



Grand design platform and database for the development of innovative adjuvant and vaccine carrier

Jun Kunisawa/National Institutes of Biomedical Innovation, Health and Nutrition

Vaccine development requires efficient adjuvants and carriers. In order to rapid clinical usage of excellent seeds in emergency situations, systematic analysis based on scientific evidence and a system for searching and providing cross-sectional information are indispensable. In particular, to promote practical application, it is important to have information not only on the immune responses to the vaccine induced by antigen with the combination of adjuvant or carrier, but also on the physical properties, safety, kinetics, and metabolism.

In this application, NIBIOHN, which has a platform for vaccine and drug discovery research integrating "evaluation of physical properties → in vitro analysis → animal studies in rodents → studies using non-human primates (monkeys)" and unique databases on adjuvants and compound toxicity will play a central role in the development of a variety of adjuvants and delivery as well as in the technical supports with strong collaboration with members who have conducted research on the development and advancement of adjuvants/carriers, immunology and safety evaluation, and distribution and metabolic analyses. Furthermore, we will build a database of adjuvant and carrier characteristics, including combinations with antigens.

These researches will promote the development of adjuvants and vaccine carriers systematically, which has been conducted individually by each researcher, and promote their clinical application by conducting and supporting not only immunological evaluation but also evaluation of physical properties, distribution and metabolic analysis, and regulatory research including safety. Furthermore, the construction of a searchable database will enable the immediate proposal of adjuvant and carrier candidates according to the characteristics of the pathogen and vaccine modality in an emergency, leading to the prompt provision of vaccines to the public. Further, in non-emergency period, it can be deployed to develop vaccines against new targets such as cancer, allergies, and lifestyle-related diseases, in addition to infectious diseases. Thus, we believe that this proposal can contribute academically, socially, and economically toward the development of wide variety of vaccines.