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Paul Chapman's Quanterix Might Save Your Life

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A series of Forbes Insights profiles of Thought Leaders changing the business landscape: Paul Chapman, CEO, Quanterix...

"You save lives. Period. And that's what really gets me excited," is how Paul Chapman describes his job as CEO of life sciences company Quanterix. Imagine taking a simple blood test to get an early warning of an impending heart attack before you exhibit any symptoms. Or detecting the presence of the HIV virus six days after infection instead of 60. Or athletes getting immediate detection for traumatic brain injuries from concussions.



Paul Chapman, CEO, Quanterix

Founded in 2007, Quanterix has developed an ultra-sensitive diagnostic platform capable of measuring individual proteins at concentrations 1000 times lower than the best immuno assays available today. The Single Molecule Array (Simoa™) technology at the heart of the platform enables the detection and quantification of biomarkers previously difficult or impossible to measure, opening up new applications to address significant commercial unmet needs in life science research, in-vitro diagnostics, companion diagnostics, blood screening, and more. Quanterix is a venture capital backed company and the exclusive licensee of a broad intellectual property portfolio initially developed at Tufts University by Dr. David Walt, scientific founder of Quanterix and Illumina (NASDAQ: ILMN).

The Lexington, Massachusetts-based company has 52 employees and is now moving from what was a predominantly PhD and scientists based employee base to building out its sales, marketing and operations part of the organization under Chapman's guidance. The company is funded by Bain Capital, Flagship Ventures, Arch Venture Partners and the venture arm of the CIA, In-Q-Tel. "We're looking to break even by 2016. We had our series C of funding last November for \$18.5 with participation from all existing investors and joined by In-Q-Tel. We expect that to be our last round," continues Chapman.

The company's Simoa HD-1 Analyzer offers researchers in the bio pharmaceutical industry, academia, CROs, and other laboratories the ability to measure the concentration of target analyses with unprecedented sensitivity. Simoa's open platform makes it easy for researchers to program his or her own assay protocols with home brewed reagents or use Quanterix's pre-made kits. Offering a wide range of pre-packaged assay kits as well as a robust, easy-to-implement home brew protocol, Simoa empowers researchers to take their bio-marker research and validation to new levels of precision and detail. "We're licensing the platform through our partnership with bioMerieux and selling the platform to Academia first in order to get more experimentation and in lab usage of the system. It's like open source software, the more people working with the platform the more discoveries will emerge," says Chapman.

The company's technology has potentially profound implications for the early detection and thus early treatment in the areas of oncology, neurology, inflammatory and infectious diseases. According to the company's literature, in oncology, for example, existing assays for measuring prostate-specific antigen (PSA) following radical prostatectomy in prostate cancer patients has been limited by the sensitivity of existing assays. In collaboration with Johns Hopkins University School of Medicine and NYU, Quanterix analyzed serum PSA levels in patients following surgery. Using Simoa, PSA levels were measured for all samples, despite being below the limit of detection of existing assays. These concentrations were found to be predictive of prostate cancer recurrence over 5 years and suggest that such a measurement could be useful to help inform the most appropriate patient treatment algorithm following prostatectomy and provide peace of mind for individuals at low risk of recurrence.

In the field of neurology, Quanterix collaborated with researchers from the University of Gothenburg, Sweden, and were able for the first time to demonstrate that Amyloid β levels in blood acutely rise after an ischemic episode, and that the concentration levels were reliable predictors of outcome as it relates to neurological function. Biomarkers typically only measurable in cerebrospinal fluid (CSF) can be measured in blood as well, offering the promise of greatly improving the access to patient samples for Alzheimer's Disease and many other neurological conditions.

In the area of inflammatory diseases, conventional immunoassays lack the sensitivity required to measure inflammatory cytokine concentration, which has limited the ability of clinicians to measure disease severity or to monitor therapeutic response. In collaboration with researchers at the Mayo Clinic, Quanterix was able to provide quantitative measurements of TNF- α and IL-6 concentrations in plasma of all patients with Crohn's disease, promising a potentially new avenue to monitor therapeutic efficacy of novel drugs.

In a paper published in the Journal of Virological Methods, researchers were able to demonstrate that Quanterix' Simoa technology provided a 3000x improvement in sensitivity over conventional immunoassays for identifying acute HIV infection. In fact, the sensitivity achieved was equivalent to the gold standard of nucleic acid testing, but at the cost of a much less expensive immunoassay. This is particularly important for viruses such as HIV, as nucleic acid testing (NAT) can be cost prohibitive, especially in resource-constrained environments like those commonly found in many less developed countries where HIV prevalence is highest. Persons recently infected by HIV are 10 times more

infectious than persons who have developed an immune response to the virus, but only NAT can reliably detect virus in the earliest stage of the infection prior to the immune response. Early detection of infection with a simple, cost-effective platform like Simoa can potentially have a significant impact in reducing the spread of the disease by making early stage detection more widely available.

The potential to replace nucleic acid testing for HIV screening has important implications for both HIV clinics globally as well as for donated blood screening. The door is now open to explore the application of Simoa to many other applications once thought to be only addressable with nucleic acid testing. “More important, it’s simpler and cheaper than nucleic acid testing, which only the richest countries can afford. Think of what a cheaper early detection system could do to combat infectious diseases in Africa, for example,” says Chapman. Not surprisingly, Chapman is in conversations with the Gates Foundation and that this kind of technology fits within the types of technologies they take interest in.

“I’m the luckiest man on the planet. I was myself a cancer patient and was lucky enough to have a known marker associated with it, so they knew how to treat it,” says Chapman of his unconventional journey to become the CEO of a life sciences company. Born in northern Ontario in a town located a five hours drive north of Toronto. He went to the University of Western Ontario, Canada. Growing up he had a lot of doctors around him both in his family and because of his cancer treatment, so he thought he would become a doctor. “I never thought I would go into the business world,” continues Chapman. “My uncle worked in HR at Baxter pharmaceuticals and advised me to go into the business world instead and I found myself lucky enough to be working in sales for Roche,” says Chapman. Even in his first days selling for Roche he saw how these tests were saving lives, which set Paul’s interest in working on the business side to help change people’s lives for the better.

He moved up and around the organization and spent time in Austria with Roche’s global hospital point of care business. “After Roche, I was hired to join Millipore, where I was responsible for the \$900 million purification and sterilization for antibodies business,” says Chapman. The business was then sold to EMD Merck. He then decided it was time to leave and started reaching out to his network. “I had not paid that much attention to the diagnostic business and set up a meeting with my old colleague Martin Madaus, former CEO at Millipore, who as it turns out was developing this exciting work at his company. Within a half hour of meeting he asked me to join the company as his new CEO. I said ‘forgive me, but what’s the name of the company?’ I went home that evening and did my research on the company and after reading their scientific papers on their new developments in single molecule array detection, my jaw dropped! Two weeks later I was on board as CEO,” exclaimed Chapman.

Chapman’s first order of business as CEO was to close a partnership deal with French in vitro diagnostic company bioMérieux to accelerate the system’s development and to acquire FDA approval through their existing channels. “It’s been breakneck speed ever since,” says Chapman of his year and a half as CEO. The company is also working with Sony DADC in Austria to manufacture its kit. Turns out Sony had excess capacity at a DVD factory that they could easily re-configure to build the Simoa kits and were also looking to diversify their business into biomedical consumables. “As we further miniaturize the system, it can become more of a ‘point of care analyzer’ to take into the field to provide immediate detection and treatment regimes. “I’d like to see our system in every stadium and arena in the world,

so that a simple blood test would provide instant analysis of concussions and would like to talk to the commissioners of the NHL and NFL about it now,” continues Chapman

What does the future hold for Quanterix? “I’ve had my head down preparing for this launch over the past year and a half, so we haven’t really done too much planning around an exit strategy for our investors, but an IPO is a possibility at some point or someone could knock on our door as a suitor,” says Chapman. Next year they expect to expand into Europe and Asia.

“We’re going to change the world,” says Chapman emphatically.