

STABILITY EVALUATION OF INACTIVATED INFLUENZA H7N9 VACCINES DERIVED FROM ADHESION AND SUSPENSION MDCK CELLS

Tsai-Teng Tzeng, National Institute of Infectious Diseases and Vaccinology, National Health Research Institutes, Miaoli, Taiwan

Chia-Chun Lai, Graduate Program of Biotechnology in Medicine, National Tsing Hua University & National Health Research Institutes, Taiwan

Min-Shi Lee, National Institute of Infectious Diseases and Vaccinology, National Health Research Institutes, Miaoli, Taiwan

Alan Yung-Chih Hu, National Institute of Infectious Diseases and Vaccinology, National Health Research Institutes, Miaoli, Taiwan

Key word: antigen stability, *suspension MDCK* cells, chemical-defined medium, H7N9 virus

In recent years, cell-based manufacturing processes for influenza vaccine production has gained a great interest over the egg-based process. We have adapted MDCK cells to grow in chemical-defined medium and found this newly suspension MDCK cell line (sMDCK cells) is very suitable for the production of influenza virus. However, the property of purified antigens from sMDCK cells remains unclear. In this study, a stability program of influenza H7N9 vaccine (NIBRG268 vaccine strain) produced by sMDCK cells was investigated, and the data were compared with the vaccine derived from adhesion MDCK (aMDCK) cells in serum-free medium. The H7N9 bulks (with different storage time) derived from sMDCK and aMDCK cells were stored at 2-8°C for some times, and a number of parameters were used to monitor the H7N9 vaccine antigen stability was evaluated at different periods (1, 2, 3 and 6 months). The monitoring parameters are including virus structure, HA titer, HA content, total protein level, antigenicity, and immunogenicity. The sMDCK-derived H7N9 bulk showed similar virus structure to that aMDCK-derived H7N9 bulk, and there was no obvious change after further 6 months of storage. Furthermore, HA titer, HA content and total protein level of sMDCK- and aMDCK-derived H7N9 bulks were stable after 6 months of storage. sMDCK- and aMDCK-derived H7N9 bulks displayed similar antigenicity detected by hemagglutination inhibition (HI) test using standard serum. Finally, the results of HI and neutralization tests showed that sMDCK- and aMDCK-derived H7N9 vaccines were similar in immunogenicity in BALB/c mice vaccinated with 0.2 µg of H7N9 vaccine with an adjuvant of aluminum hydroxide. These results indicate that sMDCK-derived H7N9 bulk has good stability data similar to the aMDCK-derived H7N9 bulk. Thus, the newly developed suspension MDCK cells show a great market potential over the traditional vaccine manufacturing methods.