The information and statistics set forth in this section and elsewhere in this prospectus have been derived from an industry report commissioned by us and independently prepared by Frost and Sullivan in connection with the Global Offering. Unless otherwise noted, Frost & Sullivan has advised us that the statistical and graphical information contained herein is drawn from its database and other sources. The following discussion includes projections for future growth, which may not occur at the rates that are projected or at all. We believe that the sources of such information and statistics are appropriate and have taken reasonable care in extracting and reproducing such information. We have no reason to believe that such information and statistics are false or misleading in any material respect. None of our Company, the Joint Sponsors, Joint Global Coordinators, Joint Bookrunners, Joint Lead Managers, Underwriters, any other party (excluding Frost & Sullivan) involved in the Global Offering or their respective directors, advisors and affiliates have independently verified such information and statistics. Accordingly, none of our Company, the Joint Sponsors, Joint Global Coordinators, Joint Bookrunners, Joint Lead Managers, Underwriters, any other party involved in the Global Offering or their respective directors, advisors and affiliates makes any representation as to the correctness or accuracy of such information and the statistics contained in this prospectus, which may be inaccurate, incomplete, out-of-date or inconsistent with the other information complied within or outside the PRC. For the above reasons, information contained in this section shall not be unduly relied upon. For a discussion of risks relating to our industry, please refer to the section headed "Risk Factors — Risks Relating to Our Business and Industry" in this prospectus.

CHINA'S PHARMACEUTICAL MARKETS

Overview

China's pharmaceutical market steadily grew in recent years and is expected to continue such growth trend in the near future. China's pharmaceutical market reached RMB1,633.0 billion in 2019, representing a CAGR of 7.5% from 2015, and is estimated to reach RMB2,228.8 billion in 2024, representing a CAGR of 6.4% from 2019.

We focus on therapeutic areas with strong growth potential. Oncology is the fastest growing major therapeutic area in China's pharmaceutical market, with a CAGR of 13.5% from 2015 to 2019, and an expected CAGR of 15.0% from 2019 to 2024; oncology is also estimated to be the largest therapeutic area in China in 2024, with a market size of RMB367.2 billon and accounting for 16.5% of the total China's pharmaceutical market in 2024. Infectious diseases are currently the second largest therapeutic area in China, with a market size of RMB225.5 billion and accounting for 13.8% of China's pharmaceutical market in 2019. In particular, the increasingly challenging treatment of complex severe infection diseases has generated unmet medical needs, leading to promising market potential.

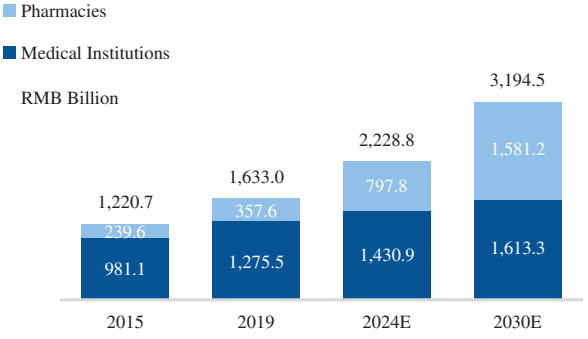
China's Pharmaceutical Market, Breakdown by Therapeutic Areas

Therapeutic Areas	Market Size						CAGR	
	2015		2019		2024E		2015-19	2019-24E
	RMB billion	*Market share*	*RMB billion*	*Market share*	*RMB billion*	*Market share*	*%*	*%*
Oncology[1]	110.2	9.0%	182.7	11.2%	367.2	16.5%	13.5%	15.0%
Alimentary tract and metabolism	173.3	14.2%	233.2	14.3%	318.9	14.3%	7.7%	6.5%
Infectious diseases[2]	195.8	16.0%	225.5	13.8%	260.7	11.7%	3.6%	2.9%
Central nerve system	144.0	11.8%	204.4	12.5%	250.9	11.3%	9.1%	4.2%
Cardiovascular system	158.8	13.0%	212.2	13.0%	247.7	11.1%	7.5%	3.1%
Blood and blood forming organ	101.9	8.4%	138.4	8.5%	184.5	8.3%	7.9%	5.9%
Respiratory system	61.4	5.0%	90.8	5.6%	131.5	5.9%	10.3%	7.7%
Muscle-skeleton system	53.5	4.4%	68.2	4.2%	90.0	4.0%	6.2%	5.7%
Systemic hormonal preparations[3]	41.4	3.4%	53.7	3.3%	72.9	3.3%	6.7%	6.3%
Urology	32.1	2.6%	41.2	2.5%	55.3	2.5%	6.4%	6.1%
Others	148.2	12.1%	182.5	11.2%	249.3	11.2%	5.4%	6.4%
Total	1,220.7	100.0%	1,633.0	100.0%	2,228.8	100.0%	7.5%	6.4%

Note: (1) not including cancer supportive care; (2) including severe infection; (3) excluding sex hormones and insulins.
Source: Frost & Sullivan

China's pharmaceutical market primarily consists of two channels: (i) medical institutions, including hospitals and primary healthcare providers (which refer to community health service centers and stations, township clinics and village clinics), and (ii) pharmacies. Although sales through medical institutions accounted for 78.1% of China's pharmaceutical market in terms of revenue, sales through pharmacies is fast-growing, with a CAGR of 17.4% from 2019 to 2024 and a CAGR of 12.1% from 2024 to 2030, in each period significantly outperforming the corresponding CAGR of sales through medical institutions. By 2030, sales revenue through pharmacies is estimated to reach RMB1,581.2 billion, accounting for 49.5% of China's pharmaceutical market.

Breakdown of China's Pharmaceutical Market by Sales Channels, 2015-2030E



Period	CAGR		
	Total	Medical Institutions	Pharmacies
2015-2019	7.5%	6.8%	10.5%
2019-2024E	6.4%	5.4%	17.4%
2024E-2030E	6.2%	4.1%	12.1%

Source: Frost & Sullivan

China's pharmaceutical market is characterized by the following entry barriers:

- **Regulatory compliance**: Each step along the business processes of the pharmaceutical industry, such as laboratory research, clinical trials, manufacturing and sales, is subject to stringent regulations. New entrants with less relevant experience are more prone to failing to comply with such regulatory requirements, leading to potential penalties from government regulatory authorities and loss of reputation among doctors and patients.
- **Professional talents**: Each step of pharmaceutical research, ranging from drug discovery to clinical trials and registration, requires close collaboration of a sizable group of multi-disciplinary talents, which is hard for new entrants to recruit.
- **Diversified product portfolio**: A diversified product portfolio not only helps pharmaceutical companies mitigate the risk of price fluctuation, but also provides synergistic effects during clinical development, regulatory approval and sales activities.
- **Upfront investments**: Pharmaceutical research, development and manufacturing activities require large amount of upfront investments, which may be hard for new entrants to afford.

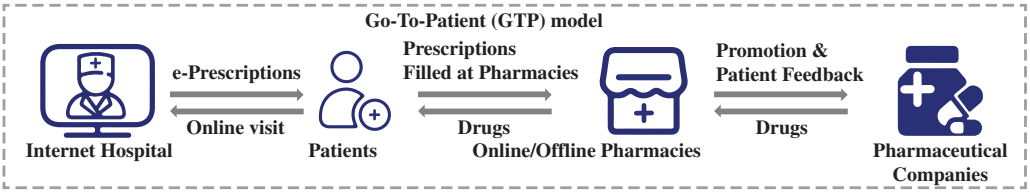
Growth Drivers and Major Trends in the PRC Pharmaceutical Market

Key growth drivers for the pharmaceutical industry in China include the following:

- **The aging trend of the Chinese population**: Due to population planning policies and the increase of average life expectancy, China's population has witnessed a significant trend of aging, which is expected to persist in the near future. In 2030, China's population aged 65 or above is estimated to reach 309.3 million, representing 21.5% of the total population in China. As elder people generally have a greater need for pharmaceutical products and services, the aging trend of China's population creates opportunities for China's pharmaceutical market.
- **Rising healthcare expenditure**: China's healthcare spending has grown steadily in recent years, both in overall level and per capita terms, due to the aging trend of the population and the rise in the prevalence of various diseases. Total healthcare expenditure in China reached RMB6,519.6 billion in 2019, representing a CAGR of 12.3% from 2015, and is expected to further grow at a CAGR of 10.3% from 2019 to 2024. The per capita healthcare expenditure in China has also grown rapidly in recent years, reaching RMB4,656.7 in 2019 and representing a CAGR of 11.8% from 2015, and is expected to further grow at a CAGR of 9.9% from 2019 to 2024.
- **Improving public medical insurance system**: Public medical insurance is the single largest payer for China's pharmaceutical market. The wide coverage and the significant growth in public medical insurance are both strong drivers for the growth of China's pharmaceutical market. In 2019, approximately 96.3% of China's population was covered by the public medical insurance. From 2015 to 2019, the public medical insurance revenue and expenditure grew at a CAGR of 20.2% and 21.0%, respectively. Moreover, the ongoing integration of public medical insurance terms for urban and rural residents will further improve the reimbursement standard and lead to greater opportunities in China's pharmaceutical market.

In China's pharmaceutical market, innovative drugs demonstrate promising prospects. Innovative drugs refer to the first drugs created containing the specific active ingredients to receive approval for its label, and the drug patents usually will be applied for and registered by the founding companies. In contrast, generic drugs refer to pharmaceutical drugs that contain the same active ingredient as the respective innovative drugs. Sales of innovative drugs accounted for 56.1% of the total China's pharmaceutical market in 2019, and is expected to account for 62.6% in 2024. The sales of innovative drugs in China are expected to grow at a CAGR of 8.8% from 2019 to 2024, significantly outpacing the growth of sales of generic and biosimilar drugs, which are expected to grow at a CAGR of 3.0% from 2019 to 2024.

In terms of the sales and marketing model, the Go-to-Patient ("GTP") model is gaining increasing popularity. This model started when pharmacies began to offer value-added services, such as drug deliveries and disease education campaigns, to enhance customer experience and loyalty. The GTP model has since evolved to encompass the Internet Hospital Model to provide full scope of services benefiting all stakeholders: (i) for patients, the GTP model allows them to order drugs online and have drugs delivered to them, efficiently enhancing their accessibility to drugs, (ii) for doctors and hospitals, the GTP model separates healthcare services and drug sales, thus enabling doctors to focus on the diagnosis and treatment of patients' diseases, (iii) for pharmaceutical companies, the GTP model extends their sales beyond hospitals into pharmacies to diversify their sales channel and maximize patient reach, and (iv) for pharmacies, the GTP model leads to an increase in drug sales revenue.



Source: Frost & Sullivan

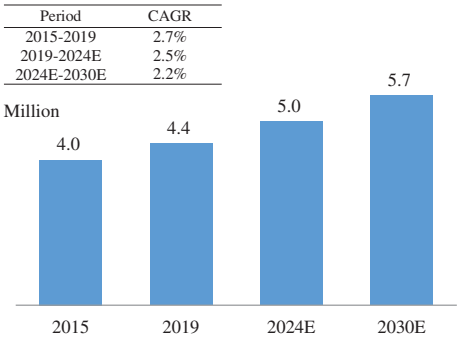
ONCOLOGY MARKET

Driven by multiple factors, the number of new cases of cancer in China has been constantly increasing, from 4.0 million in 2015 to 4.4 million in 2019, representing a CAGR of 2.7%. Such number is expected to further grow in the near future, reaching 5.0 million in 2024 and 5.7 million in 2030. Amongst other clinical adoptions, our proprietary product, Zadaxin, has been listed in the treatment guidelines for the treatment of liver cancer, pancreatic cancer and lymphoma, and the incidences of such cancers are expected to constantly increase in the near future. According to Frost & Sullivan, the incidence of liver cancer in China was 410.4 thousand in 2019, and is expected to reach 462.8 thousand in 2024 and 526.0 thousand in 2030, representing a CAGR of 2.4% from 2019 to 2024 and a CAGR of 2.2% from 2024 to 2030; the incidence of pancreatic cancer in China was 108.4 thousand in 2019, and is expected to reach 127.1 thousand in 2024 and 152.2 thousand in 2030, representing a CAGR of 3.2% from 2019 to 2024 and a CAGR of 3.0% from 2024 to 2030; the incidence of lymphoma in China was 95.4 thousand in 2019, and is expected to reach 107.1 thousand in 2024 and 121.6 thousand in 2030, representing a CAGR of 2.4% from 2019 to 2024 and a CAGR of 2.1% from 2024 to 2030. Furthermore, according to Frost & Sullivan, the market size of liver cancer drugs in China was RMB6.9 billion in 2019, and is expected to reach RMB23.1 billion in 2024 and RMB48.7 billion in 2030, representing a CAGR of 27.2% from 2019 to 2024 and a CAGR

of 13.2% from 2024 to 2030. The market size of pancreatic cancer drugs in China was RMB2.7 billion in 2019, and is expected to reach RMB5.4 billion in 2024 and RMB11.8 billion in 2030, representing a CAGR of 15.2% from 2019 to 2024 and a CAGR of 13.8% from 2024 to 2030. The market size of lymphoma drugs in China was RMB10.4 billion in 2019, and is expected to reach RMB31.3 billion in 2024 and RMB60.9 billion in 2030, representing a CAGR of 24.7% from 2019 to 2024 and a CAGR of 11.7% from 2024 to 2030.

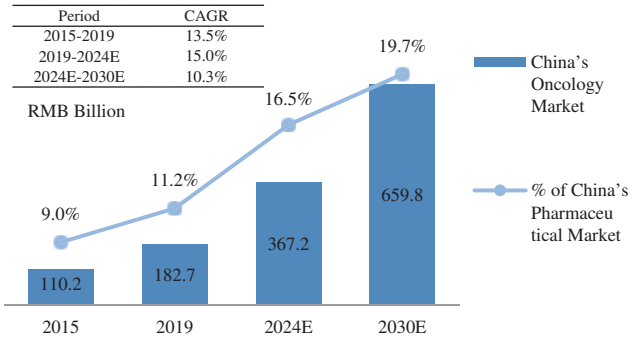
Significantly outpacing the growth rate of new cancer cases in China, the oncology drug market in China has demonstrated robust growth and is expected to continue such high-growth rate in the near future. In 2015, the size of oncology drug market in China was RMB110.2 billion, accounting for 9.0% of the total China's pharmaceutical market. In 2019, the oncology drug market in China reached RMB182.7 billion, accounting for 11.2% of China's pharmaceutical market and representing a CAGR of 13.5% from 2015 to 2019. In 2024, the oncology drug market in China is estimated to reach RMB367.2 billion, accounting for 16.5% of China's pharmaceutical market then and representing a CAGR of 15.0% from 2019 to 2024. In 2030, the oncology drug market in China is estimated to reach RMB659.8 billion, accounting for 19.7% of China's pharmaceutical market then and representing a CAGR of 10.3% from 2024.

Estimated New Cases of Cancer in China, 2015-2030E



Source: Frost & Sullivan

China's Oncology Drug Market Size and Forecast, 2015-2030E



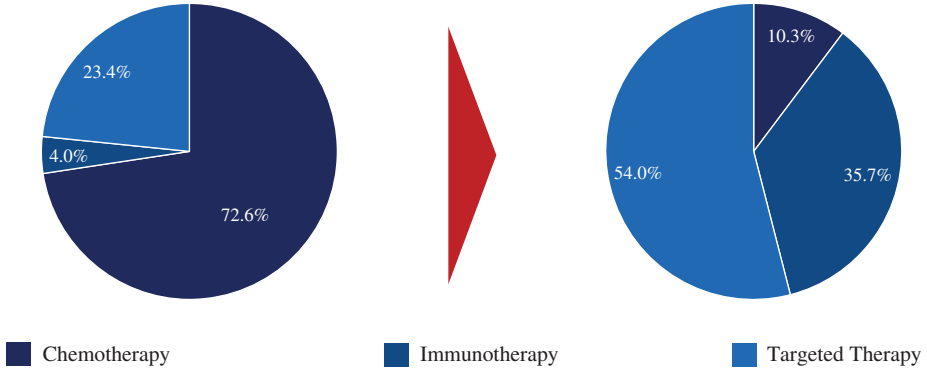
Source: Frost & Sullivan

The oncology drug market covers both the cancer treatment market and the cancer supportive care market. In terms of treatment methods, cancer treatment has gone through a long process of development in history. Today, major treatments include surgery, radiotherapy, chemotherapy, and precision oncology (which includes targeted therapy and immunotherapy). In addition, cancer supportive care, which refers to the medical care that focuses on relieving the symptoms caused by cancer treatments to improve the quality of life, has also evolved over time with the development of various cancer treatment methods.

In 2019, China's oncology drug market is dominated by chemotherapy drugs, which accounted for approximately 72.6% of the total China's oncology drug market, in terms of sales revenue. The targeted therapy drugs accounted for 23.4%, and immunotherapy drugs accounted for the remaining 4.0%. The drivers for immunotherapy and targeted therapy include favorable policy such as Notice for the Publication of the Health China — Implementation Plan for Cancer Prevention (2019-2022 edition)(《關於印發健康中國行動——癌症防治實施方案(2019 — 2022年)的通知》) issued by the NHC,

NMPA and eight other national authorities, which requires a comprehensive clinical evaluation system for oncology drugs to be established and the approval of both domestic and imported oncology drugs to be accelerated. Another driver is technology advancement, for instance in immuno-oncology field more categories of drugs have been discovered and further researched such as targeted antibodies, bispecific antibodies, checkpoint inhibitors, oncolytic virus therapy, cancer vaccines, etc., providing more treatment options for cancer patients. In addition, along with the continuous growth in economy and urbanization, the average income level of the Chinese residents has also increased continuously in recent years. From 2015 to 2019, the per capita disposable income increased from RMB21,966 to RMB30,733, representing a CAGR of 8.8%. According to Frost & Sullivan, by 2024, the per capita disposable income is expected to increase to RMB44,614, with a CAGR of 7.7% from 2019 to 2024. This illustrates that affordability has been increasing and is expected to further improve from the patient side, allowing greater penetration of targeted therapy and immunotherapy. Immunotherapy and targeted therapy are expected to account for 35.7% and 54.0%, respectively, of China's oncology drug market in 2030.

Breakdown of the Oncology Drug Market by Therapy in China, in terms of revenue, 2019 and 2030 E



Source: Frost & Sullivan

The oncology drug market in China is expected to demonstrate the following trends in the future:

- **Managing cancer as a chronic disease**: With the availability of anti-cancer drugs and the effectiveness of health management, the five-year survival rate for cancer patients has been increased, making cancer a kind of chronic disease like diabetes and hypertension, which requires not only treatment but also after-treatment and follow-up rehabilitation. Such trend has led to an increasing demand for more advanced screening methods, such as genetic sequencing and imaging detection, and more advanced rehabilitation solutions, such as special nutritional support, cachexia treatment and comorbidity treatment.
- **Emerging innovative therapies**: Emerging innovative therapies such as ADCs, gene-based therapies and cell-based therapies are now recognized as effective treatments for a specific subset of cancers. The fast-evolving clinical progresses in emerging innovative therapies are attributable to the exponential growth in understanding of the underlying cell biology, the increasingly sophisticated techniques for genetic engineering, and the increasingly advanced technology for using synthetic biology to control cellular therapeutics.

- **Expanding combination therapies**: The combination of the different therapies, such as chemotherapy with immunotherapy, would bring better efficacy of the treatment, which leads to the future direction of development for cancer therapies. The launch of an increasing number of therapies in China, such as immunotherapy, has greatly enhanced the chance to combine multiple therapies for cancer treatment.
- **Improving affordability**: The average per capita disposable income in China is expected to continue growing in the near future, which is expected to increase the willingness and ability of patients to pay for cancer treatment, including more expensive medical treatments and medications such as oncology drugs.

Such trends in the oncology drug market in China can be attributed to the drivers below:

- **Increasing number of cancer patients**: In 2019, new cases of Chinese cancer patients have reached 4.4 million. Driven by a series of factors including aging of the population, pollution, and the prevalence of unhealthy lifestyle such as smoking, high caloric diet, and lack of exercise, the number of oncology patients in China will grow further, which will drive the expansion of China's oncology drug market.
- **Growing demand for new drugs**: The demand and unmet needs for new drugs and new therapies, such as new immunotherapy, are expanding. Patients worldwide generate great demand for new drugs that are used to treat diseases such as cancers.
- **Technology advancement**: The application of biotechnology in pharmaceutical science has led to a series of breakthroughs in the development of new drugs. Biotechnology can create substances that cannot be found in nature and integrate two molecules of different substances into one to exploit benefits from both of them. In addition, biotechnology advancement may improve R&D efficiency and decrease R&D and production costs.
- **Rising small- and mid-sized pharmaceutical companies**: Many small- and mid-sized pharmaceutical companies can offer more attractive career opportunities for sales and R&D talents than MNCs. As many small- and mid-sized pharmaceutical companies are more flexible in operation and concentrate more on specialty drugs such as oncology drugs, the talent attrition from MNCs to small- and mid-sized pharmaceutical companies has brought more opportunities into the oncology drug industry.

Chemotherapy

Overview

Chemotherapy is a cancer treatment that uses chemical substances, especially one or more anti-cancer drugs to stop or slow the growth of cancer cells. Chemotherapy can be used to treat many types of cancer alone or in combination with other treatments. Chemotherapy also causes side effects such as mouth sores, nausea, and hair loss. Typical chemotherapeutic drugs include alkylating agents, antimetabolites, and anti-tumor antibiotics.

Platinum Chemotherapeutics Market

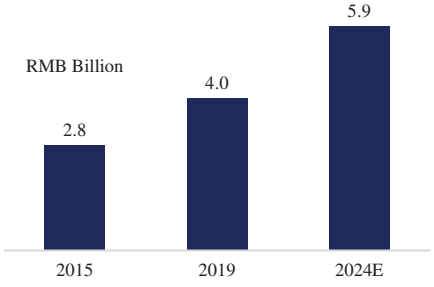
One of the sub-divisions within the chemotherapy market is the platinum chemotherapeutics market, where our pipeline product PT-112 competes in. Platinum chemotherapeutics, also known as

platinum-based anti-neoplastic drugs, are chemotherapeutic agents used to treat cancers such as lung, ovarian and breast cancer. As coordination complexes of platinum, platinum chemotherapeutics can cause the formation of platinum-DNA adducts, which will interfere with the transcription and replication of DNA, and initiate a DNA-damage recognition response that results in apoptosis. However, platinum chemotherapeutics have toxic side effects, and tumors can become resistant to them.

The platinum chemotherapeutics market in China is growing robustly, which lays out the growth prospects for our pipeline candidate, PT-112, a platinum containing compound which aims to cover indications of late stage prostate cancer and cholangiocarcinoma. The market of platinum chemotherapeutics in China, in terms of sales revenue, amounted to RMB4.0 billion in 2019, representing a CAGR of 9.9% from 2015. The market of platinum chemotherapeutic in China is estimated to reach RMB5.9 billion in 2024, representing a CAGR of 8.0% from 2019 to 2024.

The current platinum chemotherapeutics market in China faces two challenges: (i) drug resistance, including intrinsic resistance, where cancer cells are inherently resistant to platinum chemotherapeutics, and acquired resistance, where up to 80% of ovarian cancer patients eventually would develop, and (ii) drug toxicity, as serious toxicity effects may develop among patients who adopt platinum chemotherapeutics. Such challenges call for innovative platinum chemotherapeutics products, where drug resistance can be prevented and drug toxicity can be reduced. Developed to address such unmet clinical needs, PT-112 has demonstrated competitive advantages over competitors based on its ability to delay drug resistance, as well as its more favorable side-effect profile.

China's Platinum Chemotherapeutics Market Size and Forecast, 2015-2024E



Period	CAGR
2015-2019	9.9%
2019-2024E	8.0%

Source: Frost & Sullivan

In the future, the platinum chemotherapeutics market in China is expected to demonstrate the following trends:

- **Emerging innovative chemicals**: In the future, emerging innovative chemicals may deploy active targeting strategies in order to achieve better anti-tumor efficacy. Emerging innovative chemicals with different tissue distribution or mechanism of membrane transport may contribute to a greater variety of future platinum-based therapies.
- **Reduced adverse effects**: The future development of platinum drug delivery systems will focus on toxicity problems and reduce toxicity of platinum-based drugs. The reduction of adverse effects requires not only successful delivery, but also sufficient release of the drug at the tumor site.

- **Reduced resistance**: In future therapies, complexes with distinctively different DNA interaction modes from current platinum-based therapies may play a vital role. Such complexes may circumvent intrinsic and acquired resistance to the current platinum based treatments through eluding the vigilance of DNA repair systems.

Targeted Therapy

Overview

Targeted therapies block the growth and spread of cancer by interfering with cell signaling pathways. Targeted therapy uses an agent (or combination of agents) that acts with a high degree of specificity on a well-defined target or biologic pathway that drives the cancer phenotype, so that when the patient is treated with the agent(s), the cancer cells are destructed, with minimal harm to normal cells. Currently, the main categories of targeted therapy are monoclonal antibodies and small molecules. Targeted therapy market accounted for 23.4% of the total oncology drug market in China in 2019 and is expected to account for 54.0% of the total oncology drug market in China in 2030.

Small Molecule Drug Conjugates ("SMDCs") Market

One of the many sub-divisions within the targeted therapies market is the SMDCs market, where our pipeline product PEN-866 competes in. The SMDCs are built with three modules: (i) a targeting ligand, which has low-molecular weight and high affinity and can bind to specific receptors, (ii) a linker, which is designed to be stable in the bloodstream and then releases the active drug from the targeting ligand when the SMDC is taken up by the diseased cell, and (iii) a drug payload, which is a highly active molecule that is too toxic to be administered in its untargeted form at therapeutic dose levels. This modular approach allows the combination of various targeting ligands, linkers and drug payloads to generate SMDCs for different diseases.

As of October 31, 2020, there had been no approved SMDCs or relevant ongoing clinical trials in China. There are two SMDC candidates currently undergoing clinical trial worldwide, as illustrated in the following table.

Drug Name	Target	Indications	Sponsors	Phase	First Posted Date*	Location
PEN-866	HSP90, TOP1	Solid Tumors	Tarveda Therapeutics	I/IIa	2017/7/18	US
PEN-221	SSTR2	Neuroendocrine Carcinoma, Small Cell Lung Tumors	Tarveda Therapeutics	I/IIa	2016/10/18	US, UK

**Note: First Posted Date indicates the date that the sponsor of the clinical trial first submitted the study record to clinicaltrials.gov.*

Compared with traditional targeted small molecular drugs and antibody-drug conjugates ("ADCs"), SMDCs have many advantages: (i) SMDCs have lower molecular weights, so they have a

higher potential for good cell penetration in solid tumors, and the targeting ligands and linkers can be adjusted to make conjugates with the desired pharmacokinetics, (ii) synthesis of SMDCs is much more manageable, in comparison with the preparation of ADCs where the ratio of payload and antibodies is uncertain, and (iii) SMDCs have a non-immunogenic nature, as they, unlike the ADCs, do not rely on binding antigens that express on tumor cells.

The SMDCs market is expected to demonstrate the following trends in the future: (i) the targeting ligand is expected to improve in binding affinity (so the dose of drug needed to achieve high efficacy is reasonably reduced), in target selectivity (so the toxicity of the payload towards normal cells can be reduced), and in conjugate size (so low-molecular-weight therapeutic cargo can be much easier to release into the tumor), (ii) the linker is expected to enhance in both the ability to improve the hydrophilicity of the SMDCs, and the ability to release the parent drug at predicable site and reliable rate, and (iii) the drug payload is expected to have higher efficiency, fewer multi-drug interaction, less intracellular metabolism, higher binding affinity and enhanced drug release and metabolism effects.

The competitive advantage of SMDCs over traditional targeted small molecular drugs and ADCs, the currently undeveloped competitive landscape for SMDCs in China and the future trends in the SMDCs market together set forth the future growth prospects for our candidate product PEN-866.

PI3K/Akt/mTOR-targeted Drug Market

Another example of targeted therapies is the PI3K/Akt/mTOR pathway. The PI3K/Akt/mTOR pathway regulates multiple normal cellular functions (i.e. cellular proliferation, growth, survival and mobility) that are also critical for tumorigenesis. Activation of the PI3K/AKT/mTOR pathway contributes to the development of tumor and resistance to anti-cancer therapies. PI3K/Akt/mTOR pathway dysregulation is frequently found in a wide spectrum of tumors including breast cancer, colorectal cancer, and hematologic malignancies, and thus becomes an attractive target for anti-cancer treatment. Inhibition of PI3K/Akt/mTOR pathway can result in both decreased cellular proliferation and increased cellular death.

The safety and efficacy of small molecule inhibitors of PI3K/Akt/mTOR pathway have been investigated in a wide range of pre-clinical and clinical trials, and it is becoming increasingly clear that PI3K/Akt/mTOR inhibitors are effective in inhibiting tumor progression. Besides, currently available oral administration of potent PI3K/Akt/mTOR inhibitors for cancer treatment provides additional convenience to patients. Our pipeline product ABLT-0812 targets the PI3K/Akt/mTOR pathway for treatment of endometrial cancer, lung cancer and pancreatic cancer.

Immunotherapy

Overview

Immunotherapy is a type of cancer treatment that helps the immune system of the patients fight cancer. Immunotherapy mainly consists of two categories and six treatment types: checkpoint

inhibitors, adoptive cell transfer, hormone immunomodulator, traditional Chinese medicine immunomodulator, therapeutic cancer vaccines and cytokines. The immunotherapy market accounted for 4.0% of the total oncology drug market in China in 2019. With favorable policy, technology advancement, and increasing affordability of patients, immunotherapy is expected to account for 35.7% of the total oncology drug market in China in 2030, demonstrating strong potential in the future.

Currently, the growth of the immunotherapy market is driven by the following factors:

- **Indication expansion**: At present, clinical trials for immunotherapy for many different indications in China are radically advancing, and the expected expansion of indications will drive the rapid development of the immunotherapy market in China.
- **Rapid development of new generations of technology**: Based on progress in both pre-clinical and clinical science, immunotherapy has become a sub-specialty within oncology owing to its unique science and its potential for substantial and long-term clinical benefits. Such development is based on progress in both pre-clinical and clinical science, including the development of new methods of investigations
- **Emerging biotech pharmaceutical companies**: Since the early 2000s, talents have been flowing from multi-national pharmaceutical companies to emerging biotech pharmaceutical companies, and their rich industry experiences and systematic knowledge of management will further drive the development of immunotherapy market.

In the future, the immunotherapy market is expected to demonstrate the following trends:

- **Combination therapy with new therapeutic targets**: The field of cancer immunotherapy is expected to advance towards more targeted approaches that enhance efficacy and reduce toxicity. With the discovery and verification of more therapeutic targets and signaling pathways, as well as the upgrading of treatment methods, immunotherapy will provide more flexible strategies for combination therapy.
- **Precision treatment**: The development of genetic sequencing and the increased detection efficiency have made it possible to set precise immunotherapy based on patient's own tumor conditions. In the future, pharmaceutical companies and diagnostic companies will cooperate with hospitals to build a more accurate diagnostic platform, so as to customize precision treatment strategies for patients.

The Anti-CD47 Therapy Market

One example of immunotherapy is the anti-CD47 therapy. CD47 (Cluster of Differentiation 47) is a transmembrane protein that is expressed on all normal cells in human and is found to be overexpressed on cancer cells. CD47 interacts with SIRPα (signal-regulatory protein α) on the surface of myeloid cells. The CD47-SIRPα interaction inhibits macrophage phagocytosis, allowing cancer cells to escape immune surveillance.

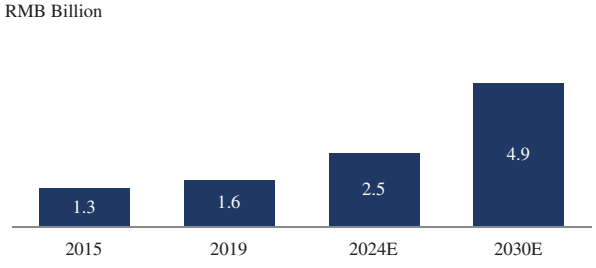
The anti-CD47 therapy works by targeting towards inhibiting the CD47-SIRPα interaction via anti-CD47 antibodies. This activates innate immunity and promotes cancer cell destruction by macrophages. Our pipeline product RRx-001 is an anti-CD47-SIRPα small molecule anti-cancer immunotherapeutic drug candidate, which competes in the anti-CD47 therapy market.

Neuroblastoma Market

Neuroblastoma starts in certain early types of nerve cells, most commonly found in an embryo or fetus. It is a cancer that develops from immature nerve cells found in several areas of the body. Neuroblastoma most commonly arises in and around the adrenal glands, and it can also start in areas near the spine in the chest or neck. Neuroblastoma can be presented as a lump in the neck, chest, or abdomen, bulging eyes, abdominal swelling, and etc. It is the most common type of extracranial solid tumor among infants in China. Currently, treatment options for neuroblastoma in China mainly consist of surgery, radiotherapy and chemotherapy.

According to Frost & Sullivan, the market size of neuroblastoma drugs in China was RMB1.3 billion in 2015, increased to RMB1.6 billion in 2019, and is expected to reach RMB2.5 billion in 2024 and RMB4.9 billion in 2030, representing a CAGR of 6.0% from 2015 to 2019, a CAGR of 8.3% from 2019 to 2024 and a CAGR of 12.4% from 2024 to 2030. Our pipeline products Naxitamab and Omburtamab are expected to enjoy potential growth of China's neuroblastoma market in the future.

China's Neuroblastoma Market Size and Forecast, 2015-2030E



Period	CAGR
2015-2019	6.0%
2019-2024E	8.3%
2024E-2030E	12.4%

Cancer Supportive Care Market

Overview

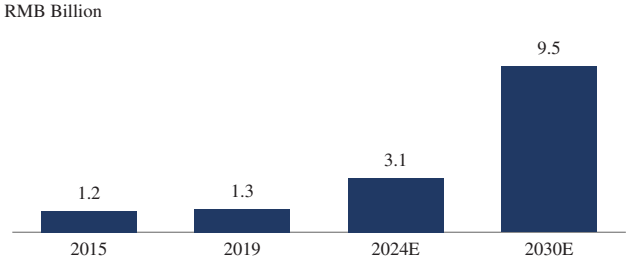
Cancer supportive care is medical care that focuses on relieving the symptoms caused by serious illnesses like cancers to improve the quality of life. The goal of supportive care is to prevent or treat as early as possible the symptoms of a disease, side effects caused by treatment of a disease, and psychological, social, and spiritual problems related to a disease or its treatment. Cancer supportive care therapeutics reduce side effects caused by cancer treatments, thereby assisting in increasing the life expectancy of individuals. In terms of therapeutic areas, cancer supportive care therapeutics can be used to treat radiation-induced nausea and vomiting, radiotherapy/chemotherapy-caused oral mucositis, tumor cachexia, bone metastases, and chemotherapy-induced neutropenia.

Bone Metastases Market

Bone metastasis occurs when cancer cells spread from their original site to a bone. Nearly all types of cancer can spread to the bones, causing pain and broken bones. With rare exceptions, cancers that have spread to the bones can't be cured, but treatments can help reduce pain and other symptoms of bone metastases. Zometa, one of our marketed products in China, is an osteoclast mediated bone resorption inhibitor used to treat bone metastases from solid tumors.

The market of bone metastases drugs in China, in terms of sales revenue, amounted to RMB1.3 billion in 2019, and represented a CAGR of 2.4% from 2015. The market is estimated to grow at a CAGR of 19.1% from 2019 to 2024 and to reach RMB3.1 billion in 2024, and is estimated to further grow at a CAGR of 20.5% from 2024 to 2030 and to reach RMB9.5 billion in 2030. The sales revenue of Zometa in China in 2019 was RMB205.7 million, ranked third in China's bone metastases market, with a market share of 15.9%. As a third-generation bisphosphonate, Zometa has the highest relative potency compared to the first- and second-generation bisphosphonate drug and more selectivity for inhibition of bone resorption.

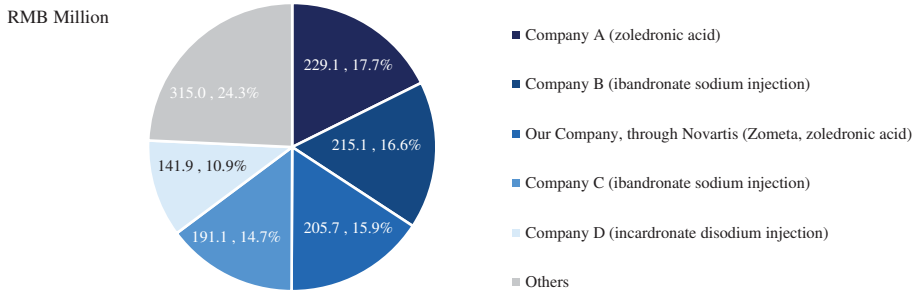
China's Bone Metastasis Market Size and Forecast, 2015-2030E



Period	CAGR
2015-2019	2.4%
2019-2024E	19.1%
2024E-2030E	20.5%

Source: Frost & Sullivan

Breakdown of China's Bone Metastasis Market by Company, 2019 in Terms of Sales Revenue



Source: Frost & Sullivan

Oropharyngeal Candidiasis Infection Market

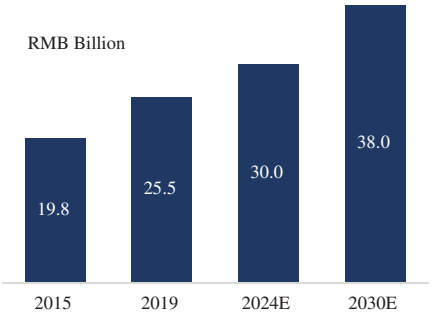
Oropharyngeal candidiasis is a common endogenous, opportunistic infection caused, in most cases, by the fungus *Candida albicans*. Symptoms of oropharyngeal candidiasis include white patches on the inner cheeks, tongue, roof of mouth and throat, redness or soreness, loss of taste, pain while eating or swallowing and cracking, and redness at the corners of the mouth. Cancer patients are at higher risk for oropharyngeal candidiasis infection due to the immunosuppressive nature following their cancer treatments.

Treatment for oropharyngeal candidiasis infection is usually antifungal medicine, which includes one of our pipeline products, Oravig, a buccal tablet to apply topically to the gum that releases miconazole. Miconazole is an imidazole anti-fungal agent which acts by inhibiting ergosterol synthesis, a major component of fungal cell membranes.

The market of anti-fungal drugs in China, in terms of sales revenue, amounted to RMB25.5 billion in 2019 and represented a CAGR of 6.5% from 2015. The market is estimated to grow at a

CAGR of 3.3% from 2019 to 2024 and to reach RMB30.0 billion in 2024, and is estimated to further grow at a CAGR of 4.1% from 2024 to 2030 and to reach RMB38.0 billion in 2030. As an imidazole anti-fungal drug, Oravig's market is expected to experience continuous growth in the future.

China's Anti-fungal Drug Market Size and Forecast, 2015-2030E



Period	CAGR
2015-2019	6.5%
2019-2024E	3.3%
2024E-2030E	4.1%

Source: Frost & Sullivan

SEVERE INFECTION MARKET

Overview

Severe infection is a severe disorder caused by organisms such as bacteria, viruses, fungi, or parasites that are passed, directly or indirectly, from one person to another.

Future trends of severe infection market in China include the following:

- **New mechanism of action ("MoA") or structure of anti-infectives**: Since the discovery of daptomycin in 1987, no antibiotic with a new MoA or structure has been developed, while the resistance of bacteria against such last resort antibiotics as daptomycin, carbapenem and linezolid has increased. Therefore, as illustrated by the market performance of linezolid and daptomycin, next generation antibiotics with new MoA or structure are urgently needed to address this problem.
- **Priority in using narrow spectrum antibiotics**: The overuse of broad spectrum antibiotics has resulted in rapid development of drug resistance, potential cross drug resistance and spectrum overlap. Therefore, there is consensus among the European, U.S. and Chinese guidelines that the use of narrow spectrum antibiotics in bacterial infections should become a priority.
- **Stringent regulatory regime for antibiotics use**: In the last five years, the FDA, the EMA, the PMDA and the NMPA have introduced regulations and policies to regulate the use of antibiotics in both human treatment and environmental use to prevent development of drug resistant bacteria, especially multi-drug resistant bacteria. For example, uses of antibiotics fall under three classes in China, and the higher the class, the more stringent certification is required for such use.
- **Preference of oral antibiotics**: Oral administration is considered to be the most acceptable and economical method of administration for antibiotics. The advent of new antibiotics that have an improved safety profile are suitable for oral administration and will offer more choices to doctors and patients.

Such trends in the severe infection drug market in China are driven by the following growth drivers:

- **Increasing number of infection cases:** Bacterial and fungal infection cases have been growing in recent years in China, which increase the demand for anti-infectives.
- **Drug resistance and increase in dosage:** The overuse of broad spectrum antibiotics has led to increased resistance of bacteria against currently available antibiotics. As a result, an increase in the dosage is required for certain antibiotics to be effective.
- **Favorable policies:** Favorable government policies that have been driving the anti-infective market in China include clear and reasonable classifications of antibiotics and the reduction of application barriers for antibiotics.
- **Needs for better potency and safety profile:** Multi-drug resistance bacterial infections are becoming increasingly common and serious, emphasizing the need for new antibiotics with better potency and safety profile.
- **Emerging oral anti-infective with improved potency and safety:** Oral anti-infectives provide convenience in administration and reduce cost for patients discharged from hospital. The emerging need for oral antibiotics with improved potency and safety profiles to treat severe infection is expected to drive the anti-infective market in the future.

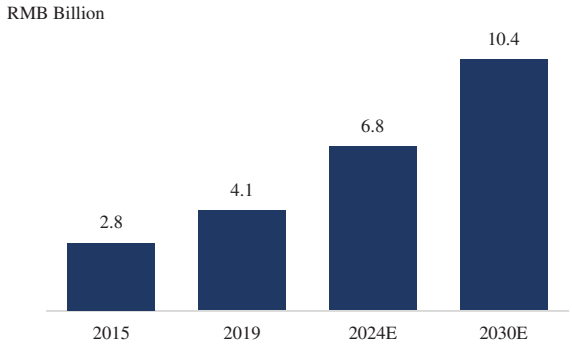
Anti-bacterial Drug Market

Anti-bacterial drug is a type of anti-infective that only targets bacteria and is used to treat or prevent bacterial infections. Anti-bacterial drugs are derived from bacteria or molds, or are synthesized in laboratories de novo. Anti-bacterial drugs target essential bacterial physiology and biochemistry, causing microbial cell death or the cessation of growth.

Among all bacterial infection cases, multi-drug resistant bacteria impose severe threat to public health worldwide. In 2017, the World Health Organization published its first list of antibiotic resistant "priority pathogens," a catalogue of 12 families of bacteria that pose the greatest threat to human health. Within the list of 12 families of bacteria, *Staphylococcus aureus*, also known as *S. aureus*, is a genus of multi-drug resistant bacteria. Among which, there is a strain called methicillin-resistant *Staphylococcus aureus* (MRSA). This is a bacterium which causes infections in different parts of the body and is tougher to treat than other strains of *S. aureus* as it is resistant to some commonly used antibiotics. MRSA infection may cause diseases including HABP and VABP.

One of our pipeline candidates, Vibativ (telavancin), is used for treating MRSA infection and the robust growth of anti-MRSA infection antibacterial drug market sets forth the growth prospects for Vibativ. The market size of anti-MRSA infection antibacterial drug in China in 2019 was RMB4.1 billion, representing a CAGR of 10.2% from 2015. This market size is estimated to continuously increase at a CAGR of 10.4% from 2019 to 2024 and is estimated to reach RMB6.8 billion in 2024. It is expected to further grow at a CAGR of 7.4% from 2024 to 2030 and to reach RMB10.4 billion in 2030. Corresponding to the growth in anti-MRSA infection antibacterial drug market in China, the market potential of Vibativ is also expected to further expand.

China Anti-MRSA Infection Antibacterial Drug Market Size and Forecast, 2015-2030E



Period	CAGR
2015-2019	10.2%
2019-2024E	10.4%
2024E-2030E	7.4%

Source: Frost & Sullivan

THE THYMIC HORMONES MARKET

Overview

Thymic hormones refer to any of the hormones produced by the thymus that can help attract lymphoid stem cells to the thymus and stimulate their development into mature T lymphocytes. Thymic hormones can be used as immunomodulators, which refer to the pharmaceutical products that enhance or suppress the immune function of the body to treat diseases resulted from abnormal immune function. Immunomodulators have been adopted in a wide range of clinical applications, ranging from oncology and severe infection to respiratory diseases and digestive system diseases. Among all types of immunomodulators, thymic hormones demonstrate advantages in that they can be applied in a wide range of indications, with manageable side effects and good safety profile.

There are three types of thymic hormone drugs available in China, namely thymosin, thymopentin and thymalfasin:

- **Thymalfasin (胸腺法新) (scientifically referred to as thymosin alpha 1, "Tα1")**: Thymalfasin, originally isolated as a natural substance from thymus tissue, is a pure, synthetic peptide of 28 amino acids, with a half-life of 1.65 hours. Thymalfasin works as immunomodulator by promoting T lymphocytes maturation, increasing the secretion of various lymphokines by activated T cells and the level of lymphokines receptor on T cells, as well as activating CD4 cells to enhance allogeneic and autologous human mixed lymphocyte response. Different from thymosin and thymopentin, thymalfasin is the only one displaying the same chemical structure and configuration as the natural Tα1 that presents in human body, leading to enhancement towards patients' immunity and life quality, and increase in remission rate and survival rate. Thymalfasin (brand name Zadaxin) was first approved in Italy in 1993, China in 1996 and registered in more than 30 countries. It has been adopted in a wide variety of clinical adoptions, including the treatment of chronic hepatitis B and chronic hepatitis C, vaccine enhancer and the adjuvant treatment of cancers. More recent evidence suggests that it has the potential to be used in combination with tumor immunotherapy drugs.

- **Thymopentin** (胸腺五肽): Thymopentin is a synthetic pentapeptide (residues 33-38 of Tmpo) that fully reproduces immunological effects of full length thymopoietin. Its natural synthesis has never been demonstrated. Thymopentin is a short-lived peptide with a half-life in plasma of about 5-6 min. Thymopentin works as immunomodulator by inducing the differentiation of T lymphocytes, promoting the development, maturation and activation of T lymphocyte subsets. Thymopentin was approved in China in 1997, one year following thymalfasin, and only approved in China. According to the search of PubMed, there are relatively few clinical studies and medical evidences.
- **Thymosin** (胸腺肽): Thymosin is extracted directly from mammals' thymuses. Though thymosin has been in China for more than 20 years, the clinical adoption is reducing given the purity challenges and corresponding safety and efficacy concerns.

Market Size and Forecast

The overall thymic hormone market in China is expected to recover from the downward trend in the past few years and realize growth in the near future. The market size of thymic hormone in China experienced moderate decrease from RMB 6.0 billion in 2015 to RMB 4.7 billion in 2019, despite the increase in the market size of thymalfasin during the same period. The reason behind such decrease includes the considerable decrease of the market size of thymopentin and thymosin from 2015 to 2019, as a result of the competition from generic drugs and the decrease in the respective prices. Meanwhile, even if the market size of thymalfasin displayed a growing trend, the increase in the market size of thymalfasin from 2015 to 2019 did not catch up the decrease in the market size of thymopentin and thymosin during the same period. With the gradual replacement of thymosin and thymopentin by thymalfasin in clinical application, despite some year-to-year fluctuation, the total sales revenue of thymic hormone in China is estimated to reach RMB5.2 billion in 2024, representing a CAGR of 2.1% from 2019 to 2024. The total sales revenue of such market is estimated to further reach RMB6.4 billion in 2030, representing a CAGR of 3.5% from 2024 to 2030. The following reasons drive the rebound to be expected on the thymic hormone market:

- **Improved affordability**: The average disposable income of the Chinese population is expected to continue growing in the near future, which is expected to increase the willingness and ability of patients to pay for medications, including more expensive medical treatments and medications such as thymic hormone drugs.
- **Growing public awareness of immunomodulators**: With the improvement of economic conditions and advances in diagnosis testing, public awareness regarding disease testing and management has gradually increased, particularly in respect of cancer and some severe infection, which use thymic hormone drugs for treatment. In addition, the current outbreak of COVID-19 worldwide has also increased the public awareness of the benefit of thymic hormones as immunomodulators and has enhanced the clinical adoption for treatment of COVID-19 by thymic hormones.
- **Advancement of medical research:** As medical research, especially researches on immunotherapy and immunomodulator, has achieved significant advancement in the past decade, the medical profession and pharmaceutical industry have gained deeper understanding in immunomodulation and its role in disease development, which provides

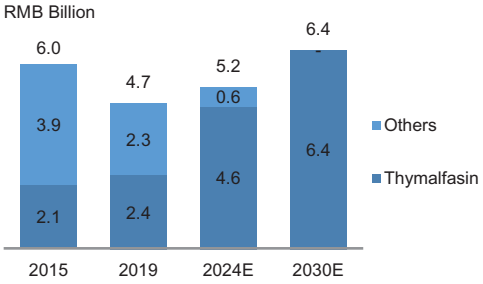
more opportunities for adoption of thymic hormone immunomodulators in more clinical applications.

In the near future, the thymic hormone market in China is expected to demonstrate the following trends:

- **Inclusion in more treatment guidelines**: With increasing clinical evidence of efficacy and safety, the thymic hormone drugs have been included into an increasing number of clinical treatment guidelines. With the further accumulation of data from ongoing clinical trials, it is expected that thymic hormone drugs will be included into more treatment regimens and guidelines.
- **Potential expansion of indications to be covered by thymic hormone drugs**: According to real-world studies and investigator-initiated trials, thymic hormone drugs have shown promising results in treating multiple cancers including pancreatic cancer, liver cancer, lung cancer and gastric cancer. Such promising clinical results, together with the inclusion of thymic hormone drugs in more treatment guidelines, may lead to an expansion of indication coverage by thymic hormone drugs.
- **Higher penetration**: With more extensive patients' education supported by governments and big pharmaceutical companies, as well as the expansion of its clinical adoption, thymic hormone drugs are expected to steadily gain deeper penetration over the cancer patient base and the hepatitis patient base, as an immune adjuvant.

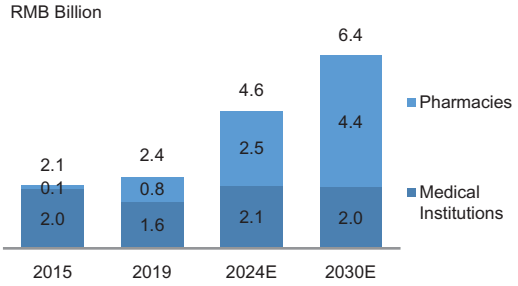
Despite the fluctuation in the overall thymic hormone market in China, the market for thymalfasin consistently grew in the past few years, resulting from the gaining of market share by thymalfasin through its competition with thymosin and thymopentin. In 2015, the market size for thymalfasin in China, in terms of revenue from pharmacies and medical institutions, was RMB2.1 billion, representing approximately 35.0% of the total thymic hormone market. In 2019, the market for thymalfasin in China, in terms of revenue from pharmacies and medical institutions, reached RMB2.4 billion, representing a CAGR of 3.5% from 2015 and accounting for 51.1% of the total thymic hormone market in 2019. The prospective growth of the total thymic hormone market in the near future, the current market share and headroom of thymalfasin within the thymic hormone market in China, together with the track record of the consistent increase of such market share, suggest considerable potential for thymalfasin to further gain market share from competing products and realize consistent and robust growth in the near future. The market for thymalfasin in China, in terms of revenue from pharmacies and medical institutions, is estimated to grow to RMB4.6 billion in 2024 and to further reach RMB6.4 billion in 2030, representing a CAGR of 13.9% from 2019 to 2024 and a CAGR of 5.8% from 2024 to 2030, in each case significantly outpacing the corresponding CAGR for the total thymic hormone market in China during the same period. Correspondingly, the market share of thymalfasin within the total thymic hormone market in China is expected to consistently increase, as thymalfasin is expected to account for 88.5% of the total thymic hormone market in China in 2024 and to ultimately take the entire thymic hormone market in China from 2026 onwards.

Breakdown of Thymic Hormone Market in China, by Product Types



Source: Frost & Sullivan

Breakdown of Thymalfasin Market in China, by Sales Channels

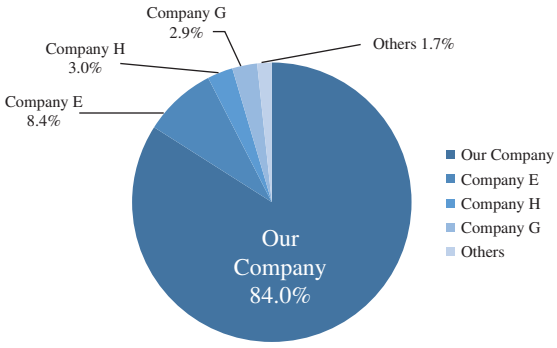


Source: Frost & Sullivan

In terms of sales channel, sales through pharmacies are expected to dominate the thymalfasin market in China in the near future. The sales of thymalfasin in China are through two major channels: medical institutions (including hospitals and primary healthcare providers) and pharmacies. While sales of thymalfasin in China have been historically dominated by the medical institutions channel, sales of thymalfasin in China through pharmacies have witnessed considerable expansion in the past few years. In 2015, sales revenue of thymalfasin in China through pharmacies were only RMB106.6 million, representing 5.1% of the total sales revenue of thymalfasin in China in 2015. In 2019, sales revenue of thymalfasin in China through pharmacies reached RMB829.7 million, representing a CAGR of 67.0% from 2015 and accounting for 34.8% of the total sales revenue of thymalfasin in China in 2019. In the near future, the pharmacy channel is expected to become the major channel for the sales of thymalfasin in China. The sales revenue of thymalfasin in China through pharmacies is estimated to increase to RMB2,474.1 million in 2024 and to further reach RMB4,363.5 million in 2030, accounting for 54.1% and 68.2% of the total thymalfasin market in China in terms of sales revenue in each respective year, and representing a CAGR of 24.4% from 2019 to 2024 and a CAGR of 9.9% from 2024 to 2030.

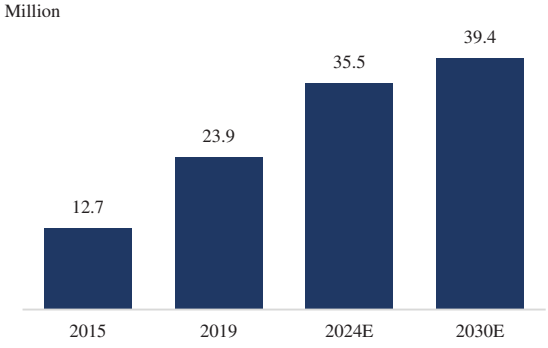
In addition, we have demonstrated significant competitive edge in terms of thymalfasin sales via pharmacies. In 2019, our sales revenue of Zadaxin via pharmacies represented a dominant market share of over 80% in the market of thymalfasin sold via pharmacies in China. According to Frost & Sullivan, sales of Zadaxin in China through pharmacies is expected to increase significantly, as it is a trend that more pharmaceutical sales in China are expected to be conducted via pharmacies in the future. Considering that the pharmacies channel is expected to become the largest channel for the sales of thymalfasin in China in the near future, our dominance in the market of thymalfasin sold via pharmacies in China provides us with strong potential for obtaining robust growth and maintaining market leadership in the future.

Breakdown of Thymalfasin Sales via Pharmacies in China by Manufacturer, 2019, in Terms of Wholesale Sales Level



Source: Frost & Sullivan

Target Addressable Patient Population of Zadaxin in China, 2015-2030E



Period	CAGR
2015-2019	17.1%
2019-2024E	8.2%
2024E-2030E	1.7%

Source: Frost & Sullivan

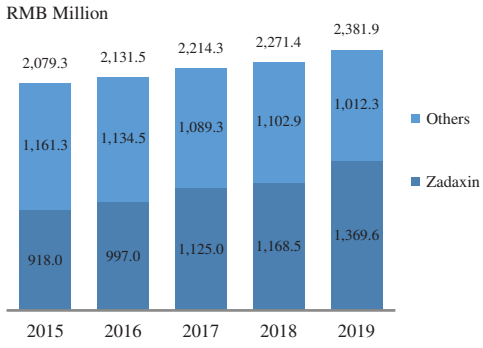
The target addressable patients of Zadaxin in China include patients with chronic hepatitis B and patients with impaired immunity. The target addressable patients of Zadaxin are assumed to be patients who are above 18 years old as stated in its drug label. For example, Zadaxin is indicated for patients with chronic hepatitis B. In the target addressable patients, no specific age segment of patients who are above 18 years old with chronic hepatitis B is targeted as Zadaxin does not discriminate for specific age segment. The number of target addressable patients of Zadaxin in China increased from 12.7 million in 2015 to 23.9 million in 2019. In 2024, the number is expected to reach 35.5 million, representing a CAGR of 8.2% from 2019 to 2024. The number is expected to reach 39.4 million by 2030 with a CAGR of 1.7% from 2024 to 2030.

Competitive Landscape

Within the thymalfasin market in China, our product Zadaxin, approved in 1996, is the first branded thymalfasin drug. Zadaxin has consistently demonstrated high product quality, as supported by academic studies including the studies conducted by Shanghai Institute for Food and Drug Control, while as of the Latest Practicable Date, only one generic drug to Zadaxin had passed the consistency evaluation for quality and efficacy. The product quality of Zadaxin is evidenced by its consistent gains in market share in recent years from competing products such as generics. From

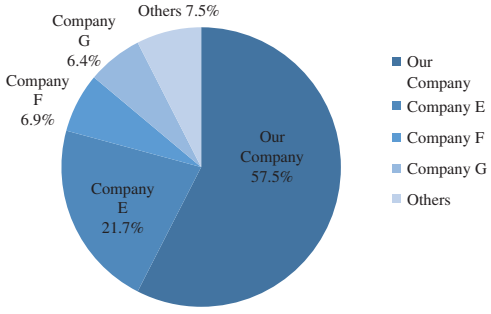
2015 to 2019, in terms of revenue, sales of Zadaxin accounted for 44.1%, 46.8%, 50.8%, 51.4% and 57.5% of the thymalfasin market in China, respectively, demonstrating an increase in market share in the thymalfasin market in China and our strong capabilities to consistently outperforming our competitors, according to Frost & Sullivan. In addition, in terms of volume, sales of Zadaxin accounted for 11.9% and 20.4% of the thymalfasin market in China in 2015 and 2019, respectively, demonstrating Zadaxin's ability to gain market shares from generic competition, as well as a significant headroom for its future growth potential.

Breakdown of Thymalfasin Market in China, by Products



Source: Frost & Sullivan

Breakdown of Thymalfasin Market in China by Company, 2019, in Terms of Wholesale Sales Level



Source: Frost & Sullivan

Drugs directly competing with Zadaxin in China include other thymalfasin drugs as shown in the table below:

Drug Name	Company	Drug Classification	Approval Time	Price[1] (RMB/1.6mg)	Annual Cost Per Patient (RMB)[1][2]	NRDL Eligibility[4]
ZADAXIN	**SciClone**	Innovative	**1996**	**474**	**24,648**	
JITAI (基泰)	ShuangCheng Pharmaceuticals	Generic	2015	84	4,368	
HERI (和日)	ZhongHe Pharmaceuticals	Generic	2015	90	4,680	
MAIPUXIN (邁普新)	DIAO Jiuhong Pharmaceutical Factory	Generic	2015	110	5,720	
Thymalfasin	Suzhou Tianji Bio-pharmaceuticals	Generic	2015	77	4,004	
Thymalfasin	SPH No. 1 Biochemical & Pharmaceutical Co.	Generic	2016	110	5,720	the work-related injury insurance catalog[4]
Thymalfasin	Harbin Pharmaceutical Group	Generic	2018	96	4,992	
Thymalfasin	ShengNuo Pharmaceuticals	Generic	2018	85	4,420	
Thymalfasin	LangTian Pharmaceuticals	Generic	2018	99	5,148	
Thymalfasin	Hanyu Phamaceuticals	Generic	2019	96	4,992	
Thymalfasin	Yangtze River Pharmaceutical Group	Generic	2019	109	5,668	
Thymalfasin	Sinopep Allsino BioPharmaceutical Co.	Generic	2019	NA[3]	NA[3]	
Thymalfasin	Haiyue Pharmaceuticals	Generic	2019	122	6,344	
Thymalfasin	CR Double-Crane Pharmaceuticals	Generic	2019	NA[3]	NA[3]	
Thymalfasin	Sailong Pharmaceuticals	Generic	2019	101	5,252	

Notes:

(1) The information on price and annual cost per patient is based on data at wholesale price level in 2019.

(2) Annual cost per patient refers to the estimated average cost incurred by the application of the drug on the patient in a year. It is calculated based on the assumption that on average each patient on the drug receives 52 shots (1.6mg per shot) annually according to the relevant drug label.

(3) These drugs were approved in late 2019 and industry information on price and annual cost per patient is not yet available for these drugs.

(4) Zadaxin was originally included in Part B of the NRDL since 1999, and was later removed based on decisions made by the regulators from Part B of the NRDL to be included in the work-related injury insurance catalog of the NRDL since February 2017. The current effective version of NRDL was promulgated on August 20, 2019 pursuant to the amendment by MHRSS and the NHSA, and became effective on January 1, 2020. On December 25, 2020, the NHSA and MOHRSS promulgated the Notice of Issuance of Drugs Catalogue for the National Basic Medical Insurance, Work-related Injury Insurance and Maternity Insurance (2020) (《關於印發<國家基本醫療保險、工傷保險和生育保險藥品目錄(2020年)>的通知》), which will take effect on March 1, 2021 and will simultaneously replace the current effective version of NRDL. See "Regulatory Overview — Laws and Regulations in Relation to the Coverage and Reimbursement — Medical Insurance Catalogue." As NRDL coverage is based on the type of compound, all thymalfasin drugs, including Zadaxin and the generics, are covered by the work-related injury insurance catalog of the NRDL, in both the current effective version of NRDL and the new NRDL promulgated on December 25, 2020, and the corresponding reimbursement is limited to patients eligible for employment injury insurance. In principle, the NRDL is to be updated once a year in the future.

(5) According to Frost & Sullivan, as of the Latest Practicable Date, Zadaxin and all of its generic thymalfasin drug competitors were covered by the centralized tender process, and none of them was covered by the volume-based procurement.

Source: Frost & Sullivan

Jitai (基泰), the generic thymalfasin drug manufactured by ShuangCheng Pharmaceuticals, passed the consistency evaluation in December 2020. Besides Jitai, there were four other generic thymalfasin drugs that await consistency evaluation as of the Latest Practicable Date. The competitive landscape for our product Zadaxin imposes several challenges:

- Generic drugs may continue to compete with Zadaxin, as Zadaxin may face continued competitions from a large number of generic thymalfasin drugs and other generic thymic hormone drugs.
- Zadaxin may face competitions from new innovative drugs, such as other types of hormone immunomodulators.
- Uncertainties in policies such as changes in the medical insurance system, the volume-based procurement policy, and policies regarding adjuvant therapies may create additional challenges for Zadaxin.

See "Risk Factors — We rely on the sales of a limited number of proprietary product and promotion products for business partners, especially in Mainland China, which account for a substantial portion of our total revenue. If we are unable to maintain the sales volume, pricing levels and profit margins of such products due to factors such as competition or change in government regulations, our operations, revenue and profitability could be adversely affected" and "Risk Factors — We operate in a highly competitive environment, and we may not be able to compete effectively against current and future competitors selling competing drugs such as substitute or generic drugs and new innovative drugs, which could subject us to the pressure of price reduction and adversely affect our operations, revenue and profitability."

Despite the competition, we and Frost & Sullivan believe that Zadaxin is expected to enjoy market advantage in comparison to its generic drugs in the near future in China, even though Zadaxin is sold at a higher price compared to its generic drug competitors, due to several factors:

- Zadaxin, as the first branded thymalfasin drug in China, possesses the first-mover advantage, which allows it to take advantage of its strong brand recognition and product loyalty from doctors and target patients, the majority of whom are self-paying or covered by private medical insurance, and are therefore less sensitive to differences in prices;
- Zadaxin, as a tested and approved thymic hormone drug, has the potential to be used as a combination therapy with other emerging treatments, which enables it to capture new industry opportunities; and
- Zadaxin is able to capitalize on our successful commercialization efforts, as well as the synergies created from innovative sales channels and the GTP model.

See "Business — Products and Services — Our Proprietary Product — Zadaxin."

According to Frost & Sullivan, if thymalfasin is included in the catalogue for volume-based procurement, the Company could either participate or decline to participate in the bidding. The competing generic drug that passes the consistency evaluation may choose to participate in the bidding, and the participation of the competing generic drugs in the volume-based procurement could

result in significant price decline of the relevant drugs, and Zadaxin may experience increased pricing pressures. See "Risk Factors — We may experience difficulties in our sales efforts as a result of pricing regulations or other policies such as the volume-based procurement that are intended to reduce healthcare costs, which could subject us to pricing and volume pressures and adversely affect our operations, revenue and profitability." and "Financial Information — Factors Affecting Our Results of Operations — The implementation and expansion of the volume-based procurement for sales of drugs to PRC public medical institutions."

PERCUTANEOUS CORONARY INTERVENTION ("PCI") ANTICOAGULANT MARKET

Overview

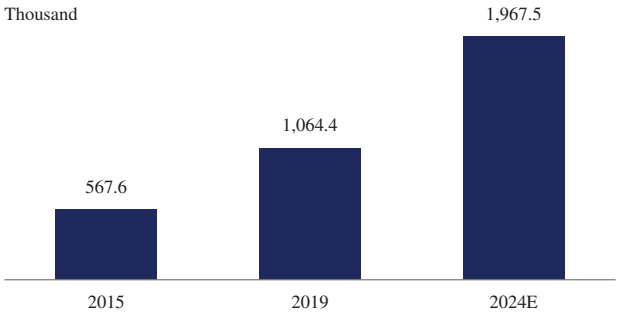
Anticoagulants are medicines that increase the time they take for blood to clot. Anticoagulants achieve their effect by suppressing the synthesis or function of various clotting factors that are normally present in the blood. Anticoagulants may be used to treat blood clots, or in conditions where the risk of blood clots is increased to reduce the risk. PCI is the most commonly performed invasive therapeutic cardiac procedure for coronary artery diseases and plays an important role in the treatment of ischemic heart disease. In the China Treatment Guideline for PCI (2016), issued by the Cardiovasculogy Society of Chinese Medical Association, four types of anticoagulants, including bivalirudin, unfractionated heparin, enoxaparin and fondaparinux, are suggested to be applied during PCIs.

Among the PCI anticoagulants, bivalirudin is a short and synthetic peptide that is used as a potent, highly specific and direct inhibitor of thrombin. It inhibits both circulating and clot bound thrombin and also inhibits thrombin medicated platelet activation and aggregation. Bivalirudin has a quick onset of action and a short half-life.

Market Size, Forecast and Growth Drivers

The markets of PCI anticoagulant in China demonstrate robust growth in the past and promising growth prospects in the future. Due to factors such as the aging population, the increase in the number of patients with coronary artery diseases, and improved accessibility to qualified healthcare institutions, the volume of PCI procedures rose rapidly at a CAGR of 17.0% from 2015 to 2019, reaching 1,064.4 thousand in 2019, and is expected to further grow at a CAGR of 13.1% and to reach 1,967.5 thousand in 2024. Corresponding to the robust growth in the volume of PCI procedures, the market PCI anticoagulant in China is also expected to further expand. The market size of PCI anticoagulants in China in 2019 was RMB4.3 billion, representing a CAGR of 26.6% from 2015, and is estimated to reach RMB8.4 billion and 12.4 billion in 2024 and 2030, respectively.

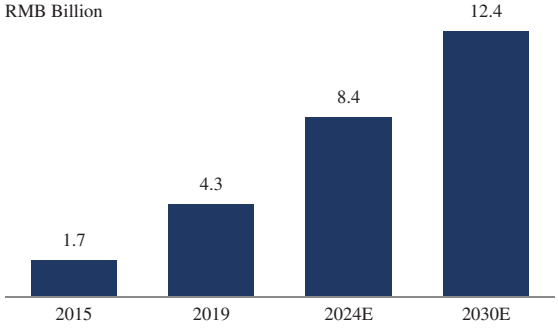
China's Volume of PCI Procedures, 2015-2024E



Period	CAGR
2015-2019	17.0%
2019-2024E	13.1%

Source: Frost & Sullivan

China's PCI Anticoagulant Market Size and Forecast, 2015-2030E



Period	CAGR
2015-2019	26.6%
2019-2024E	14.2%
2024E-2030E	6.8%

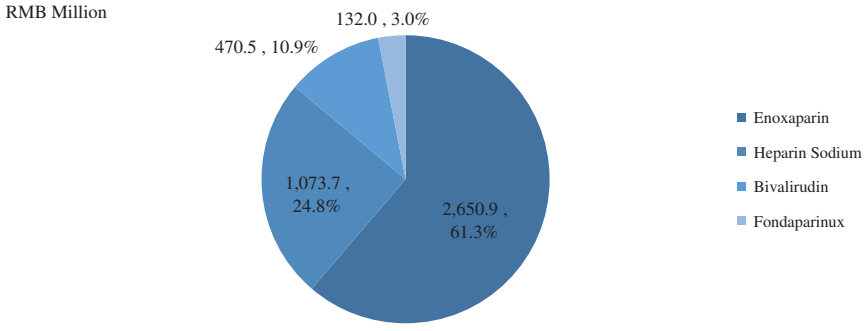
Source: Frost & Sullivan

The growth of the PCI anticoagulant market is driven by the following factors: (i) the constantly increasing number of patients with coronary artery diseases in China, due to aging of China's population as well as unhealthy lifestyle such as preference for high-fat diet and lack of exercise, (ii) the improving accessibility of PCI anticoagulants, as the continuous investment in medical resources in China is expected to make the qualified medical faculties, medical equipment and supportive therapies needed for the PCI procedures more accessible, and (iii) the improvement on personal affordability, as the continuous growing of disposable income among the Chinese population will enable patients to afford more expensive medical treatments like the PCI procedures. Driven by the factors above, the PCI anticoagulant market in China is expected to expand considerably in the near future.

Competitive Landscape

The sales revenue of bivalirudin amounted to RMB470.5 million in China in 2019, which ranked the third in China's PCI anticoagulant market, with a market share of 10.9%. Compared with the other three types of anticoagulants for PCI, bivalirudin demonstrates several advantages: (i) bivalirudin monotherapy significantly reduces major bleeding while providing similar ischemic protection and improves net clinical outcome, (ii) unlike unfractionated heparin or enoxaparin, bivalirudin does not inflict platelet activation therefore causing a reduced risk of bleeding, and (iii) bivalirudin's combination with prothrombin is reversible.

Breakdown of China's PCI Anticoagulant Market by Drug Categories, 2019, in Terms of Sales Revenue



Source: Frost & Sullivan

PROMOTION SERVICES AND DISTRIBUTION MARKET FOR PHARMACEUTICAL PRODUCTS

Promotion service providers and distributors offer pharmaceutical company partners the option to outsource their sales and marketing activities for certain products in certain markets, filling the gap for pharmaceutical companies that do not keep an in-house sales and marketing team in certain local markets. Promotion service providers and distributors also enable pharmaceutical companies to save costs as they can flexibly adjust resources allocated to sales and marketing activities. Promotion service providers and distributors possess expertise in a number of areas, such as market access, healthcare policies and regulations, and key account management on a local level. The number of promotion service providers and distributors in China has increased in recent years, and such increase is expected to continue in the near future.

In the near future, the promotion services and distribution market for pharmaceutical products is expected to demonstrate the following trends:

- **Competition in product portfolio**: The success of promotion service providers and distributors will significantly depend on the competitiveness of their product portfolio, so it is crucial for promotion service providers and distributors to implement rigorous screening process to select promising products and business partners.
- **Appropriate incentive structure**: In the future, promotion service providers and distributors may align their incentives with business partners through arrangements such as equity investment and long-term exclusive agreements.
- **Comprehensive scope of services**: To better serve their business partners, promotion service providers and distributors are expected to provide a comprehensive scope of services, including customized marketing plans, product positioning, and sales staff training.

Such trends in the promotion services and distribution market for pharmaceutical products will be driven by the following market drivers:

- **The Marketing Authorization Holder ("MAH") system**: The MAH policy provides a flexible framework for promotion service providers and distributors authorized by MAH

to engage medical representatives to conduct sales and marketing activities. In addition, the MAH system also enhances safety and compliances of services provided by promotion service providers and distributors.

- **Cost reduction for large global pharmaceutical companies**: Driven by the pressure to reduce cost, large global pharmaceutical companies may tend to reduce their spending on in-house sales and marketing team in China and may outsource some sales and marketing activities to third-party promotion service providers and distributors.
- **Challenges in market entry for overseas pharmaceutical companies**: Many overseas pharmaceutical companies face challenges in navigating China's complex pharmaceutical regulatory system, including the tender process, the hospital procurement process, and NMPA registration and renewal procedures. In addition, some small- and medium-sized overseas pharmaceutical companies may not have enough resources to establish an in-house marketing and distribution team to build an established sales and distribution network with wide geographic reach in China. Consequently, overseas pharmaceutical companies can benefit greatly from engaging promotion service providers and distributors for the sales and marketing of their products in China.
- **Service outsourcing of pharmaceutical companies**: Many domestic pharmaceutical companies in China traditionally engage in relatively limited scopes of business, such as R&D and manufacturing of pharmaceutical products, and may not have established their own in-house sales and marketing capabilities, so they may need to rely on sophisticated third-party promotion service providers and distributors for the sales and marketing of their products.

REPORT COMMISSIONED FROM FROST AND SULLIVAN

We engaged Frost & Sullivan, an independent market research consultant, to conduct an analysis of, and to prepare a report on, the pharmaceutical market in the PRC for use in this prospectus. Founded in 1961, Frost & Sullivan provides market research on a variety of industries, among other services. The information from Frost & Sullivan disclosed in the prospectus is extracted from the Frost & Sullivan Report, a report commissioned by us for a fee of RMB620,000, and is disclosed with the consent of Frost & Sullivan.

The Frost & Sullivan Report is prepared through extrapolating publicly available data, such as information provided by the government, annual reports of public companies, trade and medical journals, industry reports and other available information gathered by non-profit organizations. Frost & Sullivan also adopted the following primary assumptions while making projections on the macroeconomic environment, the overall pharmaceutical market and various segment markets in the PRC: the overall social, economic and political environment in the PRC is expected to remain stable during the forecast period; China's economic and industrial development is likely to maintain steady growth over the next decade; key industry drivers, such as accelerated aging population, growing demands from healthcare institutions, the increasing prevalence of chronic diseases, and continuous technology innovation are likely to drive the growth of China's pharmaceutical market during the forecast period; and no extreme force majeure or industry regulation will dramatically or fundamentally affect the market.

Frost & Sullivan's projection is made based on various market determinants and their coefficients assigned to a market which indicate their relative importance. Except as otherwise noted, all of the data and forecasts contained in this section are derived from the Frost & Sullivan Report. Our Directors confirm that after taking reasonable care, there is no material adverse change in the overall market information since the date of the Frost & Sullivan Report that would materially qualify, contradict or have an impact on such information.