

New ultrasensitive BDD-biosensor for influenza virus detection

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Influenza is a contagious disease caught by humans and caused by viruses belonging to the family *Orthomyxoviridae*. Each year the Influenza virus infects millions of people and kills hundreds of thousands of them. Economic losses caused by employee absenteeism are counted in the hundreds of millions of dollars a year. In order to successfully treat influenza virus infections it is necessary to detect virus during initial development phase of the infection when tens to hundreds of viruses are present in pharynx of the patient.

Here, we show a new universal diamond biosensor which enables detection of the virus at ultralow concentration even before clinical symptoms. A diamond electrodes are modified with polyclonal anti-M1 antibodies and then a universal biomarker of influenza virus – M1 protein – can be captured. In this assay we observe a changes in electrochemical impedance spectra.

A detection limit of 1×10^{-14} g/mL in saliva buffer is achieved with M1 biomarker what corresponds with 5-10 virus particle in samples. Also the universality of the assay was confirmed analyzing different strains of influenza A virus.

Biography

Dawid Nidzworski, entrepreneur and scientist. A graduate both: the Faculty of Chemistry GUT and the IFB UG-MUG. PhD at the IFB UG-MUG. Laureate of programs VENTURES FNP, IMPULS FNP, LIDER (NCRD), the SME Instrumens (H2020), “Fast Track” (NCRD) and Masovia programme. He developed biosensor (FluSensDx) which will identify influenza virus in the patient's throat swab. He is also working on an edible vaccine against influenza virus for poultry (LIDER). Winner of many awards and scholarships. Co-author of several publications, congress reports and patent applications. His start-up company SensDx will revolutionize the way of medical diagnostics in the world.