



## The use of aluminum hydroxide as adjuvant modulates the antibody response to food allergens

**Bøgh, Katrine Lindholm; Andreassen, Mie Scharff; Madsen, Charlotte Bernhard**

*Published in:*  
Clinical and Translational Allergy

*Link to article, DOI:*  
[10.1186/2045-7022-5-S3-P100](https://doi.org/10.1186/2045-7022-5-S3-P100)

*Publication date:*  
2015

*Document Version*  
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

*Citation (APA):*  
Bøgh, K. L., Andreassen, M. S., & Madsen, C. B. (2015). The use of aluminum hydroxide as adjuvant modulates the antibody response to food allergens. *Clinical and Translational Allergy*, 5(Suppl 3), 100.  
<https://doi.org/10.1186/2045-7022-5-S3-P100>

---

### General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.



POSTER PRESENTATION

Open Access

# The use of aluminum hydroxide as adjuvant modulates the antibody response to food allergens

Katrine Lindholm Bøgh\*, Mie Scharff Andreassen, Charlotte Bernhard Madsen

From Food Allergy and Anaphylaxis Meeting 2014  
Dublin, Ireland. 9-11 October 2014

## Background

Aluminum hydroxide (Al(OH)<sub>3</sub>) is a widely used adjuvant for induction of experimentally Th2 responses in animals and hence has been used for examination of food protein allergenicity. Further Al(OH)<sub>3</sub> is used as an adjuvant for subcutaneous allergy vaccines. In the present study we investigated the impact of the use of Al(OH)<sub>3</sub> on the antibody specificity to the cow's milk allergens β-lactoglobulin and α-lactalbumin.

## Methods

The cow's milk proteins were denatured by reduction and alkylation. Brown Norway rats were immunised intraperitoneally with either the native or the denatured form of the allergen with or without Al(OH)<sub>3</sub> as adjuvant. The specific IgG1 and IgE antibody responses were analysed against the native as well as the denatured allergen by different ELISAs.

## Results

Denaturation of proteins will result in the unfolding of the native structure. Thus, while linear epitopes are maintained, there will be a consequential loss of conformational epitopes. Therefore examining the antibody reactivity against both the native and the denatured form of the proteins, will allow for examination of the relative proportions between antibodies raised against linear and conformational epitopes. This study showed that the native allergens had a greater sensitising capacity than their denatured counterpart. While native allergens primarily induced antibodies against conformational epitopes, the denatured allergens only induced antibodies against linear epitopes. However, most interestingly, this

study showed that the use of Al(OH)<sub>3</sub> modulated the antibody response, increasing the percentage of antibodies raised against linear epitopes.

## Conclusion

The study demonstrated that adsorption of proteins to Al(OH)<sub>3</sub> changes the antibody specificity to the proteins. As this modulation of the antibody response was most pronounced for rats immunised with the native form of the allergen, we hypothesise that Al(OH)<sub>3</sub> causes adsorption-induced changes in the protein structure, probably leading to an unfolding of the protein.

Published: 30 March 2015

doi:10.1186/2045-7022-5-S3-P100

Cite this article as: Bøgh et al.: The use of aluminum hydroxide as adjuvant modulates the antibody response to food allergens. *Clinical and Translational Allergy* 2015 **5**(Suppl 3):P100.

Submit your next manuscript to BioMed Central and take full advantage of:

- Convenient online submission
- Thorough peer review
- No space constraints or color figure charges
- Immediate publication on acceptance
- Inclusion in PubMed, CAS, Scopus and Google Scholar
- Research which is freely available for redistribution

Submit your manuscript at  
www.biomedcentral.com/submit



National Food Institute, Technical University of Denmark, Søborg, Denmark



© 2015 Bøgh et al; licensee BioMed Central Ltd. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. The Creative Commons Public Domain Dedication waiver (<http://creativecommons.org/publicdomain/zero/1.0/>) applies to the data made available in this article, unless otherwise stated.