

significantly drive up the spending in medical equipment/devices and the high consumption of medicines.

#### **b. Westernization of living style has changed disease patterns**

Today the Western restaurants such as KFC, Pizza Hut, McDonalds, etc. have become the popular names in China. For example, Yum Brands, the parent company of KFC and Pizza Hut, has opened more than 2500 outlets in China in the past two decades. Even the smaller pizza restaurant, Papa Johns, recently celebrated the opening of its 100<sup>th</sup> restaurant in China. These restaurants are warmly welcomed by many Chinese in particular those young Chinese including children.

The gradual adoption to the Western culture has resulted in the gradual change of the living style of many ordinary Chinese. The consequence of the westernization has changed the disease pattern in China, making them more resembling those occurring in the West. Diseases popular in the West have also become gradually popular in China now. For example, the high cholesterol-associated cardiovascular diseases, hypertension, diabetes, and all types of cancer, have gradually become popular in China in recent ten years or so.

Currently, the Western-style medicines have already reached the sales revenue of more than \$30 B (2008 data) in China and expected to reach close to \$50 B by 2010.<sup>1</sup> With the strong trend of more Chinese adopting the Western culture, the demands for the Western-style medications will be even much stronger in the future.

#### **c. Growing middle class population that is able to afford high-end medicines**

At present China has more than 250 million people that could be classified into middle class. Their combined annual family incomes range from RMB 60,000 - 200,000 (or ca. \$10,000 to \$30,000). What is important is that this middle class population is still growing in an estimated rate of 3-5% each year. In other words, if China's current economy development pace could be maintained for twenty more years, the population of this middle class Chinese could reach as much as 400-500 million. More Chinese people will thus become financially capable to afford high end Western-style medicines.

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References and notes:

<sup>1</sup> Online News, "AstraZeneca increases affinity for China", DrugResearcher.com, September 5, 2007. [www.drugresearcher.com](http://www.drugresearcher.com).

#### **d. Rapid urbanization makes more Chinese able to afford high-end medicines**

Urbanization in China has been developing rapidly following the economy development. For example, in the last thirty years, more than 150 million Chinese have migrated out of the poor, rural areas and become city residents, resulting in the rapid enlarging of many cities in particular those located along the coast. As Chinese government now starts shifting its infrastructure investment focuses onto the cities in inner land of the country including those small-sized ones, it is certainly expected that the urbanization process will be continued and even accelerated. Many analysts have already predicted that by 2030 there will be 200-300 million more Chinese migrating to city, which will push the number of the cities with a population of more than one million from the current 100 to around 220 by then. In general, city residents in China earn more income than the rural residents.

#### **4.2.2 Government encouragement and support for innovative drug R&D**

Chinese government intends to dramatically boost the nation's innovative drug R&D capability. The central government has outlined a detailed plan and is determined to launch 30 new drugs in the Chinese market by 2020 that are developed entirely by Chinese companies. At least two of them should be successfully launched in the well regulated Western markets. At present government at all levels encourages the companies and research institutions to conduct early stage drug R&D.

According to the government's development plans, by the end of 2010 there should be 100 drug candidates that will have completed preclinical development and become ready to enter full scale clinical development.<sup>2</sup> The government's ambition is to transform the generic drug-focused Chinese pharma industry to an innovative drug-focused drug development powerhouse so that it could be ranked top five or higher in the world pharma industry.

To help the Chinese companies reach the goals, government will financially support the research in particular in such areas as the identification and validation of new therapeutic targets, lead discovery and optimization, pharmacological property study and preclinical research. It will also encourage companies to focus on the development of innovative drugs in the therapeutic areas of cancer, cardiovascular diseases, diabetes, autoimmune-related disease, viral infections, TB, neurodegenerative diseases, novel antibiotics against drug-resistant strands, etc.

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References and notes:

<sup>2</sup> State Council of PRC: "Guide to Application for the First Round of Government Grants of New Drug Development during the Eleventh Five-Year-Plan (2008-2010)".

In addition, the government funding will also support the development of new formulation and drug delivery technologies such as the controlled release. Also encouraged to pursue are the improvement of production and quality control techniques of ten major drugs including small molecule drugs, biologic drugs and TCMs, both brand name drugs and new generics.

Through steady but heavy investment, Chinese government plans to establish eight technical platforms covering almost the entire value chain of innovative drug R&D and manufacturing process. These eight platforms include:

- Platform for fast drug screening;
- Platform for preclinical efficacy evaluation, pharmacological evaluation, PK/PD determination and optimization;
- Platform for drug safety evaluation;
- Platform for scale-up production of biologics, quality evaluation and control;
- Platform for TCM standardization and evaluation;
- Platform for information of new drug development;
- Platform for development of new formulation and drug delivery technologies;
- Platform for clinical evaluation of new drugs.

Government will also support 10-20 pharma/biopharma companies that possess the capability of both R&D and production so that their annual revenues would exceed \$1.5 B in 5-10 years.

For TCM research, the focus will be on elucidating the key active components and the mechanism of their actions, establishing effective TCM R&D platforms that combine the features of both traditional R&D and modern Western drug research methodologies, and establishing database for TCMs including their recipes.

For development of biopharmaceutical products, the focus will be on the development of monoclonal antibodies, vaccines and peptides/peptidomimetic compounds.

Government will also strongly support the academic research and encourage them to collaborate with industry, both domestic companies and international companies.