

## Research on Development Strategies for Pharmaceutical Science and Technology Journals Under the New Situation of Zhejiang Province' s Biopharmaceutical Industry Development: A Case Study of Chinese Journal of Modern Applied Pharmacy (Postprint)

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### Abstract

**[Objective]** To investigate the current development status and existing problems of Zhejiang Province' s biomedical industry, as well as the current status and issues of biomedical scientific journals in Zhejiang, explore the supporting and promoting role of scientific journals in industrial development, and propose strategic measures for *Chinese Journal of Modern Applied Pharmacy* to serve the development of the biomedical industry.

**[Methods]** Using a combination of literature research and case analysis methods, an in-depth investigation and study of Zhejiang Province' s biomedical industry and scientific journals was conducted.

**[Results]** While Zhejiang Province' s biomedical industry is developing rapidly, it also faces certain problems, such as limited overall scale and insufficient innovation capacity. Similarly, biomedical scientific journals in Zhejiang also have issues in aspects like publication models, academic level, and dissemination channels. To address these problems, this article proposes strategic measures for *Chinese Journal of Modern Applied Pharmacy* to serve the development of the biomedical industry, aiming to enhance innovation capacity, upgrade brand image, and achieve collaborative innovative development for Zhejiang' s pharmaceutical industry. These measures include strengthening the journal' s academic quality and influence, improving its readability and visibility, expanding its dissemination channels, and establishing deep cooperation with industrial enterprises.

**[Conclusion]** Integrating medical scientific journals into research development and organically combining them with pharmaceutical innovation research can enhance innovation capacity, upgrade brand image, and achieve collaborative innovative development between industry and journals.

## Full Text

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#### Research on Development Strategies for Pharmaceutical Science and Technology Journals Under the New Situation of Zhejiang Province's Biomedical Industry Development—A Case Study of *Chinese Journal of Modern Applied Pharmacy*

(*Chinese Journal of Modern Applied Pharmacy* Editorial Office, Hangzhou, Zhejiang 310052)

## Abstract

**Objective:** This study investigates the current status and existing problems of Zhejiang Province's biomedical industry and its pharmaceutical science and technology journals, explores the supportive and promotional role of scientific journals in industrial development, and proposes strategic measures for *Chinese Journal of Modern Applied Pharmacy* to serve the biomedical industry.

**Methods:** A combination of literature research and case analysis was employed to conduct an in-depth investigation of Zhejiang's biomedical industry and its scientific journals.

**Results:** While Zhejiang's biomedical industry is developing rapidly, it faces challenges such as insufficient overall scale and inadequate innovation capacity. Similarly, the province's biomedical science and technology journals have issues in operational models, academic standards, and dissemination channels. To address these problems, this article proposes strategies for *Chinese Journal of Modern Applied Pharmacy* to serve the biomedical industry and enhance Zhejiang's pharmaceutical sector, including strengthening academic quality and influence, improving readability and visibility, expanding dissemination channels, and establishing deep cooperation with industrial enterprises.

**Conclusion:** Integrating medical science journals into scientific research development and organically combining them with pharmaceutical innovation research can enhance the innovation capacity of the pharmaceutical industry, upgrade brand image, and achieve collaborative innovation and development between industry and journals.

**Keywords:** Biomedicine; scientific journals; dissemination channels; academic influence; industrial development

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In recent years, responding to General Secretary Xi Jinping' s call to “write our papers on the land of our motherland,” China has accelerated the construction of world-class journals to advance scientific innovation and build a global scientific powerhouse. Scientific journals constitute a crucial component of national scientific soft power and play a vital role in promoting industrial development. The *Opinions on Deepening Reform and Cultivating World-Class Scientific Journals* emphasizes strengthening academic journal construction to comprehensively enhance their capacity to gather global innovative ideas and top talent, thereby boosting national scientific competitiveness [1]. In May 2021, the Publicity Department of the CPC Central Committee, Ministry of Education, and Ministry of Science and Technology jointly issued the *Opinions on Promoting the Prosperous Development of Academic Journals*, stating that “scientific journals should focus on the tasks of building an innovative country and scientific powerhouse, concentrate on major national strategic needs, and serve economic and social development” [2]. As a demonstration zone for high-quality development and common prosperity, Zhejiang Province has implemented a series of provincial science and technology innovation policies based on national policies, vigorously promoting comprehensive innovation centered on scientific innovation and based on an innovation ecosystem, placing its overall scientific development level among the nation' s top tier [3]. However, in the fields of biomedical industry and pharmaceutical science and technology journals, Zhejiang still faces problems and shortcomings, such as the relatively small overall scale of the biomedical industry and insufficient innovation capacity.

## 1. Current Status and Problems of Zhejiang' s Biomedical Industry

### 1.1 Current Status of Zhejiang' s Biomedical Industry

Zhejiang' s biomedical industry represents one of the province' s key economic pillars. According to the *Zhejiang Province Pharmaceutical Industry Development 14th Five-Year Plan*, in 2020, the province' s pharmaceutical industry above designated size (including pharmaceuticals, medical devices, and pharmaceutical equipment manufacturing) achieved a total industrial output value of 215.071 billion yuan, operating revenue of 208.47 billion yuan, total profits

of 37.345 billion yuan, and export delivery value of 54.476 billion yuan, with average annual growth rates of 12.6%, 12.0%, 21.3%, and 13.4% respectively over five years, ranking among the top industries in growth rate. Eleven companies were selected for the “China’s Top 100 Pharmaceutical Enterprises” list, five were chosen as provincial “Eagle Action” cultivation enterprises, and 50 pharmaceutical companies were listed on the Shanghai and Shenzhen stock exchanges, accounting for nearly one-seventh of the national total. Key parks such as the Hangzhou Qiantang New Area High-end Biomedical Industry Platform, Shaoxing Binhai New Area High-end Biomedical Industry Platform, and Taizhou Pharmaceutical Industry Agglomeration Area, as well as characteristic towns like Hangzhou Pharmaceutical Port and Pan’an “Jiangnan Medicine Town,” are advancing steadily, continuously improving industrial agglomeration [4].

Zhejiang’s biomedical industry structure is relatively complete, covering upstream pharmaceutical R&D and production to downstream medical device sales and pharmaceutical distribution. The industry is dominated by small and medium-sized enterprises, including numerous high-tech companies with strong innovation capabilities in developing new products, technologies, and processes. In 2020, R&D expenditure of pharmaceutical enterprises above designated size accounted for 4.9% of operating revenue, ranking among the top industrial sectors. During the 13th Five-Year Plan period, the province approved 14 new drug production licenses, 201 innovative drug clinical trial approvals, and 15 national science and technology awards, and pioneered a technology transfer platform for drug marketing authorization holders, accumulating 286 holder approvals [4].

## 1.2 Problems Facing Zhejiang’s Biomedical Industry

Despite progress, Zhejiang’s biomedical industry faces several shortcomings. First, the overall scale and capacity remain limited, with the province’s biomedical industry ranking around fifth nationally for two consecutive years; only two pharmaceutical manufacturing enterprises exceed 10 billion yuan, and none rank among the top ten in “China’s Pharmaceutical Industry Top 100.” Second, innovation capacity needs improvement, with few “national-level” major innovation carriers and a lack of specialized innovation infrastructure such as biological sample banks, gene banks, and biosafety level-3 laboratories. During the 13th Five-Year Plan period, only six Class 1 new drug specifications and six innovative medical devices were approved by the National Medical Products Administration, far lower than leading provinces and cities [4]. Third, the service system requires improvement, with few high-level service organizations like contract research organizations (CROs) and contract manufacturing organizations (CMOs), insufficient resources for drug clinical trial institutions, safety evaluation organizations, and medical device testing service platforms, no vaccine batch release institutions, and an underdeveloped targeted investment and financing system. Fourth, the professional talent pool is inadequate, with an urgent need to cultivate provincial registration and approval service personnel and

professionals in quality control, quality assurance, and drug registration. Fifth, development space constraints are prominent, with scarce Category 3 industrial land in most regions, separation between innovation resources and industrialization factors like land and environmental protection, incomplete cross-regional cooperation mechanisms, and a need to further develop high-level industrial platforms.

## 2. Current Status and Problems of Zhejiang's Pharmaceutical Science and Technology Journals

### 2.1 Overview of Zhejiang's Pharmaceutical Science and Technology Journals

The *Chinese Core Journals Overview* (Peking University Chinese Core Journals) and Chinese Science and Technology Core Journals Database are authoritative domestic journal databases, and inclusion in these databases largely reflects a journal's academic level. According to China National Knowledge Infrastructure statistics, Zhejiang had 204 academic journals in 2022, including 26 Chinese medical and health journals (14.2%), with only one pharmaceutical journal—*Chinese Journal of Modern Applied Pharmacy*. The province has few Chinese medical journals, generally low quality, with only three (11.5%) included in both core databases, 11 (42.3%) in a single core database, and 12 (46.2%) not included in any core database (see Table 1).

Zhejiang has 14 English scientific journals, accounting for 4.20% of the national total [5], including seven medical journals: *Journal of Zhejiang University (English Edition) B (Biomedicine & Biotechnology)*, *World Journal of Emergency Medicine*, *Hepatobiliary & Pancreatic Diseases International*, *World Journal of Pediatrics*, *Eye and Vision*, *World Journal of Pediatric Surgery*, and *Infectious Microbes & Diseases*, with the first five already included in SCI. However, medical science and technology journals have long lagged behind scientific and technological development, with few provincial high-level experts involved in journal construction and a persistent “SCI-only” tendency that prevents effective improvement of academic quality. Third, multimedia integrated publishing levels are low and dissemination channels are insufficient. Due to technical and talent constraints, many publishing institutions have not truly achieved multimedia integrated publishing. While 50.0% of Zhejiang's scientific journals have WeChat official accounts [5], operational levels are generally low, mostly publishing journal articles rather than interesting, knowledge-rich professional information, with little interaction with readers, resulting in low attention and inability to fully leverage new media advantages.

### **3. Strategies for Zhejiang' s Pharmaceutical Science and Technology Journals to Serve Biomedical Industry Development**

As Zhejiang' s biomedical industry flourishes, pharmaceutical science and technology journals play a crucial role in promoting industrial development. However, current problems such as fragmented operational models, low academic influence, and insufficient multimedia integrated publishing must be addressed. To better serve biomedical industry development and improve journal quality and influence, the following strategies are proposed.

#### **3.1 Building Large-Scale, High-Strength Journal Clusters**

Regarding operational models, journal cluster construction should be strengthened to build large-scale, high-strength journal echelons. Through cluster coordination and cooperation, resource sharing can be achieved to improve academic quality and influence [6]. Simultaneously, cluster specialization and refined management should be enhanced to improve service and management levels. Led by Zhejiang University' s journal cluster, the Zhejiang Provincial Pharmaceutical Science and Technology Journal Alliance should be established to serve the province' s biomedical industry development and advance world-class scientific journal construction, achieving collaborative innovation among high-level provincial experts and promoting integrated development of industry and journal influence.

#### **3.2 Enhancing Academic Influence and Quality**

In terms of academic influence, journals should strengthen academic exchange and cooperation to improve internationalization levels. Academic evaluation and management should be enhanced to improve academic quality and reputation. Additionally, support and cultivation of young scholars should be strengthened to improve innovation capacity and academic quality. Measures should be taken from two aspects: enhancing independent journal operation capabilities and improving the journal development environment to achieve autonomous, sustainable development [7].

#### **3.3 Strengthening Multimedia Integrated Publishing and Expanding Dissemination Channels**

For multimedia integrated publishing, multimedia technology applications should be enhanced to improve readability and appeal. Dissemination channels should be expanded to strengthen journal promotion and publicity, improving visibility and influence. Furthermore, cooperation with industrial enterprises can be strengthened to translate academic achievements into practical industrial outcomes. Scientific journals should leverage new media technologies to enhance mobile communication service models, establish personalized and interactive publishing service models, strengthen communication with

readers and authors through author services, reader services, short videos, and paper promotion, and vigorously develop knowledge services to improve communication power and influence [8].

## 4. Strategies for *Chinese Journal of Modern Applied Pharmacy* to Serve Biomedical Industry Development

### 4.1 Advantages of *Chinese Journal of Modern Applied Pharmacy*

*Chinese Journal of Modern Applied Pharmacy* is Zhejiang's only pharmaceutical science and technology journal, ranking not only in the province's top tier but also among China's best. The journal is included in all domestic journal evaluation databases, including Peking University Chinese Core Journals (ranking 7th among all pharmaceutical journals by core quantitative indicators), Chinese Science Citation Database (CSCD Core Collection), and Chinese Science and Technology Paper Statistics Source Journals (Chinese Science and Technology Core Journals). Internationally, it is included in Scopus (Netherlands), Chemical Abstracts (CA, USA), Cambridge Scientific Abstracts (Natural Sciences), International Pharmaceutical Abstracts (IPA, USA), and Japan Science and Technology Agency's Chinese Literature Database. In 2021, it was rated an Excellent Journal in East China and included in the *World Journal Clout Index (WJCI) Report (2020 Science & Technology Edition)*, ranking 32nd globally in the "Pharmacy Comprehensive" category (Q2 quartile) and 5th among Chinese journals.

The editorial board of *Chinese Journal of Modern Applied Pharmacy* gathers over 270 pharmaceutical experts from across China, essentially covering all pharmaceutical experts in Zhejiang Province from universities, hospitals, research institutes, and other institutions, forming an industry-academia-research-regulation expert team spanning basic R&D, enterprise production, clinical application, and supervision. Since 2009, the journal has been committed to digital integrated development, selected for the China Association for Science and Technology's journal digital publishing project in 2015, making significant progress in academic misconduct prevention, manuscript processing systems, and new media applications.

According to requirements from the Zhejiang Provincial Public Institution Reform Leading Group Office, on December 19, 2019, *Chinese Journal of Modern Applied Pharmacy* editorial office and Zhejiang Institute for Food and Drug Control were integrated to form Zhejiang Institute for Food and Drug Control (*Chinese Journal of Modern Applied Pharmacy* Editorial Office). After integration, the two units formed complementary advantages, accelerating journal quality improvement. In September 2020, the first Drug Safety Scientific Supervision and Innovation Development Summit was held, establishing the Zhejiang Provincial Drug Science and Technology Innovation Achievement Transformation Alliance to promote pharmaceutical achievement transformation and create a new journal development paradigm.

## 4.2 *Chinese Journal of Modern Applied Pharmacy* Serving Zhejiang's Biomedical Industry

**4.2.1 Focusing on National Major Needs and Competitive Scientific Fields for Quality Manuscript Organization** Organizing and soliciting manuscripts should focus on major national new drug development programs and National Natural Science Foundation projects, concentrating on pharmaceutical research with emphasis on common pathological mechanisms of diseases, precision research on major chronic diseases, comprehensive research on emerging infectious diseases, key technologies and translational research on personalized medicine, and modern medical connotations of traditional Chinese medicine theory. Special columns should be planned to organize high-quality manuscripts and promptly follow up on, report, and disseminate scientific research achievements.

**4.2.2 Guiding Academic Research Directions According to Zhejiang's Biomedical Industry Development** Following the guidance of Zhejiang's 14th Five-Year Plan for pharmaceutical industry development, journal columns and special issues should be planned according to policy orientation to guide research directions. With innovation leadership, digital empowerment, multi-party collaboration, and open sharing as content development directions, an "Innovative Drug Research" column should be established to target global pharmaceutical industry trends, using expert reviews and high-quality summaries as primary formats to synthesize the latest research directions and discuss application fields. A "Digital Intelligence Pharmacy" column should accelerate the development of "Internet + Life and Health" new models, promptly reporting digital transformation cases across all elements, links, and chains of the biomedical industry to promote high-quality development of Zhejiang's biomedical industry empowered by digital technology. A "Policy and Industrial Services" column should encourage establishing long-term mechanisms led by the market and guided by the government, creating a multi-party communication platform for government, enterprises, universities, industry associations, and service institutions to promote policy optimization and implementation. A "Zhejiang Eight Flavors Research Column" should be established based on genuine regional medicinal materials to accelerate secondary development of famous Chinese patent medicines and research on advantageous Chinese medicine compounds and active ingredients, promoting internationally recognized Chinese medicine standard systems and achieving high-quality development of the Chinese medicine industry.

**4.2.3 Coupling Local Universities, Laboratories, and Innovation Platforms Through the Zhejiang Drug Science and Technology Innovation Achievement Transformation Alliance** The alliance should deeply visit strategic innovation platforms such as the Hangzhou West City Science and Technology Innovation Corridor, Wenzhou Ring Daluo Mountain Science and Technology Innovation Corridor, and G60 Science and Technology Inno-

vation Corridor to gather high-quality innovation resources. It should leverage the role of editorial board members from prestigious universities and institutions including Zhejiang University, Westlake University, Zhejiang University of Technology, Wenzhou Medical University, Zhejiang Chinese Medical University, and Hangzhou Medical College. Relying on leading enterprises and research institutions with outstanding innovation capabilities, the alliance should establish a platform integrating advantageous innovation resources across the industrial chain, building itself into a provincial technology innovation and transformation center in the pharmaceutical field. Relying on key laboratories of Zhejiang Institute for Drug Control and various biomedical industry innovation bases, the journal platform should be used to establish a shared system for innovation resources and explore a co-construction mechanism to optimize the biomedical industry innovation ecosystem.

**4.2.4 Promoting First Release of Key Innovative Achievements in Zhejiang** Based on the industrialization achievements of new biomedical technologies, the journal should promote the first release of global new drug research results in Zhejiang, striving for first publication in *Chinese Journal of Modern Applied Pharmacy* of transformation achievements from national key R&D programs and major national new drug development projects. The journal should strengthen academic research tracking and reporting of newly obtained innovative drugs, improved new drugs, first generic drugs, innovative medical devices, innovative vaccines, and biosimilars in Zhejiang, including publishing research on development mechanisms, action mechanisms, and clinical trial results. The industry-academia-research cooperation system should be strengthened to bridge the “last mile” of innovation achievement transformation between universities and research institutes. The Zhejiang Provincial Drug Science and Technology Innovation Achievement Transformation Alliance should be actively cultivated as a third-party achievement transformation service institution to build a full life-cycle service chain for pharmaceuticals.

Zhejiang’s biomedical industry faces challenges of small overall scale, insufficient innovation capacity, imperfect service systems, inadequate professional talent, and prominent development space constraints. Correspondingly, the province has few pharmaceutical science and technology journals with weak overall academic influence that cannot achieve economies of scale. To build a high-quality development demonstration zone for common prosperity and protect public health, Zhejiang’s pharmaceutical science and technology journals should collaborate and innovate with the biomedical industry. Strengthening journal cluster construction, improving academic influence and quality, and enhancing multimedia integrated publishing and dissemination channels are important pathways to elevate journal standards. In implementation, *Chinese Journal of Modern Applied Pharmacy* serves industrial development through various methods, organizing and soliciting manuscripts around national major needs, scientific and technological development, and biomedical industry development, while establishing the Zhejiang Provincial Drug Science and Technology

Innovation Achievement Transformation Alliance to explore a shared system for innovation resources using the journal platform.

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*Note: Figure translations are in progress. See original paper for figures.*

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