FLOW CYTOMETRY IN THE DIAGNOSIS OF INFLUENZA

A. Wozniak-Kosek[1], L.B. Brydak[1,2]

[1]Department of Influenza Research. National Influenza Center, National Institute of Public Health – National Institute of Hygiene, Warsaw, Poland, Choicimska street 24 , 00-791 Warsaw akosek@pzh.gov.pl; [2]Department of Microbiology and Immunology Faculty of Biology, University of Szczecin, Szczecin, Poland

Flow cytometry is used in the analysis of the multiparameter optical properties of individual particles such as eukaryotic cells, prokaryotic cells and viruses in the flow system. Virions, or complexes consisting of virus particles attached to the specific antibody in suspension are individually arranged in a linear stream, which flows through the detection device. The parameters measured by the flow cytometer include the volume of the particles or cells, the morphological complexity, the presence of pigments, RNA content, virion surface markers, and enzymatic activity. It is possible to collect two morphological parameters and one or more signals of the fluorescence of a single particle. Multi-parameter analysis provides for the definition a population of cells based on their phenotype. Flow cytometry is characterized by the automatic determination of the value of the parameter set for a large number of individual particles or cells in the course of each measurement. For example, 100 000 or more particles such as virus, bacteria, or fungal spores are analyzed one after another typically over a period of 1 minute. The limit of detection in such studies is 100 fluorescing particles per cell. Theoretically, in the case of the influenza virus, this will be one copy of the virion combined in a complex with specific antibodies and with a built-in fluorescent label.