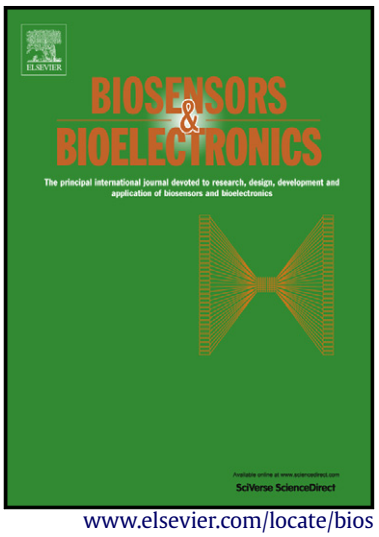

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A robust, state-of-the-art amperometric micro biosensor for glutamate detection

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Abstract:
Scientific knowledge of glutamate (GLU) neurobiology is severely hampered by the inadequacy of the available *in vivo* brain sampling techniques. Due to the crucial role of GLU in central nervous system function and pathology, the development of a reliable sampling device is mandatory. GLU biosensor holds potential to address many of the known issues of in vivo GLU measurement. We report here on the development and test of a labor- and cost-effective micro biosensor, suitable to be applied for measuring brain GLU. A glycerol-based cryopreservation method was also tested. Needle type Pt biosensors were coated with a permselective Nafion-Poly(o-phenylenediamine) layer and cross-linked to L-glutamate oxidase with poly(ethylene glycol) diglycidyl ether. Tested *in vitro*, the device shows high sensitivity and specificity for GLU, while being poorly influenced by common interfering substances such as ascorbate, dopamine and dihydroxyphenylacetic acid. Further, the cryopreservation procedure kept sensitivity unaltered for 30 days and possibly longer. We conclude that a highly efficient GLU biosensor of minimal dimensions can be consistently and affordably constructed with relative ease. Together with the possibility of cryopreservation this shall foster diffusion and exploitation of GLU biosensors technology.

Keywords:
Glutamate biosensor, Platinum, Permselective membrane, Amperometry, Cryopreservation.