

Supplementary information

SLOCK (Sensor for circadian clock): Flexible sweat-based chronobiology tracking system

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1. COMSOL Multiphysics software equations

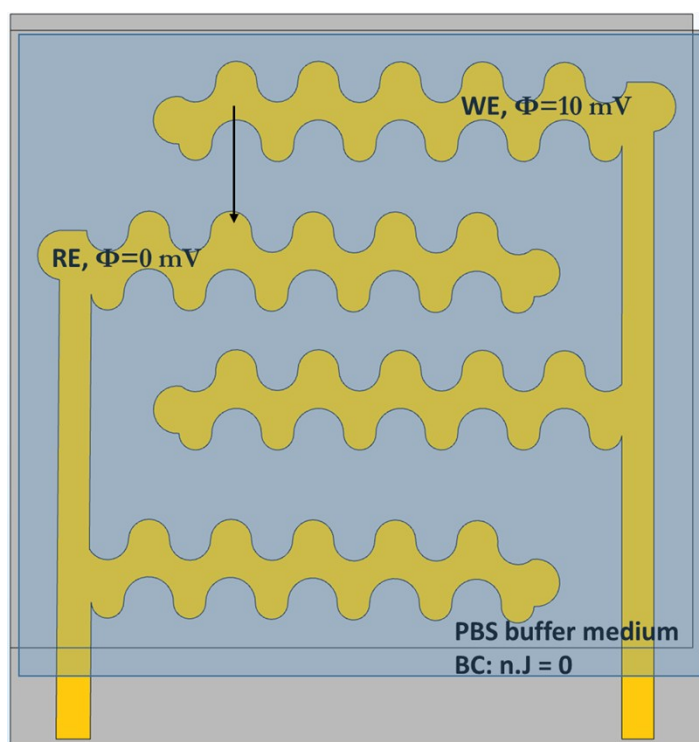


Figure S1: COMSOL simulation boundary conditions schematic, arrow points to the direction of current density plot going to WE to RE

Equations used in the COMSOL Multiphysics software simulations that govern the simulated potential and current density are follows:

1. $\nabla \cdot \mathbf{J}_I = Q_I, \mathbf{J}_I = -\sigma_I \nabla \phi_I$
2. $\nabla \cdot \mathbf{J}_S = Q_S, \mathbf{J}_S = -\sigma_S \nabla \phi_S$
3. $\phi_S - \phi_I = E_{eq}$

J_s and J_l are the current density vectors (A/m^2) for the electrode and electrolyte respectively. σ_s and σ_l are conductivities of electrolyte and electrode domains. E_{eq} depicts the equilibrium potential difference at the electrode-electrolyte interface.¹

2. Sensor block diagram for Human subject study

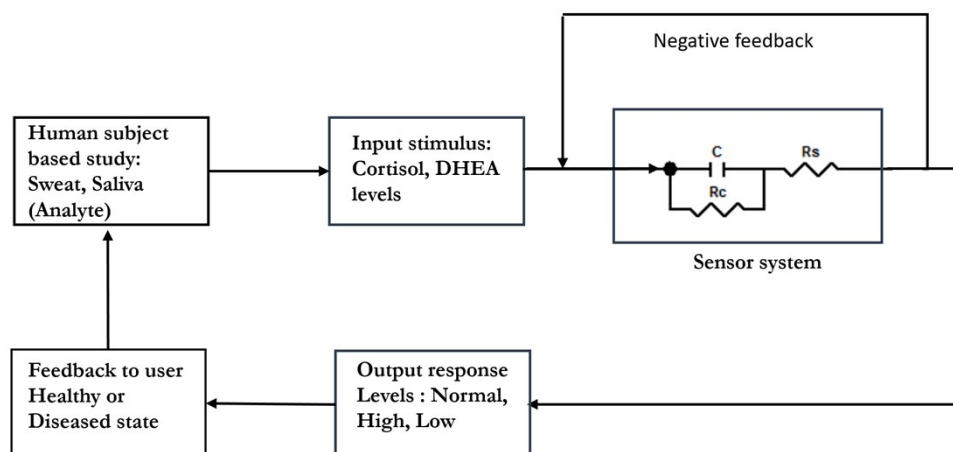


Figure S2: Block diagram for biomarker detection

3. Human subject data

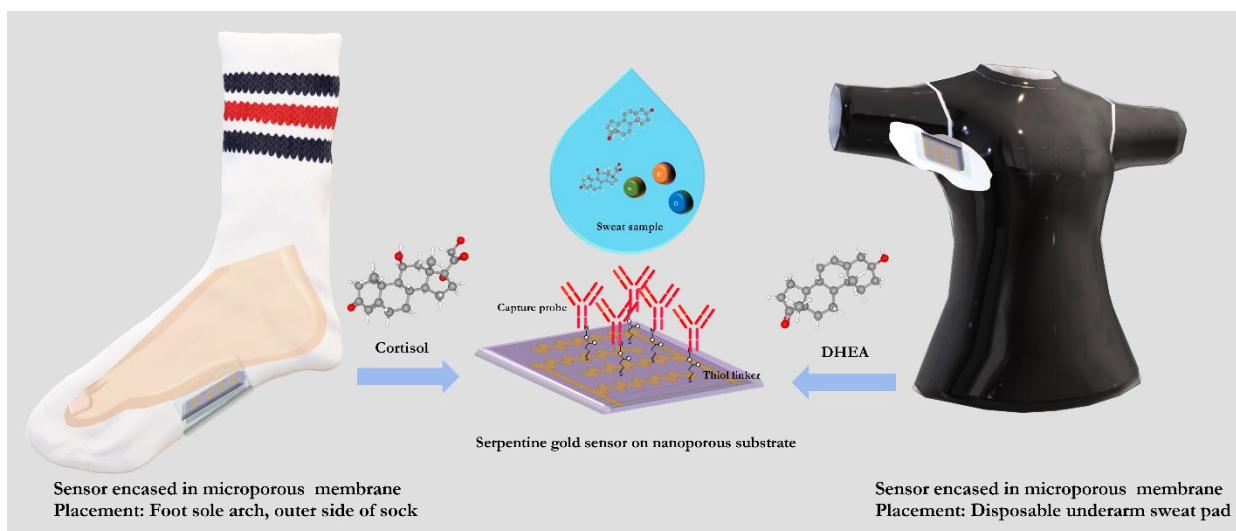


Figure S3: Sensor schematic highlighting form factor of sensor along with immunochemistry

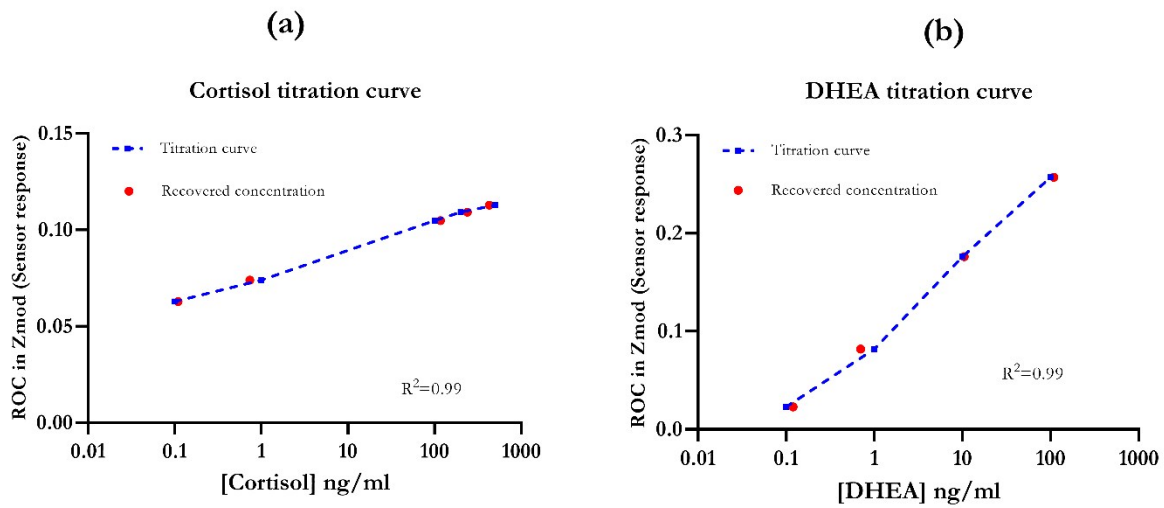


Figure S4: Cortisol and DHEA titration curves

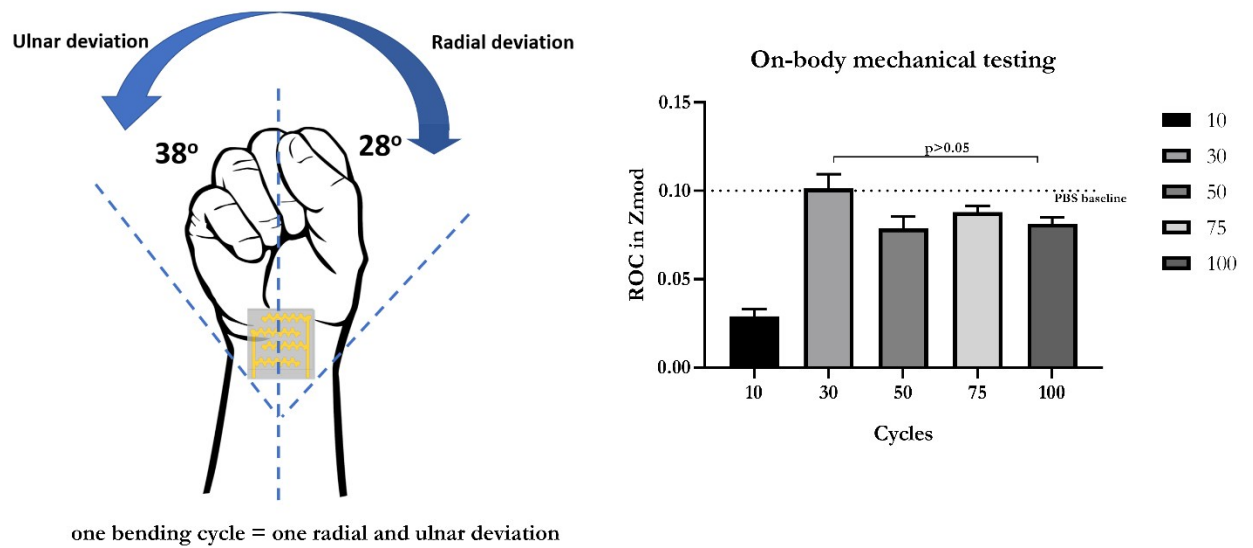


Figure S5: On-body mechanical stability test

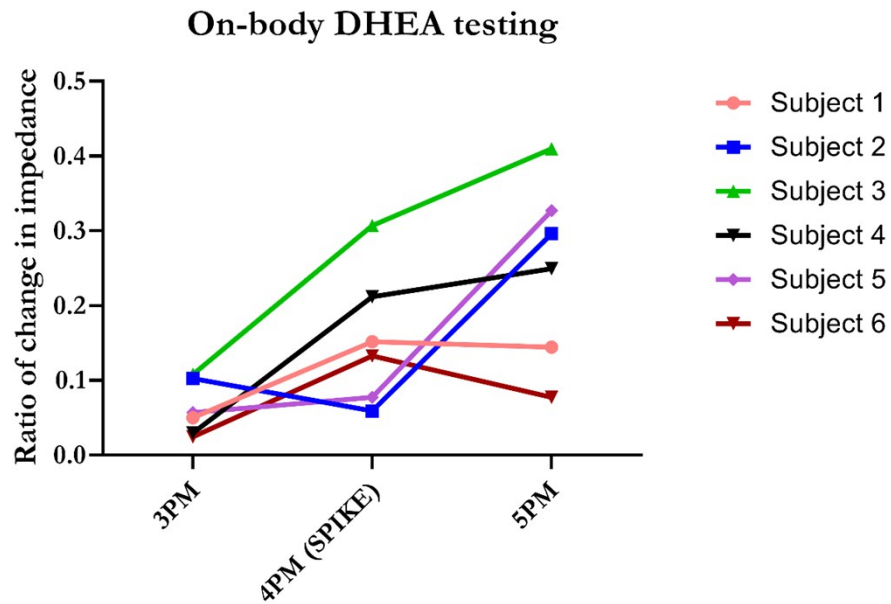


Figure S6: On-body sweat DHEA measurement across 6 subjects

4. Correlation data

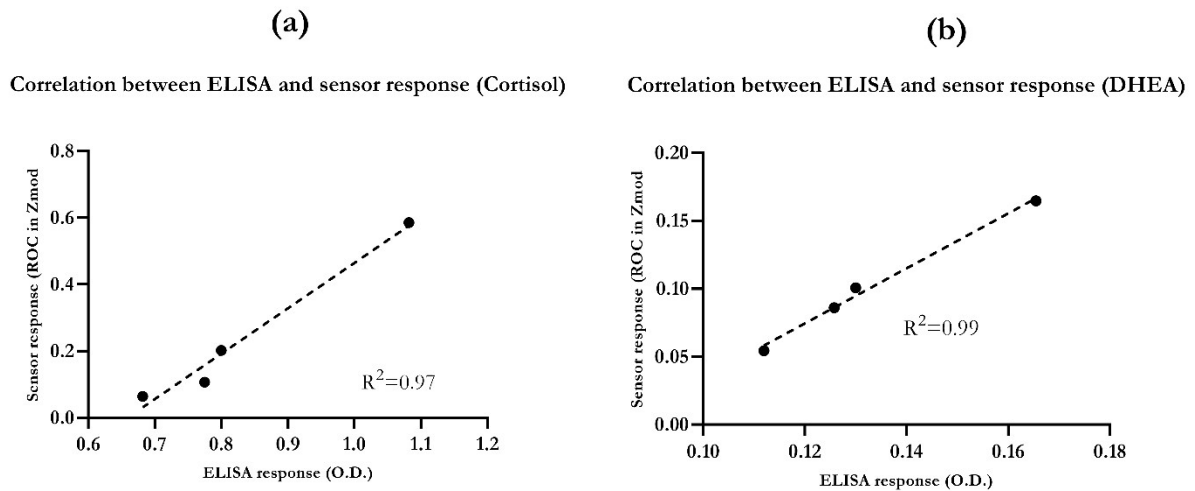


Figure S7: Correlation between sensor and commercially used ELISA

References

- 1 H. Stevenson, N. R. Shanmugam, A. P. Selvam and S. Prasad, *SLAS Technol. Transl. Life Sci. Innov.*, 2017, **23**, 5–15.