

Propylene glycol stabilizes the linear response of glutamate biosensor: potential implications for *in-vivo* neurochemical monitoring

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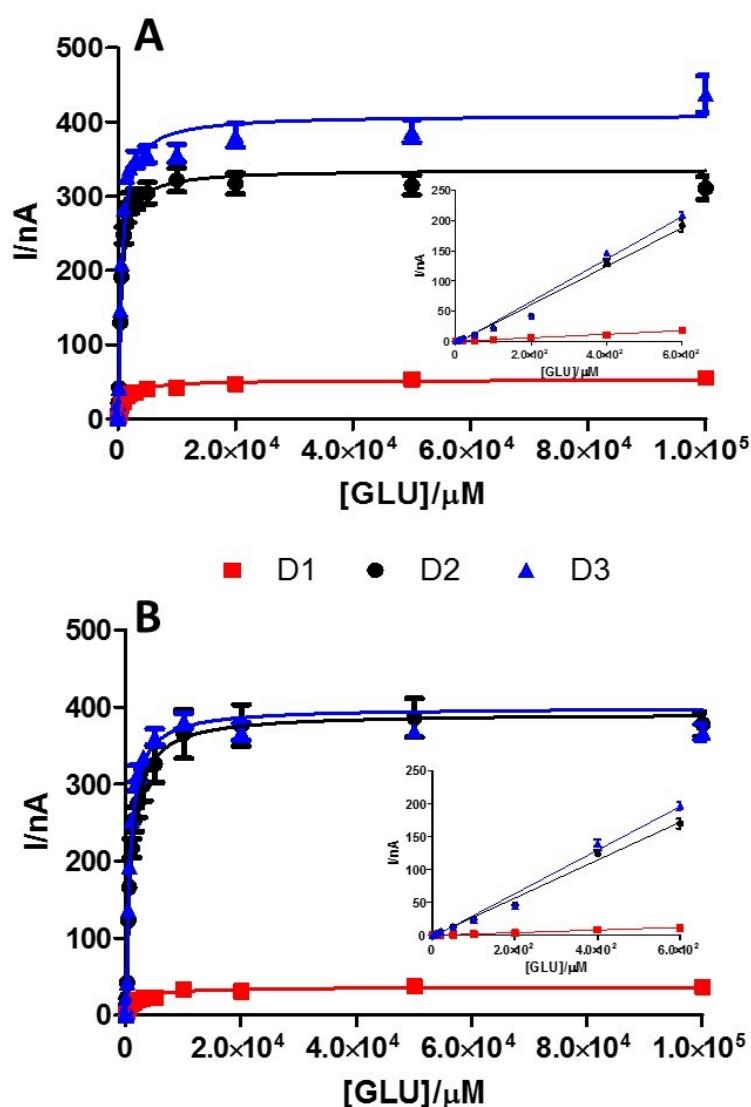


Figure S1. Michaelis-Menten kinetics plots of glutamate calibrations on different biosensor designs at Day 1 (panel A) and Day 7 (panel B), ranging from 0 to 100 mM. In the insets the relative 0–0.6 mM linear regressions. D1: red curve; D2: black curve; D3: blue curve.

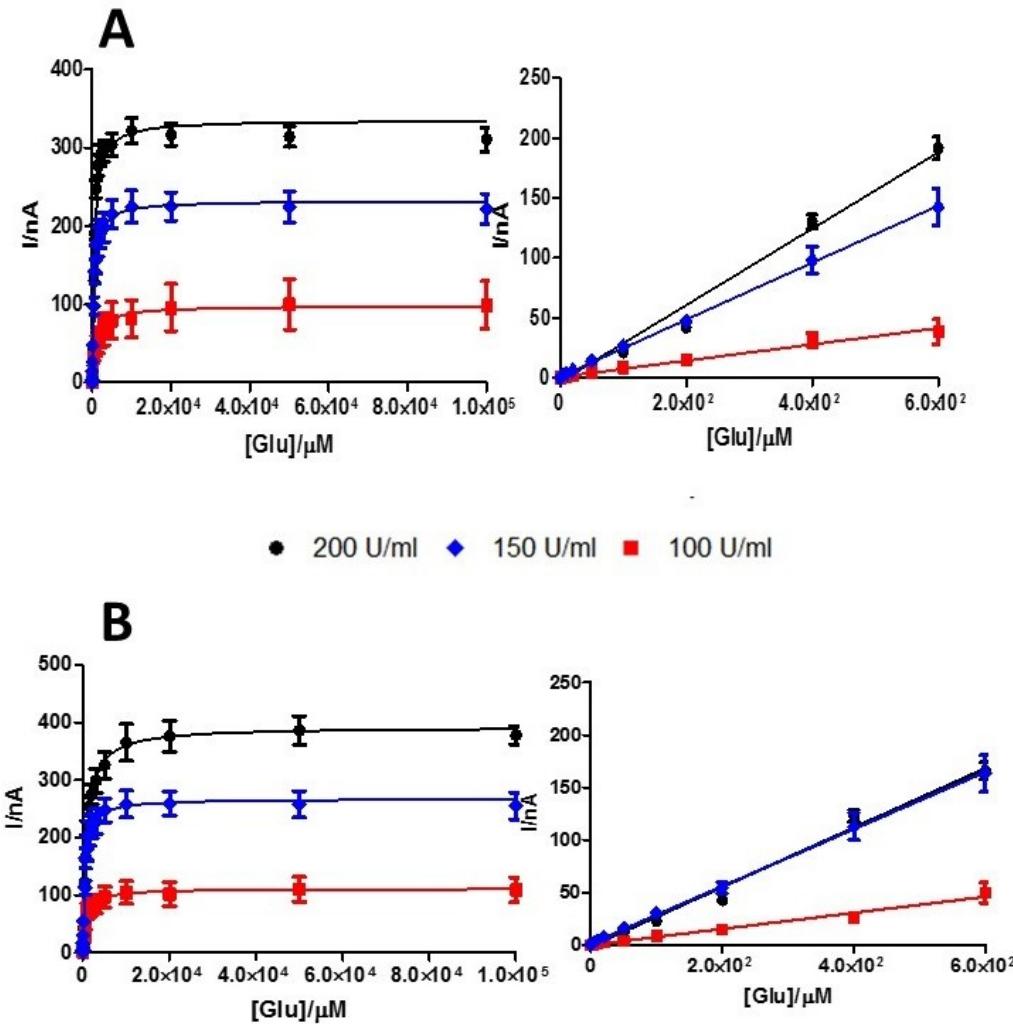


Figure S2. Michaelis-Menten kinetics plots of glutamate calibrations on different biosensor designs loading different enzyme concentrations, at Day 1 (panel A) and Day 7 (panel B), ranging from 0 to 100 mM and the relative 0-0.6 mM linear regressions. Black curve: 200 U/ml; blue curve: 150 U/ml; red curve: 100 U/ml.

Table S1. *In vitro* characterization of three biosensor designs loading different enzyme concentrations (200 U/ml, 150 U/ml and 100 U/ml) at Day 1 and day 7 in terms of Michaelis–Menten kinetic parameters (V_{MAX} and K_M) and analytical parameters (Linear Region Slope –LRS), I_{lim} and ΔI .

PARAMETERS	200 U/ml	150 U/ml	100 U/ml
DAY 1			
V_{MAX} (nA)	335.92 ± 5.03	232.84 ± 5.65	98.19 ± 7.67
K_M [μM]	524.58 ± 37.62	508.55 ± 59.54	1088.12 ± 348.93
LRS (nA/ μM)	0.318 ± 0.011	0.237 ± 0.002	0.068 ± 0.003
I_{lim} (nA)	1.984 ± 0.056	1.451 ± 0.155	1.797 ± 0.183
ΔI	-0.027	1.441	1.606
DAY 7			
V_{MAX} (nA)	392.12 ± 7.73	267.34 ± 6.54	111.08 ± 5.74
K_M [μM]	892.87 ± 73.55	508.09 ± 184.33	819.62 ± 59.88
LRS (nA/ μM)	0.283 ± 0.009	0.077 ± 0.004	0.273 ± 0.002
I_{lim} (nA)	26.072 ± 12.178	8.156 ± 0.432	11.321 ± 3.638
ΔI	15.103	5.066	7.406

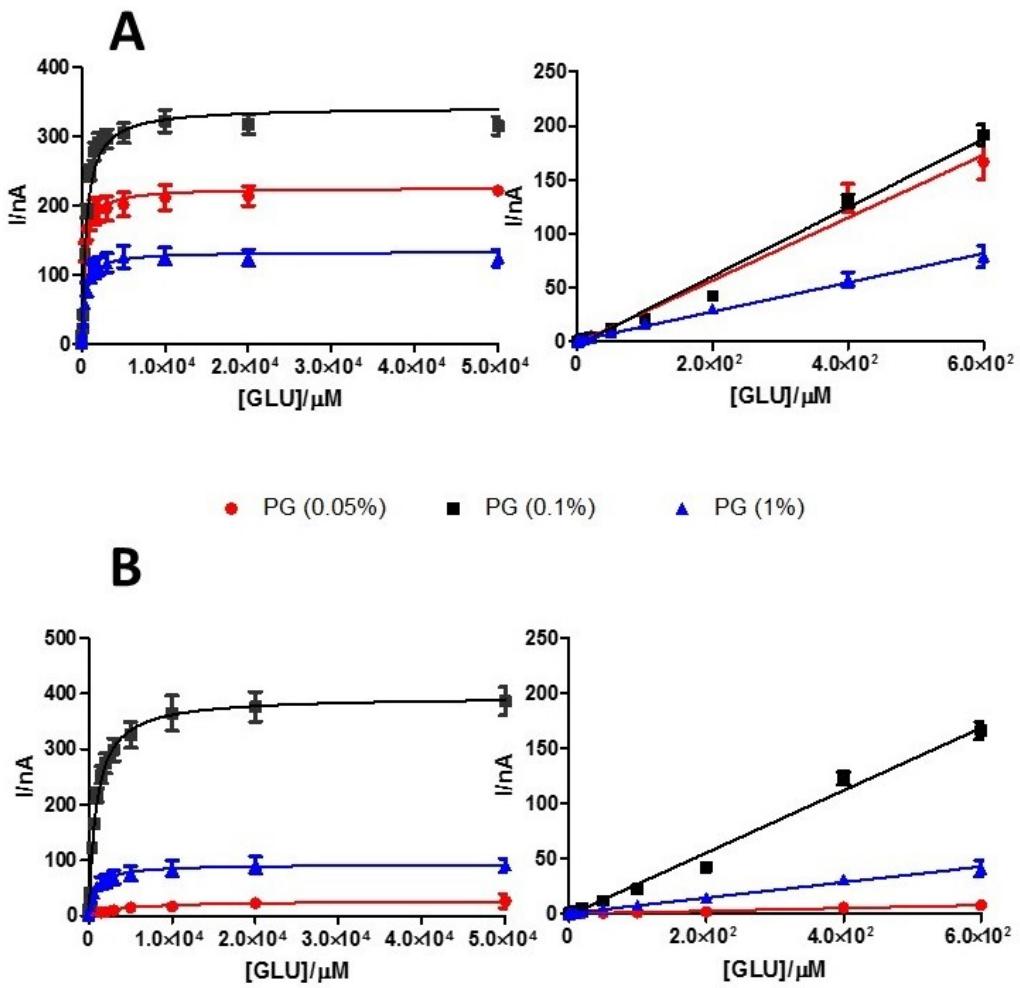


Figure S3. Michaelis-Menten kinetics plots of glutamate calibrations on different biosensor designs loading different PG concentrations, at Day 1 (panel A) and Day 7 (panel B), ranging from 0 to 100 mM and the relative 0–0.6 mM linear regressions. Black curve: PG (0.1%); blue curve: PG (1%); red curve: PG (0.05%).

Table S2. *In vitro* characterization of three biosensor designs loading different PG concentrations (0.05%, 0.1% and 1.0%) at Day 1 and day 7 in terms of Michaelis–Menten kinetic parameters (V_{MAX} and K_M) and analytical parameters (Linear Region Slope –LRS), I_{lim} and ΔI .

PARAMETERS	0.05%	0.1%	1%
DAY 1			
V_{MAX} (nA)	225.54 ± 6.23	335.91 ± 5.503	133.35 ± 4.24
K_M [μM]	369.84 ± 49.63	524.53 ± 37.62	457.93 ± 67.18
LRS (nA/ μM)	0.292 ± 0.012	0.318 ± 0.011	0.135 ± 0.003
I_{lim} (nA)	1.363 ± 0.086	1.450 ± 0.124	1.684 ± 0.036
ΔI	0.221	0.482	0.127
DAY 7			
V_{MAX} (nA)	27.25 ± 3.62	392.16 ± 7.73	92.72 ± 4.34
K_M [μM]	4091.00 ± 1598.00	892.84 ± 73.55	854.90 ± 159.10
LRS (nA/ μM)	0.130 ± 0.001	0.288 ± 0.008	0.071 ± 0.002
I_{lim} (nA)	1.984 ± 0.079	2.153 ± 0.43	5.421 ± 1.638
ΔI	0.335	1.061	1.106

