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Development of innovative vaccines by the combination of novel technologies

Fumihiko Takeshita
Daiichi Sankyo Co. Ltd., Japan

In recent years, outbreaks of infectious diseases such as Ebora hemorrhagic fever and Zika virus-associated neurological diseases have been posing global health concerns worldwide, leading to an increase of public awareness and perceptions of importance of prophylactic vaccines to prevent infectious diseases. Recent progresses in science and technology in the field of vaccine have provided us with opportunities to develop novel vaccines based on such innovations. In this session, the topic is focused on the introduction of novel vaccine technologies currently under development in our company, such as the intradermal (ID) delivery system and a novel adjuvant. With regard to the ID delivery system, which has been co-developed with TERUMO Co. Ltd., the perpendicular insertion of the very tiny needle with 1.15 mm in length and 33G in size can be achieved by specific devices. Results in clinical trials conducted for the new ID vaccine for seasonal flu have demonstrated that more than 98% out of almost 1,000 injections resulted in the wheal formation at injection sites, indicating the accurate and consistent injection into the dermis by this system. Results in non-clinical pharmacology studies for the RSV vaccine candidate have suggested advantages of ID administration and our novel adjuvant in immunogenicity, i.e., both antibody responses and cell-mediated immune responses, and inhibition of allergic responses specific to vaccine antigens. We hope that the combinatorial use of such technologies confers the realization of innovative vaccines such as that targeting respiratory syncytial virus (RSV), which is currently unavailable due to several critical issues hardly overcome by conventional vaccine technologies.

Biography

Fumihiko Takeshita has his expertise in Vaccine R&D in both academia and industry. Based on his experiences in basic research on innate immunity and mechanisms in immunologic pathways in intradermal delivery of antigens and adjuvants, he is leading several different R&D teams of vaccines based on the open innovation network.

takeshita.fumihiko.aw@daiichisankyo.co.jp

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