

Trend of Vaccine R&D in an Effort to Fight against Influenza Pandemic

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Not until recently, the main strategy for the manufacture of modern influenza vaccinations has always followed an ancient technology from many decades ago with protocols based on two essentials: "candidate vaccine strains selection" and "chicken embryo culture", which were both time-consuming and labor-intensive. The essence or the active ingredients of these past vaccines were mainly focused on some surface glycoproteins such as hemagglutinin (HA) and neuraminidase (NA) and the aimed-at target was to induce anti-HA responses. However, selected candidate vaccine strains often turned out to be quite disappointing in their protective performance due to an over exaggerated assumption of antigen drift taking place earlier in that season, causing an unexpected large drop in the immune titer of the vaccine. As a result, the newest approach of vaccine development has now shifted to adopt those rather slowly evolving NA or MA as the major components of the influenza vaccines, in an attempt to lower down its susceptibility to the potential antigen drift. Another new direction in vaccine development is to study and acquire other alternative manufacturing techniques, such as developing DNA vaccines, making use of recombinant baculovirus paired

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up with a certain low-cost insect cellular system, mass producing influenza vaccine proteins, cutting down on the process time needed for vaccine manufacturing, or searching for novel adjuvant to achieve greater savings on the consumption of the vaccine antigen. Furthermore, based on existed data of the three pandemics last (the 20th) century, the influenza outbreak analysis over the past 3 years (89% of all cases turned out to be 40 or younger), and also the age distribution of its mortality, they all clearly demonstrated that the most vulnerable age group for influenza is getting younger all the time lately and is no longer just associated with those susceptible risk groups specified in the current influenza vaccination policy. Therefore, while we are already in the middle of preparing for the seemly inevitable incoming influenza pandemic, we do certainly have an urgent need to take further steps to encourage young people to take flu vaccination and also at the same time if possible, to broaden their immune coverage.

Key Words: Influenza pandemic, Vaccine R&D