

Bridging Tradition and Innovation: An Innovative Paradigm for the Integration of Neuroscience and Traditional Chinese Medicine Empowered by Intelligent Medical Engineering

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Abstract:

The rise of Intelligent Medical Engineering has provided unprecedented technological support for the deep integration of Neuroscience and traditional Chinese medicine (TCM). This paper systematically discusses the research progress and application prospects of Intelligent Medical Engineering in the interdisciplinary field of neuroscience and TCM, with analysis conducted from three dimensions: theoretical construction, technological pathways, and clinical practice. The findings indicate that intelligent technologies, including Brain–Computer Interfaces, large artificial intelligence models, and multimodal neuroimaging, are reshaping the scientific interpretation of the TCM theory of the “brain,” giving rise to emerging interdisciplinary directions such as acupuncture neuroscience and intelligent diagnosis and treatment of TCM encephalopathies. Representative innovations, including the “Shengong–Huatuo” brain-controlled acupuncture system, intelligent moxibustion robots, and a federated learning–based diagnostic framework for depression, have preliminarily validated feasible pathways through which intelligent technologies can empower the modernization of TCM. This paper proposes that, by constructing a three-stage paradigm of interpretation–enhancement–integration, Intelligent Medical Engineering can effectively address key challenges, including the difficulty of quantifying TCM theories, the unclear underlying neural mechanisms, and the obstacles to implementing personalized diagnosis and treatment, thereby providing new insights for building a future medical system integrating Chinese and Western medicine.

Keywords:

Intelligent Medical Engineering, Neuroscience, Integrated Chinese and Western Medicine, Brain–computer Interface, Acupuncture Neuroscience

1. Introduction

In the 21st century, global healthcare systems are facing a dual challenge. On the one hand, the burden of neurological disorders continues to increase, with stroke,

Alzheimer's disease, and depression having become major causes of disability and mortality. On the other hand, medical expenditures—particularly the long-term management costs of chronic diseases—continue to rise, placing enormous pressure on healthcare security systems worldwide. Against this backdrop, exploring more efficient and sustainable models of health protection has become an urgent need. China possesses the unique healthcare resource of TCM, and promoting the deep integration of TCM with modern medicine is expected to open a new path for health governance with Chinese characteristics [5].

However, the integration of TCM with modern science is far from straightforward. TCM theory is rooted in ancient philosophy and empirical observation, with a discourse system centered on yin–yang and the five elements, meridians and qi-blood, and syndrome differentiation–based treatment, which differs substantially in methodology from modern Neuroscience grounded in reductionism and empiricism [5]. How to interpret the ancient wisdom of TCM through the “universal language” of modern science has become the core bottleneck restricting the in-depth development of integrated Chinese and Western medicine.

The rise of Intelligent Medical Engineering offers new possibilities for addressing this challenge. As an interdisciplinary field integrating cutting-edge technologies such as artificial intelligence, big data, Brain–Computer Interfaces, and medical robotics, Intelligent Medical Engineering possesses powerful capabilities in multimodal data integration, complex system modeling, and enhanced human–machine interaction. These technological characteristics align closely with the methodological demands of TCM, particularly its holistic view and syndrome differentiation–based treatment, and are expected to build a bridge between traditional TCM and modern Neuroscience [6][10].

This paper focuses on the interdisciplinary intersection of Intelligent Medical Engineering, neuroscience, and TCM, systematically reviews the research progress in this field, analyzes how intelligent technologies empower the scientific interpretation of TCM brain theory, explores the application pathways of technologies such as Brain–Computer Interfaces and large artificial intelligence models in the modernization of TCM diagnosis and treatment, and offers prospects for future development.

2. Theoretical Foundations of Cross-Disciplinary Integration

2.1. The Need for a Modern Interpretation of the TCM Theory of the “Brain”

The understanding of the brain in traditional Chinese medicine (TCM) has a long history. As early as the *Huangdi Neijing (The Yellow Emperor's Inner Canon)*, it was recorded that “the head is the residence of essence and intelligence,” while Li Shizhen more explicitly proposed that “the brain is the residence of the primordial spirit.” However, within the traditional TCM system dominated by the viscera-state theory, the functions of the brain were long subsumed under the five zang organs, particularly the heart — “the heart is the sovereign organ from which mental activities arise.” This viscera-state–oriented theoretical construction has led to relatively fragmented discussions of the brain in TCM, lacking an independent diagnostic and therapeutic system for brain disorders.

With the transition of modern disease spectra toward cerebrovascular diseases and neurodegenerative disorders, the theoretical construction and clinical practice of TCM

encephalopathy are facing new challenges. On the one hand, TCM has accumulated rich experience in treating brain disorders, with definite therapeutic effects demonstrated in acupuncture for post-stroke sequelae and herbal interventions for Alzheimer's disease. On the other hand, due to the lack of theoretical support from modern Neuroscience, the mechanisms underlying these empirical treatments remain difficult to elucidate, thereby restricting their international recognition and broader clinical translation [8].

Therefore, reinterpreting the TCM theory of the “brain” in the language of modern Neuroscience and revealing the neurobiological mechanisms underlying interventions such as acupuncture and herbal medicine have become important breakthroughs for advancing the modernization of TCM.

2.2. The Convergence Between the Systems Perspective of Neuroscience and the Holistic Theory of TCM

Notably, the development of Neuroscience is undergoing a paradigm shift from reductionism to systems theory. Early neuroscience was committed to reducing brain functions to neurons, synapses, and molecular events; however, recent brain network research has revealed that higher cognitive functions and clinical disease states often involve the coordination and dysregulation of large-scale brain networks. Functional magnetic resonance imaging studies have found that abnormal connectivity in resting-state brain networks—such as the default mode network, salience network, and central executive network—is associated with a variety of neuropsychiatric disorders.

This network-based and systems-oriented research perspective exhibits deep convergence with the TCM concepts of the holistic view and the principle of interconnection. TCM emphasizes that the human body is an organic whole, in which the zang-fu organs are interconnected through meridians, and disease represents a local manifestation of systemic imbalance. Likewise, the brain network paradigm in Neuroscience views the brain as a complex system composed of multiple functional networks, in which diseases arise from abnormalities in network nodes or connections. This paradigmatic convergence provides a shared methodological foundation for dialogue between Chinese and Western medicine [8][9].

2.3. The Methodological Advantages of Intelligent Medical Engineering

Intelligent Medical Engineering plays a unique methodological role in this interdisciplinary field. First, artificial intelligence technologies possess the capability to process multimodal and high-dimensional data, enabling the integration of genomics, neuroimaging, clinical phenotypes, and the four diagnostic methods of TCM, thereby constructing disease models that connect macro-level and micro-level mechanisms [1].

Second, machine learning algorithms can identify nonlinear patterns from complex datasets, which is highly analogous to the clinical reasoning of TCM syndrome differentiation—both rely on pattern recognition and classification decisions based on multidimensional information. Third, Brain-Computer Interfaces and neuromodulation technologies enable real-time monitoring and intervention of neural activity, providing technical means for validating TCM theories such as regulating the mind and treating the spirit [2]. Finally, digitalization and intelligent technologies can transform the clinical experience of renowned veteran TCM practitioners into

replicable and transferable algorithmic models, thereby addressing the challenge of tacit knowledge in TCM inheritance [7].

3. Key Technological Pathways and Research Progress

3.1. Deep Integration of Brain–Computer Interfaces and TCM Acupuncture

As one of the core directions of Intelligent Medical Engineering, Brain–Computer Interface technology has achieved breakthrough progress in its integration with TCM acupuncture in recent years. By collecting and analyzing neural signals, BCIs enable direct communication between the human brain and external devices, demonstrating broad application prospects in the field of neurorehabilitation [2].

In early 2026, the nation’s first brain-controlled acupuncture–integrated neurorehabilitation equipment platform, “Shengong–Huatuo,” was officially launched, marking the transition of this field from conceptual exploration to clinical application. Developed jointly by the Haihe Laboratory of Brain–Computer Interaction and Human–Machine Integration, the First Teaching Hospital of Tianjin University of Traditional Chinese Medicine, and multiple collaborating institutions, the platform is designed for patients with neurological injuries such as post-stroke hemiplegia [3]. Targeting two major bottlenecks in traditional acupuncture—namely, insufficient active participation of the patient’s brain and the lack of real-time quantitative evaluation of the arrival of qi in acupuncture—the system innovatively establishes three core technologies: active acupuncture, quantitative acupuncture, and integrative acupuncture.

The active acupuncture technology combines the active paradigm of BCI with acupuncture, enabling patients to actively participate in the acupuncture process through motor imagery and other brain activities, thereby enhancing neuroplasticity-driven rehabilitation throughout the treatment course. The quantitative acupuncture technology synchronously acquires cortical electroencephalography and near-infrared signals to quantitatively evaluate the effect described in TCM as “qi commands blood, and blood is the mother of qi,” while providing online feedback to optimize acupuncture stimulation parameters. The integrative acupuncture technology precisely detects the temporal activation patterns of sensory and motor brain regions, thereby constructing a sensorimotor coupling rehabilitation system gated by neural feedback integrating qi and blood parameters [3].

The significance of this innovation lies not only in technological integration but also in opening a pathway for deep technological convergence between TCM acupuncture and Neuroscience. Traditional acupuncture research has primarily focused on local needling effects and meridian conduction, whereas “Shengong–Huatuo” extends the research perspective to the active participation of the central nervous system, providing a new technological platform for elucidating the mind-regulating mechanisms of acupuncture.

3.2. Large AI Models for Decoding TCM Diagnosis and Treatment of Brain Disorders

The rapid development of large language models and multimodal artificial intelligence technologies has provided powerful tools for the scientific advancement of TCM diagnosis and treatment of brain disorders. Related studies indicate that AI technologies can integrate multidimensional data—including multi-omics data,

classical TCM literature, and clinical phenotypes—into structured knowledge graphs, enabling intelligent precision diagnosis and personalized treatment planning for stroke management [1].

At the level of basic research, AI virtual cell technology is transforming the research paradigm for the complex mechanisms of herbal medicine. Traditional herbal medicine research faces methodological challenges arising from multiple components, multiple targets, and multiple pathways, whereas AI virtual cells can simulate the dynamic interactions between herbal compounds and cells, thereby providing a new paradigm for decoding the complex mechanisms of TCM in treating diseases such as stroke [1]. By constructing herb–target–disease network models, researchers can predict the targets of active herbal components and systematically reveal the synergistic mechanisms of TCM compound formulas.

At the clinical level, AI technologies are empowering the objective diagnosis of TCM brain disorders. The team led by Professor Fang Min at Shanghai University of Traditional Chinese Medicine, in collaboration with domestic and international institutions, has made important progress in intelligent neuroimaging-based diagnosis of depression. This study, for the first time, combined federated learning, state-space models, and brain functional network analysis to construct a privacy-preserving intelligent diagnostic framework for depression, termed FDA-CAPMA [9]. The framework employs co-activation pattern analysis to extract dynamic functional brain states, compressing high-dimensional fMRI signals into biologically meaningful discrete brain-state sequences; introduces the Mamba state-space architecture to achieve efficient cross-modal feature fusion; and designs a local maximum mean discrepancy module to complete cross-center distribution alignment while preserving data privacy. Validation on the world’s largest multicenter depression dataset demonstrated an accuracy of 67.16%, significantly outperforming traditional methods [9].

Notably, the highlight of this study lies in the dual validation of privacy protection and performance improvement—within a federated learning scenario that strictly maintained the physical isolation of data across centers, model performance not only did not decline but even surpassed the traditional paradigm of centralized data training. This breakthrough challenges the conventional assumption that data sharing is a prerequisite for AI-driven healthcare, providing a new pathway for the collaborative analysis of multicenter TCM clinical data.

3.3. Multimodal Neuroimaging and Mechanistic Research on Acupuncture

Advances in neuroimaging technologies have provided direct evidence for elucidating the central mechanisms of acupuncture. Multimodal techniques, including functional magnetic resonance imaging, electroencephalography, and magnetoencephalography, enable researchers to “visualize” the changes in brain functional activity induced by acupuncture stimulation.

Studies have shown that acupuncture is not merely a simple local stimulation; rather, it exerts therapeutic effects by modulating brain functional activity and promoting neural network reorganization [8]. Needling at specific acupoints can induce characteristic changes in regional brain activity, and these changes correspond to the traditional functions of the acupoints. For example, acupuncture at Hegu (LI4) can activate the facial sensorimotor cortex, which is highly consistent with the classical empirical description that “Hegu treats disorders of the face and mouth”; acupuncture

at Taichong (LR3) induces activity changes in the basal ganglia and limbic system, consistent with its function of soothing the liver and relieving depression.

Against this backdrop, the theoretical framework of acupuncture neuroscience is gradually taking shape. This theory builds a bridge between the empirical medicine of traditional acupuncture and evidence-based research in modern Neuroscience, providing an intrinsic neurobiological explanation for the effects of acupuncture [8]. The innovation team for acupuncture and neurovascular research at Shandong University of Traditional Chinese Medicine has taken the neurovascular unit and the neuro-endocrine-immune network as its primary entry points, comprehensively employing technologies such as neural circuit tracing, optogenetics, and clinical multimodal assessment to investigate the mechanisms of acupuncture in treating emotional disorders and cardiovascular-cerebrovascular diseases [4]. These studies not only reveal the biological basis of acupuncture effects but also provide a scientific basis for identifying new targets for the diagnosis and treatment of brain disorders.

3.4. Intelligent Devices and the Living Inheritance of the Clinical Experience of Master TCM Practitioners

Transforming the clinical experience of master TCM practitioners into replicable algorithmic models is an important direction through which Intelligent Medical Engineering empowers the inheritance and innovation of TCM. The intelligent moxibustion robot developed by the Second Affiliated Hospital of Anhui University of Chinese Medicine provides a representative example of this approach [7].

With the academic thought of Professor Zhou Meisheng, a leading authority in moxibustion therapy, as its intellectual core, the robot achieves the living inheritance of core theories such as the syndrome differentiation system of simultaneous treatment of meridians and viscera and the three-phase moxibustion sensation theory through systematic learning and analysis of his representative work *Jiusheng*. The development team transformed Professor Zhou's valuable clinical experience, including medical case records and academic writings, into executable algorithmic models. Through image recognition and temperature-sensing technologies, the robot rapidly completes syndrome differentiation and generates personalized moxibustion treatment plans [7]. In terms of technical implementation, the system adopts a high-precision robotic arm, enabling automatic positioning during moxibustion (with an accuracy of 0.1 mm), ignition, and temperature control, thereby effectively ensuring the stability and safety of treatment delivery.

The deeper significance of this innovation lies in addressing the challenge of making tacit knowledge explicit in TCM inheritance. In traditional apprenticeship-based training, the experience of master practitioners is often difficult to convey verbally, requiring learners to engage in prolonged clinical follow-up before gaining true understanding. By contrast, through deep learning of medical case records and academic writings, artificial intelligence systems transform the diagnostic and therapeutic reasoning of master TCM practitioners into computable and reproducible algorithmic models, enabling valuable clinical experience to be preserved, disseminated, and iteratively optimized [7]. At the same time, the system comprehensively records operational parameters and patient feedback, forming a data closed loop of treatment–evaluation–optimization, which provides evidence for clinical research and protocol refinement.

4. Application Scenarios and Representative Cases

4.1. *Stroke Rehabilitation: Synergy Between Closed-Loop Neuromodulation and Acupuncture*

Stroke is a common and frequently occurring disease that seriously threatens the health of middle-aged and older adults, and its rehabilitation process is often prolonged and challenging. The integration of Intelligent Medical Engineering with Neuroscience and TCM is opening new pathways for stroke rehabilitation.

The clinical application of the “Shengong–Huatuo” brain-controlled acupuncture system represents a synergistic rehabilitation model of closed-loop neuromodulation plus TCM acupuncture [3]. The core innovation of this model lies in incorporating the patient’s central neural activity into the rehabilitation loop: patients actively participate in the rehabilitation process through Brain–Computer Interfaces, while the system monitors neural activity states in real time and provides feedback to optimize acupuncture stimulation parameters, thereby forming a complete loop of intention–execution–perception–enhancement. This model overcomes the limitation of traditional acupuncture as a passive intervention, transforming rehabilitation from unidirectional treatment into a bidirectional regulatory process characterized by physician–patient collaboration and brain–body interaction.

From a mechanistic perspective, this synergistic rehabilitation model has a solid neuroscience foundation. Functional recovery after stroke depends on neuroplasticity, whereby the brain establishes new neural connections to compensate for impaired functions. Active brain activities such as motor imagery can activate brain regions associated with motor execution and promote neuroplasticity; meanwhile, acupuncture stimulation can regulate local blood flow and the expression of neurotrophic factors by activating acupoint–brain network pathways, thereby providing nutritional support for neural remodeling. The synergy between the two may generate a rehabilitation effect in which $1 + 1 > 2$.

4.2. *Depression Diagnosis and Treatment: Federated Learning and the Mind-Regulating Effect of TCM Tuina*

As a major contributor to the global burden of disease, depression has long relied on subjective scale-based assessment for diagnosis and treatment, lacking objective biological indicators. At the same time, multicenter medical data are difficult to share due to privacy protection regulations, severely limiting the generalizability of artificial intelligence diagnostic models [9].

The study led by Professor Fang Min provides an innovative solution to this challenge. Under the premise of data privacy protection, the FDA-CAPMA framework enables cross-center intelligent diagnosis of depression, providing an objective tool for the early and precise identification of depressive disorders [9]. This breakthrough is not only of technical value but also of profound theoretical significance, as it provides scientific data support for the TCM tuina concept of regulating the mind.

As an important component of TCM non-pharmacological therapies, tuina possesses unique advantages in the treatment of emotional disorders. Traditional theory holds that tuina exerts therapeutic effects by regulating qi dynamics and calming the mind and stabilizing emotions. However, due to the lack of objective indicators for efficacy evaluation, the mechanism of mind regulation has long

remained at the theoretical level. The co-activation pattern analysis and brain functional network methods employed in the FDA-CAPMA framework provide technical means for quantifying brain functional changes before and after tuina intervention, enabling the mind-regulating effect to become visualizable and measurable [9]. This marks the transition of TCM tuina research from empirical description to evidence-based quantification.

4.3. Cognitive Impairment in Older Adults: Multimodal Early Warning and Intelligent Rehabilitation

With the acceleration of population aging, cognitive disorders such as Alzheimer's disease have become major public health challenges. The application of Intelligent Medical Engineering in this field is promoting the formation of a novel prevention and treatment model characterized by early warning, precise intervention, and full-process management.

The research team at the Institute of Intelligent Medicine Frontier Interdisciplinary Sciences of Hangzhou Medical College focuses on the early warning and intervention of neurological disorders and has developed a multimodal early warning system for Alzheimer's disease and an intelligent rehabilitation device package for TCM brain disorders [6]. This system integrates neuroimaging, blood biomarkers, cognitive-behavioral assessment, and the four diagnostic methods of TCM, employing artificial intelligence algorithms to identify populations at high risk of early cognitive decline. The intelligent rehabilitation device package combines traditional TCM therapies, such as moxibustion and acupoint massage, with intelligent sensing and human-computer interaction technologies, thereby providing personalized and quantifiable home-based rehabilitation solutions for patients with cognitive impairment [6].

The comprehensive application of intelligent rehabilitation engineering in Chinese and Western brain rehabilitation reflects multidimensional synergistic innovation, including the integration of engineering technologies with innovative methods for brain functional rehabilitation, brain rehabilitation based on neural circuit reconstruction mechanisms, and TCM intelligent rehabilitation [10]. This model emphasizes the transformation from disease treatment to health management and from experience-driven approaches to data-driven paradigms, offering new perspectives for addressing the health challenges of an aging society.

5. Challenges and Future Prospects

5.1. Deep Dilemmas in Theoretical Integration

Although Intelligent Medical Engineering provides powerful tools for the integration of Neuroscience and traditional Chinese medicine (TCM), theoretical integration still faces profound dilemmas. TCM theory is rooted in Eastern philosophical thinking, taking qi, yin-yang, and the five elements as its conceptual framework and emphasizing holistic interconnection and dynamic balance. By contrast, Neuroscience follows a reductionist paradigm and seeks to elucidate mechanisms at the molecular, cellular, and circuit levels. The two theoretical systems differ fundamentally at both the ontological and epistemological levels, and the simple application of neuroscience concepts to explain TCM theories may create the risk of forcing an inappropriate fit [8].

Addressing this dilemma requires deeper theoretical innovation. Some scholars have proposed the construction of a middle-range theory, namely, developing operational and testable intermediate concepts that serve as a bridge between traditional theories and modern science while preserving the core thinking of TCM [8]. The formation of the theoretical system of acupuncture neuroscience is precisely an embodiment of this approach: it retains the theoretical framework of meridians and acupoints in acupuncture while introducing neuroscience concepts such as brain functional networks, thereby achieving the alignment of theory and methodology at an intermediate level.

5.2. Practical Bottlenecks in Technological Applications

At the level of technological application, the empowerment of TCM development by Intelligent Medical Engineering still faces multiple bottlenecks. The first concerns data-related challenges. TCM clinical data are characterized by multimodality, unstructured formats, and substantial interindividual variability, while high-quality annotated datasets remain relatively scarce, thereby constraining the training and validation of artificial intelligence models. The second concerns standardization. TCM diagnosis and treatment lack unified operational protocols and evaluation standards, and treatment strategies often vary considerably across regions, hospitals, and individual practitioners, posing challenges for the development and dissemination of intelligent systems [8]. The third concerns validation. The effectiveness of intelligent diagnostic and therapeutic systems must be verified through rigorously designed clinical trials; however, whether traditional evidence-based medicine methodologies are fully applicable to the personalized nature of TCM diagnosis and treatment still requires in-depth exploration.

5.3. Future Development Directions

Looking ahead, the integrated development of Intelligent Medical Engineering with Neuroscience and TCM may focus on breakthroughs in the following directions.

First, a three-stage paradigm of interpretation–enhancement–integration should be established. In the first stage, intelligent technologies are used to interpret the scientific connotations of TCM theories and elucidate the mechanisms of interventions such as acupuncture and herbal medicine in the language of neuroscience. In the second stage, intelligent devices are employed to enhance the capabilities of TCM diagnosis and treatment, improving clinical efficacy through Brain–Computer Interfaces and human–machine collaboration. In the third stage, deep integration of theory and technology is achieved, giving rise to new medical paradigms and diagnostic–therapeutic systems [3][5].

Second, a brain science research framework with distinctive TCM characteristics should be developed. Starting from the TCM concepts of the holistic view and syndrome differentiation–based treatment, it is necessary to establish paradigms for brain function research that align with the cognitive characteristics of TCM, rather than simply transplanting concepts and methods from Western neuroscience. For example, TCM concepts such as qi-blood and yin–yang may be mapped onto modern concepts such as neurovascular coupling and excitatory–inhibitory balance, thereby developing a distinctly Chinese framework of TCM brain science [8].

Third, bidirectional empowerment between data-driven and knowledge-driven approaches should be promoted. On the one hand, artificial intelligence can be used to

mine new diagnostic and therapeutic patterns as well as mechanistic hypotheses from clinical data. On the other hand, TCM theoretical knowledge and the experience of master practitioners can be incorporated into algorithmic models, thereby realizing the synergistic driving force of both data and knowledge [7][9].

Fourth, an open and collaborative innovation ecosystem should be established. The integration of Intelligent Medical Engineering with neuroscience and TCM involves multiple disciplines, making it essential to build cross-institutional and cross-regional collaborative innovation platforms. The establishment of platforms such as the Haihe Laboratory of Brain–Computer Interaction and Human–Machine Integration and the Ministry of Education Engineering Research Center for Intelligent Rehabilitation of TCM indicates that such an innovation ecosystem is already taking shape [3][10].

6. Conclusions

The integration of Intelligent Medical Engineering with Neuroscience and TCM represents not only an innovative exploration at the technological level but also a profound dialogue at the theoretical level. Intelligent technologies represented by Brain–Computer Interfaces, large artificial intelligence models, and multimodal neuroimaging are building a bridge between traditional TCM and modern neuroscience. Through this bridge, the TCM theory of the “brain” can be reinterpreted in the language of modern science, while traditional therapies such as acupuncture and tuina gain support from underlying neurobiological mechanisms.

Innovative achievements such as the “Shengong–Huatuo” brain-controlled acupuncture system, intelligent moxibustion robots, and the federated learning–based diagnostic framework for depression have preliminarily validated feasible pathways through which intelligent technologies can empower the modernization of TCM. These explorations reveal an important trend: Intelligent Medical Engineering is not merely the simple application of technology to TCM, but rather a profound methodological transformation of the TCM diagnostic and therapeutic paradigm—from empirical description to mechanistic elucidation, from passive reception to active participation, from standardization to personalization, and from single-modality approaches to multimodal integration.

Looking to the future, with the continuous evolution of intelligent technologies and the deepening of interdisciplinary research, a future medical system that deeply integrates modern technology with traditional wisdom is taking shape. This path of exploration concerns not only the modernization of TCM but also the contribution of a Chinese solution to global health governance—achieving more efficient and sustainable health protection at lower cost [5]. In this process, Intelligent Medical Engineering will play an irreplaceable role as both a catalyst and a bridge, promoting dialogue and integration between Eastern and Western medicine at a higher level.

Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

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