

## 論 文 要 旨

### **Evaluation of Systemic and Mucosal Immune Responses Induced by a Nasal Powder Delivery System in Conjunction with an OVA Antigen in Cynomolgus Monkeys**

〔 粉末経鼻投与システムを用いたカニクイザルにおける OVA 経鼻投与後の全身及び粘膜免疫の誘導評価 〕

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An immune response for a nasal ovalbumin (OVA) powder formulation with an applied nasal delivery platform technology, consisting of a powdery nasal carrier and a device, was evaluated in monkeys with similar upper respiratory tracts and immune systems to those of humans, in order to assess the applicability to a vaccine antigen. Nasal distribution and retention studies using a 3D nasal cavity model and manganese-enhanced MRI were conducted by administering nasal dye and manganese powder formulations with the applied technology. Systemic and mucosal immune responses for the nasal OVA powder formulation were evaluated by determining serum IgG and nasal wash IgA antibody titers. The nasal dye and manganese powder formulations showed wider distribution and longer retention time than did a nasal liquid formulation. The nasal OVA powder formulation also showed comparable and higher antigen-specific IgG antibody titer to an injection and nasal liquid formulation, respectively. Furthermore, antigen-specific IgA antibody response was detected only for the nasal OVA powder formulation. The present study suggests that the technology, originally designed for drug absorption, is promising for nasal vaccines, enabling both a mucosal immunity response as the first line of defense and systemic immunity response as a second line of defense against infection.

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