



CASE STUDY HEALTHCARE

BIOVEDA CHINA FUND III

« We are investing in a better tomorrow »





THE FUND

BIOVEDA CHINA FUND III

Region: China

Sector: Healthcare and Life Sciences

Fund manager: BioVeda China Fund Management Ltd

Total fund size: USD 188 mio.

SIFEM commitment: USD 6.2 mio.

Portfolio: 15 companies

Employment: 17 employees (fund manager)
798 employees (portfolio companies)

> www.bvcf.com

In 2005, BioVeda China Fund (BVCF) Management Ltd became the first private equity firm specialized and dedicated to China's healthcare and life sciences industries. BVCF supports Chinese entrepreneurs who are active in the development of innovative and affordable pharmaceutical products and services, and have a global scope. SIFEM invested in BVCF's third fund, BVCF III, in 2014.



2014
Investment Year



6.2 Mio
USD Fund Investment



815
Employees



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CHINA'S HEALTHCARE SYSTEM

AN INCREASING NEED

With a current population of 1.36 billion and massive economic growth over the last 30 years, China is confronted with the consequences of an aging population, similar to other countries around the world, but on a much larger scale. This includes a rise of chronic diseases such as diabetes, cardiovascular diseases, chronic respiratory diseases and cancer, which are commonly associated with longer lifespans, increasing urbanization and industrialization, more sedentary lifestyles, changing diets and the widespread availability of tobacco products. China's rising middle class have an increasing disposable income they are willing to spend on quality healthcare products and services. This together with the general expansion of global health insurance further puts pressure on the Chinese healthcare system, resulting in soaring healthcare demands and costs.

INADEQUATE RESOURCES

Inadequate infrastructure and facilities and a lack of quality equipment and drugs are the everyday reality patients and doctors have to face. The system is plagued by high costs and poor quality of care, and is particularly deficient in rural areas. Rural residents struggle with high out-of-pocket expenses which prevent many of them from seeking medical care.

THE GOVERNMENT RESPONSE

The public financial resources are insufficient to meet China's tremendous healthcare needs. In eight years China has seen its healthcare expenditures multiply by five reaching USD 511 billion in 2013. However public expenditures for healthcare only amounted to USD 44 per capita in 2013, barely above the USD 40 which the WHO estimates as the necessary minimum required to provide basic healthcare.

To address this situation the Chinese government is implementing reforms and programs to support the development of the private health sector and encourage investments targeting better quality and improved access to an increased range of services and

treatments. Annual healthcare spending is predicted to reach USD 1 trillion by 2020 due to these implemented government reforms and policies

LACK OF FINANCE

However, many companies in the private health sector are small and medium enterprises (SME), which traditionally have difficulties to access long-term finance, including government funds. This is especially true for early stage businesses in the health sector because they are considered to be particularly risky. The lack of necessary finance for innovation, expansion, and reorganization of operations hinders the growth of the healthcare sector in general and contributes to its fragmentation, which only further leads to increased inefficiency.

QUALITY AND STANDARDS

The majority of Chinese healthcare companies are lacking in respect to international best practice management and quality standards. This affects not only the patients receiving sub-standard products and services, but also deters investors. Not operating according to international best practice standards often implies limited business and financial management capacity, and low levels of transparency. For the sake of further economic and social development and to ensure political stability, China needs to tackle its healthcare challenge by developing an efficient healthcare system which provides better quality products and services at affordable prices to all segments of the population.

DEVELOPMENT EFFECTS

ADVANCING THE HEALTHCARE SECTOR

By developing and producing healthcare products and services locally, BVCF III's portfolio companies are contributing to the advancement of the Chinese healthcare sector. The companies are taking a leading role in the development of high-demand services and products which helps to replace the dependence on imports and foster the emergence of an effective, local healthcare sector. The Fund provides support to its portfolio companies which are dedicated to the highest quality and safety of their products and services, and which abide by international environmental and social standards in a market prone to quality issues, counterfeit products, and intellectual property violations. The Manager has hands-on experience in patent application and protection and provides guidance to ensure the sustainable development of its investees. This contributes to the advancement of the standards of the entire industry.

EXPANDING FUTURE OPPORTUNITIES

BVCF III is assisting its investees on their path to commercialization, thus greatly expanding their future opportunities. The Fund Manager works closely with its investees, helping younger companies to professionalize their business processes, and supporting more mature companies in terms of business and sales strategy, as well as capital structuring and opening up of networks. The investees of BVCF III have potential for transformational impact in China through increased affordability and accessibility of their healthcare products and services, using innovative solutions to counter widespread chronic diseases and through their leadership in promoting best practices with regard to quality and safety, and environmental and social standards. The end-beneficiaries of the products and services developed by the investees will include all socio-economic classes across China, with potential global applications.

PROVIDING FINANCE

The Fund is supporting and financing companies which could not otherwise obtain financing. Although China's financial and private

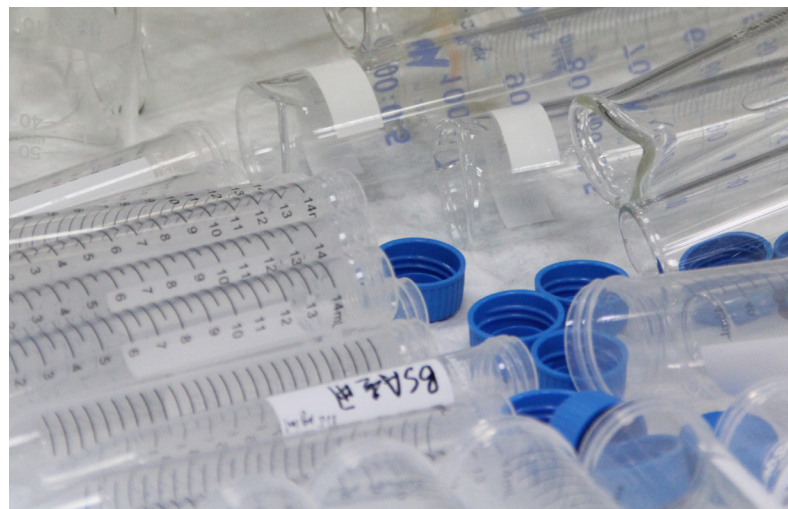
equity markets are well-developed, the majority of this is directed towards large companies. BVCF III targets early-stage SMEs in need of growth capital, taking relatively high risks in specialized areas in the healthcare sector.

ALIGNMENT WITH GOVERNMENT REFORMS

BVCF III's investments in life sciences and healthcare are aligned with the Chinese government's priorities and reforms. This alignment with governmental objectives confirms the Fund's potentially strong developmental impact for the Chinese population. A number of BVCF III investees also receive government support in the form of loans, grants, and/ or land to assist in the extensive costs of research & development and the establishment of company facilities, as well as regulatory support; these are further indicators that these investees are on the right path and are regarded as significant for the further development of the country.

CREATING VALUE

The Fund's investments support job creation and revenue generation in their underlying investees. In 2014 almost 260 new jobs were created and BVCF III's portfolio companies generated over USD 1 million of tax revenues for their government.



THE FUND

BIOVEDA CHINA FUND III

BioVeda China Fund III (BVCF III) is a private equity fund investing in the healthcare and life sciences industries in China. The Fund's portfolio currently includes 15 investments across these industries ranging from laboratory research and development activities to manufacturing pharmaceuticals and medical devices and the delivery of healthcare products and services.

BVCF III's investees develop diagnostic products such as portable eye imaging devices to diagnose and prevent potentially blinding diseases in newborn babies, or new molecular tests for cancer detection.

Some companies focus on the development of products for treatment such as artificial heart valves and artificial bone materials, but also novel pharmaceuticals such as immunotherapeutic agents for cancer treatment, anti-bacterial medicines to combat drug-resistant bacterial infections and insulin products for diabetes patients.

Other investees are using information technology (IT) to tap into the potential of the internet for efficient distribution and delivery of healthcare products and services including online pharmacy and prescription services. Others develop IT systems for enabling the consolidation, integration, mining, and interpretation of the massive data already available from China's hospitals. This will help to advance research and leverage the collective medical experience for improving diagnoses, therapies, and prescriptions.

The biochemical innovations of BVCF III investees also find applications in industrial manufacturing such as the development of clean fuel additives to drastically reduce the pollution emitted by diesel engines or the recycling of waste products to produce high-end paraffin.

All of BVCF III's investees are driven by innovation, operating in either niche markets or supplying otherwise limited generic products and services, where new formulations and improved efficiencies are sought. The new medication, medical devices and diagnostic services developed by BVCF III's investees are expected to reach numerous people in China. Some will even have potential global applications that could benefit people in other emerging markets, and also in the developed world.



THE FUND MANAGER

BIOVEDA CHINA FUND MANAGEMENT



« Our mission is to invest in a better tomorrow, whilst also providing financial returns to our investors »

-Dr. Zhi Yang, founding and managing partner of BVCF

BVCF III is the third fund managed by BioVeda China Fund Management Ltd (BVCF). Previously known as BioVeda Capital, BVCF was established in 2005 by Dr. Zhi Yang, who is now one of the four managing partners. The BVCF investment team is well-known and respected in the life sciences and healthcare field in China, due to their solid scientific background as former researchers, their managerial and financial skillsets, and their experience and extensive network in the market.

All key members of the investment team have formerly performed relevant research and development work themselves and therefore have a sound understanding of the scientific fundamentals underlying their investees' business. To complement their strong scientific credentials they have teamed up with finance and management professionals who have the necessary business and entrepreneurial experience. BVCF is working together with its portfolio companies, to improve their corporate governance and implement best practice environmental and social standards, which will eventually also trickle down the value chain and set the benchmark for the entire industry.

BVCF also maintains a constant dialogue with major stakeholders in these industries, both national and international, including regulatory bodies, provincial authorities, universities, technology centres, healthcare interest groups and potential buyers. All of these areas of expertise are crucial for providing their investees with valuable support and advice to build successful companies. Most of the companies are at an early, pre-revenue stage with multiple milestones to achieve before becoming profitable. Often those businesses are led by a small team of scientists who need strategic advice and support in properly setting up a business, for instance by introducing appropriate management information systems and reporting processes .



Shanghai



VISUNEX

MOBILE EYE SCREENING FOR NEWBORN BABIES

CRUCIAL EARLY DETECTION

China accounts for about 20% of the world's blind population, with an estimated 5 million cases and an additional 450,000 new occurrences recorded every year. Early detection of abnormalities within the first two years of life can help to prevent approximately 70% of potentially-blinding eye conditions in children. Since the development of the eye and problems associated with it are fastest during the first six months of life, it is crucial that access to screening is available at birth.

AN UNMET NEED

Current diagnostic devices are large and non-portable; they provide low image quality and need to be operated by an ophthalmologist. They originally were designed for Caucasian ethnic groups and are therefore not optimal for the diagnosis of dark-colored eyes. With an approximate cost of USD 280,000 per device they are also very expensive. Smaller hospitals in remote areas especially do not have the funding to afford the technology or

the necessary expertise to conduct the screenings.

AN ACCESSIBLE SOLUTION

Visunex is tackling this problem by developing mobile eye screening devices which can be operated by staff without extensive education. Nurses and health-care professionals trained to that effect can screen newborn babies and send the images directly via internet to pediatric ophthalmologists for remote diagnosis. Visunex' products will be sold for approximately one-third of the price of the currently-used technology, resulting in a screening process which is also affordable for smaller or rural hospitals. Thus the new technology will be accessible to all socio-economic groups, and also ideally suited for other emerging markets.

20 MILLION POTENTIAL BENEFICIARIES

Visunex' devices have the potential to become a key element in supporting the government's upcoming universal eye-screening program, which will introduce

compulsory eye exams for newborns nationwide. This means that over 20 million babies annually, born across more than 8,000 hospitals in China, could benefit from the products developed by Visunex.

BVCF III invested USD 3.7 million in Visunex in 2013.



« If newborns can have a comprehensive screening, early detection means early treatment and prevention »

-Wu Fang, Visunex Executive Vice President

SENGEN BIOTECH

AFFORDABLE AND HIGH QUALITY INSULIN

A SERIOUS HEALTH ISSUE

While diabetes is often viewed as a Western problem, it is rapidly spreading and becoming a serious health issue also in developing and emerging markets. Approximately 80% of the world's diabetic population now live in low- and middle-income countries and 30% of these are in China. In fact, 114 million people are diabetic in China, more than in any other country in the world. Furthermore research suggests that close to 500 million Chinese people are pre-diabetic and will also eventually need treatment. This further enhances the perspective of the enormity of the healthcare challenge still to come.

China currently imports over 90% of its insulin products as, until now, the lack of advanced medical technologies and insufficient quality standards has meant that foreign products have dominated China's domestic market. Relying on imported products implies high cost of treatment and dependence on external factors. It is estimated that less than 25% of diabetes patients in China currently use

insulin regularly, which is seen as the best drug to avoid serious complications and ensure a high quality of life for diabetes patients. The underuse of insulin is due to the high costs of the treatment and the low quality of the products commonly available which results in undesirable side effects.

WORLD-CLASS PRODUCTION

Sengen Biotech was founded in 2007 by scientists with the vision to provide affordable biopharmaceuticals with the highest quality standards to the largest number of patients. The company has developed processes which enable them to manufacture ready-to-use insulin and insulin analog products at a much lower cost and in much higher quality than any competitor in the market. By using locally-sourced adjuvant ingredients and streamlining the manufacturing process, Sengen's world-class production facility has a higher yield by three to five times than any competitor and it meets or exceeds current US and European pharmaceutical standards reaching a higher purity of the product than any large multinational group.



Sengen's manufacturing and development center is located just outside Shanghai, China

« I took a walk by the river early one morning, and I saw the older folks practicing Tai Chi. Then I thought to myself, 'When I'm 80, and I'm doing Tai Chi here, what will I talk to them about? How much money is in my bank account? I want to be able to say, even if it's to one out of tens of thousands of people, 'That medicine you use, I made that »

-Dr Shen Chun, Founder and CEO of Sengen



Current insulin products are available at a cost price of USD 4.7 per day per patient. Sengen's products will be available at USD 1 per day per patient, enabling millions of Chinese diabetic patients who could previously not afford the treatment to access the best quality drug at an affordable price.

STRONG LOCAL SUPPORT

At the same time Sengen's products will help to drastically reduce China's dependence on expensive imported products. Consequently the support from the local government for Sengen is strong; it assists the company with obtaining the land and setting-up the manufacturing plant.

BVCF III invested USD 11.3 million in Sengen Biotech in 2014.



YASHENTECH CORPORATION

SOOTLESS DIESEL TECHNOLOGY

Dr Youqi Wang (R), together with Yashentech clients

CHINA'S AIR POLLUTION

Air pollution in China is a major health hazard with 99% of China's 560 million urban population breathing air considered unsafe by European Union standards. This has long-term health impacts that slowly build up over time, which are not immediately apparent and therefore do not get the attention and trigger the preventive measures required. Air pollution has been linked to health issues such as heart disease, stroke and respiratory illnesses as well as an increased probability of cancer.

Coal power plants, industrial pollution and vehicle emissions are among the largest contributors to this immense problem in China. As the bulk of China's rapid industrial and economic expansion is built on the use of fossil fuels with no change in sight in the near future, making their combustion cleaner by lowering emissions and improving efficiency is essential. This is where clean technology comes into play as one of the key industries which will enable China to adapt its current economic development model to become safer and more environmentally friendly. In China an estimated 21,000 deaths per year are related to air pollution along with an

estimated 2 million work days lost due to related ill-health; in 2010 this represented USD 139 billion in monetized damages and losses. Therefore the Chinese government is naturally highly supportive of innovative solutions in this area.

CLEAN ENERGY TECHNOLOGY

Founded in 2004, Yashentech Corporation is focused on clean energy technology. The company has established a series of world-leading High-Throughput Research and Development technology platforms, out of which it has developed proprietary technologies for the Chinese domestic diesel market which satisfy stringent emission and environmental requirements. The technology involves using CO₂ and methanol to produce a biodegradable, non-toxic diesel blending material (Dimethyl Carbonate or DMC) to reduce the pollution expended during the combustion of diesel fuel. The addition of DMC can cut the amount of fine particles emitted by 90%. It is widely recognized as an important "green chemical" and is already being used in pharmaceutical, chemical, and other environmental protection and clean energy applications. With diesel engine emissions being one of the highest contributors of smog in China,

Yashentech's sootless diesel technology will have a direct impact on improving air quality for millions of people, in particular those living in densely populated areas, which are most exposed to air pollution by automobile traffic.

REAL-WORLD APPLICATION

The managers of Yashentech are all strongly committed to leverage their knowledge and the High-Throughput technology in the research of additional technologies for real-world applications. These managers not only bring a wealth of experience, but also a wide network of contacts who have agreed to advise Yashentech on an as-needed basis, resulting in an impressive pool of brain power they can tap into whenever needed.

BVCF III invested USD 7.4 million in Yashentech Corporation in 2013.

« I personally want to see the technology deployed to have an impact on the nation as a whole to create a more preventative solution. I feel really proud of our technology »

- Dr Youqi Wang, Yashentech Corp. Chief Technology Officer



WHAT ARE LIFE SCIENCES?

They comprise the field of science directed at living organisms such as microorganisms, plants, animals and human beings. While biology and medicine remain the centrepieces of life sciences many areas of specialization have developed around them such as molecular biology, biotechnology and clean technologies. The life sciences are helpful in improving the quality and standard of life and have applications in health, agriculture, medicine, and the pharmaceutical and food science industries. The life sciences industry is relevant for both the healthcare and non-healthcare fields.



HEALTHCARE

- » Creating, innovating, manufacturing, or selling medicines and/or medical equipment
- » Medical or health-related services



NON-HEALTHCARE

- » Industrial biotech - Using life science technologies to manufacture industrial materials
- » Agricultural biotech - Using life science technologies to protect or help grow crops
- » Cleantech / Greentech - Using life science technologies to make clean/green fuel or material

ABOUT OBVIAM

Obviam is an independent investment advisor specialised in long-term investments in emerging and frontier markets. Obviam advises public, institutional, and private clients, including the Swiss Investment Fund for Emerging Markets (SIFEM), the Development Finance Institution (DFI) of the Swiss Confederation. Obviam offers investors an opportunity to capture attractive returns and generate sustainable positive impact in emerging and frontier markets, via a proven and responsible investment approach.

ABOUT SIFEM

The Swiss Investment Fund for Emerging Markets (SIFEM) is the Swiss Development Finance Institution. It provides longterm finance to private equity funds and financial institutions in emerging markets. SIFEM's primary focus is on institutions investing in the small and medium enterprise (SME) sector. On a selective basis, SIFEM also invests in microfinance. SIFEM's investment philosophy is guided by the belief that investing in commercially viable emerging market SMEs can provide investors risk adjusted returns, as well as generate sustainable, long-term development effects in local communities. SIFEM is fully owned by the Swiss Confederation and managed by Obviam, a privately owned management advisory group.

CONTACT

For further information please visit our website or contact us directly at the address below:

SIFEM AG, C/O OBVIAM DFI AG

Bubenberplatz 11, 3011 Bern, Switzerland
T +41 (0)31 310 09 30, Fax +41 (0)31 310 09 39
www.sifem.ch, www.obviam.ch