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Baculovirus as a platform for the anchorage of hemagglutinin from influenza virus

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Influenza virus is an important cause of diseases circulating between humans and animals. On the envelope of this virus, hemagglutinin (HA) is the major antigen that is recognizable by the animal immune system upon viral infection. Due to the potential of viral infection, it is difficult to acquire or manipulate influenza virus. It is also difficult to purify HA (a membrane protein) as a vaccine. In order to resolve these problems, we have developed pseudotyped viruses (HA-Bac) that present HA on the envelope of baculovirus. HA-Bac is water soluble for easy isolation, and HA can retain its native trimeric conformation on HA-Bac for better antibody stimulation. We vaccinated mice separately with either HA-Bac or purified HA and then collected mouse sera at several time-points for western blotting and hemagglutinin inhibition assays. Our results show that both HA-Bac and purified HA elicited HA-inhibiting antibodies, but far less HA is needed for HA-Bac compared to purified HA to induce mouse immune responses. We also showed that HA-Bac is capable of agglutinating red blood cells, which serves as a convenient and safe tool to assay HA-neutralizing antibodies. We further expressed HA on the surface of cells and performed cell-based immunofluorescence assays with selected monoclonal antibodies and compared them with data generated from a traditional ELISA method. The results suggest that HA-Bac could provide a safe and convenient platform for antibody production and screening.

Biography

Yu-Chan Chao completed his PhD at University of Arkansas and Post-doctoral training at Cold Spring Harbor Laboratory and Cornell University. He previously served as Dean of the College of Life Science, National Chung-Hsing University and as Deputy Director at Institute of Molecular Biology, Academia Sinica, and is now a Professor at this latter institute. He has received three distinguished research awards from Ministry of Science and Technology, Taiwan, and was elected as a Distinguished Research Fellow. He is a council member of the International Congress of Entomology, and has published more than 70 papers. He also serves as an Editor for several highly-regarded international journals.

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