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Foreword

One of the key words of immunology at the beginning of the 21st century is ‘regulation’. Twenty-five years later the Th1/Th2 paradigm, the concept of regulatory cell populations, is now in the heart of our understanding of immune response.

Helminths and allergic conditions are recognized as the main Th2 cell inducers. The negative association of allergic manifestations and helminth infections has been debated for over 30 years. It is, however, only in the recent past, that modulation of allergy by helminth infections has been clearly substantiated and shown to be consistent with the activity of regulatory cell populations, which control effector mechanisms of both Th1 and Th2 types.

Although remarkable progress has been made in identifying the molecular events required for Th2 differentiation, a number of questions which are addressed in this volume point to essential challenges.

Several contributions illustrate the critical importance of characterization of helminth molecules with Th2 or regulatory inducing activities and their modes of action in dendritic cells.

The large emphasis given to glycan epitopes highlights the profound immunomodulatory properties of glycan antigens and their role in inducing two key regulatory cytokines IL-10 and TGF-β. It is striking that the specificity of helminth infection does not influence the profile of the regulatory response: Schistosomes, *Onchocerca, Wuchereria* or gut nematodes for instance, induce similar patterns of cytokine production, the regulation appearing more related to the chronicity of infections than to the pathogen itself.
Although the identification of regulatory cell populations has progressed, we are left with a global notion of heterogeneity and a rather unclear respective role of the various incriminated populations: regulatory T and B cells, natural killer T cells, mast cells and basophils, etc. The concept that primary and secondary regulatory populations may account for their heterogeneity is very stimulating, and the role of Fox p 3 as a master control gene is very attractive.

Whereas most of the contributions discuss the down-modulation of allergy by helminths, there is also some evidence that allergy or predisposition to atopic diseases may protect against helminth infections. It is, on the other hand, of particular interest that removal or inhibition of regulatory T cells leads to the effective clearance of infection and restoration of antigen specific activity.

In practical terms, one may expect that allergen-specific immunotherapy, which generates populations of allergen-specific regulatory T cells, producing IL-10 and TGF-β, can significantly reduce allergic manifestations. Conversely, successful immunization against helminth infections and the development of efficient vaccines will certainly rely on a subtle balance between the induction of appropriate effector mechanisms and the expression of regulatory responses.

In this context, the various contributions to this volume dedicated to Parasites and Allergy reveal a new dimension of host-parasite interactions and of the importance of anti-inflammatory responses in chronic helminthiasis. They also provide a novel insight on the possible modes of down-modulation of unwarranted immune responses. They finally pave the way to new directions of research for the successful immunization against helminths and the prevention of inflammatory responses in allergic and autoimmune diseases.

André and Monique Capron, Lille