

# Detection of Sweat Lactate Using Gene Circuits in Wearable Devices

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Detecting metabolites can indicate an individual's general health and fitness. Lactate is the by-product metabolite of anaerobic glycolysis, produced when the oxygen level is low in cases such as exercise or low blood oxygen levels.

Estimating lactate in sweat can be used for health and clinical applications and in athletic performance and training monitoring. It can provide additional diagnostic and monitoring information, for example, metabolic disorders, stress, or in intense exercise. Measuring lactate in sweat is a non-invasive alternative to measuring blood lactate and can give us real-time feedback for lactate levels.

Our approach is based on synthetic biology, a promising field for developing biosensors and other therapeutic and diagnostic applications. Using bacterial biosensors with genetic circuits is a relatively low-cost and simple-to-produce biosensor that can withstand a variety of environmental conditions.

Here, we develop a new wearable device that is based on bacterial biosensors to detect lactate in a non-invasive way.