Lab Report 1 - BIOINSTRUMENTATION

Group 11:

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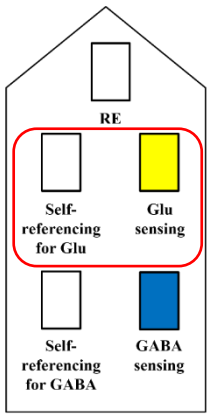
Experiment description:

To test the sensing performance of L-glutamate sensor, we add different solution with different concentration of L-glutamate and also different composition at different time. In the end we verify the performance by sensor's sensitivity and limit of detection (LOD).

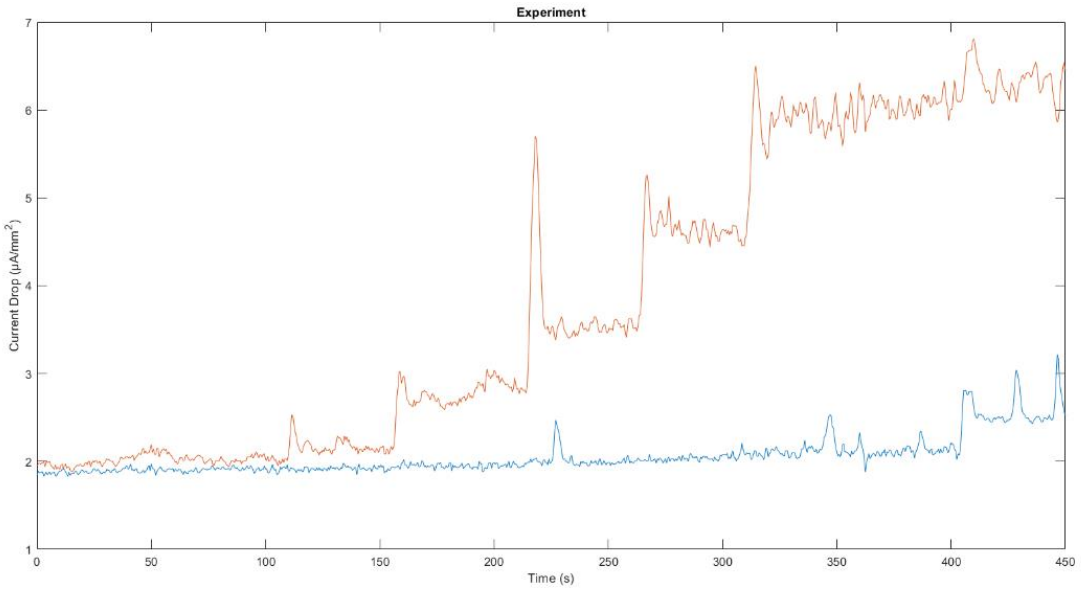
Experiment setup:

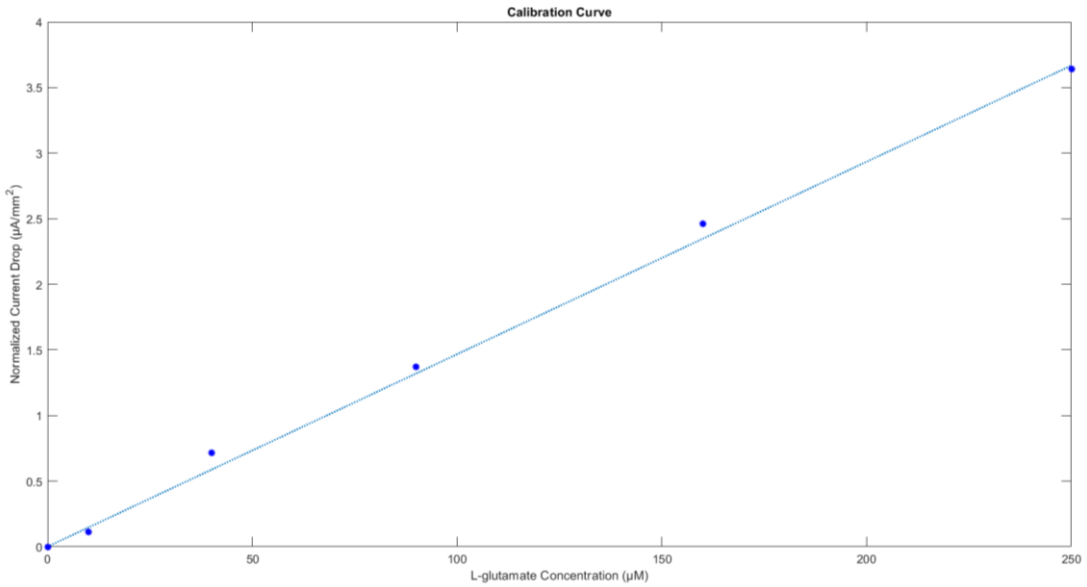
We record the current drop of L-glutamate sensing electrode and Self-referencing for L-glutamate electrode with different solution adding at time showing below.

Time	Added Solution
50s	20 μM Ascorbic Acid
100s	10 μM L-glutamate
150s	30 μM L-glutamate
200s	50 μM L-glutamate
260s	70 μM L-glutamate
310s	90 μM L-glutamate
350s	2 μM Dopamine
400s	Hydrogen Peroxide



Results:





$$\text{Sensitivity} \;=\; 14.7\ (\frac{\text{nA}}{\text{mm}^2 \times \mu\text{M}})$$

$$\text{Limit of Detection (LOD)} = \frac{(3 \times \textit{standard deviation of the baseline})}{(\textit{least squares slope})}$$

$$\text{LOD} \;=\; 11.26\ (\mu\text{M})$$