SUMMARY

Early childhood immunizations have been accused to promote atopy development, either directly by the administration of agents which induce a Th2-type immune response or indirectly by the prevention of infections which otherwise would induce a preferential Th1-type immune response, and would thus skew the cytokine balance away from atopy. By contrast, BCG immunization has gained recent interest as an antagonist of exaggerated Th2-type immune response and as a potential atopy preventive tool.

The research questions for this work were:

(1) Do routine immunizations promote atopy development in childhood?

(2) Do routine immunizations have a potential to inhibit atopy development in childhood?

These are the findings:

- There is an inverse relationship of cumulative vaccine doses and allergic sensitization to environmental allergens, atopic dermatitis, and asthma in infancy and early childhood.
- Exposition to BCG, a prototype microbial inducing a Th2-antagonizing immune response, inhibits allergic sensitization and the development of increased airway reactivity in a murine model. In children, however, traditional BCG immunization does not result in sufficient atopy prevention.
- Immunization of infants with bacterial antigens inhibits IgE formation against model antigens. Cellular pertussis immunization down-regulates production of IgE and IgG4 (but not of IgG) to co-vaccinated antigens.
- In an experimental model we could show that vaccination with bacterial compounds can effectively prevent allergic sensitization to co-vaccinated allergens.

We may thus conclude:

- Routine childhood immunizations do not promote atopy development in childhood. Any child, including children at heightened risk for atopy, should be immunized according to recommended immunization schedules.

- It seems possible to prevent allergic sensitization to antigens by co-vaccination of routine vaccine antigens. In regard to allergens, this approach seems to be biologically plausible as well.
- Further research is warranted to evaluate the safety and efficacy of this concept for the prevention of allergic disease development.