

Development for new multifunctional vaccine, artificial adjuvant vector cells against emerging and reemerging infectious diseases

Shin-ichiro Fujii/RIKEN

Artificial adjuvant vector cells (aAVCs) were originally developed as a cancer therapeutic vaccine system. The immunological efficacy of aAVCs, that of the activation of both innate and acquired immune systems especially by inducing long-term memory immunity by killer T cells, was verified in non-clinical studies using mice and dogs, and demonstrated in a firstin-human phase I study of leukemia. As a unique feature, aAVC serves as a platform for cellular therapeutics for treating various diseases by replacing antigens. In addition, because aAVCs do not need to be viable, by irradiating them, they can be made safer for use. In this study, we propose two applications of aAVC vaccines as a novel vaccine modality against infectious diseases. The first application is the development of a novel COVID-19 vaccine (aAVC-CoV-2) for high-risk groups with severe disease, which remains a challenge. The aAVC vaccine is expected to be useful for preventing severe disease because it is more effective than conventional vaccines. Within the time frame set to conduct this study, we will perform necessary non-clinical studies and a phase I clinical trial in patients with hematopoietic malignancies, particularly including those with B-cell malignancies. When this study successfully ensures their safety and long-term efficacy in humans, it will demonstrate the potential of aAVCs as a new vaccine modality. The findings from the study will demonstrate the immediate applicability of aAVC as a potent vaccine in the event of an unknown virus. The aAVC vaccine platform will enable the rapid production of vaccines against emerging and reemerging infectious diseases once an antigen information becomes available for such diseases.