

Fast Growth of a BioNanotech Start-up in China

Abstract:

NanoGlobe team conducted a site visit at NanoMed, a global bionano start-up company based in Suzhou BioBay incubator, founded by a team of overseas Chinese and Americans. NanoMed's innovative Functional Micro Array (FMA™) technology is a non-invasive drug delivery technology, which has four distinct advantages compared to the conventional needle injection: painless, less toxicity for potent drugs, improved drug efficacy, and reduced treatment time. Currently NanoMed's FMA™ Patch has potential clinical applications in the areas including skin diseases, diabetes, tumors and pain relief. Its first product for acne treatment was launched in the market in March 2010 and NanoMed expects to break even in 2011.

[Suzhou Natong BioNanotechnology Co., Ltd. \(NanoMed\)](#), based in Suzhou Industrial Park, was founded in November 2007. It is a clinical-stage medical product company focusing on developing and commercializing non-invasive drug delivery technologies. We interviewed its founding CEO Dr Bai XU who is a Chinese Canadian with a PhD in Materials Science / Chemistry from the French National Scientific Research Centre. He spent over 20 years in France, Canada and US conducting research for developing Micro-Electro-Mechanical Systems (MEMS) devices for microfluidic, optical telecommunication, RF communication and biomedical applications. "We have been told that US has the best medical technology in the world, however, my son cried when he was given a needle injection in US." Dr Xu told us during our interview with him in Suzhou (see Figure 1-A). "We decided to develop a less invasive drug delivery device using nano/micro system technology to provide painless injection and more effective and efficient drug delivery. "

From 2004 to 2007, Dr Xu worked together with researchers in the Technical Institute of Physics and Chemistry of Chinese Academy of Science (CAS) to develop a novel drug delivery platform using nanoscale MEMS fabrication technology. In 2007, Dr Xu was awarded 10 million RMB (1.47 MUSD) from Suzhou Industrial Park (SIP) "The Science and Technology Pioneer Award", for developing and commercializing his innovative intradermal drug delivery technology, also known as Functional Micro Array (FMA™) technology. [SIP Bio & Nano Technology Development Co., Ltd. \(Biobay\)](#), the most progressive bionano accelerator in China, not only houses NanoMed in Suzhou Biobay and also assists NanoMed in accessing to government and venture capital (VC) funding and other resources in China. NanoMed also won the "Most Promising Company" Award at the BioBay Investor Forum in August 2009. NanoMed licensed two patents from The Technical Institute of Physics and Chemistry of Chinese Academy of Sciences, and has applied 12 patents for its intradermal FMA™ technology, six of which have been granted, including one in the US and five in China. Two PCT applications entered national phases.

NanoMed's FMA™ Patch (see Figure 1-B) has potential clinical applications in the areas including skin diseases, diabetes, tumors and pain relief. Painless (without touching nerve and blood vessels for treating skin conditions), less toxicity for potent drugs, improved drug efficacy and reduced treatment time are the four advantages of

NanoMed's FMA technology. NanoMed collaborated with Beijing PLA General Hospital to develop its Liteclear™ products using FMA technology to treat acne. Studies showed that Liteclear™ reduced acne lesion size, diminished redness and pain in as little as 12 hours. Inflammation was eased in one week, compared with several weeks using conventional acne treatment technologies/products. The critical challenge for drug delivery into skin is penetration into the stratum corneum, the outermost layer of human skin. NanoMed's FMA™ Patch fabricated based on the MEMS technology is equipped with nanoscale needle tips capable of delivering painless injection in 10 seconds. The microscale needle embodiment is able to provide precise control of the dosage and delivery time by controlling the depth of penetration.

NanoMed outsourced the fabrication of the microneedles on 8 inch wafer to an overseas foundry and started the mass production in 2008. The first product using FMA™ Patch is for treating acne (see Figure 1-C). "We predict the sales in Zhejiang province will reach 5 million RMB (\$735,000) this year, and the total sales across all of China is expected to be 10 million RMB (\$1.5 million)," said Dr Xu. "For the long-term and global growth, NanoMed is in the process of exploring collaboration with pharmaceutical companies all over the world to innovate their drug delivery system. Compared with the high risk (up to 90%) of developing new drugs, the risk of developing new drug delivery system using our FMA™ technology is almost zero," he continued.

As a returnee, educated and trained overseas for over 20 years, Dr Xu has experienced the unique advantages for building a successful bionano company in China where he is able to lower the operation costs and have access to a wealth of clinical resources compared with that in North America and other developed regions. When asked the difference to do business in China and US, Dr Xu joked: "Chinese do deals on the dinner table in China, while Americans do deals on the golf course." As an entrepreneur running a high-tech start-up in China, the shortage of financial and legal professionals has been quite a challenge for Dr Xu. At the end of January 2010, NanoMed signed a funding agreement with Softbank's SB China Venture Capital (SBCVC). This funding was seen as an important milestone for the company. "In addition to funding support, SBCVC brings business management and market network which will benefit greatly NanoMed's future growth," said Dr. Xu.

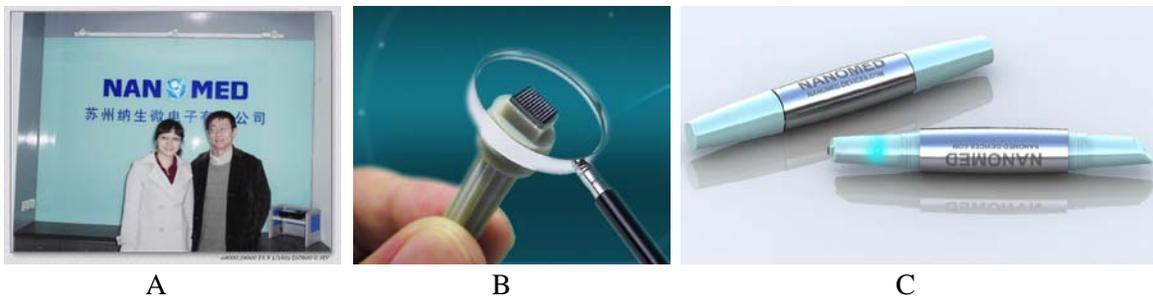


Figure 1. A) Group photo of Ms Jing Jiang (NanoGlobe) and Dr Bai Xu (NanoMed) during our site visit; B) top view of NanoMed's FMA™ Patch and C) acne treatment products using FMA™ technology.