Science* – 2017. – Vol. 15, Issue 140. – C. 28-32.

18. Lupenko S. A., Orobchuk O. R., Zahorodna N. V. Formation of the onto-oriented electronic educational environment as a direction the formation of integrated medicine using the example of CIM. // *Actual scientific research in the modern world: Collection of scientific papers of the XXIII International scientific conference, 2017 - Pereyaslav-Khmelnytsky: Issue 12(32)*. – C. 56-61.

19. Gorkunenko A. B., Lupenko S. A. Onto-oriented expert system for Chinese Image medicine. // *Materials of the XX Scientific Conference of Ternopil Ivan Pul'uj National Technical University*. – Ternopil, 2017. – C. 74.

20. Orobchuk O. R., Miz A. V. Features of forming a paradigm of computer ontologies // *Materials of the V International Scientific and Technical Conference "Information Models, Systems and Technologies" of Ternopil Ivan Pul'uj National Technical University*. – Ternopil, 2018. – C. 40.

21. Lupenko S. A. On the way to the creation of the scientific direction of medicine «Yi Xiang Yi Xue» [Electronic resources] // *Association of Chinese Image medicine of Ukraine: [site]*. – Mode of access: http://cima.org.ua/wp-content/uploads/2017/02/Conf_2015.ru_.docx, free. – Title from the screen.

22. Lupenko S. A. Elements of Western philosophical and general scientific foundations of Chinese medicine «Yi Xiang Yi Xue» [Electronic resources] // *Association of Chinese Image medicine of Ukraine: [site]*. – Mode of access: http://cima.org.ua/wp-content/uploads/2017/02/Conf_2016.ru_.docx, free. – Title from the screen.

23. Lupenko S., Xu Mintan, Pavlyshyn A. Application for a patent "A way to optimize the information-analytical environment in Chinese Image medicine", 2018.