Electrochemical Determination of Theophylline Pharmacokinetic under the Effect of Roxithromycin in Rats by the MWNTs/Au/poly-L-lysine Modified Sensor

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In this work, a novel and simple method for pharmacokinetic of theophylline in rats was described with modified sensor based on MWNTs/Au/poly-L-lysine. The modified screen-printed electrode exhibited excellent electrocatalytic activity towards the oxidation of theophylline in real biological samples. The optimum experimental conditions were explored by square wave voltammetry (SWV). The peak current of theophylline was proportional to the concentration in the range of 10 μ M to 200 μ M with the detection limit 2.0 μ M. Compared with the HPLC method, the newly proposed method also exhibited good results in the determination of theophylline pharmacokinetic under the effect of roxithromycin. The drug concentration-time curve of theophylline was also attained at different time points: 10min, 20min, 30min, 60min, 90min, 120min, 240min and 480min. The results strongly showed that the established sensor could be applied to the real-time monitoring such as the clinical drug therapeutic drug monitoring, especially in the case of high concentration theophylline intoxication.

Keywords: determination, theophylline, roxithromycin, pharmacokinetic, modified screen-printed electrode, the drug concentration-time curve

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