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# The Key to Manufacturing Viral Vaccines for Individual Human Population

## Abstract

Nowadays, subunit viral vaccine becomes the major choice for manufacturing viral vaccine with a thought of safety reason to prevent side effects. However, the success to use subunit viral vaccine to prevent a particular viral infection is very limit. This is different from the time when Cowpox virus was originally used for vaccination to prevent the smallpox viral epidemic over a century ago. Although the knowledge of immunity has been discovered a lot more than the Edward Jenner's period, the effectiveness of viral vaccine could not reach our accomplishment. Accordingly, we need to revise our knowledge and manipulate in the right direction for the viral vaccine production. Basically, to induce an immunity to prevent a viral infection, our body must produce a specific antibody which needs induction not only by a particular viral antigen but also the molecules called major histocompatibility complex (MHC). Each molecule of MHC alleles plays a key role in the immune response by forming a specific complex with its appropriate epitope to induce a specific T cell clone thru its specific receptor. MHC class I is required for inducing cytotoxic T cell while MHC class II is for helper T cell. Helper T cell plays a key role to induce an effective stage of acquired immunity especially a specific antibody which is believed to be a gearwheel to prevent an invasion of the particular viral particle. To produce the viral-specific antibody, MHC class II plays a key role to induce helper T cell and then B cell to synthesize a specific antibody. Since the MHC gene alleles are highly polymorphic so the possibility that individuals have the same gene alleles might be one in a million which, mostly, can be found in those who are an identical twin. Accordingly, a subunit viral vaccine, which contains a limit number of epitopes, would reduce a capacity of an antigen presenting cell, such as a dendritic cell, to process some epitopes to induce the particular helper T cell clones. Subsequently, the corresponding B cell clones cannot synthesize the specific antibody to neutralize the particular infectious viral particle. Accordingly, this presentation will present a different notion and principle to develop a viral vaccine for an individual human population.

***Corresponding author:** Tirasak Pasharawipas, Rangsit University, Thailand; E-mail: tirasak4124@yahoo.com

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