

# Anti-PAR2 Blocking Antibody Inhibits the Initiation of Food Allergy

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## Background and Hypothesis:

Food allergy is a public health issue of global importance, affecting approximately 8% of children and increasing in prevalence. Previously, our lab discovered that food allergy development is dependent on skin barrier mutations and skin co-exposure to food allergen and environmental allergen such as *Alternaria alternata* (Alt). Additionally, RNAseq analysis has shown increased expression of ApoE in food allergy, implicating a possible role for PAR2 in food allergy initiation due to PAR2's involvement in ApoE synthesis. The objective of this study is to determine whether PAR2 regulates the acquisition of food allergy in neonatal mice with skin barrier mutations.

## Methods:

Flaky tail +/- pups were skin sensitized five times with allergen, starting on postnatal day 3 and then again on postnatal days 6, 9, 13, and 15. On each day of sensitization, pups were given either no injection or an injection of anti-PAR2 blocking antibody, IgG isotype, or saline. Detergent was then applied to the back of each pup followed by application of Alt, peanut (PNE), or Alt+PNE. 48 hrs after the last sensitization, pups were given an oral gavage of PNE, and rectal temperatures were monitored to measure anaphylaxis. Skin, intestine, plasma, and serum were collected 8 hours after gavage for later analysis.

## Results:

Statistical analysis for the change in temperature was done using the area under the curve by summation of temperature changes at 15, 30, 45, 60, and 80 min for each pup. Only the Alt+PNE group with no injection and the Alt+PNE group with isotype injection had a decrease in temperature that was statistically significant ( $p < 0.05$ ). Thus, anaphylaxis was inhibited in mice that received injections of anti-PAR2 blocking antibodies.

## Conclusion:

PAR2 is required for the initiation of food allergy. As such, PAR2 may be a potential drug target for intervention in food allergies.