

FOCAL POINT ON THE CHINESE PHARMACEUTICAL INDUSTRY

PRODUCED IN PARTNERSHIP WITH FOSUN PHARMA

CHINESE PHARMA SETS ITS SIGHTS ON FIRST-IN-CLASS

China's rapidly **EXPANDING PHARMACEUTICAL INDUSTRY** is pivoting from producing drugs that imitate to those that set agendas.

China has been consolidating an ambition to build a world-class pharmaceutical industry. With the emergence of new technologies, collaboration paradigms, and institutional support, the next natural step for the pharmaceutical industry is to move to developing drugs that are first-in-class candidates; those that use new and unique mechanisms to treat medical conditions.

The Chinese pharmaceutical market size tripled between 2013 and 2019, according to Statista, and is expected to be worth 833.2 billion yuan by 2025. Unlike its European and US counterparts, China has traditionally focused on drugs that are broadly similar to existing products, known as 'me-too' and 'follow-on' drugs. This situation is changing rapidly as China seeks to lead, not just follow. Establishing a reputation for drugs that are first-in-class, McKinsey & Company suggests, would require building on China's existing strengths like its digital prowess, or harnessing their burgeoning AI capacity for drug discovery.

Developing these more innovative drugs locally is imminent. "Chinese first-in-class drugs might be marketed in the next three years," says Aimin Hui, president of global R&D, and chief medical officer at the Chinese healthcare group, Fosun Pharma. But, Hui emphasizes, such acceleration would require a thorough understanding of data. Many mechanisms of the drugs are not yet explained by science: data-driven studies across different databases



FAST RISING
In January 2020, there were 821 investigational anticancer drug candidates in China, including 404 me-too and 359 first-in-class agents.

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1

China currently accounts for **AROUND 40%** of active pharmaceutical ingredients (APIs) produced globally.



2

Global contribution rates of China **RANKED SECOND (AFTER US) AND THIRD (AFTER US AND JAPAN)** in terms of the number of drugs in the pipeline and the number of newly marketed drugs, respectively.



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are needed to really 'see through' the details behind the figures in computer-aided drug design.

FIRST-IN-CLASS TECHNOLOGIES

China's major advances in quantum computing, with its ability to rapidly simulate large and complex molecules, might be the breakthrough for accelerating drug discovery, especially in early stages such as virtual screening and molecular dynamics simulations.

3D printing may also play a role in the realization of truly personalized medicine, especially for rare diseases. In April 2021 a partnership of two Chinese companies announced they had successfully 'printed' drugs for pulmonary arterial hypertension (PAH), a rare, progressive disorder characterized by high blood pressure in the lung arteries.

The burgeoning digital economy in China, ranked second globally in a 2021 white paper by the China Academy of Information and Communications Technology, is also helping innovation. With the largest population in the world, China is poised to link emerging mobile technologies with digital health care.

NEW COLLABORATION PARADIGM

Although it's still early days, these innovations also signal hope for the development of first-in-class drugs, and are testament to new collaboration models, globally and nationally, being created in China between academia, other CDMO (contract development and manufacturing outsourcing companies) and start-ups.

Biotech startups are working to generate cash flow to smooth the path for their own R&D with drug licensing deals. Some of the biggest licensing deals in history between a Chinese biotech and a Western firm, according to a Reuters report in September 2021, were signed just the year before.

Fosun Pharma has been in the spotlight recently for its COVID-19 vaccine strategic alliance with German biotechnology company BioNTech. However, as Hui notes, vaccines

and first-in-class drugs require lengthy, costly and unpredictable trial processes, so it is essential for pharmaceutical companies to be set up to bear the financial risk, and yet still maintain a profit margin.

While growing in innovation capacity, the Chinese pharmaceutical industry must also respond to growth in domestic demand for high-quality pharmaceuticals. Its expansion has corresponded with demographic change: an increase in living standards, and an ageing population, are increasing the need for medical products and services.

He also notes that China's large population offers a further benefit. The enormity of its population brings potential for truly large-scale clinical studies, such as for liver and stomach cancer treatment, and other diseases whose unique epidemiological features and risk analyses are possible in China, but for whom subjects may be more difficult to enlist elsewhere.

INSTITUTIONAL SUPPORT

While a conducive environment for the biopharma industry has been facilitated through a series of regulatory reforms, a report series, 'Fostering China Pharmaceutical Innovation System', co-led by the China Pharmaceutical Innovation and Research Development Association (PhIRDA) and the R&D-based Pharmaceutical Association Committee (RDPAC), has called for more conformity to international standards.

Translational success of basic research also depends on talent and, in China, the number of STEM graduates is world-leading. For these graduates, there are more local opportunities than ever. "Ambitious young biomedical talent had usually only considered entering academia for ground-breaking research," says Hui, "But with advanced technologies and global resources, producing the highest standards of basic and clinical studies may also become possible within an in-house R&D team." ■

3

Medical publications with Chinese contributions have **MORE THAN DOUBLED FROM 4% TO 10%** during the period 2010-2019.



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