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High sensitivity and label-free detection of Enterovirus 71 by nanogold modified electrochemical impedance spectroscopy FANG-YU WANG, Department of Molecular Medicine and Bioengineering, National Chiao Tung University, Hsinchu, Taiwan, R.O.C., HSING-YUAN LI, SHING-HUA TSENG, TSAI-MU CHENG, HSUEH-LIANG CHU, Department of Biological Science and Technology, National Chiao Tung University, Hsinchu, Taiwan, R.O.C., JYH-YUAN YANG, Development, Centers for Disease Control, Department of Health, Taipei, Taiwan, R.O.C., CHIA-CHING CHANG, Department of Biological Science and Technology, National Chiao Tung University, Hsinchu, Taiwan, R.O.C. — Enterovirus 71 (EV71), which is the most fulminant and invasive species of enterovirus, can cause children neurologic complications and death within 2-3 days after fever and rash developed. Besides, EV71 has high sequence similarity with Coxsackie A 16 (CA16) that makes differential diagnosis difficult in clinic and laboratory. Since conventional viral diagnostic method cannot diagnose EV71 quickly and EV71 can transmit at low viral titer, the patients might delay in treatment. A quick, high sensitive, and high specific test for EV71 detection is pivotal. Electrochemical impedance spectroscopy (EIS) has been applied for detecting bio-molecules as biosensors recently. In this study, we try to build a detection platform for EV71 detection by nanogold modified EIS probe. The result shows that our probe can detect 3.6 VP1/50 μ l (one EV71 particle has 60 VP1) in 3 minutes. The test can also distinguish EV71 from CA16 and lysozyme. Diagnosis of enterovirus 71 by electrochemical impedance spectroscopy has the potential to apply in clinic.

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