

Supplementary materials

Employment of 1-Methoxy-5-Ethyl Phenazinium Ethyl Sulfate as a Stable Electron Mediator in Flavin Oxidoreductases-Based Sensors

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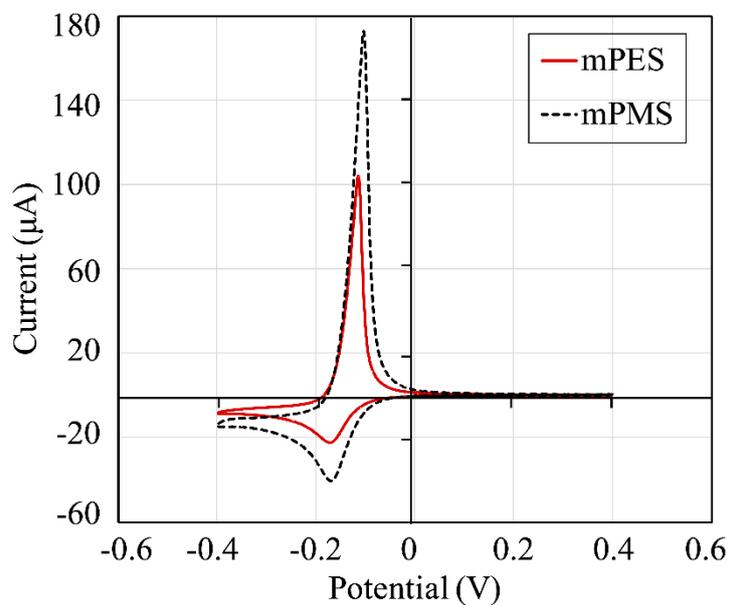
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Figure S1

Cyclic voltammograms of mediators

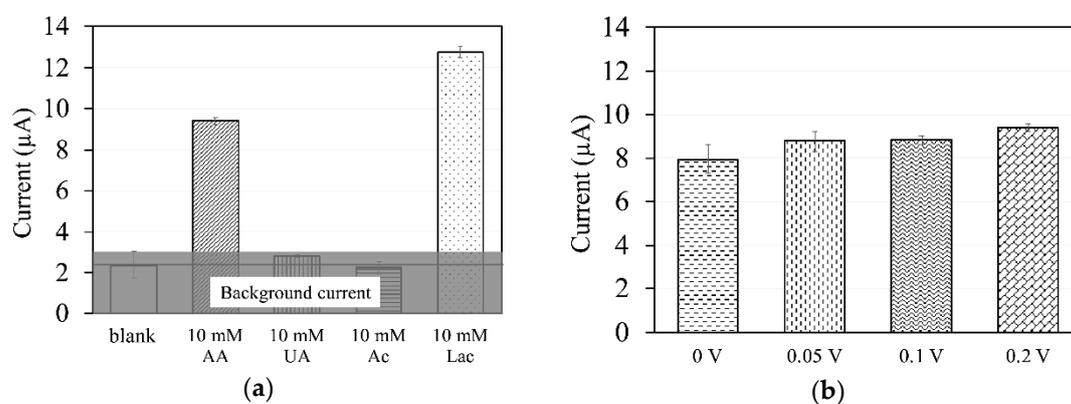


Cyclic voltammetry (CV) measurements were carried out for 1 mM mPMS (black dashed line) or mPES (red solid line) in 100 mM PPB (pH 7.0). Potential range: 0.4 to -0.4 V vs Ag/AgCl; scan rate: 0.1 V/s. Working electrode (WE): glassy carbon (GC); reference electrode (RE): Ag/AgCl; counter electrode (CE): platinum wire.

Oxidation and reduction peaks were observed at -0.11 V and -0.17 V vs Ag/AgCl, respectively, for mPMS and at -0.11 V and -0.18 V vs Ag/AgCl, respectively, for mPES. Thus, the half wave potential of both mediators was -0.14 V vs Ag/AgCl.

Figure S2

Response currents of lactate sensors toward common redox substances

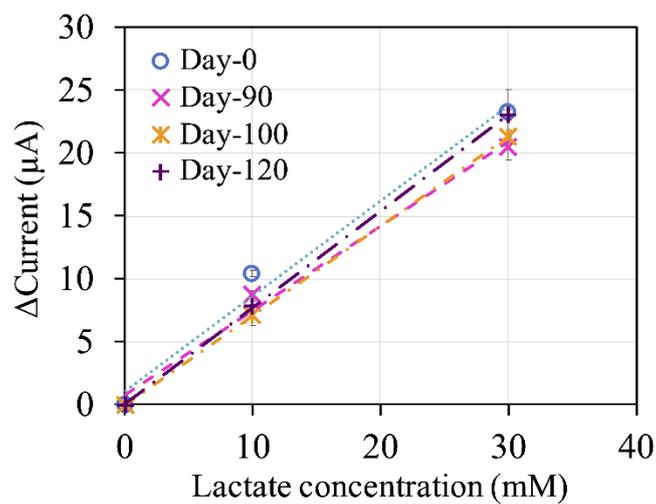


(a) Response currents to blank sample and 10 mM ascorbic acid (AA), uric acid (UA), acetaminophen (Ac), and lactate (Lac). Applied potential: +0.2 V vs Ag/AgCl. Gray area: background current. (b) Response currents to 10 mM ascorbic acid at various applied potentials.

Sensor composition: 1 U *Av*LOx A96L, 100 nmol mPES, 40 µg sucrose, and 20 µg Tween 20. Waiting time: 60 s. N = 3. Sampling point: 10 s.

Figure S3

Storage stability of lactate sensors with 1 U of *Av*LOx A96L



Calibration curves of lactate sensors stored at 25°C in the dark, evaluated after storage for 0, 90, 100 or 120 days. Linear regression was determined for up to 30 mM lactate; sensitivities were 0.68 - 0.77 μ A/mM ($R^2 > 0.98$) for all calibration curves. Sensor composition: 1 U *Av*LOx A96L, 100 nmol mPES, 40 μ g sucrose, and 20 μ g Tween 20. Waiting time: 60 s. Applied potential: +0.2 V vs Ag/AgCl. N = 3. Sampling point: 10 s.

Table S1

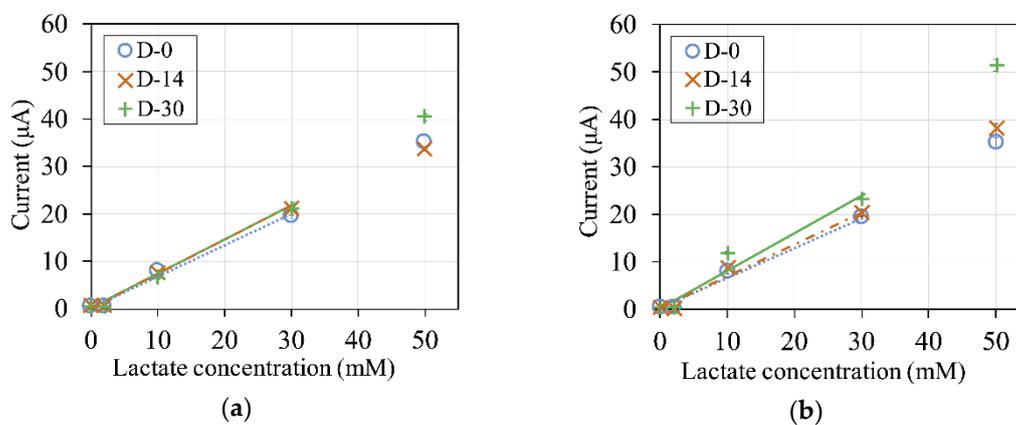
The limit of detection (LOD) of the lactate sensor with 5 U *Av*LOx A96L during storage

Day storage ¹	0	12	28	48
LOD (mM)	1.1	1.1	0.5	1.0

¹ with 2 days prestorage

Figure S4

Stability of mPES electrode strips



Sensor composition: 100 mmol mPES. Sample composition: 0-50 mM lactate, 5 U/ μL *Av*LOx A96L, 4% sucrose, and 2% Tween 20 in 100 mM PPB (pH 7.0). Waiting time: 60 s. Applied potential: +0.2 V vs Ag/AgCl. N = 3. Sampling point: 10 s. Sensor strips were stored for 0, 14, or 30 days at (a) 25°C or (b) 45°C in the dark. Linear regression: 0-30 mM lactate; sensitivities: 0.65-0.78 $\mu\text{A}/\text{mM}$; $R^2 > 0.95$.