

Sema4 Lands New Investors, Continues to Expand

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This article has been updated to clarify Sema4's relationship with Spectrum Health and to add more information about the use of the Centrellis platform.

NEW YORK – Clinical genomic testing company Sema4, a 2017 Mount Sinai Health System spinout, has landed its first outside investment, allowing it to continue its rapid growth.

Last week, the company, which is headquartered in Stamford, Connecticut and has laboratories in that state and New York, updated its investors webpage to include five new entities: private equity behemoth Blackstone; venture capital funds Section 32, OakHC/FT, and Decheng Capital; and Connecticut Innovations, the state's quasi-public investment agency.

Sema4 declined to disclose how much new money it raised or other terms of the investments but the infusion will help further grow a company that is "getting really large," CEO Eric Schadt said in a recent interview.

The firm's growth in testing volume has been "amazing," he said, estimating that the firm was operating at a pace that would translate to between 150,000 and 200,000 next-generation sequencing-based clinical genetic tests per year. "Probably 80 percent of our business today is completely outside the Mount Sinai system and their affiliates," he said, compared to approximately 70 percent of tests coming from that system [when the firm launched](#).

The funding will allow the company to build upon its new Centrellis Health Intelligence Platform, which Schadt described as "a constellation of tools and databases" that will provide value to physicians, patients, and pharmaceutical research partners. The firm is also planning to make whole-exome sequencing its default testing platform.

But not all of Sema4's recent moves have led to expansion.

The firm is still trying to find its footing in the consumer-facing genetic testing market. "The appetite on the consumer side never really took off in a significant way," Schadt said. However, the company is conducting internal studies that it believes will demonstrate to consumers the value of testing. "We're expecting over the next 12 months, we'll have adequate numbers and results to build the case that [Sema4's genetic testing] will improve both outcomes for patients and also reduces healthcare burden," he said.

Spun out of Mount Sinai in 2017, Sema4 has always targeted an integration of genetic testing and data science. Mount Sinai, based in New York, was initially the sole investor and had a technology development agreement with Sema4 covering single-cell sequencing, long-read sequencing, and data analytics.

Since launching, the firm has forged a host of partnerships, including with Thermo Fisher Scientific's data management firm [Core Informatics](#), Mount Sinai and Sanofi [on asthma](#)

[genomics](#), NYCKidSeq for [targeted panel sequencing](#), and the California Cryobank for [sperm donor genetic screening](#). The firm has also [launched](#) the Natalis newborn screening test, a noninvasive prenatal test for aneuploidies, and an expanded carrier screening test.

Back in 2017, Schadt said that aggregating data and providing the best interpretations for physicians would be a key focus of Sema4, adding that becoming a commercial lab would help collect the necessary investment for that vision.

With the addition of these five high-profile funders, Sema4 appears to be well on its way. Mount Sinai is still involved with the firm and Schadt said Sema4 has entered into several formal agreements "to solidify a lot of relationships with Mount Sinai," although he did not elaborate.

Among the new investors, Blackstone also comes with ties to Mount Sinai. In June, Blackstone Executive VP Hamilton "Tony" James, along with his wife Amabel, [pledged financial support](#) for the new \$100 million Center for Genomic Health at Mount Sinai's Icahn School of Medicine. According to Blackstone's website, he serves as chairman of the finance committee of the Mount Sinai Health System.

Blackstone confirmed it has made a minority investment in Sema4, through its Tactical Opportunities business, but did not disclose financial terms. A spokesperson said James "was recused from this transaction."

The other investors come with a high profile in the industry, too, including Section 32's founder Bill Maris, who also founded Google Ventures. Section 32 Managing Partner Michael Pellini is Foundation Medicine's former CEO and current chairman; he will serve on Sema4's board of directors, Schadt said. The fund recently co-led [Cradle Genomics' \\$17.1 million Series A round](#) with Illumina Ventures, joined [Thrive Earlier Detection's \\$110 million](#) financing round, and invested millions [in Freenome](#).

The other venture firms also have a history of investing in genomics and genomic data firms. OakHC/FT led the \$17.5 million Series B round for Core Informatics (Mount Sinai [is a Core Informatics customer](#)), and Decheng Capital led [Omniome's \\$60 million Series B round](#) and the [\\$12 million Series A round for Cirina](#), now part of Grail. Connecticut Innovations has funded the Jackson Laboratory's expansion in that state with a total of \$2.3 million.

Section 32 and OakHC/FT confirmed their investments but declined to provide additional details. The other investors did not respond to requests for comment.

Data 'ecosystem'

One of Sema4's latest launches is its health intelligence platform, Centrellis, which it announced in May. "I view it more as an ecosystem than a master app," Schadt said. Centrellis consists of databases with analytic tools on top. "It's sort of the engine that drives all the engagements and interpretations and relationships we have with physicians, patients, and with research collaborators like pharma," he said.

The tools include "Patient Journey," which helps physicians visualize patient data and can inform diagnoses, treatments, and molecular profiles; "Cohort Builder," which offers researchers the ability to group patients according to specific parameters such as cancer stage, histology, and treatments to identify appropriate clinical trials and allow data-driven decisions about patient care; and "VONC," an automated genetic variant curation platform that can recommend therapies.

Also sitting atop Centrellis are two focused clinical products in reproductive health and oncology. Each of those products has a physician and patient portal to interact with the testing data in managed ways.

There are three ways Sema4 uses Centrellis. For Mount Sinai, for example, the company serves as a so-called information partner. "We're not just a testing provider but also information provider where we have access to fully identified sets of data," Schadt said. For those types of partners, Sema4 builds tools to restructure, combine, and normalize data. "Cancer is a great example of how this works, where we perform abstraction processes on physician notes of cancer patients, restructure those data for Mount Sinai, and then provide tools to Mount Sinai that directly aid physicians in better understanding their patients and how best to treat them," Schadt said.

This is similar to what companies like Flatiron Health and Tempus provide, he added, "although in our case, we are providing holistic solutions based on the data and the tests we perform back to the systems (mainly physicians) to enable them to make maximal use of the data" for diagnoses and treatment.

Schadt noted that Sema4 acts as a so-called "business associate," a designation that permits it under HIPAA "to improve data sharing within a healthcare system so that such systems can both improve processes that enhance the care of patients but also function more seamlessly and efficiently to ensure rapid care delivery."

The firm is in the midst of building a similar relationship with Spectrum Health, a Michigan-based healthcare system, working with its pediatric cancer program at the moment. "Our role at present is to help molecularly characterize patient tumors (generating whole exome on somatic and germline DNA and whole transcriptome data on the tumor) and providing digital tools to support precision medicine-based clinical studies that have the potential to transform the standard of care for pediatric cancer patients," Schadt explained.

Sema4 also interacts with health systems as a testing provider and goes through the usual connections to facilitate orders.

The last way is by directly engaging with patients who have consented to provide the firm their information.

Centrellis is not something Sema4 plans to license or offer third-party access to at the moment. "We think data is very sensitive," Schadt said. "We're moving very purposefully in terms of managing partnerships."

Assessing DTC testing

[Last year](#), Sema4 launched the Natalis newborn screen, which consumers can order on its website. It also offers the CarrierCheck test for family planning, which it [partnered on with PWNHealth](#) for consumer ordering. "We wanted a [direct-to-consumer] channel to start to better understand where we might be able to play in that market," Schadt said. But market conditions have left the firm still searching for the right approach.

The "overwhelming majority" of genetic tests come from physicians "and are not consumer initiated, by a pretty large margin," Schadt said, adding later that "we continue to assess what the right balance is between patient initiating and physician initiating."

"It's a difficult, tough market. It's a different mindset," he said. With newborn screening, patients want their physician involved, for example, and without physician or insurer support, patients might question a test's value. "It's potentially telling you pretty serious things. That's not necessarily something a new parent wants to do on their own," he added.

Sema4 is not the only firm to struggle in the consumer testing market. [Earlier this year](#), Illumina CEO Francis deSouza noted his firm had seen weakness there and it recently [cut loose Helix](#), an online genomic data marketplace that it initially backed.

Sema4 had [offered CarrierCheck through Helix](#) and the experience has changed how it thinks about DTC testing. "The marketing is super important and super expensive," Schadt said. The number of testing orders was correlated with money spent on gaining visibility. "That's a really expensive game and not a game we necessarily want to play at this point," he said. "We can achieve very large numbers of patient engagement with partnerships with health systems, as opposed to spending gobs of money on marketing to get patients to order a test."

"But that said, I think that divide is going to close and we don't want to be out of the mix as it gets spanned," he said. " We, for sure, will keep exploring."

Schadt also said Sema4 is working on getting a whole-exome sequencing test approved by the New York State Department of Health and plans to make it the default assay for both its somatic and germline genetic tests.

"We're moving at high enough volume today, and the cost of sequencing is dropping far enough, that ... we won't generally lose money," he said. "On the cancer side, we would rather break even, and maybe even tolerate a little losing of money early on, to have a more comprehensive snapshot of what's happening in the patient."

Schadt said it's a strategic move that will help Sema4 build more comprehensive databases and give better personalized interpretations. He added that Sema4 expects to be able to run these clinical tests by year's end.

Meantime, Sema4's growth has been physically evident. The firm has expanded its Branford, Connecticut lab and Stamford headquarters. Earlier this month, the company also announced that it began construction of a new 70,000-square-foot laboratory facility in Stamford which will be able to process more than 5,000 patient samples per day.

It will house more than 300 employees — about half the company's staff today and equal to the number of people it has hired this year, Schadt said.

Sema4 expects the facility will be fully operational by mid-2020.