

Detection of Influenza A Virus by Interdigitated Nanogap Devices

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Interdigitated nanogap device (IND) is an attractive tool for biomolecular detection due to its huge on-off signal ratio, great tolerance to the variation in biochemical environment, and relatively simple implementation processes. Here, we report on the IND-based detection of Influenza A virus by sandwich immunoassay. The INDs were fabricated by photo lithography followed by the in-house chemical lithographic technique for the narrowing the initial gap distance. The surface of the silicon oxide between the two gold electrodes was chemically modified to immobilize primary antibodies for the immuno-specific interaction with the influenza A virus antigen. After immersing the functionalized-IND into the sample solution containing the influenza A virus, the device was exposed to the secondary antibody conjugated Au nanoparticles (Au NPs). The INDs showed a huge jump in the electric conductance when the sample solution contained the influenza A virus of the concentration as low as 10 ng/mL. We hope that this IND-based sensing can be applied to the development of simple and reliable diagnostic means of influenza viruses.

Keywords: Interdigitated nanogap device, sandwich immunoassay, antibody conjugated Au nanoparticles, Influenza virus

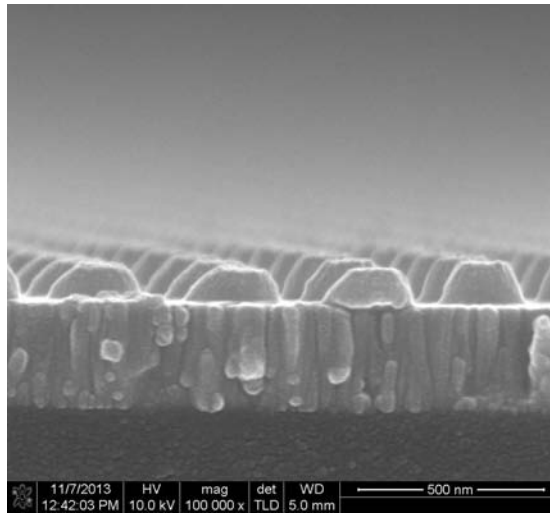


Fig. 1.