

Irvine Startup Introduces Bandage-Sized Respiratory Monitor

FDA Reviewing Device Made by UCI Engineers

IRVINE — **Makani Science** is developing a wearable respiration monitor using a popular children's toy.

The Irvine-based medtech startup's product is a bandage-sized patch made from **Shrinky Dinks**, plastic sheets that shrink when heated. The company says the product provides continuous monitoring to help detect disruptions in someone's breathing.

"We're collecting all this data about what's happening on a daily basis," Chief Executive **Greg Buchert** told the Business Journal. "It gives a great opportunity to intervene when somebody is getting worse and potentially intervene before they have a significant deterioration."

Makani is already developing a second-generation version of the device that will measure both respiratory rate and volume.

The first-generation device is currently under review by the **Food and Drug Administration** and is expected to receive approval by the end of this year, Buchert said.

The product will cost an estimated \$75 once the company begins commercialization.

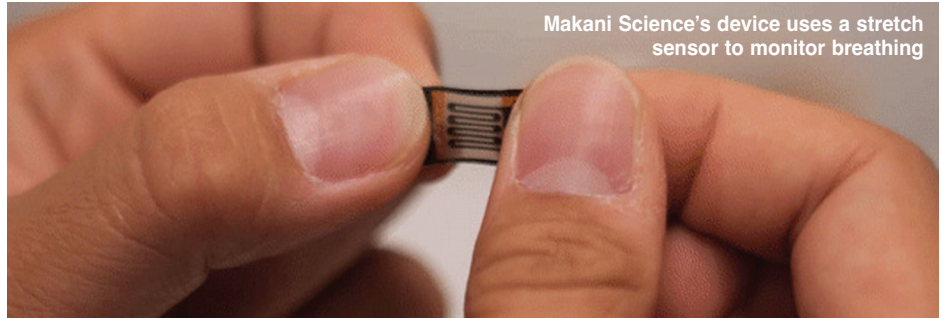
Makani has raised \$3.5 million to date, including a recent \$1.5 million bridge round. In April, Makani presented at **Octane's Tech Innovation Forum** (for more on Octane, see page 1).

Bluetooth Monitor

Makani's respiratory monitor has a bandage-sized stretch sensor that's meant to be worn on the abdomen.

Data is transmitted to the user's phone via Bluetooth, eliminating the need for wires typically associated with older respiratory monitoring technology.

While many respiratory monitors measure



Makani Science's device uses a stretch sensor to monitor breathing

breathing rate, "very few measure volume," according to Buchert.

Buchert said that tracking volume, or the amount of air going in and out of the lungs, is one of the best indicators of how well someone is breathing.

The second-generation device will also have potential uses for neonatal care due to its small size.

Makani is in talks with **Children's Hospital of Orange County (CHOC)** to conduct a study using the respiratory monitor to detect apnea of prematurity in newborn infants. The issue refers to when newborns stop breathing for 20 seconds or more, which can lead to potential eye and lung problems.

"If we could actually interrupt and prevent those from ever happening, it'll have a long-term impact on the child's life," Buchert said.

UCI Professor Startup

Makani is an accumulation of over 10 years of research done by **University of California, Irvine** biomedical engineering professor **Michelle Khine**.

Khine co-founded the company alongside one of her past doctoral students **Michael Chu**, who is now chief technology officer, in 2019.

She came up with the idea for a wearable respiratory sensor after her newborn son had a collapsed lung, and she noticed that his breathing wasn't being monitored.

Prior to Makani, Khine founded six other medtech startups, including **Fluxion**

Biosciences Inc. and **Novoheart**, which is known for developing "the world's first human heart-in-a-jar" from stem cells.

Buchert became involved with Makani through his involvement in angel investment groups **TCA Venture Group** and **MEDA Angels**.

He led due diligence on TCA Venture Group's investment in Makani, resulting in him joining Makani's board of directors in 2020 before moving up to the chief executive role last July.

Buchert brings nearly three decades of experience in healthcare planning.

He was one of the executives in 1995 that helped launch Orange-based public agency **CalOptima Health**, the largest **County Organized Health System (COHS)** in California.

Buchert started out in his career as a pediatric emergency physician, having led medical groups at **UCSF Benioff Children's Hospital Oakland** and **CHOC**. ■

Makani Science



- **FOUNDED:** 2019
- **CEO:** Greg Buchert
- **HEADQUARTERS:** Irvine
- **BUSINESS:** medtech device
- **EMPLOYEES:** 3
- **NOTABLE:** wearable respiratory monitor helps detect disruptions in breathing