

Supporting Information for

Skin-Interfaced Microfluidic Biosensors for Colorimetric Measurements of the Concentrations of Ketones in Sweat

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List of ingredients of artificial eccrine sweat purchased from Pickering Laboratories:

Amino acids (concentrations for listed amino acids range from 0.002 g/L (for Taurine) to 0.30 g/L (for Serine): Glycine, L-Alanine, L-Arginine, L-Asparagine, L-Aspartic acid, L-Citrulline, L-Glutamic acid, L-Histidine, L-Isoleucine, L-Leucine, L-Lysine as hydrochloride, L-Methionine, L-Ornithine as hydrochloride, L-Phenylalanine, L-Serine, L-Threonine, L-Tyrosine, L-Valine and Taurine.

Metabolites (concentrations for listed metabolites range from 0.015 g/L (for Uric Acid) to 1.74 g/L (for Urea): Uric Acid, Lactic Acid, Urea, and Ammonia

Minerals: Sodium (33 mM), Zinc (11.21 μ M), Chloride (80.34 mM), Calcium (5.49 mM), Iron (4.62 μ M), Magnesium (1.67 mM), Potassium (33 mM), Sulfate (2.57 mM)

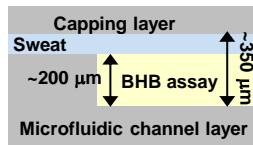


Figure S1. Schematic illustration of a BHB assay inside a microfluidic reservoir to show the position of the BHB assay relative to the flow of sweat.

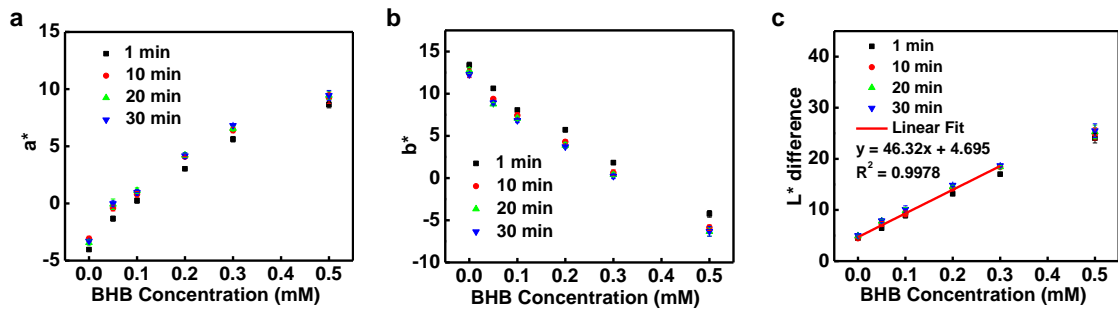


Figure S2. a) Redness a^* values extracted from images of BHB assays as a function of time after introduction of solutions of BHB at various concentrations. b) Yellowness b^* values extracted from the images of the BHB assay as a function of time after introduction of solutions of BHB at various concentrations. c) The lightness difference between the white background of the microfluidic device and the BHB assay as a function of time after introduction of solutions of BHB at various concentrations.

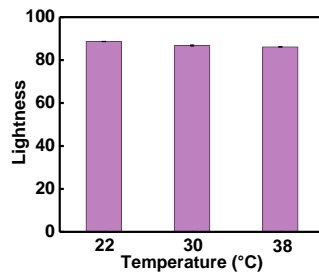


Figure S3. Lightness L* values for various tested temperature.

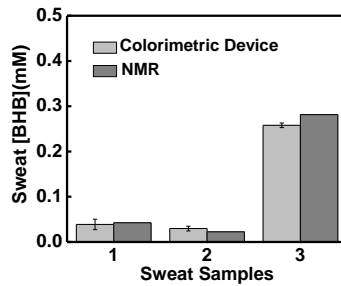


Figure S4. Measured [BHB] in sweat using NMR and the microfluidic devices.

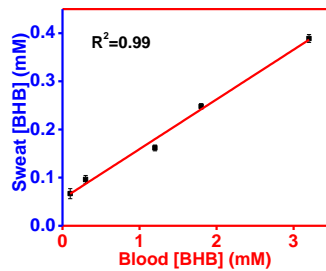


Figure S5. Plot of sweat [BHB] against blood [BHB] measured from subject 8 after taking various amounts of KE drink.

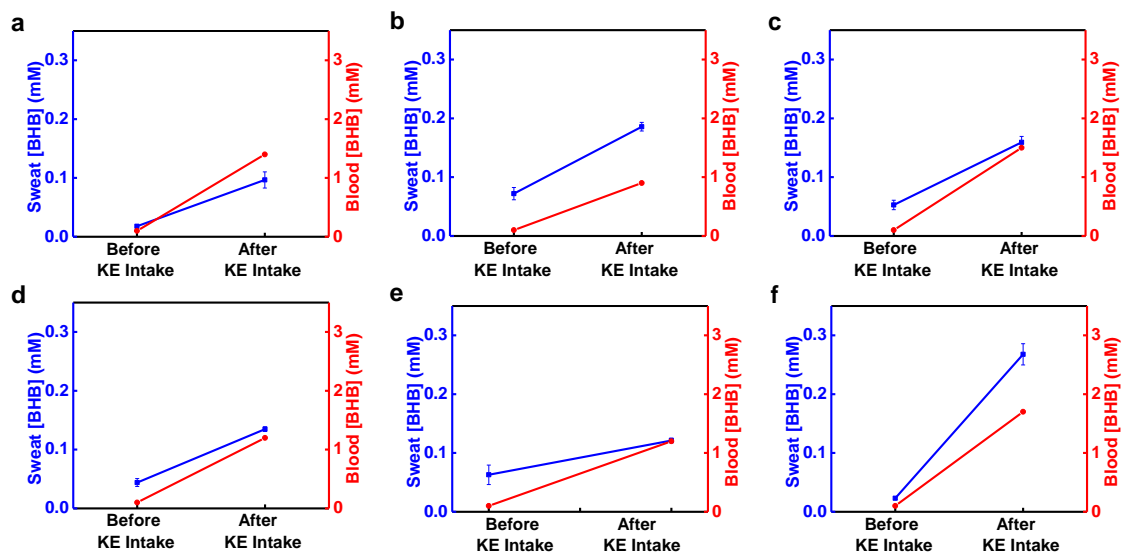


Figure S6. Measured sweat [BHB] and blood [BHB] before and after KE intake from subject 2 and subject 3 during a, d) exercise, b, e) sauna and c, f) shower.