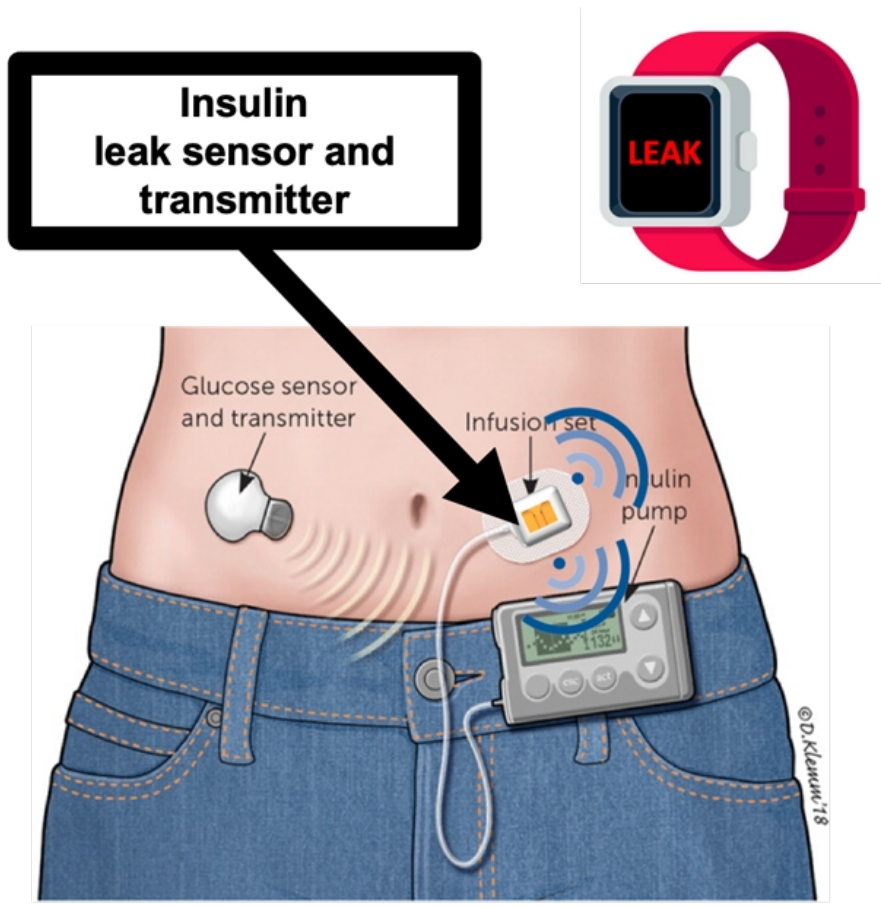
Smart Insulin Leak Detector

Tech ID: 33231 / UC Case 2022-892-0

IMAGES



FULL DESCRIPTION

Background

Globally, over one million people use insulin pumps to manage diabetes. These devices provide many benefits compared to the alternative treatment of multiple daily injections. However, pumps have one notable weakness: the infusion sites that interface a pump with a patient are prone to failure. Leaks are a common mode of failure and, if left undetected, can cause acute and potentially life-threatening complications. Pump users currently rely on their senses to identify/detect leaks, but this can be difficult as infusion sites are often covered by clothing or are on the back side of the body. Moreover, a leak of only a few drops is enough to create a significant problem.

Technology

A team of researchers from UCR, Notre Dame and Indiana University have developed a novel, intelligent insulin leak detection system. The invention utilizes new wearable, nano-enabled, electronic nose (e-nose) sensor technology to detect leaks based on chemical vapors released by exogenous insulin when exposed to air. The system does not require contact with the leak and can detect leaks both at the infusion site and

CONTACT

Venkata S. Krishnamurty
venkata.krishnamurty@ucr.edu
tel: .

OTHER INFORMATION

KEYWORDS

insulin, diabetes, infusion set, leak detection, phenols

CATEGORIZED AS

- **Biotechnology**
  - Health
- **Environment**
  - Sensing
- **Medical**
  - Devices
- **Sensors & Instrumentation**
  - Analytical
  - Medical

RELATED CASES

2022-892-0

elsewhere within the pump and/or tubing. The system will immediately notify and alert the patient and/or caregiver when a leak is detected.

ADVANTAGES

- A practical and convenient solution of insulin leak detection.
- Low-profile wearable e-nose, chemical sensor can be placed near the infusion site.
- Can be used as stand-alone or integrated into infusion sets/pumps.
- Immediately alerts and notifies patient and/or caregiver of leaks via their smart device.
- Seamless integration with current diabetes management tools.

SUGGESTED USES

Automatic and immediate insulin leak detection for diabetes patients

STATE OF DEVELOPMENT

The team has developed an initial proof-of-concept prototype. Experiments have demonstrated a robust detection of small insulin leaks.

The team is actively seeking collaboration partners to further develop the platform with an aim towards commercialization.

PATENT STATUS

Country	Type	Number	Dated	Case
Patent Cooperation Treaty	Published Application	WO 2024/050128	03/07/2024	2022-892

Additional Patent Pending

University of California, Riverside

Office of Technology Commercialization

200 University Office Building,

Riverside,CA 92521

otc@ucr.edu

research.ucr.edu/