

New diagnostic device provides 20-minute blood test results

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Credit: Vital Bio

Four and a half years ago, the VitalOne was an ambitious idea. Today, the desktop computer-sized blood diagnostics device can run comprehensive tests on comparatively small blood samples—in 20 minutes.

Made by Vital Bio, a [company](#) founded at Velocity, the VitalOne was

unveiled to the public and [scientific community](#) at a conference held by the American Association for Clinical Chemistry (AACC) last month, where Vital Bio also won the Disruptive Technology Award.

Co-founder and CEO Vasu Nadella states that developing the VitalOne to meet the gold standard in [lab testing](#) is part of the company's broader vision to make diagnostics ubiquitous and enable new forms of care delivery for everyone from patients managing complex, chronic diseases to people pursuing wellness.

Nadella asserts that current diagnostic infrastructure often results in delayed test results, putting patients at risk.

"All of these folks have clear needs that are constrained by the way care is delivered today," Nadella says. "By making [diagnostic tools] ubiquitous you get to a place where these foundational pillars of health care, diagnosis and treatment, and ultimately intervention and payment, shift into something that can be accessed on demand and that's what we want to enable."

Mounir Koussa, co-founder and vice-president of research and development, says that the VitalOne is an easy-to-use system with three blood diagnostic modalities: hematology, [clinical chemistry](#) and immunoassay, including tests for hormones, vitamins, cancer and inflammation markers.

The device's destination will include doctors' offices where patients can give a small blood sample, one-thirtieth of the volume needed for a typical test and receive results in 20 minutes. These tasks can be done before seeing the physician, enabling immediate health interventions.

"The world and the [scientific] community are ready for this," Koussa says. "We've [developed] it in a way where we've been open and

transparent so people can gain trust—even in a space where the trust has been broken by others."

Koussa and Nadella are two of Vital Bio's four co-founders, including Iman Khodadad (Ph.D. '16), vice-president of technology and Farnoud Kazemzadeh (Ph.D. '15), vice-president of engineering.

The device is not for sale yet. Koussa explains that the company's presentation on the main stage of the AACC conference, along with the validation of their technology and data by the scientific community, aligns with the company's vision of achieving success.

"By validating what we're doing they are helping us turn our dream into a reality," Koussa says. "We are taking routine diagnostics but giving results when it actually matters. It is impactful for patients' lives and the health-care system overall."

Founders join forces at Velocity

The four Vital Bio founders met when Khodadad and Kazemzadeh were at Velocity working on their company Elucid Labs, commercializing technology developed at the University of Waterloo which uses spectral imaging paired with machine learning to detect various skin diseases.

That tech would become a key component of the VitalOne.

While fundraising for Elucid Labs they met Vasu Nadella, then an entrepreneur in residence at venture capital firm Inovia Capital.

"Vasu took a keen interest in us, the technology and its potential," Kazemzadeh affirms. "We always wanted to build a blood testing company—to impact everyone's lives as opposed to a select few—and we asked: 'why not now?'"

While they had a piece of the puzzle to build a blood testing device, the biochemistry aspect was missing, which is how Koussa was brought into the fold. At his company Confer Health, Koussa had developed an at-home fertility testing diagnostic device for couples who were trying to conceive.

The four co-founders banded together understanding that by combining technology from Elucid Labs and Confer Health could have a greater impact than what each company could achieve on their own.

Vital Bio started working out of Velocity downtown Kitchener in 2019. They have since grown to more than 90 staff headquartered in Mississauga. The company has raised US\$48 million from venture capital funds, major diagnostic firm Labcorp, and individual investors.

Strategy and expertise foundation for deep tech success

In the fast-paced world of innovation, progress for deep tech companies is at the mercy of the laws of physics and chemistry. These companies develop technology grounded in scientific breakthroughs or advanced engineering endeavors. Remarkably, Vital Bio accomplished the creation of the VitalOne, from initial concept to a tangible product, in just four and a half years.

Nadella says being at the helm of a deep tech company is not so different than any other startup. They must present a problem that is a valuable one to solve and set a high standard, one from which the company never wavers even when there are limits to how fast progress can be made.

"Going in [Vital Bio] had a strategy to get investors to whom we could

point and say, 'these folks are the right caliber and have the right experience to vet what we are doing,'" he says. "Years later we would unveil our technology and tell a very specific type of story about our progress—once we paint that picture for partners, they get it."

Kazemzadeh shares that after the company took shape at Velocity and set up offices in Mississauga, they selected staff who embody what he calls "relentless agility," unafraid to push the frontiers of science and technology, unshackled by the constraints of complacency.

"We are always honing our skills, which is why we are able to move so fast," he says. "What I see in most entrepreneurs is they have a singular belief that something needs to be better."

Provided by University of Waterloo

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