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Development and application of protein kinase A biosensor for cancer diagnosis. CHIUN-JYE YUAN, JHAO-HONG LEE, Natl Chiao Tung Univ — Cancer remains the leading cause of death worldwide in recent years. The protein kinase A (PKA) was proposed to be a cancer biomarker, because its catalytic subunit was demonstrated to be released as an extracellular protein kinase A (ECPKA) in medium of many cancer cell lines and in the serum of malignant cancer patients. In this study an electrochemical PKA biosensing platform was developed by the impedance spectroscopy (EIS)-based technology for the detection of ECPKA activity. The novel multiplex printed gold electrodes were also design and developed in this study for the multiplex detection and calibration during the measurements. The developed PKA biosensor exhibit high sensitivity to PKA activity with a linear range of detection from 0.01 U/mL to 50 U/mL and a lowest detection limit of 0.005 U/mL. The IC₅₀ for the specific PKA inhibitor, H89, determined on the developed PKA biosensor is comparable to that determined by conventional methods. In conclusion, a quick, sensitive, reliable and cost-effective cancer diagnostic system for quick clinical cancer diagnosis is developed in this study.

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