

# Championing Innovation

**As one of the four global DNA microarray companies in the world headquartered in Asia, Taiwan-based Phalanx Biotech finds itself at the right moment to tap into the global market through competitive, cost effective and world-class products.**



**Sybil Yang**  
Chairman & CEO of  
Phalanx Biotech  
Group



**Voices of Leaders: What were Phalanx's most important developments in 2019?**

**Sybil Yang:** In the past, we were more focused on the technology platform and recently, we started capitalizing on this platform towards developing applications that are becoming products. When we develop applications, we are transforming from the only microarray developer in Asia, based on scientific research services, into an innovative genetic test provider along with a wide range of total solutions in the following five major areas – reproductive medicine, consumer genomics, methylation genetic testing for early detection of liver cancer, medical oncology, as well as translational medicine.

Phalanx Biotech self-developed the product of chromosomal microarray – “CytoOneArray”, which can detect more than 400 diseases per microarray test caused by chromosomal microdeletions and microduplication, well received by obstetricians and pediatricians as an advanced genetic diagnostic tool. Through our five major areas of genetic testing services, we are providing the public with one-station companionship from birth to adulthood. We allow each family member to have a professional team as the strongest support at different stages of life, and always care about and protect the health of the whole family.

**Richard Su:** This year we launched a very unique product for cancer early screening, called LiverEDx. It is currently on the market after several years of basic research and product development. LiverEDx achieves ultra early liver cancer detection through four DNA methylation genes from only a few milliliters of blood. Compared to the current non-

assay, the AFP test, we significantly boost the accuracy of liver cancer early detection – stage zero and stage one cancer – from 50% to 84%.

**SY:** Liver cancer does not particularly have a big impact in Europe and the U.S., however it most commonly occurs in Asia, and it has become a top two leading cause of death in Taiwan. That is mainly why we are currently providing LiverEDx, a breakthrough testing for liver cancer early detection, locally in Taiwan and we are expanding to China as well.

**RS:** Basically, we are focused on two major applications currently, reproductive and liver cancer preventions. Our future dimension will be exerting major efforts in these two areas. We started providing our products in Taiwan and China and we will then expand to Southeast Asia and Northern Asian countries such as Korea and Japan in the coming years.

**VoL: What is the company's commitment to R&D and innovation? What is the percentage of R&D investment each year?**

**SY:** We have been investing more than 100% of our revenue in the past few years in enabling clinical applications, since five to ten years of product roadmap development is essential for biotech firms. The research development is very much like building up a construction which requires a solid infrastructure, as deep and strong as possible. Sometimes, you don't see too many achievements above the ground, but the infrastructure underground has actually been very deep and solid. We are just completing the groundwork

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and are ready to grow something visible above the ground, which is revenue. We have been building up a reliable, scalable and certified platform like a solid groundwork, which has attracted investors to join our works and be ready to grow valuable outcomes closely together “above the ground”.

**RS:** I always believed our advantages would be in technology and engineering, not original inventions. So our commitment is to make the highest quality products with affordable cost.

**VoL:** Could you share with the readers the characteristics and main uses of microarray products?

**RS:** Our core technology is called DNA Microarray. Since it had been invented a few decades ago, it has become the first technology that can simultaneously detect genes at whole genome (20000-30000 genes) level. Before that, people could only detect tens of genes at one time. This huge difference enabled lots of new discoveries since many gene-related diseases or biological mechanisms are so complicated that researchers would need to investigate the comprehensive gene network in order to understand it. This technology has now been commonly used for clinical applications and even for the general public. We believe that early disease detection via genetic test will be the future trend so non-invasive and ultra-sensitive assays will be in high demand.

**Jack Huang:** For the prenatal and postnatal applications, we use a single microarray to detect 400 rare diseases for prenatal screening, that is our key service here in Taiwan and we expect to expand to other countries.

**RS:** Regarding the pregnancy product, most people usually know about Down syndrome but it is actually only one of the 6,000 inherited diseases, and with our product we can detect more than 400 hundred at a time, so it is very convenient for parents to be less worried.

**JH:** The product is focused on intellectual delay and developmental disorder such as Prader-Willi syndrome, Developmental Delay and Intellectual Disorders (DD/ID), two areas of diseases detected by one single chip.

**RS:** This is very important because according to the data of the WHO, more than 5% to 8% of children have DD/ID diseases every year. Our product is so powerful such that if we do a general screening of the population, we can decrease by more than 50% that 5%, which is very significant and impactful. We are trying to make this product accessible and affordable to everyone.

**JH:** The incidence rate for birth defects in China is about 6-8%, so the Chinese government is working very hard to reduce the rate of birth defects. That is why I believe it is good timing to enter the market of other countries.

**RS:** 6% in China represents over 1 million of the population; it is a high number of risk.

**VoL:** Are you launching any new products in 2020?

**RS:** The future trend for genetic testing is non-invasive and ultra-sensitive. In 2020, we may launch an ultra-sensitive research kit which improves current detection limit by 50000 times. What this improvement means to us is, as an example, if you have to draw 500cc of blood, in the future you would only need one drop of blood with this kind of technology – that is how sensitive is.

**VoL:** What is your perception about the current state of the biotech industry here in Taiwan?

**SY:** I think it's poised for taking off. When I joined the company, Phalanx Biotech positioned itself with an outstanding platform that can embed a lot of proven concepts into the development of biochips, from now on, as an original microarray developer, our prenatal and postnatal genetic testing services have become very supportive for doctors to fulfill their clinical needs to identify rare diseases by leveraging our biochips to read signals. With regards to moving on to the global arena, we are soldiering on to further optimize our genetic testing services to create cost effective, big-scale and commercialized services to tap into the growing market needs worldwide.

I believe the biotech industry in Taiwan can follow the same pattern and spirit from the ICT industry to





make our biotech business grow successfully. That's why Phalanx Biotech has been crossing boundaries, seeking international partnerships and engagements in the past few years to shape our products to become more competitive and globalized.

Phalanx BioTech is one of the global four DNA microarray companies in the world along with three other respected American counterparts, Illumina, Affymetrix and Agilent. In other words, we are also the only microarray developer in Asia, a region foreseen to have the highest growth in next decade.

**VoL:** Given your academic and professional experience and seeing the growth of the biotech industry in Taiwan, what do you think is the potential of this industry in the coming years, not just for Phalanx Biotech, but for the industry as a whole?

**SY:** A long time ago, when the semiconductors industry started in Taiwan, nobody knew it would go this far and reach such a high global profile. Currently, the status of Taiwan's biotech industry is at the stage similar to semiconductors 30 or 40 years ago. Taiwan's biotech industry has outstanding resources in terms of our National Healthcare Insurance System, our talents pick medical services as the first choice for their career path, all these have planted seeds in the biotech industry as a promising future, although there is still a space to grow in term of developing a bigger scale of services. I would not be surprised if Taiwan's biotech became the next generation leading industry, like ICT.

**VoL:** What does Taiwan need to do to become a global innovation center?

**SY:** The factors to become a global innovation center is very much dependent upon a strong international network connection and a friendly capital environment for risk-taking investment. Apart from that, we need to identify our strengths to compatibly partner with global counterparts, which are known as the original innovators, to enlarge the scale of the global market. For instance, Facebook and Tesla started in the U.S., and are known for the power of innovation, which is their strength. However, the innovative giants would need to leverage the other partners' strength from the other side of the globe to enlarge their global services. That would be the moment for the other players to get involved to form the global innovation center. To apply that scenario to the genomics business, we are

one of those players to compatibly partner with to form a global innovation hub in the genetic testing industry.

Taiwan is a global powerhouse in technology, IT, and computing systems. As biotech evolves, we are creating new services that marry breakthroughs like artificial intelligence with Big Data, derived from the human genome. Taiwan boasts a world-class healthcare system and a broad medical talent base. Strengthening biotech collaborations will help upgrade the nation's R&D capabilities, increase the global competency of Taiwan companies and raise the country's profile as a hub of innovation.

Currently, Phalanx Biotech Group has joined a talent development project initiated by the Taiwanese government, named LIFT, to provide an incubation environment for overseas biotech talents to return to bring in new blood. Additionally, Phalanx Biotech and Taipei Medical University have joined hands to collaborate in industry-academia classes and to cultivate talents for connection with the enterprise. By having more resources to promote the brands to the international market, it will also allow the world to see the top medical team from Taiwan!

**VoL:** What is Phalanx Biotech Group's message for our international audience of FORTUNE readers?

**RS:** We are one of the four global DNA microarray companies in the world and we are the only one located in Asia. Since the inauguration of array technology, key international developers except us had focused on technology improvement at array density. Instead, Phalanx Biotech persisted on both quality and cost effectiveness of our manufactured engineering. Nowadays, DNA microarray has commonly been used in clinics and general publics, so high quality and massive quantity products are highly demanded. It indicates that our persistence for both quality and cost for our microarray technology has successfully tapped into the demands of the market, which is now the right moment for us to soldier on! I hope FORTUNE magazine readers worldwide can recognize that Taiwan's biotech industry has such a company, Phalanx Biotech Group, to obtain the capability to stand up proudly in the global arena.







## Phalanx Biotech, one of the global four DNA microarray companies along with Illumina, Affymetrix and Agilent

**Phalanx Biotech**, headquartered in Taiwan for 17 years, is dedicated to the development of a genetic detection platform, incorporated with Microarrays, Next Generation Sequencing (NGS) and Big Data analysis for health informatics, positioning itself as the only Microarray developer in Asia. The core services of Phalanx Biotech lie upon five areas: **Reproductive Medicine** (prenatal/postnatal testing), **Population Medicine**, **Medical Oncology**, **Liver Cancer ctDNA Methylation Test**, and scientific research services.

- **Reproductive Medicine** - Phalanx Biotech self-developed the product of chromosomal microarray - "CytoOneArray", which can identify chromosomal aneuploidy and other large changes in the structure of chromosomes in prenatal and postnatal testing. CytoOneArray is capable of effectively detecting more than **400 diseases** per test for Developmental Delay (DD) and Intellectual Disability (ID). It provides advanced genetic diagnostic tools for obstetricians and pediatricians.
- **Population Medicine** - Provides risk and predisposition assessment for obesity, **13 chronic diseases** and **17 cancers**. Additionally, Phalanx provides custom arrays for SNP genotyping and custom-designed services for consumer genetic testing.
- **Medical Oncology** - Provides genetic tests for new generation **cancer medications** for treatment tailored to each patient.
- **Liver Cancer ctDNA Methylation Test** - A breakthrough genetic testing development by leveraging **ctDNA methylation markers** for early liver cancer detection and screening.

