

Problem and solution concerning viral vaccines.

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Editorial

Regardless of any knowledge concerning immunology, Dr. Edward Jenner and his associates had a way to initiate a success to battle against an epidemic of small pox virus during the 18th century by the term of vaccination. Up-till-now, it seems we could not go much further although a lot of fundamental medical scientific knowledge, including immunology, has been discovered. There are not sufficient kinds of viral vaccines to prevent the infection of many classic and emergence viruses. With a thought of safety reason to prevent side effects, most of the scientists decided to work on subunit viral vaccines. This is different from the time when Edward Jenner used a whole particle of Cowpox virus to vaccinate people to prevent the small pox viral epidemic.

To induce immunity to prevent viral infection, theoretically, the body needs to produce specific antibody which need induction not only by an antigen but also the molecules called major histocompatibility complex (MHC). MHCs are the sets of molecules located on the cell membrane and classified into 2 classes. Each class has three loci, probably four for MHC class II. Each locus contains definite variant genes, so called gene allele, and inherit from generation to generation. Since the gene alleles are highly polymorphic so the possibility that individual has the same gene alleles might be one in a million which, mostly, can be found in those who are identical twin. Each molecule of MHC alleles play a key role for immune response by forming a specific complex with its appropriate epitope of an antigen to induce specific T cell clone thru their 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 specific antibody which is believed to be a gearwheel to prevent an invasion of

viral particle. To produce viral specific antibody, MHC class II is the one that really corresponds to induce helper T cell and then B cell to synthesize specific antibody. Accordingly, if the epitopes of any viral vaccines were cut down, an antigen presenting cell would not be able to process induction to some particular helper T cell clones. Subsequently, the particular B cell clones cannot synthesize those particular antibodies to neutralize the infectious viral particles. Thus, this could be a reason that the viral vaccines do not work in somebody or most people in general public. Some viral vaccine might show to be successful in laboratory because the experimental animals were inbred as some specific strains. The viral vaccines that gave positive results in experimental level do not mean it can work in human population who contain various polymorphic MHC alleles. In addition, the viral vaccines that work in one population does not mean they do work in other population.

To solve the problem, the viral vaccine should contain the epitopes that relate to protect viral infection, probably thru viral receptor molecule(s) and must certainly contain the epitopes that can interact broadly to MHC alleles in each individual population. With the reason, it is pity that most of developing countries import viral vaccines regardless of any evaluation to follow up their population after vaccination. To make it fair, general public should be educated before making any decision to process any viral vaccination. Those who are vaccinated and become negative sero conversion should be compensated for any lost, at least, from the pharmaceutical company. World Health Organization should make this as a privilege policy. We (scientists, pharmaceutical company and public health organization) should keep in mind that viral vaccine should be a real useful tool, not just for business, to give the right of good health for all.

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