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Smartphone-based integrated voltammetry system for simultaneous detection of ascorbic acid, dopamine, and uric acid with graphene and gold nanoparticles modified screen-printed electrodes

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Abstract

Ascorbic acid, dopamine, and uric acid are important electroactive biomolecules for health monitoring and they coexist in serum or urine. Their quantitative determination by electrochemistry could provide the accurate reference for diseases diagnosis and treatment. However, the traditional electrochemical workstations are too large for on-field inspection. Hence, the design of handheld electrochemical system for the detection of biomolecules is significant for point-of-care testing (POCT). In this paper, a smartphone-based integrated voltammetry system using modified electrode was developed for simultaneous detection of biomolecules. The system contained a disposable sensor, a coin-size detector, and a smartphone equipped with application program. Screen-printed electrodes were used as

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