**A Scientist in a Venture Capital World**

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The rise of entrepreneurship and growth of venture funding in the U.S. inspires many Americans to buy a one-way ticket to Silicon Valley to make their million-dollar dreams come true. Dr. Han Cao, founder and Chief Scientific Officer of BioNano Genomics Inc., shared his experience with starting a successful company as a scientist in the world of venture capital-- a world where scientists are few and far between-- at the annual meeting of the American Association for the Advancement of Science in February.

Cao immigrated to America after receiving his Bachelor of Science degree from the University of Science and Technology of China. After he earned a Ph.D. in molecular biology, he began a post-doctoral fellowship program in stem cell and DNA repair at University of Pennsylvania Medical Center’s Institute for Human Gene Therapy. To add to this impressive resume, Cao joined an interdisciplinary team at Princeton working on a U.S. Defense Advanced Research Project Agency (DARPA) project. With the support of the Princeton University, he founded BioNano Genomics in 2003 and ventured into the do-or-die world of entrepreneurship.

Dr. Cao was successful in a field where many scientists fail because he was able to communicate effectively with funders. When an audience member commented on the clarity of his presentation, he candidly noted, “I have to pitch this stuff to venture capitalists and WallSstreet guys.” To explain his ideas regarding DNA analysis and microbiology to his future partners, Dr. Cao said that he had to simplify the scientific language through analogy and story-telling skills.

His explanations, he said, allowed those without his professional background to understand the bottom line about his product. He described his patented NanoChannel technology that can isolate DNA strands as trying to squeeze a pile of cooked spaghetti down a sink without mashing the strands. He likened the complexities of DNA sequencing to reading a novel, only the chapters are in random order.

As any entrepreneur will tell you, the road to starting a successful company is not smooth or straightforward. Cao admitted that BioNano Genomics underwent many iterations to become what it is today. It was founded in 2003 as a spin-off of the DARPA project he worked on at Princeton. From 2003 until 2010, Cao said he experienced the unforgiving life of an entrepreneur fraught with mistakes, false steps, and failures. Describing the company’s early days, Cao said he knew “every coffee shop in Philadelphia that had free Wi-Fi.”

Although his bank account was dwindling, Cao persistently refined his pitch and set up meetings with venture capitalists until he was able to find a financier who would help him pay more than a $700,000 debt. With his debt zeroed and his NanoChannel technology patented, he was finally able to hire staff, rent a work space, and take his vision to the next level. In a series of major successes, Cao hired BioNano Genomics’ first chief executive officer and secured $23.3 million in venture funds from Battelle Ventures, 21 Ventures, and the Ben Franklin Technology Partners in late 2011. From that point forward, his scientific work that began at Princeton ten years earlier became a multi-million dollar entrepreneurial success.

Today, BioNano Genomics sells both the hardware and software for DNA imaging and genomic analysis at the single molecule level, Dr. Cao said. This information can provide genetic diagnostics, personalized medicine, and advanced biomedical research. Since many researchers have expressed the need to look at whole sequences of genes and long segments of non-essential regions of the genome, there is a big market for BioNano Genomics’ product. As a testimony to the product’s success, his company successfully presented the first live sequencing of the human genome at a conference in February 2014.