



This rendering shows a 350,000-square-foot plant Wildcat Discovery Technologies plans to open in the Southeast. Rendering courtesy of Wildcat Discovery Technologies

Wildcat Shifting from R&D to Battery Production

ENERGY: New Manufacturing Plant in Southeast U.S. Planned

■ By GARY WARTH

SAN DIEGO – Wildcat Discovery Technologies has received its 100th patent since forming just 18 years ago, but the San Diego company is celebrating more than just reaching triple digits.

“It’s for a new cathode technology that we’re very fond of,” said CEO Mark Gresser. “It ironically turned out to be our 100th patent, but it’s probably our most important patent as well.”

The patent protects the company’s development of cathode with disordered rocksalt materials (DRX) and its method of forming

the cathode, a major component in batteries.

While the public likely is more familiar with lithium, cobalt and nickel batteries, the new DRX cathode could be a game-changer in electric vehicles, energy storage and other uses because it is smaller, holds 20% more energy and is more environmentally sustainable than other cathode material extracted through mining.

Manufacturing Plant on Horizon

Wildcat Discovery Technologies has been focused on the research and development of battery technology since the company was founded in 2006 with just 10 employees, but

the latest patent is significant enough to call for a major shift.

“Because of that patent, we realized that the next step for us was getting that product in the marketplace,” Gresser said about the company’s plans to open a 350,000-square-foot manufacturing plant in the Southeast within the next few years.

The company is in the design phase of the plant, which could be in operation in late 2026. Gresser said the company is eyeing the Southeast because electricity costs are lower there, and an announcement about its location may come in August followed by groundbreaking next year.

The plant will employ 140 people, more than doubling its current staff of 130, and the company has just launched a campaign to raise \$350 million. Up to half of the amount could come from a federal Manufacturing and Energy Supply Chains grant, Gresser said.

BMW already is interested in the battery and is in partnership with Wildcat, and other major investors include Koch Industries, Eastman Kodak and the Los Angeles-based investment firm Fifth Wall, which is active in clean energy development.

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Device Makes Eyes the Window to the Kidneys

MEDETECH: Toku Gets FDA Breakthrough Designation

■ By KAREN PEARLMAN

SAN DIEGO – Ehsan Vaghefi has long had his sights set on helping people keep their vision.



Ehsan Vaghefi
Co-founder & CEO
Toku Inc.

The co-founder of Toku Inc., a cutting-edge commercial medical device company that specializes in imaging technology and Artificial Intelligence, grew up with a father who was blind.

Toku specializes in developing non-invasive, AI-powered diagnostic

and screening tools using retinal imaging to measure cardiovascular and other health risk factors.

“Growing up I did not want to become a clinician, as I believed my impact would be limited by the hours in a day,” Vaghefi said. “I was convinced, however, that novel technologies would be the solution to help masses of people who were similar to my father.”

Toku’s MyKidneyAI, a screening technology that uses AI to analyze retinal images collected at routine eye exams to detect elevated chronic kidney disease risk in people with diabetes, was last month granted Breakthrough Device designation for it by the U.S. Food and Drug Administration.

It is Toku’s second such designation from the FDA – its first was six months ago for



Ehsan Vaghefi stands at a convention booth featuring his company, Toku Inc., which specializes in developing non-invasive, AI-powered diagnostic and screening tools using retinal imaging to measure cardiovascular and other health risk factors. Photo courtesy Toku Inc.

its cardiovascular risk identification product, CLAiR. The FDA’s Breakthrough Device designation expedites the review process, shortening the time until technology reaches patients.

The retina is the only part of the vascular system that can be photographed easily to detect microvascular disease, a key contributor to CKD.

Toku is working with investors Topcon Healthcare and National Vision to provide MyKidneyAI in the United States. Topcon Healthcare is a leading provider of medical devices and software solutions for the global eye care community. National Vision is one of the largest optical retailers in the U.S.

Founded in 2019 in Auckland, New Zealand, Toku is now based in San Diego. Its

worldwide partners and investors include National Vision, Topcon Health, Icehouse Ventures, Artemis Capital and UniServices.

Toku’s first fundraising round was in 2022, Vaghefi said, and in 2023 and during the process of Series A fundraising, he said got to know the National Vision and the Topcon executive teams.

“While Topcon is a Japanese company, its U.S. HQ is based in La Jolla,” Vaghefi said. “After finalizing the Series A investment, and since the U.S. is our primary market, it made more sense for me to move to the U.S. I chose San Diego because not only it is the center of innovation for biotech, but I also work in close proximity of the Topcon team.”

Toku has since started a Series B raise process and while it has active engagement with a few VCs, Vaghefi said, “We welcome any interest.”

Diabetes: The Leading Cause of Kidney Disease

Diabetes is the leading cause of kidney disease in developed and developing countries. Chronic Kidney Disease affects nearly 15% of the U.S. population, according to the National Kidney Foundation, which reports that nine out of 10 people with CKD are unaware that they have the condition.

Patients with impaired kidney function experience higher rates of death and cardiovascular events, and CKD is generally asymptomatic until it reaches an advanced stage, requiring dialysis or kidney transplantation.

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The Wildcat Discovery Technologies technicians are shown working in glove boxes that create a sterile environment. Photo courtesy of Wildcat Discovery Technologies

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Production of the DRX batteries won't start until 2028, and they could begin appearing in electric vehicles two years later.

The company plans to first produce lithium iron phosphate (LFP) batteries at the plant in 2026 followed by lithium manganese iron phosphate (LMFP) batteries in 2027.

More Sustainable Solution

Because of an increasing demand for nickel-free cathode materials produced in North America, the production of LFP and LMFP batteries also will be significant for the industry, Gresser said.

The U.S. backed out of the LFP market around 2010 because auto companies were not interested in them. At the time, a lithium battery's range in an electric vehicle was about 40 or 50 miles, he said.

Lithium is considered safer and more stable than other cathodes, and China began producing lithium batteries for buses. The technology improved, and the range of the batteries grew significantly. Gresser said he has seen a press release from a Chinese company that boasted of vehicles with LFP batteries having a range of 350 miles.

More than 95% of the global LFP supply now comes from China, and Gresser said the

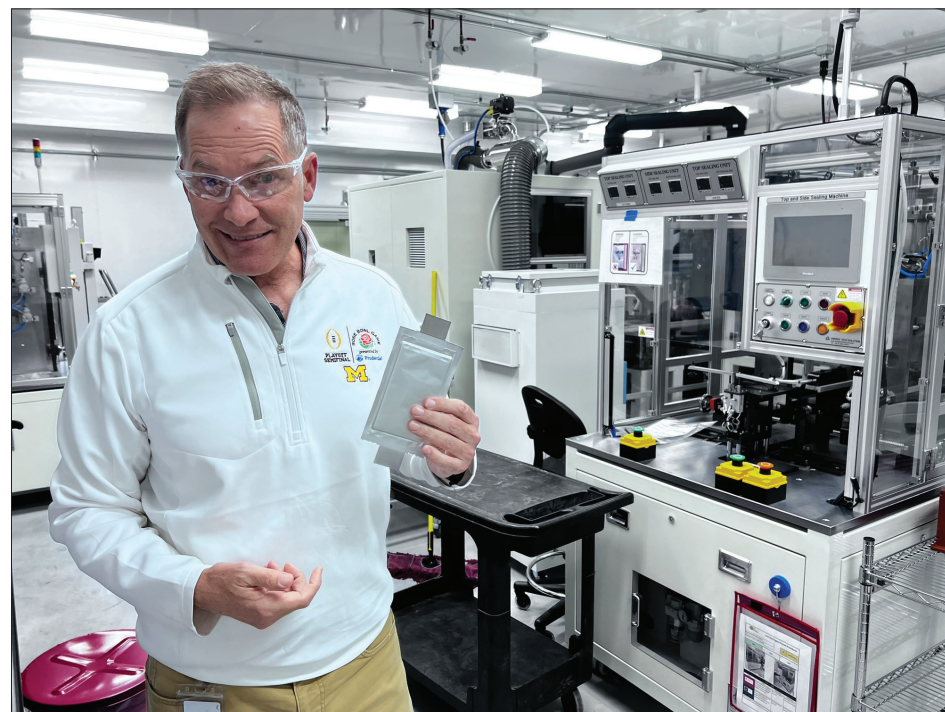
new Wildcat plant will boost the domestic production of the battery.

It also could have a long-term positive effect on the environment by decreasing the use of nickel and cobalt batteries.

"Nickel is hard to come by," Gresser said. "You need to mine it. It's expensive. It's mined

in Indonesia and processed in China. In addition, the CO2 created when you mine and process these high-nickel products is substantial."

Cobalt has its own problems, he said, explaining that the material is extracted in Africa throughout mining "in a sort of unsavory fashion."



Mark Gresser, CEO of Wildcat Discovery Technologies, holds a pouch cell battery the company creates, tests and uses for demonstrations to clients. Photo courtesy of Wildcat Discovery Technologies

After electric vehicles, grid storage of electricity is the second largest market Wildcat is pursuing.

"The market for batteries that store energy is growing and it's going to be massive," Gresser said about the need for green energy such as windmills and solar panels to store energy when its produced at peak hours.

DRX batteries could be ideal for the market because they store more energy and take up less space, and they also will be more stable and safer than ones already in use.

The company's new effort toward production does not mean it is abandoning R&D. Gresser said the company will pursue new technology to customize the energy's use for its clients, and it already has 60 more applications for patents pending. ■

Wildcat Discovery Technologies



FOUNDED: 2006

CEO: Mark Gresser

HEADQUARTERS: Sorrento Valley

BUSINESS: Battery technology

EMPLOYEES: 130

CONTACT: 858-550-1980

WEBSITE: www.wildcatdiscovery.com

SOCIAL IMPACT: The company's technology could make the U.S. less reliant on Chinese imports for battery components.

NOTABLE: Wildcat's staff includes 30 scientists with doctorate degrees.

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Glenn Chertow
Professor
Stanford University
School of Medicine

Nephrology expert **Glenn Chertow, M.D., M.P.H.**, says that MyKidneyAI technology used at routine eye exams will be a significant way to detect disease early and for better overall disease management.

"MyKidneyAI's groundbreaking early screening technology offers a way to

detect CKD in its earliest stages, when therapies can be instituted to attenuate or prevent disease progression and may significantly reduce the roughly 360 patients starting dialysis every day in the U.S.," said Chertow, professor of medicine in nephrology and professor of epidemiology and population health, and health policy at **Stanford University School**

of Medicine.

Early identification of CKD is key to enabling both clinical and economic improvement. Managing patients with CKD is expensive, with Medicare costing more than \$130 billion each year, with \$35 billion going to care for the 0.1% of the population suffering from kidney failure.

The Genesis of Toku Inc.

Vaghefi has an M.S. in biomedical/medical engineering from the **University of New South Wales, Australia** and a Ph.D. in bioengineering and biomedical engineering from the **University of Auckland, New Zealand**. He is also an associate professor at the University of Auckland.

He said growing up with a blind parent meant he was ingrained in a community where many childhood friends were blind or had a blind family member.

"I was initially inspired to work in the medical field to radically reduce the cases of preventable blindness, and I knew that this can only be achieved via novel technologies and not just training more clinicians," Vaghefi said. "I wanted to explore ocular imaging

and the diagnostic role it could play. That, coupled with my passion for delivering faster, more affordable, and individualized eye care led me to co-found Toku in 2019 with **Dr. David Squirrell**, an ophthalmologist and researcher based in Auckland."

Vaghefi said that at the time, Squirrell was overseeing New Zealand's Diabetic Screening Program, which was under pressure with many people not receiving timely care due to lack of resources, including too few clinicians.

"While we started our work by developing AI technologies for identifying eye diseases, very soon we realized that our AIs were often identifying the underlying systemic disease like diabetes and hypertension," he said. "This led to the realization that instead of saving eyesight through routine eye exams, we can save lives."

Vaghefi said next for Toku is looking into expanding vertically and horizontally -- offering more diagnostic indications as part of the eye exam, while ensuring connections to downstream providers.

"In our ideal future, every eye exam is complemented by a Toku comprehensive chronic disease screening, and by the end of the

eye exam, the patient would be connected to other providers, outside of optometry, who would be providing them with appropriate care," he said. "We believe no one should die of a preventable heart attack if they have had a chance to see their optometrist."

Toku's first commercialized product, BioAge, analyzes biometric markers visible in the retinal image to accurately measure an individual's biological age and provides a detailed report on overall health. BioAge and CLAiR are now commercially available in the U.S. market, Vaghefi said. ■

Toku Inc.



FOUNDED: 2019

CO-FOUNDER AND CEO: Ehsan Vaghefi

HEADQUARTERS: San Diego/Auckland, New Zealand

BUSINESS: AI/Diagnostics

INVESTMENTS: \$11 million

EMPLOYEES: 16

WEBSITE: tokueyes.com

SOCIAL IMPACT: Company's mission is making systemic disease screening accessible.

NOTABLE: CEO Ehsan Vaghefi's blind father was a large factor in the founding of Toku.