Allergic Diseases: OVA-Induced Asthma

Typical mouse OVA asthma models take several weeks to induce asthma because anti-OVA antibody production is essential. To bypass this rate-limiting step, a newly-developed asthma mouse model uses an anti-OVA IgE monoclonal antibody (mAb) rather than OVA for sensitization, resulting in a one-week study as shown in Figure 1 (1,2). Chondrex, Inc. provides mouse anti-OVA IgE mAbs, allergenic E-C1 and non-allergenic E-G5, anti-OVA IgG mAb L71, and related anti-OVA antibody ELISA kits for studying OVA-related allergic diseases in mice, such as *in-vivo* hypersensitivity reactions for *in-vitro* and *in-vivo* experiments. For more information, please contact support@chondrex.com.

Figure 1. General Protocols for Inducing Asthma in BALB/c Mice

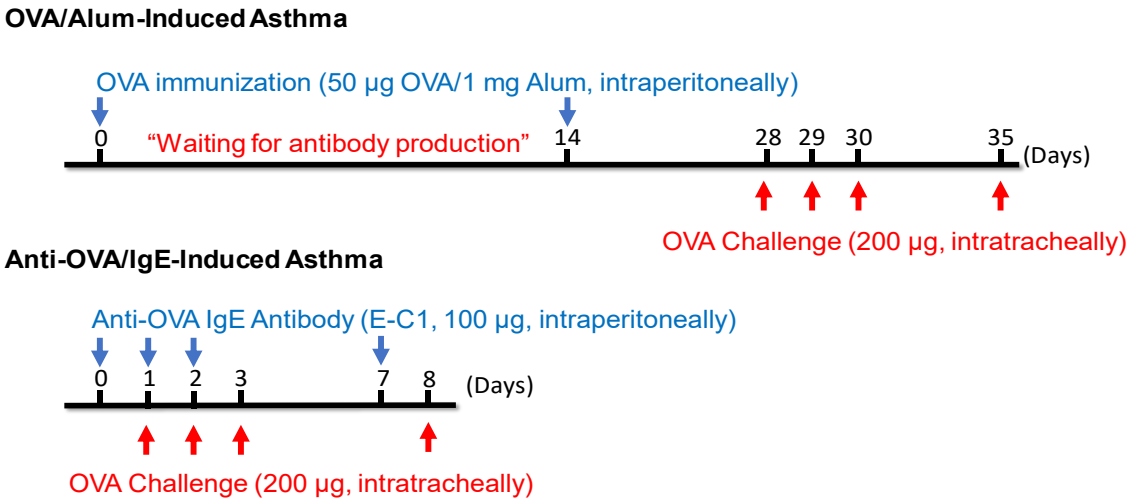

Figure 2 shows typical OVA-induced footpad swelling through the use of anti-OVA mAbs. Interestingly, anti-OVA IgG antibodies synergistically develop an allergic reaction with non-allergenic IgE. This result indicates that anti-allergen IgG antibodies may play pathogenic roles in allergic diseases by forming multivalent antigen complexes which bind to IgE on the surfaces of mast cells, rather than competing with IgE for its allergenic epitopes (3).

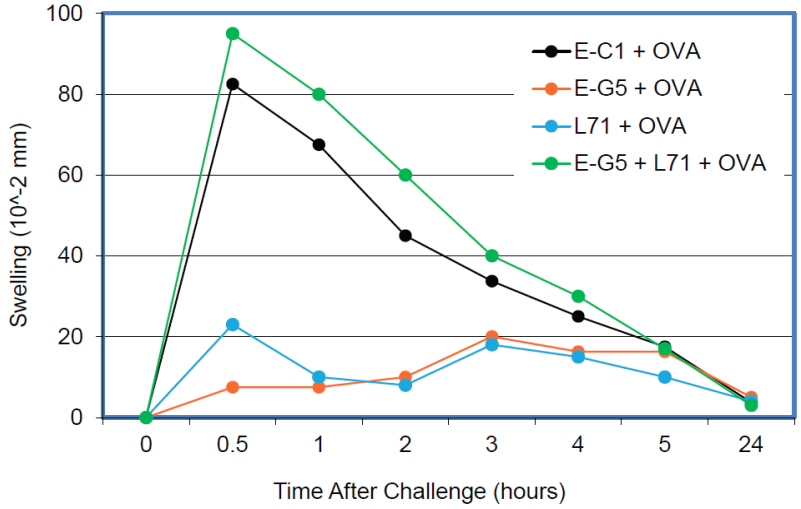

Figure 2. Footpad Swelling in Mice with Anti-OVA IgEs (E-C1 and E-G5) and IgG1 (L71)

BALB/c mice received 10 µg of anti-OVA monoclonal IgE antibodies (allergenic E-C1 and non-allergenic E-G5) and anti-OVA IgG1 antibody (L71) by IV injection, then were challenged with OVA (50 µg) by intradermal injection at the footpad after 24 hours. Footpad thickness was determined with a Loop Handle Dial Thickness Gauge and shown in mm. Sensitization with E-C1 resulted in a hypersensitivity reaction as indicated by footpad swelling (black). In contrast, E-G5 (orange) and L71 (blue) did not induce individual hypersensitivity reactions. Most importantly, co-injection of E-G5 and L71 synergistically induced a hypersensitivity reaction (green) commensurate to E-C1.

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Ovalbumin From Chick Egg White

Products	Quantity	Catalog #
Ovalbumin From Chick Egg White	50 mg, Lyophilized	30211
Low Endotoxin Ovalbumin From Chick Egg White	10 mg, Lyophilized	3022

Mouse Anti-OVA IgE and IgG Monoclonal Antibodies

Product	Mast Cell Activation	Hypersensitivity Reaction	Quantity	Catalog #
IgE, Clone E-C1	Yes	Yes	1 mg, Lyophilized	3006
IgE, Clone E-G5	No	No	1 mg, Lyophilized	3007
IgG1, Clone L71	No	No	1 mg, Lyophilized	3008

Mouse Anti-OVA Antibody and Total Immunoglobulin ELISA Kits

Products	Anti-OVA (Catalog #)	Total Immunoglobulin (Catalog #)
IgE Antibody Assay Kit	3004	3005
Serum IgE Antibody Assay Kit	3010	-
IgG Antibody Assay Kit	3011	3023
IgG1 Antibody Assay Kit	3013	3025
IgG2a Antibody Assay Kit	3015	3026
IgG2b Antibody Assay Kit	3016	3027
IgG2c Antibody Assay Kit	3029	-
IgG3 Antibody Assay Kit	-	3028
IgM Antibody Assay Kit	3017	3024
IgA Antibody Assay Kit	3018	3019

*Individual monoclonal antibodies against OVA are also available. Please visit www.chondrex.com for more information.

Other Reagents

Products	Catalog #
Mouse Mast Cell Protease-1 (MCP1-1) Detection Assay Kit	6046

References

1. N. Mizutani, H. Goshima, T. Nabe, S. Yoshino, Establishment and characterization of a murine model for allergic asthma using allergen-specific IgE monoclonal antibody to study pathological roles of IgE. *Immunol Lett* **141(2)**:235-45 (2011).
2. N. Mizutani, H. Goshina, T. Nabe, S. Yoshino, Complement C3a-Induced IL-17 Plays a Critical Role in an IgE-Mediated Late-Phase Asthmatic Response and Airway Hyperresponsiveness via Neutrophilic Inflammation in Mice. *J Immunol* **188(11)**: 5694-705 (2012).
3. P. Mehlhop, M. van de Rijn, A. Goldberg, J. Brewer, V. Kurup, *et al*. Allergen-induced bronchial hyperreactivity and eosinophilic inflammation occur in the absence of IgE in a mouse model of asthma. *Proc Natl Acad Sci USA* **94**: 1344-49 (1997).