Interview with Han Oh Park, President & CEO, Bioneer

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Could you provide our international readers with a profile of Bioneer as it stands today?

Bioneer, having a strong basis of technology and experiences in molecular biology since 1992, we have optimized various products we offer from oligonucleotides, siRNA, PCR products, the kits, instruments that are necessary from basic scientific research to molecular diagnostics. Bioneer's Exicycler™ 96 Real time qPCR instruments and the room temperature stable diagnostic kits are the one of the representative products to be dedicated in Health market. We have developed 40 different molecular diagnostic kits and the major target of these kits is infectious disease. Among 40 kits include tuberculosis, HPV, HIV, gonorrhea, and other STD's and respiratory diseases. The most unique and advantageous about our kits are room temperature stable for 3 months and moreover, the kits are stable for 2 years in the freezer where other brands only last 6 months. I am proud to say that not only those countries that are already familiar with these kits, but several African countries are using our kits for routine detection and they've found our technology very helpful. Bioneer, being the first Korean Biotech company and as a founder, my first mission in 1992 was to establish infrastructure to support local biotech industry. At that time, we mainly focused on recombinant DNA technology and became the first provider of oligonucleotides, PCR products and recombinant DNA enzymes and other instruments. Over the last 17 years, we have developed most of the recombinant DNA technology from reagents to instruments. After we developed a high throughput DNA synthesizer, we established fully equipped production line with a complete fabrication system ranging from raw materials to final oligonucleotide in both Korea and Alameda, California. We have started the business by providing molecular biology technology and moving to

molecular diagnostics. We are continuously working to dedicate in developing products that would give stability, conveniences, reproducibility and efficiencies. Many of your products are very advanced.

How is the Korean market receiving these cutting edge technologies, what is the reception?

Until last year our main products were research components for molecular biology and genomics. Last year we began providing our premixed and room temperature stable kits to hospitals. Everyone understands the advantages of our kits because they're stable and easy to use. We launched our diagnostic premix kits to a few hospitals. Their first impression was little doubtful and strange at first but then now they are being addicted to our technology. We've already experienced extreme customer loyalty with our research products. Once they have hands on our products they don't want to use any others due to reproducibility and easy-to-use, which is a huge advantage in diagnostics. The Korean Health Office is already using these products in several areas. One of the key examples of the usage in our kits' application is in 2001, where we developed the bio-terror detection system collaborating with the Korean Department of Defense. These kits are actually ideally suited for field detection because soldiers don't have either the time or the trained personnel to operate PCR's in an accurate or predictable fashion. This year, we will be launching High Density quantitative PCR's. Our technology is very unique and ease-to-use, so we are looking to replace DNA microarray technology. We can precisely measure the gene expression of more than a thousand genes simultaneously. I really believe this product will change diagnostics, especially early detection of cancer and improve research in cell biology area. The problem with existing DNA microarrays is that relative gene expression is impossible to determine. However, we can measure relative gene expression very accurately using high-density real-time PCR's. There is an existing real-time PCR product in the market, but it only allows very small volumes, just 33nl. Our device accepts 1 microliter. Also, the other product uses a difficult 'flow through' system. Our system is even easier to use than a standard QPCR. Bioneer's operations are quite far-flung, with facilities in the US and China as well as global distribution.

How do you balance these very different markets and how do you see your global strategy evolving?

Most of technologies are not yet available in developing countries because they don't have the infrastructure to support them. Conventional PCR's just don't work in Africa, but our PCR's are feasible in terms of operation, costs and the price of the device itself. We are looking at developing next generation technologies that are targeted at the unique needs of the market in developing countries as well as developed ones. We built the infrastructure for Korean biotech from nothing,

and since we have started from the scratch, we have experiences in this regard. When we started the company, nobody else was producing any of these types of products and now we are at the same level as developed countries. We are also developing other next generation technologies. We have already launched an S. pombe genomewide deletion mutant library, which is very useful for studying gene fuctional and drug target discovery. This is precisely our future direction. You seem to have a wide range of potential clients ranging from industry to academic research to hospitals.

How would you describe the breakdown of your client demographics?

Most of our clients are involved in academics, research organizations and biotech industry. We are starting to focus on the hospital market for both in Korea and abroad. We have had an ongoing relationship with major hospitals for some years. This was because back in 1992, PCR technology was just beginning to spread outside of research and into the broader medical field. Professors in medical schools and hospitals didn't have experience using PCR's and desperately wanted to learn. We provided seminars on PCR and sequencing. Through the workshops, many of these hospitals and medical schools purchased our equipment and reagents. We are utilizing these relationships to promote our new diagnostic products. I don't see clinical clients as materially different from research clients – it's just different in aspects, serious application of the same technologies. You have many patents of your own and have also licensed in some technology such as your siRNA product.

What is your overall strategy regarding partnerships?

We're also working with a US company for the distribution of their products. Our strategy is that if we don't have technology that's truly essential to our business, we outsource it. We do have many patents and I believe these technologies have a huge potential that our main focus is licensing them out. We are currently working with a major company in Switzerland to this effect. We are working very closely with the patent office. In-licensing, however can be tricky and expensive for a small company. We currently have a very small clinical trial with fewer than 60 people. This is the first obese control clinical trial with Lactobacillus. This has huge potential in the functional food space. Our Lactobacillus is isolated from milk. We've found that over a three-month period, there is an average two kilogram weight loss. We're in talks with a major European company for this product, which has a one billion dollar potential market. This approach is much better than a drug. Lactobacillus operates through a very simple mechanism, it uptakes glucose and secretes out indigestible fiber to decrease calorie uptake. We've tested all the biochemical characteristics of the substance and found the substance is effective and safe. You were previously an award winning research scientist at the KRIBB.

What caused you to move into industry, what was your inspiration?

I worked in a molecular biology laboratory at the KRIBB where I wrote my masters thesis on oligonucleotide synthesis. I wanted to make a super DNA synthesizer. The Human Genome Project had not yet started at that time, and I was very excited to develop a high throughput oligonucleotide synthesizer. There were only one or two column synthesizers and I wanted to develop 100 plus column devices. However, my proposal was dropped. At that time, nobody talked about fusion technology. There were no laboratories dedicated to develop this kind of technology. That's when I decided to set up my own company where I can follow my belief and instinct. You have come a tremendous distance in the last 17 years.

What is your vision for the next five-years for the company?

The 21st century is the era of DNA and Bioneer is positioned to provide key technology for this industry. The first application is molecular diagnostics and I believe the second major application one will be sequence based drugs such as siRNA. This will account for the majority of the pipeline in biopharma. We are continuously investing in siRNA in order to increase efficiency and cellular delivery. We are working with scientists at Yale medical school to help us identify and target their unmet needs. One key target is COPD. There is no drug in this area and more than 10 million people will die in China alone over the next decade. In the next five years we want to be the leading molecular diagnostics company based on our proprietary technology platform.

We also want to be an emerging company in the sequence based drug area. Of Bioneer's many achievements to date, what are you most proud of?

We were a pioneer as the first biotech company in Korea. I think we changed people's mindsets and proved that biotech can be a real business. We also built up the infrastructure that allowed Korea to become a major player in terms of DNA technology. Korea now has as many qualified researchers as Japan, and we have surpassed them in some areas. This is a huge accomplishment and I'm proud to be a part of that contribution.

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