Electronic Supplementary Material (ESI) for Lab on a Chip.

Eyeglasses based Wireless Electrolyte and Metabolite Sensor Platform

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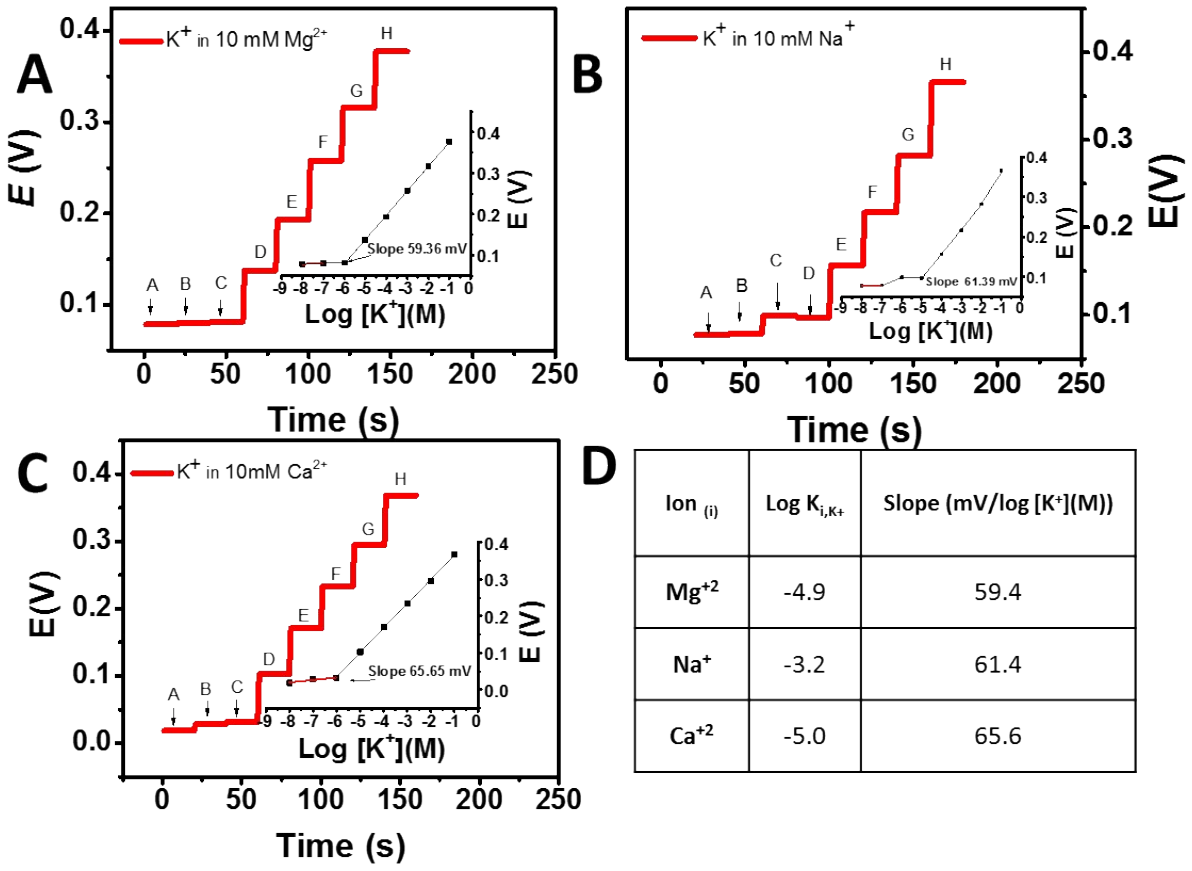
Supplementary information



Ion $_{(i)}$	Log $K_{i,K+}$	Slope (mV/log [K+](M))
Mg^{+2}	-4.9	59.4
Na^{+}	-3.2	61.4
Ca^{+2}	-5.0	65.6

Figure S1. Selectivity coefficient determination using the fixed solution method. Response of $1x10^{-5}$ – $1x10^{2}$ mM (A-H) potassium concentrations and respective calibration curves (insets) in 10 mM of A) Magnesium, B) Sodium and C) Calcium. D) Table with selective coefficient and slope for potassium response in 10 mM of magnesium, sodium, and calcium respectively.

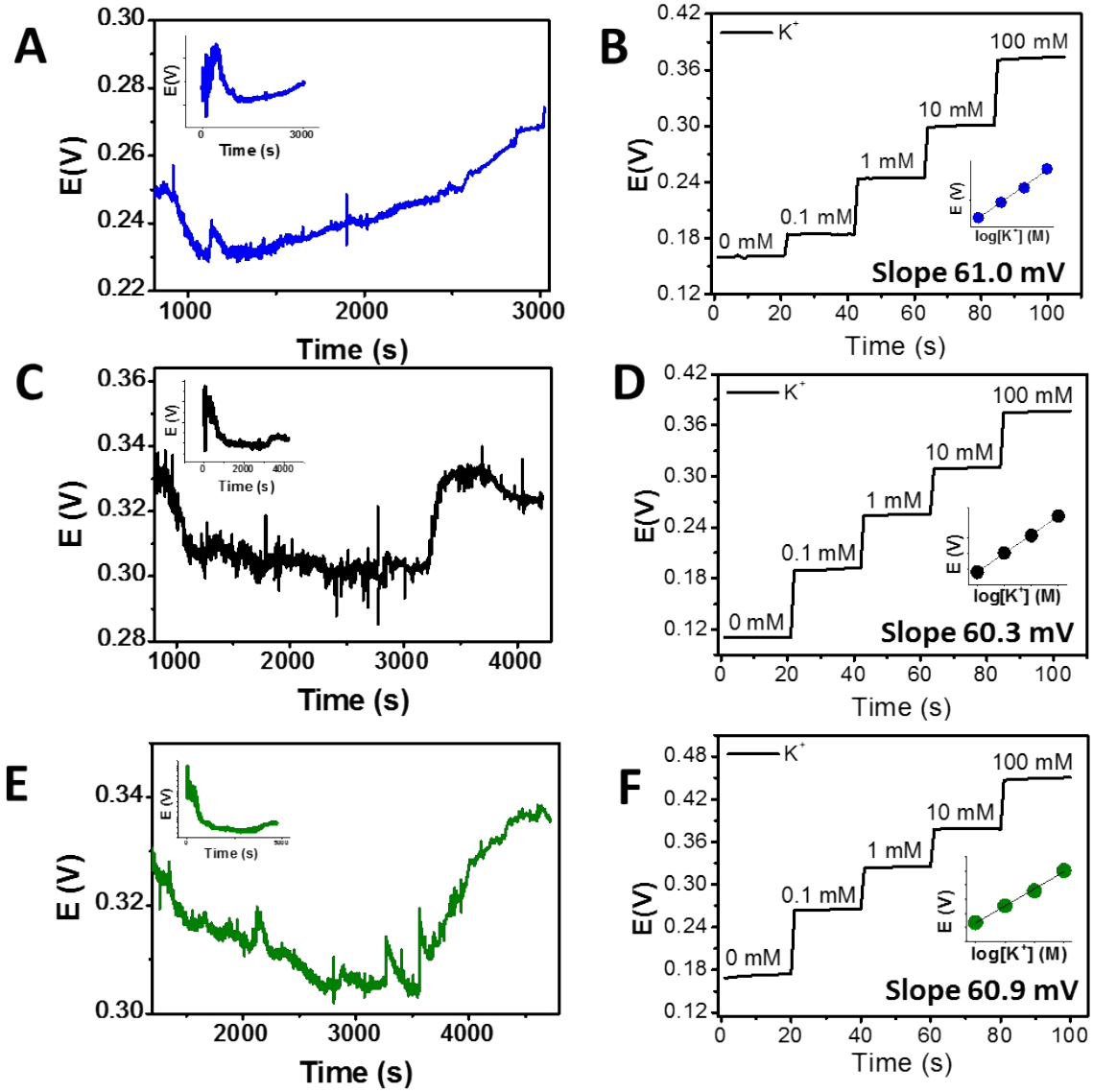


Figure S2. A, C, E) Monitoring of sweat potassium during cycling exercise from three health volunteers. Insets show on-body results starting from time 0 seconds. B, D, F) Calibration curves of potassium sensor before these on-body tests. Insets show E *vs* log [K] (mM) plot along with the slope for each calibration.

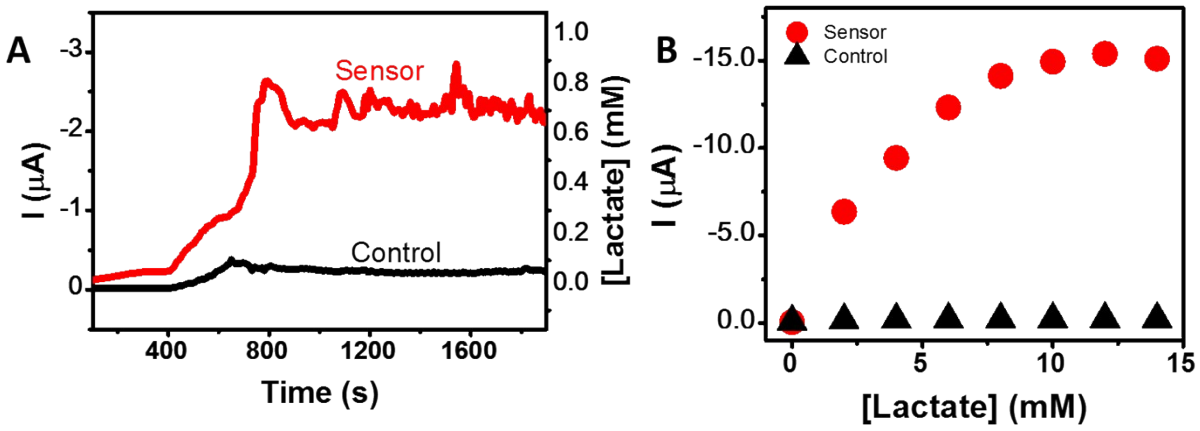


Figure S3. A) Monitoring of swear lactate during cycling exercise. B) Calibration curves for the lactate biosensor and enzyme-free contro sensor before on-body tests.

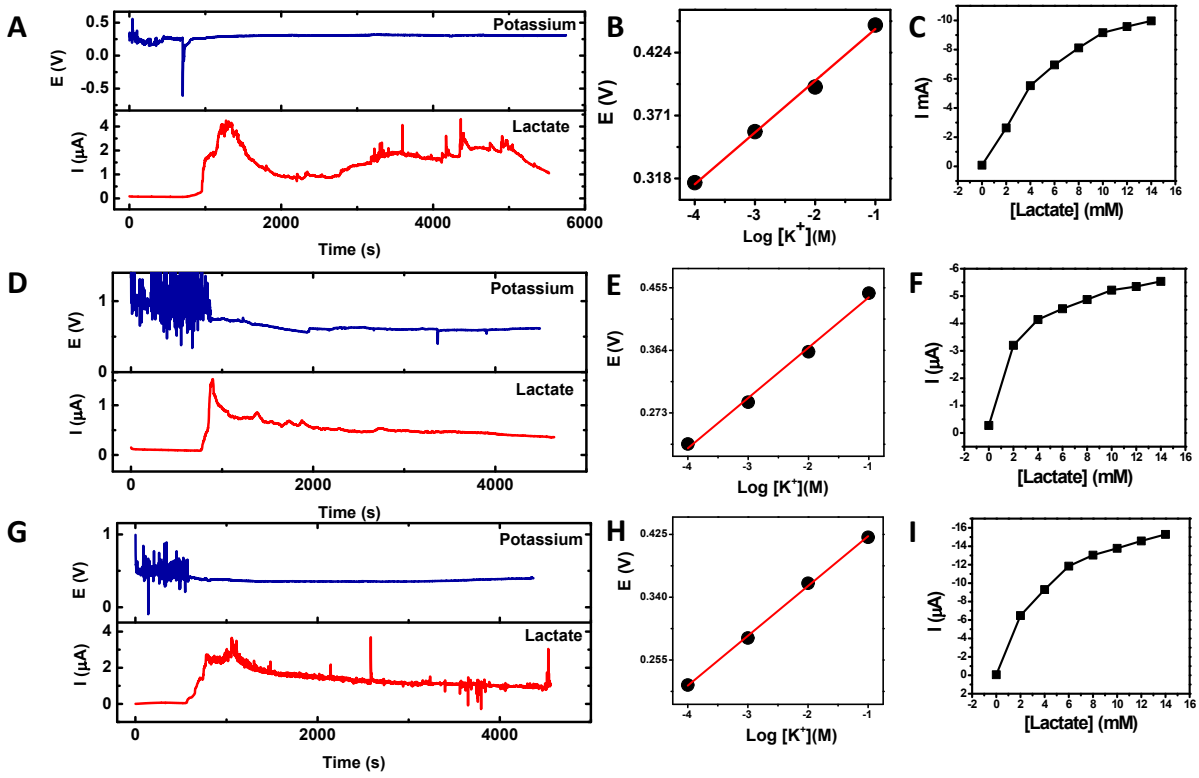


Figure S4. A, D, G) Simultaneous sweat potassium and lactate monitoring during cycling exercise from three volunteers. B, E, H) Potassium calibrations plots obtained before on-body tests. C, F, I) lactate calibration curves before on-body tests.

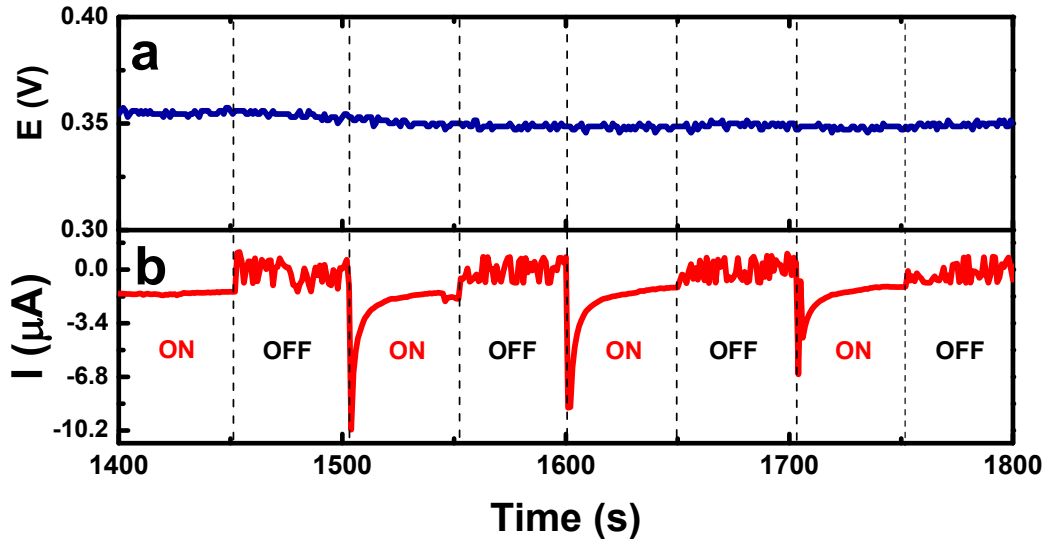


Figure S5. Cross-talk experiment between the potassium (a) and lactate (b) sensors during on-body test **using wireless MAG device**.

Table S1. Inter-electrode reproducibility for lactate sensor.

[Lactate] (mM)	I (μA)	Standard deviation	Variation (%)
0	0.08	± 0.01	12.50
2	3.93	± 0.61	15.52
4	6.80	± 0.69	10.14
6	9.06	± 0.70	7.72
8	10.47	± 0.57	5.44
10	11.83	± 0.74	6.25
12	12.06	± 0.88	7.29
14	12.34	± 0.81	6.56

Table S2. Inter-electrode reproducibility for potassium sensor.

Log [Potassium] (M)	E (V)	Standard deviation	Variation (%)
-4	0.112	± 0.016	14.28
-3	0.154	± 0.025	16.23
-2	0.216	± 0.022	10.18
-1	0.288	± 0.022	7.63

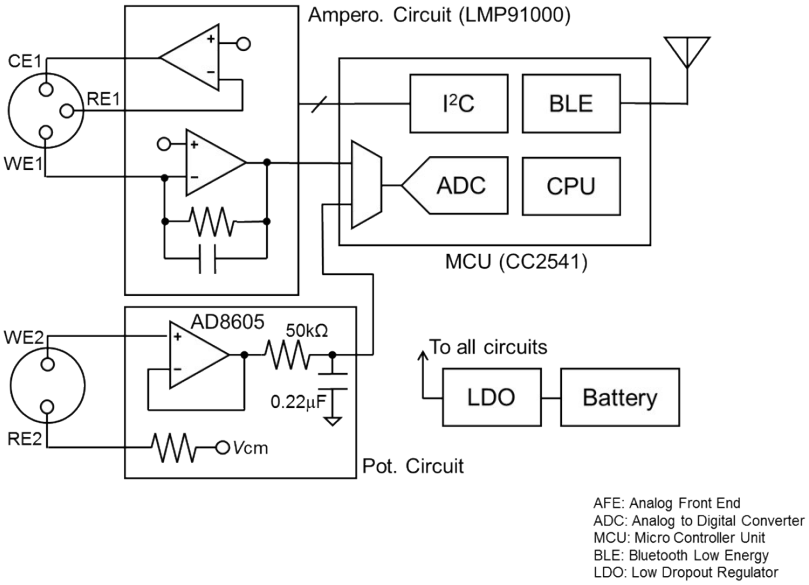


Figure S6. Block diagram of glasses sensor circuit board.

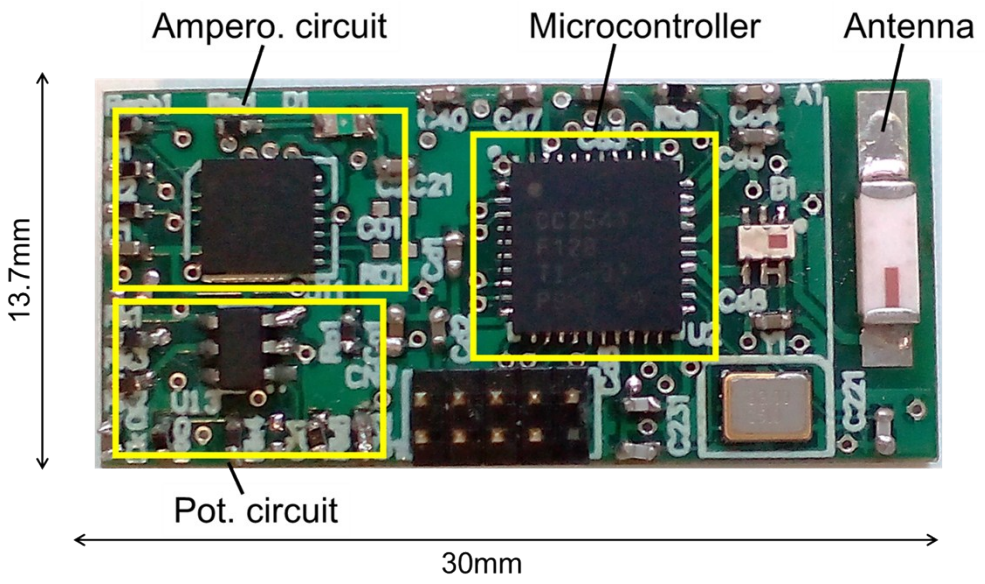


Figure S7. Amperometric and potentiometric PCB board.