

September 3, 2013
(C. online)

Swedish Researchers Adopt Quanterix Arrays to Identify Concussion Biomarkers in Hockey Players

By Justin Petrone

A research team at the University of Gothenburg in Sweden is using Quanterix's Single Molecule Array, or Simoa, platform to identify blood biomarkers related to brain injury.

As part of the project, the researchers are collaborating with the Swedish Hockey League to obtain samples and data that can be used to correlate the expression of tau proteins, which are found mostly in neurons of the central nervous system, with the severity of injury.

"Tau is one of the markers for neurons. If you have a concussion, it may alter the expression of tau, and that will show up in the blood," Henrik Zetterberg, head of the department of psychiatry and neurochemistry at the university, told *BioArray News* this week.

By using Quanterix's arrays to profile protein-level changes in hockey players one hour after concussion and then every morning after that up to six days, Zetterberg's team aims to be able to develop a test or tests that can predict if a concussion will lead to a more severe brain injury.

Such prognostic assays could "change the course of treatment" for affected athletes, as well as reduce the use of healthcare resources, such as CT scans or in-hospital visits, that are currently used to monitor players who have suffered a concussion, Zetterberg said.

For years, laboratories have been using different approaches to profile tau level changes to better understand sports-related head injuries. Earlier this year, for instance, researchers at the University of California, Los Angeles, described the use of PET scans to identify regions of the brain where tau proteins accumulated following concussions in National Football League players.

Zetterberg said that it has been hard to measure tau protein level changes using genomic and proteomic technologies in the past because the markers are found in such low abundance — in the femtomolar range. Traditionally, he said, the "only way to truly understand the extent of brain damage" has been to perform a spinal tap to measure brain fluid.

However, Zetterberg asserted that the sensitivity of Quanterix's Simoa platform has enabled the researchers to profile such changes using blood samples from impacted players in the Swedish Hockey League.

Lexington, Mass.-based Quanterix's platform consists of its Simoa HD-1 Analyzer and its Simoa Disc consumables. Produced in cooperation with Sony DADC, each disc contains 24 flow cells, each with an array of

200,000 microwells. As part of the assay, a suspension of analyte-capture beads from each sample is passed through each flow cell and across an array for signal detection. Each of the 40-femtoliter microwells contains a single bead, allowing for detection of signal from single molecules of labeled analyte, according to the company.

Neurology in focus

While Quanterix announced the commercial availability of its Simoa platform in July, the University of Gothenburg has been an early adopter of the technology. In 2011, Zetterberg and colleagues described the use of the platform in *PLoS One*. In [that study](#), they used Simoa to measure amyloid β levels in patients who had severe hypoxia due to cardiac arrest. Noting that elevated A β levels could be correlated with clinical outcome, and that A β s are thought to play a role in the development of Alzheimer's disease, the authors suggested that hypoxia may play a role in AD pathogenesis.

Quanterix is targeting neurology, along with oncology, inflammatory disease, and infectious disease as one of four main application areas.

Julien Bradley, Quanterix's senior director of sales and marketing, told *BioArray News* that "a lot of attention, especially in sports, has been limited to imaging because there hasn't been a good way to look at cerebral blood."

He claimed that Quanterix's platform is the "only technology that is sensitive enough to pick up those markers in blood." And he described Zetterberg's application of Quanterix's technology as "just the beginning of what could be a new window into research."

As part of its work with the University of Gothenburg, Quanterix has provided some financial support for technology development, Zetterberg said. The study is also being funded via a number of Swedish Research Council grants. Zetterberg added that a publication discussing "early, promising results" of the university's work could appear this autumn.

Diagnostic outlook

The University of Gothenburg's project is one of a "series of studies where our technology has been highlighted," said Bradley.

And, now that Simoa is commercially available, Quanterix intends to see more life science researchers adopt its technology, he said. Paul Chapman, the firm's CEO in a statement said that Simoa is "poised to transform the diagnostic world for both research and clinical applications," and that the platform will "provide deeper insights into human health that will allow diagnosing, treating, and monitoring conditions more effectively than ever before."

Quanterix's outreach to life science researchers like Zetterberg is a shift from an earlier effort to position itself as a molecular diagnostics company, which included the development of a test for prostate cancer called AccuPSA ([BAN 11/2/2010](#)).

"At one point, the company's strategy had been to open a CLIA lab and to run tests in its CLIA lab," said Bradley. "We realized that the opportunity was much larger, so we decided to open up the technology to empower others."

As part of its pitch to researchers, Quanterix in July launched 18 catalog assays for use on its platform, as well as a homebrew assay kit. At the same time, it maintains an avenue to the diagnostic market via a partnership with

French biotechnology company BioMérieux. Last November, BioMérieux invested \$15 million in Quanterix and obtained exclusive rights to sell *in vitro* diagnostics based on the platform to clinical laboratories and for industrial applications ([BAN 11/27/2012](#)).

As for any test that results from the University of Gotheburg's current brain injury project, Bradley said there are two ways to market.

"The laboratory-developed test route is open," said Bradley. "If they wanted to develop it as an IVD, we could introduce the idea to BioMérieux."