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The keys to manufacturing viral vaccines for individual human population

Tirasak Pasharawipas
Rangsit University, Thailand

The success to use subunit viral vaccine to prevent a particular viral infection is very limit. This is different from the time when the entire Cowpox virus was originally used for vaccination to prevent the smallpox viral epidemic over a thousand years ago in China before approved in a scientific way by Edward Jenner although immunity was not known. Knowledge of immunology has been profoundly discovered now-a-days. With a thought of safety reason to prevent side effects, subunit viral vaccine becomes the major choice for manufacturing viral vaccine. However, many kinds of viral vaccines could not reach our accomplishment. There is a question why viral vaccines cannot be effective for everybody. This is a question that we need to revise our knowledge and manipulate in the right direction for the viral vaccine production. To prevent a viral infection, a body must produce a protective antibody to prevent the particular viral particle to attach the viral receptor on a target cell. Theoretically, adaptive immunity needs induction not only by a particular antigen but also our cellular molecule called major histocompatibility complex (MHC) to form a complex molecule with its appropriate epitope to activate a specific receptor of T cell. There are two classes of MHC molecules called class I and class II. 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 including a specific protective antibody. 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, in some people, the corresponding B cell clones cannot synthesize the specific antibody to neutralize the particular infectious viral particle. Moreover, the success of vaccination might require other different thoughts. We might need to understand more about the viral receptor on the target cells. There was a proposal of an inducible viral receptor concept which can be applied to protect viral infection as an additional strategy to produce the effective viral vaccines. Accordingly, this presentation will present the novel approach to develop the viral vaccine for everybody.

Biography

Tirasak Pasharawipas completed his PhD from Faculty of Microbiology, Mahidol University, Bangkok, Thailand. He has his Postdoctoral training at Neuro Virology and Cancer biology Center, Temple University, Philadelphia. At present, he is a Full Professor in Microbiology and Immunology, Graduate Program of Medical Technology, Rangsit University, Thailand. He is interested in various academic subjects of science and liberal arts in addition to music and sports. His scientific fields mainly focus in viral and cellular interaction, bacteriophage and viral diseases in invertebrate animals. However, his research interests expand to viral vaccines, autoimmune disease and cancer biology including the relationship of MHC molecules to some specific diseases and viral vaccines. He enjoys being a reviewer for several journals and an advisor to develop young medical scientists with the wish that they would co-operate and succeed to solve all the problematic diseases, now and then, in a proper way with genuine scientific thinking.