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The scientific hypothesis of an “energy system” in the human body

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Abstract This paper proposed the scientific hypothesis that human beings have an “energy system” inside their body and put forward the necessity to propose the hypothesis. In details, this paper explained the hypothesis from its existence, composition, functions, and possible verifying methods. This paper argues that the human body includes both visible and invisible parts. The former is the material system and the latter is the energetic system. As matter and energy can be converted into each other, it is important to study the human body from the perspective of both the material and energetic systems, which can complement each other. The nature of the energetic system is different from that of the material system. The traditional Chinese medicine (TCM) perspective is based on energy; therefore, extending research on the human energy system may lead to the establishment of a modern TCM research field that is firmly grounded in the principles of TCM. Such a research field might generate novel findings.

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The testing of scientific hypotheses is fundamental to the formation of scientific theory. The proposition of a testable scientific hypothesis is the first step to progress in scientific research. Traditional Chinese medicine (TCM) has been used for over 3000 years.¹ Most researchers agree that the formation and development of TCM follows a different process from that of modern science; it is probably impossible to completely define the complexity of TCM

using the perspectives and research methods of modern science.

Therefore, what is the key factor that differentiates TCM from bio-medicine (Western medicine)? This question is not easy to answer. It is impossible for modern people to return to the time and living environment of ancient people for field discussions. We can only ascertain the development of TCM from the substantial number of ancient classic TCM texts and from long-established clinical practices. In the process, we need to do as suggested by William Ian Beardmore Beveridge, an Australian scientist: “Scientists must have imagination so that they can imagine how things that cannot be seen by the naked eye happen and work,

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and conceive a hypothesis.” Based on discussion and reflection, this paper presents the scientific hypothesis that human beings have an “energy system” inside their body.

What is the energy system of the human body?

“Qi” as “energy”

TCM theory posits the concept of qi, adopting a world view that can be considered qi monism.² Of related concepts in modern science, the one most similar to qi is energy. Qi in TCM can therefore be likened to the modern scientific concept of energy. This assumption is the foundation of the hypothesis that the human body contains an energy system, though the concept of qi may be more wide-ranging than that of energy.

By accessing relevant literature and materials and visiting TCM physicians, physicists, and philosophers, we have determined that the concepts of qi in TCM and energy in modern science have much in common and are used to explain the same type of phenomena. For example, both qi and energy refer to a force that cannot be directly observed, but that has an effect on physical entities. Comparative discussions of the two concepts can help to synthesize the knowledge accumulated from different eras and different modes of cognition, which helps to clarify the corresponding concepts and provide a broader perspective. Why do we say that the concept of qi may be broader than that of the concept of energy? *Qigong* practice shows that the concept of qi can contain information, consciousness,³ and other factors that the concept of energy does not seem to include.

Existence and composition of an energy system in the human body

The following description of the composition of the human body’s energy system is derived from modern science and the account of its existence drawn from TCM.

The human body’s energy system is related to its material system. The material system of the human body refers to the different levels of physical structure, including the material composition of genes, organs, and limbs at microscopic and macroscopic levels, as well as histology and embryology. The energy system is a dynamic system that maintains and influences human life activities, including energy operations from microscopic to macroscopic levels such as chemical energy released by mitochondria and enzymes, heat generated by food, and gravitational and electromagnetic energy generated by the moon’s waxing and waning and sunspot activity.

Studies of the human body by bio-medicine and modern science focus on the material system, which is characterized by interconnection between tangible entities. In contrast, the energy system is a system in which intangible forces interact with each other. Any living body simultaneously contains a material system and an energy system, just as shapes and their shadows are inextricably linked. As all material and structural components of the body have their corresponding energetic components, material components move owing to the action of energetic components and form functions: the life activities of the human body.

Although the existence of the material system in the human body has been confirmed by bio-medicine and modern science,^{4–7} the existence of an energy system has not yet been scientifically demonstrated. This paper proposes the hypothesis that an energy system of the human body exists.

The TCM of meridians can be used as the theoretical basis of a model of a bodily energy system.^{8,9} According to TCM, qi flows through the meridian system. If qi is energy, the meridian system constitutes the channels through which energy operates. The meridians do not correspond to any physical structures. The findings of modern scientific research on meridians support this view of the meridian system to date. However, the operation of qi or energy occurs not just inside the meridian system, but also outside it. According to TCM, nutrient qi flows inside the vessels and defensive qi flows on the surface of the body.¹⁰ The body’s organs also have their own qi, such as heart qi, liver qi, and spleen qi. Another type of qi is external qi, which can be emitted from the body by some individuals, such as *Qigong* practitioners. We can see that the location and operation of energy does not always have clear boundaries, just as electrical energy can spread both through wires and wirelessly.

TCM acupuncture and *Qigong* therapy are practical applications of the theory of human energy and depend on the operation of the meridian system. These are the two therapies based most heavily on TCM and have demonstrated clinical effects. They are further discussed later in the paper.

Why should the energy in the human body be termed a system?

Ludwig Von Bertalanffy, the founder of general systems theory, defines a system as “a set of interrelated elements that interact with each other”.¹¹ A system is an organic whole composed of several interrelated, interactive, and interdependent parts. Material and energetic components in the human body are formed by the interrelations and interactions between different levels and different parts; therefore, these components can be considered a system.

The material structure of the human body forms a system because of its interconnection at different levels, and the energy operation of the human body forms a system because of its mutual communication at different levels. Although both systems exist in the human body, the material system is tangible and can be observed whereas the energetic system is intangible and unobservable.

Here, it is necessary to define tangibility and intangibility as well as visibility and invisibility. In ancient times, tangibility and visibility referred to things that could be directly observed by the naked eye; things that could not be so observed were defined as intangible and invisible. In modern times, the use of observation equipment such as magnifying glasses and telescopes has expanded the range of what is tangible and visible.

Why is it necessary to propose an energy system for the human body?

As mentioned above, one fundamental difference between matter and energy is that the former is visible and the latter is invisible (except for the visible part of light). The

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