

## Helminth Parasites and Allergic Disease in Vietnam: Do Gut Worms Protect against Allergic Sensitisation, Asthma, Eczema, and Hay Fever?

Carsten Flohr, Lambert Academic Publishing, Köln, Germany,  
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Allergic diseases can be described as hypersensitive disorders of the human immune system that cause serious specific immune responses against normally innocuous substances generally referred to as “allergens”. The immune response creates an inflammation, which can ultimately lead to a variety of symptoms, including asthma, eczema, and allergic rhinitis. Furthermore, approximately 1 of 5 children in industrialized countries suffers from allergic disease symptoms. It has long been suggested that allergic symptoms are rare in areas with increasing parasite exposure but common where parasite exposure is non-existent or highly reduced. Areas with low parasite exposures include rural regions in westernized countries and urban areas of developing countries. In spite of several studies performed on parasitic infections and their effects on the human immune system, there has been a great deal of controversy as to whether the prevalence of parasite infections induces a suppression of atopy and respiratory allergic diseases as well as a decline of prevalence in respect to these symptoms. Thus, the nature of the interaction between the host and parasite may be considerably complex, thus contributing to the current void in knowledge.

This book is one in a series that has been generated from master's or bachelor's theses published by the VDM Publishing House, Ltd. In the book, Carsten Flohr provides content for several studies that are focused toward preclinical observations over the course of several years in Vietnam. Each chapter of the book is generally presented in a peer-reviewed publication format, including methods, results, and summary sections. The material covered is very specific and goes into comprehen-

sive details about the specific results generated. A particular focus is the possible relationship between parasite infections and allergic diseases. The book is clearly organized into 5 major sections. The overall structure of the sections includes background and methods (Chapters 1-3), a treatment comparison study (Chapter 4), an intervention study (Chapter 5), cytokine profiles (Chapter 6), and discussions and conclusions (Chapter 7). This book might be interesting to those researchers in academia, clinical medicine, and biotechnology sectors. The readers might benefit from a greater understanding of the consequences of helminth infection as it relates to their respective studies of parasitology, allergy therapy, and chemotherapy.

The first chapter explains why this research had been performed, what the relevance of the research was, and what the research hypotheses were. The author provides evidence from prospective studies about the inverse relationship between helminth infection and skin sensitization. In the figures and tables, the author described the postulated link between the gut microflora and allergic diseases. Chapter 2 describes the methods that were used in the pilot studies and 3 major research projects that were being planned and conducted as part of Ph.D. degree studies. The cross-sectional baseline survey was detailed in Chapter 3, the randomized controlled trial to identify the best anthelmintic agent was overviewed in Chapter 4 and the main intervention study was described in Chapter 5. Chapter 3 focused on the results of the baseline survey for identifying associations with parasites and hygiene. This chapter also demonstrated independent protective effects of helminth infections, demographic and socioeconomic factors, and household exposure. A comprehensive statistical analysis generated by a multivariate model was also reported. In Chapter 4, the author presents a treatment comparison study between single oral dose of mebendazole (500 mg), which is currently being used by the World Health Organization-led National Helminth Control Program (NHCP), and placebo. Interestingly, the chapter reports that the treatment was not significantly superior to the placebo during the study of the hookworm-positive Viet-

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namese cohort. This chapter also suggests that it is necessary to implement a second study to search for a more effective anthelmintic regimen. As suggested in the previous chapter, the intervention study in Chapter 5 shows that anthelmintic therapy doses every 3 months during a 1-year period had no significant impact on the primary endpoint of exercise-induced bronchospasm in children from an area exhibiting a high prevalence of hookworm infections. However, the treatment significantly increased the risk of allergenic skin irritation. Chapter 6 tested the hypotheses of whether allergenic sensitization could be inversely related to hookworm-specific IL-10 at baseline and if anthelmintic treatment could lead to a reduction in hookworm-induced IL-10 when compared to placebo. The results of hookworm-specific host cytokine responses provided minimal support for a direct role of helminth-induced IL-10-mediated suppression of allergen skin sensitization. There was also no significant correlation between IL-5 or IFN- $\gamma$  responses and skin prick test positivity. In Chapter 7, the author discussed and summarized the overall results and implications from the studies of allergic diseases in Vietnam. In summary, the author

emphasized that the study presented here provides compelling independent evidence of a protective effect of *Ascaris lumbricoides* infection on allergen skin prick test responses not only in cross-sectional analysis, but also from a large individually randomized, double-blind, placebo-controlled trial with an anthelmintic agent.

Overall, this book provides an excellent resource for an experimental immunologist or biologist searching for interesting facts on an inverse correlation between allergy and helminth infections. Most of the topics illustrate a fascinating snapshot of progress in allergy and immunology that has been made through the use of current and advanced technology. Moreover, the studies described in this book can aid in teaching graduate students how to design and implement well-organized experiments.

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