

## From BioArray News, GenomeWeb

# Q&A: Geisinger CSO David Ledbetter on Making Genomics Valuable for Healthcare Organizations

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**Name:** David Ledbetter

**Title:** Chief Scientific Officer, Geisinger Health System

**Professional background:** 2010-present, CSO, Geisinger Health System, Danville, Pa.; 2003-2010, director, division of medical genetics, Emory University, Atlanta; 1996-2003, chair, department of human genetics, University of Chicago

**Education:** 1981 — PhD, behavioral genetics, University of Texas at Austin

**The last year** has been eventful one for David Ledbetter. In May, the International Standards for Cytogenomic Arrays Consortium, of which he is director, published a consensus statement recommending the use of chromosomal microarrays as a first-tier test for pediatric disorders ([BAN 5/18/2010](#)). In June, he took part in a public meeting hosted by the US Food and Drug Administration on how to best regulate the use of arrays in cytogenetics ([BAN 7/6/2010](#)), and in September, the American College of Medical Genetics, informed in part by ISCA's activities, revised its guidelines, making arrays, in Ledbetter's words, the "standard of care" for constitutional testing ([BAN 9/28/2010](#)).

(In November), Ledbetter left his position as director of the division of medical genetics at Emory University in Atlanta to assume the role of chief scientific officer and executive vice president at Geisinger Health System, a Danville, Pa.-based health service organization. In this new role, Ledbetter aims to expand Geisinger's research enterprise, which includes the Weis Center for Research, the Geisinger Center for Health Research, the Center for Clinical Studies, as well as interdisciplinary research institutes.

While a tremendous task, Ledbetter said he made the move from academia to healthcare to see genomic technologies, which have been widely adopted in the research setting, finally get implemented in treatment decisions. *BioArray News* spoke with Ledbetter this week about his

new role at Geisinger, as well as the continued activities of ISCA. Below is an edited transcript of that interview.

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**You recently joined Geisinger Health System after seven years at Emory. Why was it time for you to make the switch?**

In health care there is an emphasis on improving quality and restraining or reducing costs. And things like genomic technology generally increase costs. My interest is in how to make genomic technology and data clinically valuable. Geisinger's interest is how to implement new technology and new innovations in a cost-effective way. It is one of the leading healthcare organizations in the US doing internal research to re-engineer how it delivers healthcare in a cost-effective way. And it has had a number of successes in actually improving quality and decreasing cost at the same time. [Geisinger is] interested in looking at genomic and other technologies and figuring out how to integrate those in a way that might improve patient care but at the same time decreasing the cost of healthcare.

**Why did you want to be part of that project**

I think universities do a good job at basic science and the early translational research to show that it is potentially clinically useful, but the gap in the system is that we don't get the technology out to a large enough number of patients and healthcare organizations very effectively, so the implementation of technology, the downstream translational healthcare re-engineering steps, don't go as well as the early discovery and feasibility steps.

**What does your new role at Geisinger entail**

There's already a very good start on research there, so my job as CSO is to integrate all the research activities that currently exist throughout the entire organization. At the moment there are three research centers with a different focus for each center. There is a basic and translational research center, there is a population and epidemiology research center, and then there is a clinical trials and clinical studies center. They are already well established with good faculties, so I have good partners there to work with me to help build research. So we are trying to better integrate and leverage a very large patient population with very advanced electronic medical records, and to engage and integrate more of clinical departments into research on a routine basis.

One of my interests is how to take advantage of genomic data that is being generated in the clinical setting to capture it and leverage it for discovery, new knowledge, and to determine the clinical utility. Geisinger is an organization with advanced electronic records, so there is an opportunity to marry clinical data, which is free, with genomic data generated through routine patient care, so that the cost of research is marrying those types of data rather than generating more data. There is probably more microarray data generated today in clinical labs than in research labs.

**To what extent are arrays being used in Geisinger's research programs?**

There is a genomics core facility and there is a genomics medicine research program. It is fairly small scale at the moment and obviously we plan to grow that program. They do some genotyping work there and are familiar with most platforms. But it is modest, and at the moment their clinical microarrays are outsourced. So we are discussing now how to create a clinical microarray facility and to expand the core facility, and whether that should be concentrated in one location or [kept] as separate research and clinical activities.

**You were at Emory for seven years. How would you assess your time there?**

My time at Emory was great. I was allowed to build and test a model of translational genomics, to rapidly move new technologies from the research lab to the clinical diagnostic lab and patient care. We were able to recruit great faculty and staff, and the resulting division of medical genetics and Emory Genetics Laboratory are among the best in the country. But too few patients benefit from these technologies, and we need to develop methods to have a greater impact on more patients and the public health system. There is always a significant time lag in getting the technology out to all patients in the healthcare system in a broader way. I am interested in how you streamline and improve that entire process of implementation and getting the technology as broadly utilized and useful as possible in medical and public health settings.

**You have been involved with ISCA since its establishment. What have been some of its greatest successes? What else needs to be achieved?**

Last year was a big year with the consensus statement and the [ACMG] guidelines establishing chromosomal microarray as the genetic first-tier test for pediatric population with unexplained developmental disabilities. That was a high priority, the most urgent priority, but there is still a tremendous amount left to be done in terms of developing a process to determine the functional and clinical significance of every [copy number variant] and every CNV region in the genome.

The model of collecting this data from clinical labs and putting it into central public databases for both research purposes and for clinical interpretation purposes is still very important, but we are at a very early stage of doing that. There were a lot of infrastructure development requirements to set up a system to help clinical labs, which usually don't have the strong informatics teams that genomic research organizations have. [Submitting] their data to [the National Center for Biotechnology Information] is not a trivial task, and [getting] the phenotypic clinical data is a humongous task, and we are just scratching the surface on how to get that data into the NCBI databases in a way that will be useful for discovery and clinical interpretation. So there is plenty of work to be done.

**Have you been following the efforts of the Cancer Cytogenetics Microarray Consortium?**

From the beginning of ISCA, there were questions about cancer because we started with a pediatric constitutional array focus. My answer was always that cancer was really important, but for me, personally, it was overwhelming to try and take on cancer and constitutional genetics at the same time and that we needed to get started with ISCA focusing on pediatric populations and

developmental disabilities. At several public meetings, I said it would be great if someone else would start a separate cancer consortium project because we didn't have time to do it. And [CCMC organizers] Marilyn Li and Anwar Iqbal took up that challenge and seem to be doing a great job in organizing the cancer cytogenetic community. They are doing a great job and we are in close contact. They plan to develop a similar public database and they will be represented at ISCA meetings and we will attend CCMC meetings to stay closely partnered with them.

There is some overlap. There are some labs that do both cancer and constitutional cytogenetic microarrays. And certainly the technology issues are the same. There is also overlap in [the need to build an] infrastructure and process for getting data into the database and building a process for evidence-based evaluation of clinical significance of CNVs in the cancer setting versus a constitutional setting.

**The regulatory environment for arrays in cytogenetics still has a question mark hanging over it. Has anything changed since the FDA-hosted meeting in Washington last summer?**

I am not aware of any specific changes or decisions since that meeting. I think the dialog between the FDA and industry and the FDA and professional societies is continuing. It seems to be an open and productive dialog without any indications of FDA trying to make final decisions too quickly. [The FDA appears to want] to make good decisions that will allow patients and the healthcare systems to benefit from the new technology. The dialog and interaction seems to be at a good stage. There will be a representative from the FDA at the next ISCA meeting in Atlanta on Jan. 31.