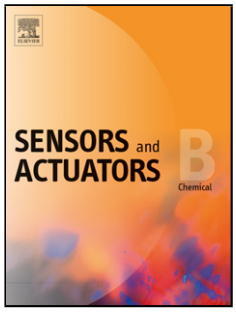

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Sensitive electrochemical detection of cardiac troponin I in serum and saliva by nitrogen-doped porous reduced graphene oxide electrode

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HIGHLIGHTS

- The utility of N-doped porous reduced graphene oxide (N-prGO) for detecting and quantifying of cardiac troponin I is presented
- A detection limit of 1 pg mL^{-1} for cardiac troponin I was achieved
- The possibility to use this sensor interface in human serum and saliva is shown

ABSTRACT

Cardiovascular diseases pose one of the highest mortality risks among all diseases in developed countries, steadily increasing the burden on the health systems. Early diagnosis of cardiovascular diseases has consequently become highly important to decrease mortality and to use more adapted therapeutic decisions. We demonstrate here the utility of nitrogen-doped reduced graphene oxide (N-prGO) for detecting and quantifying of cardiac troponin I (cTnI), a key human cardiac protein biomarker, under physiologically relevant conditions. Non-covalent modification of N-prGO by 1-pyrenecarboxylic acid (py-COOH) and poly(ethylene