

# Wearable Metabolic Rate Sensor

## Summary

Vanderbilt researchers have developed a portable, non-invasive sensor system that can take measurements through the skin to provide insights into metabolic rate and energy expenditure outside of a clinical setting. Existing methods for estimating metabolic rate rely on comparisons between user-reported body parameters and population averages, which can result in inaccurate estimates. Additionally, existing portable devices that provide estimates of metabolic rate are limited by factors such as cost per use and frequency of measurement. The present technology overcomes these limitations and can be directly integrated with commercial wearable devices for an accurate assessment of metabolic rate.

## Addressed Need

Currently, determining a user's metabolic rate requires large, stationary, expensive equipment, such as environmental chambers and indirect calorimeters, to collect and analyze the amount of O<sub>2</sub> ingested and CO<sub>2</sub> expelled during a set amount of time. This equipment is typically only found in hospitals, laboratories, and athletic training facilities. The present wearable sensor is a more cost effective, smaller, and portable option that can non-invasively measure metabolic markers to provide regular and long-term insight into metabolic rate and energy expenditure.

## Commercial Applications

- Weight management and fitness apps
- Tracking patient nutrition or metabolic disorders in the medical industry
- Monitoring diet and health for athletes in a portable, wearable device

## Unique Features

- Provides continuous, long-term, real-time monitoring of metabolic markers that can be used to determine metabolic rate
- Can be integrated with existing wearables or smartphones
- Non-invasive, transdermal measurements of metabolic markers

## Intellectual Property Status

A patent application has been filed.

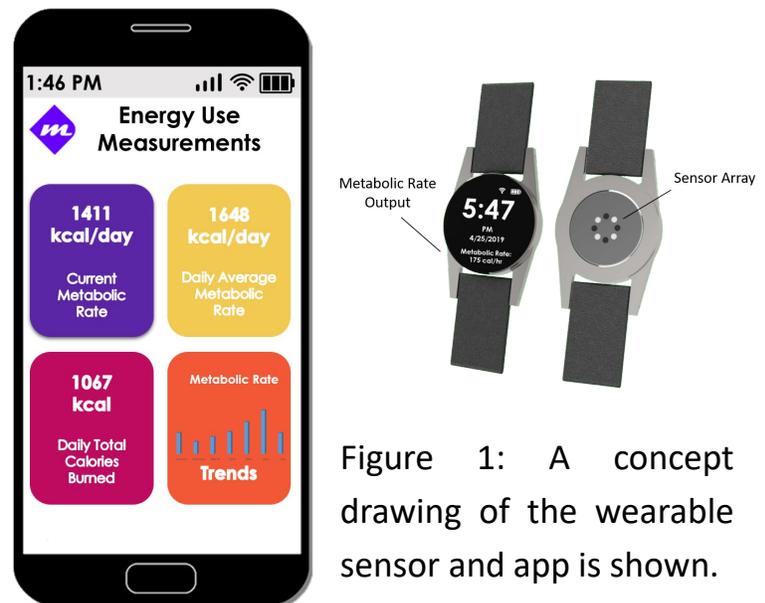


Figure 1: A concept drawing of the wearable sensor and app is shown.

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